Washington State School Seismic Safety Assessments Project

SEISMIC UPGRADES CONCEPT DESIGN REPORT

Columbia High School – Gym

White Salmon Valley School District

June 2019

PREPARED FOR

PREPARED BY

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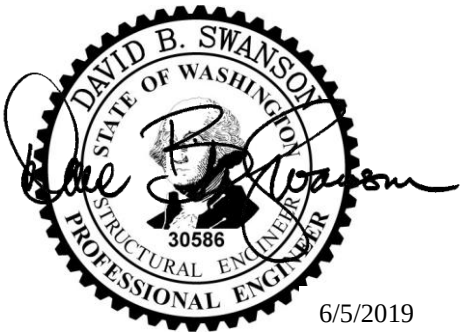

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EXECUTIVE SUMMARY

This report documents the findings of a preliminary seismic evaluation of the Columbia High School Gymnasium Building in White Salmon, Washington. The high school serves more than 380 students. The 14,000-square-foot, single-story building, with a partial below-grade basement, houses a gymnasium, classrooms, storage, and office spaces. The building was originally constructed in 1970. The Columbia High School Gymnasium Building is a precast tilt-up concrete panel structure with a wood-framed roof and an elevated concrete slab above a partial basement. The cast-in-place elevated concrete floor is supported with reinforced concrete beams spanning between interior concrete columns and exterior precast panels and pilasters. The wood-framed roof is constructed with Tectum panels over a wood frame system supported by exterior concrete precast panels and pilasters. The foundation system for the building is composed of shallow continuous strip footings under exterior wall panels and interior concrete walls. The foundation also consists of shallow spread footings below interior concrete columns.

WRK Engineers performed a Tier 1 screening in accordance with the ASCE 41-17 standard *Seismic Evaluation and Retrofit of Existing Buildings*. The evaluation included field observations and review of record drawings to verify the existing construction. The structural seismic evaluation indicated that the building has multiple seismic deficiencies, including the absence of structural plywood sheathing at the roof diaphragm and insufficient out-of-plane wall-to-diaphragm anchorage.

Conceptual seismic upgrade recommendations for structural systems are provided to improve the performance of the building to meet the Life Safety structural performance objective criteria of ASCE 41-17. Sketches for the concept-level seismic upgrades are provided in Appendix B. The structural upgrades to the roof include adding a connection between the roof framing and precast wall panels and installing new plywood roof sheathing, blocking, and nailing.

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Acronyms

ADA	Americans with Disabilities Act
ASCE	American Society of Civil Engineers
BPOE	Basic Performance Objective for Existing Buildings
BSE	Basic Safety Earthquake
BU	Built-Up
CMU	Concrete Masonry Unit
CP	Collapse Prevention
DNR	Department of Natural Resources
DCR	Demand-to-Capacity Ratio
EERI	Earthquake Engineering Research Institute
EPAT	EERI Earthquake Performance Assessment Tool
FEMA	Federal Emergency Management Agency
IBC	International Building Code
ICOS	Information and Condition of Schools
IEBC	International Existing Building Code
IO	Immediate Occupancy
LS	Life Safety
MCE	Maximum Considered Earthquake
MEP	Mechanical/Electrical/Plumbing
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
OSPI	Office of the Superintendent of Public Instruction
PBEE	Performance-Based Earthquake Engineering
PR	Position Retention
ROM	Rough Order-of-Magnitude
SSSSC	School Seismic Safety Steering Committee
UBC	Uniform Building Code
USGS	United States Geological Survey
WF	Wide Flange
WGS	Washington Geological Survey

Reference List

Codes and References

2015 IBC, *2015 International Building Code,* prepared by the International Code Council, Washington, D.C.

ASCE 7-10, 2010, *Minimum Design Loads for Buildings and Other Structures*, prepared by the Structural Engineering Institute of the American Society of Civil Engineers, Reston, Virginia.

ASCE 31-03, 2003, *Seismic Evaluation of Existing Buildings*, prepared by the Structural Engineering Institute of the American Society of Civil Engineers, Reston, Virginia.

ASCE 41-06, 2007, *Seismic Rehabilitation of Existing Buildings*, prepared by the Structural Engineering Institute of the American Society of Civil Engineers, Reston, Virginia.

ASCE 41-13, 2014, *Seismic Evaluation and Retrofit of Existing Buildings*, prepared by the Structural Engineering Institute of the American Society of Civil Engineers, Reston, Virginia.

ASCE 41-17, 2018, *Seismic Evaluation and Retrofit of Existing Buildings*, prepared by the Structural Engineering Institute of the American Society of Civil Engineers, Reston, Virginia.

ATC-14, *Evaluating the Seismic Resistance of Existing Buildings,* prepared for Applied Technology Council by H.J. Degenkolb Associates, San Francisco, California.

FEMA E-74, 1994, *Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide*, prepared by Wiss, Janney, Elstner Associates, Inc., under contract from the Federal Emergency Management Agency (FEMA), Washington, D.C.

FEMA E-74-FM, 2005, *Earthquake Hazard Mitigation for Nonstructural Elements, Field Manual*, prepared by Wiss, Janney, Elstner Associates, Inc., under contract with URS Corporation for the Federal Emergency Management Agency (FEMA), Washington, D.C.

FEMA 310, 1998, *Handbook for Seismic Evaluations of Buildings – A Prestandard*, prepared by America Society of Civil Engineers, Reston, Virginia.

FEMA 547, 2006, *Techniques for the Seismic Rehabilitation of Existing Buildings*, prepared by Rutherford & Chekene Consulting Engineers under contract with the National Institute of Standards and Technology (NIST), funded by the Federal Emergency Management Agency (FEMA).

NFPA 13, 2019, *Standard for the Installation of Sprinkler Systems*, prepared by National Fire Protection Association.

FEMA P-1000, *Safer, Stronger, Smarter: A Guide to Improving School Natural Hazard Safety*. Prepared by www.fema.gov/media-library/assets/documents/132592

Case Studies of Successful U.S. School Seismic Screening Programs. Prepared by EERI Staff, Members and Volunteers. https://www.eeri.org/wp-content/uploads/SESI_Screening_BestPractices_Version1_Dec2016.pdf

Incremental Seismic Rehabilitation of School Buildings (K-12): Providing Protection to People and Buildings (2003). Prepared by https://www.fema.gov/media-library/assets/documents/5154

FEMA E-74, *Reducing the Risks of Nonstructural Earthquake Damage.* Prepared by https://www.fema.gov/fema-e-74-reducing-risks-nonstructural-earthquake-damage

FEMA Earthquake School Hazard Hunt Game and Poster. Prepared by https://www.fema.gov/media-library/assets/documents/90409

Promoting Seismic Safety: Guidance for Advocates. Prepared by https://www.fema.gov/media-library/assets/documents/3229

Drawings

Hewlett and Jamison, February 1969, existing drawings titles "Columbia High School," Columbia High School District 405-17, White Salmon, Washington.

1.0 Introduction

1.1 Background

The Washington Geological Survey (WGS), a division of the Department of Natural Resources (DNR), is conducting a seismic assessment of 222 school buildings and 5 fire stations across Washington State to better understand the current level of seismic risk of Washington State's public-school buildings. The two main components of this project are: (1) geologic site characterization, and (2) the seismic assessment of buildings. As a part of the seismic assessments, Tier 1 screening of structural systems and nonstructural assessments were performed in accordance with the American Society of Civil Engineers' (ASCE) Standard 41-17 *Seismic Evaluation and Retrofit of Existing Buildings*. Concept-level seismic upgrades were developed to address the identified deficiencies of a select number of school buildings to evaluate seismic upgrade strategies, feasibilities, and implementation costs.

Fifteen school buildings were selected in consultation with WGS and the School Seismic Safety Steering Committee (SSSSC) to receive concept-level seismic upgrade designs utilizing the ASCE 41 Tier 1 evaluation results. This report documents the concept-level seismic upgrade design for one of those school buildings. The concept-level seismic upgrades will include structural and nonstructural seismic upgrade recommendations, with concept-level sketches and rough order-of-magnitude (ROM) construction costs determined for each building. The fifteen school buildings were selected from the list of schools with the intent of representing a variety of regions, building uses, construction eras, and construction materials.

The overall goal of the project is to provide a better understanding of the current seismic risk of our state's K-12 school buildings and what needs to be done to improve the buildings in accordance with ASCE 41 to meet seismic performance objectives.

The seismic evaluation consists of a Tier 1 screening for the structural systems performed in accordance with ASCE 41-17.

1.2 Scope of Services

The project is being performed in several distinct and overlapping phases of work. The scope of this report is as listed in the following sections.

1.2.1 Information Review

1. Project Research: Reid Middleton and their project team researched available school building records, such as relevant site data and record drawings, in advance of the field investigations. This research included searching school building records and contacting the districts and/or the Office of Superintendent of Public Instruction (OSPI) to obtain building plans, seismic reports, condition reports, property records, or related construction information useful for the project.

2. Site Geologic Data: Site geological data provided by the WGS, including site shear wave velocities, was utilized to determine the project Site Class in accordance with ASCE 41, which is included in the Tier 1 checklists and concept-level seismic upgrades design work.

1.2.2 Field Investigations

1. Field Investigations: Each of the identified buildings was visited to observe the building's age, condition, configuration, and structural systems for the purposes of the ASCE 41 Tier 1 seismic evaluations. This task included confirmation of general information in building records or layout drawings and visual observation of the structural condition of the facilities. Engineer field reports, notes, photographs, and videos of the facilities were prepared and utilized to record and document information gathered in the field investigation work.

2. Limitations Due to Access and Worker Safety: Field observations at each site were typically performed by an individual engineer. Observation efforts were limited to areas and building elements that were readily observable and safely accessible. Observations requiring access to confined spaces, potential hazardous material exposure, access by unsecured ladder, work around energized equipment or mechanical hazards, access to areas requiring Occupational Safety and Health Administration (OSHA) fall-protection, steep or unstable slopes, deteriorated structural assemblies, or other conditions deemed potentially unsafe by the engineer were not performed. Removal of finishes (e.g., gypsum board, lathe and plaster, brick veneer, roofing materials) for access to concealed conditions or to expose elements that could not otherwise be visually observed and assessed was not performed. Material testing or sampling was not performed. The ASCE checklist items that were not documented due to access limitations are noted.

1.2.3 Seismic Evaluations

1. Preliminary Seismic Evaluations: Preliminary seismic assessments of the structural and nonstructural systems of the school buildings were performed in accordance with ASCE 41-17 Tier 1 Evaluation Procedures.

2. Concept-Level Designs: Further seismic evaluation work was performed to provide concept-level seismic retrofits and/or upgrade designs for the selected school buildings based on the results of the Tier 1 seismic evaluations. The concept-level seismic upgrades design work included narrative descriptions of proposed seismic retrofits and/or upgrade schemes and concept sketches depicting the extent and type of recommended structural upgrades.

3. Cost Estimating: Through the concept-level seismic upgrades design process, ProDims provided opinions of probable construction costs for the concept-level seismic upgrade designs for the selected school buildings. These concept-level seismic upgrade designs and the associated opinions of probable construction costs are intended to be

representative samples that can be extrapolated to estimate the overall capital needs of seismically upgrading Washington State schools.

1.2.4 Reporting and Documentation

1. Project Reports: A preliminary seismic evaluation report on the overall Tier 1 seismic assessment of the schools will be provided to DNR/WGS and OSPI. The Tier 1 seismic evaluation of each building was documented by a standard report format that provides a summary of the structural systems of the building, Tier 1 checklist, building sketches/plans (if available), and site photographs. The reports will summarize the seismic evaluation, with concept-level seismic upgrade sketches and opinions of probable construction costs for seismic upgrades for each school building.

2. Building Photography: Photos and videos were taken of each building during on-site walkthroughs to document the existing building configurations, conditions, and structural systems.

3. Record Drawings: Record drawings and other information that was collected during the evaluation process are available for DNR/WGS, OSPI, and the school districts.

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2.0 Seismic Evaluation Procedures and Criteria

2.1 ASCE 41 Seismic Evaluation and Retrofit Overview

The current standard for seismic evaluation and retrofit (upgrades) of existing buildings is ASCE 41-17. ASCE 41 provides screening and evaluation procedures used to identify potential seismic deficiencies that may require further investigation or hazard mitigation. It presents a three-tiered review process, implemented by first following a series of predefined checklists and "quick check" structural calculations. Each successive tier is designed to perform an increasingly refined evaluation procedure for seismic deficiencies identified in previous tiers in the process. The flow chart in Figure 2.1 illustrates the evaluation process.

TIER 1 – Screening Phase

- Checklists of evaluation statements to quickly identify potential deficiencies
- Requires field investigation and/or review of record drawings
- Analysis limited to "Quick Checks" of global elements
- May proceed to Tier 2, Tier 3, or rehabilitation design if deficiencies are identified

TIER 2 – Evaluation Phase

- "Full Building" or "Deficiency Only" evaluation
- Address all Tier 1 seismic deficiencies
- Analysis more refined than Tier 1, but limited to simplified linear procedures
- Identify buildings not requiring rehabilitation

TIER 3 – Detailed Evaluation Phase

- Component-based evaluation of entire building using reduced ASCE 41 forces
- Advanced analytical procedures available if Tier 1 and/or Tier 2 evaluations are judged to be overly conservative
- Complex analysis procedures may result in construction savings equal to many times their cost

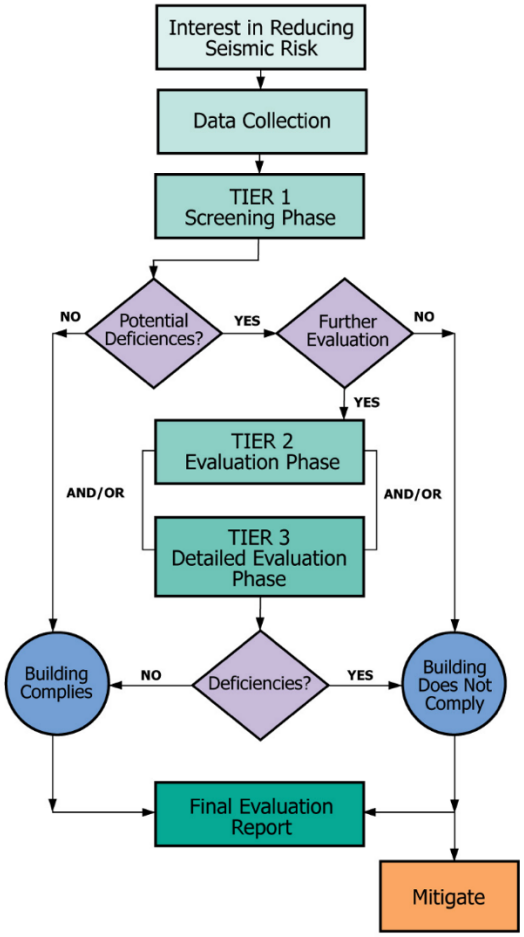

Figure 2-1. Flow Chart and Description of ASCE 41 Seismic Evaluation Procedure.

The Tier 1 checklists in ASCE 41 are specific to each common building type and contain seismic evaluation statements based on observed structural damage in past earthquakes. These checklists screen for potential seismic deficiencies by examining the lateral-force-resisting systems and details of construction that have historically caused poor seismic performance in similar buildings. Tier 1 screenings include basic "Quick Check" analyses for primary components of the lateral system: in this building's case, the wall anchorage to the diaphragm. Tier 1

screenings also include prescriptive checks for proper seismic detailing of connections, diaphragm spans and continuity, and overall system configuration.

Tier 2 evaluations then follow with more-detailed structural and seismic calculations and assessments to either confirm the potential deficiencies identified in the Tier 1 review or demonstrate their adequacy. A Tier 3 evaluation involves an even more detailed analysis and advanced structural and seismic computations to review each structural component's seismic demand and capacity. A Tier 3 evaluation is similar in scope and complexity to the types of analyses often required to design a new building in accordance with the International Building Code (IBC), with a comprehensive analysis aimed at evaluating each component's seismic performance. Generally, Tier 3 evaluations are not practical for typical and regular-type buildings due to the rigorous and complicated calculations and procedures. As indicated in the Scope of Services, this evaluation included a Tier 1 screening of the structural systems.

2.2 Seismic Evaluation and Retrofit Criteria

Performance-Based Earthquake Engineering (PBEE) can be defined as the engineering of a structure to resist different levels of earthquake demand in order to meet the needs and performance objectives of building owners and other stakeholders. ASCE 41 employs a PBEE design methodology that allows building owners, design professionals, and the local building code authorities to establish seismic hazard levels and performance goals for individual buildings.

2.2.1 Columbia High School Seismicity

Seismic hazards for the United States have been quantified by the United States Geological Survey (USGS). The information has been used to create seismic hazard maps, which are currently used in building codes to determine the design-level earthquake magnitudes for building design.

The Level of Seismicity is categorized as Very Low, Low, Moderate, or High based on the probabilistic ground accelerations. Ground accelerations and mass generate inertial (seismic) forces within a building (Force = mass x acceleration). Ground acceleration therefore is the parameter that classifies the level of seismicity. From geographic region to region, as the ground accelerations increase, so does the level of seismicity (from low to high). Where this building is located, the design short-period spectral acceleration, S_{DS}, is 0.43 g, and the design 1-second period spectral acceleration, S_{D1} is 0.258 g. Based on ASCE 41 Table 2-4, the Level of Seismicity for this building is classified as **Moderate**.

The ASCE 41 Basic Performance Objective for Existing Buildings (BPOE) makes use of the Basic Safety Earthquake – 1E (BSE-1E) seismic hazard level and the Basic Safety Earthquake – 2E (BSE-2E). The BSE-1E earthquake is defined by ASCE 41 as the probabilistic ground motion with a 20 percent probability of exceedance in 50 years, or otherwise characterized as a ground motion acceleration with a probabilistic 225-year return period. The BSE-2E earthquake is defined by ASCE 41 as the probabilistic ground motion with a 5 percent probability of exceedance in 50 years, or otherwise characterized as a ground motion acceleration with a

probabilistic 975 year return period. The BSE-2N seismic hazard level is the Maximum Considered Earthquake (MCE) ground motion used in current codes for the design of new buildings and is also used in ASCE 41 to classify the Level of Seismicity for a building. The BSE-2N has a statistical ground motion acceleration with 2 percent probability of exceedance in 50 years, or otherwise characterized as a ground motion acceleration with a probabilistic 2,475-year return period.

Table 2.2.1-1 provides the spectral accelerations for the 225-year, 975-year, and 2,475-year return interval events specific to Columbia High School that are considered in this study.

Table 2.2.1-1. Spectral Acceleration Parameters (Not Site-Modified).

BSE-1E 20%/50 (225-year) Event		BSE-1N 2/3 of 2,475-year Event		BSE-2E 5%/50 (975-year) Event		BSE-2N 2%/50 (2,475-year) Event	
0.2 Seconds	0.16 g	0.2 Seconds	0.34 g	0.2 Seconds	0.37 g	0.2 Seconds	0.51 g
1.0 Seconds	0.07 g	1.0 Seconds	0.16 g	1.0 Seconds	0.17 g	1.0 Seconds	0.24 g

2.2.2 Columbia High School Structural Performance Objective

The school building is an Educational Group E occupancy (Risk Category III) structure and has not been identified as a critical structure requiring immediate use following an earthquake. However, Risk Category III buildings are structures that represent a substantial hazard to human life in the event of failure. According to ASCE 41, the BPOE for Risk Category III structures is the Damage Control structural performance level at the BSE-1E seismic hazard level and the Limited Safety structural performance level at the BSE-2E seismic hazard level. The ASCE 41 Tier 1 evaluations were conducted in accordance with ASCE 41 requirements and ASCE 41 seismic performance levels. Concept-level upgrades were developed for the **Life Safety** structural performance level at the **BSE-2E** seismic hazard level in accordance with DNR direction, the project scope of work, and the project legislative language.

At the Life-Safety performance level, the building may sustain damage while still protecting occupants from life-threatening injuries and allowing occupants to exit the building. Structural and nonstructural components may be extensively damaged, but some margin against the onset of partial or total collapse remains. Injuries to occupants or persons in the immediate vicinity may occur during an earthquake; however, the overall risk of life-threatening injury as a result of structural damage is anticipated to be low. Repairs may be required before reoccupying the building, and, in some cases, repairs may be economically unfeasible.

Knowledge Factor

A knowledge factor, *k*, is an ASCE 41 prescribed factor that is used to account for uncertainty in the as-built data considering the selected Performance Objective and data collection processes (availability of existing drawings, visual observation, and level of materials testing). No in-situ testing of building materials was performed; however, some material properties and existing construction information were provided in the existing record drawings. If the concept design is

developed further, additional materials tests and site investigations will be required to substantiate assumptions about the existing framing systems.

ASCE 41 Classified Building Type

Use of ASCE 41 for seismic evaluations requires buildings to be classified from a group of common building types historically defined in previous seismic evaluation standards (ATC-14, FEMA 310, and ASCE 31-03). The school is classified in ASCE 41 Table 3-1 as a Precast or Tilt-Up Concrete Shear Wall with Flexible Diaphragms, **PC1**. Precast or Tilt-Up Concrete Shear Wall (PC1) buildings have precast concrete perimeter wall panels that are typically cast on site and tilted into place. Floor and roof framing consists of wood joists, glulam beams, steel beams, or open-web joists. Framing is supported on the interior steel or wood columns and perimeter concrete bearing walls. The floors and roof consist of wood sheathing or untopped metal deck.

2.3 Report Limitations

The professional services described in this report were performed based on available record drawing information and limited visual observation of the structure. No other warranty is made as to the professional advice included in this report. This report provides an overview of the seismic evaluation results and does not address programming and planning issues. This report has been prepared for the exclusive use of DNR/WGS and is not intended for use by other parties, as it may not contain sufficient information for purposes of other parties or their uses.

3.0 Building Description & Seismic Evaluation Findings

3.1 Building Overview

3.1.1 Building Description

Original Year Built: 1970
Building Code: Unknown

Number of Stories: 1
Floor Area: 14,000 SF

FEMA Building Type: PC1a
ASCE 41 Level of Seismicity: Moderate
Site Class: C

The Columbia High School Gymnasium building is a one-story, concrete tilt-up structure with four buildings under one roof system. A lower basement level beneath the gym building is below grade on one side. The 1970 building is constructed on sloping ground located in White Salmon, Washington. The complete structure has a rectangular floor plan, 121 feet by 116 feet, with a maximum roof height of 32 feet.

The building's construction consists of precast concrete tilt-up walls. The upper roof system at the gym building is composed of Tectum panels over glulam girders and purlins. The floor system over the gymnasium basement is composed of concrete slab over concrete beams and joists. The building shares the site with three other buildings that make up Columbia High School.

3.1.2 Building Use

The gymnasium building includes a basketball court and several classrooms. The school serves over 380 students.

3.1.3 Structural System

Table 3.1.3-1. Structural System Descriptions.

Structural System	Description
Structural Roof	The upper roof system is composed of Tectum roof panels over glulam framing. The lower roof system is a mixture of tongue and groove decking and plywood sheathing over wood framing

Table 3.1.3-1. Structural System Descriptions.

Structural System	Description
Structural Floor	The ground floor is a concrete slab on grade. The floor system over the basement is a concrete slab over concrete beams and joists.
Foundation	The walls are supported by continuous strip footings.
Gravity System	The gravity system consists of glulam beam framing supported by concrete pilasters and the concrete tilt-up walls.
Lateral System	Concrete tilt-up shear walls resist the forces in the longitude and transverse directions.

3.1.4 Structural System Visual Conditions

Table 3.1.4-1. Structural System Condition Descriptions.

Structural System	Description
Roof	No visible signs of corrosion, damage, or deterioration.
Structural Floor	No visible signs of corrosion, damage, or deterioration.
Foundations	Unknown.
Gravity System	No visible signs of corrosion, damage, or deterioration.
Lateral System	No visible signs of corrosion, damage, or deterioration.

3.2 Seismic Evaluation Findings

3.2.1 Structural Seismic Deficiencies

The structural seismic deficiencies identified during the Tier 1 evaluation are summarized below. Commentary for each deficiency is provided based on this evaluation.

Table 3.2.1-1. Identified Structural Seismic Deficiencies Based on Tier 1 Checklists.

Deficiency	Description
Load Path	No out-of-plane resistance. No connection between tilt-up panels between floors. Roof diaphragms inadequate.
Wall Anchorage	Exterior tilt-up concrete walls that are dependent on the diaphragm for lateral support are not anchored for out-of-plane forces at each

Table 3.2.1-1. Identified Structural Seismic Deficiencies Based on Tier 1 Checklists.

Deficiency	Description
	diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm.
Geometry	The basement level has more than a 30% net change in horizontal dimension of structural-force-resisting system from the main level. Further investigation is required to determine geometric irregularity effects on the lateral system.
Torsion	Building has eccentric stiffness. Further investigation is required to determine torsional effects on the lateral system. Strengthening may be appropriate to mitigate seismic risk.
Spans	Wood diaphragms do not consist of wood structural panels or diagonal sheathing at gymnasium roof diaphragm. Installation of wood structural panels may be appropriate to mitigate seismic risk.
Other Diaphragms	Diaphragm consists of Tectum roof deck at gymnasium. Diaphragm strengthening may be appropriate to mitigate seismic risk.

3.2.2 Structural Checklist Items Marked as "U"nknown

Where building structural component seismic adequacy was unknown due to lack of available information or limited observation, the structural checklist items were marked as "unknown." These items require further investigation if definitive determination of compliance or noncompliance is desired. The unknown structural checklist items identified during the Tier 1 evaluation are summarized below. Commentary for each unknown item is provided based on the evaluation.

Table 3.2.2-1. Identified Structural Checklist Items Marked as Unknown.

Deficiency	Description
Liquefaction	The liquefaction potential of site soils is unknown at this time given available information. Very low liquefaction potential is identified per ICOS based on state geologic mapping. Requires further investigation by a licensed geotechnical engineer to determine liquefaction potential.
Slope Failure	Requires further investigation by a licensed geotechnical engineer to determine susceptibility to slope failure.
Surface Fault Rupture	Requires further investigation by a licensed geotechnical engineer to determine whether site is near locations of expected surface fault ruptures.

3.2.3 Nonstructural Seismic Deficiencies

The nonstructural seismic deficiencies identified during the Tier 1 evaluation are summarized below. Commentary for each deficiency is provided based on this evaluation. Some nonstructural deficiencies may be able to be mitigated by school district staff. Other nonstructural components that require substantial mitigation may be more appropriately included in a long-term mitigation strategy. Some typical conceptual details for the seismic upgrade of nonstructural components can be found in the FEMA E-74 Excerpts appendix.

Table 3.2.3-1. Identified Nonstructural Seismic Deficiencies Based on Tier 1 Checklists.

Deficiency	Description
CF-2 Tall Narrow Contents	Anchorage is required for tall narrow contents more than six feet high to provide overturning restraint.
CF-3 Fall-Prone Contents	Anchorage is required for fall-prone contents weighting more than 20 pounds.
ME-2 In-Line Equipment	Independent vertical support and lateral bracing is required for in-line equipment.

3.2.4 Nonstructural Checklist Items Marked as "U"nknown

Where building nonstructural component seismic adequacy was unknown due to lack of available information or limited observation, the nonstructural checklist items were marked as "unknown." These items require further investigation if definitive determination of compliance or noncompliance is desired. The unknown nonstructural checklist items identified during the Tier 1 evaluation are summarized below. Commentary for each unknown item is provided based on the evaluation.

Some nonstructural deficiencies may be able to be mitigated by school district staff. Other nonstructural components that require substantial mitigation may be more appropriately included in a long-term mitigation strategy. Some typical conceptual details for the seismic upgrade of nonstructural components can be found in the FEMA E-74 Excerpts appendix.

Table 3.2.4-1. Identified Nonstructural Checklist Items Marked as Unknown.

Deficiency	Description
PCOA-4 Appendages	Wood parapets. Further investigation is required to verify reinforcing/anchorage of appendages extending above the main structural building system.
S-2 Stair Details	No details at stairs provided. Further investigation is required to verify stair connections.

Table 3.2.4-1. Identified Nonstructural Checklist Items Marked as Unknown.

Deficiency	Description
LSS-3 Emergency Power	Further investigation is required to review the life-safety system anchorage and bracing.
P-3 Drift	Further investigation is required to verify detailing of rigid cementitious partitions for drift.
LF-1 Independent Support	Further investigation is required to review the support system for light fixtures.
CG-8 Overhead Glazing	Further investigation is required to verify detailing of glazing panes.

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4.0 Conclusion and Recommendations

4.1 Seismic-Structural Upgrade Recommendations

Concept-level seismic upgrade recommendations to improve the lateral-force-resisting system were developed. The sketches in Appendix B depict the concept-level structural upgrade recommendations outlined in this section. The following concept recommendations are intended to address the structural deficiencies noted in Table 3.2.1-1. This concept-level seismic upgrade design represents just one of several alternative seismic upgrade design solutions and is based on preliminary seismic evaluation and analysis results. Final analysis and design for seismic upgrades must include a more detailed seismic evaluation of the building in its present or future configuration. Proposed seismic upgrades include the following.

4.1.1 Roof Diaphragm

The existing Tectum roof panels are insufficient to transfer seismic forces. The diaphragm capacity can be enhanced by adding a new layer of plywood sheathing with new blocking and nailing. The sheathing should be nailed to a sleeper system, which will be connected to the existing wood framing with wood screws.

4.1.2 Wall Anchorage at Roof

Exterior precast concrete wall panel-to-roof diaphragm anchors should be added. This will consist of Simpson hold-downs with post-installed adhesive concrete anchors or a similar product at existing purlins along the east and west walls. Blocking and hold-downs will also be added along the north and south walls. Anchorage will allow for adequate out-of-plane load transfer between the two elements.

4.2 Nonstructural Upgrade Recommendations

There are no recommendations for upgrade of nonstructural building elements.

4.2.1 Architectural Considerations

This section addresses existing construction that, while not posing specific hazards during a seismic event, would be affected by the seismic improvements proposed.

For existing building remodel projects, the International Existing Building Code (IEBC) is applicable. The intent of the IEBC is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the work being done. Elements of the exterior building envelope being affected by the seismic work would also be required to be brought up to the current Washington State Energy Code per Chapter 5, where applicable.

It should also be noted that as a part of any upgrade to existing buildings, the IEBC will require that any altered primary function spaces (classrooms, gyms, entrances, offices) and routes to these spaces, be made accessible to current accessibility standards per the American with Disabilities Act (ADA), unless technically infeasible. This would include, but is not limited to: accessible restrooms, paths of travel, entrances and exits, parking, signage, fire alarm system, etc. Under no circumstances should the facility be made less accessible. The IEBC does however have exceptions for areas that do not contain a primary function (storage room, utility rooms) and states that costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of Primary Function. As with any major renovation and modernization, an ADA study would be recommended to determine the extent to which an existing facility needs to be improved to be in compliance with the ADA.

All existing interior walls are composed of timber structural framing and 5/8-inch gypsum board on either side. These interior walls must be sheathed with APA shear-rated sheathing.

Proposed plywood shear wall thickness may differ from existing shear wall thickness, depending on finishes proposed. The restroom and janitor room interior walls will be removed/replaced, significantly impacting existing finishes.

Built-in cabinets in classrooms will need to be removed and replaced, affecting plumbing fixtures.

Openings in the new CMU shear walls for items such as electrical outlets and switches will need to be coordinated with existing conditions.

Plywood panels with supplemental sill plate to foundation connections will impact existing floor and wall finishes, and ceilings will be affected throughout.

Exterior Walls: Steel Moment Frames

To strengthen existing wood-framed walls, steel moment frames can be added on the exterior in select locations. Moment frames will be constructed with steel posts between classrooms, with steel beams located over the windows spanning approximately 16 feet. As each classroom is approximately 32 feet long, each moment frame would have two bays. At 8 feet on center maximum. The impact on existing finishes will need to be addressed on a case-by-case basis, depending on location of the proposed work.

Foundation Work

The proposed moment frames to be installed on the exterior will require new foundations. Existing interior gypsum board walls to be converted to plywood-sheathed shear walls may require cutting in foundations where few are now. The existing concrete slab on grade and floor finishes would be removed. After the floor slab is replaced, new flooring must be installed in affected areas. Care must be taken to integrate new with existing finishes; in some cases, this may require replacing the floor finish throughout the room. Ensure foundation drains, buried utilities, and other items will not be impacted by this work. Landscaping will be affected by the work, and should be restored to pre-construction condition after completion of the work.

Drag Struts

Drag struts and collectors need to be added at certain sections along the interior corridors of the building. The impact on corridor widths, travel paths, and ADA requirements must be considered. Floor finishes and ceilings will be impacted by this work as well.

Ceilings

Removal of the existing plaster and acoustic ceiling tiles would be required to gain access to the trusses and underside of the roof deck. Repair plaster ceilings and replace damaged acoustic tiles to match existing. Fire ratings, if present, must be retained.

Existing suspended T-bar ceilings would need to be removed and reinstalled with new seismically-braced T-bar in order to gain access to the underside of the roof diaphragm for the work.

Lighting should be updated to current lightweight LED fixtures with seismic bracing.

Roof Diaphragm Improvements

The existing roof is constructed with Tectum panels over a wood-frame system, supported by exterior concrete precast panels and pilasters. The ceiling consists of the underside of the roof deck panels, supported by exposed glulam and timber purlins. Structural upgrades to the roof include adding a connection between the roof framing and precast wall panels, and installing new plywood roof sheathing, blocking, and nailing.

The existing Tectum roof panels are insufficient to transfer seismic forces. The diaphragm capacity can be enhanced by adding a new layer of plywood sheathing with new blocking and nailing. The sheathing should be nailed to a sleeper system, which will be connected to the existing wood framing with wood screws.

Connections at exterior walls between the foundation and the roof structure are also required.

To perform the work, portions – if not all – of the existing roofing and roof deck may need to be removed. Protection from the weather must be provided wherever roofing has been removed.

If existing insulation is above the roof deck, it will need to be replaced with additional insulation to meet current energy code requirements (R-38). Existing ceilings may need to be removed and replaced to allow access to the underside of the roof deck.

This work would take place mainly above the open gymnasium, shop, and wrestling spaces, classrooms, and restrooms. Access to the underside of the roof deck is unencumbered in these areas.

Wall Anchorage at Roof

The exterior precast concrete wall panel-to-roof diaphragm anchors should be added. This will consist of Simpson hold-downs with post-installed adhesive concrete anchors or a similar product at existing purlins along the east and west walls. Blocking and hold-downs will also be added along the north and south walls.

There will be many exposed anchors/fasteners added to the existing roof framing. Care must be taken to minimize the visual impact of these items on the existing character of the building interior.

Repairs to exterior finishes, where affected by the work, should match existing finishes to either side to retain building character.

4.3 Opinion of Conceptual Construction Costs

A preliminary opinion of probable construction costs to perform the concept-level seismic upgrade recommendations provided in this report is included in Appendix C. The input for these preliminary probable costs are the Tier 1 checklists and the preliminary concept-level seismic upgrades design recommendations and sketches. These preliminary concept-level design sketches depict a design concept that could be implemented to improve the seismic safety of the building structure. It is important to note that this preliminary seismic upgrades design concept is based on the results of the Tier 1 seismic screening checklists and engineering design judgement and has not been substantiated by detailed structural analyses and calculations. Consequently, the costs presented in this concept-level design report are very preliminary in nature and are only intended to be utilized in their aggregate form with the entire statewide school seismic safety assessments study.

For this preliminary opinion of probable construction costs, an estimate of the current year (2019) construction costs of the probable scope of work was developed. These costs were developed based on the Tier 1 checklist, concept-level seismic upgrade design sketches, and project narratives. Then a -20 percent (low) to +50 percent (high) range variance was used to develop the construction cost estimate range for the concept-level scope of work. The -20 percent to +50 percent range variance guidance is from Table 1 of the AACE International Recommended Practice 56R-08, *Cost Estimate Classification System for Class 5 Estimates*. The variable cost range of a Class 5 estimate is due to the limited design completeness and is defined as 0 percent to 2 percent Project Definition Deliverables.

The estimated structural and nonstructural construction cost to mitigate the deficiencies identified in the Tier 1 checklists of the Columbia High School Gymnasium ranges between approximately $464,000 and $869,000 (-20 percent/+50 percent). The estimated construction cost to seismically upgrade this building is approximately $580,000. On a per-square-foot basis, the seismic upgrade construction cost is estimated to be approximately $47 per square foot in 2019 dollars, with a variance range between $37 per square foot and $70 per square foot.

This preliminary opinion of construction cost includes labor, materials, equipment, and general contractor general conditions (mobilization), overhead, and profit. This is based on a public

sector design-bid-build project delivery method. Project delivery methods such as negotiated, State of Washington GC/CM, and design-build are not the basis of the construction costs. Owner's project costs not included in the construction cost estimate are building permits, design fees, change order contingencies, escalation at a recommended 4.1 percent* per year to the midpoint of construction (currently unknown), materials testing/inspection, project planning and design schedule delay contingencies, and owner's overall project contingency. Additional owner's project costs would likely include owner's general overhead costs, including project management, financing/bond costs, administration/contract/accounting costs, review of plans, value engineering studies, equipment, fixtures, furnishings and technology, and relocation of the school staff and students during construction. These additional costs are not included in this preliminary concept-level design construction cost estimate.

Costs of all types excluded from the construction costs are site work, construction of replacement facilities, and mitigation of seismic risks for existing facilities and building code changes that occur over time after this report. Future planning budgets should not be set on the basis of the preliminary construction costs estimate based on the concept-level design ideas presented in this report. For budget planning purposes, it is highly recommended that a seismic upgrade budget be determined after the owner defines the scope of work and obtains the services of an A/E design team to study the proposed seismic mitigation strategies and to refine the concept-level seismic upgrades design approach contained in this report.

*-4.1%/year escalation rate for planning purposes should be compounded annually to the midpoint of construction and is sourced from *Engineering News Record (ENR),* November, 2017, the most recent rate representative of the escalation of construction costs throughout the state of Washington.

Table 4.3.1. Seismic Upgrades Opinion of Probable Construction Costs.

Building	FEMA Bldg Type	ASCE 41 Level of Seismicity / Site Class	Structural Performance Objective	Bldg Gross Area	Estimated Seismic Upgrade Cost Range $/SF (Total)	Estimated Seismic Upgrade Cost/SF (Total)
Columbia HS Gym	PC1a	Moderate / C	**Structural**			
			Life Safety	33,246 SF	$28 - $52 ($346K) ($649K)	$35 ($433K)
			Nonstructural			
			Life Safety	33,246 SF	$9 - $18 ($118K) ($220K)	$12 ($147K)
			Total			
				33,246 SF	$37 - $70 ($464K) ($869K)	$47 ($580K)

·W: Wood-Framed; URM: Unreinforced Masonry; RM: Reinforced Masonry; C: Reinforced Concrete; PC: Precast concrete; S: Steel-framed

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Appendix A: Field Investigation Report and Tier 1 Checklists

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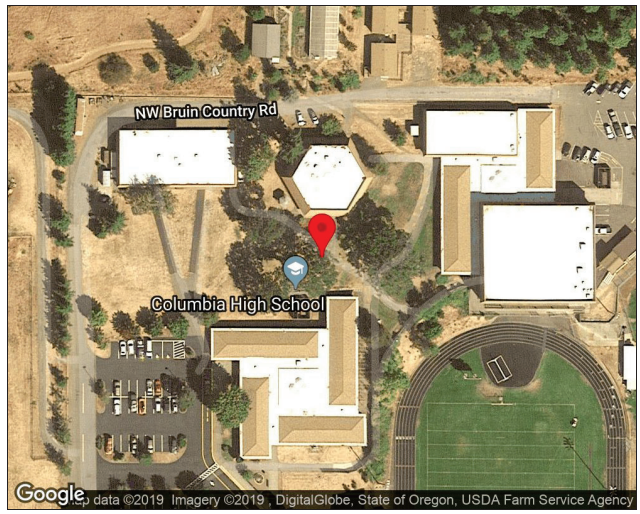
1. White Salmon Valley, Columbia High School, C Court - Gym

1.1 Building Description

Building Name:	C Court - Gym
Facility Name:	Columbia High School
District Name:	White Salmon Valley
ICOS Latitude:	45.742
ICOS Longitude:	-121.494
ICOS County/District ID:	20405
ICOS Building ID:	22348
ASCE 41 Bldg Type:	PC1a
Enrollment:	387
Gross Sq. Ft. :	33,246
Year Built:	1970
Number of Stories:	1
$S_{XS\ BSE\text{-}2E}$:	0.466
$S_{X1\ BSE\text{-}2E}$:	0.292
ASCE 41 Level of Seismicity:	High
Site Class:	C
V_{S30}(m/s):	380
Liquefaction Potential:	Very Low
Tsunami Risk:	None
Structural Drawings Available:	Yes
Evaluating Firm:	WRK Engineers



The Columbia High School gymnasium building is a one-story concrete tilt-up structure with four buildings under one roof system. There is a lower basement level beneath the gym building that is below grade on one side. The 1970 building is constructed on sloping ground and is located in White Salmon, Washington. The complete structure is rectangular in plan, 181 feet by 116 feet, with a maximum roof height of around 30 feet at the gym. Building construction consists of precast concrete tilt-up walls. The upper roof system at the gym building is composed of Tectum panels over glulam framing. The lower roof system is a flexible diaphragm composed of a mixture of T&G decking and plywood sheathing. The floor system over the gymnasium basement is composed of a concrete slab over concrete beams and joists. The building shares the site with three other buildings that compose Columbia High School.

1.1.1 Building Use

The gymnasium building includes the gymnasium, classrooms, and a cafeteria. There is a central courtyard in the middle of the structure. The school has over 380 student occupants.

1.1.2 Structural System

Table 1.1-1. Structural System Description of Columbia High School

Structural System	Description
Structural Roof	The upper roof system is composed of Tectum roof panels over glulam framing. The lower roof system is a mixture of T&G decking and plywood sheathing over wood framing.
Structural Floor(s)	The ground floor is a concrete slab-on-grade. The floor system over the basement is a concrete slab over concrete beams and joists.
Foundations	The walls are supported by continuous wall footings.
Gravity System	The gravity system consists of glulam beam framing supported by concrete pilasters and the concrete tilt-up walls.
Lateral System	Concrete tilt-up shear walls resist the forces in the longitudinal and transverse directions.

1.1.3 Structural System Visual Condition

Table 1.1-2. Structural System Condition Description of Columbia High School

Structural System	Description
Structural Roof	No visible signs of corrosion, damage, or deterioration.
Structural Floor(s)	No visible signs of corrosion, damage, or deterioration.
Foundations	Unknown.
Gravity System	No visible signs of corrosion, damage, or deterioration.
Lateral System	No visible signs of corrosion, damage, or deterioration.

1.2 Seismic Evaluation Findings

1.2.1 Structural Seismic Deficiencies

The structural seismic deficiencies identified during the Tier 1 evaluation are summarized below. Commentary for each deficiency is also provided based on this evaluation.

Table 1-3. Identified Structural Seismic Deficiencies for White Salmon Valley Columbia High School C Court - Gym

Deficiency	Description
Load Path	No out-of-plane resistance. No connection between tilt-up panels between floors. Roof diaphragms inadequate. Post-installed out-of-plane connections, the addition of a new diaphragm, and panel base connection strengthening may be appropriate.
Geometry	The basement level has more than a 30% net change in horizontal dimension of structural-force-resisting system from the main level. Further investigation is required to determine geometric irregularity effects on the lateral system. The addition of new shear walls may be appropriate to resist geometric irregularity effects.
Torsion	Building has eccentric stiffness. Further investigation is required to determine torsional effects on the lateral system. The addition of new shear walls may be appropriate to resist torsional irregularity effects and to mitigate seismic risk.
Wall Anchorage	Out-of-plane wall anchorage is not present. Tension ties, blocking, strapping, and diaphragm nailing are required along precast concrete wall.
Spans	Wood diaphragms do not consist of wood structural panels or diagonal sheathing at gymnasium roof diaphragm. Installation of wood structural panels may be appropriate to mitigate seismic risk.
Other Diaphragms	Diaphragm consists of Tectum roof deck at gymnasium. Installation of plywood sheathing may be appropriate to mitigate seismic risk.

1.2.2 Structural Checklist Items Marked as 'U'nknown

Where building structural component seismic adequacy was unknown due to lack of available information or limited observation, the structural checklist items were marked as “unknown”. These items require further investigation if definitive determination of compliance or noncompliance is desired. The unknown structural checklist items identified during the Tier 1 evaluation are summarized below. Commentary for each unknown item is also provided based on the evaluation.

Table 1-4. Identified Structural Checklist Items Marked as Unknown for White Salmon Valley Columbia High School C Court - Gym

Unknown Item	Description
Liquefaction	The liquefaction potential of site soils is unknown at this time given available information. \very low\ liquefaction potential is identified per ICOS based on state geologic mapping. Requires further investigation by a licensed geotechnical engineer to determine liquefaction potential.
Slope Failure	Requires further investigation by a licensed geotechnical engineer to determine susceptibility to slope failure.
Surface Fault Rupture	Requires further investigation by a licensed geotechnical engineer to determine whether site is near locations of expected surface fault ruptures.

1.3.1 Nonstructural Seismic Deficiencies

The nonstructural seismic deficiencies identified during the Tier 1 evaluation are summarized below. Commentary for each deficiency is also provided based on this evaluation. Some nonstructural deficiencies may be able to be mitigated by school district staff. Other nonstructural components that require more substantial mitigation may be more appropriately included in a long-term mitigation strategy. Some typical conceptual details for the seismic upgrade of nonstructural components can be found in the FEMA E-74 Excerpts appendix.

Table 1-5. Identified Nonstructural Seismic Deficiencies for White Salmon Valley Columbia High School C Court - Gym

Deficiency	Description
CF-2 Tall Narrow Contents. HR-not required; LS-H; PR-MH.	Anchorage is required for tall narrow contents more than six feet high to provide overturning restraint.
CF-3 Fall-Prone Contents. HR-not required; LS-H; PR-H.	Anchorage is required for fall-prone contents weighting more than 20 pounds.
ME-2 In-Line Equipment. HR-not required; LS-H; PR-H.	Independent vertical support and lateral bracing is required for in-line equipment.

1.3.2 Nonstructural Checklist Items Marked as 'U'nknown

Where building nonstructural component seismic adequacy was unknown due to lack of available information or limited observation, the nonstructural checklist items were marked as “unknown”. These items require further investigation if definitive determination of compliance or noncompliance is desired. The unknown nonstructural checklist items identified during the Tier 1 evaluation are summarized below. Commentary for each unknown item is also provided based on the evaluation.

Some nonstructural deficiencies may be able to be mitigated by school district staff. Other nonstructural components that require more substantial mitigation may be more appropriately included in a long-term mitigation strategy. Some typical conceptual details for the seismic upgrade of nonstructural components can be found in the FEMA E-74 Excerpts appendix.

Table 1-6. Identified Nonstructural Checklist Items Marked as Unknown for White Salmon Valley Columbia High School C Court - Gym

Unknown Item	Description
LSS-3 Emergency Power. HR-not required; LS-LMH; PR-LMH.	Further investigation is required to review the life-safety system anchorage and bracing. All life-safety equipment should be braced or anchored.
P-3 Drift. HR-not required; LS-MH; PR-MH.	Further investigation is required to verify detailing of rigid cementitious partitions for drift.
LF-1 Independent Support. HR-not required; LS-MH; PR-MH.	Further investigation is required to review the support system for light fixtures. All light fixtures in grid ceiling system should have seismic bracing.
CG-8 Overhead Glazing. HR-not required; LS-MH; PR-MH.	Further investigation is required to verify detailing of glazing panes.
PCOA-4 Appendages. HR-MH; LS-MH; PR-LMH.	Wood parapets. Further investigation is required to verify reinforcing/anchorage of appendages extending above the main structural building system.
S-2 Stair Details. HR-not required; LS-LMH; PR-LMH.	No details at stairs provided. Further investigation is required to verify stair connections.

Photos:

Figure 1-1. Columbia High School Gym - South Exterior

Figure 1-2. Columbia High School Gym - West Exterior

Figure 1-3. Northwest Classroom with Glulam Beam Roof Framing and Fall-Prone Contents

Figure 1-4. Typical Classroom with Moveable Partition

Figure 1-5. Central Commons

Figure 1-6. Gymnasium with Glulam Arches and Tectum Roof Panels

Figure 1-7. Weight Room at Lower Level with Suspended Mechanical Equipment

Figure 1-8. West Hallway

Figure 1-9. Suspended Mechanical Equipment at Lower Level

Figure 1-10. Unbraced Nonstructural Components, Typical Throughout

White Salmon Valley, Columbia High School, C Court - Gym

17-2 Collapse Prevention Basic Configuration Checklist

Building record drawings have been reviewed, when available, and a non-destructive field investigation has been performed for the subject building. Each of the required checklist items are marked Compliant (C), Noncompliant (NC), Not Applicable (N/A), or Unknown (U). Items marked Compliant indicate conditions that satisfy the performance objective, whereas items marked Noncompliant or Unknown indicate conditions that do not. Certain statements might not apply to the building being evaluated.

Low Seismicity

Building System - General

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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. (Tier 2: Sec. 5.4.1.1; Commentary: Sec. A.2.1.10)		X			No out-of-plane resistance. No connection between tilt-up panels between floors. Roof diaphragms inadequate. Post-installed out-of-plane connections, the addition of a new diaphragm, and panel base connection strengthening may be appropriate.
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. (Tier 2: Sec. 5.4.1.2; Commentary: Sec. A.2.1.2)	X				
Mezzanines	Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Tier 2: Sec. 5.4.1.3; Commentary: Sec. A.2.1.3)			X		

Building System - Building Configuration

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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. (Tier 2: Sec. 5.4.2.1; Commentary: Sec. A.2.2.2)	X				
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. (Tier 2: Sec. 5.4.2.2; Commentary: Sec. A.2.2.3)	X				

Vertical Irregularities	All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Tier 2: Sec. 5.4.2.3; Commentary: Sec. A.2.2.4)	X				
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. (Tier 2: Sec. 5.4.2.4; Commentary: Sec. A.2.2.5)		X			The basement level has more than a 30% net change in horizontal dimension of structural-force-resisting system from the main level. Further investigation is required to determine geometric irregularity effects on the lateral system. The addition of new shear walls may be appropriate to resist geometric irregularity effects.
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. (Tier 2: Sec. 5.4.2.5; Commentary: Sec. A.2.2.6)	X				
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. (Tier 2: Sec. 5.4.2.6; Commentary: Sec. A.2.2.7)		X			Building has eccentric stiffness. Further investigation is required to determine torsional effects on the lateral system. The addition of new shear walls may be appropriate to resist torsional irregularity effects and to mitigate seismic risk.

