FACILITY CONDITION ASSESSMENT

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number
2240412.01

MACKENZIE
Since 1960

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PERTEET MACKENZIE.

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I. EXECUTIVE SUMMARY

The Old Fire House Teen Center is an 8,600 SF single story facility built in 1952 located at 16510 NE 79th St. It was last renovated in 2002 with voluntary seismic retrofits and a small tenant improvement. The facility has served the community as a fire station, police station, city hall and more. Most recently, since 1992, the building has served as the Old Fire House Teen Center – a gathering space for teens and a music venue, beloved by the community.

Today, the building shows clear signs of age. Critical building systems are old and failing. Water damage and hazardous materials are present throughout. The building is not adequately braced for seismic activity and the Hose Tower, could partially collapse in a seismic event. Significant overhauls are required to bring the building up to compliance with current codes and industry standards.

The architectural, engineering and hazardous materials teams were engaged by the City of Redmond to review several building and site evaluation reports, visit the site to verify conditions, and provide a compiled review of the building condition. The City is considering options to either renovate the building or completely demolish the building and construct a building of similar size and materials on the same site. To facilitate that evaluation, a high-level rough order of magnitude cost estimate for both options is included in the report. See Appendix A.

Below is a brief summary of current conditions and proposed remediation strategies. Refer to the expanded sections for additional detail.

Site and Accessibility

The Barrier Summary Report identified exterior ADA deficiencies including signing, vertical clearance, parking space sizing, sidewalk access withs, sidewalk vertical clearance, sidewalk slopes (longitudinal and cross), / picnic stage access, gates, turning spaces, parking lot slopes, and step, risers / heights. Nearly all of these ADA deficiencies still exist. These ADA deficiencies and deteriorated condition of the exterior site surface facilities will require complete replacement in either a remodel or complete building replacement. The service utility connections have been operational with no reported issues but would likely need to be replaced to current code standards for any remodel or replacement of the building.

Interior Accessibility

Doors, work spaces, and stairs throughout the building should be retrofitted or replaced to meet compliance. New ramps and or lifts are required at the Recording Studio, Sound Booth, and Showroom. The Kitchen should be gutted and furnished with compliant cabinetry and appliances. The Men's and Women's restrooms are not accessible, however with new signage the Unisex Restroom may meet code requirements. Fixtures and doors in the Unisex Restroom should be adjusted or replaced to meet current code.

Structural

The building structure is composed of a wood-framed roof on concrete masonry unit (CMU) bearing walls. New structural roof sheathing is required to seismically strengthen the building. All wood beams need to be inspected for wood rot and repaired or replaced as necessary. CMU walls require additional reinforcement with new steel strongbacks. The two braced frames, installed during the 2002 retrofit, need to be reinforced and partially replaced to meet current seismic design requirements. A geotechnical investigation is required to determine if the foundation requires strengthening; for the purposes of this evaluation, it is assumed that conventional shallow foundations are an appropriate foundation system for this structure.

Additionally, the Hose Tower is the greatest structural concern and poses a risk of breaking apart in a seismic event if it is not removed or strengthened. It could be a potential life safety issue and damage the rest of the building. The tower's cast in place concrete frame requires strengthening and the CMU façade is beyond repair and needs to be rebuilt with reinforced CMU or replaced with a light façade panel.

Building Envelope

The existing roof needs to be removed and replaced with all new flashing, downspouts, gutters, and insulation due to water damage and inadequate energy performance. All windows should be removed and replaced with modern high-efficiency windows. The Hose Tower needs to be reclad with a modern system. Furring and insulation should be added to all interior wall, or the building should be entirely reclad with a new system and insulation.

Interior Finishes

Interior partition walls should remain in place, maintaining current building layout. However, the interior finishes are dated and heavily worn. Floors, walls, and ceilings should receive fresh finishes. Additionally, some cabinetry should be provided or replaced at the entry office and kitchen. The kitchen should receive a fresh suite of appliances as well.

Mechanical, Plumbing, Fire, and Electrical

In general, the building systems are dated. Many are nearing end of life some have already failed.

Mechanical systems are old equipment models and do not meet current energy code. The rooftop unit should be replaced. Exhaust fans should be installed at restrooms and kitchen. Control system should be replaced with a modern one. Gas furnaces should be replaced with more modern, efficient systems.

Plumbing systems do not meet energy code and some have failed and are no longer in use. However, the restroom fixtures are active and functioning. The water heated should be replaced to meet modern loads, all galvanized and copper piping should be replaced and insulated. Sanitary lines should be cleaned out and inspected for signs of failure.

The fire sprinkler system is active and functioning, however it does not meet current water safety or fire system standards. The system should be upgraded with proper backflow requirements and quick response sprinkler heads to meet current standards.

The old electrical panels should be replaced with new. All new receptacles should be installed. All lighting controls should be replaced with a modern, energy compliant system. All light fixtures should be replaced with LED versions. The Fire Alarm system should be replaced. Old and unused wiring in the electrical room should be replaced or removed.

Hazardous Materials

Asbestos-Containing Material (ACM) was found in window glazing, flooring, interior walls, CMU walls, and piping.

II. SCOPE OF ASSESSMENT

Extent of Investigation

This assessment is based on documentation developed for the City of Redmond by outside agencies. Perteet, Mackenzie, and consultants analyzed these documents and performed additional investigation as necessary.

Site and Building

Figure I.1 Aerial

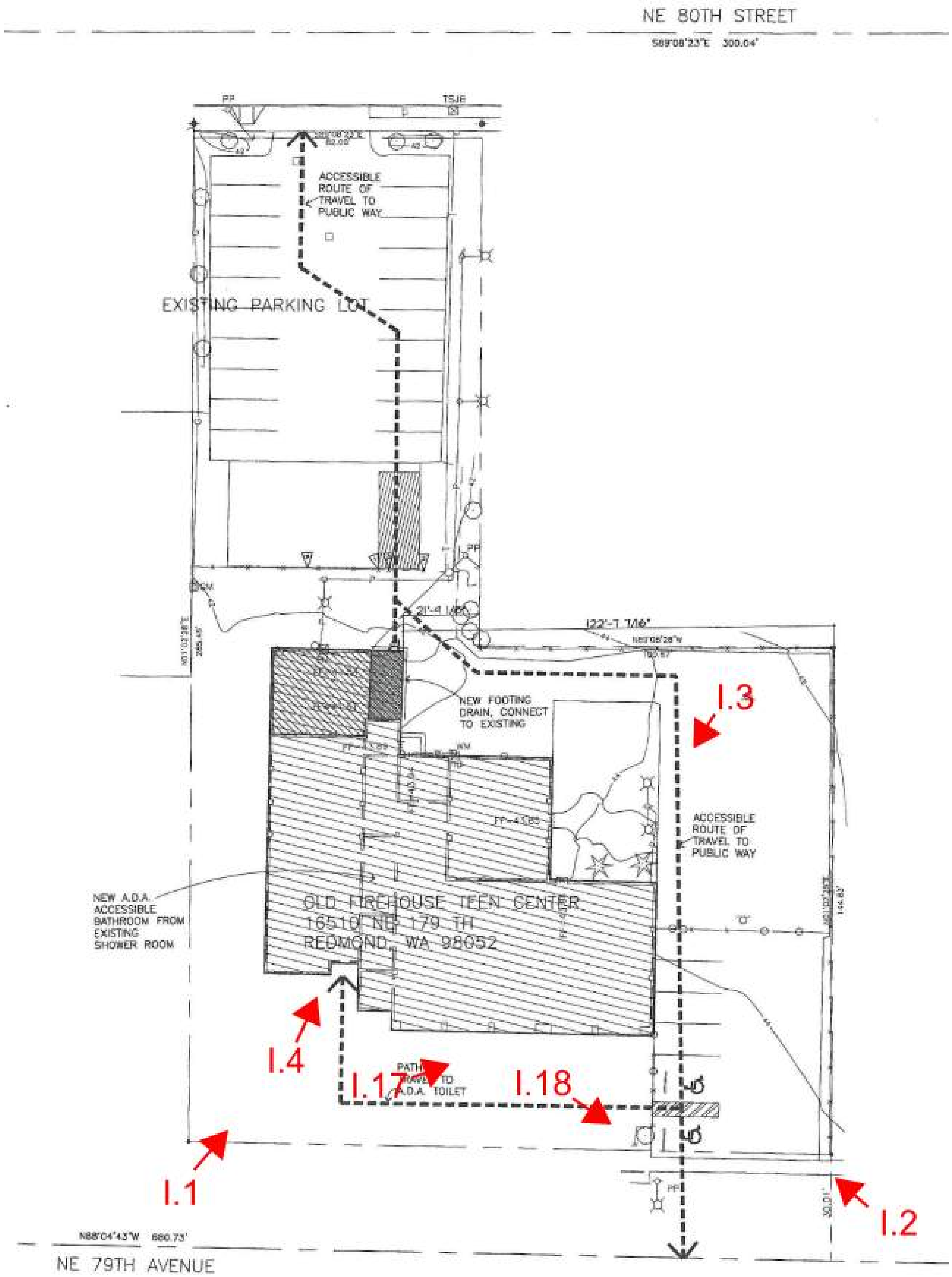

Figure I.2 Site Plan with Photo References

Figure I.3 Building Plan with Photo References

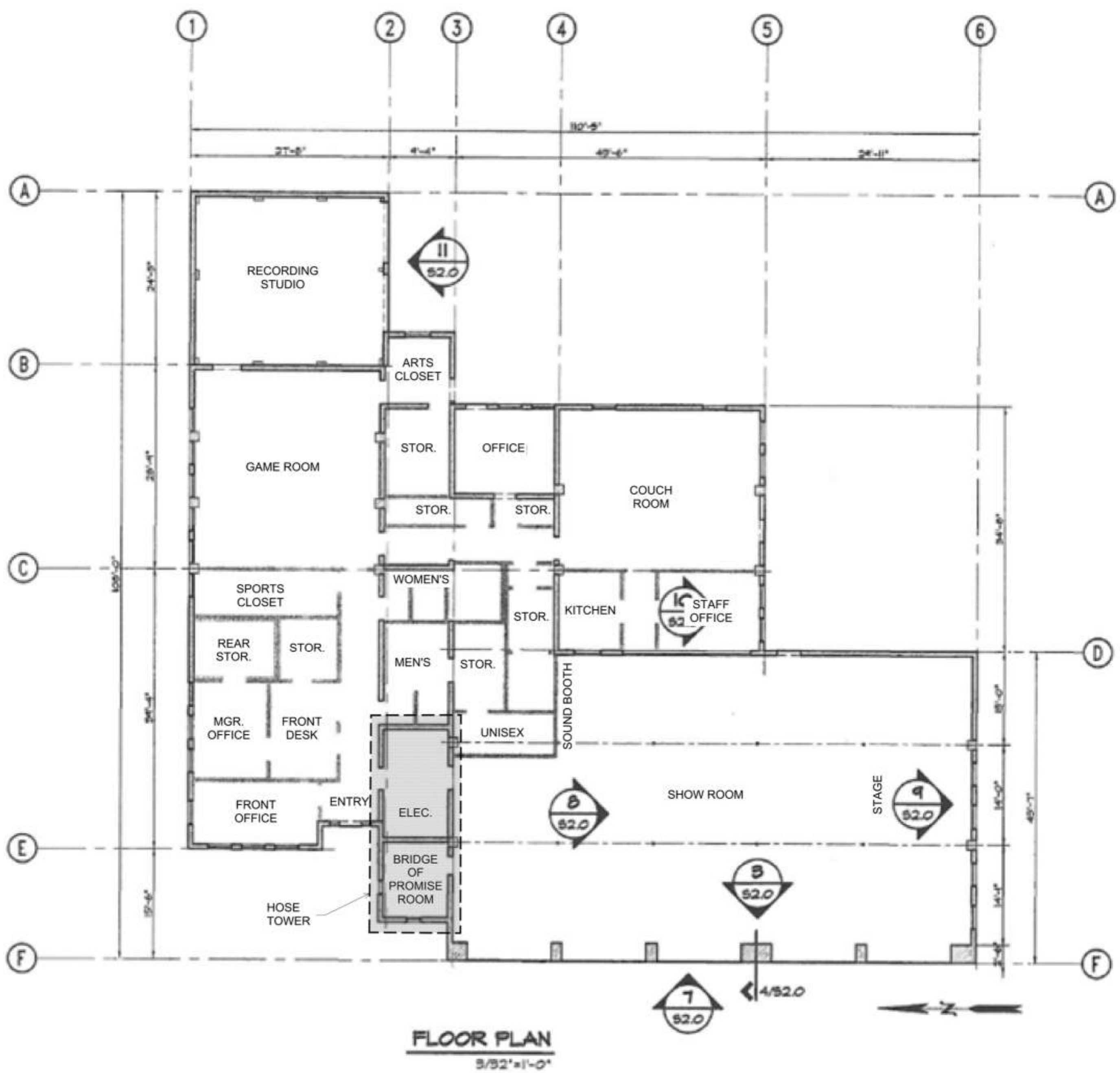

Figure I.4 Building Floor Plan (From 2002 drawings)

Image I.1 Southwest Corner

Image I.2 Southeast Corner

Image I.3 Northeast Corner

Image I.4 Building Entrance

Image I.5 Entry Door

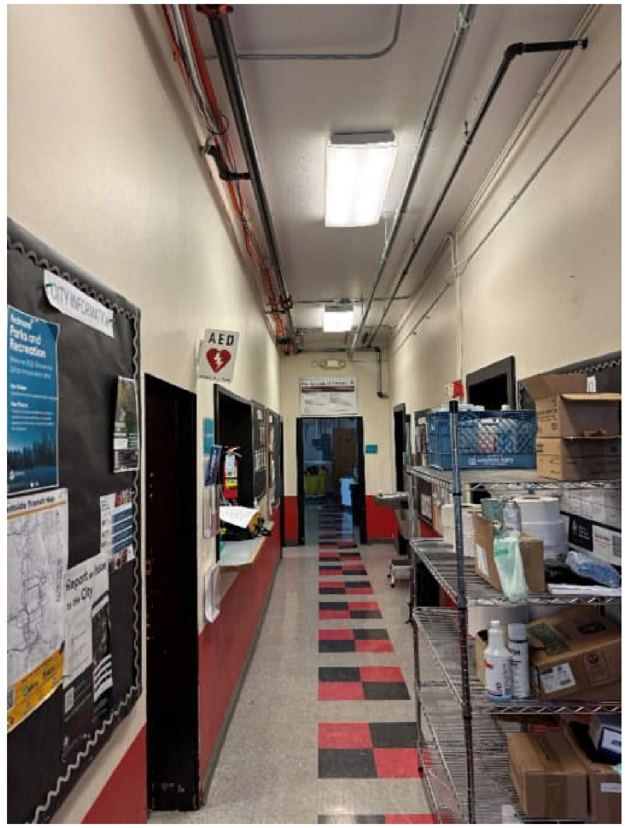

Image I.6 Entry Hall

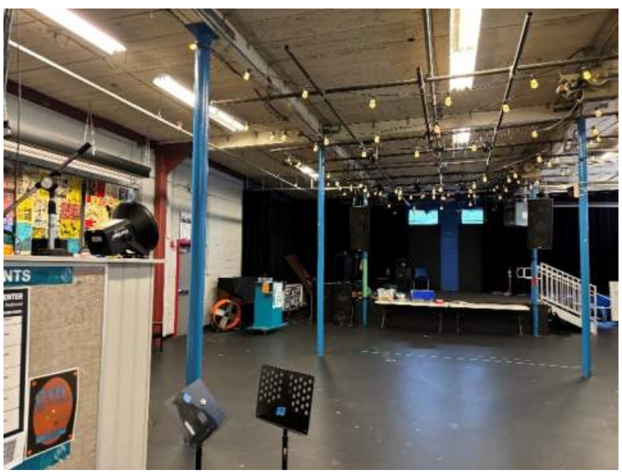

Image I.7 Showroom

Image I.8 Showroom

Image I.9 Kitchen

Image I.10 Kitchen

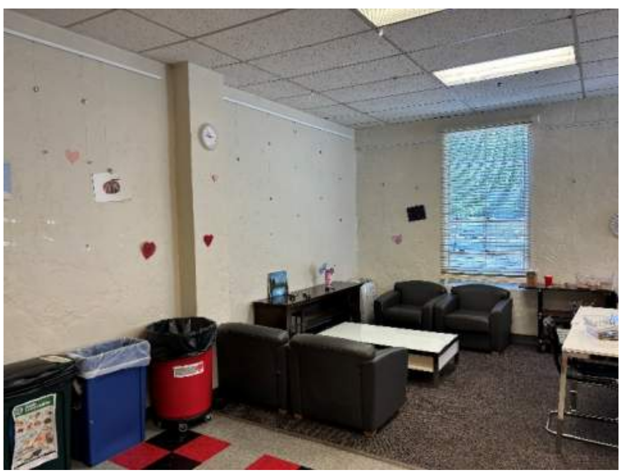

Image I.11 Couch Room

Image I.12 Couch Room

Image I.13 Game Room

Image I.14 Recording Studio

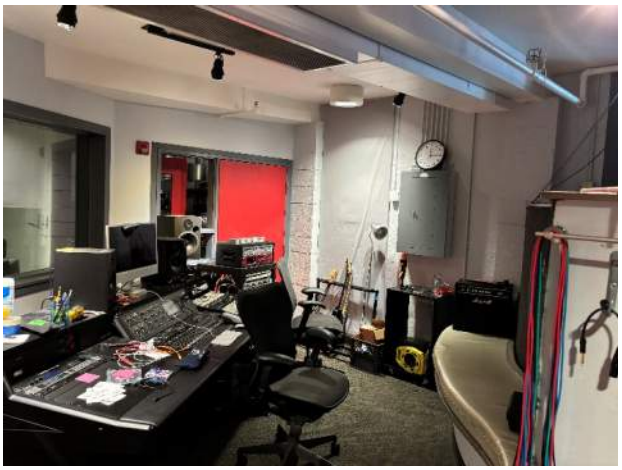

Image I.15 Recording Studio

Image I.16 Recording Studio

Image I.17 Patio Cover

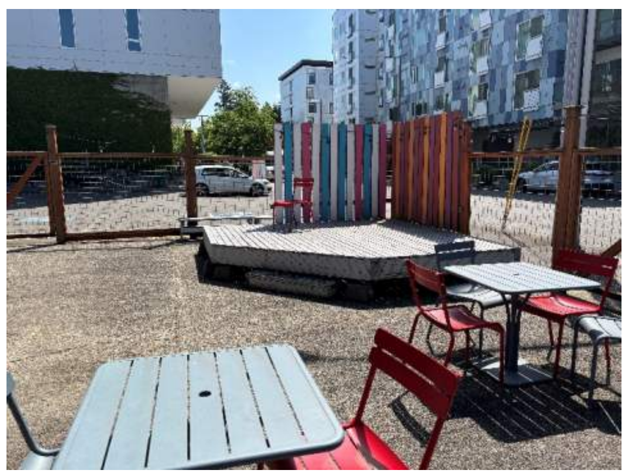

Image I.18 Patio Stage

Documents Provided

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf
- *Barrier Summary Report*, May 2025, ADA Barriers OFH.pdf
- ARC Architects, *Redmond Teen Center*, Aug 2002, OFH Teen Center 2002 TI and Seismic Plans.pdf
- Swenson Say Fagét, *Redmond City Facilities Building Seismic Evaluation*, Nov 2016, Redmond Building Seismic Eval SSF 2016.pdf
- Amec Foster Wheeler, *Summary of Asbestos-Containing Materials*, May 2015, Summary- Teen Center.pdf
- Amec Foster Wheeler, *Bulk Asbestos Sampling and Analysis_Old Fire Station and Teen Center*, May 2015, Bulk Asbestos Sampling and Analysis_Old Fire Station and Teen Center.pdf
- Amec Foster Wheeler, *Sample Collection Locations*, May 2015, Figure Teen Center
- NVL Labs, *RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507912.00*, May 2015, Lab Results RED OFC1-ACM.pdf
- NVL Labs, *RE: Bulk Asbestos Fiber Analysis, NVL Batch # 15079013.00*, May 2015, Lab Results RED OFC2-ACM.pdf

The following documents were provided by the City of Redmond; however, they refer to a different building – the senior center located at 160th Ave NE which has since been demolished. As such, these documents were not analyzed for this report.

- HDR, *Redmond Senior Center Final Building Investigation Report*, Nov 2019, HDR Building Investigation Report.pdf
- Swenson Say Fagét, *Redmond Senior Center Building Investigation*, Aug 2019, Redmond Senior Center Investigation Report 2019-08-29.pdf
- ARC Architects, *Redmond Senior Center Comparative Market Analysis*, Aug 2019, Senior Center Comparative Market Analysis.pdf

See Appendix B for Documents Provided

PERTEET MACKENZIE.

III. Civil Site, Exterior Accessability and Utilities

To
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I. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
  - Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf
- *Barrier Summary Report*, May 2025, ADA Barriers OFH.pdf
- Civil and Utility Site Plans
- Civil and Utilities Opinion of Cost

Additional Investigation

June 4th, 2025: Perteet visited the site to get measurements of all civil site elements to support completion of the Civil Site plan and opinion of Cost.

II. SUMMARY OF CONDITIONS

The Old Firehouse Teen Center is a one-story building that was constructed in 1952 and partially renovated in 2002. Perteet evaluated all the site civil elements including utility service lines.

III. VERIFICATION AND ASSESSMENTS

Existing mature trees and landscaping will be saved, but new landscaping will be installed under a building upgrade scenario. The attached Redmond Firehouse Exhibit shows all the Civil Site elements reviewed by Perteet. Additionally, the Barrier Summary Report identified exterior ADA deficiencies including signing, vertical clearance, parking space sizing, sidewalk access withs, sidewalk vertical clearance, sidewalk slopes (longitudinal and cross), / picnic stage access, gates, turning spaces, parking lot slopes, and step, risers / heights. Nearly all of these ADA deficiencies still exist. These ADA deficiencies and deteriorated condition of the exterior site surface facilities will require complete replacement.

IV. PROPOSED REMEDIATION

The proposed remediation recommends replacement of all civil site elements, excluding mature trees and landscaping. The cost estimate includes replacement value of the current exterior site facilities. The cost estimate also includes costs for replacement of the current service utility lines to the building. These service connections have been operational with no reported issues but may need to be replaced for any remodel or replacement of the building. The costs for the civil site element replacement are included in the overall project cost sheet.

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IV. ACCESSIBILITY (INTERIOR)

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I. SCOPE OF ASSESSMENT

Relevant Documentation

- *Barrier Summary Report*, May 2025, ADA Barriers OFH.pdf

Additional Investigation

June 5, 2025: Mackenzie visited the site to verify previously documented assessments of the building's interior accessibility. The following summary is based on the findings of the above report.

II. SUMMARY OF CONDITIONS

The facility does not comply with modern accessibility standards in several ways. Most rooms have at least a few deficiencies. Many doors, stairs, workspaces, and reach ranges require updates to come into compliance with current code. The Kitchen, Recording Studio, Sound Booth and Showroom, and Unisex Restroom have additional significant infractions.

Typical Noncompliant Items

Doors

Many do not comply with minimum height and width requirements. In many conditions the hardware does not comply, requiring “grasping, pinching, or twisting” actions or the hardware is mounted outside allowable heights. A few doors do not provide adequate clearance for push and pull operations between the door and other obstructions. A few have vision lights mounted too high. Finally, the main entrance door and adjacent office are too close to each other and do not meet requirements for doors in a series.

Note: While there are numerous infractions with doors throughout the facility, many of these are double- and triple- counted in the original barriers report. For instance, the Bridge of Promise Office has five separate infractions. Replacing the door would resolve all of these, however the original cost estimate counted this door replacement five times. The new cost estimate from Wiggins Preconstruction Services has resolved these multi-counts.

Stairs

Most stairs are lacking adequate handrails. A few do not have uniform risers or have open risers.

Work Spaces and Reach Ranges

Numerous work surfaces do not provide adequate reach ranges for operable parts and appliances. Many are mounted too high and do not comply with knee and toe clearances.

Circulation

Protruding objects including hand sanitizers, fire extinguishers, and a drinking fountain impede the circulation path in a few locations.

Drinking Fountains

The facility does not meet the minimum required fixtures, including the requirement for a low level fountain.

Larger Infractions

The following spaces contain many of the infractions above along with a few major elements out of compliance.

Kitchen

Most of the kitchen cabnitery is non-compliant. Overall layout, clearances, hardware and more are not up to current code. Exposed pipes lack insulation or abrasive surfaces are present beneath the sink. Many appliances are outdated, such as the stove which does not comply because operation requires reaching across the burners.

Recording Studio

In addition to many of the above items, the recording studio lacks an accessible route. The entire studio is depressed a few feet below the rest of the building. Currently a stair is the only means of access to the space. With a limited footprint, a ramp is not feasible. A platform lift will be necessary to bring the space into compliance.

Sound Booth and Showroom

A ramp is required at both locations in order to provide an accessible route.

Unisex Restroom

Most fixtures in the Unisex Restroom including the water closet and shower controls do not comply with required clearances and reach ranges. Grab bars in the shower are not compliant. The threshold into the room exceeds that allowable by code. The barriers report did not identify any accessibility issues in the men’s and women’s restrooms.

Men’s and Women’s Restrooms

These restrooms are not accessible.

III. VERIFICATION AND ASSESSMENTS

Verification

Barrier Summary Report

This report provides line-item coverage of interior accessibility issues. It describes the building component at issue, location, and detail of the of the issue.

On June 5, 2025, Mackenzie visited the facility to perform a qualitative review of this report's findings. We determined this report still accurately represents current conditions.

However, the Barrier Summary Report appears to double- and triple- count many line items, which inflated the total cost estimate at the end of the original document. Mackenzie reviewed each line item and excluded duplicate counts. The cost estimate attached to the end of our executive summary reflects these exclusions.

Assessments

No additional assessment was required for interior accessibility.

IV. PROPOSED REMEDIATION

Typical Infractions

The following proposed remediations are based on the summary of deficiencies found in the Barrier Summary Report.______

Doors
Most are not compliant in at least one manner. Upgrade or replace all noncompliant doors to meet accessibility requirements for hardware, height, width, and vision lites.

Stairs
Install handrails as required. Replace or upgrade stair at Sound Booth to meet code requirements for rise:run ratio, tread, and nosing.

Work Spaces and Reach Ranges
A number of work surfaces do not provide adequate reach ranges for operable parts and appliances. Many are mounted too high and do not comply with knee and toe clearances. If the owner chooses to replace these work spaces, they should be replaced with code compliant work surfaces and equipment.

Circulation
Protruding objects should be relocated or recessed.

Drinking Fountains
Install a hi-lo drinking fountain with bottle filler.

Larger Infractions

The following spaces contain many of the infractions above along with a few major elements out of compliance.

Kitchen
Replace and upgrade all cabinetry and appliance with commercial grade equipment and accessible layout.

Recording Studio
Install a platform lift.

Sound Booth and Showroom
Install a ramp at both the Sound Booth and Stage.

Unisex Restroom
Shift water closet for compliance. Adjust or replace all fixtures for required reach range. Install accessible controls at shower. Install compliant grab bars at shower and water closet. Replace threshold to be code compliant.

Men's and Women's Restrooms

Provide signage to direct occupants to the accessible Unisex Restroom.

The above recommendation summary and attached Barrier Summary report anticipates that the entire building would be completely brought up to current ADA standards as an owner request. However, in the case of a renovation of an existing facility, it is not always required to bring the entire facility up to the ADA code. According to the ADA Accessibility Standards, Section 202, Existing Buildings and Facilities, where existing elements or spaces are altered, each altered element or space shall be updated per the code requirements. If compliance is technically infeasible, the alteration should comply to the maximum extent feasible. The extent of ADA upgrades may be limited to the areas, rooms and spaces that have other alterations. Additionally, where a primary function area is altered, to the maximum extent feasible, the accessible path of travel to the area and restrooms through the building and site should be made accessible. The accessible path of travel upgrade is required to the extent that it is not "disproportionate" to the total cost, which is generally considered to be at a threshold of 20% of the total cost of the alterations to the primary function area.

The provided cost estimate assumes that the owner requires that all accessibility upgrades would be implemented in all areas, irrespective of whether the spaces may be altered or not altered in a renovation, so that all elements of the building meet the current ADA code.

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V. STRUCTURAL SUMMARY OF FACILITY CONDITIONS

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I. SCOPE OF ASSESSMENT

Relevant Documentation

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- ARC Architects, *Redmond Teen Center*, Aug 2002, OFH Teen Center 2002 TI and Seismic Plans.pdf

- Swenson Say Fagét, *Redmond City Facilities Building Seismic Evaluation*, Nov 2016, Redmond Building Seismic Eval SSF 2016.pdf

Additional Investigation

An ASCE 41-17 Tier 1 seismic evaluation of the existing Old Fire House Teen Center was conducted for the City of Redmond. As part of the review, a site visit was conducted on June 5, 2025. Mackenzie visited the site to verify previously documented assessments of the building's structure. All easily accessible areas of the building were observed including the roof, spaces above acoustic ceiling, hose tower, and basement.

II. SUMMARY OF CONDITIONS

The Old Firehouse Teen Center is a one-story building that was constructed in 1952 and renovated in 2002. Original construction drawings were not available; however, the renovation drawings were available which specify some original structural information. The renovation included a partial voluntary seismic retrofit which appeared to address global stability of the structure and improved the load path of critical structural elements.

The building's gravity system consists of a wood framed roof and concrete masonry unit (CMU) bearing walls throughout the building. The lateral force resisting system consists of CMU bearing shear walls and two steel braced frames that were added in the 2002 retrofit. One frame is a double-channel braced frame in an X orientation located along the interior of the east elevation on gridline 5 (*Image VI.3)*. The other braced frame is a round steel section in a chevron orientation located on the south exterior elevation in one of the garage door openings along gridline F (*Image VI.13)*.

The roof diaphragm appears to consist of straight-sheathed 1x or 2x decking spanning between solid sawn wood beams (*Image VI.6)*. The decking may have an additional wood layer above; however, that could not be verified. In many parts of the building, especially the Show Room, Game/Rec Room and Couch/TV Room, the wood decking and beams have indications of water damage including warping and discoloration. One wood beam in the showroom has extensive checking in the grain that may require structural reinforcing after additional investigation (*Image VI.7)*. There is a discontinuation of the CMU not shown on the retrofit plans along the Gridline D in the show room which is infilled with light frame wood wall, it is unclear if this was a modification to the original wall construction (*Image VI.4)*.

The location, size, and spacing of the steel reinforcing bars in the CMU walls could not be confirmed from a visual inspection of the building, however the reinforcement locations and spacing are partially verified in the 2002 structural drawings. The drawings noted this information came from a masonry condition survey conducted in 2002; however, that report was not available to verify. Interior light framed non-bearing wood walls exist throughout the building.

The hose tower is constructed of a board-formed, cast-in-place concrete frame with a CMU façade covered with stucco and rock aggregate on the exterior (*Image VI.9, 10)*. The frame consists of three levels of concrete columns, beams, and slabs. The beam to column connections have chamfered corbels which were poured monolithically with the framing. The corbels appear in both directions of framing and there is a perforated concrete wall in the center of the tower. Exposed aggregate is visible in many parts of the hose tower indicating poor consolidation of the original concrete (*Image VI.16-21)*. The non-structural CMU facade does not appear to be reinforced, grouted, nor anchored to the concrete frame. The CMU mortar beds are in poor condition and seem to be non-existent in some areas. The walls are perforated with louver vents at each level on multiple elevations, and there are several blocks which have one or more faces broken (*Image VI.22)*. There is no major cracking readily visible on the exterior of the tower, but the structural condition of the external face of the CMU is difficult to assess as it is covered with stucco.

In the room labeled "rear storage" on the north side of the building it appears to previously have been a bank vault of some sort (*Image VI.1)*. It is framed with the exterior CMU structural wall on Gridline 1 and three interior non-bearing CMU walls on the other sides. All mortar beds show minimal to no mortar; empty gaps exist between many of the masonry units. The northern wall is covered by thick plaster and the condition of the mortar beds for the remaining wall is unconfirmed. The board formed concrete ceiling in the "vault" storage closet shows exposed aggregate indicating poor confinement of the concrete.

In the storage closet near the game room, it appears an interior CMU wall was partially demolished in the past based on CMU remnants extending perpendicular from the remaining wall. The blocks in the remaining wall are cracked and have been filled with non-structural expansion foam (*Image VI.2)*.

Along the gridline F in the show room, there are exterior, light metal framed fabric canopies above the roll-up doors (*Image VI.12)*. These are supported by exterior steel columns and the exterior walls. They appear to be anchored to the parapet with thru-bolts and a nut resting on exposed wood blocking (*Image VI.11)*. The blocking is discolored and saturated, and the threaded rods are rusting. Exposed wood trim also exists at the transition between roof heights where the galvanized trim is damaged, the wood has water damage and is allowing water infiltration.

Image VI.1 "Vault" in Office Area

Image VI.2 Demolished Wall

Image VI.3 Braced Frame on GL 5

Image VI.4 Steel column and wood framed wall in Showroom

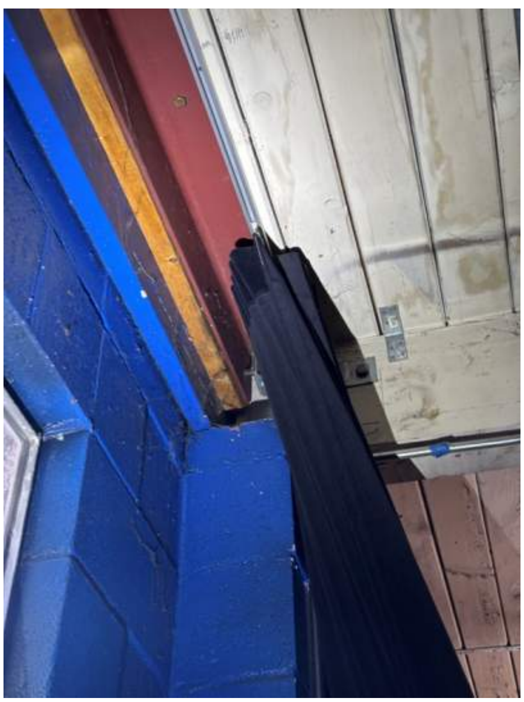

Image VI.5 Roof framing at pilaster in Showroom

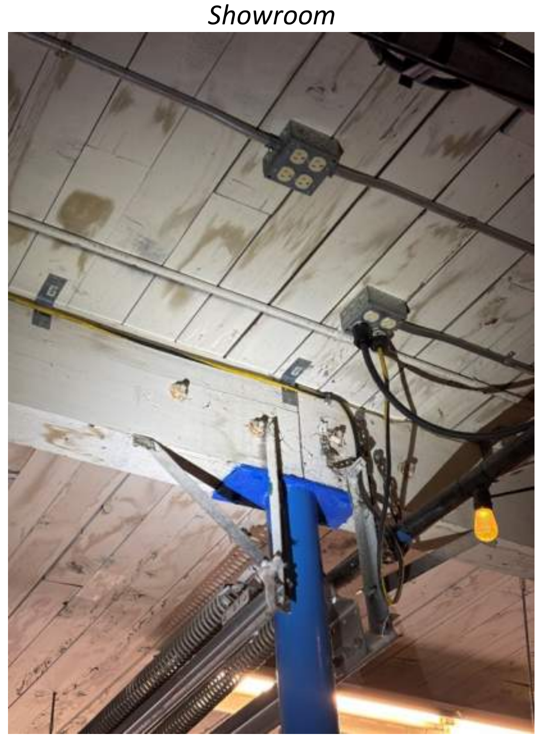

Image VI.6 Steel column and roof framing in Showroom

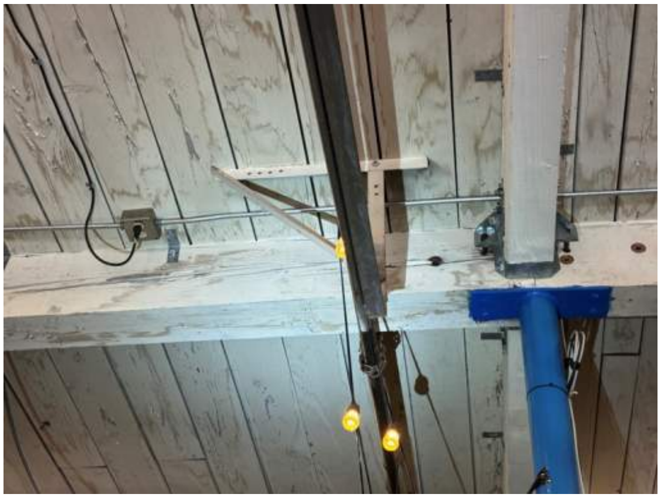
Image VI.7 Beam with large wood check in Showroom


Image VI.8 Exterior roof to wall anchorage


Image VI.9 East Elevation of hose tower

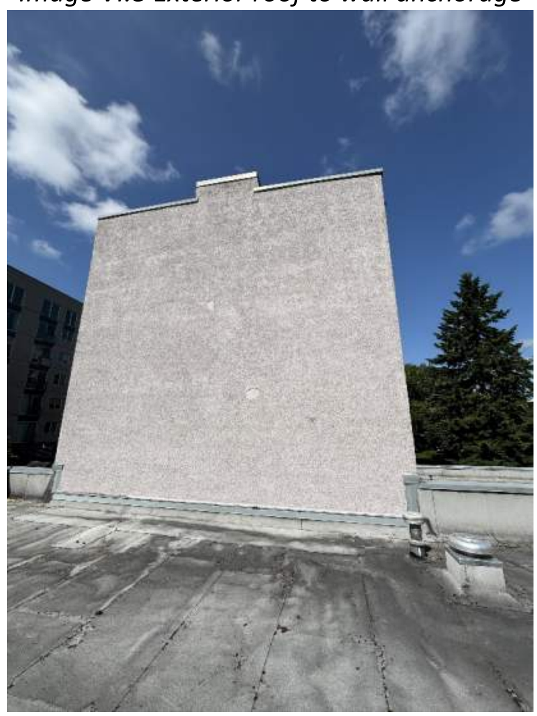
Image VI.10 South Elevation of hose tower

Image VI.11 Canopy anchorage on GL F

Image VI.12 Exterior canopy

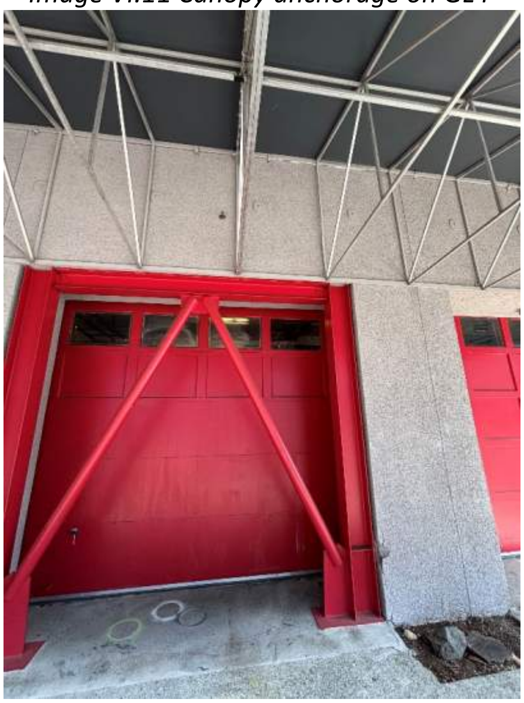

Image VI.13 Braced Frame on GL F

Image VI.14 Water-damaged roof decking in couch room

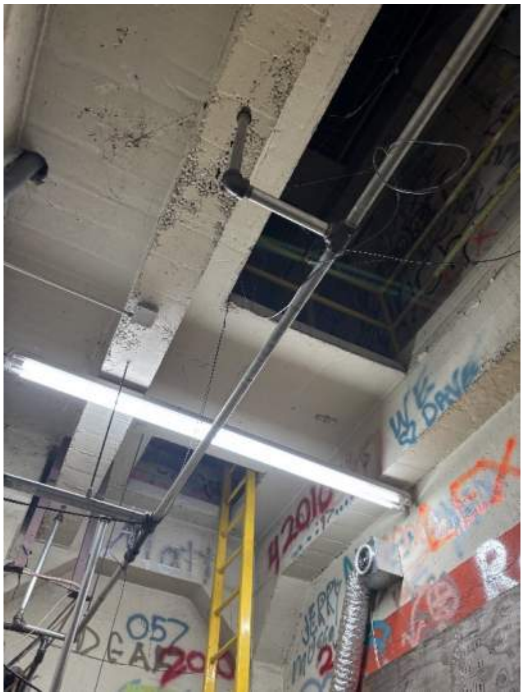

Image VI.15 Hose Tower from first floor

Image VI.16 Hose Tower concrete frame with poor consolidation

Image VI.17 Interior of hose tower from second floor

Image VI.18 Hose Tower concrete frame

Image VI.19 Hose Tower concrete frame

Image VI.20 Hose Tower and louver in CMU wall

Image VI.21 Hose Tower and louver in CMU wall

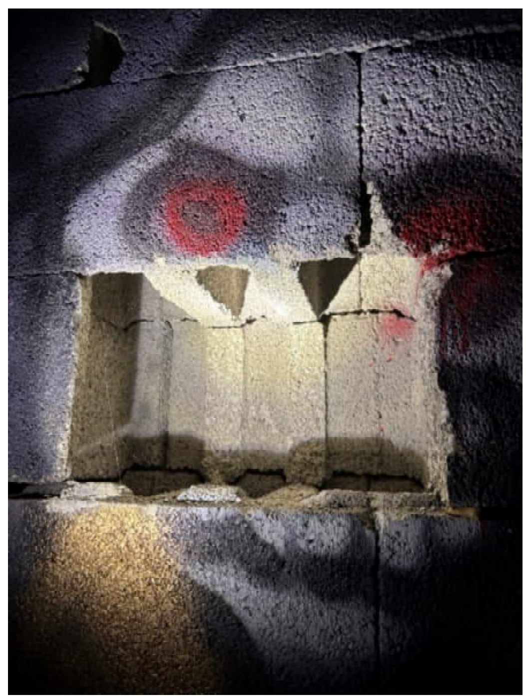

Image VI.22 Broken CMU block in Hose Tower wall

III. VERIFICATION AND ASSESSMENTS

Verification

City of Redmond Facility Condition Assessment, Mar 2024

This report describes the general construction type and deficiencies of the building. Listed structural deficiencies include repair of water-damaged roof framing and hose tower seismic reinforcing.

Redmond Teen Center, Aug 2002, OFH Teen Center 2002 TI and Seismic Plans

These are the drawings for the renovation and partial structural retrofit in 2002. The structural drawings appear generally accurate relative to the as-built conditions observed in the field.

Swenson Say Fagét, Redmond City Facilities Building Seismic Evaluation, Nov 2016

This report mainly focuses on the Fire Station facilities owned by the City of Redmond. However, there is a brief assessment of the Teen center. It generally describes the structure and common deficiencies of similar types of buildings. The report questioned whether the hose tower was retrofitted in 2002. Based on our observation and review of drawings, it appears that it was not retrofitted.

Assessments

ASCE 41-17 Tier 1 Evaluation

The seismic evaluation was conducted using ASCE 41-17 Seismic Evaluation and Retrofit of Existing Buildings. This document is a nationally recognized standard used by engineers to evaluate and retrofit existing buildings. New building codes include many provisions that require or encourage design and detailing practices that improve the seismic performance of a building, including regular building configuration, ductile detailing, and high-quality materials. While most existing buildings will not meet these criteria for new construction, ASCE 41 recognizes that these existing structural systems still have capacity that the new building code does not otherwise recognize. ASCE 41 includes guidelines and methods for evaluating the capacities of existing structural elements that might otherwise be insufficient when analyzed using the new building code provisions.

Within the ASCE 41-17 there are four building Performance Levels (lower to higher performance): Collapse Prevention (5-E), Life Safety (3-C), Immediate Occupancy (1-B), and Operational (1-A). Typically, only critical facilities and other high-risk structures are designed for Immediate Occupancy and Operational performance levels. Figure VI.1 and VI.2 summarize each performance level and the anticipated damage to a building designed to each performance level.

Table C2-3. Damage Control and Building Performance Levels

	Target Building Performance Levels			
	Collapse Prevention Level (5-D)	Life Safety Level (3-C)	Immediate Occupancy Level (1-B)	Operational Level (1-A)
Overall damage	Severe	Moderate	Light	Very light
Structural components	Little residual stiffness and strength to resist lateral loads, but gravity load-bearing columns and walls function. Large permanent drifts. Some exits blocked. Building is near collapse in aftershocks and should not continue to be occupied.	Some residual strength and stiffness left in all stories. Gravity-load-bearing elements function. No out-of-plane failure of walls. Some permanent drift. Damage to partitions. Continued occupancy might not be likely before repair. Building might not be economical to repair.	No permanent drift. Structure substantially retains original strength and stiffness. Continued occupancy likely.	No permanent drift. Structure substantially retains original strength and stiffness. Minor cracking of facades, partitions, and ceilings as well as structural elements. All systems important to normal operation are functional. Continued occupancy and use highly likely.
Nonstructural components	Extensive damage. Infills and unbraced parapets failed or at incipient failure.	Falling hazards, such as parapets, mitigated, but many architectural, mechanical, and electrical systems are damaged.	Equipment and contents are generally secure but might not operate due to mechanical failure or lack of utilities. Some cracking of facades, partitions, and ceilings as well as structural elements. Elevators can be restarted. Fire protection operable.	Negligible damage occurs. GPower and other utilities are available, possibly from standby sources.
Comparison with performance intended for typical buildings designed to codes or standards for new buildings, for the design earthquake	Significantly more damage and greater life-safety risk.	Somewhat more damage and slightly higher life-safety risk.	Less damage and low life-safety risk.	Much less damage and very low life-safety risk.

FIGURE VI.1: Table C2-3; ASCE Standard – ASCE/SEI 41-23: American Society of Civil Engineers – Seismic Evaluation and Retrofit of Existing Buildings

FIGURE VI.2: Building Performance Levels

ASCE 41-17 incorporates a multi-tier methodology for evaluating existing structures. Tier 1, which was chosen for this analysis, is a preliminary screening phase which utilizes a checklist approach to identify seismic deficiencies. As a part of the Tier 1 screening phases, various analyses or "Quick Checks" are to be performed where specifically required. Not all items that pass the quick check will necessarily meet more detailed checks nor are they guaranteed to meet current code requirements. It should be noted that at this stage, any identified deficiencies are preliminary and may or may not be justifiable using a higher tier analysis. Tier 2 and Tier 3 are the evaluation and detailed evaluation phases, respectively, which were not conducted at this time. If a deficiency is identified in the Tier 1 screening phase, further Tier 2 or Tier 3 analysis may possibly be used to show the specific item is acceptable or can be used to design retrofit measures.

The Tier 1 analysis consists of checklists evaluating typical structural elements. For each of the Tier 1 checklist items, an evaluation of Compliant (C), Non-compliant (NC), Not Applicable (N/A), or Unknown (U) is marked. NC does not necessarily mean that the issue cannot be justified with a higher tier evaluation phase; rather, only that it does not pass the Tier 1 screening criteria. See Appendix C.

.

SCOPE AND LIMITATIONS

The Tier 1 analysis and retrofit scheme is based on site observations, evaluation of available historic drawing documents, and preliminary calculations. It should be noted that other deficiencies might exist that have not been identified by this screening phase and quick checks. In addition, no material or other structural testing was performed at this time for review. No official geotechnical investigation was performed, and this scope only included a review of published hazard maps to estimate the liquefaction hazard potential.

STRUCTURAL DEFICIENCIES

Based on the ASCE 41-17 Tier-1 evaluation of the building, we have determined the Redmond Old Firehouse Teen Center has structural elements that are noncompliant and prevent the building from meeting the minimum structural performance objective level for existing buildings (BPOE) as defined in ASCE 41-17. A copy of the checklists used to determine the non-compliant (NC) items have been included in the Appendix. The noncompliant items and resulting deficiencies are outlined below.

1. Hose Tower – Inadequate CMU anchorage and in-plane strength and/or stiffness. The hose tower CMU is at risk of breaking apart in a seismic event and causing damage to the rest of the structure. The mortar beds appear beyond repair and are non-existent in some areas.

2. Braced frames – Load path and seismic detailing. At the time of its construction, the retrofit steel braced frames met seismic requirements; however, engineering and seismic hazard knowledge is continually evolving, and they do not meet ductility and stability requirements found in current code.

3. Diaphragms – Inadequate in-plane strength and/or stiffness. The straight-sheathed diaphragms have very low capacity to resists seismic loads.

4. CMU Walls – Inadequate out-of-plane wall strength. The existing structural CMU walls are under-reinforced and/or unreinforced in some locations. Additional investigation is required to verify existing reinforcing.

5. Foundations – Inadequate foundation ties and shear, flexural, and uplift anchorage. The building site is classified as having a low to moderate susceptibility of liquefaction according to the Washington State Dept of Natural Resources hazard map and would be classified as site class D or E per ASCE 7-16. It is assumed that all continuous footings under CMU walls and spread footings under columns would need to be interconnected with ties to comply with current code requirement for liquefaction mitigation. Additional geotechnical investigation is required to determine conformance.

IV. PROPOSED REMEDIATION

Based on the identified deficiencies and building condition, we have developed a conceptual strengthening scheme (see Appendix for sketch) for the Old Firehouse Teen center. Strengthening measures are recommendations intended to provide a general discussion of the potential mitigation and remediation likely needed for this building. However, they are conceptual and do not constitute a final engineered solution.

1. Hose Tower – A cost-effective option to mitigate seismic risk of the hose tower would be to demolish the hose tower and rebuild it out of light-framed wood construction.

2. Braced frames – The braces and gusset plate connections should be replaced. Foundation strengthening may be required.

3. Diaphragms – Add new plywood diaphragm above the existing straight-sheathing. This will require a new roof and insulation and possible structural upgrades to the gravity roof framing, such as reinforcing beams for additional weight.

4. CMU Walls – Strengthen CMU walls out-of-plane with steel column strongback bracing.

5. Foundations – The current soil conditions are unknown and additional geotechnical investigation is required to determine conformance. Foundations A contingency should be carried for foundation strengthening such as concrete foundation piles or micro-piles with uplift anchorage.

6. Wood Framing – All wood roof framing members and structural decking should be inspected by a wood rot specialist and repaired or replaced where there are concerns of water rot.

VI. BUILDING ENVELOPE SUMMARY OF FACILITY CONDITIONS

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number
2240412.01

MACKENZIE
Since 1960

Logan Building | 500 Union Street, Suite 410, Seattle, WA 98101
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I. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf
- ARC Architects, *Redmond Teen Center*, Aug 2002, OFH Teen Center 2002 TI and Seismic Plans.pdf

Additional Investigation

June 5, 2025: Mackenzie visited the facility to verify previously documented assessments of the building envelope. The following summary is based on the findings from the above reports.

II. SUMMARY OF CONDITIONS

The facilities envelope shows signs of aging and failure in some core elements. Roofing and Flashing, Exterior Stucco Finishing, and Exterior Windows are especially concerning – showing significant signs of age and failing in areas. Observations are based on visible exterior issues that could impact additional layers of internal roof and wall assemblies that are not visible. The Meng analysis did not speculate on damage not visibly apparent, such as moisture issues within a wall. If a more in depth analysis of building assemblies is desired, it is recommended that a forensic consultant do selective demolition into walls and roof assemblies for analysis .

Areas of Concern

Roofing and Flashing
The torch down roofing is near end of life, with many patches and bubbling. Areas around the hose tower are of particular concern. Gutters and downspouts are failing. Wood deck in the showroom is damaged from previous leaks with paint peeling. This paint is likely lead based due to the age of the building. Insulation is likely far below current code minimum.

Windows
Exterior windows are original single-pane glazing in aluminum frames. Many are broken, warped, and failing. Some broken windows have been replaced with plexiglass set in silicon caulking. There is some daylighting between the frames and walls. Air infiltration is widespread and some water infiltration is causing condensation buildup which may have infiltrated the walls. Windows contain hazardous materials, refer to the Hazardous Materials section for details.

Exterior Walls
Exterior finish of stucco on concrete block masonry is peeling off in many areas. In some cases (particularly around the hose tower), temporary cement board cover has been bolted over to hide failing stucco. This board cover is now water damaged. In general cracks and minor damage is present throughout the exterior finish, requiring minor maintenance. Interior wall surfaces do not show visible surface damage, but the white coating on plaster contains asbestos and likely lead-based paint. Walls are not insulated.

Good or Acceptable Condition

Exterior Doors
Hollow metal doors appear in acceptable condition. Overhead doors show signs of age.

Projections
Fabric awnings in acceptable condition.

Basement
Due to asbestos, the basement was not observed.

III. VERIFICATION AND ASSESSMENTS

Verification

City of Redmond Facility Condition Assessment

This report provides a line-item analysis of building envelope concerns. The findings are still applicable and represent a holistic assessment of the building envelope.

Facility Summary

This report is superseded by the 2024 report provided by Meng above.

Redmond Teen Center

This drawing set provides some information regarding the recording studio construction.

Assessments

The *City of Redmond Facility Condition Assessment* report was found to be thorough applicable to current facility conditions. The summary and proposed remediations are based on that report.

IV. PROPOSED REMEDIATION

There is a range of upgrades that can be made to an existing building envelope to meet current code at the time of a renovation. It is not always required to bring all elements up to current code if the particular element is not disturbed in a renovation. However, due to the current damaged condition of the building and needed repairs, and the lack of fundamental insulation and other building envelope protections, it is recommended that the building undergo a full update of all building assembly components for the health, safety, comfort and durability of the building.

Roofing and Flashing

Remove existing flashing and roofing. Add rigid insulation above deck to meet or exceed current energy code, taper for drainage. Install all new flashing, roofing, downspouts, and gutters. Repair any roof components that may have water damage.

Windows

Remove and replace all windows with high-efficiency windows and frames. Repair adjacent wood framing that may be damaged by water intrusion, and add window wrap for a water and air barrier and add window flashing.

Exterior Walls

Replace all cladding and flashing at hose tower with a modern system providing drainage and a rainscreen. Repair and maintain minor cracks around remainder of facility. Inspect behind areas of damaged stucco for damage to concrete masonry wall structure and make required repairs.

On the interior, add furred framing, waterproofing, and rigid insulation to the inside face of all concrete masonry walls to meet or exceed current insulation code. Add a layer of gypsum board and paint for the interior surface finish.

Optional alternate: reclad entire building with modern system to replace the stucco, such as a furred rainscreen, waterproofing and fiber cement siding, adding insulation at exterior side to meet or exceed current code.

VII. Interior Finishes

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number
2240412.01

Logan Building | 500 Union Street, [illegible] Seattle, WA 98101
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I. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf
- ARC Architects, *Redmond Teen Center*, Aug 2002, OFH Teen Center 2002 TI and Seismic Plans.pdf

Additional Investigation

June 5, 2025: Mackenzie visited the facility to verify previously documented assessments of the building envelope. The following summary is based on the findings from the above reports.

II. SUMMARY OF CONDITIONS

Partitions and Wall Finishes

On frame or masonry with lath and plaster. Paint appears in good condition with minor areas needing touch-up. Interior surfaces contain asbestos and likely lead-based paint.

Interior Doors

Wood doors and frames. Many show signs of paint damage and heavy wear, especially at the restroom doors. Likely contain lead-based paint.

Floor Finishes

Vinyl composition tile, carpet, and rubber tile. Broadloom carpet with runs/tears, wear, and stains. Mastic and other material below contain asbestos. Rubber bases contain asbestos mastic.

Ceiling Finishes

Open ceilings, suspended acoustic ceiling tile (does not meet seismic requirements). Original glue-up fiberboard panel ceiling tiles. Ceilings contain asbestos. Worn and scuffed.

Cabinetry

Kitchen, dated, worn, and not accessible (see Accessibility section). Office storage consists of standalone shelving and cabinets.

Miscellaneous

Graffiti on toilet partitions.

Sound Booth. Currently OSB floor and stair. Exposed studs on booth side. Worn work surface.

III. VERIFICATION OF ASSESSMENT

Verification

City of Redmond Facility Condition Assessment

This report provides a line item analysis of building envelope concerns. The findings are still applicable and represent a holistic assessment of the building envelope.

Facility Summary

This report is superseded by the 2024 report provided by Meng above.

Redmond Teen Center

This drawing set provides some information regarding the recording studio construction.

Assessments

The *City of Redmond Facility Condition Assessment* report was found to be thorough applicable to current facility conditions. The summary and proposed remediations are based on that report.

IV. PROPOSED REMEDIATION

Partitions and Wall Finishes

It is expected interior partitions will remain in place. Update all walls with fresh finishes or coats of paint. Abate hazardous materials per the hazardous materials report.

Interior Doors

Update all doors with fresh paint. Replace doors any doors that cannot be restored to like-new condition. Abate as required per the hazardous materials section.

Floor Finishes

Provide all new flooring. Abate as required per the hazardous materials section.

Ceiling Finishes

Refresh all ceiling finishes. Replace worn and broken finishes. Replace suspended acoustic tile ceilings with seismic systems.

Cabinetry

Replace all Kitchen cabinetry. Replace standalone storage at Front Desk with new built-in cabinetry. Refresh all work surfaces.

Miscellaneous

Refresh toilet partitions.

Sound Booth: provide new floor and wall finishes to cover exposed OSB board flooring and studs at half-wall. Replace existing work surface with new countertop.

VIII. MECHANICAL, PLUMBING, AND FIRE

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number
2240412.01

V. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf

Additional Investigation

June 5th, 2025: Hargis visited the site to investigate fire protection, plumbing, heating, ventilation and air conditioning assessment related to current conditions and codes.

VI. SUMMARY OF CONDITIONS

The mechanical systems are tired and do not meet current construction standards with many systems well beyond their useful life. Systems do not meet the current energy codes and have not been upgraded related to energy conservation for both plumbing and HVAC. Some systems have failed and are no longer in use. The fire sprinkler system is active and functioning. The restroom fixtures are active and functioning.

Fire Protection

The system itself is functioning and has been tested in the past year. A fire hydrant is within 50' of the fire department connection (FDC) and post indicator valve (PIV). The riser is located on the West side of the building in a riser room that shares as a storage space with gym type equipment. There is a single dry riser, however, the system itself along with the backflow do not meet current water safety standards or NFPA-13 standards. The sprinkler heads themselves are not quick response heads. The system is functional and holding pressure.

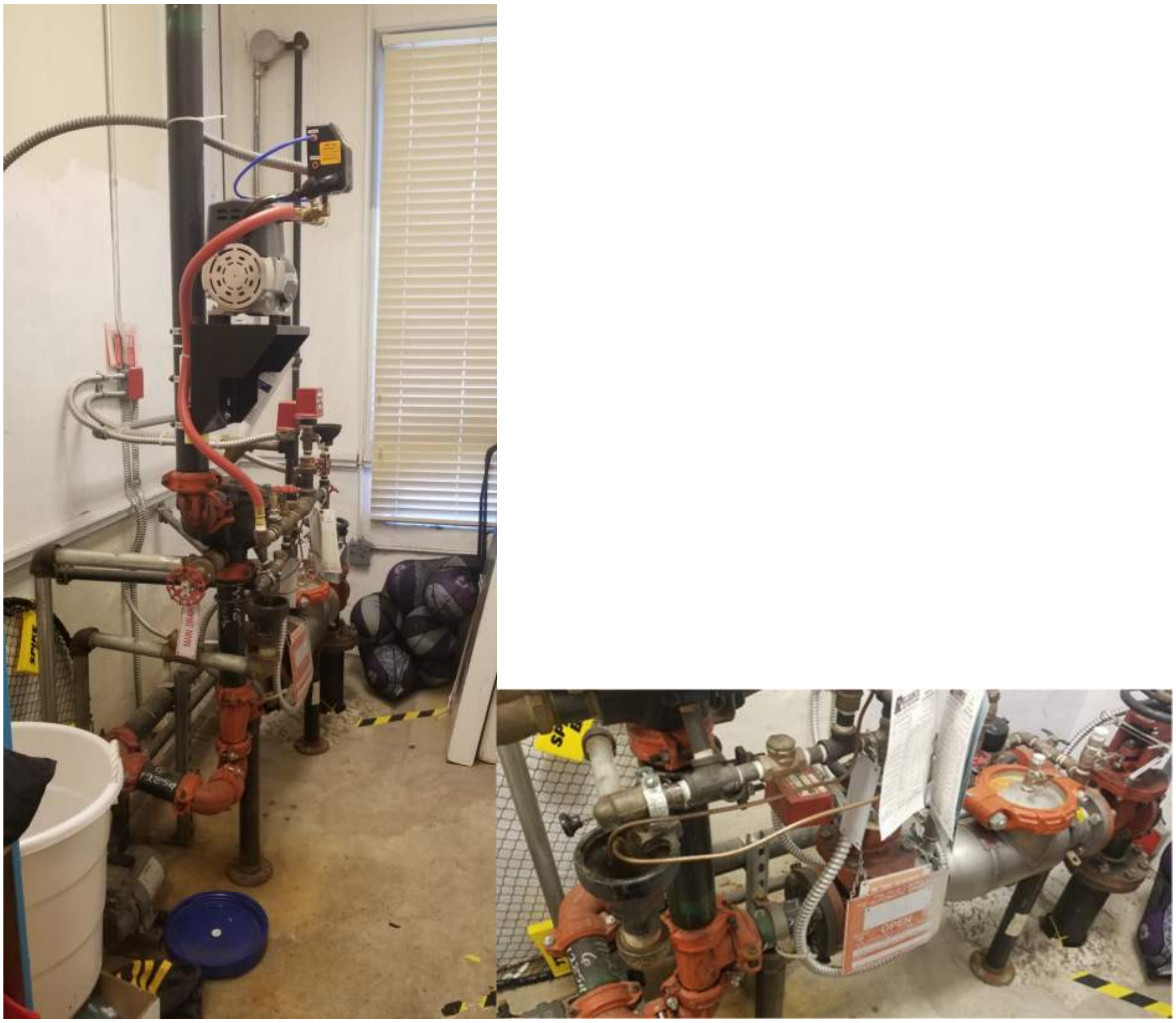

Figure M1A and M1B – Fire xFIRiser with backflow

Plumbing

The plumbing system consists of older vitreous china fixtures for the water closets utilizing tank style flushing. There is a urinal in the men's restroom. ADA for these fixtures was attempted, but there are some variations that meet current standards. The lavs are in counter style in the main restrooms and wall hung at the apparatus bay. The drinking fountain was replaced at some point and has a bottle filler component. The kitchen area has a standard stainless steel sink. There is a functioning shower within the apparatus bay. Only two hose-bibbs were observed on the exterior of the building in conjunction with an irrigation system. A mop sink exists in a room beyond the men's restroom. All fixtures are in fair condition. None have current water saving features or requirements meeting water conservation requirements.

The piping distribution system could not be observed other than where exposed at the water heater and below grade at an access panel. Based on the age of the building, it is likely that the sanitary sewer lines are not cast iron, but should be confirmed in conjunction with videoing of the lines to understand the condition. The piping is a combination of galvanized and copper. The water heater was replaced in 2014/15 based on the manufacture date. The hot water system is currently using natural gas with a flue through the roof. A circulation pump was not observed allowing for a hot water recirculation system to get hot water to lavatory fixtures within the health code required 10 seconds. These systems were observed to be functioning, but well beyond their useful life.

Figure M2 – Water Heater **Figure M3 – Fixtures** **Figure M4 – Drinking Fountain**

HVAC

The HVAC system is antiquated for current day requirements and programming. Some spaces have electric wall heaters to provide heating within the original building. Signage is posted to not place anything in front of the units for the risk of fire. The ventilation for these spaces is through opening windows. There is no ventilation system for the existing building other than the addition. The existing main building consists of four Modine style gas fired furnaces with flues through the roof. These units do not distribute air evenly through the space and are loud when used (exceeds code required NC-40 or 45 for the various spaces). There is one each in the larger activity rooms and two in the old apparatus bay that contains the stage. It was not confirmed whether these units were functioning or not. Each unit is controlled off of a stand-alone thermostat. The three restrooms (men's, women's and family/unisex) have a combined exhaust fan serving these spaces. The interior spaces do not have access to windows or ventilation. The addition is served by a 4-ton packaged gas/electric carrier rooftop unit that serves the sound studio and practice spaces only. This system does have ventilation air with ducting routed on the roof and not through the building. Based on the serial number, it appears the unit was manufactured in 2010. The exhaust fan ages could not be confirmed. All of these systems are beyond their useful life.

The equipment has been replaced along throughout the life of the building with the most recently observed new equipment being the packaged rooftop unit from 2010. The exhaust fans, wall heaters and gas fired units are all older than 20 years. The ducting on the roof did not appear to be insulated and does not meet current energy code requirements for efficiency or refrigerant type. Some of the thermostats did not appear to be functioning as the readout was not visible.

Figure M5 – Packaged HVAC unit

Figure M6 – HVAC unit Exterior Ducting

Figure M7 – Gas Furnace **Figure M8 – Wall Heater** **Figure M9 – Thermostat**

VII. VERIFICATION AND ASSESSMENTS

Verification

City of Redmond Facility Condition Assessment

This report provides a summary of the teen center on pages 510-553. Original construction was 1952 with gas as the energy source. The description of the fire, plumbing and HVAC aligns with this summary.

Facility Summary

This report is superseded by the 2024 report provided by Meng above.

Assessments

The water at the restrooms did not get hot right away and took well over a minute to get hot water to the lav.

Hargis observed that some of the thermostats were not functional and that the gas heaters were manually controlled.

Some of the existing shower and restrooms were converted to storage with plumbing lines abandoned and floor drains sealed.

When reviewing the rooftop exhaust fans, the fan wheels were not active. It could not be determined how the exhaust fans are being controlled

VIII. PROPOSED REMEDIATION

Remediation

In general, the mechanical systems are all well beyond their useful life and should be replaced in their entirety. None of the mechanical systems meet current codes or energy conservation measures. Some of the piping is in excess of 70 years old including all of the underground piping. This stated, the fire protection system, plumbing fixtures and HVAC system in general met code at the time of construction and is not required to be brought up to current codes.

Minimum recommendations are as follows:

- Update plumbing fixtures to meet ADA requirements
- Provide circulation pump and hot water circulation system to meet health code standards at the lavatory fixtures.
- Updating the control systems so the gas furnaces can be better controlled.
- Confirm exhaust fans are functioning properly for the restrooms and mop sink location

General recommendations are as follows:

- Upgrade fire sprinkler riser with current backflow standards and state requirements
- Upgrade fire sprinkler heads to quick response to meet current standards
- Update water heater based on age of equipment and current load requirements
- Replace existing galvanized and copper piping with new and provide non asbestos style insulation
- Jet and clean existing sanitary sewer lines. Provide photos to ensure existing system does not have pits or failed piping repaired as needed.
- Replace existing gas furnaces with packaged rooftop equipment and/or VRF equipment with DOAS meeting current energy code for larger spaces and offices. The wall heaters and gas furnaces would be removed.
- Replace existing rooftop unit with new based on the age of the equipment
- Replace/Upgrade exhaust fan systems at mop sink, restrooms, kitchen, etc to align with current code requirements and validate make-up air is properly provided.
- Update control system with new

IX. ELECTRICAL

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number
2240412.01

IX. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf
- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf

Additional Investigation

June 5th, 2025: Hargis visited the site to investigate electrical systems assessment related to current conditions and codes.

X. SUMMARY OF CONDITIONS

Much of the electrical system infrastructure is over 20 years in age and in general provides reasonable functionality for the current building uses but is outdated when compared to current construction standards and code requirements.

Power Distribution Equipment

The electrical service consists of a 400A 120/240V single phase overhead service connected from exterior PSE 37.5kVA pole mount transformer. The 400A service panel (Square D) is was installed in 2002 based on record drawings and supplies four additional branch circuit panels. Electrical panel summary is as follows:

1) Main service panel MDP. 400A ,120/240V, 1phase, 3 wire, bolt-on circuit breakers. Square-D installed in 2002. Condition appears adequate. Location is in a utility/electrical room.
2) Panel A. 100A, 120/240V, 1phase, 3wire, 30 circuit bolt-on circuit breakers. Square-D installed in 2002. Condition appears adequate. Location is at the north recreation room.
3) Panel B. 50A 1phase, 120/240V, 3wire, 30 circuit bolt-on circuit breakers with isolated ground bus. Square-D installed in 2002. Condition appears adequate. This panel is supplied through a 10kVA isolation transformer for audio noise control and located within the sound studio space.
4) Panel 1. 100A, 120/240V, 1phase, 3wire, 12 circuit residential load center style with plug-in circuit breakers. Half of the breakers are using high density dual breakers. Square-D, 1970s vintage. Panel is beyond useful life. Location is in electrical service room.
5) Panel 2. 100A, 120/240V, 1phase, 3wire, 24 circuit residential load center style with plug-in circuit breakers. Half of the breakers are using high density dual breakers. Square-D, 1970s vintage. Panel is beyond useful life. Location is in the auditorium area.

Figure E1 – Electrical Panels

The electrical panels do not include arc flash labels as recommended by NFPA70E for equipment maintenance. Not clear if a fault study has been performed in past. Panels 1 and 2 do not have any spare circuits available. Several spare circuits are present in Panels MDP, A and B. Regular electrical panel maintenance is not evident at this facility. The electrical service capacity appears adequate for the building.

Branch Power

Branch power consists primarily of EMT raceways although concealed construction areas were not reviewed. Power receptacles appear to be located in appropriate locations although additional distribution would be recommended for new construction. Receptacles appear to be 20 year or older. Several extension cords are installed at the auditorium stage areas – proper power circuit allocation should be reviewed.

Lighting

Interior light fixtures are predominantly fluorescent surface or lay-in using T8 lamps. Overall lighting distribution is adequate. Interior lighting controls are through manual on/off switching. Automatic occupancy sensor or dimming controls are not installed. Exterior light fixtures consist of wallpacks surrounding the building and surface mount fixtures along front of building. Specific exterior fixture lamp types or functionality was not reviewed. Distribution of perimeter lighting appears adequate. Electromagnetic timeclocks for site lighting are located in the electrical room. Functionality is not known.

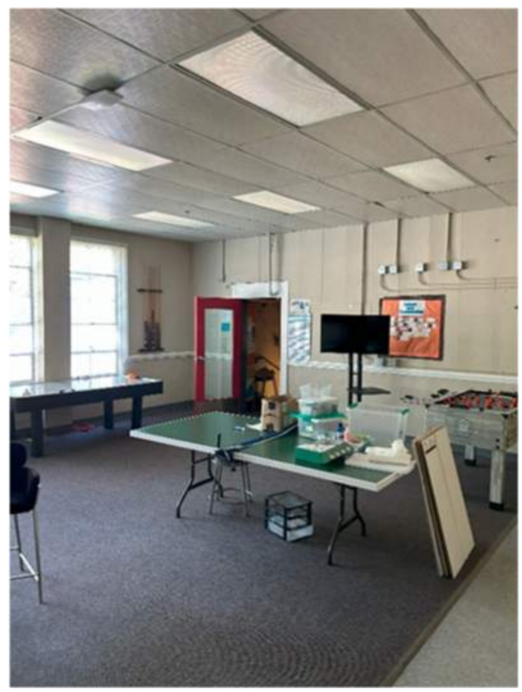

Figure E2 – Light Fixtures

Fire Alarm

Fire alarm system is controlled from a Fire Lite zoned type panel Model 5024UD connected to a wireless control communicator. Fire alarm devices per the FA panel markings includes horn/strobes, exterior alarm bell, 1 smoke detector, 2 pull stations and sprinkler valve monitoring. There are recent fire department testing records that show no deficiencies. The system is outdated although it appears to be functioning adequately. Fire alarm distribution devices appear to meet code requirements.

Figure E3 – Fire Alarm Panel

Figure E4 – Telecom Enclosure

<u>Telecommunications Systems</u>

Telecommunications is connected through a wall mount data/voice enclosure within the electrical room. Cat (5 or 6) data wiring is distributed to office areas within the building. The system appears to be functional. Wifi repeaters are installed throughout the building. A detail review of wiring distribution was not performed.

The building includes a Maxsys security system alarm keypad. This system appears to be outdated. Functionality is not known.

XI. VERIFICATION AND ASSESSMENTS

Verification

City of Redmond Facility Condition Assessment

The content within the 2024 Meng report are consistent with the recent electrical systems review findings by Hargis.

Assessments

Electrical service capacity appears to be adequate for the building use.

Electrical panels do not include arc flash labels as recommended by NFPA70E.

Two legacy load center style electrical panels are beyond useful life and do not have spare circuits. Internal wiring condition is a concern and should be reviewed.

The building does not include a generator backup power system. (not required per code)

The three electrical panels from 2002 include 10kAIC rated circuit breakers.

Power circuiting may not be adequate in some building areas.

Emergency lighting is through self-contained battery fixture units. Emergency lighting coverage is adequate in most areas although is missing from restrooms.

Exterior lighting fixtures are outdated. Timeclock control functionality was not reviewed.

Interior lighting utilizes T8 fluorescent lamps. Interior lighting controls is limited to manual on/off switching.

The fire alarm panel is a zoned system that appears to be limited to five zones. Pull stations are not located at all exterior doors.

There appears to be legacy unused telecom and low voltage infrastructure within the electrical room.

XII. PROPOSED REMEDIATION

Much of the electrical infrastructure is outdated and should be considered for replacement as part of planned remodels. In general the existing systems appear to be functional. Our recommendations include minimum actions due to safety concerns and additional secondary recommendations associated with operational, maintenance and energy savings enhancements.

Minimum Recommendations

- Perform power short circuit study and arc flash calculations. Verify electrical panels are properly rated for fault current and provide arc flash labels per NFPA70E recommendations.
- Replace the two legacy load center electrical panels with new. At a minimum review internal electrical wiring conditions and address any issues.
- Perform thermographic scan of all electrical panels to ensure proper terminations.
- Test all emergency battery pack light fixtures for proper operation. Install emergency lighting in restrooms and other non-illuminated areas.
- Review code requirements for building egress and associated fire alarm pull stations. Install additional stations where required by code.
- Test and address timeclock auto on/off function of all exterior light fixtures.

General Recommendations

- Replace all light fixtures with LED. Interior and exterior. This will save energy and lower lifetime operating costs.
- Install lighting controls consisting of occupancy sensor, manual dimming and daylighting controls consistent with current code requirements. Replace exterior lighting controls with digital system with multiple programming schedules.
- Replace existing power receptacles with new. Review receptacle distribution and add devices and circuits where appropriate.
- Replace existing fire alarm system with analog addressable system with internal diagnostics to enhance reliability and maintenance. Replace existing notification devices and pull stations.
- Test telecommunications system and station wiring. Review need for additional locations with stakeholders.
- Review and remove legacy, unused low voltage and power wiring within the electrical room.

X. HAZARDOUS MATERIALS

To
City of Redmond

For
Old Fire House Teen Center
16510 NE 79th St.
Redmond, WA 98052

Dated
July 9, 2025

Project Number

Logan Building | 500 Union Street, Suite [illegible] Seattle, WA 98[illegible]01
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I. SCOPE OF ASSESSMENT

Relevant Documentation

- Meng Analysis, *City of Redmond Facility Condition Assessment,* Mar 2024, MENG Facility Detail Report_March 2024.pdf

- Meng Analysis, *Facility Summary*, Mar 2014, Doc00329120250508143527.pdf

- Amec Foster Wheeler, *Summary of Asbestos-Containing Materials*, May 2015, Summary- Teen Center.pdf

- Amec Foster Wheeler, *Bulk Asbestos Sampling and Analysis_Old Fire Station and Teen Center*, May 2015, Bulk Asbestos Sampling and Analysis_Old Fire Station and Teen Center.pdf

- Amec Foster Wheeler, *Sample Collection Locations*, May 2015, Figure Teen Center

- NVL Labs, *RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507912.00*, May 2015, Lab Results RED OFC1-ACM.pdf

- NVL Labs, *RE: Bulk Asbestos Fiber Analysis, NVL Batch # 15079013.00*, May 2015, Lab Results RED OFC2-ACM.pdf

Additional Investigation

June 3, 2025: Perteet visited the site to complete a preliminary assessment of the building interior to determine any safety concerns related to hazardous materials. No concerns were raised during the site visit.

June 18th, 2025: Perteet visited the site to complete an AHERA compliant limited hazardous building materials survey to identify hazardous materials that will require abatement or mitigation prior to building demolition. The survey included the sampling of additional suspect asbestos containing materials (ACM) lead containing paint, as well as an inventory of fluorescent light ballasts that may contain PCBs, mercury-containing fluorescent and high-intensity discharge (HID) lamps and temperature control thermostats, and potential CFC-containing components that were not identified in the previous hazardous materials survey conducted by Amec Foster Wheeler in May 2015. This site sampling visit encompassed both the interior and exterior building envelope including the building roof.

II. SUMMARY OF CONDITIONS AND VERIFICATION

The Old Firehouse Teen Center is a one-story building that was constructed in 1952 and partially renovated in 2002. In 2015 Amec Foster Wheeler completed a Hazmat Inspection that included sampling and analysis of suspect ACM, lead containing paint, and arsenic (CMU and mortar), including an inventory of other hazardous materials within the building. The results of the sampling and analysis for asbestos are provided in the NVL laboratory reports dated May 6 and 7, 2015. The sampling and testing identified ACM within the building that included window glazing, trace black flooring mastic, white skim coat with plaster walls, off-white material on CMU walls, hard mudded piping, and aircell piping. Gaskets and insulation associated with the basement boiler were presumed ACMs. Some lead-based paint was found, along with an inventory of PCB-containing light ballasts and mercury-containing lamps were also noted. No arsenic was found in the CMU and CMU mortar.

III. ASSESSMENT

Perteet observed the same hazardous materials identified in the original hazmat inspection performed by Amec Foster Wheeler in May 2015. Selected ACMs were resampled to AHERA standards (minimum of two samples per homogenous area). Perteet also completed an additional sampling of painted materials covering the building to identify any additional lead-based paint surfaces. An inventory of fluorescent light ballasts that may contain PCBs, mercury-containing fluorescent and high-intensity discharge (HID) lamps and temperature control thermostats, and potential CFC-containing components was also performed.

In addition, Perteet recommends addressing the potential for vermiculite (ACM) inside the CMU throughout the building prior to abatement/demolition.

IV. PROPOSED REMEDIATION

Any remodeling or replacement of the existing Teen Center building requires abatement of all hazardous materials. This abatement can be accomplished while preserving the integrity of the building under a remodel scenario. If full removal of the existing building is proposed in a replacement scenario, then abatement of the hazardous materials can be completed under selective demolition prior to final demolition of the structure.

XI. COST ESTIMATE SUMMARY

Costs for both abatement and renovation as well as new construction are included in the attached cost estimate, see Appendix A for additional detail. A summary of these estimates are as follows. Based on Wiggins Preconstruction Services “Best Guess” estimate, Building Renovation would cost $8,889,721 while demolition and new construction would cost $11,707,548. These values represent moderately conservative estimates based on conceptual information and current market conditions.

Note: There is a potential cost increase for a Deep Foundation Retrofit. If the Geotech report finds liquefaction is a hazard, additional foundation work will be required. This effort is not included in the base estimate for renovation or new construction. See alternates for each option in Appendix A for additional details.

APPENDIX A
COST ESTIMATE

City of Redmond
Old Firehouse Teen Center Renovation

Redmond, WA

Concept Estimate

Version: DRAFT
July 9, 2025

Prepared for:

Mackenzie / Perteet

WIGGINS
PRECONSTRUCTION SERVICES

July 9, 2025

EXECUTIVE SUMMARY

PROJECT INFORMATION

Owner:	City of Redmond	**Project Name:**	Old Firehouse Teen Center Renovation
Location:	Redmond, WA	**Project Type:**	Community Center
Building GSF:	8,600	**Site Gross Area:**	-

PROJECT SCHEDULE

Bid Date:	Q2, 2026	**Construction Strt:**	Q3, 2026
Duration:	10 to 12 months	**Mid-Point:**	Q1, 2027
Phasing:	Single Phase		

DOCUMENTS INFORMATION

Drawings Set:	Summary of Facility Conditions	**Design Firm:**	Mackenzie / Perteet
Other Reports:			

ESTIMATE DESCRIPTION

Estimate Level:	Concept Estimate	**Estimate Date:**	July 9, 2025
Delivery Method:	Design - Bid - Build	**Set Aside Reqs:**	No
Swing Shift?	No	**Occupied Bldg?**	No
Renovation?	Yes	**Critical Facility?**	No

ESTIMATOR

Name:	Matt Wiggins	**Title:**	Principal
Phone:	(360) 870-5100	**Email:**	mattw@wigginsprecon.com

WIGGINS
PRECONSTRUCTION SERVICES

July 9, 2025

COMPARISON COST SUMMARY

Description	*Renovation*	*New Construction*
Demolition & Abatement	$718,200	$307,919
Building Improvements	$3,805,926	$4,774,385
Sitework Improvements	$549,367	$1,800,000
Soil Liquefaction Structural Requirements	*Excluded*	*Excluded*
Contractor General Conditions & Requirements	$500,000	$720,000
Total Est. Construction Cost (Today's $)	**$5,573,493**	**$7,602,304**
Escalation to Midpoint (Q3, 2026 @ 4% / Yr)	$557,349	$760,230
Total Estimated Contract Cost (Escalated)	**$6,130,842**	**$8,362,534**
Owner Soft Costs (Design Fees, Owner Consultants, Moving, Permits, City Admin., Builder's Risk Insurance, Construction C.O. Contingency, FF&E, & Sales Tax)	$2,758,879	$3,345,014
Total Estimated Project Cost	**$8,889,721**	**$11,707,548**

City of Redmond
Old Firehouse Teen Center Renovation
Redmond, WA
Concept Estimate

WIGGINS
PRECONSTRUCTION SERVICES

July 9, 2025

RENOVATION OVERALL COST SUMMARY

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Building Selective Demolition & Abatement	1	LS		$718,200
Building Improvements	8,600	GSF	$442.55	$3,805,926
Sitework Improvements (see separate Perteet est.)	1	LS		$549,367
Contractor General Conditions & Requirements	10	MO	$50,000	$500,000
Total Estimated Facility Renovation Construction Cost (Today's Dollars)				**$5,573,493**
Escalation to Midpoint (Q1, 2027 @ 4% / Yr)	10%	on	$5,573,493	$557,349
Total Estimated Construction Contract (less Sales Tax)				**$6,130,842**
Owner Soft Costs (Design Fees, Owner Consultants, Moving, Permits, City Admin., Builder's Risk Insurance, Construction C.O. Contingency, FF&E, & Sales Tax)	45%	on	$6,130,842	$2,758,879
Total Estimated Project Cost				**$8,889,721**

Exclusions

Alternative Delivery Method (10 to 20% first construction cost budget increase is recommend if project is not competitively hard bid)

New Addition Construction (project is assumed to stay within the existing building footprint)

Seismic updates beyond "Life Safety" level of performance

Major Program & Interior Layout Chances (estimate assumes maximum reuse of existing partitions with some code required modifications)

New Overhead Doors (existing assumed to remain)

Commercial Kitchen Equipment (type 1 hood, grease interceptor, etc.. not anticipated)

Music Recording Equipment

Renovation Project Alternates (values are total project cost including escalation & owner soft costs)

Deep foundation retrofit (if Geotech report finds that liquefaction is a hazard) 685,850

SELECTIVE DEMOLITION & ABATEMENT ESTIMATES DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
F2010 - Building Elements Demolition				
Selective building demolition (structural, exterior enclosure, & interior construction)	8,600	gsf	$8.00	$68,800
Mechanical, Electrical and Plumbing	8,600	gsf	$4.00	$34,400
Misc. requirements				
Supervision, hauling, and dump fees	15%	on	$103,200	$15,480
F2010 - Building Elements Demolition				$118,680
F2020 - Hazardous Components Abatement				
Hazardous materials abatement (Dickson Company budget allowance)	1	ls	$284,985	$284,985
CMU vermiculite abatement (Dickson Company budget allowance)	1	ls	$180,000	$180,000
Engineer oversight				*Included w/ Soft Costs*
F2020 - Hazardous Components Abatement				$464,985
Subtotal Direct Costs				**$583,665**
Estimating / Design Contingency	15%	on	$583,665	$87,550
Contractor Markup (OH&P, Insurance, Bond, B&O Tax)	7%	on	$671,215	$46,985
Total Estimated Construction Cost (Today's Dollars)				**$718,200**

BUILDING RENOVATION ELEMENTS SUMMARY (UNIFORMAT II)

Ref	*Group Element*	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
A10	Foundations	8,600	GSF	$13.58	$116,800
A20	Basement Construction	8,600	GSF	$0.00	$0
B10	Superstructure	8,600	GSF	$46.98	$404,000
B20	Exterior Enclosure	8,600	GSF	$60.35	$519,002
B30	Roofing	8,600	GSF	$35.42	$304,630
C10	Interior Construction	8,600	GSF	$33.94	$291,850
C20	Stairs	8,600	GSF	$0.00	$0
C30	Interior Finishes	8,600	GSF	$32.49	$279,400
D10	Conveying Systems	8,600	GSF	$0.00	$0
D20	Plumbing	8,600	GSF	$18.21	$156,627
D30	HVAC	8,600	GSF	$57.55	$494,948
D40	Fire Protection	8,600	GSF	$6.00	$51,600
D50	Electrical	8,600	GSF	$51.71	$444,700
E10	Equipment	8,600	GSF	$13.37	$115,000
E20	Furnishings (Casework)	8,600	GSF	$11.74	$101,000
F10	Special Construction	8,600	GSF	$0.00	$0
F20	Selective Building Demolition	8,600	GSF	$0.00	$0
	Building Direct Construction Costs Subtotal				**$3,279,557**
	Estimating / Design Contingency	15.0%	on	$3,279,557	$491,934
	Contractor Markup (OH&P, Insurance, Bond, B&O Tax)	7.0%	on	$491,934	$34,435
	Total Building Construction Cost (Today's Dollars)				**$3,805,926**

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
A10 Foundations				
A1010 - Standard Foundations				
Footing system retrofits to meet code minimum seismic performance standards - Area allowance	8,600	gsf	$10.00	$86,000
Perimeter Drainage				*See sitework estimate*
A1010 - Standard Foundations	8,600	GSF	$10.00	$86,000
A1030 - Slabs on Grade				
Patching of Slab on Grade (incl. reinforcing, base course & vapor barrier) - 15% of existing allowance	1,290	sf	$20.00	$25,800
Trenches, Pits & Bases				
New Mech Pads - Allowance	200	sf	$25.00	$5,000
A1030 - Slabs on Grade	8,600	GSF	$3.58	$30,800
Subtotal A10 Foundations	**8,600**	**GSF**	**$13.58**	**$116,800**
A20 Basement Construction				
Subtotal A20 Basement Construction	**8,600**	**GSF**	**$0.00**	**$0**
B10 Superstructure				
Structural Concrete, Masonry, and Steel				
Mixture of existing CMU wall retrofitting & structural steel strongback construction to achieve code minimum seismic performance standards (includes upgrading existing brace frames) - Area allowance	8,600	gsf	$25.00	$215,000
Structural Concrete, Masonry, and Steel	8,600	GSF	$25.00	$215,000

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Structural Wood Framing				
Roof framing retrofit - New plywood diaphragm w/ structural upgrades to beams and columns for additional gravity load (includes support framing for new rooftop equipment) - Area allowance	8,600	sf	$15.00	$129,000
Hose Tower replacement (wood framed)	1	ls	$60,000	$60,000
Structural Wood Framing	8,600	GSF	$21.98	$189,000
Subtotal B10 Superstructure	**8,600**	**GSF**	**$46.98**	**$404,000**
B20 Exterior Enclosure				
B2011, 12 - Exterior Wall Construction & Parapets				
Insulating Assembly on Interior Face of Exterior Walls (GWB - Finish 1 Side, vapor barrier, 2x4 wd framing, batt insulation)	5,656	sf	$11.50	$65,044
Exterior wall finish				
New cladding allowance (mixture fiber cement & concealed fastener metal panel accents)	6,868	sf	$30.00	$206,040
WRB & rigid insulation	6,868	sf	$11.00	$75,548
Exterior paint & sealants				
Paint, sealer, caulking and sealants - Area budget	6,868	sf	$2.50	$17,170
Building graphics				
Building identifying signage - Allowance	1	ls	$5,000	$5,000
B2011, 12 - Exterior Wall Construction & Parapets	8,600	GSF	$42.88	$368,802
B2016 - Exterior Soffits & Canopies				
Existing to remain				*No work anticipated*
B2016 - Exterior Soffits	8,600	GSF	$0.00	$0
B2020 - Exterior Windows				
Aluminum storefront, std. insulated glazing, anodized finish	1,212	sf	$100.00	$121,200
B2020 - Exterior Windows	8,600	GSF	$14.09	$121,200

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
B2030 - Exterior Doors				
Glazed doors & entrances				
Storefront doors & hardware, per leaf	2	ea	$7,500	$15,000
ADA auto operator, per vestibule	1	ea	$10,000	$10,000
Solid exterior doors				
Existing doors & frames to remain - Misc. hardware adjustments	1	ls	$4,000	$4,000
Overhead doors				
Existing doors to remain				*No work anticipated*
B2020 - Exterior Doors	8,600	GSF	$3.37	$29,000
Subtotal B20 Exterior Enclosure	**8,600**	**GSF**	**$60.35**	**$519,002**
B30 Roofing				
B3010 - Roof Coverings				
Roof finishes & insulation				
Membrane roofing system w/ rigid insulation	8,600	sf	$27.00	$232,200
Flashings & sheet metal				
Copings, roof system flashing & rough carpentry, downspo	15%	on	$232,200	$34,830
Accessories				
Walk pads, fall restraint anchors, etc..	8,600	sf	$3.50	$30,100
B3010 - Roof Coverings	8,600	GSF	$34.55	$297,130
B3020 - Roof Openings				
Glazed roof openings				*None anticipated*
Roof hatch & ladder	1	ea	$7,500	$7,500
B3020 - Roof Openings	8,600	GSF	$0.87	$7,500
Subtotal B30 Roofing	**8,600**	**GSF**	**$35.42**	**$304,630**

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
C10 Interior Construction				
C1010 - Partitions				
GWB Partitions - Area allowance for code required updates (maximum reuse of existing layout assumed)	8,600	gsf	$10.00	$86,000
Misc. carpentry, blocking, & backing - Area budget	8,600	gsf	$1.00	$8,600
Interior caulking & joint sealants - Area budget	8,600	gsf	$0.50	$4,300
Retractable partitions				*None anticipated*
Interior balustrades				
Ramp railings, per ramp	3	ea	$2,000	$6,000
Interior windows and storefronts				
HM relites - Allowance	250	sf	$40.00	$10,000
C1010 - Partitions	8,600	GSF	$13.36	$114,900
C1020 - Interior Doors				
HM / SCW Dr, HM frame, & hardware - per leaf	25	ea	$3,600	$90,000
Premiums (STC & fire rated, electronic hardware, door glazing)	20%	on	$90,000	$18,000
C1020 - Interior Doors	8,600	GSF	$12.56	$108,000
C1030 - Fittings				
Raised flooring & ramp systems				
New stage and sound booth floor systems	500	sf	$30.00	$15,000
ADA ramps @ Stage, Sound Booth, & Recording	3	ea	$5,000.00	$15,000
Toilet Partitions				
Full height, zero sight line	6	ea	$1,100	$6,600
Toilet Accessories				
Single occupant restrooms, ADA	2	ea	$2,500	$5,000
WC stall accessories	6	ea	$500.00	$3,000
Handwash area	2	ea	$2,500	$5,000

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Identifying Devices				
Code signage - Area budget	8,600	gsf	$0.25	$2,150
Wayfinding and room signage - Area budget	8,600	gsf	$0.50	$4,300
General fittings and specialties				
Lockers, FECs, corner guards, knox box, etc... - Area budget	8,600	gsf	$1.50	$12,900
C1030 - Fittings	8,600	GSF	$8.02	$68,950
Subtotal C10 Interior Construction	**8,600**	**GSF**	**$33.94**	**$291,850**
C20 Stairs				
C2010 - Stair Construction				
No stair construction anticipated (see C10 for ADA access ramps)				*None anticipated*
C2010 - Stair Construction	8,600	GSF	$0.00	$0
Subtotal C20 Stairs	**8,600**	**GSF**	**$0.00**	**$0**
C30 Interior Finishes				
C3010 - Wall Finishes				
Paint to walls, doors, frames and misc. - Area budget	8,600	sf	$5.00	$43,000
Acoustical wall panels				
Show Room - Allowance	1	ls	$20,000	$20,000
Recording Studio - Allowance	1	ls	$10,000	$10,000
Wall tile, finish carpentry & other manufactured wall panels / coverings - Area allowance	8,600	gsf	$5.00	$43,000
C3010 - Wall Finishes	8,600	GSF	$13.49	$116,000
C3020 - Floor Finishes				
Flooring & wall bases (all new assumed) - Area allowance	8,600	gsf	$9.00	$77,400
C3020 - Floor Finishes	8,600	GSF	$9.00	$77,400

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
C3030 - Ceiling Finishes				
Ceilings Finishes (all new assumed) - Area allowance	8,600	gsf	$10.00	$86,000
C3030 - Ceiling Finishes	8,600	GSF	$10.00	$86,000
Subtotal C30 Interior Finishes	**8,600**	**GSF**	**$32.49**	**$279,400**
D10 Conveying Systems				
Subtotal D10 Conveying Systems	**8,600**	**GSF**	**$0.00**	**$0**
D20 Plumbing				
D2010 - Plumbing Fixtures				
Bottle Fill/Drinking Fountain	1	EA	$4,287.61	$4,288
Lav: CT - Toilet Rooms	4	EA	$939.89	$3,760
Lav: WH - Apparatus Bay	1	EA	$1,037.87	$1,038
Lav/DF Carrier	2	EA	$434.90	$870
TMV-2 under counter	5	EA	$359	$1,795
Sink: SS, 2 Compartment - Kitchen	1	EA	$1,647.31	$1,647
Domestic Water Outlet Box	1	EA	$308.90	$309
Service Sinks, Molded Stone	1	EA	$2,175.81	$2,176
Urinal	1	EA	$906.90	$907
Urinal Carrier	1	EA	$435	$435
Water Closet: Floor Mount, Tank Flush	4	EA	$1,142.06	$4,568
Shower, ADA	1	EA	$8,227.72	$8,228
D2020 - Domestic Water Distribution				
Domestic Hot Water Heater	1	EA	$16,000	$16,000
Combustion/vent	1	EA	$2,673.23	$2,673
Expansion Tank	1	EA	$1,327.30	$1,327
Domestic Hot Water Circ Pump	1	EA	$1,501.06	$1,501
Service Valves	12	EA	$250.18	$3,002

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Water Hammer Arrestors	5	EA	$239	$1,197
WH-1	2	EA	$1,011.15	$2,022
Domestic water piping and fittings	608	LF	$54.43	$33,096
Piping Insulation	608	LF	$18.58	$11,295
D2030 - Sanitary Waste				
Sanitary waste and vent piping	390	LF	$54.78	$21,364
Shower Drain, EEW Drain	1	EA	$537.52	$538
TPV-1 (trap primer)	1	EA	$825.32	$825
Wall Clean Out	5	EA	$250.18	$1,251
D2090 Other Plumbing				
Excavation and Native Fill	116	LF	$87.48	$10,141
Access Panels	5	EA	$348.16	$1,741
Video Waste Piping - Allowance	1	LS	$3,100.30	$3,100
Seismic	1	LS	$623.33	$623
Plumbing contractor general requirements (trucking, rentals, cleanup, labeling, trade supervision, etc..)	1	ls	$14,910.00	$14,910
D20 - Plumbing	8,600	GSF	$18.21	$156,627
Subtotal D20 Plumbing	**8,600**	**GSF**	**$18.21**	**$156,627**
D30 HVAC				
D3041 Air Distribution Systems				
Replace eixsting existing rooftop unit with new and replace gas furnaces with rooftop VRF equipment + DOAS	8,600	GSF	$22.50	$193,500
Ductwork and fittings, OSA/SA/RA/HREA	7,740	LB	$14.86	$114,985
Wall Heater	2	EA	$1,652.60	$3,305
Flexible ductwork	204	LF	$17.50	$3,561
Volume Control Dampers	37	EA	$63.69	$2,356
Duct insulation	2,365	SF	$5.25	$12,416
Sound lining	237	SF	$10.96	$2,591
Air Devices (GRD's)	37	EA	$266.66	$9,867

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
D3042 Exhaust Ventilation Systems				
Exhaust Fans and Roof Curbs, including roof curbs	4	EA	$1,183.93	$4,736
Ductwork and fittings	215	LB	$11.32	$2,434
Sound lining	2	SF	$11.89	$23
Flexible ductwork	30	LF	$17.50	$525
Grilles, registers and diffusers	4	EA	$197.92	$792
D3060 Controls and Instrumentation				
Controls/EMCS	8,600	GSF	$13.00	$111,800
D3070 Systems Testing and Balancing				
Test and Balance (TAB)	1	LS	$5,757.70	$5,758
Commissioning	1	LS	$6,315.48	$6,315
D3090 Other HVAC				
Seismic	1	LS	$1,148.27	$1,148
HVAC contractor general requirements (trucking, rentals, cleanup, labeling, trade supervision, etc..)	1	LS	$18,835.00	$18,835
D30 - HVAC	8,600	GSF	$57.55	$494,948
Subtotal D30 HVAC	**8,600**	**GSF**	**$57.55**	**$494,948**
D40 Fire Protection				
Adjust existing sprinkler system (includes upgrading existing riser)	8,600	gsf	$6.00	$51,600
D40 - Fire Protection	8,600	GSF	$6.00	$51,600
Subtotal D40 Fire Protection	**8,600**	**GSF**	**$6.00**	**$51,600**
D50 Electrical				
Distribution (replace legacy panels and reconnection of branch circuits)	8,600	gsf	$3.50	$30,100
Fault calculations, arc flash labels and thermographic scanning	1	ls	$30,000	$30,000
Generator & Transfer Equipment				*None anticipated*
Mechanical Equipment and Branch (new rooftop units)	8,600	gsf	$2.50	$21,500

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Power Devices & Branch, EMT concealed (all new recepts)	8,600	gsf	$5.00	$43,000
Lighting (replace existing w/ LED, new controls)	8,600	gsf	$14.00	$120,400
Stage lighting				*See E1020*
Fire Alarm, EMT concealed (new)	8,600	gsf	$4.00	$34,400
LV System (existing to remain, some new drops)	8,600	gsf	$2.50	$21,500
CCTV & Access Controls	8,600	gsf	$5.00	$43,000
A/V Systems				
Show Room	1	ls	$75,000	$75,000
Other	8,600	gsf	$3.00	$25,800
Photovoltaic system				*None anticipated*
D50 - Electrical	8,600	GSF	$51.71	$444,700
Subtotal D50 Electrical	**8,600**	**GSF**	**$51.71**	**$444,700**
E10 Equipment				
E1020 - Institutional Equipment				
Theater & stage equipment	1	ls	$100,000	$100,000
E1020 - Institutional Equipment	8,600	GSF	$11.63	$100,000
E1090 - Other Equipment				
Residential equipment				
Kitchen appliance package	1	ls	$15,000	$15,000
E1090 - Other Equipment	8,600	GSF	$1.74	$15,000
Subtotal E10 Equipment	**8,600**	**GSF**	**$13.37**	**$115,000**
E20 Furnishings				
E2010 - Fixed Furnishings				
Fixed Casework (all new assumed) - Area allowance	8,600	gsf	$10.00	$86,000
Blinds & other window treatment				
Roller shades, manual	1	ls	$15,000	$15,000

BUILDING RENOVATION ESTIMATE DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
E2010 - Fixed Furnishings	8,600	GSF	$11.74	$101,000
E2020 - Moveable Furnishings				
EXCLUDED				
E2020 - Moveable Furnishings	8,600	GSF	$0.00	$0
Subtotal E20 Furnishings	**8,600**	**GSF**	**$11.74**	**$101,000**
F10 Special Construction				
Subtotal F20 Special Construction	**8,600**	**GSF**	**$0.00**	**$0**
F20 Selective Building Demolition				
F2010 - Building Elements Demolition				
Selective building demolition (structural, exterior enclosure, & interior construction)				*See Separate Estimate*
F2010 - Building Elements Demolition	8,600	GSF	$0.00	$0
F2020 - Hazardous Components Abatement				
Removal of hazardous components				*See Separate Estimate*
F2020 - Hazardous Components Abatement	8,600	GSF	$0.00	$0
Subtotal F20 Selective Building Demolition	**8,600**	**GSF**	**$0.00**	**$0**

City of Redmond
Old Firehouse Teen Center Renovation
Redmond, WA
Concept Estimate

WIGGINS
PRECONSTRUCTION SERVICES

July 9, 2025

NEW BUILDING OVERALL COST SUMMARY

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
Total Building Demolition & Abatement	1	LS		$307,919
New Building	8,600	GSF	$555.16	$4,774,385
Sitework Improvements (all new)	40,000	SGA	$45.00	$1,800,000
Contractor General Conditions & Requirements	12	MO	$60,000	$720,000
Total Estimated Facility Renovation Construction Cost (Today's Dollars)				**$7,602,304**
Escalation to Midpoint (Q1, 2027 @ 4% / Yr)	10%	on	$7,602,304	$760,230
Total Estimated Construction Contract (less Sales Tax)				**$8,362,534**
Owner Soft Costs (Design Fees, Owner Consultants, Moving, Permits, City Admin., Builder's Risk Insurance, Construction C.O. Contingency, FF&E, & Sales Tax)	40%	on	$8,362,534	$3,345,014
Land Acquisition Costs				*Excluded*
Total Estimated Project Cost				**$11,707,548**

Exclusions

Alternative Delivery Method (10 to 20% first construction cost budget increase is recommend if project is not competitively hard bid)

Size Increase (project is assumed to have same GSF as existing building)

Seismic updates beyond "Life Safety" level of performance

Commercial Kitchen Equipment (type 1 hood, grease interceptor, etc.. not anticipated)

Music Recording Equipment

Alternates (values are total project cost including escalation & owner soft costs)

Deep foundations (if Geotech report finds that liquefaction is a hazard)	617,265

TOTAL BUILDING DEMOLITION & ABATEMENT ESTIMATES DETAIL

Description	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
G1010,20 - Site Clearing & Demolition				
Building demolition				
Remove existing building (including foundations)	8,600	sf	$11.00	$94,600
G1010,20 - Site Clearing & Demolition				$94,600
F2020 - Hazardous Components Abatement				
Hazardous materials abatement (Dickson Company budget allowance)	1	ls	$158,000	$158,000
Engineer oversight				*Included w/ Soft Costs*
F2020 - Hazardous Components Abatement				$158,000
Subtotal Direct Costs				**$252,600**
Estimating / Design Contingency	15%	on	$252,600	$37,890
Contractor Markup (OH&P, Insurance, Bond, B&O Tax)	6%	on	$290,490	$17,429
Total Estimated Construction Cost (Today's Dollars)				**$307,919**

NEW BUILDING ELEMENTS SUMMARY (UNIFORMAT II)

Ref	*Group Element*	*QTY*	*UOM*	*$ / UOM*	*Total Cost*
A10	Foundations	8,600	GSF	$25.00	$215,000
A20	Basement Construction	8,600	GSF	$0.00	$0
B10	Superstructure (Wood Framed)	8,600	GSF	$60.00	$516,000
B20	Exterior Enclosure	8,600	GSF	$75.00	$645,000
B30	Roofing	8,600	GSF	$36.00	$309,600
C10	Interior Construction	8,600	GSF	$40.00	$344,000
C20	Stairs	8,600	GSF	$0.00	$0
C30	Interior Finishes	8,600	GSF	$35.00	$301,000
D10	Conveying Systems	8,600	GSF	$0.00	$0
D20	Plumbing	8,600	GSF	$30.00	$258,000
D30	HVAC	8,600	GSF	$70.00	$602,000
D40	Fire Protection	8,600	GSF	$7.00	$60,200
D50	Electrical (includes AV equipment)	8,600	GSF	$75.00	$645,000
E10	Equipment (includes theater equipment)	8,600	GSF	$14.00	$120,400
E20	Furnishings (Casework)	8,600	GSF	$12.00	$103,200
F10	Special Construction	8,600	GSF	$0.00	$0
F20	Selective Building Demolition	8,600	GSF	$0.00	$0
	Building Direct Construction Costs Subtotal				**$4,119,400**
	Estimating / Design Contingency	15.0%	on	$4,119,400	$617,910
	Contractor Markup (OH&P, Insurance, Bond, B&O Tax)	6.0%	on	$617,910	$37,075
	Total Building Construction Cost (Today's Dollars)				**$4,774,385**

APPENDIX B
LIMITED HAZARDOUS BUILDING MATERIALS REPORT

Logan Building | 500 Union Street, Suite 410 Seattle, WA 98101
T 206.749.9993 | F 503.228.1285 | www.mackenzie.inc

Limited Hazardous Building Materials Survey Report

Submitted to
City of Redmond

JULY 2025

Old Firehouse Teen Center
16510 NE 79th Street, Redmond, WA

Property:
City of Redmond
Old Firehouse Teen Center
16510 NE 79th Street
Redmond, WA 98052

Prepared for:
City of Redmond
15670 NE 85th Street
Redmond, WA 98082

PERTEET.COM
2707 COLBY AVENUE, SUITE 900
EVERETT, WA 98201
425.252.7700

NOT FOR CONSTRUCTION

PERTEET
Better communities, by design

LIMITED HAZARDOUS BUILDING MATERIALS SURVEY REPORT

Prepared for:

City of Redmond
15670 NE 85th Street
Redmond, WA 98052

Location:

Old Firehouse Teen Center
16510 NE 79th Street
Redmond, WA 98052

Project No.: 20240182.0001

Prepared by:

Andrea Winder

Lead Environmental Scientist
AHERA Building Inspector No. 195554

Reviewed by:

Peter Battuello
Director of Environmental Services

July 8, 2025

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FIGURES

TABLES

APPENDICES

EXECUTIVE SUMMARY

Perteet, Inc. conducted a limited hazardous building materials survey on the Old Firehouse Teen Center building located at 16510 NE 79th Street, in Redmond, WA 98052 (the Property). The Survey was completed for City of Redmond to identify, to the extent feasible, regulated building materials that may require abatement prior to demolition activities. This Survey included visual inspections of the interior and exterior of the Property building for the presence of suspect asbestos-containing materials (ACM), lead-based paint (LBP) and lead-containing building materials, polychlorinated biphenyls (PCB)-containing fluorescent light ballasts, mercury-containing lamps, and refrigerant systems that may contain Chlorofluorocarbon (CFCs); along with the sampling and analysis of suspect ACM and LBP. Amec Foster Wheeler conducted a Good Faith Inspection for the Property building win May 2015 (Amec Inspection). Perteet reviewed the results of that inspection and conducted this survey to identify any additional hazardous materials.

The Amec Inspection identified the following regulated building materials. Perteet is not aware of any renovations to the building since the Amec Inspection.

Regulated Material	Material Description/Sample ID	Quantity[1]/Location
Materials containing equal to or more than 1 percent asbestos		
	Window Glazing (white, brittle)	2,000 LF/Exterior metal framed windows
	Trace black flooring mastic	800 SF/southwest office, north storage, and south office
	White skim coating on plaster and CMU walls	Throughout walls and ceilings
	Diner-style seating base (red, cementitious)	70 SF/Game Room
	Hard mudded piping manifold insulation (white, hard)	10 LF/Basement
	Hard mudded water piping fittings, elbows	350 Each/Piping tunnels, in walls and ceiling
	Aircell piping insulation (fabric lagging on cardboard layers)	2,500 LF/Piping tunnels, in walls and ceiling
Presumed Asbestos-Containing Material		
	Boiler breach gasket	2/Basement
	Boiler breach insulation	10 SF/Basement
Lead-based paint		
	Blue/Door Casing/Wood	Not quantified/unknown

Regulated Material	Material Description/Sample ID	Quantity[1]/Location
Lead-based paint	Red/Door/Wood	Not quantified/unknown
	Black/Window Panel/Unknown	Not quantified/unknown
Fluorescent light fixtures (Universal Waste)	Magnetic ballasts (assumed to contain regulated concentrations of PCBs in Washington State)	135 ballasts/Throughout building
	Mercury-containing fluorescent light bulbs	250 light bulbs/Throughout building
	Mercury-containing HID	10/Exterior

NOTES:

[1]Quantities of hazardous materials are preliminary estimates that should be verified by an abatement contractor before providing removal estimates.
ACM = asbestos-containing materials
CMU = cement masonry unit
HID – High intensity discharge lamps
PCB = polychlorinated biphenyl

Perteet's survey identified no additional ACM or lead-based paint. Additional regulated materials identified during Perteet's survey included five (5) lead vent tubes located on the roof; a refrigerator (likely CFCs) located in the main office and; a heating, ventilation and air conditioning (HVAC) unit containing CFCs located on the roof.

Cement masonry unit (CMU) walls were observed throughout the building. Vermiculite (known to often contain asbestos) is commonly used in CMU walls for insulation and fire resistance. Perteet did not inspect the interior of the CMU walls; therefore, the CMU walls should be inspected prior to abatement and demolition activities, to determine whether abatement is required.

1.0 INTRODUCTION

Perteet Inc. (Perteet) has prepared this report to present the results of the limited hazardous building materials survey (the survey) conducted at the Old Firehouse Teen Center building located at 16510 NE 79th Street, in Redmond, WA 98052 (the Property; Figure 1 – Vicinity Map).

Perteet's survey included visual inspections of the interior and exterior of the Property building for the presence of any suspect asbestos-containing materials (ACM), lead-based paint (LBP) and lead-containing building materials, polychlorinated biphenyls (PCB)-containing fluorescent light ballasts, mercury-containing lamps, and refrigerant systems that may contain Chlorofluorocarbon (CFCs); along with the sampling and analysis of suspect ACM and LBP. Perteet based its' survey on the Amec Foster Wheeler Good Faith Inspection from May 2015 (Amec Inspection). Perteet reviewed the results of that inspection and conducted this survey to identify any additional hazardous materials.

The purpose of Perteet's survey was to identify building materials and components at the Property that may require special handling and/or disposal during any future demolition and construction activities. The survey was conducted by an Asbestos Hazard Emergency Response Act (AHERA)-accredited Building Inspector(s).[1] Copies of AHERA certifications are provided in Appendix D.

This report includes inspection findings and presents the laboratory analytical results from samples collected from the building.

2.0 PROPERTY DESCRIPTION

The Property consists of one (1) parcel (King County Parcel No. 122505-9059) approximately 0.64 acres in size and located at 16510 NE 79th Street, Redmond, WA. The Property building is a former fire station and current teen center measuring at 7,907 square feet (vintage 1952). The building is constructed of masonry and contains a single story with a basement that measures approximately 150 square feet. The basement is occupied by a boiler. The most recent tenant improvements for the community teen center were completed in 2000.