Moderate Seismicity **(Complete the Following Items in Addition to the Items for Low Seismicity)**

Geologic Site Hazards

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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. (Tier 2: Sec. 5.4.3.1; Commentary: Sec. A.6.1.1)				X	The liquefaction potential of site soils is unknown at this time given available information. Very low liquefaction potential is identified per ICOS based on state geologic mapping. Requires further investigation by a licensed geotechnical engineer to determine liquefaction potential.

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. (Tier 2: Sec. 5.4.3.1; Commentary: Sec. A.6.1.2)				X	Requires further investigation by a licensed geotechnical engineer to determine susceptibility to slope failure.
Surface Fault Rupture	Surface fault rupture and surface displacement at the building site are not anticipated. (Tier 2: Sec. 5.4.3.1; Commentary: Sec. A.6.1.3)				X	Requires further investigation by a licensed geotechnical engineer to determine whether site is near locations of expected surface fault ruptures.

High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)

Foundation Configuration

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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 0.6Sa. (Tier 2: Sec. 5.4.3.3; Commentary: Sec. A.6.2.1)	X				
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. (Tier 2: Sec. 5.4.3.4; Commentary: Sec. A.6.2.2)			X		

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

Building record drawings have been reviewed, when available, and a non-destructive field investigation has been performed for the subject building. Each of the required checklist items are marked Compliant (C), Noncompliant (NC), Not Applicable (N/A), or Unknown (U). Items marked Compliant indicate conditions that satisfy the performance objective, whereas items marked Noncompliant or Unknown indicate conditions that do not. Certain statements might not apply to the building being evaluated.

Low Seismicity

Connections

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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. (Tier 2: Sec. 5.7.1.1; Commentary: Sec. A.5.1.1)		X			Out-of-plane wall anchorage is not present. Tension ties, blocking, strapping, and diaphragm nailing are required along precast concrete wall.

Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seimicity)

Seismic-Force-Resisting System

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Redundancy	The number of lines of shear walls in each principal direction is greater than or equal to 2. (Tier 2: Sec. 5.5.1.1; Commentary: Sec. A.3.2.1.1)	X				
Wall Shear Stress Check	The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.2 (0.69 MPa) or $2\sqrt{f'c}$. (Tier 2: Sec. 5.5.3.1.1; Commentary: Sec. A.3.2.3.1)	X				
Reinforcing Steel	The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. (Tier 2: Sec. 5.5.3.1.3; Commentary: Sec. A.3.2.3.2)	X				
Wall Thickness	Thicknesses of bearing walls are not less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm). (Tier 2: Sec. 5.5.3.1.2; Commentary: Sec. A.3.2.3.5)	X				

Diaphragms

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT

Topping Slab	Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm). (Tier 2: Sec. 5.6.4; Commentary: Sec. A.4.5.1)			X		

Connections

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Wood Ledgers	The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers. (Tier 2: Sec. 5.7.1.3; Commentary: Sec. A.5.1.2)	X				
Transfer to Shear Walls	Diaphragms are connected for transfer of seismic forces to the shear walls. (Tier 2: Sec. 5.7.2; Commentary: Sec. A.5.2.1)	X				
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. (Tier 2: Sec. 5.7.2; Commentary: Sec. A.5.2.3)			X		
Girder-Column Conncection	There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec. 5.7.4.1; Commentary: Sec. A.5.4.1)	X				

High Seismicity **(Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)**

Seismic-Force-Resisting System

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Deflection Compatibility for Rigid Diaphragms	Secondary components have the shear capacity to develop the flexural strength of the components. (Tier 2: Sec. 5.5.2.5.2; Commentary: Sec. A.3.1.6.2)	X				
Wall Openings	The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Tier 2: Sec. 5.5.3.3.1; Commentary: Sec. A.3.2.3.3)	X				

Diaphragms

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Cross Ties in Flexible Diaphragms	There are continuous cross ties between diaphragm chords. (Tier 2: Sec. 5.6.1.2; Commentary: Sec. A.4.1.2)	X				
Straight Sheathing	All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Tier 2: Sec. 5.6.2; Commentary: Sec. A.4.2.1)			X		

Spans	All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing. (Tier 2: Sec. 5.6.2; Commentary: Sec. A.4.2.2)		X			Wood diaphragms do not consist of wood structural panels or diagonal sheathing at gymnasium roof diaphragm. Installation of wood structural panels may be appropriate to mitigate seismic risk.
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. (Tier 2: Sec. 5.6.2; Commentary: Sec. A.4.2.3)			X		
Other Diaphragms	Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Tier 2: Sec. 5.6.5; Commentary: Sec. A.4.7.1)		X			Diaphragm consists of Tectum roof deck at gymnasium. Installation of plywood sheathing may be appropriate to mitigate seismic risk.

Connections

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Minimum Number of Wall Anchors Per Panel	There are at least two anchors connecting each precast wall panel to the diaphragm elements. (Tier 2: Sec. 5.7.1.4; Commentary: Sec. A.5.1.3)	X				
Precast Wall Panels	Precast wall panels are connected to the foundation. (Tier 2: Sec. 5.7.3.4; Commentary: Sec. A.5.3.6)	X				
Uplift at Pile Caps	Pile caps have top reinforcement, and piles are anchored to the pile caps. (Tier 2: Sec. 5.7.3.5; Commentary: Sec. A.5.3.8)			X		
Girders	Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7. (Tier 2: Sec. 5.7.4.2; Commentary: Sec. A.5.4.2)	X				

White Salmon Valley, Columbia High School, C Court - Gym

17-38 Nonstructural Checklist

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

Life Safety Systems

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
LSS-1 Fire Suppression Piping. HR-not required; LS-LMH; PR-LMH.	Fire suppression piping is anchored and braced in accordance with NFPA-13. (Tier 2: Sec. 13.7.4; Commentary: Sec. A.7.13.1)			X		No fire sprinklers
LSS-2 Flexible Couplings. HR-not required; LS-LMH; PR-LMH.	Fire suppression piping has flexible couplings in accordance with NFPA-13. (Tier 2: Sec. 13.7.4; Commentary: Sec. A.7.13.2)			X		
LSS-3 Emergency Power. HR-not required; LS-LMH; PR-LMH.	Equipment used to power or control Life Safety systems is anchored or braced. (Tier 2: Sec. 13.7.7; Commentary: Sec. A.7.12.1)				X	Further investigation is required to review the life-safety system anchorage and bracing. All life-safety equipment should be braced or anchored.
LSS-4 Stair and Smoke Ducts. HR-not required; LS-LMH; PR-LMH.	Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints. (Tier 2: Sec. 13.7.6; Commentary: Sec. A.7.14.1)			X		
LSS-5 Sprinkler Ceiling Clearance. HR-not required; LS-MH; PR-MH.	Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13. (Tier 2: Sec. 13.7.4; Commentary: Sec. A.7.13.3)			X		
LSS-6 Emergency Lighting. HR-not required; LS-not required; PR-LMH	Emergency and egress lighting equipment is anchored or braced. (Tier 2: Sec. 13.7.9; Commentary: Sec. A.7.3.1)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Hazardous Materials

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
HM-1 Hazardous Material Equipment. HR-LMH; LS-LMH; PR-LMH.	Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers. (Tier 2: Sec. 13.7.1; Commentary: Sec. A.7.12.2)			X		
HM-2 Hazardous Material Storage. HR-LMH; LS-LMH; PR-LMH.	Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods. (Tier 2: Sec. 13.8.3; Commentary: Sec. A.7.15.1)			X		

HM-3 Hazardous Material Distribution. HR-MH; LS-MH; PR-MH.	Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.4)			X		
HM-4 Shutoff Valves. HR-MH; LS-MH; PR-MH.	Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.3)			X		
HM-5 Flexible Couplings. HR-LMH; LS-LMH; PR-LMH.	Hazardous material ductwork and piping, including natural gas piping, have flexible couplings. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.15.4)			X		
HM-6 Piping or Ducts Crossing Seismic Joints. HR-MH; LS-MH; PR-MH.	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. (Tier 2: Sec. 13.7.3, 13.7.5, 13.7.6; Commentary: Sec. A.7.13.6)			X		

Partitions

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
P-1 Unreinforced Masonry. HR-LMH; LS-LMH; PR-LMH.	Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity. (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.1.1)			X		
P-2 Heavy Partitions Supported by Ceilings. HR-LMH; LS-LMH; PR-LMH.	The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system. (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.2.1)			X		
P-3 Drift. HR-not required; LS-MH; PR-MH.	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. (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.1.2)				X	Further investigation is required to verify detailing of rigid cementitious partitions for drift.
P-4 Light Partitions Supported by Ceilings. HR-not required; LS-not required; PR-MH.	The tops of gypsum board partitions are not laterally supported by an integrated ceiling system. (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.2.1)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
P-5 Structural Separations. HR-not required; LS-not required; PR-MH.	Partitions that cross structural separations have seismic or control joints. (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.1.3)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
P-6 Tops. HR-not required; LS-not required; PR-MH.	The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m). (Tier 2: Sec. 13.6.2; Commentary: Sec. A.7.1.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Ceilings

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
C-1 Suspended Lath and Plaster. HR-H; LS-MH; PR-LMH.	Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft2 (1.1 m2) of area. (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.3)			X		
C-2 Suspended Gypsum Board. HR-not required; LS-MH; PR-LMH.	Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft2 (1.1 m2) of area. (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.3)			X		
C-3 Integrated Ceilings. HR-not required; LS-not required; PR-MH.	Integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression. (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.2)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
C-4 Edge Clearance. HR-not required; LS-not required; PR-MH.	The free edges of integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm). (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
C-5 Continuity Across Structure Joints. HR-not required; LS-not required; PR-MH.	The ceiling system does not cross any seismic joint and is not attached to multiple independent structures. (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.5)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
C-6 Edge Support. HR-not required; LS-not required; PR-H.	The free edges of integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) are supported by closure angles or channels not less than 2 in. (51 mm) wide. (Tier 2: Sec. 13.6.4 ; Commentary: Sec. A.7.2.6)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
C-7 Seismic Joints. HR-not required; LS-not required; PR-H.	Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft2 (232.3 m2) and has a ratio of long-to-short dimension no more than 4-to-1. (Tier 2: Sec. 13.6.4; Commentary: Sec. A.7.2.7)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Light Fixtures

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
LF-1 Independent Support. HR-not required; LS-MH; PR-MH.	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. (Tier 2: Sec. 13.6.4, 13.7.9; Commentary: Sec. A.7.3.2)				X	Further investigation is required to review the support system for light fixtures. All light fixtures in grid ceiling system should have seismic bracing.
LF-2 Pendant Supports. HR-not required; LS-not required; PR-H.	Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure. (Tier 2: Sec. 13.7.9; Commentary: Sec. A.7.3.3)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
LF-3 Lens Covers. HR-not required; LS-not required; PR-H.	Lens covers on light fixtures are attached with safety devices. (Tier 2: Sec. 13.7.9; Commentary: Sec. A.7.3.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Cladding and Glazing

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
CG-1 Cladding Anchors. HR-MH; LS-MH; PR-MH.	Cladding components weighing more than 10 lb/ft2 (0.48 kN/m2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m) (Tier 2: Sec. 13.6.1; Commentary: Sec. A.7.4.1)			X		
CG-2 Cladding Isolation. HR-not required; LS-MH; PR-MH.	For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less. (Tier 2: Sec. 13.6.1; Commentary: Sec. A.7.4.3)			X		

CG-3 Multi-Story Panels. HR-MH; LS-MH; PR-MH.	For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less. (Tier 2: Sec. 13.6.1; Commentary: Sec. A.7.4.4)			X		
CG-4 Threaded Rods. HR-not required; LS-MH; PR-MH.	Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity. (Tier 2: Sec. 13.6.1; Commentary: Sec. A.7.4.9)			X		
CG-5 Panel Connections. HR-MH; LS-MH; PR-MH.	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. (Tier 2: Sec. 13.6.1.4; Commentary: Sec. A.7.4.5)			X		
CG-6 Bearing Connections. HR-MH; LS-MH; PR-MH.	Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel. (Tier 2: Sec. 13.6.1.4; Commentary: Sec. A.7.4.6)			X		
CG-7 Inserts. HR-MH; LS-MH; PR-MH.	Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel. (Tier 2: Sec. 13.6.1.4; Commentary: Sec. A.7.4.7)			X		
CG-8 Overhead Glazing. HR-not required; LS-MH; PR-MH.	Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft2 (1.5 m2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked. (Tier 2: Sec. 13.6.1.5; Commentary: Sec. A.7.4.8)				X	Further investigation is required to verify detailing of glazing panes.

Masonry Veneer

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
M-1 Ties. HR-not required; LS-LMH; PR-LMH.	Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft2 (0.25 m2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm). (Tier 2: Sec. 13.6.1.2; Commentary: Sec. A.7.5.1)			X		No masonry veneer
M-2 Shelf Angles. HR-not required; LS-LMH; PR-LMH.	Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor. (Tier 2: Sec. 13.6.1.2; Commentary: Sec. A.7.5.2)			X		No masonry veneer
M-3 Weakened Planes. HR-not required; LS-LMH; PR-LMH.	Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing. (Tier 2: Sec. 13.6.1.2; Commentary: Sec. A.7.5.3)			X		No masonry veneer
M-4 Unreinforced Masonry Backup. HR-LMH; LS-LMH; PR-LMH.	There is no unreinforced masonry backup. (Tier 2: Sec. 13.6.1.1, 13.6.1.2; Commentary: Sec. A.7.7.2)			X		No masonry veneer
M-5 Stud Tracks. HR-not required; LS-MH; PR-MH.	For veneer with coldformed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center. (Tier 2: Sec. 13.6.1.1, 13.6.1.2; Commentary: Sec. A.7.6.)			X		No masonry veneer
M-6 Anchorage. HR-not required; LS-MH; PR-MH.	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. (Tier 2: Sec. 13.6.1.1, 13.6.1.2; Commentary: Sec. A.7.7.1)			X		No masonry veneer
M-7 Weep Holes. HR-not required; LS-not required; PR-MH.	In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing. (Tier 2: Sec. 13.6.1.2; Commentary: Sec. A.7.5.6)			X		No masonry veneer
M-8 Openings. HR-not required; LS-not required; PR-MH.	For veneer with cold-formed-steel stud backup, steel studs frame window and door openings. (Tier 2: Sec. 13.6.1.1, 13.6.1.2; Commentary: Sec. A.7.6.2)			X		No masonry veneer

Parapets, Cornices, Ornamentation, and Appendages

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
PCOA-1 URM Parapets or Cornices. HR-LMH; LS-LMH; PR-LMH.	Laterally unsupported unreinforced masonry parapets or cornices have height-tothickness 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. (Tier 2: Sec. 13.6.5; Commentary: Sec. A.7.8.1)			X		

PCOA-2 Canopies. HR-not required; LS-LMH; PR-LMH.	Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m). (Tier 2: Sec. 13.6.6; Commentary: Sec. A.7.8.2)			X		
PCOA-3 Concrete Parapets. HR-H; LS-MH; PR-LMH.	Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement. (Tier 2: Sec. 13.6.5; Commentary: Sec. A.7.8.3)			X		
PCOA-4 Appendages. HR-MH; LS-MH; PR-LMH.	Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements. (Tier 2: Sec. 13.6.6; Commentary: Sec. A.7.8.4)				X	Wood parapets. Further investigation is required to verify reinforcing/anchorage of appendages extending above the main structural building system.

Masonry Chimneys

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
MC-1 URM Chimneys. HR-LMH; LS-LMH; PR-LMH.	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. (Tier 2: Sec. 13.6.7; Commentary: Sec. A.7.9.1)			X		
MC-2 Anchorage. HR-LMH; LS-LMH; PR-LMH.	Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof. (Tier 2: Sec. 13.6.7; Commentary: Sec. A.7.9.2)			X		

Stairs

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
S-1 Stair Enclosures. HR-not required; LS-LMH; PR-LMH.	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. (Tier 2: Sec. 13.6.2, 13.6.8; Commentary: Sec. A.7.10.1)			X		

S-2 Stair Details. HR-not required; LS-LMH; PR-LMH.	The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs. (Tier 2: Sec. 13.6.8; Commentary: Sec. A.7.10.2)				X	No details at stairs provided. Further investigation is required to verify stair connections.

Contents and Furnishings

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
CF-1 Industrial Storage Racks. HR-LMH; LS-MH; PR-MH.	Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15. (Tier 2: Sec. 13.8.1; Commentary: Sec. A.7.11.1)			X		
CF-2 Tall Narrow Contents. HR-not required; LS-H; PR-MH.	Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other. (Tier 2: Sec. 13.8.2; Commentary: Sec. A.7.11.2)		X			Anchorage is required for tall narrow contents more than six feet high to provide overturning restraint.
CF-3 Fall-Prone Contents. HR-not required; LS-H; PR-H.	Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained. (Tier 2: Sec. 13.8.2; Commentary: Sec. A.7.11.3)		X			Anchorage is required for fall-prone contents weighting more than 20 pounds.
CF-4 Access Floors. HR-not required; LS-not required; PR-MH.	Access floors more than 9 in. (229 mm) high are braced. (Tier 2: Sec. 13.6.10; Commentary: Sec. A.7.11.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
CF-5 Equipment on Access Floors. HR-not required; LS-not required; PR-MH.	Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor. (Tier 2: Sec. 13.7.7 13.6.10; Commentary: Sec. A.7.11.5)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
CF-6 Suspended Contents. HR-not required; LS-not required; PR-H.	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. (Tier 2: Sec. 13.8.2; Commentary: Sec. A.7.11.6)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Mechanical and Electrical Equipment

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
ME-1 Fall-Prone Equipment. HR-not required; LS-H; PR-H.	Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced. (Tier 2: Sec. 13.7.1 13.7.7; Commentary: Sec. A.7.12.4)			X		No fall-prone equipment observed.

ME-2 In-Line Equipment. HR-not required; LS-H; PR-H.	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system. (Tier 2: Sec. 13.7.1; Commentary: Sec. A.7.12.5)		X			Independent vertical support and lateral bracing is required for in-line equipment.
ME-3 Tall Narrow Equipment. HR-not required; LS-H; PR-MH.	Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls. (Tier 2: Sec. 13.7.1 13.7.7; Commentary: Sec. A.7.12.6)			X		No tall narrow equipment observed.
ME-4 Mechanical Doors. HR-not required; LS-not required; PR-MH.	Mechanically operated doors are detailed to operate at a story drift ratio of 0.01. (Tier 2: Sec. 13.6.9; Commentary: Sec. A.7.12.7)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
ME-5 Suspended Equipment. HR-not required; LS-not required; PR-H.	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. (Tier 2: Sec. 13.7.1, 13.7.7; Commentary: Sec. A.7.12.8)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
ME-6 Vibration Isolators. HR-not required; LS-not required; PR-H.	Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning. (Tier 2: Sec. 13.7.1; Commentary: Sec. A.7.12.9)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
ME-7 Heavy Equipment. HR-not required; LS-not required; PR-H.	Floor supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure. (Tier 2: Sec. 13.7.1, 13.7.7; Commentary: Sec. A.7.12.10)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
ME-8 Electrical Equipment. HR-not required; LS-not required; PR-H.	Electrical equipment is laterally braced to the structure. (Tier 2: Sec. 13.7.7; Commentary: Sec. A.7.12.11)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
ME-9 Conduit Couplings. HR-not required; LS-not required; PR-H.	Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections. (Tier 2: Sec. 13.7.8; Commentary: Sec. A.7.12.12)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Piping

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
PP-1 Flexible Couplings. HR-not required; LS-not required; PR-H.	Fluid and gas piping has flexible couplings. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.2)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
PP-2 Fluid and Gas Piping. HR-not required; LS-not required; PR-H.	Fluid and gas piping is anchored and braced to the structure to limit spills or leaks. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

PP-3 C-Clamps. HR-not required; LS-not required; PR-H.	One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.5)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
PP-4 Piping Crossing Seismic Joints. HR-not required; LS-not required; PR-H.	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. (Tier 2: Sec. 13.7.3, 13.7.5; Commentary: Sec. A.7.13.6)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Ducts

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
D-1 Duct Bracing. HR-not required; LS-not required; PR-H.	Rectangular ductwork larger than 6 ft2 (0.56 m2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m). (Tier 2: Sec. 13.7.6; Commentary: Sec. A.7.14.2)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
D-2 Duct Support. HR-not required; LS-not required; PR-H.	Ducts are not supported by piping or electrical conduit. (Tier 2: Sec. 13.7.6; Commentary: Sec. A.7.14.3)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"
D-3 Ducts Crossing Seismic Joints. HR-not required; LS-not required; PR-H.	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. (Tier 2: Sec. 13.7.6; Commentary: Sec. A.7.14.4)			X		Non-applicable due to ASCE 41 Performance Level: "Life Safety (LS)"

Elevators

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
EL-1 Retainer Guards. HR-not required; LS-H; PR-H.	Sheaves and drums have cable retainer guards. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.1)			X		No elevator
EL-2 Retainer Plate. HR-not required; LS-H; PR-H.	A retainer plate is present at the top and bottom of both car and counterweight. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.2)			X		No elevator
EL-3 Elevator Equipment. HR-not required; LS-not required; PR-H.	Equipment, piping, and other components that are part of the elevator system are anchored. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.3)			X		No elevator
EL-4 Seismic Switch. HR-not required; LS-not required; PR-H.	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. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.4)			X		No elevator

EL-5 Shaft Walls. HR-not required; LS-not required; PR-H.	Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.5)			X		No elevator
EL-6 Counterweight Rails. HR-not required; LS-not required; PR-H.	All counterweight rails and divider beams are sized in accordance with ASME A17.1. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.6)			X		No elevator
EL-7 Brackets. HR-not required; LS-not required; PR-H.	The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.7)			X		No elevator
EL-8 Spreader Bracket. HR-not required; LS-not required; PR-H.	Spreader brackets are not used to resist seismic forces. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.8)			X		No elevator
EL-9 Go-Slow Elevators. HR-not required; LS-not required; PR-H.	The building has a go-slow elevator system. (Tier 2: Sec. 13.7.11; Commentary: Sec. A.7.16.9)			X		No elevator

Appendix B: Concept-Level Seismic Upgrade Figures

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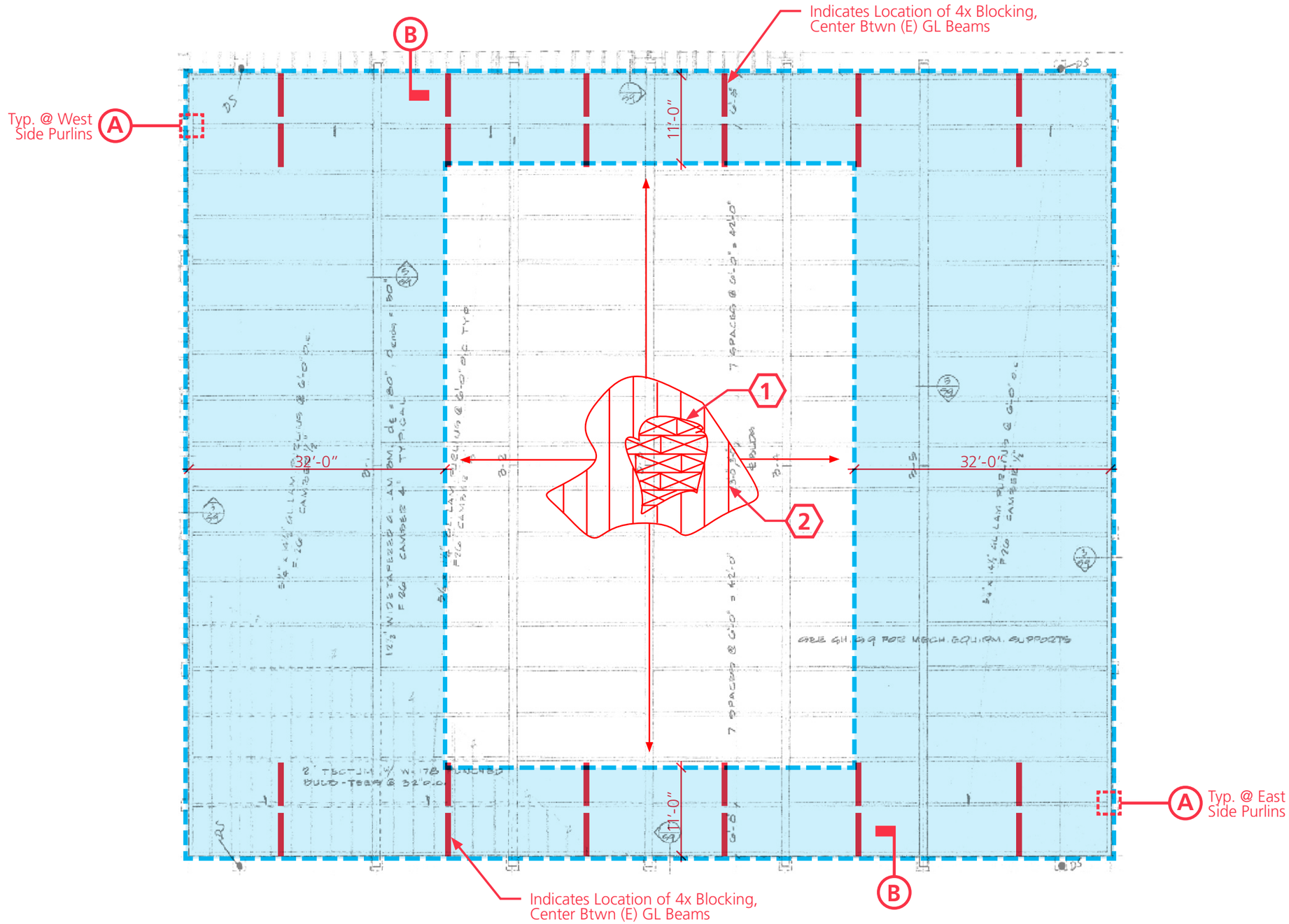


1 Provide Min 15/32" APA Rated Structural Plywood Sheathing Nail Over (N) Flat 4x Sleepers & (E) Tectum w/ 10D Nails @ 6" OC @ Edges & 12" OC in the Field, UNO, Provide Flat 4x Blkg @ Panel Edges

2 Flat 4x Sleepers @ 48" OC, Use Lag Screws to Fasten Sleepers to (E) Glulam Beams & Purlins

Nail w/ 10D Nails @ 4" OC @ Edges in This Region

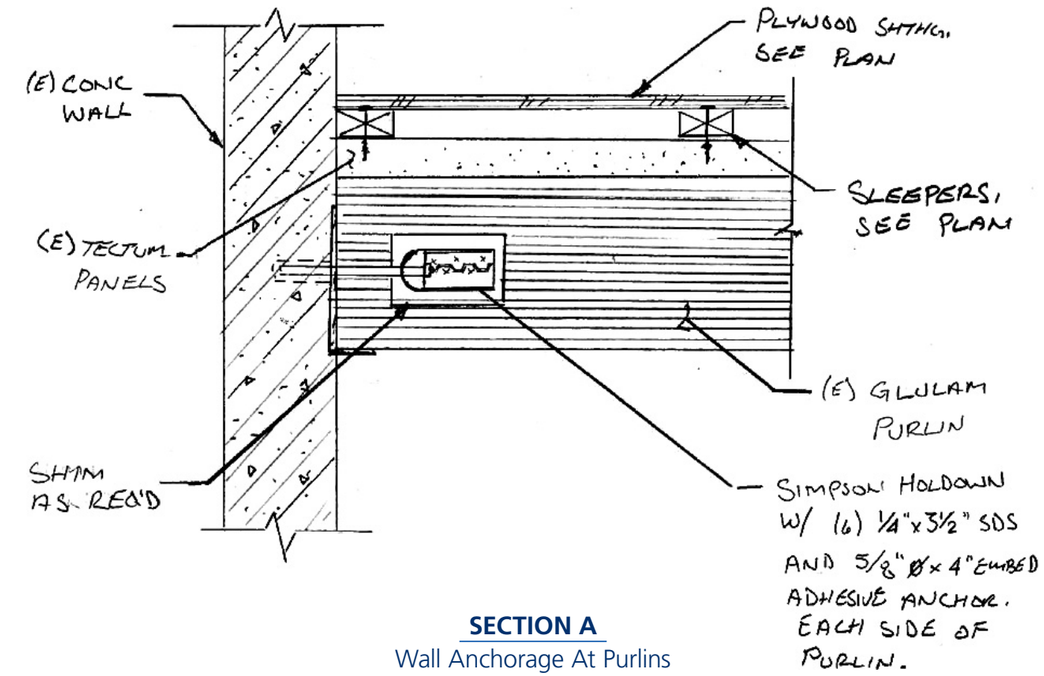
N

ReidMiddleton wrk engineers

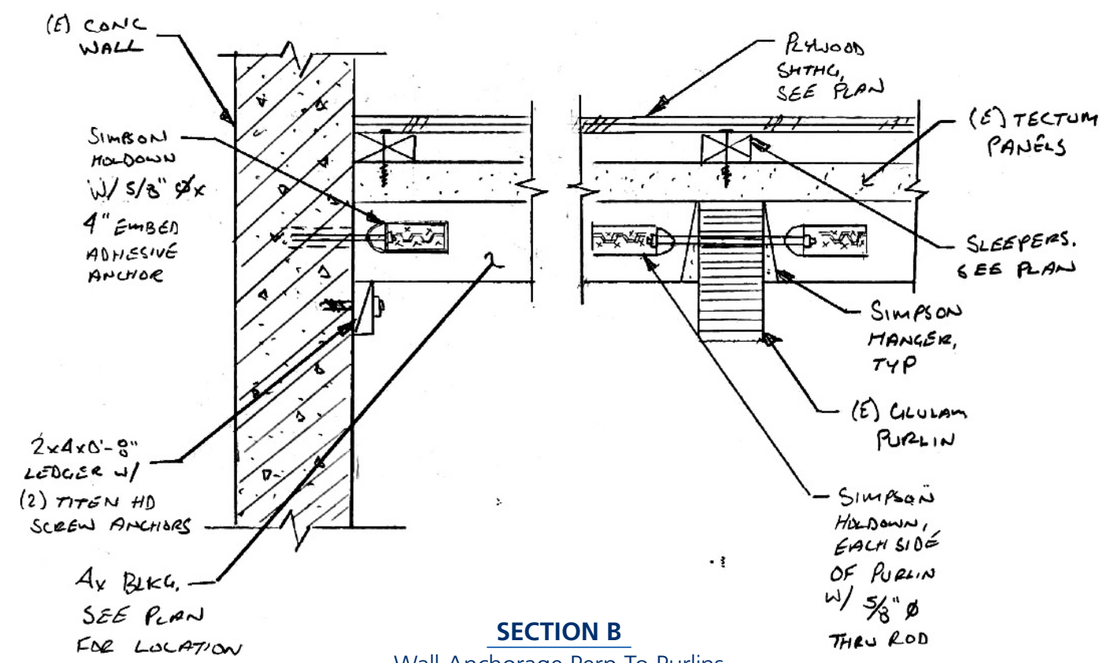
Columbia High School Seismic Upgrades – Gym Building

Washington State School Seismic Safety Assessments Project – White Salmon Valley School District – June 2019

Figure 1 - Roof Structural Plan



SECTION A
Wall Anchorage At Purlins



SECTION B
Wall Anchorage Perp To Purlins

Figure 2 - Conceptual Sections

Appendix C: Opinion of Probable Construction Costs

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520 Kirkland Way, Suite 301
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fax: (425) 828-0700
www.prodims.com

Name:	**Wa State School Seismic Safety Assessment**
Second Name:	**Columbia High School Gym**
Location:	**State of Washington**
Design Phase:	**ROM Cost Estimates**
Date of Estimate:	**March 2, 2019**
Date of Revision:	
Month of Cost Basis:	**1Q, 2019**

Columbia High School Gym

Master Estimate Summary

Project Name		Total Estimated Construction Cost
Columbia High School Gym	**Structural Costs**	**$432,638**
Columbia High School Gym	**Non-Structural Costs**	**$146,934**
TOTAL ESTIMATED CONSTRUCTION COST		**$579,573**

Estimate Assumptions:

The ROM Construction Cost estimates are based on the Concept Design Report for the Project.
Construction Escalation is not included. Costs are current as of month of Cost Basis noted Above

Estimate Qualifications:

The ROM estimates are not be relied on solely for proforma development and financial decisions.
Further design work is required to determine construction budgets.
All Buildings Estimated to the 5' foot line for Utilities, All Sitework is estimated to go with any combination of the buildings and alternatives.
The ROM estimates do not include any Hazardous Material Abatement/Disposal.
For Construction Cost Markups they are additive, not cumulative. Percentages are added to the previous subtotal rather than the direct cost subtotal.
Owner Soft Costs are not included in the estimates. Soft costs can include design fees, sales tax, permits, owner's contingency and FF+E.
Estimated labor is based on an 8 hour per day shift 5 days a week. Accelerated schedule work of overtime has not been included.
Estimated labor is based on working on unoccupied facility without phased construction.
Estimate is based on a competitive public bid with at least 3 bona fide submitted and unrescinded general contractor bids.
Estimate is based on a competitive public bid with a minimum 6 week bidding schedule and no significant addendums within 2 weeks of bid opening.
State of Washington General Contractor/ Construction Manager (GC/CM) contracts typically raises construction costs. It is Not Included in this estimate.
Estimated construction cost is for the entire project. This estimate is not intended to be used for other projects.
Please consult the cost estimator for any modifications to this estimate. Unilaterally adding and deleting markups, scope of work, schedule, specifications, plans and bid forms could incorrectly restate the project construction cost.
Construction reserve contingency for change orders is not included in the estimate.
Sole source supply of materials and/ or installers typically results in a 40% to 100% premium on costs over open specifications.

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Structural Costs

Name:	Wa State School Seismic Safety Assessment	Areas	sqft
Second Name:	Columbia High School Gym	Building Area	12,463
Location:	White Salmon, WA		
Design Phase:	ROM Cost Estimates		
Date of Estimate:	March 2, 2019		
Date of Revision:			
Month of Cost Basis:	4Q, 2018, 1Q, 2019	Total Areas	12,463

Columbia High School Gym

Construction Cost Estimate

Subtotal Direct Cost From the Estimate Detail Below $ 330,258

	Percentage of Previous Subtotal	Amount	Running Subtotal
Scope Contingency	10.0%	$ 33,026	$ 363,284
General Conditions	10.0%	$ 33,026	$ 396,310
Home Office Overhead	5.0%	$ 16,513	$ 412,823
Profit	6.0%	$ 19,816	$ 432,638
Escalation Not Included-Costs in 1Q, 2019 Dollars	0.0%	$ -	$ 432,638
Washington State Sales Tax	0.0%	$ -	$ 432,638

Total Markups Applied to the Direct Cost 31.00%
Markups are multiplied from each subtotal- They are not multiplied from the direct cost

		$/sqft
TOTAL ESTIMATED CONSTRUCTION COST--	**$ 432,638**	**$ 34.71**
-20% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --	**$ 346,111**	**$ 27.77**
+50% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --	**$ 648,958**	**$ 52.07**

Please see the Master Summary for Assumptions and Qualifications for ROM Cost Estimates

Direct Cost of Construction

WBS	Description	Quantity	U of M	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Total $/U of M	Direct Cost
1 - Seismic Retrofit											
Superstructure											
	Remove Existing Roofing System	12,463	sqft	$ 2.02	$ 25,125.41	$ 0.08	$ 1,046.89	$ 0.13	$ 1,570.34	$ 2.23	$ 27,742.64

WBS	Description	Quantity	U of M	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Total $/U of M	Direct Cost
	Install New Roofing System - Including Roof Membrane, New Insulation, Coverboard and Flashing and Trim for a Complete System	12,463	sqft	$ 10.02	$ 124,841.87	$ 8.53	$ 106,346.78	$ 1.11	$ 13,871.32	$ 19.66	$ 245,059.97
	Install New 1/2" Plywood Directly to 4x sleepers with the two Specified Nailing Patterns	12,463	sqft	$ 0.59	$ 7,403.02	$ 0.51	$ 6,306.28	$ 0.07	$ 822.56	$ 1.17	$ 14,531.86
	Install New 4x Sleepers at 48" o. c. with Lag Screw Attachement to Glu-lam Beams	3,116	lnft	$ 2.05	$ 6,377.54	$ 1.74	$ 5,432.72	$ 0.23	$ 708.62	$ 4.02	$ 12,518.87
	Det A: Wall Anchorage at Purlins - SST Holdown with 6 ea. -1/4" x 3-1/2" SDS and 5/8" Dia 4" Embed Drilled in Epoxied Anchor with nut and Washer and shim Assembly	32	each	$ 270.64	$ 8,660.48	$ 127.36	$ 4,075.52	$ 23.88	$ 764.16	$ 421.88	$ 13,500.16
	Det B: Wall Anchorage Perpendicular to Purlins - SST Holdown with 6 ea. -1/4" x 3-1/2" SDS and 5/8" Dia 4" Embed Drilled in Epoxied Anchor with nut and Washer and shim, 2 Each SST Holdown with 6 ea. -1/4" x 3-1/2" SDS and 1 each 5/8" Dia Rod Drilled Through GLB with nuts and Washers and shims, 2x4 x 0-8" with 2 ea. SST Titen HD Screw in Anchors and 11 LF 4X Blocking with 3 SST Hangers with Nails for a complete Assembly	12	each	$ 903.72	$ 10,844.64	$ 425.28	$ 5,103.36	$ 79.74	$ 956.88	$ 1,408.74	$ 16,904.88
Subtotal of the Direct Cost of Construction				**Columbia High School Gym**							**$ 330,258**

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Non-Structural Costs

Name:	Wa State School Seismic Safety Assessment	Areas	sqft
Second Name:	Columbia High School Gym	Building Area	12,463
Location:	White Salmon, WA		
Design Phase:	ROM Cost Estimates		
Date of Estimate:	March 2, 2019		
Date of Revision:			
Month of Cost Basis:	4Q, 2018, 1Q, 2019	Total Areas	12,463

Columbia High School Gym

Construction Cost Estimate

Subtotal Direct Cost From the Estimate Detail Below $ 112,164

	Percentage of Previous Subtotal	Amount	Running Subtotal
Scope Contingency	10.0%	$ 11,216	$ 123,380
General Conditions	10.0%	$ 11,216	$ 134,596
Home Office Overhead	5.0%	$ 5,608	$ 140,205
Profit	6.0%	$ 6,730	$ 146,934
Escalation Not Included-Costs in 1Q, 2019 Dollars	0.0%	$ -	$ 146,934
Washington State Sales Tax	0.0%	$ -	$ 146,934

Total Markups Applied to the Direct Cost 31.00%
Markups are multiplied from each subtotal- They are not multiplied from the direct cost

		$/sqft
TOTAL ESTIMATED CONSTRUCTION COST--	**$ 146,934**	**$ 11.79**
-20% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --	**$ 117,548**	**$ 9.43**
+50% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --	**$ 220,402**	**$ 17.68**

Please see the Master Summary for Assumptions and Qualifications for ROM Cost Estimates

Direct Cost of Construction

WBS	Description	Quantity	U of M	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Total $/U of M	Direct Cost
2- Non- Structural Demo/Restoration*											
Interiors and M/E/P/FP systems											
	Ceilings and Finishes and Gym Equipment tempaory relocation for Installation of Seismic Work	12,463	sqft	$ 0.54	$ 6,789.98	$ 0.45	$ 5,555.44	$ 0.06	$ 740.73	$ 1.05	$ 13,086.15

WBS	Description	Quantity	U of M	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Total $/U of M	Direct Cost
	Mechanical/Electrical/Fire Protection Systems	12,463	sqft	$ 4.12	$ 51,408.14	$ 3.37	$ 42,061.21	$ 0.45	$ 5,608.16	$ 7.95	$ 99,077.51

*Allows 30 percent of existing nonstructural systems M/E/P/FP require upgrades/replacement.

Subtotal of the Direct Cost of Construction				**Columbia High School Gym**							**$ 112,164**

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Appendix D: Earthquake Performance Assessment Tool (EPAT) Worksheet

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Washington Schools Earthquake Performance Assessment Tool (EPAT)
MAIN PAGE

Full District Name	White Salmon Valley		
Point of Contact	Jerry Lewis/Mike Clark		
Telephone	509-637-0333		
E-Mail	jerry.lewis@whitesalmonschools.org/mike.clark@whitesalmonschools.org		
File Name	White Salmon Valley, Columbia High School, Gym Building EPAT.xlsm	**File Date:**	10/19/2018

District	White Salmon Valley
Facility Name	Columbia High School
Building Part Name	Gym Building

Earthquake Ground Motion (% g)		**Earthquake Hazards**	
20% in 50 year PGA	8.3%	**Site Class**	C
10% in 50 year PGA	12.7%	**Ground Shaking Hazard**	Moderate
2% in 50 year PGA	26.9%	**Liquefaction Potential**	Very Low
Percentile S_s *Among all WA Campuses*	21%	**Combined Earthquake Hazard Level**	Moderate

Total Building Part Area (Square Feet)	**Building Evaluated By**	**Input Data by Person(s)**
33,246	DNR, Reid Middleton	Kendra Tappe, Reid Middleton

The Earthquake Ground Motion and Earthquake Hazard Hazards data shown above are primarily for use and interpretation by engineers.

Refer to the EPAT User Guide for technical explanations of the Earthquake Ground Motion and the Earthquake Hazards information.

Washington Schools Earthquake Performance Assessment Tool (EPAT)
BUILDING DATA PAGE

Facility Name	Columbia High School
Building Name	Gym Building
Building Use	Assembly

Data Entry Item	User Entered Values	Default Values	Used for BCA
Seismic Data			
Decimal Latitude	45.742	45.741603	45.742
Decimal Longitude	-121.494	-121.494053	-121.494
Site Class (Soil/Rock Type)	C	C	C
Liquefaction Potential	Very Low	Very Low	Very Low
Geographic Region for Seismic Zones	Eastern	Eastern	Eastern
Building Structural Data			
HAZUS Building Type***	PC1	Precast Concrete Tilt-Up Walls	PC1
Number of Stories (Excluding Basement)***	1		1
Year Built***	1970		1970
Code for Building Design (if known)	Unknown	**Use the Drop-Down menus to Select Data Entries for the Bright Green Shaded data cells.**	Unknown
Design Code Year (if known)	Unknown		Unknown
Severe Vertical Irregularity***	No		No
Moderate Vertical Irregularity***	No		No
Plan (Horizontal) Irregularity***	Yes		Yes

***** Mandatory Data Entry**

Washington Schools Earthquake Performance Assessment Tool (EPAT)
RESULTS SUMMARY

District Name	White Salmon Valley	**Existing Building Life Safety Risk & Priority for Retrofit or Replacement**
School Name	Columbia High School	
Building Name	Gym Building	Moderate-High

Building Data

HAZUS Building Type	PC1	Precast Concrete Tilt-Up Walls
Year Built	1970	These parameters determine the capacity of the existing building to withstand earthquake forces.
Building Design Code	<1973 UBC	
Existing Building Code Level	Pre	
Geographic Area	Eastern	
Severe Vertical Irregularity	No	Buildings with irregularities have greater earthquake damage than otherwise similar buildings that are regular.
Moderate Vertical Irregularity	No	
Plan Irregularity	Yes	

Seismic Data

Earthquake Ground Shaking Hazard Level	Moderate	Frequency and severity of earthquakes at this site
Percentile S_s Among WA K-12 Campuses	21%	Earthquake ground shaking hazard is higher than 21% of WA campuses.
Site Class (Soil or Rock Type)	C	Very Dense Soil and Soft Rock
Liquefaction Potential	Very Low	Liquefaction increases the risk of major damage to a building
Combined Earthquake Hazard Level	Moderate	Earthquake ground shaking and liquefaction potential

Severe Earthquake Event (Design Basis Earthquake Ground Motion)[1]

Building State	Building Damage Estimate[2]	Probability Building is not Repairable[3]	Life Safety[4] Risk Level	Most Likely Post-Earthquake Tagging[5]
Existing Building	49%	47%	Moderate-High	Red
Life Safety Retrofit Building	24%	19%	Low	Yellow
Current Code Building	19%	14%	Low	Green/Yellow

1. 2/3rds of the 2% in 50 year ground motion
2. Percentage of building replacement value.
3. Probability building is in the Extensive or Complete damage states. For existing buildings, the probability that the building is not economically repairable may be higher: some buildings in the Moderate Damage state are also likely to be demolished.
4. Based on probability of Complete Damage State.
5. Most likely post-earthquake damage state per ATC-20.

Source for the Data Entered into the Tool

Building Evaluated By:	DNR, Reid Middleton
Person(s) Who Entered Data in EPAT:	Kendra Tappe, Reid Middleton
User Overrides of Default Parameters:	Building Design Code Year, Latitude, Longitude, Site Class, Liquefaction, Geographic Region

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Appendix E: Columbia High School Existing Drawings

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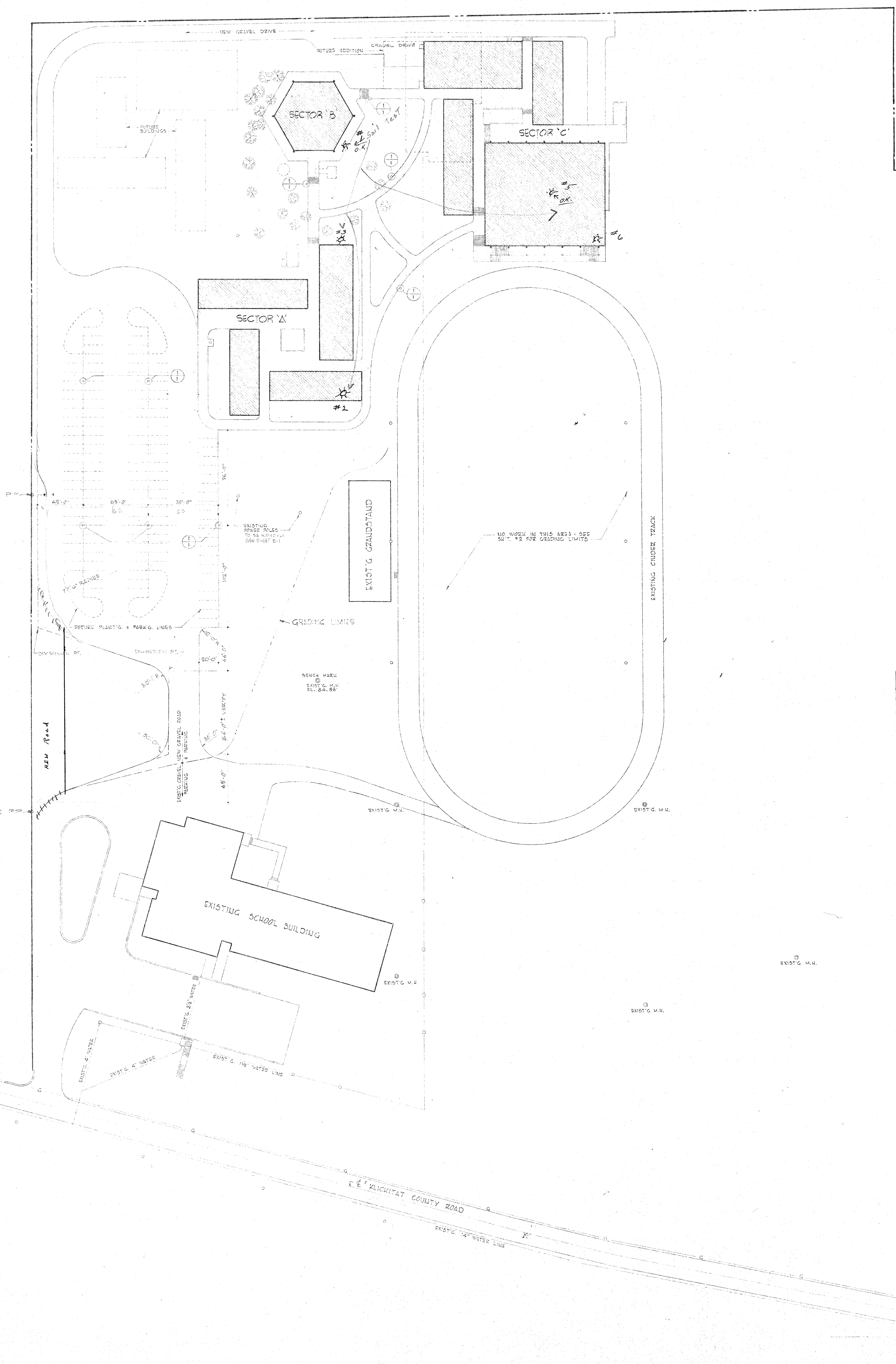
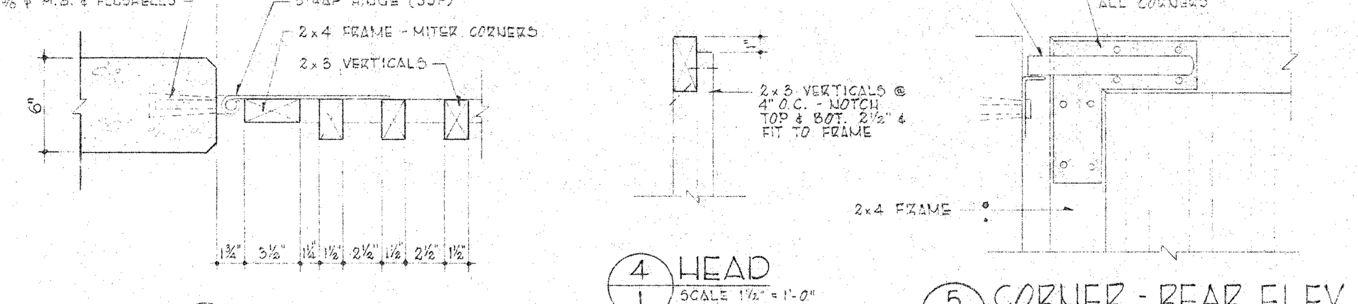
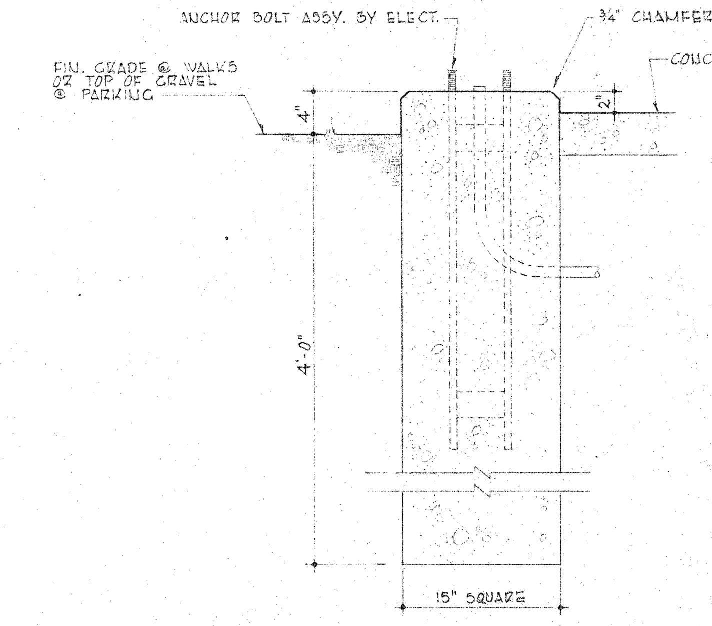




3/1 JAMB SCALE 1½" = 1'-0"

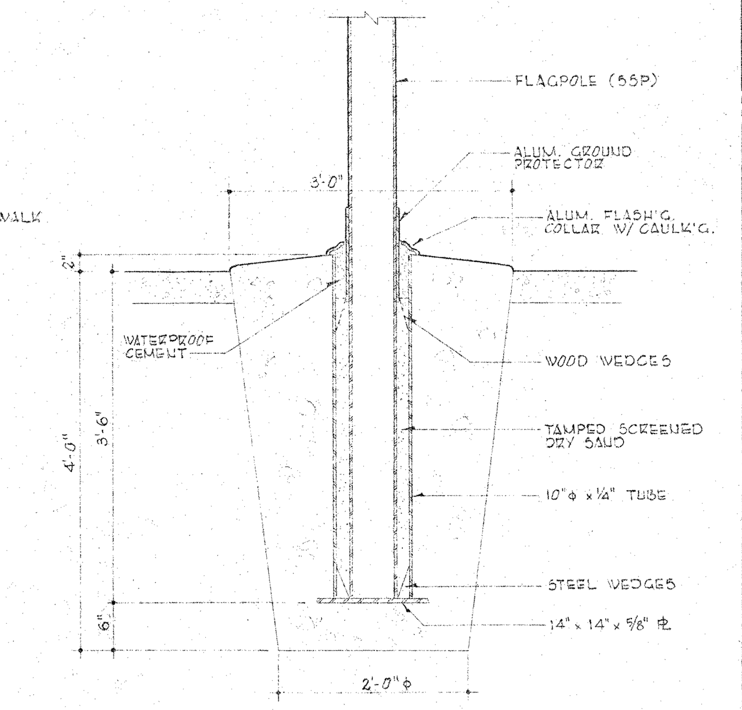
4/1 HEAD SCALE 1½" = 1'-0"

5/1 CORNER - REAR ELEV. SCALE 1½" = 1'-0"



1/1 LIGHT POLE BASE SCALE 1" = 1'-0"

NOTE - SEE ALTERNATE #3



2/1 FLAGPOLE SCALE ¾" = 1'-0"

SHEET INDEX

architectural

1 PLOT PLAN, INDEX, SCHEDULES
2 SITE PLAN
3 STAIR DETAILS
4 SECTOR "A" FLOOR PLAN, WALL SECTION
5 SECTOR "B" FL'R PLAN, SECTOR "C" LOWER LEVEL PLAN, WALL SECTION
6 SECTOR "C" FLOOR PLAN, WALL SECTIONS
7 DOOR, ROOM FINISH & EXTERIOR FINISH SCHEDULES
8 SECTOR "A" REFLECTED CEILING PLAN, DOOR & WINDOW DETAILS
9 SECTOR "B" & SECTOR "C" REFLECTED CEILING PLANS
10 ROOF PLANS & DETAILS
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16 INTERIOR ELEVATIONS & DETAILS
17 INTERIOR ELEVATIONS
18 INTERIOR ELEVATIONS & DETAILS
19 GYM COURT MARKINGS & DETAILS
20 ALT. #6 PLANS, ELEVATIONS & DETAILS
21 STANDARD DETAILS

structural

S-1 FOUNDATION PLAN - SECTOR "A"
S-2 FOUNDATION PLAN - SECTOR "B"
S-3 FOUNDATION PLAN - SECTOR "C"
S-4 FOUNDATION & TILT-UP WALL DETAILS
S-5 GYMNASIUM FLOOR DETAILS
S-6 ROOF FRAMING PLAN - SECTOR "A"
S-7 ROOF FRAMING PLAN - SECTOR "B"
S-8 ROOF FRAMING PLAN - SECTOR "C"
S-9 ROOF FRAMING DETAILS

mechanical

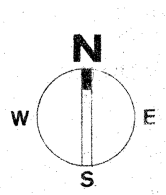
M-1 PLOT PLAN & SITE PLAN
M-2 FOUNDATION PLANS - SECTORS "A" & "B"
M-3 FOUNDATION PLAN - SECTOR "C"
M-4 FLOOR PLANS - SECTORS "A" & "B" - PLUMBING
M-5 FLOOR PLAN - SECTOR "C" - PLUMBING
M-6 FLOOR PLAN - SECTOR "A" - HEATING
M-7 FLOOR PLAN - SECTOR "B" - HEATING LOWER LEVEL FL'R. PLAN - SECT. "C" - HTG.
M-8 UPPER LEVEL FL'R. PLAN - SECT. "C" - HTG.
M-9 LOWER LEVEL FLOOR PLAN - SECTOR "C" FIRE SPRINKLERS
M-10 LOWER LEVEL FL'R PLAN - SECT. "C" - ALT. #6

electrical

E-1 SITE PLAN & RISER DIAGRAM
E-2 SECTOR "A" LIGHTING PLAN
E-3 SECTOR "A" POWER & SIGNAL PLAN
E-4 SECTOR "C" LIGHTING PLAN
E-5 SECTOR "C" POWER & SIGNAL PLAN

PLOT PLAN & SITE PLAN LEGEND

- PROPERTY LINE
- 00 EXISTING CONTOUR
- 00 FINISH CONTOUR
- 00 FINISH GRADE - SPOT ELEVATION
- 00 EXISTING GRADE - SPOT ELEVATION
- EXPOSED AGGREGATE
- EXISTING TREES TO REMAIN



PLOT PLAN

SCALE 1" = 50'-0"

IN S.E. ¼ SECTION 13, T. 3N., R. 10E., W.M.

LIST OF PRINCIPAL SYMBOLS

AB-1, etc. . . Acoustic Boards & Tiles (Suffix No. denotes type)
ACD-1, etc . . Access Doors (Suffix No. denotes type)
ACP. . . . . . Acrylic Cement Paint
ADB. . . . . . Automatic Door Bottom
ALUM . . . . . Aluminum
ALTR . . . . . Aluminum Trim with baked enamel finish
APE. . . . . . All Purpose Equipment Enamel
APL. . . . . . Acoustical Plaster
AT . . . . . . Asphalt Tile
B. . . . . . . Birch
BO . . . . . . By Owner or By Others
BP . . . . . . Building Paper
/2c, etc . . . Denotes number of coats
CB . . . . . . Chalkboard
CBL. . . . . . Cabinet Lock
CE . . . . . . Concrete
CGL. . . . . . Colored Glass
CJ . . . . . . Control Joint
CK . . . . . . Cork
CPL. . . . . . Cement Plaster
CSH. . . . . . Concrete Surface Hardener
CSK. . . . . . Countersunk
CSP. . . . . . Concrete Soil Pipe
CT . . . . . . Ceramic Tile
D. . . . . . . Dash Coat of Plaster (A suffix)
DF . . . . . . Drinking Fountain
DS . . . . . . Downspout
DWR. . . . . . Drawer
EJ . . . . . . Expansion Joint
E. . . . . . . Enamel, Semi-Gloss
ENF. . . . . . Enamel, Flat
ENG. . . . . . Enamel, Gloss
F. . . . . . . Fir
FA-1, etc. . . Floor Anchor (Suffix denotes type)
FD . . . . . . Floor Drain
FEC. . . . . . Fire Extinguisher Cabinet
FEC. . . . . . Fire Extinguisher & Waste Cabinet
FFP. . . . . . Folding Fabric Partition
FG-H . . . . . Flat Grain (Suffix denotes material)
FOHC . . . . . Free of Heart Center
FPP. . . . . . Folding Panel Partition
FPR. . . . . . Floor Preservative Finish
G. . . . . . . Gypsum (Mineral) Core Doors or Gravel Roof Surfacing
G-1, etc . . . Grilles in doors (Suffix # denotes type)
GA . . . . . . Gauge of material
GALV . . . . . Galvanized
GBF. . . . . . Gypsum Board, UL rated, 1 layer
GBF-2. . . . . Gypsum Board, UL rated, 2 layers
GBF-MR . . . . Gypsum Board, Moisture Resistant
GI . . . . . . Galvanized Iron
GL . . . . . . Gypsum Lath
GLZ-1, etc . . Glaze Finish (Suffix No. denotes type)
GST. . . . . . Gasket
GU . . . . . . Gypsum (Mineral) core UL labeled fire door
H. . . . . . . Hemlock
HB-1, etc. . . Hardboard (Suffix No. denotes type)
HMC. . . . . . Hollow Metal Cabinet of Steel
HR . . . . . . Handrail
HRC. . . . . . Hose Reel Cabinet
I. . . . . . . Insulation, on roof deck
IB . . . . . . Ironbound Floor
KD . . . . . . Kiln Dried
KO . . . . . . Knock Out
L. . . . . . . Flush door, laminated core
LWT. . . . . . Light Weight Concrete Block
M. . . . . . . Hollow Metal Doors or Frames
M-1, etc . . . Mullion (Suffix No. denotes type)
MAT. . . . . . Material
MDO. . . . . . Medium Density Overlayed Plywood
MET. . . . . . Metal
MH . . . . . . Manhole
MIR. . . . . . Mirror
ML . . . . . . Metal Lath
MLR. . . . . . Metal Lath with Ribs
MLF. . . . . . Metal Lath Self Furring
MSD. . . . . . Midget Slat Door
MT . . . . . . Metal Trim
MU . . . . . . Hollow Metal Door UL labeled
NRC. . . . . . Noise Reduction Coefficient
NV . . . . . . Varnish Finish
OBS. . . . . . Obscure Glass
P. . . . . . . Paint
PB-4, etc. . . Painted Band (Suffix No. denotes width in inches)
PC . . . . . . Plastic Laminate, Formica etc. type
PF . . . . . . "Powerlock" Floor
PL . . . . . . Plaster, sand finish
PLG. . . . . . Plate Glass
PWD. . . . . . Plywood
PWP. . . . . . Plastic Wall Paneling
PWS. . . . . . Pigmented Wood Stain
PTL-1, etc . . Plastic Top Lights (Suffix No. denotes type)
QT . . . . . . Quarry Tile
R. . . . . . . Rock Roof Surfacing
RBP. . . . . . Rubber Base Paint
RB . . . . . . Rubber Base
RBC. . . . . . Rubber Base of Light Color
RC . . . . . . Rubber (type) Coatings
RD . . . . . . Roof Drain
RFD. . . . . . Rolling Steel Fire Door
RG . . . . . . Register
RSD. . . . . . Rolling Service Door
RST. . . . . . Rubber Coverings for Stairs
RT . . . . . . Rubber Tile
S. . . . . . . Stipple Paint Finish (A suffix)
SCW. . . . . . Silicone Waterproofing
SD . . . . . . Standard Detail
SDP. . . . . . See Details & Plans
SH . . . . . . Shelf or Shelving
SHG. . . . . . Sheathing
SHP. . . . . . Shake Paint
SPG-A, etc . . Special Glass (Suffix letter denotes type)
SS . . . . . . Stainless Steel
SSP. . . . . . See Specifications
STR. . . . . . Stripping
T. . . . . . . Tectum Roof Deck
-T . . . . . . Textured Paint Finish (A suffix)
TB . . . . . . Tackboard
TC . . . . . . Toilet Compartment
TE . . . . . . Trim Enamel
T&G. . . . . . Tongue & Groove
TGL. . . . . . Tempered Glass
TH-1A, etc . . Threshold (Suffix denotes type)
TPL. . . . . . Thin Coat Plaster
TR . . . . . . Transom over door
TRZ. . . . . . Terrazzo
U- . . . . . . Unselected for color (A prefix)
UOS. . . . . . Unless Otherwise Shown
VAT. . . . . . Vinyl Asbestos Tile
VC . . . . . . Vinyl Covered Tackboard
VCT. . . . . . Vinyl Covered Tackboard w/matching colored metal trim
VWC. . . . . . Vinyl Wall Covering
W. . . . . . . Wood Roof Deck
WD . . . . . . Wood
WWM. . . . . . Welded Wire Mesh
WFP. . . . . . Wood Fiber Plaster sand finish
WRG. . . . . . Wired Glass
WROG . . . . . Wired Glass, Obscure
WSPL . . . . . Wood Fiber Plaster, smooth finish
WT-1, etc. . . Glazed Wall Units (Suffix No. denotes number of sides glazed).

NOTE: Mark thus: "/" means "applied on, over, or in." Mark thus: "w/" means "with".

TEC TEXTURED CONCRETE
REN RUBBER BASE ENAMEL

T 3N R 10E W.M.
T 3N R 11E W.M.
13 | 18
24 | 19

DRAFTING SYMBOLS

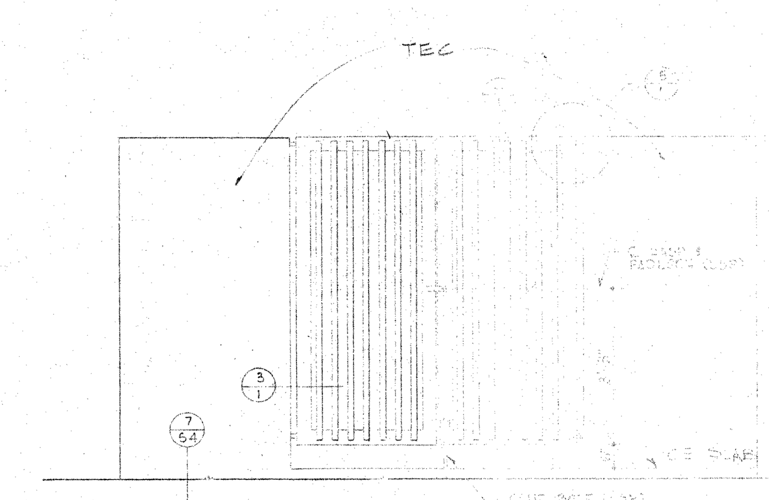
BUILDING SECTION	A / A-3	SECT. Nº / PLAN SHEET ON WHICH SECT. OCCURS
WALL SECTION	B / A-4	SECT. Nº / PLAN SHEET ON WHICH SECT. OCCURS
DETAIL SECTION	7 / A-9	SECT. Nº / SHEET ON WHICH SECTION OCCURS
EXTERIOR ELEV.	1 / A-12	ELEV. Nº / SHEET ON WHICH ELEV. OCCURS
INTERIOR ELEV. PLAN SYMBOL	A-18	ARROW INDICATES ELEV. SHOWN / CIRCLE INDICATES SHEET ON WHICH ELEV. OCCURS
INT. ELEV. SYMBOL		Nº INDICATES ELEV. SHOWN ON PLAN
ROOM NUMBER	B-103	LETTER INDICATES SECTOR / Nº INDICATES ROOM NUMBER
DOOR NUMBER	SECTOR LETTER B / 100A / 54-HARDWARE	DOOR Nº SAME AS ROOM Nº W/ SUFFIX ADDED FOR EA. DOOR SERVING ROOM
WINDOW TYPE	D	
NORTH ARROW	REFER. NORTH / TRUE NORTH — ON PLOT PLAN	ALL OTHER SHEETS
EXISTING GRADE	000.0	
FINISH GRADE	000.0	

DRAWN: 10 OCT. '67 — DRAFTING SYMBOLS — hewlett & jamison, 3223 s.w. harbor drive, portland 1, oregon — ARCHITECTS

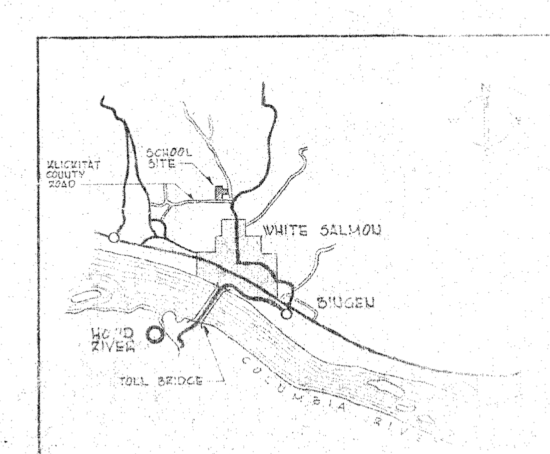
MATERIAL SYMBOLS

EARTH	FRAMING LUMBER
GRAVEL	BLOCKING CUT BETWEEN CONTINUOUS MEMBERS
CONCRETE POURED IN PLACE	PLYWOOD
CONCRETE PRE CAST	METAL LATH & PLASTER
CONCRETE MASONRY UNITS	GYPSUM LATH & PLASTER
TERRAZZO	GYPSUM WALLBOARD
ASPHALTIC CONCRETE	GLASS IN SECT. & DETAIL
STRUCTURAL CLAY TILE	WOOD FRAME WALL OR PARTITION IN ALTERATION WORK ONLY
BRICK	WOOD FRAME WALL OR PARTITION EXCEPT IN ABOVE CONDITION
FIRE BRICK ON COMMON BRICK	METAL STUD PARTITION
CERAMIC TILE	SOLID PLASTER PARTITION
QUARRY TILE	FLEXIBLE INSULATION
METAL	ACOUSTIC TILE
SMALL METAL & ALL METAL @ SMALL SCALE	FINISHED WOOD
RIGID INSULATION	

DRAWN: 10 OCT. '67 — MATERIAL SYMBOLS — hewlett & jamison, 3223 s.w. harbor drive, portland 1, oregon — ARCHITECTS



1 TRANSCLOSURE GATES SCALE 3/8" = 1'-0"

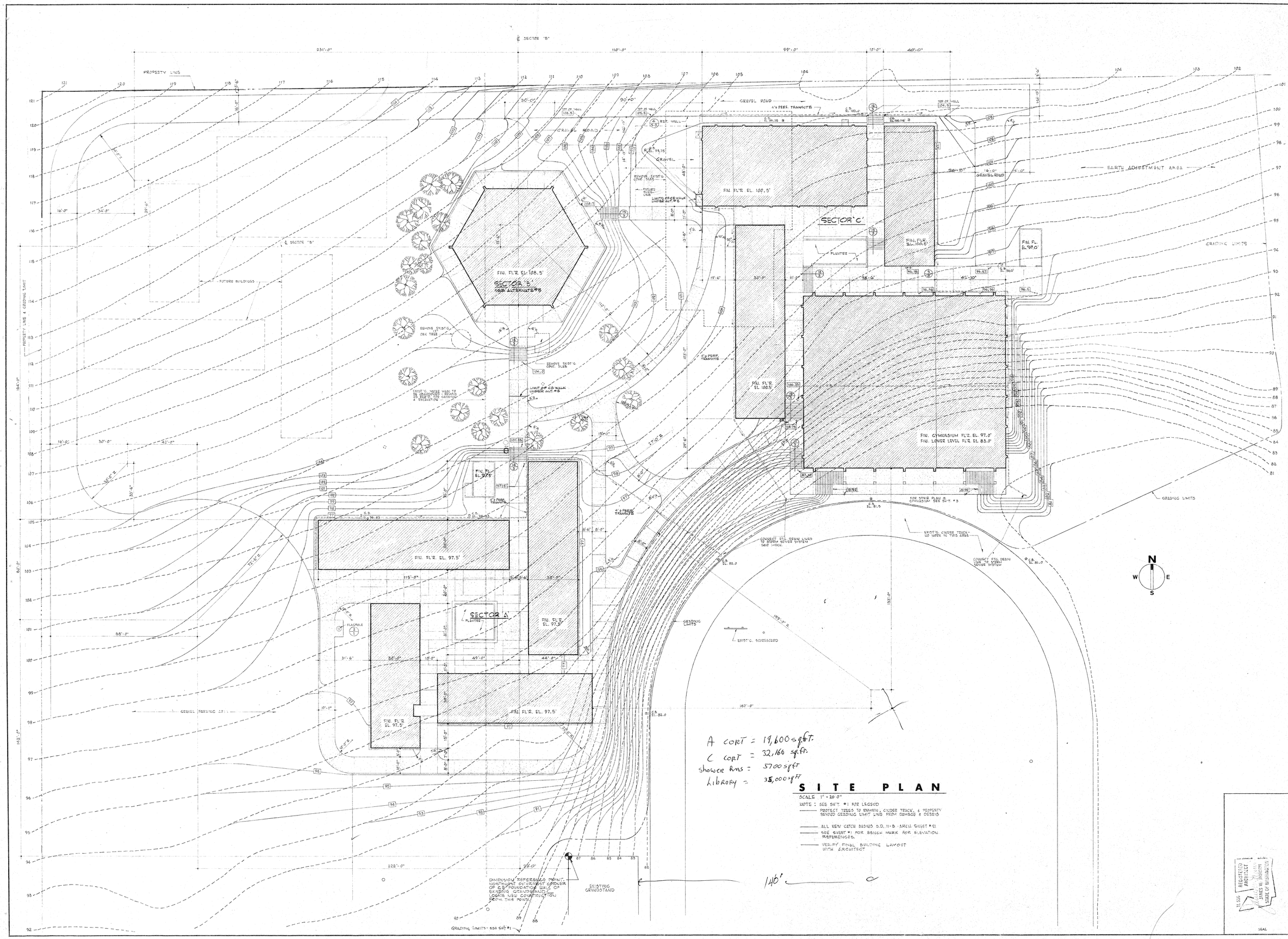


VICINITY MAP

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON TL 556

hewlett & jamison ARCHITECTS
3223 s.w. harbor drive portland 1, oregon 223-9468

COLUMBIA HIGH SCHOOL
KLICKITAT COUNTY SCHOOL DISTRICT 405-17
WHITE SALMON, WASHINGTON



A CORT = 19,600 sq.ft.
C CORT = 32,160 sq.ft.
Shower Rms = 5700 sq ft
Library = 35,000 sq ft

SITE PLAN

SCALE 1" = 20'-0"

NOTE: SEE SH'T. #1 FOR LEGEND

- PROTECT TREES TO REMAIN, CINDER TRACK, & PROPERTY BEYOND GRADING LIMIT LINE FROM DAMAGE & DEBRIS
- ALL NEW CATCH BASINS S.D. 11-8 - ARCH. SHEET #21
- SEE SHEET #1 FOR BENCH MARK FOR ELEVATION REFERENCES.
- VERIFY FINAL BUILDING LAYOUT WITH ARCHITECT

hewlett & jamison
ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COMM. NO. 676
REVISED 5-2-69

DRAWN BY: C. TRASK
DATE 2/3/69
SCALE 1" = 20'-0"

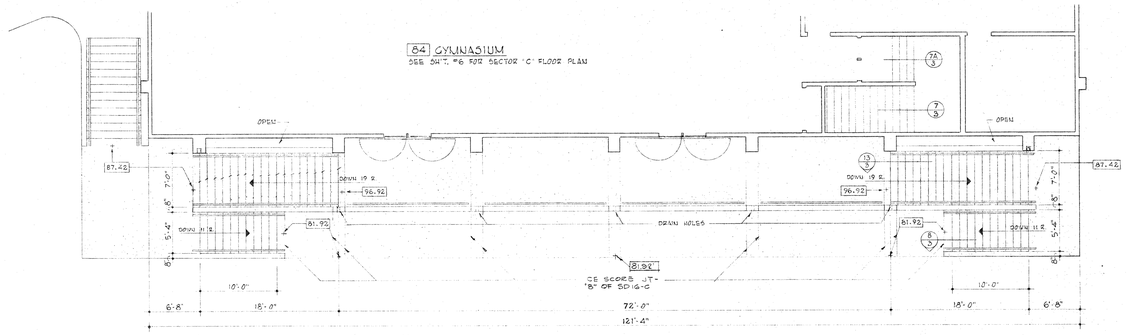
COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

DRAWING TITLE
SITE PLAN

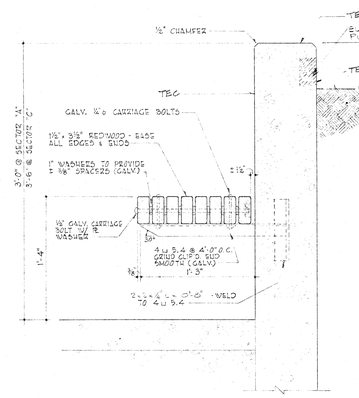
SHEET NO.
2

REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
11,566

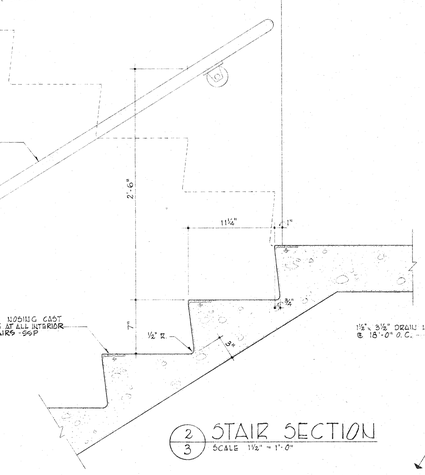
SEAL



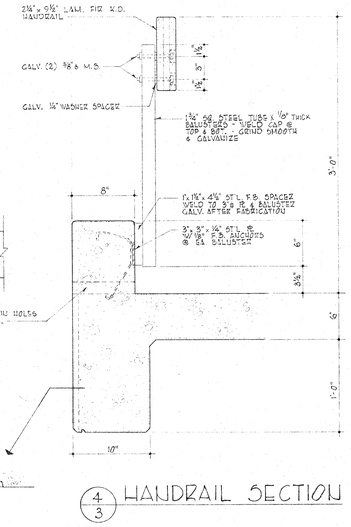
STAIR PLAN @ GYMNASIUM
SCALE 1/8" = 1'-0"



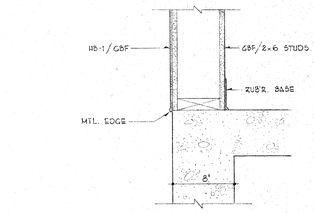
1/3 BENCH SECTION
SCALE 1 1/2" = 1'-0"
NOTE: GALV. ALL MTL. AFTER FABRICATION



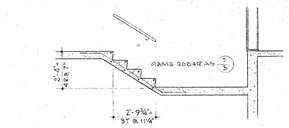
2/3 STAIR SECTION
SCALE 1 1/2" = 1'-0"



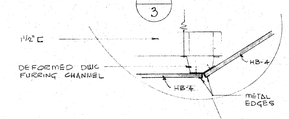
4/3 HANDRAIL SECTION

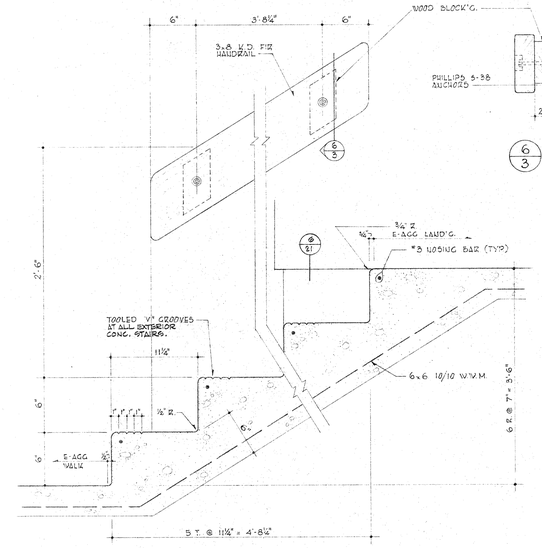


3/3
SCALE 1 1/2" = 1'-0"

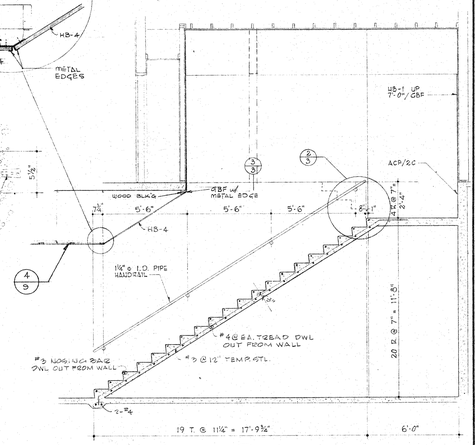


7A/3

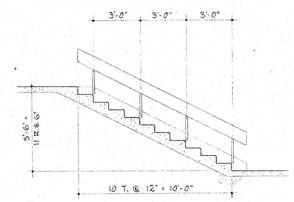




6/3

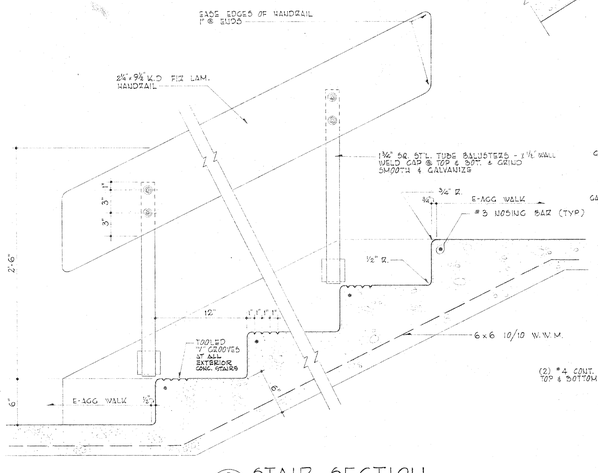


7/3

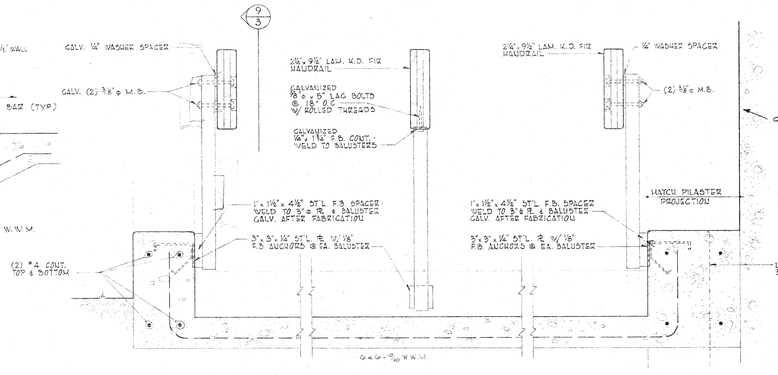


8/3

5/3 STAIR SECTION
SCALE 1 1/2" = 1'-0"



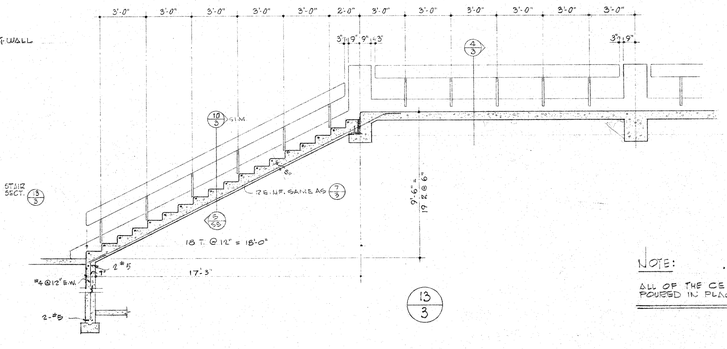
9/3 STAIR SECTION
SCALE 1 1/2" = 1'-0"



10/3 HANDRAIL
SCALE 1 1/2" = 1'-0"

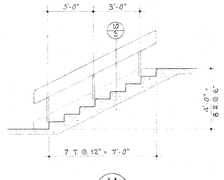
11/3 INTERWED. RAIL
SCALE 1 1/2" = 1'-0"

12/3 RAIL @ BLDG.
SCALE 1 1/2" = 1'-0"

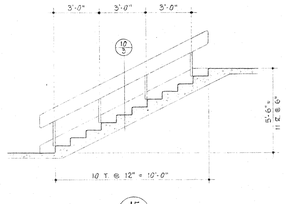


13/3

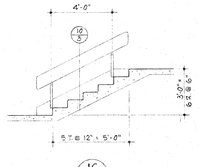
NOTE:
ALL OF THE CE ON THIS SHEET IS POURED IN PLACE U.O.S.



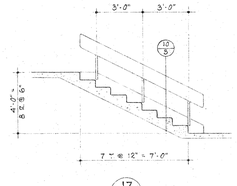
14/3



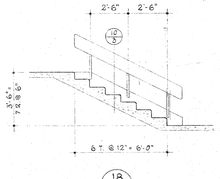
15/3



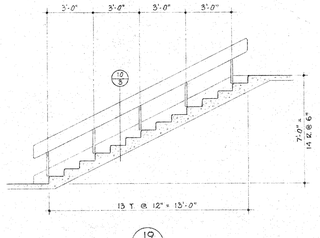
16/3



17/3



18/3



19/3

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

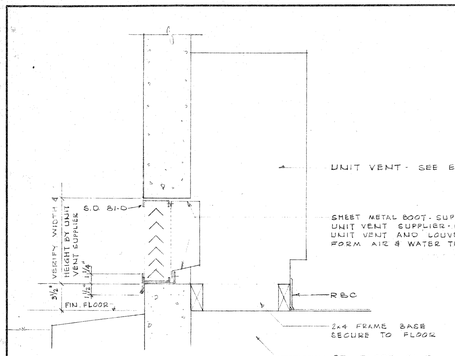
COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON

DRAWN BY: G. TAZIAK
DATE: 2/9/69
SCALE: AS NOTED
COMM. NO. 676
REVISED 5-2-69

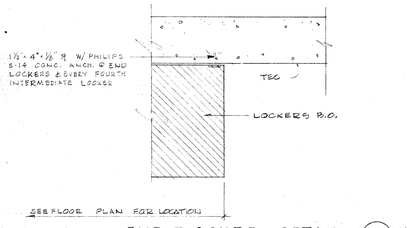
DRAWING TITLE
STAIR DETAILS

SHEET NO.
5

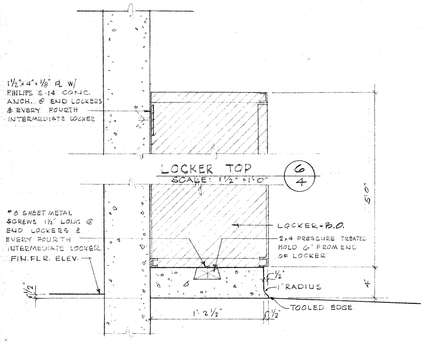
REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
SEAL



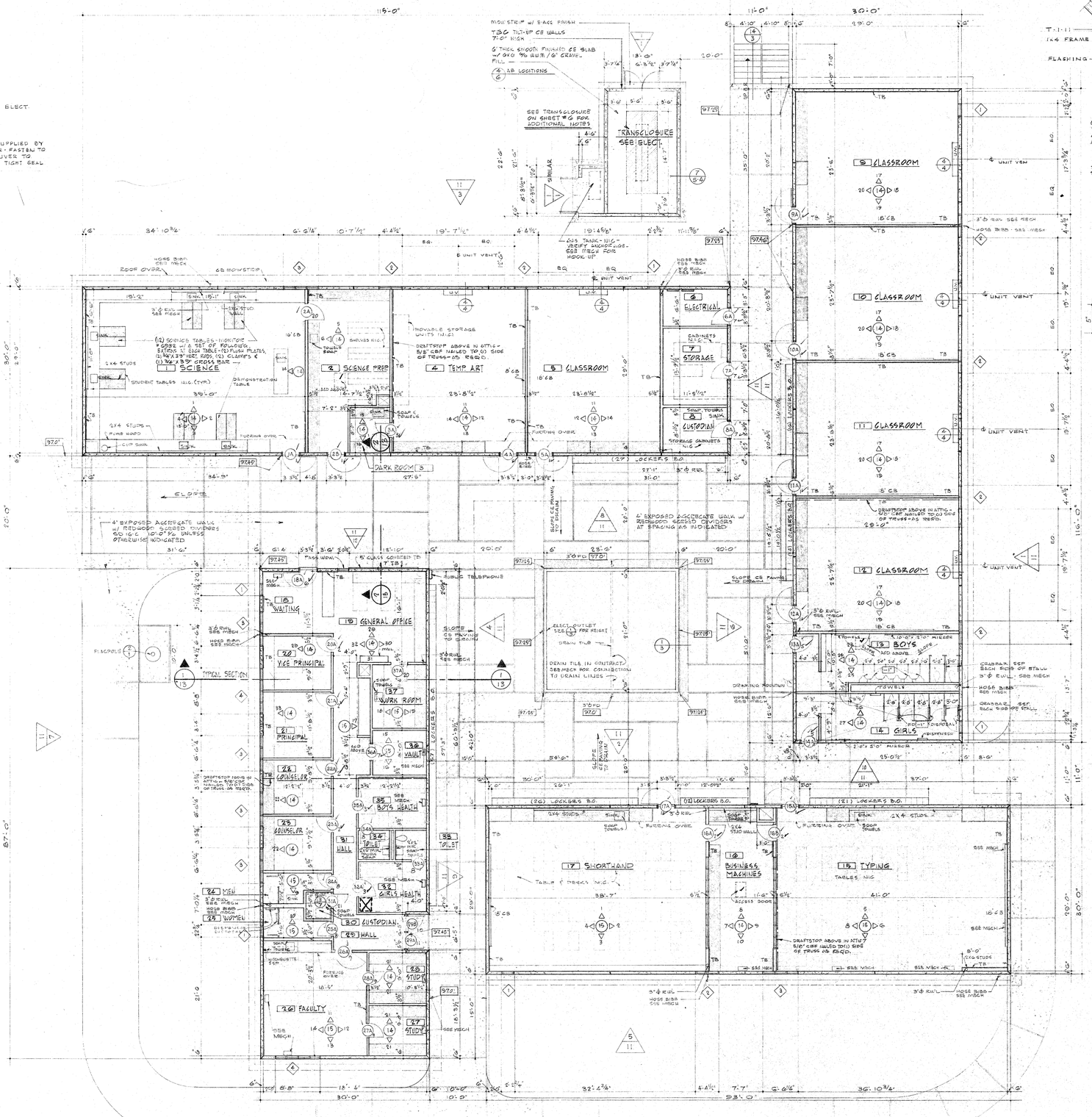
WALL SECTION @ UNIT VENTILATOR (4/4)
SCALE: 1½" = 1'-0"



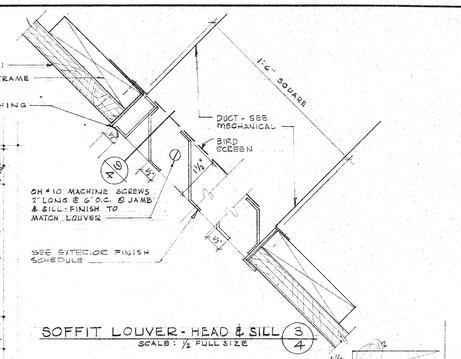
END LOCKER DETAIL (5/4)
SCALE: 1½" = 1'-0"



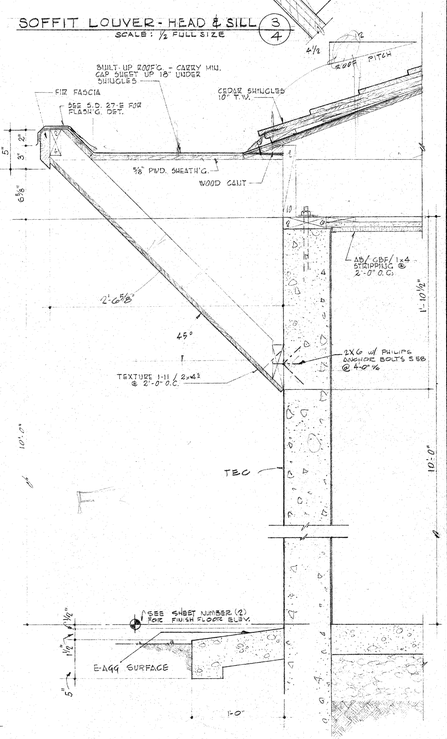
EXTERIOR LOCKER BASE (7/4)
SCALE: 1½" = 1'-0"



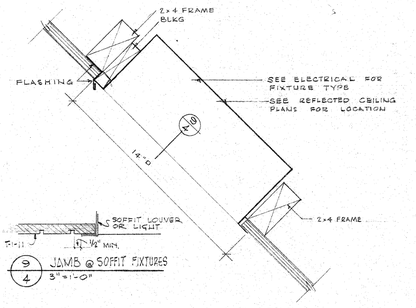
FLOOR PLAN - SECTOR "A"
SCALE: 1/8" = 1'-0"



SOFFIT LOUVER - HEAD & SILL (3/4)
SCALE: ½ FULL SIZE

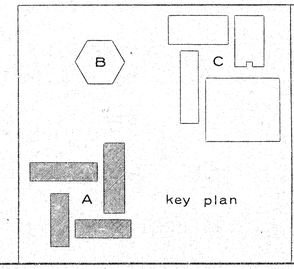


(1/4) TYPICAL WALL SECTION
SCALE 1½" = 1'-0"



(9/4) JAMB @ SOFFIT FIXTURES
3" = 1'-0"

SOFFIT LIGHT (2/4)
SCALE: 3" = 1'-0"



FLOOR PLAN LEGEND

SEE ARCHITECTURAL SHEET #1 FOR: ABBREVIATIONS, DRAFTING SYMBOLS & MATERIAL SYMBOLS

SHADED CABINETS ARE CABINETS WHICH SHALL BE OMITTED IF ALTERNATE #1.18 EXERCISED.

◇ INDICATES WINDOW TYPES - SEE SHEET #8
SEE EXTERIOR ELEVATIONS FOR WINDOW PANEL TYPES

SEE S.D. 44-B FOR TB INSTALLATION ON CB WALL

REGISTERED ARCHITECT — JAMES W. JAMISON — STATE OF WASHINGTON — SEAL

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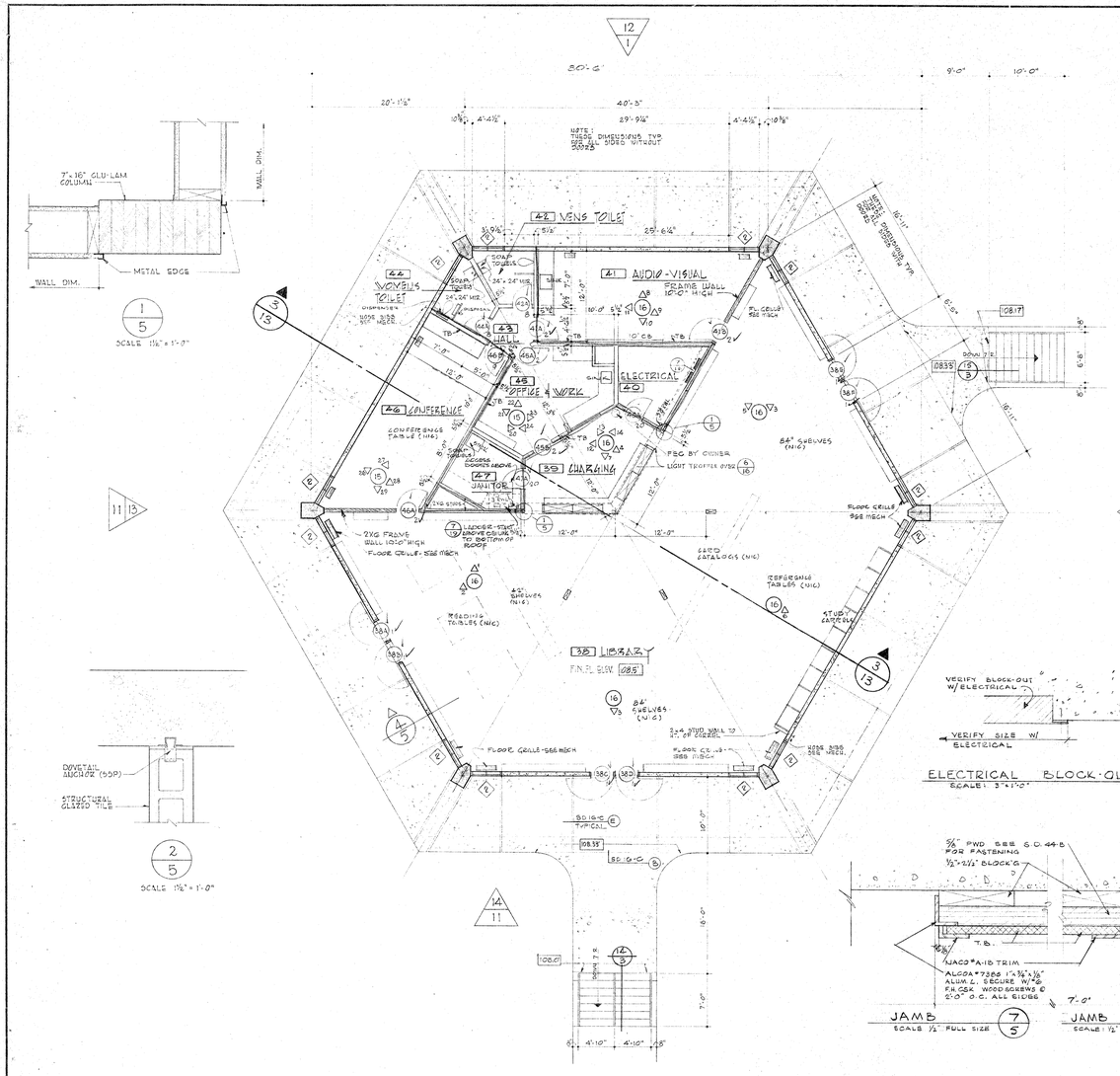
COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

CONTR. NO. 675
REVISED 8-2-69
J. MCCLELLAND & G. TRASK
DRAWN BY: C. BAUGH
DATE 2/3/69
SCALE AS NOTED

DRAWING TITLE
SECTOR "A" FLOOR PLAN
WALL SECTION

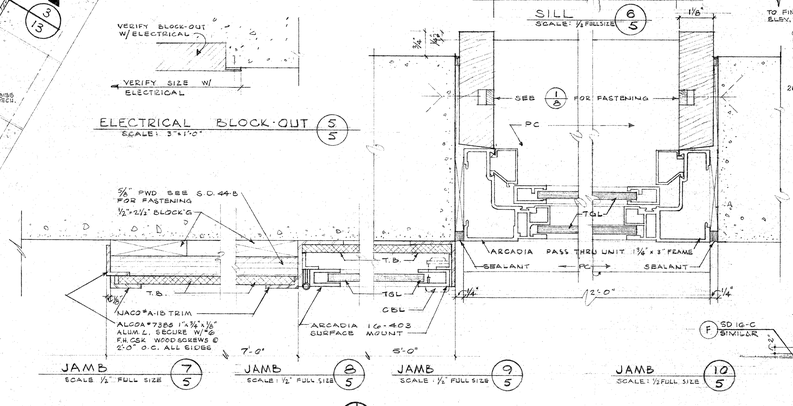
SHEET NO. 4

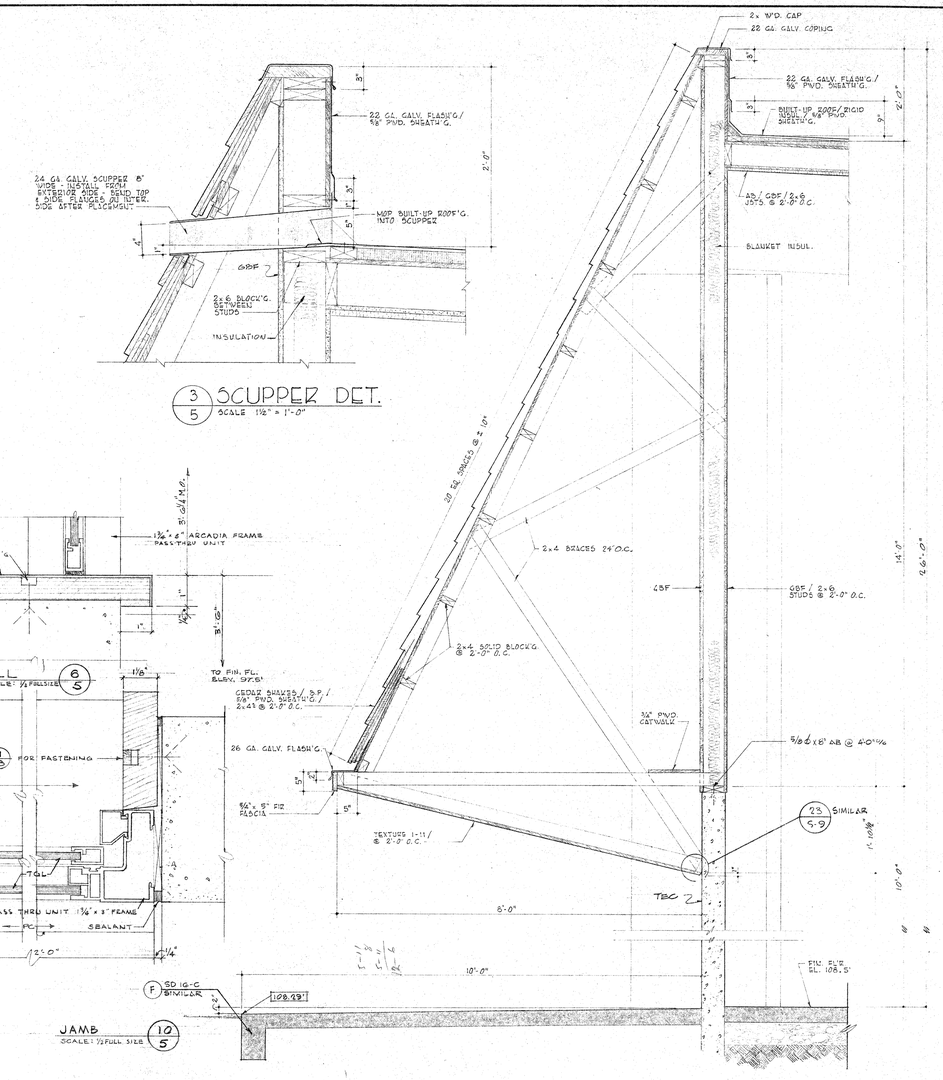


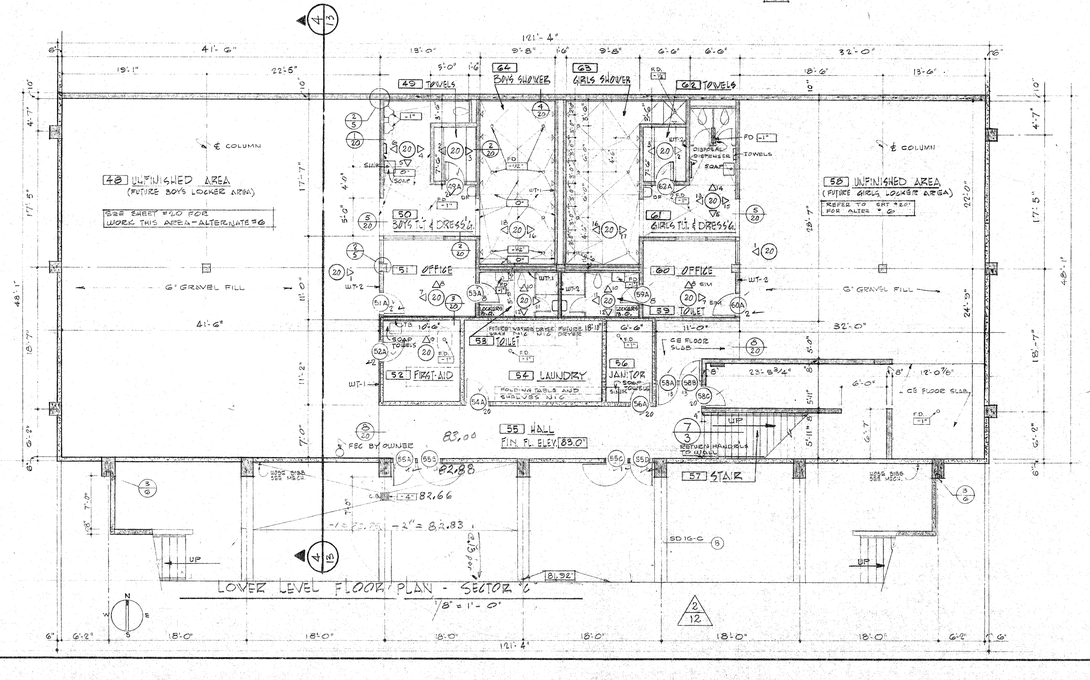
FLOOR PLAN - SECTOR "B"
SCALE 1/8" = 1'-0"