3.0 HAZARDOUS MATERIALS SURVEY

Perteet performed its survey on June 18, 2025. The scope of the survey included the following:

- Visual inspection of the interior and exterior of the Property building for the presence of suspect ACM, lead-based paint and lead-containing building materials, PCB-containing fluorescent light ballasts, mercury-containing lamps, and refrigerant systems that may contain CFCs.
- Collection and analysis of bulk samples to identify the presence of asbestos-containing building materials.
- Collection and analysis of suspect lead-based paint samples to confirm whether the paint contained lead.
- Documentation of the number of lead-containing building materials (vent tubes), fluorescent light ballasts, mercury-containing fluorescent and high-intensity discharge (HID) lamps, and potential CFC-containing components at the Property building.
- Preparation of this report.

[1] As required by Part 763 of Title 40 of the Code of Federal Regulations (40 CFR 763; US Environmental Protection Agency 1987).

3.1 Asbestos

Perteet conducted a survey for suspect ACM on the Property building, which included collecting bulk samples of miscellaneous, in accordance with AHERA sampling protocol. The sample collection and handling methods are described below, along with a summary of the laboratory analytical results.

3.1.1 Procedures and Methodology

Sample locations of identified suspect ACM in accessible locations were chosen by the inspector. The following sampling procedures were followed:

- Non-destructive sampling techniques were used.
- Labelling sample containers with identification numbers, and sample locations and material type were documented on a sampling data form.
- Collecting samples with a decontaminated knife or chisel to cut out or scrape off the material. When layers were present in the building material, all layers were penetrated and incorporated into each specific sample.
- Each sample was placed in a resealable plastic bag, which was then sealed.
- Sampling tools were decontaminated with wet wipes, and loose material generated during sampling was wet-wiped to remove all debris.
- Protective clothing, wet wipes, rags, and drop cloths were placed in a labeled plastic waste bag for disposal.
- Sample bags were placed in a large, labeled, resealable plastic bag for transport to NVL Laboratories, Inc. of Seattle, Washington, a National Voluntary Laboratory Accreditation Program (NVLAP) laboratory, using chain-of-custody protocols for Bulk Asbestos Analysis by Polarized Light Microscopy, US Environmental Protection Agency (EPA) Method 600R-93/116. A copy of the NVLAP certificate of accreditation is included in Appendix C.

3.1.2 Results

Perteet collected a total of 45 samples (16510-01 through 45) of suspect ACM from the interior and exterior of the Property building. Sample locations are presented on Figure 2 and 3, and analytical results are provided in Table 1. Laboratory analytical reports are provided in Appendix B. No ACM was identified during this survey.

Materials containing greater than 1 percent asbestos (ACM) identified in the Amec Foster Wheeler Inspection. Laboratory analytical reports are provided in Appendix A:

- Approximately 2,000 square feet of window glazing (white, brittle) located on exterior metal framed windows.
- Approximately 800 square feet of trace black flooring located on the floor in the southwest office, north storage, and south office.
- White skim coating on plaster and cement mason unit (CMU) walls throughout the walls and ceiling of the building.
- Approximately 70 square feet of diner-style seating base (red, cementious) located in the Game Room.
- Approximately 10 square feet of black mastic associated with blue carpet flooring (Sample ID 210-265 and 266) located in Rooms 27 and 28 on the 2nd floor.

- Approximately 10 linear feet of hard mudded piping manifold insulation located in the basement.
- Approximately 350 each hard mudded water piping fittings, elbows located in the basement/piping tunnels and in the walls and ceilings throughout.
- Approximately 2,500 square feet of aircell piping insulation (fabric lagging on cardboard layers) located in the basement/piping tunnels and in the walls and ceiling throughout.

3.1.3 Presumed Asbestos-Containing Materials

The following building components were not tested but should be presumed to contain asbestos:

- Approximately 2 boiler breach gaskets located in the basement.
- Approximately 10 square feet boiler breach insulation located in the basement.

3.2 Lead

Perteet conducted a survey for interior and exterior paint coatings on the Property. Perteet also inspected for other lead materials. The sample collection and handling methods are described below, along with a summary of the laboratory analytical results.

3.2.1 Procedures and Methodology

Sample locations of identified painted surfaces were chosen by the inspector in accessible locations. The following sampling procedures were followed:

- Use of personal protective equipment, including gloves and/or protective coveralls.
- Labelling sample containers with identification numbers, and sample locations were documented on a sampling data form.
- Each sample was placed in a resealable plastic bag, which was then sealed.
- Protective clothing, wet wipes, rags, and drop cloths were placed in a labeled plastic waste bag for disposal.
- Sample bags were then placed in a large, labeled, resealable plastic bag for transport to NVL Laboratories, Inc. of Seattle, Washington, an AIHA Laboratory Accreditation Programs, LLC laboratory using chain-of-custody protocols for lead by EPA Method 7000B and EPA Method 3051/6010D. A copy of the laboratory accreditation is included in Appendix C.

3.2.2 Results

Amec Foster Wheeler collected a total of 3 paint chip samples from representative interior painted surfaces at the Property building. No laboratory analytical reports were provided to Perteet; however, the results were listed in the Amec Inspection, as included in Appendix A. Based on the United States Department of Housing and Urban Development/EPA standard for lead-based paint of 1.0 mg/cm^2, as defined by Title X of the 1992 Housing and Community Development Act, all 3 samples collected are considered LBP (Appendix A).

Perteet collected a total of 8 paint chip samples (16510-01 through 08) from representative interior and exterior painted surfaces at the Property building. Sample locations are presented on Figure 2, and laboratory analytical results are provided in Table 2. The laboratory analytical reports are provided in Appendix B. Pereet's survey indicated detectable concentrations of lead in paint as follows:

- Off-white/Concrete/Wall located in the hose tower

No lead-based paint was identified during Perteet's survey.

Approximately five (5) lead vent tubes were identified on the roof of the Property building during this survey. The vent tubes were not sampled, and the presence of lead is assumed based on the inspector's observations.

3.3 Fluorescent Light Ballasts

Magnetic fluorescent light ballasts manufactured prior to July 1, 1978, may contain PCBs. All ballasts manufactured after July 1, 1978, that do not contain PCBs are required to be marked "No PCBs". The "No PCBs" label indicates less than 50 parts per million (ppm) PCBs in the ballast; however, PCBs in Washington are regulated above 2 ppm (WAC 173-303-9904). As such, magnetic ballasts with "No PCBs" labeling may contain regulated concentrations of PCBs. Magnetic fluorescent light ballasts manufactured after 1978 may contain diethylhexyl phthalate (DEHP). Both PCBs and DEHP are listed as a Washington dangerous waste. Electronic ballasts have been used since the early 1990s, after discontinued use of DEPH in magnetic ballasts. Electronic ballasts contain heavy metals that may fail the Toxicity Characteristic Leaching Procedure (TCLP) under WAC 173-303. The specific number and location of the inventoried ballasts were as follows:

- **Throughout the building—**135 magnetic ballasts were identified.
- No electronic ballasts were identified.

3.4 Mercury

Fluorescent and HID lamps, which may contain mercury, were inventoried during the survey. Perteet personnel counted a total of 250 fluorescent (located throughout the building) and 10 HID lamps (exterior walls) at the Property building. This inventory was confirmed in the Amec Inspection.

3.5 CFCs

A rooftop HVAC unit was observed during the survey, as well as a single refrigerator in the main office. Refrigerant located inside the HVAC and refrigerator should be presumed to contain CFCs unless sampled and otherwise shown.

4.0 RECOMMENDATIONS

Based on the information gathered during the survey, Perteet offers the following recommendations.

4.1 Asbestos

Planning and coordination of ACM removal should begin prior to demolition activities. The ACM identified in this report should be removed by certified, trained, and protected personnel using appropriate work practices and engineering controls prior to disturbance by renovation or demolition, as outlined in WAC 296-62, Part I-1, WAC 296-65, and PSCAA Regulation III, Article 4. The ACM should also be disposed of in accordance with the EPA National Emissions Standards for Hazardous Air Pollutants, 40 CFR 61, Subpart M.

Building materials with equal to or less than 1 percent asbestos should be handled according to WAC 296-62, which outlines general work practices and air monitoring requirements when building materials containing equal to or less than 1 percent asbestos are impacted by renovation or demolition.

If any additional, previously unsampled, suspect materials are encountered during demolition activities, sampling should be performed by an AHERA-accredited Building Inspector and analysis by an NVLAP-accredited laboratory to evaluate asbestos content prior to disturbing the material.

4.2 Lead

Any contractor who may come into contact with materials containing lead at any detectable concentration is required to address worker exposure responsibilities as outlined in WAC 296-155-176.

Any identified lead-painted surfaces or leaded material (such as lead vent pipes/exhaust stacks on the roof) slated for impact by future demolition activities should be removed, handled, and disposed of or recycled in accordance with WAC 296-155, which applies to construction work with materials containing lead.

Should additional, previously unsampled, painted surfaces be revealed through demolition activities, the coatings must be sampled and analyzed to evaluate lead content prior to destruction, removal, or potential personnel exposure.

The purpose of sampling representative painted surfaces for lead was for a hazard evaluation and not for disposal purposes. Additional sampling and evaluation will need to be performed prior to disposal. Waste generators are required to determine if there are any hazardous levels of lead prior to disposal by using a Toxicity Characteristic Leaching Procedure (TCLP) to characterize the waste. Demolition waste streams with leachable lead concentrations exceeding 5.0 mg/L when analyzed for lead by the TCLP test are considered hazardous and require special handling according to federal and state regulations, including 40 CFR 247. A TCLP evaluation on building materials is required prior to disposal.

4.3 Fluorescent Light Ballasts

All magnetic light ballasts are assumed to contain PCBs and/or DEHP and should be handled and disposed of according to state and federal regulations (i.e., workers should employ proper personal protective equipment when handling the ballasts and properly store the ballasts in sealed plastic bags or buckets to minimize potential contact with any exposed or leaking PCB- and/or DEHP-containing oil). All PCB and DEHP waste must be labeled, manifested, transported, and disposed of according to federal and state regulations, including 40 CFR 761.

Electronic ballasts should be recycled prior to demolition activities.

4.4 Mercury

Fluorescent and HID lamps may contain mercury vapors. These lamps should be removed without breakage and disposed of properly in accordance with WAC 173-303-573, Standards for Universal Waste Management.

4.5 CFCs

If refrigeration components containing CFCs are encountered through demolition activities, the refrigerant should be properly transported, recycled, and reclaimed in accordance with all applicable federal, state, and local regulations by an authorized hazardous waste handler.

5.0 LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made. These services were performed consistent with our current consulting agreement with the client. This report is solely for our client's use and information unless otherwise noted. This document is not meant to be used as a hazardous materials specification document. Any reliance on this report by a third party is at such party's sole risk.

CMU walls were observed throughout the building. Vermiculite (known to often contain asbestos) is commonly used in CMU walls for insulation and fire resistance. Perteet did not inspect the interior of the CMU walls; therefore, the CMU walls should be inspected prior to abatement and demolition activities, to determine whether abatement is required.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. Perteet is not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. Perteet does not warrant the accuracy of information supplied by others or the use of segregated portions of this report.

TABLES

Table 1. Asbestos-Containing Materials Sample Inventory and Results
Old Firehouse Teen Center
Redmond, Washington

Sample ID	Sample Date	Material Description	Location	Lab Description	Material Type: TSI, Surfacing, Misc.	Bulk Asbestos[1]
*16510-01	6/18/2025	Layer 1: 12x12-inch black mottling vinyl floor tile Layer 2: Backing with beige mastic	Main hallway, north	Layer 1: Black crumbly vinyl tile Layer 2: Backing thin layer beige crumbly material	M	ND ND
*16510-02	6/18/2025	Layer 1: 12x12-inch grey with mottling vinyl floor tile Layer 2: Backing with tan adhesive	Main hallway, north	Layer 1: Gray vinyl tile Layer 2: Backing trace of tan adhesive with fibrous debris	M	ND ND
*16510-03	6/18/2025	Layer 1: 12x12-in red with mottling vinyl floor tile Layer 2: Gray backing with adhesive	Main hallway, north	Layer 1: Red vinyl tile with fibrous debris Layer 2: Backing gray crumbly material with adhesive	M	ND ND
*16510-04	6/18/2025	Layer 1: Gray speckled vinyl floor sheeting Layer 2: White backing Layer 3: Gray mastic	Woman's restroom	Layer 1: Gray ribbery vinyl surface speckled pattern Layer 2: White fibrous backing with adhesive Layer 3: Gray crumbly material	M	ND ND ND
*16510-05	6/18/2025	Layer 1: 4-inch grey vinyl cove base Layer 2: Backing with off-white mastic	Game room, entrance from hallway	Layer 1: Gray rubbery material with paint Layer 2: Backing trace off-white mastic with debris	M	ND ND
*16510-06	6/18/2025	Layer 1: 4-inch black vinyl cove base Layer 2: Backing with tan adhesive	Hallway across from basement entrance	Layer 1: Black rubbery material with fibrous debris Layer 2: Backing tan adhesive with paper and paint	M	ND ND
*16510-07	6/18/2025	Layer 1: Multicolored carpet Layer 2: Backing with adhesive	Main office	Layer 1: Multi-colored woven fibrous material Layer 2: Backing gray rubbery material and adhesive with debris	M	ND ND
*16510-08	6/18/2025	Layer 1: Red and blue carpet squares Layer 2: Backing with adhesive	Closet by tv room	Layer 1: Multi-colored woven fibrous material Layer 2: Backing gray rubbery material and adhesive and debris	M	ND ND
*16510-09	6/18/2025	White elastomeric window glazing	Southwest office, west window	Clear soft material	M	ND
*16510-10	6/18/2025	Brown fiberboard wall panel with paint	Southwest office, east wall	Tan compressed fibrous material with paint	M	ND
*16510-11	6/18/2025	Glue dot	Game room, above 2-ft x 2-ft white fiberglass ceiling tile	Brown crumbly loose mastic with fibrous debris	M	ND
*16510-12	6/18/2025	Black window door pane foam	Media lab room, across from entrance	Black soft elastic material with fibrous debris	M	ND
*16510-13	6/18/2025	Layer 1: Black wall carpet with mastic Layer 2: Tan mastic	Media lab room, entrance	Layer 1: Black & white woven fibrous material with white & black plastic mesh with mastic Layer 2: White fibrous and plastic mesh with tan mastic	M	ND ND
*16510-14	6/18/2025	Grey HVAC duct seam sealant	Media lab room, HVAC, ceiling	Gray soft crumbly elastic material with paint	M	ND
*16510-15	6/18/2025	2-ft x 2-ft white ceiling tile with pinholes and gouges	TV room	Beige compressed fibrous material with paint	M	ND
*16510-16	6/18/2025	White sink undercoating	Kitchen, shallow stainless steel sink	White crumbly soft loose material	M	ND
*16510-17	6/18/2025	White sink undercoating	Kitchen, deep stainless steel sink	White crumbly soft loose material	M	ND
*16510-18	6/18/2025	1-ft x 3-ft brown fiberboard ceiling tile	Computer lab, ceiling	Tan compressed fibrous material with paint	M	ND
*16510-19	6/18/2025	Light grey brittle window glazing	South office window (2'x8')	White crumbly loose material with paint	M	ND
*16510-20	6/18/2025	Tan cement asbestos board	Exterior, east wall, near entry	Thin layer beige compressed material with paint	M	ND
*16510-21	6/18/2025	White elastomeric window frame siding sealant	Exterior, south office window	Gray soft crumbly material with paint	M	ND
*16510-22	6/18/2025	White crumbly relite window putty	Exterior, south, main entry	White crumbly loose material with paint	M	ND
*16510-23	6/18/2025	Dark grey elastomeric door frame sealant	South door to media room	Black soft elastic material with paint	M	ND
*16510-24	6/18/2025	Roll-on asphalt roofing with pebbles	Roof, north	Black asphaltic soft loose material with granules	M	ND
*16510-25	6/18/2025	Black asphaltic HVAC fence footing sealant	Roof, north, HVAC fence footings	Black asphaltic soft loose material with granules	M	ND
*16510-26	6/18/2025	Gray elastomeric HVAC duct seam sealant	Roof, north	Gray soft elastic material	M	ND
*16510-27	6/18/2025	Light grey roof vent sealant	Roof, center	Gray soft elastic material	M	ND
*16510-28	6/18/2025	Light grey sealant along siding to flashing	Roof, hose tower, south	Gray soft elastic material	M	ND
16510-29	6/18/2025	Layer 1: Swirl multicolored carpet Layer 2: Backing	Hallway across from tv room	Layer 1: Multi-colored woven fibrous material Layer 2: Backing brown rubbery material	M	ND ND
16510-30	6/18/2025	Layer 1: Swirl multicolored carpet Layer 2: Backing	Hallway across from tv room	Layer 1: Multi-colored woven fibrous material Layer 2: Backing brown rubbery material	M	ND ND
16510-31	6/18/2025	Layer 1: Red carpet Layer 2: Backing with adhesive	Closet by tv room	Layer 1: Multi-colored woven fibrous material Layer 2: Backing gray rubbery material with tan adhesive	M	ND ND
16510-32	6/18/2025	Layer 1: Red carpet Layer 2: Backing with adhesive	Closet by tv room	Layer 1: Multi-colored woven fibrous material Layer 2: Backing gray rubbery material with thin layer adhesive	M	ND ND

NOT FOR CONSTRUCTION

Sample ID	Sample Date	Material Description	Location	Lab Description	Material Type: TSI, Surfacing, Misc.	Bulk Asbestos[1]
16510-33	6/18/2025	Layer 1: Light grey, white speckled vinyl floor sheeting Layer 2: Backing with mastic	Room across from basement entrance	Layer 1: Gray rubbery vinyl with speckled surface Layer 2: Beige fibrous backing with mastic	M	ND ND
16510-34	6/18/2025	Layer 1: Light grey, white speckled vinyl floor sheeting Layer 2: Backing with mastic	Room across from basement entrance	Layer 1: Gray rubbery vinyl with speckled surface Layer 2: Beige fibrous backing with mastic	M	ND ND
16510-35	6/18/2025	Layer 1: Black, blue speckled rubber flooring Layer 2: Tan adhesive	Hallway across from basement entrance	Layer 1: Black hard rubbery material with fibrous debris Layer 2: Backing tan adhesive	M	ND ND
16510-36	6/18/2025	Layer 1: Black, blue speckled rubber flooring Layer 2: Tan adhesive	Showroom	Layer 1: Black hard rubbery material with fibrous debris Layer 2: Backing tan adhesive	M	ND ND
16510-37	6/18/2025	Layer 1: 12x12-in yellow ceramic floor tile Layer 2: Red grout Layer 3: Gray mortar	Shower room, adjacent showroom	Layer 1: Beige ceramic tile Layer 2: Red brittle material Layer 3: Gray brittle material	M	ND ND ND
16510-38	6/18/2025	Layer 1: Clear mastic Layer 2: 12x12-in yellow ceramic floor tile Layer 3: Red grout Layer 4: Gray mortar	Shower room, adjacent showroom	Layer 1: Clear soft material with debris Layer 2: Beige ceramic tile Layer 3: Red brittle material Layer 4: Gray crumbly material	M	ND ND ND ND
16510-39	6/18/2025	CMU wall	Basement entrance room	Gray crumbly material with paint and fibrous debris	M	ND
16510-40	6/18/2025	CMU wall	Basement entrance room	Gray crumbly material with paint and fibrous debris	M	ND
16510-41	6/18/2025	Layer 1: Blue and brown carpet Layer 2: White mesh with mastic	Media lab	Layer 1: Multi-colored woven fibrous material with white and black plastic mesh with mastic Layer 2: White plastic and fibrous mesh with masti	M	ND ND
16510-42	6/18/2025	Layer 1: Blue and brown carpet Layer 2: Backing	Media lab	Layer 1: Multi-colored woven fibrous material Layer 2: Backing gray rubbery material	M	ND ND
*16510-43	6/18/2025	Dark brown vapor barrier (paper)	Basement boiler room, west pipe chase	Black asphaltic fibrous material	M	ND
16510-44	6/18/2025	Black penetration mastic on vent pipe	Roof, center	Black asphaltic fibrous material with granules	M	ND
16510-45	6/18/2025	Black penetration mastic on vent pipe	Roof, center	Black asphaltic fibrous material with granules	M	ND

Notes:

ACM = Asbestos-containing material

Laboratory analyses conducted by NVL Laboratories, Inc. Seattle, Washington.

Bold and shading denotes that the sample contains asbestos in quantities greater than 1%.

Bold denotes detectible concentrations of asbestos. Chapter 296-62 WAC, Part I-1 applies to all asbestos exposure in the workplace.

[1]Analyzed by polarized light microscopy and EPA Method 600/R-93/116

*Sample ID 16510-01 through 28, and 43: additional materials collected to fulfill the AHERA requirement of "manner sufficient" for miscellaneous materials (2 samples) as represented in the May 2015 Good Faith Inspection by Amec Foster Wheeler

DOSH = Washington State Department of Occupational Safety and Health

EPA = US Environmental Protection Agency

NESHAP = National Emission Standards for Hazardous Air Pollutants

OSHA = Occupational Safety and Health Administration

Misc = Miscellaneous

ND = not detected

PLM = polarized light microscopy

WAC = Washington Administrative Code

NOT FOR CONSTRUCTION

Table 2. Lead-Based Paint Sample Inventory and Results
Old Firehouse Teen Center
Redmond, Washington

Sample ID	Sample Date	Description (paint, color, substrate)	Location	Analytical Results[1] (percent by weight)
16510-L01	6/18/2025	Off-white / Plaster / Wall	Game room, west wall	<0.014
16510-L02	6/18/2025	White/Plaster/Wall	Game room closet, south wall	<0.016
16510-L03	6/18/2025	Off-white/GWB/Wall	Main hallway, adjacent sprinkler room	<0.0093
16510-L04	6/18/2025	Red/GWB/Wall	Main hallway, adjacent woman's restroom	<0.0062
16510-L05	6/18/2025	Off-white/CMU/Wall	Woman's restroom, entry	<0.012
16510-L06	6/18/2025	Off-White/Concrete/Wall	Hose Tower	0.0061
16510-L07	6/18/2025	Red/Wood/Window Frame	Exterior, main entrance	<0.018
16510-L08	6/18/2025	Grey/CAB/Wall	Exterior, main entrance	<0.017
16510-L09	6/18/2025	Off-white/CMU/Wall	Exterior, media lab east wall	<0.016
Federal Regulations Limit				0.5%[2]

Notes:

Laboratory analyses conducted by NVL Laboratories, Inc. Seattle, Washington

[1]Lead analysis by EPA 7000B and EPA Method 3051/6010D

[2]HUD/EPA standard for lead-based paint.

<=not detected at a concentration exceeding the laboratory reporting limit

CAB = cement asbestos board

CMU = cement masonry unit

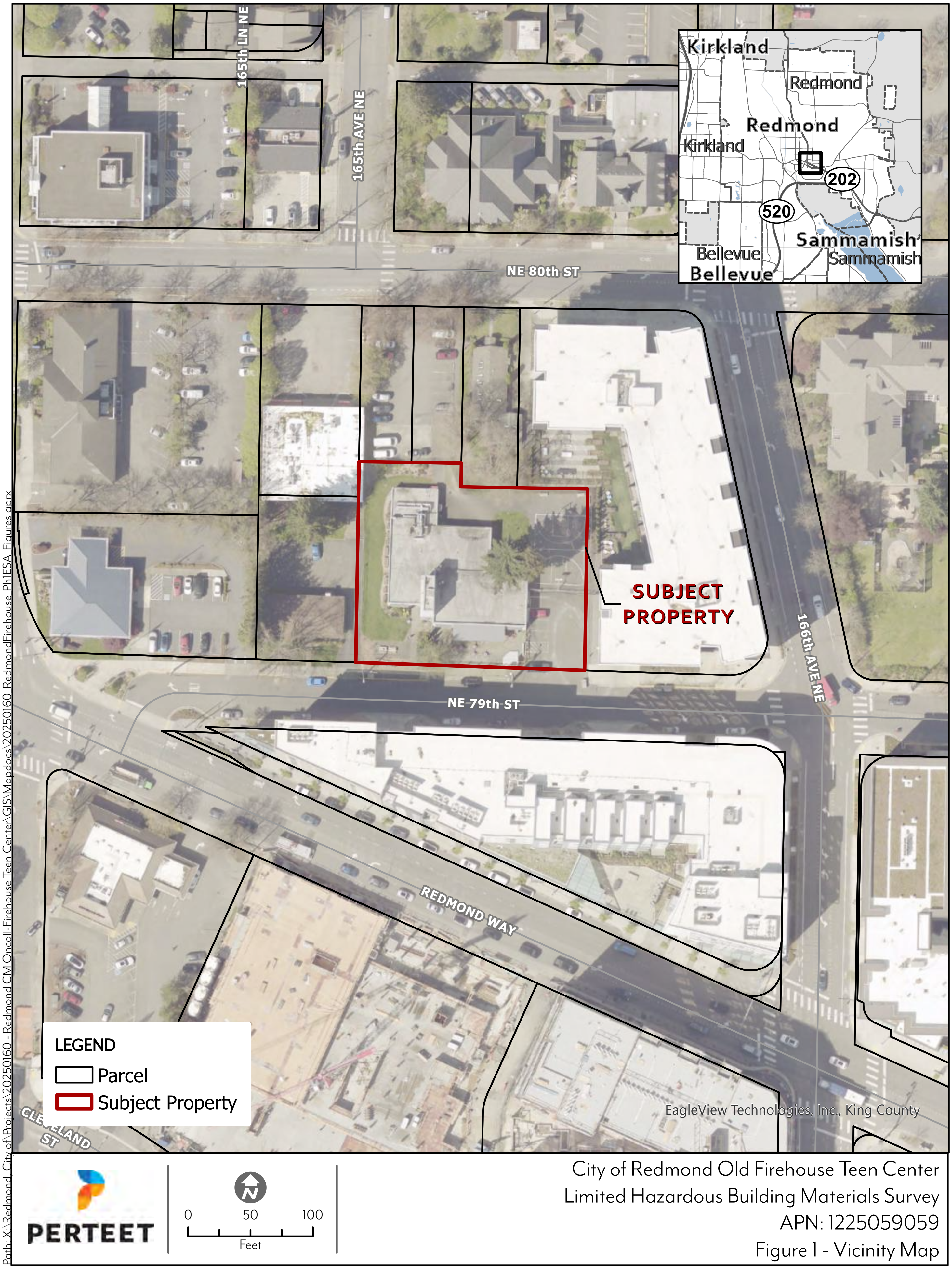
EPA = United States Environmental Protection Agency

HUD = U.S. Department of Housing and Urban Development

GWB = Gypsum Wallboard

NOT FOR CONSTRUCTION

FIGURES



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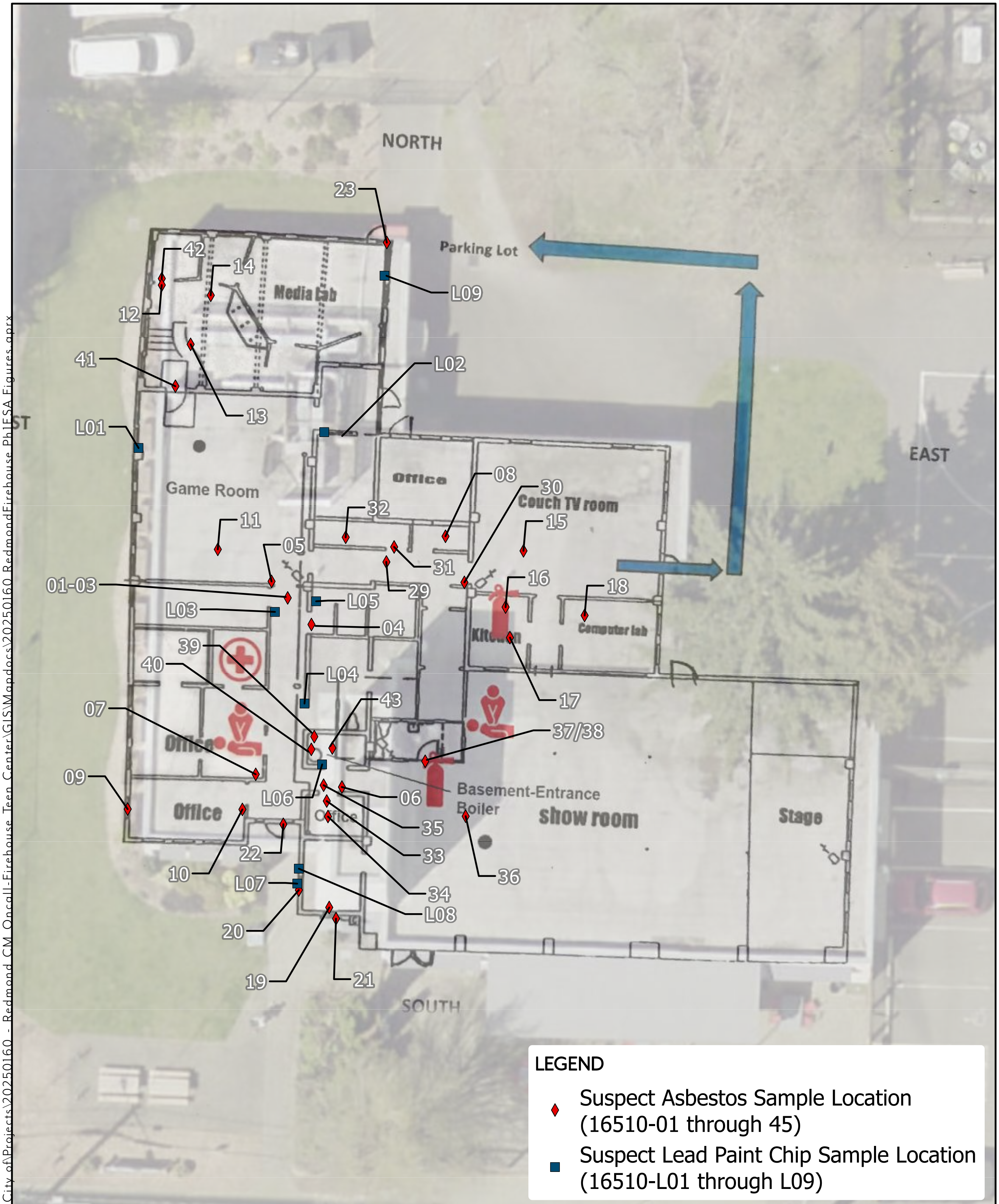
PERTEET

City of Redmond Old Firehouse Teen Center
Limited Hazardous Building Materials Survey
APN: 1225059059
Figure 1 - Vicinity Map

This map is for informational purposes and may have not been prepared for or be suitable for legal, engineering, or surveying purposes.
Date Exported: 7/7/2025 7:40 PM Source: City of Redmond GIS; WSDOT GIS; King County GIS



PERTEET

0 10 20
Feet

City of Redmond Old Firehouse Teen Center
Limited Hazardous Building Materials Survey
APN: 1225059059
Figure 2 - Sample Locations (Interior and Exterior)

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Date Exported: 7/8/2025 11:34 AM Source: WADOT GIS; Okanogan County GIS; ESRI

PERTEET

0 10 20
Feet

City of Redmond Old Firehouse Teen Center
Limited Hazardous Building Materials Survey
APN: 1225059059
Figure 3 - Sample Locations (Roof)

Path: X:\Redmond, City of\Projects\20250160 - Redmond CM Oncall-Firehouse Teen Center\GIS\Mapdocs\20250160 RedmondFirehouse PhIESA Figures.aprx

This map is for informational purposes and may have not been prepared for or be suitable for legal, engineering, or surveying purposes.
Date Exported: 7/8/2025 11:40 AM Source: WADOT GIS; Okanogan County GIS; ESRI

APPENDIX A

Amec Foster Wheeler Inspection

OLD FIRE STATION / TEEN CENTER

16510 Northeast 79th Street

- **Summary of Asbestos-Containing Materials**

Homogeneous Area	Description	Quantity	Cat. / Type	Percent Asbestos
Exterior metal framed windows	Window Glazing (white, brittle)	2,000 LF	Misc. / NF	2% Chrysotile
Floor in southwest office, north storage, south office	Trace black flooring mastic	800 SF	Misc. / NF	5% Chrysotile
Walls and ceilings	White skim coating on plaster and CMU walls	T / O Walls and Ceilings	Surf. / F	4% Chrysotile
Game Room	Diner-style seating base (red, cementitious)	70 SF	Misc. / NF	4% Chrysotile
Basement	Hard mudded piping manifold insulation (white, hard)	10 LF	TSI / F	20% Chrysotile 15% Amosite
Basement / piping tunnels, in walls and ceilings	Hard mudded water piping fittings, elbows	350 Each	TSI / F	25% Chrysotile 21% Amosite
Basement / piping tunnels, in walls and ceilings	Aircell piping insulation (fabric lagging on cardboard layers)	2,500 LF	TSI / F	50% Chrysotile
Basement boiler	PACM Boiler breach gasket	2 Each	Misc. / F	Presumed Asbestos-Containing Material
Basement boiler	PACM Boiler breach insulation	10 SF	TSI / F	Presumed Asbestos-Containing Material

Basement boiler	AACM Boiler refractory brick	50 SF	Misc. / F	Assumed Asbestos-Containing Material

AACM Assumed Asbestos-Containing Material
F Friable
LF Linear Feet
ND None Detected
NF Nonfriable
Misc. Miscellaneous
SF Square Feet
Surf. Surfacing
TSI Thermal System Insulation

- **Summary of Lead-Based Paint**

Location	Component	Substrate	Color	Lead Concentration (mg/cm^2)
Old Fire Station	Door Casing	Wood	Blue	2.00
Old Fire Station	Door	Wood	Red	2.30
Old Fire Station	Window Panel	Other	Black	3.00

mg/cm^2 Milligrams per square centimeter

- **Summary of Bulk Arsenic Sampling**

Sample Number	Location	Description	Results (mg/kg)
RED-OFC-AS-01	Old Fire Station – media lab wall	CMU	<18.0
RED-OFC-AS-02	Old Fire Station – media lab wall	Grey CMU mortar	<19.0

CMU Cement Masonry Unit
Mg/kg milligrams per kilogram

- **Universal Waste Inventory**

Location	PCB Light Ballasts	Fluorescent Lamps	High Intensity Discharge Lamps (HID)
Old Fire Station / Teen Center	135	250	10

HID High intensity discharge
PCB Polychlorinated biphenyls

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-01	Window glazing (white, elastomeric)	Misc. / NF	Southwest office, south, center window	Throughout patches in window glazing	ND
RED-OFC-ACM-02	**Window glazing (white, brittle)**	**Misc. / F**	**Southwest office, south, center window**	**Throughout exterior metal framed windows** **25 windows /** **2,000 LF**	**2% Chrysotile**
RED-OFC-ACM-03	Vinyl cove base (4”, grey) with off-white mastic	Misc. / NF	Southwest office	Southwest office, hall, work room, office, vault, storage, restrooms, game room, art/reading/game room,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-04	Green and beige carpet with green glue and **trace black mastic**	**Misc. / NF**	**Southwest office floor**	**Southwest office, north storage, south office** **800 SF**	Layer 1: ND Layer 2: ND **Layer 3: 5% Chrysotile**
RED-OFC-ACM-05	Fiberboard wall panel (brown)	Misc. / NF	Southwest office wall	Southwest office,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-06	Vinyl floor tile (12”x12”, grey with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, art room, hall near kitchen 462	Layer 1: ND Layer 2: ND
RED-OFC-ACM-07	Vinyl floor tile (12”x12”, red with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, art room, hall near kitchen 124	Layer 1: ND Layer 2: ND

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-08	Vinyl floor tile (12”x12”, black with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, game room, hall near kitchen 124	Layer 1: ND Layer 2: ND
RED-OFC-ACM-09	Multicolored carpet (blue, pink, grey)	Misc. / NF	Small work room	Small work room, counter, storage room, game room, art storage rooms, north hall, computer lab,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-10	CMU wall (grey, cementitious) **with trace off-white material**	**Misc. / NF**	**Old vault wall**	**Throughout on CMU walls** **500 SF**	**Layer 1: 3% Chrysotile** Layer 2: ND
RED-OFC-ACM-11 **RED-OFC-ACM-12** RED-OFC-ACM-13 RED-OFC-ACM-14 **RED-OFC-ACM-15** RED-OFC-ACM-16 **RED-OFC-ACM-17**	**White skim coat** with plaster (grey, cementitious)	**Surf. / F**	Southwest office, south center office, game room, mixing area, art storage, art room, garage/theater, south office	**Throughout original walls** **15,000 SF**	**Layer 1: 3-4% Chrysotile** Layer 2: ND
RED-OFC-ACM-18	Vinyl floor sheeting (grey, speckled) with light grey backing and yellow blue	Misc. / F	Men’s restroom	Men’s restroom, women’s restroom 300 SF	Layer 1: ND Layer 2: ND
RED-OFC-ACM-19 RED-OFC-ACM-20 RED-OFC-ACM-21 RED-OFC-ACM-22 RED-OFC-ACM-23	Gypsum wallboard system -white paint -off-white orange peel texture -off-white joint compound -off-white seam tape -gypsum -brown paper	Surf. / F	Men’s restroom Women’s restroom North hall South hall West hall	Throughout interior located walls	Layer 1: ND Layer 2: ND Layer 3: ND Layer 4: ND

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-24	Acoustic ceiling tile (12"x12", white with pinholes)	Misc. / F	Game room above drop ceiling attached to nail (residual)	Throughout stuck to glue dots on ceiling	ND
RED-OFC-ACM-25	Ceiling tile (2'x4', white) fiberglass, thin	Misc. / NF	Game room drop ceiling	Game room drop ceiling	ND
RED-OFC-ACM-26	Glue dot (brown, brittle)	Misc. / NF	Game room above drop ceiling on wood ceiling	Throughout above ceiling on wood deck ceiling	Layer 1: ND Layer 2: ND
RED-OFC-ACM-27	**Diner style counter base (red, cementitious) with small pebbles**	**Misc. / NF**	**Game room along north wall**	**Game room along north wall** **70 SF**	**4% Chrysotile**
RED-OFC-ACM-28	Door window pane foam (black foam) with clear, sticky adhesive	Misc. / NF	Northwest media lab room	Media lab door windows	ND
RED-OFC-ACM-29	Black wall carpet with yellow glue	Misc. / NF	Media lab central area	Media lab central wall	ND
RED-OFC-ACM-30	Window frame sealant (white, elastomeric)	Misc. / NF	Media lab southeast window	Media lab southeast window	
RED-OFC-ACM-31	HVAC duct seam sealant (grey, elastomeric)	Misc. / NF	Media lab center HVAC duct	Media lab HVAC ducts	ND
RED-OFC-ACM-32	Red and blue carpet squares (2'x2') with off-white adhesive	Misc. / NF	Small closet near art room	Small closet near art room	Layer 1: ND Layer 2: ND Layer 3: ND
RED-OFC-ACM-33	Acoustic ceiling tile (2'x4', white) with pinholes and gouges	Misc. / F	Art/reading/game room	Art/reading/game room 24x28	ND
RED-OFC-ACM-34	Sink undercoating (white)	Misc. / NF	Shallow stainless steel sink in kitchen	Shallow stainless steel sink in kitchen	ND
RED-OFC-ACM-35	Sink undercoating (white)	Misc. / NF	Deep stainless steel sink in kitchen	Deep stainless steel sink in kitchen	ND

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

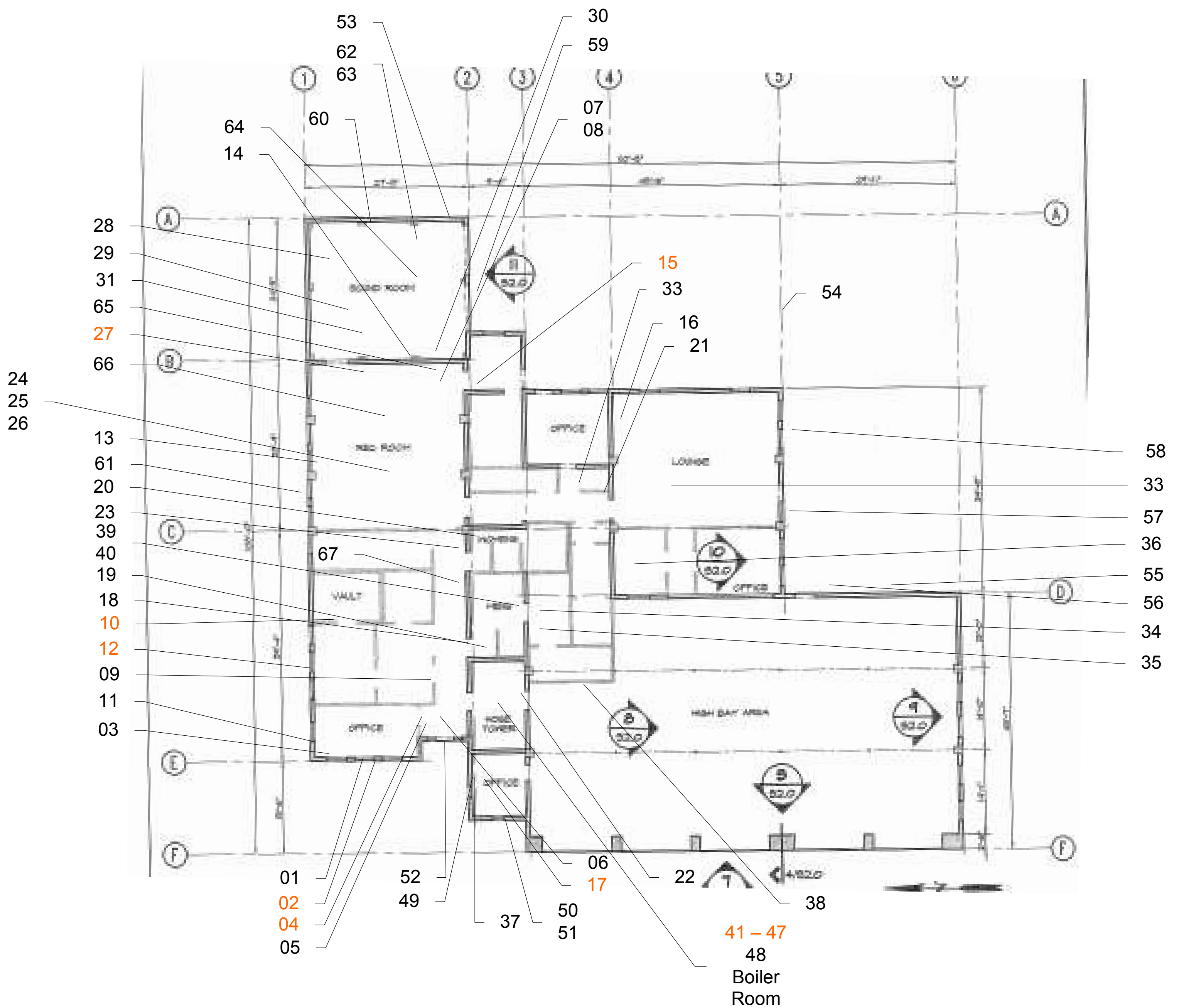
Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-36	Acoustic ceiling tile (1’x3’) brown fiberboard	Misc. /. F	Computer lab ceiling	Computer lab, north storage	ND
RED-OFC-ACM-37	Window glazing (light grey, brittle)	Misc. / NF	South office window 2’x8’ window	South office 2 each 96 LF	ND
RED-OFC-ACM-38	Vinyl cove base (4”, black) with off-white glue and bits of GWB	Misc. / NF	Theater near bathroom	Theater and south hall	Layer 1: ND Layer 2: ND
RED-OFC-ACM-39	Vapor barrier (brown, heavy paper)	Misc. / NF	Inside wall, top of tower at vent	Throughout inside wall	Layer 1: ND Layer 2: ND
RED-OFC-ACM-40	Wall interior concrete (grey, cementitious) with brown, light paper	Misc. / NF	Inside wall, top of tower	Throughout concrete interior walls	Layer 1: ND Layer 2: ND
RED-OFC-ACM-41	**Hard mudded pipe manifold insulation (fabric lagging with white, packed material)**	**TSI / F**	**Basement above boiler**	**Basement boiler piping manifold** **10 LF**	**20% Chrysotile** **15% Amosite**
RED-OFC-ACM-42 **RED-OFC-ACM-43** **RED-OFC-ACM-44**	**Hard mudding water piping elbow insulation (fabric lagging with packed white material)**	**TSI / F**	**Basement piping elbows and fitting**	**Throughout hard mudded fittings and elbows** **350 Each**	**25% Chrysotile** **21% Amosite**
RED-OFC-ACM-45 **RED-OFC-ACM-46** **RED-OFC-ACM-47**	**Aircell piping insulation (fabric lagging on white cardboard layers)**	**TSI / F**	**Basement piping straight runs**	**Throughout piping insulation** **2,500 LF**	**Layer 1: 50% Chrysotile** Layer 2: ND
RED-OFC-ACM-48	Concrete vapor barrier (dark brown, heavy paper)	Misc. / NF	West piping corridor ceiling	Throughout beneath concrete slab and ceiling of piping corridors	ND
RED-OFC-ACM-49	CAB (tan)	Misc. / NF	South exterior near entry	Exterior south areas	ND
RED-OFC-ACM-50	Window putty clear, elastomeric	Misc. / NF	South exterior window (2’x8’)	Throughout 2’x8’ windows	ND

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-51	Window frame to siding sealant (white, elastomeric)	Misc. / NF	South exterior window	Throughout window frames	ND
RED-OFC-ACM-52	Relite window putty (white, crumbly)	Misc. / NF	South main entry	Throughout relite windows 56 LF	ND
RED-OFC-ACM-53	Door frame sealant (dark grey, elastomeric)	Misc. / NF	South door to media lab	Throughout exterior metal framed doors	ND
RED-OFC-ACM-54	Addition-to-main building sealant (grey, elastomeric)	Misc. / NF	East side of media lab exterior seam	Media lab addition seams and other seams	Layer 1: ND Layer 2: ND
RED-OFC-ACM-55 RED-OFC-ACM-56 RED-OFC-ACM-57 RED-OFC-ACM-58 RED-OFC-ACM-59 RED-OFC-ACM-60 RED-OFC-ACM-61	Spray-on exterior wall (off-white, cementitious) with gravel	Surf. / NF	Exterior	Throughout exterior	ND
RED-OFC-ACM-62	HVAC fence footing sealant (black, asphaltic)	Misc. / NF	HVAC fence footings on roof near HVAC ducts	HVAC fence footings on roof	ND
RED-OFC-ACM-63	Roll-on roofing (heavy roofing with pebbles)	Misc. / NF	Roof, north side	Throughout roof	ND
RED-OFC-ACM-64	HVAC duct seam sealant (off-white, elastomeric)	Misc. / NF	Roof, north side ducts	Throughout HVAC units and ducts	ND
RED-OFC-ACM-65	Roofing paper (black, light)	Misc. / NF	Roof at edge to 2nd level	Throughout roof beneath roll-on composite roofing	ND
RED-OFC-ACM-66	Roof vent sealant (light grey, elastomeric)	Misc. / NF	Roof, center	Throughout roof vents	ND

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-67	Siding to flashing sealant (light grey, elastomeric)	Misc. / NF	Roof, south side at tower	Throughout siding-to-flashing seams	ND
Assumed	**Boiler breach gasket**	**Misc. / F**	**Basement boiler room on boiler doors**	**Boiler door gaskets** **2 Each**	**Assumed ACM**
Assumed	**Boiler refractory brick**	**Misc. / F**	**Basement boiler room inside boiler**	**Boiler interior** **50 SF**	**Assumed ACM**
Assumed	**Boiler breach insulation**	**TSI / F**	**Basement boiler in boiler breach**	**Boiler breach** **10 SF**	**PACM**

PACM Presumed Asbestos-Containing Material
F Friable
LF Linear Feet
ND None Detected
NF Nonfriable
Misc. Miscellaneous
SF Square Feet
Surf. Surfacing
TSI Thermal System Insulation



OLD FIRE STATION / TEEN CENTER

Not to scale

REVISIONS			
NO.	DESCRIPTION	BY	DATE

PROJECT: Hazmat Inspection, Testing and Reporting

TITLE: SAMPLE COLLECTION LOCATIONS

Client: City of Redmond

Amec Foster Wheeler
Environment & Infrastructure, Inc.
11810 North Creek Parkway North
Bothell, WA 98011
425.368.1000

5-915-17894-0	REV. NO.
DR:	CHK:

DATE: APRIL 2015

FIGURE NUMBER

22

May 6, 2015

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

Chris Miele
AMEC Environment & Infrastructure, Inc-Bothell
11810 North Creek Parkway North
Bothell, WA 98011

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507912.00

Dear Mr. Miele,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043611 **Client Sample #: RED-OFC-ACM-01**
Location: C of R

Layer 1 of 1 **Description:** White soft putty material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected ND	**None Detected ND**

Lab ID: 15043612 **Client Sample #: RED-OFC-ACM-02**
Location: C of R

Layer 1 of 1 **Description:** Off-white putty material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected ND	**Chrysotile 2%**

Lab ID: 15043613 **Client Sample #: RED-OFC-ACM-03**
Location: C of R

Layer 1 of 2 **Description:** Gray rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder	None Detected ND	**None Detected ND**

Lab ID: 15043614 **Client Sample #: RED-OFC-ACM-04**
Location: C of R

Layer 1 of 3 **Description:** Multi-color woven fibrous material with yellow mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Fine particles, Mastic/Binder	Synthetic fibers 85%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 3 **Description:** Green soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Trace black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Mastic/Binder	Cellulose	3%	**Chrysotile 5%**

Lab ID: 15043615 **Client Sample #: RED-OFC-ACM-05**
Location: C of R

Layer 1 of 2 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Adhesive/Binder, Paint	Cellulose	96%	**None Detected ND**

Layer 2 of 2 **Description:** White soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Perlite	None Detected	ND	**None Detected ND**

Lab ID: 15043616 **Client Sample #: RED-OFC-ACM-06**
Location: C of R

Layer 1 of 2 **Description:** Gray tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Trace yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	None Detected	ND	**None Detected ND**

Lab ID: 15043617 **Client Sample #: RED-OFC-ACM-07**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** Pink tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray crumbly material with thin mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler, Mastic/Binder	Cellulose	6%	**None Detected ND**

Lab ID: 15043618 **Client Sample #: RED-OFC-ACM-08**
Location: C of R

Layer 1 of 2 **Description:** Black tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Trace gray crumbly material with trace mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler, Mastic/Binder	Cellulose	4%	**None Detected ND**

Lab ID: 15043619 **Client Sample #: RED-OFC-ACM-09**
Location: C of R

Layer 1 of 2 **Description:** Multi-color woven fibrous material with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Mastic/Binder	Synthetic fibers	88%	**None Detected ND**

Layer 2 of 2 **Description:** Black soft material with trace adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler, Adhesive/Binder	Glass fibers	8%	**None Detected ND**

Lab ID: 15043620 **Client Sample #: RED-OFC-ACM-10**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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NVL LABS

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** Trace off-white material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 3%**

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043621 **Client Sample #: RED-OFC-ACM-11**
Location: C of R

Layer 1 of 1 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043622 **Client Sample #: RED-OFC-ACM-12**
Location: C of R

Layer 1 of 3 **Description:** Off-white skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 3%**
Paint			

Layer 2 of 3 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Gray hard brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains, Gravel	None Detected	ND	**None Detected ND**

Lab ID: 15043623 **Client Sample #: RED-OFC-ACM-13**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043624 **Client Sample #: RED-OFC-ACM-14**
Location: C of R

Layer 1 of 2 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Gray hard brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains, Gravel	None Detected	ND	**None Detected ND**

Lab ID: 15043625 **Client Sample #: RED-OFC-ACM-15**
Location: C of R

Layer 1 of 2 **Description:** Off-white skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 4%**
Paint			

Layer 2 of 2 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: **Mr. Chris Miele**
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15043626 **Client Sample #: RED-OFC-ACM-16**
Location: C of R

Layer 1 of 2 **Description:** Off-white thin skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043627 **Client Sample #: RED-OFC-ACM-17**
Location: C of R

Layer 1 of 2 **Description:** Yellow skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mica, Paint	None Detected	ND	**Chrysotile 3%**

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043628 **Client Sample #: RED-OFC-ACM-18**
Location: C of R

Layer 1 of 2 **Description:** Gray with black specks sheet vinyl

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white fibrous backing with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Mastic/Binder	Cellulose	75%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043629 **Client Sample #: RED-OFC-ACM-19**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 3	**Description:** Off-white/white compacted powdery material with paint		
	Calcareous particles, Binder/Filler, Paint	None Detected ND	**None Detected ND**
Layer 2 of 3	**Description:** White compacted powdery material with paper		
	Calcareous particles, Binder/Filler	Cellulose 40%	**None Detected ND**
Layer 3 of 3	**Description:** White chalky material with paper		
	Fine particles, Gypsum/Binder	Cellulose 16% Glass fibers 5%	**None Detected ND**

Lab ID: 15043630 **Client Sample #: RED-OFC-ACM-20**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 3	**Description:** Off-white/white compacted powdery material with paint		
	Calcareous particles, Binder/Filler, Paint	None Detected ND	**None Detected ND**
Layer 2 of 3	**Description:** White compacted powdery material with paper		
	Calcareous particles, Binder/Filler	Cellulose 37%	**None Detected ND**
Layer 3 of 3	**Description:** White chalky material with paper		
	Fine particles, Gypsum/Binder	Cellulose 12% Glass fibers 4%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15043631 **Client Sample #: RED-OFC-ACM-21**
Location: C of R

Layer 1 of 4 **Description:** White bumpy compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Layer 2 of 4 **Description:** Off-white/white compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Layer 3 of 4 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	Cellulose	43%	**None Detected ND**

Layer 4 of 4 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Gypsum/Binder	Cellulose	16%	**None Detected ND**
	Glass fibers	3%	

Lab ID: 15043632 **Client Sample #: RED-OFC-ACM-22**
Location: C of R

Layer 1 of 2 **Description:** White thin bumpy compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Gypsum/Binder	Cellulose	20%	**None Detected ND**
	Glass fibers	5%	

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043633 **Client Sample #: RED-OFC-ACM-23**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%		Asbestos Type: %
Layer 1 of 4	**Description:** White bumpy compacted powdery material with paint			
	Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**
Layer 2 of 4	**Description:** Off-white/white compacted powdery material			
	Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**
Layer 3 of 4	**Description:** White compacted powdery material with paper			
	Calcareous particles, Binder/Filler	Cellulose	35%	**None Detected ND**
Layer 4 of 4	**Description:** White chalky material with paper			
	Fine particles, Gypsum/Binder	Cellulose	17%	**None Detected ND**
		Glass fibers	3%	

Lab ID: 15043634 **Client Sample #: RED-OFC-ACM-24**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%		Asbestos Type: %
Layer 1 of 1	**Description:** Off-white compressed fibrous material with paint			
	Fine particles, Binder/Filler, Paint	Cellulose	60%	**None Detected ND**

Lab ID: 15043635 **Client Sample #: RED-OFC-ACM-25**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%		Asbestos Type: %
Layer 1 of 1	**Description:** White hard material			
	Fine particles, Binder/Filler	Glass fibers	40%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043636 **Client Sample #: RED-OFC-ACM-26**
Location: C of R

Layer 1 of 2 **Description:** Trace off-white material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler	Cellulose	10%	None Detected ND

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	None Detected	ND	None Detected ND

Lab ID: 15043637 **Client Sample #: RED-OFC-ACM-27**
Location: C of R

Layer 1 of 1 **Description:** Dark red brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler	Cellulose	3%	Chrysotile 4%

Lab ID: 15043638 **Client Sample #: RED-OFC-ACM-28**
Location: C of R

Layer 1 of 1 **Description:** Black foamy material with clear soft adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Synthetic foam, Adhesive/Binder	Cellulose	3%	None Detected ND

Lab ID: 15043639 **Client Sample #: RED-OFC-ACM-29**
Location: C of R

Layer 1 of 1 **Description:** Beige /white woven fibrous material with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Mastic/Binder	Synthetic fibers	90%	None Detected ND

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043640 **Client Sample #: RED-OFC-ACM-30**
Location: C of R

Layer 1 of 1 **Description:** White soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, Technical Director

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1507912

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CHAIN of CUSTODY SAMPLE LOG

LABS HAZARDOUS MATERIALS SERVICES

Client AMEC Environment & Infrastructure, Inc.
Street 11810 North Creek Parkway North
Bothell, WA 98011
Project Manager Chris Miele
Project Location C of R
Phone: 425-368-1000 **Fax:** 425-368-1001

NVL Batch Number
Client Job Number 5915178940
Total Samples 116
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☒ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address Christopher.miele@amecfw.com
brandon.kemperman@amecfw.com

☐ **Asbestos Air**	☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other
☒ **Asbestos Bulk**	☒ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk
☐ **Mold/Fungus**	☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS	**Inst./Det Limit**	**Matrix**		**RCRA Metals** ☐ All 8		**Other Metals** ☐ All 3
☐ Total Metals ☐ TCLP	☐ FAA (ppm) ☐ ICP (ppm) ☐ GFAA (ppb)	☐ Air Filter ☐ Drinking water ☐ Dust/wipe (Area) ☐ Soil ☐ Paint Chips in %	☐ Paint Chips in cm ☐ Waste Water ☐ Other	☐ Arsenic (As) ☐ Barium (Ba) ☐ Cadmium (Cd) ☐ Chromium (Cr) ☐ Lead (Pb)	☐ Mercury (Hg) ☐ Selenium (Se) ☐ Silver (Ag)	☐ Copper (Cu) ☐ Nickel (Ni) ☐ Zinc (Zn)

☐ **Other Types of Analysis**	☐ Fiberglass ☐ Nuisance Dust ☐ Other (Specify) ☐ Silica ☐ Respirable Dust

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		RED-FS16-ACM-01		
2		↓		
3		RED-FS16-ACM-23		
4		RED-FMS-ACM-01		
5		↓		
6		RED-FMS-ACM-26		
7		RED-OFC-ACM-01		
8		↓ -30		
9		RED-OFC-ACM-67		
10				
11				
12				
13			Br J Kemp	
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Brandon Kemperman	Br J Kemp	Amec FW		
Relinquished by	Brandon Kemperman	Br J Kemperman	Amec FW	4-30-15	1600
Received by	Fatimatta	[signature]	NVL Labs	5/1/15	10:45a fale
Analyzed by	Nadia	[signature]	NVL	5/6/15	1:10 PM
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

May 7, 2015

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INDUSTRIAL HYGIENE SERVICES
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Chris Miele
AMEC Environment & Infrastructure, Inc-Bothell
11810 North Creek Parkway North
Bothell, WA 98011

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507913.00

Dear Mr. Miele,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043641 **Client Sample #: RED-OFC-ACM-31**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	Gray soft/elastic material with paint	Binder/Filler, Fine particles, Paint	Cellulose 2%	None Detected ND

Lab ID: 15043642 **Client Sample #: RED-OFC-ACM-32**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 3	Red/blue fibrous material with mastic	Binder/Filler, Mastic/Binder	Synthetic fibers 70% Cellulose 4%	None Detected ND
Layer 2 of 3	Black rubbery material	Binder/Filler, Rubber/Binder	Glass fibers 10% Synthetic fibers 2%	None Detected ND
Layer 3 of 3	Tan soft mastic	Binder/Filler, Mastic/Binder	Cellulose 3% Synthetic fibers 3%	None Detected ND

Lab ID: 15043643 **Client Sample #: RED-OFC-ACM-33**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	Gray fibrous material with paint	Binder/Filler, Paint, Perlite	Cellulose 35%	None Detected ND

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

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Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

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Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Glass fibers 18%

Lab ID: 15043644 **Client Sample #: RED-OFC-ACM-34**
Location: C of R

Layer 1 of 1	**Description:** Off-white flaky material with fibrous elements		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles	Cellulose 10%	**None Detected ND**

Lab ID: 15043645 **Client Sample #: RED-OFC-ACM-35**
Location: C of R

Layer 1 of 1	**Description:** Off-white flaky material with fibrous elements		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles	Cellulose 9%	**None Detected ND**

Lab ID: 15043646 **Client Sample #: RED-OFC-ACM-36**
Location: C of R

Layer 1 of 1	**Description:** Tan compressed fibrous material with paint		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Paint	Cellulose 85%	**None Detected ND**

Lab ID: 15043647 **Client Sample #: RED-OFC-ACM-37**
Location: C of R

Layer 1 of 1	**Description:** Light gray hard material with paint		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles, Paint	Cellulose 2%	**None Detected ND**

Lab ID: 15043648 **Client Sample #: RED-OFC-ACM-38**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

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Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** Black rubbery material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Rubber/Binder, Paint	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** White compacted powdery material with paint & paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Calcareous particles, Paint	Cellulose 12%	**None Detected ND**

Lab ID: 15043649 **Client Sample #: RED-OFC-ACM-39**
Location: C of R

Layer 1 of 2 **Description:** Black asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Asphalt/Binder, Binder/Filler	Cellulose 90%	**None Detected ND**

Layer 2 of 2 **Description:** Trace gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Sand, Binder/Filler	Cellulose 2%	**None Detected ND**

Lab ID: 15043650 **Client Sample #: RED-OFC-ACM-40**
Location: C of R

Layer 1 of 2 **Description:** Black thin asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Asphalt/Binder	Cellulose 65%	**None Detected ND**
	Spider silk 3%	

Layer 2 of 2 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Sand	Cellulose 2%	**None Detected ND**

Lab ID: 15043651 **Client Sample #: RED-OFC-ACM-41**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 1 **Description:** Light gray crumbly fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler	Cellulose 10%	**Chrysotile 20%**
		Amosite 15%

Lab ID: 15043652 **Client Sample #: RED-OFC-ACM-42**
Location: C of R

Layer 1 of 1 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler	Cellulose 20%	**Chrysotile 25%**
		Amosite 21%

Lab ID: 15043653 **Client Sample #: RED-OFC-ACM-43**
Location: C of R

Layer 1 of 1 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler	Cellulose 10%	**Amosite 20%**
		Chrysotile 7%

Lab ID: 15043654 **Client Sample #: RED-OFC-ACM-44**
Location: C of R

Layer 1 of 2 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler	Cellulose 12%	**Amosite 20%**
		Chrysotile 7%

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 2 **Description:** Beige woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Glass fibers 95%	**None Detected ND**

Lab ID: 15043655 **Client Sample #: RED-OFC-ACM-45**
Location: C of R

Layer 1 of 1 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 46%**

Lab ID: 15043656 **Client Sample #: RED-OFC-ACM-46**
Location: C of R

Layer 1 of 2 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 50%**

Layer 2 of 2 **Description:** Gray woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 80%	**None Detected ND**

Lab ID: 15043657 **Client Sample #: RED-OFC-ACM-47**
Location: C of R

Layer 1 of 1 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 50%**

Lab ID: 15043658 **Client Sample #: RED-OFC-ACM-48**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 1 **Description:** Black asphaltic fibrous material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Miscellaneous particles	Cellulose	75%	**None Detected ND**

Lab ID: 15043659 **Client Sample #: RED-OFC-ACM-49**
Location: C of R

Layer 1 of 1 **Description:** Gray brittle material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Cellulose	5%	**None Detected ND**

Lab ID: 15043660 **Client Sample #: RED-OFC-ACM-50**
Location: C of R

Layer 1 of 1 **Description:** Gray soft material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 15043661 **Client Sample #: RED-OFC-ACM-51**
Location: C of R

Layer 1 of 1 **Description:** White soft material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Wood flakes	Cellulose	2%	**None Detected ND**
	Wood fibers	2%	

Lab ID: 15043662 **Client Sample #: RED-OFC-ACM-52**
Location: C of R

Layer 1 of 1 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

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Project Location: C of R

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Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043663 **Client Sample #: RED-OFC-ACM-53**
Location: C of R

Layer 1 of 1 **Description:** Black soft material with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Paint, Sand	Cellulose <1%	**None Detected ND**

Lab ID: 15043664 **Client Sample #: RED-OFC-ACM-54**
Location: C of R

Layer 1 of 2 **Description:** Gray rubbery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Synthetic foam		**None Detected ND**

Lab ID: 15043665 **Client Sample #: RED-OFC-ACM-55**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose 2%	**None Detected ND**

Lab ID: 15043666 **Client Sample #: RED-OFC-ACM-56**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose 2%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

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Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043667 **Client Sample #: RED-OFC-ACM-57**
Location: C of R

Layer 1 of 1 **Description:** White sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Sand, Paint, Binder/Filler	None Detected ND	**None Detected ND**

Lab ID: 15043668 **Client Sample #: RED-OFC-ACM-58**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Sand, Paint, Binder/Filler	Cellulose <1%	**None Detected ND**

Lab ID: 15043669 **Client Sample #: RED-OFC-ACM-59**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Sand, Paint, Binder/Filler	None Detected ND	**None Detected ND**

Lab ID: 15043670 **Client Sample #: RED-OFC-ACM-60**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Sand, Paint, Binder/Filler	Cellulose 2%	**None Detected ND**

Lab ID: 15043671 **Client Sample #: RED-OFC-ACM-61**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Sand, Paint, Binder/Filler	None Detected	ND	**None Detected ND**

Lab ID: 15043672 **Client Sample #: RED-OFC-ACM-62**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic material with granules and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Granules	Cellulose	2%	**None Detected ND**

Lab ID: 15043673 **Client Sample #: RED-OFC-ACM-63**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Granules	Synthetic fibers	12%	**None Detected ND**
	Glass fibers	8%	

Lab ID: 15043674 **Client Sample #: RED-OFC-ACM-64**
Location: C of R

Layer 1 of 1 **Description:** Gray soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 15043675 **Client Sample #: RED-OFC-ACM-65**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic fibrous material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Asphalt/Binder, Sand	Glass fibers	15%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Cellulose 10%

Lab ID: 15043676 **Client Sample #: RED-OFC-ACM-66**
Location: C of R

Layer 1 of 1 **Description:** Gray soft/elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Polyethylene fibers 25%	**None Detected ND**

Lab ID: 15043677 **Client Sample #: RED-OFC-ACM-67**
Location: C of R

Layer 1 of 1 **Description:** Gray soft/elastic material with metal foil

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Metal foil	Polyethylene fibers 23%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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CHAIN of CUSTODY SAMPLE LOG

1507913

Client: AMEC Environment & Infrastructure, Inc.
Street: 11810 North Creek Parkway North
Bothell, WA 98011

NVL Batch Number:
Client Job Number: 5915178940
Total Samples: 116

Project Manager: Chris Miele
Project Location: C of R

Turn Around Time: ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs

Email address: christopher.miele@amecfw.com
brandon.kemperman@amecfw.com

Phone: 425-368-1000 Fax: 425-368-1001

☐ Asbestos Air: ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other

☑ Asbestos Bulk: ☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk

☐ Mold/Fungus: ☐ Mold Air ☐ Mold Bulk ☐ Rotometer Calibration

METALS	Inst./Det Limit	Matrix		RCRA Metals ☐ All 8		Other Metals
☐ Total Metals	☐ FAA (ppm)	☐ Air Filter	☐ Paint Chips in cm	☐ Arsenic (As)	☐ Mercury (Hg)	☐ All 3
☐ TCLP	☐ ICP (ppm)	☐ Drinking water	☐ Waste Water	☐ Barium (Ba)	☐ Selenium (Se)	☐ Copper (Cu)
	☐ GFAA (ppb)	☐ Dust/wipe (Area)	☐ Other	☐ Cadmium (Cd)	☐ Silver (Ag)	☐ Nickel (Ni)
		☐ Soil		☐ Chromium (Cr)		☐ Zinc (Zn)
		☐ Paint Chips in %		☐ Lead (Pb)		

☐ Other Types of Analysis: ☐ Fiberglass ☐ Nuisance Dust ☐ Other (Specify) ☐ Silica ☐ Respirable Dust

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		RED-FS16-ACM-01		
2		↓		
3		RED-FS16-ACM-23		
4		RED-FMS-ACM-01		
5		↓		
6		RED-FMS-ACM-26		
7		RED-OFC-ACM-01		
8		↓ 31		
9		RED-OFC-ACM-67		
10				
11				
12				
13			B J Kemp	
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Brandon Kemperman	B J Kemp	Amec FW		
Relinquished by	Brandon Kemperman	B J Kemperman	Amec FW	4-30-15	1600
Received by	[illegible]	[illegible]	NVL Labs	5/1/15	10:45a Late
Analyzed by	Dhatar U.	[illegible]	N	5/8/15	940
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

APPENDIX B

Laboratory Analytical Reports

June 24, 2025

Andrea Winder
Perteet, Inc.
PO Box 1186
Everett, WA 98206

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 2510555.00

Client Project: 20250160
Location: Old Fire House and Teen Center

Dear Ms. Winder,

Enclosed please find test results for the 45 sample(s) submitted to our laboratory for analysis on 6/18/2025.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with **U. S. EPA 40 CFR Appendix E to Subpart E of Part 763**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116**, Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Hilary Crumley, Manager Asbestos Laboratory

Testing

Lab Code: 102063-0

Enc.: Sample Results

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 250061198 **Client Sample #: 16510-01**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Black crumbly vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Backing thin layer beige crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Fine grains	Cellulose	5%	**None Detected ND**

Lab ID: 250061199 **Client Sample #: 16510-02**
Location: Old Fire House and Teen Center
Comments: Insufficient adhesive for analysis in layer-2

Layer 1 of 2 **Description:** Gray vinyl tile

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Backing trace of tan adhesive with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Adhesive/Binder, Debris	Cellulose	3%	**None Detected ND**

Lab ID: 250061200 **Client Sample #: 16510-03**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Red vinyl tile with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Fine grains, Debris	Cellulose	3%	**None Detected ND**

Layer 2 of 2 **Description:** Backing gray crumbly material with adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Adhesive/Binder, Fine particles, Fine grains	Cellulose	5%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley

Hilary Crumley, Manager Asbestos Laboratory

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and EPA 40 CFR Appendix E to Subpart E of Part 763 with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Lab ID: 250061201 **Client Sample #: 16510-04**
Location: Old Fire House and Teen Center

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 3	**Description:** Gray rubbery vinyl surface speckled pattern		
	Vinyl/Binder, Fine grains, Rubber	Cellulose 1%	**None Detected ND**
Layer 2 of 3	**Description:** White fibrous backing with adhesive		
	Adhesive/Binder, Fine particles	Cellulose 34%	**None Detected ND**
Layer 3 of 3	**Description:** Gray crumbly material		
	Binder/Filler, Fine particles, Fine grains	Cellulose 6%	**None Detected ND**

Lab ID: 250061202 **Client Sample #: 16510-05**
Location: Old Fire House and Teen Center
Comments: Insufficient mastic for analysis in layer-2

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	**Description:** Gray rubbery material with paint		
	Paint, Rubber/Binder, Fine particles	None Detected ND	**None Detected ND**
Layer 2 of 2	**Description:** Backing trace off-white mastic with debris		
	Mastic/Binder, Fine particles, Debris	Cellulose <1%	**None Detected ND**

Lab ID: 250061203 **Client Sample #: 16510-06**
Location: Old Fire House and Teen Center

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	**Description:** Black rubbery material with fibrous debris		
	Rubber/Binder, Fine particles, Debris	Cellulose 3%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Backing tan adhesive with paper and paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Adhesive/Binder, Fine particles, Paint	Cellulose	15%	**None Detected ND**

Lab ID: 250061204 **Client Sample #: 16510-07**

Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Synthetic fibers	39%	**None Detected ND**

Layer 2 of 2 **Description:** Backing gray rubbery material and adhesive with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Rubber, Debris	Glass fibers	4%	**None Detected ND**
	Wood fibers	2%	

Lab ID: 250061205 **Client Sample #: 16510-08**

Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	Synthetic fibers	34%	**None Detected ND**

Layer 2 of 2 **Description:** Backing gray rubbery material and adhesive with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Rubber, Debris	Glass fibers	3%	**None Detected ND**
	Synthetic fibers	1%	

Lab ID: 250061206 **Client Sample #: 16510-09**

Location: Old Fire House and Teen Center

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and EPA 40 CFR Appendix E to Subpart E of Part 763 with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASB-02

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 1 **Description:** Clear soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 250061207 **Client Sample #: 16510-10**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Paint, Binder/Filler, Fine particles	Cellulose	28%	**None Detected ND**

Lab ID: 250061208 **Client Sample #: 16510-11**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Brown crumbly loose mastic with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles, Debris	Cellulose	2%	**None Detected ND**

Lab ID: 250061209 **Client Sample #: 16510-12**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Black soft elastic material with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Fine particles, Debris	Cellulose	2%	**None Detected ND**

Lab ID: 250061210 **Client Sample #: 16510-13**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Black & white woven fibrous material with white & black plastic mesh with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Mastic/Binder, Fine particles, Plastic	Synthetic fibers	41%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** White fibrous and plastic mesh with tan mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder, Fine particles, Plastic	Synthetic fibers 14%	**None Detected ND**

Lab ID: 250061211 **Client Sample #: 16510-14**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Gray soft crumbly elastic material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Caulking compound, Rubber	None Detected ND	**None Detected ND**

Lab ID: 250061212 **Client Sample #: 16510-15**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Beige compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Perlite	Cellulose 54%	**None Detected ND**
	Glass fibers 18%	

Lab ID: 250061213 **Client Sample #: 16510-16**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** White crumbly soft loose material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains	Cellulose 1%	**None Detected ND**

Lab ID: 250061214 **Client Sample #: 16510-17**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** White crumbly soft loose material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains	Cellulose 3%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley
Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Lab ID: 250061215 **Client Sample #: 16510-18**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Fine particles	Cellulose 39%	**None Detected ND**

Lab ID: 250061216 **Client Sample #: 16510-19**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** White crumbly loose material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 250061217 **Client Sample #: 16510-20**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Thin layer beige compressed material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Fine particles	Cellulose 34%	**None Detected ND**

Lab ID: 250061218 **Client Sample #: 16510-21**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Gray soft crumbly material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Fine grains	None Detected ND	**None Detected ND**

Lab ID: 250061219 **Client Sample #: 16510-22**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** White crumbly loose material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Paint, Binder/Filler, Fine grains	None Detected ND	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and EPA 40 CFR Appendix E to Subpart E of Part 763 with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 250061220 **Client Sample #: 16510-23**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Black soft elastic material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Paint, Binder/Filler, Fine particles	Cellulose	<1%	**None Detected ND**

Lab ID: 250061221 **Client Sample #: 16510-24**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Black asphaltic fibrous material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Granules	Glass fibers	44%	**None Detected ND**

Lab ID: 250061222 **Client Sample #: 16510-25**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Black asphaltic soft loose material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Granules	Cellulose	1%	**None Detected ND**

Lab ID: 250061223 **Client Sample #: 16510-26**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Gray soft elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Polyethylene fibers	1%	**None Detected ND**

Lab ID: 250061224 **Client Sample #: 16510-27**
Location: Old Fire House and Teen Center
Layer 1 of 1 **Description:** Gray soft elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Polyethylene fibers	3%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley

Hilary Crumley, Manager Asbestos Laboratory

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and EPA 40 CFR Appendix E to Subpart E of Part 763 with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASB-02

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Lab ID: 250061225 **Client Sample #: 16510-28**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Gray soft elastic material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Polyethylene fibers	5%	**None Detected ND**

Lab ID: 250061226 **Client Sample #: 16510-29**
Location: Old Fire House and Teen Center
Comments: No mastic or adhesive present in layer-2

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers	35%	**None Detected ND**

Layer 2 of 2 **Description:** Backing brown rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Rubber	Glass fibers	2%	**None Detected ND**

Lab ID: 250061227 **Client Sample #: 16510-30**
Location: Old Fire House and Teen Center
Comments: No mastic or adhesive present in layer-2

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers	38%	**None Detected ND**

Layer 2 of 2 **Description:** Backing brown rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine grains, Rubber	Glass fibers	4%	**None Detected ND**

Lab ID: 250061228 **Client Sample #: 16510-31**
Location: Old Fire House and Teen Center

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers	34%	None Detected ND

Layer 2 of 2 **Description:** Backing gray rubbery material with tan adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Adhesive/Binder, Fine grains, Rubber	Glass fibers	2%	None Detected ND
	Cellulose	1%	

Lab ID: 250061229 **Client Sample #: 16510-32**

Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers	24%	None Detected ND

Layer 2 of 2 **Description:** Backing gray rubbery material with thin layer adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Adhesive/Binder, Fine grains, Rubber	Glass fibers	1%	None Detected ND

Lab ID: 250061230 **Client Sample #: 16510-33**

Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Gray rubbery vinyl with speckled surface

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Rubber	None Detected	ND	None Detected ND

Layer 2 of 2 **Description:** Beige fibrous backing with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose	13%	None Detected ND
	Glass fibers	5%	

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Lab ID: 250061231 **Client Sample #: 16510-34**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Gray rubbery vinyl with speckled surface

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Fine grains, Rubber	Cellulose	15%	**None Detected ND**
	Glass fibers	7%	

Layer 2 of 2 **Description:** Beige fibrous backing with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles	Cellulose	14%	**None Detected ND**
	Glass fibers	6%	

Lab ID: 250061232 **Client Sample #: 16510-35**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Black hard rubbery material with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Rubber, Debris	Cellulose	3%	**None Detected ND**

Layer 2 of 2 **Description:** Backing tan adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Adhesive/Binder, Fine particles	Cellulose	1%	**None Detected ND**

Lab ID: 250061233 **Client Sample #: 16510-36**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Black hard rubbery material with fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Rubber, Debris	Cellulose	1%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and EPA 40 CFR Appendix E to Subpart E of Part 763 with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

ASB-02

Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 2 of 2 **Description:** Backing tan adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Adhesive/Binder, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 250061234 **Client Sample #: 16510-37**
Location: Old Fire House and Teen Center

Layer 1 of 3 **Description:** Beige ceramic tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Ceramic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** Red brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Putty Compound, Fine particles, Quartz	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Cellulose	<1%	**None Detected ND**

Lab ID: 250061235 **Client Sample #: 16510-38**
Location: Old Fire House and Teen Center

Layer 1 of 4 **Description:** Clear soft material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Caulking compound, Fine particles, Debris	Cellulose	1%	**None Detected ND**

Layer 2 of 4 **Description:** Beige ceramic tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Ceramic/Binder, Fine particles	None Detected	ND	**None Detected ND**

Layer 3 of 4 **Description:** Red brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Putty Compound, Fine particles, Quartz	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 4 of 4 **Description:** Gray crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 250061236 **Client Sample #: 16510-39**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Gray crumbly material with paint and fibrous debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Paint, Binder/Filler, Fine particles	Cellulose	5%	**None Detected ND**

Lab ID: 250061237 **Client Sample #: 16510-40**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Gray crumbly material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Cellulose	2%	**None Detected ND**

Lab ID: 250061238 **Client Sample #: 16510-41**
Location: Old Fire House and Teen Center

Layer 1 of 2 **Description:** Multi-colored woven fibrous material with white and black plastic mesh with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles, Plastic	Synthetic fibers	41%	**None Detected ND**

Layer 2 of 2 **Description:** White plastic and fibrous mesh with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder, Fine particles, Plastic	Synthetic fibers	13%	**None Detected ND**

Lab ID: 250061239 **Client Sample #: 16510-42**
Location: Old Fire House and Teen Center

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: **Ms. Andrea Winder**
Project Location: Old Fire House and Teen Center

Batch #: 2510555.00
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 45
Samples Analyzed: 45
Method: EPA/600/R-93/116

Layer 1 of 2 **Description:** Multi-colored woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine particles	Synthetic fibers 38%	**None Detected ND**

Layer 2 of 2 **Description:** Backing gray rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Binder/Filler, Fine grains, Rubber	Glass fibers 4%	**None Detected ND**

Lab ID: 250061240 **Client Sample #: 16510-43**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Black asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Asphalt/Binder, Asphaltic Particles	Cellulose 29%	**None Detected ND**

Lab ID: 250061241 **Client Sample #: 16510-44**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Black asphaltic fibrous material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Granules	Cellulose 1%	**None Detected ND**

Lab ID: 250061242 **Client Sample #: 16510-45**
Location: Old Fire House and Teen Center

Layer 1 of 1 **Description:** Black asphaltic fibrous material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Asphalt/Binder, Asphaltic Particles, Granules	Cellulose 1%	**None Detected ND**

Sampled by: Client
Analyzed by: Urooj Yousuf **Date:** 06/23/2025
Reviewed by: Hilary Crumley **Date:** 06/24/2025

Hilary Crumley, Manager Asbestos Laboratory

ASB-02

ASBESTOS LABORATORY SERVICES

NVL

Company	Perteet, Inc.	**NVL Batch Number**	**2510555.00**
Address	PO Box 1186 Everett, WA 98206	**TAT**	5 Days **AH** No
		Rush TAT	
Project Manager	Ms. Andrea Winder	**Due Date**	6/25/2025 **Time** 3:45 PM
Phone	(425) 252-7700	**Email**	Andrea.winder@perteet.com
Cell	(425) 426-3814	**Fax**	

Project Name/Number: 20250160 **Project Location:** Old Fire House and Teen Center

Subcategory PLM Bulk

Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	250061198	16510-01		A
2	250061199	16510-02		A
3	250061200	16510-03		A
4	250061201	16510-04		A
5	250061202	16510-05		A
6	250061203	16510-06		A
7	250061204	16510-07		A
8	250061205	16510-08		A
9	250061206	16510-09		A
10	250061207	16510-10		A
11	250061208	16510-11		A
12	250061209	16510-12		A
13	250061210	16510-13		A
14	250061211	16510-14		A
15	250061212	16510-15		A
16	250061213	16510-16		A
17	250061214	16510-17		A
18	250061215	16510-18		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	6/18/25	1545
Analyzed by	Urooj Yousuf		NVL	6/23/25	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 6/18/2025
Time: 4:50 PM
Entered By: Fatima Khan

ASBESTOS LABORATORY SERVICES

Company	Perteet, Inc.	**NVL Batch Number**	**2510555.00**
Address	PO Box 1186 Everett, WA 98206	**TAT**	5 Days — **AH** No
		Rush TAT	
Project Manager	Ms. Andrea Winder	**Due Date**	6/25/2025 **Time** 3:45 PM
Phone	(425) 252-7700	**Email**	Andrea.winder@perteet.com
Cell	(425) 426-3814	**Fax**	

Project Name/Number: 20250160 **Project Location:** Old Fire House and Teen Center

Subcategory PLM Bulk

Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
19	250061216	16510-19		A
20	250061217	16510-20		A
21	250061218	16510-21		A
22	250061219	16510-22		A
23	250061220	16510-23		A
24	250061221	16510-24		A
25	250061222	16510-25		A
26	250061223	16510-26		A
27	250061224	16510-27		A
28	250061225	16510-28		A
29	250061226	16510-29		A
30	250061227	16510-30		A
31	250061228	16510-31		A
32	250061229	16510-32		A
33	250061230	16510-33		A
34	250061231	16510-34		A
35	250061232	16510-35		A
36	250061233	16510-36		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	6/18/25	1545
Analyzed by	Urooj Yousuf		NVL	6/23/25	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 6/18/2025
Time: 4:50 PM
Entered By: Fatima Khan

ASBESTOS LABORATORY SERVICES

NVL

Company	Perteet, Inc.	**NVL Batch Number**	**2510555.00**
Address	PO Box 1186	**TAT**	5 Days **AH** No
	Everett, WA 98206	**Rush TAT**	
Project Manager	Ms. Andrea Winder	**Due Date**	6/25/2025 **Time** 3:45 PM
Phone	(425) 252-7700	**Email**	Andrea.winder@perteet.com
Cell	(425) 426-3814	**Fax**	

Project Name/Number: 20250160 **Project Location:** Old Fire House and Teen Center

Subcategory PLM Bulk

Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 45 Rush Samples

	Lab ID	Sample ID	Description	A/R
37	250061234	16510-37		A
38	250061235	16510-38		A
39	250061236	16510-39		A
40	250061237	16510-40		A
41	250061238	16510-41		A
42	250061239	16510-42		A
43	250061240	16510-43		A
44	250061241	16510-44		A
45	250061242	16510-45		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	6/18/25	1545
Analyzed by	Urooj Yousuf		NVL	6/23/25	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 6/18/2025
Time: 4:50 PM
Entered By: Fatima Khan

NVL
INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

ASBESTOS CHAIN OF CUSTODY

2510555

❑ 2 Hours ❑ 2 Days ❑ 4 Days
❑ 4 Hours ❑ 3 Days ☑ 5 Days
❑ 10 Days

Please call for TAT less than 24 Hours

Company: Perteet
Address: 2707 Colby Ave, Ste 900, Everett, WA 98201
Phone:

Project Manager: Andrea Winder
Cell: (206) 841-4091
Email: andrea.winder@perteet.com
Fax: ( ) -

Project Name/Number: 20250160
Project Location: Old Fire House and Teen Center

❑ PCM Air (NIOSH 7400) ❑ TEM (NIOSH 7402) ❑ TEM (AHERA) ❑ TEM (EPA Level II Modified)
☑ PLM (EPA 600/R-93-116) ❑ EPA 400 Points (600/R-93-116) ❑ EPA 1000Points (600/R-93-116)
❑ PLM Gravimetry (600/R-93-116) ❑ Asbestos in Vermiculite (EPA 600/R-04/004) ❑ Asbestos in Sediment (EPA 1900 Points)
❑ Asbestos Friable/Non-Friable (EPA 600/R-93/116) ❑ Other

Reporting Instructions
❑ Call ( ) - ❑ Fax ( ) - ☑ Email same as above

Total Number of Samples ______

	Sample ID	Description	A/R
1	16510-01		
2			
3			
4			
5	16510-45		
6	~~aw~~		
7			
8			
9			
10			
11			
12			
13			
14			
15			

	Print Name	Signature	Company	Date	Time
Sampled by	Andrea Winder	[signature]	Perteet	6/16/25	
Relinquish by	Tim Smith	Tim Smith	Perteet	6/16/25	3:40PM

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	Fatimalla	[signature]	NVL Labs	6/16/25	345p
Analyzed by					
Called by					
Faxed/Email by					

June 23, 2025

Andrea Winder
Perteet, Inc.
PO Box 1186
Everett, WA 98206

NVL Batch # 2510554.00

RE: Total Metal Analysis
Method: EPA 7000B Lead by FAA <paint>
Item Code: FAA-02

Client Project: 20250160
Location: Old Fire House and Teen Center

Dear Ms. Winder,

NVL Labs received 9 sample(s) for the said project on 6/18/2025. Preparation of these samples was conducted following protocol outlined in EPA 3051/7000B , unless stated otherwise. Analysis of these samples was performed using analytical instruments in accordance with EPA 7000B Lead by FAA <paint>. The results are usually expressed in mg/Kg and percentage (%). Test results are not blank corrected.

For recent regulation updates pertaining to current regulatory levels or permissible exposure levels, please call your local regulatory agencies for more detail.

At NVL Labs all analyses are performed under strict guidelines of the Quality Assurance Program. If samples were collected by the customer, then the reported test results apply only to the samples as received by NVL Labs. This report is considered highly confidential and will not be released without your approval. Samples are archived after two weeks from the analysis date. Please feel free to contact us at 206-547-0100, in case you have any questions or concerns.

Sincerely,

Shalini Patel, Manager Metals/Org Laboratory

Enc.: Sample results

Analysis Report

Total Lead (Pb)

Client: Perteet, Inc.
Address: PO Box 1186
Everett, WA 98206

Attention: Ms. Andrea Winder
Project Location: Old Fire House and Teen Center

Batch #: 2510554.00
Matrix: Paint
Method: EPA 3051/7000B
Client Project #: 20250160
Date Received: 6/18/2025
Samples Received: 9
Samples Analyzed: 9

Lab ID	Client Sample #	Sample Weight (g)	RL in mg/Kg	Results in mg/Kg	Results in percent
250061189	16510-L01	0.0360	140	< 140	<0.014
250061190	16510-L02	0.0322	160	< 160	<0.016
250061191	16510-L03	0.1076	93	< 93	<0.0093
250061192	16510-L04	0.1614	62	< 62	<0.0062
250061193	16510-L05	0.0434	120	< 120	<0.012
250061194	16510-L06	0.2018	50	61	0.0061
250061195	16510-L07	0.0281	180	< 180	<0.018
250061196	16510-L08	0.0290	170	< 170	<0.017
250061197	16510-L09	0.0317	160	< 160	<0.016

Comments: Small samples size (<0.05g) for most samples

Sampled by: Client
Analyzed by: Whitney Corley
Reviewed by: Shalini Patel
Date Analyzed: 06/20/2025
Date Issued: 06/23/2025

Shalini Patel, Manager Metals/Org Laboratory

mg/ Kg =Milligrams per kilogram
Percent = Milligrams per kilogram / 10000
RL = Reporting Limit
'<' = Below the reporting Limit
Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

Bench Run No: 2025-0620-2

FAA-02

LEAD LABORATORY SERVICES

Company	Perteet, Inc.	**NVL Batch Number**	**2510554.00**
Address	PO Box 1186	**TAT**	5 Days **AH** No
	Everett, WA 98206	**Rush TAT**	
Project Manager	Ms. Andrea Winder	**Due Date**	6/25/2025 **Time** 3:45 PM
Phone	(425) 252-7700	**Email**	Andrea.winder@perteet.com
Cell	(425) 426-3814	**Fax**	

Project Name/Number: 20250160 **Project Location:** Old Fire House and Teen Center

Subcategory Flame AA (FAA)
Item Code FAA-02 EPA 7000B Lead by FAA <paint>

Total Number of Samples 9 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	250061189	16510-L01		A
2	250061190	16510-L02		A
3	250061191	16510-L03		A
4	250061192	16510-L04		A
5	250061193	16510-L05		A
6	250061194	16510-L06		A
7	250061195	16510-L07		A
8	250061196	16510-L08		A
9	250061197	16510-L09		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	6/18/25	1545
Analyzed by	Whitney Corley		NVL	6/20/25	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 6/18/2025
Time: 4:49 PM
Entered By: Fatima Khan

INDUSTRIAL HYGIENE SERVICES
LABORATORY + MANAGEMENT + TRAINING

METALS CHAIN OF CUSTODY

2510554

Turn Around Time
- ❑ 2 Hour
- ❑ 2 Days ❑ 3 Days ❑ 4 Days
- ☑ 5 Days ❑ 6-10 Days

Please call for TAT less than 24 Hours

Company: Perteet
Address: 2707 Colby Ave, Ste 900, Everett WA 98201
Phone:
Project Manager: Andrea Winder
Cell: (206) 841-4091
Email: andrea.winder@perteet.com
Fax: ( ) -

Project Name/Number: 20250160
Project Location: Old Fire House and Teen Center

❑ Total Metals ❑ TCLP | ☑ FAA (ppm ❑ ICP (PPM ❑ GFAA (ppb) ❑ CVAA (ppb) | ❑ Air Filter ❑ Paint Chips (cm) ❑ Drinking Water ❑ Other | ☑ Paint Chips (%) ❑ Dust Wipes ❑ Waste Water | ❑ Soil

RCRA 8: ❑ Barium ❑ Chromium ❑ Silver ❑ Arsenic ❑ Mercury ☑ Lead ❑ Selenium ❑ Cadmium

RCRA 11: ❑ Copper ❑ Zinc ❑ Other

Reporting Instructions
❑ Call ( ) - ❑ Fax ( ) - ☑ Email Same as above

Total Number of Samples 9

	Sample ID	Description	A/R
1	16510-L01		
2			
3			
4			
5			
6			
7			
8			
9	16510-L09		
10			
11			
12			
13			
14			
15			

	Print Name	Signature	Company	Date	Time
Sampled by	Andrea Winder	[signature]	Perteet	6/16/25	
Relinquish by	Tim Smith	Tim Smith	Perteet	6/16/25	3:40 PM

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	[illegible]	[signature]	NVL Labs	6/16/25	3:45 pm
Analyzed by					
Called by					
Faxed/Email by					

APPENDIX C

Laboratory Certificates of Accreditation

Certificate of Completion

This is to certify that

Andrea L. Winder

has satisfactorily completed
4 hours of online refresher training as an

AHERA Building Inspector

to comply with the training requirements of

TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

195554
Certificate Number

Instructor: David Welch

Nov 25, 2024 Expires in 1 year.

Date(s) of Training

Exam Score: N/A
(if applicable)

Terracon
Explore with us

- Facilities
- Environmental
- Geotechnical
- Materials

STATE OF WASHINGTON

Department of Commerce

Lead-Based Paint Activities Program

Andrea Liljegren Winder

Has fulfilled the certification requirements of
WAC 365-230
and has been certified to conduct lead based
paint activities as a
***Risk Assessor**.*

Certification #	Issuance Date	Expiration Date
0779	12/18/2023	01/28/2027

APPENDIX D

AHERA Building Inspector Certifications

PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc.
has assessed the Organization of:

NVL Laboratories
4708 Aurora Avenue, Seattle, WA 98103

(Hereinafter called the Organization) and hereby declares that Organization has met the requirements of ISO/IEC 17025:2017 General Requirements for the competence of Testing and Calibration Laboratories and the United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP) requirements identified within the DoD/DOE Quality Systems Manual (DoD/DOE QSM) Version 5.4 October 2021 and is accredited in accordance with the:

United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP)

This accreditation demonstrates the technical competence for the defined scope and the operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Environmental Testing
(As detailed in the supplement)

Accreditation claims for such activities shall only be made from the addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation Body's duty to observe and comply with the said rules.

Initial Accreditation Date:	*Issue Date:*	*Expiration Date*
April 08, 2012	May 28, 2024	June 30, 2026

For PJLA

Tracy Szerszen
President

Accreditation No:	*Certificate No:*
72200	L24-406

Perry Johnson Laboratory
Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: **www.pjlabs.com**

Certificate of Accreditation: Supplement

NVL Laboratories

4708 Aurora Avenue, Seattle, WA 98103
Contact Name: Nick Ly   Phone: 206-547-0100

Accreditation is granted to the facility to perform the following testing:

	Code
Asbestos	
CARB M435 by Polarized Light Microscopy (PLM)	10294583
Solid	
Asbestos	1520
EPA 600/M4-82/020 by Polarized Light Microscopy (PLM)	10294583
Solid	
Asbestos	1520
EPA 600/R-93/116 by Polarized Light Microscopy (PLM)	10294583
Solid	
Asbestos	1520
NIOSH 7400 by Phase Contrast Microscopy (PCM)	90018001
Air	
Asbestos	1520
Inorganic	
EPA 6010D by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES)	10155949
Solid	
Arsenic	1010
Barium	1015
Cadmium	1030
Chromium	1040
Copper	1055
Lead	1075
Nickel	1105
Selenium	1140
Silver	1150
Zinc	1190
EPA 7000B by Flame Atomic Absorption Spectrophotometry (FAAS)	10157707
Solid	
Lead	1075
EPA 7471B by Cold Vapor Atomic Absorption Spectrophotometry (CVAAS)	10166402
Solid	
Mercury	1095
NIOSH 7082 by Flame Atomic Absorption Spectrophotometry (FAAS)	90012230
Air	
Lead	1075
NIOSH 7300 by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES)	90012401
Air	
Arsenic	1010
Barium	1015

Certificate of Accreditation: Supplement

NVL Laboratories

4708 Aurora Avenue, Seattle, WA 98103

Contact Name: Nick Ly   Phone: 206-547-0100

Accreditation is granted to the facility to perform the following testing:

	Code
Inorganic	
NIOSH 7300 by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES)	90012401
Air	
Cadmium	1030
Chromium	1040
Copper	1055
Lead	1075
Nickel	1105
Selenium	1140
Silver	1150
Zinc	1190

Preparation	
Air	
EPA 3051	Acid Digestion for Metals
Solid	
EPA 1311	Toxicity Characteristic Leaching Procedure (TCLP)
EPA 3050B	Acid Digestion for Metals

Footnotes:

> Method codes are typically based on The NELAC Institute (TNI) Laboratory Accreditation Management System (LAMS) and are used to compare to the laboratory reported Performance Test (PT) results. Although the method code may not represent the specific method version, it is the method code used to represent the method/technology used to report PTs. (NC = No Code)

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

NVL Laboratories, Inc.

4708 Aurora Ave N, Seattle, WA 98103-6516

Laboratory ID: LAP-101861

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs, LLC (AIHA LAP) accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: July 01, 2027
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: July 01, 2027
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: July 01, 2027
☐	**FOOD**	Accreditation Expires:
☑	**UNIQUE SCOPES**	Accreditation Expires: July 01, 2027
☐	**BE FIELD/MOBILE**	Accreditation Expires:

Specific Field(s) of Testing/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision21: 10/24/2023

Date Issued: 06/01/2025

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

NVL Laboratories, Inc.

Laboratory ID: LAP-101861

Issue Date: 06/01/2025
Expire Date: 07/01/2027

4708 Aurora Ave N, Seattle, WA 98103-6516

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Unique Scopes Laboratory Accreditation Programs (Unique Scopes)

Initial Accreditation Date: 04/01/2013

Unique Scopes Scope Category	Field of Testing (FOT)	Component, parameter, characteristic, material, or product tested	Method	Method Description *(for internal methods only)*
Consumer Product Testing	Lead in Paint and Other Similar Surface Coatings	Paint	CPSC-CH-E1003-09	-
	Lead in metal	Solid	CPSC-CH-E1001-08	-
	Lead in non-metal	Solid	CPSC-CH-E1002-08	-

A complete listing of currently accredited Unique Scopes laboratories is available on the AIHA LAP, LLC website at: *http://www.aihaaccreditedlabs.org*

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

NVL Laboratories, Inc.

Laboratory ID: LAP-101861

4708 Aurora Ave N, Seattle, WA 98103-6516

Issue Date: 06/01/2025
Expire Date: 07/01/2027

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 04/01/1997

IHLAP Scope Category	Field of Testing (FOT)	Technology sub-type/Detector	Published Reference Method/Title of In-house Method	Component, parameter, characteristic, material, or product tested
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)	-	NIOSH 7400	Asbestos/Fibers
Miscellaneous Core	Gravimetric	-	NIOSH 0500	Total Dust
Miscellaneous Core	Gravimetric	-	NIOSH 0600	Respirable Dust
Spectrometry Core	Atomic Absorption	FAA	EPA SW-846 3051	Lead
Spectrometry Core	Atomic Absorption	FAA	NIOSH 7082	Lead
Spectrometry Core	Inductively-Coupled Plasma	ICP/AES	EPA SW-846 3051	RCRA Metals
Spectrometry Core	Inductively-Coupled Plasma	ICP/AES	NIOSH 7300	RCRA Metals
Spectrometry Core	X-ray Diffraction (XRD)	-	NIOSH 7500	Silica

A complete listing of currently accredited IHLAP laboratories is available on the AIHA LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

NVL Laboratories, Inc.

Laboratory ID: LAP-101861

4708 Aurora Ave N, Seattle, WA 98103-6516

Issue Date: 06/01/2025
Expire Date: 07/01/2027

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Environmental Microbiology Laboratory Accreditation Program (EMLAP)

Initial Accreditation Date: 02/01/1997

EMLAP Scope Category	Field of Testing (FOT)	Component, parameter, characteristic, material, or product tested	Method	Method Description *(for internal methods only)*
Fungal	Air - Direct Examination	Spore Trap	SOP 12.133	In House: Direct Analysis of Spore Trap Samples and Direct Exam for the presence of Fungai
Fungal	Bulk - Direct Examination	Bulk	SOP 12.133	In House: Direct Analysis of Spore Trap Samples and Direct Exam for the presence of Fungai
Fungal	Surface - Direct Examination	Surface	SOP 12.133	In House: Direct Analysis of Spore Trap Samples and Direct Exam for the presence of Fungai

A complete listing of currently accredited EMLAP laboratories is available on the AIHA LAP, LLC website at: http://www.aihaaccreditedlabs.org

APPENDIX C

SITE PLAN EXHIBIT

LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- SIDEWALK
- CLEARING AND GRUBBING
- RETAINING WALL
- BOLLARD
- SIGN
- WOOD FENCE
- METAL FENCE

SCALE

10 0 10 20

FEET

EXHIBIT DRAWING
FOR INFORMATIONAL PURPOSES ONLY

PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

Redmond WASHINGTON

FIREHOUSE TEEN CENTER

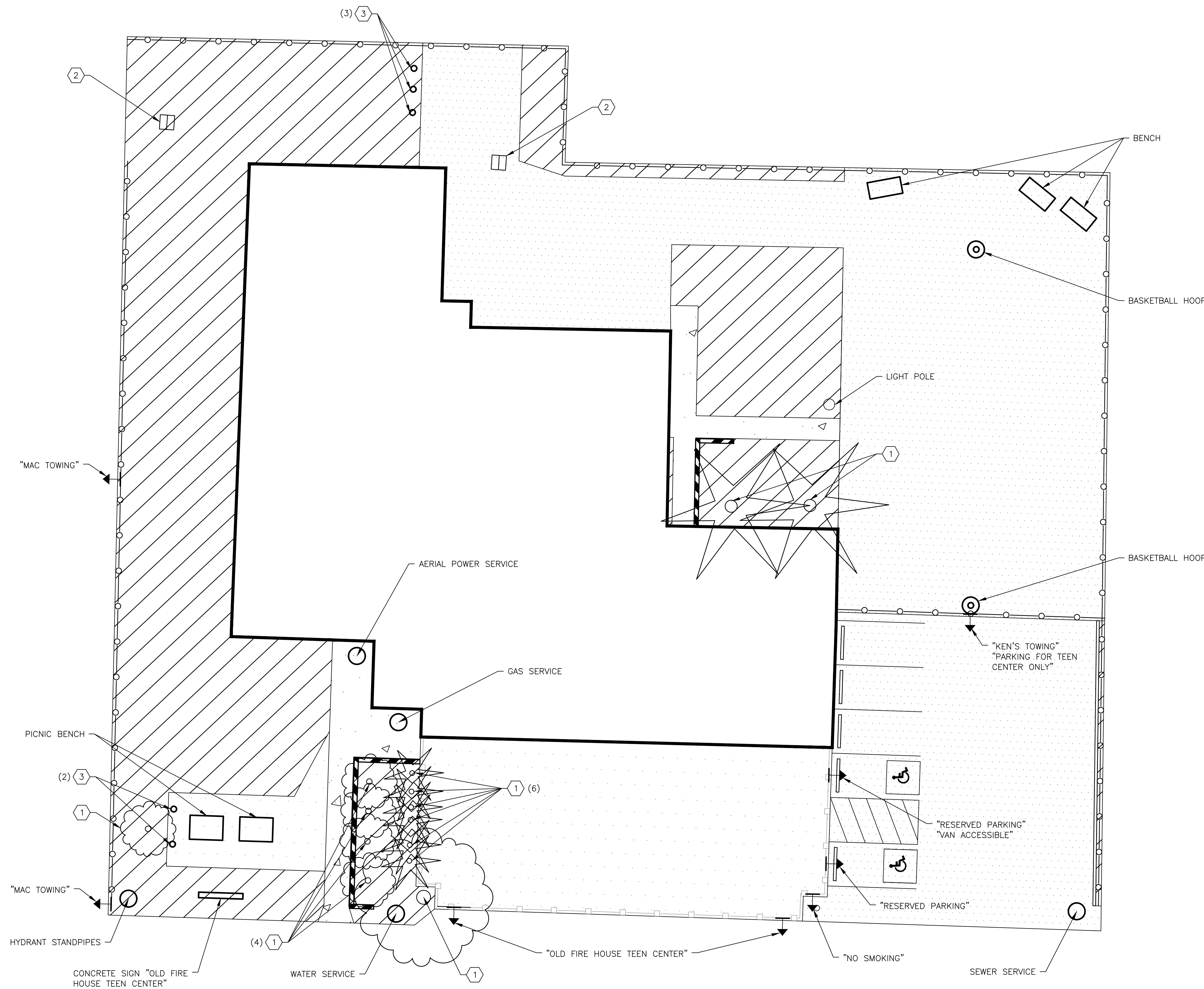
SITE PLAN

DATE: JUNE 2025

SHEET: 1 OF 2

DEMOLITION LEGEND

- (1) PROTECT TREE
- (2) INLET PROTECTION
- (3) REMOVE BOLLARD



LEGEND

- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- SIDEWALK
- CLEARING AND GRUBBING
- RETAINING WALL
- BOLLARD
- SIGN
- WOOD FENCE
- METAL FENCE

SCALE
10 0 10 20
FEET

Jul 07, 2025 - 12:05pm reed.lewis C:\Users\REED-1.LEW\AppData\Local\Temp\AcPublish_23016\Firehouse Teen Center Exhibit.dwg Layout Name: Exhibit

EXHIBIT DRAWING
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PERTEET
801 2ND AVENUE, SUITE 302
SEATTLE, WA 98104
206.436.0515 | 800.615.9900

Redmond WASHINGTON

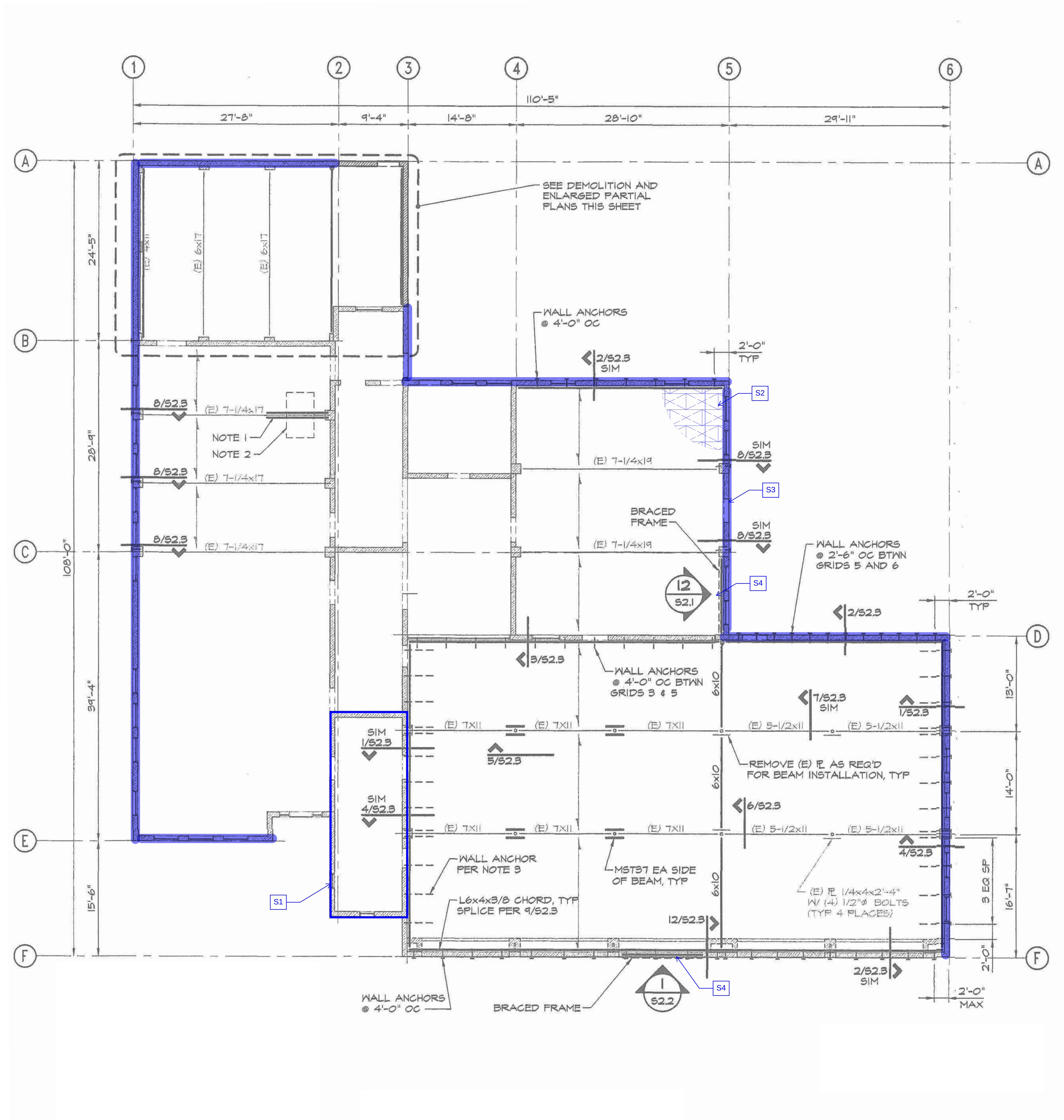
FIREHOUSE TEEN CENTER

SITE PLAN

DATE: JUNE 2025 SHEET: 2 OF 2

APPENDIX D
STRUCTURAL STRENGTHENING PLAN

Logan Building | 500 Union Street, S[illegible] 410 Sea[illegible], W[illegible] 98[illegible]1
T 206.749.9993 | F 503.228.1285 | www.mackenzie.inc



N

SK1 STRUCTURAL STRENGTHENING PLAN

SHEET NOTES

1. REMOVE AND REPLACE ALL (E) ROOFING, CEILING, AND WALL FINISHES AS REQUIRED TO CONSTRUCT STRUCTURAL RETROFITS.

2. CARRY ALLOWANCE FOR POSSIBLE FOUNDATION STRENGTHENING FOR LIQUEFACTION AFTER FURTHER GEOTECHNICAL INVESTIGATION.

3. INSPECT WOOD ROOF FRAMING FOR ROT AND REPAIR AND REPLACE AS REQUIRED.

KEYNOTES

- S1 DEMO HOSE TOWER CMU EXTERIOR WALL AND CONCRETE FRAME. REBUILD WITH GROUTED, REINFORCED CMU.
- S2 ADD NEW 1/2" PLYWOOD OVER ENTIRE ROOF AREA. NAIL TO (E) FRAMING.
- S3 ADD STEEL COLUMN BRACING FOR OUT-OF-PLANE WALL SUPPORT.
- S4 REMOVE AND REPLACE BRACE AND GUSSET PLATE.

FEMA 547 EXAMPLE DETAILS

1. THESE DETAILS ARE PROVIDED FOR REFERENCE ONLY AND ARE MEANT TO BE INDICITIVE OF VARIOUS TYPES OF STRUCTURAL RETROFIT DETAILS THAT MAY BE NEEDED TO BRING A BUILING OF THIS TYPE INTO COMPLIANCE.