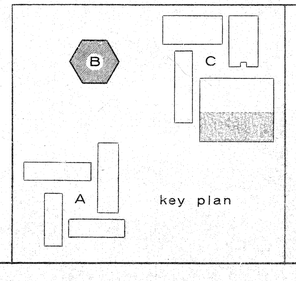
NOTE:

- SEE ARCHITECTURAL SHEET #1 FOR ABBREVIATIONS, DRAFTING & MATERIAL SYMBOLS.
- SEE ALTERNATE #5









REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON
SEAL

DRAWING TITLE
SECTOR "B" FLOOR PLAN
SECTOR "C" LOWER LEVEL PLAN
WALL SECTION

SHEET NO. 5

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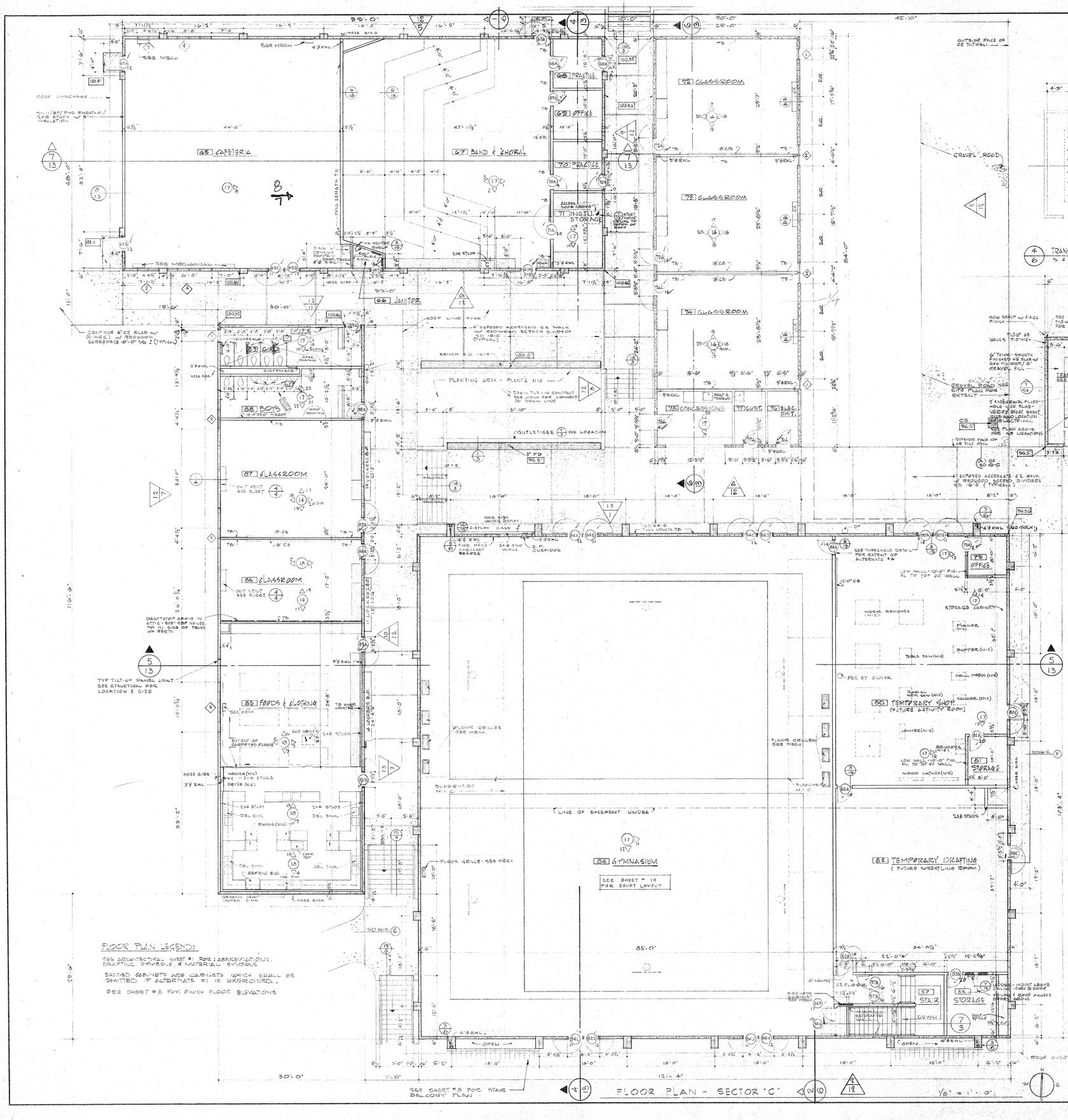
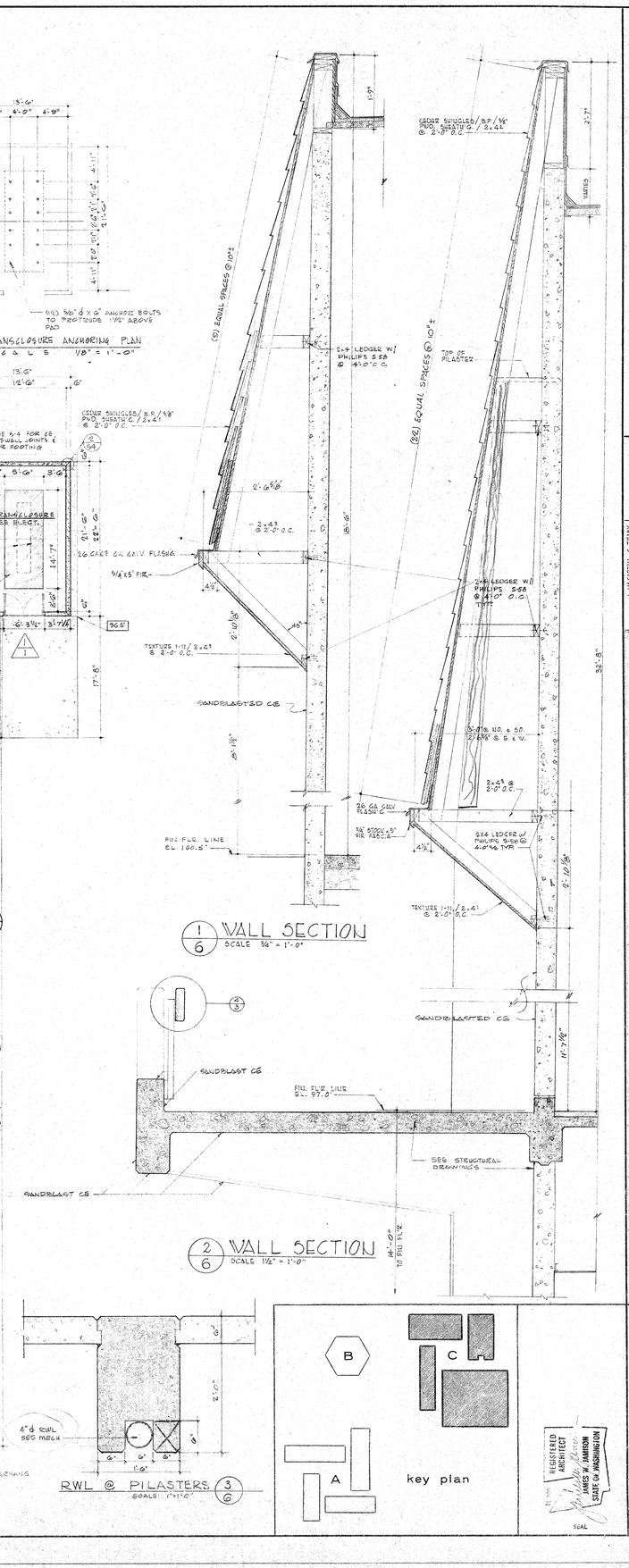
COMM. NO. 876
REVISED: 5-2-69
DRAWN BY: M. CASTELLO, G. TRZSK
CHECKED BY: J. JAMISON
DATE 2/3/69
SCALE AS NOTED

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON





FLOOR PLAN LEGEND:

SEE ARCHITECTURAL SHEET #1 FOR: ABBREVIATIONS, DRAFTING SYMBOLS & MATERIAL SYMBOLS

SHADED CORNERS AND CABINETS WHICH SHALL BE OMITTED IF ALTERNATE #1 IS EXERCISED.

SEE SHEET #3 FOR FINISH FLOOR ELEVATIONS

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COMM. NO. 676
REVISED 5-2-65

DRAWN BY: J. VAUGHTIN, C. FRANK
DATE 2/3/65
SCALE AS NOTED

SCHOOL HIGH
KLICKITAT COUNTY
WASHINGTON

COLUMBIA
SCHOOL DISTRICT 405-17
WHITE SALMON

DRAWING TITLE
SECTOR "C" FLOOR PLAN
WALL SECTIONS

SHEET NO. 5

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON
SEAL

DOOR SCHEDULE

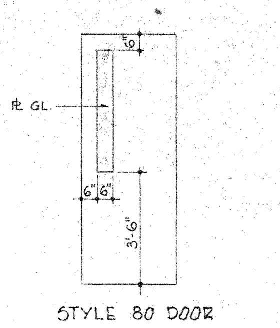
SEE DOOR SCHEDULE NOTES

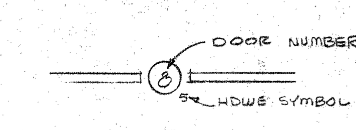
(Sector labels beside the table: SECTOR "A"; SECTOR "B" SEE ALTERNATE #5; SECTOR "C" LOWER LEVEL; SECTOR "C" UPPER LEVEL)

DOOR NUMBER	OPENING SIZE	STYLE (2)	GRILLE OR LOUVER (5)	FRAME MAT.	FRAME FIN.	DOOR MAT.	DOOR FIN.	MULLION	THRESH'D (3)	HDWE. GROUP	DETAIL	REMARKS (4)
1A	3'-0" x 7'-11"	80		M	APE/2C	M	APE/2C	—	TH-2	1	7/8 8/8	
2A	3'-0" x 7'-0"	10				B	EN/3C	—	—	20	16/8	
2B	3'-0" x 7'-11"	80				M	APE/2C	—	TH-2	1	7/8 8/8	
3A	2'-8" x 7'-0"	40				B	EN/3C	—	—	3	13/8	WEATHER TIGHT GASKETS (GST)
4A	3'-0" x 7'-11"	80				M	APE/2C	—	TH-2	1	7/8 8/8	
5A	3'-0" x 7'-11"	80						—		1	7/8 8/8	
6A	3'-0" x 7'-11"	40	G-1					—	4/7	7	7/8 8/8	
7A	3'-0" x 7'-11"	40						—		7	7/8 8/8	UNDERCUT 3/8"
8A	3'-0" x 7'-11"	40						—		7	7/8 8/8	UNDERCUT 3/8"
9A	3'-0" x 7'-11"	80						—	TH-2	1	7/8 8/8	
10A	3'-0" x 7'-11"	80						—		1	7/8 8/8	
11A	3'-0" x 7'-11"	80						—		1	7/8 8/8	
12A	3'-0" x 7'-11"	80						—		1	7/8 8/8	
13A	3'-0" x 7'-11"	40						—	4/7	5	11/8 8/8 SIM	
14A	3'-0" x 7'-11"	40						—		5	11/8 8/8 SIM	
15A	3'-0" x 7'-11"	80						—	TH-2	1	7/8 8/8	
16A	3'-0" x 7'-11"	10				B	EN/3C	—	—	2	16/8	
16B	3'-0" x 7'-11"	10				B	EN/3C	—	—	2	16/8	
17A	3'-0" x 7'-11"	80				M	APE/2C	—	TH-2	3	7/8 8/8	
18A	3'-0" x 7'-11"	10				M	APE/2C	—	4/7	6	7/8 8/8	
20A	2'-8" x 7'-0"	40				B	EN/3C	—	—	2	13/8	
21A	2'-8" x 7'-0"	40						—	—	2	13/8	
22A	2'-8" x 7'-0"	10						—	—	2	13/8	
23A	2'-8" x 7'-0"	10						—	—	2	13/8	
24A	2'-6" x 7'-0"	40						—	—	8	~~13/8~~ 1/4 (uncertain)	
25A	2'-6" x 7'-0"	40						—	—	8	~~13/8~~ 1/4 (uncertain)	
26A	3'-0" x 7'-0"	40						—	—	9	13/8	
27A	2'-8" x 7'-0"	10						—	—	9	13/8	
28A	2'-8" x 7'-0"	10						—	—	9	13/8	
*29A&B	6'-1½" x 7'-11"	10				M	APE/2C	19/8	TH-2	11, 10	18/8, 20/8	
31A	2'-8" x 7'-0"	40				B	EN/3C	—	—	21	13/8	UNDER CUT 3/8"
32A	3'-0" x 7'-0"	40						—	—	3	13/8	
33A	2'-6" x 7'-0"	40						—	—	8	13/8	UNDERCUT 1/2"
34A	2'-6" x 7'-0"	40						—	—	8	13/8	UNDERCUT 1/2"
35A	3'-0" x 7'-0"	40						—	—	3	13/8	
36A	3'-0" x 7'-0"	40						—	—	7	17/8	"B" 1½ HR. LABEL RATED DOOR
37A	3'-0" x 7'-0"	10						—	—	20	13/8	
*38A	6'-1½" x 7'-11"	12				M	APE/2C	M-1	TH-2	1	7/8 8/8	
38B		12								1	7/8 8/8	
*38C	6'-1½" x 7'-11"	12								1	7/8 8/8	
38D		12								1	7/8 8/8	
*38E	6'-1½" x 7'-11"	12						19/8		1	7/8 8/8	
38F		12						19/8		1	7/8 8/8	
40A	2'-8" x 7'-0"	40				B	EN/3C	—	—	20	16/8	UNDERCUT 3/8"
41A	3'-0" x 7'-0"	40						—	—	2	16/8	
41B	3'-0" x 7'-0"	10						—	—	2	16/8	
42A	2'-6" x 7'-0"	40						—	—	8	16/8	
44A	2'-6" x 7'-0"	40						—	—	8	16/8	
45A	2'-6" x 7'-0"	10						—	—	2	16/8	
45B	2'-8" x 7'-0"	10						—	—	2	14/8	UNDERCUT 1"
46A	3'-0" x 7'-0"	10						—	—	2	16 8	
46B	3'-0" x 7'-0"	40						—	—	9	16 8	
47A	2'-8" x 7'-0"	40						—	—	20	14/8	UNDERCUT 3/8"
49A	2'-6" x 7'-0"	50				M	APE/2C	—	—	2	10/8	
51A	2'-8" x 7'-0"	12						—	8/20	2	10/8	
52A	2'-8" x 7'-0"	12						—	8/20	2	9/8 SIM	UNDERCUT 1"
53A	2'-6" x 7'-0"	40						—	—	8	10/8	UNDER CUT 1"
54A	3'-0" x 7'-0"	40						—	—	20	9/8	UNDER CUT 3/8"
*55A	6'-1½" x 7'-0"	40						M-1	TH-2	1	7/8 8/8 SIM	
55B		40						M-1		1	7/8 8/8 SIM	
*55C	6'-1½" x 7'-0"	40						M-5		1	7/8 8/8 SIM	
55D		40						M-5		1	7/8 8/8 SIM	
56A	2'-8" x 7'-0"	40						—	—	20	9/8	UNDERCUT 3/8"
*57A	5'-5½" x 7'-0"	13				B	EN/3C	M-1	—	16	16/8 SIM	
57B		13				B	EN/3C	M-1	—	16	16/8 SIM	
*58A	5'-5½" x 7'-0"	40				M	APE/2C	M-5	—	13	9/8 SIM	
58B		40						M-5	—	13	9/8 SIM	
58C	2'-6" x 7'-0"	40						—	—	20	7/8 SIM	UNDERCUT 3/8"
59A	2'-6" x 7'-0"	40						—	—	8	10/8	UNDERCUT 1"
60A	2'-8" x 7'-0"	12						—	8/20	2	10/8	
62A	2'-6" x 7'-0"	50						—	—	2	10/8	
65A	3'-0" x 7'-11"	12						—	TH-2	12	7/8 8/8	
65B	3'-0" x 7'-11"	12						—		12	7/8 8/8	
*65C	6'-1½" x 7'-11"	12						M-5		11	7/8 8/8	
65D		12						M-5		12	7/8 8/8	
66A	2'-6" x 7'-11"	40						—	4/7	4	7/8 8/8	UNDERCUT 1/2"
67A	3'-6" x 7'-11"	80						—	TH-2	1	7/8 8/8	
67B	3'-0" x 7'-11"	80						—		1	7/8 8/8	
68A	2'-8" x 7'-11"	12				B	EN/3C	—	—	9	22/8	
68B	3'-0" x 7'-11"	40				M	APE/2C	—	4/7	1	21/8	
69A	2'-8" x 7'-11"	12				B	EN/3C	—	—	2	16/8	
70A	2'-8" x 7'-11"	70				B	EN/3C	—	—	9	22/8	
70B	3'-0" x 7'-11"	40				M	APE/2C	—	4/7	1	21/8	
71A	3'-6" x 7'-0"	12				B	EN/3C	—	—	20	16/8	
71B	DELETED											
72A	3'-0" x 7'-11"	80		M	APE/2C	M	APE/2C	—	TH-2	1	7/8 8/8	
72B	DELETED											
73A	3'-0" x 7'-11"	80		M	APE/2C	M	APE/2C	—	TH-2	1	7/8 8/8	
73B	DELETED											
74A	3'-0" x 7'-11"	80		M	APE/2C	M	APE/2C	—	TH-2	1	7/8 8/8	
74B	DELETED											
74C												
74D												
75A												
75B												
76A	3'-0" x 7'-0"	40	G-6	M	APE/2C	M	APE/2C	—	4/7	4	7/8 8/8	
77A	3'-0" x 7'-0"	40						—		4	7/8 8/8	UNDER CUT 1"
78A	3'-0" x 7'-0"	40						—		4	7/8 8/8	UNDER CUT 1"
79A	3'-0" x 7'-0"	10				B	EN/3C	—	—	2	16/8	
*80A	6'-1½" x 7'-11"	40				M	APE/2C	M-5 19/8	TH-2	12	7/8 8/8	
80B		40				M	APE/2C	M-5 19/8	TH-2	11	7/8 8/8	
81A	3'-0" x 7'-0"	40				B	EN/3C	—	—	20	16/8	
82A	3'-0" x 7'-0"	40						—	—	15	14/8	UNDERCUT DOOR 2¼" IF ALTER #4 IS NOT EXERCIZED
82B	3'-0" x 7'-0"	40						—	—	14	14/8	
83A	3'-0" x 7'-0"	40						—	—	20	14/8	
*84A	6'-1½" x 7'-11"	40				M	APE/2C	M-1	TH-2	12	7/8 8/8	
84B		40						M-1		11	7/8 8/8	
*84C	6'-1½" x 7'-11"	40						M-5		12	7/8 8/8	
84D		40						M-5		11	7/8 8/8	
84E	3'-0" x 7'-0"	40				B	EN/3C	—	—	14	14/8	
*84F	5'-6" x 7'-0"	40						—	—	17	14/8 SIM	
84G		40								18	14/8 SIM	
*84H	6'-1½" x 7'-11"	40				M	APE/2C	M-1	TH-2	12	7/8 8/8	
84J		40						M-1		11	7/8 8/8	
*84K	6'-1½" x 7'-11"	40						M-5		12	7/8 8/8	
84L		40						M-5		11	7/8 8/8	
85A	3'-0" x 7'-0"	80						—		1	7/8 8/8	
85B	3'-0" x 7'-0"	80						—		1	7/8 8/8	
86A	3'-0" x 7'-0"	80						—		1	7/8 8/8	
87A	3'-0" x 7'-0"	80						—		1	7/8 8/8	
88A	3'-0" x 7'-0"	40						—	4/7	6	11/8	
89A	3'-0" x 7'-0"	40						—		6	11/8	
80C	3'-0" x 7'-0"	40						—	TH-2	11	7/8 8/8	
82C	3'-0" x 7'-0"	40						—		1	7/8 8/8	

NOTE: SEE SHEET #20 FOR DOOR IN ALTERNATE #6

DOOR NUMBERING SYMBOL





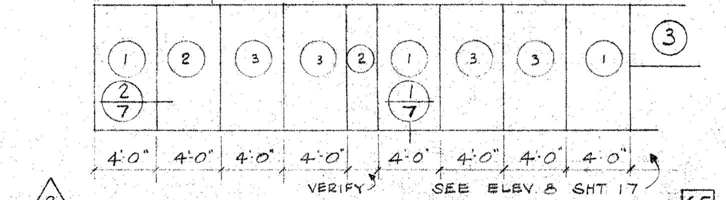
SEE FLOOR PLANS FOR DOOR NUMBERS - CENTERED IN DOOR OPENING IN SYMBOL SHOWN ABOVE

DOOR SCHEDULE NOTES

1. * INDICATES A PAIR OF DOORS.
2. SEE DETAIL ABOVE & S.D. 50-A FOR DOOR STYLES.
3. SEE S.D. 71-B FOR THRESHOLDS. & DTL 4/7
4. SEE S.D. 52-A FOR HINGE REINFORCEMENT.
5. SEE S.D. 50-A FOR DOOR GRILLES

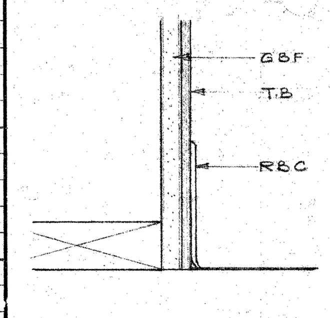
FINISH SCHEDULE NOTES

1. ALL CERAMIC FLOOR TILE 1"x1". ALL CERAMIC WALL TILE 4¼"x4¼" (UOS). SEE C.T. DETAILS BELOW.
2. PAINT METAL RELITE FRAMES APE/2C TO MATCH ADJACENT DOOR FRAMES.
3. ALL INTERIOR EXPOSED POURED IN PLACE VERTICAL CONCRETE SURFACES TO RECEIVE TPL FINISH EXCEPT RMS. #90, 91, 93, 95 & 97. ROOMS #92, 94, 96 & 98 TO RECEIVE TPL UNDER ALT. #6 ONLY.
4. INTERIOR WALL MECHANICAL GRILLES TO HAVE PRIME COAT & EN/2C TO MATCH ADJACENT WALL SURFACES.
5. EXPOSED DUCT WORK, PIPING, ELECTRICAL CONDUIT & BOXES APE/2C. IN FINISHED AREAS ONLY.
6. BASKETBALL STRUCTURAL METAL APE/2C. SEE SHEET #20 FOR GAME FLOOR LINES. BULB TEES APE/2C. BEAMS & PURLINS PWS/1C
7. SEE SHT. #8 FOR INTERIOR WDW TRIM - TO BE F W/ NV/4C
8. CE AT CARPETS TO RECEIVE COMBINATION SURFACE HARDENER AND CURING COMPOUND.

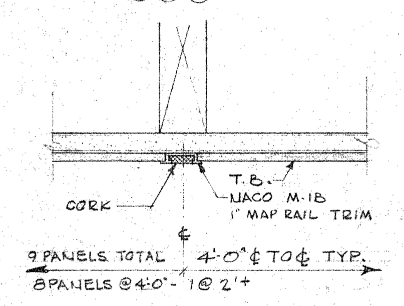


8 CAFETERIA 65 NO SCALE

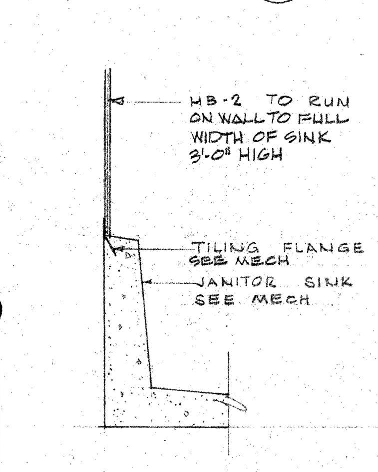
COLOR OF T.B. AS SELECTED BY ARCHITECT FROM (3) COLORS. APPLY IN PATTERN AS SHOWN ABOVE BY NUMBERS (1)(2)(3)



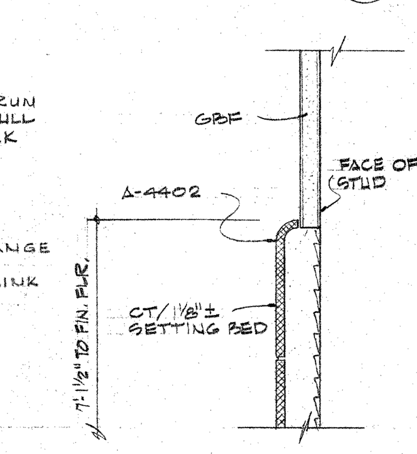
BASE @ T.B. 1/7 SCALE: 3"=1'-0"



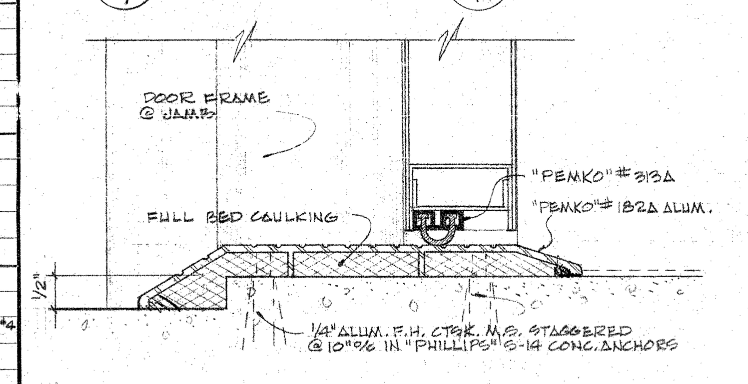
MAP RAIL TRIM 2/7 SCALE: 3"=1'-0"



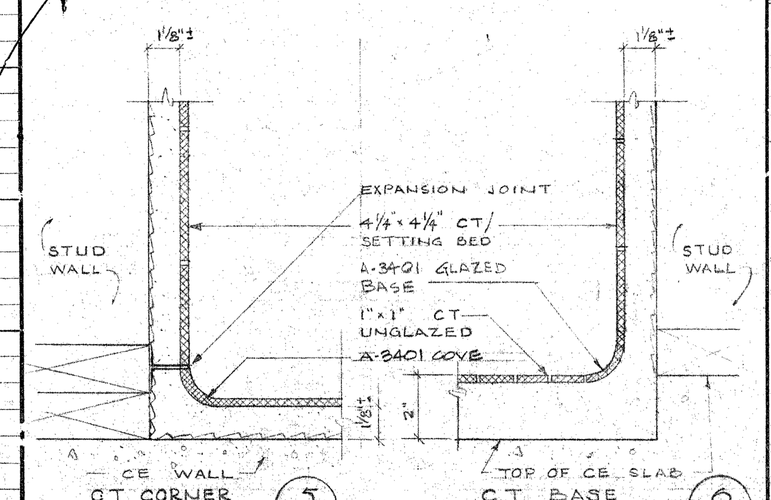
JANITOR SINK 3/7 SCALE: 1½"=1'-0"



CT CAP 7/7 3" = 1'-0"



TH-5 THRESHOLD 4/7 ½ FULL SIZE



CT CORNER 5/7 SCALE: 3"=1'-0"

CT BASE 6/7 SCALE: 3"=1'-0"

Item No. 10: Sheet 7 - Detail 4: Full bed of caulking is not required under Threshold TH-5. Bed threshold on two (2) beads of sealant at each edge of threshold. Sealant as specified in Section ~~7H-2~~a.

ROOM FINISH SCHEDULE

SEE FINISH SCHEDULE NOTES

SECTOR	ROOM NUMBER	ROOM NAME	FLOOR MAT.	FLOOR FIN.	BASE MAT.	BASE FIN.	WAINSCOT MAT.	WAINSCOT FIN.	WAINSCOT HEIGHT	INTERIOR WALLS MAT.	INTERIOR WALLS FIN.	INTERIOR WALLS BACK'G.	EXTERIOR WALLS MAT.	EXTERIOR WALLS FIN.	EXTERIOR WALLS BACK'G.	CEILING MAT.	CEILING FIN.	CEILING HEIGHT	(7)(3) REMARKS
SECTOR A	1	SCIENCE	VAT		RBC					GBF	EN/3C		GBF / CE	EN/3C / ACP/2C	CE	AB-1		10'-0"	
	2	SCIENCE PREP.																	
	3	DARKROOM																	
	4	TEMPORARY ART																	
	5	CLASSROOM																	
	6	ELECTRICAL	CE	CSH	RB											GBF	EN/2C		
	7	STORAGE																	
	8	CUSTODIAN																	(3/7)
	9	CLASSROOM	VAT		RBC											AB-1			
	10	CLASSROOM																	
	11	CLASSROOM																	
	12	CLASSROOM																	
	13	BOYS	C.T.		C.T.		CT		7'-1½"		REN/2C		CE	REN/2C					(1) CT WAINS. @ ALL WALLS
	14	GIRLS	C.T.		C.T.		CT		7'-1½"		REN/2C		CE	REN/2C					(1) CT WAINS. @ ALL WALLS
	15	TYPING	VAT		RBC						EN/3C		GBF / CE	EN/3C / ACP/2C	CE				(2)
	16	BUSINESS MACHINES																	(2)
	17	SHORTHAND																	(2)
	18	WAITING											CE	ACP/2C					
	19	GENERAL OFFICE																	
	20	VICE PRINCIPAL																	
	21	PRINCIPAL																	
	22	COUNSELOR																	
	23	COUNSELOR																	
	24	MEN	C.T.		C.T.		CT		7'-1½"		REN/2C			REN/2C					(1) CT WAINS. @ ALL WALLS
	25	WOMEN	C.T.		C.T.		CT		7'-1½"		REN/2C			REN/2C					(1) CT WAINS. @ ALL WALLS
	26	FACULTY	VAT		RBC						EN/3C			ACP/2C					
	27	STUDY																	
	28	STUDY																	
	29	HALL																	
	30	CUSTODIAN	CE	CSH												GBF	EN/2C		(3/7)
	31	HALL	VAT													AB-1			
	32	GIRL'S HEALTH											CE	ACP/2C					
	33	TOILET											CE	ACP/2C					
	34	TOILET																	
	35	BOY'S HEALTH											CE	ACP/2C					
	36	VAULT								GBF-2									AB APPLIED TO GBF-2 @ CEILING
	37	WORK ROOM								GBF									
SECTOR B SEE ALTERNATE #5	38	LIBRARY	CARPET		RBC								CE / GBF	ACP/2C / EN/3C				VARIES	GLU-LAM COLUMNS & BEAMS PWS/1C TRIM NV/4C (8)
	39	CHARGING	CARPET															VARIES	(2) (8)
	40	ELECTRICAL	VAT													GBF	EN/2C	10'-0"	
	41	AUDIO-VISUAL	VAT										CE / GBF	ACP/2C / EN/3C		AB-1		VARIES	GLU-LAM BEAMS PWS/1C
	42	MEN'S TOILET	C.T.		C.T.		CT		7'-1½"		REN/2C		CE	REN/2C				10'-0"	(1) CT WAINS. @ ALL WALLS
	43	HALL	VAT		RBC						EN/3C							10'-0"	
	44	WOMEN'S TOILET	C.T.		C.T.		CT		7'-1½"		REN/2C		CE	REN/2C				10'-0"	(1) CT WAINS @ ALL WALLS
	45	OFFICE & WORK	VAT		RBC						EN/3C							VARIES	
	46	CONFERENCE	VAT		RBC								CE / GBF	ACP/2C / EN/3C				VARIES	GLU-LAM BEAMS PWS/1C
	47	JANITOR	VAT		RBC											GBF	EN/2C	10'-0"	(3/7)
SECTOR C	48	UNFINISHED AREA	GRAVEL							WT-1 / WT-2		LWT	CE			CE		12'-6"±	
	49	TOWELS	C.T.		WT-2					WT-2						HB-4		10'-0"	(1)
	50	BOY'S TOILET & DRESSING	C.T.		WT-1 / WT-2					WT-2			WT-1		CE				(1)(2)
	51	OFFICE	CE	CSH						WT-1 / WT-2		LWT							(1)(2)
	52	FIRST AID	CE	CSH						LWT									
	53	TOILET	C.T.		WT-1 / WT-2					WT-1 / WT-2		LWT							
	54	LAUNDRY	CE	CSH						LWT	ACP/2C								
	55	HALL											CE	ACP/2C					
	56	JANITOR																	(3/7)
	57	STAIR								CE / HB-1	ACP/2C	GBF	CE	ACP/2C		AB-1		10'-0"	CEILING HEIGHT GIVEN FROM GYM FLOOR
	58	UNFINISHED AREA	GRAVEL / CE	CSH						WT-2			CE	ACP/2C		CE		12'-6"	
	59	TOILET	C.T.		WT-1 / WT-2					WT-1 / WT-2		LWT				HB-4		10'-0"	
	60	OFFICE	CE	CSH						WT-2									
	61	GIRL'S TOILET & DRESSING	C.T.										WT-1		CE				
	62	TOWELS			WT-2														
	63	GIRL'S SHOWER			WT-1 / WT-2								WT-1		CE				
	64	BOY'S SHOWER			WT-1 / WT-2								WT-1		CE				
	65	CAFETERIA	VAT		RBC					GBF	EN/3C		GBF / CE	EN/3C / ACP/2C	2x6 STUDS	AB-1		17'-0"	GLU-LAM BEAMS PWS/1C
	66	JANITOR	CE	CSH									CE	ACP/2C		GBF	EN/2C	10'-0"	(3/7)
	67	BAND & CHORAL	VAT													AB-1		12'-0"	RISERS RBC TREADS VAT W/PRE-FORMED RUBBER NOSING
	68	PRACTICE																10'-0"	
	69	OFFICE																	
	70	PRACTICE																	
	71	INSTRUMENT STORAGE																	
	72	CLASSROOM																	
	73	CLASSROOM																	
	74	CLASSROOM																	
	75	DELETED																	
	76	ELECTRICAL DISTRIBUTION	CE	CSH	RBC					GBF	EN/3C		CE	ACP/2C		GBF	EN/2C	10'-0"	
	77	CUSTODIAN														GBF	EN/2C	10'-0"	(3/7)
	78	CONCESSIONS	VAT													AB-1		10'-0"	
	79	OFFICE	3/4 PWD / PF	P/2C															SEE ALTER. #2 FOR TEMP. FLR & PF
	80	TEMPORARY SHOP	3/4 PWD / PF	P/2C			HB-1		7'-1½"?							TECTUM	RBP/1C	VARIES	HB ON STUD WALL BEAMS & PURLINS PWS/1C
	81	STORAGE	3/4 PWD / PF	P/2C															SEE ALTER. #2 FOR TEMP FLR & PF
	82	TEMPORARY DRAFTING	PF	FPR/3C			HB-1		7'-1½"							TECTUM	RBP/1C	VARIES	BEAMS & PURLINS PWS/1C HB ON STUD WALL
	83	STORAGE	CE	CSH												GBF	EN/2C	10'-0"	
	84	GYMNASIUM	PF	FPR/3C			HB-1		7'-1½"							TECTUM	RBP/1C	VARIES	(6) BEAMS & PURLINS PWS/1C HB ON STUD WALL (5)
	85	FOODS & CLOTHING	VAT / CARPET										GBF / CE	EN/3C / ACP/2C		AB-1		10'-0"	(8)
	86	CLASSROOM	VAT										CE	ACP/2C					
	87	CLASSROOM	VAT											ACP/2C					
	88	BOYS	C.T.		C.T.		CT		7'-1½"		REN/2C			REN/2C					(1) CT WAINS. @ ALL WALLS
	89	GIRLS	C.T.		C.T.		CT		7'-1½"		REN/2C			REN/2C					(1) CT WAINS. @ ALL WALLS
SECTOR "C" ALTERNATE #6 SEE SHEET #20	90	STORAGE	CE	CSH						LWT						CE		12'-6"	(3)
	91	EQUIPMENT DRYING									ACP/2C			ACP/2C		CE	ACP/2C	12'-6"	
	92	BOYS LOCKER			C.T.						ACP/2C			ACP/2C		HB-4		10'-0"	
	93	STORAGE																12'-6"	
	94	ISSUE									ACP/2C			ACP/2C		CE	ACP/2C	12'-6"	
	95	MECH. & ELECT. ROOM														CE		12'-6"	
	96	ISSUE									ACP/2C			ACP/2C		CE	ACP/2C	12'-6"	
	97	STORAGE														CE		12'-6"	
	98	GIRLS LOCKER			C.T.					LWT / CE	ACP/2C / ACP/2C			ACP/2C		HB-4		10'-0"	

EXTERIOR FINISH SCHEDULE

MATERIAL	FINISH	MATERIAL	FINISH
CE PILASTERS (TEC)	GLZ-1	METAL DOORS & FRAMES	APE/2C
CE WALLS (TEC)	GLZ-1	MECHANICAL ROOF MOUNTED UNITS	FACTORY
CEDAR SHAKES	NO FINISH	METAL FLASHING	APE/3C
T 1-11 SOFFITS & SIDING	PWS/2C	METAL MECHANICAL LOUVERS	FACTORY
WOOD BENCHES	PWS/2C	METAL HAND RAILS	APE/3C
WOOD HANDRAILS	PWS/2C	TRANSCLOSURE DOORS	PWS/2C (APE/3C ON METAL)

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COMM. NO. 676
REVISED 5-2-69
DRAWN BY: G. TRASK, C. BROSH
DATE 2/3/69
SCALE AS NOTED

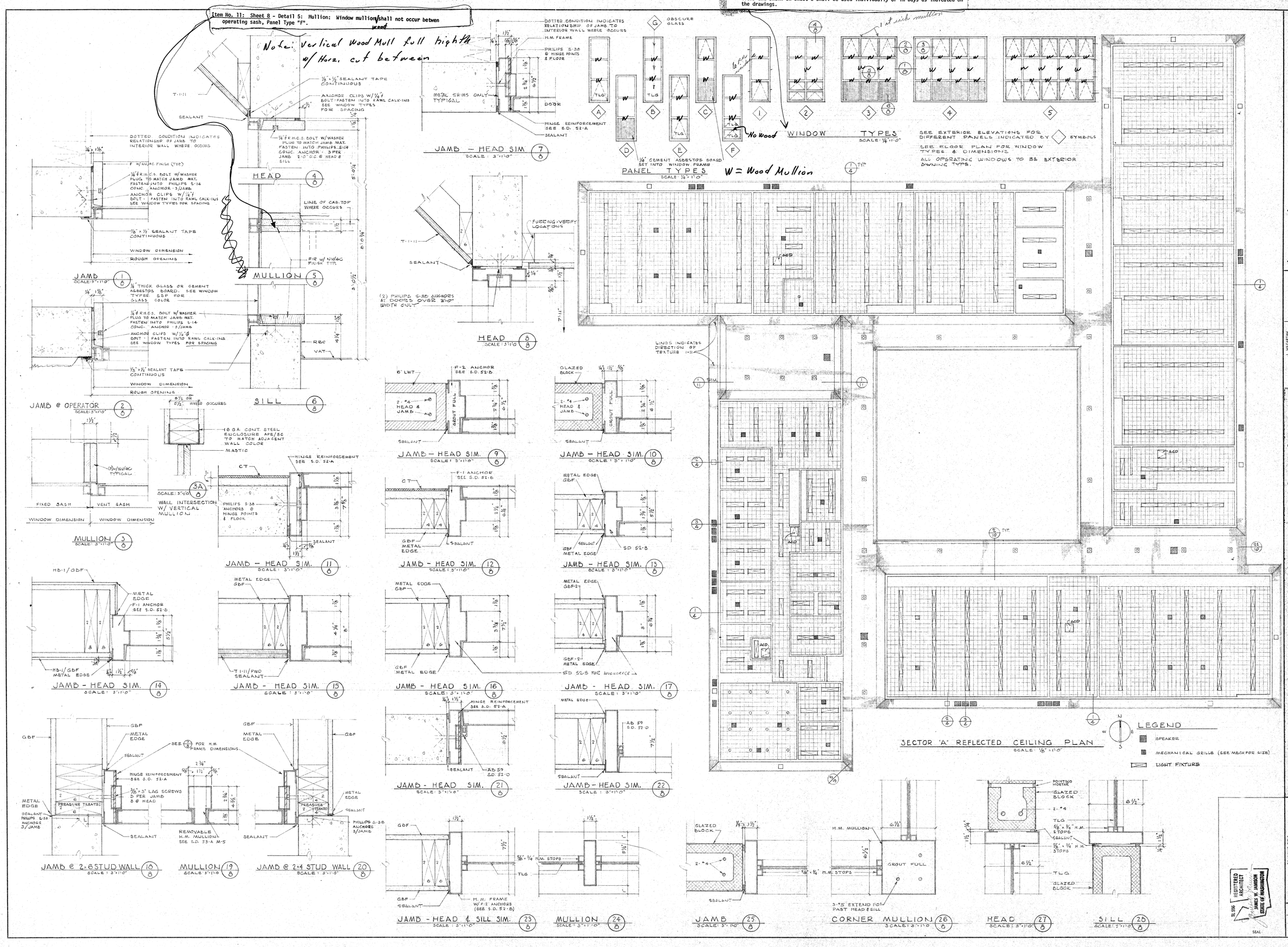
COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON

DRAWING TITLE
DOOR, ROOM FINISH & EXTERIOR FINISH SCHEDULES

SHEET NO. 7

Item No. 11: Sheet 8 - Detail 5: Mullion: Window mullion/wood shall not occur betwen operating sash, Panel Type "F".

Item No. 12: Sheet 8 - Window Types: The window type Symbol shown does not appear on the elevations of the building. Panel type symbols as indicated on the elevations and shown on Sheet 8 shall be used individually or in bays as indicated on the drawings.



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3223 S. W. harbor drive
portland 1, oregon · 228-9468

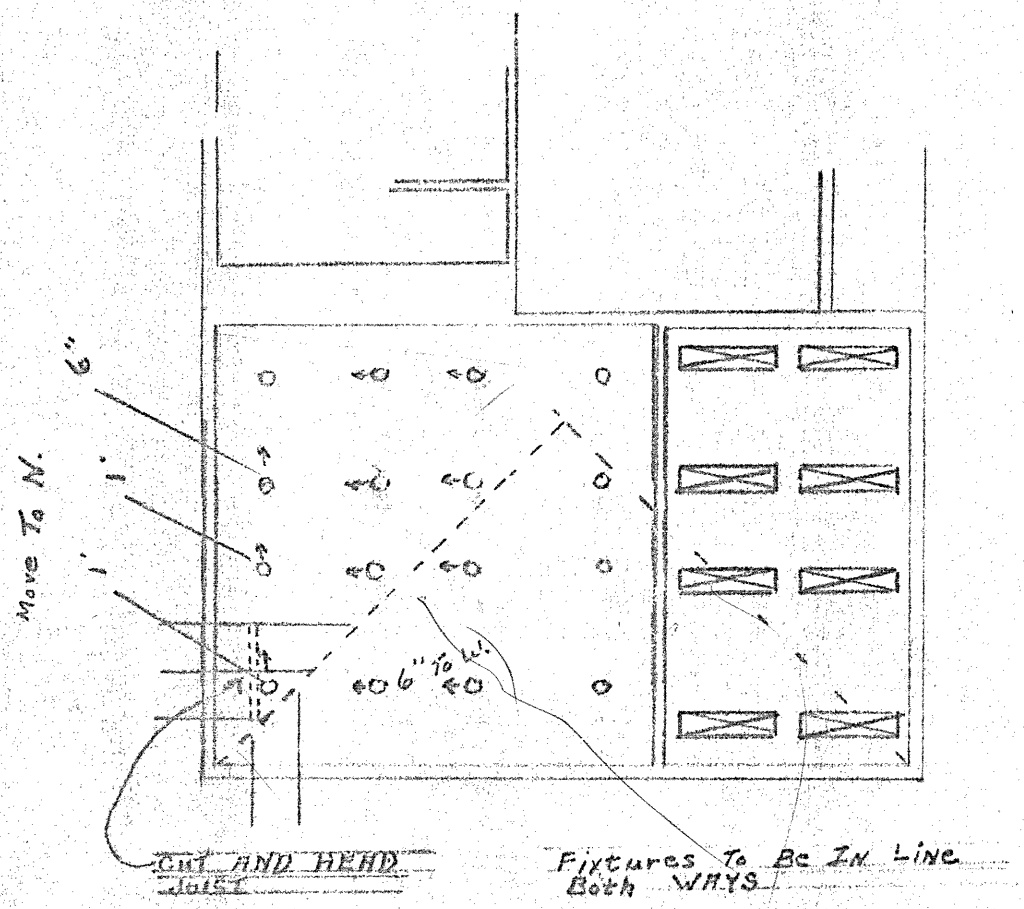
COMM. NO. 676
REVISED 5-2-69
DRAWN BY: J. McCARTAN C. BROSH
DATE 2/3/69
SCALE AS NOTED

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON

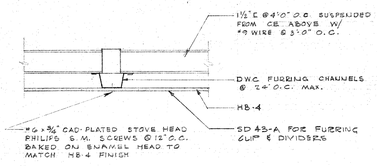
DRAWING TITLE
SECTOR 'A' REFLECTED CEIL'G. PLAN
DOOR & WINDOW DETAILS

SHEET NO.
8

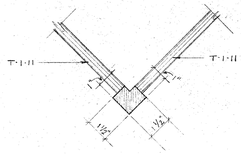
REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
TL 556
SEAL



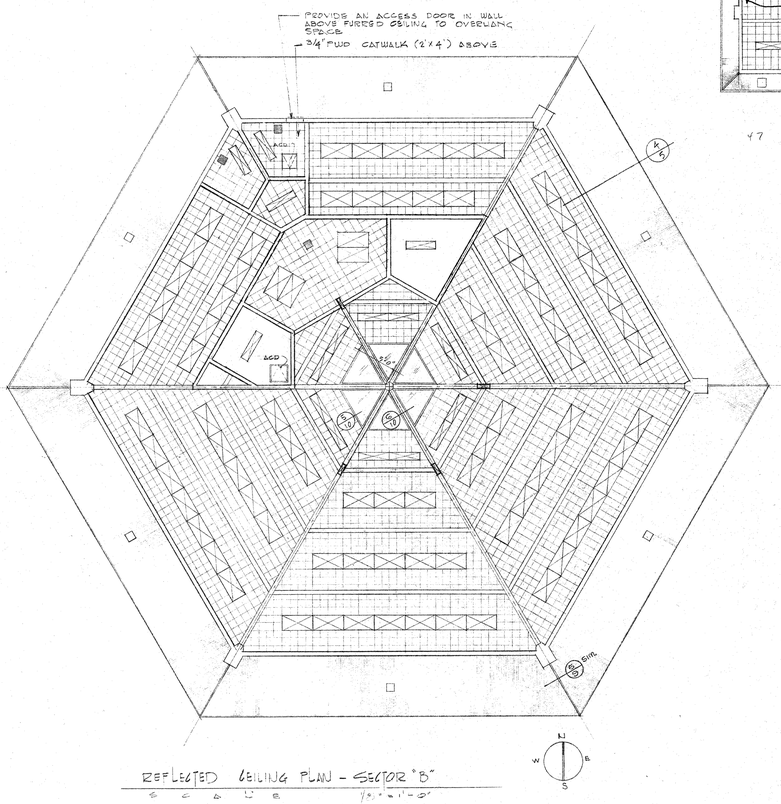
FACULTY ROOM #26



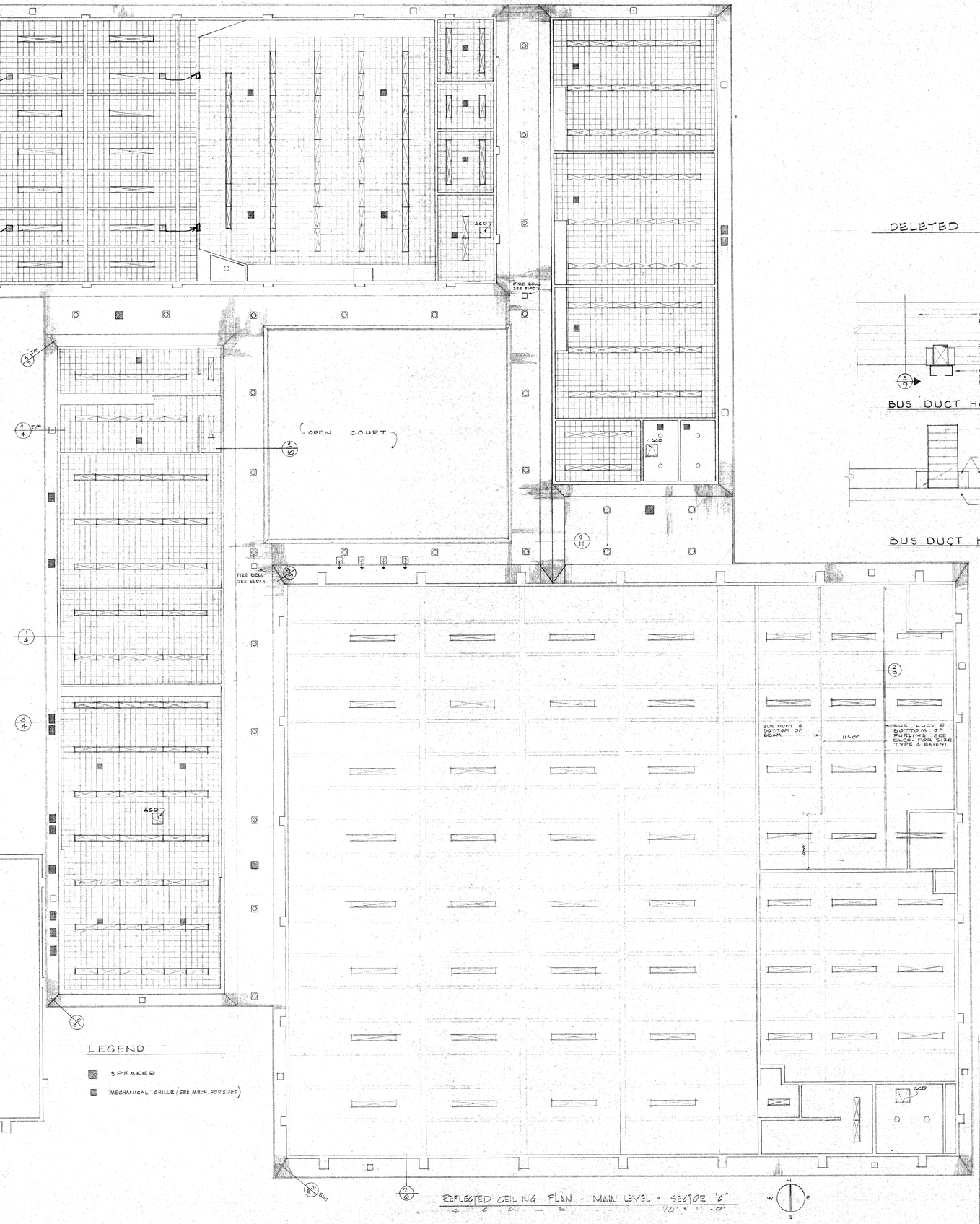
SUSPENDED CEILING 4/9
SCALE: 3"=1'-0"



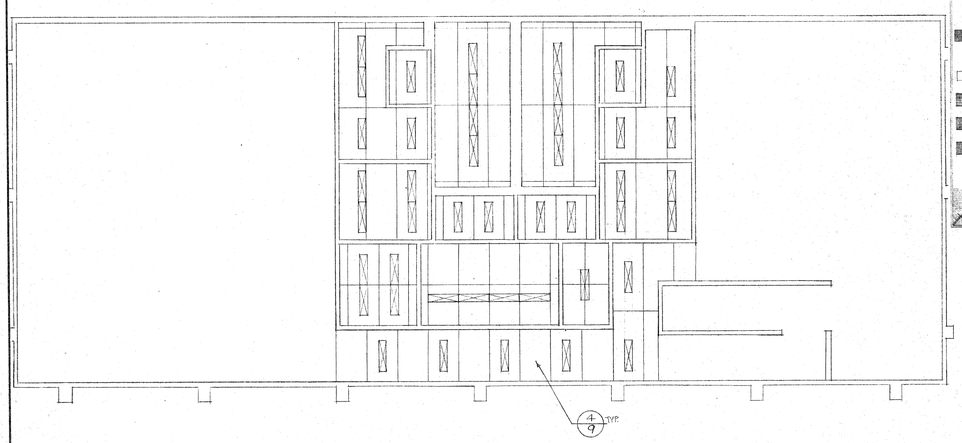
SOFFIT TRIM 5/9
SCALE: 3"=1'-0"



REFLECTED CEILING PLAN - SECTOR "B"
SCALE 1/8" = 1'-0"



REFLECTED CEILING PLAN - MAIN LEVEL - SECTOR "C"
SCALE 1/8" = 1'-0"

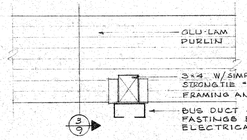


REFLECTED CEILING PLAN @ LOWER LEVEL - SECTOR "C"
SCALE 1/8" = 1'-0"

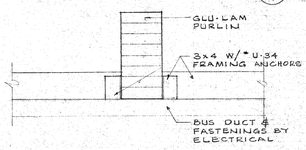
LEGEND

- SPEAKER
- MECHANICAL GRILLE (SEE MECH. FOR SIZES)

DELETED 1/9



BUS DUCT HANGER 2/9



BUS DUCT HANGER 3/9

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3223 S.W. harbor drive
portland 1, oregon • 228-9468

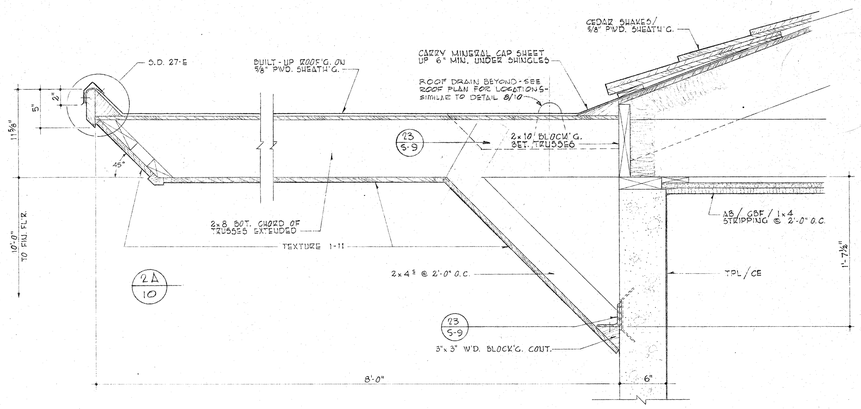
COMM. NO. 676
REVISED 8-2-69
DRAWN BY: C. VAN SETTEN
DATE 12-5-68
SCALE AS NOTED

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

DRAWING TITLE
SECTOR "B" & SECTOR "C"
REFLECTED CEILING PLANS

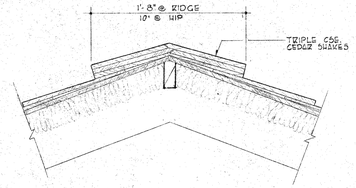
SHEET NO. 9

REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
SEAL

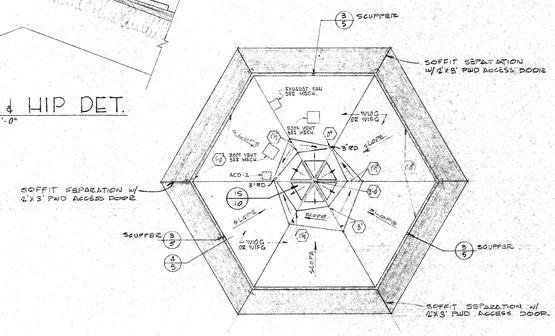


2A/10

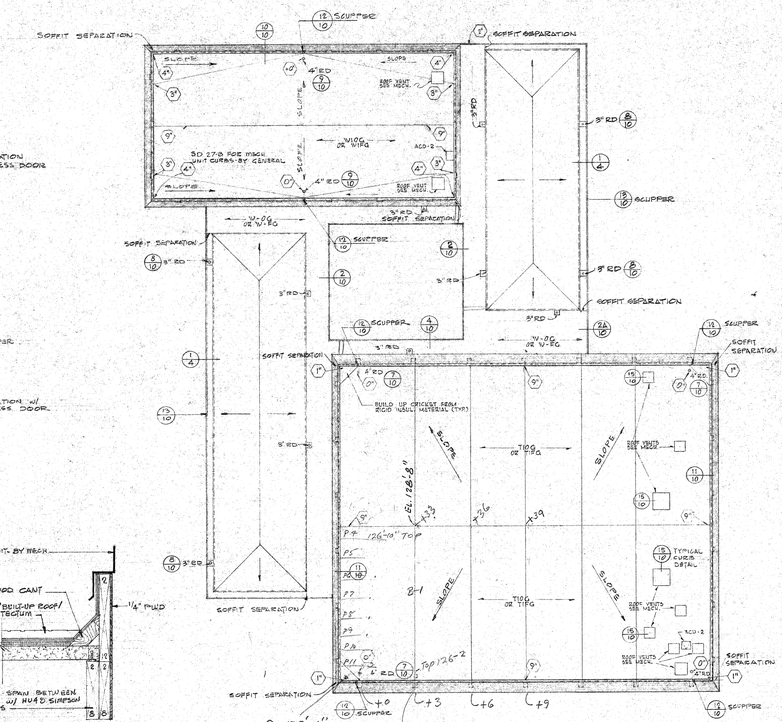
2/10 SCALE 1½" = 1'-0"



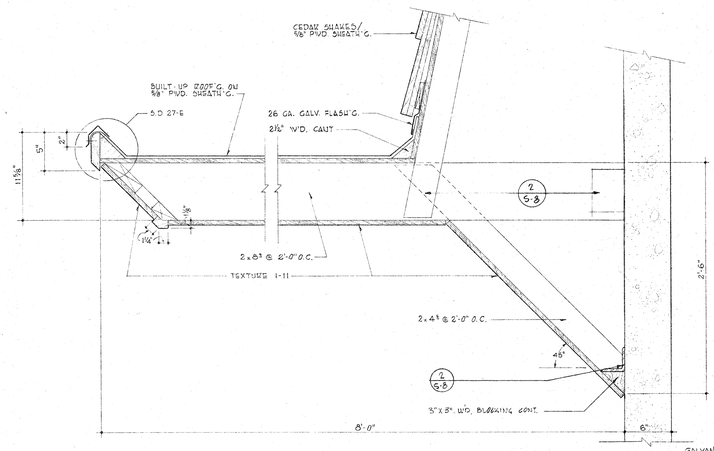
1/10 RIDGE & HIP DET.
SCALE 1½" = 1'-0"



SECTOR "B" ROOF PLAN
SCALE 1" = 20'-0"



SECTOR "C" ROOF PLAN
SCALE 1" = 20'-0"



4/10 SCALE 1½" = 1'-0"

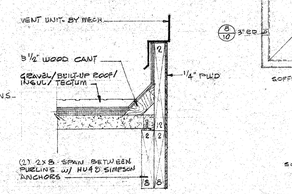
3/10 DELETED

GENERAL ROOF PLAN NOTES:

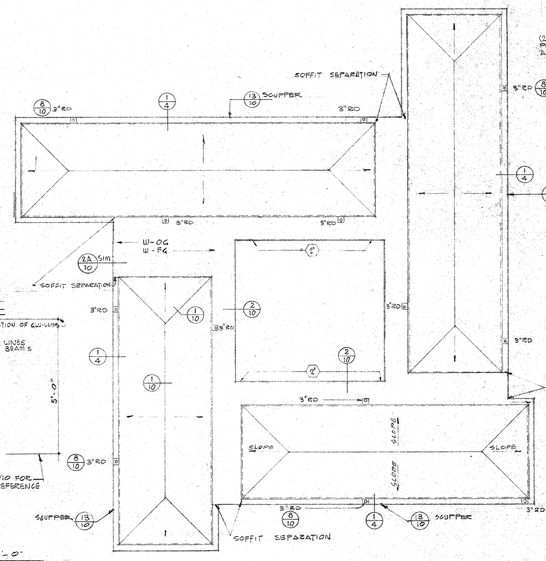
— SEE SD27B FOR MECH UNIT CURBS BY GENERAL

— ROOF DRAINS ARE AT A CONSTANT PERCENTAGE BELOW OR ⊙. ROOF ELEVATIONS ARE INDICATED AS DISTANCE ABOVE THE ROOF ELEVATION AT ROOF DRAIN.

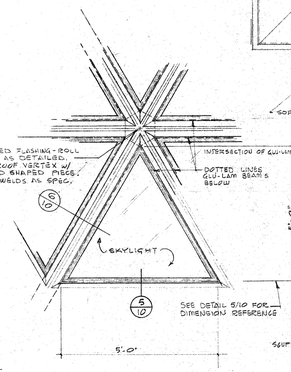
— SEE FLOOR PLANS FOR ATTIC FIRE SEPARATIONS. SOFFIT SEPARATIONS OF ½" EXTERIOR GRADE PWD AT LOCATIONS SHOWN ON ROOF PLAN.



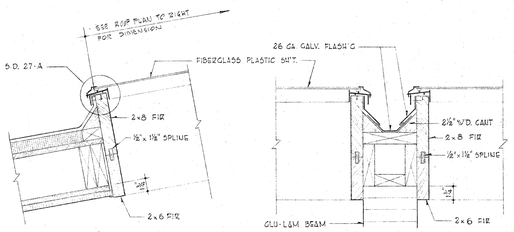
15/10 ROOF VENT BASE @ TECTUM ROOF
SCALE 1½" = 1'-0"



SECTOR "A" ROOF PLAN
SCALE 1" = 20'-0"



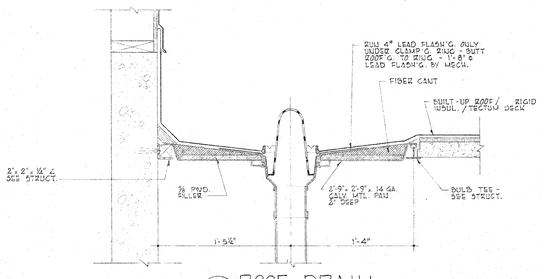
15/10 SKYLIGHT ROOF PLAN 1/16" = 1'-0"



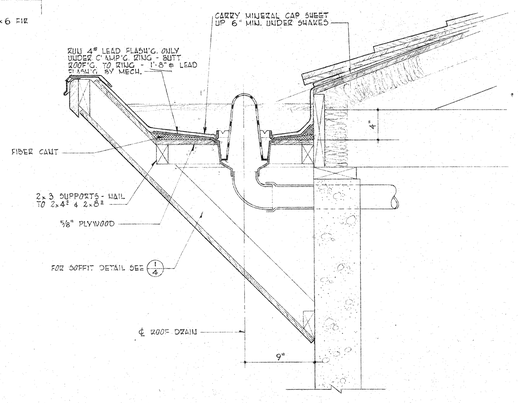
5/10 SILL

6/10 JAMB

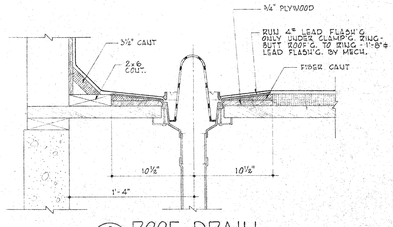
SKYLIGHT DETAILS
SCALE 1½" = 1'-0"



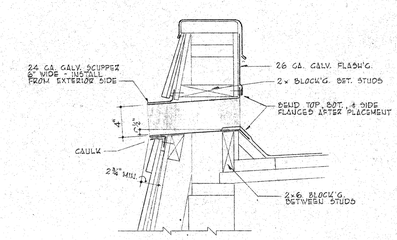
7/10 ROOF DRAIN
SCALE 1½" = 1'-0"
NOTE: SEE DET. 14/10 FOR DOWNSPOUT



8/10 ROOF DRAIN
SCALE 1½" = 1'-0"

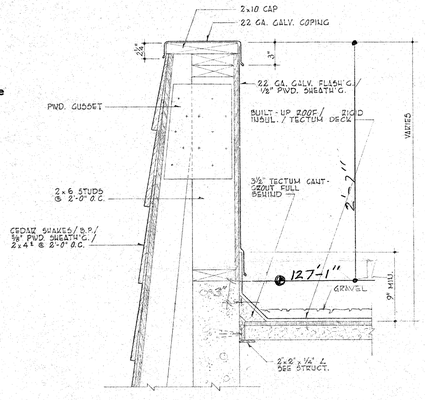


9/10 ROOF DRAIN
SCALE 1½" = 1'-0"

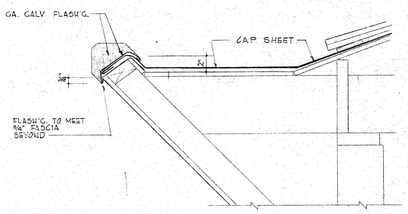


10/10 PARAPET
SCALE 1½" = 1'-0"

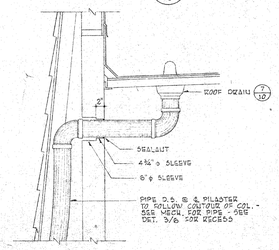
12/10 SCUPPER
SCALE 1½" = 1'-0"



11/10 PARAPET
SCALE 1½" = 1'-0"



13/10 SCUPPER
SCALE 1½" = 1'-0"



14/10 DOWNSPOUT
SCALE ½" = 1'-0"

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON 11,556
SEAL

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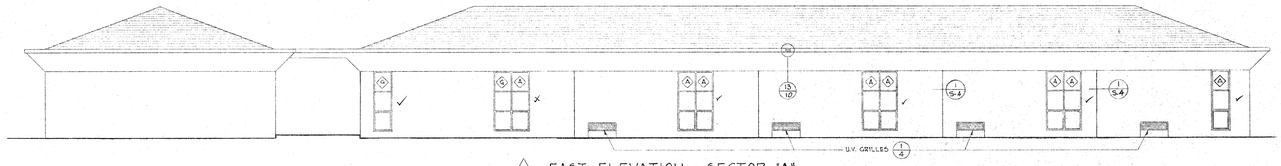
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY WASHINGTON

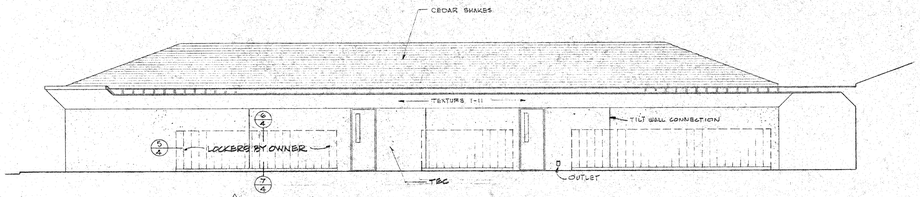
DRAWN BY: J. WILLETTS / C. TIEGS
DATE: 2/8/69
SCALE: AS NOTED
COMM. NO. 676.
REVISED: 5-2-69

DRAWING TITLE: ROOF PLANS & DETAILS

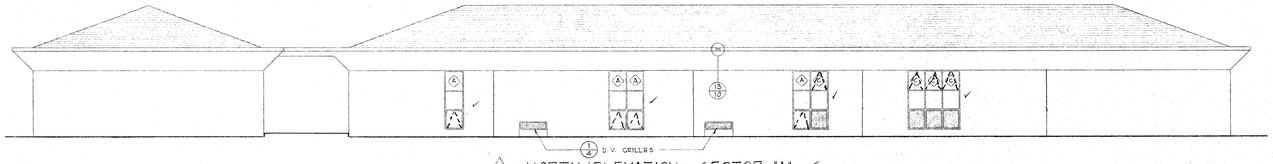
SHEET NO. 10



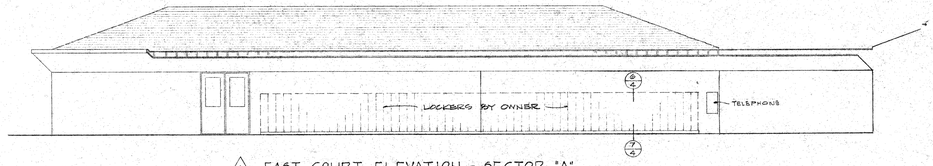
1/11 EAST ELEVATION - SECTOR "A"



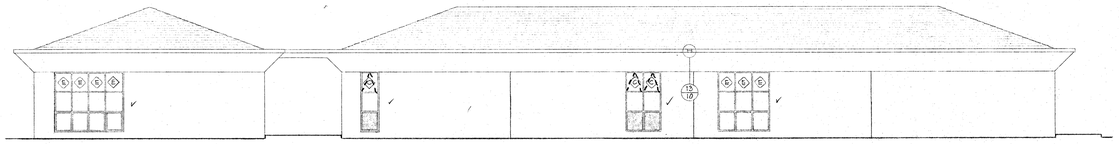
2/11 NORTH COURT ELEVATION - SECTOR "A"



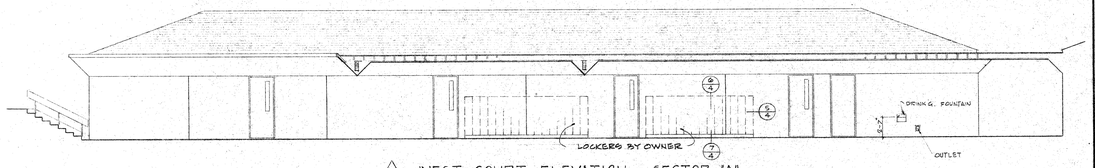
3/11 NORTH ELEVATION - SECTOR "A"



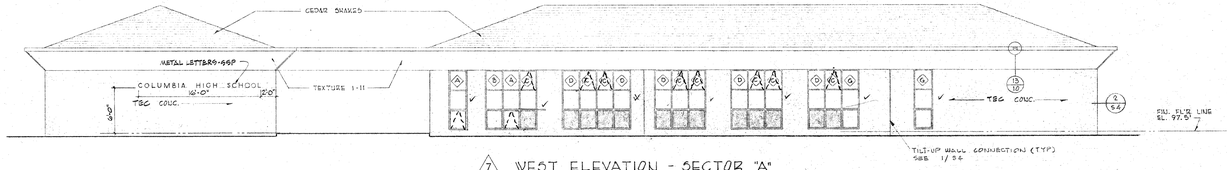
4/11 EAST COURT ELEVATION - SECTOR "A"



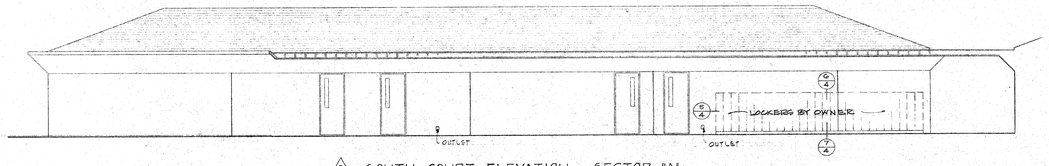
5/11 SOUTH ELEVATION - SECTOR "A"



6/11 WEST COURT ELEVATION - SECTOR "A"

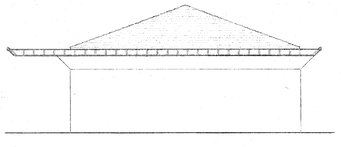


7/11 WEST ELEVATION - SECTOR "A"

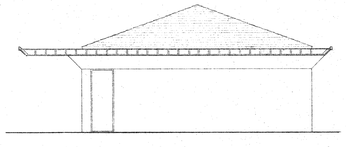


8/11 SOUTH COURT ELEVATION - SECTOR "A"

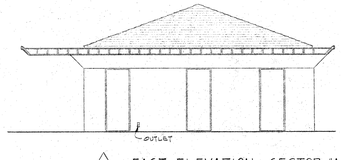
NOTE:
1. SEE SHEET NO. 8 FOR WINDOW TYPES & DETAILS
2. SEE REFLECTED CEIL'G. PLANS FOR LOCATION OF LIGHTS & MECH. GRILLES IN SOFFITS



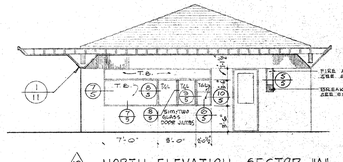
9/11 WEST ELEVATION - SECTOR "A"



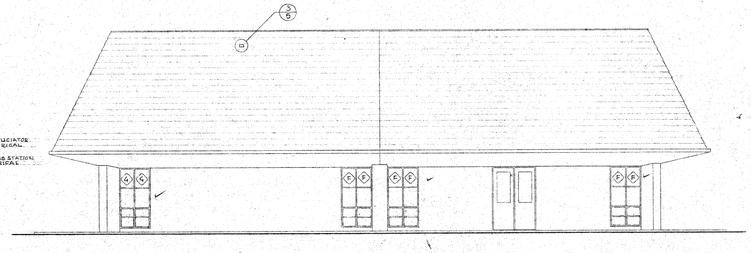
10/11 SOUTH ELEVATION - SECTOR "A"



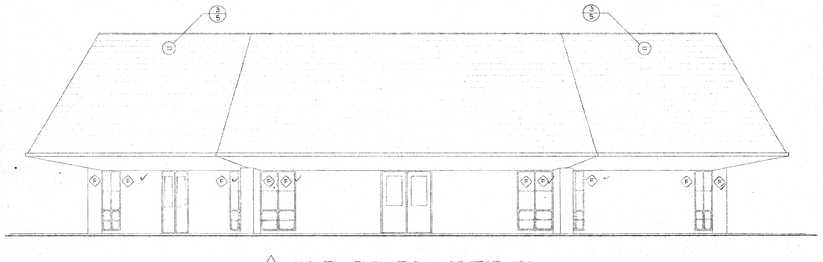
11/11 EAST ELEVATION - SECTOR "A"



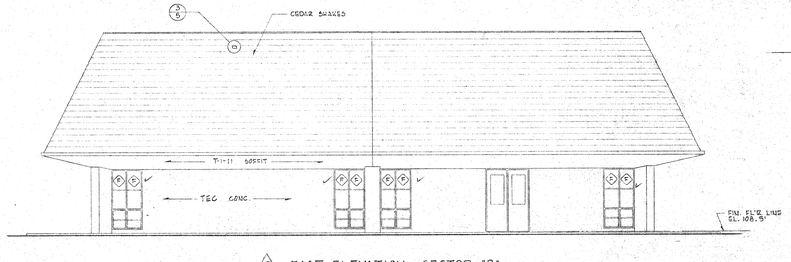
12/11 NORTH ELEVATION - SECTOR "A"



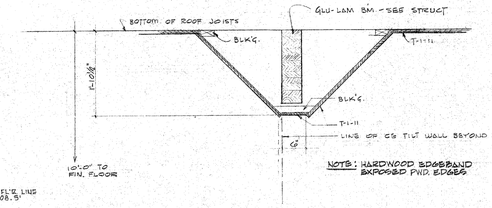
13/11 WEST ELEVATION - SECTOR "B"



14/11 SOUTH ELEVATION - SECTOR "B"

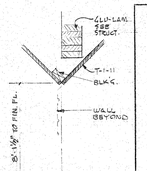


15/11 EAST ELEVATION - SECTOR "B"



NOTE: HARDWOOD EDGEBAND EXPOSED PWD. EDGES

1/11 3/4" = 1'-0"



2/11 3/4" = 1'-0"

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COMM. NO. 676
REVISED 5-2-69

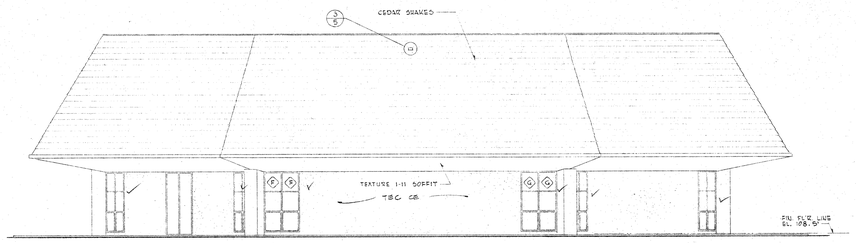
DRAWN BY: C. TRESK
DATE 2/3/69
SCALE 1/8" = 1'-0"

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

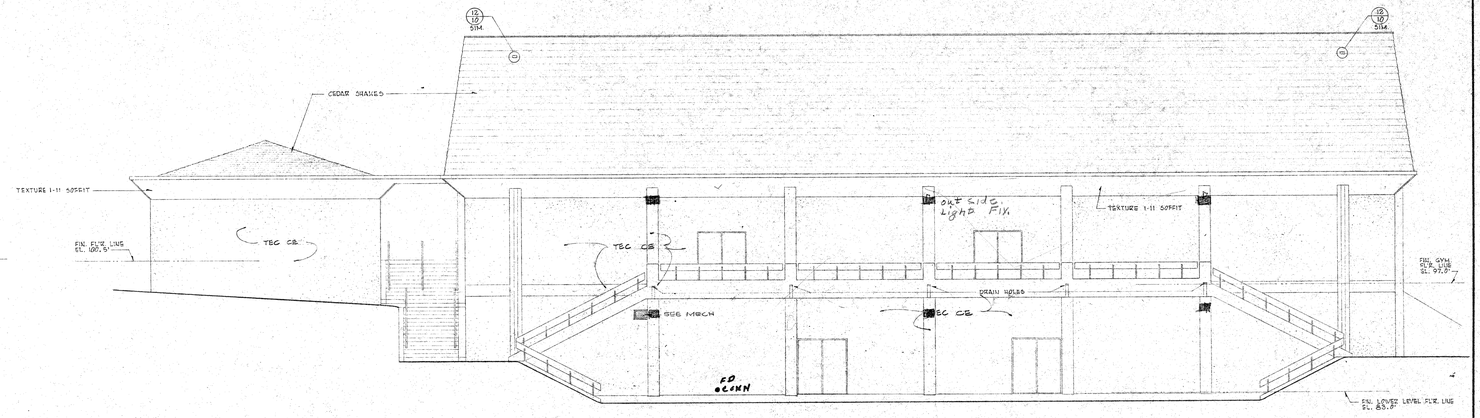
DRAWING TITLE
EXTERIOR ELEVATIONS

REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
TL 566
SEAL

SHEET NO.
11

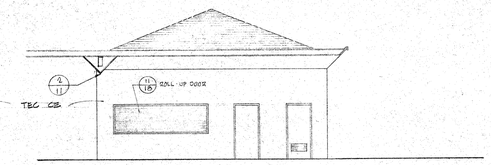


1/12 NORTH ELEVATION - SECTOR "B"

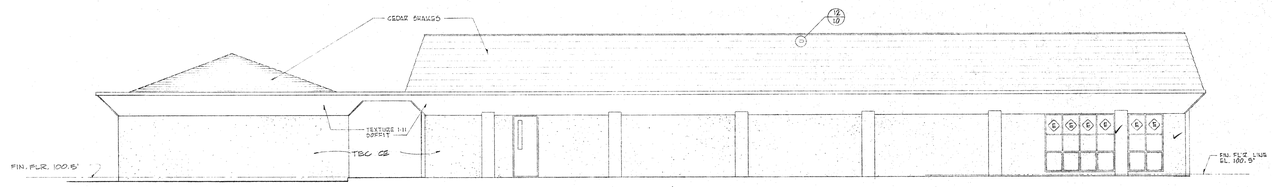


2/12 SOUTH ELEVATION - SECTOR "C"

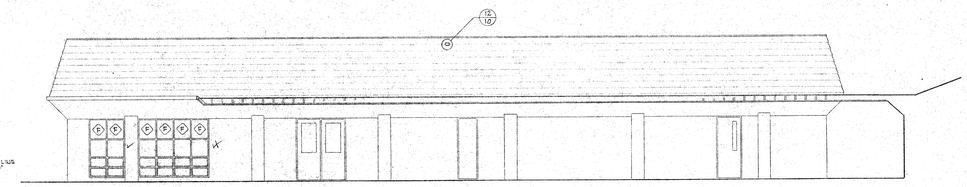
3/12 EAST ELEVATION - SECTOR "C"



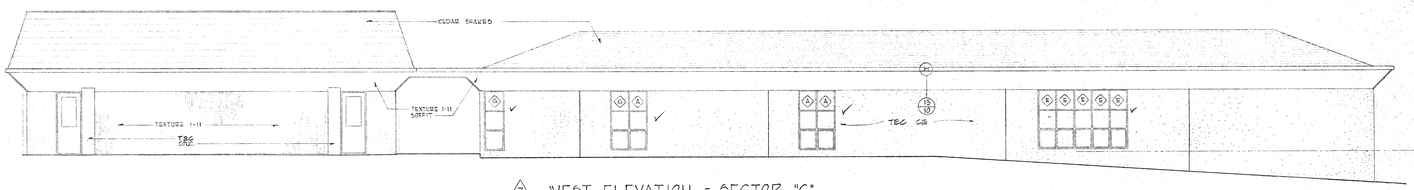
4/12 SOUTH ELEVATION - SECTOR "C"



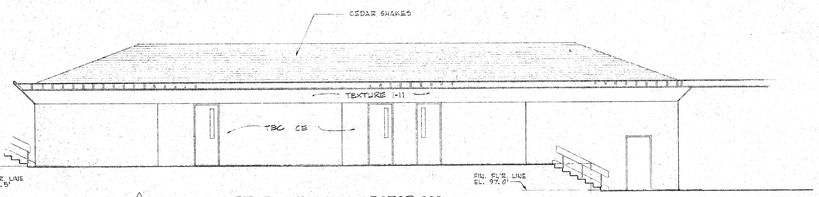
5/12 NORTH ELEVATION - SECTOR "C"



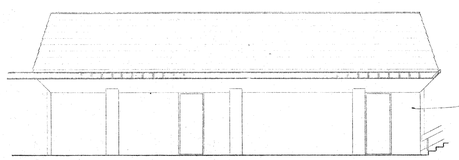
6/12 SOUTH COURT ELEVATION - SECTOR "C"



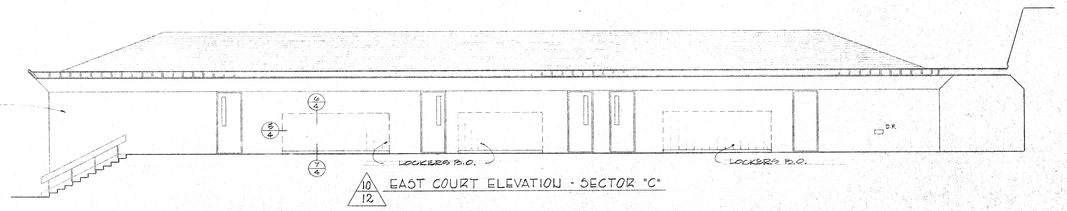
7/12 WEST ELEVATION - SECTOR "C"



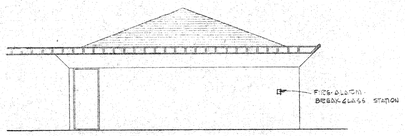
8/12 WEST COURT ELEVATION - SECTOR "C"



9/12 EAST ELEVATION - SECTOR "C"



10/12 EAST COURT ELEVATION - SECTOR "C"



11/12 NORTH ELEVATION - SECTOR "C"

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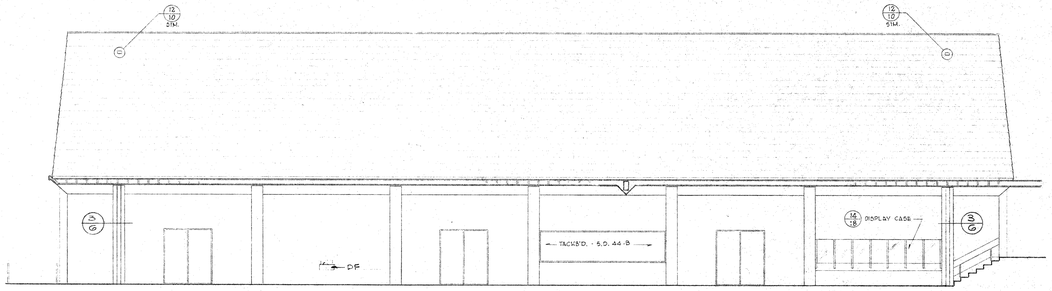
REVISED 5-2-69
DRAWN BY: C. TRASK
DATE 7/3/69
SCALE 1/8" = 1'-0"

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

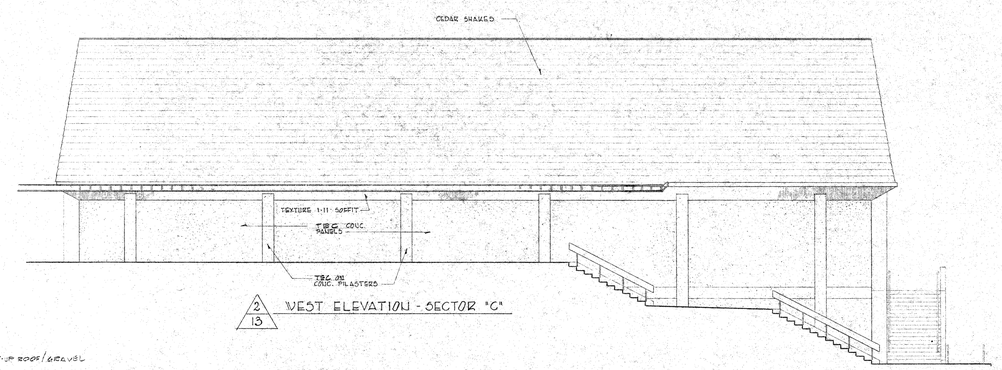
DRAWING TITLE
EXTERIOR ELEVATIONS

REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
TL 556
SEAL

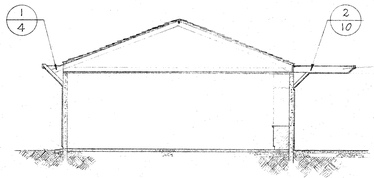
SHEET NO.
12



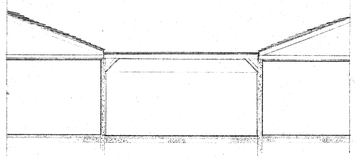
1/13 NORTH COURT ELEVATION - SECTOR "C"



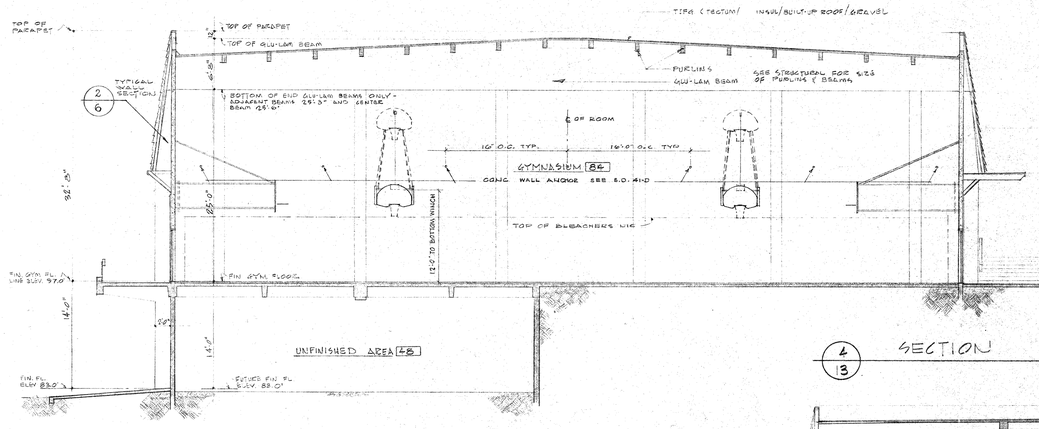
2/13 WEST ELEVATION - SECTOR "C"



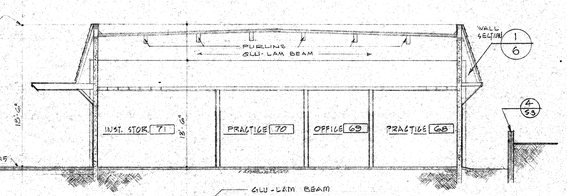
1/13 SECTION SCALE 1/8" = 1'-0"

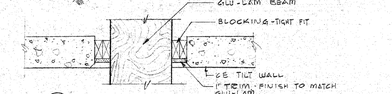


2/13 SECTION SCALE 1/8" = 1'-0"

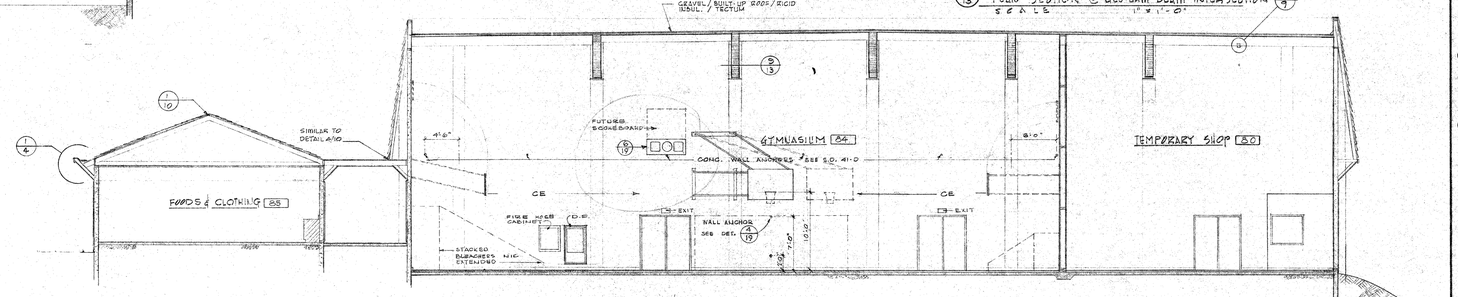


4/13 SECTION 1/8" = 1'-0"

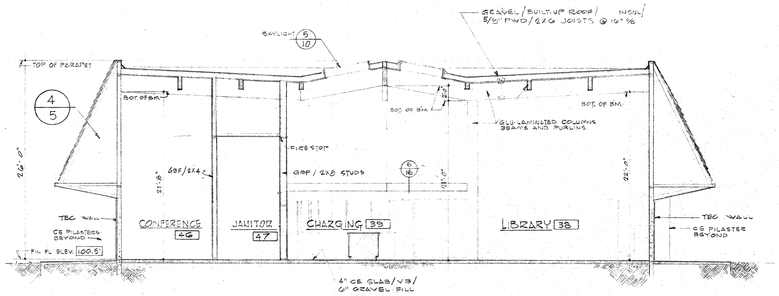




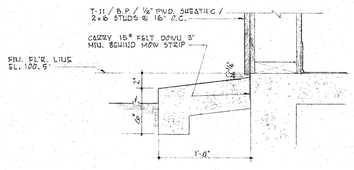
3/13 PLAN SECTION @ GLU-LAM-BEAM INTERSECTION SCALE 1" = 1'-0"



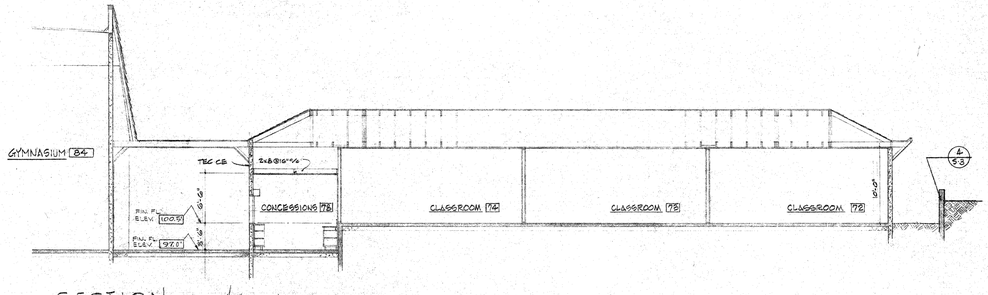
5/13 SECTION 1/8" = 1'-0"



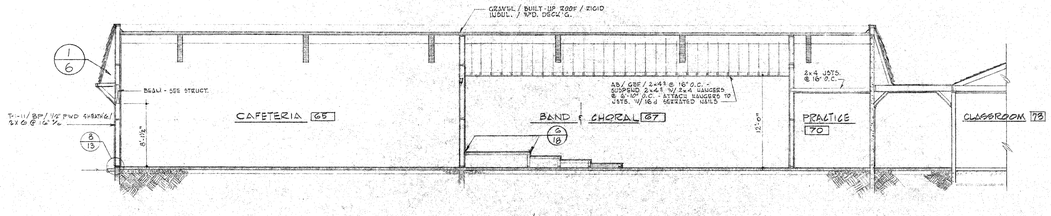
3/13 SECTION SCALE 1/8" = 1'-0"



8/13



6/13 SECTION 1/8" = 1'-0"



7/13 SECTION 1/8" = 1'-0"

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON

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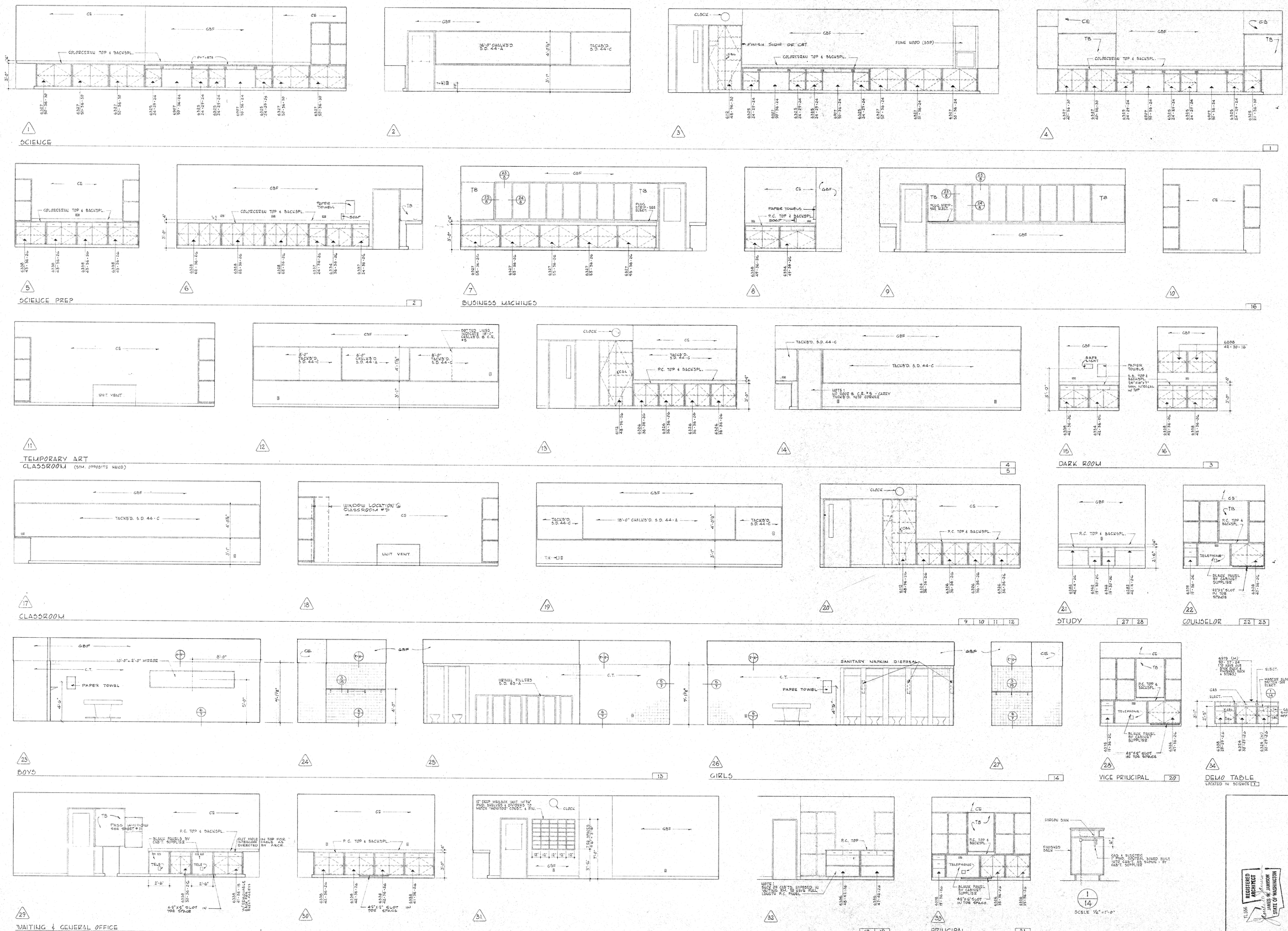
portland 1, oregon • 228-9468

COMM. NO. 676
REVISED 5-2-68
DRAWN BY G. TRAN
CHECKED BY
DATE 6/5/68
SCALE 1/8" = 1'-0"