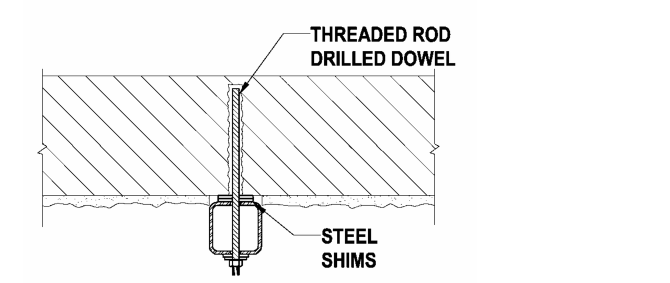


Figure 21.4.3-2: Vertical Bracing Alternatives

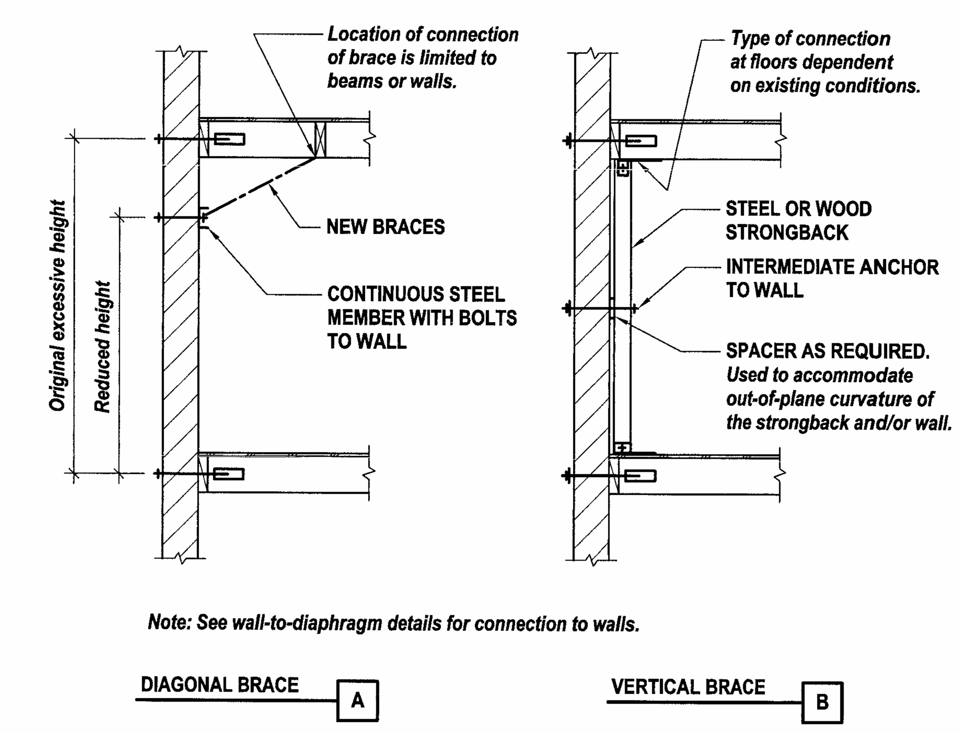


Figure 21.4.3-1: Exposed Out-of-Plane Wall Bracing

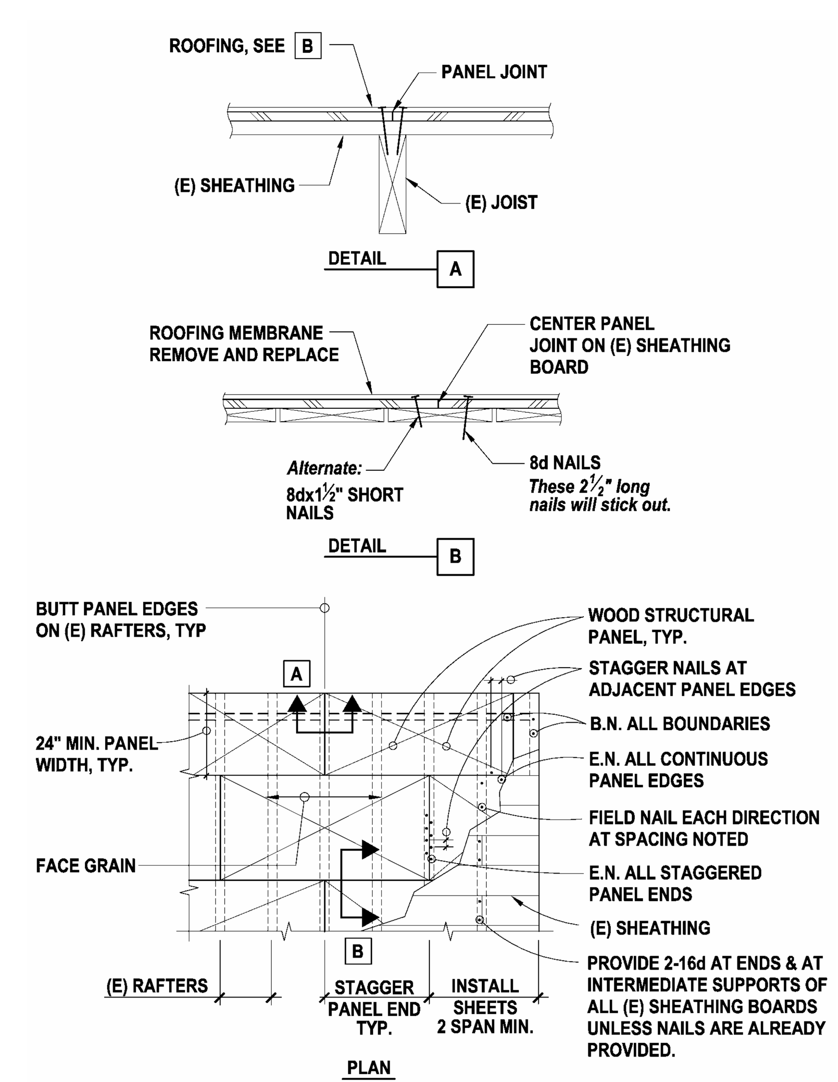


Figure 22.2.1-3: Wood Panel Overlay without Blocking Over Existing Sheathing

PRELIMINARY STRENGTHENING SKETCHES 07/09/25

M.
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Vancouver, WA 360.695.7879
Seattle, WA 206.749.9993
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Client
City of Redmond

Project
Redmond Old Fire House Teen Center Evaluation

REVISION SCHEDULE

Delta	Issued As	Issue Date

SHEET TITLE:
STRUCTURAL STRENGTHENING PLAN

SHEET
SK- 1

JOB NO. 2240412.01

SHEET NOTES
1. THESE DETAILS ARE PROVIDED FOR REFERENCE ONLY AND ARE MEANT TO BE INDICITIVE OF VARIOUS TYPES OF STRUCTURAL RETROFIT DETAILS THAT MAY BE NEEDED TO BRING A BUILING OF THIS TYPE INTO COMPLIANCE.

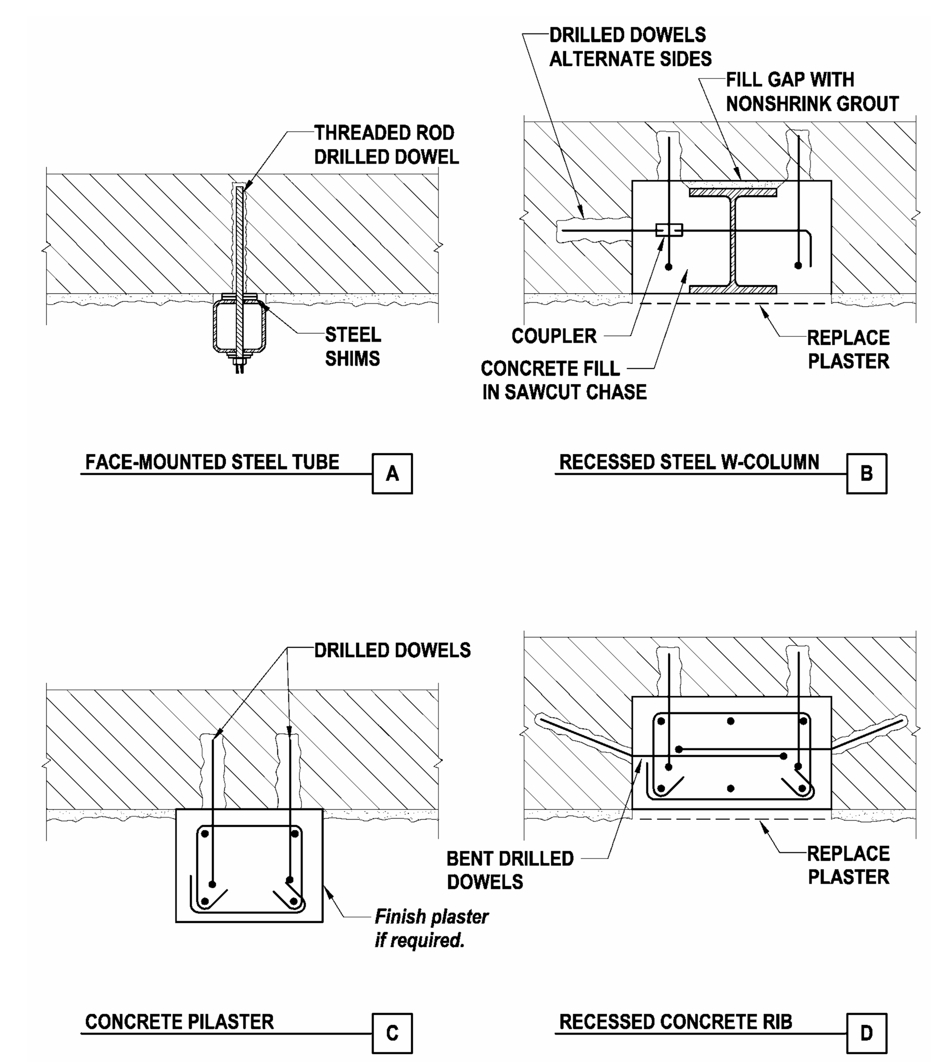

Figure 21.4.3-2: Vertical Bracing Alternatives

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Project
Redmond Old Fire House Teen Center Evaluation

REVISION SCHEDULE

Delta	Issued As	Issue Date

SHEET TITLE:
FEMA 547 - TYPICAL DETAILS (FOR REFERENCE ONLY)

SHEET
SK- 2

PRELIMINARY STRENGTHENING SKETCHES 07/09/25

JOB NO. **2240412.01**

APPENDIX E
STRUCTURAL ASCE 41 CHECKLIST AND CALCS

Logan Building | 500 Union Street, Suite 410 Seattle, WA 98101
T 206.749.9993 | F 503.228.1285 | www.mackenzie.inc

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 0.015*h < 1ft OK	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 DOES NOT EXIST	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 SINGLE STORY	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 SINGLE STORY	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 HOSE TOWER CONTINOUS PATH TO FOUNDATION	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 SINGLE STORY	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 HOSE TOWER = "PENTHOUSE"	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 FLEXIBLE DIAPHRAGM	A.2.2.7

continues

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 NO SOILS TESTS CONDUCTED	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 TERRAIN < 6% SLOPE WITHIN 1500FT OF BUILDING	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 SOUTHERN WHIDBEY ISLAND FAULTS WITHIN 5MI, 9MI DEEP MINIMUM	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 43.5FT LONG 15FT TALL	A.6.2.1 Sa = Sxs (BSE-2E) = 2.9 > 0.6*1.068 = 0.65
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 NO FOUNDATION TIES PER PLAN	A.6.2.2

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

Table 17-36. Collapse Prevention Structural Checklist for Building Types URM and URMa

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate Seismicity			
Seismic-Force-Resisting System		QUICK CALC 1	
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 3+ NORTH SOUTH LINES OF ACTION 4+ EAST WEST LINES OF ACTION	A.3.2.1.1
C NC N/A U	SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 30 lb/in.^{2} (0.21 MPa) for clay units and 70 lb/in.^{2} (0.48 MPa) for concrete units.	5.5.3.1.1 QUICK CALC 2 vj_avg_NS =40lb/in^2 vj_avg_EW =52lb/in^2	A.3.2.5.1
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 QUICK CALC 4	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 SEE DET 1/S2.03, 4/S2.03, 8/S2.03, 12/S2.03	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 SEE DET 2/S2.03, 3/S2.03	A.5.2.1
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 BOLTS FROM GIR TO PIL USING HDU	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	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than the following: 8" CMU Top story of multi-story building ✓ 9 h < 6ft First story of multi-story building ✗ 15 h < 10ft All other conditions ✗ 13 h < 8.67ft	5.5.3.1.2 QUICK CALC 5	A.3.2.5.2
C NC N/A U	MASONRY LAYUP: Filled collar joints of multi-wythe masonry walls have negligible voids.	5.5.3.4.1 NOT MULTI-WYTHE	A.3.2.5.3
Diaphragms (Stiff or Flexible)			
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 QUICK CALC 6	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 QUICK CALC 6	A.4.1.6
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 2-to-1 in the direction being considered.	5.6.2 QUICK CALC 7	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 QUICK CALC 7 STRAIGHT SHEATHED ONLY	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 STRAIGHT SHEATHED ONLY	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 STRAIGHT SHEATHED ONLY	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 ANCHORS INSTALLED WITHOUT SLACK, ZERO DEFLECTION BEFORE ENGAGEMENT	A.5.1.4
C NC N/A U	BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads.	5.7.4.4 PILASTERS ACTING IN GRAVITY AND AS LATERAL SUPPORT OF GIRDERS	A.5.4.5

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

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.	QUICK CALC 1 5.5.1.1 3+ NORTH SOUTH LINES OF ACTION 4+ EAST WEST LINES OF ACTION	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 QUICK CALC 2 vj_avg_NS =40b/in^2 vj_avg_EW =52lb/in^2	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 QUICK CALC 3 BAR DIAMETER UNKNOWN, ASSUMING #4 BAR PRODUCES INSUFFICIENT REINFORCEMENT RATIO	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 NO TOPPING SLAB	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 QUICK CALC 4	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 SEE DET 1/S2.03, 4/S2.03, 8/S2.03, 12/S2.03	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 SEE DET 2/S2.03, 3/S2.03	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 NO TOPPING SLAB	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 BOLTS FROM GIR TO PIL USING HDU	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 QUICK CALC 6	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 QUICK CALC 6	A.4.1.6

continues

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.	SEE DET 6/S2.03 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 QUICK CALC 6	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 QUICK CALC 6	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 QUICK CALC 7	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 QUICK CALC 7 STRAIGHT SHEATHED ONLY	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 STRAIGHT SHEATHED DIAPHRAGM ONLY	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 STRAIGHT SHEATHED DIAPHRAGM ONLY	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 ANCHORS INSTALLED WITHOUT SLACK, ZERO DEFLECTION BEFORE ENGAGEMENT	A.5.1.4

01.3

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

Table 17-10. Collapse Prevention Structural Checklist for Building Types S2 and S2a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low Seismicity			
Seismic-Force-Resisting System			
C NC N/A U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2.	*QUICK CALC 1* 5.5.1.1 ONE LINE OF BF EA DIR TO AUGMENT MAIN RM SYSTEM	A.3.3.1.1
C NC N/A U	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.4.3.6, is less than $0.30F_y$.	5.5.2.1.3 *QUICK CALC 8*	A.3.1.3.2
C NC N/A U	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.4.3.4, is less than $0.50F_y$.	5.5.4.1 *QUICK CALC 9*	A.3.3.1.2
Connections			
C NC N/A U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames.	5.7.2 SEE DET 3/S2.01, 4/S2.01, 8/S2.02	A.5.2.2
C NC N/A U	STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation.	5.7.3.1 SEE DET 9/S2.01, 11/S2.01, 6/S2.02	A.5.3.1
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 braced bays in each line is greater than 2.	SINGLE BRACE PER DIRECTION 5.5.1.1	A.3.3.1.1
C NC N/A U	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals.	5.5.4.4 *QUICK CALC 10*	A.3.3.1.5
C NC N/A U	COMPACT MEMBERS: All brace elements meet compact section requirements in accordance with AISC 360, Table B4.1.	5.5.4 *QUICK CALC 10*	A.3.3.1.7
C NC N/A U	K-BRACING: The bracing system does not include K-braced bays.	5.5.4.6	A.3.3.2.1
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	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column.	5.5.4.2 NO SPLICES	A.3.3.1.3
C NC N/A U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have *Kl*/*r* ratios less than 200.	5.5.4.3 *QUICK CALC 10*	A.3.3.1.4
C NC N/A U	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals.	5.5.4.4 *QUICK CALC 10*	A.3.3.1.5
C NC N/A U	COMPACT MEMBERS: All brace elements meet section requirements in accordance with AISC 341, Table D1.1, for moderately ductile members.	5.5.4 *QUICK CALC 10*	A.3.3.1.7
C NC N/A U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs.	*QUICK CALC 11* 5.5.4.6 BRACES ACT IN PURELY LATERAL CAPACITY, REDUNDANT GRAVITY FRAMING ALREADY EXISTS	A.3.3.2.3
C NC N/A U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces frame into the beam–column joints concentrically.	5.5.4.8 SEE WORK POINTS IN DETAILS 1/S2.01, 9/S2.01, 4/S2.02, 6/S2.02	A.3.3.2.4
Diaphragms (Stiff or Flexible)			
C NC N/A U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames extend less than 25% of the frame length.	5.6.1.3 MAX ROOF PENETRATION: 20"x8" HVAC DUCT	A.4.1.5
Flexible Diaphragms			
C NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	SEE DET 5/S2.03, 6/S2.03 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 *SEE QUICK CALC*	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 STRAIGHT SHEATHED DIAPHRAGM ONLY	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 STRAIGHT SHEATHED DIAPHRAGM ONLY	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 STRAIGHT SHEATHED DIAPHRAGM ONLY	A.4.7.1

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

01.4

ROOF LOADING

Reference Standards: IBC 2021, ASCE 7-16

Input Result Check/Confirm

LIVE LOAD:

L_{rf} = 20 psf	Roof Live Load
SL = 15 psf + 5 psf = 20 psf	Roof Snow Load

ROOF DEAD LOAD:

R = 2 psf	Roofing - Aggregate on Asphalt + Felt
I = 0 psf	Insulation - N/A??
CE = 1.5 psf	Ceiling - Suspended ACT + Framing
D = 35 pcf · 3 in = 8.75 psf	Deck - 2X Diagonal + 2X Sub-deck
FP = 0 psf	Fireproofing
P = 1.3 psf	Sub-Purlins - 2x4 @ 1 ft OC
J = 0 psf	Joists - N/A??
G = 3.2 psf	Girders - 7.25"x17" Girders, 9.5ft TRIB
E = 1 psf	Electrical
M = 1 psf	Mechanical
SP = 1 psf	Sprinkler
Misc = 1.25 psf	Miscellaneous

Total Roof Dead Load Without Solar PV Panels:

DL_{rf} = R + I + CE + D + FP + P + J + G + E + M + SP + Misc = 21 psf

WALL DEAD LOAD:

SH = 0.5 psf	Sheathing - Double Sided Gypsum Board
STD = 1 psf	Studs - 2X4 @ 16"OC
MEP = 0.25 psf	MEP Allowance
$Misc_{wall}$ = 0.25 psf	Miscellaneous

Interior Bearing Walls: $DL_{int,wall}$ = SH + STD + MEP + $Misc_{wall}$ = 2 psf

Exterior Walls: $DL_{ext,wall}$ = 83 psf 8" CMU Fully Grouted

ROOF SEISMIC DEAD LOAD:

$CE_{seis} = 0.25$ psf	Ceiling - Suspended ACT + Framing
$FP_{seis} = 0$ psf	Fireproofing
$E_{seis} = 0.5$ psf	Electrical
$M_{seis} = 0.5$ psf	Mechanical
$SP_{seis} = 0.75$ psf	Sprinkler
$Misc_{seis} = 0.75$ psf	Miscellaneous

Total Roof Seismic Dead Load Without Solar PV Panels:

$DL_{rf,seis} = R + I + CE_{seis} + D + FP_{seis} + P + J + G + E_{seis} + M_{seis} + SP_{seis} + Misc_{seis} = 18$ psf

BASE SHEAR

37ft*92.5ft - 9.5ft*16ft = 3268sf
43.5ft*22ft = 960sf
73.5ft*43.5ft = 3200sf
9.5ft*26ft = 247sf

WEIGHT OF BUILDING

RDL = 21psf   See Dead Load Takeoff
ps < 30psf --> Neglect Snow Load
A_roof = 7800sf
Wt_rf = 163.8K

DL_CMU_wall = 83psf   FULLY GROUTED
DL_hose_twr_wall = 39psf   NO GROUT
A_CMU_w = 4691sf
A_hose_twr_wall = 1026sf
DL_int_wall = 10psf   See Dead Load Takeoff
A_int_w = 1968sf
Wt_wall = 449.1K
Wt_tot = Wt_rf + Wt_wall = **612.9K**

CMU WALL AREA BY HEIGHT:
LOW ROOF:
9FT/2 * 96ft = 432sf
MID ROOF:
(14FT/2 +1FT) * 376ft = 3008sf
HIGH ROOF:
(15FT/2 + 1.5FT) * 90ft + 6FT*(73.5ft) = 1251sf
HOSE TOWER:
(15FT/2 + 21FT) * 36ft = 1026sf

LIGHT FRAME WALL AREA BY HEIGHT:
LOW ROOF:
9FT/2 * (14ft + 14ft + 10ft + 7ft + 8ft + 11ft) = 288sf
MID ROOF:
(14FT/2) * (86ft + 24ft + 18ft + 18ft + 9ft + 12ft + 22ft + 29ft + 22ft)
= 1680sf

ASCE 41-17 2.4.1 / 4.1.2 / 4.4.2

$$T = C_t h_n^{\beta} \quad (4\text{-}4)$$

Ct = 0.02 "ALL OTHER FRAMING SYSTEMS"
β = 0.75   "ALL OTHER FRAMING SYSTEMS"
hn = 15ft
T_main_rf = 0.02*15ft^0.75 = **0.152**
T_hose_twr = 0.02*36ft^0.75 = 0.294

$$S_a = \frac{S_{X1}}{T} \quad (4\text{-}3)$$

"COLLAPSE PREVENTION"   PER TBL 2-1
S_x1 = S1 = 0.144   BSE-1E from ASCE HAZARDS TOOL
S_x1 = S1 = **0.327**   BSE-2E from ASCE HAZARDS TOOL
Sa = 0.327/0.152 = **2.151**
C = 1.0   PER TBL 4-7

$$V = C S_a W \quad (4\text{-}1)$$

V = 1.0*2.151*612.9K = **1318.3K**

$$F_x = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} V \quad (4\text{-}2a)$$

$$V_j = \sum_{x=j}^{n} F_x \quad (4\text{-}2b)$$

Single story building with the fire hose tower weight acting at roof story:
Vj = V = 1318.3K

2.4.1.3 BSE-2E Spectral Response Acceleration Parameters. The design short-period spectral response acceleration parameter, S_{XS}, and the design spectral response acceleration parameter at a 1-s period, S_{X1}, for the BSE-2E Seismic Hazard Level shall be taken as values from approved 5%/50-year maximum direction spectral response acceleration contour maps (denoted S_S and S_1 in this standard), modified for site class in accordance with Chapter 11 of ASCE 7. Values for BSE-2E need not be greater than those for BSE-2N.

2.4.1.4 BSE-1E Spectral Response Acceleration Parameters. The design short-period spectral response acceleration parameter, S_{XS}, and the design spectral response acceleration parameter at a 1-s period, S_{X1}, for the BSE-1E Seismic Hazard Level shall be taken as values from approved 20%/50-year maximum direction spectral response acceleration contour maps (denoted S_S and S_1 in this standard), and modified for site class in accordance with Chapter 11 of ASCE 7. Values for BSE-1E need not be greater than those for BSE-1N.

Table 4-7. Modification Factor, *C*

	Number of Stories			
Building Type[a]	**1**	**2**	**3**	**≥4**
Unreinforced masonry (URM) Flexible diaphragms (S1a, S2a, S5a, C2a, C3a, PC1, RM1)	1.0			

QUICK CALCULATIONS

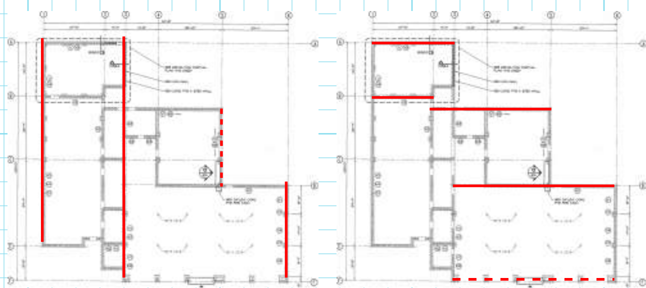
For Reinforced Masonry Checklist, Unreinforced Masonry Checklist, and Steel Checklist from ASCE 41-17

REINFORCED MASONRY CHECKLIST

URM CHECKLIST

1. REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.

SHEAR WALLS ARE CONSTRUCTED OF REINFORCED CMU AND STEEL BRACE FRAMES. REDUNDANCY PARTIALLY DERIVED FROM MASONRY.



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By RMS
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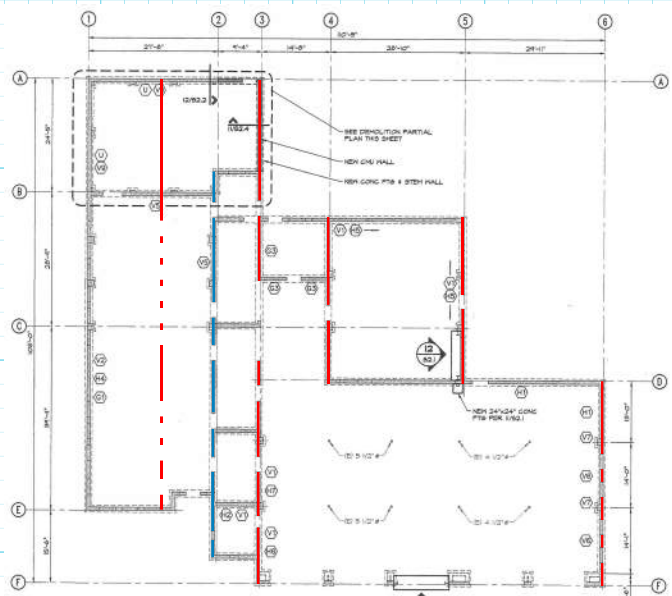
Job# 2240412.01
Sht. 01.8 of

2. 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).

$$v_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right) \quad (4\text{-}8)$$

Vj = 1318.3K SEE BASE SHEAR CALCULATION, ASCE 41-17 4.4.2.2
Ms = 1.75 CP URM, ASCE 41-17 TBL 4-8
Aw (SEE BELOW)

NORTH-SOUTH SHEAR WALLS HORIZONTAL CROSS-SECTIONAL AREA



GL1 GROSS LENGTH: 92.5ft
OPENING: 3.33ft*10 = 33.3ft
NET AREA: 8in*(92.5ft-33.3ft)*12in/ft = 5683in^2

GL2 GROSS LENGTH: 83ft
OPENING: 3.33ft*6 = 20ft
NET AREA: 8in*(83ft-20ft)*12in/ft = 6048in^2

GL3 GROSS LENGTH: 108ft
OPENING: 3.33ft*4 + 16ft = 29.4ft
NET AREA: 8in*(108ft-29.4ft)*12in/ft = 7545in^2

GL4 GROSS LENGTH: 35ft
OPENING: 3.33ft
NET AREA: 8in*(35ft-3.33ft)*12in/ft = 3040in^2

GL5 GROSS LENGTH: 35ft
OPENING: 3.33ft
NET AREA: 8in*(35ft-3.33ft)*12in/ft = 3040in^2

GL6 GROSS LENGTH: 43ft
OPENING: 3.33ft*4 = 13.4ft
NET AREA: 8in*(43ft-13.4ft)*12in/ft = 2841in^2

A_NS_wall = GL1+GL3+GL5+GL6 = 19100in^2

vj_avg = (Vj/Aw)/Ms = (1318.3K*1000lb/19100in^2)/1.75
= **39.44lb/in^2 < 70lb/in^2**

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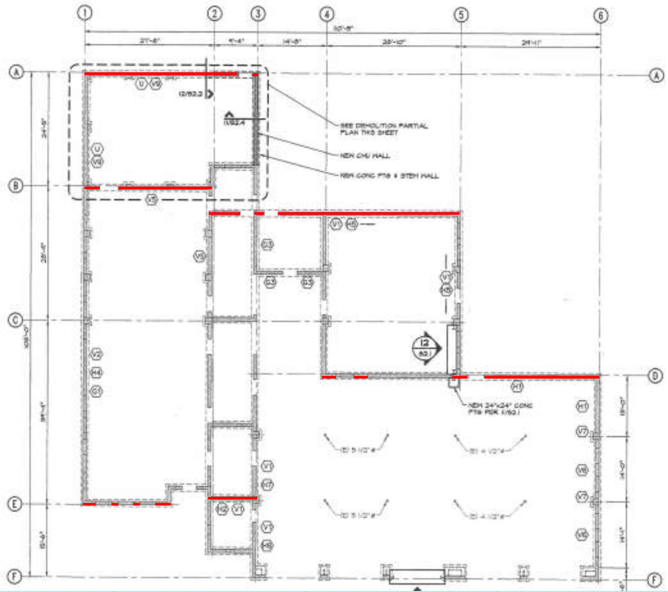
EAST-WEST SHEAR WALLS HORIZONTAL CROSS-SECTIONAL AREA



A GROSS LENGTH: 37ft
OPENING: 3.33ft
NET AREA: 8in*(37ft-3.33ft)*12in/ft = 3232.3in^2

B GROSS LENGTH: 27.67ft
OPENING: 3.33ft
NET AREA: 8in*(27.67ft-3.33ft)*12in/ft = 2329in^2

B1 GROSS LENGTH: 52.75ft
OPENING: 3.33ft*2 = 6.67ft
NET AREA: 8in*(52.8ft-6.67ft)*12in/ft = 4428in^2

D GROSS LENGTH: 58.75ft
OPENING: 3.33ft*2 + 18ft = 24.67ft
NET AREA: 8in*(58.75ft-24.67ft)*12in/ft = 3271.6in^2

E GROSS LENGTH: 28ft
OPENING: 3.33ft*4 = 13.4ft
NET AREA: 8in*(28ft-13.4ft)*12in/ft = 1402in^2

F NEGLIGIBLE LATERAL RESISTANCE

A_EW_wall = GLA+GLB+GLB1+GLD+GLE = 14662in^2

vj_avg = (Vj/Aw)/Ms = (1318.3K*1000lb/14662in^2)/1.75
= **51.37lb/in^2 < 70lb/in^2**

SHEAR WALLS CONFORM TO MINIMUM SHEAR FOR BOTH DIRECTION

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3. 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.

NO BAR SIZE PROVIDED, ASSUMING #4 MIN
48in OC MAX SPACING
CANNOT CONIRM VERTICAL BARS EXTEND TO TOP OF WALL

ρ_total = ρ_vert + ρ_horiz = A/bd + A/bd
GL1: #4@36"OC VERT, #4@32"OC HORIZ
ρ_vert = 0.20in^2/(8in*36in) = 0.00069 = 0.0007 OK
ρ_horiz = 0.20in^2/(8in*32in) = 0.00078 > 0.0007 OK
ρ_total = 0.0007+0.00078 = 0.00148 < 0.002 NG

GL2/GLB: #4@48"OC VERT, HORIZ UNKNOWN
ρ_vert = 0.20in^2/(8in*48in) = 0.00052 < 0.0007 NG

GL5/GLB.1: #4@32"OC VERT, #4@36"OC HORIZ
ρ_vert = 0.20in^2/(8in*32in) = 0.00078 > 0.0007 OK
ρ_horiz = 0.20in^2/(8in*36in) = 0.00069 = 0.0007 OK
ρ_total = 0.0007+0.00078 = 0.00148 < 0.002 NG

GL3: #4@32"OC VERT, #4@54"OC HORIZ
ρ_vert = 0.20in^2/(8in*32in) = 0.00078 > 0.0007 OK
ρ_horiz = 0.20in^2/(8in*54in) = 0.00046 < 0.0007 NG

GL6: VERT UNKNOWN, #4@32"OC HORIZ
ρ_horiz = 0.20in^2/(8in*32in) = 0.00078 > 0.0007 OK
ρ_vert = ?? NG

REINFORCEMENT IS INSUFFICIENT

Spacing is too far apart and portions of wall were not surveyed / do not have reinforcing information. Overall the system is under reinforced.

LEGEND:

(XX) EXISTING WALL REINFORCEMENT FOR INFORMATION ONLY
SEE SCHEDULE BELOW.

EXISTING WALL REINFORCEMENT SCHEDULE

MARK	HJR	BB	V	SPACING/LOCATION
H1	X			2'-0", 4'-8", 6'-8", 10'-0" AFF
		X		7'-9" AFF & TOP OF WALL
H2		X		1'-2" AFF
H3		X		1'-10" AFF
H4		X		2'-8" AFF
H5		X		3'-0" AFF
H6		X		4'-6" AFF
V1			X	32" OC
V2			X	36" OC
V3			X	40" OC
V4			X	32" TO 36" OC
V5			X	32" TO 48" OC
V6			X	CTR CELLS OF WALL SECTION
V7			X	PILASTER CORNERS
V8			X	DOWELS @ 18" OC
G1				SOLID GROUTED
U				UNREINFORCED

HJR = HORIZONTAL JOINT REINFORCEMENT
BB = HORIZONTAL BOND BEAM
V = VERTICAL REINFORCEMENT
AFF = ABOVE FINISHED FLOOR

NOTES:

1. INFORMATION IN SCHEDULE TAKEN FROM LETTER REPORT, TITLED "REDMOND TEEN CENTER MASONRY CONDITION SURVEY", BY MAYES TESTING ENGINEERS, INC., DATED FEBRUARY 25, 2002.
2. WALL REINFORCEMENT UNKNOWN AT UNMARKED WALLS DUE TO FURRING, METAL, OR OTHER SURFACE MATERIALS.

4. 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.

ANCHORS @ 2'-6"OC

$$T_c = \psi S_{XS} w_p A_p \quad (4\text{-}12)$$

THREADED ROD CAPACITY: (SEE DET 1,4,8, AND 12 ON S2.03)
As = pi*(0.625"/2)^2 = 0.306in^2
phi*Tn = 0.9*Fy*As = 0.9*36ksi*0.1306in^2 = 9.9K

PLATE: SIMPSON RP6

GL D BETWEEN GL 4/5:

ψ = 1.0, COLLAPSE PREVENTION
wp = 83psf, ASSUME FULLY GROUTED 8" CMU WALL
Ap = 2.5ft*(15ft/2+1.5ft) = 23sf
Sxs = Ss = 0.459 BSE-1E
Sxs = Ss = 0.956 BSE-2E
Tc = 1.0*0.956*83psf*23sf = 1.83K
DCR_t: 0.29 < 1.0

GL F:

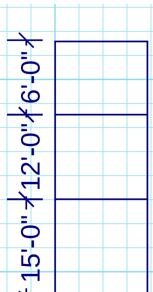
ψ = 1.0, COLLAPSE PREVENTION
wp = 83psf, ASSUME FULLY GROUTED 8" CMU WALL
Ap = 4ft*(5.5ft+1.5ft) = 28sf
Sxs = Ss = 0.459 BSE-1E
Sxs = Ss = 0.956 BSE-2E
Tc = 1.0*0.956*83psf*28sf = 2.22K
DCR_t: 0.35 < 1.0

MAIN BUILDING ANCHORAGE CONFORMING

HOSE TOWER ANCHORAGE TO CONCRETE FRAME UNKNOWN

5. PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than the following:

Top story of multi-story building	9
First story of multi-story building	15
All other conditions	13



0'-8" CMU: 0.667ft

Story 1: 15ft/0.667ft = 22.5 > 15 NG
Story 2: 12ft/0.667ft = 18.0 > 13 NG
Top Story: 6ft/0.667ft = 9.0 = 9 OK

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6\.

OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.
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.

REINFORCED MASONRY CHECKLIST
URM CHECKLIST

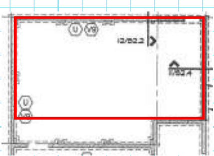
MAXIUMUM PENETRATION SIZE: 20"x8"
FOR HVAC DUCT TO NORTH ROOM "RECORDING STUDIO"

CLOSEST OPENING TO MASONRY SHEAR WALL LINE: 4'-3" FROM EDGE
0.25*L_SW = 108FT/4 = 27FT

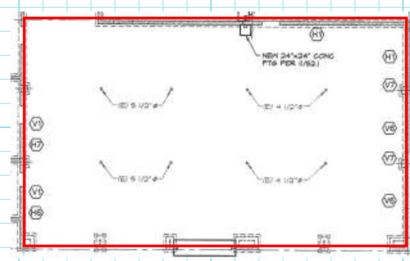
7\.

STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.

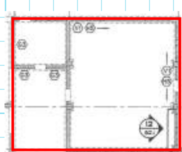
REINFORCED MASONRY CHECKLIST
URM CHECKLIST



37ft : 24ft= 1.54 < 2:1 OK
SPAN 24ft



74ft : 57ft = 1.29 < 2:1 OK
SPAN > 24ft



44ft : 35ft = 1.25 < 2:1 OK
SPAN > 24ft

68ft : 27ft = 2.52 > 2:1 NG
SPAN > 24ft

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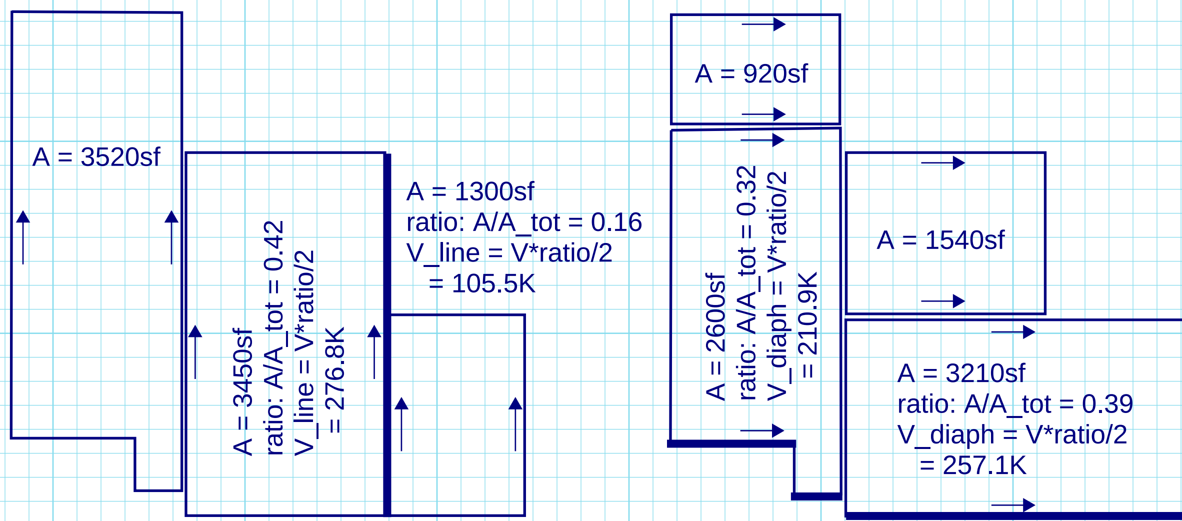
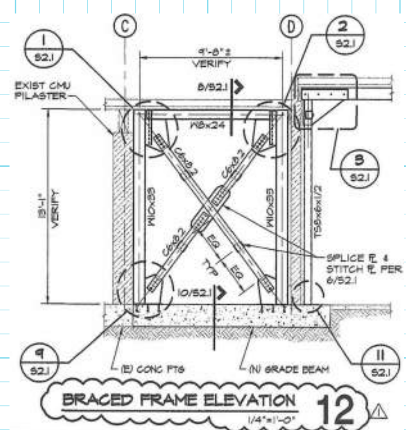
8. COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than $0.10F_y$. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.4.3.6, is less than $0.30F_y$.

V = 1318.3K *SEE BASE SHEAR CALC*

p_gravity = 0 ksi < 0.1*Fy   Braced DO NOT act as gravity framing members



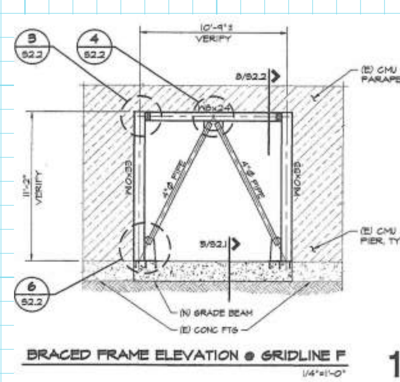
$$\boxed{p_{ot} = \frac{1}{M_s}\left(\frac{2}{3}\right)\left(\frac{Vh_n}{Ln_f}\right)\left(\frac{1}{A_{col}}\right) \qquad (4\text{-}11)}$$



COLUMN IN BRACE FRAME ALONG GRIDLINE 5

nf = 1   Total number of frames in the direction of loading
V = 382.3 k   Pseudo Seismic Force
hn = 13.17ft
L = 9.67ft
Ms = 2.5   CP, ASCE 41-17 EQN 4-11 FOOTNOTE
Acol = 9.71in^2   W10X33

p_ot = 0.667*382.3k*13.17ft/9.67ft/1/9.71in^2/2.5
= 14.31ksi < 0.3*Fy = 15ksi



COLUMN IN BRACE FRAME ALONG GRIDLINE F

nf = 1   Total number of frames in the direction of loading
V = 257.1 k   Pseudo Seismic Force
hn = 11.17ft
L = 10.75ft
Ms = 2.5   CP, ASCE 41-17 EQN 4-11 FOOTNOTE
Acol = 9.71in^2   W10X33

p_ot = 0.667*257.1k*11.17ft/10.75ft/1/9.71in^2/2.5
= 7.40ksi < 0.3*Fy = 15ksi

COLUMN STRESS CONFORMS TO REQUIREMENT

9. BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.4.3.4, is less than $0.50F_y$.

$$f_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{sN_{br}}\right)\left(\frac{L_{br}}{A_{br}}\right) \quad (4\text{-}9)$$

BRACE IN BF ALONG GRIDLINE 5

Vj = 105.5K *REFER TO QUICK CALC 8 FOR SHEAR DISTRIBUTION*
Ms = 3.5 CP Tension Only, AISC 41-17 TBL 4-9
Nbr = 1 Number of Braces in Tension
Lbr = SQRT(h^2+L^2) = 16.34ft Average Brace Length
Abr = 2.39in^2 C6X8.2
s = 9.67ft Plan Length of Brace

f_j_avg = 105.5K*16.34ft/9.67ft/1/(2*2.39in^2)/3.5 = **10.65ksi < 0.5*36ksi = 18ksi OK**

BRACE IN BF ALONG GRIDLINE F

Vj = 257.1K *REFER TO QUICK CALC 8 FOR SHEAR DISTRIBUTION*
D/t = 19.0 < 1500ksi/1.25/35ksi = 34.2
Ms = 7.0 CP Pipe, AISC 41-17 TBL 4-9
Nbr = 2 Number of Braces in Tension/Compression
Lbr = SQRT(h^2+L^2) = 12.39ft Average Brace Length
Abr = 2.96in^2 C6X8.2
s = 10.75ft Plan Length of Brace

f_j_avg = 257.1K*12.39ft/5.375ft/1/(2*2.96in^2)/7.0 = **5.0ksi < 0.5*35ksi = 17.5ksi OK**

BRACE STRESS CONFORMS TO REQUIREMENT

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10. SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have *Kl/r* ratios less than 200.

COMPACT MEMBERS: All brace elements meet compact section requirements in accordance with AISC 360, Table B4.1.

COMPACT MEMBERS: All brace elements meet section requirements in accordance with AISC 341, Table D1.1, for moderately ductile members.

CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals.

CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals.

BRACE IN BF ALONG GRIDLINE 5: (2) C6X8.2 BACK-TO-BACK

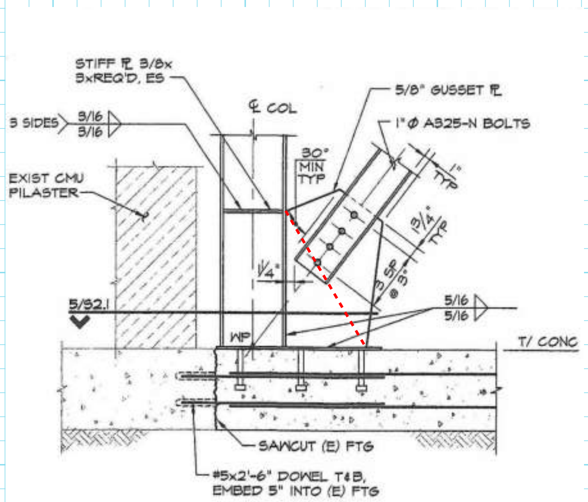
Slenderness / Compactness:
b/tf = 1.92in/0.343in = **5.6 <** 1.49*SQRT(E/Fy) = **42.2 --> NOT SLENDER**
KL/r = 1.0*16.34ft*12in/ft/2.34in = **83.8 < 200 OK**
h/tw = 6in/0.2in = **30 <** 3.76*SQRT(E/Fy) = **106.7** (AISC 360 B4.1, Stiffened Channel)
h/tw = **30 <** 1.57*SQRT(E/Ry/Fy) = **36.3 --> COMPACT** (AISC 341 D1.1, Stiffened Channel, Moderately Ductile)

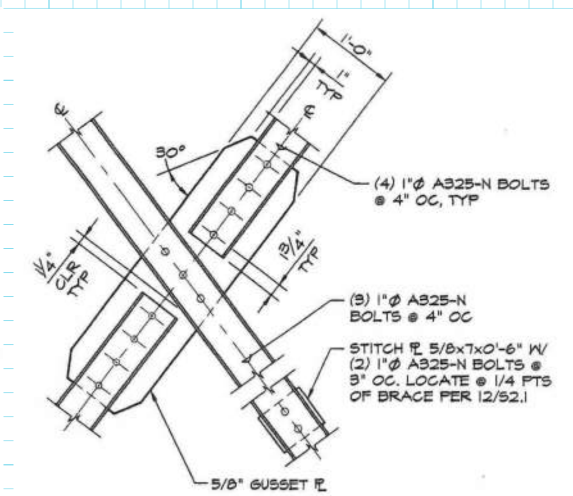
Yield Capacity (per AISC 360 Chapter D):
Ag = 2*2.39in^2 = 4.78in^2
phi*Pn = 0.9*Fy*Ag = 0.9*36ksi*4.78in^2 = **154.9K**

Buckling Capacity (per AISC 360 Chapter E):
KL/r < 3.76*SQRT(29000ksi/36ksi) = 106.7
Fe = pi^2*E/(KL/r)^2 = 3.14^2*29000ksi/83.8^2 = 40.75ksi
Fcr = Fy*0.658^(Fy/Fe) = 36ksi*0.658^(36ksi/40.75ksi) = 24.87ksi
phi*Pn = 0.9*Fcr*Ag = 0.9*24.87ksi*4.78in^2 = **106.9K**

Bolt Shear (per AISC 360 Chapter J):
Fn = 54ksi (A325 BOLTS)
Ag = 4*1in^2 = 4in^2
phi*Rn = 0.9*Fn*Ab = 0.9*54ksi*4in^2 = **194.4K > Yield > Buckling OK**

Bolt Bearing (per AISC 360 Chapter J):
Fu = 58ksi (Channel)
t = 2*0.2in = 0.4in
d = 6in
phi*Rn = 0.75*2.4*d*t*Fu = 0.75*0.4in*6in*58ksi = **104.4K < Yield < Buckling NG**





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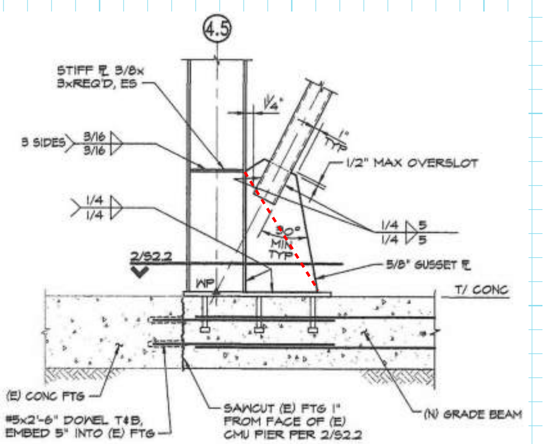
BRACE IN BF ALONG GRIDLINE F: 4"DIA PIPE

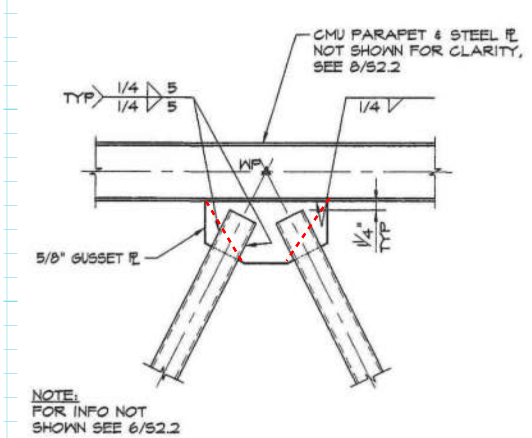
Slenderness / Compactness:
D/t = **19.0 <** 0.11*E/Fy = 0.11*29000ksi/36ksi = **88.6 --> NOT SLENDER**
KL/r = 1.0*12.4ft*12in/ft/1.51in = **98.54 < 200 OK**
D/t = **19.0 <** 0.07*E/Fy = **56.3 --> COMPACT** (AISC 360 TBL B4.1, Round Pipe)
D/t = **19.0 <** 0.062*E/Ry/Fy = **39.5 --> COMPACT** (AISC 341 TBL D1.1, Round Pipe, Moderately Ductile)

Yield Capacity (per AISC 360 Chapter D):
phi*Pn = 0.9*Fy*Ag = 0.9*35ksi*2.96in^2 = **93.2K**

Buckling Capacity (per AISC 360 Chapter C):
KL/r < 4.71*SQRT(29000ksi/36ksi) = 133.68
Fe = pi^2*E/(KL/r)^2 = 3.14^2*29000ksi/98.54^2 = 2904.6ksi
Fcr = Fy*0.658^(Fy/Fe) = 36ksi*0.658^(36ksi/2904.6ksi) = 35.81ksi
phi*Pn = Fcr*Ag = 0.9*35.81ksi*2.96in^2 = **95.4K**

Weld (per AISC 360 EQN 8-2a):
phi*Rn = 1.392k/in*D*l = 1.392k/in*4*(4*5in) = **111.3K > Buckling > Yield OK**





X-BRACE CONNECTION CAPACITY FOR PIPE BRACE
DOES NOT EXCEED BUCKLING AND YIELD CAPACITY OF BRACE

INVERSE V-BRACE CONNECTION CAPACITY FOR PIPE BRACE
EXCEEDS BUCKLING AND YIELD CAPACITY OF BRACE

NOTE THE BRACES WILL NOT RESULT IN A DUCTILE FAILURE IN THE CURRENT GEOMETRIC CONFIGURATION, THE BRACE TO GUSSET PLATE CONNECTION WILL NEED TO BE ADJUSTED TO MEET THIS CRITERIA

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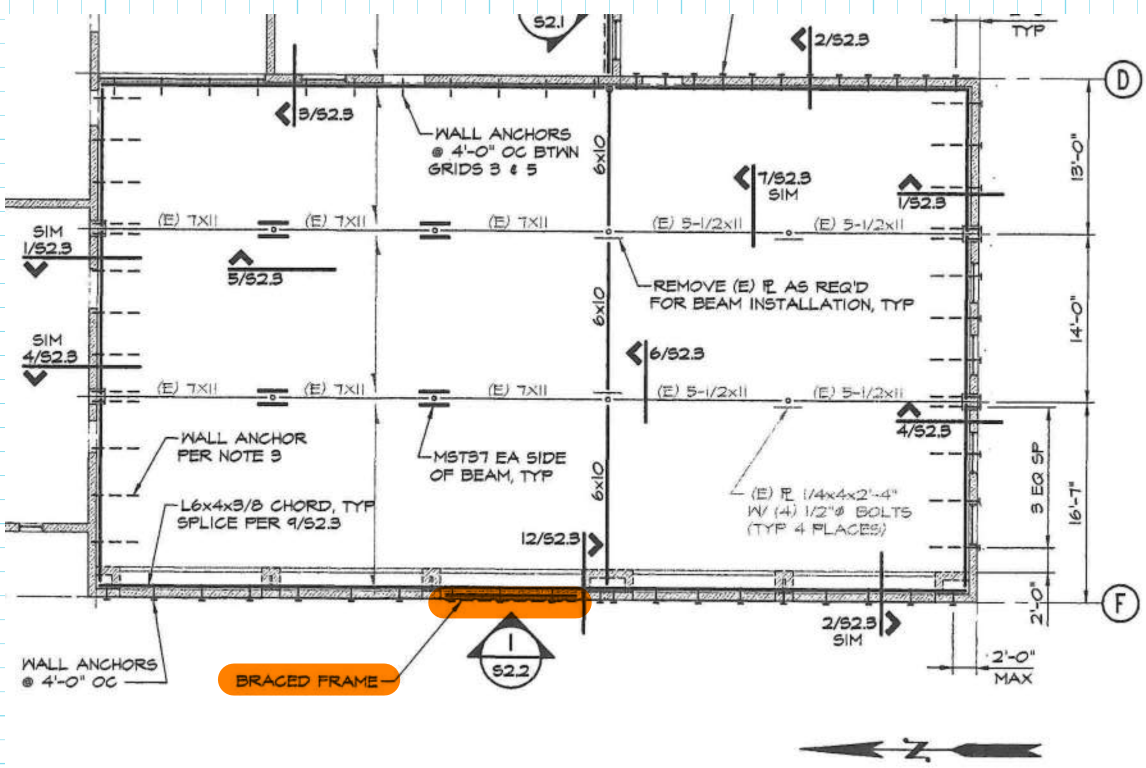
CMU LINTEL

Load Path
through
CMU WALL



REDMOND OLD FIRE STATION TEEN CENTER EVALUATION

APPENDIX F
DOCUMENTS PROVIDED

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Facility Summary

City of Redmond
Teen Center Site
Teen Center

16510 NE 79th Street
Redmond, WA 98052

Facility Size - Gross S.F.	8,600
Year Of Original Construction	1952
Facility Use Type	Teen Center
Construction Type	Heavy
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	2000
Historic Register	No

Weighted Avg Condition Score	**3.4**
Facility Condition Index (FCI)	0.23
Current Replacement Value (CRV)	$4,076,000
Beginning Budget Year	2023
Escalation	3%
Discount Rate	1.5%

	Total Project Cost	Total Project Cost Present Value
Observed Deficiencies 2023 - 2028	$1,931,000	$1,992,000
Predicted Renewal Budget 2029 - 2042	$944,000	$1,075,000
Opportunities	$1,358,000	N/A

Facility Condition Summary

The Teen Center building has previously served as City Hall, fire and police station, and YMCA. Roofing and flashings are approaching end of life with leaks. Windows are inefficient original aluminum single-pane glazing. There is also a large amount of hazardous materials (per 2016 Amec Foster Wheeler hazardous materials survey report), including in the sealed-off basement, reportedly containing abandoned equipment. HVAC is four gas-fired unit heaters, one rooftop gas-pack unit, several electric wall heaters, natural ventilation via operable windows and doors, and exhaust fans for toilet rooms. Plumbing is city water and sewer with one gas-fired domestic hot water heater. Fire sprinkler is dry-pipe throughout. Power is 120/240V, single-phase with newer 400A panel subfeeding two other newer and several older panels. Lighting is mostly older fluorescent with manual control. Building fire alarm system and security alarm system are outdated with minimal capacity, but are working. Building has battery pack emergency wall lights. No diesel generator, no renewable energy, and no electric vehicle charging.

Facility Summary

City of Redmond
Teen Center Site
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Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
A Substructure				**3.0**			
A10	**Foundations**						
A1010	**Standard Foundations**	1952	1952	3	TRB	12/08/23	Poured in place concrete. Some cracks and leaks caused by tree root intrusion.
A1030	**Slab On Grade**	1952	1952	3	TRB	12/08/23	Concrete slab floor.
A20	**Basements**						
A2020	**Basement Walls**	1952	1952	3	TRB	12/08/23	Very small basement area under hose tower with 2-foot wide by 3-foot high tunnel to kitchen area. Closed and abandoned due to hazardous materials including asbestos dust contamination (see 2016 Amec Foster Wheeler Hazardous materials survey report).
B Shell				**3.7**			
B10	**Superstructure**						
B1010	**Floor Construction**	1952	2000	3	TRB	12/08/23	Limited area of raised wood platform at sound studio. Concrete decks inside former hose tower.
B1020	**Roof Construction**	1952	1952	3	TRB	12/08/23	Wood deck on wood and steel beams on steel columns. Roof deck over multipurpose / showroom has been damaged by earlier leaks and paint peeling. Based on age, likely contains lead.

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Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
B Shell				**3.7**			
B20	**Exterior Closure**						
B2010	**Exterior Walls**	1952	1952	4	TRB	12/08/23	Exterior stucco with rock aggregate on concrete block masonry (assumed based on age to be unreinforced). Stucco peeling off all around hose tower, temporary protective cement board cover bolted over to hide failing stucco is now water damaged with bubbling paint. Interior of walls with white skim coating on plaster and CMU also contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report). Other areas of cracks and damage to stone stucco finish (minor maintenance to clean, repair, seal, and repaint).
B2020	**Exterior Windows**	1952	1952	5	TRB	12/08/23	Original aluminum frames (warped and some daylight visible), single-pane windows some broken panes, some replaced with plastic. Windows contain hazardous materials (per 2016 Amec Foster Wheeler hazardous materials survey report): lead-based paint and asbestos window putty. Windows are allowing air infiltration and some water which produces condensation (silicon caulk holding Plexiglas panes in some frames).
B2030	**Exterior Doors**	1952	2022	3	TRB	12/08/23	Hollow metal doors. Aged overhead doors to patio.
B30	**Roofing**						
B3010	**Roof Coverings**	1952	2004	4	TRB	12/08/23	Torch down roof and flashings nearing end of life with patches, bubbling, four areas of roof leaks at flashings. The area around the hose tower is particularly concerning. Areas of ponding.
B3030	**Projections**	1952	1952	4	TRB	12/08/23	Fabric awnings on steel frames (fabric recently replaced). Original hose tower appears to be constructed of unreinforced masonry with poor mortar bed construction. Mechanical screens constructed with white plastic lattice screwed into wood posts and frame. Lattice material broken away and loose on areas and dirty (minor maintenance to clean and resecure).

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Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
C Interiors				**3.2**			
C10	**Interior Construction**						
C1010	**Partitions**	1952	1952	3	TRB	12/08/23	Partitions on frame or masonry with lath and plaster.
C1020	**Interior Doors**	1952	1952	3	TRB	12/08/23	Interior wood doors and frames. Paint damage and wear especially on restroom doors. Lead-based paint is likely present, so any maintenance touch up should follow safety regulations.
C1030	**Fittings**	1952	1952	3	TRB	12/08/23	Rubber base with asbestos mastic (per 2016 Amec Foster Wheeler hazardous materials survey report). Some minor graffiti on toilet partitions.
C20	**Staircases**						
C2010	**Stair Construction**	1952	1952	3	TRB	12/08/23	Hose tower metal ladder, wood stair at recording studio.
C2020	**Stair Finishes**	1952	2000	3	TRB	12/08/23	Carpet at recording studio.
C30	**Interior Finishes**						
C3010	**Wall Finishes**	1952	2018	3	TRB	12/08/23	Paint appears in good condition with minor areas of touch-up recommended. However, interior wall surfaces contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report). Lead-based paint also assumed.
C3020	**Floor Finishes**	1952	2000	3	TRB	12/08/23	Vinyl composition tile (VCT), carpet, and rubber tile. Broadloom carpets with runs/tears, wear, and stains. Mastic and flooring materials below current flooring contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report).
C3030	**Ceiling Finishes**	1952	1980	4	TRB	12/08/23	Open ceilings, suspended acoustical ceiling tile dated, (does not meet current seismic code and minor areas of broken tiles). Original glue-up fiberboard panel ceiling tiles. Ceilings contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report).

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Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
D Services			**3.3**			
D20 Plumbing						
D2010 Plumbing Fixtures	1952	1980	3	DCS	12/08/23	Porcelain, fiberglass, and stainless steel plumbing fixtures with chrome trim, with tank-type water closets, urinal in men's room, and several showers no longer in use. One newer single-height (non-ADA) drinking fountain. Plumbing fixtures are aged and worn, with some slow-draining, but still mostly functional. Back-ups are due to waste piping, not fixtures. While there are relatively few fixtures, staff report the fixture quantities are adequate for most needs.
D2020 Domestic Water Distribution	1952	1980	4	DCS	12/08/23	City water with mix of older galvanized and newer copper distribution piping. 2013 Rheem gas domestic hot water heater with 50-gallon and 38 mbh capacity. Observed domestic hot water pipping is missing insulation - minor maintenance to install where accessible. No hot water recirculation pump, but not necessary. Irrigation system with reduced pressure backflow prevention from domestic cold water at service entry at base of hose tower.
D2030 Sanitary Waste	1952	1952	4	DCS	12/08/23	Drain, waste, and vent piping is a mix of cast iron and ABS. Several floor drains in toilet rooms. Several plumbing fixtures are slow draining and flushing.
D2040 Rain Water Drainage	1952	1980	4	DCS	12/08/23	Entire multi-level roof sheet flows to north to two sets of gutters; one east and one west, each with downspouts to grade. Gutters and downspouts are damaged. Ponding on roof in several locations with leakage - see B3010 Roof Coverings.

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D Services				**3.3**			
D30	**HVAC**						
D3010	**Energy Supply**	1952	1980	3	DCS	12/08/23	Natural gas from Puget Sound Energy via meter number 804499 with 425-cfh capacity; gas distribution to four unit heaters, one rooftop gas-pack unit, and one domestic hot water heater. No seismic valve at gas service entry - minor maintenance to install. Gas service entry piping appears to pass through the inaccessible (due to asbestos contamination) basement. Short run of gas piping through roof to rooftop unit is rusted and corroding - minor maintenance to clean and preserve. No gas pressure issues reported.
D3020	**Heat Generating Systems**	1952	1952	4	DCS	12/08/23	Reportedly abandoned original boiler in sealed-off basement due to asbestos contamination. The boiler chimney is integrated into the hose tower, and still in use by gas-fired water heater flue exhaust, but the condition of the flue is unclear.
D3030	**Cooling Generating Systems**	1952	1952	4	DCS	12/08/23	No permanent cooling systems, except for rooftop unit serving the sound studio. Portable Dx cooling is used for office and support area cooling during summer months. Large portable fans are used for event space cooling.
D3040	**HVAC Distribution Systems**	1952	1980	4	DCS	12/08/23	Minimal HVAC for all areas except sound room/studio. Currently, most spaces are heated by gas-fired unit heaters, electric wall heaters, and naturally ventilated via operable windows and doors. Space-by-space exhaust fans for restrooms and several other spaces, but not the kitchen.
D3050	**Terminal and Package Units**	1952	2004	3	DCS	12/08/23	Four 2004 gas-fired vented ceiling-mounted unit heaters serving larger spaces (multipurpose, activity, and game room). One aging 2004 rooftop gas-pack unit with rooftop internally insulated galvanized sheet metal ductwork. Mix of 1980 and 2000 electric resistance wall heaters for smaller spaces - minor maintenance to replace wall heaters individually as they fail.

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D Services				**3.3**			
D30	**HVAC**						
D3060	**Controls and Instrumentation**	1952	2004	3	DCS	12/08/23	Programmable thermostats for rooftop unit and gas-fired unit heaters, with manual thermostats for wall heaters. Reverse acting manual thermostat for former computer room transfer air fan. Thermostats are aging, but minor maintenance to replace when associated equipment is replaced.
D40	**Fire Protection**						
D4010	**Fire Protection Sprinkler Systems**	1990	1990	3	DCS	12/08/23	Four-inch fire service from city with post indicator valve and fire department connection in yard to southwest underground to inside riser room to west, with backflow preventer, supplying one 2.5-inch dry-pipe riser serving entire building, including outside sprinkler head under multipurpose room garage door.
D4030	**Fire Protection Specialties**	1990	2015	3	DCS	12/08/23	Fire extinguishers in cabinets. AED in cabinet. First aid kit in administration area.
D50	**Electrical**						
D5010	**Electrical Service and Distribution**	1952	2000	3	DCS	12/08/23	Electrical panel main distribution panel (MDP) in custodial room at the base of the hose tower. MDP is Square D, 120/240V, single-phase, 400A, in turn subfeeding two newer Square D branch panels and other small older Square D load centers in the building. All panels are beaker-type, grounded but with no surge protection. No issues reported other than circuit trips due to overloading with excessive portable HVAC equipment.
D5020	**Lighting and Branch Wiring**	1952	2000	3	DCS	12/08/23	Interior lighting is fluorescent with manual control; fixtures are 2x4 troffer, fluorescent industrial, recessed down-lights, and 1x4 wrap around. Lamps are T8 fluorescent.
D5032	**Low Voltage Communication**	1952	1990	3	DCS	12/08/23	Several abandoned plain old telephone service panels, newer VoIP phone handsets for staff, several wall-mounted TVs - minor maintenance to demolish abandoned communications cabling, equipment, and devices.

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D Services				**3.3**			
D50	**Electrical**						
D5037	**Low Voltage Fire Alarm**	1952	2004	4	DCS	12/08/23	The building has an obsolete zoned fire alarm system, Fire-Lite #5012, four zones, hardwired system; but with newer AED wireless alarm transmitter. Fire alarm device consists of horn strobes, pull stations, and old heat detectors. Fire alarm system is outdated but reportedly operable.
D5038	**Low Voltage Security**	1952	2004	3	DCS	12/08/23	The building has a simple burglar alarm type security system including perimeter monitoring, motion detectors, and keypad. No card-key access. No CCTV. Security alarm system is outdated but working.
D5039	**Low Voltage Data**	1952	2000	3	DCS	12/08/23	Building has a Cat-6 data/voice system with intermediate distribution frame in custodial space at base of hose tower, and includes several newer WiFi antennas. Staff report existing system is adequate for current needs.
D5090	**Other Electrical Systems**	1952	1990	3	DCS	12/08/23	Building has no standby or emergency power. Emergency lighting includes battery-backed egress pathway wall-mounted fixture and lighted exit signs, but with poor coverage in some areas - minor maintenance to add where missing.
E Equipment and Furnishings				**3.0**			
E10	**Equipment**						
E1010	**Commercial Equipment**	1952	2000	3	DCS	12/08/23	Kitchen appliances.
E1020	**Institutional Equipment**	1952	2004	3	DCS	12/08/23	Limited game and art program equipment; more extensive music event equipment.
E1030	**Vehicular Equipment**	1952	2000	3	DCS	12/08/23	Sectional doors with aging motor operators, but no issues reported.

Facility Summary

City of Redmond
Teen Center Site
Teen Center

16510 NE 79th Street
Redmond, WA 98052

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
E Equipment and Furnishings			**3.0**			
E20 Furnishings						
E2010 Fixed Furnishings	1952	2000	3	TRB	12/08/23	Horizontal blinds, some discolored. Plastic laminate on wood counter and vanity aged and delaminating.
F Special Construction						
F10 Special Construction						
F1030 Special Construction Systems	2000	2000	3	DCS	12/08/23	Sound room with recording studio equipment.

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

A2020	Basement Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2023	40	$500.00	SF	$20,000	$39,000

Deficient Material: **Basement**

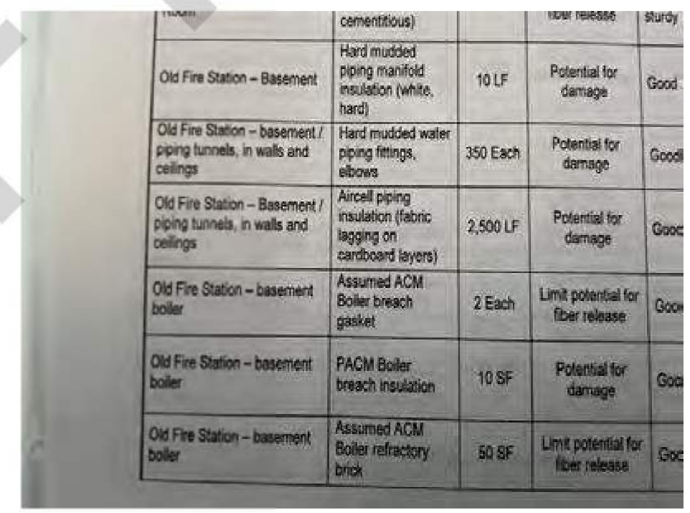
Tunnel contains hazardous materials including asbestos dust contamination.

Remedial Action:

Abate hazardous materials prior to demolition. In the meantime, install warning signage to prevent unintended access and exposure.

Action Type:

Life Safety



	cementitious)		fiber release	sturdy
Old Fire Station – Basement	Hard mudded piping manifold insulation (white, hard)	10 LF	Potential for damage	Good
Old Fire Station – basement / piping tunnels, in walls and ceilings	Hard mudded water piping fittings, elbows	350 Each	Potential for damage	Good
Old Fire Station – Basement / piping tunnels, in walls and ceilings	Aircell piping insulation (fabric lagging on cardboard layers)	2,500 LF	Potential for damage	Goo
Old Fire Station – basement boiler	Assumed ACM Boiler breach gasket	2 Each	Limit potential for fiber release	Goo
Old Fire Station – basement boiler	PACM Boiler breach insulation	10 SF	Potential for damage	Goo
Old Fire Station – basement boiler	Assumed ACM Boiler refractory brick	50 SF	Limit potential for fiber release	Goo

Detailed Assessment - Observed Deficiencies 2023 - 2028

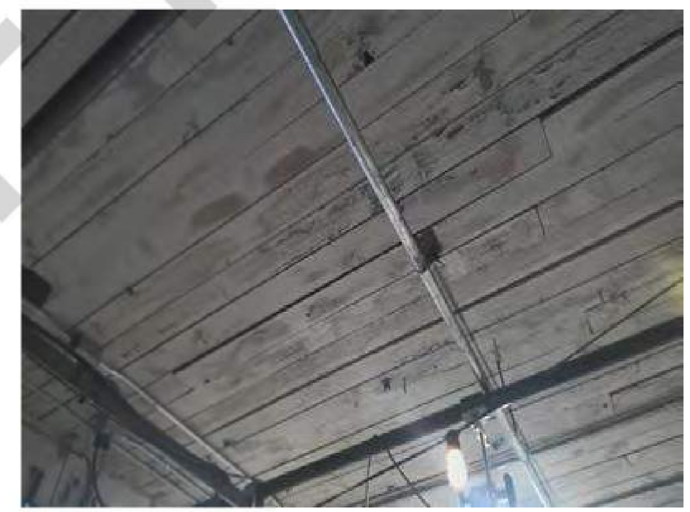
City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation	3%
Discount Rate	1.5%

B1020	Roof Construction	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2027	3,500	$15.00	SF	$52,500	$103,000

Deficient Material: **Wood Deck**

Roof deck over multipurpose / showroom has been damaged by earlier leaks and paint peeling. Based on age, likely contains lead.



Remedial Action:

Test for lead and abate if present. Otherwise, strip paint, repair damaged boards, prime, and repaint.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

B2010	Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2024	3,000	$38.00	SF	$114,000	$223,000

Deficient Material: **Cement Board Siding**

Stone/stucco plaster at hose tower failing, temporary cement board siding near main entry now water damaged with peeling paint.

Remedial Action:

Remove hose tower siding and flashings, install new flashing and cladding system on entire hose tower. (Consider modern system with weather drainage plane behind vented rain screen cladding and all new weather and cap flashings.)

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

B2010	Exterior Walls	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2023	1	$60,000.00	LS	$60,000	$118,000

Deficient Material: **Plaster**

Although in good condition and painted, interior surfaces of exterior walls with white skim coating on plaster and CMU contain asbestos and likely lead-based paint.

Remedial Action:

Do no work impacting interior wall surfaces. Abate interior wall surfaces prior to any work or demolition.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

B2020	Exterior Windows	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2024	28	$2,000.00	EA	$56,000	$110,000

Deficient Material: **Windows**

Original aluminum frames (warped and some daylight visible), single-pane windows, some broken panes, some replaced with plastic. Windows contain hazardous materials (per 2016 Amec Foster Wheeler hazardous materials survey report), lead-based paint and asbestos window putty. Windows are allowing air infiltration and some water which produces condensation.

Remedial Action:

Abate and remove and replace frames and windows with high-efficiency windows and frames. Properly dispose of hazardous materials.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

B3010	Roof Coverings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2027	8,600	$32.00	SF	$275,200	$539,000

Deficient Material: **Torch Down Roof**

Torch down roof and flashings nearing end of life with patches, bubbling, and four areas of roof leaks at flashings. The area around the hose tower is particularly concerning. Assume limited to code minimum insulation from time of past reroof (would not meet current code). Gutters and downspouts failing.

Remedial Action:

Remove flashing and roofing. Provide rigid insulation to meet or exceed code and tapered to provide positive drainage. Install new flashing systems, roofing, downspouts, and gutters. See also opportunity described under B1020 Roof Construction to add rigid insulation at time of roofing replacement.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

B3030	Projections	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2023	1	$80,000.00	LS	$80,000	$157,000

Deficient Material: **Hose Tower**

Original hose tower appears to be constructed of unreinforced masonry with poor mortar bed construction (broken CMU and gaps in mortar bed visible from interior of shaft). No seismic upgrade evident.

Remedial Action:

Conduct a seismic investigation and analysis and conduct reinforcing to tower (perhaps attaching a steel frame on interior) as recommended by engineers to reduce risk of collapse in a seismic event.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: **Teen Center Site**
Facility: **Teen Center**

Escalation	3%
Discount Rate	1.5%

C1030	Fittings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2023	1	$7,000.00	LS	$7,000	$14,000

Deficient Material: **Rubber Base**

Rubber base with asbestos mastic (per 2016 Amec Foster Wheeler hazardous materials survey report).

Remedial Action:

Do no work impacting interior wall systems unless abatement occurs. Abate base and replace with new.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

C3010	Wall Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2025	1	$25,000.00	LS	$25,000	$49,000

Deficient Material: **Paint**

Paint appears in good condition with minor areas of touch-up recommended. However, interior wall surfaces contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report). Lead-based paint also assumed.

Remedial Action:

Do no work impacting interior wall surfaces. Abate interior wall surfaces prior to any work or demolition.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

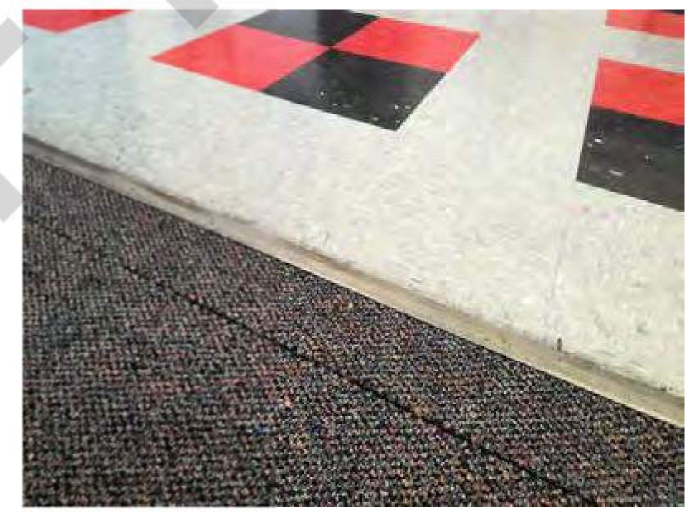
City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation	3%
Discount Rate	1.5%

C3020	Floor Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2028	3,000	$7.50	SF	$22,500	$44,000

Deficient Material: **Carpet**

Broadloom carpets with runs/tears, wear, and stains. Mastic and flooring materials below current flooring contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report).



Remedial Action:

Replace carpet with carpet tile. Use caution and proper procedures to not disrupt asbestos-containing materials.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

C3030	Ceiling Finishes	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		5	2023	2024	4,000	$10.00	SF	$40,000	$78,000

Deficient Material: **Ceiling Finishes**

Suspended acoustical ceiling tile dated and grid does not meet current seismic code and minor areas of broken tiles. Original glue-up fiberboard panel ceiling tiles. Ceilings contain asbestos (per 2016 Amec Foster Wheeler hazardous materials survey report).

Remedial Action:

Abate hazardous materials, demo remaining ceilings. Install new grids (to current code) and install new ceiling tiles.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

D1090	**Other Conveying Systems**	**Score**	**Survey Year**	**Budget Year**	**Qty**	**Unit Cost**	**Unit**	**Direct Cost**	**Marked Up Cost**
		5	2023	2023	1	$5,000.00	EA	$5,000	$10,000

Deficient Material: **Roof Access**
No roof access to maintain roof and rooftop equipment.

Remedial Action:
Provide roof access to facilitate maintenance, including rooftop HVAC unit service. Install access door from existing hose tower to roof.

Action Type:
Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

		Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
D2010	**Plumbing Fixtures**								
		4	2023	2026	5	$3,500.00	EA	$17,500	$34,000

Deficient Material: **Plumbing Fixtures**
Some fixtures aged and worn.

Remedial Action:
Replace aged and worn fixtures.

Action Type:
Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation	3%
Discount Rate	1.5%

D2020	**Domestic Water Distribution**	**Score**	**Survey Year**	**Budget Year**	**Qty**	**Unit Cost**	**Unit**	**Direct Cost**	**Marked Up Cost**
		4	2023	2026	8,600	$1.55	SF	$13,330	$26,000

Deficient Material: **Drain, Waste, and Vent**
Suspected segments of original galvanized piping in concealed spaces.

Remedial Action:
Replace with copper and/or PEX.

Action Type:
Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

D2030 Sanitary Waste	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2025	8,000	$3.85	SF	$30,800	$60,000

Deficient Material: **Waste piping**

Aged waste piping with several slow draining and flushing fixtures and reports of failing waste piping under the floor slab.

Remedial Action:

Renew drain, waste, and vent piping system.

Action Type:

Code Issue

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation	3%
Discount Rate	1.5%

D2040 Rain Water Drainage	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2026	100	$50.00	LF	$5,000	$10,000

Deficient Material: **Gutter and Downspout**
Damaged gutters and downspouts.

Remedial Action:
Replace gutters and downspouts.

Action Type:
Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

D3020	Heat Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2026	1	$5,000.00	LS	$5,000	$10,000

Deficient Material: **Boiler**

Original boiler reportedly abandoned-in-place in the basement boiler room; unclear condition of the boiler flue still in use by the water heater flue.

Remedial Action:

Following basement asbestos removal, demolish and remove the boiler and accessories; inspect and service the remaining flue as needed to support flue gas venting of served gas appliances, specifically the water heater.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: **Teen Center Site**
Facility: **Teen Center**

Escalation 3%
Discount Rate 1.5%

D3030	Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2024	3,000	$15.00	SF	$45,000	$88,000

Deficient Material: **Cooling**

No permanent cooling or ventilation for the high-bay event space; large portable fans used, creating safety and trip hazards.

Remedial Action:

Install ceiling fans and ventilation cooling system, for example with natural ventilation exhaust up through hose tower.

Action Type:

Energy Efficiency

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

D3030 Cooling Generating Systems	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2024	2,000	$16.50	SF	$33,000	$65,000

Deficient Material: **Cooling**

No permanent cooling for administration, support, and activity areas; portable cooling in use during summer months.

Remedial Action:

Install permanent cooling system for office, support, and activity area spaces; for example, ductless split-Dx.

Action Type:

Energy Efficiency

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

D3050	Terminal and Package Units	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2027	1	$19,800.00	EA	$19,800	$39,000

Deficient Material: **Rooftop Units**
Aging rooftop unit serving studio space.

Remedial Action:
Budget to replace upon failure.

Action Type:
Energy Efficiency

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation	3%
Discount Rate	1.5%

D5037 Low Voltage Fire Alarm	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2025	8,000	$3.75	SF	$30,000	$59,000

Deficient Material: **Fire Alarm**
Obsolete zoned fire alarm system.

Remedial Action:
Upgrade to modern addressable system.

Action Type:
Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: **Teen Center Site**
Facility: **Teen Center**

Escalation 3%
Discount Rate 1.5%

D5038	Low Voltage Security	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2025	8,000	$2.65	SF	$21,200	$42,000

Deficient Material: **Electronic security**

Aged burglar alarm system with no card-key access or CCTV.

Remedial Action:

Upgrade to city standard electronic security system with access control, intrusion detection, and CCTV monitoring.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center

Escalation 3%
Discount Rate 1.5%

E2010 Fixed Furnishings	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2025	2	$3,500.00	EA	$7,000	$14,000

Deficient Material: **Casework**

Plastic laminate on wood counter and vanity aged and delaminating.

Remedial Action:

Demo and replace vanities.

Action Type:

Other

Facility Summary

City of Redmond
Teen Center Site
Teen Center Infrastructure

16510 NE 79th Street
Redmond, WA 98052

Facility Condition Summary

The site extends between NE 79th and NE 80th Streets. It includes two asphalt parking lots and a fenced in outdoor patio area. There is a smaller patio of pavers near the front door. The site includes a paved basketball court and lawn area and a gravel area at the rear for storm water infiltration.

City of Redmond water, fire, sewer, and storm. Puget Sound Energy power and natural gas. Local purveyors for telecom services. No site electronic security. The side sewer is aged and failing. No on-site renewable energy or electric vehicle charging stations.

Facility Summary

City of Redmond
Teen Center Site
Teen Center Infrastructure

16510 NE 79th Street
Redmond, WA 98052

Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework							
G20	**Site Improvements**						
G2020	**Parking Lots**	1952	1980	3	TRB	12/08/23	Asphalt parking lot at north side of building for approximately 25 vehicles. Portion of the lot is an old concrete slab. Pitting of north parking lot and some potholes. Paint striping has faded.
G2030	**Pedestrian Paving**	1952	1980	3	TRB	12/08/23	Concrete patio at front of building. Asphalt walkways at rear of building. Concrete slab settlement and trip hazards near front entry and outdoor yard.
G2040	**Site Development**	1952	2000	2	TRB	12/08/23	Picnic tables throughout. Bike racks. Monument sign. Basketball court at rear of building. Chain link fencing.
G2050	**Landscaping**	1952	2000	3	TRB	12/08/23	Limited site landscaping, primarily grass and mature trees. Small raised vegetable gardens actively used.
G30	**Site Civil / Mechanical Utilities**						
G3010	**Water Supply**	1952	1980	3	DCS	12/08/23	One-inch domestic water and four-inch fire sprinkler supply with post-indicator valve to SW from the City of Redmond water system. While irrigation is observed on-site, a separate meter was not observed. A four-inch fire department connection is also located to SW. Water pressure is near 90 psig. The building water service entry is via the original basement window well under the hose tower with failing makeshift block vault - minor maintenance to make this service entrance more permanent and bypass the asbestos-contaminated basement.
G3020	**Sanitary Sewer**	1952	1980	4	DCS	12/08/23	Building sanitary sewer connects to City of Redmond system with circuitous and failing side sewer.

Facility Summary

City of Redmond
Teen Center Site
Teen Center Infrastructure

16510 NE 79th Street
Redmond, WA 98052

Facility Components

Systems		Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework							
G30	**Site Civil / Mechanical Utilities**						
G3030	**Storm Sewer**	1952	1980	3	DCS	12/08/23	Roof runoff discharges by downspout onto ground and to underground piping. Parking lot and site runoff is collected in catch basins and area drains and conveyed to City of Redmond system. Minor maintenance to connect downspouts to storm that currently discharge at grade. There appears to be a gravel infiltration area at the rear of the building.
G3060	**Fuel Distribution**	1952	1980	3	DCS	12/08/23	Puget Sound Energy natural gas diaphragm meter No. 804499 with 425 cfh capacity and no seismic shut-off valve - minor maintenance to install. Meter appears to be of adequate capacity to meet current loads including four units heaters, one rooftop gas-pack unit, and one water heater, but not any future commercial kitchen. No observed or reported fuel oil systems, however there is reportedly an old abandoned boiler in the basement, which was not accessible due to asbestos, and potentially was fuel-oil fired - further investigation is suggested.
G40	**Site Electrical utilities**						
G4010	**Electrical Distribution**	1952	2000	3	DCS	12/08/23	Overhead power from pole at street to weather head at hose tower, with Puget Sound Energy meter No. X144383839 delivered at 120/240V, single-phase to main electrical panel inside the base of hose tower. No standby generator, no renewable energy, and no electric vehicle charging.
G4020	**Site Lighting**	1952	2004	3	DCS	12/08/23	Wall lights on all sides of the building, including newer LED at fenced activity yard to SE. Pole lights at paved activity and both parking areas. Minor maintenance to upgrade remaining non-LED lamps to LED as they fail. Some outside lights on during daylight hours - minor maintenance to adjust controls.
G4030	**Site Communications and Security**	1952	2000	3	DCS	12/08/23	No site electric security, but no issues reported - minor maintenance to add two wireless CCTV cameras to minimally monitor the site.

Facility Summary

City of Redmond
Teen Center Site
Teen Center Infrastructure

16510 NE 79th Street
Redmond, WA 98052

Facility Components

Systems	Original System Date	Last Renewal Date	Score	Surveyor	Survey Date	Comments
G Sitework						
G90 Other Site Construction						
G9010 Service and Pedestrian Tunnels	1952	1952	4	DCS	12/08/23	Reportedly, a tunnel exists under the building and/or site, but is condemned from entry due to asbestos contamination.

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center Infrastructure

Escalation	3%
Discount Rate	1.5%

G2020	Parking Lots	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2027	7,000	$4.00	SF	$28,000	$55,000

Deficient Material: **Parking Lot**

Pitting of north parking lot and some potholes. Paint striping has faded.

Remedial Action:

Fill potholes, top coat, and repaint stripes in lot.

Action Type:

Other

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: Teen Center Site
Facility: Teen Center Infrastructure

Escalation	3%
Discount Rate	1.5%

G2030	Pedestrian Paving	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
		4	2023	2025	400	$20.00	SF	$8,000	$16,000

Deficient Material: **Concrete Sidewalk**

Concrete slab settlement and trip hazards near front entry and outdoor yard.

Remedial Action:

Saw cut, demo, and repave entry plaza.

Action Type:

Life Safety

Detailed Assessment - Observed Deficiencies 2023 - 2028

City of Redmond
Site: **Teen Center Site**
Facility: **Teen Center Infrastructure**

Escalation 3%
Discount Rate 1.5%

G3020 Sanitary Sewer	Score	Survey Year	Budget Year	Qty	Unit Cost	Unit	Direct Cost	Marked Up Cost
	4	2023	2025	200	$60.00	LF	$12,000	$24,000

Deficient Material: **Sanitary Sewer**

Sanitary side sewer reportedly failing with dirt and debris in partially collapsed line.

Remedial Action:

Replace side sewer.

Action Type:

Other

Deficiency Repair Cost Markups By System 2023 - 2028

City of Redmond
Site: Teen Center Site

Escalation 3%
Discount Rate 1.5%

Facility	System	Direct Construction Cost	Contingency 20%	Contractor's OH & P 20%	Project Soft Cost 36%	Total Project Cost	Total Project Cost (Present Value)
Teen Center	A20 Basements	$20,000	$4,000	$4,800	$10,368	$39,000	$39,000
	B10 Superstructure	$52,500	$10,500	$12,600	$27,216	$103,000	$109,000
	B20 Exterior Closure	$230,000	$46,000	$55,200	$119,232	$451,000	$456,000
	B30 Roofing	$355,200	$71,040	$85,248	$184,136	$696,000	$729,000
	C10 Interior Construction	$7,000	$1,400	$1,680	$3,629	$14,000	$14,000
	C30 Interior Finishes	$87,500	$17,500	$21,000	$45,360	$171,000	$176,000
	D10 Vertical Transportation	$5,000	$1,000	$1,200	$2,592	$10,000	$10,000
	D20 Plumbing	$66,630	$13,326	$15,991	$34,541	$130,000	$135,000
	D30 HVAC	$102,800	$20,560	$24,672	$53,292	$202,000	$206,000
	D50 Electrical	$51,200	$10,240	$12,288	$26,542	$101,000	$104,000
	E20 Furnishings	$7,000	$1,400	$1,680	$3,629	$14,000	$14,000
	Facility Total	**$984,830**	**$196,966**	**$236,359**	**$510,536**	**$1,931,000**	**$1,992,000**
Teen Center Infrastructure	G20 Site Improvements	$36,000	$7,200	$8,640	$18,662	$71,000	$74,000
	G30 Site Civil / Mechanical Utilities	$12,000	$2,400	$2,880	$6,221	$24,000	$24,000
	Facility Total	**$48,000**	**$9,600**	**$11,520**	**$24,883**	**$95,000**	**$98,000**
	Site Total	**$1,032,830**	**$206,566**	**$247,879**	**$535,419**	**$2,026,000**	**$2,090,000**

Opportunity Summary By Subsystem

City of Redmond

Site: Teen Center Site **Total Site Opportunity Cost: $1,677,000**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Direct Cost	Total Project Cost
Facility:	**Teen Center**							
System:	**Superstructure**							**$101,000**
B1020	**Roof Construction**							
		Building does not appear to include roof insulation (or minimal).	Insulate to improve thermal energy efficiency, meet city decarbonization goals, and improve thermal comfort. Insulate under roof or add rigid insulation when reroof occurs to meet or exceed current energy code.	8,600.00	$6.00	SF	$51,600	$101,000
Facility:	**Teen Center**							
System:	**Exterior Closure**							**$97,000**
B2010	**Exterior Walls**							
		Building exterior walls are uninsulated.	Add insulation to exterior walls to improve energy efficiency, carbon reduction, and thermal comfort. Furr out and insulate from interior with 2x and minimum R-21 batt insulation and new painted gypsum wall board interior. Alternatively, consider adding exterior rigid insulation as a means to insulate and include a new rain screen cladding.	3,400.00	$14.50	SF	$49,300	$97,000

Note: Cost estimates shown include project markups, but exclude escalation.

Print Date: 02/20/24

Opportunity Summary By Subsystem

City of Redmond

Site: Teen Center Site **Total Site Opportunity Cost: $1,677,000**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Direct Cost	Total Project Cost
Facility:	**Teen Center**							
System:	**Plumbing**							**$49,000**
D2040	**Rain Water Drainage**							
		Interior roof drains, crawlspace, and lightly-used basement.	Install 5,000-gallon rain water harvesting system to supply flushing water to toilets and urinals.	1.00	$25,000.00	LS	$25,000	$49,000
Facility:	**Teen Center**							
System:	**HVAC**							**$777,000**
D3030	**Cooling Generating Systems**							
		Natural ventilation is currently via operable windows and doors only. The abandoned-in-place hose tower may be cleaned and configured for enhanced natural ventilation.	Clean hose tower. Install louvers from occupied spaces to base of tower. Install relief hood at top of tower.	1.00	$10,000.00	LS	$10,000	$20,000
D3040	**HVAC Distribution Systems**							
		Current HVAC system of unit heaters and natural ventilation is typical of semi-heated shop or warehouse space, not for human occupancy.	Install a code-compliant HVAC system suitable for full heating and cooling. For example, variable refrigerant flow system with heat recovery dedicated outside air system.	7,000.00	$46.00	SF	$322,000	$631,000
D3060	**Controls and Instrumentation**							
		Opportunity to install new DDC control system in conjunction with new HVAC for current use suggested in D3040 HVAC Distribution Systems opportunity.	Install new DDC controls in conjunction with new HVAC system.	8,600.00	$7.50	SF	$64,500	$126,000

Note: Cost estimates shown include project markups, but exclude escalation.

Print Date: 02/20/24

Opportunity Summary By Subsystem

City of Redmond

Site: Teen Center Site — **Total Site Opportunity Cost: $1,677,000**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Direct Cost	Total Project Cost
Facility:	**Teen Center**							
System:	**Electrical**							**$211,000**
D5020	**Lighting and Branch Wiring**							
		Aging fluorescent lighting with manual control.	Replace with LED and automatic control.	8,600.00	$11.50	SF	$98,900	$194,000
D5039	**Low Voltage Data**							
		Apparent aged cable data service.	Upgrade to high-speed fiber-optic per city standard.	1.00	$8,500.00	LS	$8,500	$17,000
Facility:	**Teen Center**							
System:	**Equipment**							**$123,000**
E1010	**Commercial Equipment**							
		Very small kitchen area, with minimal appliances. Reported food insecurity among some teen center patrons.	Upgrade to small commercial kitchen.	1.00	$38,000.00	LS	$38,000	$74,000
E1020	**Institutional Equipment**							
		Limited art and game equipment.	Expand program support equipment.	1.00	$25,000.00	LS	$25,000	$49,000
Facility:	**Teen Center Infrastructure**							
System:	**Site Electrical utilities**							**$319,000**
G4010	**Electrical Distribution**							
		No electric vehicle (EV) charging stations.	Install one double-cable EV charging station with rough-in for one more.	1.00	$10,000.00	EA	$10,000	$20,000

Opportunity Summary By Subsystem

City of Redmond

Site: Teen Center Site **Total Site Opportunity Cost: $1,677,000**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Direct Cost	Total Project Cost
G4010	Electrical Distribution	Overhead single-phase power service is increasingly obsolete and may not support decarbonization.	Replace overhead single-phase 120/240V power with modern underground three-phase 208V power service; includes cost to upgrade building electrical distribution.	1.00	$75,000.00	LS	$75,000	$147,000
		No standby power.	Install disconnect and manual transfer switch to allow essential loads to operate during power outage, so patrons can shelter-in-place for short periods, with 10-kW economy portable generator.	10.00	$1,750.00	EA	$17,500	$34,000
		Portions of flat roof with modest southern exposure.	Install 10-kW photovoltaic power system on roof to SE.	10.00	$6,000.00	EA	$60,000	$118,000

Note: Cost estimates shown include project markups, but exclude escalation.

Print Date: 02/20/24

Facility Summary

City of Redmond
Old Fire House Teen Center Site
Old Fire House Teen Center Building

16510 NE 79th Street
Redmond, WA 98052

Facility Code	
Facility Size - Gross S.F.	8,600
Year Of Original Construction	1952
Facility Use Type	Community Center
Construction Type	Heavy
# of Floors	1
Energy Source	Gas
Year Of Last Renovation	2000
Historic Register	No

			Total Project Cost	Total Project Cost - Present Value
Weighted Avg Condition Score	**3.4**			
Facility Condition Index (FCI)	0.22			
Current Replacement Value (CRV)	$4,144,000	**Predicted Renewal Budget (6 yrs)**	$909,000	$865,000
Beginning Budget Year	2013	**Predicted Renewal Budget (20 yrs)**	$2,024,000	$1,812,000
		Observed Deficiencies (6 yrs)	$520,000	$502,000
		Observed Deficiencies (ALL)	$520,000	$502,000
		Opportunity Total Project Cost	$1,286,000	N/A

Facility Condition Summary

Architectural:
The Facility Condition Assessment team was told, "This is the oldest, darkest, grimiest place for teens to go in Redmond." The building has served as City Hall, Fire and Police Station, YMCA, and as a community teen center. It needs to be refreshed, remodeled, and reconfigured to address the Teen Center mission. Building went through a comprehensive seismic retrofit in 2000. The inclusion of hose tower needs to be verified.

Electrical:
Old Fire House Teen Center building's electrical service is 120/208V IP, 3-wire overhead service from Puget Sound Energy pole mounted transformer, 37.5-kva rated. Building interior lighting is all fluorescent, T8 lamps, 2x4 troffer in offices; open reflector industrial in storage; and 1x4 wrap around fixtures in hallway. Building exterior lights are wall mounted high pressure sodium (HPS) wall pack, to provide lighting to building perimeter and parking area. Branch wiring devices are old and has insufficient outlets. Building fire alarm system and security alarm system are outdated and small capacity but are working. Building has battery pack emergency wall lights. In general, the building's electrical systems are working at marginal capacity, except the fluorescent lamps, main electrical service and main panels, along with two (2) newer branch panels; all other electrical systems are old and outdated.

Mechanical:
Original construction in 1952 for use as Redmond City Hall, Police, and Fire Station. Tenant improved approximately 1980 for use by YMCA. Use changed to Teen Center in the late 1990s. Tenant improvement in 2000 as Teen Center including: seismic retrofit; conversion of north garage addition to sound room/studio; ADA toilet room with shower; vinyl composition tile floor and carpet; outside paint; new main electrical panel (400 amp); darkroom; kitchen; and north storm drain improvement. In 2004 new torch down roof installed and awnings added. New computer lab in 2006. HVAC is four (4) gas fired unit heaters, one roofing gas-pack unit, several resistance wall heaters, natural ventilation via operable windows and doors and exhaust fans for toilet rooms.
Plumbing is city water and sewer with gas-fired domestic hot water heaters.
Fire sprinkler is from city services and is a dry pipe system throughout.

Facility Summary

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Old Fire House Teen Center Building

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Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/	Survey Date	Comments
A Substructure			**3.0**				
Foundations							
A1010 Standard Foundations	1952	1952	3	17	RD	08/22/13	Poured in place concrete. No deficiencies observed.
A1030 Slab On Grade	1952	1952	3	17	RD	08/22/13	Concrete slab floor.
Basements							
A2020 Basement Walls	1952	1952	3	20	RD	08/22/13	Very small basement area under hose tower with 2-foot wide by 3-foot high tunnel to kitchen area. Reportedly abandoned in place; all original MEP (mechanical, electrical, plumbing) distribution rerouted above grade around 1990.
B Shell			**3.2**				
Superstructure							
B1020 Roof Construction	1952	1952	3	17	RD	08/22/13	Wood deck on wood and steel beams on steel columns. Roof deck over multipurpose room has been damaged by earlier leaks.
Exterior Closure							
B2010 Exterior Walls	1952	2000	3	10	RD	08/22/13	Exterior stucco with rock aggregate on block cement board siding. Stucco is wearing well. Cement board is failing.
B2020 Exterior Windows	1952	1952	4	3	RD	08/22/13	Original metal frame, single pane windows. Windows are allowing air infiltration and some water which produces condensation; silicon caulk holding Plexiglas panes in some frames.
B2030 Exterior Doors							

Facility Summary

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Facility Components

Systems		Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/	Survey Date	Comments
B Shell				**3.2**				
Exterior Closure								
B2030	**Exterior Doors**							
		1952	1952	3	5	RD	08/22/13	Hollow metal doors.
								No deficiencies noted. Doors are worn but currently functional.
Roofing								
B3010	**Roof Coverings**							
		1952	2004	3	16	RD	08/22/13	Torch down roof.
								In good condition. Coating may extend roof life.
B3020	**Roof Openings**							
		1952	1952	3	30	RD	08/22/13	Limited roof openings.
								No exception.
B3030	**Projections**							
		1952	2004	3	15	RD	08/22/13	Awnings.
								Main awning is in good condition. Smaller red awnings need new covers.
C Interiors				**3.4**				
Interior Construction								
C1010	**Partitions**							
		1952	1952	3	10	RD	08/22/13	Partitions on frame or masonry with lath and plaster.
								Wall structure has no deficiencies.
C1020	**Interior Doors**							
		1952	1952	4	1	RD	08/22/13	Interior wood doors and frames.
								Doors damaged or missing. Frames damaged.
C1030	**Fittings**							
		1952	1952	3	5	RD	08/22/13	Counters and vanities.
								Counters and vanities are aged and dated but functional.

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Facility Components / Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain. Useful Life - Yrs	Surveyor/	Survey Date	Comments
C Interiors			**3.4**				
Interior Finishes							
C3010 Wall Finishes	1952	2000	3	2	RD	08/22/13	Wall paint is random, aged, discolored, and worn. Repaint majority of surfaces.
C3020 Floor Finishes	1952	2000	3	8	RD	08/22/13	Vinyl composition tile (VCT), carpet, and rubber tile. Except for carpet in storage rooms, floors are in good condition under heavy use.
C3030 Ceiling Finishes	1952	1980	4	5	RD	08/22/13	Open ceilings, suspended acoustical ceiling tile (ACT). Suspended ceilings are dated, lack sway braces and struts, and have broken tiles.
D Services			**3.6**				
Vertical Transportation							
D1090 Other Conveying Systems	1952	1952	5	0	DCS	08/22/13	No roof access. Provide roof access to facilitate maintenance.
Plumbing							
D2010 Plumbing Fixtures	1952	1980	4	3	DCS	08/22/13	Porcelain, fiberglass, and stainless steel plumbing fixtures with chrome trim. Plumbing fixtures are worn, damaged, slow draining, slow flushing, discolored, leaking, outdated, and mismatched.
D2020 Domestic Water Distribution	1952	1980	4	5	DCS	08/22/13	City water with mix of older galvanized and newer copper distribution piping. 1991 gas domestic hot water (DHW) heater. Irrigation system with reduced pressure backflow preventers from domestic cold water.

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Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/ Survey Date		Comments
D Services			3.6				
Plumbing							
D2020 Domestic Water Distribution							Marginal water pressure and taste. Domestic hot water (DHW) heaters are at end of useful life. DHW piping is uninsulated. DHW heaters and distribution piping do not meet several code requirements. Hose bibs are not frost free.
D2030 Sanitary Waste	1952	1952	4	5	DCS	08/22/13	City sewer service is a mix of cast iron and ABS drain, waste, and vent (DW&V) piping. Several floor drains in toilet rooms. Plumbing fixtures are slow draining and flushing. Screens in vents-to-roofs (VTR) may be a code violation.
D2040 Rain Water Drainage	1952	1980	4	5	DCS	08/22/13	Entire multi-level roof sheet flows to north to two (2) sets of gutters; one (1) east and one (1) west, each with one (1) downspout. Gutter is narrow and damaged. Downspouts are made of multiple materials. A second downspout should be added to each gutter to increase capacity and reliability.
D2090 Other Plumbing Systems	1952	2000	5	0	DCS	08/22/13	Dark room equipment and systems including plumbing support. Dark room appears abandoned in place but chemicals and support system remain in place. Hazardous materials and chemicals should be removed.
HVAC							
D3010 Energy Supply	1952	1980	3	10	DCS	08/22/13	Natural gas from Puget Sound Energy via Meter Number 804490 with 425-cfh capacity; gas distribution to four (4) unit heaters and one (1) rooftop gas-pack unit. No seismic valve at gas service entry. Some gas piping may be below grade/foundation. Less than $2,000 to address.

Facility Summary

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Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/ Survey Date	Comments
D Services			**3.6**			
HVAC						
D3030 Cooling Generating Systems	1952	1952	5	0	DCS 08/22/13	No cooling systems, except roof top units serving sound room/studio. Cooling should be provided for the staff administration area and computer rooms as a minimum. Opportunity for enhanced natural ventilation using hose tower.
D3040 HVAC Distribution Systems	1952	1980	5	0	DCS 08/22/13	Minimal HVAC for all areas except sound room/studio. Currently, most spaces are heated by gas-fired unit heaters, electric wall heaters, and naturally ventilated via operable windows and doors. Opportunity to install an HVAC system more suitable for current use. No exhaust fan kitchen. Unknown exhaust chemical containing darkroom. No HVAC service for vault and most storage rooms.
D3050 Terminal and Package Units	1952	2000	3	7	DCS 08/22/13	Four (4) gas-fired vented ceiling mounted unit heaters serving large spaces (multipurpose, activity, and game room). One (1) roof top unit gas-pack with rooftop internally insulated galvanized sheet metal ductwork. Surface mounted electric resistance wall heaters for administration and computer areas. Equipment is in fair to good condition. No discrete source of combustion air for unit heaters. Marginal comfort as detailed in "HVAC Distribution Systems" section above.
D3060 Controls and Instrumentation	1952	2000	3	3	DCS 08/22/13	Programmable thermostats for unit heaters and manual thermostats for wall heaters. Reverse acting manual thermostat for computer room transfer air fan. Thermostats are aging. Opportunity to upgrade to DDC in conjunction with all new HVAC system suggested in "HVAC Distribution Systems" section above.
Fire Protection						

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Old Fire House Teen Center Building

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Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/ Survey Date		Comments
D Services			**3.6**				
D4010 Fire Protection Sprinkler Systems	1990	1990	3	17	DCS	08/22/13	There is a 4-inch fire service from city with post indicator valve (PIV) and fire department connection (FDC) in yard to southwest. One (1) 3-inch dry pipe riser serving entire building including outside sprinkler head under multipurpose room garage door awning. Service pressure is at 95-psig; air pressure is at 40-psig. Fire sprinkler riser room is dirty and used for storage, but riser is accessible. Sprinkler piping used to support various items in some locations (especially in the multipurpose room). Move items away from sprinkler riser and mark clear area on floor (less than $2,000).
D4030 Fire Protection Specialties	1990	1990	3	7	DCS	08/22/13	Fire extinguishers in plastic cabinets. Automatic external defibrillator (AED) in cabinets. First aid kit in administration area. Plastic cabinets are aging and discolored, but functional. Fire extinguisher tags are mostly current (outside units are out of date); (less than $2,000).
Electrical							
D5010 Electrical Service and Distribution	1952	2000	3	27	RA	08/22/13	Electrical panel MDP (main distribution panel) is in custodian room; 400A, 120/280v IP, 3-wire system, subfeeds two (2) newer Square-D branch panels and other small older Square-D load center in the building. All panels are breaker type. The main MDP panel and two (2) branch panels installed in 2000 and are in good condition. Service was upgraded to 400A, 120/280V. There are about four (4) Square-D load centers in storage room apparatus bay which are small and outdated; needs replacement.
D5020 Lighting and Branch Wiring	1952	2000	3	17	RA	08/22/13	Interior lighting is all fluorescent by manual control with switches; fixtures consist of 2x4 troffer, fluorescent industrial, recess down lights 1x4 wrap around. Lamps are T8. Fixtures are old, over 20 years. Exterior lighting is wall pack fixtures, high pressure sodium (HPS) lamps with

Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/	Survey Date	Comments
D Services			**3.6**				
Electrical							
D5020 Lighting and Branch Wiring							
							insufficient coverage. All electrical branch wiring and devices are old, over 20 years, and at end of life. Interior lighting is generally working; fixtures are over 20 years and should be upgraded (including controls) in the next 5 years. Exterior lighting is insufficient, poorly installed, marginal wiring method; should be upgraded to provide sufficient lighting around the building. Insufficient electrical outlets throughout building.
D5030 Low Voltage Communication Security and Fire Alarm							
	1952	1990	3	5	RA	08/22/13	Building has a Cat-6 data/voice system with IDF (intermediate distribution frame) in janitor room; in working condition. The building has a small fire alarm system, Fire-Lite #5012, 4-zones, hard wired system. Fire alarm device consists of horn strobes, pull station, and old heat detectors. The building has a small security alarm system which consists of motion detectors and keypad. Fire alarm system and security alarm system are outdated but working. Recommend replacement in the next 5 years.
D5090 Other Electrical Systems							
	1952	1990	3	10	RA	08/22/13	Building has no emergency generator. Building emergency lights are battery backup type wall mounted units. Building emergency lights are located inside building egress paths. Some hallways, large rooms, and exterior door areas do not have emergency lights.
E Equipment and Furnishings			**3.0**				
Equipment							
E1020 Institutional Equipment							
	1952	2004	3	5	RD	08/22/13	Recording equipment. Older equipment; functional.
Furnishings							

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Facility Components

Systems		Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/	Survey Date	Comments
E Equipment and Furnishings				**3.0**				
E2010	**Fixed Furnishings**							
		1952	2004	3	3	RD	08/22/13	Vinyl blinds.
								No deficiencies.
E2020	**Moveable Furnishings (Capital Funded Only)**							
		1952	2004	3	3	RD	08/22/13	Office and casual furniture.
								Worn and aged but functional.
F Special Construction								
Special Construction								
F1010	**Special Structures**							
		1952	1952	3	10	RD	08/22/13	Hose drying tower.
								Tower leaks water into building. Recommend further investigation. Building has obvious seismic retrofit except for hose tower. Status of tower's seismic resistance as noted in presumed seismic report should be verified.
F1030	**Special Construction Systems**							
		2000	2000	3	7	RD	08/22/13	Sound room with recording studio equipment.
								While sound equipment and instruments are aging, reportedly they are donated so not carried as a cost item under this Facility Condition Assessment.

Facility Summary

City of Redmond

Old Fire House Teen Center Site

Old Fire House Teen Center Infrastructure

16510 NE 79th Street
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Facility Condition Summary

The Old Fire House Teen Center site extends between NE 79th and NE 80th Streets. It includes two asphalt parking lots and a large fenced in outdoor patio area. There is a smaller patio of pavers near the front door. The site includes a paved basketball court and lawn area, and a gravel area at the rear for storm water infiltration. The building is served by City of Redmond utilities.

Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain.Useful Life - Yrs	Surveyor/	Survey Date	Comments
G Sitework							
Site Improvements							
G2020 Parking Lots	1952	1980	3	5	MK	08/21/13	Asphalt parking lot at north side of building for approximately 25 vehicles. Portion of the lot is an old concrete slab. Small parking lot on east side of building is deteriorating and lacks markings. ADA stalls do not have pavement markings but have signs. Parking lot on east side needs patching and striping.
G2030 Pedestrian Paving	1952	1980	3	10	MK	08/21/13	Large concrete patio at front of building. Asphalt walkways at rear of building. Patio is in good condition with some cracking. Asphalt areas are in good condition.
G2040 Site Development	1952	1980	2	10	MK	08/21/13	Picnic tables throughout. Basketball court at rear of building. All features are in good condition.
G2050 Landscaping	1952	1980	3	10	MK	08/21/13	Limited site landscaping, primarily grass and mature trees. Small vegetable area. Landscaping is in fair condition. Irrigation control valve is by the front door. Unclear if irrigation is operational.
Site Civil / Mechanical Utilities							
G3010 Water Supply							

City of Redmond
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Old Fire House Teen Center Infrastructure

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Facility Components

Systems	Original System Date	Last Major System Renew.	Cond. Scores	Subsystem Remain. Useful Life - Yrs	Surveyor/	Survey Date	Comments
G Sitework							
Site Civil / Mechanical Utilities							
	1952	1980	3	10	MK	08/21/13	Domestic water and fire sprinkler supply from the City of Redmond system. No known issues.
G3020 Sanitary Sewer							
	1952	1980	3	10	MK	08/21/13	Building sanitary sewer connects to City of Redmond system. No known issues.
G3030 Storm Sewer							
	1952	2000	3	10	MK	08/21/13	Roof runoff discharges by downspout onto ground and to underground piping. Parking lot and site runoff is collected in catch basins and area drains and conveyed to City of Redmond system. There appears to be a gravel infiltration area at the rear of the building. No known issues.
G3060 Fuel Distribution							
	1952	1980	3	10	MK	08/21/13	Natural gas meter with seismic valve located near front entry. No known issues.
Site Electrical utilities							
G4010 Electrical Distribution							
	1952	2000	3	10	MK	08/21/13	Service to building from Puget Sound Energy; reportedly upgraded to 400-amp service in year 2000. No issues reported or observed.
G4020 Site Lighting							
	1952	2004	3	20	MK	08/21/13	Wall lights on all sides of the building. Pole lights throughout site and in parking areas. Some lighting is reported to be marginal, although there are a lot of exterior fixtures. Upgrades/repairs probably warranted. (See building's electrical sections.)