DRAWING TITLE
EXTERIOR ELEVATIONS, BLDG. SECTIONS

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON
SEAL

SHEET NO.
13



hewlett & jamison
ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

CONM. NO. 676
REVISED 5-2-69

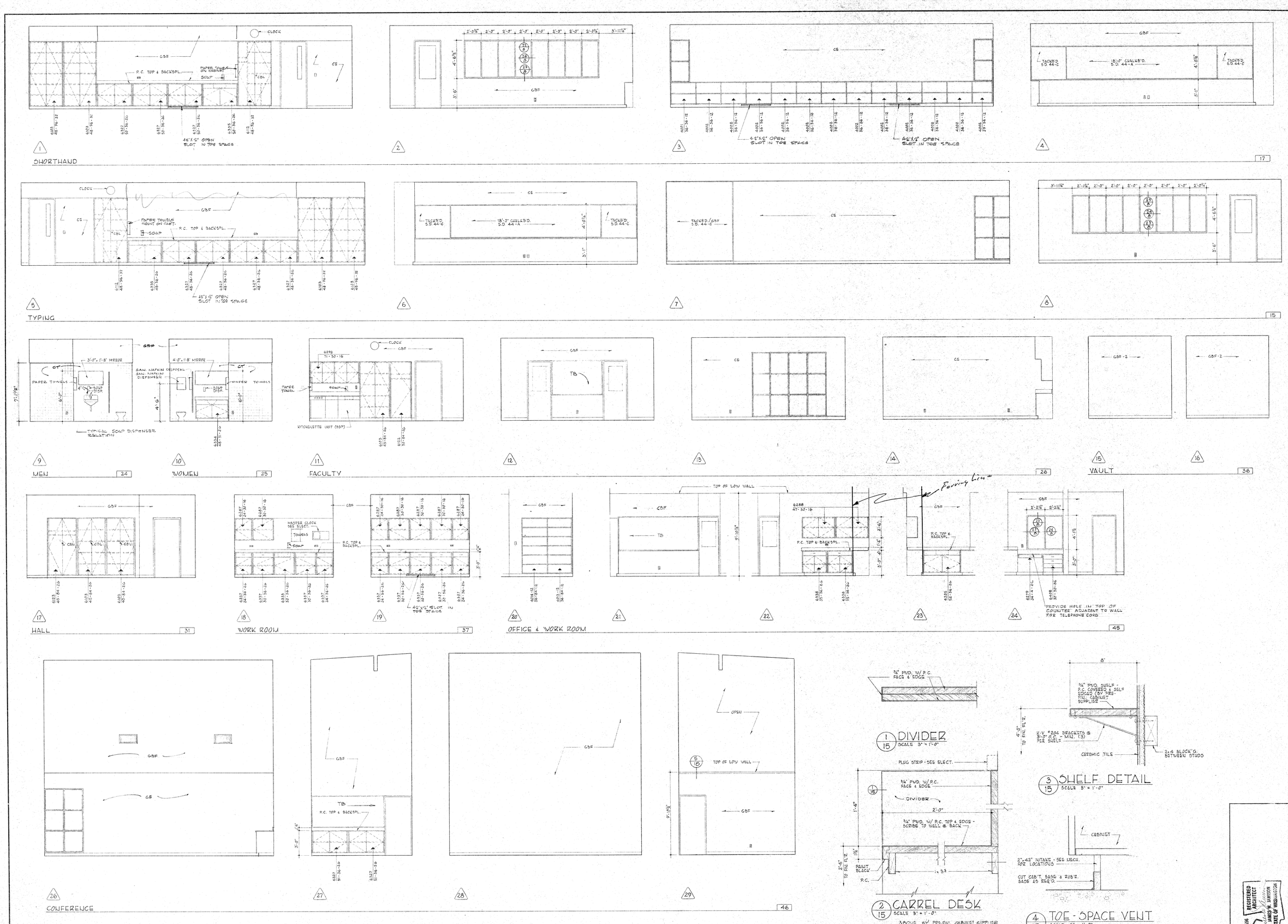
DRAWN BY: L. TALASK
DATE 2.5.69
SCALE 1/4" = 1'-0"

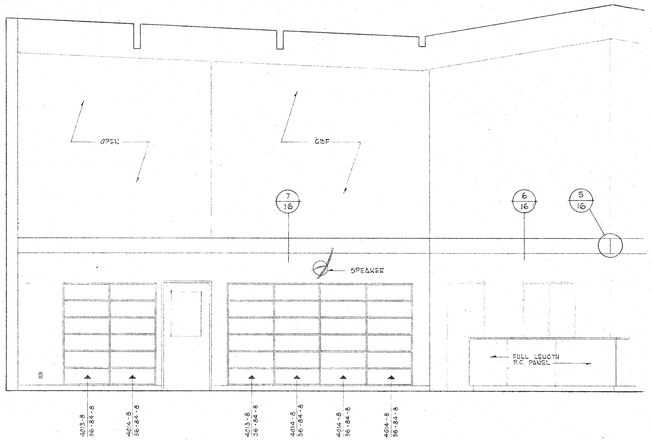
C O L U M B I A H I G H S C H O O L
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

DRAWING TITLE
INTERIOR ELEVATIONS

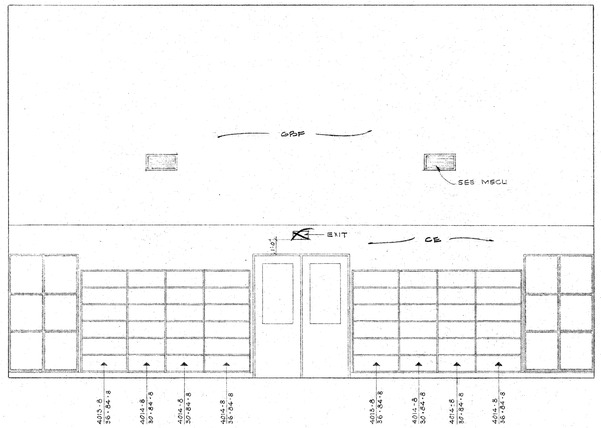
REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
SEAL

SHEET NO.
14

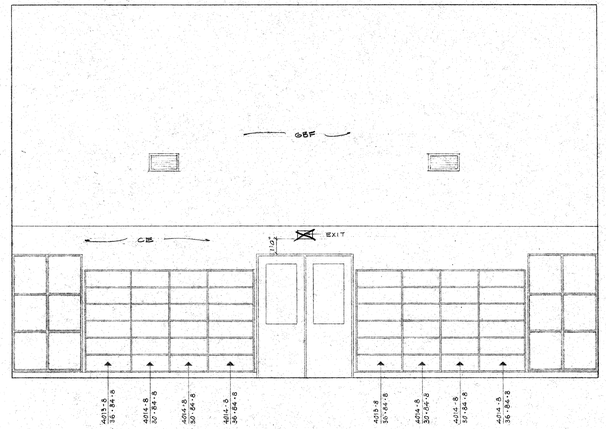

SHORTHAND
TYPING
MEN
WOMEN
FACULTY
VAULT
HALL
WORK ROOM
OFFICE & WORK ROOM
CONFERENCE
1/15 DIVIDER
SCALE 3" = 1'-0"
2/15 CARREL DESK
SCALE 3" = 1'-0"
3/15 SHELF DETAIL
SCALE 3" = 1'-0"
4/15 TOE-SPACE VENT
SCALE 3" = 1'-0"
hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468
COMM. NO. 676
REVISED 5-2-69
DRAWN BY: G. TRAZAK
DATE 2/3/69
SCALE 1/4" = 1'-0"
COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON
DRAWING TITLE
INTERIOR ELEVATIONS
SHEET NO.
15
REGISTERED ARCHITECT
JAMES W. JAMISON
STATE OF WASHINGTON
SEAL



1 LIBRARY

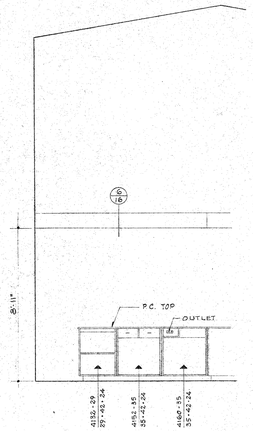


2



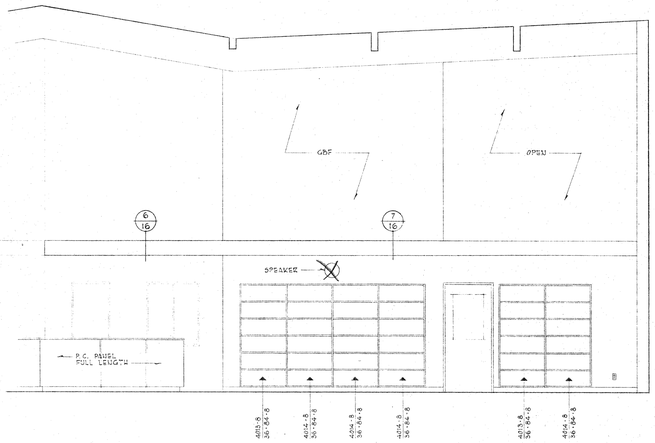
3

38



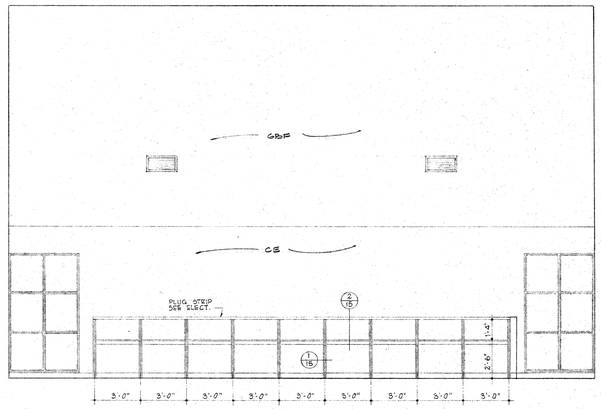
4 CHARGING

39



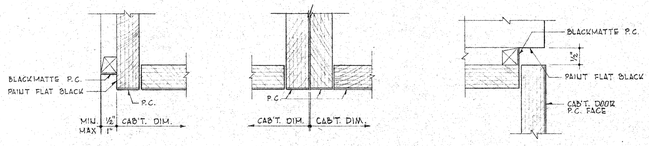
5 LIBRARY

38



NOTE:
STUDY CARRELS BY PRE-FAB CABINET SUPPLIER IS DETAILED

6

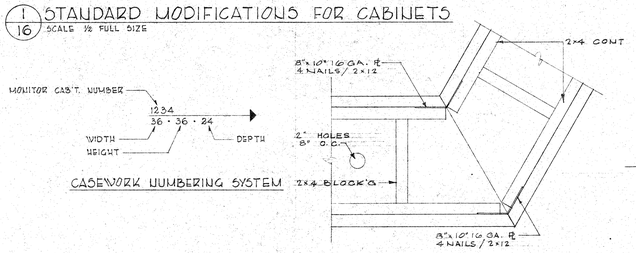


2/16 WALL SCRIBE

3/16 TYPICAL JOINT BET. CABINETS

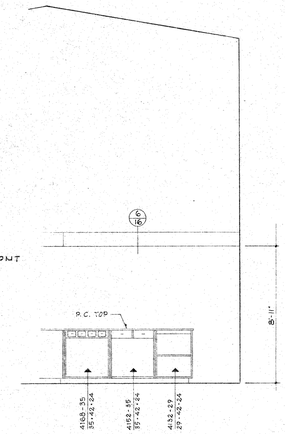
4/16 TYPICAL HEAD @ FURRED CEILING

1/16 STANDARD MODIFICATIONS FOR CABINETS
SCALE ½ FULL SIZE



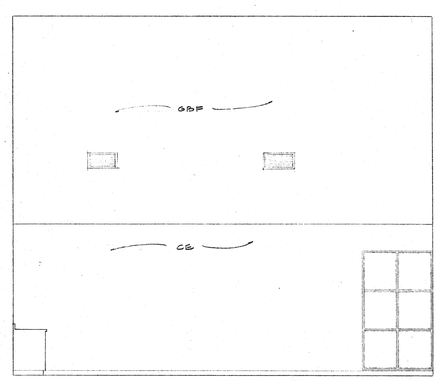
CASEWORK NUMBERING SYSTEM

LIGHT TROFFER 5/16
SCALE: 1½"=1'-0"

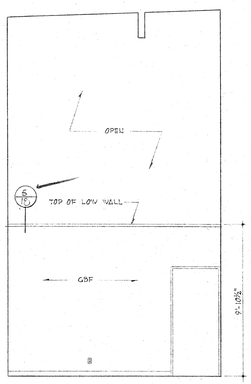


7 CHARGING

39



8 AUDIO - VISUAL



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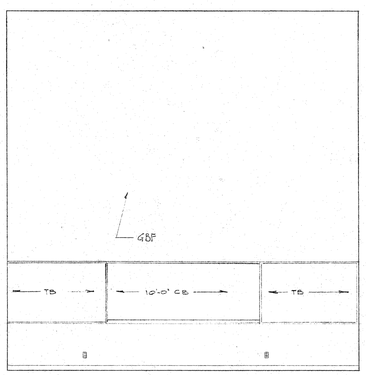

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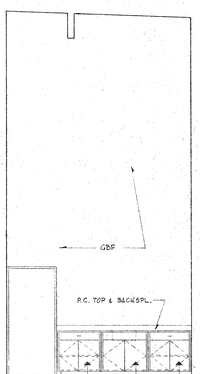

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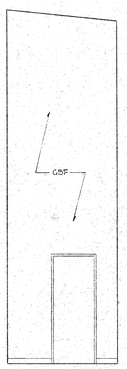

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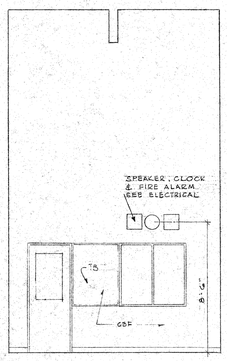

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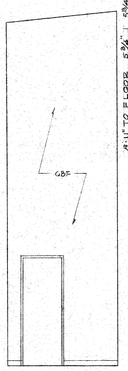
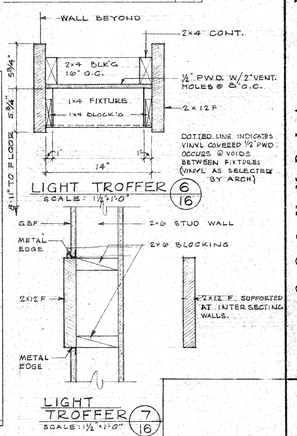


14

CHARGING

39



LIGHT TROFFER 6/16
SCALE: 1½"=1'-0"

LIGHT TROFFER 7/16
SCALE: 1½"=1'-0"

NOTE: SEE ALTERNATE #5

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON
TL 586
SEAL

DRAWING TITLE
INTERIOR ELEVATIONS & DETAILS

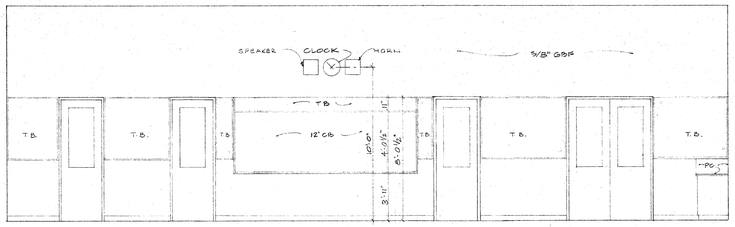
SHEET NO.
16

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 226-9468

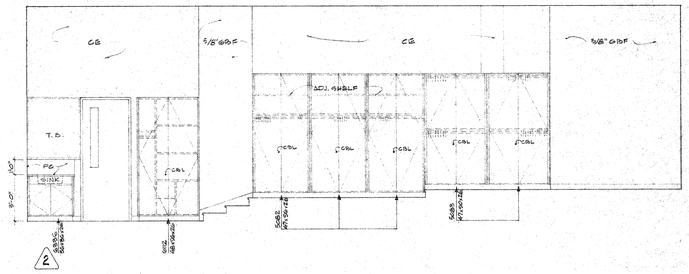
COMM. NO. 676
REVISED 5-2-69

DRAWN BY G. TRUSK
DATE 2/8/69
SCALE ¼"=1'-0"

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON



1 BAND & CHORAL 1/4" = 1'-0"



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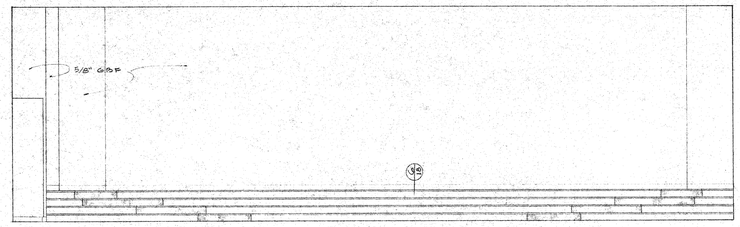

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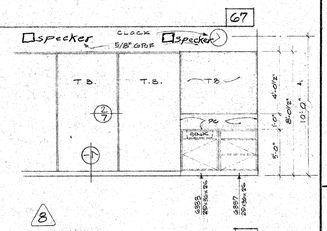
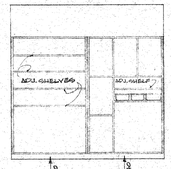
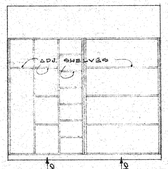


8 CAFETERIA 1/4" = 1'-0" 65



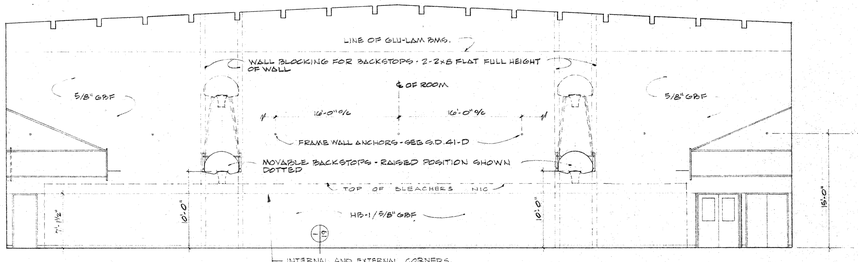
9 INSTRU. STOR. 1/4" = 1'-0" 71

NOTE: FURNISH CABINETS IN RM. #71 WITHOUT DOORS



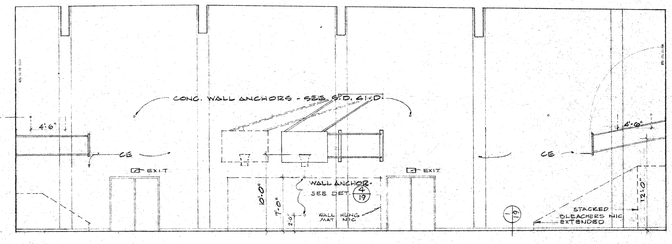
10 INSTRU. STOR. 1/4" = 1'-0" 71

4 5 6 & 7 DELETED

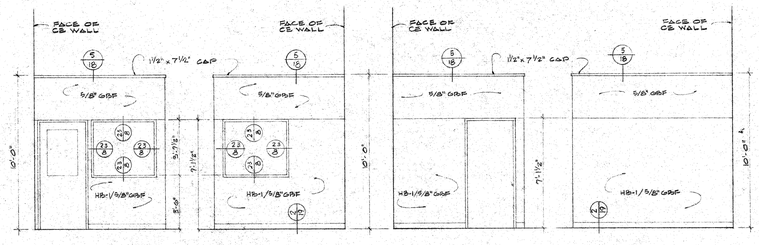


11 GYMNASIUM 1/8" = 1'-0"

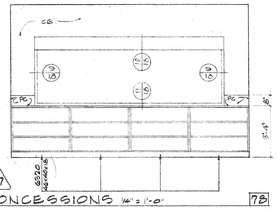
NOTE: VERIFY LOCATION OF BACKSTOPS WITH GYMNASIUM FLOOR PLAN SHT. # 18



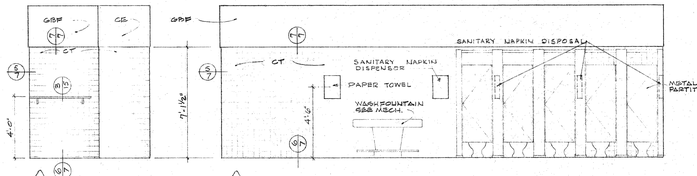
12 84



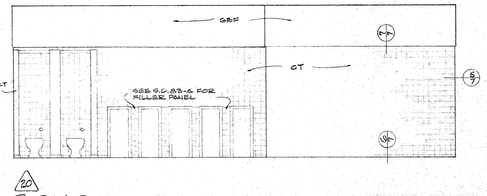
13 14 15 16 TEMPORARY SHOP 1/4" = 1'-0" 80



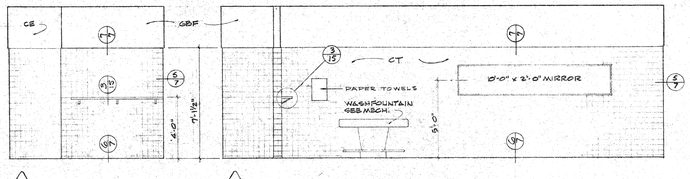
17 CONCESSIONS 1/4" = 1'-0" 78



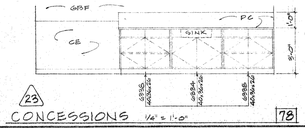
18 19 GIRLS 1/4" = 1'-0" 89



20 BOYS 1/4" = 1'-0" 88



21 22 88



23 CONCESSIONS 1/4" = 1'-0" 78

TL 556 REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON

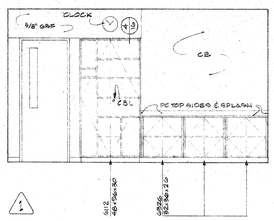
hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COMM. NO. 676
REVISED 5-2-69
DRAWN BY: A. W.L.D.(L)
DATE 2/3/69
SCALE 1/4" = 1'-0"

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17 KLICKITAT COUNTY
WHITE SALMON WASHINGTON

DRAWING TITLE
INTERIOR ELEVATIONS

SHEET NO.
17



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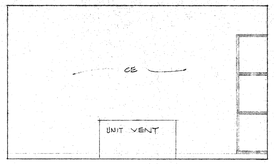
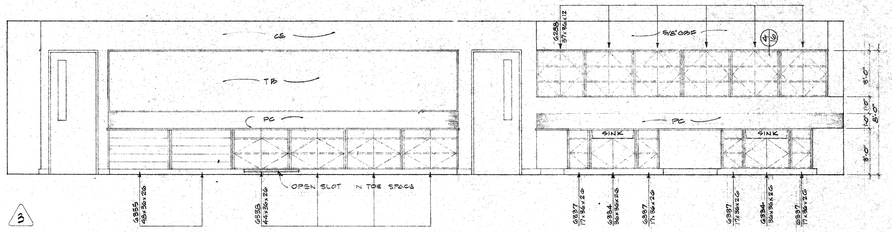


2

CLASSROOM 1/4" = 1'-0" 86



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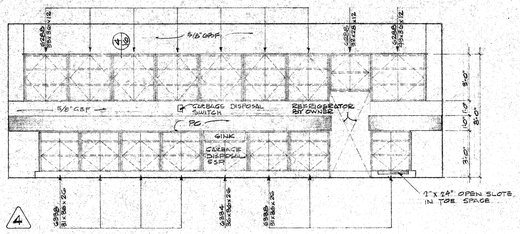

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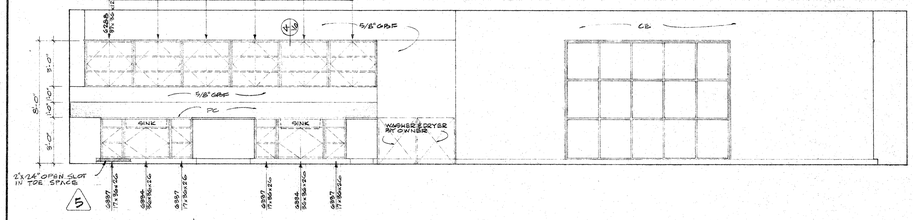
FOODS & CLOTHING 1/4" = 1'-0" 85



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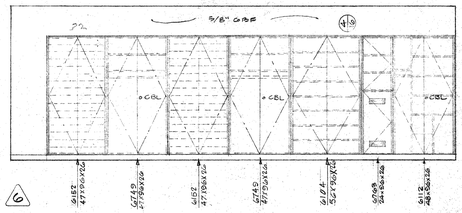

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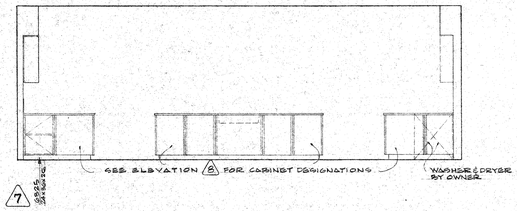
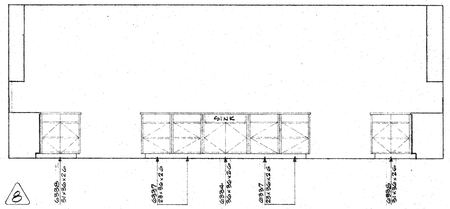


7

FOODS & CLOTHING 1/4" = 1'-0" 85



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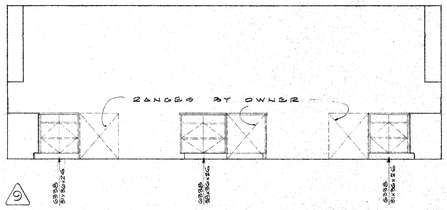

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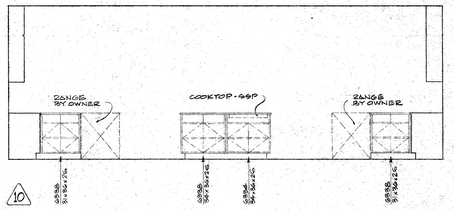


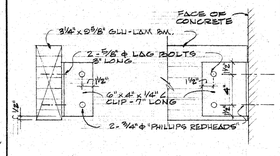
10

FOODS & CLOTHING 1/4" = 1'-0" 85

1/16 = 1/48

4/18 DELETED

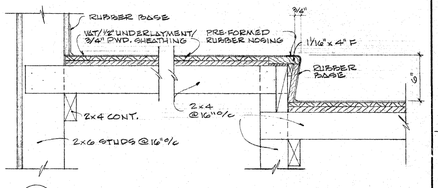
5/18 WALL CAP 1 1/2" = 1'-0"



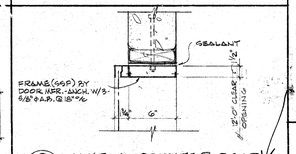
END ELEVATION SIDE ELEVATION

8/18 GLU-LAM CONN. AT DISPLAY 1 1/2" = 1'-0"

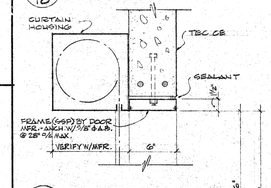
1/18 2/18 & 3/18 DELETED



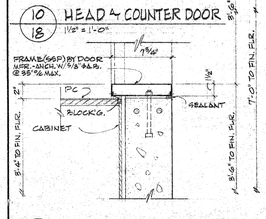
6/18 RISER DETAIL 1 1/2" = 1'-0"



9/18 JAMB AT COUNTER DOOR 1 1/2" = 1'-0"



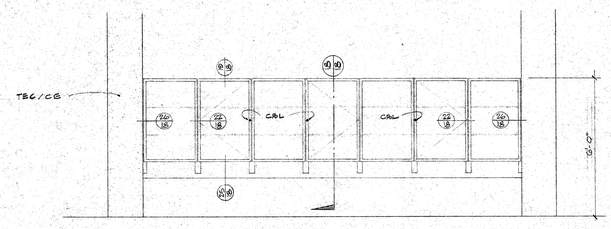
10/18 HEAD AT COUNTER DOOR 1 1/2" = 1'-0"



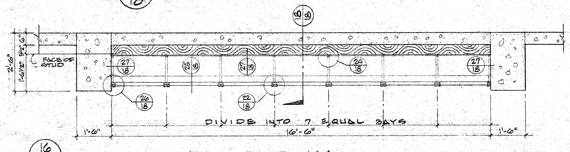
11/18 SILL AT COUNTER DOOR 1 1/2" = 1'-0"

7/18 DELETED

12/18 13/18 & 15/18 DELETED



14/18 ELEVATION AT WALL DISPLAY 3/8" = 1'-0"



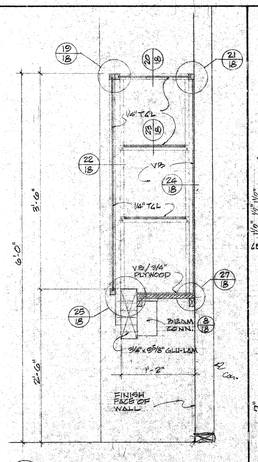
16/18 PLAN AT WALL DISPLAY 3/8" = 1'-0"

Item No. 13: Sheet 18 - Detail 9:

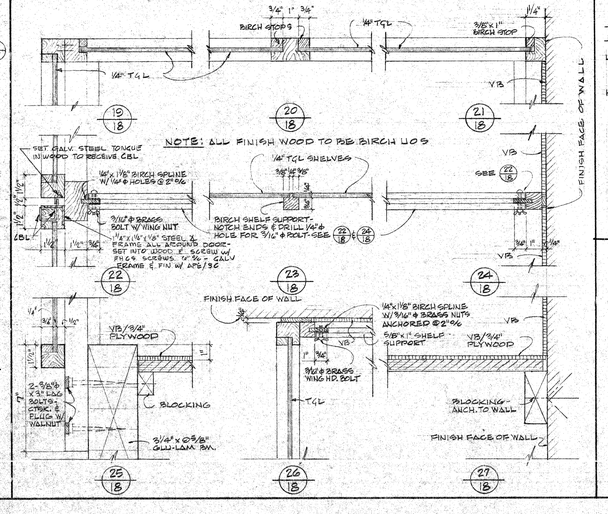
a. Change the width of counter door as follows:
Rough horizontal opening in concrete wall shall be 12'-0". Mount side tracks of counter door on concrete jamb to lap concrete.

b. Metal frame shall be provided by hollow metal frame supplier, Section 8A.

17/18 DELETED



18/18 SECTION AT WALL DISPLAY 1" = 1'-0"



19/18 20/18 21/18 22/18 23/18 24/18 25/18 26/18 27/18

DISPLAY CASE HARDWARE

LOCKS: SEE SPECS. FOR TYPICAL CABINET LOCK (CBL)

HINGES: PR. 8C-1224-2 1/2" W/ RIVITED PINS - GSP FOR FINISH

REGISTERED ARCHITECT — STATE OF WASHINGTON — SEAL

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon · 228-9468

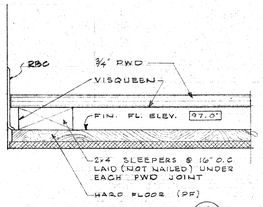
COMM. NO. 767
REVISED 5-2-68
DRAWN BY: Wilson
DATE 4-9-68
SCALE Noted

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT 405-17
WHITE SALMON
KLICKITAT COUNTY
WASHINGTON

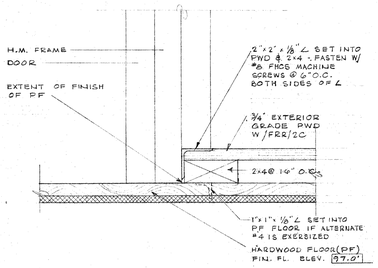
INTERIOR DOWNSTAIRS ELEVATIONS & DETAILS

SHEET NO. 18

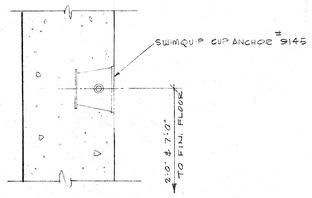
1/19 DELETED



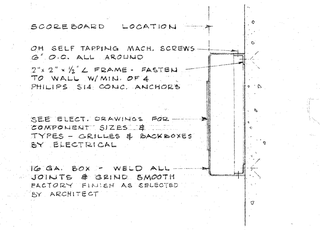
SHOP FLOOR 2/19
SCALE: 3"=1'-0"
REFER TO ALTERNATE #2



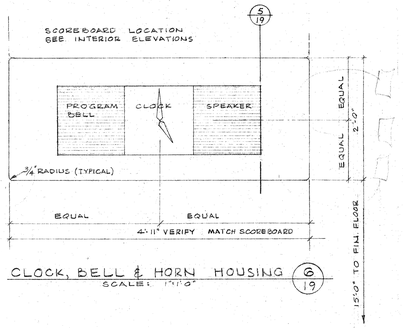
THRESHOLD 3/19
SCALE: 3"=1'-0"
REFER TO ALTERNATE #2



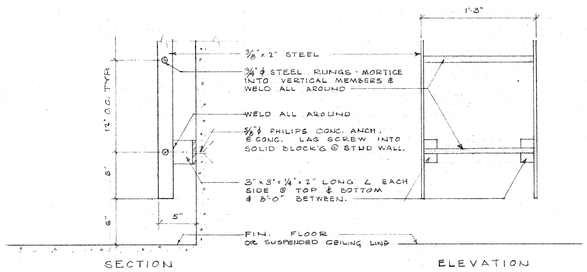
WALL & NET ANCHORS 4/19
SCALE: 3"=1'-0"



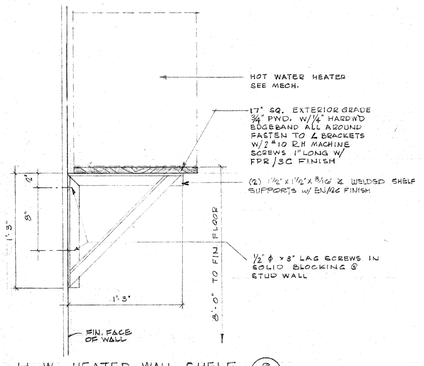
CONTROL BOARD HOUSING 5/19
SCALE: 1"=1'-0"



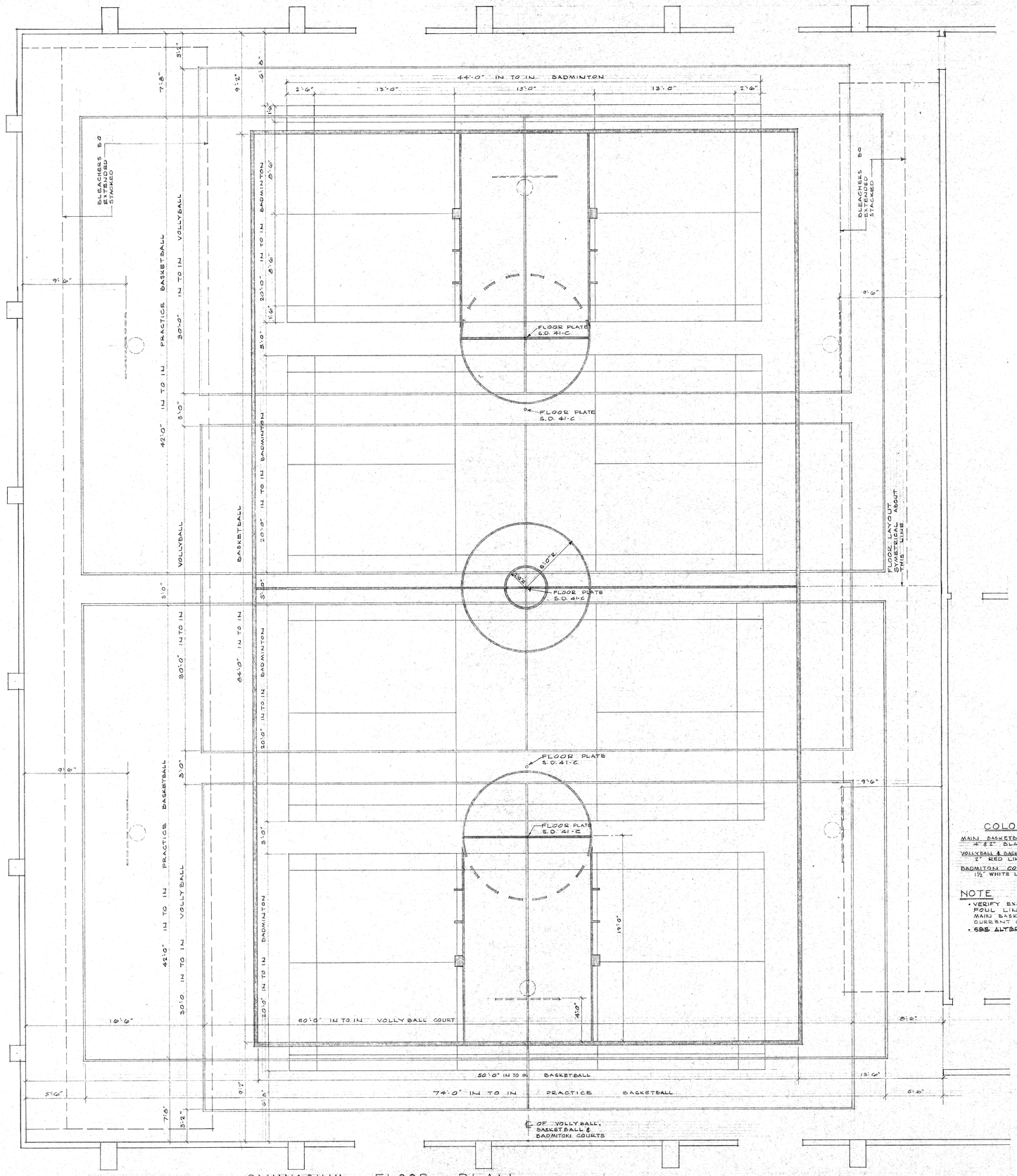
CLOCK, BELL & HORN HOUSING 6/19
SCALE: 1"=1'-0"



STEEL LADDER 7/19



H. W. HEATER WALL SHELF 8/19
SCALE: 1"=1'-0"



GYMNASIUM FLOOR PLAN
SCALE: 1/4"=1'-0"

COLOR SCHEME

MAIN BASKETBALL COURT
4" & 2" BLACK LINES

VOLLYBALL & BASKETBALL PRACTICE COURT
2" RED LINES

BADMITON COURT
1½" WHITE LINES

NOTE

- VERIFY EXACT LOCATION OF FOUL LINE INDICATORS ON MAIN BASKETBALL COURT WITH CURRENT OFFICIAL GAME RULES.
- SEE ALTERNATE #2

hewlett & jamison ARCHITECTS
3223 S.W. harbor drive
portland 1, oregon • 228-9468

COLUMBIA HIGH SCHOOL
SCHOOL DISTRICT KLICKITAT COUNTY
WHITE SALMON 405-17 WASHINGTON

DRAWN BY: C. BRUSH
DATE: 2/5/69
SCALE: AS NOTED
COMM. NO. 676
REVISED 5-2-69

DRAWING TITLE: GYM COURT LAYOUTS & DETAILS

REGISTERED ARCHITECT JAMES W. JAMISON STATE OF WASHINGTON
TL 556
SEAL

SHEET NO. 19

Appendix F: FEMA E-74 Nonstructural Seismic Bracing Excerpts

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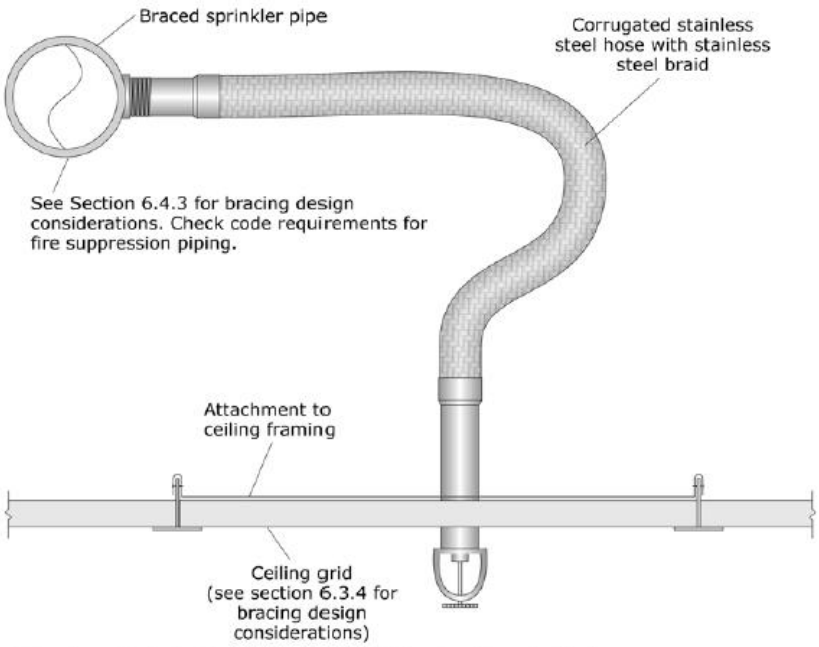


Note: for seismic design category D, E & F, the flexible sprinkler hose fitting must accommodate at least 1" of ceiling movement without use of an oversized opening. Alternatively, the sprinkler head must have a 2" oversize ring or adapter that allows 1" movement in all directions.

Figure G-1. Flexible Sprinkler Drop.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

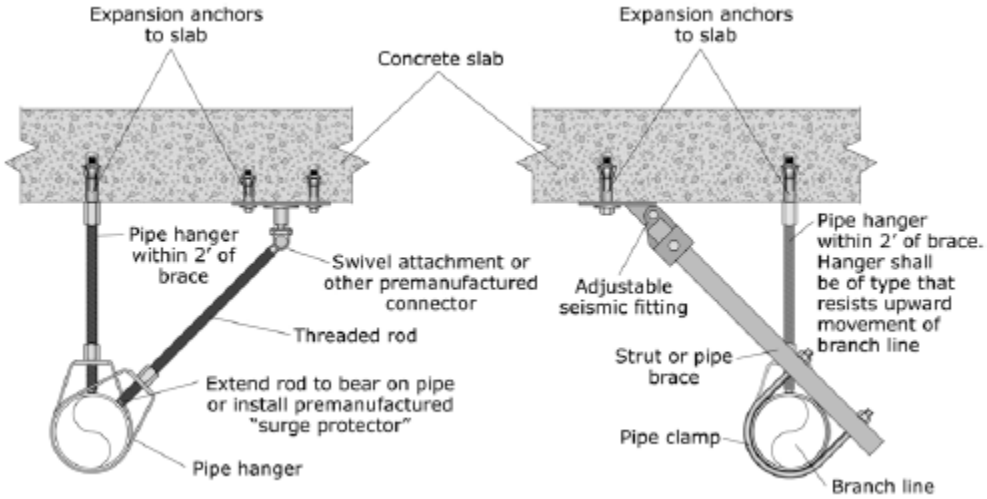


Figure G-2. End of Line Restraint.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Partitions

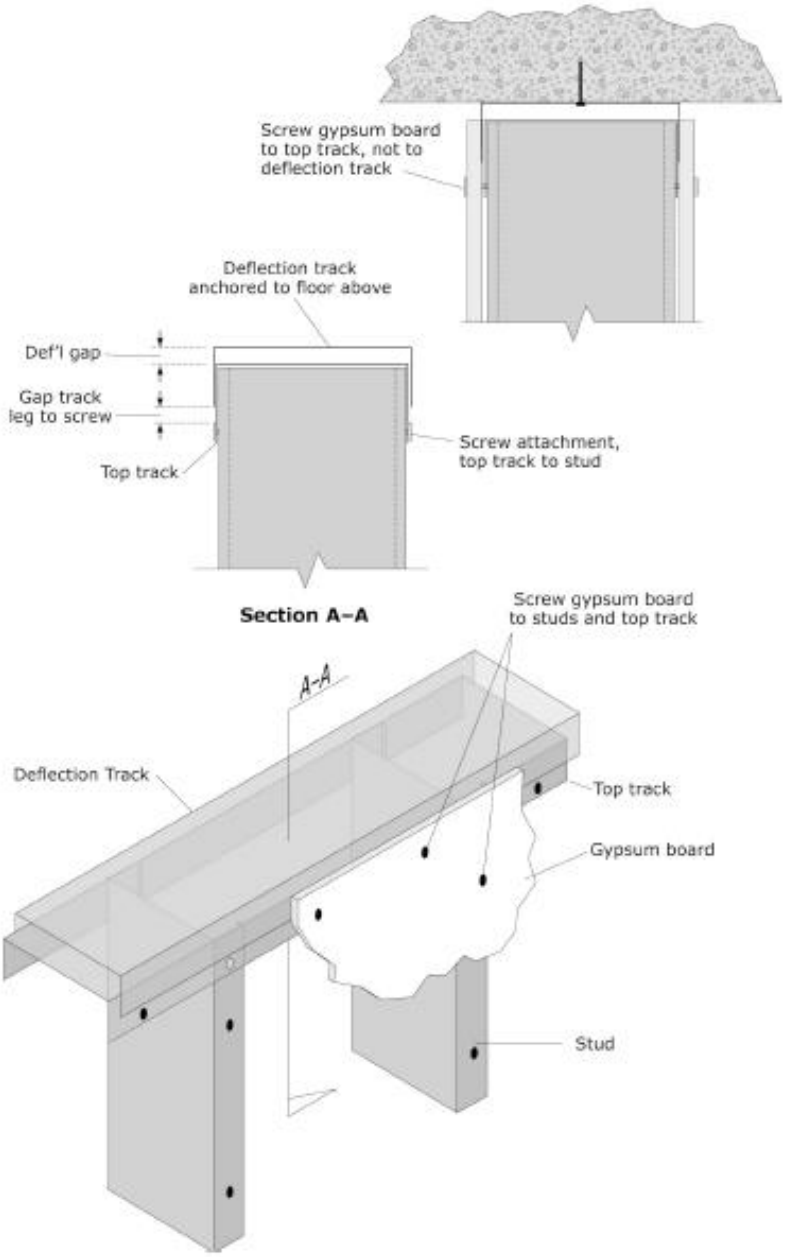


Figure G-3. Mitigation Schemes for Bracing the Tops of Metal Stud Partitions Walls.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

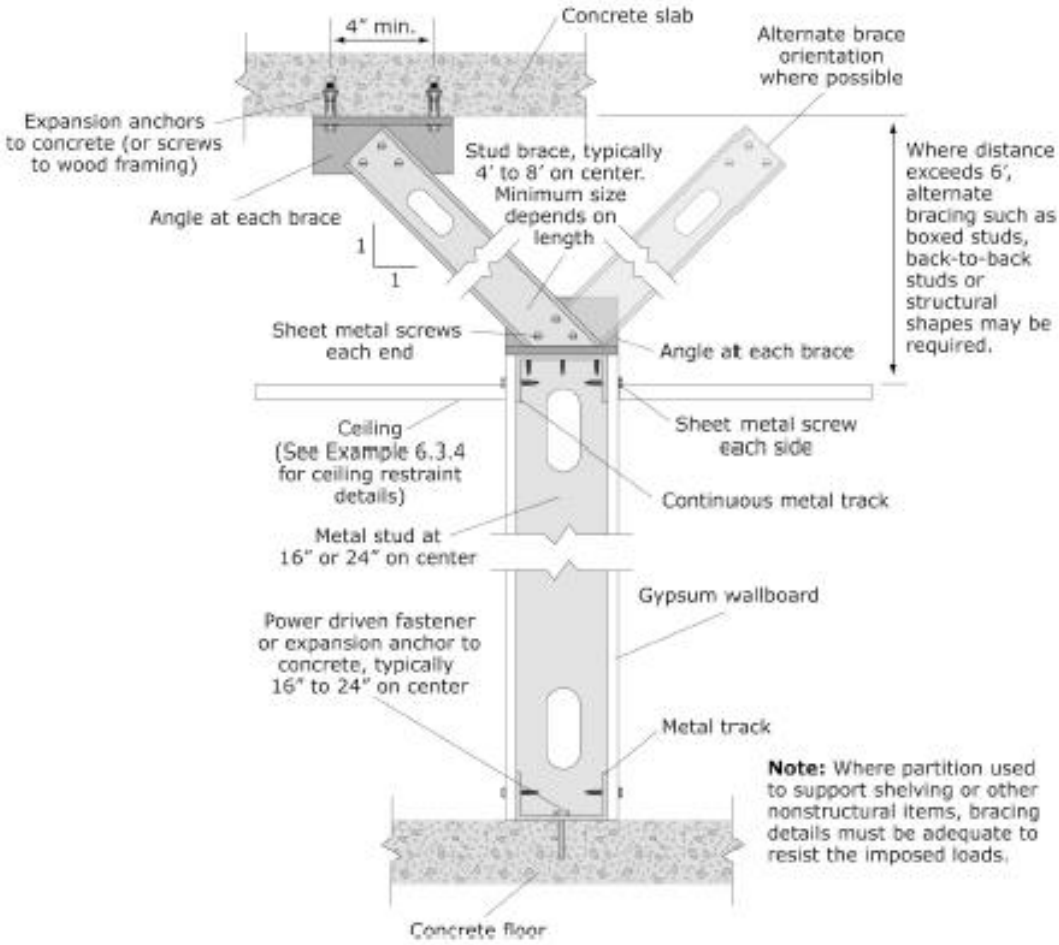
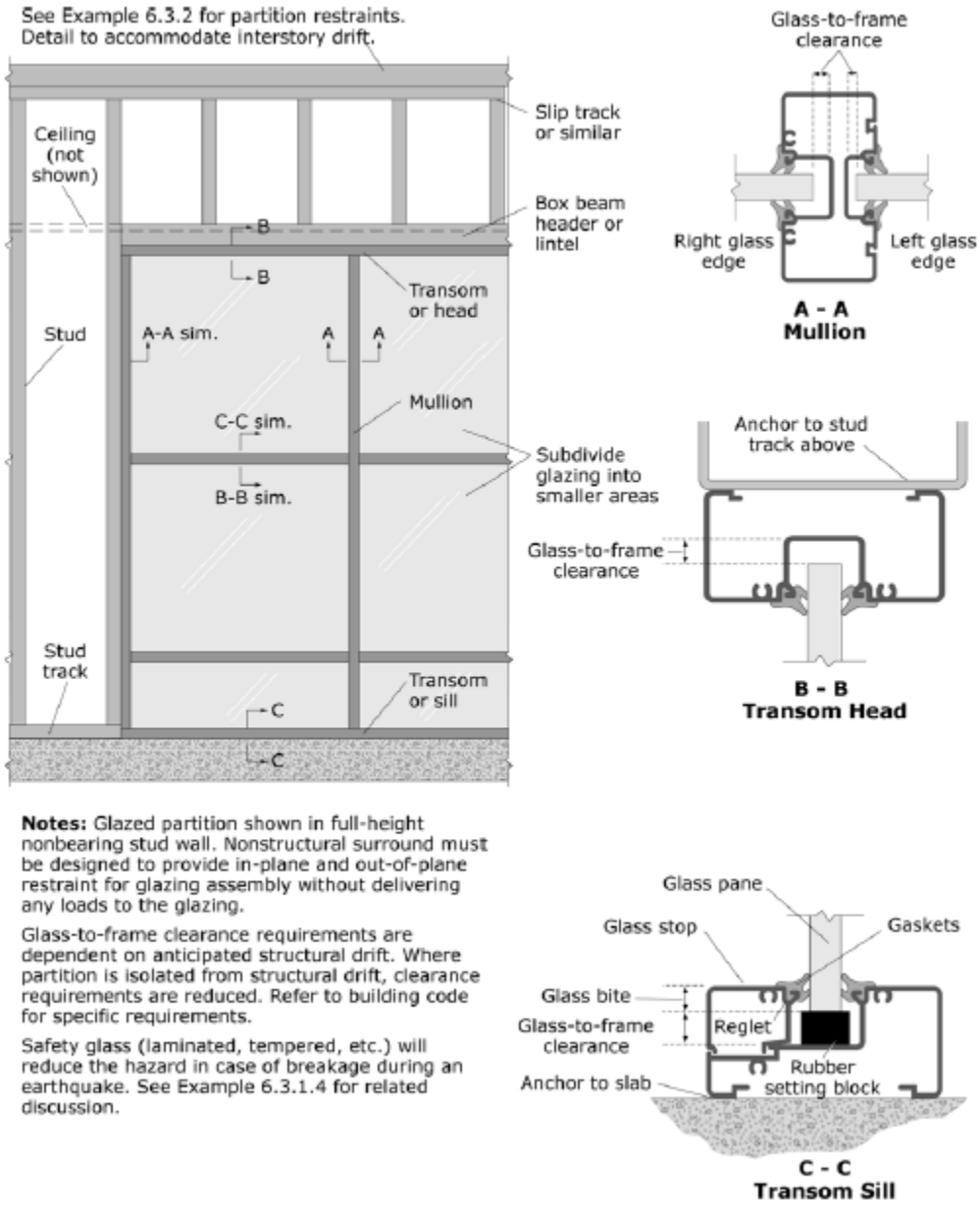


Figure G-4. Mitigation Schemes for Bracing the Tops of Metal Stud Partitions Walls.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Notes: Glazed partition shown in full-height nonbearing stud wall. Nonstructural surround must be designed to provide in-plane and out-of-plane restraint for glazing assembly without delivering any loads to the glazing.

Glass-to-frame clearance requirements are dependent on anticipated structural drift. Where partition is isolated from structural drift, clearance requirements are reduced. Refer to building code for specific requirements.

Safety glass (laminated, tempered, etc.) will reduce the hazard in case of breakage during an earthquake. See Example 6.3.1.4 for related discussion.

Figure G-5. Full-height Glazed Partition.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

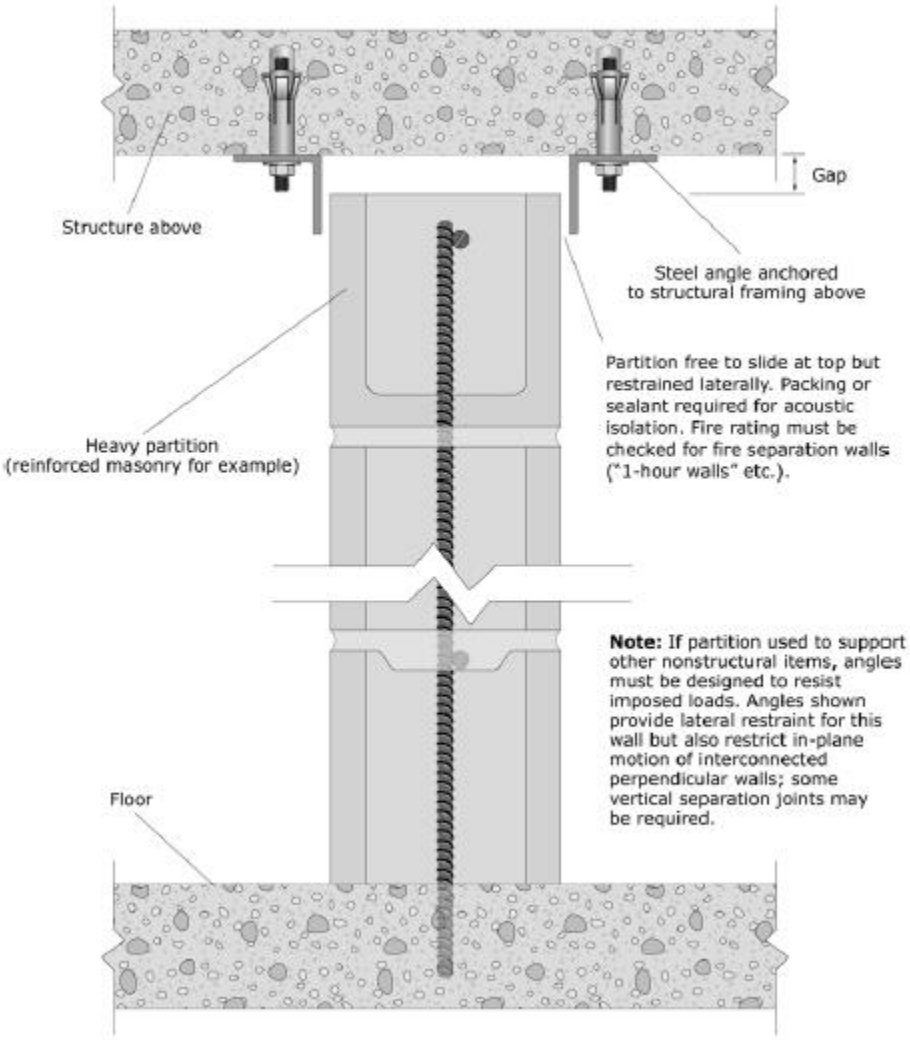


Figure G-6. Full-height Heavy Partition.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

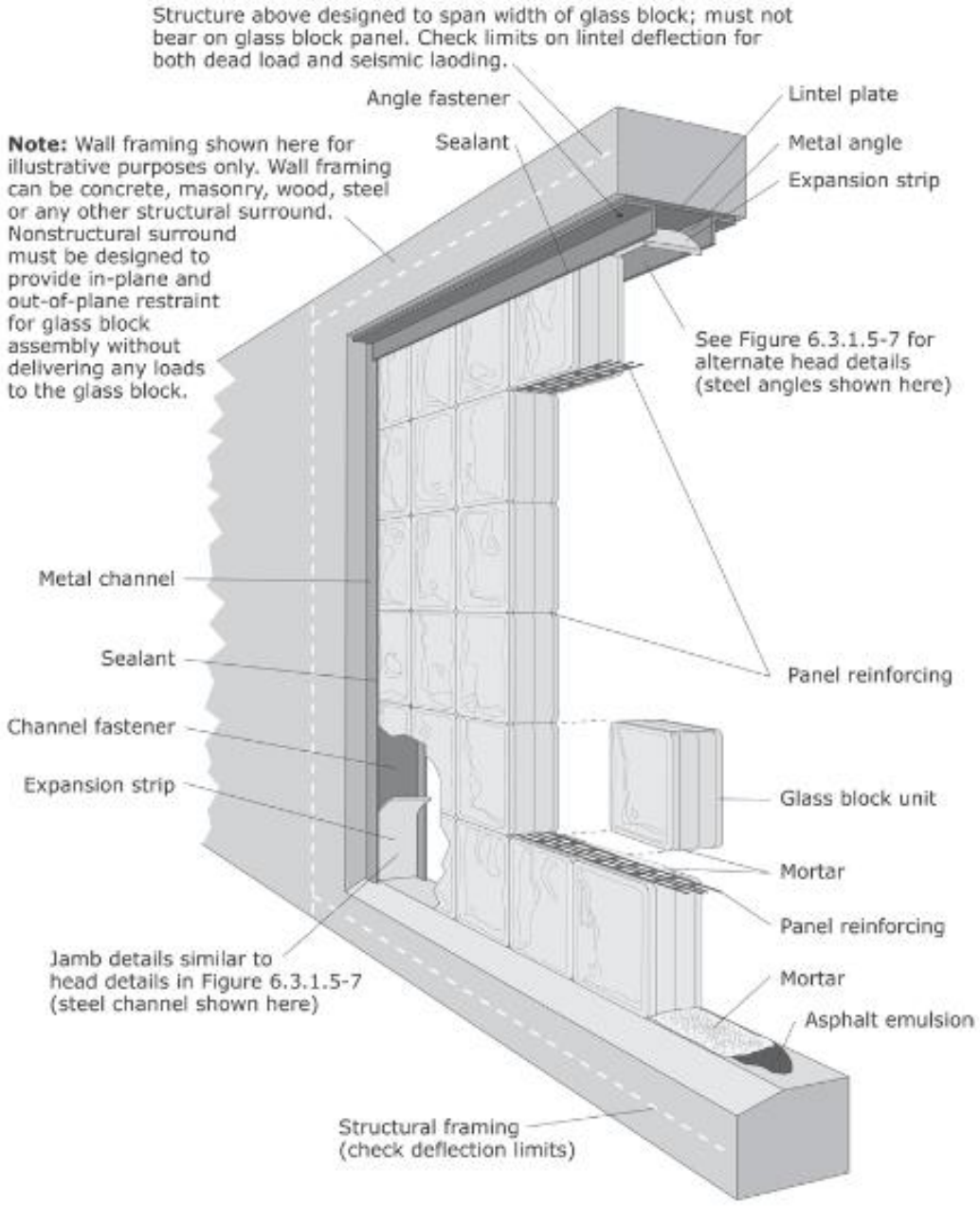


Figure G-7. Typical Glass Block Panel Details.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Ceilings

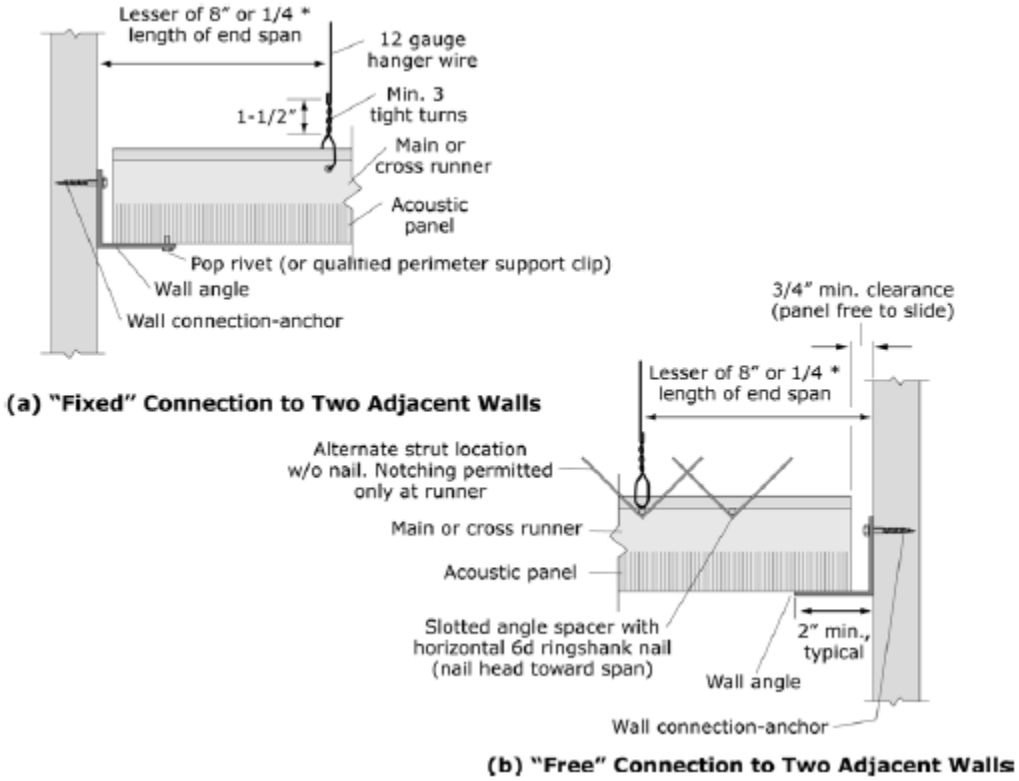
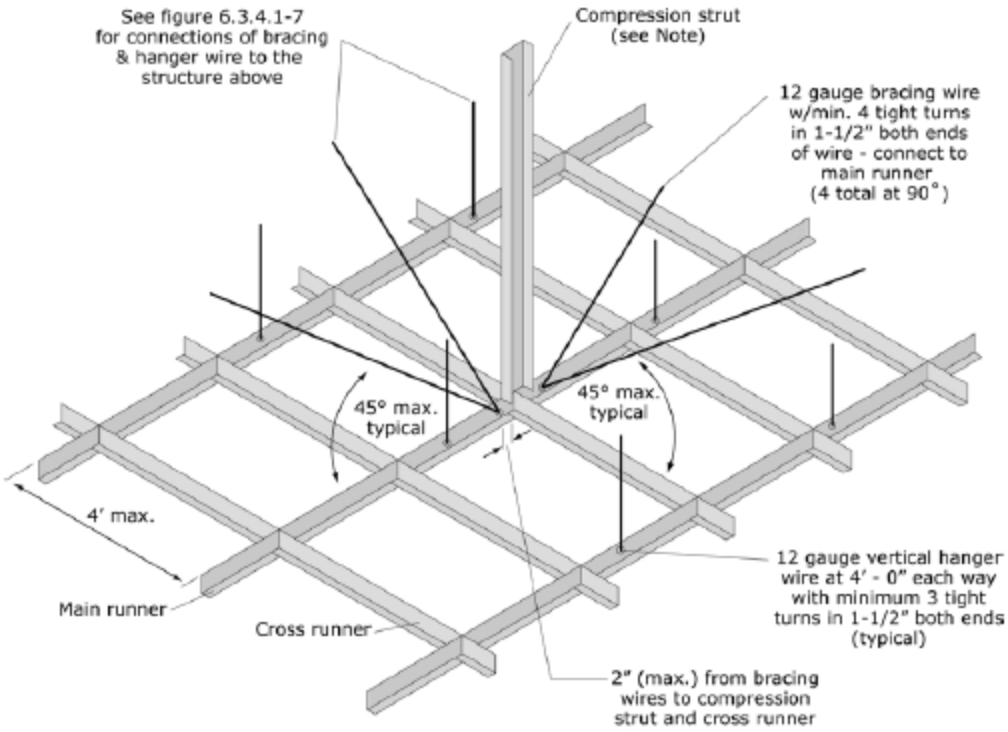


Figure G-8. Suspension System for Acoustic Lay-in Panel Ceilings – Edge Conditions.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Note: Compression strut shall not replace hanger wire. Compression strut consists of a steel section attached to main runner with 2 - #12 sheet metal screws and to structure with 2 - #12 screws to wood or 1/4" min. expansion anchor to structure. Size of strut is dependent on distance between ceiling and structure ($l/r \leq 200$). A 1" diameter conduit can be used for up to 6', a 1-5/8" X 1-1/4" metal stud can be used for up to 10'

Per DSA IR 25-5, ceiling areas less than 144 sq. ft, or fire rated ceilings less than 96 sq. ft., surrounded by walls braced to the structure above do not require lateral bracing assemblies when they are attached to two adjacent walls. (ASTM E580 does not require lateral bracing assemblies for ceilings less than 1000 sq. ft.; see text.)

Figure G-9. Suspension System for Acoustic Lay-in Panel Ceilings – General Bracing Assembly.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

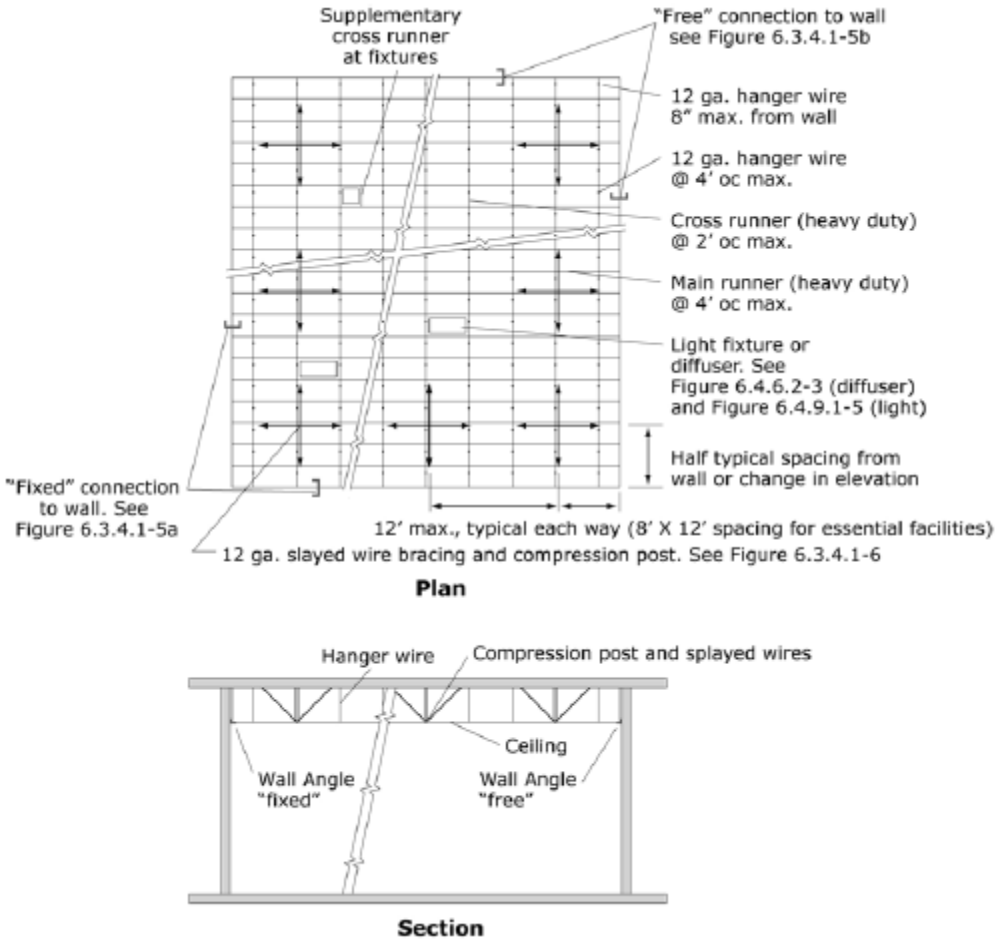


Figure G-10. Suspension System for Acoustic Lay-in Panel Ceilings – General Bracing Layout.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

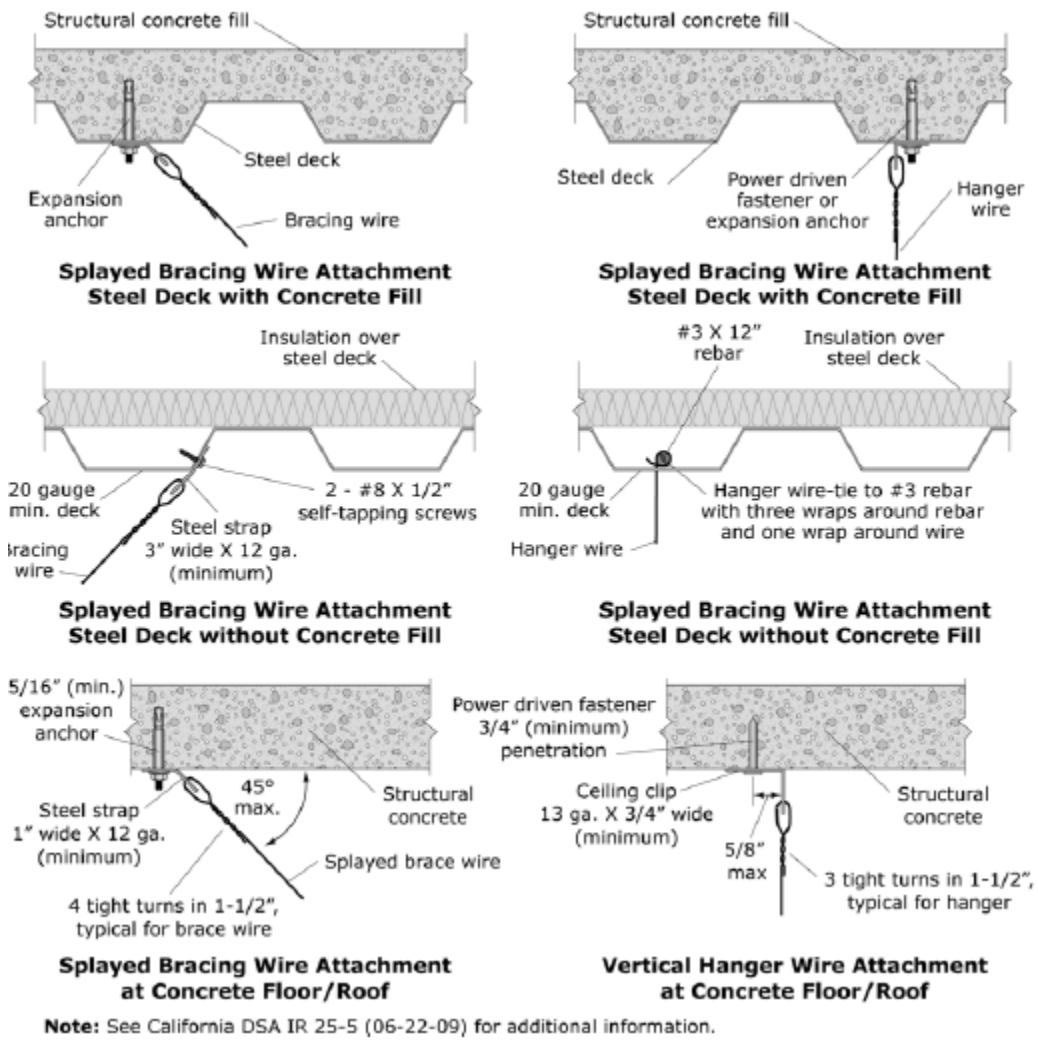
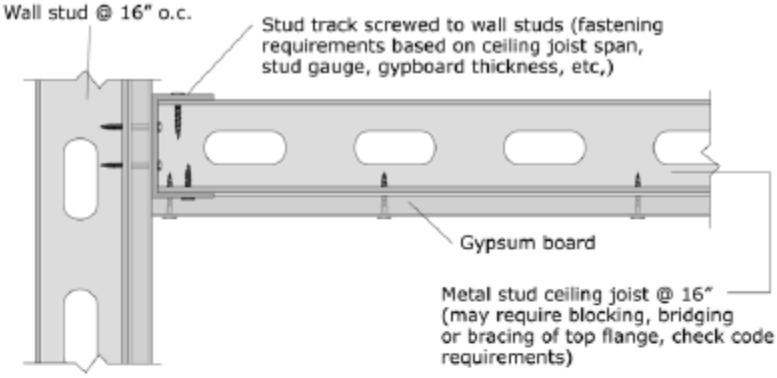
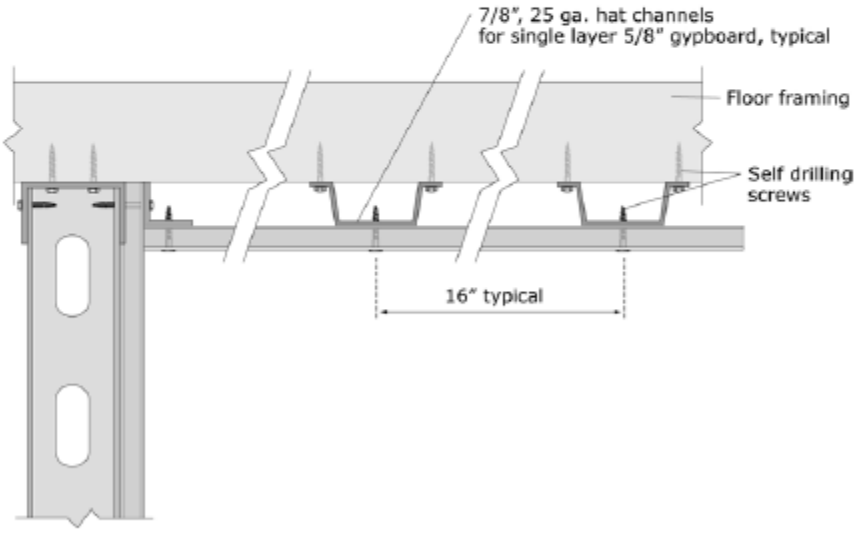


Figure G-11. Suspension System for Acoustic Lay-in Panel Ceilings – Overhead Attachment Details.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



a) Gypsum board attached directly to ceiling joists



b) Gypsum board attached directly to furring strips (hat channel or similar)

Note: Commonly used details shown; no special seismic details are required as long as furring and gypboard secured. Check for certified assemblies (UL listed, FM approved, etc.) if fire or sound rating required.

Figure G-12. Gypsum Board Ceiling Applied Directly to Structure.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

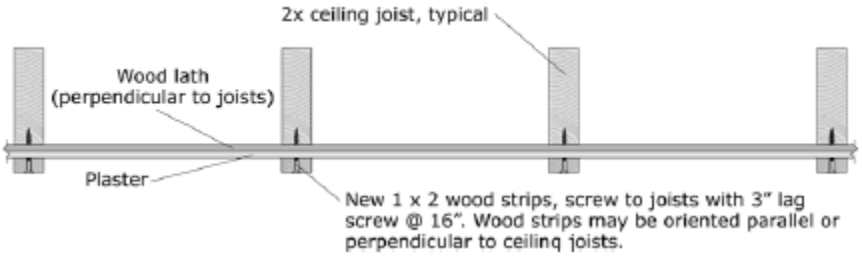


Figure G-13. Retrofit Detail for Existing Lath and Plaster.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

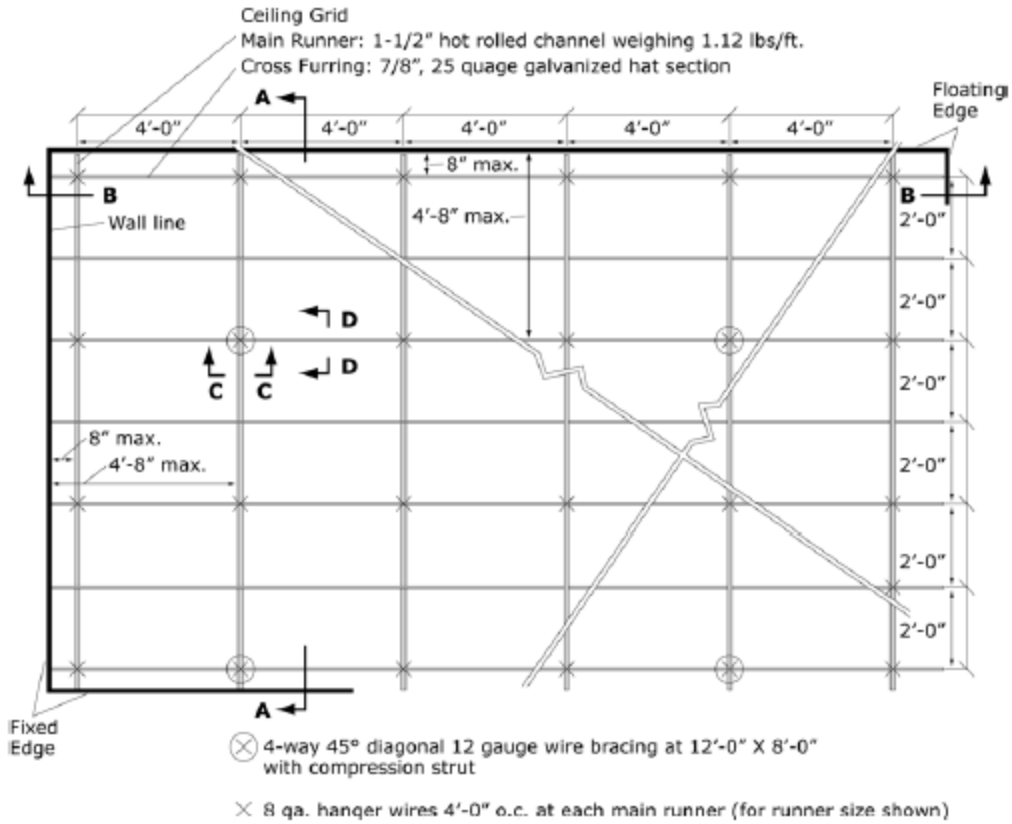


Figure G-14. Diagrammatic View of Suspended Heavy Ceiling Grid and Lateral Bracing.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

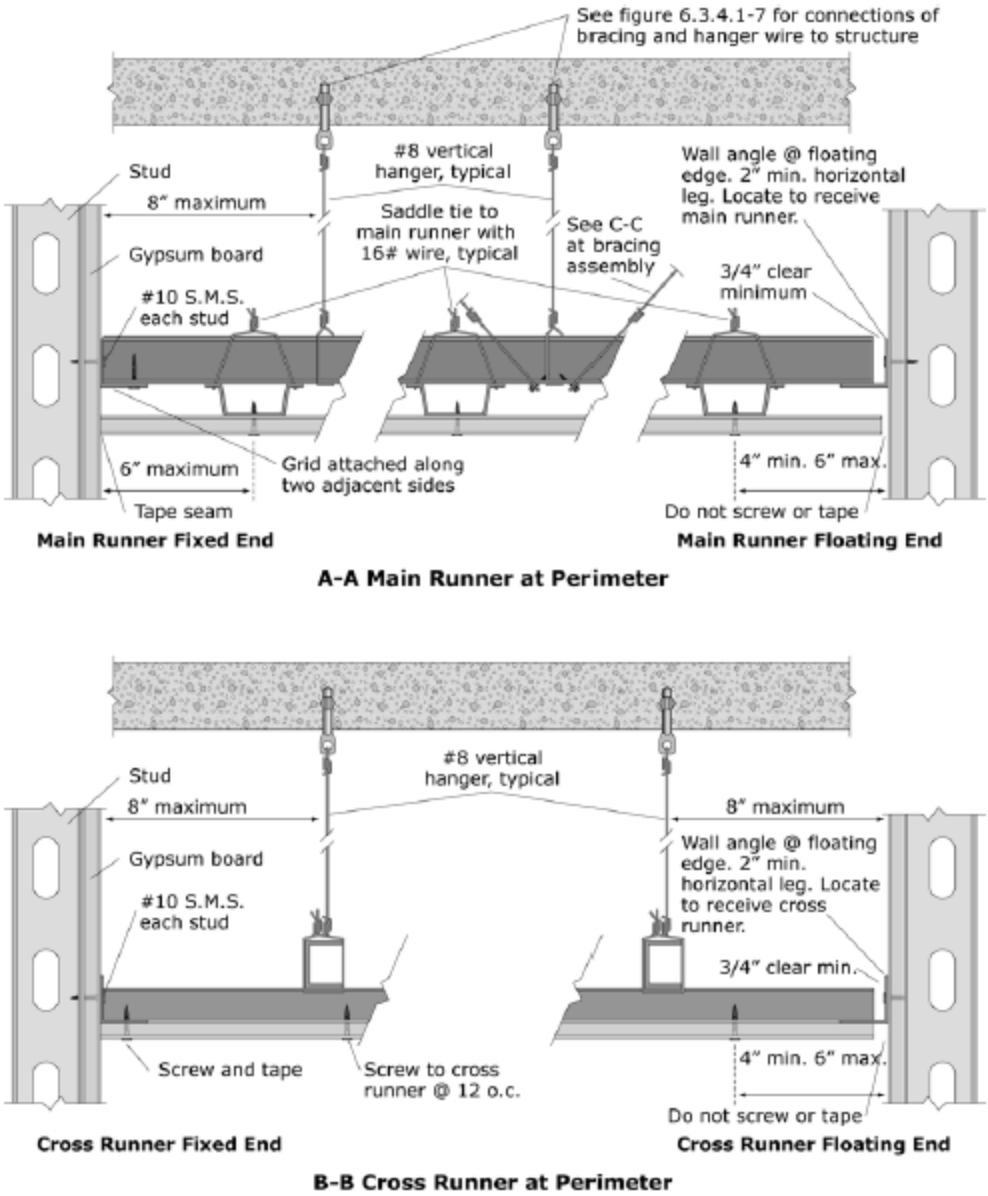
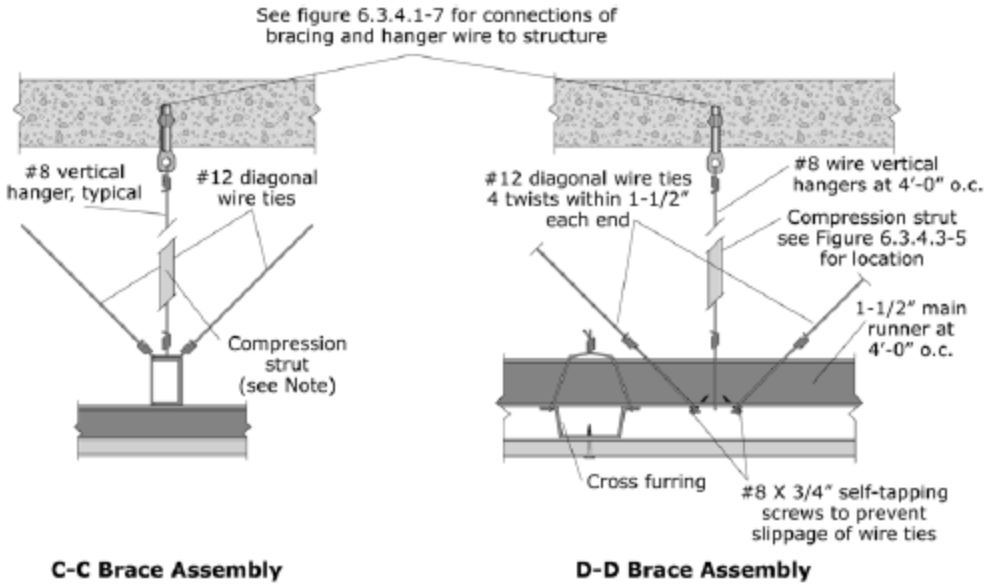


Figure G-15. Perimeter Details for Suspended Gypsum Board Ceiling.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Note: Compression strut shall not replace hanger wire. Compresion strut consists of a steel section attached to main runner with 2 - #12 sheet metal screws and to structure with 2 - #12 screws to wood or 1/4" min. expansion anchor to concrete. Size of strut is dependent on distance between ceiling and structure ($l/r \leq 200$). A 1" diameter conduit can be used for up to 6', a 1-5/8" X 1-1/4" metal stud can be used for up to 10'. See figure 6.3.4.1-6 for example of bracing assembly.

Figure G-16. Details for Lateral Bracing Assembly for Suspended Gypsum Board Ceiling.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Light Fixtures

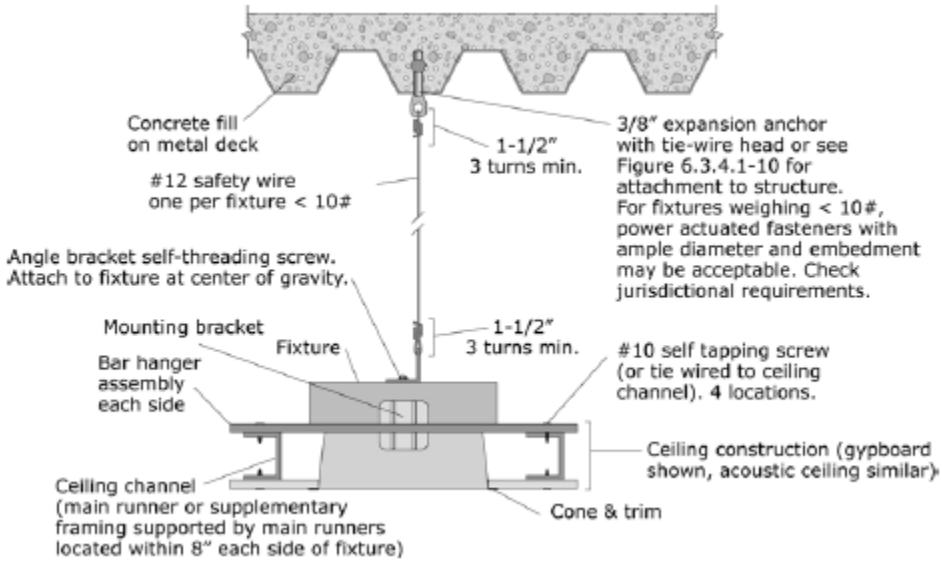


Figure G-17. Recessed Light Fixture in suspended Ceiling (Fixture Weight < 10 pounds).

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

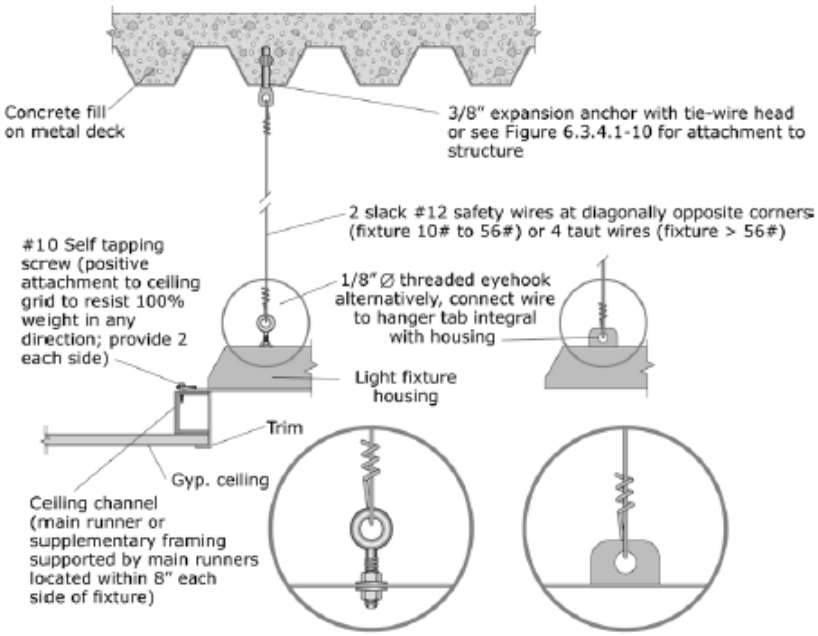


Figure G-18. Recessed Light Fixture in suspended Ceiling (Fixture Weight 10 to 56 pounds).

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Contents and Furnishings

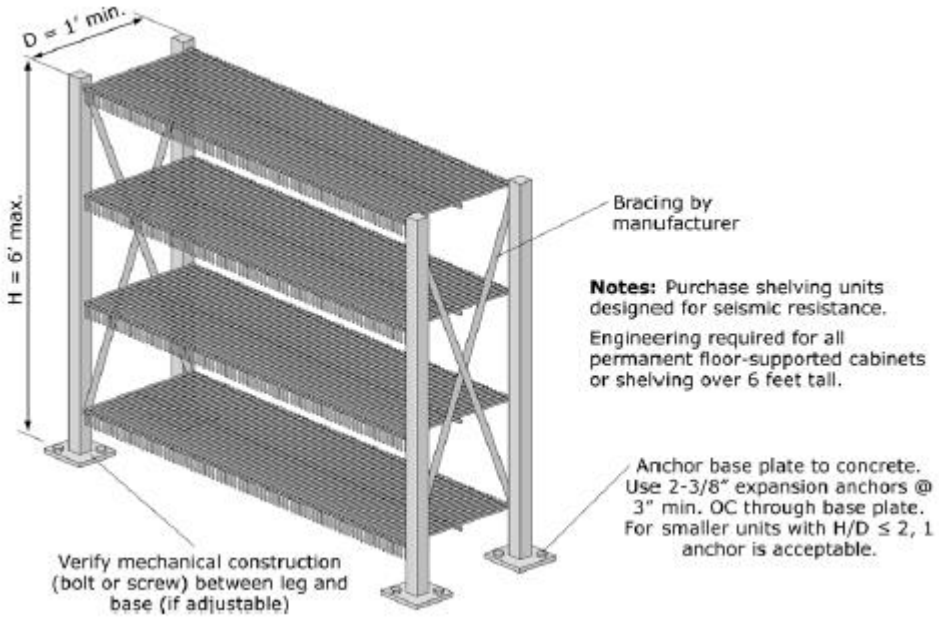
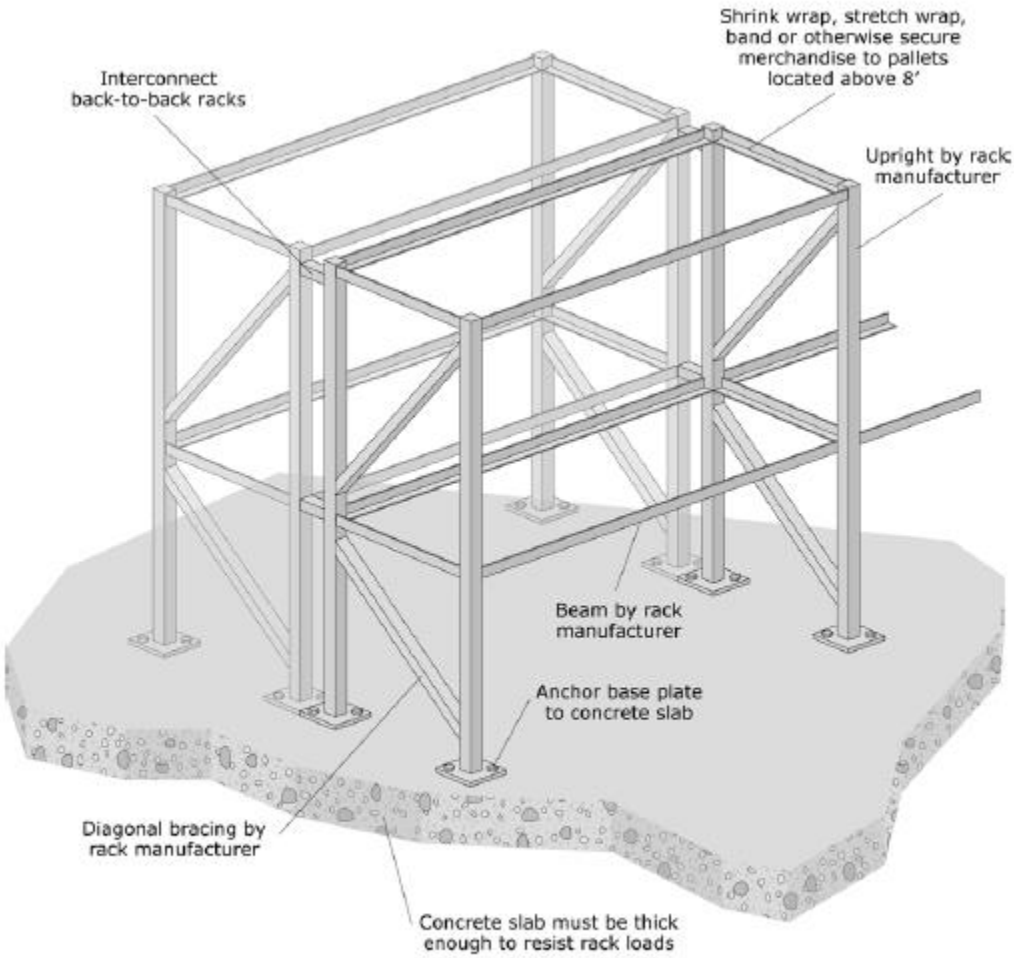


Figure G-19. Light Storage Racks.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Note: Purchase storage racks designed for seismic resistance. Storage racks may be classified as either nonstructural elements or nonbuilding structures depending upon their size and support conditions. Check the applicable code to see which provisions apply.