Deficiency Repair Cost Markups By System

2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Facility	System	Direct Construction Cost	Contingency 30%	Contractor's OH & P 20%	Project Soft Cost 50%	Total Project Cost	Total Project Cost (Present Value)
Old Fire House Teen Center Building	Superstructure	$3,500	$1,050	$910	$2,730	$8,190	$7,584
	Exterior Closure	$46,100	$13,830	$11,986	$35,958	$107,874	$105,387
	Roofing	$2,250	$675	$585	$1,755	$5,265	$4,970
	Interior Construction	$36,900	$11,070	$9,594	$28,782	$86,346	$83,936
	Interior Finishes	$23,800	$7,140	$6,188	$18,564	$55,692	$53,591
	Vertical Transportation	$2,500	$750	$650	$1,950	$5,850	$5,850
	Plumbing	$61,800	$18,540	$16,068	$48,204	$144,612	$135,428
	HVAC	$27,650	$8,295	$7,189	$21,567	$64,701	$64,348
	Electrical	$14,100	$4,230	$3,666	$10,998	$32,994	$32,994
	Special Construction	$3,500	$1,050	$910	$2,730	$8,190	$7,881
	Facility Total	**$222,100**	**$66,630**	**$57,746**	**$173,238**	**$519,714**	**$501,967**
Old Fire House Teen Center Infrastructure	Site Improvements	$5,000	$1,500	$1,300	$3,900	$11,700	$10,834
	Facility Total	**$5,000**	**$1,500**	**$1,300**	**$3,900**	**$11,700**	**$10,834**
	Site Total	**$227,100**	**$68,130**	**$59,046**	**$177,138**	**$531,414**	**$512,802**

Print Date: 03/10/14

Detailed Assessment - Observed Deficiencies 2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Total Observed Deficiency Repair Direct Cost : $227,100

Total Observed Deficiency Repair Direct Cost (Present Value): $219,146

Material	Cond.	Material Useful Life / Survey Year	Deficiency Condition Notes	Action	Qty	Unit Cost	Unit	Direct Construction Cost
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$3,500**
System: Superstructure				**Total System Deficiency Repair Cost (Present Value):**				**$3,241**
Roof Construction								
Wood Deck	4	4 / 2013	Wood roof deck in multipurpose room has water damage; some boards are loose and need repair.	Repair deck, pressure wash, and repaint.	1	$3,500.00	ls	$3,500
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$46,100**
System: Exterior Closure				**Total System Deficiency Repair Cost (Present Value):**				**$45,037**
Exterior Walls								
Cement Board Siding	4	1 / 2013	Cement board siding near main entry has failing seals and attachments.	Remove and repair underlying walls.	250	$100.00	sf	$25,000
Exterior Windows								
Windows	4	1 / 2013	Single glazed metal frame windows with caulked in fiberglass: condensation accumulates during winter, air infiltrates, and leaks water.	Remove and replace windows.	28	$575.00	ea	$16,100
Exterior Doors								
Exterior Doors	4	3 / 2013	Doors worn but functional.	Schedule door replacement at end of life.	5	$1,000.00	ea	$5,000

Note: Cost estimates shown are direct construction costs.

Print Date: 03/10/14

Detailed Assessment - Observed Deficiencies 2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Total Observed Deficiency Repair Direct Cost : $227,100

Total Observed Deficiency Repair Direct Cost (Present Value): $219,146

Material	Cond.	Material Useful Life / Survey Year	Deficiency Condition Notes	Action	Qty	Unit Cost	Unit	Direct Construction Cost
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$2,250**
System: Roofing				**Total System Deficiency Repair Cost (Present Value):**				**$2,124**
Projections								
Awnings	4	3 / 2013	Small red awnings are decorative and color has faded.	Remove and replace awnings.	5	$450.00	ea	$2,250
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$36,900**
System: Interior Construction				**Total System Deficiency Repair Cost (Present Value):**				**$35,870**
Interior Doors								
Wood Doors and Frames	4	1 / 2013	Severely damaged wood doors and frames. Damage from impact or misuse.	Remove and replace doors in existing frames. Provide new hardware.	18	$1,800.00	ea	$32,400
Fittings								
Fittings	4	5 / 2013	Several counters and vanities are aged and worn more than others.	Schedule counter and vanity renewals.	3	$1,500.00	ea	$4,500
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$23,800**
System: Interior Finishes				**Total System Deficiency Repair Cost (Present Value):**				**$22,902**
Wall Finishes								
Paint	4	2 / 2013	Much of painted wall surface is aged, discolored, and worn.	Repair surfaces and repaint.	1	$15,000.00	ls	$15,000
Ceiling Finishes								
Suspended Ceiling	4	2 / 2013	Suspended ceiling lacks sway bracing and struts; tiles are broken and system is dated.	Replace suspended ceiling.	1,600	$5.50	sf	$8,800

Note: Cost estimates shown are direct construction costs.

Print Date: 03/10/14

Detailed Assessment - Observed Deficiencies 2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Total Observed Deficiency Repair Direct Cost : $227,100

Total Observed Deficiency Repair Direct Cost (Present Value): $219,146

Material	Cond.	Material Useful Life / Survey Year	Deficiency / Condition Notes	Action	Qty	Unit Cost	Unit	Direct Construction Cost
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$2,500**
System: Vertical Transportation				**Total System Deficiency Repair Cost (Present Value):**				**$2,500**
Other Conveying Systems								
Roof Access	5	0 / 2013	No roof access to maintain roof and rooftop equipment.	Install man-door from existing hose tower to roof.	1	$2,500.00	ea	$2,500
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$61,800**
System: Plumbing				**Total System Deficiency Repair Cost (Present Value):**				**$57,875**
Plumbing Fixtures								
Plumbing Fixtures	4	3 / 2013	Many fixtures heavily worn and/or damaged with marginal function. Water closets, urinals, lavatories, sinks, drinking fountains, showers, and others.	Replace plumbing fixtures.	12	$3,000.00	ea	$36,000
Domestic Water Distribution								
Drain, Waste, and Vent	4	5 / 2013	Slow draining and flushing fixtures.	Clean, inspect, and repair or replace drain, waste, and vent system as necessary.	8,650	$2.00	sf	$17,300
Rain Water Drainage								
Gutter and Downspout	4	5 / 2013	Narrow damaged gutters and single downspout from each gutter.	Install wide (6-inch) gutter and two (2) downspouts for each gutter.	100	$35.00	lf	$3,500
Other Plumbing Systems								
Dark Room System	5	0 / 2013	Abandoned photo chemicals and system.	Properly dispose of abandoned chemicals and contaminated equipment and systems. Demo or lay-up as needed.	1	$5,000.00	ls	$5,000

Note: Cost estimates shown are direct construction costs.

Detailed Assessment - Observed Deficiencies 2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Total Observed Deficiency Repair Direct Cost : $227,100

Total Observed Deficiency Repair Direct Cost (Present Value): $219,146

Material	Cond.	Material Useful Life / Survey Year	Deficiency Condition Notes	Action	Qty	Unit Cost	Unit	Direct Construction Cost
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$27,650**
System: HVAC				**Total System Deficiency Repair Cost (Present Value):**				**$27,499**
Cooling Generating Systems								
Cooling	5	0 / 2013	No cooling for administration and computer room areas.	Provide cooling.	1,000	$15.00	sf	$15,000
HVAC Distribution Systems								
Ventilation	5	0 / 2013	No exhaust for kitchen. Unclear exhaust for dark room. No exhaust for several storage rooms.	Provide code minimum ventilation and exhaust for all spaces.	8,650	$1.00	sf	$8,650
Terminal and Package Units								
Unit Heaters	4	2 / 2013	No discrete combustive air source for unit heaters. Combustive air is drawn from the served space.	Provide combustive air to unit heaters.	4	$1,000.00	ea	$4,000
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$14,100**
System: Electrical				**Total System Deficiency Repair Cost (Present Value):**				**$14,100**
Electrical Service and Distribution								
Electrical Panels	5	0 / 2013	Existing branch panel load centers have insufficient capacity and are outdated.	Replace existing outdated branch panel load centers.	4	$400.00	ea	$1,600
Other Electrical Systems								
Emergency Lighting	5	0 / 2013	Battery backup emergency wall lights are missing in hallways, large rooms, and building exterior doors.	Add emergency lights in hallways, large rooms, multipurpose room, and building exterior doors.	25	$500.00	ea	$12,500

Detailed Assessment - Observed Deficiencies 2013 - 2018

City of Redmond

Site: Old Fire House Teen Center Site

Total Observed Deficiency Repair Direct Cost : $227,100

Total Observed Deficiency Repair Direct Cost (Present Value): $219,146

Material	Cond.	Material Useful Life / Survey Year	Deficiency Condition Notes	Action	Qty	Unit Cost	Unit	Direct Construction Cost
Facility: Old Fire House Teen Center Building				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$3,500**
System: Special Construction				**Total System Deficiency Repair Cost (Present Value):**				**$3,368**
Special Structures								
Hose Drying Tower	4	2 / 2013	Hose drying tower leaks water into building under east wall.	Recommend further investigation of tower.	1	$3,500.00	ls	$3,500
Facility: Old Fire House Teen Center Infrastructure				**Total System Deficiency Repair Cost (Undiscounted/Unescalated):**				**$5,000**
System: Site Improvements				**Total System Deficiency Repair Cost (Present Value):**				**$4,630**
Parking Lots								
Parking Lot	2	4 / 2013	East parking lot pavement is deteriorating and lacks striping.	Provide approximately 100 sy of pavement removal and replacement. Provide pavement markings for stalls and ADA.	1	$5,000.00	ls	$5,000

Note: Cost estimates shown are direct construction costs.

Print Date: 03/10/14

Opportunity Summary By Subsystem

City of Redmond

Site: Old Fire House Teen Center Site **Total Site Opportunity Cost: $549,725**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
Facility:	Old Fire House Teen Center Building						
System:	Superstructure	Total Cost: $77,850					
B1020	Roof Construction						
		Building has no insulated roof construction.	Insulate under roof.	8,650.00	$9.00	sf	$77,850
Facility:	Old Fire House Teen Center Building						
System:	Exterior Closure	Total Cost: $68,000					
B2010	Exterior Walls						
		Building exterior walls are uninsulated.	Fur-out and insulate exterior walls. Assume 2x6 multi-stud with R-21 batt insulation and painted gypsum wall board (GWB).	3,400.00	$20.00	sf	$68,000
Facility:	Old Fire House Teen Center Building						
System:	Interior Finishes	Total Cost: $60,200					
C3020	Floor Finishes						
		Current tile and carpet will wear out over the next 5 to 10 years. Opportunity to simplify with polished concrete.	Upon end of life for tile and carpet, polish concrete slab on grade floors in lieu of re-covering.	8,600.00	$7.00	sf	$60,200
Facility:	Old Fire House Teen Center Building						
System:	Plumbing	Total Cost: $45,000					
D2040	Rain Water Drainage						
		With interior roof drains, crawl space and lightly used basement are opportunities for rain water harvesting system at modest cost.	Install rain water harvesting system to supply flushing water to toilets and urinals.	15,000.00	$3.00	gal	$45,000
Facility:	Old Fire House Teen Center Building						
System:	HVAC	Total Cost: $105,950					
D3030	Cooling Generating Systems						
		Natural ventilation is currently via operable windows and doors only. The abandoned in place hose tower may be cleaned and configured for enhanced natural ventilation of much of the Teen Center.	Clean hose tower. Install louvers from occupied spaces to base of tower. Install relief hood at top of tower.	1.00	$10,000.00	ls	$10,000
D3040	HVAC Distribution Systems						

Opportunity Summary By Subsystem

City of Redmond

Site: Old Fire House Teen Center Site — **Total Site Opportunity Cost: $549,725**

Subsystem		Opportunity	Action	Qty	Unit Cost	Unit	Cost
		Current HVAC system of unit heaters and natural ventilation is typical of semi-heated shop or warehouse space, not for human occupancy.	Install a code compliant HVAC system suitable for full heating and cooling.	7,000.00	$10.00	sf	$70,000
D3060	**Controls and Instrumentation**						
		Opportunity to install new DDC control system in conjunction with new HVAC for current use suggested in "HVAC Distribution Systems" section.	Install new DDC controls in conjunction with new HVAC system.	8,650.00	$3.00	sf	$25,950
Facility:	**Old Fire House Teen Center Building**						
System:	**Electrical**	**Total Cost: $142,725**					
D5020	**Lighting and Branch Wiring**						
		Old, outdated lighting fixtures and control switches. Lighting has no automatic lighting controls.	Upgrade building lighting and controls.	8,650.00	$7.00	sf	$60,550
		Old branch building wiring and devices are outdated are insufficient.	Upgrade building branch wiring and devices.	8,650.00	$6.00	sf	$51,900
D5030	**Low Voltage Communication Security and Fire Alarm**						
		Existing security alarm system is small capacity and outdated.	Upgrade security alarm system to addressable system.	8,650.00	$1.50	sf	$12,975
		Existing fire alarm system is small capacity and outdated.	Upgrade fire alarm system to addressable system.	8,650.00	$2.00	sf	$17,300
Facility:	**Old Fire House Teen Center Building**						
System:	**Furnishings**	**Total Cost: $40,000**					
E2020	**Moveable Furnishings (Capital Funded Only)**						
		All furnishings are worn, dated, and unattractive. New furnishings would support the Teen Center programs.	Replace furnishings.	1.00	$40,000.00	ls	$40,000
Facility:	**Old Fire House Teen Center Building**						
System:	**Special Construction**	**Total Cost: $10,000**					
F1030	**Special Construction Systems**						
		Abandoned in place hose drying tower currently used mostly as an unapproved graffiti gallery. Opportunity to do something creative with the tower: 1) indoor rock climbing wall; 2) short bungee jump; or 3) other innovative idea.	Allowance for creative re-use of tower.	1.00	$10,000.00	ls	$10,000

Note: Cost estimates shown are raw construction costs and do not include any mark-ups or escalation.

Print Date: 03/10/14

Barrier Summary Report

5/9/2025

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197388	Old Fire Station Teen Center	EXTERIOR	Accessible Parking	Parking Space-Van	1	WASHINGTON: Signage is not located at the required height for the van accessible space.	Parking Stalls P1-1 and P1-2	ADA	$560
197389	Old Fire Station Teen Center	EXTERIOR	Accessible Parking	Parking Space-Van	1	WASHINGTON: The van access aisle signage is not compliant or not provided.	Parking Stalls P1-1, P1-2 and P2-1	State of Washington	$560
197390	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	The accessible route does not have 80" vertical clearance.	Gate G-1	ADA	$200
197393	Old Fire Station Teen Center	EXTERIOR	Entrance to Building	Building Entrance-Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Entrance E-4	ADA	$1,250
197395	Old Fire Station Teen Center	EXTERIOR	Accessible Parking	Parking Space-Van	1	WASHINGTON: The van access aisle is not compliant.	Parking Stall P2-1	State of Washington	$420

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197398	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The clear width of the exterior accessible route is less than 44".	Route from Parking Lot 2 to Entrance E-3	State of Washington	$108
197399	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	The sidewalk does not have 80" vertical clearance.	Route to Entrance E-1	ADA	$500
197401	Old Fire Station Teen Center	EXTERIOR	Entrance to Building	Building Entrance-Door	1	The maneuvering clearance at the accessible door is not level and clear.	Entrance E-1	ADA	$1,250
197402	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: An exterior accessible route is not provided.	Picnic Area - Stage	State of Washington	$551
197403	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Gate	1	The gate hardware is not compliant.	Gate G-3	ADA	$200
197408	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	A compliant turning space is not provided at a change of direction.	Picnic Area	ADA	$672

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197409	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Picnic Area	State of Washington	$178
197412	Old Fire Station Teen Center	EXTERIOR	Entrance to Building	Building Entrance-Door	1	The maneuvering clearance at the accessible door is not level and clear.	Entrance E-2	ADA	$1,250
197413	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Gate	1	The gate maneuvering clearance area is not compliant.	Gate G-4	ADA	$568
197414	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Gate	1	The gate maneuvering clearance area is not compliant.	Gates G-1, G-4	ADA	$1,136
197415	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	A compliant turning space is not provided at a change of direction.	Route from Gate G-4 to Entrance E-1	ADA	$496
197419	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Route from the Entrance E-1 to the Public Sidewalk	State of Washington	$357

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197420	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Route from Parking Lot 1 to the Entrance E-1	State of Washington	$7,928
197423	Old Fire Station Teen Center	EXTERIOR	Accessible Parking	Parking Space-Van	1	The parking space slope is greater than 1:50 (2%).	Parking Stalls P1-2 and P2-1	ADA	$12,600
197425	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Route from Gate G-1	State of Washington	$1,000
197429	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Route from Entrance E-4 to Gate G-2	State of Washington	$717
197430	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	1	WASHINGTON: The slopes of the exterior accessible route are not compliant.	Route from Parking Stall P2-1 Access Aisle to Gate G-2	State of Washington	$600
197432	Old Fire Station Teen Center	EXTERIOR	Accessible Parking	Parking Space-Van	1	The access aisle slope is greater than 1:50 (2%).	Parking Stall P2-1	ADA	$5,000

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197434	Old Fire Station Teen Center	EXTERIOR	Entrance to Building	Building Entrance-Door	1	The maneuvering clearance at the accessible door is not level and clear.	Entrance E-3	ADA	$1,250
199229	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Steps do not have uniform and compliant riser heights and/or tread depths.	Show Room - Stage	ADA	$0
199233	Old Fire Station Teen Center	INTERIOR	Common Areas	Interior Doors	1	The door does not have 80" minimum vertical clearance from finish floor, excluding the door closer hinged bar and door stops.	Show Room, Game Room, Couch Room	ADA	$7,800
199235	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Controls And Dispensers	1	Controls throughout the common area are not compliant.	Game Room	ADA	$225
199421	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Handrails are not provided.	Show Room - Sound Booth	ADA	$1,304
199422	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Ramp	1	A ramp is required but not provided.	Show Room - Sound Booth	ADA	$12,578

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
199423	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Ramp	1	The ramp run rises 6" or greater but has no handrails.	Show Room - Sound Booth	ADA	$10,080
199424	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Gate	1	The gate is less than 32" in width.	Show Room - Sound Booth	ADA	$568
197313	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Stairs have open risers.	Show Room - Stage	ADA	$5,040
197315	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Handrails are not compliant.	Show Room - Stage	ADA	$3,260
197317	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Protruding Object	1	Protruding objects in the 27' to 80' range above finished floor protrude more than 4' into the circulation path along the interior accessible route.	Show Room, Couch Room	ADA	$2,184
197319	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Steps do not have uniform and compliant riser heights and/or tread depths.	Show Room - Sound Booth	ADA	$689

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197326	Old Fire Station Teen Center	INTERIOR	Restroom	Door	1	The hardware at the accessible door (including sliding doors - both sides) requires tight grasping, pinching or twisting of the wrist to operate OR is mounted below 34" or above 48".	Unisex Restroom	ADA	$293
197354	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Protruding Object	1	Protruding objects in the 27" to 80" range above finished floor protrude more than 4" into the circulation path along the interior accessible route.	Front Desk	ADA	$728
197355	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Front Desk, Bridge of Promise Office	ADA	$2,500

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197356	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The space between two doors in a series is less than 48" clear with doors open 90 degrees.	Front Office	ADA	$1,080
197358	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The threshold at the accessible door is greater than ½" in height.	Front Office - Rear Storage Room	ADA	$179
197360	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Protruding Object	1	Protruding objects in the 27" to 80" range above finished floor protrude more than 4" into the circulation path along the interior accessible route.	Game Room	ADA	$728
197362	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The hardware at the accessible door (including sliding doors - both sides) requires tight grasping, pinching or twisting of the wrist to operate OR is mounted below 34" or above 48".	Recording Studio	ADA	$879

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197363	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Platform Lift	1	A platform lift is required but not provided.	Recording Studio	ADA	$22,525
197364	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Stairs	1	Handrails are not compliant.	Recording Studio	ADA	$815
197367	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Recording Studio - Sound Booth Door	ADA	$1,250
197370	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Recording Studio	ADA	$250
197372	Old Fire Station Teen Center	INTERIOR	Entrance to Building	Building Entrance-Door	1	The accessible door with door closer has a sweep period of less than 5 seconds from 90 degrees to a position 12 degrees from latch.	Entrance E-4	ADA	$366

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197373	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Game Room	ADA	$1,250
197379	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	1	The pull side of the accessible door does not have the required maneuvering clearances.	Kitchen	ADA	$250
197391	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Gate	2	The gate does not have a smooth surface within 10" of the ground.	Gates G-1, G-2, G-3, G-4	ADA	$640
197400	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Picnic Table	2	The picnic table does not allow a clear space for forward wheelchair approach with knee and toe clearance.	Patio and Picnic Areas	ADA	$3,900
197410	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	2	Clear ground space is not provided at the operable part.	Picnic Area	ADA	$478

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197416	Old Fire Station Teen Center	EXTERIOR	Site Furnishings	Trash Receptacle With Operable Lid	2	Clear ground space is not provided at the trash receptacle with lid requiring operation.	Patio Area	ADA	$238
197418	Old Fire Station Teen Center	EXTERIOR	Exterior Access Route	Exterior Accessible Route	2	Clear ground space is not provided at the operable part.	Patio Area	ADA	$238
199234	Old Fire Station Teen Center	INTERIOR	Common Areas	Service Counter	2	The service counter does not have 36" wide section that is 36" maximum above finished floor that is oriented for a parallel approach, or the service counter does not have a 30" wide section that is 36" maximum, with knee and toe clearance, that is oriented for a forward approach.	Front Desk	ADA	$1,805

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
199251	Old Fire Station Teen Center	INTERIOR	Kitchen	Sink	2	Exposed pipes lack insulation and/or sharp or abrasive surfaces are present under the sink.	Kitchen	ADA	$65
197309	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Signage	2	The existing signage is not mounted at the latch side of the door or at a compliant height.	Staff Offices, Staff Meeting Room	ADA	$220
197311	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Signage	2	Means of egress signage does not have tactile lettering.	Show Room (2), Front Entry, Recording Studio, Couch Room	ADA	$275
197312	Old Fire Station Teen Center	INTERIOR	Common Areas	Assembly Area	2	An accessible route does not connect the assembly area wheelchair spaces with performing areas.	Show Room - Stage	ADA	$6,000

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197318	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	2	Items requiring an unobstructed forward reach motion are higher than 48" maximum or lower than 15" minimum height above finish floor.	Stage Room, Game Room, Couch Room	ADA	$600
197320	Old Fire Station Teen Center	INTERIOR	Common Areas	Work Surface	2	The work surface height is not compliant. Knee and toe clearances are not provided.	Show Room - Sound Booth	ADA	$4,764
197321	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Gate	2	The gate does not have a smooth surface within 10" of the ground measured vertically on the push side extending the full width of the gate.	Show Room - Sound Booth	ADA	$160

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197340	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	2	Items requiring an unobstructed forward reach motion are higher than 48" maximum or lower than 15" minimum height above finish floor.	Front Entry, Couch Room	ADA	$1,000
197341	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Signage	2	The interior signage does not have compliant visual and tactile characters, with raised or indented characters or symbols.	Sports Closet, Arts Closet	ADA	$110
197353	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Signage	2	The existing signage is not mounted at the latch side of the door or at a compliant height.	Recording Studio	ADA	$55
197366	Old Fire Station Teen Center	INTERIOR	Common Areas	Work Surface	2	The work surface height is not compliant. Knee and toe clearances are not provided.	Recording Studio - Sound Booth	ADA	$1,031

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197368	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	2	Items requiring an obstructed side reach motion are higher than 48" maximum where the obstruction depth is 10" maximum, or higher than 46" maximum where the obstruction depth is between 10" and 24" and/or lower than 15" minimum height above finish floor.	Recording Studio	ADA	$400
197381	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	2	Items requiring an unobstructed side reach motion are higher than 48" maximum and/or lower than 15" minimum height above finish floor.	Kitchen	ADA	$200

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197383	Old Fire Station Teen Center	INTERIOR	Kitchen	Sink	2	The accessible sink is not installed with the front of the higher of the rim or counter surface 34" maximum above finished floor.	Kitchen	ADA	$720
197386	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	2	Items requiring an unobstructed forward reach motion are higher than 48" maximum or lower than 15" minimum height above finish floor.	Kitchen	ADA	$400
199231	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Roll-In Shower Stall	3	WASHINGTON: Grab bars are not provided or are not compliant in the roll-in shower.	Unisex Restroom	IBC	$1,405
199232	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Roll-In Shower Stall	3	WASHINGTON: The shower and/or controls are not compliant in the roll-in shower.	Unisex Restroom	IBC	$1,405

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197323	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Door	3	The threshold at the accessible door is greater than 1/2" in height.	Unisex Restroom	ADA	$1,250
197324	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Door	3	The pull side of the accessible door does not have the required maneuvering clearances.	Unisex Restroom	ADA	$1,250
197327	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Coat Hook	3	The coat hook is not within an allowable reach range.	Unisex Restroom	ADA	$115
197328	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Water Closet	3	The water closet in a single user / unisex restroom does not have the required clearance.	Unisex Restroom	ADA	$1,368
197330	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Water Closet	3	WASHINGTON: The toilet paper dispenser location is not compliant.	Unisex Restroom	State of Washington	$293
197331	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Water Closet	3	The centerline of the toilet in the wheelchair stall is not 16" minimum to 18" maximum from the sidewall.	Unisex Restroom	ADA	$630

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197333	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Water Closet	3	The rear grab bar at the water closet is not compliant.	Unisex Restroom	ADA	$355
197334	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Water Closet	3	The space between the grab bar and projecting objects above the grab bar is less than 12" minimum.	Unisex Restroom	ADA	$100
197337	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Roll-In Shower Stall	3	WASHINGTON: The shower and/or controls are not compliant in the roll-in shower.	Unisex Restroom	IBC	$500
197339	Old Fire Station Teen Center	INTERIOR	Restroom	Restroom/Bathroom-Toilet Stall	3	WASHINGTON: A vertical side grab bar is not present at the water closet.	Unisex Restroom	ANSI A117.1	$355
197346	Old Fire Station Teen Center	INTERIOR	Restroom	Signage	3	Restroom is not accessible, and directional signs to the nearest accessible restroom is not provided.	Men's and Women's Restrooms	ADA	$110

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197345	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Drinking Fountain/Water Cooler	4	The minimum number of drinking fountains is not provided. If the minimum number is provided, two levels or a hi-lo are not provided. If more than 2 are provided, less than 50% are high or less than 50% are low.	Front Hallway	ADA	$5,440
197361	Old Fire Station Teen Center	INTERIOR	Common Areas	Locker Rooms	4	The locker room does not have at least one of the shelves at 40" minimum and 48" maximum height.	Game Room	ADA	$330
197380	Old Fire Station Teen Center	INTERIOR	Kitchen	Kitchen-Range/Cooktop/Oven	4	The location of the controls requires reaching across burners.	Kitchen	ADA	$759

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197382	Old Fire Station Teen Center	INTERIOR	Kitchen	Storage	4	The storage does not have at least 50% of cabinet shelf space within reach ranges (15"-48"; 46" max when shelving is 10" deep) AND/OR with handles that cannot be operated with one hand, and require tight grasping, pinching, or twisting of the wrist, or require more than 5 pounds force to operate, AND/OR without clear floor space.	Kitchen	ADA	$1,689
197384	Old Fire Station Teen Center	INTERIOR	Kitchen	Kitchen- Counter In Publicly Used Kitchens	4	A minimum 30" wide section of the counter is not a minimum height of 28" and maximum height of 34" with knee and toe clearance.	Kitchen	ADA	$2,382

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197387	Old Fire Station Teen Center	INTERIOR	Kitchen	U-Shaped or L-Shaped Layout	4	The clearance between opposing base cabinets, counter tops, appliances or walls within kitchen work areas in a U-shaped kitchen enclosed on three sides are less than 60".	Kitchen	ADA	$9,850
199224	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	5	The door has less than 32" clear width.	Manager's Office, Front Desk Storage Room, Bridge of Promise Office	ADA	$7,800
199225	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	5	The hardware at the accessible door (including sliding doors - both sides) requires tight grasping, pinching or twisting of the wrist to operate OR is mounted below 34" or above 48".	Manager's Office, Front Desk (2), Bridge of Promise Office	ADA	$1,172

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
199226	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	5	The bottom of the door vision light is higher than 43".	Manager's Office, Staff Meeting Room, Bridge of Promise Office	ADA	$7,800
199227	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	5	Items requiring an unobstructed forward reach motion are higher than 48" maximum or lower than 15" minimum height above finish floor.	Manger's Office, Bridge of Promise Office	ADA	$1,000
199228	Old Fire Station Teen Center	INTERIOR	Employee Work Areas	Work Surface	5	The work surface is not compliant.	Manager's Office, Bridge of Promise Office, Front Office	ADA	$3,092
197310	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Door	5	The pull side of the accessible door does not have the required maneuvering clearances.	Staff Offices	ADA	$2,500

Total Barriers: 97, Total Cost: $205,817

Id	Facility	Building	Assembly	Type	Barrier Priority	Detail	Location Description	ADA	Total
197342	Old Fire Station Teen Center	INTERIOR	Employee Work Areas	Door	5	The door does not have 80" minimum vertical clearance from finish floor, excluding door closer hinged bar and door stops which can be 78" minimum.	Staff Offices (2), Front Desk (2), Bridge of Promise Office	ADA	$13,000
197359	Old Fire Station Teen Center	INTERIOR	Interior Access Route	Reach Range	5	Items requiring an unobstructed forward reach motion are higher than 48" maximum or lower than 15" minimum height above finish floor.	Front Desk - Storage Room, Staff Office	ADA	$400

Total Barriers: 97, Total Cost: $205,817

APPLICABLE CODES

1997 UNIFORM BUILDING CODE AS AMENDED BY STATE OF WASHINGTON
1997 WASHINGTON STATE ENERGY CODE
1997 UNIFORM PLUMBING CODE
1997 UNIFORM MECHANICAL CODE

BUILDING INFORMATION AND CODE DATA

ZONING : CC4

CONSTRUCTION TYPE: V-N
NUMBER OF STORIES: 1
BUILDING SQUARE FOOTAGE:
TOTAL EXISTING: 7571 SF
ADDITION: 170 SF
TOTAL BUILDING S.F.: 7741 SF
SCOPE OF WORK: VOLUNTARY SEISMIC UPGRADE TO ENTIRE BUILDING, ADDITION AND RENOVATION OF EXISTING SPACE FOR CREATION OF "SOUND STUDIO" LAB.

LEGEND

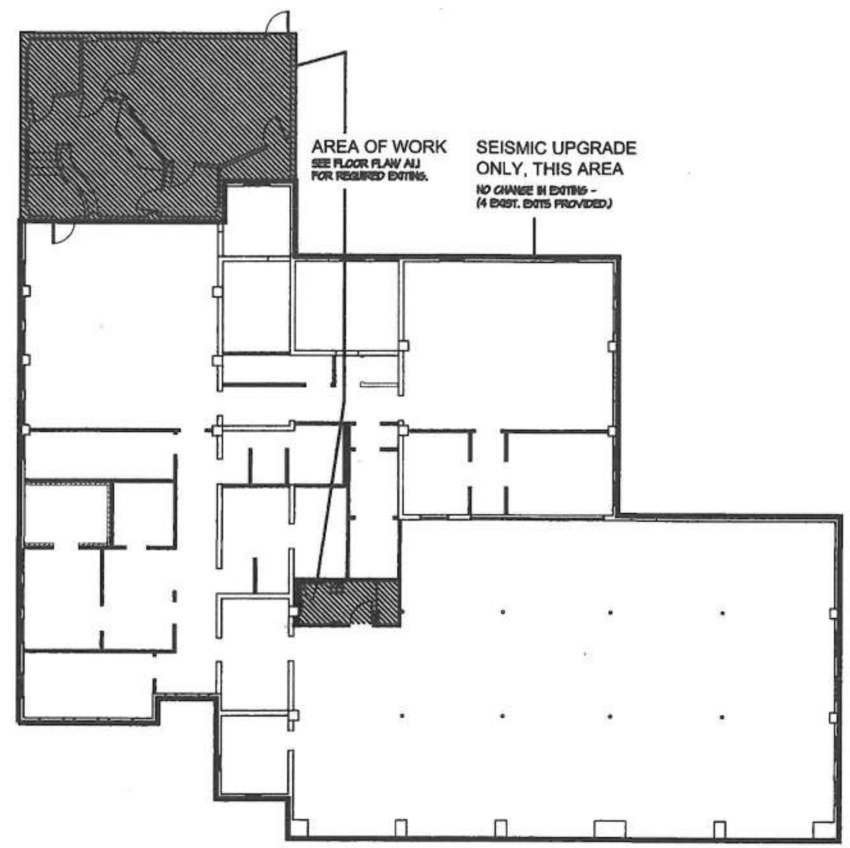
DETAILS		DETAIL NUMBER / SHEET NUMBER
INTERIOR ELEVATION		DRAWING NUMBER / SHEET NUMBER
EXTERIOR ELEVATION		DRAWING NUMBER / SHEET NUMBER
BUILDING SECTION		DRAWING NUMBER / SHEET NUMBER
ROOM NAME TAG	ABCD 1000	ROOM NAME / ROOM NUMBER
WALL TAG		WALL TYPE

ABBREVIATIONS

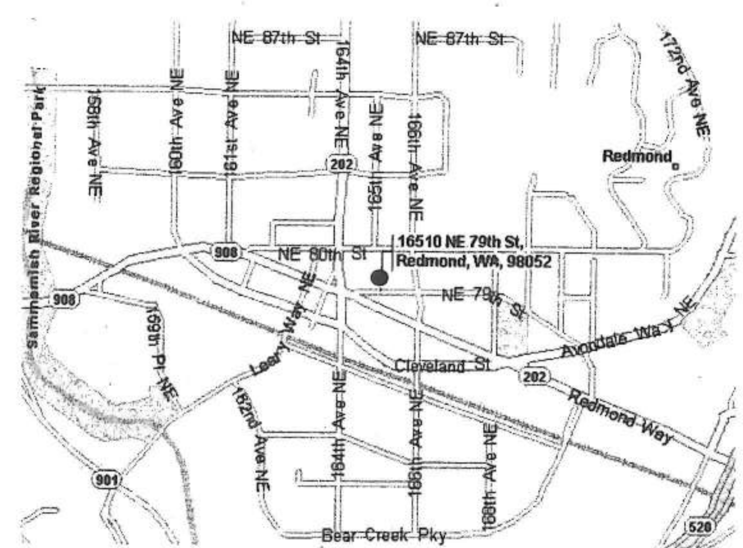
L	ANGLE
℄	CENTER LINE
#	NUMBER
℞	PROPERTY LINE
A.B.	ANCHOR BOLT
A/C	AIR CONDITIONING
A.C.T.	ACOUSTICAL TILE CEILING
ADJ.	ADJACENT
A.F.F.	ABOVE FINISH FLOOR
ALT.	ALTERNATE
ARCH.	ARCHITECT(URAL)
BD.	BOARD
BLK'G.	BLOCKING
BOT.	BOTTOM
CAB.	CABINET
C.B.	CATCH BASIN
C.F.	CUBIC FEET
C.J.	CONTROL JOINT
CLG.	CEILING
CLR.	CLEAR(ANCE)
C.M.U.	CONCRETE MASONRY UNIT
C.O.	CLEAN OUT
COL.	COLUMN
CONC.	CONCRETE
CONT.	CONTINUOUS
COORD.	COORDINATE
CPT.	CARPET
C.T.	CERAMIC TILE
C.Y.	CUBIC YARDS
D.F.	DRINKING FOUNTAIN
D.H.	DOUBLE HUNG
DIM.	DIMENSION
DISP.	DISPENSER
DIV.	DIVISION
DN.	DOWN
DR.	DOOR
D.S.	DOWN SPOUT
DWG.	DRAWING
E.	EAST (COORDINATE)
EA.	EACH
E.B.	EXPANSION BOLT
E.J.	EXPANSION JOINT
ELEC.	ELECTRICAL
ELEV.	ELEVATION
ENCL.	ENCLOSURE
EQ.	EQUAL
EQUIP.	EQUIPMENT
E.W.C.	ELECTRIC WATER COOLER
EXT.	EXTERIOR
F.A.	FIRE ALARM
F.C.O.	FLOOR CLEANOUT
F.D.	FLOOR DRAIN
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.	FINISH FLOOR
F.F.E.	FINISH FLOOR ELEVATION
F.H.	FIRE HYDRANT
FIN.	FINISH
FND.	FOUNDATION
F.O.C.	FACE OF CONCRETE
F.O.F.	FACE OF FOUNDATION
F.O.I.C.	FURNISHED BY OWNER/ INSTALLED BY CONTRACTOR
F.O.M.	FACE OF MASONRY
F.O.S.	FACE OF STUD OR STRUCTURE
F.P.	FIRE PROOF
GA.	GAUGE
GALV.	GALVANIZED
G.C.	GENERAL CONTRACTOR
GLULAM	GLUE LAMINATED
GND.	GROUND
GR.	GRADE
G.W.B.	GYPSUM WALLBOARD
H.B.	HOSE BIB
H.C.	HOLLOW CORE
HDBD.	HARDBOARD
HDR.	HEADER
HDWR.	HARDWARE
HDWD.	HARDWOOD
H.M.	HOLLOW METAL
H.V.A.C.	HEATING/VENTILATION/ AIR CONDITIONING
I.D.	INSIDE DIAMETER (DIM.)
INSUL.	INSULATED (-ION)
INT.	INTERIOR
JT.	JT. JOINT
KIT.	KIT. KITCHEN
L.F.	L.F. LINEAL FEET
LT.WT.	LT.WT. LIGHT WEIGHT
MAS.	MASONRY
M.B.	MACHINE BOLT
M.D.F.	MEDIUM DENSITY FIBERBOARD
M.D.O.	MEDIUM DENSITY OVERLAY
M.D.X.	MEDIUM DENSITY EXTERIOR OVERLAY
MECH.	MECHANICAL
MEMB.	MEMBRANE
MFG	MANUFACTURING
MFR.	MANUFACTURER
MIN.	MINIMUM
MIR.	MIRROR
M.O.	MASONRY OPENING
MTL.	MTL. METAL
N.	NORTH
N.I.C.	NOT IN CONTRACT
NOM.	NOMINAL
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OPN'G.	OPENING
OPP.	OPPOSITE
PERF.	PERFORATED
P.L.	PROPERTY LINE
P-LAM.	PLASTIC LAMINATE
PR.	PAIR
PT.	PAINT, POINT
P.T.	PRESSURE TREATED
PTD.	PAINTED
PTN.	PARTITION
P.V.C.	POLYVINYL CHLORIDE PIPE
Q.T.	QUARRY TILE
R.	RADIUS, RISER
REF.	REFER(ENCE)
REFR.	REFRIGERATOR
REINF.	REINFORCED
REQ'D	REQUIRED
RESIL.	RESILIENT
REV.	REVISION, REVISED
R.O.	ROUGH OPENING
S.	SOUTH
S.C.	SOLID CORE
S.C.D.	SEAT COVER DISPENSER
S.D.	SOAP DISPENSER, STORM DRAIN
S.F.	SQUARE FEET
SHT.	SHEET
SHWR.	SHOWER
SIM.	SIMILAR
S.N.D.	SANITARY NAPKIN DISPENSER
S.N.R.	SANITARY NAPKIN RECEPTACLE
S.S.	STAINLESS STEEL
STL.	STEEL
STA.	STATION
S.T.C.	SOUND TRANSMISSION CLASS
SUB.	SUBSTITUTE
SUSP.	SUSPENDED
SYM.	SYMMETRICAL
SYS.	SYSTEM
T.	TREAD
TB	TACKBOARD
T.O.C.	TOP OF CURB
TEL.	TELEPHONE
TER.	TERAZZO
T.O.P.	TOP OF PLATE OR PAVEMENT
T.P.D.	TOILET PAPER DISPENSER
T.O.W.	TOP OF WALL
TYP.	TYPICAL
U.S.	UNDERSIDE
UNF.	UNFINISHED
U.O.N.	UNLESS OTHERWISE NOTED
V.	VENT
V.B.	VAPOR BARRIER
V.C.T.	VINYL COMPOSITION TILE
V.I.F.	VERIFY IN FIELD
W.	WEST, WIDTH
WB	WHITEBOARD
W.C.	WATER CLOSET
WD.	WOOD
W.G.	WIRED GLASS
W.H.	WATER HEATER
WIN.	WINDOW
W.P.	WATER PROOF(ING)
W.R.	WATER RESISTANT
WT.	WT. WEIGHT
W.W.F.	WELDED WIRE FABRIC

KEY PLAN

NOT TO SCALE



VICINITY MAP



APPROVED FOR CONSTRUCTION:

Ronald D. Grant 9/17/02

WILLIAM J. CAMPBELL, P.E.,PLS for CITY ENGINEER — DATE

FED. AID CONTRACT NO.

THE CITY OF REDMOND WASHINGTON

LEGAL DESCRIPTION

STEWART TITLE COMPANY OF WASHINGTON, INC.
TITLE ORDER NO. 272847 (UNIT NO. 12)
JULY 18, 1995.

PARCEL A
THE SOUTH 125 FEET OF THE NORTH 155 FEET OF THE EAST 82 FEET OF THE WEST 387.63 FEET OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST., W.M., IN KING COUNTY, WASHINGTON.

PARCEL B
THAT PORTION OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST., W.M., IN KING COUNTY, WASHINGTON DEFINED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTH MARGIN OF NORTHEAST 79TH STREET (JACKSON STREET) 318 FEET SOUTH AND 305.63 FEET EAST ON THE NORTHWEST CORNER OF SAID SUBDIVISION:
THENCE EAST ALONG SAID NORTH LINE 182.67 FEET;
THENCE NORTH 144 FEET;
THENCE WEST 100.87 FEET;
THENCE NORTH 19 FEET;
THENCE WEST 82 FEET;
THENCE SOUTH 163 FEET TO THE POINT OF THE BEGINNING.

SURVEYOR'S NOTE
THE ABOVE LEGAL DESCRIPTION CONTAINS MINOR DISCREPANCIES WHICH ARE RESOLVED IF THE TRACT IS MORE CORRECTLY DESCRIBED AS FOLLOWS:
THE EAST 182.87 FEET OF THE WEST 488.50 FEET OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M., IN THE CITY OF REDMOND, IN KING COUNTY, WASHINGTON. LYING NORTH OF THE NORTH MARGIN OF NORTHEAST 79TH STREET (JACKSON STREET); EXCEPT THE SOUTH 144 FEET OF THE NORTH 174 FEET OF THE EAST 100.87 FEET THEREOF; AND EXCEPT THE NORTH 30 FEET THEREOF.

ADDRESS

CITY OF REDMOND PARKS & RECREATION
OLD FIRE HOUSE TEEN CENTER
16510 NE 179TH
REDMOND, WA 98052
425-556-2370

DRAWING LIST

T1.1	GENERAL INFORMATION
	SURVEY
C1.0	SITE PLAN
C2.0	GRADING, DRAINAGE, AND EROSION CONTROL PLAN
C2.1	GRADING, DRAINAGE, AND EROSION CONTROL DETAILS
C3.0	PAVING PLAN, NOTES AND DETAILS
A0.1	SITE PLAN
A1.1	DEMOLITION PLAN/FLOOR PLAN
A2.1	HANDICAPP BATHROOM PLAN
A2.2	ROOF PLAN/REFLECTED CLG. PLAN
A2.3	SCHEDULES
A3.1	ELEVATIONS & SECTIONS
A8.1	EXTERIOR & INTERIOR DETAILS
A8.2	EXTERIOR & INTERIOR DETAILS
S0.1	GENERAL NOTES
S0.2	GENERAL NOTES, ABBREVIATIONS, LEGEND
S1.0	FOUNDATION PLAN
S1.1	ROOF FRAMING PLAN
S2.0	FLOOR PLAN, DETAILS & PHOTOS
S2.1	FRAMING DETAILS & ELEVATIONS
S2.2	FRAMING DETAILS & ELEVATIONS
S2.3	FRAMING DETAILS & ELEVATIONS
S2.4	CMU DETAILS
M1.1	LEGEND AND MECHANICAL SCHEDULES
M2.1	HVAC PLANS
M2.2	HVAC PLAN, SECTION, AND DETAIL
E2.1	SOUND STUDIO LIGHTING PLAN
E3.1	SOUND STUDIO POWER/COMM PLAN
E8.1	SCHEDULES AND DIAGRAMS

GENERAL NOTES

1. ALL DIMENSIONS ARE FROM FACE OF STUD OF NEW CONSTRUCTION AND ARE FROM FACE OF FINISH OF EXISTING CONSTRUCTION, U.O.N.

2. ALL WORK SHALL COMPLY WITH APPLICABLE CODES AND ORDINANCES. IF A CONFLICT ARISES BETWEEN WHAT IS SHOWN IN THE CONTRACT DOCUMENTS AND AN APPLICABLE CODE, PROMPTLY NOTIFY ARCHITECT FOR DETERMINATION ON HOW TO PROCEED.

3. WHERE A CONFLICT ARISES BETWEEN ONE ASPECT OF THE CONTRACT DOCUMENTS AND ANOTHER, SUCH AS A DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, NOTIFY THE ARCHITECT PROMPTLY FOR DETERMINATION ON HOW TO PROCEED.

DESIGN TEAM

OWNER
CITY OF REDMOND, PUBLIC WORKS DEPARTMENT
DENNIS BRUNELLE, PROJECT MANAGER
8414 154TH AVENUE N.E.
P.O. BOX 97010
REDMOND, WA 98073-9710
(425) 556-2723
dbrunelle@ci.redmond.wa.us

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CIVIL & STRUCTURAL ENGINEER
REID MIDDLETON
KYLIE YAMATSUKA
728 134TH ST. SW, SUITE 200
EVERETT, WA 98204
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(425) 741-3900 FAX
kyamatsuka@reidmidd.com

MECHANICAL ENGINEER
NOTKIN ENGINEERING, INC.
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2601 4TH AVE., SUITE 420
2702 S 42nd STREET - SUITE 301
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(206) 285-7294 FAX
craig@travisfitzmaurice.com

ACCOUSTIC ENGINEER/ DESIGN
BEAR CREEK STUDIO & MUSIC PRODUCTION
JOE HADLOCK
6313 MALTBY ROAD
WOODINVILLE, WA 98072
(425) 481-4100
(425) 486-2718
JOEHADLOCK@HOTMAIL.COM

ARC Architects
1101 East Pike Street
Seattle, WA 98122-3
206.322.3322
206.322.9323 Fax
arc@arcarchitects.co

4349 REGIST ARCH
REX LEE BO STATE OF WASH

PERMIT SI
SEPTEMBER

PROJECT NO

ISSUE DATE: 8/22/02
PERMIT SET

MARK	DATE	D

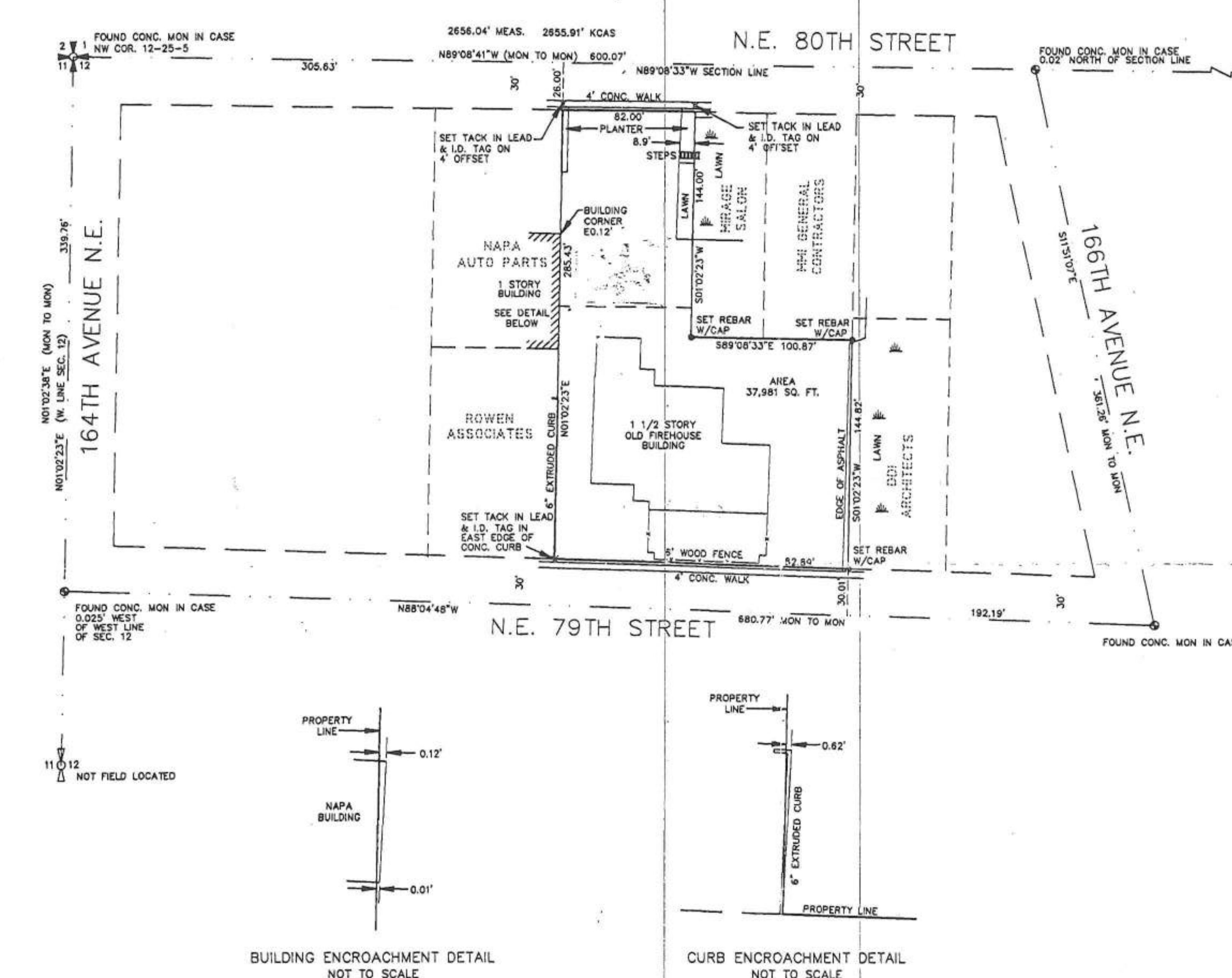
REDM TEE CENT

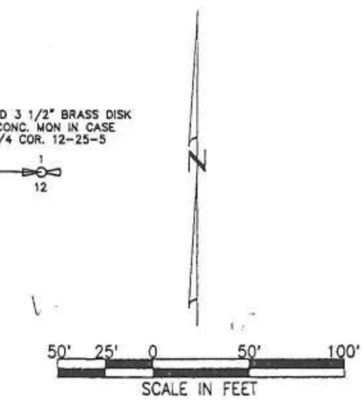
CONTENTS:
GENERAL INFORMAT

SCALE:	N.T.S.
DRAWN:	-
CHECKED:	-
PROJECT NO:	2002603
VIEW:	PLOT
SHEET:	

T1.

NW1/4, NW1/4, SEC. 12, TWP. 25N., RGE. 5E., W.M.





MERIDIAN: KCAS

LEGAL DESCRIPTION

STEWART TITLE COMPANY OF WASHINGTON, INC.
TITLE ORDER NO. 272897 (UNIT NO. 12)
JULY 18, 1995.

PARCEL A

THE SOUTH 125 FEET OF THE NORTH 155 FEET OF THE EAST 82 FEET OF THE WEST 387.63 FEET OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST., W.M., IN KING COUNTY, WASHINGTON.

PARCEL B

THAT PORTION OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST., W.M., IN KING COUNTY, WASHINGTON, DEFINED AS FOLLOWS:
BEGINNING AT A POINT ON THE NORTH MARGIN OF NORTHEAST 79TH STREET (JACKSON STREET) 318 FEET SOUTH AND 305.63 FEET EAST ON THE NORTHWEST CORNER OF SAID SUBDIVISION;
THENCE EAST ALONG SAID NORTH LINE 182.67 FEET;
THENCE NORTH 144 FEET;
THENCE WEST 100.87 FEET;
THENCE NORTH 19 FEET;
THENCE WEST 82 FEET;
THENCE SOUTH 163 FEET TO THE POINT OF BEGINNING.

SURVEYOR'S NOTE

THE ABOVE LEGAL DESCRIPTION CONTAINS MINOR DISCREPANCIES WHICH ARE RESOLVED IF THE TRACT IS MORE CORRECTLY DESCRIBED AS FOLLOWS:

THE EAST 182.87 FEET OF THE WEST 488.50 FEET OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 12, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M., IN THE CITY OF REDMOND, IN KING COUNTY, WASHINGTON, LYING NORTH OF THE NORTH MARGIN OF NORTHEAST 79TH STREET (JACKSON STREET); EXCEPT THE SOUTH 144 FEET OF THE NORTH 174 FEET OF THE EAST 100.87 FEET THEREOF; AND EXCEPT THE NORTH 30 FEET THEREOF.

GENERAL NOTES

THE LOCATION AND DESCRIPTION OF ALL SURVEY MARKERS SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS TAKEN DURING AUGUST, 1995 UNLESS OTHERWISE INDICATED.

THE PRIMARY MEASUREMENT EQUIPMENT UTILIZED IN THE PERFORMANCE OF THIS SURVEY WAS THE LIETZ SET 4A. ALL PRIMARY MEASUREMENT EQUIPMENT UTILIZED HAS BEEN COMPARED TO AND ADJUSTED AGAINST A NATIONAL GEODETIC SURVEY CALIBRATED BASELINE WITHIN THE PREVIOUS ONE YEAR.

THE RELATIVE LOCATION OF ALL SURVEY MONUMENTS AND MARKERS SHOWN HEREON ARE BASED ON A CLOSED LOOP FIELD TRAVERSE. THE LINEAR ERROR OF CLOSURE, AFTER ADJUSTMENT OF ANGLES, IS EQUAL TO 1 PART IN 45,000. THE METHOD OF ADJUSTMENT USED WAS COMPASS RULE.

DUANE HARTMAN & ASSOCIATES, INC.
SURVEYING – FIELD ENGINEERING – MAPPING
16928 WOODINVILLE-REDMOND RD. B-209
WOODINVILLE, WASHINGTON 98072
(206)483-5355

Drawn WRF	Date AUGUST 7, 1995	Job No. 146.00
Checked DTH	Scale 1"=50' F.B. LL	Sheet 1 of 1

RECORDER'S CERTIFICATE 9508159004
Filed for record this 15th day of August, 1995 at 2:28 P.M., in BOOK 105 of SURVEYS at page 38
at the request of DUANE HARTMAN & ASSOCIATES, INC.

DIVISION OF RECORDS & ELECTIONS

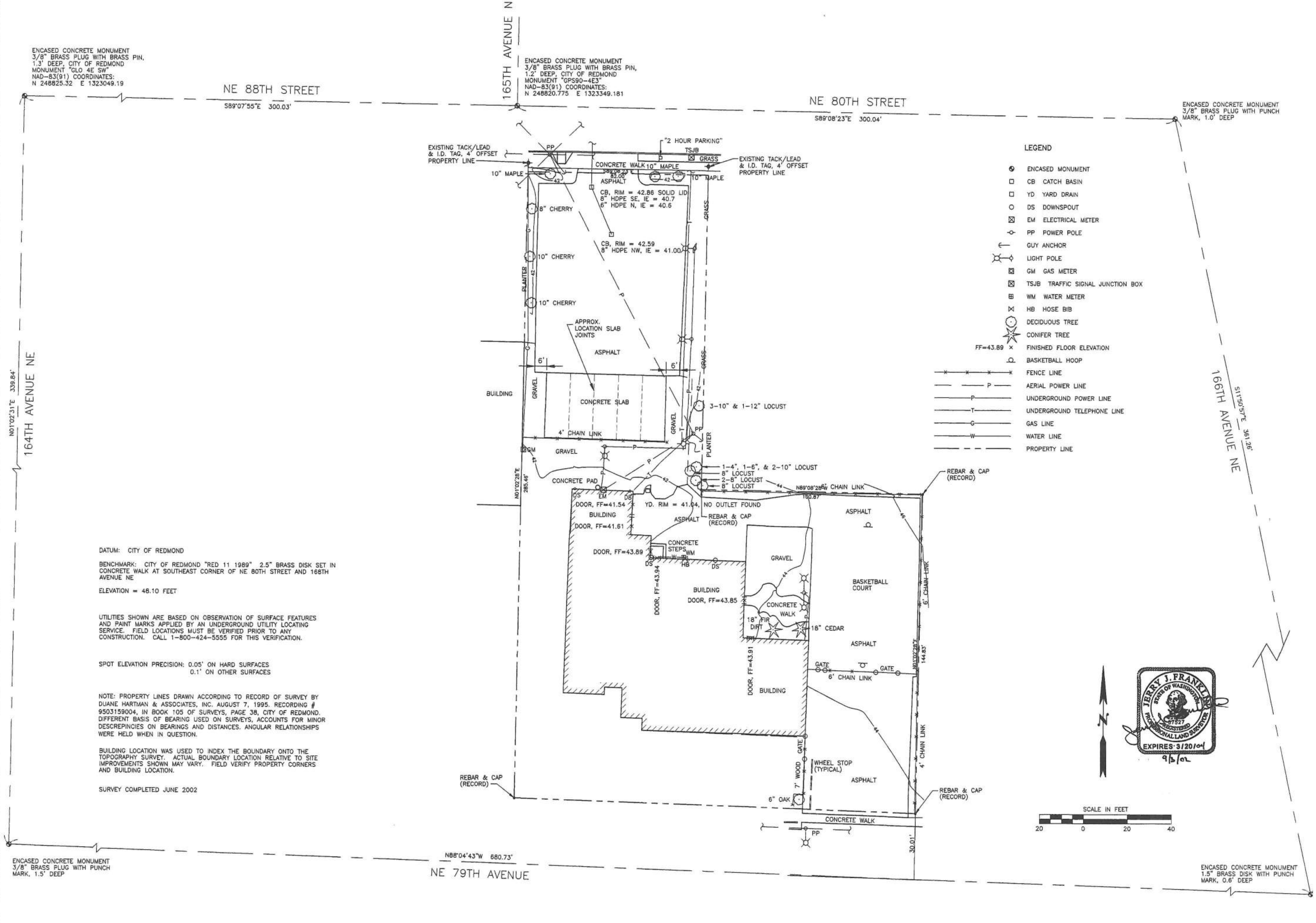
Manager ______ Supt. of Records ______

RECORD OF SURVEY FOR CITY OF REDMOND

SURVEYOR'S CERTIFICATE
This map correctly represents a survey made by me or under my direction in conformance with the requirements of the SURVEY RECORDING ACT at the request of THE CITY OF REDMOND
in AUGUST, 1995
Duane T. Hartman
CERTIFICATE NO. 9158

DUANE T. HARTMAN · STATE OF WASHINGTON · 9158 · REGISTERED · PROFESSIONAL LAND SURVEYOR · EXPIRES 10/20/96

TEEN CENTER / OLD FIRE HOUSE



DATUM: CITY OF REDMOND

BENCHMARK: CITY OF REDMOND "RED 11 1989" 2.5" BRASS DISK SET IN CONCRETE WALK AT SOUTHEAST CORNER OF NE 80TH STREET AND 168TH AVENUE NE

ELEVATION = 46.10 FEET

UTILITIES SHOWN ARE BASED ON OBSERVATION OF SURFACE FEATURES AND PAINT MARKS APPLIED BY AN UNDERGROUND UTILITY LOCATING SERVICE. FIELD LOCATIONS MUST BE VERIFIED PRIOR TO ANY CONSTRUCTION. CALL 1-800-424-5555 FOR THIS VERIFICATION.

SPOT ELEVATION PRECISION: 0.05' ON HARD SURFACES
0.1' ON OTHER SURFACES

NOTE: PROPERTY LINES DRAWN ACCORDING TO RECORD OF SURVEY BY DUANE HARTMAN & ASSOCIATES, INC. AUGUST 7, 1995. RECORDING # 9503159004, IN BOOK 105 OF SURVEYS, PAGE 38, CITY OF REDMOND. DIFFERENT BASIS OF BEARING USED ON SURVEYS. ACCOUNTS FOR MINOR DESCREPINCIES ON BEARINGS AND DISTANCES. ANGULAR RELATIONSHIPS WERE HELD WHEN IN QUESTION.

BUILDING LOCATION WAS USED TO INDEX THE BOUNDARY ONTO THE TOPOGRAPHY SURVEY. ACTUAL BOUNDARY LOCATION RELATIVE TO SITE IMPROVEMENTS SHOWN MAY VARY. FIELD VERIFY PROPERTY CORNERS AND BUILDING LOCATION.

SURVEY COMPLETED JUNE 2002

XREF ATTACHMENTS: XR6137AR.dwg XR6137SV.dwg xr-tbint.dwg
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206.322.9323 Fax
arc@arcarchitects.com

PERMIT SET
AUGUST 28, 20

PROJECT NO.

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ReidMidd
728 134th Stree
Everett, Washingt
Ph 425 741-38

CONTENTS:

EXISTING FEATURES & TOPOGRA SURVEY

SCALE: AS NOTED
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CHECKED:
PROJECT NO: 26-01-037
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SHEET:

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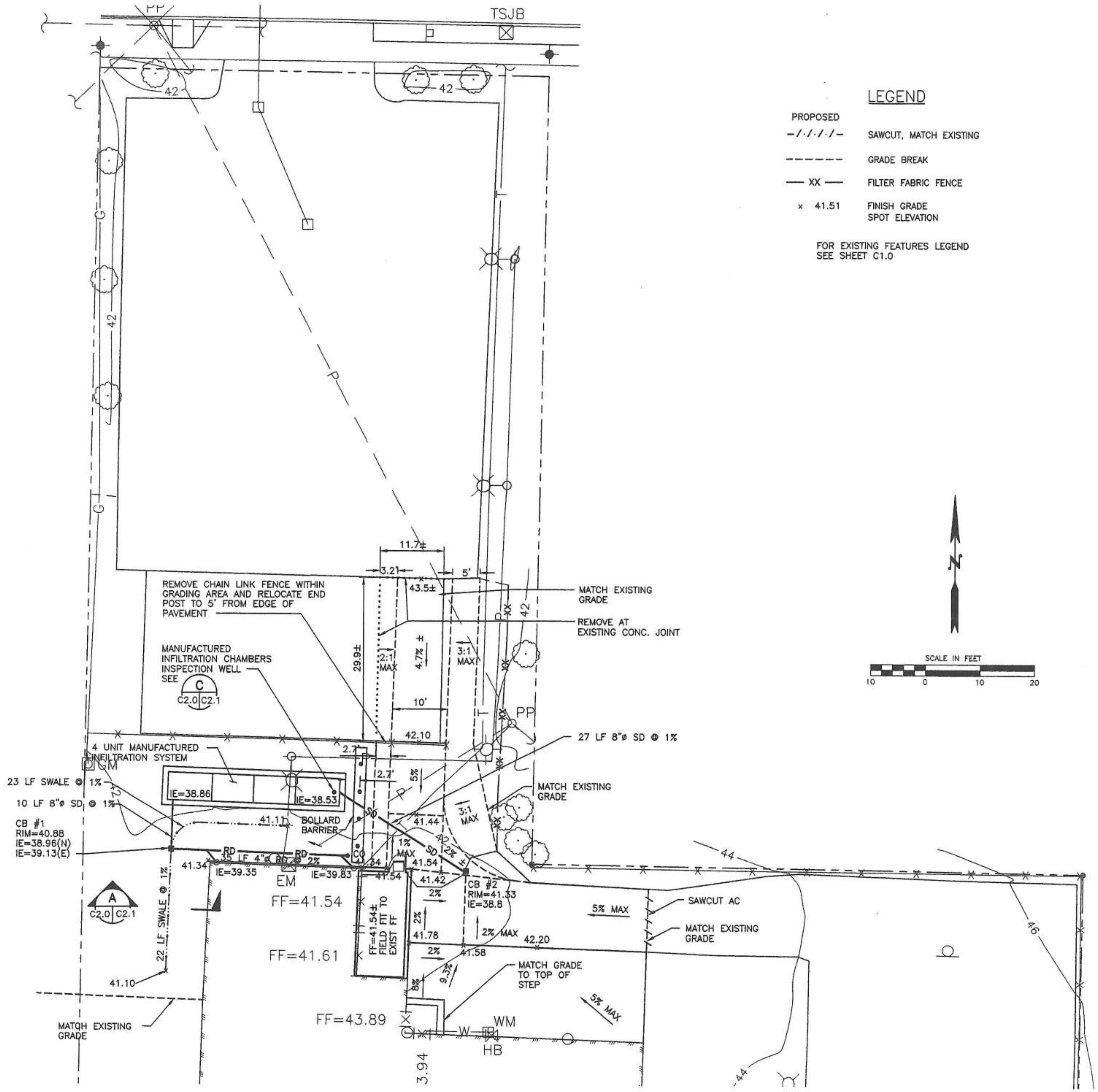

LEGEND

PROPOSED

-/-/-/-/-	SAWCUT, MATCH EXISTING
------	GRADE BREAK
— XX —	FILTER FABRIC FENCE
x 41.51	FINISH GRADE SPOT ELEVATION

FOR EXISTING FEATURES LEGEND SEE SHEET C1.0

N

SCALE IN FEET

10 0 10 20

XREF ATTACHMENTS: XRGRD6137.dwg XRAR6137.dwg XRSV6137.dwg xr-tbinf.dwg

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AUGUST 28, 20

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HUGH N. KUY STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGI

EXPIRES 3/3/0

ReidMidd
728 134th Stree
Everett, Washingt
Ph: 425 741-38

CONTENTS:

GRADING, DRAINAGE, AND EROSI CONTROL P

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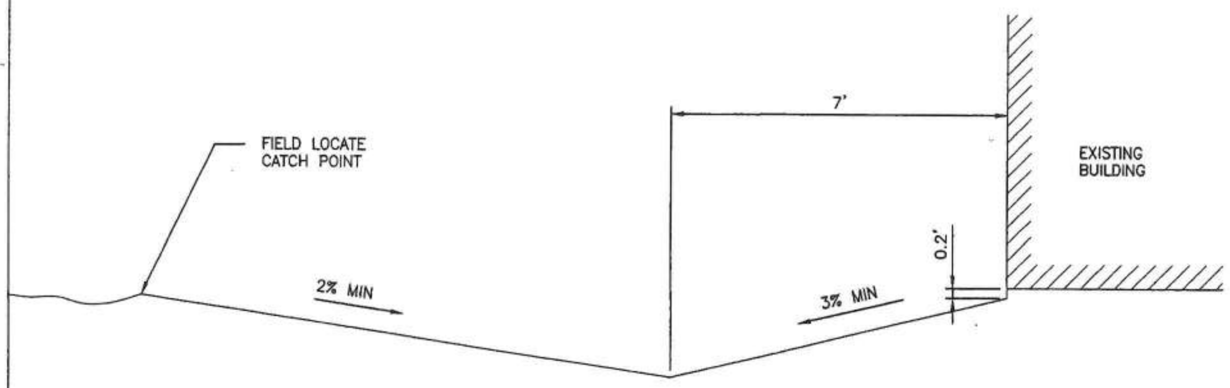
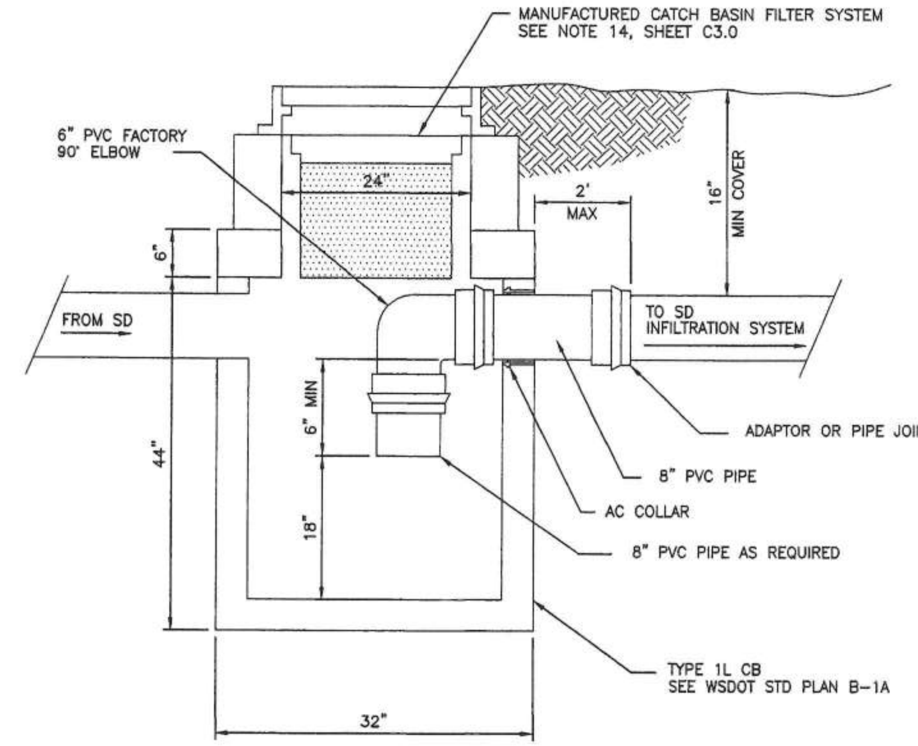
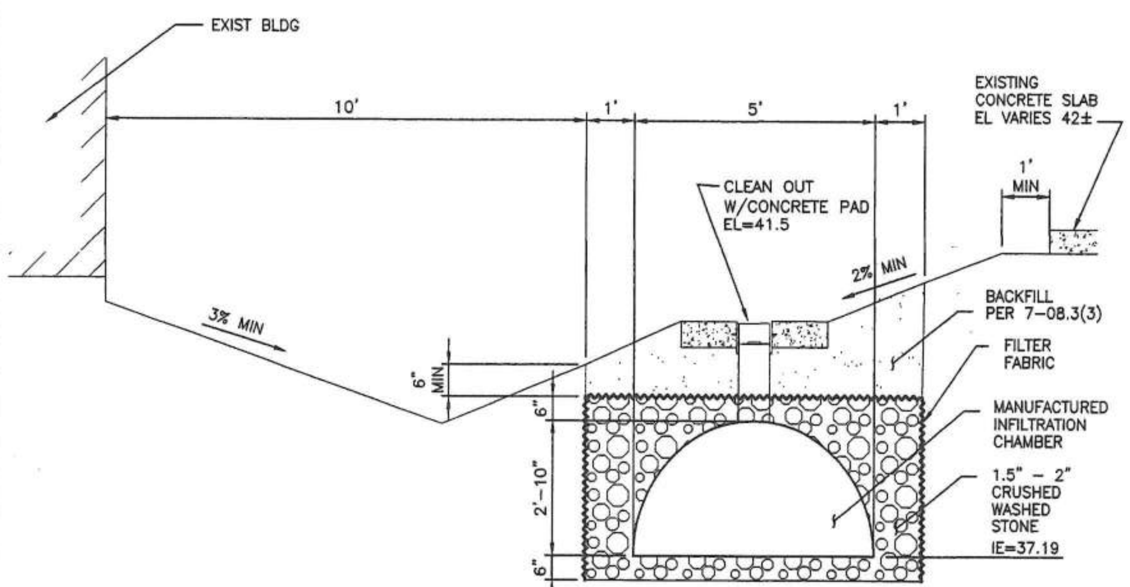


(A) C2.0 | C2.1 TYPICAL SECTION – DRAINAGE SWALE
NOT TO SCALE

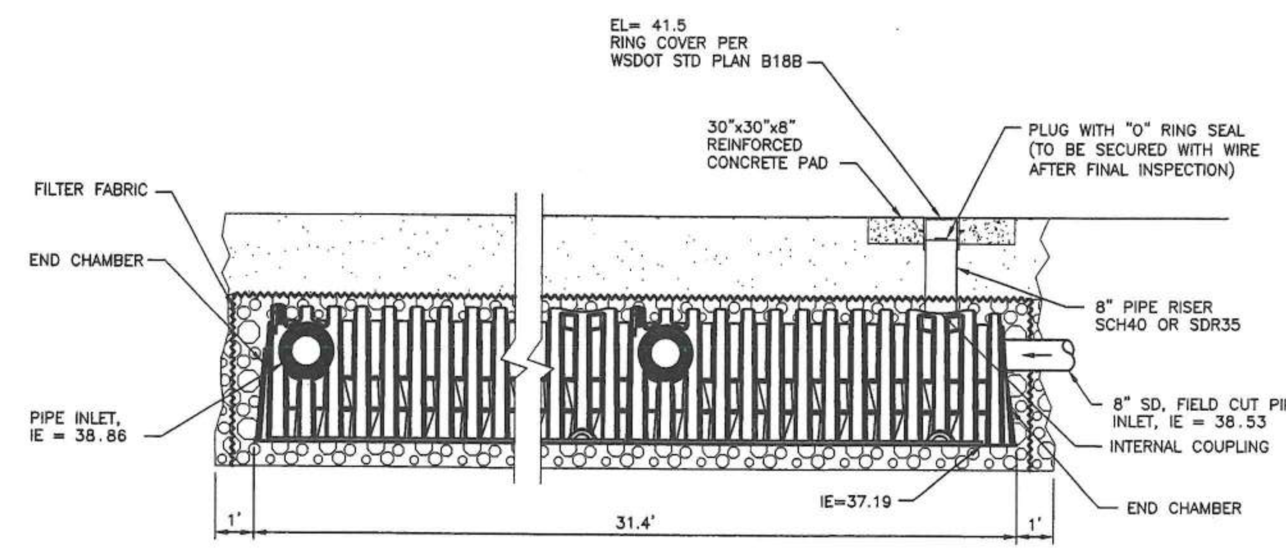


(1) C2.0 | C2.1 TYPICAL CATCH BASIN W/FLOATABLE MATERIAL SEPARATOR(CB1 & CB2)
NOT TO SCALE



NOTE: TO PREVENT UNDERCUT FROM STORMWATER FLOWS, PLACE A 2' X 2' PRECAST CONCRETE BLOCK BENEATH CHAMBER AT (1) OPPOSITE WALL WHERE STORM DRAIN INLET ENTERS SIDE WALL
(2) DOWNSTREAM 1/3 LENGTH OF CHAMBER WHERE INLET ENTERS END WALL.

(B) C2.0 | C2.1 TYPICAL SECTION – MANUFACTURED INFILTRATION SYSTEM
NOT TO SCALE



(C) C2.0 | C2.1 MANUFACTURED INFILTRATION CHAMBER – LONGITUDINAL SECTION
NOT TO SCALE

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CONTENTS:
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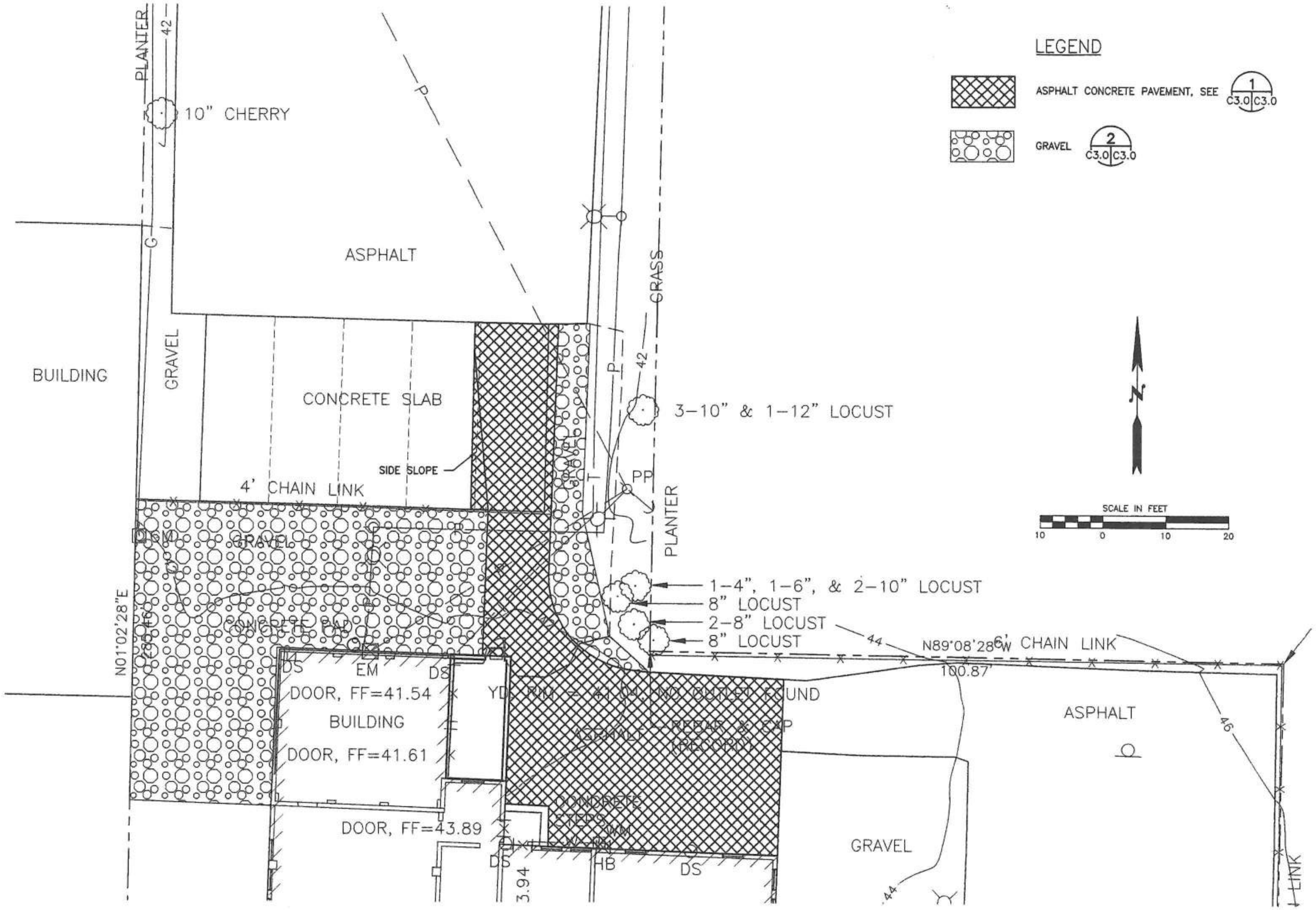
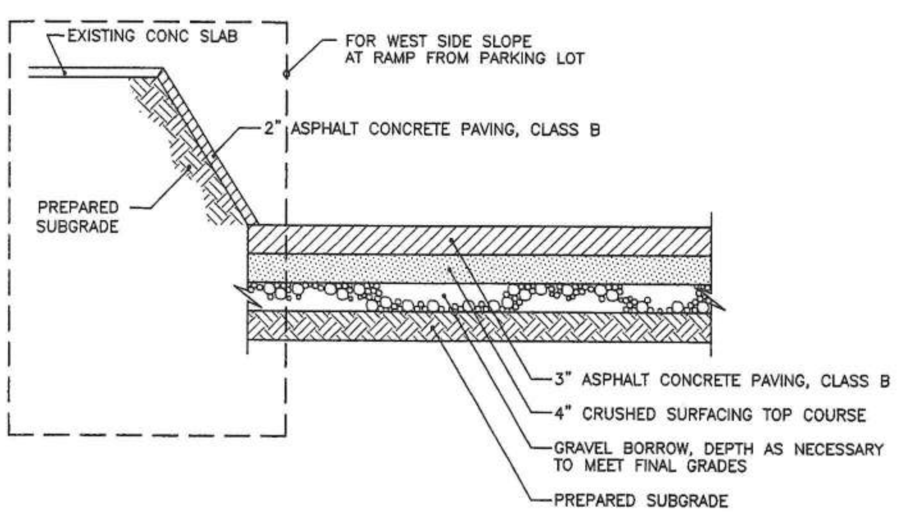
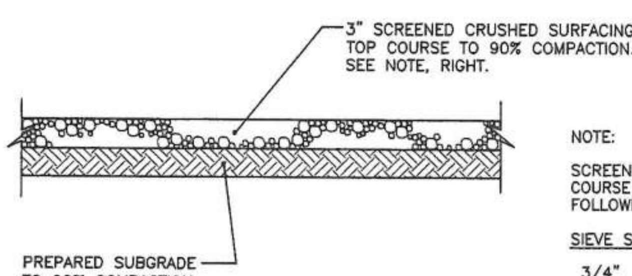


LEGEND

(crosshatch)	ASPHALT CONCRETE PAVEMENT, SEE 1 C3.0/C3.0
(circles)	GRAVEL 2 C3.0/C3.0



1 C3.0/C3.0 **TYPICAL PAVEMENT SECTION**
NOT TO SCALE



NOTE:

SCREENED CRUSHED SURFACING TOP COURSE SHALL CONFORM TO THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING
3/4"	100
1/2"	71
3/8"	32
1/4"	6
#10	2
#40	2
WET #200	1

ALL PERCENTAGES ARE BY WEIGHT.

2 C3.0/C3.0 **TYPICAL GRAVEL SECTION**
NOT TO SCALE

CLEARING, GRADING & EROSION CONTROL NOTES

1. ALL WORK AND MATERIALS TO BE PER CITY OF REDMOND STANDARDS.
2. KEEP OFF-SITE STREETS CLEAN AT ALL TIMES. FLUSHING STREETS SHALL NOT BE ALLOWED. ALL STREETS SHOULD BE SWEPT.
3. ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES MAY BE REQUIRED BY CITY OF REDMOND INSPECTOR.
4. WHEN WORK IS STOPPED/COMPLETED IN AN AREA, THE CITY INSPECTOR MAY REQUIRE POST-CONSTRUCTION EROSION CONTROL INCLUDING SEEDING OR OTHER MEASURES.
5. LOCATIONS SHOWN OF EXISTING UTILITIES ARE APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CORRECT LOCATIONS TO AVOID DAMAGE OR DISTURBANCE.
6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN STREET USE AND OTHER RELATED PERMITS PRIOR TO ANY CONSTRUCTION.
7. ALL GROUND COVER IS TO REMAIN UNDISTURBED OUTSIDE OF CLEARING AREAS.
8. THE TEMPORARY EROSION/SEDIMENT CONTROLS SHALL BE INSTALLED, INSPECTED AND OPERATING BEFORE ANY GRADING OR EXTENSIVE LAND CLEARING. THESE CONTROLS MUST BE SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION AND LANDSCAPING ARE COMPLETE.
9. TIE IMPERVIOUS SURFACES (ROOF, STREETS, DRIVEWAYS, ETC.) TO COMPLETED DRAINAGE SYSTEM AS SOON AS POSSIBLE.
10. A PRECONSTRUCTION MEETING WITH THE CONSTRUCTION DIVISION AND ALL PERMITS MUST BE COMPLETED BEFORE START OF CONSTRUCTION.
11. CLEARING LIMITS SHALL BE LOCATED BY A LICENSED CIVIL ENGINEER OR LAND SURVEYOR.
12. FILTER FABRIC FENCE SHALL BE INSTALLED PER CITY STANDARD DETAIL 502.
13. DO NOT ALLOW SILT LADEN WATER INTO STORMWATER INFILTRATION SYSTEM. PLUG PIPE INLETS TO INFILTRATION SYSTEM AND DISPOSE OF RUNOFF BY PUMPING TO OTHER STORM SYSTEM OR REMOVING FROM SITE.
PLUGGED INLETS TO REMAIN UNTIL PERMANENT EROSION CONTROL IS COMPLETED AND SURFACES SWEPT AND MATERIAL REMOVED.
OBTAIN ARCHITECT'S APPROVAL PRIOR TO ALLOWING DRAINAGE TO INFILTRATION SYSTEM.

STORM DRAINAGE NOTES

1. A PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE ANY WORK COMMENCES ON THE SITE.
2. ALL SURVEYING OF CLEARING LIMITS AND CONSTRUCTION STAKING SHALL BE DONE BY A LICENSED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.
3. BEFORE MASS CLEARING OF THE SITE CLEARING LIMITS INITIAL EROSION CONTROL MEASURES SHALL BE INSPECTED BY THE CITY.
4. ANY WORK WITHIN AN EXISTING STREET SHALL NOT COMMENCE UNTIL THE CONTRACTOR PREPARES A TRAFFIC CONTROL PLAN AND RECEIVES APPROVAL OF THE PLAN FROM THE CITY TRANSPORTATION DIVISION AND CITY CONSTRUCTION INSPECTOR.
5. AT ALL TIMES DURING CONSTRUCTION THE APPROVED CONSTRUCTION DRAWINGS, THE CITY OF REDMOND STANDARD SPECIFICATIONS AND DESIGN DETAILS, AND THE WSDOT STANDARD SPEC SHALL BE ON SITE.
6. STENCIL ALL ON SITE STORM INLETS WITH "DUMP NO WASTE DRAINS TO GROUND WATER.
7. PIPE TRENCH REQUIREMENTS SHALL CONFORM TO COR STANDARD DETAIL 201.
8. CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL SIGNS AND CHANNELIZATION PER CITY OF REDMOND STANDARDS. CONTRACTOR SHALL LAY OUT ALL SIGNS AND CHANNELIZATION, AND THEN CONTACT THE TRANSPORTATION DIVISION AT 556-2854 48 HOURS IN ADVANCE OF INSTALLATION TO VERIFY LAYOUT.
9. ALL NECESSARY SIGNS AND MARKINGS ON-SITE, ALONG PROPERTY FRONTAGE, AND AT SPECIFICALLY DESIGNATED OFF-SITE LOCATIONS SHALL BE PROVIDED BY THE APPLICANT AS REQUIRED BY THE TRANSPORTATION DIVISION WHETHER OR NOT THESE ARE INDICATED ON THE CONSTRUCTION DRAWINGS.
10. ALL STORM DRAINAGE PIPE SHALL BE PVC PER CITY STANDARDS.
11. MANUFACTURED INFILTRATION CHAMBERS SHALL BE HYDROLOGIC SOLUTIONS STORMCHAMBERS OR APPROVED SUBSTITUTION. INSTALL MANUFACTURED INFILTRATION CHAMBERS PER MANUFACTURER'S INSTALLATION RECOMMENDATIONS.
12. ROOF DRAIN CLEANOUT SHALL BE PER CITY STANDARD DETAIL 810.
13. CATCH BASIN FRAMES AND GRATES SHALL CONFORM TO CITY STANDARD DETAILS 619 & 626.
14. MANUFACTURED CATCH BASIN FILTER SYSTEM SHALL BE KRISTAR ENTERPRISES, INC. FLOGARD+PLUS CATCH BASIN FILTER INSERT FGP-1822F OR APPROVED SUBSTITUTION. BOTTOM OF CATCH BASIN FILTER SHALL EXTEND A MAXIMUM OF 12" BELOW GRATE BOTTOM ELEVATION. INSTALL MANUFACTURED CATCH BASIN FILTER SYSTEM PER MANUFACTURER'S INSTALLATION RECOMMENDATIONS.
15. BOLLARD BARRIER SHALL BE PER CITY OF REDMOND STD. DETAIL 890.

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Everett, Washington
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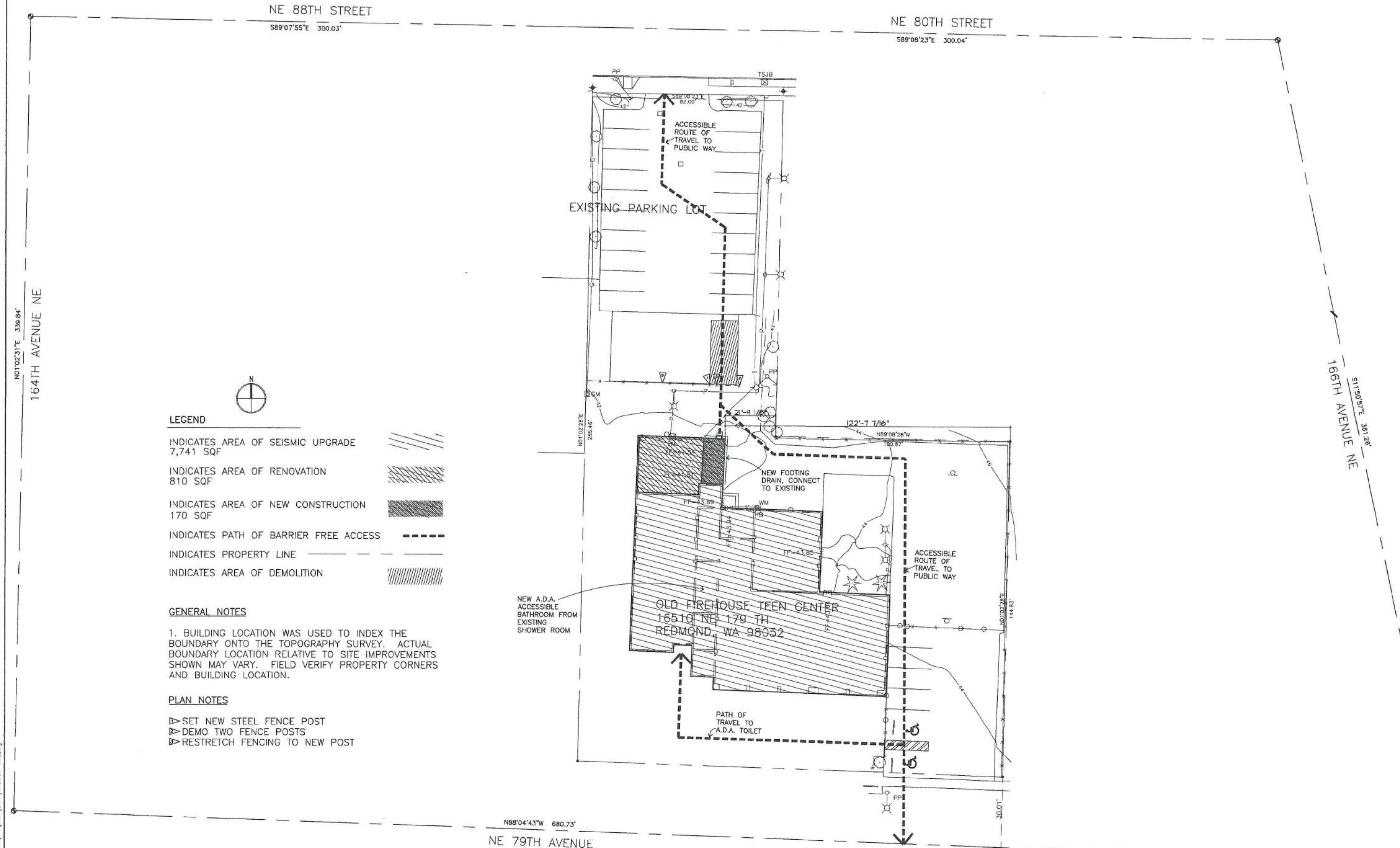

TOTAL SITE AREA 771,978 SQF

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CONTENTS:
SITE PLAN

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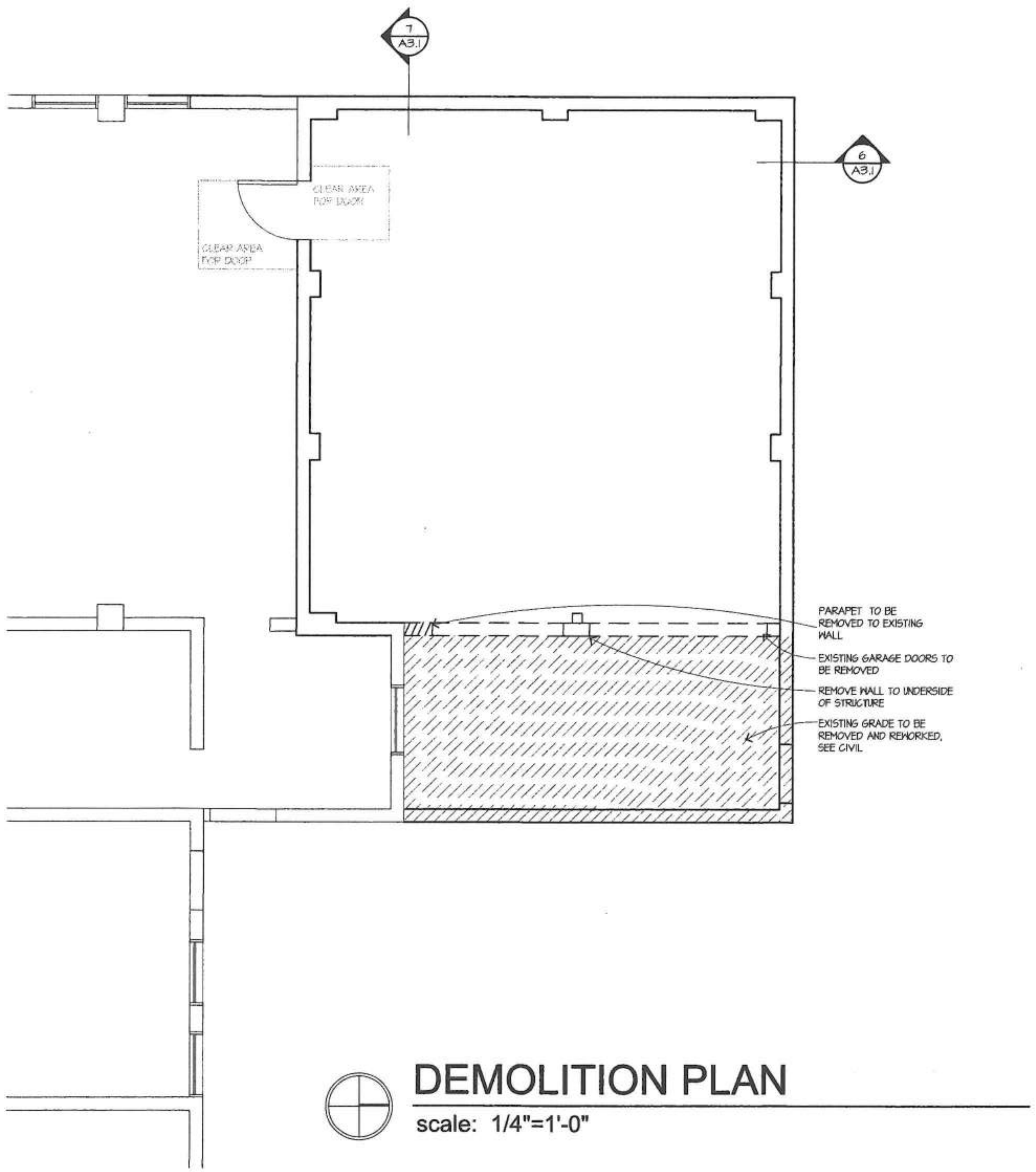
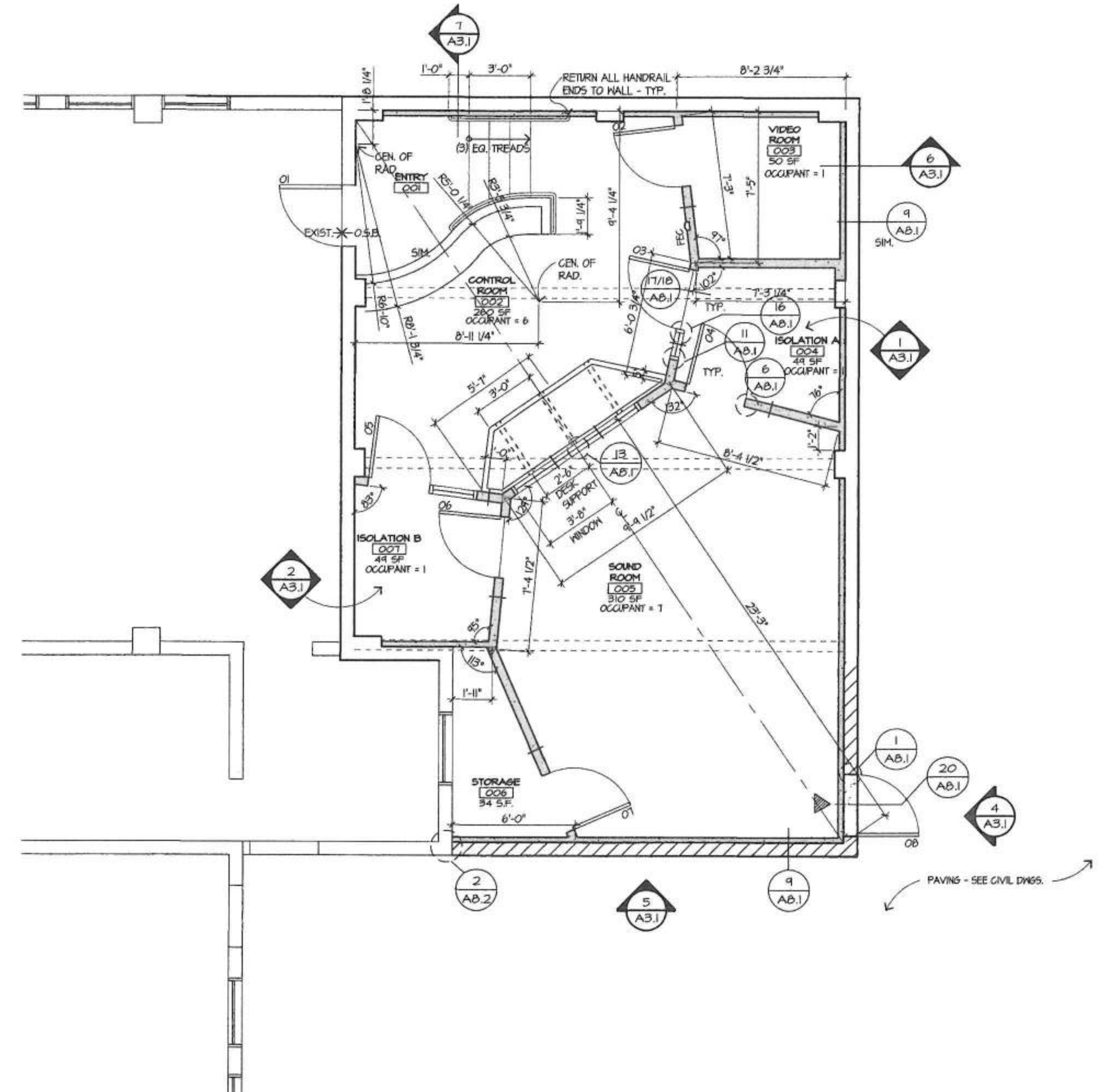


DEMOLITION PLAN

scale: 1/4"=1'-0"



FLOOR PLAN

scale: 1/4"=1'-0"

LEGEND

- EXISTING WALL
- NEW C.M.U. WALL
- NEW GWB. PARTITION SEE DTL. 10/A8.1
- INDICATES LOCATION OF WALL PENETRATION - SEE DETAIL 8/A8.1 & 9/A8.1
- INDICATES EXIT
- FEC INDICATES FIRE EXTINGUISHER CABINET - SEE DTL. 1/A8.1

GENERAL NOTES

1. "SOUND STUDIO" LAB: U.B.C. OCCUPANCY B
TOTAL AREA = 880 SQF
1 EXIT REQUIRED
2. ALL DIMENSIONS TO ℄ OF WALLS, DOORS, AND WINDOWS UNLESS NOTED OTHERWISE

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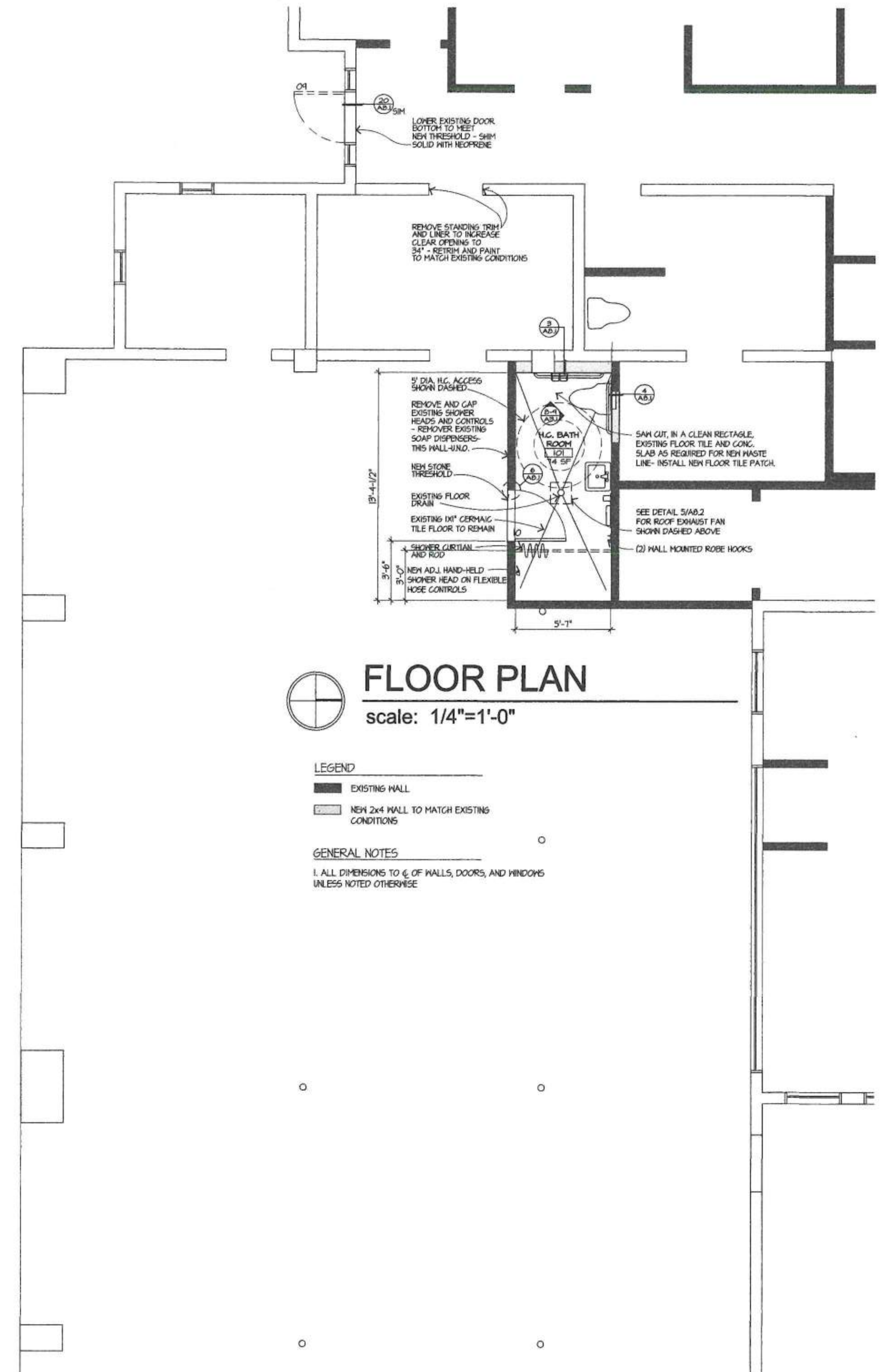

FLOOR PLAN

scale: 1/4"=1'-0"

LEGEND

EXISTING WALL

NEW 2x4 WALL TO MATCH EXISTING CONDITIONS

GENERAL NOTES

1. ALL DIMENSIONS TO ℄ OF WALLS, DOORS, AND WINDOWS UNLESS NOTED OTHERWISE

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H.C. BATH PLAN

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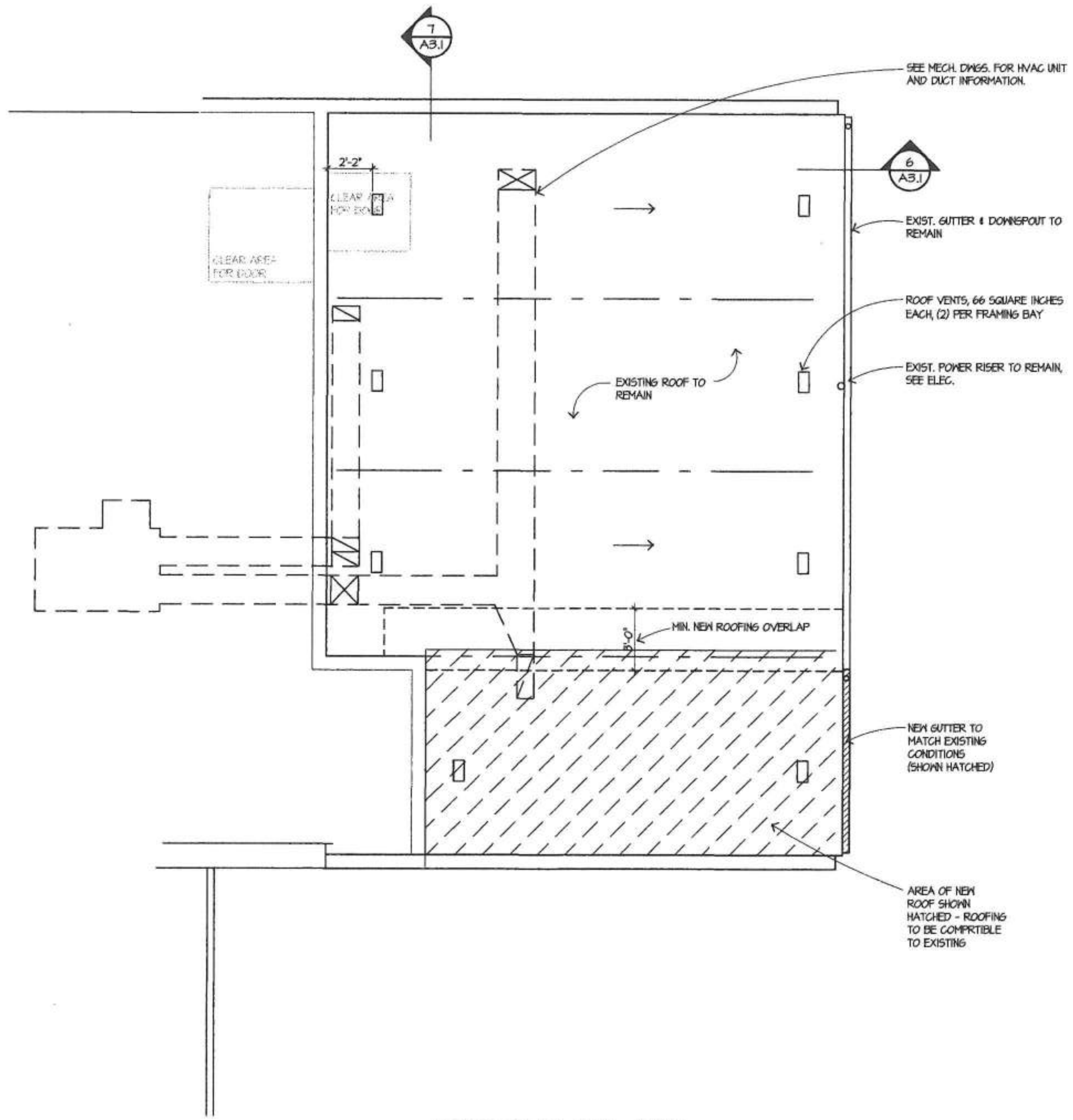

ROOF PLAN

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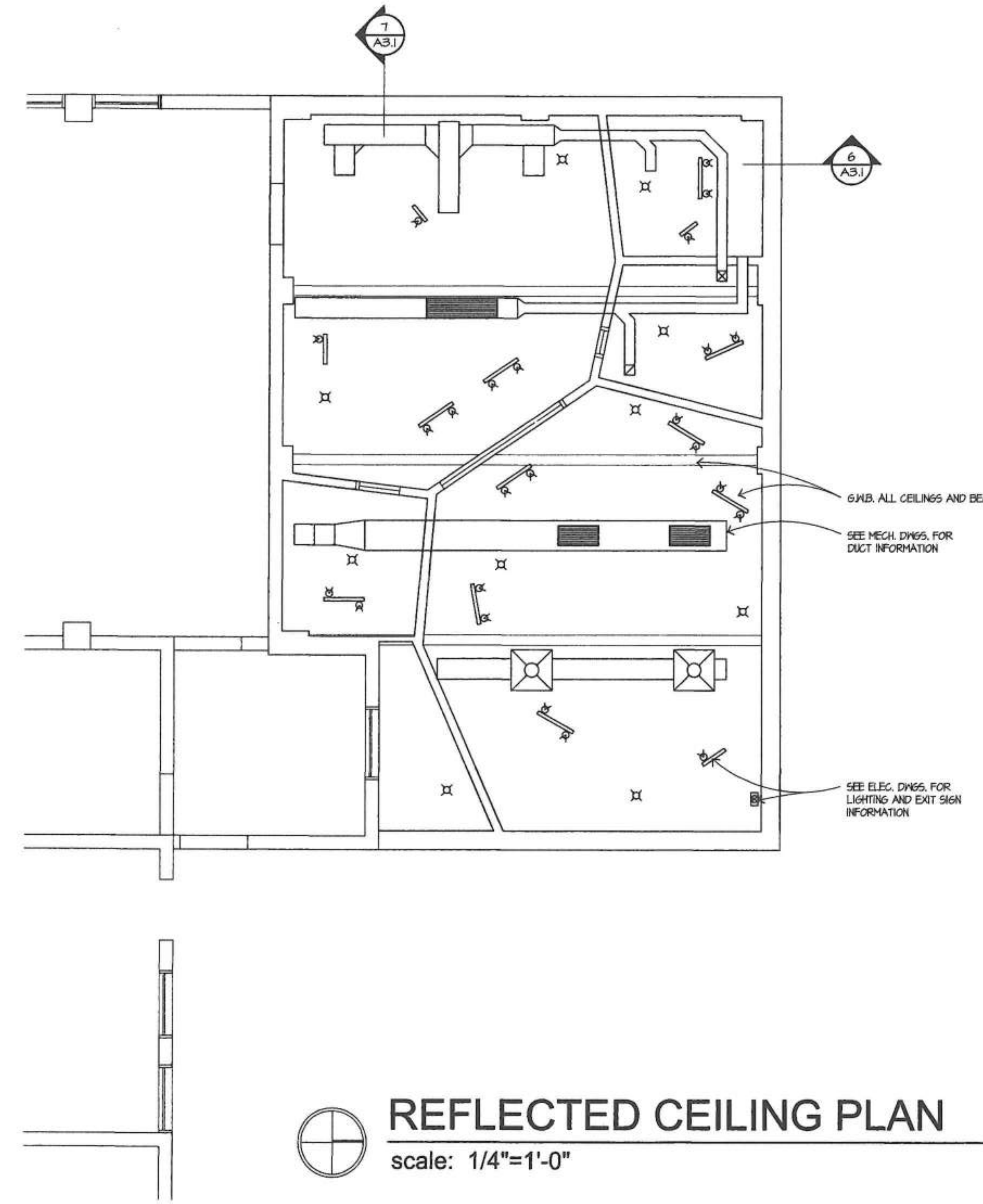

REFLECTED CEILING PLAN

scale: 1/4"=1'-0"

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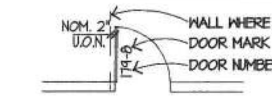
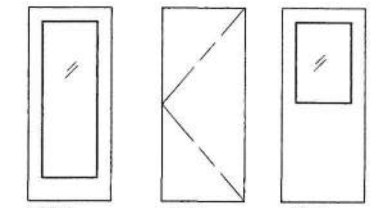
DOOR SCHEDULE

PLAN INDICATION



DOOR SCHEDULE NOTES:

1. DOOR TYPES:



TYPE A　　TYPE B　　TYPE C

2. DOOR THICKNESS AS INDICATED
3. DOOR CONSTRUCTION:
   W = SOLID CORE, WOOD
   HM = HOLLOW METAL
   AL = ALUMINUM
4. FACING AND FINISH:
   S = STAIN AND/OR CLEAR FINISH
   MP = METAL, FIELD PAINTED
   P = PAINTED
   A = ANODIZED
5. GLASS:
   W = ¼" CLEAR WIRE
   T = 1/4" TEMPERED
   I = INSULATED, TEMPERED
6. "1" INDICATES HOUR OF FIRE RATING, "20" INDICATES MINUTES OF FIRE RATING
7. FRAME CONSTRUCTION:
   W = WOOD
   HM = HOLLOW METAL
   AL = ALUMINUM

GENERAL DOOR NOTES:

9. ALL FRAMES IN RATED WALLS SHALL BEAR A LABEL FROM A RECOGNIZED AGENCY.
10. APPROVED GASKETING REQUIRED FOR ANY 20 MINUTE RATED DOOR
11. MAX. GLAZING 100 SQ. IN. FOR 1 1/2 HR. RATED DOORS
12. MAX. GLAZING 1296 SQ. IN. FOR 20 MINUTES RATED DOORS
13. TO DETERMINE FRAME DEPTH, SEE PARTITION SCHEDULE FOR WALL CONSTRUCTION AND STRUCTURAL DRAWINGS FOR SHEAR WALL LOCATIONS.
14. FIRE DOORS SHALL BE EQUIPPED W/ APPROVED LATCHES & SELF-CLOSING DEVICE.
15. -
   -
   -
   -
   -

NA: NOT APPLICABLE

		1	2	3	4	5	6	7	8	
NUMBER	OPENING SIZE	TYPE	THICKNESS	CONSTRUCTION	FACING & FINISH	GLASS	RATING	FRAME CONSTRUCTION	DETAILS	REMARKS *
01	3' X 6'-8"	A	1-3/4	W	P	-	-	W	-	-
02	3' X 6'-8"	C	1-3/4	W	P	I	-	W	-	-
03	3' X 6'-8"	B	1-3/4	W	P	-	-	W	-	-
04	3' X 6'-8"	A	1-3/4	W	P	I	-	W	-	-
05	3' X 6'-8"	B	1-3/4	W	P	-	-	W	-	-
06	3' X 6'-8"	A	1-3/4	W	P	I	-	W	-	-
07	3' X 6'-8"	B	1-3/4	W	P	-	-	W	-	-
08	3' X 6'-8"	B	1-3/4	W	P	-	-	HM	-	-
09	3' X 6'-8"									EXISTING W/ NEW BOTTOM RAIL
10	3' X 6'-8"	B	1-3/4	W	P	-	-	HM	-	-

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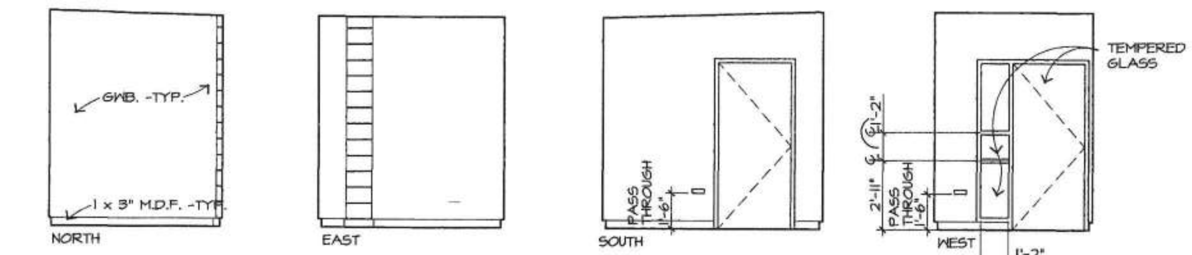
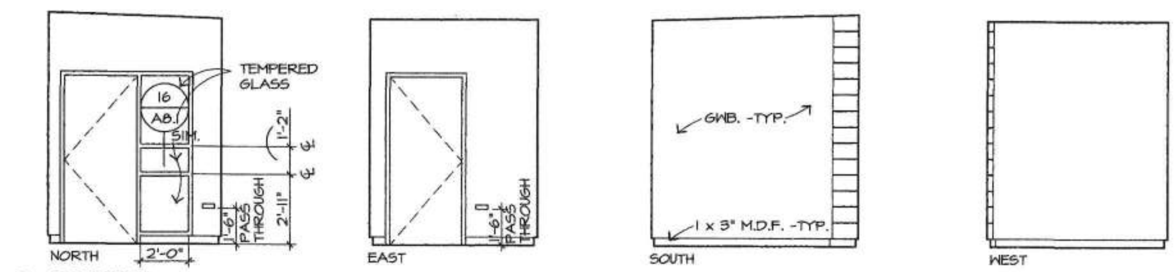
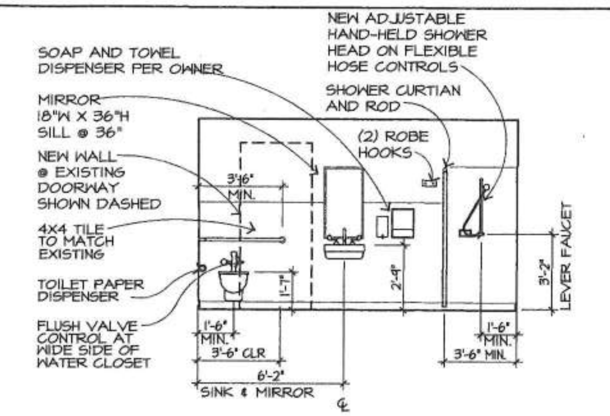


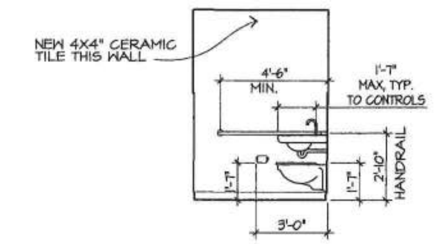
1 ISOLATION A
SCALE: 1/4"=1'-0"



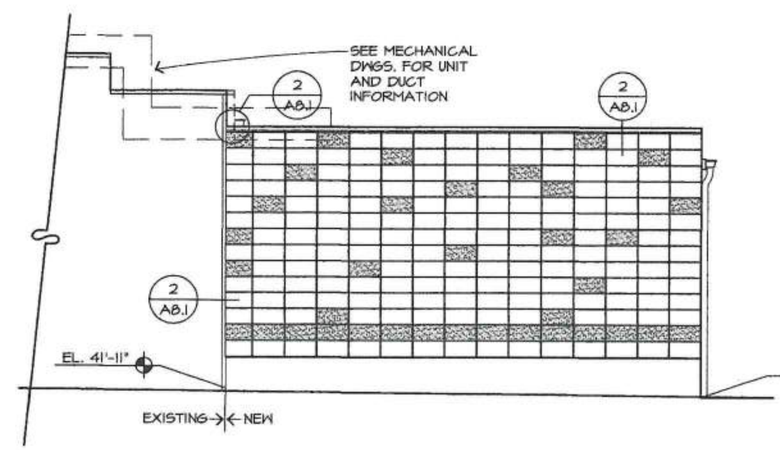
2 ISOLATION B
SCALE: 1/4"=1'-0"



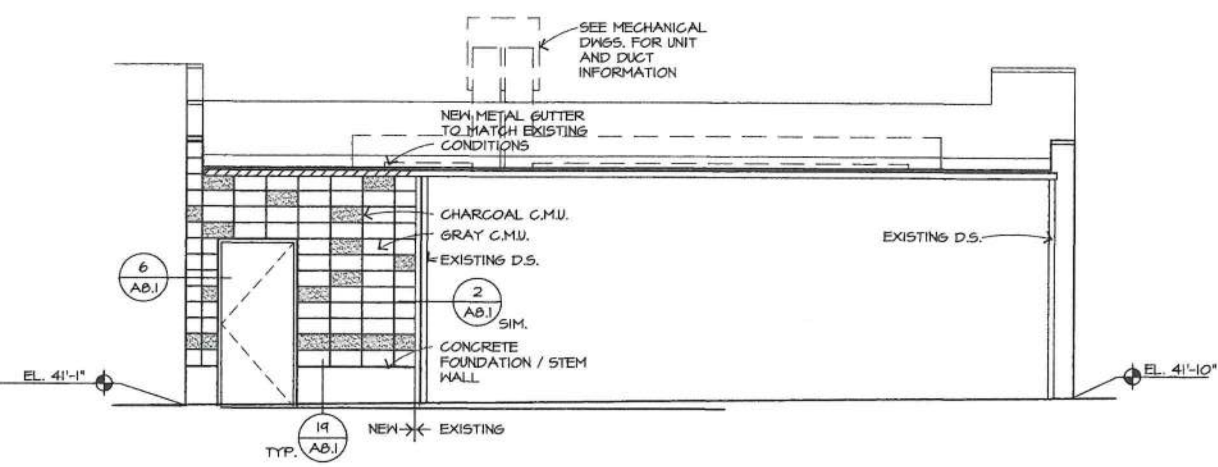
8 NORTH ELEVATION
SCALE: 1/4"=1'-0"



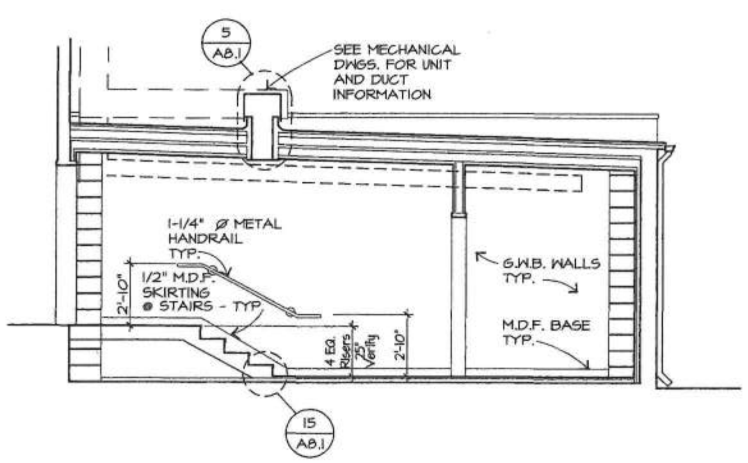
9 WEST ELEVATION
SCALE: 1/4"=1'-0"



4 SOUTH ELEVATION
SCALE: 1/4"=1'-0"



5 EAST ELEVATION
SCALE: 1/4"=1'-0"



6 SECTION LOOKING WEST
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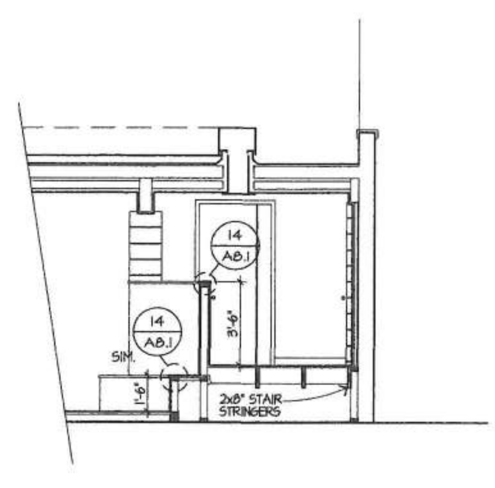

7 SECTION LOOKING SOUTH
SCALE: 1/4"=1'-0"

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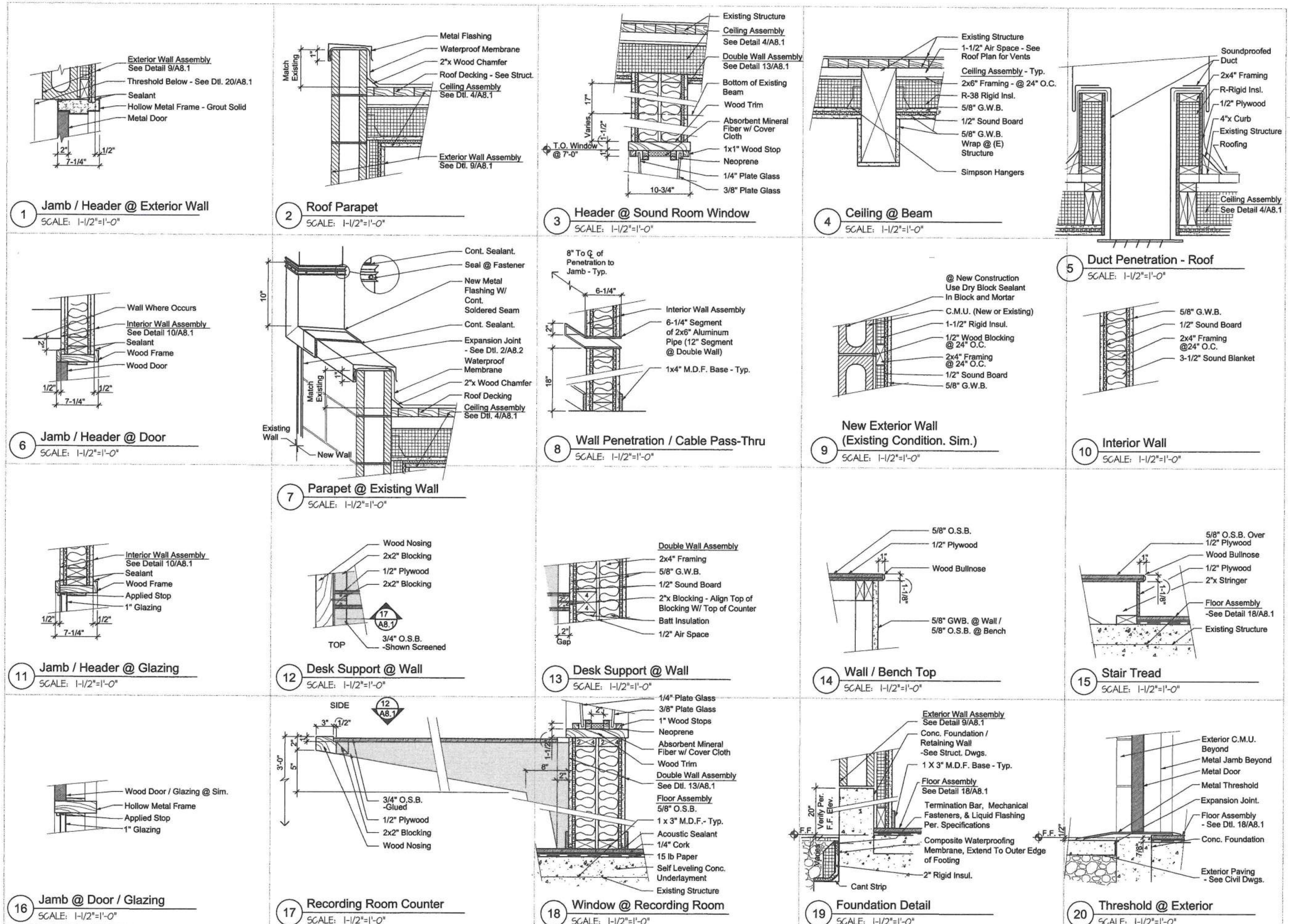

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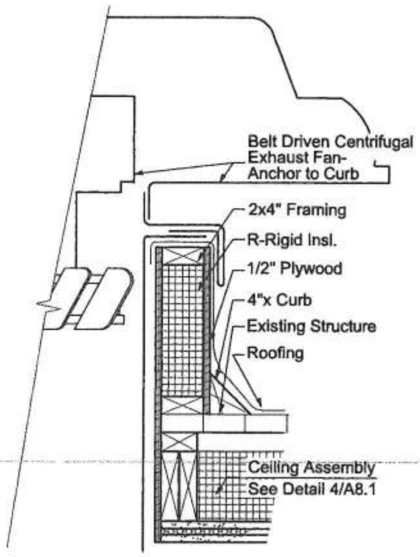

5 Exhaust Fan - Roof
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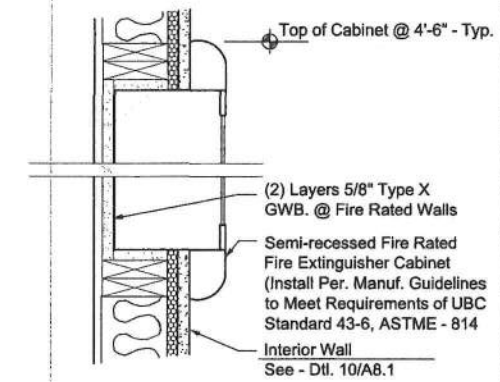

1 Fire Extinguisher Cabinet
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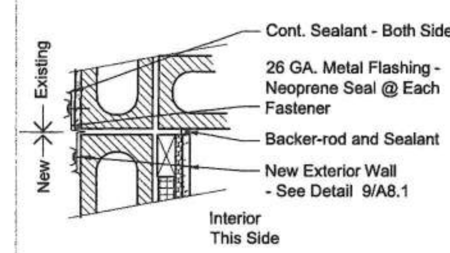
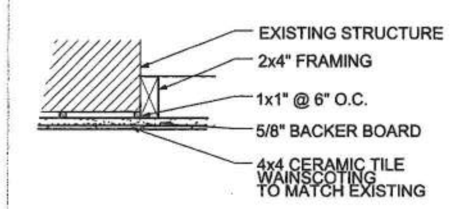
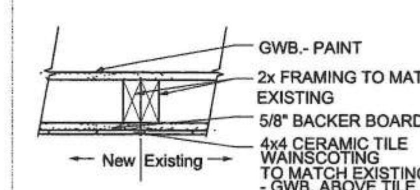


2 Expansion Joint @ New Wall
SCALE: 1-1/2"=1'-0"



3 New Wall @ Column
SCALE: 1-1/2"=1'-0"



4 New Wall @ Door
SCALE: 1-1/2"=1'-0"

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GENERAL STRUCTURAL NOTES:

CODES

1.1 ALL MATERIALS, WORKMANSHIP, AND CONSTRUCTION SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE UNIFORM BUILDING CODE (UBC), 1997 EDITION.

1.2 THIS STRUCTURE DOES NOT CONFORM TO PRESENT EARTHQUAKE CODE REQUIREMENTS. IT HAS BEEN REINFORCED IN ACCORDANCE WITH UBC CHAPTER 34 AND IS WITHIN THE CURRENT PRACTICE FOR THE RENOVATION OF EXISTING BUILDINGS OF THIS AGE AND TYPE OF CONSTRUCTION.

LOADS

2.1 SUPERIMPOSED DEAD LOADS AND FLOOR/ROOF LIVE LOADS

ROOF SNOW LOAD. . . . . .25 PSF

2.2 LATERAL LOADS

WIND. . . . . 80 MPH, EXPOSURE "C"

EARTHQUAKE. . . . . . . S_1 = 0.41g, S_s = 1.25g, SOIL = S_d

CRITERIA

3.1 NEW ELEMENTS ARE DESIGNED PER FEMA 356 CHARTER 10 AND DETAILED PER THE 1997 UBC.

3.2 STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL AND OTHER DISCIPLINES' DRAWINGS FOR BIDDING AND CONSTRUCTION. CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS FOR COMPATIBILITY AND SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

3.3 CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR THE STURCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PLANS.

ERECTION PLANS AND DETAILS OF SHORING SYSTEMS SHALL BE PROVIDED BY THE CONTRACTOR. DESIGN CALCULATIONS AND DRAWINGS ARE TO BE STAMPED BY A LICENSED STRUCTURAL ENGINEER, STATE OF WASHINGTON. TWO SETS OF CALCULATIONS AND DRAWINGS ARE TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW. THIS REVIEW WILL CHECK WHETHER THE CONTRACTOR'S ENGINEER HAS COMPLETED THE LOAD PATH TRANSFERRING ALL THE BUILDING'S DEAD LOADS AND CONSTRUCTION LIVE LOADS DOWN TO NATIVE SOILS. THE SHORING SHALL NOT BE SUPPORTED BY THE EXISTING STRUCTURE.

CHANGES IN FIELD CONDITIONS DURING CONSTRUCTION WILL REQUIRE RE-EVALUATION BY THE CONTRACTOR'S SHORING ENGINEER.

3.4 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES REQUIRED TO PERFORM THE WORK.

3.5 CONTRACTOR-INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT AND STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT.

3.6 DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED, BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT AND THE STRUCTURAL ENGINEER.

3.7 STRUCTURAL SYSTEMS WHICH ARE TO BE COMPOSED OF FIELD-ERECTED COMPONENTS SHALL BE SUPERVISED BY THE SUPPLIER DURING MANUFACTURING, DELIVERY, HANDLING, STORAGE AND ERECTION IN ACCORDANCE WITH INSTRUCTIONS PREPARED BY THE SUPPLIER.

3.8 SHOP DRAWINGS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION:

REINFORCING STEEL (FOR CONCRETE AND MASONRY CONSTRUCTION)
STRUCTURAL STEEL

CONTRACTOR SHALL SUBMIT ERECTION PLANS, ELEVATIONS AND DETAILS DRAWN BY THE FABRICATOR (COPIES OF THE STRUCTURAL DRAWINGS WILL NOT BE ACCEPTED).

3.9 SHOP DRAWING REVIEW: DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER OF RECORD AND, THEREFORE, MUST BE REVIEWED BY THE CONTRACTOR. CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMITTING FOR REVIEW BY ENGINEER OF RECORD. SUBMISSIONS SHALL INCLUDE A REPRODUCIBLE AND ONE COPY. THE REPRODUCIBLE WILL BE MARKED AND RETURNED.

RESUBMITTALS OF PREVIOUSLY SUBMITTED SHOP DRAWINGS SHALL HAVE ALL CHANGES CLOUDED AND DATED WITH A SEQUENTIAL REVISION NUMBER. CONTRACTOR SHALL REVIEW AND STAMP ALL REVISED AND RESUBMITTED SHOP DRAWINGS PRIOR TO SUBMITTAL AND REVIEW BY THE ENGINEER OF RECORD.

SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT. THE CONTRACTOR DEMONSTRATES THIS UNDERSTANDING BY INDICATING WHICH MATEIRAL THEY INTEND TO FURNISH AND INSTALL AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS THEY INTEND TO USE. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED.

CRITERIA (continued)

1 3.10 SPECIAL INSPECTION: THE FOLLOWING ITEMS SHALL BE SUPERVISED IN ACCORDANCE WITH UBC SECTIONS 108 AND 1701 AND THE PROJECT SPECIFICATIONS BY A QUALIFIED TESTING AGENCY DESIGNATED BY THE ENGINEER.

REINFORCED CONCRETE CONSTRUCTION
MASONRY CONSTRUCTION (PERIODIC INSPECTION OF REBAR PLACEMENT)
STRUCTURAL STEEL (INCL FIELD WELDING & HIGH STRENGTH BOLTING)
DRILLED AND EPOXIED BOLTS, RODS AND ANCHORS

THE STRUCTURAL ENGINEER SHALL BE FURNISHED WITH COPIES OF ALL INSPECTION REPORTS AND TEST RESULTS.

EARTHWORK

4.1 SUBGRADE PREPARATION, INCLUDING DRAINAGE, EXCAVATION, COMPACTION, AND FILLING REQUIREMENTS, SHALL CONFORM STRICTLY WITH RECOMMENDATIONS GIVEN BY THE GEOTECHNICAL ENGINEER.

FOOTING DEPTHS/ELEVATIONS SHOWN ON PLANS (OR IN DETAILS) ARE MINIMUM AND FOR GUIDANCE ONLY. THE ACTUAL ELEVATIONS OF FOOTINGS MUST BE ESTABLISHED BY THE CONTRACTOR IN THE FIELD WORKING WITH THE TESTING LAB AND GEOTECHNICAL ENGINEER.

ALLOWABLE SOIL PRESSURE . . . . 3,000 PSF

RENOVATION

5.1 DEMOLITION: CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING ANY DEMOLITION. SHORING SHALL BE INSTALLED TO SUPPORT EXISTING CONSTRUCTION AS REQUIRED AND IN A MANNER SUITABLE TO THE WORK SEQUENCES. EXISTING REINFORCING SHALL BE SAVED WHERE AND AS NOTED ON THE DRAWINGS. SAWCUTTING, IF AND WHERE USED, SHALL NOT CUT EXISTING REINFORCING THAT IS TO BE SAVED. DEMOLITION DEBRIS SHALL NOT BE ALLOWED TO DAMAGE OR OVERLOAD THE EXISTING STRUCTURE.

A. ALL NEW OPENINGS THROUGH EXISTING WALLS, SLABS, AND BEAMS SHALL BE ACCOMPLISHED BY SAWCUTTING WHEREVER POSSIBLE. UNLESS OTHERWISE NOTED, ALL NEW OPENINGS SHALL BE SAWCUT NEAT AND CLEAN; NO OVERCUTTING AT OPENING CORNERS SHALL BE ALLOWED. AS REQUIRED, CORE DRILL CORNERS AND CHIP, GRIND, OR CUT THE CORNERS TO PROVIDE THE REQUIRED DIMENSIONS.

B. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND LOCATION OF MEMBERS, INCLUDING LOCATION AND EXTENT OF ALL REINFORCING STEEL, PRIOR TO CUTTING ANY OPENINGS.

C. SMALL ROUND OPENINGS SHALL BE ACCOMPLISHED BY CORE DRILLING.

ANCHORAGE

6.1 EPOXY-GROUTED RODS OR REBAR TO CONCRETE, MASONRY OR UNREINFORCED MASONRY SPECIFIED ON THE DRAWINGS SHALL BE GROUTED WITH HEA RESIN, AS MANUFACTURED BY HILTI CORP. INSTALL IN STRICT CONFORMANCE WITH ICBO REPORT NO. 4016, INCLUDING MINIMUM EMBEDMENT REQUIREMENTS. SPECIAL INSPECTION OF INSTALLATION IS REQUIRED. RODS SHALL BE ASTM A-307 UNLESS OTHERWISE NOTED. EPOXY ANCHORS TO EXISTING MASONRY WALLS SHALL BE "HIT" ANCHORING SYSTEM AS MANUFACTURED BY HILTI CORP. INSTALL IN STRICT ACCORDANCE WITH ICBO REPORT NO 5193. SPECIAL INSPECTION OF INSTALLATION IS REQUIRED. RODS SHALL BE THREADED ASTM A-36 MATERIAL UNLESS OTHERWISE NOTED. PROVIDE SCREEN TUBES AT HOLLOW CMU. HOLES IN BRICK MASONRY AND HOLLOW CMU SHALL BE CORE DRILLED. HOLES IN CONCRETE AND SOLIDLY GROUTED MASONRY MAY BE DRILLED BY CORING OR ROTO-HAMMER UNLESS OTHERWISE NOTED.

6.2 SUBSTITUTES PROPOSED BY CONTRACTOR SHALL BE SUBMITTED FOR REVIEW WITH ICBO REPORTS INDICATING EQUIVALENT OR GREATER LOAD CAPACITITES. IN ADDITION, FOR WIND OR SEISMIC APPLICATIONS, SUBSTITUTIONS SHALL MEET ICBO ACCEPTANCE CRITERIA AC58.

6.3 DRILLED-IN WALL ANCHORS INSTALLED IN MASONRY WALLS SHALL BE TESTED IN PULL-OUT BY AN APPROVED AGENCY. THE MINIMUM NUMBER TESTED SHALL BE FOUR PER FLOOR AND ROOF. NUMBER OF TESTS AND TEST LOCATIONS SHALL BE DETERMINED AT THE BUILDING SITE BY THE STRUCTURAL ENGINEER. THE TEST APPARATUS SHALL BE SUPPORTED ON THE MASONRY WALL AT A MINIMUM DISTANCE EQUAL TO THE WALL THICKNESS FROM THE ANCHOR TESTED. THE ROD SHALL BE TESTED TO A LOAD DETERMINED BY THE STRUCTURAL ENGINEER PRIOR TO TESTING OR TO FAILURE (ULTIMATE). RESULTS OF ALL TESTS SHALL BE RECORDED. THE REPORT SHALL INCLUDE TEST RESULTS AS RELATED TO THE WALL THICKNESS AND JOIST ORIENTATION. THE RESULTS OF THE TEST SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER.

CONCRETE

7.1 CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED AND PLACED IN ACOORDANCE WITH UBC SECTION 1905 AND ACI 301. STRENGTHS AT 28 DAYS AND MIX CRITERIA SHALL BE AS FOLLOWS:

TYPE OF CONSTRUCTION	28-DAY STRENGTH (f'c)	MAXIMUM SLUMP	MINIMUM CEMENT PER CUBIC YARD
A. SLABS ON GRADE	3,000 PSI	4"	5 1/2 SACKS
B. ALL STRUCTURAL CONCRETE	4,000 PSI	4"	6 1/2 SACKS

MIXES SHALL BE PROPORTIONED SO AS NOT TO EXCEED THE MAXIMUM SLUMPS INDICATED.

CONCRETE (continued)

THE MINIMUM AMOUNTS OF CEMENT AND MAXIMUM AMOUNTS OF WATER MAY BE CHANGED IF A CONCRETE PERFORMANCE MIX IS SUBMITTED TO THE STRUCTURAL ENGINEER AND THE BUILDING DEPARTMENT FOR APPROVAL TWO WEEKS PRIOR TO PLACING ANY CONCRETE. THE PERFORMANCE MIX SHALL INCLUDE THE AMOUNTS OF CEMENT, FINE AND COARSE AGGREGATE, WATER AND ADMIXTURES, AS WELL AS THE WATER CEMENT RATIO, SLUMP, CONCRETE YIELD AND SUBSTANTIATING STRENGTH DATA IN ACCORDANCE WITH ACI 318-95, CHAPTER 5. THE USE OF A PERFORMANCE MIX REQUIRES BATCH PLANT INSPECTION, THE COST OF WHICH SHALL BE PAID BY THE GENERAL CONTRACTOR. REVIEW OF MIX SUBMITTALS BY THE ENGINEER OF RECORD INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH CONTRACT DOCUMENTS. CONTRACTOR OR SUPPLIER MAINTAINS FULL RESPONSIBILITY FOR SPECIFIED PERFORMANCE.

ALL CONCRETE WITH SURFACES EXPOSED TO STANDING WATER SHALL BE AIR-ENTRAINED WITH AN AIR-ENTRAINING AGENT CONFORMING TO UBC TABLE 19-A-I.

7.2 REINFORCING STEEL SHALL CONFORM TO ASTM A615 (INCLUDING SUPPLEMENT S1), GRADE 60, Fy = 60,000 PSI. EXCEPTIONS: ANY BARS SPECIFICALLY SO NOTED ON THE DRAWINGS SHALL BE GRADE 40, Fy = 40,000 PSI. GRADE 60 REINFORCING BARS INDICATED ON DRAWINGS TO BE WELDED SHALL CONFORM TO ASTM A706. REINFORCING COMPLYING WITH ASTM A615 (S1) MAY BE WELDED ONLY IF MATERIAL PROPERTY REPORTS INDICATING CONFORMANCE WITH WELDING PROCEDURES SPECIFIED IN AWS D1.4.92 ARE SUBMITTED.

7.3 WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185.

7.4 REINFORCING STEEL SHALL BE DETAILED (INCLUDING HOOKS AND BENDS) IN ACCORDANCE WITH ACI 315-92 AND 318-95. LAP ALL CONTINUOUS REINFORCEMENT IN ACCORDANCE WITH "REINFORCEMENT SPLICE AND DEVELOPMENT LENGTH SCHEDULE." PROVIDE CORNER BARS AT ALL WALL AND FOOTING INTERSENCTIONS. LAP ADJACENT MATS OF WELDED WIRE FABRIC A MINIMUM OF 8" AT SIDES AND ENDS.

NO BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE SHALL BE FIELD BENT UNLESS SPECIFICALLY SO DETAILED OR APPROVED BY THE STRUCTURAL ENGINEER.

7.5 CONCRETE PROTECTION (COVER) FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

FOOTINGS & OTHER UNFORMED SURFACES, EARTH FACE . . . . 3"
FORMED SURFACES EXPOSED TO EARTH OR WEATHER (#6 & LARGER) . . . 2"
(#5 & SMALLER) . . 1 1/2"
COLUMN TIES OR SPIRALS AND BEAM STIRRUPS . . . . 1 1/2"
SLABS & WALLS (INTERIOR FACE). . . GREATER OF (BAR DIA. + 1/8" OR). . 3/4"

7.6 CAST-IN-PLACE CONCRETE: SEE MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF MISCELLANEOUS MECHANICAL OPENINGS THROUGH CONCRETE WALLS. SEE ARCHITECTURAL DRAWINGS FOR ALL GROOVES, NOTCHES, CHAMFERS, FEATURE STRIPS, COLOR, TEXTURE, AND OTER FINISH DETAILS AT ALL EXPOSED CONCRETE SURFACES.

7.7 BONDING AGENT SHALL BE "CONCRESIVE STANDARD LIQUID" BY MASTER BUILDERS, INC., OR EQUIVALENT, AND SHALL BE USED WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE. PLACE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, INCLUDING PREPARATION OF EXISTING SURFACES.

7.8 NON-SHRINK GROUT SHALL BE FURNISHED BY AN APPROVED MANUFACTURER AND SHALL BE MIXED AND PLACED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS. GROUT STENGTH SHALL BE AT LEAST EQUAL TO THE MATERIAL ON WHICH IT IS PLACED (3000 PSI MINIMUM).

7.9 MECHANICAL SPLICING OF REINFORCING STEEL BARS, WHERE INDICATED ON THE DRAWINGS, SHALL BE BY AN ICBO APPROVED SYSTEM (SUCH AS LENTON, FOX-HOWLETT, ETC.) AND SHALL DEVELOP 125% OF THE SPECIFIED YIELD STRENGTH OF THE BARS. SPLICE LOCATIONS OF ALTERNATE BARS SHALL BE OFFSET BY A DISTANCE WHICH CONFORMS TO THE ICBO REPORT OF THE SPLICE USED AND TO UBC SECTION 1921.2.6.

MASONRY

8.1 REFERENCE STANDARDS: REINFORCED CONCRETE MASONRY SHALL CONFORM TO UBC SECTION 2104 AND ALL REQUIREMENTS OF THE FOLLOWING DOCUMENTS, EXCEPT AS MODIFIED BELOW:

ACI 530.1 "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES"

8.2 MASONRY CONSTRUCTION: MASONRY CONSTRUCTION SHALL CONFORM TO UBC SECTION 2104. MASONRY SHALL BE LAID IN RUNNING BOND UNLESS NOTED OTHERWISE.

8.3 ASSEMBLY STRENGTH: CONCRETE MASONRY ASSEMBLIES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF F'm = 1500 PSI. COMPLIANCE SHALL BE IN ACCORDANCE WITH UBC SECTION 2105.3.

8.4 CONCRETE MASONRY UNITS: CONCRETE MASONRY UNITS SHALL BE GRADE N, TYPE I, MOISTURE-CONTROLLED AND SHALL CONFORM TO ASTM C90 AND UBC STANDARD 21-4. UNITS SHALL BE PROTECTED FROM EXPOSURE TO MOISTURE PRIOR TO CONSTRUCTION.

MASONRY (continued)

8.5 MORTAR: MORTAR SHALL BE TYPE S AND SHALL CONFORM TO ASTM C270 AND UBC SECTIONS 2102 AND 2103. MASONRY CEMENT SHALL NOT BE USED. MORTAR SAND CONFORMING TO ASTM C144 SHALL BE USED.

8.6 GROUT: GROUT SHALL CONFORM TO ASTM C476 AND C404, AND UBC SECTIONS 2102 AND 2103. PROPORTIONS SHALL CONFORM TO UBC TABLE 21-B. GROUT STRENGTH SHALL BE 2000 PSI, MINIMUM. MORTAR SAND SHALL BE USED. GROUT SHALL BE POURED IN MAXIMUM LIFTS OF 5'-0". ALL CELLS CONTAINING VERTICAL BARS AND ALL BOND BEAMS SHALL BE FILLED WITH GROUT.

8.7 REINFORCING: REINFORCING STEEL SHALL CONFORM TO UBC SECTION 2102.2.10. DEFORMED BARS SHALL BE GRADE 60 AND SHALL BE SECURELY PLACED IN ACCORDANCE WITH UBC SECTION 2104.5. LAP BARS 48 DIAMETERS AT SPLICES UNLESS NOTED OTHERWISE. MINIMUM WALL REINFORCEMENT SHALL BE AS FOLLOWS:

		HORIZONTAL BARS	
WALL THK	VERT BARS	RUNNING BOND	STACK BOND
4"	#4 @ 48" O.C.	#4 @ 48" O.C.	#5 @ 48" O.C.
6"	#5 @ 36" O.C.	#5 @ 48" O.C.	#6 @ 48" O.C.
8"	#6 @ 48" O.C.	#6 @ 48" O.C.	(2) #5 @ 48" O.C.
12"	#7 @ 48" O.C.	(2) #5 @ 48" O.C.	(2) #6 @ 48" O.C.

BOND BEAMS WITH HORIZONTAL BAR OR BARS SHALL BE PROVIDED AT ALL FLOOR AND ROOF LINES AND AT THE TOP OF THE WALL. PROVIDE A BOND BEAM AT TOP AND BOTTOM OF ALL OPENINGS.

STEEL

9.1 STRUCTURAL STEEL DESIGN, FABRICATION, AND ERECTION SHALL BE BASED ON THE AISC "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" LATEST EDITION, PLUS ALL REFERENCED CODES.

9.2 STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

TYPE OF MEMBER	ASTM SPECIFICATION	Fy
A. WIDE FLANGE SHAPES	A572	50 KSI
B. PLATES, ANGLES & CHANNELS	A36	36 KSI
C. PIPE MEMBERS	A53 (TYPE E OR S, GR.B)	35 KSI
D. STRUCTURAL TUBES	A500 (GR. B)	46 KSI
E. ANCHOR BOLTS (EMBEDDED IN CONC.)	A307	
F. CONNECTION BOLTS (3/4" ROUND UNLESS SHOWN OTHERWISE)	A325-X	

9.3 DIMENSIONAL TOLERANCES FOR STRUCTURAL STEEL MEMBERS SHALL BE PER THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES (ADOPTED JUNE 10, 1992), SECTION 6.4, AND ASTM SPECIFICATION A6. UNLESS SPECIFICALLY ALLOWED BY THE ENGINEER, COLUMN MEMBERS SHALL NOT BE MODIFIED BY THE ROTARY STRAIGHTENING PROCESS.

9.4 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL SHALL CONFORM TO SECTION 10 OF THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES (ADOPTED JUNE 10, 1992). ANY STEEL THAT IS TO BE EXPOSED TO VIEW UPON COMPLETION OF THE PROJECT SHALL BE CONSIDERED ARCHITECTURALLY EXPOSED.

9.5 ALL A-325 CONNECTION BOLTS SHALL BE APPROVED SELF LOAD INDICATING TYPES (SUCH AS BETHLEHEM LOAD INDICATOR BOLTS, LeJEUNE TENSION CONTROL BOLTS, ETC.) AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS.

9.6 ALL WELDING SHALL BE IN CONFORMANCE WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED BY WABO CERTIFIED WELDERS USING E70XX ELECTRODES. ONLY PRE-QUALIFIED WELDS (AS DEFINED BY AWS) SHALL BE USED. ALL FILLET WELDS SHALL BE 3/16" UNLESS NOTED OTHERWISE. WELDING OF GRADE 60 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING LOW HYDROGEN ELECTRODES. WELDING OF GRADE 40 REINFORCING BARS (IF REQUIRED) SHALL BE PERFORMED USING E70XX ELECTRODES. WELDING WITHIN 4 FEET OF COLD BENDS IN REINFORCING STEEL IS NOT PERMITTED. SEE REINFORCING NOTE FOR MATERIAL REQUIREMENTS OF WELDED BARS.

9.7 HEADED STUDS FOR COMPOSITE CONNECTION OF STRUCTURAL STEEL TO CAST-IN-PLACE CONCRETE AND THREADED STUDS FOR CONNECTION OF STRUCTURAL STEEL TO OTHER ELEMENTS SHALL BE MANUFACTURED FROM MATERIAL CONFORMING TO ASTM A-108 AND SHALL BE WELDED IN CONFORMANCE WITH AWS REQUIREMENTS.

9.8 DEFORMED BAR ANCHORS SHALL BE TYPE D2L ANCHORS BY NELSON STUD WELDING DIVISION, TRW ASSEMBLIES AND FASTENERS GROUP, OR EQUIVALENT. ANCHORS SHALL BE MADE FROM COLD ROLLED, DEFORMED STEEL CONFORMING TO ASTM A-496.

FOR CONTINUATION SEE SHEET S0.2

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GENERAL NOTES (CONTINUED FROM SHEET S0.1)

WOOD:

10.1 REFERENCE STANDARDS: WOOD FRAMING SHALL CONFORM TO UBC CHAPTER 23 AND ALL REQUIREMENTS OF THE FOLLOWING DOCUMENTS, EXCEPT AS MODIFIED BELOW:

AITC "TIMBER CONSTRUCTION MANUAL"
NFPA "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION"

10.2 PLYWOOD: PLYWOOD PANELS SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST EDITION OF U.S. PRODUCT STANDARD PS-1 FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD. EACH PANEL SHALL BEAR THE AMERICAN PLYWOOD ASSOCIATION (APA) GRADE MARK. SEE DRAWINGS FOR THICKNESS AND GRADE.

10.3 SHEATHING: ALL ROOF, FLOOR, AND WALL PANELS SHALL BE INSTALLED WITH FACE GRAIN PERPENDICULAR TO SUPPORTS UNLESS NOTED OTHERWISE. NAILS SHALL BE DRIVEN FLUSH, BUT SHALL NOT FRACTURE THE SURFACE OF THE SHEATHING.

10.4 SAWN LUMBER: LUMBER SHALL BE GRADED PER WEST COAST LUMBER INSPECTION BUREAU (WCLIB) STANDARD NO. 17, GRADING RULES FOR WEST COAST LUMBER, 2000 OR WESTERN WOOD PRODUCTS ASSOCIATION (WWPA) STANDARD GRADING RULES FOR WESTERN LUMBER, 1998. SAWN LUMBER SPECIES, GRADES AND MINIMUM BASE DESIGN VALUES SHALL BE AS NOTED BELOW:

USE	SIZE	SPECIES	GRADE	Fb MIN	E MIN
DECKING	2x 8x	HEM-FIR	NO. 2	850 PSI	1300 KSI
JOISTS	4x	HEM-FIR	NO. 2	850 PSI	1300 KSI
BEAMS	4x 6x	DOUG-FIR	NO. 1	1350 PSI	1600 KSI

10.5 ENGINEERED LUMBER: DESIGN SHOWN ON DRAWINGS IS BASED ON LUMBER MANUFACTURED BY TRUS-JOIST IN ACCORDANCE WITH REPORT ER-4979. SUBSTITUTES SHALL BE SUBMITTED WITH A CURRENT NER OR ICBO EVALUATION REPORT AND AN ITEMIZED SUBSTITUTION LIST FOR APPROVAL.

10.6 CONNECTORS: DESIGN SHOWN ON DRAWINGS IS BASED ON CONNECTORS MANUFACTURED BY SIMPSON IN ACCORDANCE WITH CATALOG C-2000. SUBSTITUTES SHALL BE SUBMITTED WITH A CURRENT NER OR ICBO EVALUATION REPORT AND AN ITEMIZED SUBSTITUTION LIST FOR APPROVAL. CONNECTORS SHALL BE INSTALLED IN CONFORMANCE WITH MANUFACTURER INSTRUCTIONS.

10.7 NAILING: NAILING NOT SHOWN SHALL BE AS SHOWN IN UBC TABLE 23-II-B-1 OR CURRENT NER-272. MINIMUM NAIL DIMENSIONS SHALL BE AS FOLLOWS:

SIZE	DIAMETER	LENGTH
8d	0.131"	2-1/2"
10d	0.148"	3"
16d	0.162"	3-1/2"

10.8 BOLTS AND LAG SCREWS: BOLTS AND LAG SCREWS SHALL CONFORM TO ASTM A307. BOLT HOLES SHALL BE A MINIMUM OF 1/32" AND A MAXIMUM OF 1/16" LARGER THAN THE BOLT DIAMETER. BOLTS SHALL NOT BE FORCIBLY DRIVEN. PROVIDE WASHERS UNDER ALL BOLT HEADS AND NUTS.

10.9 LAG SCREWS: LAG SCREWS SHALL CONFORM TO ASTM A307. CLEARANCE HOLES FOR THE SHANK SHALL HAVE THE SAME DIAMETER AND LENGTH AS THE UNTHREADED SHANK. LEAD HOLES FOR THE THREADED PORTION SHALL HAVE DIAMETER OF 0.4 TO 0.7 TIMES THE SHANK DIAMETER AND MINIMUM LENGTH EQUAL TO THE THREAD PORTION LENGTH. THE THREADED PORTION OF THE LAG SCREW SHALL BE INSERTED INTO THE LEAD HOLE BY TURNING WITH A WRENCH, NOT BY DRIVING WITH A HAMMER. SOAP OR OTHER LUBRICANT SHALL BE USED ON THE THREADS OR LEAD HOLE TO FACILITATE INSERTION.

10.10 WOOD PROTECTION: ALL WOOD MEMBERS IN CONTACT WITH CONCRETE OR MASONRY, OR EXPOSED TO WEATHER, SHALL BE PRESSURE TREATED WITH AN APPROVED PRESERVATIVE. FASTENERS IN TREATED WOOD SHALL BE HOT-DIPPED ZINC COATED GALVANIZED, STAINLESS STEEL, SILICON BRONZE OR COPPER.

ABBREVIATIONS

AB	ANCHOR BOLT
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
ANCH	ANCHOR
APPROX	APPROXIMATE
AR	ANCHOR ROD
ARCH	ARCHITECT, ARCHITECTURAL
B/	BOTTOM OF
BF	BRACED FRAME
BLDG	BUILDING
BLK	BLOCK, BLOCKING
BM	BEAM
BOT	BOTTOM
BTWN	BETWEEN
BU	BUILT-UP
C	CAMBER, CHANNEL
CAP	CAPACITY
CC	CENTER-TO-CENTER
CF	COLD-FORMED
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT, CONTROL JOINT
CL, ℄	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUE, CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CP	COMPLETE PENETRATION
CTR	CENTER
CY	CUBIC YARD
d	PENNY (NAILS)
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEG, °	DEGREE
DET	DETAIL
DF	DOUGLAS FIR
DIA, ø	DIAMETER
DIAG	DIAGONAL
DIAPH	DIAPHRAGM
DICA	DRILLED-IN CONCRETE ANCHOR
DIM	DIMENSION
DN	DOWN
DO	DITTO
DWG	DRAWING
DWL	DOWEL
(E), EXIST	EXISTING
EA	EACH
EJ	EXPANSION JOINT
EL	ELEVATION
ELECT	ELECTRICAL
EMBED	EMBEDMENT
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
ETC	ET CETERA
EW	EACH WAY
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FAR FACE
FLR	FLOOR
FS	FAR SIDE
FT, '	FEET
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
GL, GLULAM	GLUED LAMINATED MEMBER
GR	GRADE
GRND	GROUND
HF	HEM-FIR
HGR	HANGER
HK	HOOK
HORIZ, H	HORIZONTAL
HP	HIGH POINT
HSS	HOLLOW STRUCTURAL SECTION
HT	HEIGHT
IF	INSIDE FACE
IN, "	INCH
INCL	INCLUDE
INFO	INFORMATION
JT	JOINT
K	KIP (1,000 LB)
L	LENGTH, ANGLE
LB, #	POUND
LEV	LEVEL
LF	LINEAL FOOT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION, LOCATE
LONGIT	LONGITUDINAL
LP	LOW POINT
LSH	LONG SLOTTED HOLE
LSL	LAMINATED STRAND LUMBER
LVL	LAMINATED VENEER LUMBER
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NF	NEAR FACE
NOM	NOMINAL
NO, #	NUMBER
NS	NEAR SIDE, NONSHRINK
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
OSH	OVERSIZED HOLE
PEN	PENETRATION
PERP	PERPENDICULAR
PL, ⅊	PLATE, PROPERTY LINE
PLCS	PLACES
PLWD	PLYWOOD
PNL	PANEL
PP	PARTIAL PENETRATION
PSL	PARALLEL STRAND LUMBER
PT	POINT, PRESSURE TREATED
P/T	POST-TENSION
PVC	POLYVINYL CHLORIDE
R, RAD	RADIUS
RD	ROOF DRAIN
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
RND	ROUND
RO	ROUGH OPENING
RTN	RETURN
SC	SLIP CRITICAL
SCHED	SCHEDULE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SPC	SPACE, SPACING
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
SSH	SHORT SLOTTED HOLE
STD	STANDARD
STIFF	STIFFENER
STIR	STIRRUP
STL	STEEL
STRUC	STRUCTURAL
SUPP	SUPPORT
SYM	SYMMETRICAL
SW	SHEAR WALL
T/	TOP OF
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TEMP	TEMPERATURE
THK	THICK(NESS)
THRU	THROUGH
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT, V	VERTICAL
W	WIDTH
W/	WITH
WD	WOOD
WHS	WELDED HEADED STUD
W/O	WITHOUT
WP	WORK POINT
WT	WEIGHT
WWF	WELDED WIRE FABRIC

SYMBOL LEGEND

GENERAL SYMBOLS

- (E) GRID BUBBLE
- GRID LINE
- NORTH ARROW
- UNDISTURBED SOIL
- COMPACTED SOIL
- GRAVEL
- OPENING IN FLOOR OR WALL
- MATCHLINE
- REFERENCE LINE, EXIST OR ARCHITECTURAL ELEMENTS
- A — DIMENSION PER ARCHITECT
- WP — WORKPOINT
- DIRECTION OF SPAN
- LIMIT OF SPAN
- SLOPE

CONNECTORS

PLAN SECTION

- CONCRETE ANCHOR BOLT
- DRILLED IN CONCRETE ANCHOR
- BOLT
- NAIL

STEEL SYMBOLS

- BEAM/GIRDER
- COLUMN - STARTING AT THIS LEVEL
- COLUMN - BELOW THIS LEVEL
- BEAM/COLUMN SPLICE
- BRACING — DIAGONAL BRACING
- STEEL IN CROSS SECTION

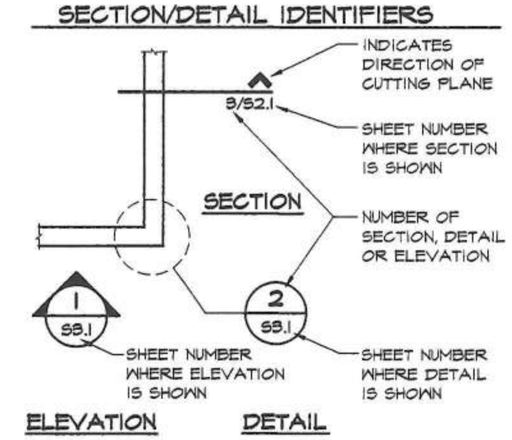
WOOD SYMBOLS

- BUNDLED STUDS, WOOD POST
- GLULAM SECTION
- SOLID WOOD SECTION
- SOLID WOOD BLOCKING SECTION
- BEARING WALL IN SECTION
- WALL BELOW
- PLYWOOD IN SECTION

CONCRETE SYMBOLS

- CONCRETE WALL-IN SECTION
- CONCRETE CURB/PARTIAL HEIGHT WALL
- CONCRETE WALL BELOW THIS LEVEL
- CONCRETE COLUMN
- CONCRETE COLUMN BELOW THIS LEVEL

SECTION/DETAIL IDENTIFIERS



DETAIL LABELS

DETAIL/SECTION/ELEVATION 15
1"=1'-0"
SCALE

A R C Architects
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Everett, Wash
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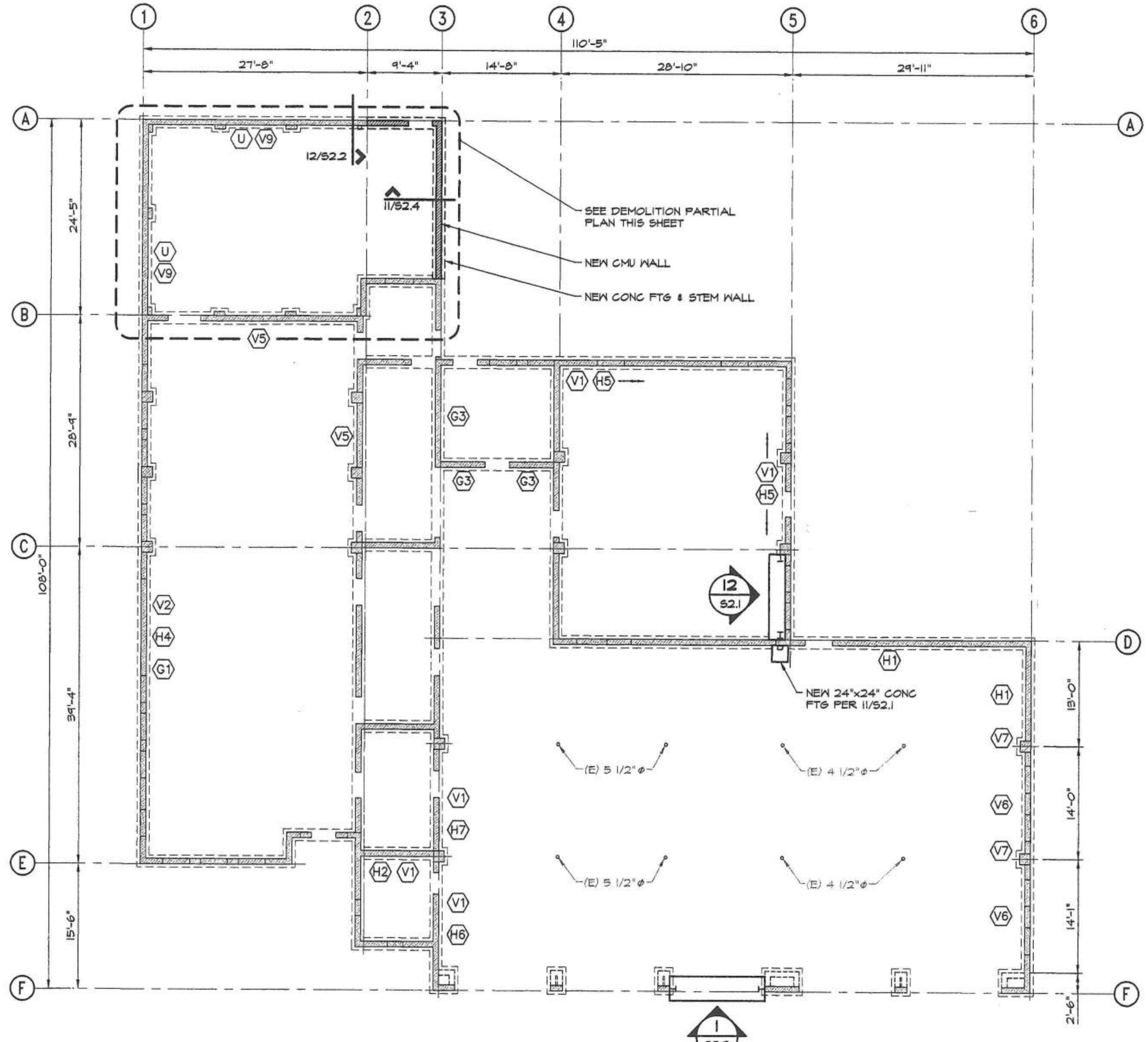
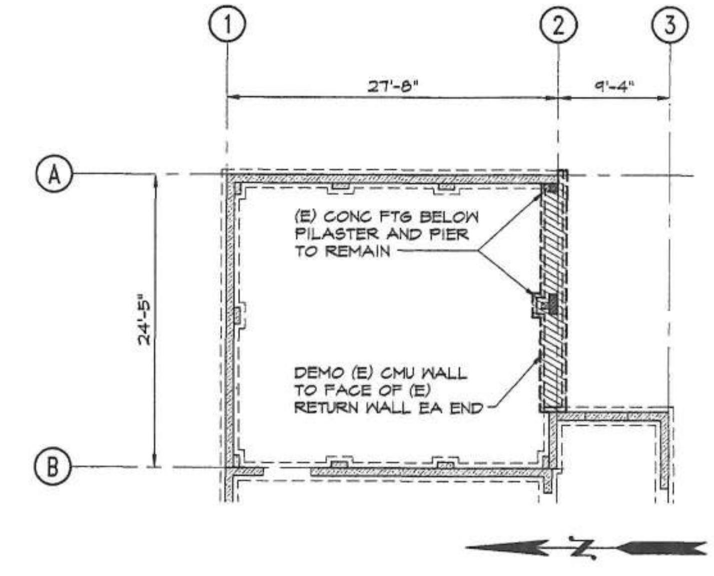


FOUNDATION PLAN
1/8"=1'-0"



DEMOLITION PARTIAL PLAN
1/8"=1'-0"

LEGEND:

(XX) EXISTING WALL REINFORCEMENT FOR INFORMATION ONLY, SEE SCHEDULE BELOW.

EXISTING WALL REINFORCEMENT SCHEDULE

MARK	HJR	BB	V	SPACING/LOCATION
H1	X			2'-0", 4'-8", 6'-8", 10'-0" AFF
		X		7'-4" AFF & TOP OF WALL
H2		X		1'-2" AFF
H3		X		1'-10" AFF
H4		X		2'-8" AFF
H5		X		3'-0" AFF
H6		X		4'-6" AFF
V1			X	32" OC
V2			X	36" OC
V3			X	40" OC
V4			X	32" TO 36" OC
V5			X	32" TO 48" OC
V6			X	CTR CELLS OF WALL SECTION
V7			X	PILASTER CORNERS
V8			X	DOWELS @ 18" OC
G1				SOLID GROUTED
U				UNREINFORCED

HJR = HORIZONTAL JOINT REINFORCEMENT
BB = HORIZONTAL BOND BEAM
V = VERTICAL REINFORCEMENT
AFF = ABOVE FINISHED FLOOR

NOTES:

1. INFORMATION IN SCHEDULE TAKEN FROM LETTER REPORT, TITLED "REDMOND TEEN CENTER MASONRY CONDITION SURVEY", BY MAYES TESTING ENGINEERS, INC., DATED FEBRUARY 25, 2002.
2. WALL REINFORCEMENT UNKNOWN AT UNMARKED WALLS DUE TO FURRING, METAL, OR OTHER SURFACE MATERIALS.

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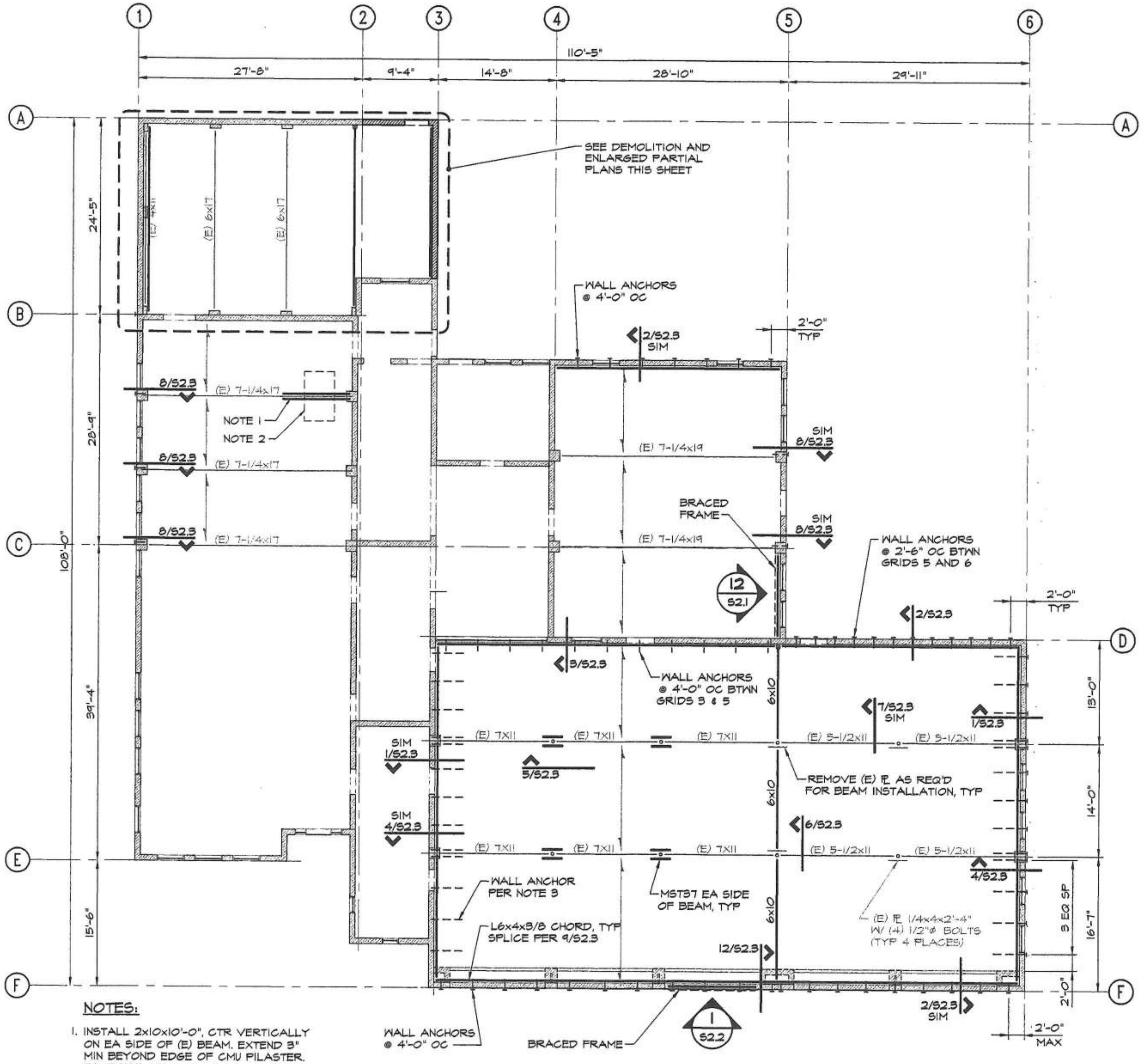
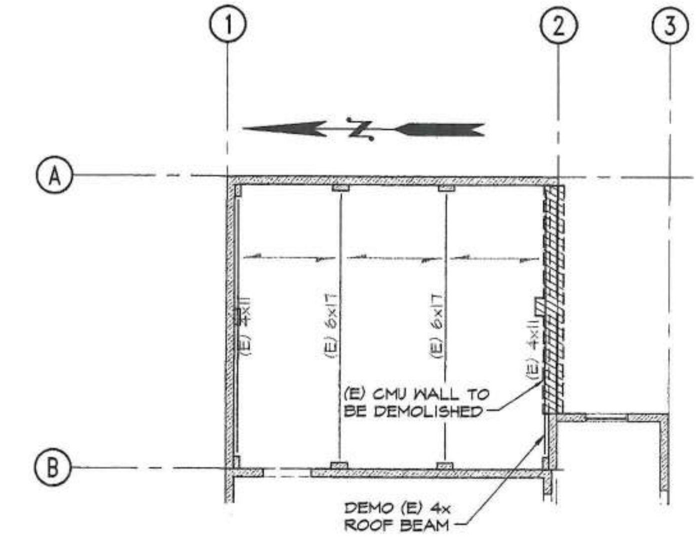


NOTES:

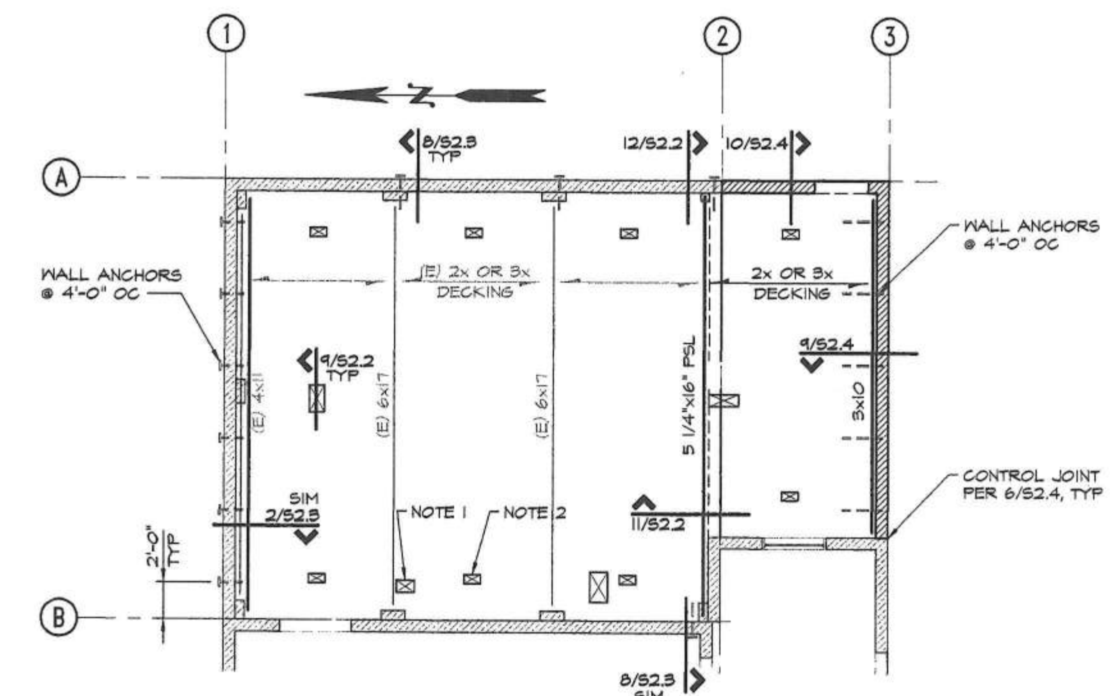
1. INSTALL 2x10x10'-0", CTR VERTICALLY ON EA SIDE OF (E) BEAM. EXTEND 3" MIN BEYOND EDGE OF CMU PILASTER. FACE NAIL W/ 16d @ 6" OC, STAGGER TOP & BOT.
2. NEW ROOF-TOP MECH UNIT CENTERED OVER (E) BEAM. INSTALL 1/2" PLYWOOD, 4'-0" SQUARE, EA SIDE OF BEAM BELOW MECH UNIT. ATTACH TO UNDERSIDE OF DECK WITH 10d NAILS @ 6" OC.
3. AT GRIDS 3 & 6, INSTALL NUMBER OF ANCHORS SHOWN, EQUALLY SPACED BTWN ANCHORS AT PILASTERS AND ANCHORS AT WALL ENDS.

ROOF FRAMING PLAN

1/8"=1'-0"



DEMOLITION PARTIAL PLAN



NOTES:

1. MECH DUCT PENETRATION (4 TOTAL). SEE MECH FOR SIZE OF OPENINGS.
2. ROOF VENT PER ARCH (8 TOTAL). SEE 10/S2.2 FOR FRAMING AROUND VENT OPENINGS.

ENLARGED PARTIAL PLAN

3/16"=1'-0"

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CONTENTS:
ROOF FRA
PLAN

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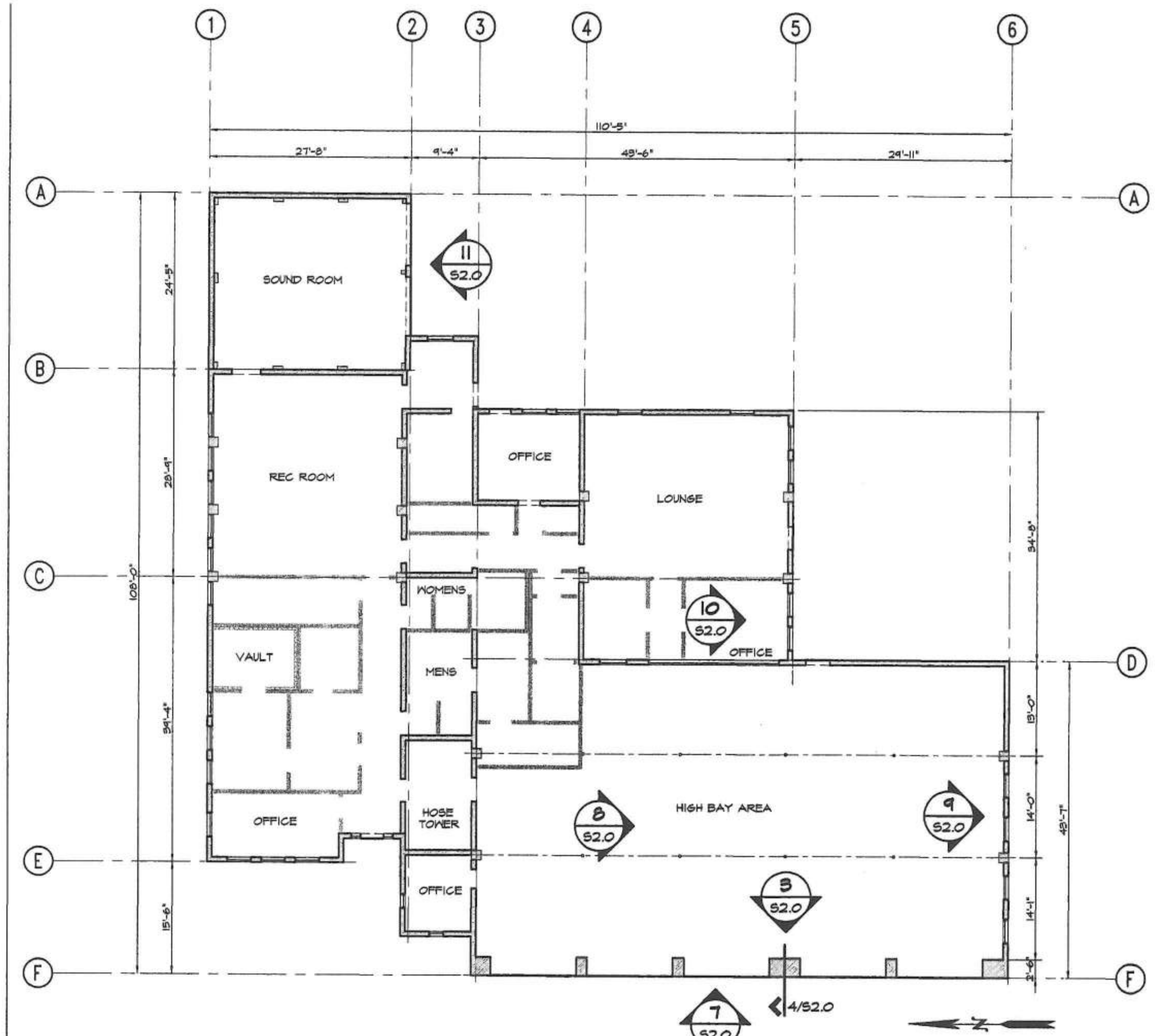
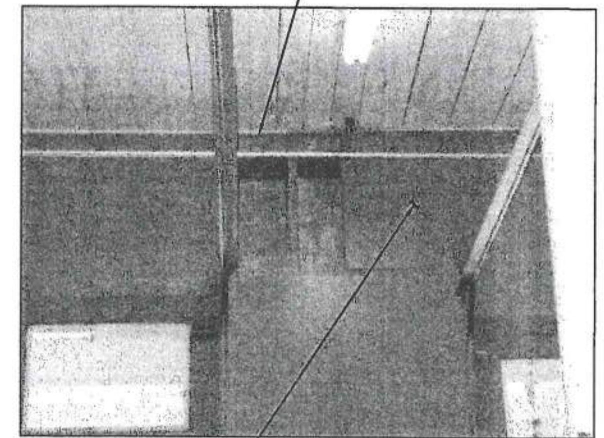


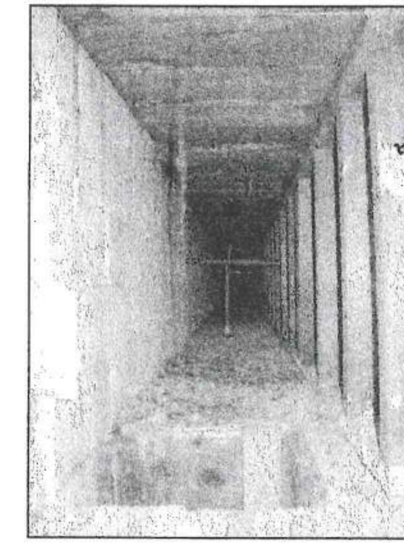
FLOOR PLAN
3/32"=1'-0"

CUT (E) TOP PL AS REQ'D FOR NEW COLLECTOR BEAM



REMOVE & REPLACE (E) SHEATHING

PHOTO DETAIL 3
NTS



REMOVE & REPLACE (E) STUDS AS REQ'D FOR INSTALLATION OF NEW LEDGER. DO NOT REMOVE ADJACENT STUDS AT SAME TIME.

PHOTO DETAIL 4
NTS

INSTALL NEW BRACED FRAME BELOW PARAPET WALL IN THIS BAY

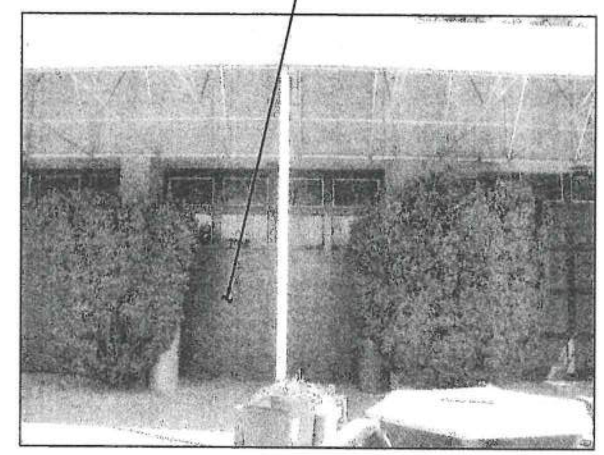


PHOTO DETAIL 7
NTS

RELOCATE (E) PIPING & CONDUIT AS REQ'D FOR NEW COLLECTOR BEAM

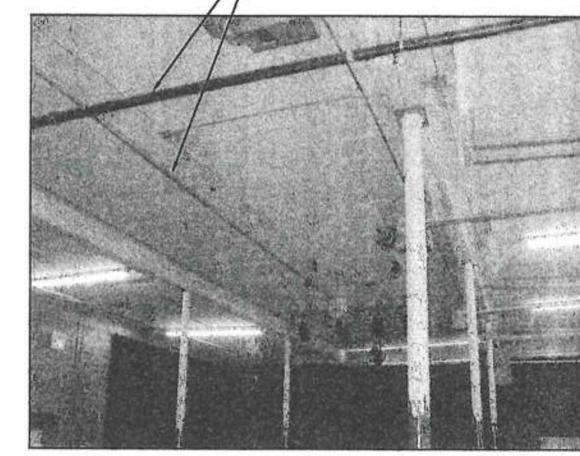


PHOTO DETAIL 8
NTS

RELOCATE (E) CONDUIT AS REQ'D FOR NEW LEDGER AND TIES

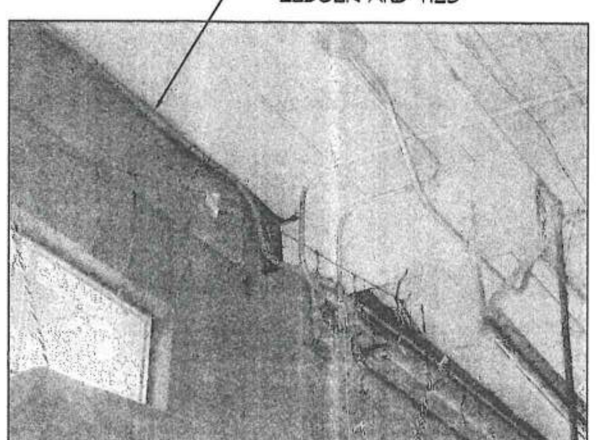


PHOTO DETAIL 9
NTS

REMOVE & REPLACE CEILING PANELS & LIGHTS AS REQ'D FOR INSTALLATION OF BRACED FRAME

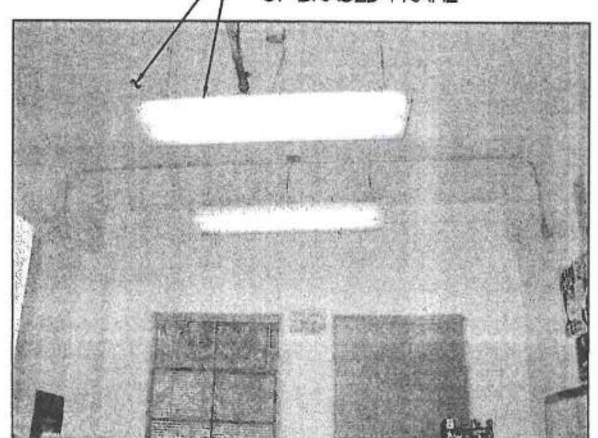


PHOTO DETAIL 10
NTS

(E) WALL & DOORS TO BE REMOVED

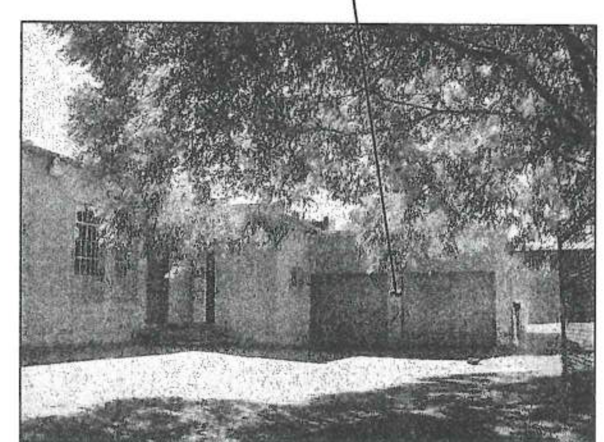


PHOTO DETAIL 11
NTS

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728 134th Str
Everett, Washin
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CONTENTS:
FLOOR PLA
DETAILS &
PHOTOS

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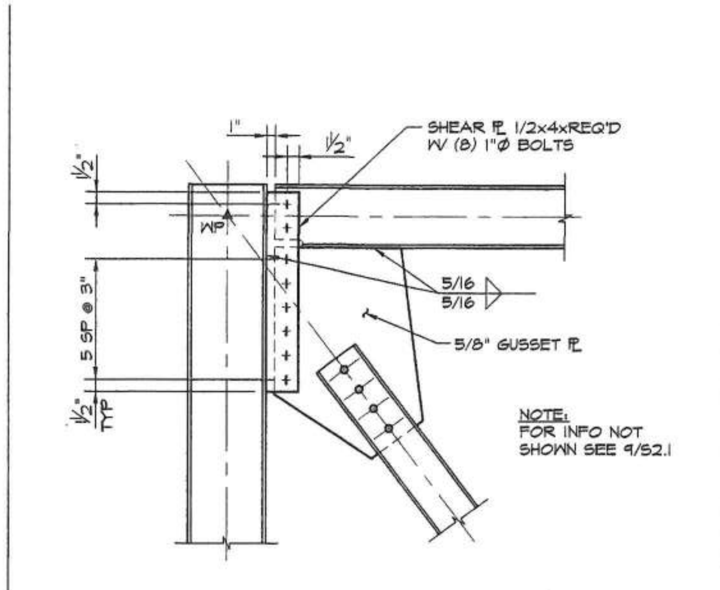
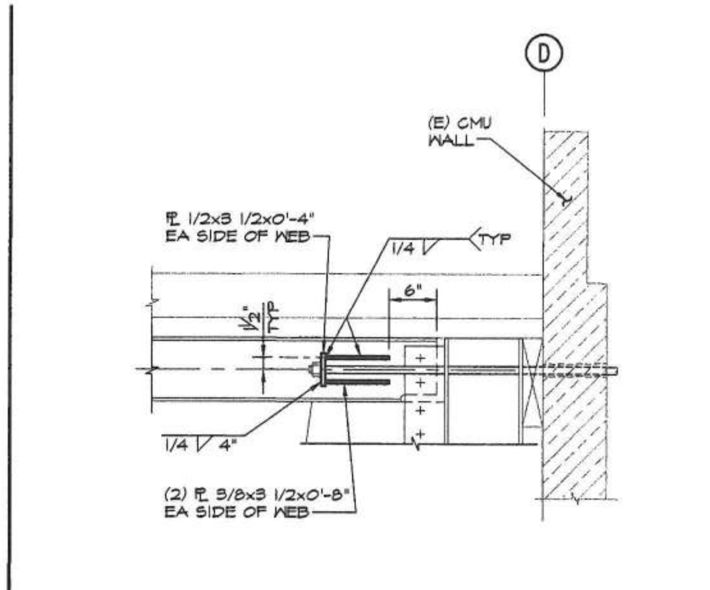
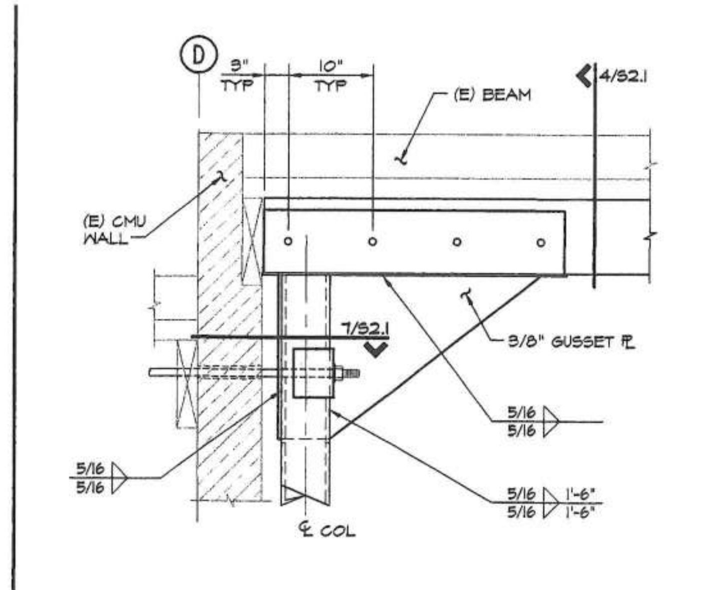


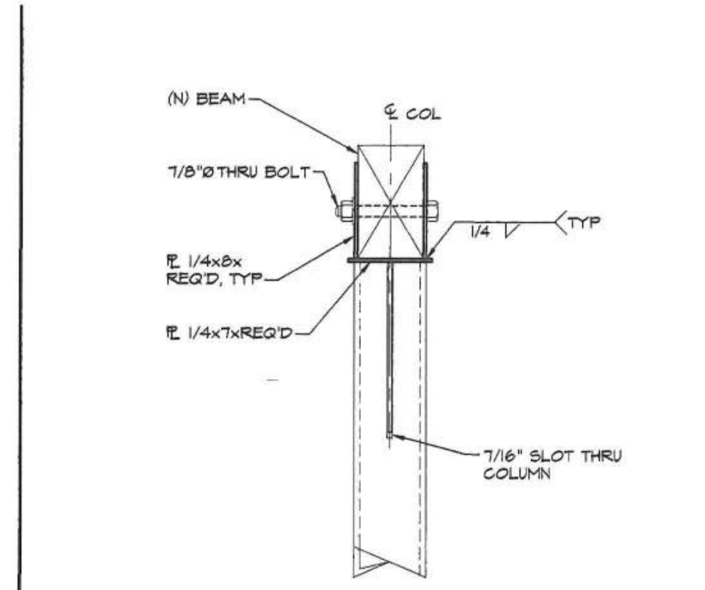
BRACED FRAME DETAIL 1
1"=1'-0"



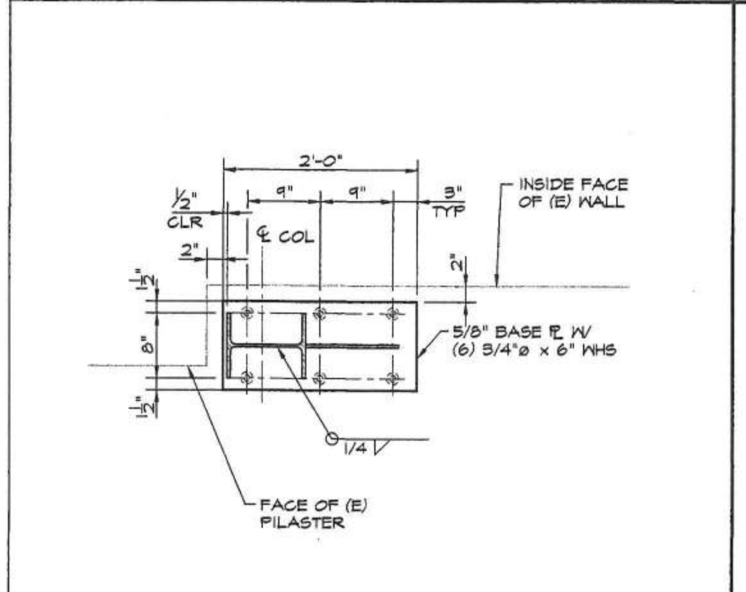
CONNECTION DETAIL 2
1"=1'-0"



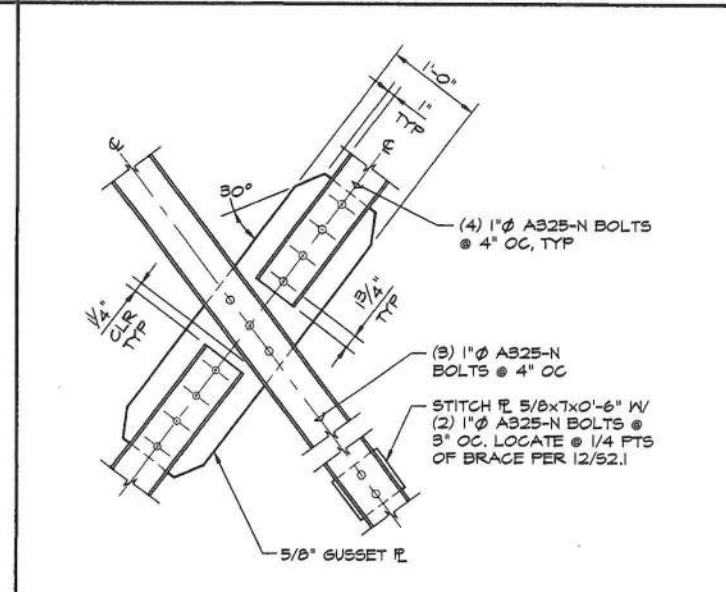
CONNECTION DETAIL 3
1"=1'-0"



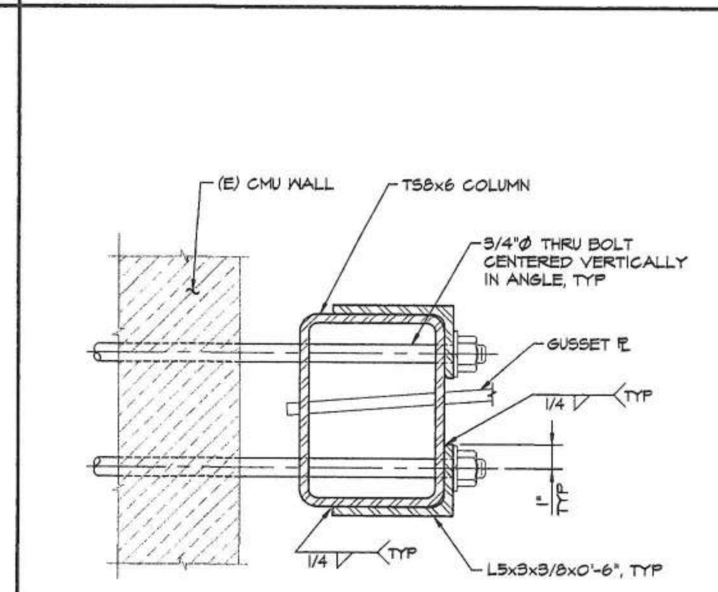
SECTION 4
1 1/2"=1'-0"



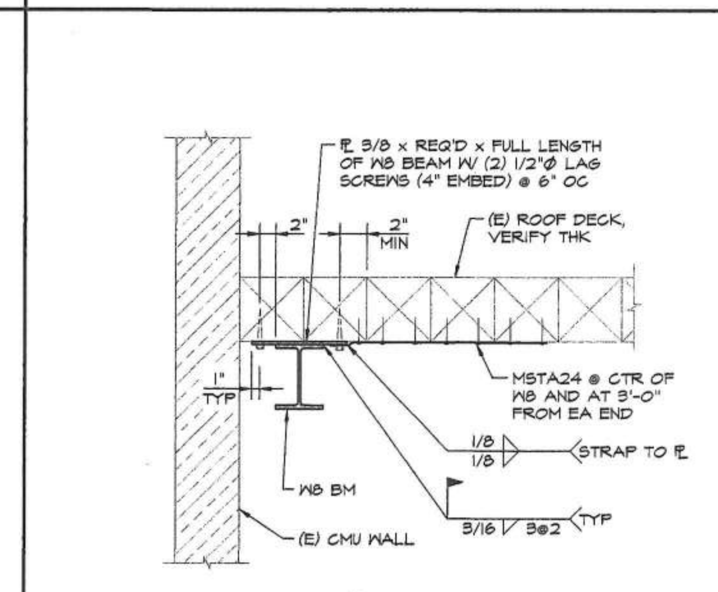
BASE PLATE DETAIL 5
1"=1'-0"



BRACED FRAME DETAIL 6
1"=1'-0"



DETAIL 7
3"=1'-0"



DETAIL 8
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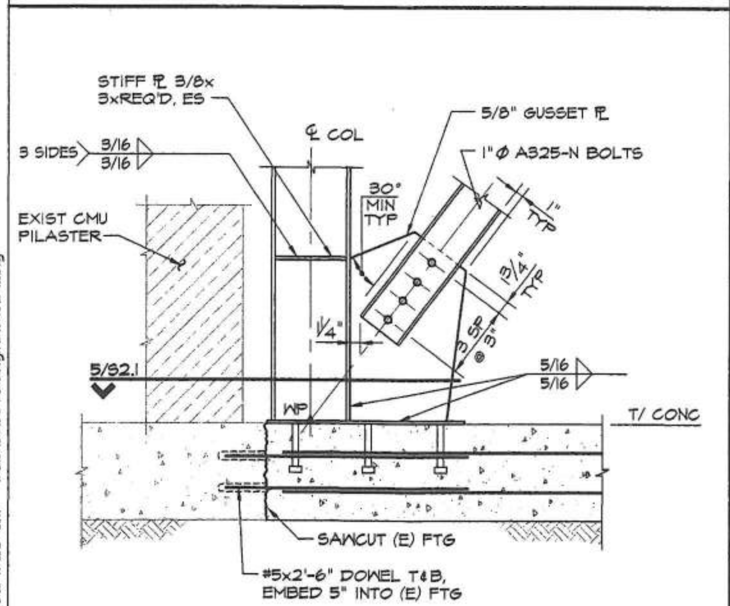
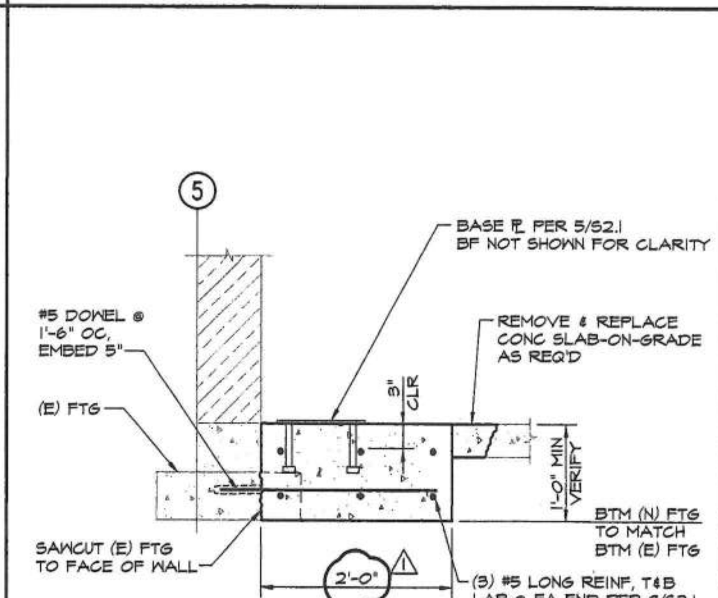


BRACED FRAME DETAIL 9
1"=1'-0"



SECTION 10
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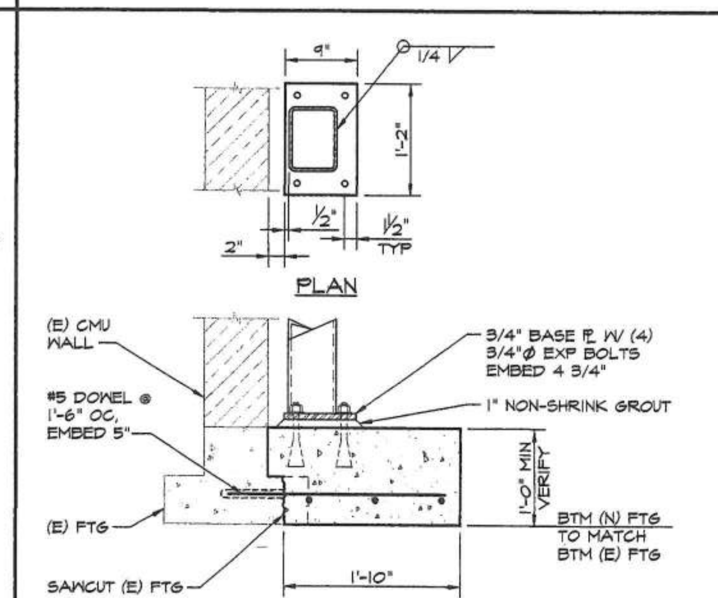
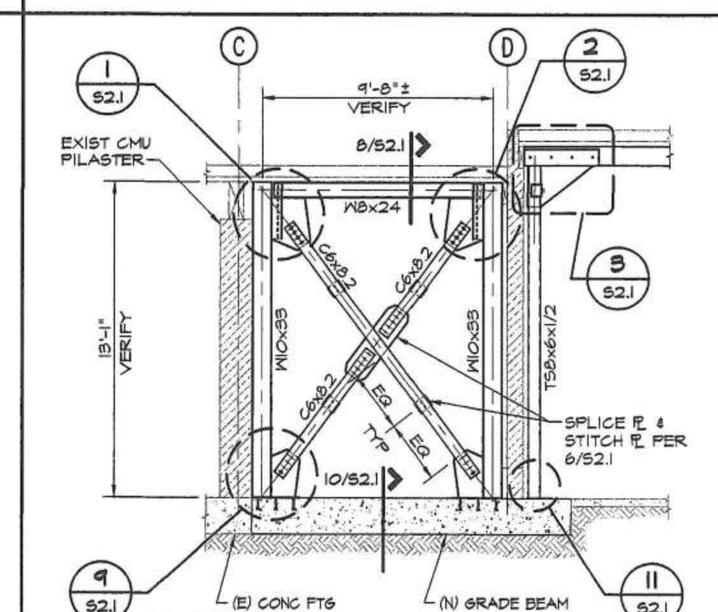


FOOTING DETAIL 11
1"=1'-0"



BRACED FRAME ELEVATION 12
1/4"=1'-0"

08/30/2002 11:20 am

AR

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Seattle, WA 98122-3
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PERMIT S
AUGUST 28,

PROJECT NO

MARK	DATE	D
1	8/13/02	PER

REDM
TEE
CENT

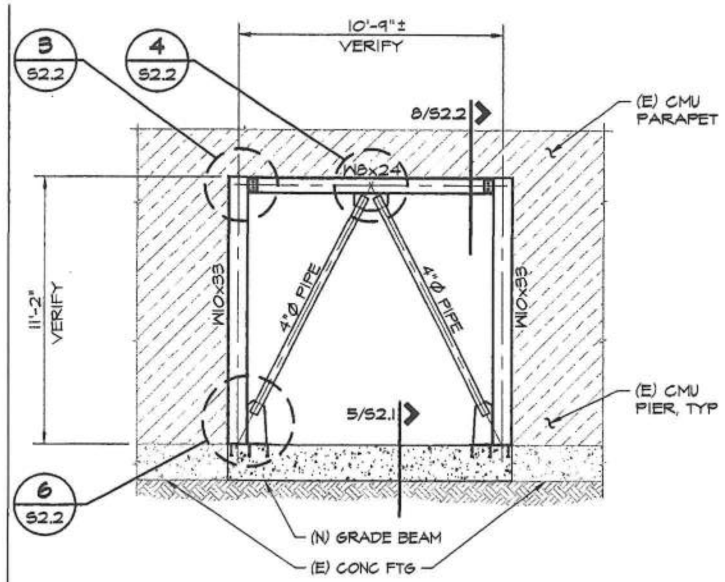
EXPIRES 6/2

ReidMid
728 134th S
Everett, Wash
Ph: 425 741-

CONTENTS:
FRAMING
DETAILS A
ELEVATIO

SCALE:	AS NOT
DRAWN:	GPM
CHECKED:	KKY
PROJECT NO:	28-01-0
VIEW:	PLOTD
SHEET:	

S2



BRACED FRAME ELEVATION @ GRIDLINE F 1
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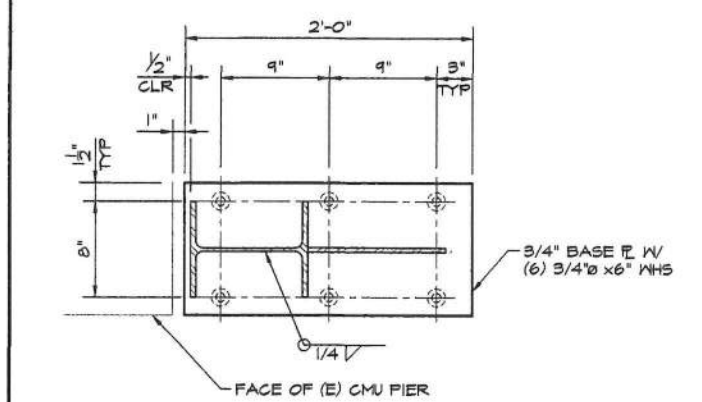
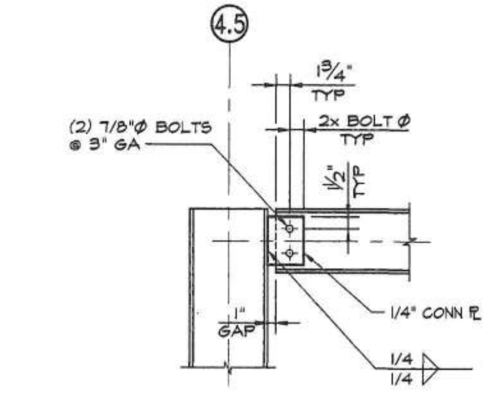
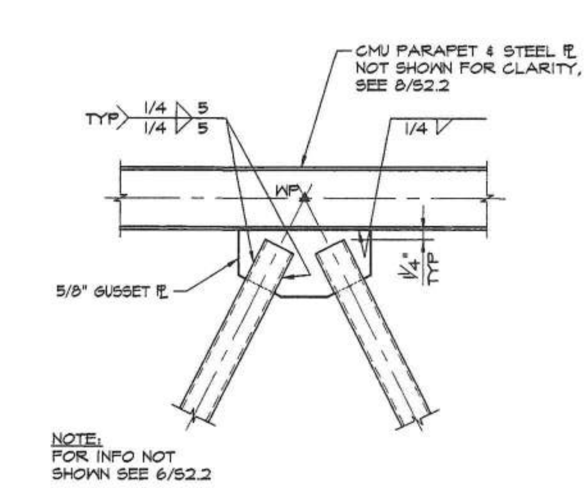


BASE PLATE DETAIL 2
1 1/2"=1'-0"



BOLTED BEAM CONN DETAIL 3
1"=1'-0"



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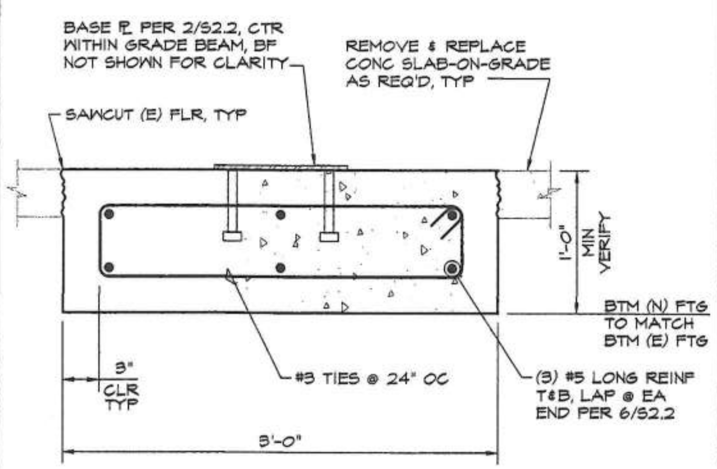
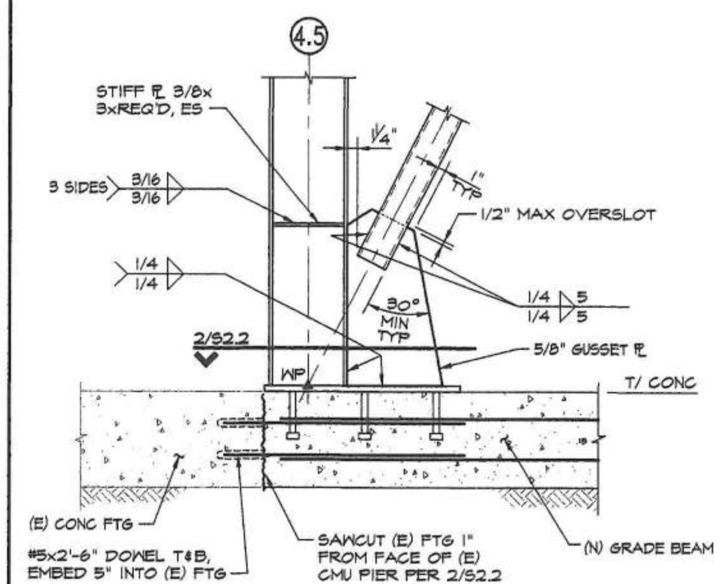
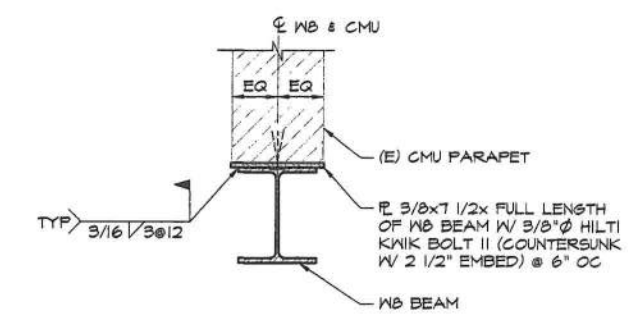


SECTION - GRADE BEAM 5
1 1/2"=1'-0"



BRACED FRAME DETAIL 6
1"=1'-0"



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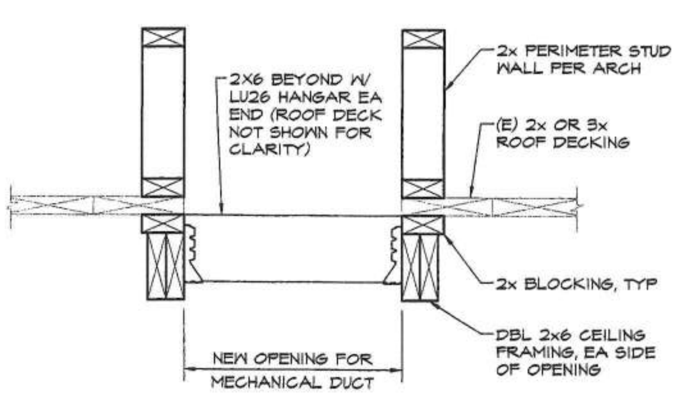

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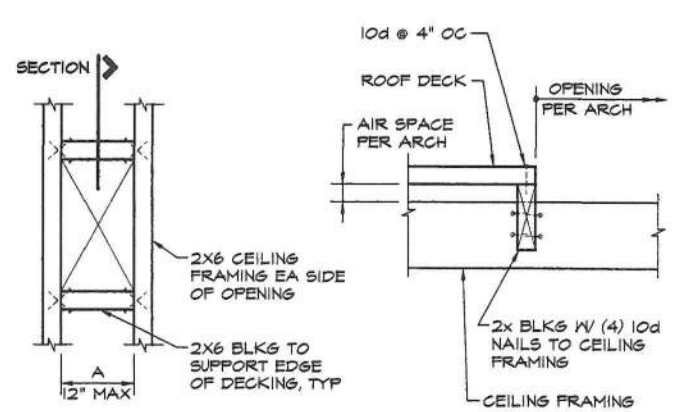

DETAIL 10
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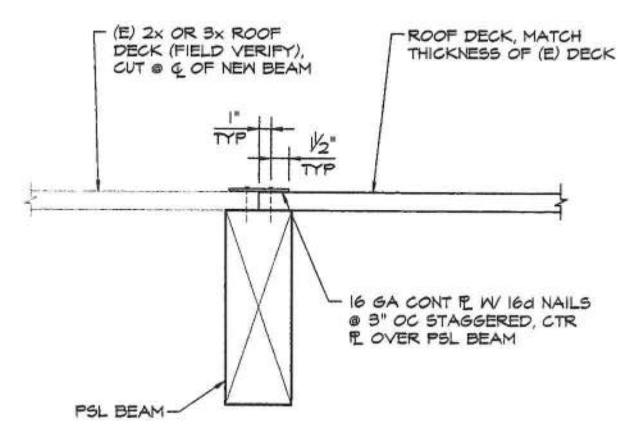

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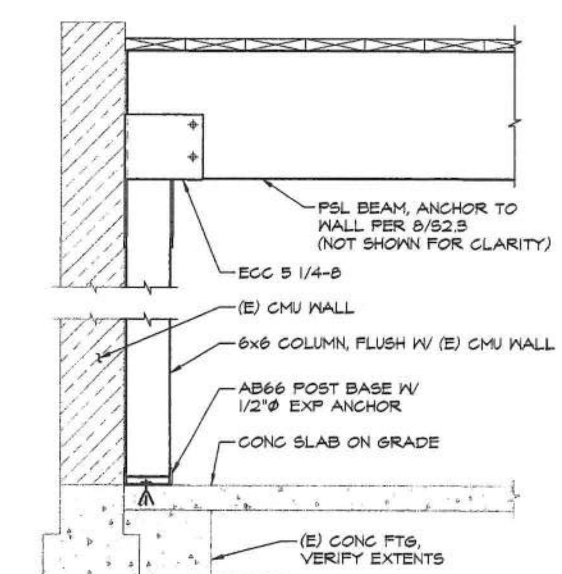

DETAIL 12 1
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CONTENTS:
FRAMING
DETAILS
ELEVATIO

SCALE:	AS NOT
DRAWN:	GPM
CHECKED:	KKY
PROJECT NO:	26-01-
VIEW:	PLOTO
SHEET:	

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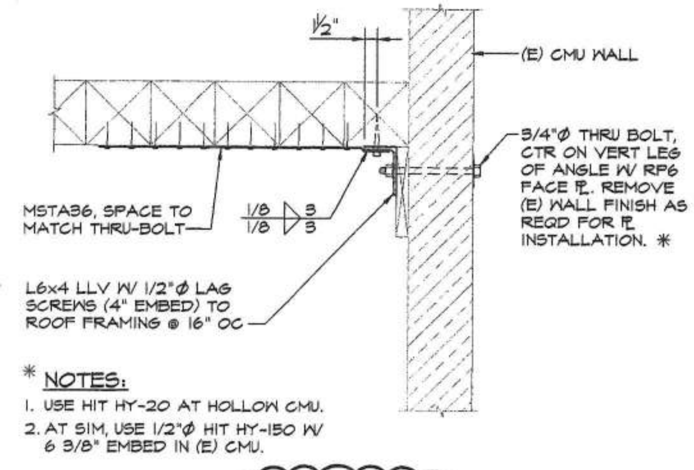
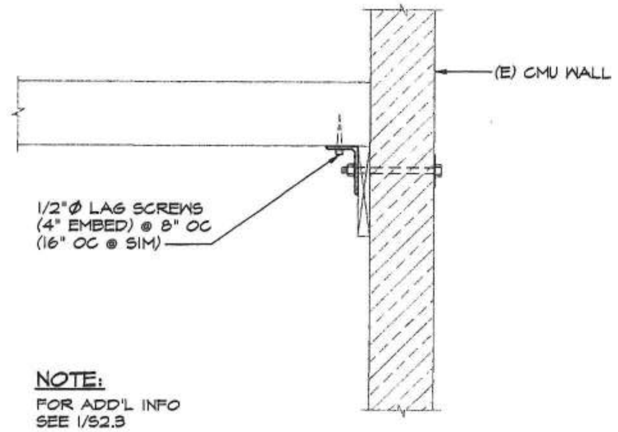


* NOTES:

1. USE HIT HY-20 AT HOLLOW CMU.
2. AT SIM, USE 1/2"Ø HIT HY-150 W/ 6 3/8" EMBED IN (E) CMU.

DETAIL 1
1"=1'-0"



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FOR ADD'L INFO SEE 1/S2.3

DETAIL 2
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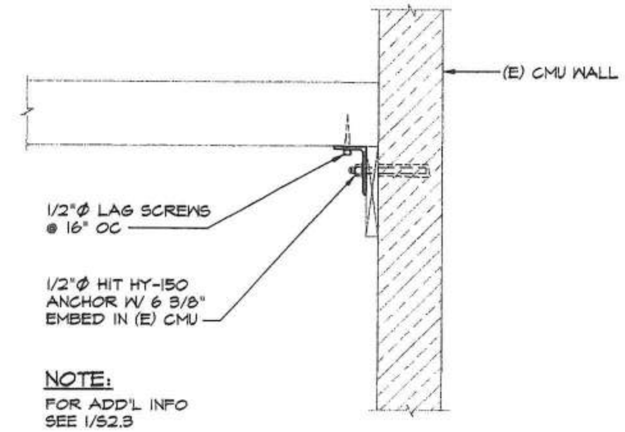

NOTE:
FOR ADD'L INFO SEE 1/S2.3

DETAIL 3
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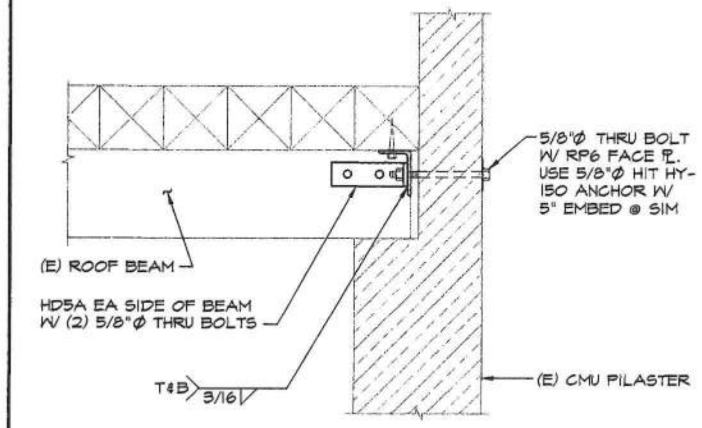
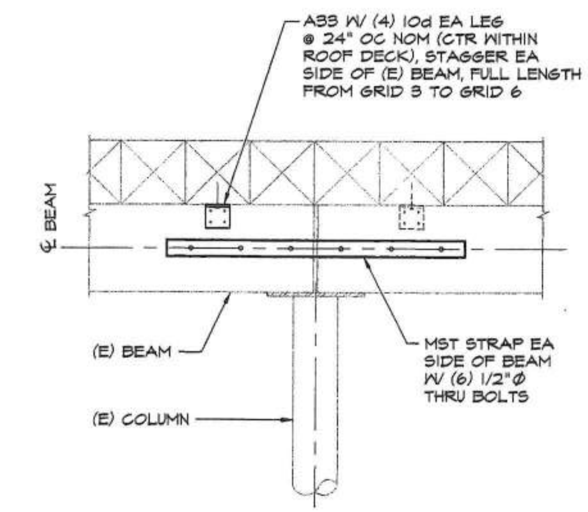


NOTE:
FOR ADD'L INFO SEE 1/S2.3

DETAIL 4
1"=1'-0"



DETAIL 5
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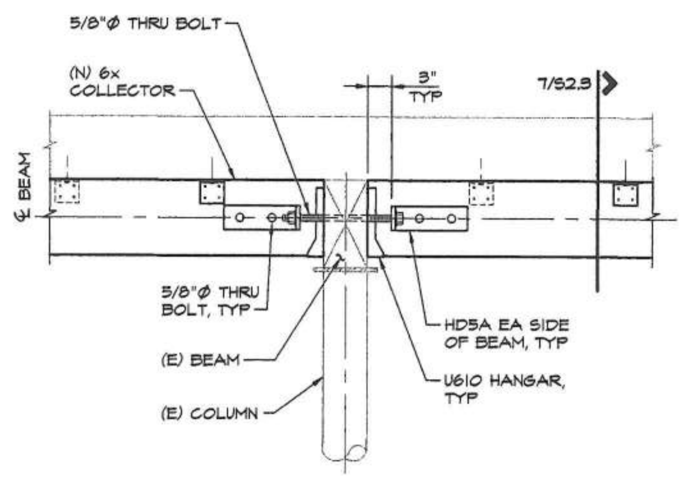
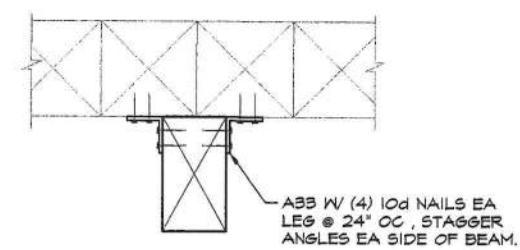
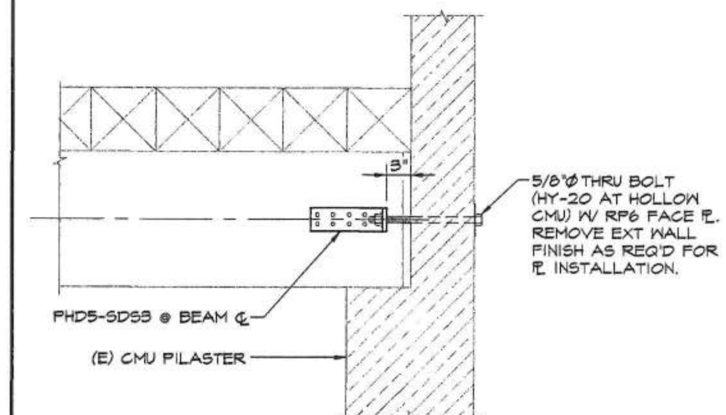


DETAIL 6
1"=1'-0"



SECTION 7
1 1/2"=1'-0"



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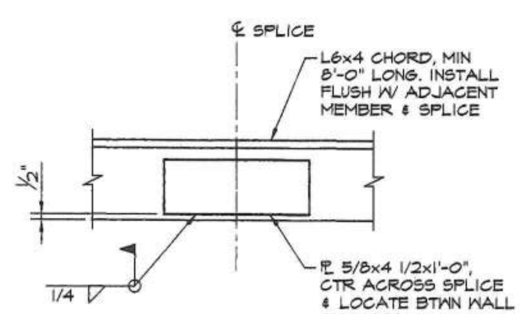
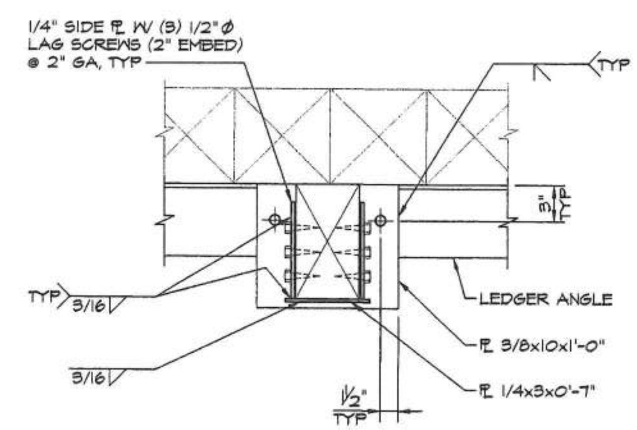
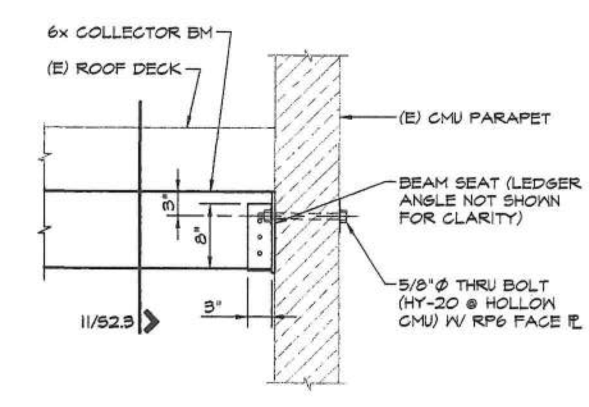
1"=1'-0"



CHORD SPLICE DETAIL 9
1 1/2"=1'-0"



DETAIL 11
1 1/2"=1'-0"



DETAIL 12
1"=1'-0"

08/30/2002 11:26 am

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1	8/13/02	PER

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30589
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CONTENTS:
FRAMING
DETAILS A
ELEVATIO

SCALE:	AS NOT
DRAWN:	GPM
CHECKED:	KKY
PROJECT NO:	28-01-0
VIEW:	PLOTD
SHEET:	

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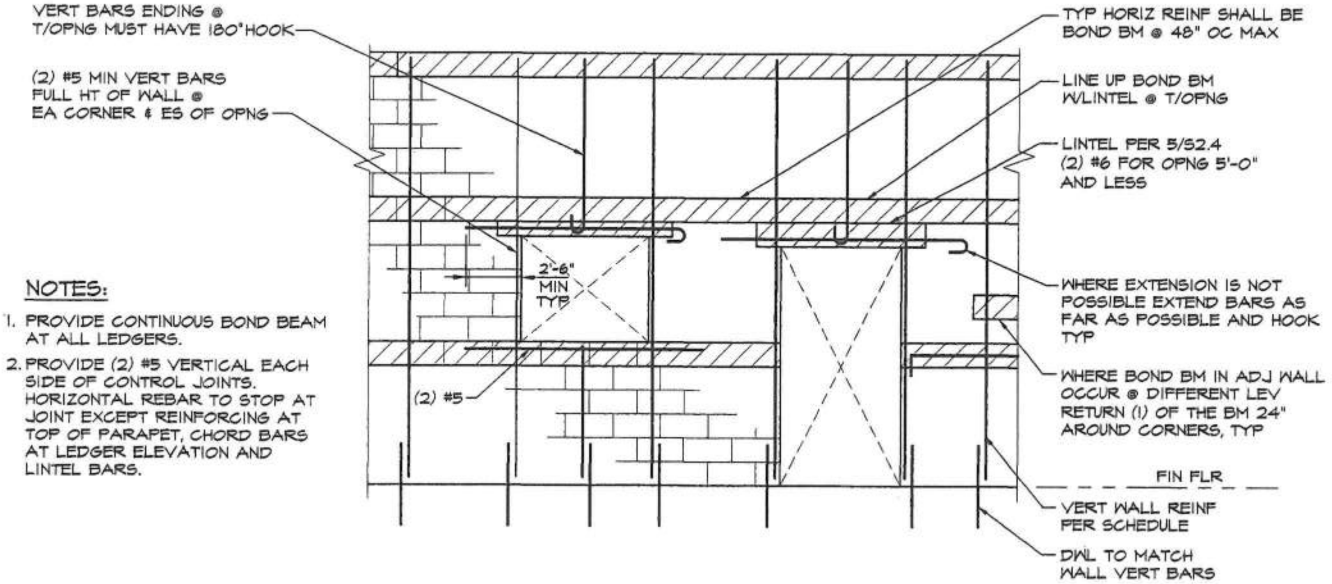


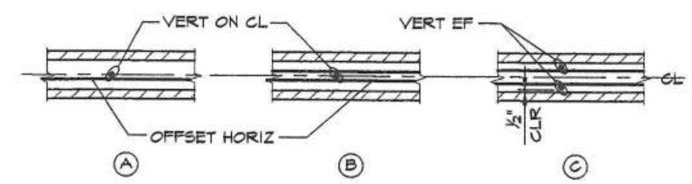
NOTES:

1. PROVIDE CONTINUOUS BOND BEAM AT ALL LEDGERS.
2. PROVIDE (2) #5 VERTICAL EACH SIDE OF CONTROL JOINTS. HORIZONTAL REBAR TO STOP AT JOINT EXCEPT REINFORCING AT TOP OF PARAPET, CHORD BARS AT LEDGER ELEVATION AND LINTEL BARS.

MINIMUM REINFORCING AT CMU WALL OPENINGS 2

NTS

CMU REINFORCING SCHEDULE						
NOMINAL WALL THICKNESS	BOND BM REINF		VERTICAL REINF		BAR LOC TYPE	MAX WALL HEIGHT
	NUMBER & SIZE	LAP LENGTH	#/SIZE/SPC	LAP LENGTH		
8"	(1) #6	3'-0"	#6 @ 48"	3'-0"	Ⓐ	9'-0"



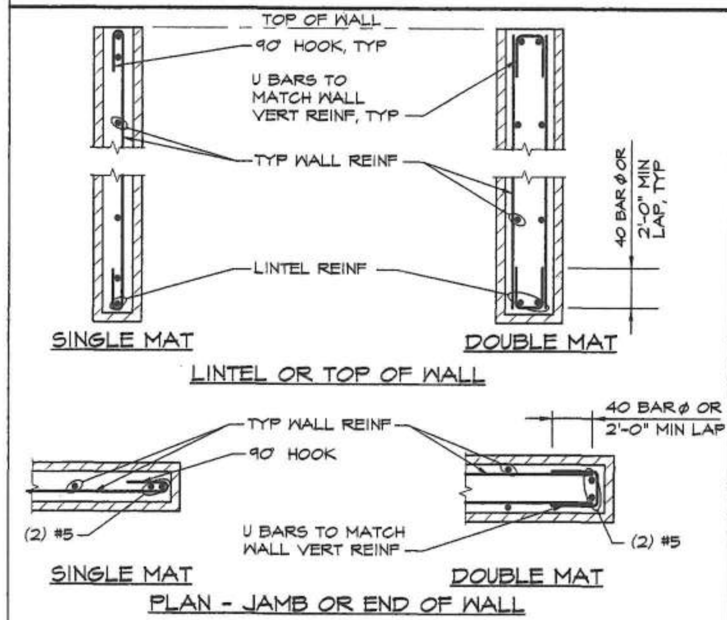
BAR LOCATION TYPES

NOTES:

1. BOND BEAM REINFORCING ABOVE AND BELOW OPENINGS SHALL BE CONTINUOUS (UNSPLICED) AND EXTENDED 2'-0" MINIMUM BEYOND OPENING.
2. WHERE BOND BEAM DOES NOT ALIGN WITH TOP OR BOTTOM OF OPENINGS, ADD A BOND BEAM COURSE EXTENDING 2'-0" BEYOND THE OPENING.
3. LOCATE SCHEDULED BARS FROM TABLE EACH SIDE OF EACH OPENING, EACH CORNER, AND WALL ENDS.
4. BOND BEAM BARS MAY BE USED TO ARRIVE AT TOTAL STEEL AREA REQUIRED BY REINFORCING SCHEDULE.
5. GROUT ALL CELLS THAT CONTAIN REINFORCEMENT OR EMBEDDED ITEMS.

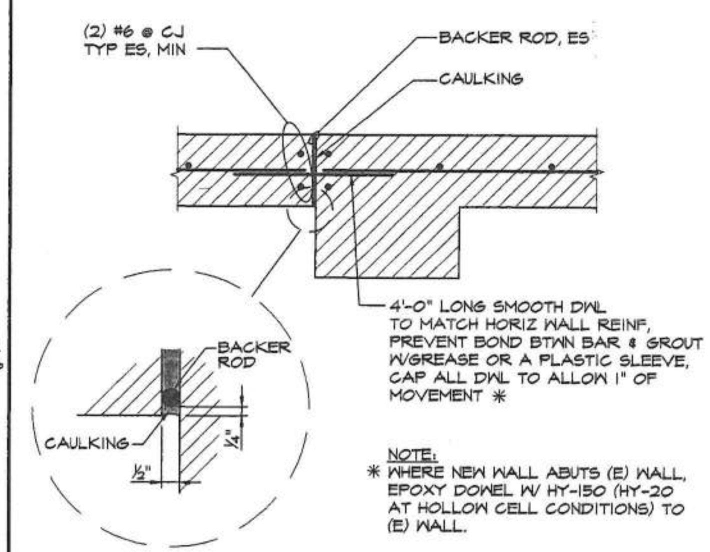
TYPICAL CMU LOAD BEARING WALL REINFORCEMENT SCHEDULE AND NOTES 4

1"=1'-0"



TYPICAL CMU WALL DETAILS 5

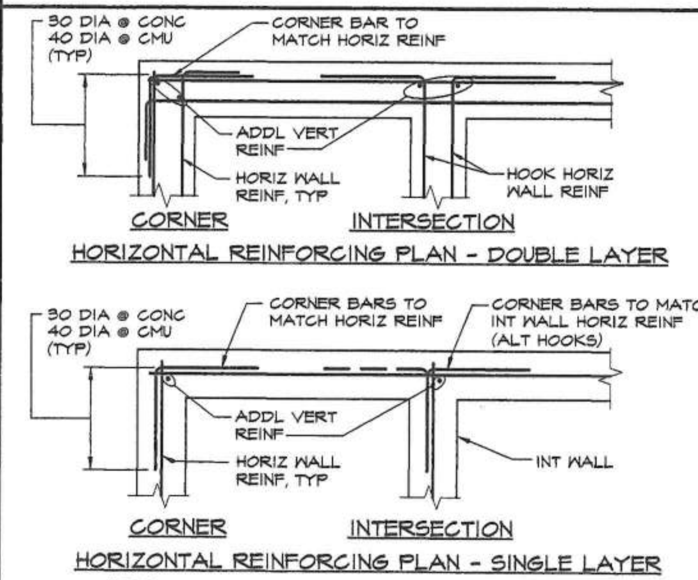
NTS



NOTE:
* WHERE NEW WALL ABUTS (E) WALL, EPOXY DOWEL W/ HY-150 (HY-20 AT HOLLOW CELL CONDITIONS) TO (E) WALL.

TYPICAL CMU CONTROL JOINT DETAIL 6

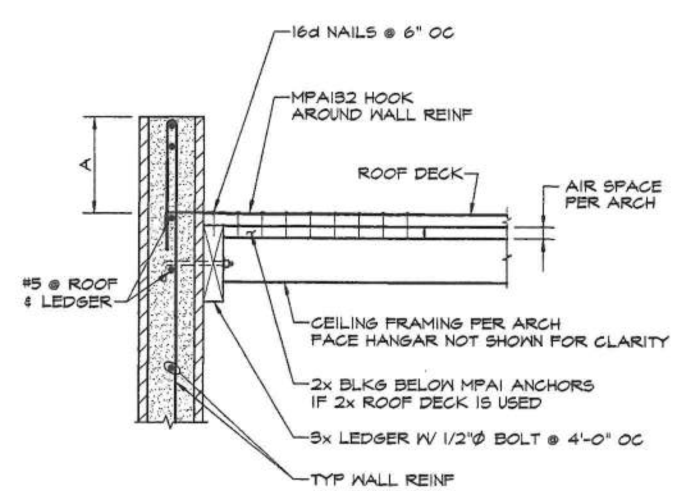
NTS



NOTE:
1. THIS DETAIL IS FOR BOTH CONCRETE AND CMU REINFORCING.

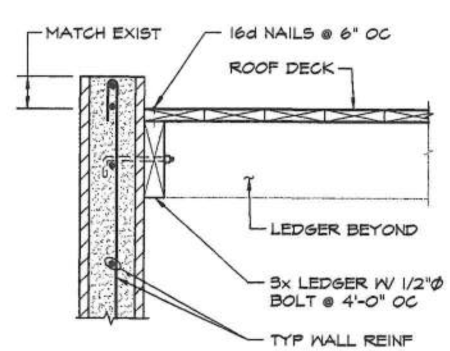
TYPICAL CORNER REINFORCING DETAIL 7

NTS



DETAIL 9

1 1/2"=1'-0"



DETAIL 10

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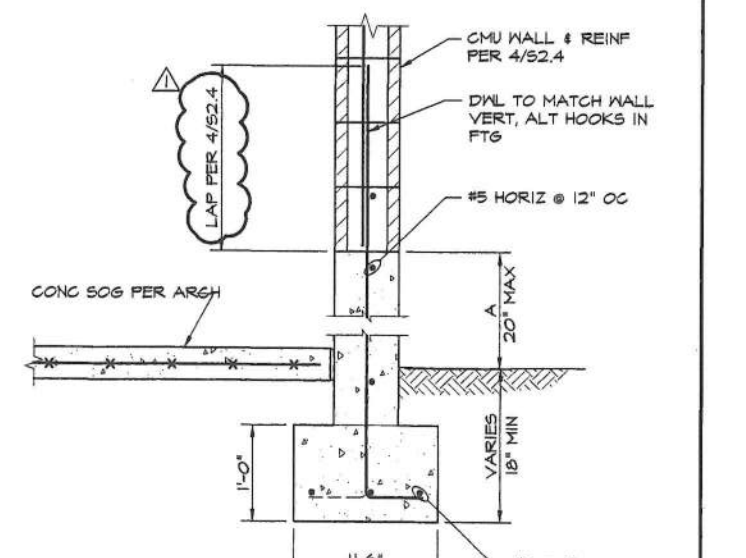

FOOTING AT WALL SECTION 11

1"=1'-0"

08/30/2002 11:13 am

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1	8/13/02	PEF

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STATE OF WASH
30580
REGISTERED
PROFESSIONAL

EXPIRES 6/2

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CONTENTS:
CMU DETAILS

SCALE: AS NOT
DRAWN: GPM
CHECKED: KKY
PROJECT NO: 26-01-0
VIEW: PLOTd
SHEET:

S2

SOUND TRAP (ATTENUATOR) SCHEDULE

MARK	UNIT SERVES	LOCATION	CFM	MAX. PRESS. DROP (IN. WG)	SIZE WxHxL INCHES	ATTENUATION @ 1000 FPM OCTAVE BAND 1	2	3	4	5	6	7	8	REMARKS	MANUFACTURER & MODEL NO. (2)
ST-1	SUPPLY AIR	ROOF	1200	0.15	16x14x84	8	18	28	41	48	42	39	35	(1)	VIBRO-ACOUSTICS RED-MV-F8
ST-2	RETURN AIR	ROOF	1200	0.13	20x12x84	10	19	27	42	50	46	35	27	(1)	VIBRO-ACOUSTICS RED-MV-F9

NOTE:
(1) 22 GAUGE GALVANIZED STEEL CASING.
(2) BOTH SOUNDTRAPS ARE RECTANGULAR ELBOW DISSIPATIVE TYPE. (FULL 90 DEGREE).

FILENAME: 810-2-Sound trap

AIR CONDITIONING UNIT SCHEDULE

MARK	UNIT SERVES	LOCATION	FAN NO.	FAN RPM	FAN BHP	FAN CFM	FAN ESP (IN. WG)	UNIT COOLING COOLING CAP. (MBH) TOTAL	UNIT COOLING COOLING CAP. (MBH) SENSIBLE	HEATING HEATING CAPACITY (MBH)	ELECTRICAL V	ELECTRICAL PH	REMARKS	MANUFACTURER & MODEL NO.	OPER. WEIGHT (LBS)
ACU-1	STUDIO	ROOF	1	1201	0.61	1200	1.1	31.0	29.7	32.0	230	1	(1), (2), (3), (4), (5), (6)	CARRIER 48HJD004	750

NOTES:
(1) FACTORY 24/7 ELECTRONIC PROGRAMMABLE WALL MOUNTED THERMOSTAT. SETPOINTS ARE:
240 CFM MINUMUM OUTSIDE AIR, 70° F FOR HEATING AND 78° F FOR COOLING.
(2) 14-INCH HIGH FACTORY ROOF CURB, FULLY MODULATING ECONOMIZER HOOD WITH 100% BAROMETRIC RELIEF DAMPERS.
(3) GAS HEAT/ELECTRIC COOLING.
(4) STANDARD MOTOR, ADJUSTABLE BELT DRIVE, FIELD SUPPLIED DRIVE.
(5) NATURAL GAS INPUT = 72.0 MBH. SEER = 13.0. EER = 11.20.
(6) UNIT FAN MOTOR TO BE INTERNALLY ISOLATED

FILENAME: 810-104

GRILLE, REGISTER & DIFFUSER SCHEDULE

ITEM	FACE NOMINAL	NECK SIZE INCHES	CONNECTED DUCT SIZE INCHES	MAX AIRFLOW CFM	NC	ESP IN. W.G.	THROW FT.	DESCRIPTION	MANUFACTURER & MODEL NO.
CD	24x24	10	10	290	–	0.02	3-5-10	STEEL CONSTRUCTION, SQUARE FACE WITH	TITUS OMNI
								ROUND NECK. FACE OF DIFFUSER TO BE	
								FLUSH WITH BOTTOM OF BEAM.	
SR	6x6 (4)	6x6	6x6	70	–	0.02	4-6-11	DOUBLE DEFLECTION, FRONT BLADES	TITUS 272RL
								PARALLEL TO LONG DIMENSION, WHITE	
								FINISH, 0.75" BLADE SPACING.	
	12x8 (4)	12x8	12x8	200	–	0.02	4-6-11		
CG	6x6 (4)	–	(5)	50	10	0.03	–	ALUMINUM, 1/2 BLADE SPACING, 45 DEGREE	TITUS 4-FL
								BLADE DEFLECTION, BAKED ENAMELED	
	10x6 (4)	–	(5)	75	10	0.01	–	FINISH, BLADES PARALLEL TO LONG	
								DIMENSION.	
	24x14 (4)	–	(5)	315	10	0.01	–		
	42x12 (4)	(6)	(5)	375	12	0.01	–		

FILENAME: Air Terminal

NOTES:
(1) COORDINATE LOCATIONS WITH ARCHITECTURAL CEILING PLAN FOR LOCATIONS AND CEILING TYPE.
(2) THROW VALUES ARE BASED ON ISOTHERMAL AIR AND VELOCITIES OF 50 AND 150 FPM.
(3) NC VALUES ARE BASED ON ROOM ATTENUATION OF 10dB RE:12 - 12 WATTS.
(4) DUCT SIZE PLUS 1-1/4".
(5) SIZE NOTED ON PLANS.
(6) PROVIDE OPPOSED BLADE DAMPER.

EXHAUST FAN SCHEDULE

MARK	UNIT SERVES	LOCATION	CFM	T.S.P. (IN. W.G.)	FAN RPM	MOTOR AMPS	MOTOR VOLT	MOTOR PH	DRIVE TYPE	REMARKS	MANUFACTURER & MODEL NO.
EF-1	ADA BATHROOM	CEILING	150	0.25	1400	1.3	120	1	DIRECT	(1), (2)	GREENHECK SP-218

FILENAME: 800-2

NOTES
(1) PROVIDE FACTORY BACKDRAFT DAMPER, MODEL RCC-7 FACTORY FLAT ROOF CAP WITH CURB CAP AND BIRDSCREEN.
(2) INTERNAL RUBBER-IN-SHEAR VIBRATION ISOLATION, VERTICAL DISCHARGE

MECHANICAL LEGEND

GENERAL

SYMBOL	ABBREVIATION	DESCRIPTION
M-1		MECHANICAL SYMBOL
P-1		PLUMBING SYMBOL
		ITEM TO BE REMOVED

PIPING

SYMBOL	ABBREVIATION	DESCRIPTION
F	F	FIRE LINE
	CW	COLD WATER
	HW	HOT WATER
	W	WASTE
	V	VENT
	VTR	VENT THROUGH ROOF
	BV	BALL VALVE
	SA	SHOCK ARRESTOR

DUCTWORK

SINGLE LINE	DOUBLE LINE & ABBREV.	DESCRIPTION
		BRANCH TAKEOFF
		BRANCH TEE
S	CD	CEILING DIFFUSER (CFM. SUPPLY)
E	CG	RETURN GRILLE (OR REGISTER CFM, RETURN)
	TVE	TURNING VANE ELBOW
		90° TURNING VANE ELBOW, UP (SUPPLY)
		90° TURNING VANE ELBOW, UP (RETURN)
		90° TURNING VANE ELBOW, DOWN (SUPPLY)
		90° TURNING VANE ELBOW, DOWN (RETURN)
		TRANSITION (RECTANGULAR TO RECTANGULAR)
	VD	MANUAL VOLUME DAMPER
		LINED DUCT
		FLEXIBLE CONNECTION

NOTKIN ENGINEERING, INC.
4th & Vine Bldg.
2601 4th Ave., Suite 420
Seattle, WA 98121
OFF: 206/448-1911
WWW.NOTKIN.COM
CONTACT: LARRY SWARTZ, P.E.

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ISSUE DATE: SEPTEM
PERMIT

MARK	DATE	

PROJECT NC

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PROFESSIONA
EXPIRES 7-11

CONTENTS:
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SCALE: NONE
DRAWN: CBA
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PROJECT NO: 2000
VIEW:
SHEET:
M

END & SCHEDULES
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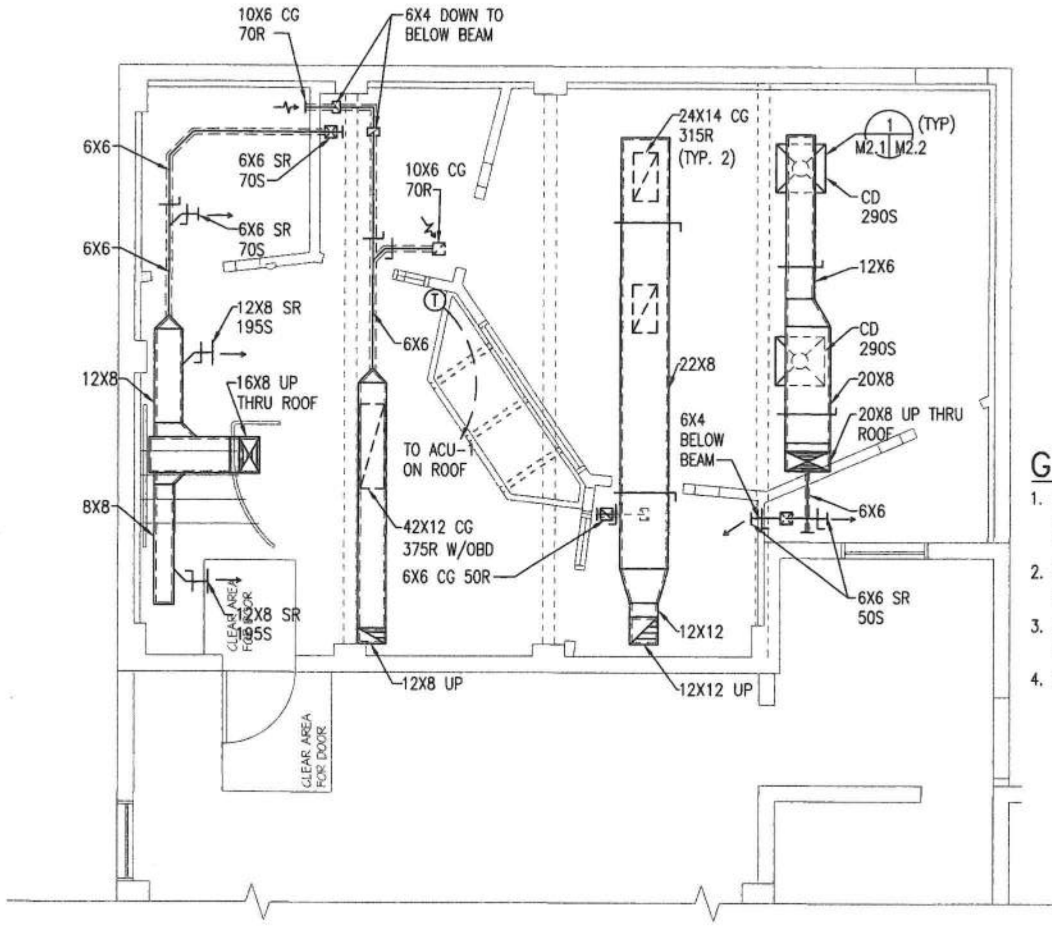
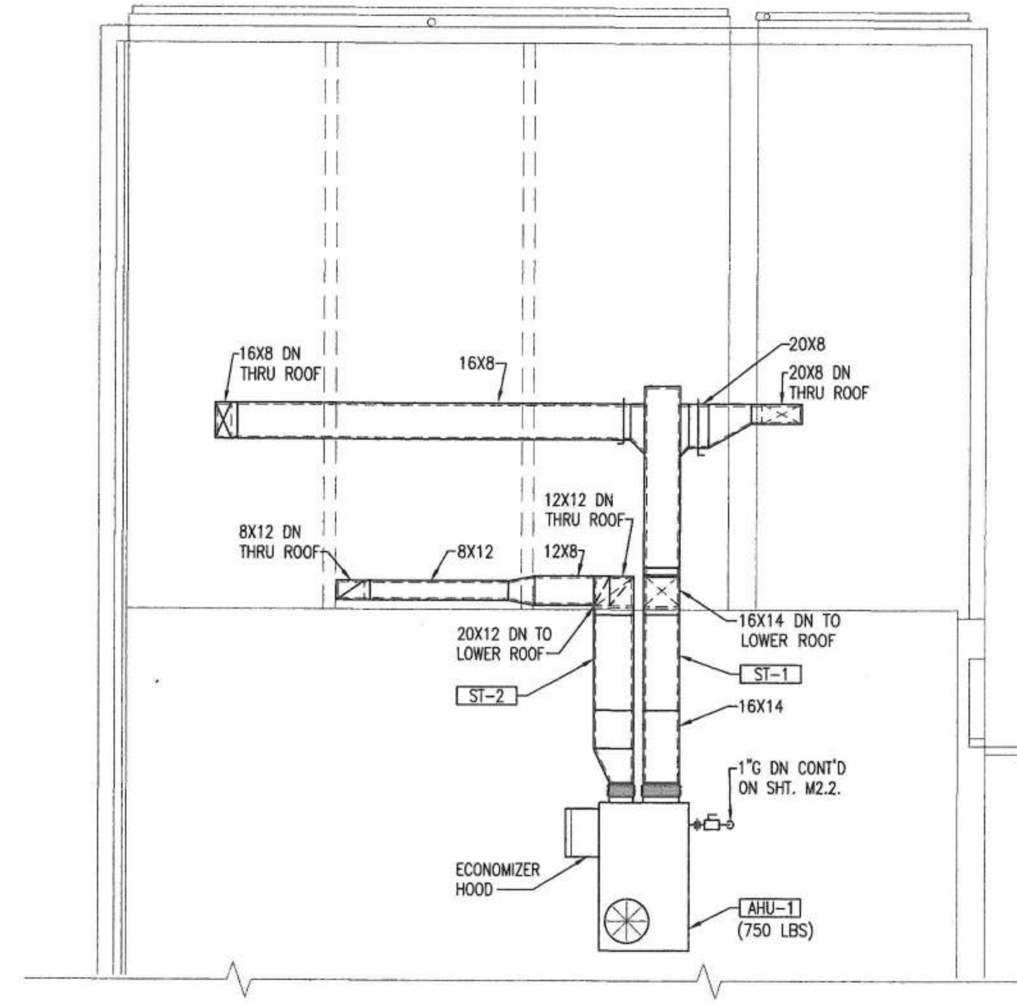


PARTIAL FLOOR PLAN–HVAC
SCALE: 1/4"= 1'-0"

GENERAL NOTES:

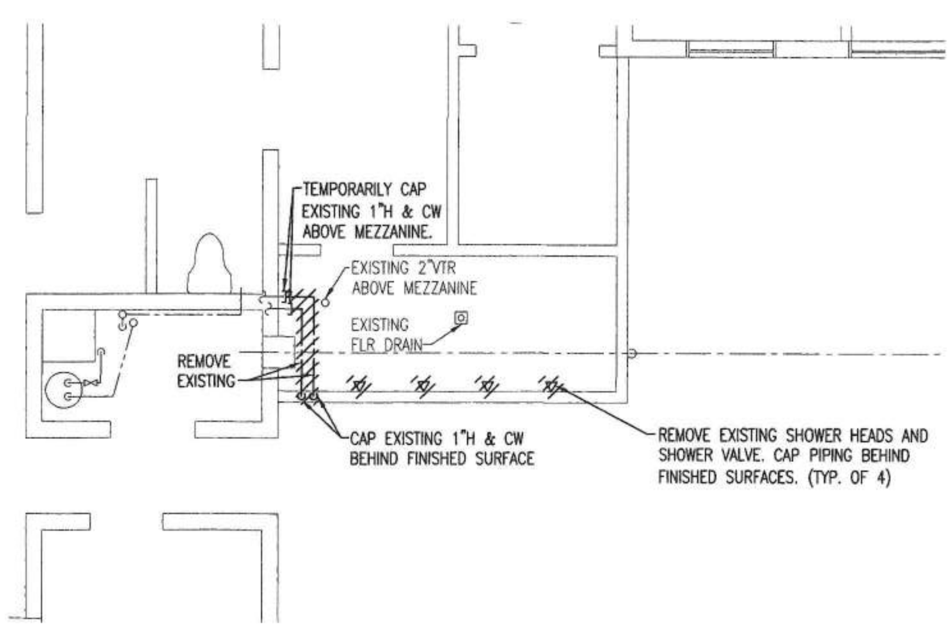
1. MODIFY EXISTING FIRE SPRINKLER PIPING & ASSOCIATED HEADS TO ACCOMMODATE NEW WALL CONFIGURATIONS.
2. HOLD DUCTWORK HIGH AS POSSIBLE TO STRUCTURE ABOVE.
3. SEAL ALL DUCT PENETRATIONS THROUGH WALLS AIR TIGHT.
4. SOUNDLINE ALL SUPPLY AND RETURN AIR DUCTWORK.



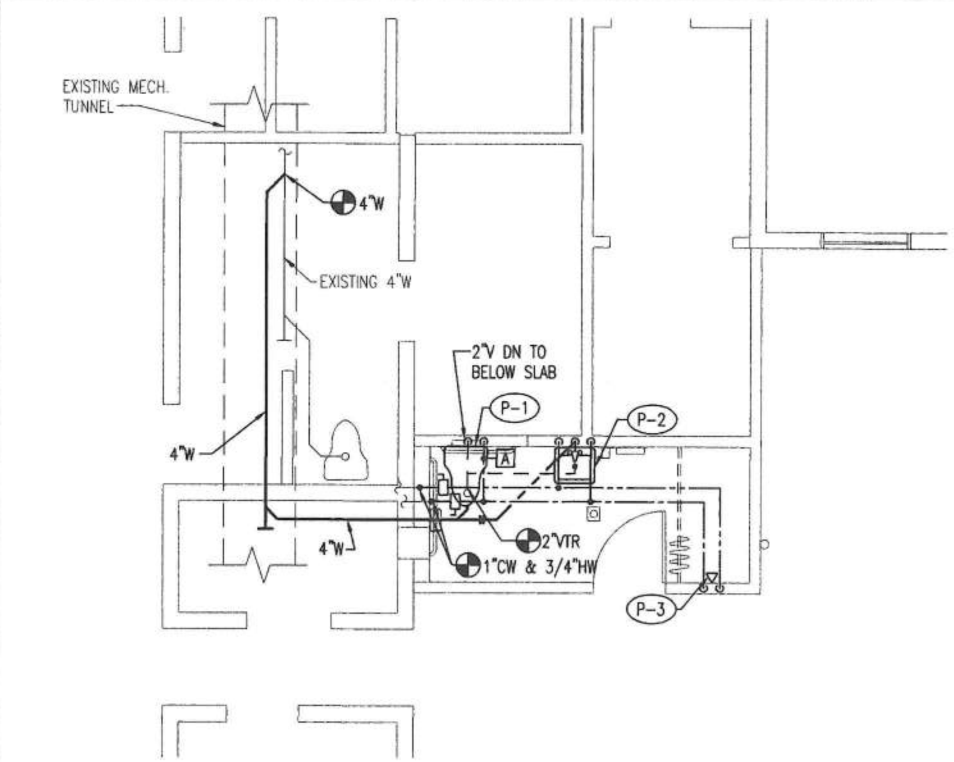
PARTIAL ROOF PLAN–HVAC
SCALE: 1/4"= 1'-0"

GENERAL NOTES:

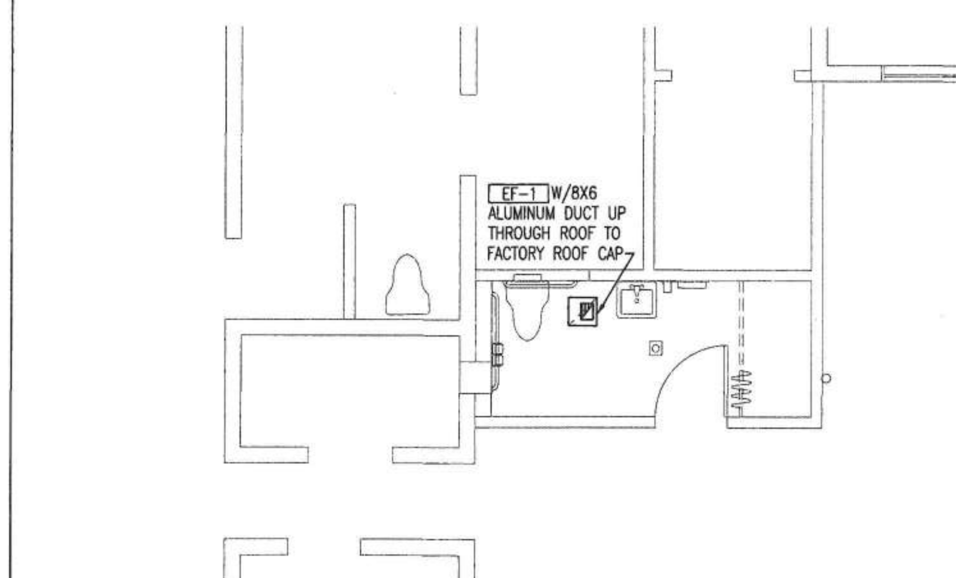
1. ALL SUPPLY & RETURN AIR DUCTWORK LOCATED OUTSIDE THE BUILDING ENVELOPE SHALL BE SOUNDLINED TO MEET THE WASHINGTON STATE ENERGY CODE OF INSULATION VALUE OF R-7.
2. THE NEW AIR CONDITIONING SYSTEM SHALL BE COMMISSIONED PER WASHINGTON STATE ENERGY CODE CHAPTER 14 "SIMPLE SYSTEM".



PARTIAL FLOOR PLAN–PLUMBING DEMOLITION
SCALE: 1/4"= 1'-0"



PARTIAL FLOOR PLAN–PLUMBING
SCALE: 1/4"= 1'-0"



PARTIAL FLOOR PLAN–MECHANICAL
SCALE: 1/4"= 1'-0"

1/4" = 1'-0"
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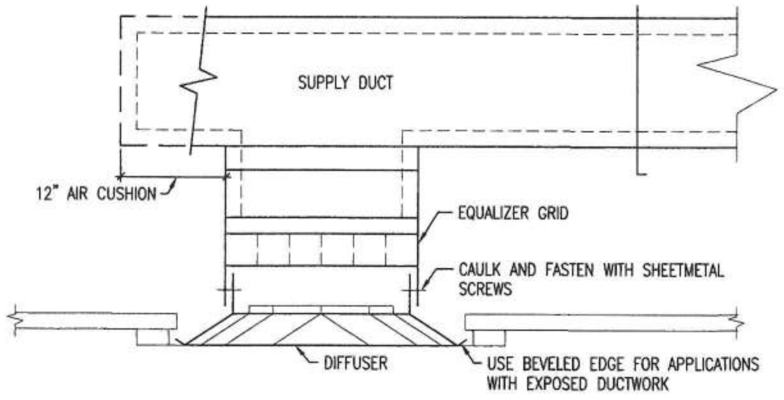
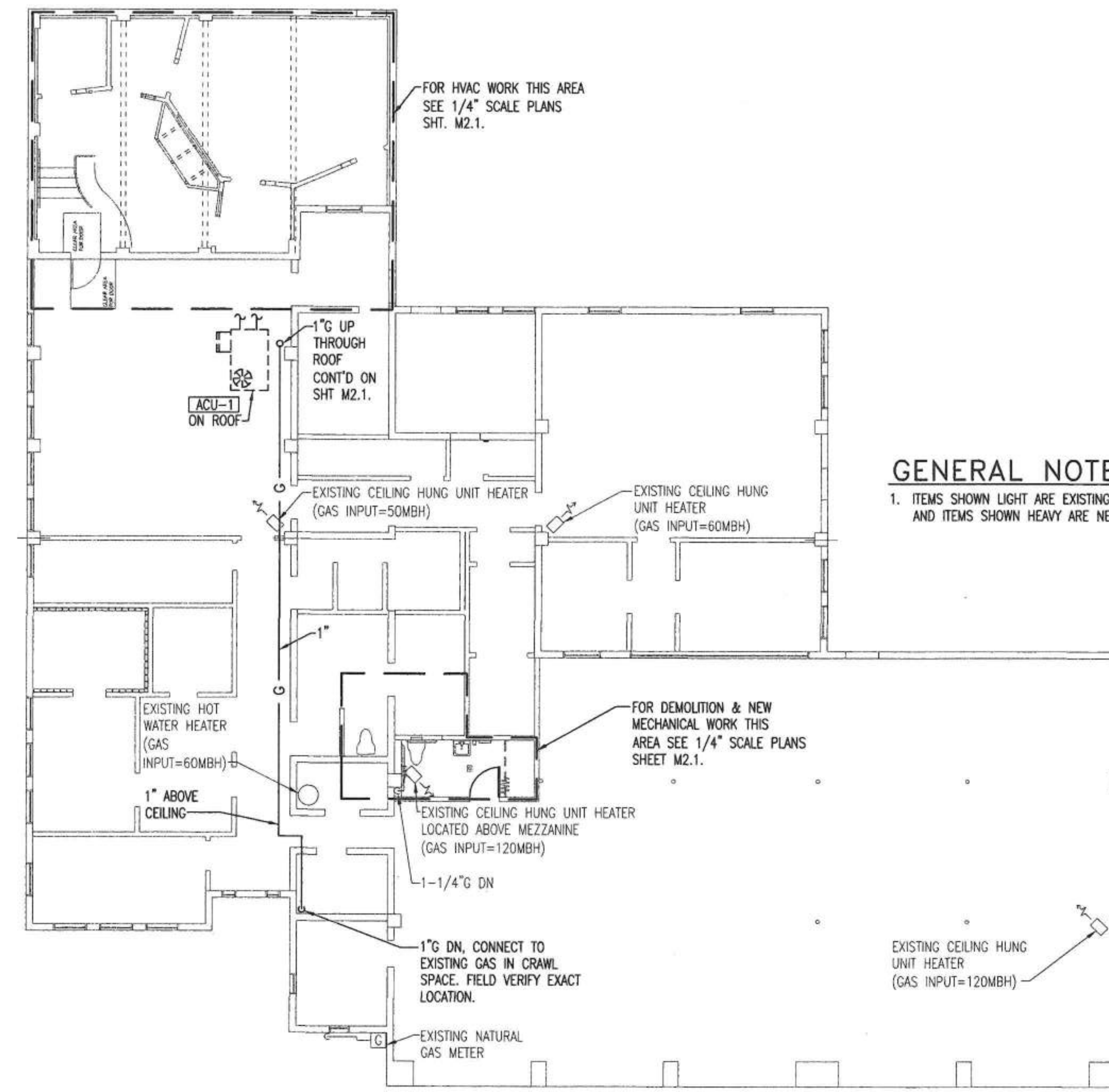


1 M2.1 M2.2 DIFFUSER INSTALLATION DETAIL
SCALE: NONE
15810-22

PLUMBING FIXTURE SCHEDULE

MARK	ITEM	MFR/ MODEL	DESCRIPTION	COLD WATER (IN)	HOT WATER (IN)	WASTE (IN)	VENT (IN)
P-1	WATER CLOSET	KOHLER 4302	FLOOR SET, VITREOUS CHINA, ELONGATED BOWL, 1-1/2" TOP SPUD, SIPHON JET ACTION, 1.6 GPF.	1	–	4	2
	FLUSH VALVE	SLOAN REGAL 113-1.6	WATER SAVER FLUSH VALVE, CHROME PLATED, SCREWDRIVER STOP, INTEGRAL VACUUM BREAKER, 1.6 GPF.				
	SEAT	BEMIS L1955C	SOLID PLASTIC, OPEN FRONT,STAINLESS STEEL HINGE WITH CHECK, HEAVY DUTY MOLTEX COMMERCIAL HIGH IMPACT, 2" LIFT SEAT.				
P-2	LAVATORY	KOHLER K-2005	WALL HUNG, VITREOUS CHINA, 21" x 18" WITH BACKSPLASH, CONCEALED ARM, 4" CENTERS.	1/2	1/2	1-1/4	1-1/4
	FAUCET	CHICAGO 2200-4VPP-E12	SINGLE LEVER, DECK MOUNTED, CHROME PLATED, 4" VANDAL RESISTANT COVER PLATE, SOFTFLO OUTLET, INTEGRAL WATER HAMMER ARRESTOR.				
	DRAIN	CHICAGO 337	1-1/4" CHROME OFF-SET TAILPIECE, NON-REMOVABLE GRID STRAINER.				
	TRAP WRAP	TRUEBRO 103	ONE P-TRAP COVER, TWO ANGLE VALVE COVERS, TWO SUPPLY TUBE COVERS, ONE 5" OFFSET TAILPIECE WHEELCHAIR STRAINER COVER.				
P-3	SHOWER TRIM	CHICAGO 1762VOC-151	PRESSURE BALANCING SHOWER VALVE, 1/2" IPS FEMALE INLET AND OUTLET, CHROME PLATED, HAND HELD SHOWER FITTING, 24" SLIDE BAR, 60" CHROME PLATED HOSE, IN-LINE VACUUM BREAKER.	1/2	1/2	–	–



GENERAL NOTE:

1. ITEMS SHOWN LIGHT ARE EXISTING TO REMAIN AND ITEMS SHOWN HEAVY ARE NEW.

N MECHANICAL FLOOR PLAN
SCALE: 1/8"= 1'-0"

1/8" = 1'-0"
0 4 8 16 24

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LIGHTING FIXTURE SCHEDULE

A — Single circuit light track, 2' length, with PAR20 "Mini Parlight" fixture heads with single circuit track adaptors. Track, fixtures and accessories black color. Times Square basic single circuit track with #SB20 fixtures and 50 watt PAR20/NFL lamps.
Provide 24 fixture heads total.
Provide accessories: 24 total color frames, #SB20CF, and 6 total barndoors, #M2BD4.

B — Aisle light recessed flush in wall, with one 13 watt compact fluorescent lamp. Vertical orientation with horizontal louver openings. Coordinate with other trades for suitable installation in curved wall, resulting appearance to meet Architect's approval.
C.W. Cole #F2156V-HPF-BLK.

C — Surface ceiling mounted 6" x 13" diameter cylinder fluorescent fixture with matte white baked enamel finish, and two 18 watt compact fluorescent lamps. Kurt Versen #P601.

ELBU — Wall mounted emergency lighting battery unit with sealed lead calcium battery, black color, and two 5.4 watt lamp heads.
Chloride #S 12L T6 B.

X — Wall mount LED thermoplastic exit sign with black stencil face and housing, and integral NICAD emergency battery. Provide lettering color as required by Authority Having Jurisdiction. Bottom of fixture 1" above door frame.
Chloride #E (R or G) B-B.

LIGHTING FIXTURE NOTES:

L-1. Refer to architectural drawings for ceiling type and exact location of fixtures. (Verify dimensions shown on E2-1 in Light Track Locations schedule and light track orientations shown on E2-1 plan with Architect prior to installation.) Refer to electrical plans for fixture quantities and types. Fixture colors and finishes as selected by Architect from manufacturer's full range of standard options. Where colors are listed in the schedule, confirm with Arcitect prior to manufacture.

L-2. Aiming of light track fixtures, and installation of color frames and barndoors, by Owner.

L-3. Provide ballasts to match voltage of circuit on which each fixture is installed. All ballasts electronic high power factor.

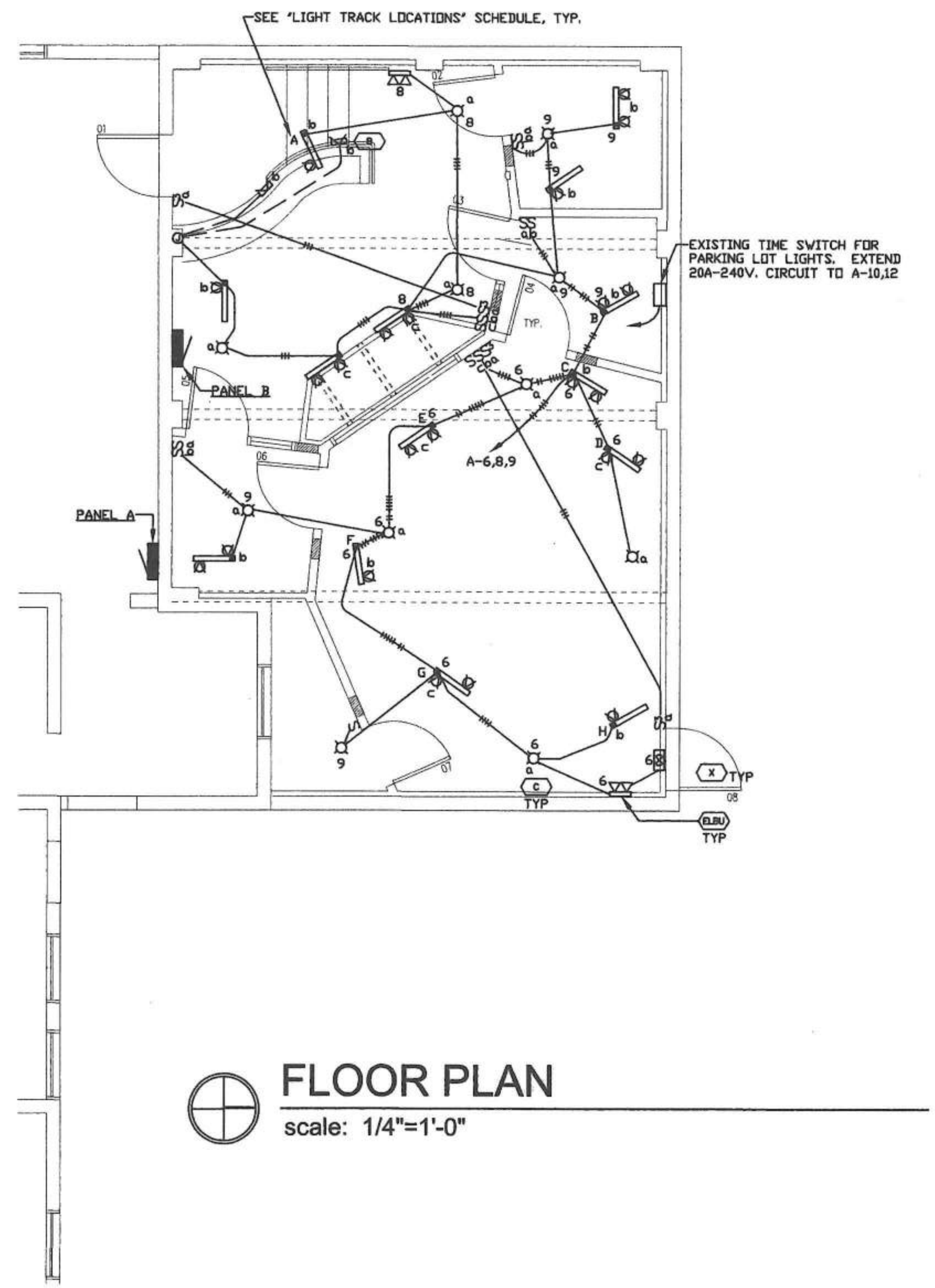
L-4. Identify fixtures not approved for through wiring, and provide adjacent junction box in location acceptable to Architect, or other wiring arrangement as needed. Wiring layout shown on plans is diagrammatic.

L-5. Comply with Washington State Energy Code paragraph 1513.1: Lighting controls to be located in same space as lights controlled; provide controls to turn off all lights.

L-6. Comply with Washington State Energy Code paragraph 1513.2: No switch or dimmer to control more than 1920 watts.

L-7. Fixture wattages (including ballasts) are:

	Watts	Va
A	50/LF	150/2LF
B	17	18
C	38	39



FLOOR PLAN
scale: 1/4"=1'-0"

LEGEND

—///•—	1/2" CONDUIT, NUMBER OF MARKS SHOWS NUMBER OF #12 WIRES. NO MARKS=2#12, DOT INDICATES #10 ISOLATED GROUND WIRE.
—FA—	FIRE ALARM SYSTEM WIRING
	SURFACE CEILING LIGHT FIXTURE
	LIGHT TRACK, 24" LENGTH, QUANTITY OF FIXTURES AS SHOWN
	AISLE LIGHT, RECESSED
	EXIT SIGN
	EMERGENCY LIGHTING BATTERY UNIT
XX	LIGHTING FIXTURE TYPE DESIGNATOR, SEE LIGHT FIXTURE SCHEDULE
S_a	WALL SWITCH, 1-POLE, 48" AFF, SUBSCRIPT INDICATES LIGHTS CONTROLLED
S^3	WALL SWITCH, 3-WAY, 48" AFF
S^{FD}	FAN-DELAY SWITCH, 48" AFF
	DUPLEX RECEPTACLE
IG	DOUBLE DUPLEX RECEPTACLE, ISOLATED GROUND
WP GFI	DUPLEX RECEPTACLE, WEATHERPROOF, GFI
	JUNCTION BOX
	MOTOR OUTLET
	EQUIPMENT CONNECTION
	DISCONNECT SWITCH
	FIRE ALARM PULL STATION, HEIGHT PER A.D.A., 48" AFF TO TOP
	SMOKE DETECTOR
	FIRE ALARM HORN WITH ADA STROBE, HEIGHT PER A.D.A., 6'-8" AFF OR 6"BELOW CEILING, WHICH EVER IS LOWER
	FIRE ALARM STROBE, HEIGHT PER A.D.A., 6'-8" AFF OR 6"BELOW CEILING, WHICH EVER IS LOWER
	TELEPHONE OUTLET - ROUGH-IN ONLY - 18" AFF, 4" SQUARE BOX, 1-GANG RING, BLANK PLATE

ABBREVIATIONS

AFF	ABOVE FINISH FLOOR
CCT	CIRCUIT
C.O.	CONDUIT ONLY
DIST'N	DISTRIBUTION
EXIST.	EXISTING
FUT.	FUTURE
IG	ISOLATED GROUND
J-BOX	JUNCTION BOX
MIN.	MINIMUM
PSE	PUGET SOUND ENERGY

LIGHT TRACK LOCATIONS

OUTLET BOX DISTANCE FROM EAST AND SOUTH WALLS

FIXTURE	NORTH (FT)	WEST (FT)
A	32	17.5
B	23.5	3
C	20.5	4.5
D	17	3
E	18	11
F	12	15
G	6	11
H	3.5	2.5

NOTES:

1. CONCEAL CONDUIT ABOVE CEILING AND IN NEW AND NEWLY FURRED WALLS. EXPOSED EMT PERMITTED WHERE EXISTING WALL FINISHES REMAIN.
2. ISOLATED GROUND CONDUCTORS: #10.
3. REMOVE EXISTING WIRE, DEVICES, AND EXPOSED BOXES AND CONDUIT NOT REQUIRED FOR NEW INSTALLATION.

ELECTRICAL DRAWING INDEX

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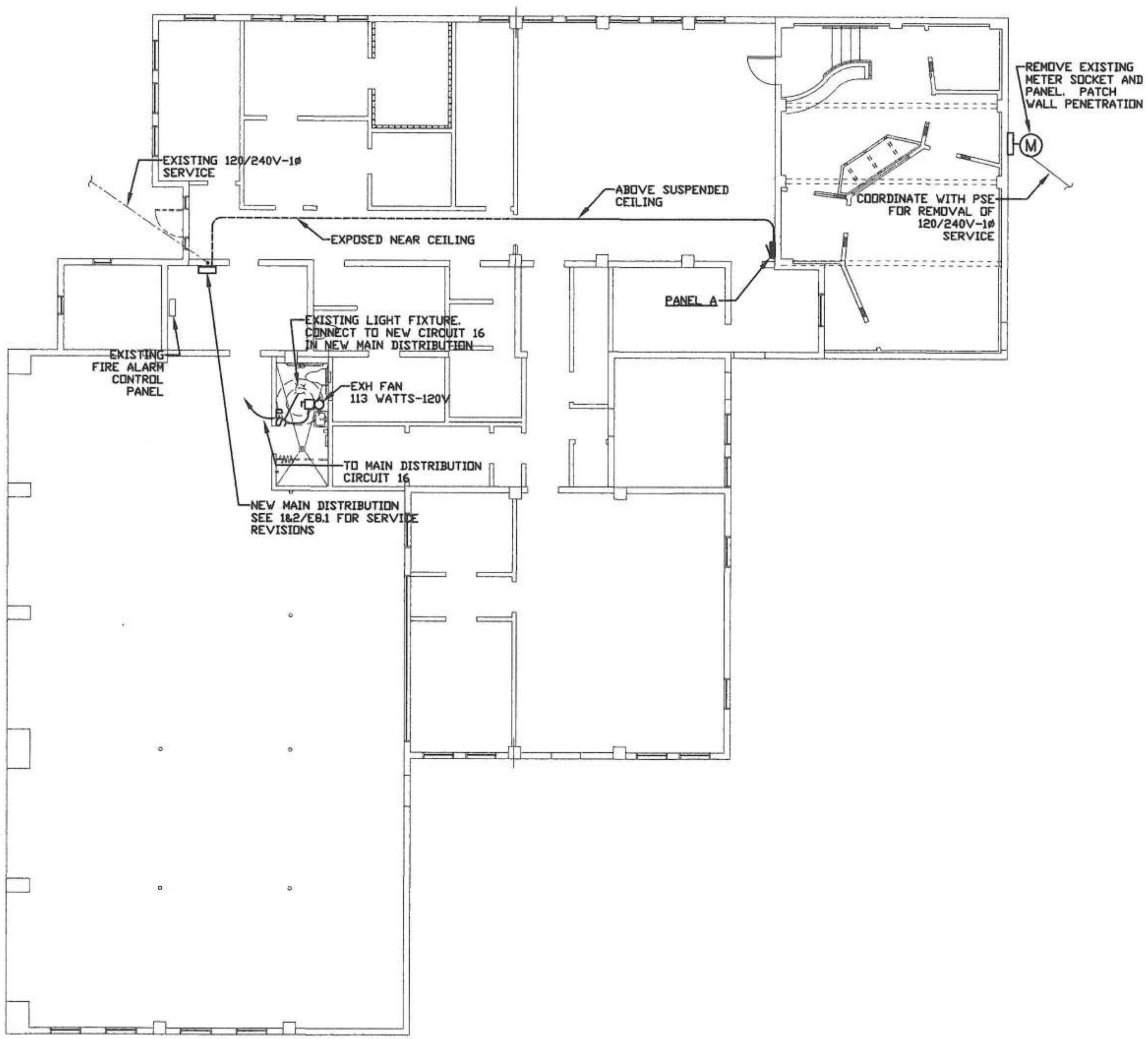

BUILDING PLAN

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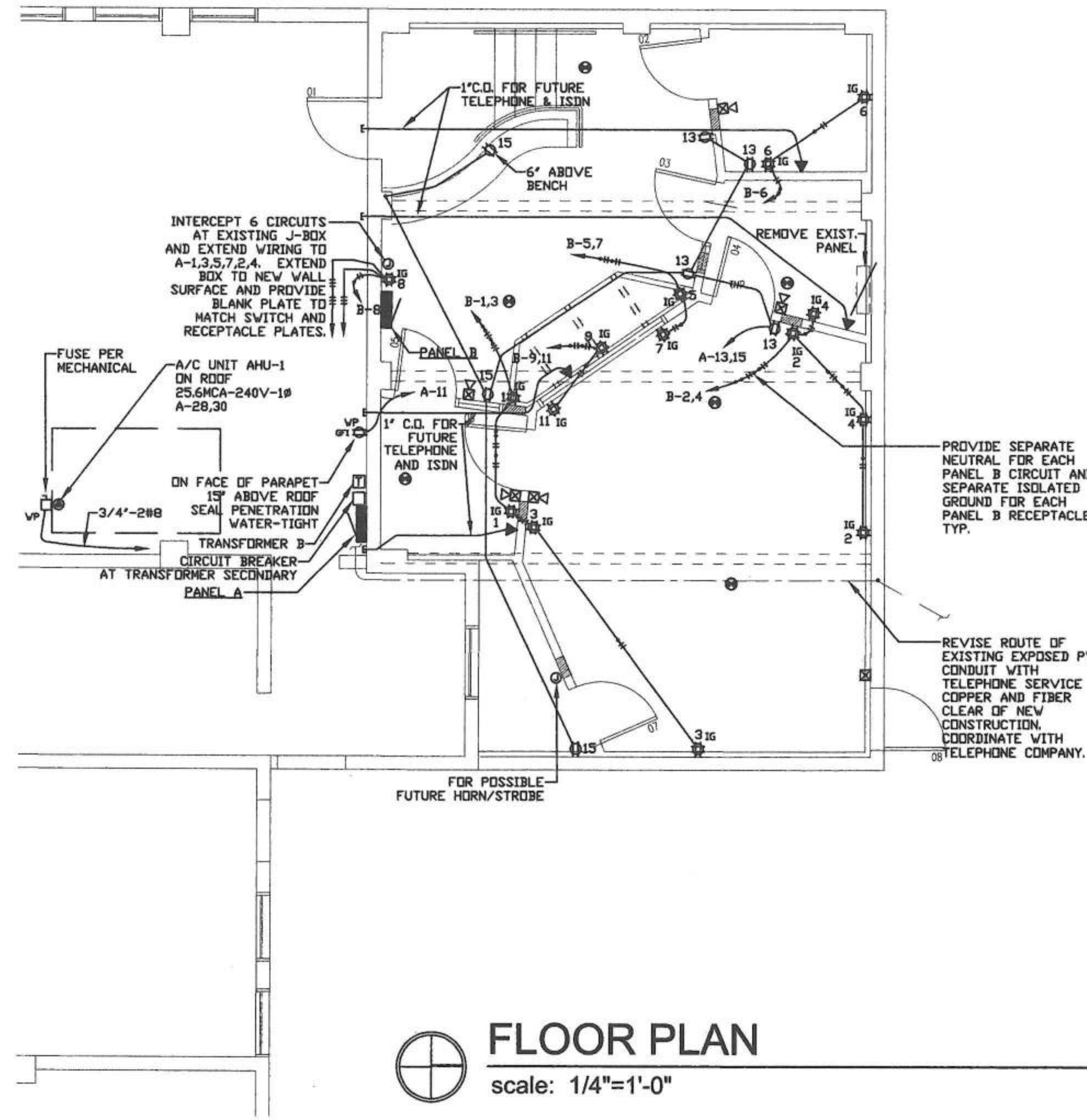

FLOOR PLAN

scale: 1/4"=1'-0"

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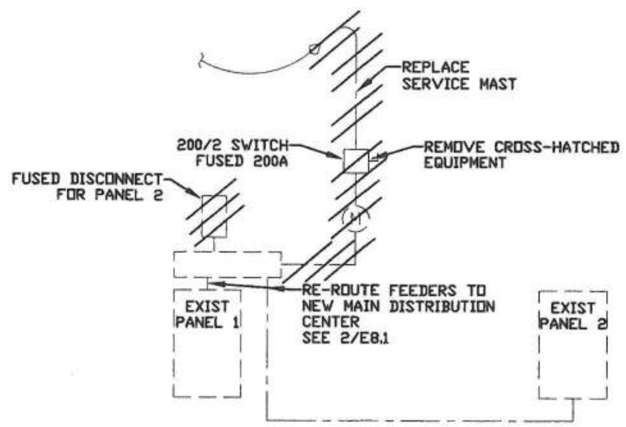
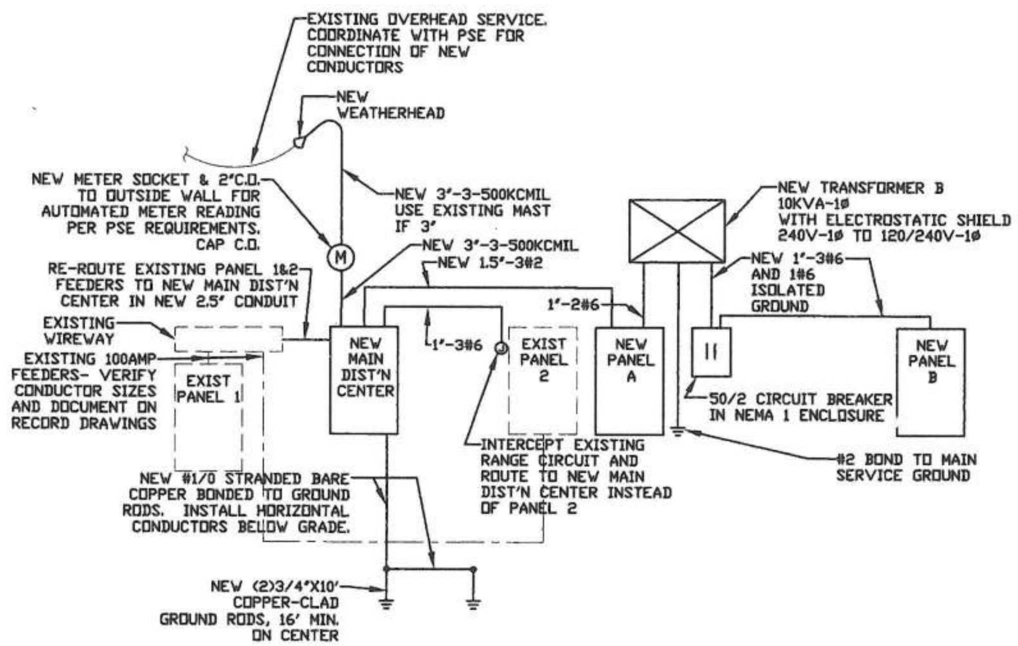
E3



1 E8.1 POWER DISTRIBUTION DIAGRAM - EXISTING CONDITIONS

NOT TO SCALE



2 E8.1 POWER DISTRIBUTION DIAGRAM - NEW WORK

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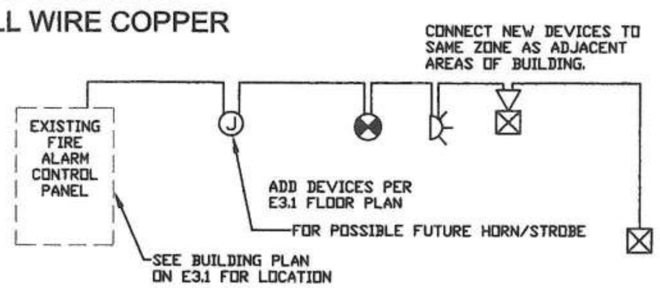
ALL WIRE COPPER



3 E8.1 FIRE ALARM SYSTEM DIAGRAM

NOT TO SCALE

PANEL SCHEDULE

DESIGNATION:	NEW MAIN DISTRIBUTION CENTER			VOLTAGE:	240 /120 V	1 PHASE -- 3 WIRE	
#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA	#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA
1	100/2	EXISTING PANEL 1	18500	2	50/2	EXISTING RANGE	8000
3	|		0	4	|		0
5	100/2	EXISTING PANEL 2	20218	6	100/2	NEW PANEL A	18825
7	|		0	8	|		0
9	100/2	SPACE ONLY	0	10	100/2	SPACE ONLY	0
11	|		0	12	|		0
13	100/2	SPACE ONLY	0	14	20/1	SPARE	0
15	|		0	16	"	LIGHT AND EXHAUST FAN	213

LOCATION:	Main electric room	KVA:	CONNECTED	DEMAND %	DEMAND
		LIGHTING	16.2	125	20.2
FED FROM:	Service	EXTERIOR LTG		100	0.0
		RECEPTACLES	11.6	100&50	10.8
RATING:	400 AMPS [X] 2-P MAIN CCT BRKR	LARGEST MOTOR	6.5	125	8.1
	[ ] MAIN LUGS ONLY	OTHER MOTORS	1.1	100	1.1
	10K A.I.C. MINIMUM	HEATING	15.0	100	15.0
		KITCHEN EQUIP	9.6	100	9.6
MOUNTING:	[X] SURFACE MOUNTED	MISC CONTINUOUS	0.0	125	0.0
	[ ] FLUSH MOUNTED	MISC NON-CONTIN	5.7	100	5.7
Provide Service Entrance Label.		TOTAL KVA	65.8		70.6
		TOTAL AMPS	274		294

DESIGNATION:	NEW PANEL A			VOLTAGE:	240 /120 V	1 PHASE -- 3 WIRE	
#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA	#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA
1	20/1	EXIST. RECEPTACLE CCT	180	2	20/1	EXIST. RECEPTACLE CCT	180
3	"	"	360	4	"	"	180
5	"	EXIST LTG/RECEPT CCT	750	6	"	LIGHTS	1056
7	"	"	750	8	"	"	753
9	"	LIGHTS	756	10	20/2	EXIST PARKING LOT LTS	1200
11	"	RECEPTACLES	180	12	|		0
13	"	"	720	14	20/1	SPARE	0
15	"	"	540	16	"	"	0
17	"	SPACE ONLY	0	18	"	SPACE ONLY	0
19	"	"	0	20	"	"	0
21	"	"	0	22	"	"	0
23	"	"	0	24	"	"	0
25	"	"	0	26	"	"	0
27	50/2	NEW PANEL B	5220	28	35/2	A/C UNIT AHU-1	6000
29	|		0	30	|	"	0

LOCATION:	Exterior	KVA:	CONNECTED	DEMAND %	DEMAND
		LIGHTING	3.8	125	4.7
FED FROM:	Service	EXTERIOR LTG		100	0.0
		RECEPTACLES	3.8	100&50	3.8
RATING:	100 AMPS [ ] 2-P MAIN CCT BRKR	LARGEST MOTOR	6.0	125	7.5
	[X] MAIN LUGS ONLY	OTHER MOTORS	0.0	100	0.0
	10K A.I.C. MINIMUM	HEATING	0.0	100	0.0
		KITCHEN EQUIP	0.0	100	0.0
MOUNTING:	[X] SURFACE MOUNTED	MISC CONTINUOUS	0.0	125	0.0
	[ ] FLUSH MOUNTED	MISC NON-CONTIN	5.2	100	5.2
Provide HACR breaker at circuit A-28.30.		TOTAL KVA	18.8		21.3
		TOTAL AMPS	78		89

DESIGNATION:	NEW PANEL B			VOLTAGE:	240 /120 V	1 PHASE -- 3 WIRE	
#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA	#	BRKR	CIRCUIT DESCRIPTION	LOAD, VA
1	20/1	ISOLATED GRND REC	720	2	20/1	ISOLATED GRND REC	720
3	"	"	720	4	"	"	540
5	"	"	360	6	"	"	720
7	"	"	360	8	"	"	360
9	"	"	360	10	"	SPARE	0
11	"	"	360	12	"	"	0
13	"	SPACE ONLY	0	14	"	SPACE ONLY	0
15	"	"	0	16	"	"	0
17	"	"	0	18	"	"	0
19	"	"	0	20	"	"	0
21	"	"	0	22	"	"	0
23	"	"	0	24	"	"	0

LOCATION:	Control Room 002	KVA:	CONNECTED	DEMAND %	DEMAND
		LIGHTING	0.0	125	0.0
FED FROM:	Panel A	EXTERIOR LTG		100	0.0
		RECEPTACLES	0.0	100&50	0.0
RATING:	50 AMPS [ ] 2-P MAIN CCT BRKR	LARGEST MOTOR	0.0	125	0.0
	[X] MAIN LUGS ONLY	OTHER MOTORS	0.0	100	0.0
	10K A.I.C. MINIMUM	HEATING	0.0	100	0.0
		KITCHEN EQUIP	0.0	100	0.0
MOUNTING:	[X] SURFACE MOUNTED	MISC CONTINUOUS	0.0	125	0.0
	[ ] FLUSH MOUNTED	MISC NON-CONTIN	5.2	100	5.2
Provide isolated ground bus.		TOTAL KVA	5.2		5.2
		TOTAL AMPS	22		22

PANEL SCHEDULE NOTES

1 CONNECT GROUNDS OF "ISOLATED GRND REC" CIRCUITS TO ISOLATED GROUND BUS.

Panel schedule edit date: 9/5/2002

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Redmond City Facilities

Redmond, WA

Building Seismic Evaluations

November 1st, 2016

Table of Contents

Purpose and Scope

This report summarizes our investigation, findings and recommendations regarding the probable seismic performance of Redmond city facilities located in Redmond, Washington. Our scope of work was limited as follows:

1. Using the current national standard, ASCE 41-13 "Seismic Evaluation and Retrofit of Existing Buildings", perform full Tier I, and where appropriate, Tier II and Tier III evaluation of Fire Stations 11, 12, 13, 14, 16, and due to the age of construction, only the K-Braced frame for Fire Station 18. This level of evaluation outlines seismic deficiencies for each building and provides recommendations for retrofit to determine rough order of magnitude (ROM) costs.
2. Perform evaluations based on a review of existing drawings in conjunction with common deficiencies found in structures of similar age and construction for the Old Medic One Building, FS16 Shop Building, Hartman Park Swimming Pool, Central Stores Warehouse Building 5, MOC Building 1, Parks Operations Center Building 8, Senior Center Building, Old Fire House Teen Center, Old Redmond School House, and Trinity Building. This level of review provides a summary of anticipated deficiencies without the breadth and depth of calculations associated with an ASCE 41-13 analysis. Experience, engineering judgement, and FEMA document 547 was used for this portion of the evaluation. No calculations were performed for this level of evaluation.
3. Prepare a report that outlines the results of the assessment along with recommendations for possible seismic improvements or mitigation measures.

None of the evaluations performed are required as part of a substantial alteration or change of use as outlined by the 2012 or 2015 International Existing Building Code and are therefore considered voluntary in nature.

Available Documents

The following documents were used in the seismic evaluations for the City of Redmond's portfolio of buildings:

Fire Station 11, McAdoo Malcolm & Youel Architects, 10.04.00
Fire Station 12, Lawhead Architects, 12.21.98
Fire Station 13, Douglas Bertsch Architects, 9.28.93
Fire Station 14, Mithun, 5.15.90
Fire Station 16, Lawhead Architects / Douglas Bertsch Architects, 4.12.94
Fire Station 18, Lawhead Architects, 2.15.05
Hartman Park Swimming Pool, Cummings Associates, 3.19.70
Central Stores Warehouse Building 5
Maintenance Operations Center Building 1, Robert Wagner Architecture, 3.10.97
Parks Operations Center Building 8, Robert Wagner Architecture, 2.10.97
Senior Center Building, ARA/Jackson Architects, 1.05.89
Old Fire House Teen Center Building, ARC Architects, 9.09.02
Old Redmond School House, ARC Architects, 4.09.08

Seismic Hazard

Western Washington is one of the more seismically active regions in the nation. Research indicates that there are three sources of strong ground motion in the Puget Sound region. The first is an inter-plate event off the coast of Washington where the Juan de Fuca plate drives under (subducts) the North American plate. Earthquakes up to a Magnitude 9.0 and strong ground motion lasting several minutes are predicted from this source at intervals of approximately 500 years. The 1964 Alaska earthquake was caused by a similar mechanism. The second source is an intraplate event deep in the Juan de Fuca plate directly beneath Puget Sound. This event is thought to be capable of producing a Magnitude 7.5 earthquake with strong ground motion lasting 20 seconds and occurring approximately once every 500 years. Recent earthquakes, such as the 2001 Nisqually Earthquake (Magnitude 6.8), the 1965 SeaTac Earthquake (Magnitude 6.5), and the 1949 Olympia Earthquake (Magnitude 7.1), are examples of this type of event. The third source is a crustal event, which may occur along known or unknown fault lines. Figure 1, courtesy of the USGS "Seismic Hazards Investigation in Puget Sound" research program (http://earthquake.usgs.gov/regional/pacnw/ships/), illustrates major known crustal fault lines around Seattle. Those within a 60 mile radius, indicated by the circle, are considered capable of causing damage within the City, such as the Seattle Fault (SF) and South Whidbey Island Fault (SWF). The 1996 Duvall earthquake (Magnitude 5.7) on the South Whidbey Island Fault is an example of this type of event. Since these shallow earthquakes are much closer to the surface, ground motions are expected to be very intense, producing a Magnitude 7+ event with 20 seconds of strong ground motion. Many of the Redmond facilities experienced the 2001 Nisqually earthquake with minimal visible damage. However, this is no guarantee of future performance; the ground shaking in Redmond was relatively light with likely accelerations less than 1/5th of design-level ground motions. It should be noted therefore, that past performance is not an accurate predictor of future performance under design-level events.

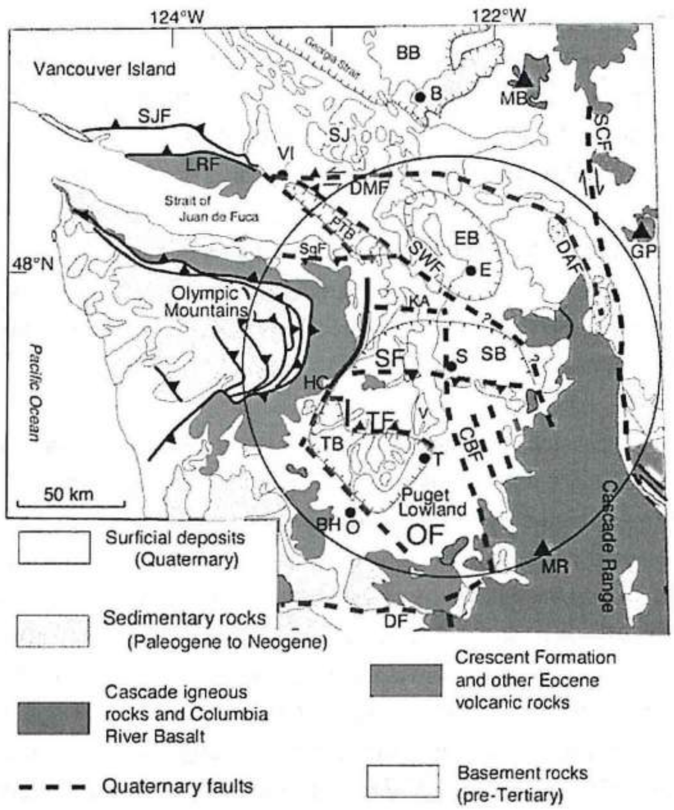


Figure 1: Earthquake Faults around Seattle

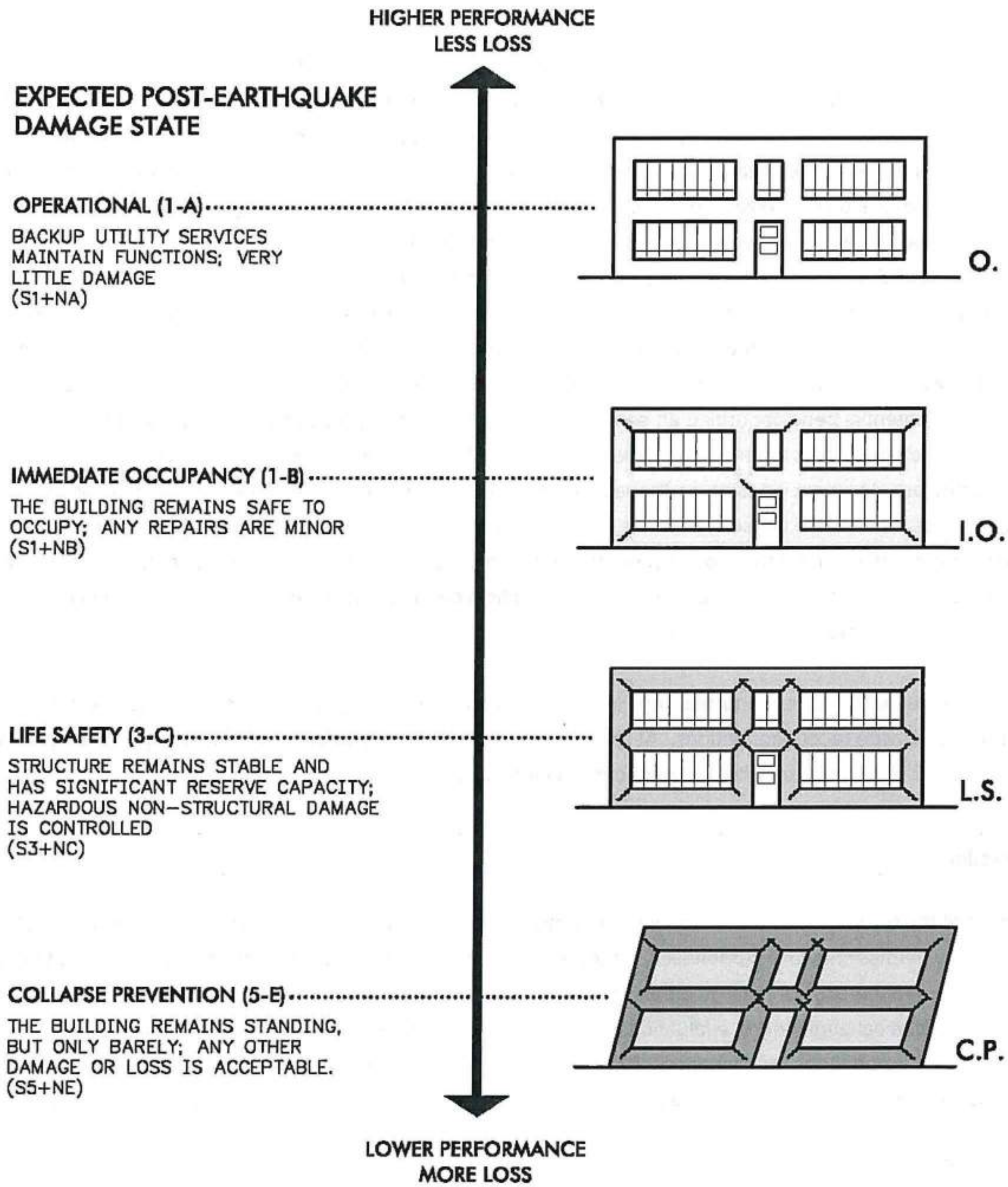
Performance Objective

The most current national standard for existing building evaluation is ASCE 41-13 "*Seismic Evaluation and Retrofit of Existing Buildings*". Although not currently adopted by Washington State at the time of this writing, it is expected to be adopted in July of 2016 with the 2015 International Existing Building Code. ASCE 41-13 provides a methodology for a deficiency based structural retrofit and utilizes a three-tier evaluation process with checklists specific to building type and level of seismicity. A Tier-1 screening consists of a visual screening with basic and supplemental checklists to quickly identify potential structural deficiencies and potential behavior during an earthquake. Items found to be nonconforming based on the results of the Tier-1 evaluation are identified for remediation and Tier-2 or Tier-3 evaluations may be required. Where new structural elements are recommended, they would be designed to meet strength and detailing requirements in accordance with current building code requirements (2012 International Existing Building Code at the time of this report).

The initial step in the seismic evaluation of the buildings was to define the seismic performance objective. The performance objective is described in terms of a post- earthquake damage control state for a particular earthquake. The damage control states range from collapse prevention to fully operational. Collapse prevention is typically reserved for historical and limited use structures that have mitigating circumstances which prevent more comprehensive damage control measures. This post-earthquake damage state is such that the building is on the verge of partial or total collapse with extensive damage to non-structural components. Fully operational is typically reserved for the design of *new* critical facilities that must remain functional after an earthquake, including emergency response centers, hospital emergency rooms and fire and police stations. A fully operational damage control state requires that structural components have no permanent drift and substantially retains its original strength and stiffness. This damage control state is equivalent to the immediate occupancy performance level for all structural components. The difference in seismic performance levels occurs at the non-structural level where, for operational building performance, negligible damage occurs to non-structural components and power and other utilities are available. Existing buildings are typically evaluated to a lower standard than new buildings due to their shorter design life.

The standard for the evaluation and retrofit of critical facilities is the Immediate Occupancy Level per the 2012 International Existing Building Code (IEBC) which is the current building code in the State of Washington. This performance level remains unchanged in the 2015 International Existing Building Code. Basic Safety Earthquake 1E as referenced by ASCE 41-13 was used for the fire station evaluations. This level of performance is based on a seismic event with a 20% probability of exceedance in 50 years, corresponding to a 225-year return period for the event.

All fire stations included in this report were evaluated using the immediate occupancy performance level and position retention nonstructural performance level as outlined in Table 2-1 of ASCE 41-13 for. Recommendations for all other buildings are based on experience, engineering judgement, and FEMA document 547, "Techniques for the Seismic Rehabilitation of Existing Buildings," which describes common seismic deficiencies for different building types and provides common retrofit techniques to mitigate those deficiencies.



TARGET BUILDING PERFORMANCE
LEVELS AND RANGES

(ADAPTED FROM FIG. C1-2 IN FEMA 356, 2000)

Seismic Evaluation Methodology

ASCE 41-13 (Seismic Evaluation and Retrofit of Existing Buildings) was used for the evaluation of the fire stations. ASCE 41-13 provides an option for a deficiency-based retrofit evaluation. Under ASCE 41-13, buildings are evaluated to either the Life Safety or Immediate Occupancy Performance Level using a three tier evaluation process. As mentioned above, the fire stations have been evaluated using the Immediate Occupancy Performance Level. A Tier-1 and Tier-2, or screening phase, evaluation consists of checklists to quickly identify potential building structural deficiencies. Based on the results of the Tier-1 and Tier-2 evaluation, Tier-3 (Evaluation Phase) evaluations may be required. The checklists are based on the building type. For the fire stations, W2 (Wood Frames, Commercial and Industrial) and RM (Reinforced Masonry) Tier-1 evaluation checklists were utilized. Based on the high level of seismicity for the site, ASCE 41-13 also requires the immediate occupancy basic configuration checklist and the supplemental life safety structural checklist, as well as checks for nonstructural components. These checklists provide a means to identify potential deficiencies in a structure and potential behavior during an earthquake. When evaluating capacities of individual portions of the structure, it will often be expressed as a demand to capacity ratio (DCR). DCR is determined by comparing seismic demand, based on the Immediate Occupancy design earthquake, to the calculated capacity of the element being analyzed. Elements with a DCR less than 1.0 are considered to meet the specified performance objective while elements with a DCR greater than 1.0 are considered deficient. To account for the inherent ductility of an individual element, capacities are increased by "m-factors". "M-factors" are component demand modification factors to account for expected ductility associated with this action at the selected structural performance level.

For all additional buildings, existing drawings (when available), engineering experience and judgement, and FEMA 547 were used to provide recommendations. At the request of the City of Redmond, these buildings were not evaluated using the ASCE 41-13 deficiency-based procedure outlined above.

Liquefaction

A number of the building sites are underlain by liquefiable soils according to the State of Washington Liquefaction Susceptibility map as shown in Appendix A, sheet 5. Liquefaction has the potential to severely damage the buildings that it supports due to the chance of large differential settlements. As indicated in the following sections of this report, site specific geotechnical engineering evaluations should be provided for each site to determine site specific liquefaction risks and recommendations for mitigation. Typical retrofit options to mitigate liquefaction risk take the form of deep foundation elements. Examples of this would be small diameter pin piles, helical anchors, or 6"-7" diameter micro-piles.

Prioritization

Prioritization of retrofit work should align with the corresponding risk factor associated with the building. For the Redmond facilities portfolio of buildings, it is recommended to prioritize work for the fire stations over the rest of the portfolio, as the fire stations have the greatest impact on public health and safety because they need to continuously operate after a seismic event in the region. Other considerations include the building occupancy category. Those buildings with housing and public occupancy considered a higher priority than those with more limited occupancies such as warehouses and storage facilities. The Redmond portfolio of buildings has been divided into three levels of prioritization. Level 1 is considered to be the most immediate retrofit need and consists of all fire stations. Level 2 consists of those buildings that have moderate risk based on the occupancy of the building. And Level 3 contains those buildings with the lowest risk and have more limited occupancies.

To assist in coordinating the work and available resources, for each fire station, we have listed our recommendations in an order of priority. Order is based on the magnitude of overstress, cost verses benefit of the recommendation, construction sequence, life-safety and exiting concerns, and our professional judgment. Although a recommendation may have a low priority, it does not imply that the recommendation is not important. When all of our recommendations are implemented, the seismic performance will meet the performance objective outlined previously in this report. In our professional opinion, a goal of implementing all of our recommendations should be set.

Prioritization Matrix			Prioritization Level		
	Building Use	Performance Level	1	2	3
Fire Station 11	Fire Station	Immediate Occupancy	•		
Fire Station 12	Fire Station	Immediate Occupancy	•		
Fire Station 13	Fire Station	Immediate Occupancy	•		
Fire Station 14	Fire Station	Immediate Occupancy	•		
Fire Station 16	Fire Station	Immediate Occupancy	•		
Fire Station 18	Fire Station	Immediate Occupancy	•		
Hartman Park Pool	Recreational Facility	Life Safety		•	
Central Stores Warehouse Building 5	Storage Warehouse	Life Safety			•
Maintenance Operations Center Building 1	Office	Life Safety		•	
Parks Operation Center Building 8	Storage Structure	Life Safety			•
Senior Center Building	Public Center	Life Safety		•	
Old Fire House Teen Center	Public Center	Life Safety		•	
Old Redmond School House Community Center	Public Center	Life Safety		•	
Trinity Building	Storage Warehouse	Life Safety			•

Fire Station 11

Building Description

Fire Station 11 is a single-story reinforced masonry building constructed in 1981 with an addition constructed in 1998. The building consists of a long rectangular office area and a roughly square, taller, apparatus bay. The main level is 16790 sq. ft. with an additional 2800 sq. ft. of mezzanine in the apparatus bay.

The structural system consists of brick masonry unit (BMU) shear walls with wood diaphragms. Structural plans are not available for the original portion of the building. The roof over the apparatus bay is timber framing with plywood sheathing and dimensional joists over solid sawn purlins and glulam girders. The office area roof is typical plywood sheathing over 2x framing in both the original building and the addition.

Construction plans from the 1998 addition to the fire station were available for review. No drawings were located for the original 1983 construction. Assumptions about the construction are based on visual inspection during a site visit and engineering judgement.

A follow up site visit was performed on September 7th, 2016 with staff from Otto Rosenau & Associates to determine if reinforcing is present in the existing walls utilizing hand operated radar. Reinforcing was confirmed to be present in the existing BMU walls. The size of reinforcing was unable to be verified, however spacing was roughly 4'-0" on center for vertical reinforcing and roughly 2'-0" on center for horizontal reinforcing.

Findings and Recommendations

Based on the ASCE 41-13 Tier-1 evaluation and subsequent Tier-2 and Tier-3 evaluations of the building, we have determined Redmond Fire Station 11 has elements that are noncompliant and prevent the building from meeting the minimum performance objective level as defined in ASCE 41-13. Some of these elements were determined to be acceptable based on the Tier-2 evaluation; however, deficiencies were still present. A copy of the checklists used to determine the non-compliant items have been included in Appendix B. The noncompliant (NC) items and resulting deficiencies, if they occur, are outlined below.

1. **Mezzanines** – The west mezzanine is neither independently braced nor anchored to the seismic-force-resisting elements of the main structure.

   Recommendation:

   Due to its positioning in the apparatus bay, a supplementary seismic-force-resisting system for the mezzanine should be added. An interior elevation schematic of a braced frame system is shown on detail sheet 6 in Appendix A.

2. **Non-structural components** – Non-structural components include mechanical, electrical and plumbing (MEP) components as well as architectural features, such as canopies and signage, that are not a part of the main building system. These components are vulnerable to becoming separated from the building during a seismic event and may pose a safety risk to the buildings occupants as well as impede operations of personnel.

   Recommendation:

   Provide lateral bracing for any fall prone equipment and verify presence of bracing for all duct work, piping, electrical supply and emergency equipment.

3. **Wood ledgers –** The diaphragm connection to the wood ledgers is properly detailed to prevent cross grain bending in the ledger in the addition. It is unknown if the existing structure is also properly detailed

   Recommendation:

   The ledger connections in the original building should be investigated to verify their compliance.

4. **Transfer to shear walls –** The ledger bolts to the shear wall is the primary transfer of lateral force and are required to be capable of transferring the full strength of the shear wall. The full strength of the shear wall exceeds the capacity of the ledger bolts by a factor of 1.4. Anchorage at the original building should be verified.

   Recommendation:

   The quantity of ledger bolts should be increased. The ledger bolts in question are shown on detail sheet 7 in Appendix A.

5. **Hose Tower –** The construction of the hose tower is not represented on the available building documents. By assuming the minimum reinforcing schedule, the hose tower was found to be not able to resist overturning forces during a seismic event.

   Recommendation:

   With information from the follow up site visit to radar the existing walls, a Tier 2 analysis was completed and indicated that the hose tower has sufficient reinforcing to resist flexural overturning forces. No further action is required.

6. **Continuous cross ties –** No purlin-to-purlin connection is present to develop a tension force across the diaphragm.

   Recommendation:

   Simpson holdown hardware is recommend to create a complete load path across the diaphragm. Detail sheet 9 in Appendix A shows a typical purlin crosstie connection.

7. **Plan irregularities –** The office area of Fire Station 11 has multiple re-entrant corners distributed around the floorplan. There is no information provided that indicates if they are properly detailed to transfer forces into the diaphragm chords.

   Recommendation:

   Additional onsite investigation and pictures indicated the presence of wood ledgers attached to the existing BMU walls with bolts spaced at roughly 48" on center. Other locations indicated a continuous rim above the BMU walls with blocking between joists. While observation of all similar existing conditions was not achievable, it is the opinion of SSF that this construction is typical throughout FS11 and as such resolved the diaphragm chord forces at re-entrant corners.

8. **Wall shear stress –** Shear stresses in the shared BMU wall between the office and apparatus bay has a demand to capacity ratio (DCR) of 1.4 for the Tier 1 check.

   Recommendation:

   With information from the follow up site visit to radar the existing walls, a Tier 2 analysis was completed and indicated that the existing BMU walls between the office and apparatus bay have sufficient capacity to resist the seismic demands.

9. **Liquefaction** – According to the State of Washington Liquefaction Susceptibility map, Fire Station 11 lies on the border of a "Low to Moderate" liquefaction zone. Detail sheet 5 in Appendix A shows the liquefaction susceptibility of the area surrounding Fire Station 11.

   Recommendation:

   A full geotechnical study should be performed to evaluate the liquefaction susceptibility of the soils underlying the fire station.

Redmond Fire Station 12

General Description and Condition

Redmond Fire Station 12 is a one-story, rectangular building, constructed in 1980 and retrofitted in 1999. This building was retrofitted to meet the standards of the 1997 Uniform Building Code (UBC). Roof construction consists of plywood sheathing over 2x joists supported by glulam beams which frame into masonry bearing walls. The foundation appears to consist of conventional strip footings and slab on grade. Fire Station 12 does not fall within Redmond's liquefiable zone, therefore further study of the foundation is not required. The lateral force resisting system is masonry shear walls. Available building plans do not specify whether the masonry walls are reinforced, however, given the time of construction was likely designed under the 1976 Uniform Building Code and therefore would require reinforcing. The 1998 retrofit added out-of-plane anchorage and tension ties to allow out-of-plane wall forces to develop into the diaphragm.

A follow up site visit was performed on September 7th, 2016 with staff from Otto Rosenau & Associates to determine if reinforcing is present in the existing walls utilizing hand operated radar. Reinforcing was confirmed to be present in the existing BMU walls. The size of reinforcing was unable to be verified, however spacing was roughly 4'-0" on center for vertical reinforcing and roughly 2'-0" on center for horizontal reinforcing.

Findings and Recommendations

Based on the ASCE 41-13 Tier-1 evaluation and subsequent Tier-2 and Tier-3 evaluations of the building, Fire Station 12 has elements that are noncompliant and prevent the building from meeting the minimum performance objective level identified earlier in this report. Some of these elements were determined to be acceptable based on the Tier-2 evaluation; however, deficiencies were still present. A copy of the checklists used to determine the non-compliant items is included in Appendix B. The noncompliant (NC) items and resulting deficiencies, if they occur, are outlined below.

1. **Non-Structural – Ceilings, Mechanical and Electric Equipment**

   The walkthrough of the fire station found fall-prone equipment unbraced for lateral forces. Additionally, further items that were not visible during the walkthrough of the fire station may be unbraced as well.

   Recommendation:

   Provide lateral bracing for any fall-prone equipment and verify presence of bracing for all ducts, piping, electrical equipment, and emergency power.

2. **Diaphragms – Plan Irregularities**

   Detailing at the reentrant corner on the west side of the building does not provide sufficient tensile capacity to develop the strength of the diaphragm. The 1998 retrofit added CMST14 and MTT 28B steel straps, however a Tier-3 evaluated Demand Capacity Ratio (DCR) of the connection determined the straps do not carry adequate capacity to meet the intended performance objective.

   Reentrant corner connection: DCR – 1.91

   Recommendation:

   Add HD7B and HDU5 straps to existing connection per Appendix A, Detail 1 to increase capacity to meet design requirements.

Fire Station 13

Building Description

Fire Station 13 is a single-story reinforced masonry building originally constructed in 1974 with an addition constructed in 1993 under the 1988 Uniform Building Code. A partial renovation was completed in 2009 that did not include any seismic retrofit work. The building is rectangular in plan with a re-entrant corner in the north-west quadrant of the building where the addition is located. The main level is 7350 sq. ft. with an additional 1120 sq. ft. of mezzanine in the apparatus bay.

The structural system consists of brick masonry unit (BMU) shear walls with wood diaphragms. Structural plans are not available for the original portion of the building, but it is assumed that a reinforcing schedule typical of the brick type would have been used. The roof over the apparatus bay is heavy timber framing with tongue and groove decking over glulam girders and solid sawn purlins. The office area roof is typical plywood sheathing over 2x framing in both the original building and the addition. The north wall of the addition relies on plywood shear walls for lateral force resistance.

Construction plans from the 1993 addition to the fire station were available for review. No drawings were located for the original 1974 construction. Assumptions about the construction are based on visual inspection during a site visit and best engineering judgement.

A follow up site visit was performed on September 7th, 2016 with staff from Otto Rosenau & Associates to determine if reinforcing is present in the existing walls utilizing hand operated radar. Reinforcing was confirmed to be present in the existing BMU walls. The size of reinforcing was unable to be verified, however spacing was roughly 4'-0" on center for vertical reinforcing and roughly 2'-0" on center for horizontal reinforcing.

Findings and Recommendations

Based on the ASCE 41-13 Tier-1 and Tier-2 evaluations of Fire Station 13 and Maintenance Building, the following items were identified as non-compliant towards meeting the Immediate Occupancy performance objective. A copy of the checklists used to determine the non-compliant items have been included in appendix B. The non-compliant checklist items and cause of the deficiency are listed below:

1. **Non-structural components** – Non-structural components include mechanical, electrical and plumbing (MEP) components as well as architectural features, such as canopies and signage that are not a part of the main building system.

   Recommendation:

   Provide lateral bracing for any fall prone equipment and verify presence of bracing for all duct work, piping, electrical supply, emergency equipment, and apparatus bay doors.

2. **Wood ledgers –** The diaphragm connection to the wood ledgers is not properly detailed to prevent cross grain bending in the ledger.

   Recommendation:

   Holdown hardware should be installed in line with the roof joists to create a positive out-of-plane attachment between the roof diaphragm and the BMU walls. Detail sheets 10 and 11 in Appendix A shows typical out-of-plane anchorage methods.

3. **Transfer to shear walls –** The lateral force transfer between the diaphragm and shear walls occurs through a pony wall between the BMU wall and the roof structure. Plywood sheathing prevented verification of the anchor bolt spacing. Assuming anchor bolts at 4'-0" on center, the DCR is 3.3..

   Recommendation:

   The anchor type and spacing of the pony walls should be verified, and additional anchors installed in the concrete bond beam. Increased panel edge nailing is required as shown on detail sheet 12 in Appendix A.

4. **Continuous cross ties –** No purlin-to-purlin connection is present to develop a tension force across the diaphragm.

Recommendation:

Simpson holdown hardware is recommend to create a complete load path across the diaphragm. Detail sheet 9 in Appendix A shows a typical purlin crosstie connection.

5. **Plan Irregularities –** The reentrant corner at the north-west quadrant of the building does not appear to be detailed to develop tension forces into the diaphragm.

   Recommendation:

   Additional blocking and strapping should be added at the connection between the addition and the original structure as shown on detail sheet 13 in Appendix A.

6. **Wall shear stress –** Shear stresses in the east and west BMU walls had a demand to capacity ratio of 1.4.

   Recommendation:

   With information from the follow up site visit to radar the existing walls, a Tier 2 analysis was completed and indicated that the existing BMU walls are sufficiently reinforced to resist in plane shear stresses.

Redmond Fire Station 14

General Description and Condition

Redmond Fire Station 14 is a one-story building constructed in 1991 under the 1988 Uniform Building Code (UBC). Roof and siding issues were addressed in a 2009 renovation, however it is unknown if seismic retrofit measures were taken at that time. Roof construction consists of 1/2" plywood sheathing over premanufactured wood trusses supported by wood bearing walls. The lateral system consists of wood shear walls sheathed with either or both ½" plywood and ⅝" gypsum board. Bearing and shear walls are supported by conventional foundations. Fire Station 14 is not located in Redmond's liquefaction zone therefore further foundation analysis is not required.

Findings and Recommendations

Based on the ASCE 41-13 Tier-1 evaluation and subsequent Tier-2 and Tier-3 analysis of the building, Redmond Fire Station 14 has elements that are noncompliant and prevent the building from meeting the minimum performance objective level defined in ASCE 41-13. Some of these elements were determined to be acceptable based on the Tier-2 evaluation; however, deficiencies were still present. A copy of the checklists used to determine the non-compliant items has been included in Appendix B. The noncompliant (NC) items and resulting deficiencies, if they occur, are outlined below.

1. **Non-Structural – Ceilings, Mechanical and Electric Equipment**
   A walkthrough of the fire station found fall-prone equipment unbraced for lateral forces. Additionally, further items that were not visible during the walkthrough of the fire station, such as water heaters, may be unbraced as well.

Recommendation:

Provide lateral bracing for any fall-prone equipment and verify presence of bracing for all ducts, piping, electrical equipment, and emergency power.

2. **Seismic-Force-Resisting System – Hold-Down Anchors**

   Not all shear walls used to resist seismic forces have hold-down anchors. Wall line 7 as shown on page 23 of the structural calculations, is used to resist a large portion of the seismic forces and has no hold-down anchors to support the correspondingly large uplift forces.

   Recommendation:

   Add missing hold-down anchors to shear walls.

3. **Seismic-Force-Resisting System – Shear Stress Check**

   The capacity of the shear walls does not meet the Immediate Occupancy seismic objective of ASCE 41-13. Demand Capacity Ratios (DCR) of each wall line were determined by comparing seismic demand to the calculated capacity.

   Wall Line 7 per page 23 of structural calculations: DCR – 1.51

   Recommendation:

   Replace gypsum board sheathing with ½" plywood sheathing and nail panel edges with 8d nails at 2" on center to deficient shear walls to increase capacity.

4. **Seismic-Force-Resisting System – Narrow Wood Shear Walls**

   Several shear walls with aspect (height-to-width) ratios greater than 1.5-to-1 are used to resist seismic forces.

   Recommendation:

   A Tier-2 and Tier-3 analysis of the walls verified that shear walls with the maximum height-to-width ratio of 1.5 have sufficient capacity.

Fire Station 16 and Maintenance Building

Building Description

Fire Station 16 is a single-story building constructed in 1994 under the direction of Lawhead Architecture with engineering services provided by Heung K. Kim, P.E.. It is L-shaped in plan and consists of a rectangular office wing to the south and an attached apparatus bay to the north. The main level is 8,811 square feet with an additional 928 square feet split between two mezzanines.

The structural system consists of light framed wood construction with exterior plywood shear walls. The wood structural panel flat roof diaphragms vary in height from ten to 23 feet. A 30-foot tall reinforced CMU hose tower is located on the northeast corner of the garage. The building is clad in corrugated metal siding and standing seam metal roofing.

During the site visit one of the firefighters mentioned the building has a history of water leaks, though there are no visible signs of water damage. Renovation work in 2004 addressed these issues. Leaks may lead to hidden structural damage caused by decay. If wood decay is found, it is recommended that it be evaluated by a structural engineer.

Also on the site of Fire Station 16 is a 5,325 square-foot building for the maintenance of fire district apparatus. The maintenance building was built at the same time as the fire station and is of similar construction. The maintenance building was not evaluated per the ASCE 41-13. As a maintenance facility, the building would be evaluated per the life safety performance standards of ASCE 41-13. Considering the similar construction between the fire station and maintenance facility, the deficiencies found for the fire station building can be assumed to be present, albeit to a lesser extent, for the maintenance building as well.

Original 1994 architectural and structural permit documents were available for review. There are no indications that there have been significant remodels to the structure since its construction.

Findings and Recommendations

Based on the ASCE 41-13 Tier-1 and Tier-2 evaluations of Fire Station 16 and Maintenance Building, the following items were identified as non-compliant towards meeting the Immediate Occupancy performance objective. A copy of the checklists used to determine the non-compliant items is included in appendix B. The non-compliant checklist items and cause of the deficiency are listed below:

1. **Non-structural components** – Non-structural components include mechanical, electrical and plumbing (MEP) components, as well as architectural features, such as canopies and signage, that are not a part of the main building system.

   Recommendation:

   Provide lateral bracing for any fall-prone equipment and verify presence of bracing for all duct work, piping, electrical supply, and emergency equipment.

2. **Walls connected through floors –** Although the fire station is a single story structure, there are two areas with mezzanines set between platform framed walls. The floor framing causes a discontinuity in the wall framing. Without proper detailing the shear wall may not properly transfer overturning and shear forces between the two levels.

   Recommendation:

   To ensure transfer of seismic forces between shear wall levels at the mezzanine areas, hardware may be added connecting the upper shear wall to the base. Shear transfer between levels may be improved by installing Simpson LTP plates to connect the top and bottom wall plates to the TJI rim board. The existing plywood panel edge nailing at the rim board should be verified prior to installing lateral transfer plates. Overturning forces may be resolved by adding Simpson CS16 straps at wall ends, connecting the upper wall segment to the lower holdowns per detail 17 in appendix A.

3. **Hose tower attachment –** The hose tower adjacent to the fire station relies on its attachment to the roof diaphragm for stability. The attachment is made by nailing the diaphragm to a ledger board which is bolted to the wall. This construction detail induces cross grain bending in the ledger that can result in abrupt splitting of the ledger and failure of the attachment.

   Recommendation:

   Holdown hardware should be installed in line with the roof joist to create a positive out-of-plane attachment between the roof diaphragm and the hose tower. Detail sheets 10 and 11 in Appendix A show typical out-of-plane anchorage methods.

4. **Narrow wood shear walls –** Narrow shear walls are prone to severe deformations and high overturning forces that can cause damage to the sill plate, holdown anchors and end studs. To reduce the risks associated with highly stressed narrow shear walls, the aspect ratio of wood panel shear walls is limited to 2:1 in Tier 1 checklists. Approximately half of the shear walls in the firehouse exceed this limit with a maximum aspect ratio of 3.25.

   Recommendation:

   Narrow wood shear walls primarily occur in wall lines with multiple window openings in a row. The aspect ratio of these shear walls can be reduced by connecting the wall piers to the next pier with a tension strap. A typical strapping detail involves providing Simpson CS16 straps above and below the window opening. Strapping the openings also reduces the holdown and compression chord forces by increasing the shearwalls effective length.

5. **Roof chord continuity –** Discontinuity in the diaphragm chords can lead to excess flexibility and cause more damage during a seismic event than a diaphragm with properly detailed, continuous diaphragm chords. A common cause of chord discontinuity are vertical offsets in the roof diaphragm. Fire Station 16 has multiple roof steps in the diaphragm that do not appear properly detailed to transfer diaphragm chord forces.

   Recommendation:

   Where a vertical offset exists in the diaphragm, the wall segment connecting the diaphragm levels should be strengthened to transfer the lateral forces. Typical strengthening procedures involve installing full height posts *and tension straps adequate to transfer diaphragm forces. Detail sheet 15 in Appendix A shows a strapping method to create chord continuity.*

6. **Shear wall stresses –** The lateral force resisting system of the firehouse was originally detailed to utilize shear walls sheathed with either plywood or gypsum wall board (GWB). The shear stress check exceeds the acceptance criteria for structural panel sheathing with a DCR of 2.3.

   Recommendation:

   To resolve the overstress of the existing wood structural panel shear walls, we recommend increasing the total length of shear wall in the building. The total wall length may be increased by either replacing existing interior GWB walls with plywood, adding plywood sheathing to the interior side of existing plywood walls, or a combination of the two methods. By upgrading existing GWB shearwalls to plywood, it may be possible to re-use the existing holdowns instead of installing new holdowns. Detail sheet 14 in Appendix A highlights existing shearwalls and proposed shearwall upgrades.

6. **Plan Irregularities –** Plan irregularities present in the Fire Station 16 diaphragm include the L-shaped building configuration, re-entrant corners, and plan insets. These irregularities may cause large tensile and compressive forces to generate in the diaphragm resulting in local damage. These forces may be resolved by supporting the irregularity with shear wall, or by properly detailing chord reinforcing to develop the forces into the diaphragm.

   Recommendation:

   Re-entrant corners in the diaphragm that are not adequately supported by a shear wall segment require reinforcement to transfer chord forces into the diaphragm. The diaphragm should be blocked and strapped in-line with the unsupported diaphragm chord to develop the forces into the diaphragm as shown on detail sheet 13 in Appendix A.

8. **Liquefaction** – According to the State of Washington Liquefaction Susceptibility map, Fire Station 16 lies on the border of a "Low to Moderate" liquefaction zone. Detail sheet 5 in Appendix A shows the liquefaction susceptibility of the area surrounding Fire Station 11.

   Recommendation:

   A full geotechnical study should be performed to evaluate the liquefaction susceptibility of the soils underlying the fire station.

Redmond Fire Station 18

General Description and Condition

Redmond Fire Station 18 is a one-story, rectangular building, constructed in 2002 and designed to meet the standards of the 1997 Uniform Building Code (UBC). Construction consists of 15/32" plywood sheathing over premanufactured wood roof trusses supported by wood shear walls. At the time of its construction, Fire Station 18 met the seismic requirements for critical facilities of its type. However, engineering and seismic hazard knowledge is continually evolving and portions of Fire Station 18 do not meet ductility and stability requirements found in current code. Specifically, the lateral force resisting system of the apparatus bay in the East-West direction consists of seven steel "K-braces" that do not meet current seismic standards. The scope for evaluating Fire Station 18 was limited to the K-brace frames that make up the seismic-force-resisting system of the apparatus bay. Due to the relatively recent construction (2005), the focus was on the elements specifically affected by recent code changes.

Findings and Recommendations

Based on the ASCE 41-13 Tier 1 and subsequent Tier 2 and Tier-3 evaluation of the K-braced frames, it was determined Redmond Fire Station 18 has elements that are noncompliant and prevent the building from meeting the minimum performance objective level defined in ASCE 41-13. Some of the elements of the K-frames were determined to be acceptable based on the Tier-2 evaluation; however, deficiencies were still present. A copy of the checklists used to determine the non-compliant items is included in Appendix B. The noncompliant (NC) items and resulting deficiencies, if they occur, are outlined below.

1. **Non-Structural – Ceilings, Mechanical and Electric Equipment**

   The walkthrough found fall-prone equipment unbraced for lateral forces. Additionally, further items that were not visible during the walkthrough may be unbraced as well.

   Recommendation:

   Provide lateral bracing for any fall-prone equipment and verify presence of bracing for all ducts, piping, electrical equipment, and emergency power.

2. **Connections – Transfer to Steel Frames**

   The capacity of the connection transferring lateral forces into the K-brace frames is insufficient. Existing details show building seismic forces are transferred through glulam beams into steel angles connected by lag screws. Forces are then transferred to the WT beam at the top of the K-braces through a welded connection of the angle to WT. The steel and glulam members, as well as the welded connection, meet design requirements. However, the lag screws do not provide sufficient capacity.

   Lag Screw Connection: DCR – 1.69

   Recommendation:

   Add (4) ⅝" diameter lag screws connecting the K-brace frames to existing glulam beams per Appendix A, Detail 3.

3. **Seismic-Force-Resisting System – Out-of-Plane Bracing**

   The apparatus bay K-brace frames do not have out-of-plane bracing, thus are prone to out-of-plane buckling.

   Recommendation:

   Add out-of-plane anchorage in the form of full building height HSS tubes attached to the K-brace columns and tied into the roof framing per Appendix A, Detail 2 to transfer out-of-plane forces into the roof diaphragm.

4. Fire Station 18 also contains a mezzanine level that does not have a permanent stair. It is recommended that a

stair meeting current code standards be constructed to allow for safe egress in the event of a seismic event.

5. **Connections – Steel Frame Anchorage to Foundation**

   Anchorage of the K-brace frames to the concrete grade beams below is insufficient for design uplift forces. The recommendations are based on a Tier-3 evaluated Demand Capacity Ratio (DCR) of existing anchorage. DCR is determined by comparing seismic demand, based on the Immediate Occupancy design earthquake, to the calculated capacity. Elements with a DCR less than 1.0 are considered to meet the specified performance objective while elements with a DCR greater than 1.0 are considered deficient.

   The North K-brace frame anchorage was found deficient:

   North K-Brace Anchorage: DCR – 1.30

   Recommendation:

   Pour new foundation to supplement existing grade beam beneath the North K-braces and upgrade anchorage to sufficient capacity.

6. **Seismic-Force-Resisting System – K-Bracing**

   The apparatus bay seismic-force-resisting system consists of seven K-braces in the east-west direction. The intended performance of K-brace frames is for energy to dissipate through the buckling of compression braces and yielding of tension braces. However, when a compression brace buckles, large mid-height horizontal forces can lead to column instability and collapse. As a result, K-bracing is no longer allowed in new construction. A performance-based analysis was performed according to ASCE 41-13.

   Recommendation:

   The column and brace capacities meet or exceed the seismic demands. No additional retrofit of these members is required. However, as mentioned in the preceding paragraph, this type of lateral system is no longer allowed in current building codes. We would recommend retrofitting or replacing the existing frame with a more ductile system.

Additional Redmond Facilities

The following buildings were not evaluated using ASCE 41-13 as outlined in the performance objective section of this report. Existing drawings when available, engineering experience and judgement, and FEMA document 547 were used to provide the following recommendations. For the most accurate and specific determination of seismic deficiencies, we recommend utilizing the ASCE 41-13 as done in this report for the fire stations. Utilizing the ASCE 41 methodology provides a consistent evaluation procedure for the entire portfolio of buildings and allows for "apples-to-apples" comparisons.

Hartman Park Swimming Pool Building:

The Hartman Park Swimming Pool is a rectangular building built in 1970. Roof construction over the swimming pool consists of pre-cast concrete t-beams over pre-cast concrete piers. Areas between columns are infilled with brick masonry unit shear walls. The area of the building used for the lobby and locker rooms consists of brick masonry unit shear walls with a likely roof construction of plywood sheathing over wood joists. The building foundation appears to consist of conventional strip footings and slab on grade. Based on documents provided, it appeared the slab on grade had significant cracking in areas due to settlement issues and was renovated in 2010 to mitigate these issues. At the time of the site visit, the building appeared to be in good condition with no visible deficiencies.

Common Deficiencies of Similar Type Buildings per FEMA 547:

1. Load Path – inadequate force transfer, diaphragm to shear wall, shear wall to foundation, inadequate connection of beam or girders to supporting elements
   Rehabilitation Measures: Enhance anchorage between elements. This can be achieved with the addition of steel angles and adhesive anchors as required to carry design seismic forces.

2. Diaphragms – inadequate strength and/or stiffness
   Rehabilitation Measures: Add steel braced-frames or concrete/masonry shear walls to reduce diaphragm span and seismic force demand. Adequate strength can also be achieved through an increase in shear force capacity of the diaphragm.

3. Diaphragms – excessive stresses at openings and irregularities
   Rehabilitation Measures: Enhance diaphragm detailing around openings. This is commonly achieved with the addition of structural steel sections or reinforcing bars at the diaphragm boundary locations. Shear is transferred into the new section through adhesive anchors or reinforcing dowels.

Central Stores Warehouse Building 5

Building 5 is a rectangular shaped premanufactured metal building with mezzanine built in 1988. This building is located on liquefaction susceptible soil per Redmond's liquefaction map. The building and foundation were observed to be in good condition during a walkthrough of the building.

Common Deficiencies of Similar Type Buildings:

1. Load Path – inadequate shear, flexural, and uplift anchorage to foundation
   Rehabilitation Measures: Anchorage to the foundation can be achieved by either adding anchor rods or welding shear lugs to the base plate into the foundation, or embedding the moment frame columns into a concrete pedestal bonded to other existing foundation elements.

2. Component Detailing – inadequate capacity of beams, columns, and/or connections
   Rehabilitation Measures: Wide flange members with inadequate capacity can be strengthened by adding side plates to create box sections. Beam-column connections can be improved with use of a reduced beam section

(RBS), welded haunch, or bolted bracket method. Each of these methods either reduce inelastic rotational demands or increase the beam plastic moment capacity.

3. Diaphragms – inadequate in-plane strength and/or stiffness
Rehabilitation Measures: Diaphragm forces can be reduced by adding collectors or moment frames, braced frames, or concrete/masonry shear walls to distribute diaphragm forces. Another common rehabilitation measure involves increasing the diaphragm strength by overlaying the existing diaphragm with concrete topping or wood structural panels.

4. Diaphragms – inadequate shear transfer to frames
Rehabilitation Measures: Shear transfer capacity can be enhanced by providing additional shear studs, anchors, or welds connecting diaphragm to frames.

Maintenance Operations Center Building 1

Maintenance Operations Center Building 1 was constructed in 1977 and renovated in 1998. It is located on liquefaction susceptible soil per Redmond's liquefaction map. Building construction consists of 8-inch brick masonry unit shear and load bearing walls which based on the age of construction are likely reinforced. Roof construction consists of a plywood diaphragm over wood framing. The building and foundations appeared to be in good condition during the walkthrough.

Common Deficiencies of Similar Type Buildings:

1. Configuration – Torsionally irregular plans
Rehabilitation Measures: Add steel braced frame or concrete/masonry shear wall or increase existing wall stiffness with concrete wall overlay or infill openings in order to decrease the eccentricity between center of mass and center of rigidity.

2. Load Path – inadequate anchorage for out-of-plane load and in-plane forces
Rehabilitation Measures: Add new or improve existing tension anchors, shear anchors, cross-ties and subdiaphragms, and supplemental vertical supports to ensure a complete load path.

3. Diaphragms – inadequate in-plane strength and/or stiffness
Rehabilitation Measures: Add steel braced frame or concrete/masonry shear wall to decrease force demand on diaphragm or increase the capacity of existing diaphragm.

4. Diaphragms – re-entrant corners
Rehabilitation Measures: Add steel braced frames, concrete/masonry shear wall, or collector to support re-entrant corner forces. Otherwise enhance existing collector or increase existing wall with concrete overlay. Enhance diaphragm detailing to increase capacity.

Parks Operations Center Building 8

Parks Operations Center Building 8 is a steel framed building constructed in 1970 and renovated in 1998. It is located on liquefaction susceptible soil per Redmond's liquefaction map. An approximately 20 ft. tall stand-alone canopy at the back of the building, that may have been added in the 1998 remodel, consists of steel columns and knee braces embedded in concrete sonotubes. The foundation appeared to be in good condition.

Common Deficiencies of Similar Type Buildings:

1. Load Path – inadequate shear, flexural, and uplift anchorage to foundation
   Rehabilitation Measures: Anchorage to the foundation can be achieved through adding additional anchor rods or welding shear lugs to the base plate into the foundation, or embedding the moment frame columns into a concrete pedestal bonded to other existing foundation elements.

2. Component Detailing – inadequate capacity of beams, columns, and/or connections
   Rehabilitation Measures: Wide flange members with inadequate capacity can be strengthened by adding side plates to create box sections. Beam-column connections can be improved with the use of a reduced beam section (RBS), welded haunch, or bolted bracket method. Each of these methods either reduce inelastic rotational demands or increase the beam plastic moment capacity.

3. Component Detailing – inadequate capacity of horizontal steel bracing
   Rehabilitation Measures: Provide additional secondary bracing. Strengthen bracing elements and/or reduce unbraced lengths. Strengthen connections.

4. Diaphragms – inadequate in-plane strength and/or stiffness
   Rehabilitation Measures: Add steel braced frame or concrete/masonry shear wall to decrease force demand on diaphragm or increase the capacity of existing diaphragm by overlaying existing diaphragm with concrete topping or wood structural panels.

5. Diaphragms – inadequate shear transfer to frames
   Rehabilitation Measures: Shear transfer capacity can be enhanced by providing additional shear studs, anchors, or welds connecting diaphragm to frames.

Senior Center Building

The Senior Center Building is a one-story wood framed building with stucco cladding constructed in 1990. Roof levels change elevation in several areas of the building. A walk around of the building revealed no cracking in the stucco finishes and foundations appeared to be in good condition. This building is located on liquefaction susceptible soil per Redmond's liquefaction map.

Common Deficiencies of Similar Type Buildings:

1. Load Path – inadequate shear anchorage to foundation
   Rehabilitation Measures: Improve existing or add new anchorage to the foundation to prevent the building from sliding off the foundation during an earthquake. Expansion bolts are the preferred method of anchorage to foundations, though anchorage can also be achieved with hardware such as the Simpson UFP or FAP foundation plates.

2. Load Path – inadequate overturning anchorage
   Rehabilitation Measures: Improve or add uplift anchors and compression posts. This can be achieved with adhesive anchors, however new footings or footing reinforcement may also be required if existing footings lack sufficient shear and flexural capacity to handle the uplift and compressive forces.

3. Load Path – inadequate shear transfer in wood framing
   Rehabilitation Measures: Enhance diaphragm to shear wall connection to allow design shear force to transfer from the roof diaphragm into the top of the wall. This is commonly achieved with the addition of angle clips or edge nailing.

4. Diaphragms – inadequate in-plane strength and/or stiffness
   Rehabilitation Measures: Enhance existing diaphragm with additional wood structural panel sheathing and/or additional nailing and blocking to existing sheathing.

5. Diaphragms – re-entrant corners
   Rehabilitation Measures: Enhance diaphragm detailing to handle re-entrant corner forces. This can usually be achieved by adding a collector to distribute re-entrant corner forces into the diaphragm.

Old Fire House Teen Center

The Old Fire House is a one story steel and masonry framed building constructed in 1952 and renovated in 2000. Roof construction consists of wood diaphragm over wood and steel beams and steel columns. The 2000 renovation included a seismic retrofit of the main building. The retrofit included the addition of a new braced frame for global lateral support and out-of-plane anchorage of the existing exterior shear walls. Based on the documents provided and the site visit, it is unclear whether the hose tower was also retrofitted in 2000. Cracking was observed on the East elevation of the hose tower. This building is located on liquefaction susceptible soil per Redmond's liquefaction map.

Common Deficiencies of Similar Type Buildings:

1. Global Strength – insufficient wall strength
   Rehabilitation Measures: Add steel braced-frame or concrete/masonry shear wall. Increase existing wall capacity with concrete wall overlay or by infilling openings.

2. Load Path – inadequate shear, flexural, and uplift anchorage to foundation
   Rehabilitation Measures: Embed column into a pedestal bonded to other existing foundation elements or provide steel shear lugs or anchor bolts from base plate to foundation.

3. Load Path – inadequate out-of-plane anchorage at walls connected to diaphragm
   Rehabilitation Measures: Add tension anchors attaching walls to diaphragm.

4. Diaphragms – inadequate in-plane strength and/or stiffness
   Rehabilitation Measures: Add collectors to distribute forces or add moment frames, braced frames, or concrete/masonry shear walls to reduce diaphragm forces. Otherwise, increase capacity of existing diaphragm with wood structural panel overlay and/or additional nailing.

5. Load Path – inadequate anchorage to diaphragms for in-plane forces
   Rehabilitation Measures: Add wall-to-diaphragm shear anchors.

Old Redmond School House Community Center

The Old Redmond School House is a two story, unreinforced masonry building built in 1922 and renovated in 1980 and 2007. Roof and floor construction consists of wood decking over 2x10 joists supported by built up beams. The 2007 renovation does not appear to have included any seismic retrofit measures. Any seismic upgrades in the building's history likely occurred prior to modern seismic design guidelines developed as a result of the 1994 Northridge earthquake. Building elevations have a high percentage of openings which may indicate insufficient global lateral support. Additionally, the school house is located on liquefaction susceptible soil per Redmond's liquefaction map. A full evaluation based on ASCE 41 is recommended to clarify any deficiencies present in the building.

Common Deficiencies of Similar Type Buildings:

1. Global Strength – insufficient in-plane wall strength
   Rehabilitation Measures: Add either a new wood structural panel shear wall, concrete/masonry shear wall, steel braced frame, or steel moment frame. Global strength can also be improved by enhancing existing elements through concrete wall overlay or by infilling wall openings.

2. Load Path – inadequate or missing wall-to-diaphragm tie
   Rehabilitation Measures: Add new or improve existing tension anchors, shear anchors, cross-ties and subdiaphragms, and supplemental vertical supports to ensure a complete load path.

3. Non-Structural – unbraced parapet or chimney
   Rehabilitation Measures: Brace parapet and chimney to withstand design level earthquake forces. Parapets and chimneys can also be shortened to meet allowable height-to-width ratios, however this method is not always an option particularly with historic buildings.

4. Diaphragms – inadequate in-plane strength and/or stiffness
   Rehabilitation Measures: Add collectors to distribute forces or add moment frames, braced frames, or concrete/masonry shear walls to reduce diaphragm forces. Otherwise, increase capacity of existing diaphragm with wood structural panel overlay and/or additional nailing.

Trinity Building

The Trinity Building is a rectangular, concrete tilt-up building constructed in 1981 and renovated in 1997. The 6" concrete walls are reinforced with #4's at 12 inches on center each way. Additional out-of-plane wall reinforcement was observed during a walkthrough of the building. A roof that was rebuilt after a snow-induced roof collapse in the 1990's consists of (assumed) plywood sheathing over 2x joists supported by glulam purlins and girders on steel columns. The mezzanine area of the building used for meeting and office spaces consists of conventional wood framing. The Trinity Building is located on liquefaction susceptible soil per Redmond's liquefaction map. No significant cracking of the walls or slab-on-grade was observed during the walkthrough.

Common Deficiencies of Similar Type Buildings:

1. Global Strength – insufficient in-plane strength of shear walls or frames
   Rehabilitation Measures: Add a new steel braced frame or concrete/masonry shear wall. Enhance existing shear walls with concrete overlay.

2. Configuration – incidental bracing
   Rehabilitation Measures: Isolate mezzanine from the lateral force resisting system of the main building to prevent mezzanine from restraining seismic deflections and consequently creating an unintended load path in the main structure.

3. Load Path – inadequate connection at base of tilt-up panel
   Rehabilitation Measures: Improve wall-to-foundation connections by adding steel angles and adhesive anchors between the wall panel and adjacent slab-on-grade. It may be necessary to remove and recast a thicker pour strip if the slab-on-grade was not thickened next to the tilt-up panel.

Medic One Modular Building

The Medic One modular building is what appears to be an "L" shaped, one story, pre-manufactured modular building. We were unable to verify existing construction due to existing finishes and were unable to verify the existing foundation system due to limited visibility.

Common Deficiencies of Similar Buildings:

1. Sufficient Foundation – insufficient foundation system unable to resolve all lateral forces into soils.
   Rehabilitation Measures: pour in place new reinforced concrete stemwall and footing.

2. Anchorage to Foundation – insufficient attachment from sill plates to foundation to transfer lateral forces. Rehabilitation Measures: provide post installed anchors to sufficiently resist lateral forces at the wall to foundation interface.

Summary of Findings and Recommendations

The assessments of the Redmond Fire Stations find that structural deficiencies cause some of the buildings to fall below the minimum immediate-occupancy performance level outlined in ASCE 41-13. The report outlines these deficiencies and provides recommended mitigation measures. This information is intended to provide a scope of likely repairs required to mitigate the identified deficiencies. It is our professional opinion that the improvements outlined can be made to the buildings' lateral load resisting system to bring the buildings' performance during a seismic event into general conformance with current standards for building seismic rehabilitation. The improvements outlined above will help to limit building damage during an event and will increase the likelihood that the building will remain operational afterward. Should the City of Redmond decide to proceed with these repairs, Swenson Say Faget would be happy to help with providing construction documents to achieve a building permit.

Limitations

This study and report represent Swenson Say Faget's opinions based solely on our site observations made during brief site visits, as well as review of existing drawings. No exploratory demolition or in-situ testing of the existing building materials has been performed.

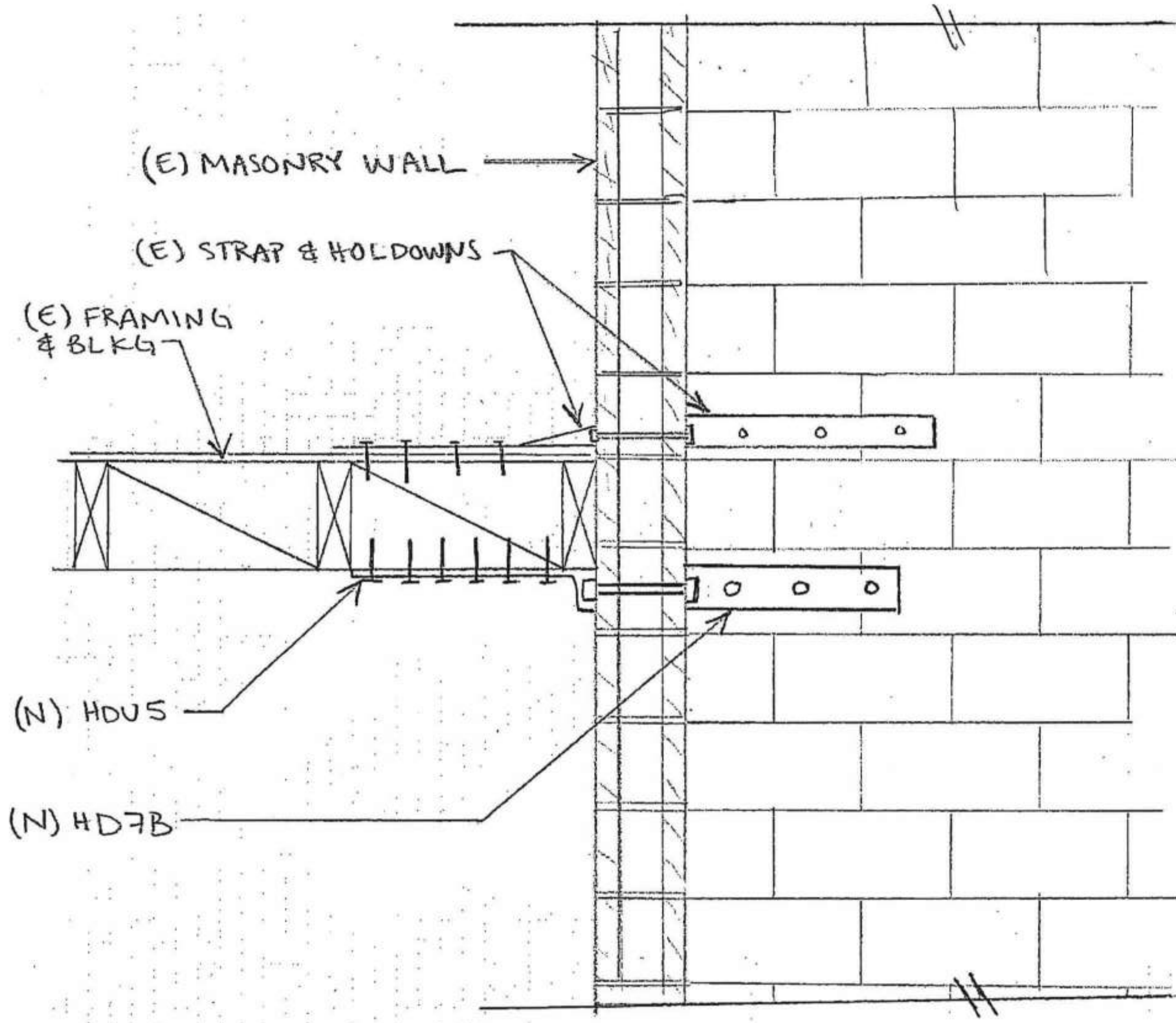
The scope of work was limited to a seismic evaluation of the primary lateral force resisting systems of the buildings. No assessment of the vertical (gravity) load carrying capability of the structure were made.

It is important to note that the fire stations were evaluated based on the 3-Tier Evaluation method of ASCE 41-13. This method is based on the Immediate Occupancy objective, as defined by the Seismic Evaluation and Retrofit of Existing Buildings (ASCE 41-13) and is discussed in detail in the section on Seismic Evaluation Methodology. Additional buildings in the City of Redmond's portfolio were evaluated using engineering experience and judgement as well as FEMA document 547.

This report is intended for the sole use of the City of Redmond and its consultants. The scope of work performed for this evaluation may not be appropriate to satisfy the needs of other users, and any use or re-use of this document and the findings and recommendations presented herein is at the sole risk of said user. Furthermore, this evaluation does not represent a warranty or guarantee by Swenson Say Faget that other problems do not exist. Swenson Say Fagét's professional services are performed using the degree of care and skill ordinarily exercised under similar circumstances by reputable structural engineers practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional opinions included in this report.

Appendix A

Schematic Structural Details



DETAIL ①

STRUCTURAL ENGINEERING

PROJECT: Redmond FS 12

DATE: 4/1/2016

PROJ. #

DESIGN

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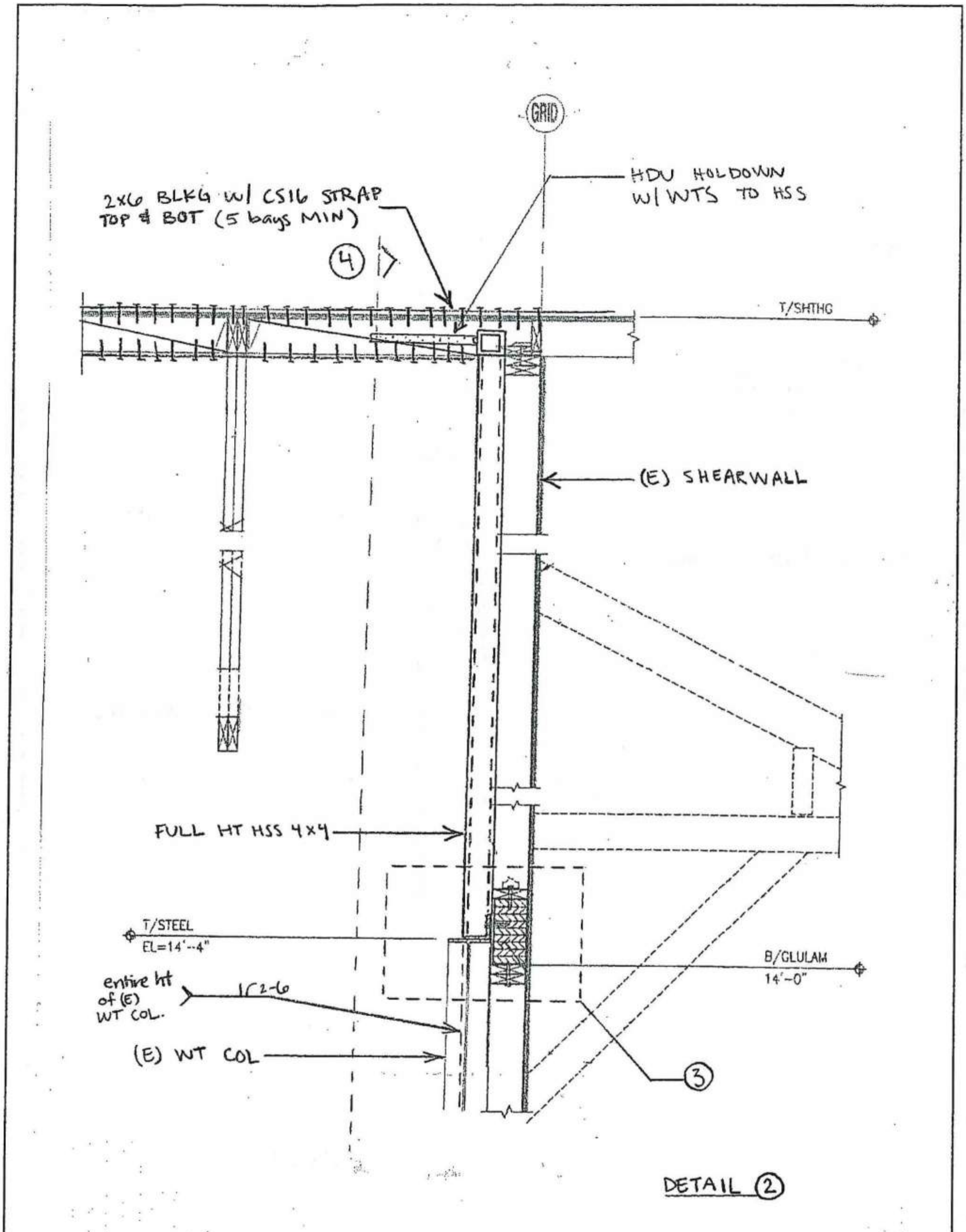

STRUCTURAL ENGINEERING

Redmond FS 18	4/1/2016
PROJECT	DATE
	PROJ. #
	DESIGN
	SHEET

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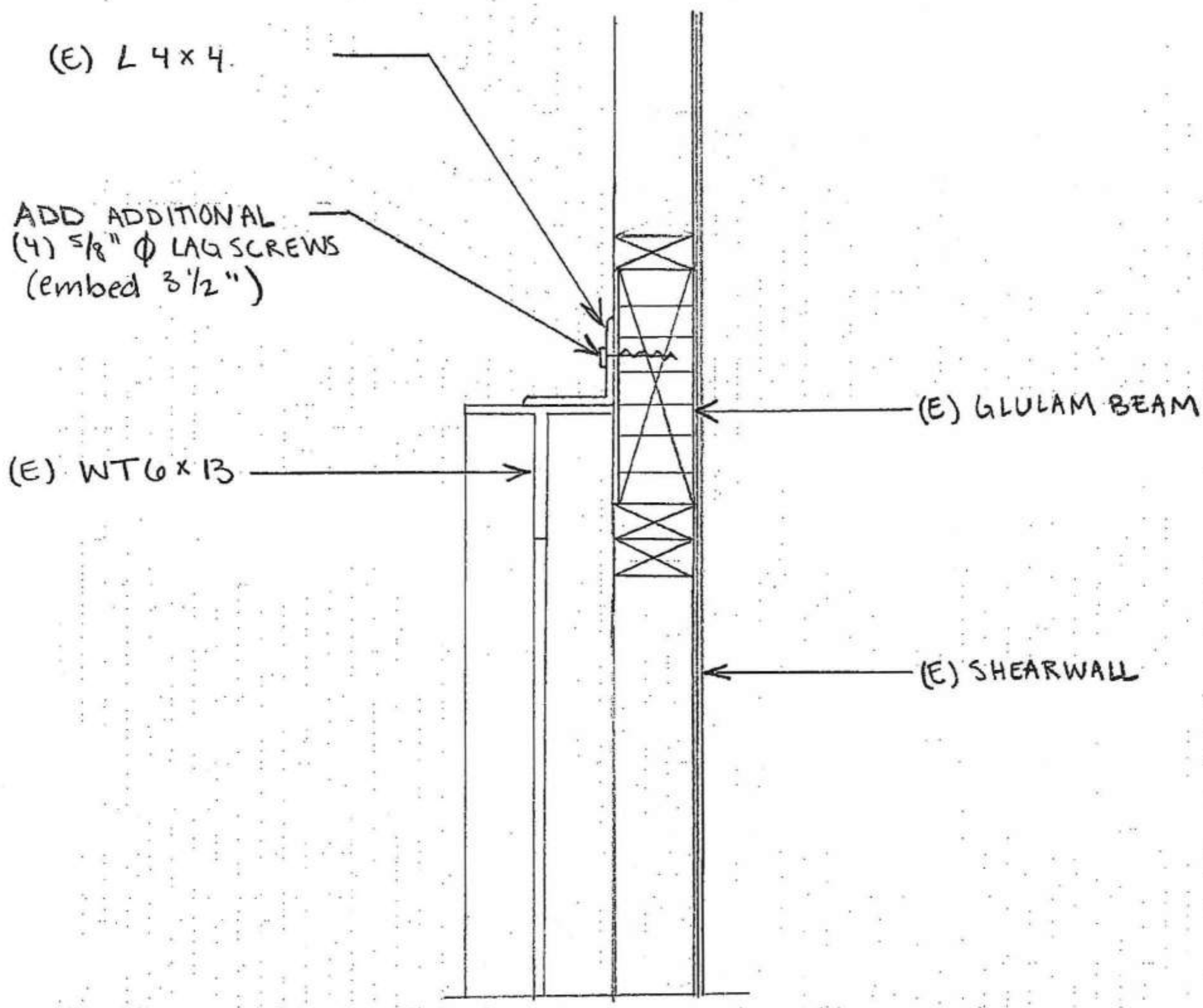

DETAIL (3)

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STRUCTURAL ENGINEERING

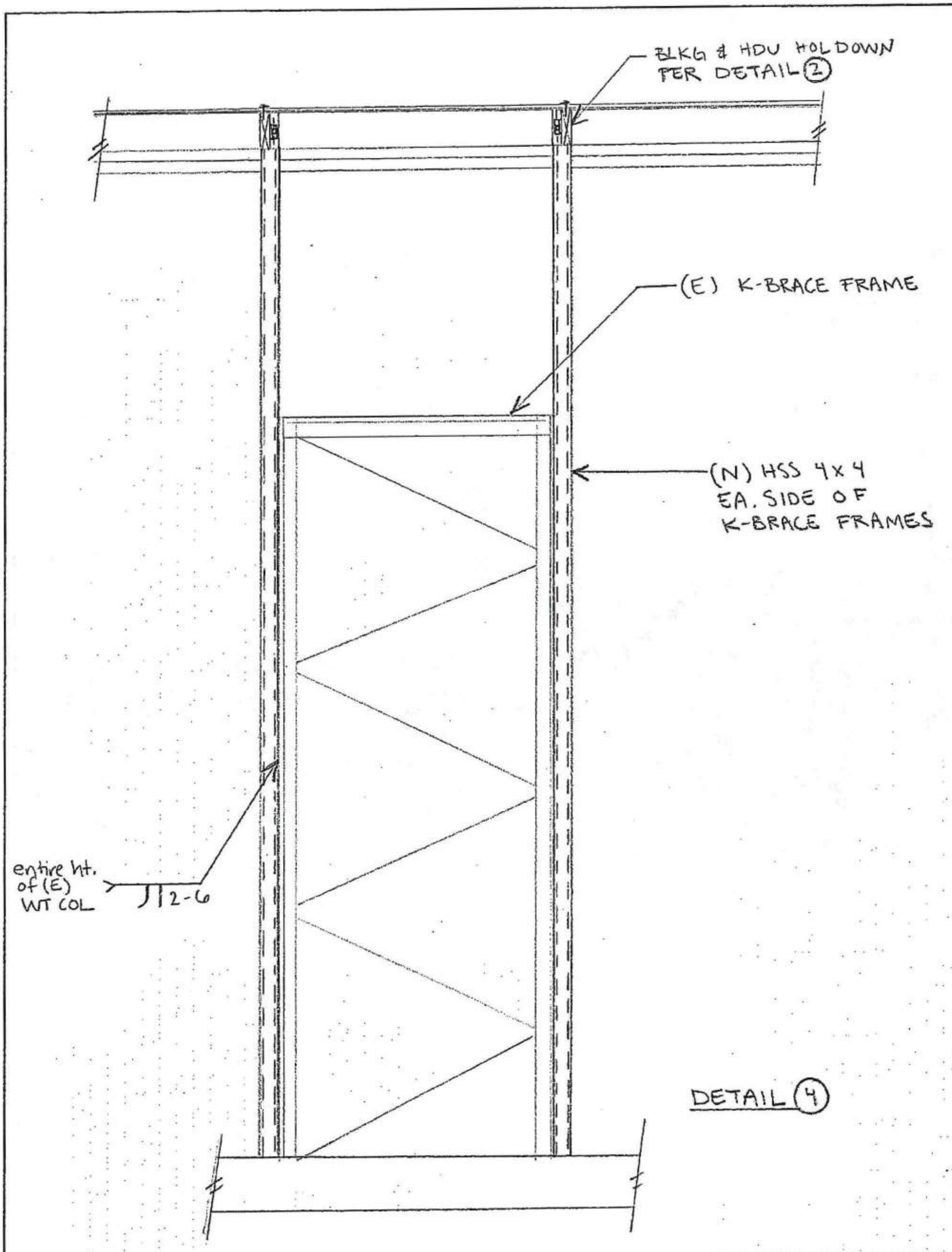
PROJECT: Redmond FS 18

DATE: 4/1/2016

PROJ. #

DESIGN

SHEET



Redmond FS 18
PROJECT

4/4/2016
DATE

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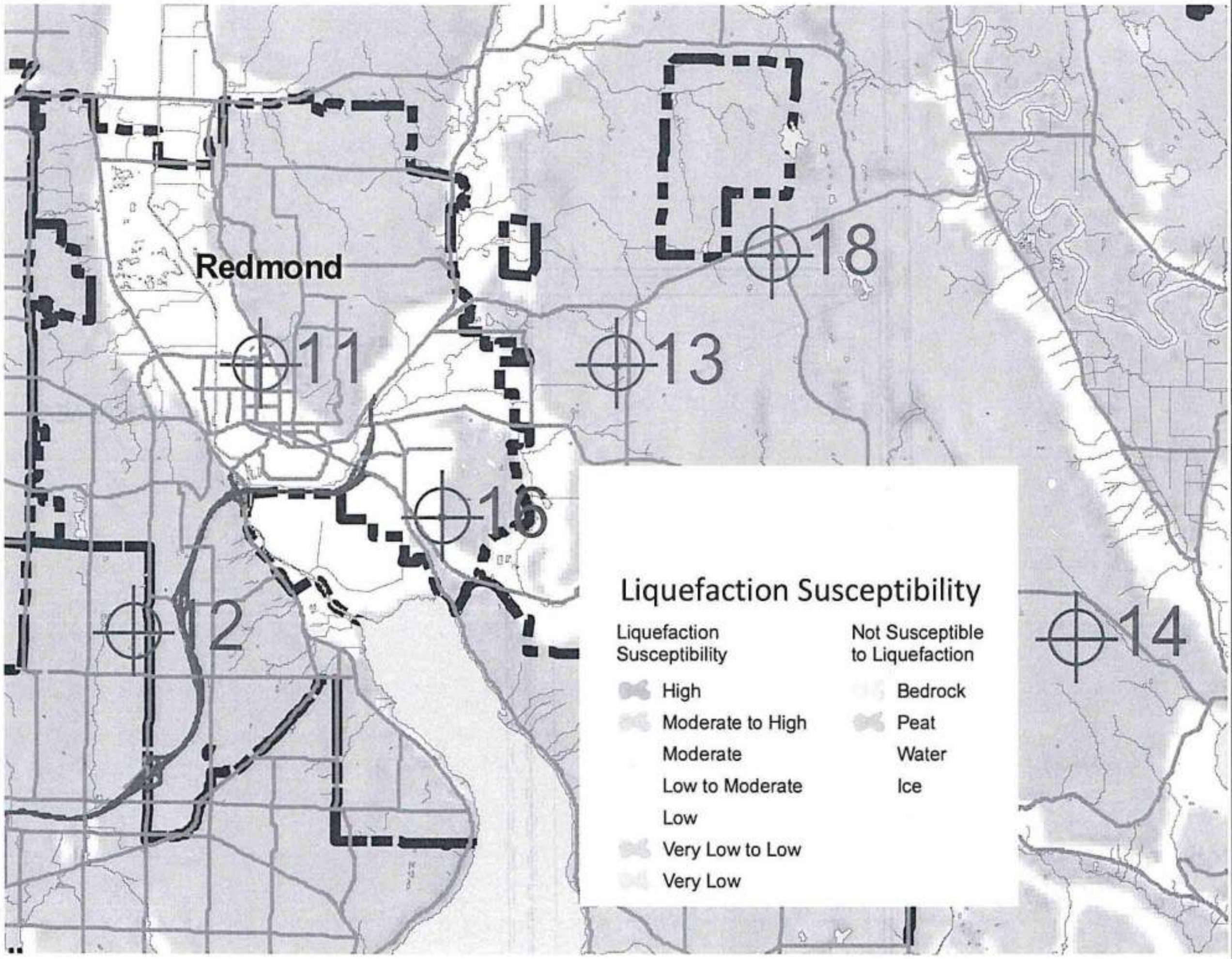

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SSF STRUCTURAL ENGINEERING

LIQUEFACTION SUSCEPTIBILITY
REDMOND FACILITIES MANAGEMENT
FIRE STATION 11/12/13/14/16/18

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
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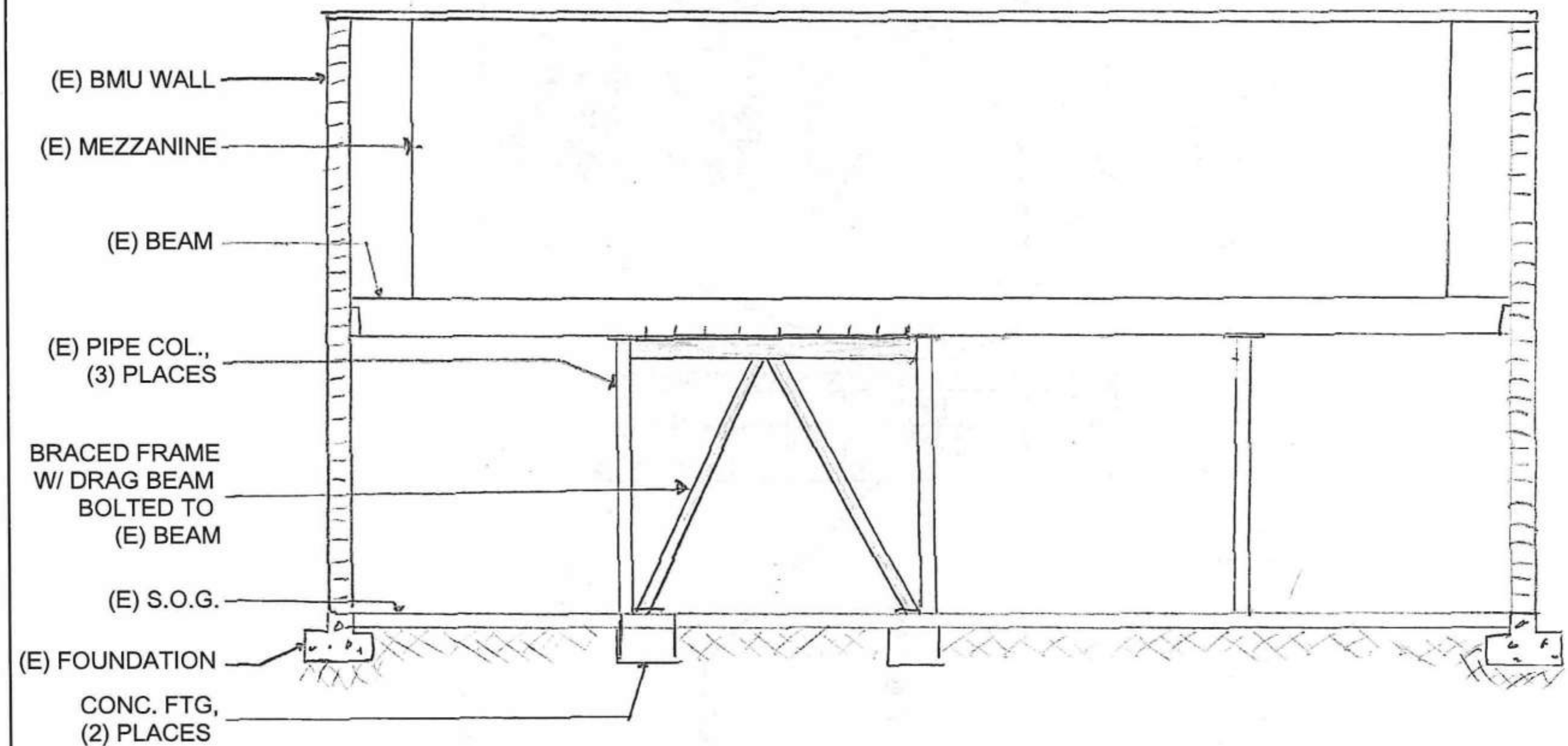

STRUCTURAL ENGINEERING

BRACED FRAME UNDER MEZZ. IN APPARATUS BAY
REDMOND FACILITIES MANAGEMENT
FIRE STATION 11/13/16

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
SHEET	6

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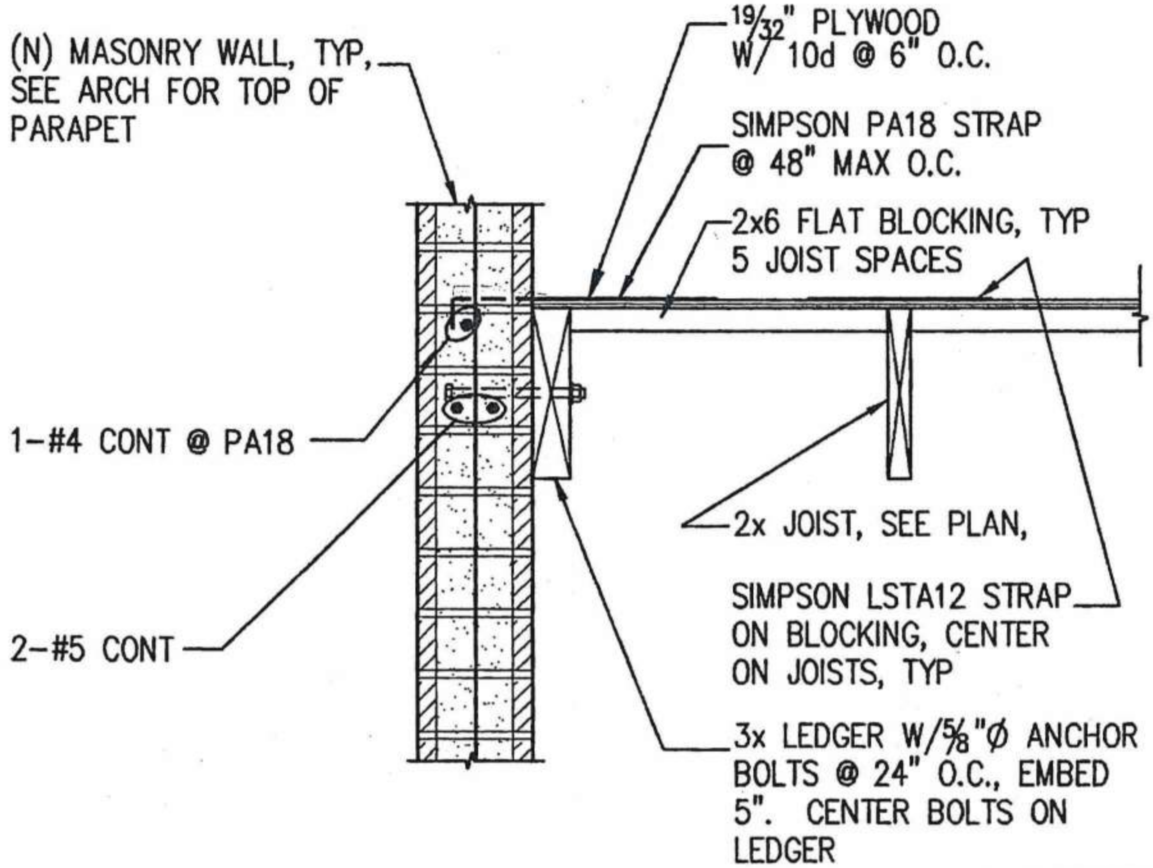

*ALL CONDITIONS EXISTING

INCREASE QUANTITY OF (E) ANCHOR BOLTS.

VERIFY ANCHOR BOLTS AT ORIGINAL BUILDING SECTION

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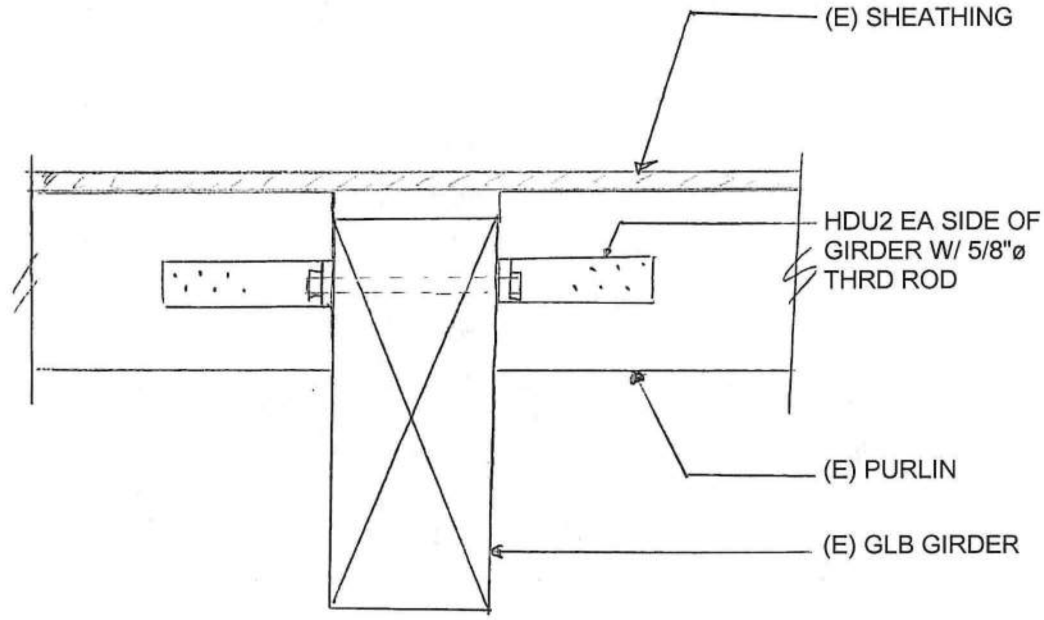
LEDGER ATTACHMENT TO BMU WALL	DATE 04/04/2016
REDMOND FACILITIES MANAGEMENT	PROJ. # 00665-2015-01
FIRE STATION 11	DESIGN RDO
	SHEET 7



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PURLIN CROSS TIE CONNECTION

REDMOND FACILITIES MANAGEMENT

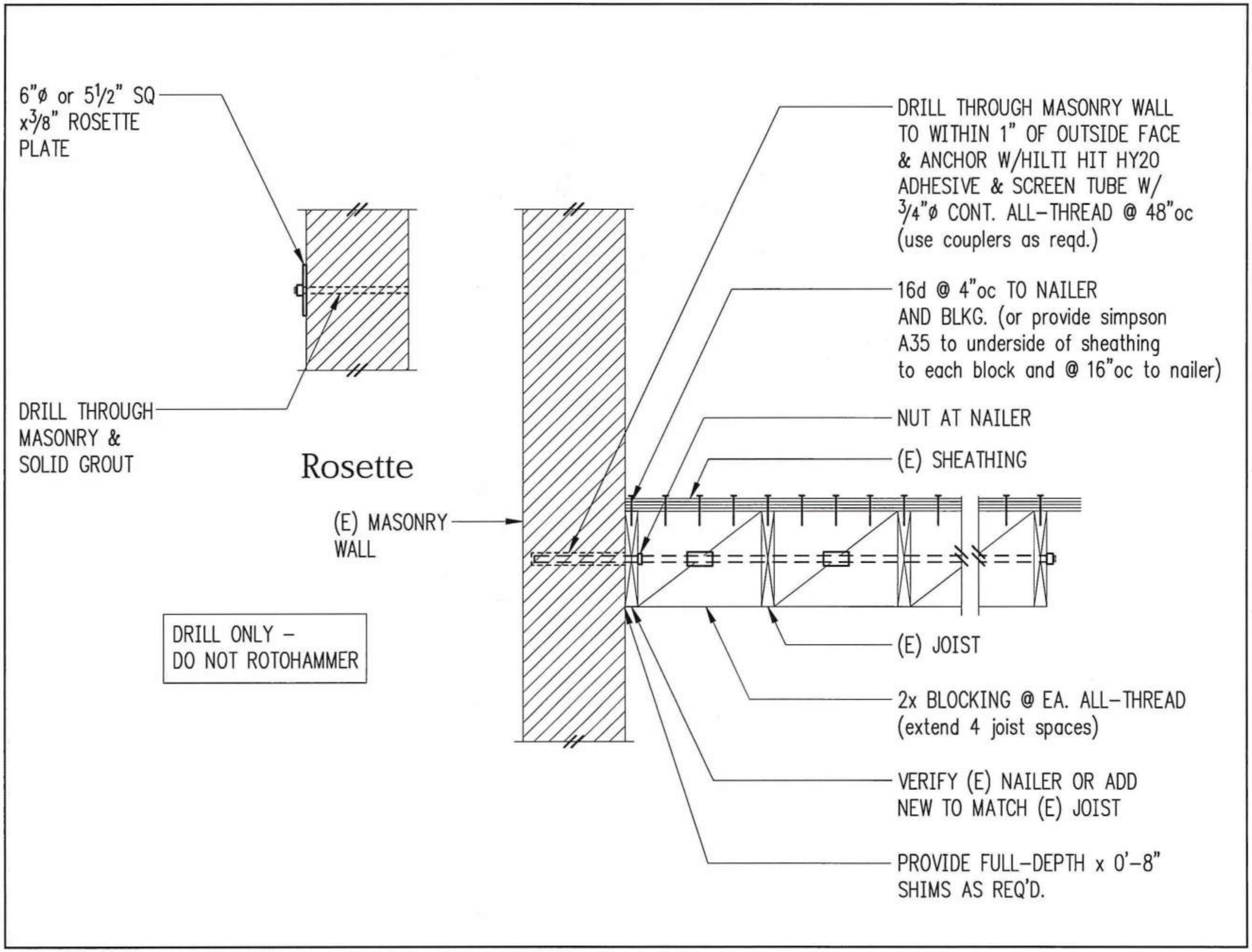
FIRE STATION 11/13/16

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
SHEET	9

SSF STRUCTURAL ENGINEERING

TYPICAL WALL ANCHOR W/ JOISTS PARALLEL
REDMOND FACILITIES MANAGEMENT
FIRE STATION 11/13/16

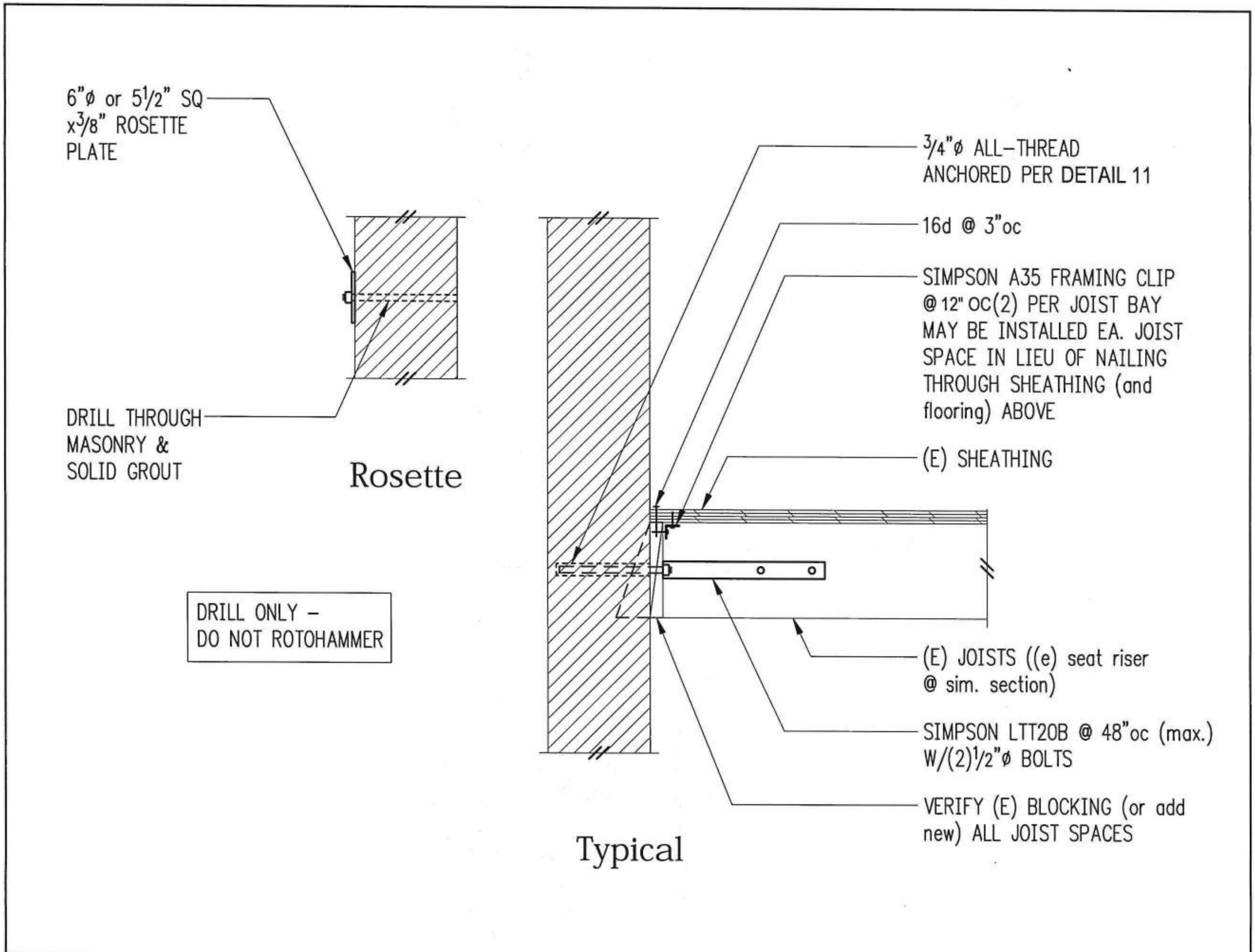
DATE 04/04/2016
PROJ.# 00665-2015-01
DESIGN RDO
SHEET 10

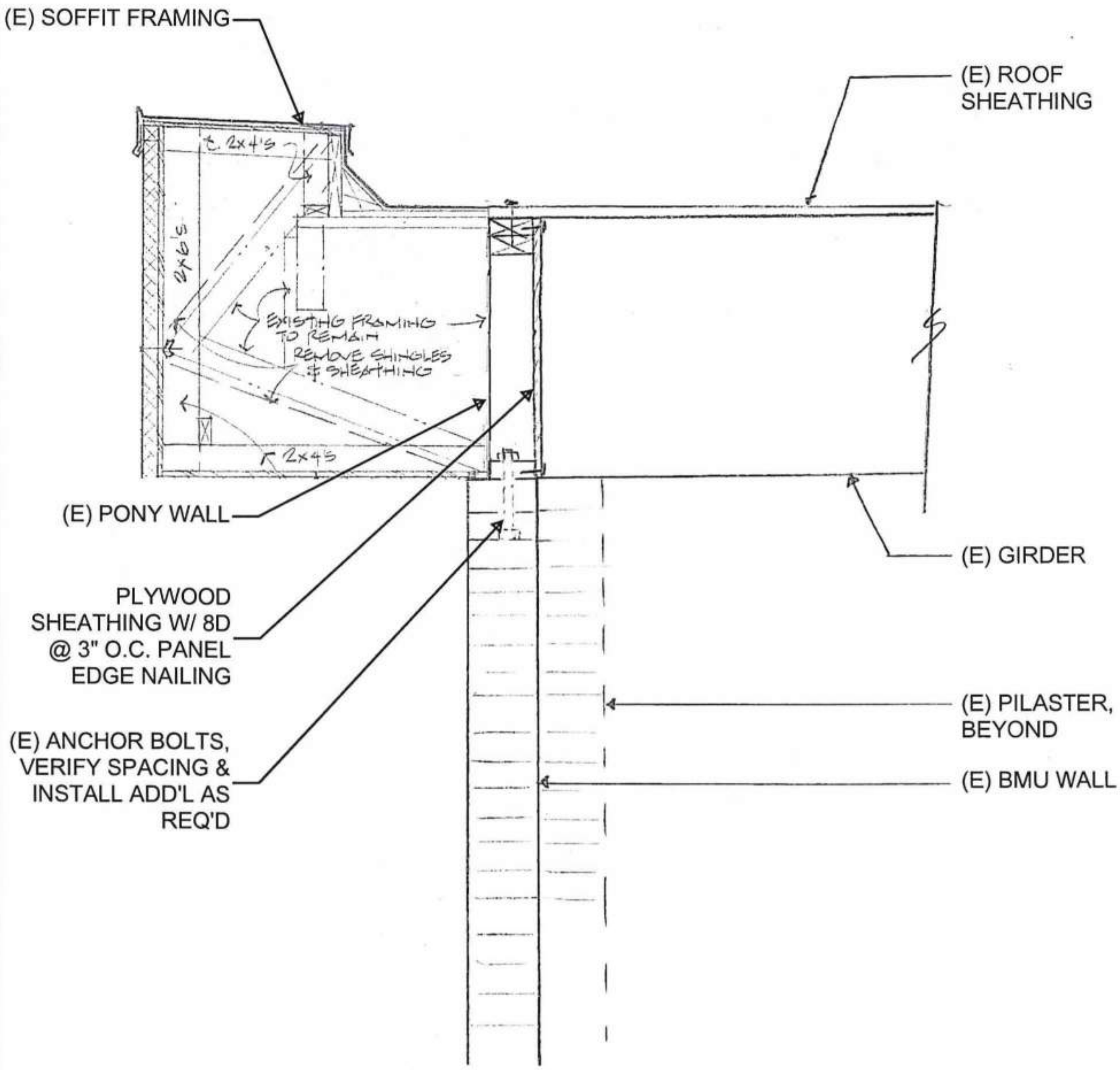


STRUCTURAL ENGINEERING

TYPICAL WALL ANCHOR AT JOIST PERPENDICULAR
REDMOND FACILITIES MANAGEMENT
FIRE STATION 11/13/16

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
SHEET	11





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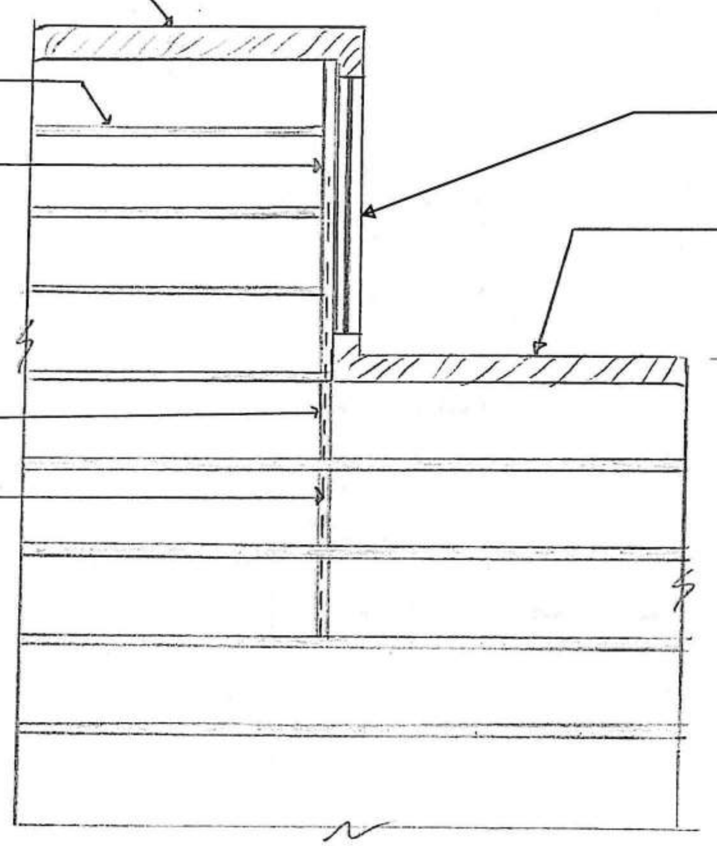
SSF STRUCTURAL ENGINEERING

PONY WALL OVER (E) BMU
REDMOND FACILITIES MANAGEMENT
FIRE STATION 13

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
SHEET	12



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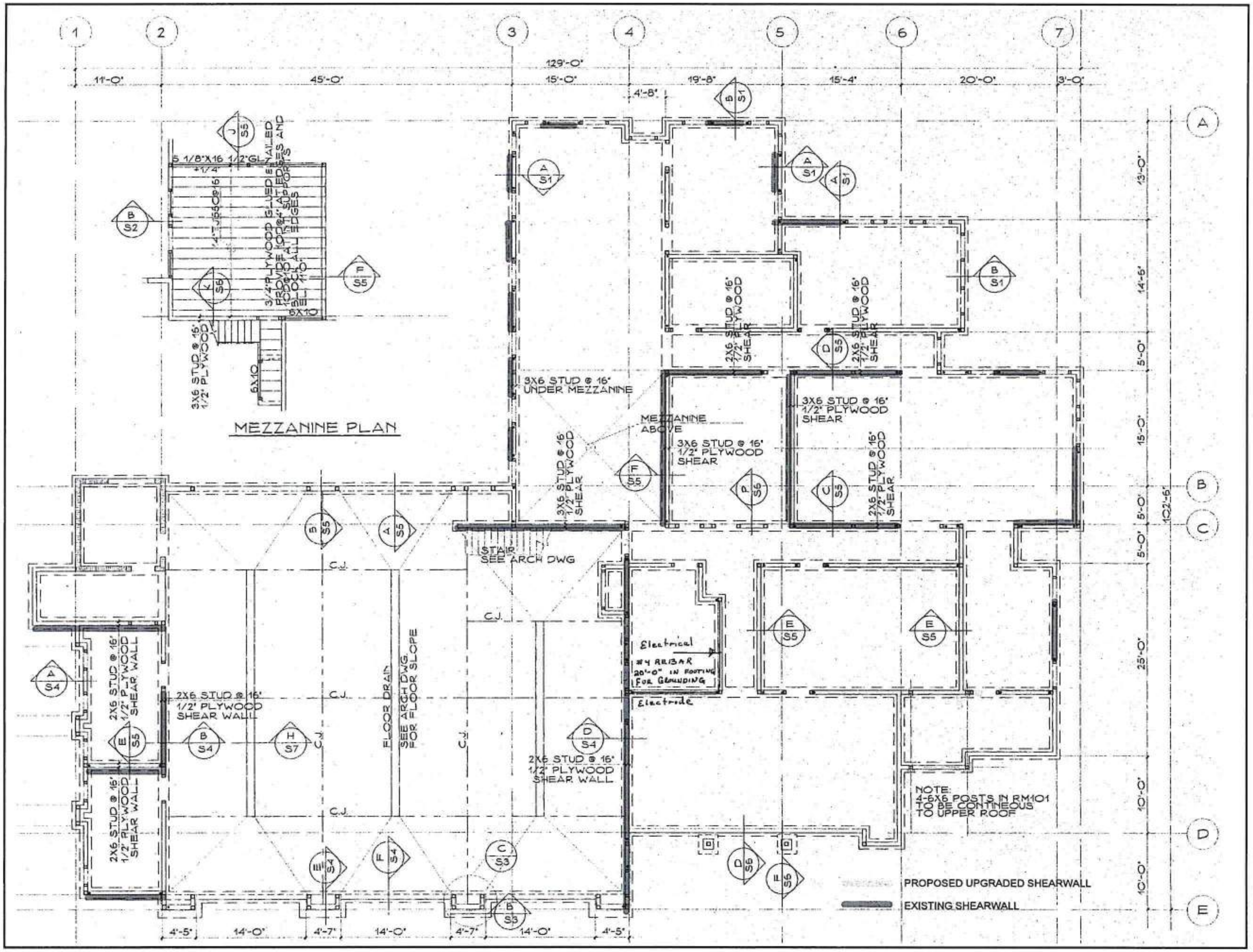
SSF STRUCTURAL ENGINEERING

STRAPPING DETAIL @ REENTRANT CORNER	DATE 04/04/2016
REDMOND FACILITIES MANAGEMENT	PROJ. # 00665-2015-01
FIRE STATION 11/13/16	DESIGN RDO
	SHEET 13



SSF STRUCTURAL ENGINEERING

FIRE STATION 16 SHEAR WALL PLAN

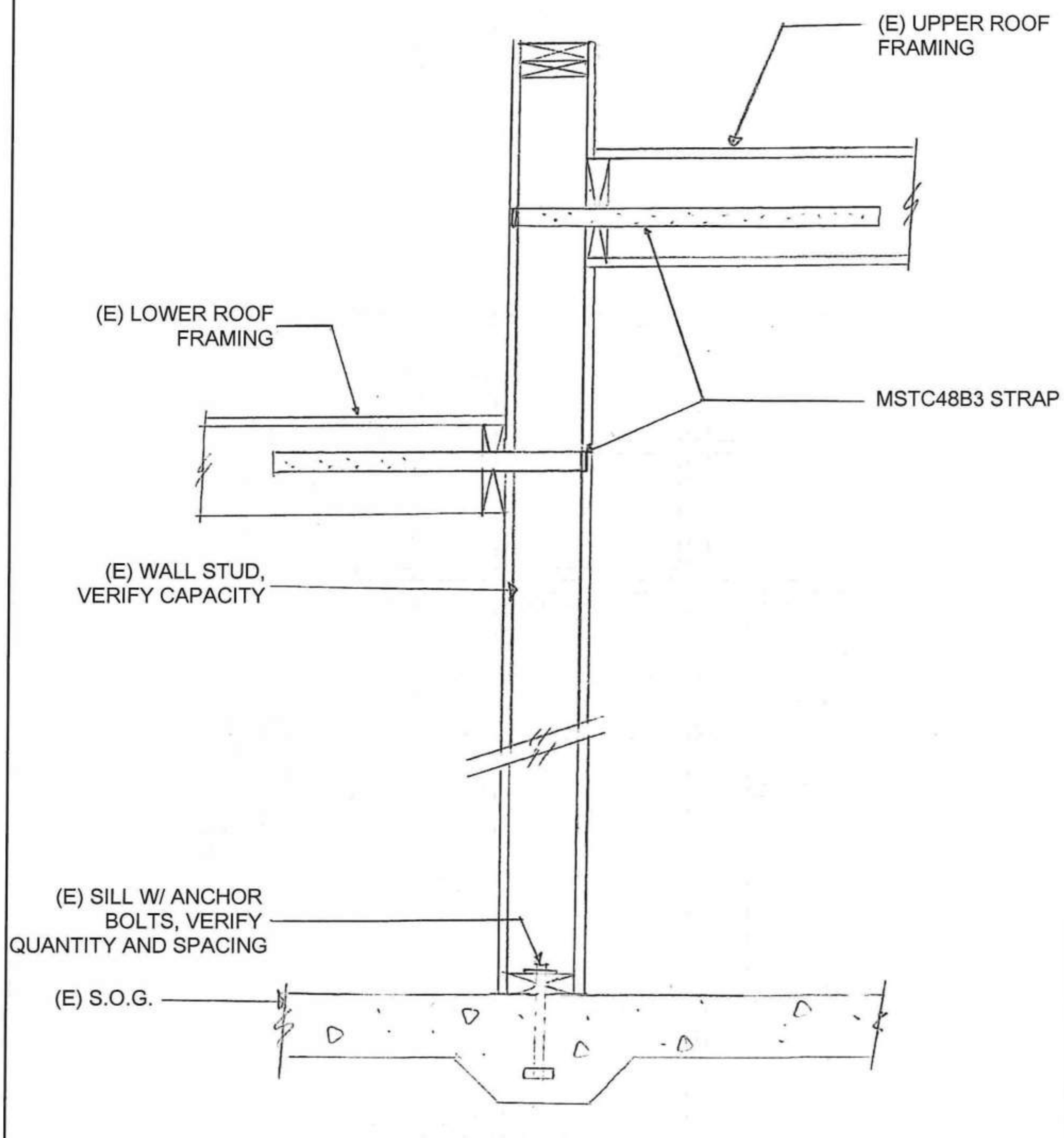
REDMOND FACILITIES MANAGEMENT

DATE 04/04/2016

PROJ. # 00665-2015-01

DESIGN RDO

SHEET 14



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SSF STRUCTURAL ENGINEERING

FORCE TRANSFER @ STEP IN DIAPHRAGM	DATE 04/04/2016
REDMOND FACILITIES MANAGEMENT	PROJ. # 00665-2015-01
FIRE STATION 16	DESIGN RDO
	SHEET 15

STRUCTURAL ENGINEERING

TYPICAL STRAPPING AROUND OPENINGS

REDMOND FACILITIES MANAGEMENT

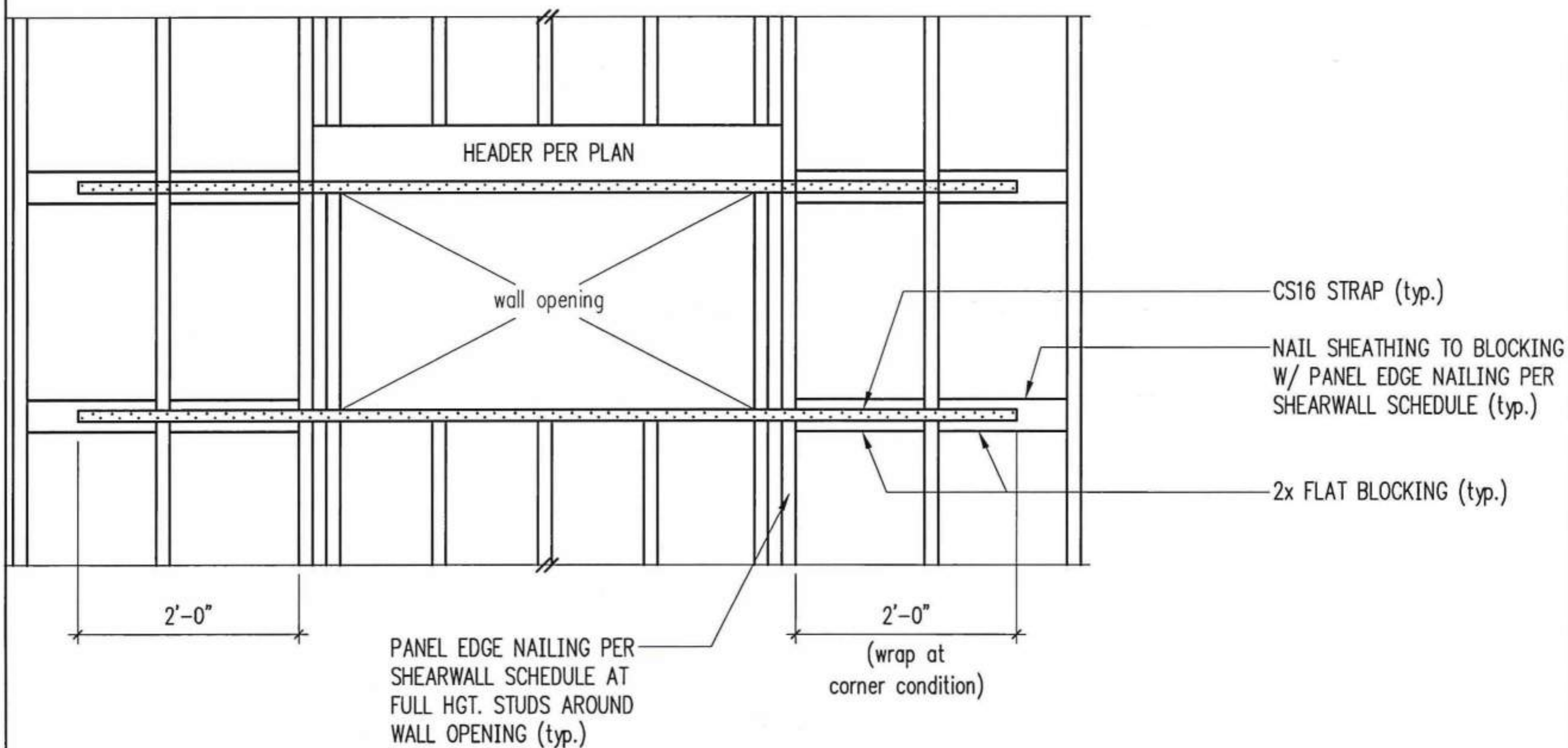
FIRE STATION 16

DATE 04/04/2016

PROJ. # 00665-2015-01

DESIGN RDO

SHEET 16



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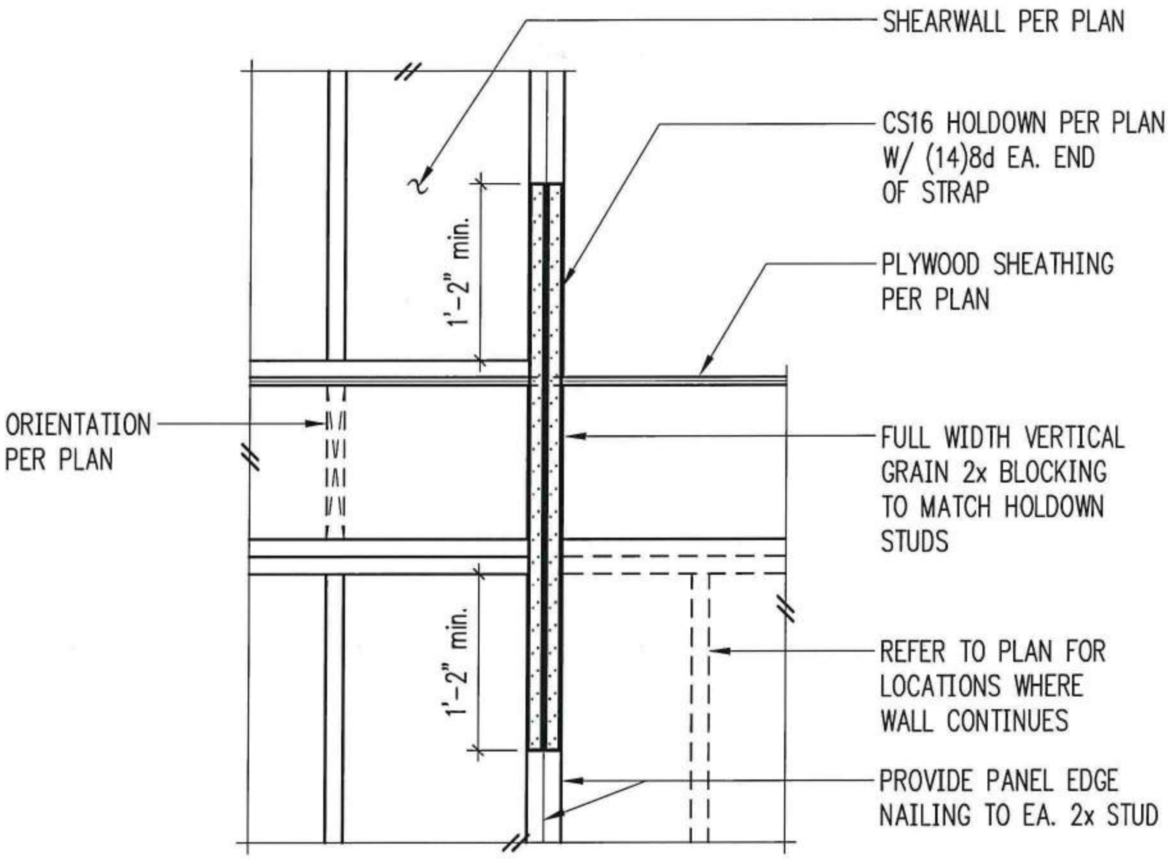

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SSF STRUCTURAL ENGINEERING

TYPICAL HOLDOWN BETWEEN FLOORS

REDMOND FACILITIES MANAGEMENT

FIRE STATION 16

DATE	04/04/2016
PROJ. #	00665-2015-01
DESIGN	RDO
SHEET	17

Appendix B

ASCE 41-13

Tier-1 Checklist

Project: Redmond Facilities: Fire Station 11 Location: Redmond, WA

Completed by: RDO Date: 3/9/16

16.15IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES RM1: REINFORCED MASONRY BEARING WALLS AND RM1A: REINFORCED MASONRY BEARING WALLS WITH STIFF DIAPHRAGMS

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

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 4.5.3.3, is less than 70 lb/in.^{2}. (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1) DCR= 1.4 at Wall line B (shared wall between apparatus bay and office)

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. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3) Wall scanning recommended at original building section.

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. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)

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. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1) Anchorage from remodel is adequate, however anchorage at original construction is unknown and should be verified.

Stiff Diaphragms

C NC N/A U TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)

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. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.4.3. Tier 2: Sec. 5.5.3.1.5)

C NC N/A U PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30. (Commentary: Sec. A.3.2.4.4. Tier 2: Sec. 5.5.3.1.2) H:T ratio is exceeded by 5 for the horizontal span between pilasters.

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. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)
Strapping details are unknown for the original structure. assumed not present.

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

Flexible Diaphragms

C NC N/A U CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2) Purlins are not connected between girder bays.

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

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. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: Redmond FS 12 Date: 2/25/2016
Building Address: 4211 148th Ave NE
Latitude: 47.648486 Longitude: -122.143625 By: FR
Year Built: 1991 Year(s) Remodeled: 1998 Original Design Code: UBC 1997
Area (sf): ______ Length (ft): ______ Width (ft): ______
No. of Stories: ______ Story Height: ______ Total Height: ______

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☐ Other: ______

CONSTRUCTION DATA

Gravity Load Structural System: ______
Exterior Transverse Walls: ______ Openings? ______
Exterior Longitudinal Walls: ______ Openings? ______
Roof Materials/Framing: ______
Intermediate Floors/Framing: ______
Ground Floor: ______
Columns: ______ Foundation: ______
General Condition of Structure: ______
Levels Below Grade? ______
Special Features and Comments: ______

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:		
Vertical Elements:		
Diaphragms:		
Connections:		

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{DS} = ______ S_{D1} = ______
Soil Factors: Class = ______ F_a = ______ F_v = ______
BSE-1E Spectral Response Accelerations: S_{XS} = 1.03 S_{X1} = 0.60
Level of Seismicity: ______ Performance Level: Immediate Occupancy
Building Period: T = ______
Spectral Acceleration: S_a = ______
Modification Factor: $C_mC_1C_2$ = ______ Building Weight: W = ______
Pseudo Lateral Force: V= $C_mC_1C_2S_aW$= 701 kip

BUILDING CLASSIFICATION: ______

REQUIRED TIER 1 CHECKLISTS	**Yes**	**No**
Basic Configuration Checklist	☐	☐
Building Type _____ Structural Checklist	☐	☐
Nonstructural Component Checklist	☐	☐

FURTHER EVALUATION REQUIREMENT: ______

Project: Redmond FS 12 Location: ____

Completed by: ____ Date: ____

TIER 1 CHECKLISTS

16.1 BASIC CHECKLIST

Very Low Seismicity

Structural Components

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

Project: Redmond FS 12 Location:

Completed by: Date:

16.1.2IO IMMEDIATE OCCUPANCY BASIC CONFIGURATION CHECKLIST

Very Low Seismicity

Building System

General

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

C NC N/A U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)

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. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

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 shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)

C NC N/A U SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be 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 stiffnessof the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)

C NC N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)

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. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)

C NC N/A U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)

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. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Low Seismicity: Complete the Following Items in Additionto 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 shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)

C NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)

C NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

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 $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)

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. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Project: Redmond FS 12 Location:

Completed by: Date:

16.15IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES RM1: REINFORCED MASONRY BEARING WALLS AND RM1A: REINFORCED MASONRY BEARING WALLS WITH STIFF DIAPHRAGMS

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

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 4.5.3.3, is less than 70 lb/in.^{2}. (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)

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. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)

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. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)

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. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

SIMPSON STRAPS VISIBLE. UNABLE TO VERIFY CAPACITY OF A.B.

Stiff Diaphragms

C NC N/A U TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)

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. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.4.3. Tier 2: Sec. 5.5.3.1.5)

C NC N/A U PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30. (Commentary: Sec. A.3.2.4.4. Tier 2: Sec. 5.5.3.1.2)

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. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

Flexible Diaphragms

C NC N/A U CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

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. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)

Project: Redmond FS 12 Location:

Completed by: Date:

16.16IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES URM: UNREINFORCED MASONRY BEARING WALLS WITH FLEXIBLE DIAPHRAGMS AND URMA: UNREINFORCED MASONRY BEARING WALLS WITH STIFF DIAPHRAGMS

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 30 lb/in.^{2} for clay units and 70 lb/in.^{2} for concrete units. (Commentary: Sec. A.3.2.5.1. Tier 2: Sec. 5.5.3.1.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

SIMPSON STRAPS VISIBLE. UNABLE TO VERIFY CAPACITY OF A.B.

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. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)

C NC N/A U TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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 PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than the following (Commentary: Sec. A.3.2.5.2. Tier 2: Sec. 5.5.3.1.2):

COMPLIANT IF WALL REINFORCEMENT PRESENT

Top story of multi-story building	9
First story of multi-story building	15
All other conditions	13

C NC N/A U MASONRY LAYUP: Filled collar joints of multi-wythe masonry walls have negligible voids. (Commentary: Sec. A.3.2.5.3. Tier 2: Sec. 5.5.3.4.1)

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. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

C NC N/A U OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are be greater than 4 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

Flexible Diaphragms

C NC N/A U CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete shall consist of horizontal spans of less than 40 ft and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. and Tier 2: Sec. 5.6.3)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

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. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)

C NC N/A U BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads. (Commentary: Sec. A.5.4.5. Tier 2: Sec. 5.7.4.4)

Project: Redmond FS 12 Location:

Completed by: Date:

16.17 NONSTRUCTURAL CHECKLIST

Life Safety Systems

C NC N/A U LS-LMH; PR-LMH. FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13. (Commentary: Sec. A.7.13.1. Tier 2: Sec. 13.7.4)

C NC N/A U LS-LMH; PR-LMH. FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13. (Commentary: Sec. A.7.13.2. Tier 2: Sec. 13.7.4)

C NC N/A U LS-LMH; PR-LMH. EMERGENCY POWER: Equipment used to power or control life safety systems is anchored or braced. (Commentary: Sec. A.7.12.1. Tier 2: Sec. 13.7.7)

C NC N/A U LS-LMH; PR-LMH. STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints. (Commentary: Sec. A.7.14.1. Tier 2: Sec. 13.7.6)

C NC N/A U LS-MH; PR-MH. SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13. (Commentary: Sec. A.7.13.3. Tier 2: Sec. 13.7.4)

C NC N/A U LS-not required; PR-LMH. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced. (Commentary: Sec. A.7.3.1. Tier 2: Sec. 13.7.9)

Hazardous Materials

C NC N/A U LS-LMH; PR-LMH. HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers. (Commentary: Sec. A.7.12.2. Tier 2: 13.7.1)

C NC N/A U 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. (Commentary: Sec. A.7.15.1. Tier 2: Sec. 13.8.4)

C NC N/A U 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. (Commentary: Sec. A.7.13.4. Tier 2: Sec. 13.7.3 and 13.7.5)

C NC N/A U LS-MH; PR-MH. SHUT-OFF VALVES: Piping containing hazardous material, including natural gas, has shut-off valves or other devices to limit spills or leaks. (Commentary: Sec. A.7.13.3. Tier 2: Sec. 13.7.3 and 13.7.5)

C NC N/A U LS-LMH; PR-LMH. FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, has flexible couplings. (Commentary: Sec. A.7.15.4, Tier 2: Sec.13.7.3 and 13.7.5)

C NC N/A U 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. (Commentary: Sec. A.7.13.6. Tier 2: Sec.13.7.3, 13.7.5, and 13.7.6)

Partitions

C NC N/A U LS-LMH; PR-LMH. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft in Low or Moderate Seismicity, or at most 6 ft in High Seismicity. (Commentary: Sec. A.7.1.1. Tier 2: Sec. 13.6.2)

C NC N/A U 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. (Commentary: Sec. A.7.2.1. Tier 2: Sec. 13.6.2)

C NC N/A U 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. (Commentary A.7.1.2 Tier 2: Sec. 13.6.2)

C NC N/A U 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. (Commentary: Sec. A.7.2.1. Tier 2: Sec. 13.6.2)

C NC N/A U LS-not required; PR-MH. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints. (Commentary: Sec. A.7.1.3. Tier 2. Sec. 13.6.2)

C NC N/A U 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. (Commentary: Sec. A.7.1.4. Tier 2. Sec. 13.6.2)

Ceilings

C NC N/A U LS-MH; PR-LMH. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 of area. (Commentary: Sec. A.7.2.3. Tier 2: Sec. 13.6.4)

C NC N/A U LS-MH; PR-LMH. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 of area. (Commentary: Sec. A.7.2.3. Tier 2: Sec. 13.6.4)

C NC N/A U LS-not required; PR-MH. INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft^2, and ceilings of smaller areas that are not surrounded by restraining partitions, are laterally restrained at a spacing no greater than 12 ft 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. (Commentary: Sec. A.7.2.2. Tier 2: Sec. 13.6.4)

C NC N/A U LS-not required; PR-MH. EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in.; in High Seismicity, 3/4 in. (Commentary: Sec. A.7.2.4. Tier 2: Sec. 13.6.4)

C NC N/A U 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. (Commentary: Sec. A.7.2.5. Tier 2: Sec. 13.6.4)

C NC N/A U LS-not required; PR-H. EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 are supported by closure angles or channels not less than 2 in. wide. (Commentary: Sec. A.7.2.6. Tier 2: Sec. 13.6.4)

C NC N/A U 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 2500 ft^2 and has a ratio of long-to-short dimension no more than 4-to-1. (Commentary: Sec. A.7.2.7. Tier 2: 13.6.4)

Light Fixtures

C NC N/A U 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. (Commentary: Sec. A.7.3.2. Tier 2: Sec. 13.6.4 and 13.7.9)

C NC N/A U LS-not required; PR-H. PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft and, if rigidly supported, are free to move with the structure to which they are attached without damaging adjoining components. (Commentary: A.7.3.3. Tier 2: Sec. 13.7.9)

C NC N/A U LS-not required; PR-H. LENS COVERS: Lens covers on light fixtures are attached with safety devices. (Commentary: Sec. A.7.3.4. Tier 2: Sec. 13.7.9)

Cladding and Glazing

C NC N/A U LS-MH; PR-MH. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^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; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft. (Commentary: Sec. A.7.4.1. Tier 2: Sec. 13.6.1)

C NC N/A U LS-MH; PR-MH. CLADDING ISOLATION: For steel or concrete moment frame buildings, panel connections are detailed to accommodate a story drift ratio 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. (Commentary: Sec. A.7.4.3. Tier 2: Section 13.6.1)

C NC N/A U 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 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 seismicty, 0.02. (Commentary: Sec. A.7.4.4. Tier 2: Sec. 13.6.1)

C NC N/A U 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. (Commentary: Sec. A.7.4.5. Tier 2: Sec. 13.6.1.4)

C NC N/A U LS-MH; PR-MH. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel. (Commentary: Sec. A.7.4.6. Tier 2: Sec. 13.6.1.4)

C NC N/A U LS-MH; PR-MH. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel. (Commentary: Sec. A.7.4.7. Tier 2: Sec. 13.6.1.4)

C NC N/A U LS-MH; PR-MH. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes over 16 ft^2 in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked. (Commentary: Sec. A.7.4.8: Tier 2: Sec. 13.6.1.5)

Masonry Veneer

C NC N/A U 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, and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in.; for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (Commentary: Sec. A.7.5.1. Tier 2: Sec. 13.6.1.2)

C NC N/A U LS-LMH; PR-LMH. SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor. (Commentary: Sec. A.7.5.2. Tier 2: Sec. 13.6.1.2)

C NC N/A U LS-LMH; PR-LMH. WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing. (Commentary: Sec. A.7.5.3. Tier 2: Sec. 13.6.1.2)

C NC N/A U LS-LMH; PR-LMH. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup. (Commentary: Sec. A.7.7.2. Tier 2: Section 13.6.1.1 and 13.6.1.2)

C NC N/A U LS-MH; PR-MH. STUD TRACKS: For veneer with metal stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. on center. (Commentary: Sec. A.7.6.1. Tier 2: Section 13.6.1.1 and 13.6.1.2)

C NC N/A U 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. (Commentary: Sec. A.7.7.1. Tier 2: Section 13.6.1.1 and 13.6.1.2)

C NC N/A U LS-not required; PR-MH. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing. (Commentary: Sec. A.7.5.6. Tier 2: Section 13.6.1.2)

C NC N/A U LS-not required; PR-MH. OPENINGS: For veneer with metal stud backup, steel studs frame window and door openings. (Commentary: Sec. A.7.6.2. Tier 2: Sec. 13.6.1.1 and 13.6.1.2)

Parapets, Cornices, Ornamentation, and Appendages

C NC N/A U 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. (Commentary: Sec. A.7.8.1. Tier 2: Sec. 13.6.5)

C NC N/A U 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; for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft. (Commentary: Sec. A.7.8.2. Tier 2: Sec. 13.6.6)

C NC N/A U LS-MH; PR-LMH. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement. (Commentary: Sec. A.7.8.3. Tier 2: Sec. 13.6.5)

C NC N/A U 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. This checklist item does not apply to parapets or cornices covered by other checklist items. (Commentary: Sec. A.7.8.4. Tier 2: Sec. 13.6.6)

Masonry Chimneys

C NC N/A U 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. (Commentary: Sec. A.7.9.1. Tier 2: 13.6.7)

C NC N/A U LS-LMH; PR-LMH. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof. (Commentary: Sec. A.7.9.2. Tier 2: 13.6.7)

Stairs

C NC N/A U 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. (Commentary: Sec. A.7.10.1. Tier 2: Sec. 13.6.2 and 13.6.8)

C NC N/A U LS-LMH; PR-LMH. STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure does not rely on shallow anchors in concrete. Alternatively, the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.5.3.1 without including any lateral stiffness contribution from the stairs. (Commentary: Sec. A.7.10.2. Tier 2: 13.6.8)

Contents and Furnishings

C NC N/A U LS-MH; PR-MH. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/MH 16.1 as modified by ASCE 7 Chapter 15. (Commentary: Sec. A.7.11.1. Tier 2: Sec. 13.8.1)

C NC N/A U LS-H; PR-MH. TALL NARROW CONTENTS: Contents more than 6 ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other. (Commentary: Sec. A.7.11.2. Tier 2: Sec. 13.8.2)

C NC N/A U LS-H; PR-H. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb whose center of mass is more than 4 ft above the adjacent floor level are braced or otherwise restrained. (Commentary: Sec. A.7.11.3. Tier 2: Sec. 13.8.2)

C NC N/A U LS-not required; PR-MH. ACCESS FLOORS: Access floors more than 9 in. high are braced. (Commentary: Sec. A.7.11.4. Tier 2: Sec. 13.8.3)

C NC N/A U 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. (Commentary: Sec. A.7.11.5. Tier 2: Sec. 13.7.7 and 13.8.3)

C NC N/A U 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. (Commentary. A.7.11.6. Tier 2: Sec. 13.8.2)

Mechanical and Electrical Equipment

C NC N/A U LS-H; PR-H. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb whose center of mass is more than 4 ft above the adjacent floor level, and which is not in-line equipment, is braced. (Commentary: A.7.12.4. Tier 2: 13.7.1 and 13.7.7)

C NC N/A U 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, is supported and laterally braced independent of the duct or piping system. (Commentary: Sec. A.7.12.5. Tier 2: Sec. 13.7.1)

C NC N/A U LS-H; PR-MH. TALL NARROW EQUIPMENT: Equipment more than 6 ft 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. (Commentary: Sec. A.7.12.6. Tier 2: Sec. 13.7.1 and 13.7.7)

C NC N/A U LS-not required; PR-MH. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01. (Commentary: Sec. A.7.12.7. Tier 2: Sec. 13.6.9)

C NC N/A U 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. (Commentary: Sec. A.7.12.8. Tier 2: Sec. 13.7.1 and 13.7.7)

C NC N/A U 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. (Commentary: Sec. A.7.12.9. Tier 2: Sec. 13.7.1)

C NC N/A U LS-not required; PR-H. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb is anchored to the structure. (Commentary: Sec. A.7.12.10. Tier 2: 13.7.1 and 13.7.7)

C NC N/A U LS-not required; PR-H. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure. (Commentary: Sec. A.7.12.11. Tier 2: 13.7.7)

C NC N/A U LS-not required; PR-H. CONDUIT COUPLINGS: Conduit greater than 2.5 in. trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections. (Commentary: Sec. A.7.12.12. Tier 2: 13.7.8)

Piping

C NC N/A U LS-not required; PR-H. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings. (Commentary: Sec. A.7.13.2. Tier 2: Sec. 13.7.3 and 13.7.5)

C NC N/A U 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. (Commentary: Sec. A.7.13.4. Tier 2: Sec. 13.7.3 and 13.7.5)

C NC N/A U LS-not required; PR-H. C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. in diameter are restrained. (Commentary: Sec. A.7.13.5. Tier 2: Sec. 13.7.3 and 13.7.5)

C NC N/A U 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. (Commentary: Sec. A7.13.6. Tier 2: Sec.13.7.3 and Sec. 13.7.5)

Ducts

C NC N/A U LS-not required; PR-H. DUCT BRACING: Rectangular ductwork larger than 6 ft^2 in cross-sectional area and round ducts larger than 28 in. in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft. The maximum spacing of longitudinal bracing does not exceed 60 ft. (Commentary: Sec. A.7.14.2. Tier 2: Sec. 13.7.6)

C NC N/A U LS-not required; PR-H. DUCT SUPPORT: Ducts are not supported by piping or electrical conduit. (Commentary: Sec. A.7.14.3. Tier 2: Sec. 13.7.6)

C NC N/A U 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. (Commentary: Sec. A.7.14.5. Tier 2: Sec. 13.7.6)

Elevators

C NC N/A U LS-H; PR-H. RETAINER GUARDS: Sheaves and drums have cable retainer guards. (Commentary: Sec. A.7.16.1. Tier 2: 13.8.6)

C NC N/A U LS-H; PR-H. RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight. (Commentary: Sec. A.7.16.2. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored. (Commentary: Sec. A.7.16.3. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/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. (Commentary: Sec. A.7.16.4. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking. (Commentary: Sec. A.7.16.5. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1. (Commentary: Sec. A.7.16.6. Tier 2: 13.8.6)

C NC N/A U 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. (Commentary: Sec. A.7.16.7. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. SPREADER BRACKET: Spreader brackets are not used to resist seismic forces. (Commentary: Sec. A.7.16.8. Tier 2: 13.8.6)

C NC N/A U LS-not required; PR-H. GO-SLOW ELEVATORS: The building has a go-slow elevator system. (Commentary: Sec. A.7.16.9. Tier 2: 13.8.6)

Project: Redmond Facilities: Fire Station 13 Location: Redmond, WA

Completed by: RDO Date: 3/9/16

16.15IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES RM1: REINFORCED MASONRY BEARING WALLS AND RM1A: REINFORCED MASONRY BEARING WALLS WITH STIFF DIAPHRAGMS

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

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 4.5.3.3, is less than 70 lb/in.^{2}. (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1) Conforms in E/W direction. DCR=1.42 in N/S direction.

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. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3) No horizontal reinforcement is shown on plan. Wall scanning recommended.

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. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3) Diaphragm sheathing nails directly to top of ledger. Recommend horizontal connection of joists to walls.

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. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2) Type and spacing of anchorage needs to be verified. Assumed spacing inadequate.

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. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1) Girder connections to South wall conforms. No anchorage is detailed at N/S walls.

Stiff Diaphragms

C NC N/A U TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)

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. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.4.3. Tier 2: Sec. 5.5.3.1.5)

C NC N/A U PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30. (Commentary: Sec. A.3.2.4.4. Tier 2: Sec. 5.5.3.1.2) H:T ratio is exceeded by 5 for the horizontal span between pilasters.

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. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)
No tensile capacity is detailed at the NW reentrant corner.

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

Flexible Diaphragms

C NC N/A U CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2) Purlins are not connected between girder bays.

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

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. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: Redmond FS 14 Date: 2/25/2016
Building Address: 5021 264th Ave NE
Latitude: 47.651964 Longitude: -121.987798 By: FR
Year Built: 1991 Year(s) Remodeled: ____ Original Design Code: UBC 1988
Area (sf): ____ Length (ft): ____ Width (ft): ____
No. of Stories: ____ Story Height: ____ Total Height: ____

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☐ Other: ____

CONSTRUCTION DATA

Gravity Load Structural System: ____
Exterior Transverse Walls: ____ Openings? ____
Exterior Longitudinal Walls: ____ Openings? ____
Roof Materials/Framing: ____
Intermediate Floors/Framing: ____
Ground Floor: ____
Columns: ____ Foundation: ____
General Condition of Structure: ____
Levels Below Grade? ____
Special Features and Comments: ____

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:		
Vertical Elements:		
Diaphragms:		
Connections:		

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{Ds} = ____ S_{D1} = ____
Soil Factors: Class = ____ F_a = ____ F_v = ____
BSE-1E Spectral Response Accelerations: S_{XS} = 0.999 S_{X1} = 0.577
Level of Seismicity: ____ Performance Level: Immediate Occupancy
Building Period: T = ____
Spectral Acceleration: S_a = ____
Modification Factor: $C_mC_1C_2$ = ____ Building Weight: W = ____
Pseudo Lateral Force: $V=$
$C_mC_1C_2S_aW=$ 185 kip

BUILDING CLASSIFICATION: ____

REQUIRED TIER 1 CHECKLISTS	**Yes**	**No**
Basic Configuration Checklist	☐	☐
Building Type _____ Structural Checklist	☐	☐
Nonstructural Component Checklist	☐	☐

FURTHER EVALUATION REQUIREMENT: ____

Project: Redmond FS 14 Location:

Completed by: Date:

TIER 1 CHECKLISTS

16.1 BASIC CHECKLIST

Very Low Seismicity

Structural Components

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

Project: Redmond FS 14 Location:

Completed by: Date:

16.1.2IO IMMEDIATE OCCUPANCY BASIC CONFIGURATION CHECKLIST

Very Low Seismicity

Building System

General

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

C NC N/A U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)

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. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

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 shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)

C NC N/A U SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be 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 stiffnessof the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)

C NC N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)

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. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)

C NC N/A U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)

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. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Low Seismicity: Complete the Following Items in Additionto 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 shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)

C NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)

C NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

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 $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)

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. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Project: Redmond FS 14 Location:

Completed by: Date:

16.21O IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES W1: WOOD LIGHT FRAMES AND W1A: MULTI-STORY, MULTI-UNIT RESIDENTIAL WOOD FRAME

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft
Diagonal sheathing	700 lb/ft
Straight sheathing	100 lb/ft
All other conditions	100 lb/ft

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. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C NC N/A U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard are not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec.5.5.3.6.2)

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. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.5.5.3.6.3)

C NC N/A U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

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. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

FRONT OPENINGS = 65% < 80%

Connections

C NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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 HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1 ft. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

Project: Redmond FS 14 Location:

Completed by: Date:

16.3IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft
Diagonal sheathing	700 lb/ft
Straight sheathing	100 lb/ft
All other conditions	100 lb/ft

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. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C NC N/A U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)

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. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)

C NC N/A U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

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. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

C NC N/A U HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

Connections

C NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

Project: Redmond Fire Station 16 Location: Redmond, WA

Completed by: RDO Date: 2/26/16

16.3IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft	v=1100 lb/ft
Diagonal sheathing	700 lb/ft	
Straight sheathing	100 lb/ft	
All other conditions	100 lb/ft	v=572 lb/ft at GWB shearwalls (if considered)

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. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C NC N/A U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)
highest ratio is 3.25 @ N elevation of office

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. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)
no strapping provided where wall is platform framed over mezzanine

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. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)

C NC N/A U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

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. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

C NC N/A U HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

Connections

C NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)
highest ratio is 3.25 @ N elevation of office

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1) diaphragm steps at multiple locations of building

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)
no strapping detailed at reentrant corners

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: Redmond FS 14 Date: 2/25/2016

Building Address: 5021 264th Ave NE

Latitude: 47.651964 Longitude: -121.987798 By: FR

Year Built: 1991 Year(s) Remodeled: ______ Original Design Code: UBC 1988

Area (sf): ______ Length (ft): ______ Width (ft): ______

No. of Stories: ______ Story Height: ______ Total Height: ______

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☐ Other: ______

CONSTRUCTION DATA

Gravity Load Structural System: ______

Exterior Transverse Walls: ______ Openings? ______

Exterior Longitudinal Walls: ______ Openings? ______

Roof Materials/Framing: ______

Intermediate Floors/Framing: ______

Ground Floor: ______

Columns: ______ Foundation: ______

General Condition of Structure: ______

Levels Below Grade? ______

Special Features and Comments: ______

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:		
Vertical Elements:		
Diaphragms:		
Connections:		

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{Ds} = ______ S_{D1} = ______

Soil Factors: Class = ______ F_a = ______ F_v = ______

BSE-1E Spectral Response Accelerations: S_{XS} = 0.999 S_{X1} = 0.577

Level of Seismicity: ______ Performance Level: Immediate Occupancy

Building Period: T = ______

Spectral Acceleration: S_a = ______

Modification Factor: $C_m C_1 C_2$ = ______ Building Weight: W = ______

Pseudo Lateral Force: V=

$C_m C_1 C_2 S_a W$= 185 kip

BUILDING CLASSIFICATION: ______

REQUIRED TIER 1 CHECKLISTS	**Yes**	**No**
Basic Configuration Checklist	☐	☐
Building Type _____ Structural Checklist	☐	☐
Nonstructural Component Checklist	☐	☐

FURTHER EVALUATION REQUIREMENT: ______

Project: Redmond FS 14 Location:

Completed by: Date:

TIER 1 CHECKLISTS

16.1 BASIC CHECKLIST

Very Low Seismicity

Structural Components

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

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 shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)

Project: Redmond FS 14 Location:

Completed by: Date:

16.1.2IO IMMEDIATE OCCUPANCY BASIC CONFIGURATION CHECKLIST

Very Low Seismicity

Building System

General

C NC N/A U LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)

C NC N/A U ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1a, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)

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. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)

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 shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)

C NC N/A U SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be 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 stiffnessof the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)

C NC N/A U VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)

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. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)

C NC N/A U MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)

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. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)

Low Seismicity: Complete the Following Items in Additionto 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 shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)

C NC N/A U SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)

C NC N/A U SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)

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 $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)

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. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Project: Redmond FS 14 Location: ____

Completed by: ____ Date: ____

16.2IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPES W1: WOOD LIGHT FRAMES AND W1A: MULTI-STORY, MULTI-UNIT RESIDENTIAL WOOD FRAME

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft
Diagonal sheathing	700 lb/ft
Straight sheathing	100 lb/ft
All other conditions	100 lb/ft

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. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C NC N/A U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard are not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec.5.5.3.6.2)

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. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.5.5.3.6.3)

C NC N/A U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

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. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

FRONT OPENINGS = 65% < 80%

Connections

C NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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 HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1 ft. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

Project: Redmond FS 14 Location:

Completed by: Date:

16.3IO IMMEDIATE OCCUPANCY STRUCTURAL CHECKLIST FOR BUILDING TYPE W2: WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

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. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)

C NC N/A U SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Structural panel sheathing	1,000 lb/ft
Diagonal sheathing	700 lb/ft
Straight sheathing	100 lb/ft
All other conditions	100 lb/ft

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. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)

C NC N/A U GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

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. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)

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. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)

C NC N/A U CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)

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. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)

C NC N/A U HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)

Connections

C NC N/A U WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)

C NC N/A U WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)

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. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)

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. (Commentary: Sec. 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 shall not exceed one story high. (Commentary: Sec. 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. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)

Diaphragms

C NC N/A U DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)

C NC N/A U ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)

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. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)

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. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)

C NC N/A U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

C NC N/A U SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)

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 and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)

C NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)

Connections

C NC N/A U WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)

Appendix C

Structural Calculations

USGS Design Maps Summary Report

User–Specified Input

Report Title Fire Station #11
Thu January 14, 2016 23:02:21 UTC

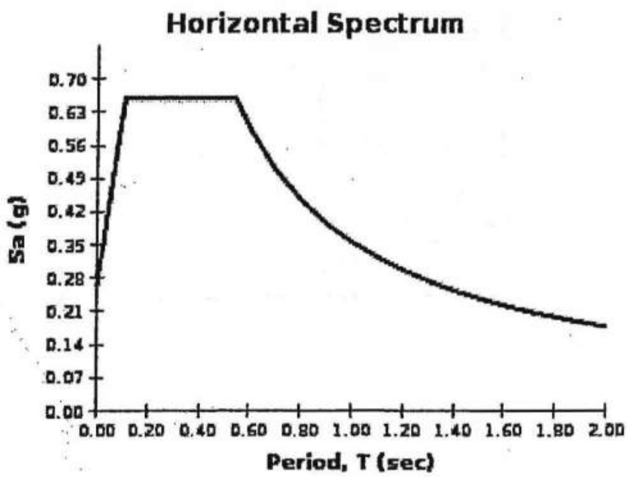
Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1E
(which utilizes USGS hazard data available in 2008)

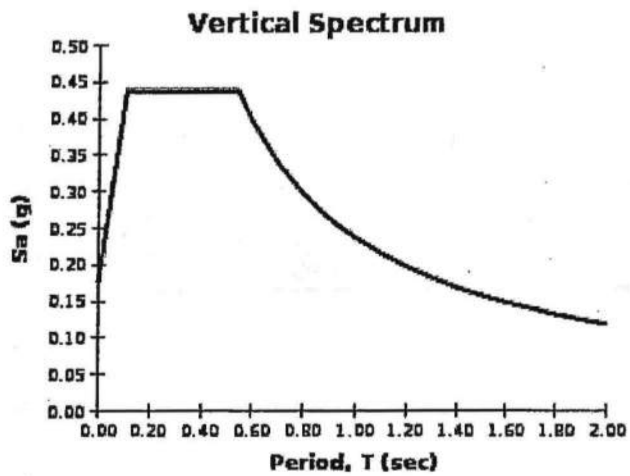
Site Coordinates 47.67807°N, 122.12548°W

Site Soil Classification Site Class D – "Stiff Soil"

USGS–Provided Output

$S_{S,20/50}$	0.459 g	$S_{XS,BSE-1E}$	0.658 g
$S_{1,20/50}$	0.167 g	$S_{X1,BSE-1E}$	0.356 g





ASCE 41-13 Pseudo Lateral Seismic Analysis

Project: Redmond Facilities - FS 11
47.67807 -122.1255

STRUCTURAL ENGINEERING

Performance Objective	Immediate Occupancy
Site Class	D

S_S	0.459		20% in 50-year ground motions, USGS Hazard Tool
S_1	0.167		20% in 50-year values per Section C2.2
$S_{XS,BSE\text{-}1E}$	0.658		USGS Hazard Tool
$S_{X1,BSE\text{-}1E}$	0.356		USGS Hazard Tool
h_n	21	ft	
Ct	0.02		Section 4.5.2.4 All other systems
β	0.75		Section 4.5.2.4 All other systems
T	0.20	(sec)	Eq. 4-5
k	0.85		Section 4.5.2.2, interpolated
C	1.0		Table 4-8 1 Story RM1
$S_a=S_{X1}/T$	0.66		Eq. 4-4
Ms	1		Table 4-9 URM
Bldg. Weight	695	k	
$V = CS_aW$	457.1	k	Eq. 4-1, Pseudo lateral force

$$T_a = C_t h_n^{\beta} \quad \text{Eq. 4-5}$$

Level	hx (ft)	Wx (k)	hx^k (ft)	$Wxhx^k$	Cvx	Story Force Fx (k)	Story Shear V (k)	Wall Shear Stress N v_j (psi)	S v_j (psi)	E v_j (psi)	W v_j (psi)
Apparatus	21	261				172					
Office	13	434				286					
	Σ	695									

$$F_x = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k} \quad \text{Eq. 4-3a}$$

$$v_j^{avg} = \frac{1}{M_s}\left(\frac{V_j}{A_w}\right) \quad \text{Eq. 4-9}$$

Flexible Diaphragm Connection Forces

$$T_c = \psi S_{XS} w_p A_p \qquad (4\text{-}13)$$

ψ*Sxs 1.18

	Tc (plf)			
Level	N	S	E	W
Apparatus	467	473	576	622
Office	349	349	321	302

Wall Proportion Quick Check

Floor	H	t	H/t	
Apparatus	21	6	42	1.4
Office	13	6	26	

Diaphragm Forces

N/S	m=	3			E/W	m=	3		
End Walls k	Diap	Fx k	Qud plf	Q_{ud}/m	End Walls k	Diap	Fx k	Qud plf	Q_{ud}/m
69	114	120	690	230	78	114	76	495	165
30	312	225	2461	820	92	312	160	598	199

Roof - Apparatus		
Roofing Membrane	2 psf	
8" Rigid Insulation	1.6 psf	
19/32 plywood	1.8 psf	
2x6 @ 24" o.c.	2.1 psf	
4x16 DF Purlins @ 8' oc	1.6 psf	
6.75x18 Girder @ 19' oc	1.6 psf	
5/8" GWB	3.1 psf	
MEP/Misc	3 psf	
Total	17 psf	
Roof - Office		
Roofing Membrane	2 psf	
8" Rigid Insulation	1.6 psf	
19/32 plywood	1.8 psf	
2x12 @ 24" o.c.	2.1 psf	
5/8" GWB	3.1 psf	
MEP/Misc	3 psf	
Partition	15 psf	
Total	29 psf	
East Mezzanine Floor		
1.5" Conc. Topping	18 psf	
23/32" Plywoo	2.2 psf	
16" TJL @ 16" oc	3 psf	
5/8" GWB	3.1 psf	
MEP/Misc	3 psf	
Total	30 psf	48 k
West Mezzanine		
23/32" Plywoo	2.2 psf	
16" TJL @ 24" oc	2 psf	
5/8" GWB	3.1 psf	
MEP/Misc	3 psf	
Total	11 psf	15.6 k
Exterior walls		
6" BMU Grouted @ 48"	48 psf	
2X6 @ 24" oc	1 psf	
Insulation	1 psf	
Total	50 psf	
Glazing	10 psf	

Apparatus

	N	S	E	W		h=	21 ft
Total Area	1839	1861	1749	557 ft^2		A_{roof}	6696 ft^2
Solid Wall	1253	1290	1579	557 ft^2		w_{roof}	113.8 kip
% Open	0.32	0.31	0.1	0			
Length	87.33	87.33	76.67	76.67 ft			
Weight	34.4	34.8	37.3	40.3 kip			**260.7**

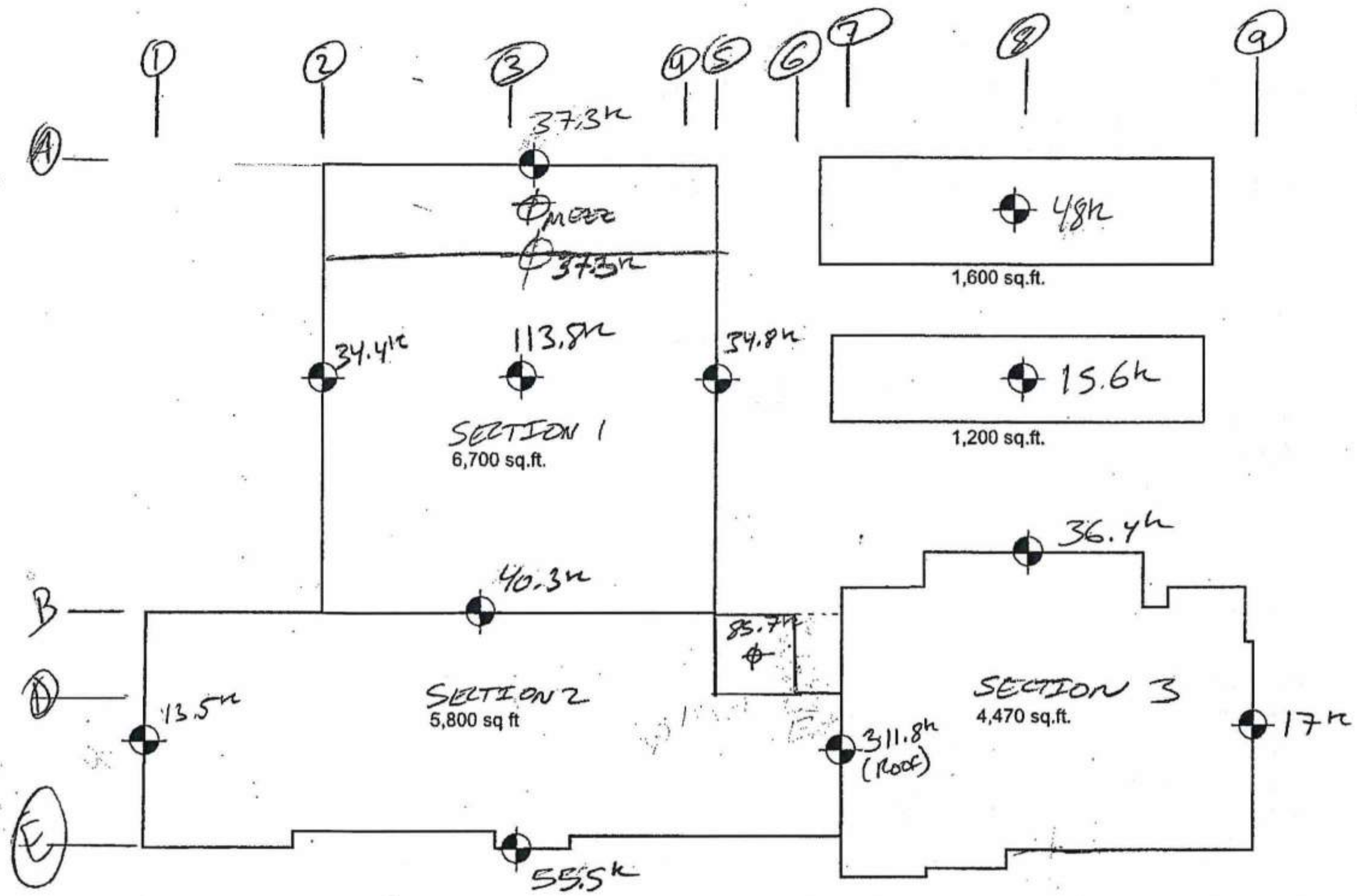
Office

	N	S	E	W		h=	13 ft
						A_{roof}	10750 ft^2
Total Area	587	773	1607	2940 ft^2		w_{roof}	311.8 kip
Solid Wall	421	619	1263	2201 ft^2			
% Open	0.28	0.2	0.21	0.25			
Length	45.75	57.50	134.00	217.75 ft			
Weight	13.5	17	36.4	55.5 kip			**434.1**

Hose Tower

	N	S	E	W		h=	41 ft
						A_{roof}	340 ft^2
Total Area	444	448	620	571 ft^2		w_{roof}	9.9 kip
Solid Wall	444	448	573	571 ft^2			
% Open	0	0	0.08	0			
Length	21.25	21.25	16.00	16.00 ft			
Weight	21.8	21.8	15.9	16.4 kip			**85.7**

Weight total	69.7	73.6	89.6	112	435.4	844



$W_{TOT} = 881^k$

TIER 1 PSEUDO SEISMIC FORCE

$V = CS_a W = 1.4(0.66)W = 0.924\,W = \boxed{814^k}$ TOTAL

SECTION 1: $W = 360.9^k$, $V = 333.5^k$

SECTION 2/3: $W = 434.1^k$, $+HT = 519.8^k$, $V = 480.2^k$

TOTAL AREA: $A = 19{,}770\ ft^2$

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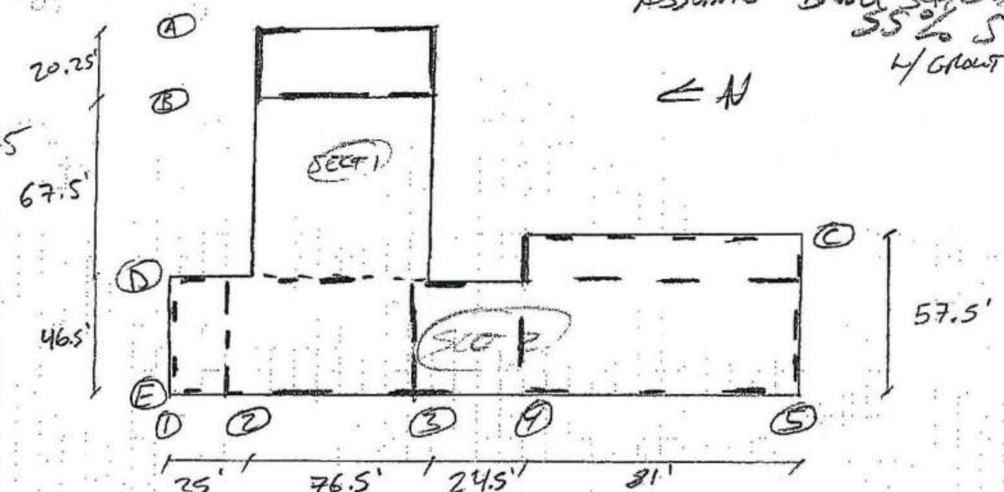
Project Title: REDMOND	Date 10/29/2015	SSF project no.
FIRE STATION 11	Design RDO	
Sheet Title:	Drawn RDO	Sheet

TIER 1 SHEAR STRESS CHECK

ASSUME BRICK SHEARWALLS
55% SOLID
W/ GROUT @ 48" o.c.



N/S

WALL LINE A: $l_{wall} = 56.64$ %V = 11.5% of SECT 1 = 38.3k

$f_v = 17psi$

WALL LINE B: $l_{wall} = 66$ ft   %V = 50% = 167k

$f_v = 63$ psi

WALL D: $l_{wall} = 57'$ %V = 36.5% = 128.7k

$f_v = 56psi + 40psi = 96psi > 70psi$ NO GOOD

AVG SHEAR STRESS FOR SECTION 2:

$l_{N/S} = 300'$ $V = 480.2^k$

$f_v = 40psi$

E/W: SECTION 1, LINE 3 $l_w = 15.25'$ %V = 50% =

$f_v = 25psi$

SECTION 2 AVG: $l_w = 209'$ $V = 480^k$

$f_v = 57psi$

TOWER: $V = 0.924(85^k) = 78.5^k$

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REINFORCING STEEL (6" BMU GROUTED @ 48" = ~55% SOLID)

VERT & HORIZ: #5 @ 48" o.c. $\rho = \frac{0.31}{48" \times 6" \times 0.55} = 0.0022$ OK

TRANSFER TO SHEAR WALLS:

TYP LEDGER ANCHOR: 3x LEDGER w/ 5/8" A.B. @ 24" o.c.

$\phi Z_{11} = 1.0(1180^{\#})(3.32) = 3918^{\#}/2 = 1959$ plf

WOOD DIAPHRAGM: 1000 plf

WALL SHEAR STRENGTH: $0.55 (12" \times 6")(70 psi) = 2772$ plf

% SOLID

DCR = 1.4

WALL ANCHORAGE

APPARATUS BAY - N/S: $T_c = 473$ plf $\times \frac{80"}{12} = 3153^{\#}$

1/2" Ø BOLT IN SIMPSON GLB $\phi Z_{11} = 1650^{\#}(3.32) = 5478^{\#}$

DEMAND PER TIER 1 FORCES

ANCHORS ASSUMED SPACED @ 4' o.c. - VERIFY SPACING

OOP: $T = 349^{\#}/ft (4') = 1396^{\#} < \phi Z$ DCR = 0.51 OK

IP: $V = \frac{480 k}{46.5 \times 3 + 57.5 \times 2} = 1886$ plf $\times 4' = 7544^{\#} > \phi Z_{11}$

DCR = 2.6

CHECK I.P. VS MAX STRENGTH OF DIAPHRAGM

1/2" PLY w/ 8d @ 6" o.c., BLOCKED

EXPECTED STRENGTH = 1.5 (510 plf) = 765 plf

ANCHOR DEMAND = 4' x 765 plf = 3060 plf ← CONTROLS

DCR = 1.07 ACCEPTABLE @ TIER 1

FS 11

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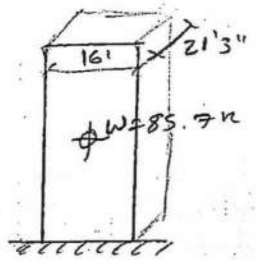
FS 11 HOSE TOWER

$H = 41'$



$V = 0.66\,(1.0)(85.7^k) = 56.6^k$ (28.3^k/WALL LINE)

$M_{o/t} = 56.6^k\left(\frac{41'}{2}\right) = 1160\,k\text{-}ft$ (580 k-ft/WALL)

SHEAR STRESS: $v = \dfrac{56.6^k}{16' \times 2 \times 12''/' \times 6''(0.55)} = 45\ psi < 70$ ok

FLEXURE $T = \dfrac{M}{d} = \dfrac{580\,k\text{-}ft}{16'} = 36.3\ k$

ASSUME #5 END BAR $f_y = 117\ ksi$

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USGS Design Maps Summary Report

User–Specified Input

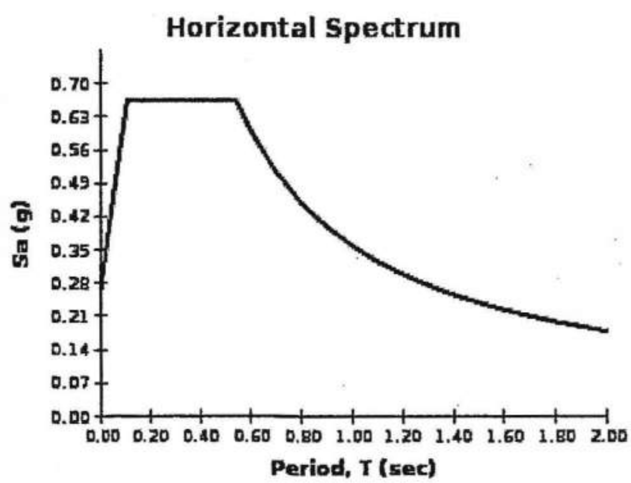
Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1E
(which utilizes USGS hazard data available in 2008)

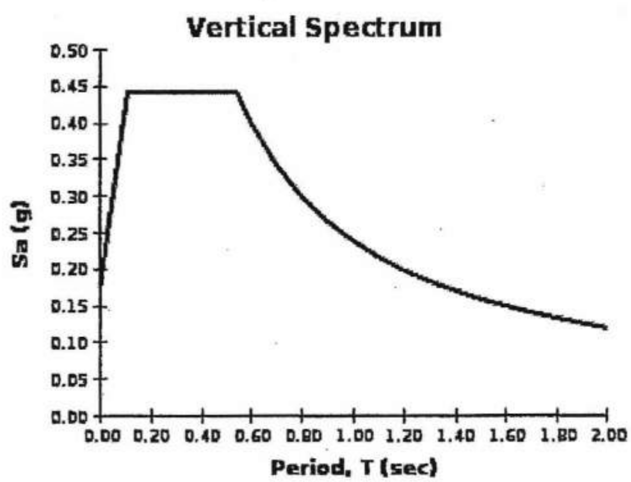
Site Coordinates 47.64849°N, 122.14363°W

Site Soil Classification Site Class D – "Stiff Soil"

USGS–Provided Output

$S_{S,20/50}$	0.465 g	$S_{XS,BSE-1E}$	0.664 g
$S_{1,20/50}$	0.169 g	$S_{X1,BSE-1E}$	0.359 g





Seismic Design

Evaluation Method: ASCE 41-13 Tier 3

Analysis Procedure: Linear Static Procedure (LSP)

Performance Objective

Seismic Hazard Level	BSE-1E	BSE-1E, 2E, 1N, 2N per ASCE 41-13 Table 2-1.
Occupancy Category	IV	I, II, or III, or IV per ASCE 7-10 Table1-1
BOPE	IO	Immediate Occupancy Performance (1-B)

Soil

Site Class	D	per soils report (D assumed, without soils report)

Period Determination

T_1		sec	Method-1 (Eigenvalue)
h_n	17.67	ft	
Ct	0.02		
β	0.75		
T_2	0.17	sec	Method -2 (Eq. 7-18)
T_3		sec	Method-3 (Approx. Rayleigh's)
T	0.17	sec	Period Used

General Response Parameters

S_S	0.465		20% in 50-year USGS Latitude & Longitude lookup
S_1	0.169		20% in 50-year USGS Latitude & Longitude lookup
S_{XS}	0.66		(Eq. 2-1)
S_{X1}	0.36		(Eq. 2-2)
Fa	1.43		(Eq. 2-3)
Fv	2.12		(Eq. 2-4)
β	0.05		Effective Damping
β_I	1.00		(Eq. 2-11)
T_S	0.54	sec	(Eq. 2-9)
T_L		sec	Long Period Transition
Sa	0.66		(Eq. 2-5)

0.861189237

Pseudo Seismic Force for LSP

C1	1.24	(Eq. 7-22)
C2	1.01	(Eq. 7-23)
Cm	1	(Table 7-4)
DCRmax	2.38 ← highest m factor	
$\mu_{strength}$	1.59	(Eq. C7-3)
Bldg. Weight	359.6 k	
$V=C_1C_2C_mS_aW$	301 k	(Eq. 7-21)

$$C_1 = 1 + \frac{\mu_{strength} - 1}{aT^2}$$

$$C_2 = 1 + \frac{1}{800}\left(\frac{\mu_{strength} - 1}{T}\right)^2$$

Vertical Distribution

k	1.00			Story Force for LSP			Diaphragm Force for LSP		
Level	hx ft	wx kips	hx^k ft	$Wxhx^k$ ft-kips	Cvx (%) %	Fx (k) kips	ΣFx kips	Σwi kips	Fpx kips
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
Roof	18	360	18	6,354	1.00	300.7	301	360	301
	Σ	360		6,354		301			

(Eq. 7-24) $F_x = C_{vx}V$

(Eq. 7-25) $C_{vx} = \dfrac{w_x h_x^{\,k}}{\sum_{i}^{n} w_i h_i^{\,k}}$

Redmond FS 12 3/9/2016 Date

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Proj. No. FR

Seismic Weight:

Roof$_1$: Area = 3596 ft^2
W = 53.94^K

Roof$_2$: Area = 2960 ft^2
W = 44.39^K

Walls:

(D): ℓ = 71'-11"
ht = 17'-8"
$W = 80^{psf}(\ell)(\frac{ht}{2}) = 50.8^K$

(B): ℓ = 68'-10"
ht = 17'-8"
W = 48.6^K

(A): ℓ = 39'-9"
ht = 13'
W = 20.7^K

(1'): ℓ = 19'
ht = 17'-8"
W = 13.4^K

(2): ℓ = 39'-4"
ht = 13'
W = 20.5^K

(3): ℓ = 38'-8"
ht = 13'
W = 20.1^K

Miscellaneous Walls: W = 87.2^K

W_{total} = 359.6^K

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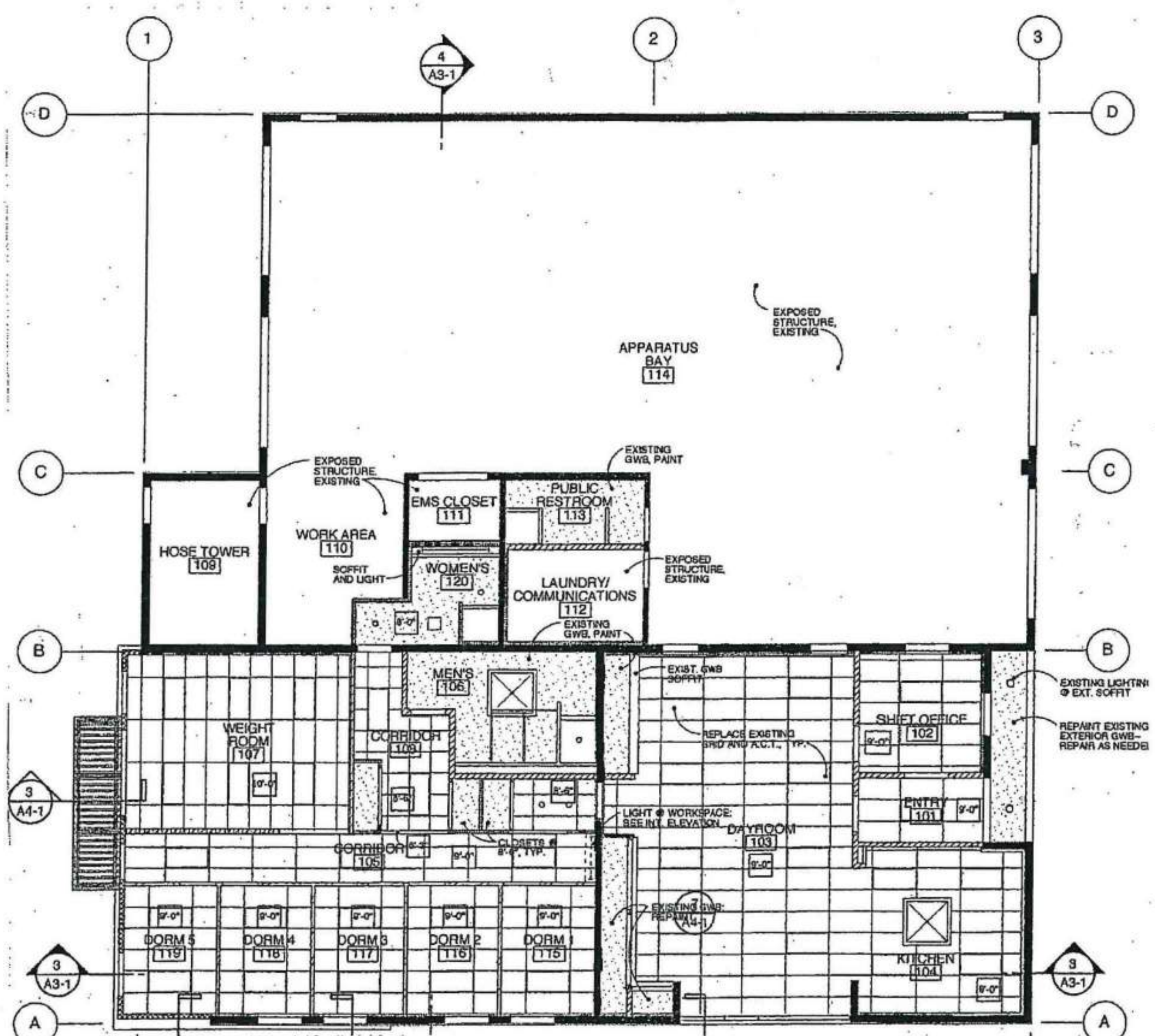

$V = C_1 C_2 C_m S_a W = 0.83\,W$ (Tier 2+3) $\quad V = C\,S_a W = 0.924W$ (Tier 1)

Tributary Weights & Seismic Shear:

(D) $W_{trib} = 50.8^k + \frac{53.9}{2} + (2)\left(\frac{13.4}{2}\right) = 91.2^k$

$V_D = 84.3^k$

$w = 1.17^{k/l}$

(B) $W_{trib} = 48.6^k + \frac{53.9}{2} + \frac{44.4}{2} + \frac{13.4}{2} + \frac{20.5}{2} + \frac{20.1}{2} = 124.8^k$

$V_B = 115.3^k$

$w = 1.68^{k/l}$

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PROJECT

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(A) $W_{trib} = 20.7^{K} + \frac{44.4}{2} + \frac{20.5}{2} + \frac{20.1}{2} = 63.2^{K}$

$V_A = 58.4^{K}$

$w = 1.47^{K/1}$

(1') $W_{trib} = 13.4^{K} + \frac{53.9}{4} + \frac{44.4}{4} + \frac{50.8}{4} + \frac{48.6}{4} + \frac{20.7}{4} = 68^{K}$

$V_{1'} = 62.8^{K}$

$w = 3.30^{K/1}$ ← worst case $V = \frac{3300}{8 \times 12} = 34\,PSI < 70\,PSI$ OK

(2) $W_{trib} = 20.5^{K} + \frac{53.9}{2} + \frac{44.4}{2} + \frac{50.8}{2} + \frac{48.6}{2} + \frac{20.7}{2} = 129.7^{K}$

$V_2 = 119.8^{K}$

$w = 3.05^{K/1}$

(3) $W_{trib} = 20.1^{K} + \frac{53.9}{4} + \frac{44.4}{4} + \frac{50.8}{4} + \frac{48.6}{4} + \frac{20.7}{4} = 74.7^{K}$

$V_3 = 69.0^{K}$

$w = 1.79^{K/1}$

Reentrant corner: (Tier 1 check)

$m = 2.1$

$\text{Trib} = \frac{45'}{2} \times 35' = 788 \text{ ft}^2$

$W = 11.8^K$

$T = \frac{C S_a W}{m} = \frac{0.924 W}{m} = 5198^{\#}$

current connection:

CMST 14 × 12'-0" & MTT 28B w/(4) ½"ϕ Thru bolts

$T_a = 6490^{\#}$ $T_a = 2725^{\#}$

DCR = 0.80 DCR = 1.91

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SSF STRUCTURAL ENGINEERING

PROJECT: Redmond FS 12

DATE: 3/3/2016

PROJ. #

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FS 13 / SEISMIC WT.

APPARATUS ROOF

VINYL ROOFING	2psf
1" FIBER BOARD	2psf
½" PLY	1.5psf
2x T+G	4.2psf
4X14 @ 7' o.c.	1.6psf
GLB 6¾ x31½@17'8" o.c.	3.0psf
MISC / M.E.P.	3.0psf
	17.3psf → $\boxed{18psf}$

OFFICE ROOF

MEMBRANE ROOF	2psf
½" PLY SHEATHING	1.5psf
12"x12 @ 16" o.c.	3.1psf
INSULATION	5psf
SUSP. CEILING	2.0psf
MISC/MEP	3psf
	16.6psf → $\boxed{17psf}$
	+ 5psf PARTITION
	$\boxed{22psf}$

EXT WALLS

TYPE 1

6" BMU (GROUT @ 32" o.c)	$\boxed{46psf}$	← APPARATUS
TYPE 2 2X6 @ 16" o.c	1.4 psf	6.4psf @ OFFICE ONLY
INSUL	2.5 psf	
GWB	2.5psf	
	52.4psf → $\boxed{53 psf}$	

TYPE 3

EIFS	1.5psf
½" PLY	1.5psf
2x4 @ 16" o.c.	0.9psf
INSUL	1.75psf
5/8" GWB	2.5psf
	8.2psf → $\boxed{10psf}$

PROJECT FS 13

DATE 3/8/16

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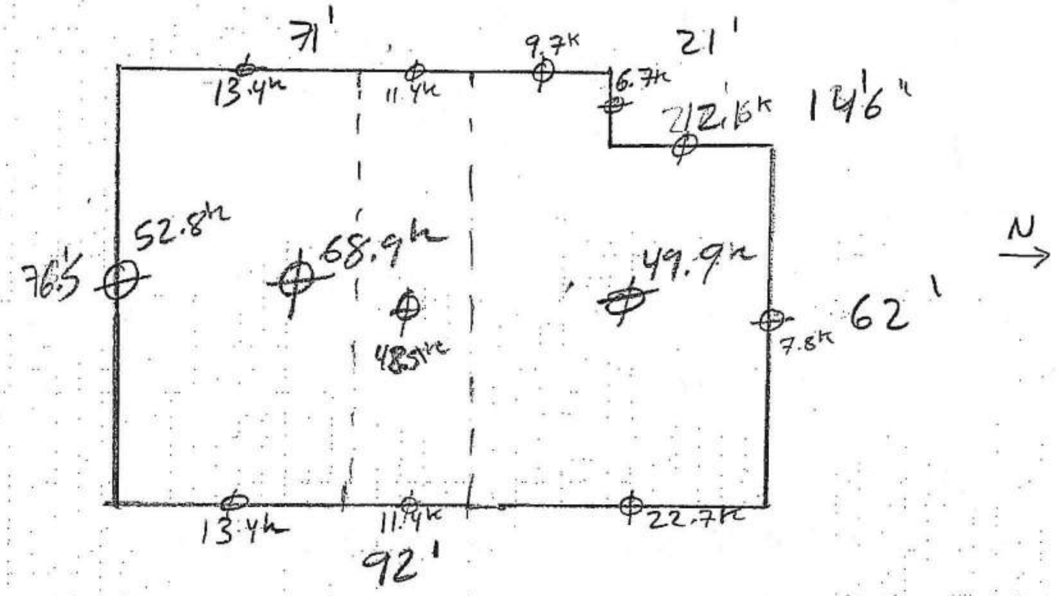
SEISMIC WT MAP



WEIGHTS

ROOF : $W = 167.3^k$

NORTH : $W = 14.5^k$

SOUTH : $W = 52.8^k$

EAST : $W = 47.5^k$

WEST : $W = 46.6^k$

$W_{TOT} = 328.7^k$

TIER 1 PSEUDO SEISMIC FORCE

$V = C S_a W = 1.4(0.66)W = 0.924W$

$\underline{V = 303.7^k}$

TIER 2 PSEUDO SEISMIC FORCE

$V = C_1 C_2 C_m S_a W = 1.4(1.0)(0.66)W = 0.924W$

$\underline{V = 303.7^k}$

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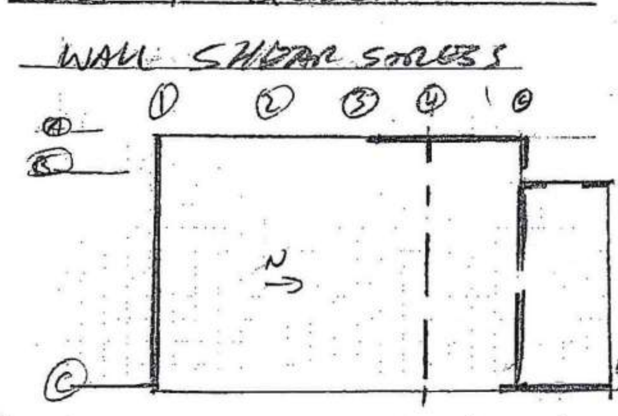
TIER 1 QUICK CHECKS

WALL SHEAR STRESS



6" BMU : 52% SOLID
+21% @ 32" o.c. GROUT
160% SOLID

(A) $l = 16.33'$
(B) $l = 10'$ } $36.33'$ $V = 152^k$ $v = 96\,psi$
(C) $l = 35'$ $V = 152^k$ $v = 100\,psi$

(1) $l_1 = 71.5'$ T.W. = 25/92 = 27% $V = 82^k$ $v = 26\,psi < 70\,psi$
(4) $l_4 = 47'$ T.W. = 35.5/92 = 38% $V = 115.4^k$ $v = 57\,psi < 70\,psi$
(5) $l_5 = 49.5'$ T.W. = 21/92 = 22% $V = 66.8^k$ $v = 31\,psi < 70\,psi$

REINF STEEL

ASSUMED #5 @ 32" o.c. - TYPICAL FOR ADDITION

$\rho = \frac{0.31 in^2}{6"(32")(0.60)} = 0.0027$ VERT

NO HORIZ REINF SHOWN ON PLAN

SHEAR WALL TRANSFER

$V_{WALL} = 2455\ plf \times 4 = 9820\#/BOLT$

ASSUME 5/8" Ø 18" BOLTS @ 48" o.c. TO GROUTED BOND BEAM

CAPACITY = 930# (BEARING ON 2X SILL PLATE)

$\phi = 1.0$, EXPECTED STRENGTH $K_f = 3.32$

$= 3087\# \ll 9820\#$ NG

$D/C = 3.2$

WALL ANCHORS: CHECK BEAM ANCHORAGE @ S WALL

$T = \gamma S_{XS} W_p A_p = 1.8(0.66)(46\,psf)\left(\frac{15 \times 19.66}{4}\right) = 4{,}029\#$

ASSUME 3/4" Ø BOLT $\phi Z_{11} = 3340\#(3.32) = 11{,}088\#$ OK

ANCHORAGE UNKNOWN @ (N) BMU WALL

NO O.OP ANCHORAGE PRESENT @ E WALL

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HEIGHT → THICKNESS RATIO

VERT: $H_{MAX} = 12'6"$ $t = 6"$ $H:t = 25 < 30$ OK

HORIZ: $l = 17'6"$ $t = 6"$ $H:t = 35 > 30$ NG

PROJECT FS 13

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PROJ. # R00

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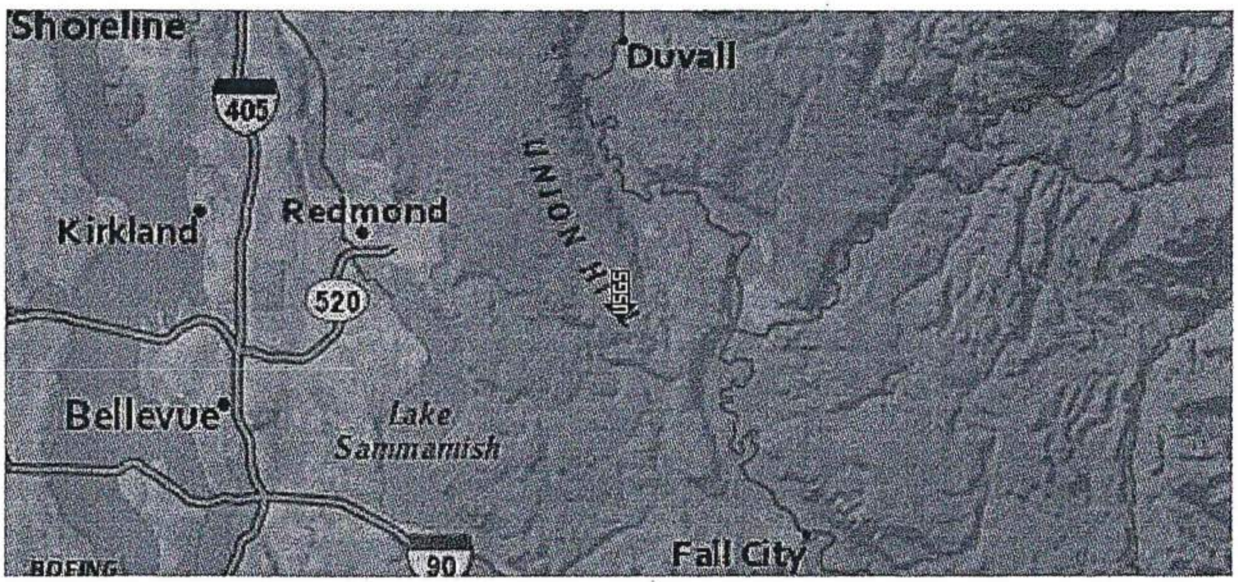
USGS Design Maps Summary Report

User–Specified Input

Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1E
(which utilizes USGS hazard data available in 2008)

Site Coordinates 47.65196°N, 121.9878°W

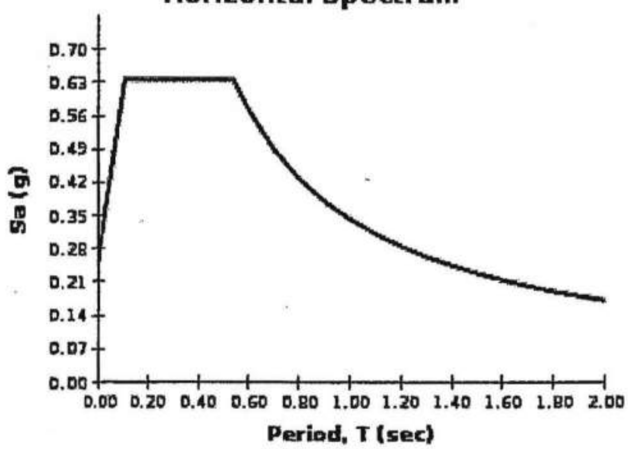
Site Soil Classification Site Class D – "Stiff Soil"



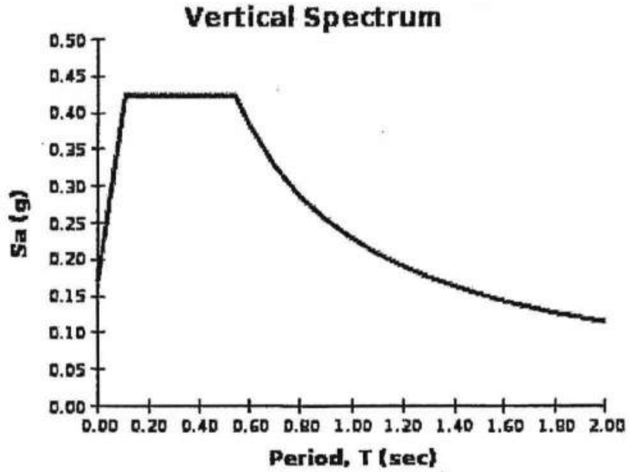
USGS–Provided Output

$S_{S,20/50}$	0.439 g	$S_{XS,BSE-1E}$	0.636 g
$S_{1,20/50}$	0.159 g	$S_{X1,BSE-1E}$	0.344 g

Horizontal Spectrum



Vertical Spectrum



Seismic Design

Evaluation Method: ASCE 41-13 Tier 3
Analysis Procedure: Linear Static Procedure (LSP)

Performance Objective

Seismic Hazard Level	BSE-1E	BSE-1E, 2E, 1N, 2N per ASCE 41-13 Table 2-1.
Occupancy Category	IV	I, II, or III, or IV per ASCE 7-10 Table1-1
BOPE	IO	Immediate Occupancy Performance (1-B)

Soil

Site Class	D	per soils report (D assumed, without soils report)

Period Determination

T_1		sec	Method-1 (Eigenvalue)
h_n	22.5	ft	
Ct	0.02		
β	0.75		
T_2	0.21	sec	Method -2 (Eq. 7-18)
T_3		sec	Method-3 (Approx. Rayleigh's)
T	0.21	sec	Period Used

General Response Parameters

S_S	0.439		20% in 50-year USGS Latitude & Longitude lookup
S_1	0.159		20% in 50-year USGS Latitude & Longitude lookup
S_{XS}	0.64		(Eq. 2-1)
S_{X1}	0.34		(Eq. 2-2)
Fa	1.45		(Eq. 2-3)
Fv	2.16		(Eq. 2-4)
β	0.05		Effective Damping
β_I	1.00		(Eq. 2-11)
T_S	0.54	sec	(Eq. 2-9)
T_L		sec	Long Period Transition
Sa	0.63		(Eq. 2-5)

Pseudo Seismic Force for LSP

C1	1.29	(Eq. 7-22)	
C2	1.02	(Eq. 7-23)	
Cm	1	(Table 7-4)	0.83286459
DCRmax	2.62		
$\mu_{strength}$	1.75	(Eq. C7-3)	0.69797477
Bldg. Weight	169.0 k		
$V=C_1C_2C_mS_aW$	118 k	(Eq. 7-21)	

$$C_1 = 1 + \frac{\mu_{strength} - 1}{aT^2}$$

$$C_2 = 1 + \frac{1}{800}\left(\frac{\mu_{strength} - 1}{T}\right)^2$$

Vertical Distribution

k	1.00			Story Force for LSP			Diaphragm Force for LSP		
Level	hx	wx	hx^k	$Wxhx^k$	Cvx (%)	Fx (k)	ΣFx	Σwi	Fpx
	ft	kips	ft	ft-kips	%	kips	kips	kips	kips
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
Roof	23	169	23	3,803	1.00	118.0	118	169	118
	Σ	169		3,803		118			

(Eq. 7-24) $F_x = C_{vx}V$

(Eq. 7-25) $$C_{vx} = \frac{w_x h_x^{\,k}}{\sum_{i=1}^{n} w_i h_i^{\,k}}$$

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Tel: 253·284·9470 Fax: 253·284·9471

Seismic Weight:

Roof Area = 8242 ft^2 $W_{roof} = 123.6^k$

Mezzanine Area = 1036 ft^2 $W_{mezz} = 10.4^k$

Wall Length = 482.5 ft

h_{tavg} = 14'-6" $W_{walls} = 35.0^k$

$W_{total} = 169^k$

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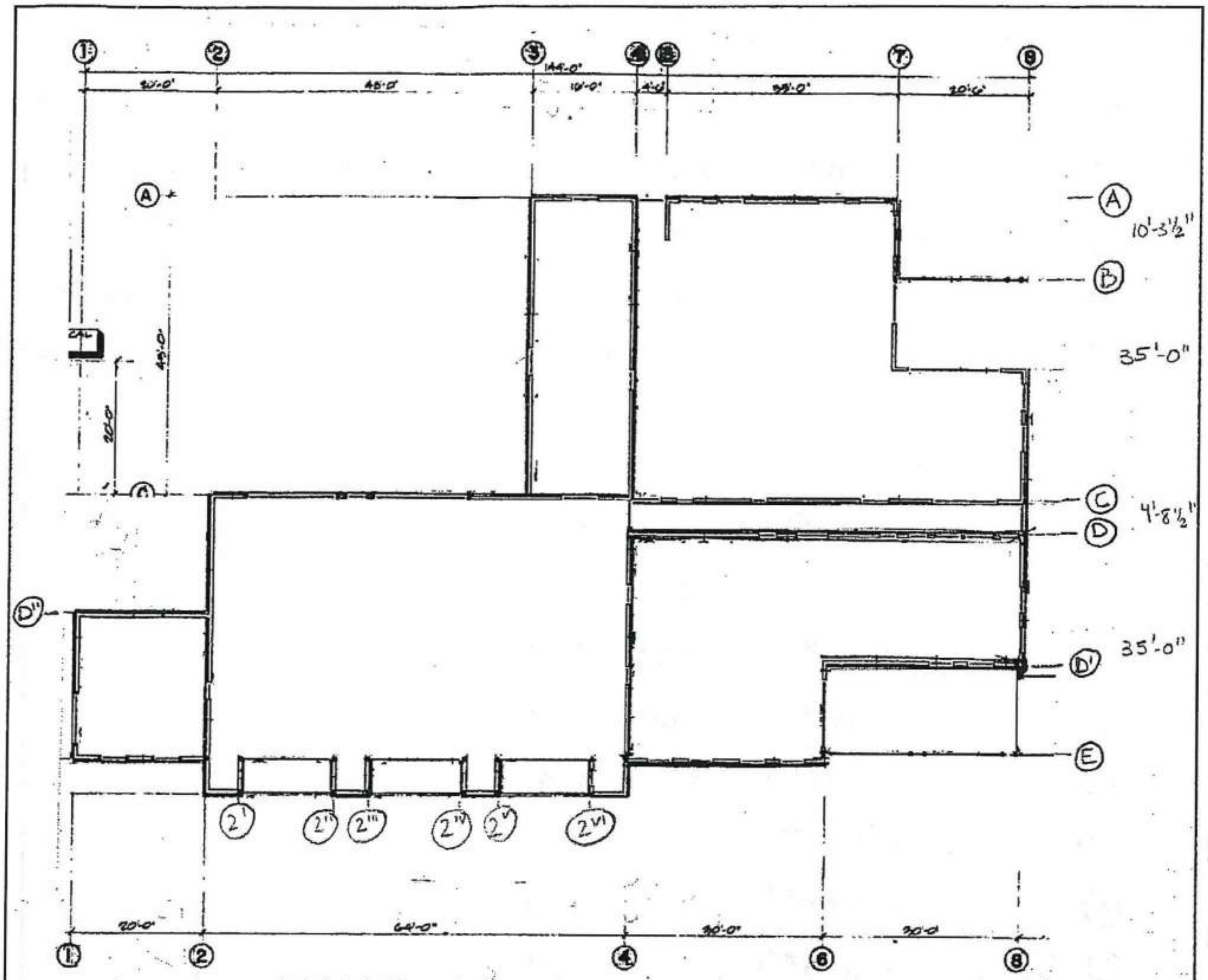

North-south: DCRmax = 2.62 $(C_1 C_2 C_m = 1.0)$

①	$l = 12'$-$2''$	Trib = 216 ft²	$V_1 = 2.91^k$	$w_1 = 239$ #/l
②	$l = 43'$-$7''$	Trib = 1871 ft²	$V_2 = 25.18^k$	$w_2 = 578$ #/l
③	$l = 41'$-$7''$	Trib = 353 ft²	$V_3 = 8.39^k$	$w_3 = 202$ #/l
④	$l = 76'$-$10''$	Trib = 2659 ft²	$V_4 = 39.42^k$	$w_4 = 513$ #/l
~~⑥~~	~~$l = 2'$-$10''$~~	~~Trib = 800 ft²~~	~~$V_6 = 27.33^k$~~	~~$w_6 = 2871$ #/l~~
⑦	$l = 11'$-$0''$	Trib = 1949 ft²	$V_7 = 26.23^k$	$w_7 = 2384$ #/l
⑧	$l = 15'$-$10''$	Trib = 548 ft²	$V_8 = 6.73^k$	$w_8 = 425$ #/l

wall capacity = 760 + 290 = 1050 #/l × m = 1575 #/l

Ⓑ wall capacity = 760 × m = 1140 #/l

m-factor from ASCE 41-13 Table 12-3
m = 1.5

PROJECT: Redmond FS 14

DATE: 3/2/16

PROJ. #

DESIGN

SHEET 23 of 34

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East - West DCRmax = 1.42

A	$\ell = 23'-2''$	Trib = 1425 ft^2	$V_A = 22.82^K$	$w = 985^{\#/l}$
C + D	$\ell = 86'-10''$	Trib = 3912 ft^2	$V_{CD} = 56.29^K$	$w = 648^{\#/l}$
D'	$\ell = 20'-5''$	Trib = 809 ft^2	$V_{D'} = 10.89^K$	$w = 533^{\#/l}$
E	$\ell = 44'-8''$	Trib = 1854 ft^2	$V_E = 24.95^K$	$w = 559^{\#/l}$
D''	$\ell = 20'-0''$	Trib = 221 ft^2	$V_{D''} = 2.97^K$	$w = 149^{\#/l}$

Wall Capacities

1	$w_n = 1140^{\#/l}$	DCR = 0.21
2	$w_n = 1575^{\#/l}$	DCR = 0.37
3	$w_n = 1140^{\#/l}$	DCR = 0.18
4	$w_n = 1575^{\#/l}$	DCR = 0.33
7	$w_n = 1575^{\#/l}$	DCR = 1.51
8	$w_n = 1575^{\#/l}$	DCR = 0.27
A	$w_n = 1140^{\#/l}$	DCR = 0.87
C + D	$w_n = 1140^{\#/l}$	DCR = 0.57
E	$w_n = 1575^{\#/l}$	DCR = 0.35
D''	$w_n = 1140^{\#/l}$	DCR = 0.13
D'	$w_n = 1140^{\#/l}$	DCR = 0.47

Seismic Design

Evaluation Method: ASCE 41-13

Analysis Procedure: Linear Static Procedure (LSP)

Performance Objective

Seismic Hazard Level	BSE-1 20/50	Per 1.6.1.1
Occupancy Category	IV	I, II, or III, or IV per ASCE 7-10 Table1-1
Performance Level	IO	Immediate Occupancy

Soil

Site Class	D	per soils report (D assumed, without soils report)

Period Determination

T_1		sec	Method-1 (Eigenvalue)
h_n	24	ft	
Ct	0.02		
β	0.75		
T_2	0.22	sec	Method -2 (Eq. 3-6)
T_3		sec	Method-3 (Approx. Rayleigh's)
T	0.22	sec	Period Used

General Response Parameters

S_S	0.459		20% in 50-year USGS Latitude & Longitude lookup
S_1	0.167		20% in 50-year USGS Latitude & Longitude lookup
S_{XS}	0.66		(Eq. 2-1)
S_{X1}	0.36		(Eq. 2-2)
Fa	1.43		(Table 2-3)
Fv	2.13		(Table 2-4)
β	0.05		Effective Damping
β_1	1.00		(Eq. 2-11)
T_S	0.54	sec	(Eq. 2-9)
T_L		sec	Long Period Transition
Sa	0.66		(Eq. 2-5,2-6,2-7,2-8))

(Eq. 3-10) $F_x = C_{vx} V$

(Eq. 3-11) $C_{vx} = \dfrac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k}$

Pseudo Seismic Force for LSP

C1	1.35	
C2	1.03	
Cm	1	(Table 3-1)
DCRmax	3	
R	2.00	
Bldg. Weight	295.0 k	
$V=C_1C_2C_mS_aW$	269 k	(Eq. 3-9)

$$C_1 = 1 + \frac{R-1}{aT^2}$$

$$C_2 = 1 + \frac{1}{800}\left(\frac{R-1}{T}\right)^2$$

Vertical Distribution

k	1.00			Story Force for LSP			Diaphragm Force for LSP		
Level	hx ft	wx kips	hx^k ft	$Wxhx^k$ ft-kips	Cvx (%) %	Fx (k) kips	ΣFx kips	Σwi kips	Fpx kips
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
Roof	24	295	24	7,080	1.00	269.1	269	295	269
	Σ	295		7,080		269			

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FS 16 COMPONENT WEIGHTS

ROOF - TYPICAL (OFFICE)

COMPOSITE ROOFING	1.5 psf
INSULATION	1.5 psf
5/8" PLY	1.9 psf
11 7/8 TJI 35C @ 24" o.c.	1.5 psf
GIRDERS (VARIES)	1.0 psf
5/8" GWB	3.1 psf
MISC/MEP	3 psf
	13.5 psf
PARTITION	5 psf
	18.5 psf → 19 psf

ROOF - TRUCK BAY (GARAGE)

COMPOSITE ROOFING	1.5 psf
INSULATION	1.5 psf
3/4" PLY	2.3 psf
48"/30 TJH @ 48" o.c.	1 psf
MISC/MEP	3 psf
	9.3 psf → 10 psf

NO INT PARTITIONS

EXT WALLS: LT. FRAMED WOOD - 10 psf, TYP

SECTION 1 WT: ROOF = 5180 ft²(19 psf) = 98,420 #
N/S WALLS = 102.5'(18½)(10psf) = 9,225 # /WALL
W/E WALLS = 73'(18½)(10psf) = 6570 #
W = 130 K

SECTION 2 WT: ROOF: 3900 ft²(10psf) = 39 k
N/S WALLS 12'x10psf = 120plf x (15+60) =

ROOF w/ STORAGE MEZZ BELOW: 15+15+0.25(125) = 62 psf

8" CMU GROUTED @ 32" o.c.: 55 psf

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PROJECT FS 16
DATE 2/25/16
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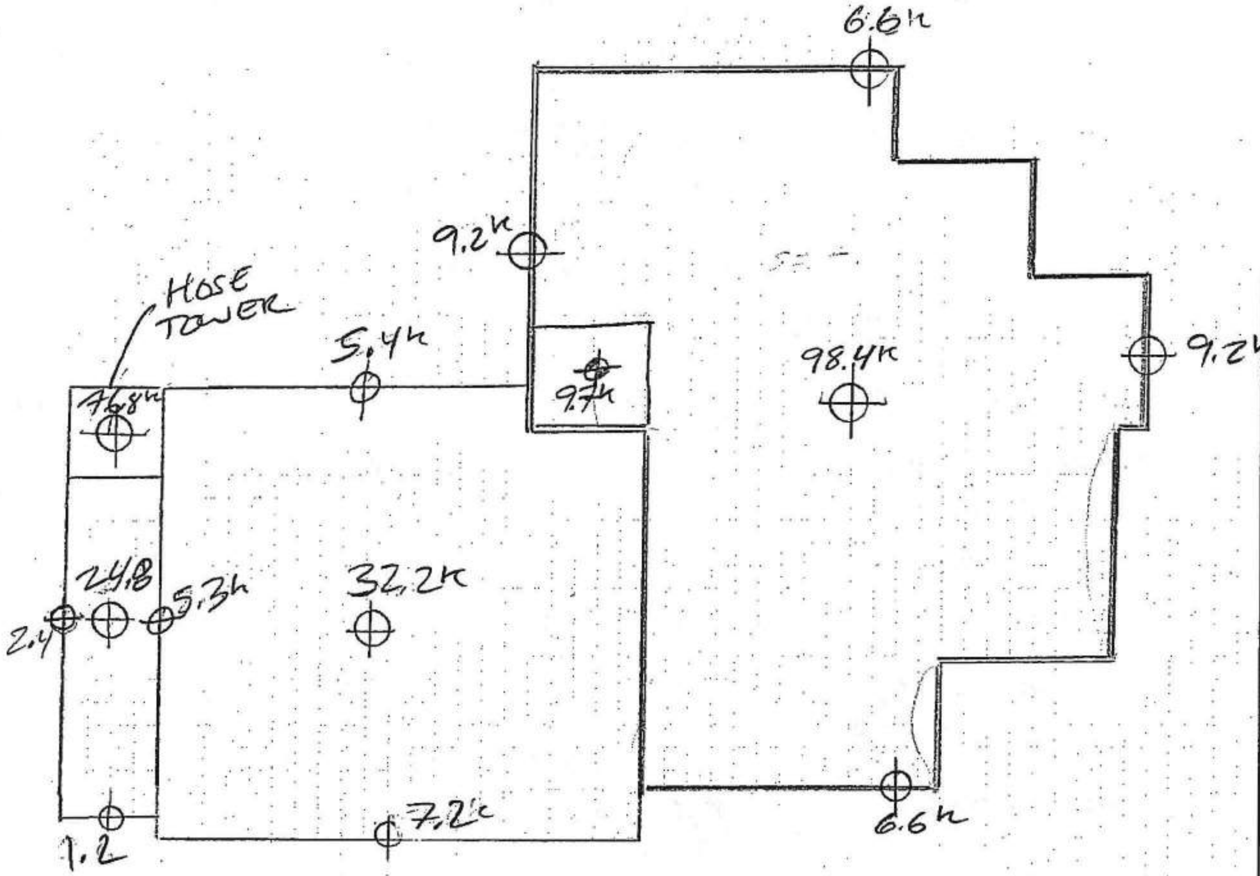
SHEET



WEIGHT SUMMARY

OFFICE = 131.7k
GARAGE = 78.5k
HOSE TOWER = 76.8k
295k

BASE SHEAR

V = 128.5k
V = 72.2k
V = 73 k

TIER 2 $V = C_1 C_2 M S_a W = 0.92W$ (TIER 2)

$V_{TOTAL} = 274 K$

TIER 1 PSEUDO SEISMIC FORCE
$V = CS_1 W = 1.3(0.66)W = 0.86 W$
$V = 256 K$

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TIER 1/2 CHECKS (TIER 1 DEFICIENCIES)

SHEAR WALL STRESS - CONSIDER PLY WALLS ONLY

N/S - $l_{wall} = 134'$ $v = \frac{274k}{134'} = 2.04k/ft > 1.0k/ft$

E/W - $l_{wall} = 120'$ $v = \frac{274k}{120'} = 2.28k/ft > 1.0k/ft$

BLOCKED ½" PLY w/ 8d @ 4" o.c. $m = 1.7$

$mKQ_{CE} = 1.7(1.0)(920\,plf) = 1564\,plf < 2280\,plf$

$DCR = 1.45$

NARROW WOOD SHEAR WALLS - OVERTURNING & SHEAR DEMAND

NARROWEST WALL SEGMENTS: N/S $l = 4'6"$ $h = 13'$

$h:l = 2.88:1$

$V = 2.04k/ft\ (4.5') = 9.18\ k$

CHECK HOLD DOWN CAPACITY TO RESIST O/T

$M_{ST} > \frac{M_{OT}}{C_1C_2J}$ $C_1C_2 = 1.4$ (ALT VALUE)

$J = 2.0$ (ALT VALUE)

HOLDDOWN TENSION = $\frac{2.04k/ft\,(13')}{1.4(2.0)} = 9.47\ k$

HOLDOWN CAPACITY $M_{ST} = 2775\#$ (2.8k) NO GOOD

WALLS CONNECTED THRU FLOORS

- NO STRAPPING PROVIDED AT BALLOON FRAMED MEZZANINES TO CREATE CONTINUOUS SHEAR WALL CHORDS

PROVIDE CS STRAPS - FORCES TBD AFTER SHEAR WALLS ARE UPGRADED

DIAPHRAGM CONTINUITY

STEPS IN ROOF ARE NOT DETAILED TO PROPERLY TRANSFER FORCES.

PROJECT FS 16

DATE 3/3/16

PROJ. # KDO

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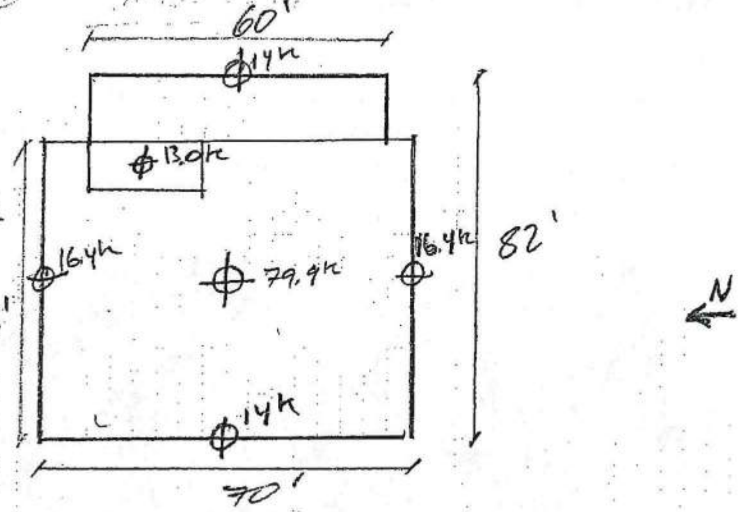
GARAGE



AREA

MAIN : 5325 ft²
MEZZ : 300 ft²

SEISMIC WEIGHTS

ROOF: 5325 ft² (15psf) = 79.9 k

MEZZ: 300 ft² [12psf + 0.25(125psf)] = 13.0k

W_{TOT} = 153.7k

TIER 1 : PSEUDO SEISMIC BASE SHEAR

$V = C S_a \cdot W$ $\quad C = 1.3 \quad S_a = 0.66$

V = 131.3 k

TIER 2 LSP PSEUDO SEISMIC FORCE

$V = C_1 C_2 C_m S_a W$ $\quad C_1 C_2 = 1.4$

$C_m = 1.0$

V = 1.4 (1.0)(0.66)(153.7k) = 142.0 k

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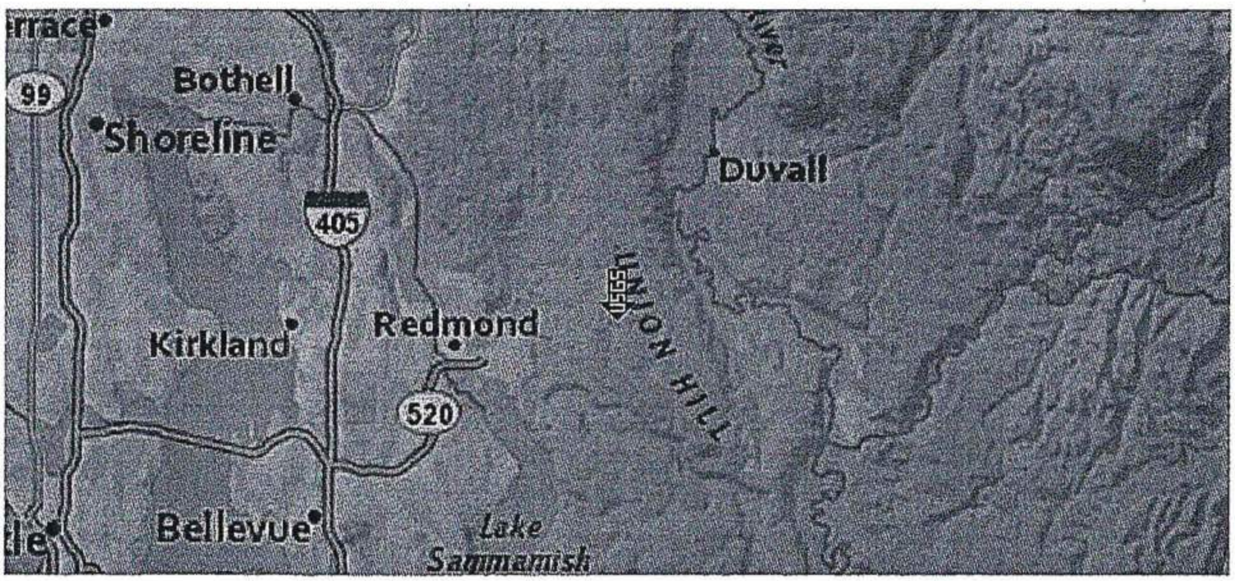
USGS Design Maps Summary Report

User–Specified Input

Building Code Reference Document ASCE 41-13 Retrofit Standard, BSE-1E
(which utilizes USGS hazard data available in 2008)

Site Coordinates 47.69224°N, 122.03718°W

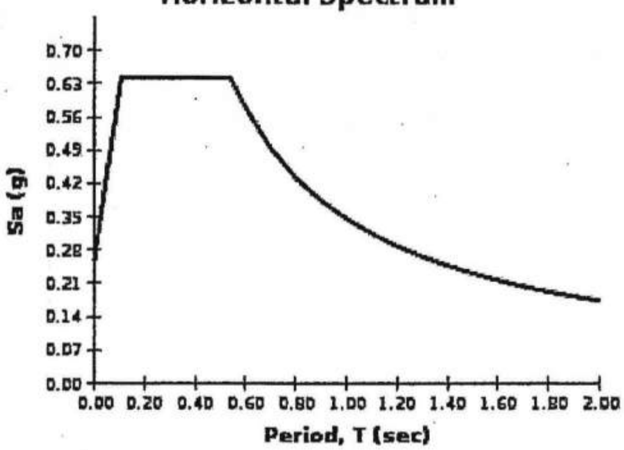
Site Soil Classification Site Class D – "Stiff Soil"



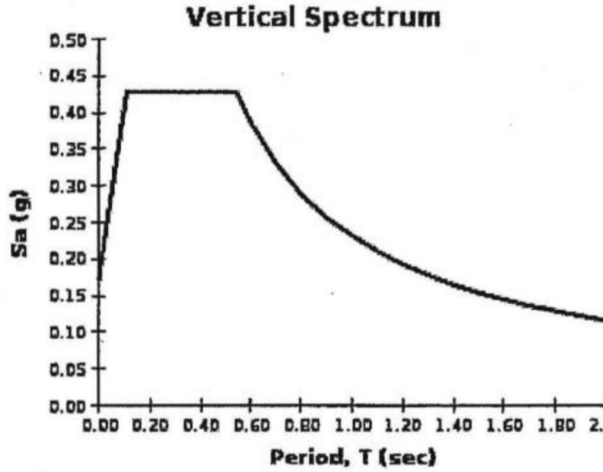
USGS–Provided Output

$S_{S,20/50}$	0.444 g	$S_{XS,BSE-1E}$	0.642 g
$S_{1,20/50}$	0.161 g	$S_{X1,BSE-1E}$	0.347 g

Horizontal Spectrum



Vertical Spectrum



Seismic Design

Evaluation Method:	ASCE 41-13 Tier 3
Analysis Procedure:	Linear Static Procedure (LSP)

Performance Objective

Seismic Hazard Level	BSE-1E	BSE-1E, 2E, 1N, 2N per ASCE 41-13 Table 2-1.
Occupancy Category	IV	I, II, or III, or IV per ASCE 7-10 Table1-1
BOPE	IO	Immediate Occupancy Performance (1-B)

Soil

Site Class	D	per soils report (D assumed, without soils report)

Period Determination

T_1		sec	Method-1 (Eigenvalue)
h_n	20	ft	
Ct	0.02		
β	0.75		
T_2	0.19	sec	Method -2 (Eq. 7-18)
T_3		sec	Method-3 (Approx. Rayleigh's)
T	0.19	sec	Period Used

General Response Parameters

S_S	0.444		20% in 50-year USGS Latitude & Longitude lookup
S_1	0.161		20% in 50-year USGS Latitude & Longitude lookup
S_{XS}	0.64		(Eq. 2-1)
S_{X1}	0.35		(Eq. 2-2)
Fa	1.44		(Eq. 2-3)
Fv	2.16		(Eq. 2-4)
β	0.05		Effective Damping
β_1	1.00		(Eq. 2-11)
T_S	0.54	sec	(Eq. 2-9)
T_L		sec	Long Period Transition
Sa	0.64		(Eq. 2-5)

Pseudo Seismic Force for LSP

C1	1.14		(Eq. 7-22)	
C2	1.00		(Eq. 7-23)	1.30504668
Cm	1		(Table 7-4)	81.6959222
DCRmax	2			
$\mu_{strength}$	1.33		(Eq. C7-3)	44.0688586
Bldg. Weight	62.6	k		
$V=C_1C_2C_mS_aW$	46	k	(Eq. 7-21)	

$$C_1 = 1+\frac{\mu_{strength}-1}{aT^2}$$

$$C_2 = 1+\frac{1}{800}\left(\frac{\mu_{strength}-1}{T}\right)^2$$

Vertical Distribution

k	1.00				Story Force for LSP		Diaphragm Force for LSP		
Level	hx	wx	hx^k	$Wxhx^k$	Cvx (%)	Fx (k)	ΣFx	Σwi	Fpx
	ft	kips	ft	ft-kips	%	kips	kips	kips	kips
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
			0	-	0.00	0.0	0	0	
Roof	20	63	20	1,252	1.00	45.8	46	63	46
	Σ	63		1,252		46			

(Eq. 7-24) $F_x = C_{vx}V$

(Eq. 7-25) $$C_{vx} = \frac{w_x h_x^k}{\sum_{i=1}^{n} w_i h_i^k}$$

Seismic Weight: $W_{roof} = 58' \times 55' \times 15^{psf} = 47.9^k$
$W_{walls} = 2(58' + 55')(10)(13') = 29.4^k \div 2$

$W_{total} = 62.6^k$

$V_{base} = 46^k$

$V_{per\,brace} = \frac{V_{base}}{2 \cdot 3} = 7.67^k$

K-Brace: $\Delta = 0.4075''$

Braces: L 2×2×1/4
$P_u = -9.743^k$
$M_u = 0^{k'}$
$L_b = 2.9'$
$P_n/\Omega = 12.9^k$ OK

Verticals: WT 6×13
$P_u = -45.71^k$
$M_u = 2.759^{k'}$
$L_b = 3.5'$
$P_n/\Omega = 53.9^k$ OK

w/ $m = 1.25$: $V_{per\,brace} = 6.136^k$
Braces: $P_u = 7.79^k < P_n/\Omega = 12.9^k$
Verticals: $P_u = 36.57^k < P_n/\Omega = 53.9^k$

Reactions: $F_x = 6.86^k$
$F_y = 47.43^k$

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K-Brace Top Connection:

$V = 7.67^k$

weld: 1/4" filet weld 2" @ 12" oc total $\ell = 6"$

$R_n/\Omega = 22.3^k > V_u$ OK

GL 3 1/8 x 10 1/2 : $F_t = 600^{psi} \times 3\frac{1}{8} \times 10\frac{1}{2} = 19.7^k > V_u$ OK

Lag screws: (3) 5/8" ϕ (embed 3 1/2")

$Z_n \times C_D = 945^{\#} \times 1.6 = 1512^{\#}$

Capacity $= 3 \times 1.512 = 4.54^k < V_u$ NG

DCR = 2.55

add (4) 5/8" ϕ lag screws (embed 3.5")

capacity $= 4.54 + 4(0.945)(1.6) = 10.58^k$ OK

Grade Beam Check: North $0.9M_{ST} > M_{OT}/C_1C_2\mu_{OT}$

$18" \times 48"$ w/ (6) #3 T & B $\mu_{OT} = 4$ (ASCE 41-13 eqtn 7-6)

$\ell = 42'-10"$

$P = \pm 47.43^k$ @ 2.5', 4.75', 20.25', 22.5', 38.25', 40.5'

$M_u = 88.83^{k'} \div \mu_{OT} = 22.21^{k'}$

$\phi M_n = 44.07^{k'} \times 0.9 = 39.66^{k'}$ OK

South:

$18" \times 48"$ w/ (6) #5 T & B

$\ell = 60'-9"$

$P = \pm 35.58^k$ @ 2.5', 4.75', 20.25', 22.5', 38.25', 40.5', 56', 58.25'

$M_u = 87.33^{k'} \div \mu_{OT} = 21.83^{k'}$

$\phi M_n = 121.73^{k'} \times 0.9 = 109.56^{k'}$ OK

Appendix D

Existing BMU Wall Investigation

OTTO ROSENAU & ASSOCIATES, INC.

SUBSURFACE INTERFACE RADAR INVESTIGATION REPORT № 282868

Job Number: 16 - 0652	Permit Number:
Project: CITY OF REDMOND FACILITIES SIR	Client/Contact:
Address: VARIOUS	Phone Number:
Date: 9/7/2016	Technicians: D. HELGESON

Important Notice

The operator has marked the approximate location of subsurface items detected by the equipment. The equipment may NOT detect some subsurface items. The client understands this fact and assumes full and complete responsibility for any subsurface items, detected or not, by the machine. This service is intended to provide information to the client only. Otto Rosenau & Associates, Inc. does not assume any responsibility for how the client interprets or utilizes this information. In the case of concrete slabs (slab on grade, structural and/or post-tensioned), walls, columns, Otto Rosenau & Associates, Inc. strongly recommends that the client does not core, drill, sawcut, bore, and/or excavate within 3" minimum of any marked locations by the operators of this equipment.

1. Representative to work with survey operator: YES
2. Itemized areas cleared for survey: YES
3. Alternate areas available: YES

Area and Purpose of Survey

INSPECTED AND PERFORMED RADAR LOCATE OF REDMOND FIRE STATION WALLS @ STATIONS 11, 12 AND 13. USING STRUCTURE SCAN MINI SCANNED EXTERIOR EXISTING BRICK WALLS LOOKING FOR ANY AND ALL DETECTABLE SUBSURFACE EMBEDED OBJECTS

FOUND WHAT APPEARS TO BE REINFORCING STEEL AT ALL THREE STATIONS WITH A PATTERN OF 4 FEET ON CENTER VERTICAL BARS WITH 2-3 FOOT ON CENTER HORIZONTAL BARS.

Authorized Signature: [signature]

Title:

Company Name: Swenson Say Faget

Date: 9/7/16

Tested by: [signature]

Reviewed by:

Start Time:

Finish Time:

Page 1 of 1

OLD FIRE STATION / TEEN CENTER
16510 Northeast 79th Street

- **Summary of Asbestos-Containing Materials**

Homogeneous Area	Description	Quantity	Cat. / Type	Percent Asbestos
Exterior metal framed windows	Window Glazing (white, brittle)	2,000 LF	Misc. / NF	2% Chrysotile
Floor in southwest office, north storage, south office	Trace black flooring mastic	800 SF	Misc. / NF	5% Chrysotile
Walls and ceilings	White skim coating on plaster and CMU walls	T / O Walls and Ceilings	Surf. / F	4% Chrysotile
Game Room	Diner-style seating base (red, cementitious)	70 SF	Misc. / NF	4% Chrysotile
Basement	Hard mudded piping manifold insulation (white, hard)	10 LF	TSI / F	20% Chrysotile 15% Amosite
Basement / piping tunnels, in walls and ceilings	Hard mudded water piping fittings, elbows	350 Each	TSI / F	25% Chrysotile 21% Amosite
Basement / piping tunnels, in walls and ceilings	Aircell piping insulation (fabric lagging on cardboard layers)	2,500 LF	TSI / F	50% Chrysotile
Basement boiler	PACM Boiler breach gasket	2 Each	Misc. / F	Presumed Asbestos-Containing Material
Basement boiler	PACM Boiler breach insulation	10 SF	TSI / F	Presumed Asbestos-Containing Material

Basement boiler	AACM Boiler refractory brick	50 SF	Misc. / F	Assumed Asbestos-Containing Material

AACM Assumed Asbestos-Containing Material
F Friable
LF Linear Feet
ND None Detected
NF Nonfriable
Misc. Miscellaneous
SF Square Feet
Surf. Surfacing
TSI Thermal System Insulation

- **Summary of Lead-Based Paint**

Location	Component	Substrate	Color	Lead Concentration (mg/cm^2)
Old Fire Station	Door Casing	Wood	Blue	2.00
Old Fire Station	Door	Wood	Red	2.30
Old Fire Station	Window Panel	Other	Black	3.00

mg/cm^2 Milligrams per square centimeter

- **Summary of Bulk Arsenic Sampling**

Sample Number	Location	Description	Results (mg/kg)
RED-OFC-AS-01	Old Fire Station – media lab wall	CMU	<18.0
RED-OFC-AS-02	Old Fire Station – media lab wall	Grey CMU mortar	<19.0

CMU Cement Masonry Unit
Mg/kg milligrams per kilogram

- **Universal Waste Inventory**

Location	PCB Light Ballasts	Fluorescent Lamps	High Intensity Discharge Lamps (HID)
Old Fire Station / Teen Center	135	250	10

HID High intensity discharge
PCB Polychlorinated biphenyls

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-01	Window glazing (white, elastomeric)	Misc. / NF	Southwest office, south, center window	Throughout patches in window glazing	ND
RED-OFC-ACM-02	**Window glazing (white, brittle)**	**Misc. / F**	**Southwest office, south, center window**	**Throughout exterior metal framed windows** **25 windows / 2,000 LF**	**2% Chrysotile**
RED-OFC-ACM-03	Vinyl cove base (4”, grey) with off-white mastic	Misc. / NF	Southwest office	Southwest office, hall, work room, office, vault, storage, restrooms, game room, art/reading/game room,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-04	Green and beige carpet with green glue and **trace black mastic**	**Misc. / NF**	**Southwest office floor**	**Southwest office, north storage, south office** **800 SF**	Layer 1: ND Layer 2: ND **Layer 3: 5% Chrysotile**
RED-OFC-ACM-05	Fiberboard wall panel (brown)	Misc. / NF	Southwest office wall	Southwest office,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-06	Vinyl floor tile (12”x12”, grey with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, art room, hall near kitchen 462	Layer 1: ND Layer 2: ND
RED-OFC-ACM-07	Vinyl floor tile (12”x12”, red with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, art room, hall near kitchen 124	Layer 1: ND Layer 2: ND

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-08	Vinyl floor tile (12"x12", black with mottling) with clear glue	Misc. / NF	Main hall, south	Main hall, game room, game room, hall near kitchen 124	Layer 1: ND Layer 2: ND
RED-OFC-ACM-09	Multicolored carpet (blue, pink, grey)	Misc. / NF	Small work room	Small work room, counter, storage room, game room, art storage rooms, north hall, computer lab,	Layer 1: ND Layer 2: ND
RED-OFC-ACM-10	CMU wall (grey, cementitious) **with trace off-white material**	**Misc. / NF**	**Old vault wall**	**Throughout on CMU walls** **500 SF**	**Layer 1: 3% Chrysotile** Layer 2: ND
RED-OFC-ACM-11 **RED-OFC-ACM-12** RED-OFC-ACM-13 RED-OFC-ACM-14 **RED-OFC-ACM-15** RED-OFC-ACM-16 **RED-OFC-ACM-17**	**White skim coat** with plaster (grey, cementitious)	**Surf. / F**	Southwest office, south center office, game room, mixing area, art storage, art room, garage/theater, south office	**Throughout original walls** **15,000 SF**	**Layer 1: 3-4% Chrysotile** Layer 2: ND
RED-OFC-ACM-18	Vinyl floor sheeting (grey, speckled) with light grey backing and yellow blue	Misc. / F	Men's restroom	Men's restroom, women's restroom 300 SF	Layer 1: ND Layer 2: ND
RED-OFC-ACM-19 RED-OFC-ACM-20 RED-OFC-ACM-21 RED-OFC-ACM-22 RED-OFC-ACM-23	Gypsum wallboard system -white paint -off-white orange peel texture -off-white joint compound -off-white seam tape -gypsum -brown paper	Surf. / F	Men's restroom Women's restroom North hall South hall West hall	Throughout interior located walls	Layer 1: ND Layer 2: ND Layer 3: ND Layer 4: ND

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-24	Acoustic ceiling tile (12”x12”, white with pinholes)	Misc. / F	Game room above drop ceiling attached to nail (residual)	Throughout stuck to glue dots on ceiling	ND
RED-OFC-ACM-25	Ceiling tile (2’x4’, white) fiberglass, thin	Misc. / NF	Game room drop ceiling	Game room drop ceiling	ND
RED-OFC-ACM-26	Glue dot (brown, brittle)	Misc. / NF	Game room above drop ceiling on wood ceiling	Throughout above ceiling on wood deck ceiling	Layer 1: ND Layer 2: ND
RED-OFC-ACM-27	**Diner style counter base (red, cementitious) with small pebbles**	**Misc. / NF**	**Game room along north wall**	**Game room along north wall** **70 SF**	**4% Chrysotile**
RED-OFC-ACM-28	Door window pane foam (black foam) with clear, sticky adhesive	Misc. / NF	Northwest media lab room	Media lab door windows	ND
RED-OFC-ACM-29	Black wall carpet with yellow glue	Misc. / NF	Media lab central area	Media lab central wall	ND
RED-OFC-ACM-30	Window frame sealant (white, elastomeric)	Misc. / NF	Media lab southeast window	Media lab southeast window	
RED-OFC-ACM-31	HVAC duct seam sealant (grey, elastomeric)	Misc. / NF	Media lab center HVAC duct	Media lab HVAC ducts	ND
RED-OFC-ACM-32	Red and blue carpet squares (2’x2’) with off-white adhesive	Misc. / NF	Small closet near art room	Small closet near art room	Layer 1: ND Layer 2: ND Layer 3: ND
RED-OFC-ACM-33	Acoustic ceiling tile (2’x4’, white) with pinholes and gouges	Misc. / F	Art/reading/game room	Art/reading/game room 24x28	ND
RED-OFC-ACM-34	Sink undercoating (white)	Misc. / NF	Shallow stainless steel sink in kitchen	Shallow stainless steel sink in kitchen	ND
RED-OFC-ACM-35	Sink undercoating (white)	Misc. / NF	Deep stainless steel sink in kitchen	Deep stainless steel sink in kitchen	ND

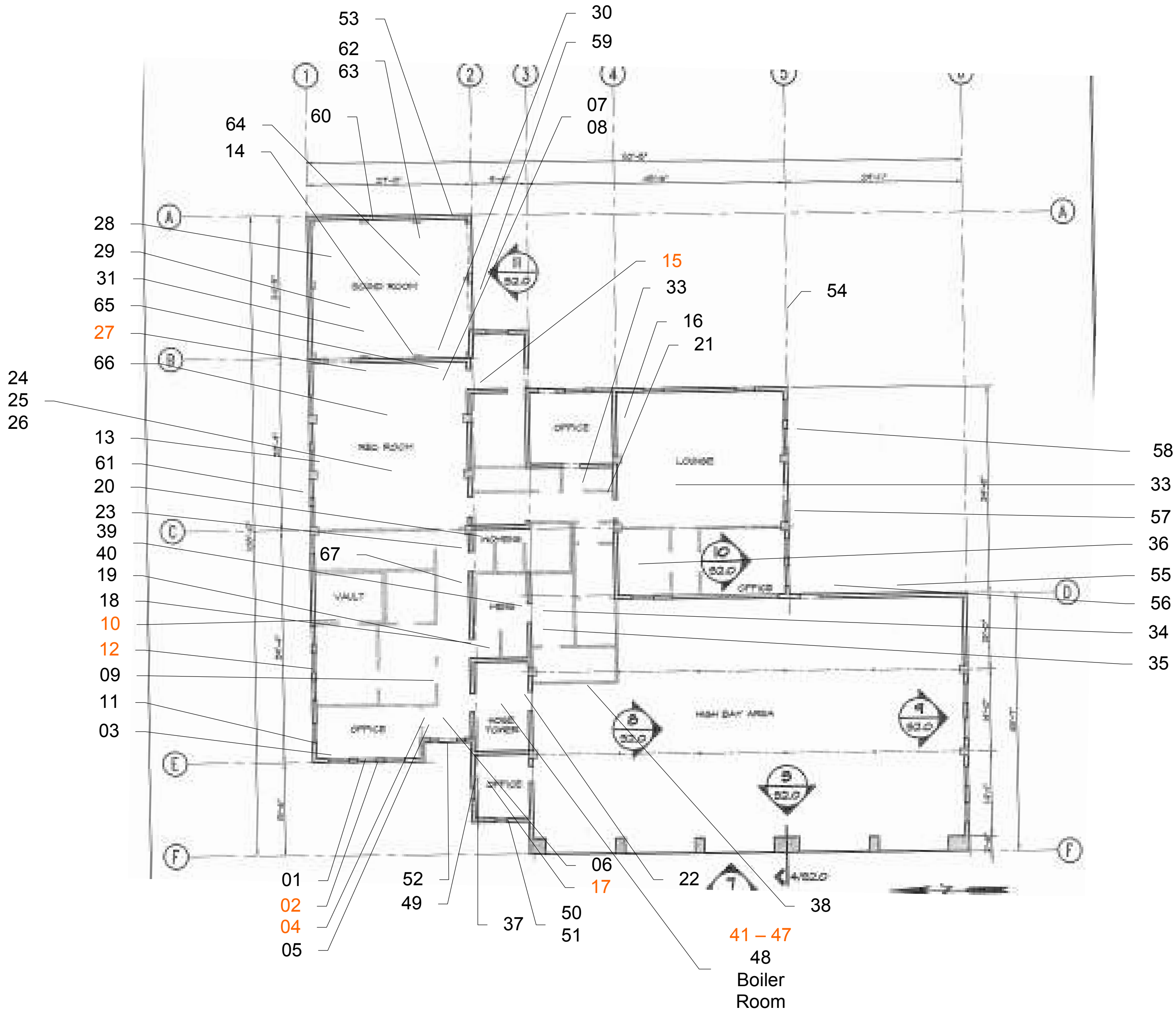
Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-36	Acoustic ceiling tile (1'x3') brown fiberboard	Misc. /. F	Computer lab ceiling	Computer lab, north storage	ND
RED-OFC-ACM-37	Window glazing (light grey, brittle)	Misc. / NF	South office window 2'x8' window	South office 2 each 96 LF	ND
RED-OFC-ACM-38	Vinyl cove base (4", black) with off-white glue and bits of GWB	Misc. / NF	Theater near bathroom	Theater and south hall	Layer 1: ND Layer 2: ND
RED-OFC-ACM-39	Vapor barrier (brown, heavy paper)	Misc. / NF	Inside wall, top of tower at vent	Throughout inside wall	Layer 1: ND Layer 2: ND
RED-OFC-ACM-40	Wall interior concrete (grey, cementitious) with brown, light paper	Misc. / NF	Inside wall, top of tower	Throughout concrete interior walls	Layer 1: ND Layer 2: ND
RED-OFC-ACM-41	**Hard mudded pipe manifold insulation (fabric lagging with white, packed material)**	**TSI / F**	**Basement above boiler**	**Basement boiler piping manifold** **10 LF**	**20% Chrysotile** **15% Amosite**
RED-OFC-ACM-42 **RED-OFC-ACM-43** **RED-OFC-ACM-44**	**Hard mudding water piping elbow insulation (fabric lagging with packed white material)**	**TSI / F**	**Basement piping elbows and fitting**	**Throughout hard mudded fittings and elbows** **350 Each**	**25% Chrysotile** **21% Amosite**
RED-OFC-ACM-45 **RED-OFC-ACM-46** **RED-OFC-ACM-47**	**Aircell piping insulation (fabric lagging on white cardboard layers)**	**TSI / F**	**Basement piping straight runs**	**Throughout piping insulation** **2,500 LF**	**Layer 1: 50% Chrysotile** Layer 2: ND
RED-OFC-ACM-48	Concrete vapor barrier (dark brown, heavy paper)	Misc. / NF	West piping corridor ceiling	Throughout beneath concrete slab and ceiling of piping corridors	ND
RED-OFC-ACM-49	CAB (tan)	Misc. / NF	South exterior near entry	Exterior south areas	ND
RED-OFC-ACM-50	Window putty clear, elastomeric	Misc. / NF	South exterior window (2'x8')	Throughout 2'x8' windows	ND

Appendix A Bulk Asbestos Sampling and Analysis – Old Fire Station and Teen Center

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-51	Window frame to siding sealant (white, elastomeric)	Misc. / NF	South exterior window	Throughout window frames	ND
RED-OFC-ACM-52	Relite window putty (white, crumbly)	Misc. / NF	South main entry	Throughout relite windows 56 LF	ND
RED-OFC-ACM-53	Door frame sealant (dark grey, elastomeric)	Misc. / NF	South door to media lab	Throughout exterior metal framed doors	ND
RED-OFC-ACM-54	Addition-to-main building sealant (grey, elastomeric)	Misc. / NF	East side of media lab exterior seam	Media lab addition seams and other seams	Layer 1: ND Layer 2: ND
RED-OFC-ACM-55 RED-OFC-ACM-56 RED-OFC-ACM-57 RED-OFC-ACM-58 RED-OFC-ACM-59 RED-OFC-ACM-60 RED-OFC-ACM-61	Spray-on exterior wall (off-white, cementitious) with gravel	Surf. / NF	Exterior	Throughout exterior	ND
RED-OFC-ACM-62	HVAC fence footing sealant (black, asphaltic)	Misc. / NF	HVAC fence footings on roof near HVAC ducts	HVAC fence footings on roof	ND
RED-OFC-ACM-63	Roll-on roofing (heavy roofing with pebbles)	Misc. / NF	Roof, north side	Throughout roof	ND
RED-OFC-ACM-64	HVAC duct seam sealant (off-white, elastomeric)	Misc. / NF	Roof, north side ducts	Throughout HVAC units and ducts	ND
RED-OFC-ACM-65	Roofing paper (black, light)	Misc. / NF	Roof at edge to 2nd level	Throughout roof beneath roll-on composite roofing	ND
RED-OFC-ACM-66	Roof vent sealant (light grey, elastomeric)	Misc. / NF	Roof, center	Throughout roof vents	ND

Sample Number	Description	Cat. / Type	Location	Homogenous Sampling Area Quantity	Percent Asbestos
RED-OFC-ACM-67	Siding to flashing sealant (light grey, elastomeric)	Misc. / NF	Roof, south side at tower	Throughout siding-to-flashing seams	ND
Assumed	**Boiler breach gasket**	**Misc. / F**	**Basement boiler room on boiler doors**	**Boiler door gaskets** **2 Each**	**Assumed ACM**
Assumed	**Boiler refractory brick**	**Misc. / F**	**Basement boiler room inside boiler**	**Boiler interior** **50 SF**	**Assumed ACM**
Assumed	**Boiler breach insulation**	**TSI / F**	**Basement boiler in boiler breach**	**Boiler breach** **10 SF**	**PACM**

PACM	Presumed Asbestos-Containing Material
F	Friable
LF	Linear Feet
ND	None Detected
NF	Nonfriable
Misc.	Miscellaneous
SF	Square Feet
Surf.	Surfacing
TSI	Thermal System Insulation



OLD FIRE STATION / TEEN CENTER

Not to scale

REVISIONS			
NO.	DESCRIPTION	BY	DATE

PROJECT: Hazmat Inspection, Testing and Reporting

TITLE: SAMPLE COLLECTION LOCATIONS

Client: City of Redmond

Amec Foster Wheeler
Environment & Infrastructure, Inc.
11810 North Creek Parkway North
Bothell, WA 98011
425.368.1000

5-915-17894-0	REV. NO.
DR:	CHK:

DATE: APRIL 2015

FIGURE NUMBER

22

May 6, 2015

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

Chris Miele
AMEC Environment & Infrastructure, Inc-Bothell
11810 North Creek Parkway North
Bothell, WA 98011

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507912.00

Dear Mr. Miele,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043611 **Client Sample #: RED-OFC-ACM-01**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	White soft putty material with paint	Calcareous particles, Binder/Filler, Paint	None Detected ND	**None Detected ND**

Lab ID: 15043612 **Client Sample #: RED-OFC-ACM-02**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	Off-white putty material with paint	Calcareous particles, Binder/Filler, Paint	None Detected ND	**Chrysotile 2%**

Lab ID: 15043613 **Client Sample #: RED-OFC-ACM-03**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 2	Gray rubbery material	Rubber/Binder	None Detected ND	**None Detected ND**
Layer 2 of 2	Off-white soft mastic	Mastic/Binder	None Detected ND	**None Detected ND**

Lab ID: 15043614 **Client Sample #: RED-OFC-ACM-04**
Location: C of R

Layer	Description	Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 3	Multi-color woven fibrous material with yellow mastic	Fine particles, Mastic/Binder	Synthetic fibers 85%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, ~~Technical Director~~

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 3 **Description:** Green soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Trace black asphaltic mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Mastic/Binder	Cellulose	3%	**Chrysotile 5%**

Lab ID: 15043615 **Client Sample #: RED-OFC-ACM-05**
Location: C of R

Layer 1 of 2 **Description:** Tan compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Adhesive/Binder, Paint	Cellulose	96%	**None Detected ND**

Layer 2 of 2 **Description:** White soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Perlite	None Detected	ND	**None Detected ND**

Lab ID: 15043616 **Client Sample #: RED-OFC-ACM-06**
Location: C of R

Layer 1 of 2 **Description:** Gray tile

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Trace yellow soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Mastic/Binder	None Detected	ND	**None Detected ND**

Lab ID: 15043617 **Client Sample #: RED-OFC-ACM-07**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015
Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** Pink tile

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected ND	None Detected ND

Layer 2 of 2 **Description:** Gray crumbly material with thin mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Calcareous particles, Binder/Filler, Mastic/Binder	Cellulose 6%	None Detected ND

Lab ID: 15043618 **Client Sample #: RED-OFC-ACM-08**
Location: C of R

Layer 1 of 2 **Description:** Black tile

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Vinyl/Binder, Calcareous particles	None Detected ND	None Detected ND

Layer 2 of 2 **Description:** Trace gray crumbly material with trace mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Calcareous particles, Binder/Filler, Mastic/Binder	Cellulose 4%	None Detected ND

Lab ID: 15043619 **Client Sample #: RED-OFC-ACM-09**
Location: C of R

Layer 1 of 2 **Description:** Multi-color woven fibrous material with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Fine particles, Mastic/Binder	Synthetic fibers 88%	None Detected ND

Layer 2 of 2 **Description:** Black soft material with trace adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Calcareous particles, Binder/Filler, Adhesive/Binder	Glass fibers 8%	None Detected ND

Lab ID: 15043620 **Client Sample #: RED-OFC-ACM-10**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** Trace off-white material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 3%**

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043621 **Client Sample #: RED-OFC-ACM-11**
Location: C of R

Layer 1 of 1 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043622 **Client Sample #: RED-OFC-ACM-12**
Location: C of R

Layer 1 of 3 **Description:** Off-white skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 3%**
Paint			

Layer 2 of 3 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Layer 3 of 3 **Description:** Gray hard brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains, Gravel	None Detected	ND	**None Detected ND**

Lab ID: 15043623 **Client Sample #: RED-OFC-ACM-13**
Location: C of R

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 2 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043624 **Client Sample #: RED-OFC-ACM-14**
Location: C of R

Layer 1 of 2 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**
Paint			

Layer 2 of 2 **Description:** Gray hard brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mineral grains, Gravel	None Detected	ND	**None Detected ND**

Lab ID: 15043625 **Client Sample #: RED-OFC-ACM-15**
Location: C of R

Layer 1 of 2 **Description:** Off-white skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Binder/Filler, Mica	None Detected	ND	**Chrysotile 4%**
Paint			

Layer 2 of 2 **Description:** Off-white sandy material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Sand	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: **Mr. Chris Miele**
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15043626 **Client Sample #: RED-OFC-ACM-16**
Location: C of R

Layer 1 of 2 **Description:** Off-white thin skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043627 **Client Sample #: RED-OFC-ACM-17**
Location: C of R

Layer 1 of 2 **Description:** Yellow skim coat material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mica, Paint	None Detected	ND	**Chrysotile 3%**

Layer 2 of 2 **Description:** Light gray brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Mineral grains	None Detected	ND	**None Detected ND**

Lab ID: 15043628 **Client Sample #: RED-OFC-ACM-18**
Location: C of R

Layer 1 of 2 **Description:** Gray with black specks sheet vinyl

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Vinyl/Binder, Calcareous particles	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** Off-white fibrous backing with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Mastic/Binder	Cellulose	75%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043629 **Client Sample #: RED-OFC-ACM-19**
Location: C of R

Layer 1 of 3 **Description:** Off-white/white compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler	Cellulose	40%	**None Detected ND**

Layer 3 of 3 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Gypsum/Binder	Cellulose	16%	**None Detected ND**
	Glass fibers	5%	

Lab ID: 15043630 **Client Sample #: RED-OFC-ACM-20**
Location: C of R

Layer 1 of 3 **Description:** Off-white/white compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 3 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Calcareous particles, Binder/Filler	Cellulose	37%	**None Detected ND**

Layer 3 of 3 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Fine particles, Gypsum/Binder	Cellulose	12%	**None Detected ND**
	Glass fibers	4%	

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043631 **Client Sample #: RED-OFC-ACM-21**
Location: C of R

Layer 1 of 4 **Description:** White bumpy compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Layer 2 of 4 **Description:** Off-white/white compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Layer 3 of 4 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	Cellulose	43%	**None Detected ND**

Layer 4 of 4 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Gypsum/Binder	Cellulose	16%	**None Detected ND**
	Glass fibers	3%	

Lab ID: 15043632 **Client Sample #: RED-OFC-ACM-22**
Location: C of R

Layer 1 of 2 **Description:** White thin bumpy compacted powdery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Fine particles, Gypsum/Binder	Cellulose	20%	**None Detected ND**
	Glass fibers	5%	

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043633 **Client Sample #: RED-OFC-ACM-23**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 4	**Description:** White bumpy compacted powdery material with paint		
	Calcareous particles, Binder/Filler, Paint	None Detected ND	**None Detected ND**
Layer 2 of 4	**Description:** Off-white/white compacted powdery material		
	Calcareous particles, Binder/Filler	None Detected ND	**None Detected ND**
Layer 3 of 4	**Description:** White compacted powdery material with paper		
	Calcareous particles, Binder/Filler	Cellulose 35%	**None Detected ND**
Layer 4 of 4	**Description:** White chalky material with paper		
	Fine particles, Gypsum/Binder	Cellulose 17% Glass fibers 3%	**None Detected ND**

Lab ID: 15043634 **Client Sample #: RED-OFC-ACM-24**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	**Description:** Off-white compressed fibrous material with paint		
	Fine particles, Binder/Filler, Paint	Cellulose 60%	**None Detected ND**

Lab ID: 15043635 **Client Sample #: RED-OFC-ACM-25**
Location: C of R

Layer	Description / Non-Fibrous Materials	Other Fibrous Materials:%	Asbestos Type: %
Layer 1 of 1	**Description:** White hard material		
	Fine particles, Binder/Filler	Glass fibers 40%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043636 **Client Sample #: RED-OFC-ACM-26**
Location: C of R

Layer 1 of 2 **Description:** Trace off-white material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Fine particles, Binder/Filler	Cellulose 10%	**None Detected ND**

Layer 2 of 2 **Description:** Brown brittle mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Mastic/Binder	None Detected ND	**None Detected ND**

Lab ID: 15043637 **Client Sample #: RED-OFC-ACM-27**
Location: C of R

Layer 1 of 1 **Description:** Dark red brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Fine particles, Binder/Filler	Cellulose 3%	**Chrysotile 4%**

Lab ID: 15043638 **Client Sample #: RED-OFC-ACM-28**
Location: C of R

Layer 1 of 1 **Description:** Black foamy material with clear soft adhesive

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Synthetic foam, Adhesive/Binder	Cellulose 3%	**None Detected ND**

Lab ID: 15043639 **Client Sample #: RED-OFC-ACM-29**
Location: C of R

Layer 1 of 1 **Description:** Beige /white woven fibrous material with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	Asbestos Type: %
Fine particles, Mastic/Binder	Synthetic fibers 90%	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507912.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 30
Samples Analyzed: 30
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043640 **Client Sample #: RED-OFC-ACM-30**
Location: C of R

Layer 1 of 1 **Description:** White soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Calcareous particles, Binder/Filler	None Detected	ND	**None Detected ND**

Sampled by: Client
Analyzed by: Nadezhda Prysyazhnyuk **Date:** 05/06/2015
Reviewed by: Nick Ly **Date:** 05/06/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

1507912

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Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

L A & B S
HAZARDOUS MATERIALS SERVICES

Client: AMEC Environment & Infrastructure, Inc.
Street: 11810 North Creek Parkway North
Bothell, WA 98011
Project Manager: Chris Miele
Project Location: C of R

NVL Batch Number:
Client Job Number: 5915178940
Total Samples: 116
Turn Around Time: ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☑ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address: Christopher.miele@amecfw.com
brandon.kemperman@amecfw.com

Phone: 425-368-1000 Fax: 425-368-1001

☐ Asbestos Air	☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other ______
☑ Asbestos Bulk	☑ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk
☐ Mold/Fungus	☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS	Inst./Det Limit	Matrix		RCRA Metals ☐ All 8		Other Metals ☐ All 3
☐ Total Metals	☐ FAA (ppm)	☐ Air Filter	☐ Paint Chips in cm	☐ Arsenic (As)	☐ Mercury (Hg)	☐ Copper (Cu)
☐ TCLP	☐ ICP (ppm)	☐ Drinking water	☐ Waste Water	☐ Barium (Ba)	☐ Selenium (Se)	☐ Nickel (Ni)
	☐ GFAA (ppb)	☐ Dust/wipe (Area)	☐ Other	☐ Cadmium (Cd)	☐ Silver (Ag)	☐ Zinc (Zn)
		☐ Soil		☐ Chromium (Cr)		
		☐ Paint Chips in %		☐ Lead (Pb)		

☐ Other Types of Analysis	☐ Fiberglass ☐ Nuisance Dust ☐ Other (Specify) ______ ☐ Silica ☐ Respirable Dust

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		RED-FS16-ACM-01		
2		↓		
3		RED-FS16-ACM-23		
4		RED-FMS-ACM-01		
5		↓		
6		RED-FMS-ACM-26		
7		RED-OFC-ACM-01		
8		↓ -30		
9		RED-OFC-ACM-67		
10				
11				
12				
13			Br J Kemp	
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Brandon Kemperman	Br J Kemp	Amec FW		
Relinquished by	Brandon Kemperman	Br J Kemperman	Amec FW	4-30-15	1600
Received by	Johnathan	[signature]	NVL labs	5/1/15	10:45a Late
Analyzed by	Nadia	[signature]	NVL	5/6/15	1:10PM
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

May 7, 2015

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

Chris Miele
AMEC Environment & Infrastructure, Inc-Bothell
11810 North Creek Parkway North
Bothell, WA 98011

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1507913.00

Dear Mr. Miele,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043641 **Client Sample #: RED-OFC-ACM-31**
Location: C of R

Layer 1 of 1 **Description:** Gray soft/elastic material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	Cellulose	2%	**None Detected ND**

Lab ID: 15043642 **Client Sample #: RED-OFC-ACM-32**
Location: C of R

Layer 1 of 3 **Description:** Red/blue fibrous material with mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mastic/Binder	Synthetic fibers	70%	**None Detected ND**
	Cellulose	4%	

Layer 2 of 3 **Description:** Black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Rubber/Binder	Glass fibers	10%	**None Detected ND**
	Synthetic fibers	2%	

Layer 3 of 3 **Description:** Tan soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Mastic/Binder	Cellulose	3%	**None Detected ND**
	Synthetic fibers	3%	

Lab ID: 15043643 **Client Sample #: RED-OFC-ACM-33**
Location: C of R

Layer 1 of 1 **Description:** Gray fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Paint, Perlite	Cellulose	35%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Glass fibers 18%

Lab ID: 15043644 **Client Sample #: RED-OFC-ACM-34**
Location: C of R

Layer 1 of 1	**Description:** Off-white flaky material with fibrous elements		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles	Cellulose 10%	**None Detected ND**

Lab ID: 15043645 **Client Sample #: RED-OFC-ACM-35**
Location: C of R

Layer 1 of 1	**Description:** Off-white flaky material with fibrous elements		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles	Cellulose 9%	**None Detected ND**

Lab ID: 15043646 **Client Sample #: RED-OFC-ACM-36**
Location: C of R

Layer 1 of 1	**Description:** Tan compressed fibrous material with paint		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Paint	Cellulose 85%	**None Detected ND**

Lab ID: 15043647 **Client Sample #: RED-OFC-ACM-37**
Location: C of R

Layer 1 of 1	**Description:** Light gray hard material with paint		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Fine particles, Paint	Cellulose 2%	**None Detected ND**

Lab ID: 15043648 **Client Sample #: RED-OFC-ACM-38**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

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Address: 11810 North Creek Parkway North
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Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Attention: Mr. Chris Miele
Project Location: C of R

Layer 1 of 2 **Description:** Black rubbery material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Rubber/Binder, Paint	None Detected	ND	**None Detected ND**

Layer 2 of 2 **Description:** White compacted powdery material with paint & paper

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Calcareous particles, Paint	Cellulose	12%	**None Detected ND**

Lab ID: 15043649 **Client Sample #: RED-OFC-ACM-39**
Location: C of R

Layer 1 of 2 **Description:** Black asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Asphalt/Binder, Binder/Filler	Cellulose	90%	**None Detected ND**

Layer 2 of 2 **Description:** Trace gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Sand, Binder/Filler	Cellulose	2%	**None Detected ND**

Lab ID: 15043650 **Client Sample #: RED-OFC-ACM-40**
Location: C of R

Layer 1 of 2 **Description:** Black thin asphaltic fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Asphalt/Binder	Cellulose	65%	**None Detected ND**
	Spider silk	3%	

Layer 2 of 2 **Description:** Gray sandy/brittle material

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Binder/Filler, Sand	Cellulose	2%	**None Detected ND**

Lab ID: 15043651 **Client Sample #: RED-OFC-ACM-41**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015
Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 1 **Description:** Light gray crumbly fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 10%	**Chrysotile 20%**
		Amosite 15%

Lab ID: 15043652 **Client Sample #: RED-OFC-ACM-42**
Location: C of R

Layer 1 of 1 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 20%	**Chrysotile 25%**
		Amosite 21%

Lab ID: 15043653 **Client Sample #: RED-OFC-ACM-43**
Location: C of R

Layer 1 of 1 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 10%	**Amosite 20%**
		Chrysotile 7%

Lab ID: 15043654 **Client Sample #: RED-OFC-ACM-44**
Location: C of R

Layer 1 of 2 **Description:** Light gray crumbly fibrous material with off-white woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 12%	**Amosite 20%**
		Chrysotile 7%

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 2 of 2 **Description:** Beige woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Glass fibers 95%	**None Detected ND**

Lab ID: 15043655 **Client Sample #: RED-OFC-ACM-45**
Location: C of R

Layer 1 of 1 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 46%**

Lab ID: 15043656 **Client Sample #: RED-OFC-ACM-46**
Location: C of R

Layer 1 of 2 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 50%**

Layer 2 of 2 **Description:** Gray woven fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 80%	**None Detected ND**

Lab ID: 15043657 **Client Sample #: RED-OFC-ACM-47**
Location: C of R

Layer 1 of 1 **Description:** Gray fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler	Cellulose 30%	**Chrysotile 50%**

Lab ID: 15043658 **Client Sample #: RED-OFC-ACM-48**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 1 **Description:** Black asphaltic fibrous material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Miscellaneous particles	Cellulose	75%	**None Detected ND**

Lab ID: 15043659 **Client Sample #: RED-OFC-ACM-49**
Location: C of R

Layer 1 of 1 **Description:** Gray brittle material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	Cellulose	5%	**None Detected ND**

Lab ID: 15043660 **Client Sample #: RED-OFC-ACM-50**
Location: C of R

Layer 1 of 1 **Description:** Gray soft material with trace paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	None Detected	ND	**None Detected ND**

Lab ID: 15043661 **Client Sample #: RED-OFC-ACM-51**
Location: C of R

Layer 1 of 1 **Description:** White soft material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Wood flakes	Cellulose	2%	**None Detected ND**
	Wood fibers	2%	

Lab ID: 15043662 **Client Sample #: RED-OFC-ACM-52**
Location: C of R

Layer 1 of 1 **Description:** White brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles, Paint	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15043663 **Client Sample #: RED-OFC-ACM-53**
Location: C of R

Layer 1 of 1 **Description:** Black soft material with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Paint, Sand	Cellulose <1%	**None Detected ND**

Lab ID: 15043664 **Client Sample #: RED-OFC-ACM-54**
Location: C of R

Layer 1 of 2 **Description:** Gray rubbery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Fine particles, Paint	None Detected ND	**None Detected ND**

Layer 2 of 2 **Description:** Gray foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Synthetic foam		**None Detected ND**

Lab ID: 15043665 **Client Sample #: RED-OFC-ACM-55**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose 2%	**None Detected ND**

Lab ID: 15043666 **Client Sample #: RED-OFC-ACM-56**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose 2%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Lab ID: 15043667 **Client Sample #: RED-OFC-ACM-57**
Location: C of R

Layer 1 of 1 **Description:** White sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Sand, Paint, Binder/Filler	None Detected	ND	**None Detected ND**

Lab ID: 15043668 **Client Sample #: RED-OFC-ACM-58**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose	<1%	**None Detected ND**

Lab ID: 15043669 **Client Sample #: RED-OFC-ACM-59**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Sand, Paint, Binder/Filler	None Detected	ND	**None Detected ND**

Lab ID: 15043670 **Client Sample #: RED-OFC-ACM-60**
Location: C of R

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
Sand, Paint, Binder/Filler	Cellulose	2%	**None Detected ND**

Lab ID: 15043671 **Client Sample #: RED-OFC-ACM-61**
Location: C of R

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Layer 1 of 1 **Description:** Gray sandy/brittle material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Sand, Paint, Binder/Filler	None Detected	ND	**None Detected ND**

Lab ID: 15043672 **Client Sample #: RED-OFC-ACM-62**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic material with granules and debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Granules	Cellulose	2%	**None Detected ND**

Lab ID: 15043673 **Client Sample #: RED-OFC-ACM-63**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic material with granules

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Asphalt/Binder, Binder/Filler, Granules	Synthetic fibers	12%	**None Detected ND**
	Glass fibers	8%	

Lab ID: 15043674 **Client Sample #: RED-OFC-ACM-64**
Location: C of R

Layer 1 of 1 **Description:** Gray soft material

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Fine particles	None Detected	ND	**None Detected ND**

Lab ID: 15043675 **Client Sample #: RED-OFC-ACM-65**
Location: C of R

Layer 1 of 1 **Description:** Black asphaltic fibrous material with debris

Non-Fibrous Materials:	Other Fibrous Materials:%		Asbestos Type: %
Binder/Filler, Asphalt/Binder, Sand	Glass fibers	15%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015

Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: AMEC Environment & Infrastructure, Inc-Bothell
Address: 11810 North Creek Parkway North
Bothell, WA 98011

Attention: Mr. Chris Miele
Project Location: C of R

Batch #: 1507913.00
Client Project #: 5915178940
Date Received: 5/1/2015
Samples Received: 37
Samples Analyzed: 37
Method: EPA/600/R-93/116
& EPA/600/M4-82-020

Cellulose 10%

Lab ID: 15043676 **Client Sample #: RED-OFC-ACM-66**
Location: C of R

Layer 1 of 1	**Description:** Gray soft/elastic material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler	Polyethylene fibers 25%	**None Detected ND**

Lab ID: 15043677 **Client Sample #: RED-OFC-ACM-67**
Location: C of R

Layer 1 of 1	**Description:** Gray soft/elastic material with metal foil		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Metal foil	Polyethylene fibers 23%	**None Detected ND**

Sampled by: Client
Analyzed by: Dhafar Mohammedi **Date:** 05/07/2015
Reviewed by: Nick Ly **Date:** 05/07/2015 Nick Ly, Technical Director

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CHAIN of CUSTODY SAMPLE LOG

1507913

Client AMEC Environment & Infrastructure, Inc.
Street 11810 North Creek Parkway North
Bothell, WA 98011

Project Manager Chris Miele
Project Location C of R

Phone: 425-368-1000 **Fax:** 425-368-1001

NVL Batch Number
Client Job Number 5915178940
Total Samples 116
Turn Around Time ☐ 1-Hr ☐ 24-Hrs ☐ 4 Days ☐ 2-Hrs ☐ 2 Days ☒ 5 Days ☐ 4-Hrs ☐ 3 Days ☐ 6 to 10 Days
Please call for TAT less than 24 Hrs
Email address Christopher.miele@amecfw.com
brandon.kemperman@amecfw.com

☐ **Asbestos Air** ☐ PCM (NIOSH 7400) ☐ TEM (NIOSH 7402) ☐ TEM (AHERA) ☐ TEM (EPA Level II) ☐ Other

☒ **Asbestos Bulk** ☒ PLM (EPA/600/R-93/116) ☐ PLM (EPA Point Count) ☐ PLM (EPA Gravimetry) ☐ TEM Bulk

☐ **Mold/Fungus** ☐ Mold Air ☐ Mold Bulk ☐ **Rotometer Calibration**

METALS	Inst./Det Limit	Matrix		RCRA Metals	☐ All 8	Other Metals
☐ Total Metals	☐ FAA (ppm)	☐ Air Filter	☐ Paint Chips in cm	☐ Arsenic (As)	☐ Mercury (Hg)	☐ All 3
☐ TCLP	☐ ICP (ppm)	☐ Drinking water	☐ Waste Water	☐ Barium (Ba)	☐ Selenium (Se)	☐ Copper (Cu)
	☐ GFAA (ppb)	☐ Dust/wipe (Area)	☐ Other	☐ Cadmium (Cd)	☐ Silver (Ag)	☐ Nickel (Ni)
		☐ Soil		☐ Chromium (Cr)		☐ Zinc (Zn)
		☐ Paint Chips in %		☐ Lead (Pb)		

☐ **Other Types of Analysis** ☐ Fiberglass ☐ Nuisance Dust ☐ Other (Specify) ☐ Silica ☐ Respirable Dust

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample area, Sample Volume, etc)	A/R
1		RED-FS16-ACM-01		
2		↓		
3		RED-FS16-ACM-23		
4		RED-FMS-ACM-01		
5		↓		
6		RED-FMS-ACM-26		
7		RED-OFC-ACM-01		
8		↓ 31		
9		RED-OFC-ACM-67		
10				
11				
12			Br J Kemp	
13				
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	Brandon Kemperman	Br J Kemp	Amec FW		
Relinquished by	Brandon Kemperman	Br J Kemperman	Amec FW	4-30-15	1600
Received by	[illegible]	[illegible]	NVL Labs	5/1/15	10:45a Late
Analyzed by	Dhatar U.	[illegible]	N	5/8/15	940
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.