Figure G-20. Industrial Storage Racks.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

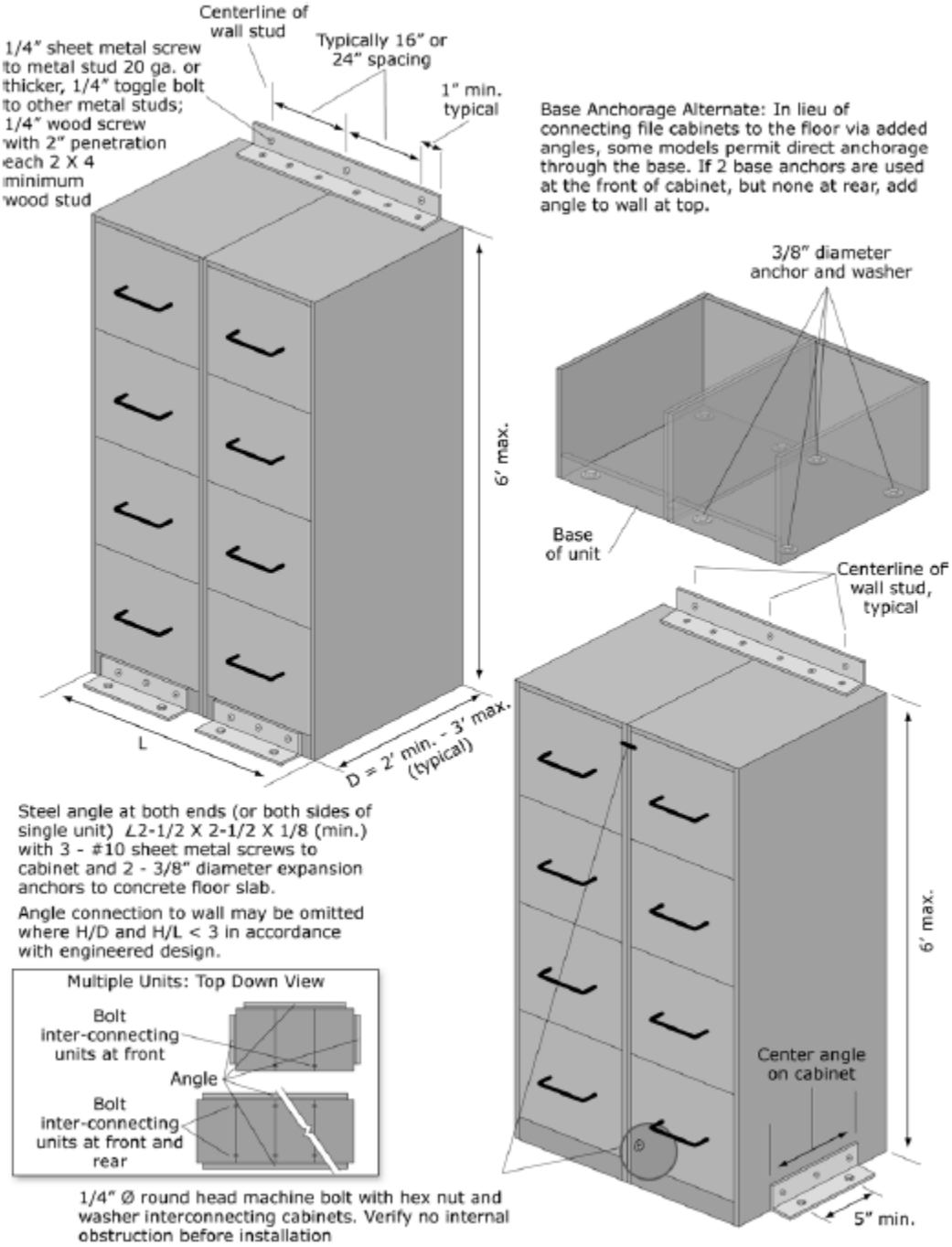


Figure G-21. Wall-mounted File Cabinets.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

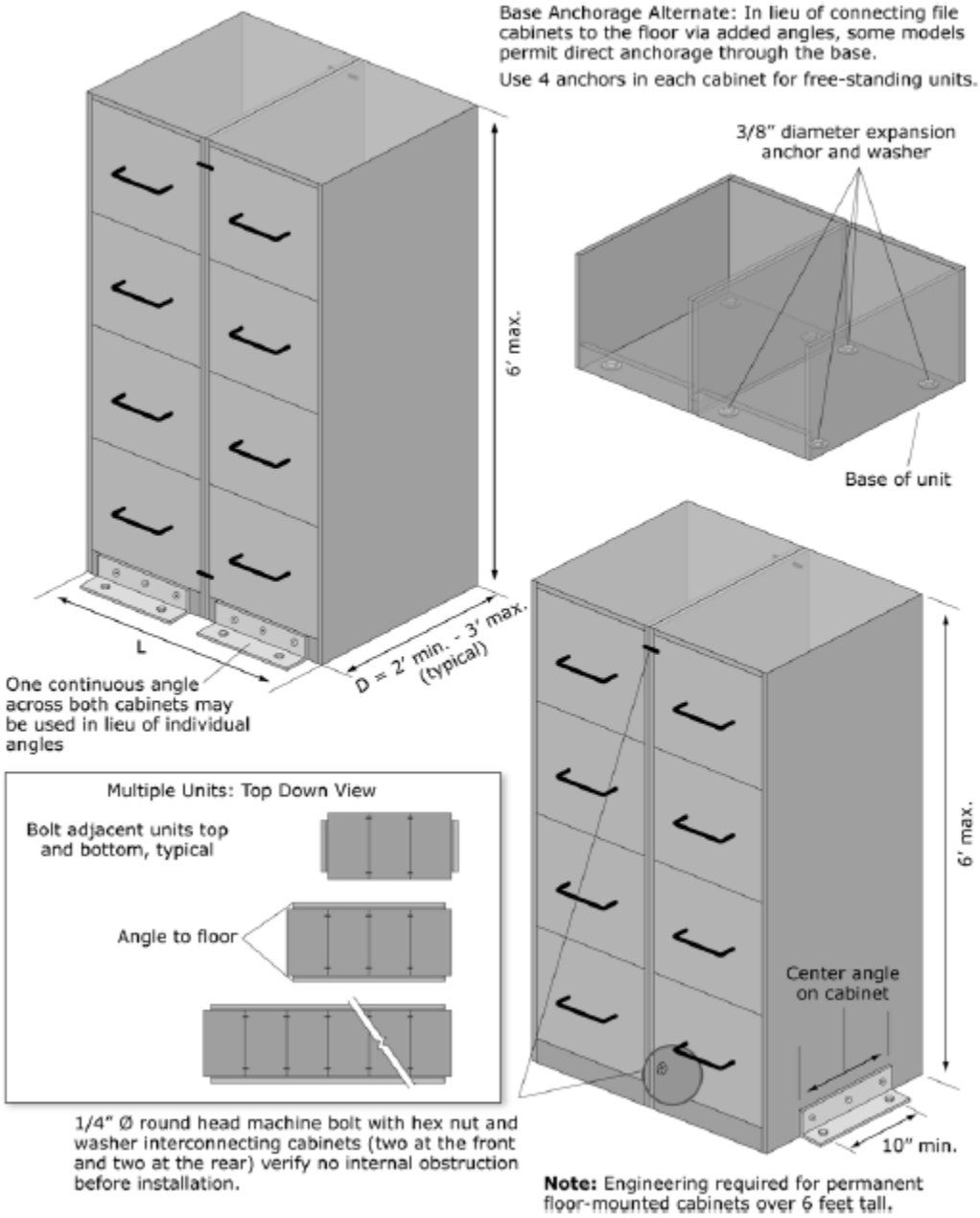


Figure G-22. Base Anchored File Cabinets.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

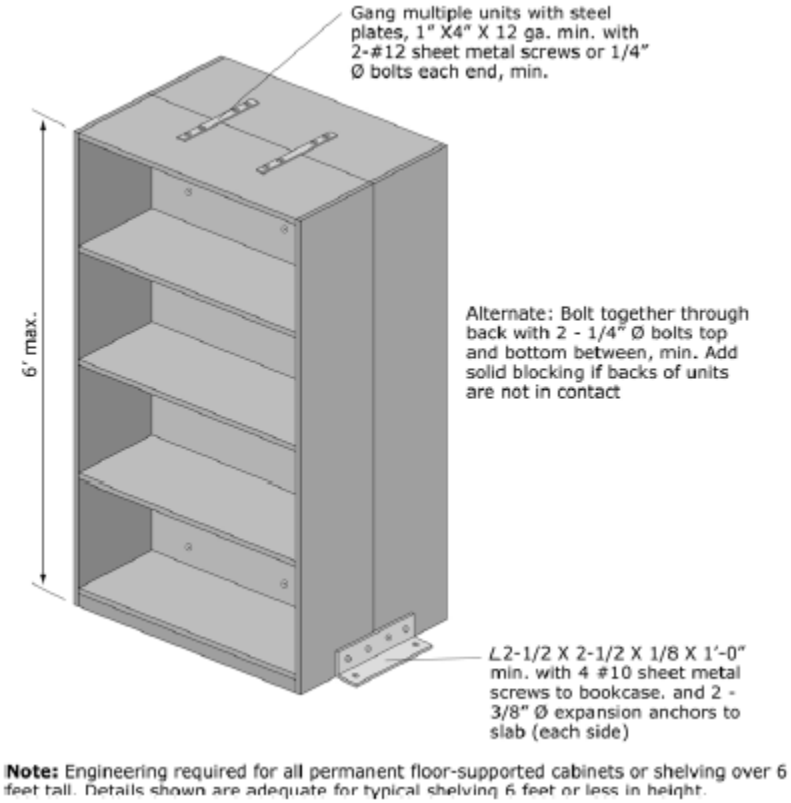


Figure G-23. Anchorage of Freestanding Book Cases Arranged Back to Back.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

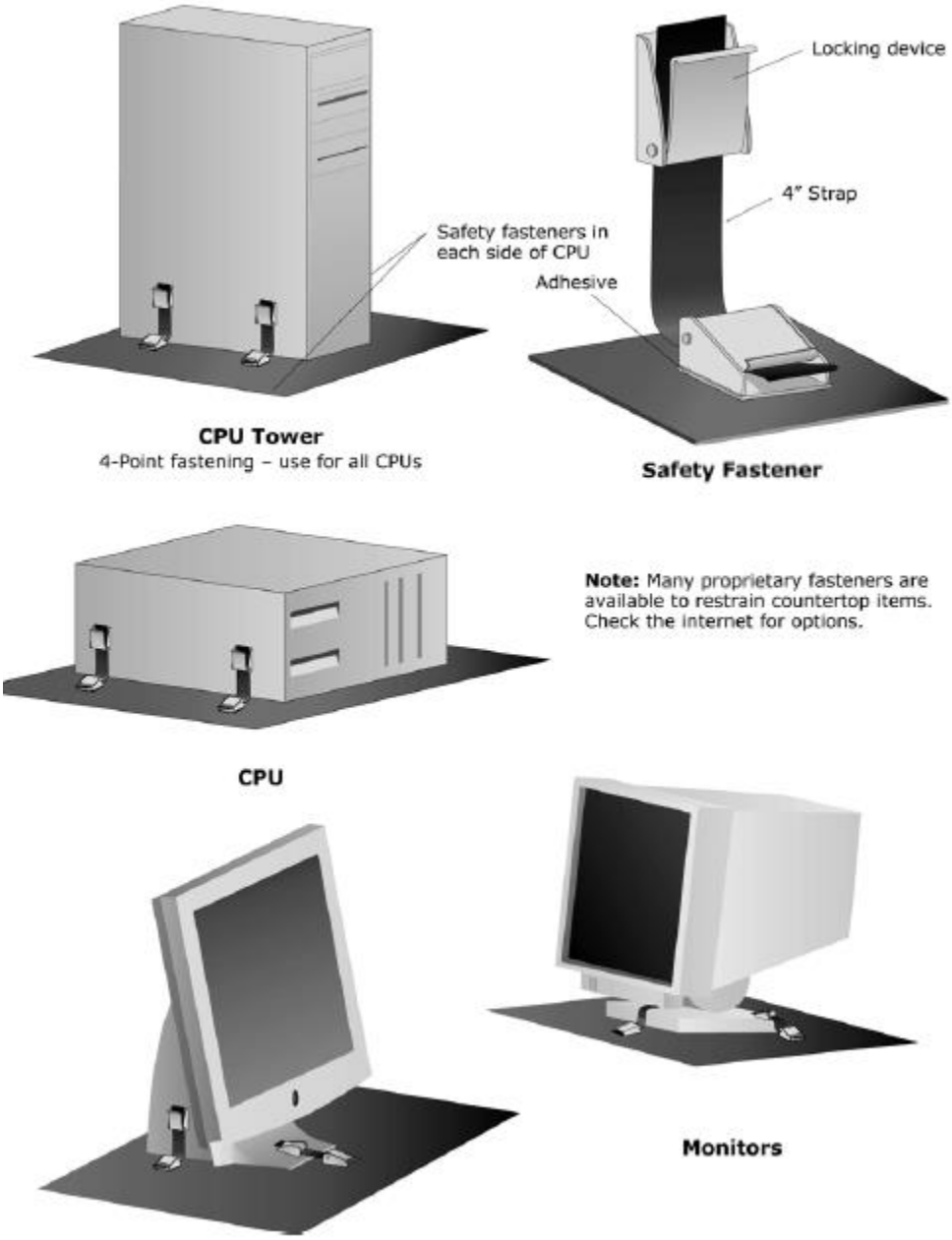
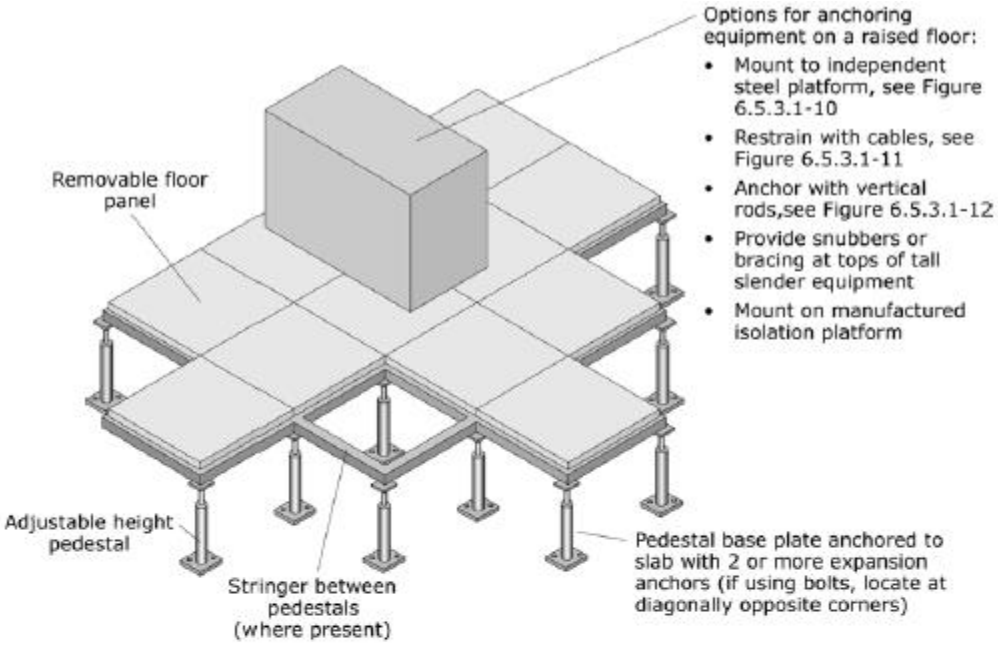
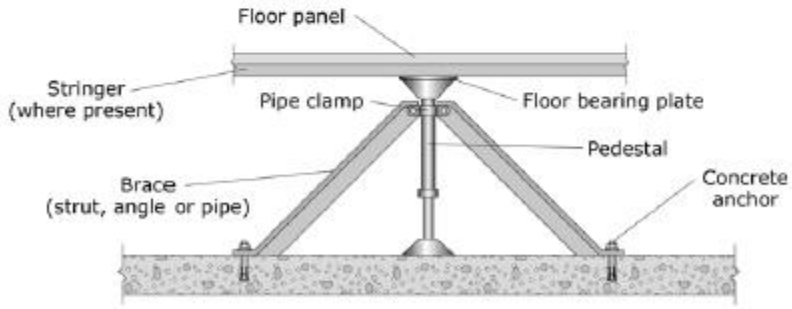


Figure G-24. Desktop Computers and Accessories.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Cantilevered Access Floor Pedestal



Braced Access Floor Pedestal
(use for tall floors or where pedestals are not strong enough to resist seismic forces)

Note: For new floors in areas of high seismicity, purchase and install systems that meet the applicable code provisions for "special access floors."

Figure G-25. Equipment Mounted on Access Floor.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

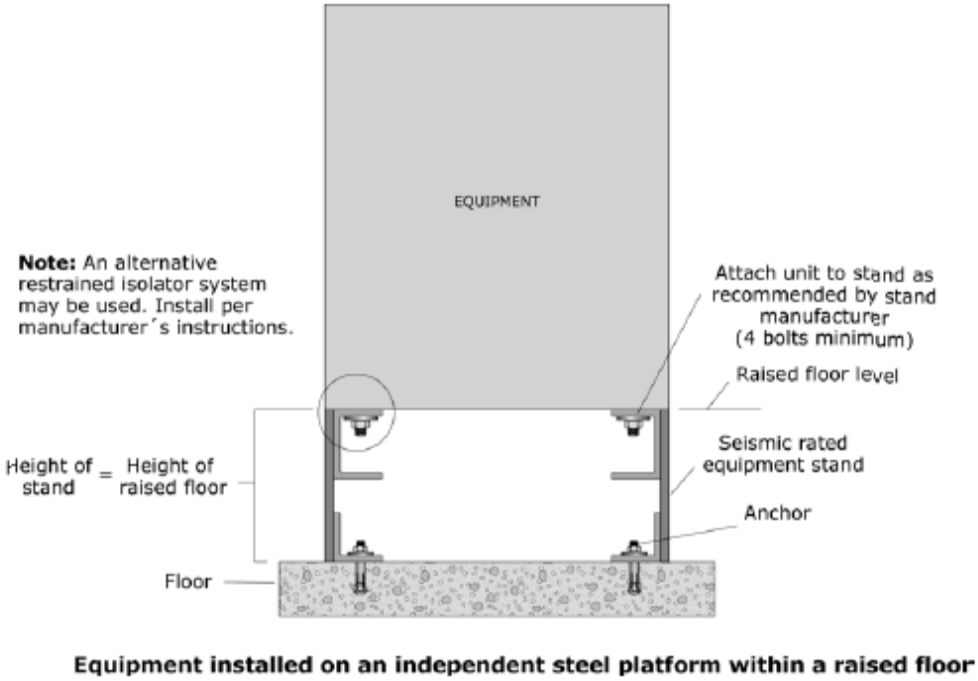


Figure G-26. Equipment Mounted on Access Floor – Independent Base.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

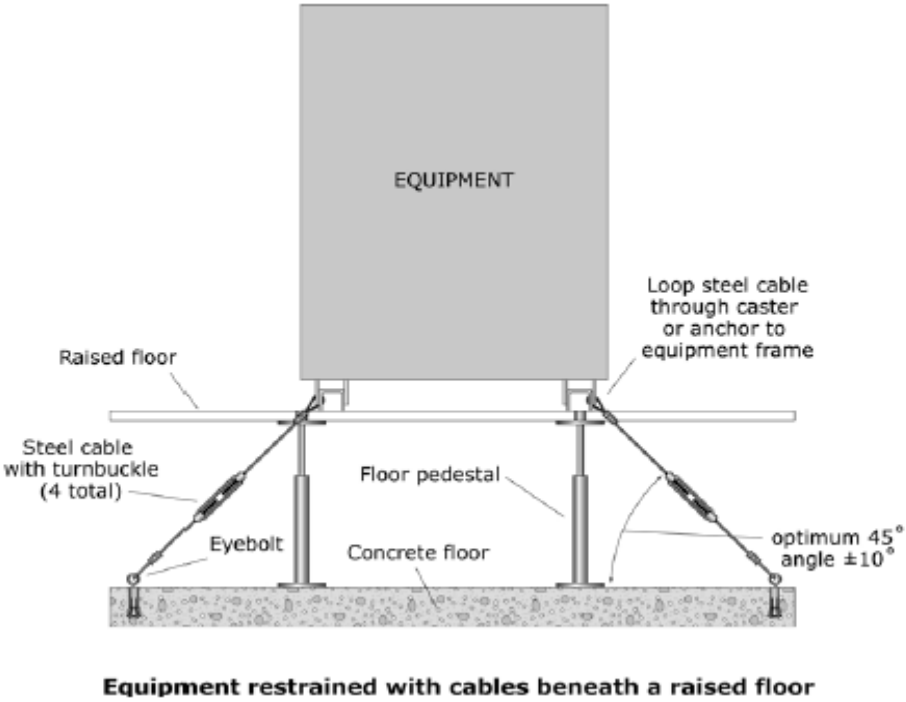
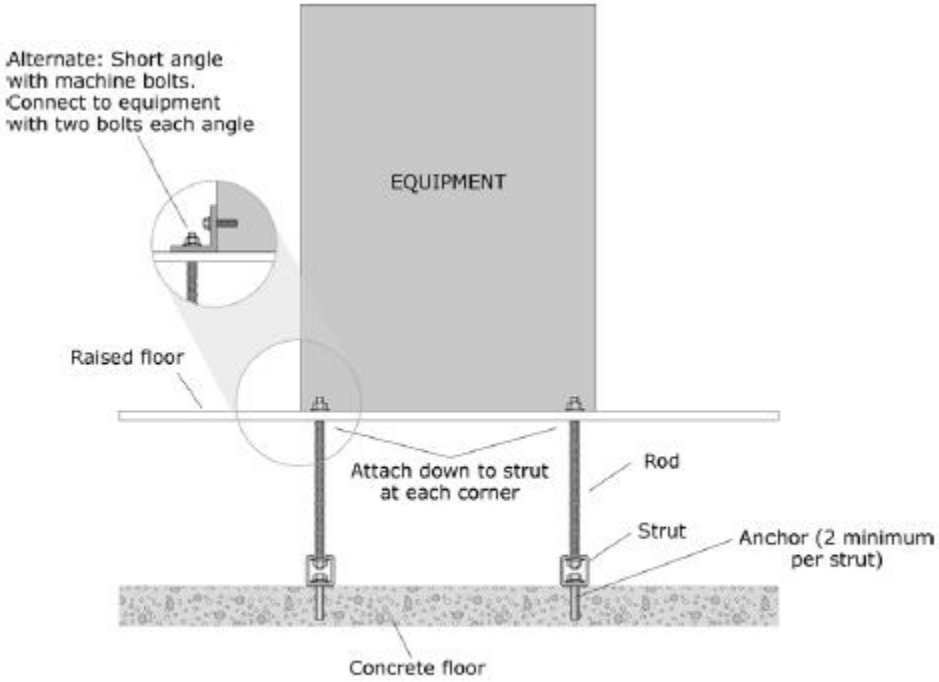


Figure G-27. Equipment Mounted on Access Floor – Cable Braced.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

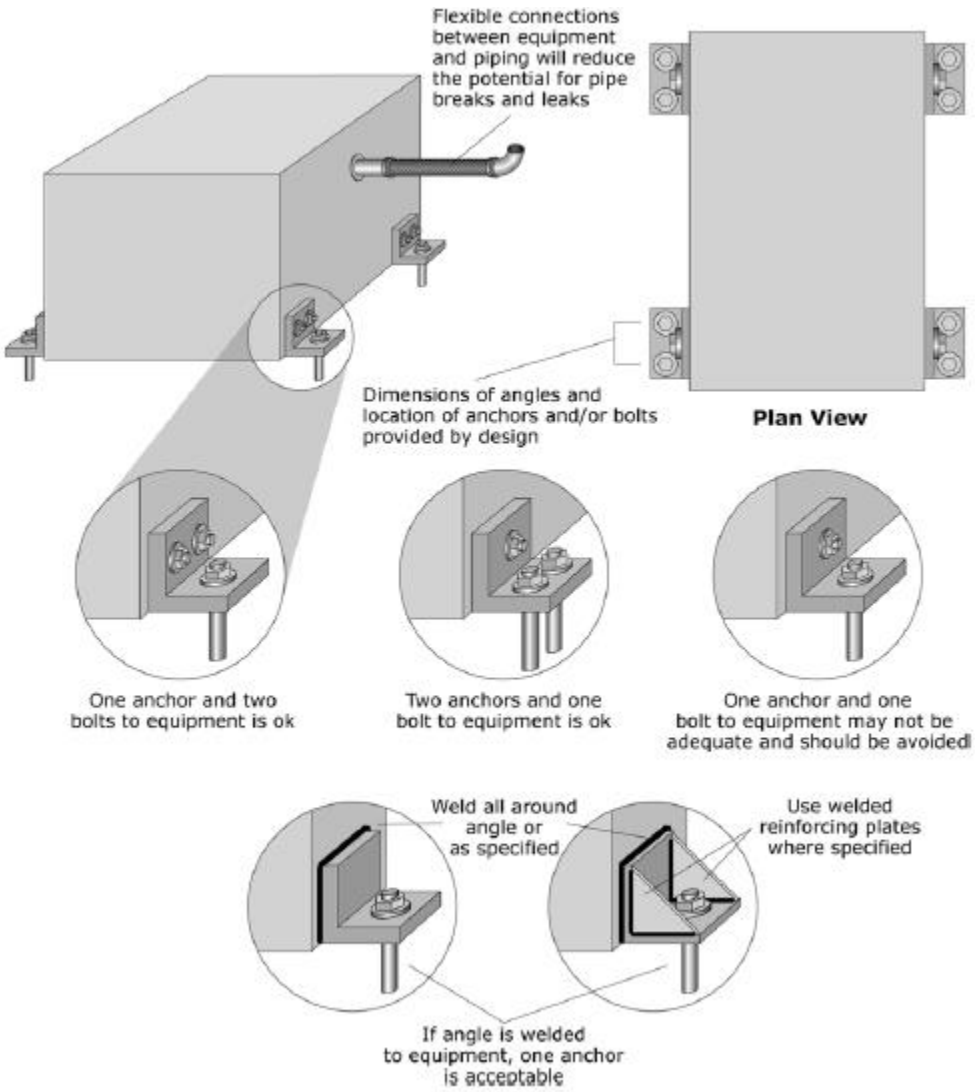


Equipment anchored with vertical rods beneath a raised floor

Figure G-28. Equipment Mounted on Access Floor – Tie-down Rods.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Mechanical and Electrical Equipment



Note: Rigidly mounted equipment shall have flexible connections for the fuel lines and piping.

Figure G-29. Rigidly Floor-mounted Equipment with Added Angles.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

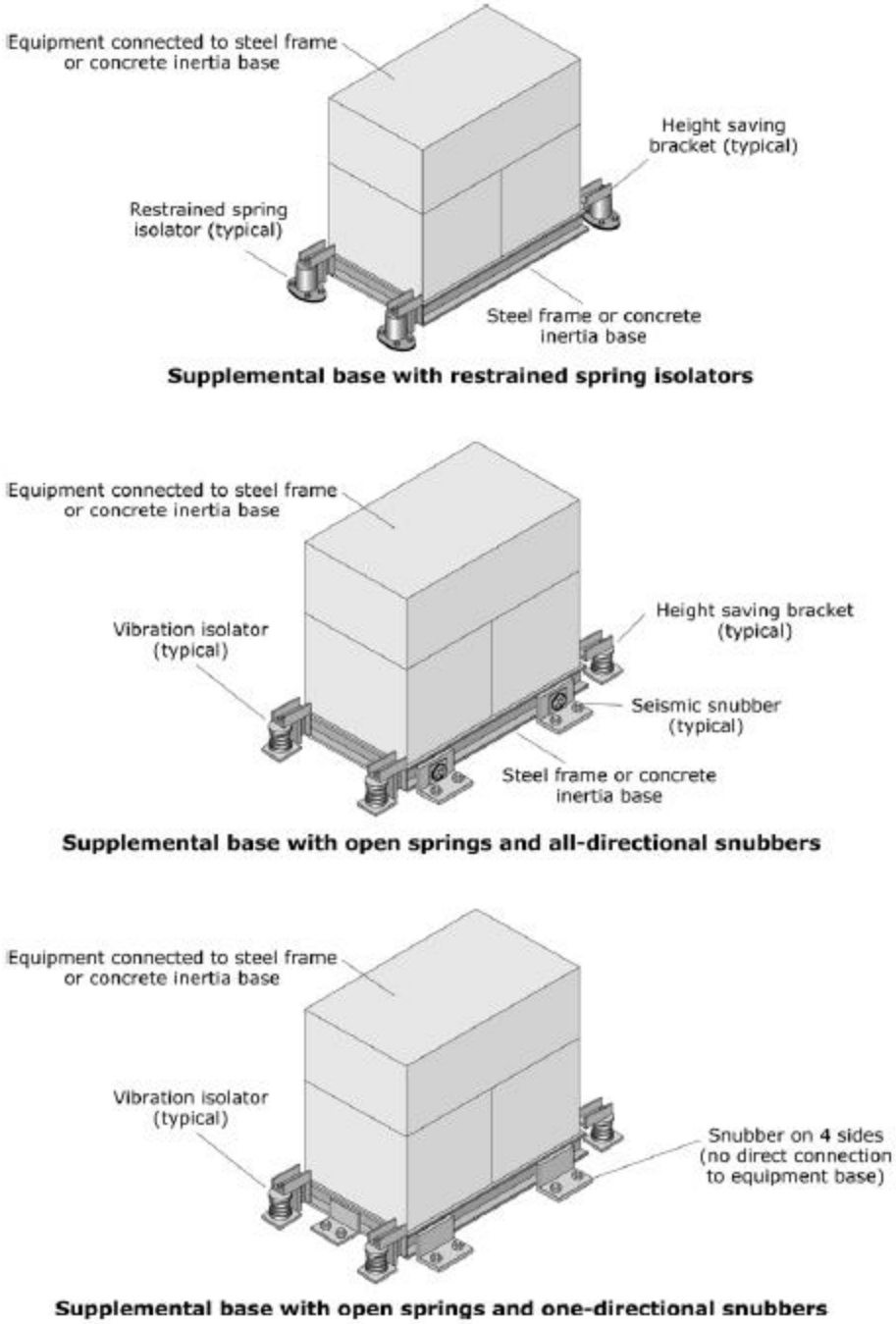


Figure G-30. HVAC Equipment with Vibration Isolation.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

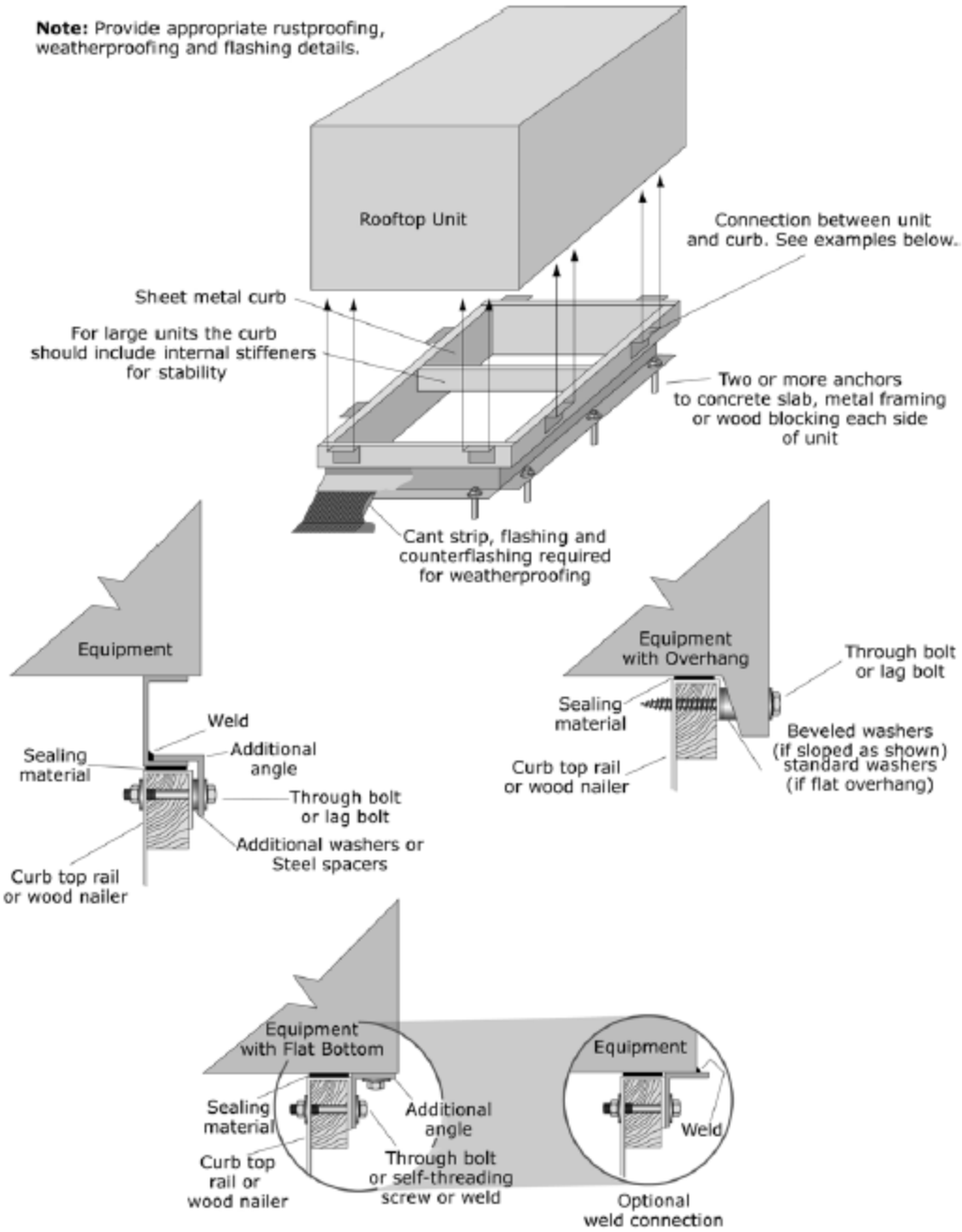


Figure G-31. Rooftop HVAC Equipment.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

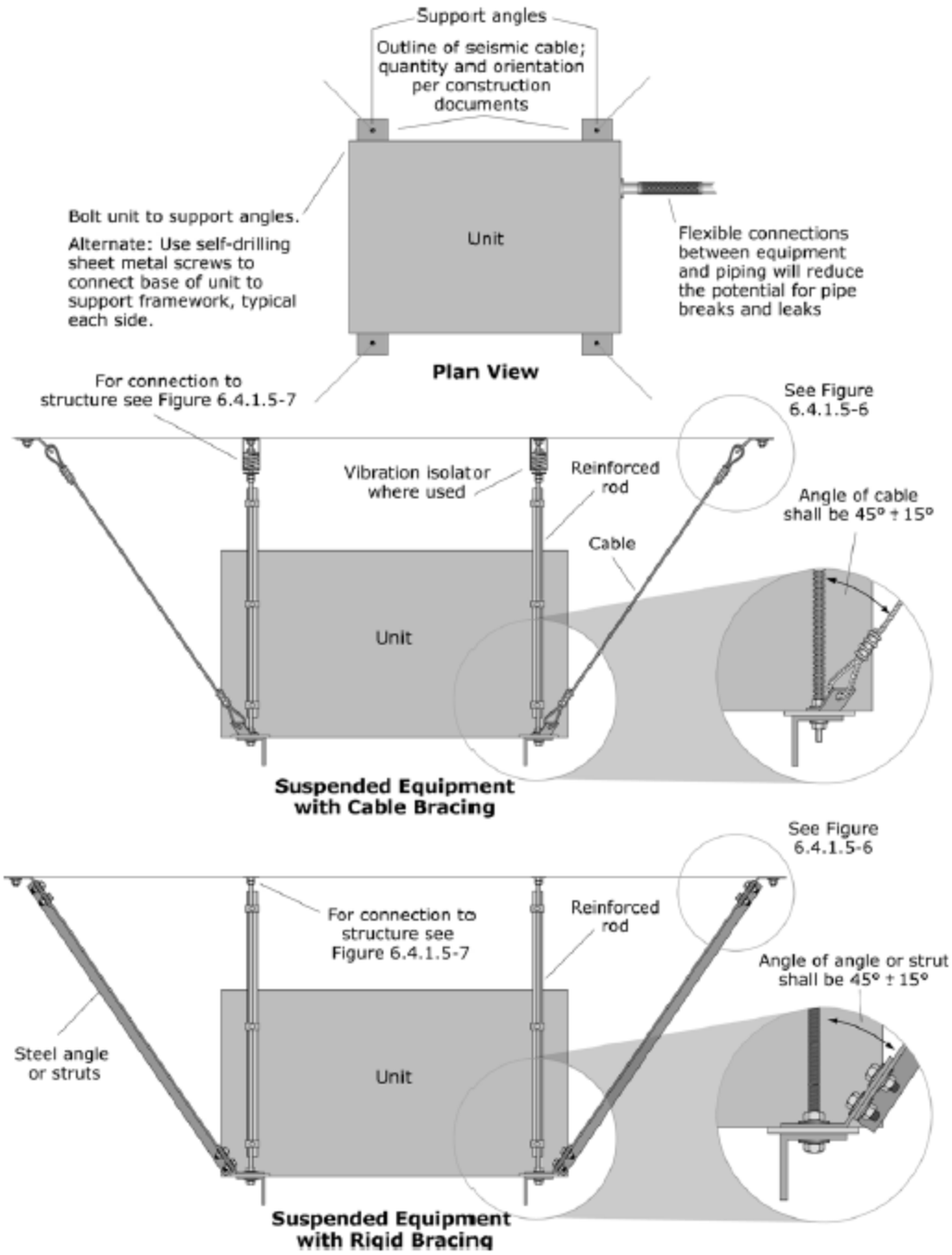


Figure G-32. Suspended Equipment.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

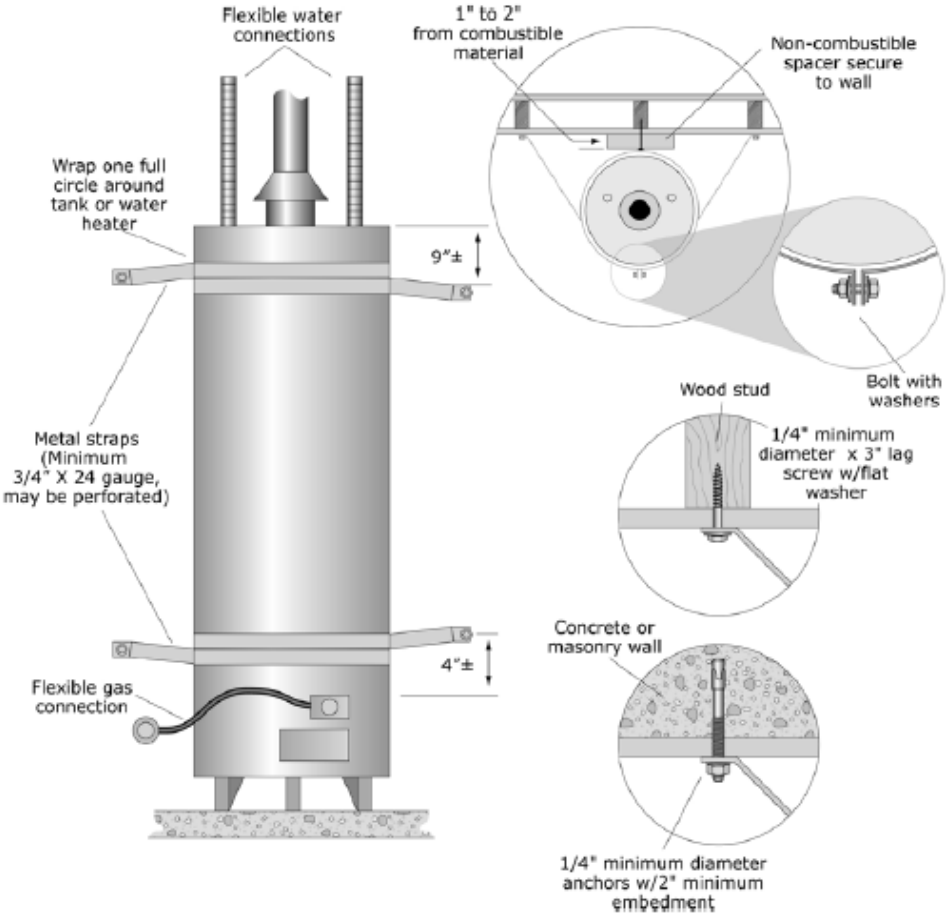


Figure G-33. Water Heater Strapping to Backing Wall.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

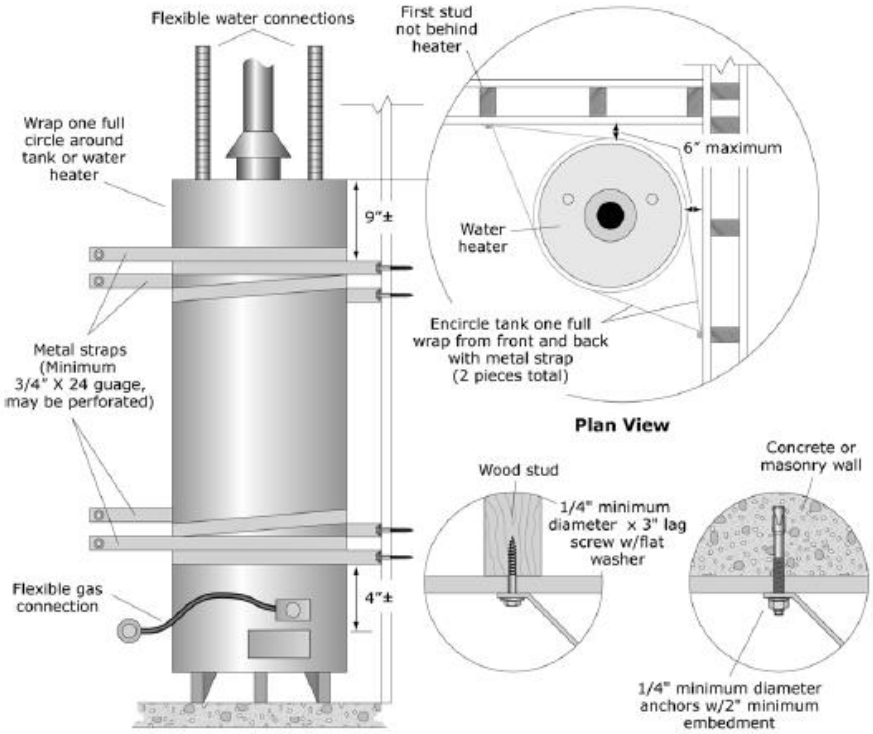


Figure G-34. Water Heater – Strapping at Corner Installation.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

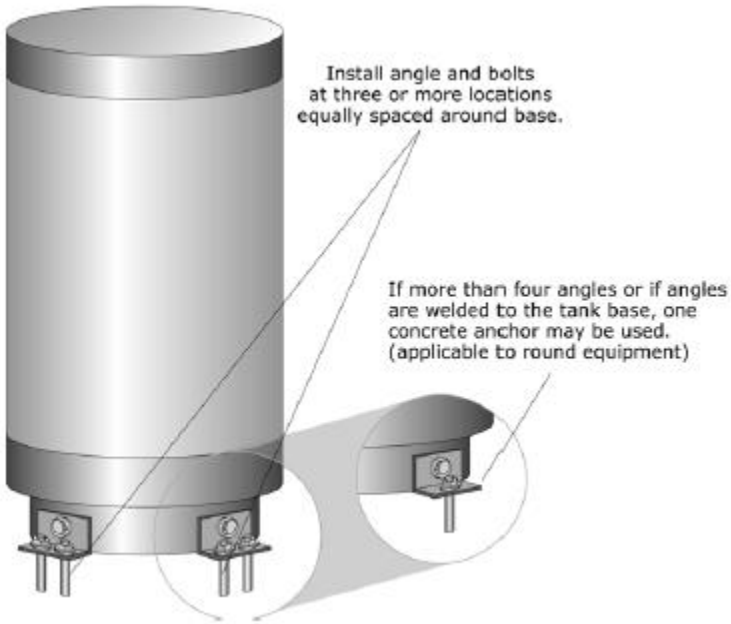


Figure G-35. Water Heater – Base Mounted.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

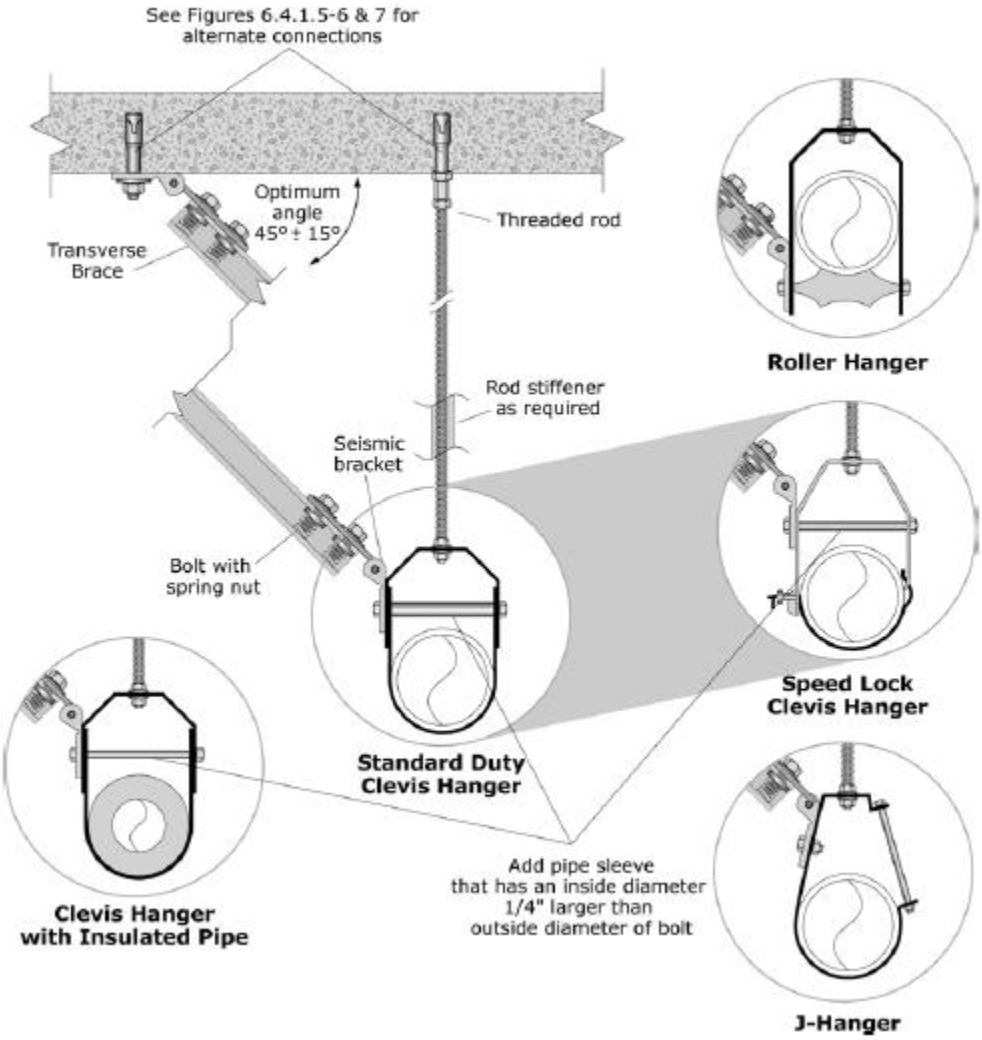


Figure G-36. Rigid Bracing – Single Pipe Transverse.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

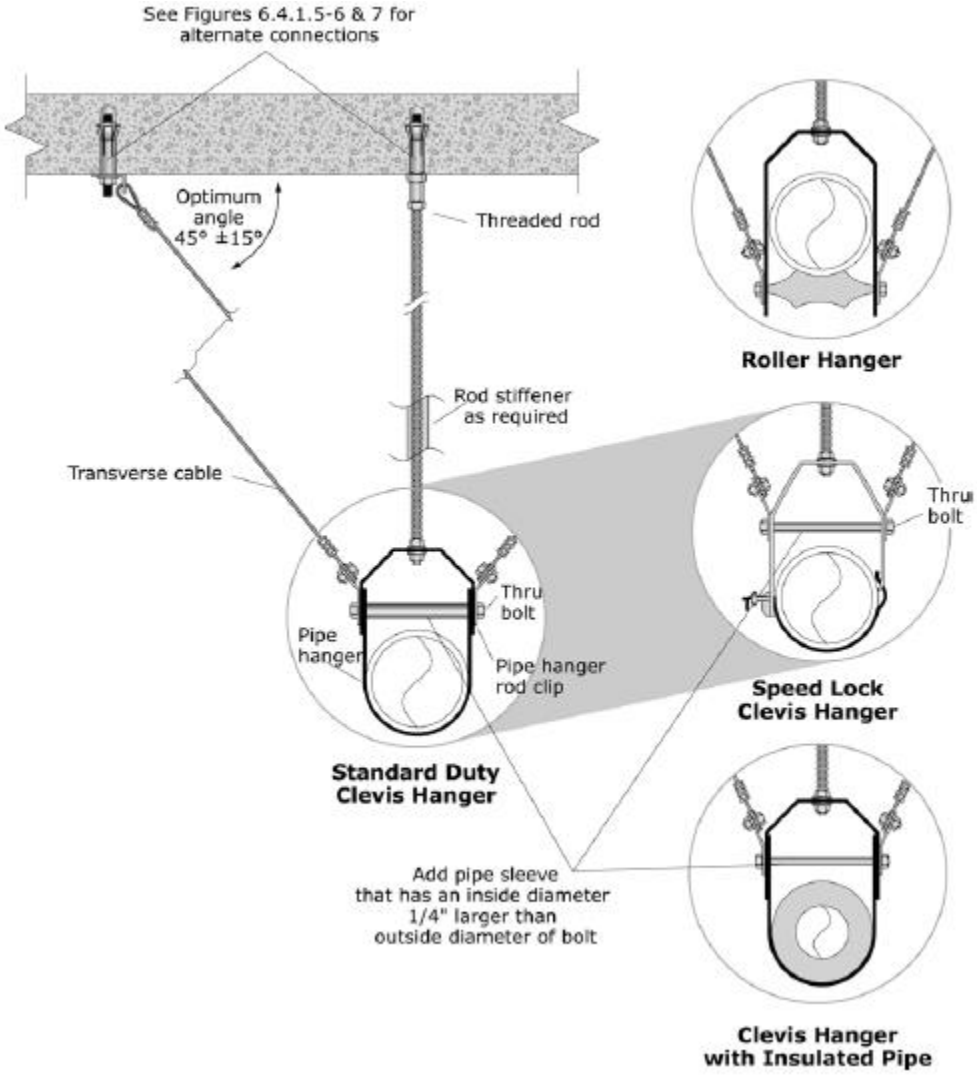


Figure G-37. Cable Bracing – Single Pipe Transverse.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

Electrical and Communications

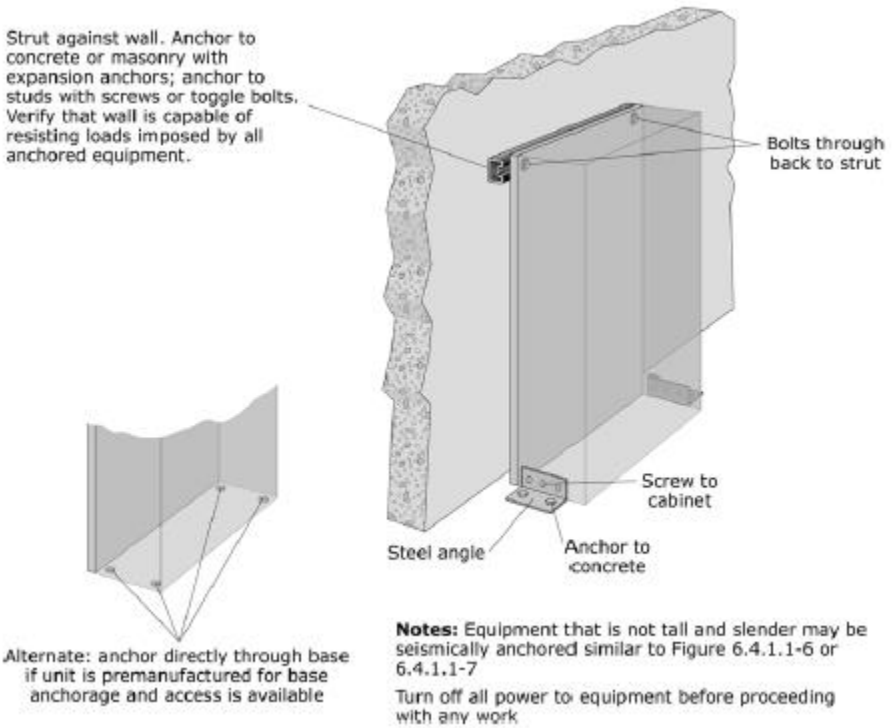


Figure G-38. Electrical Control Panels, Motor Controls Centers, or Switchgear.

(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

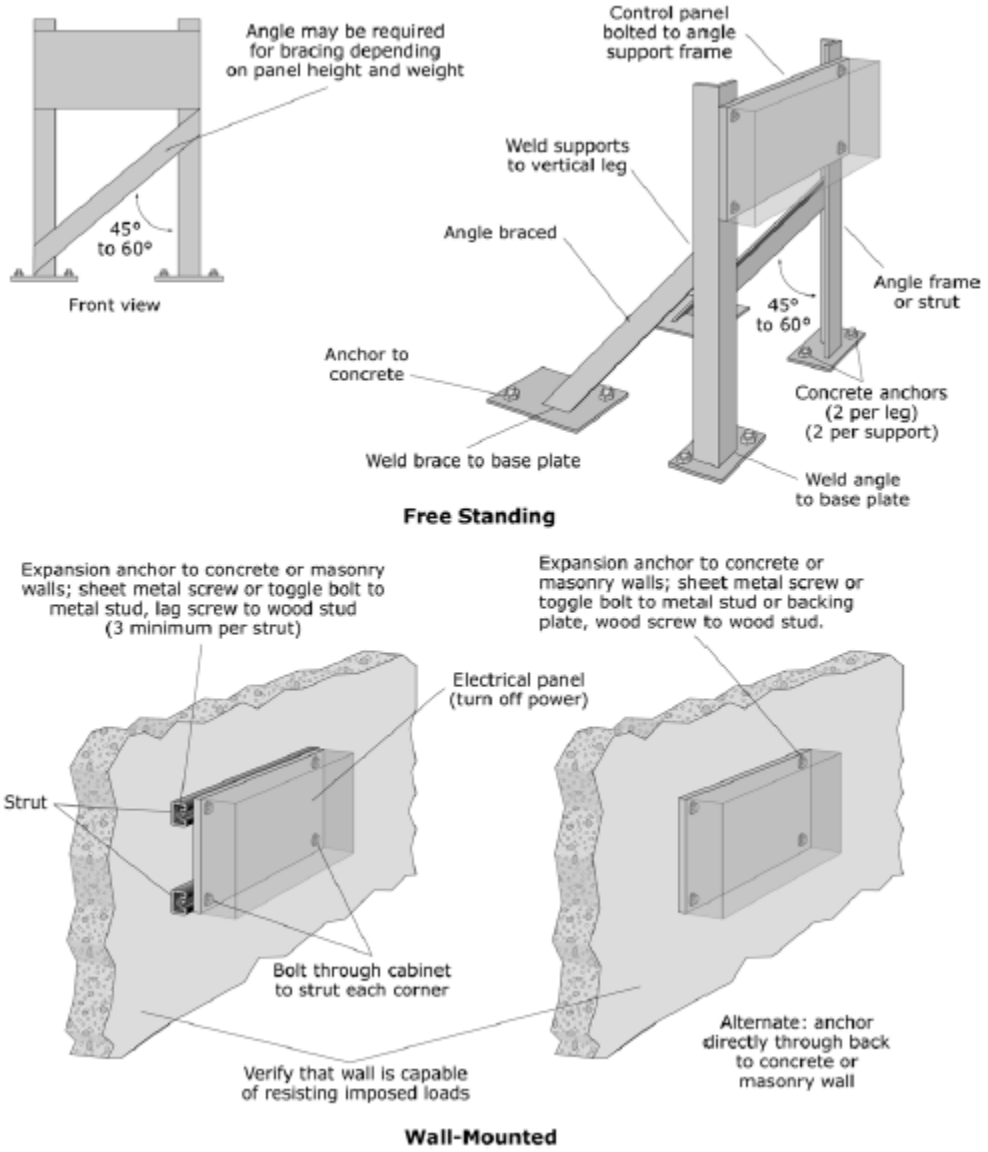


Figure G-39. Freestanding and Wall-mounted Electrical Control Panels, Motor Controls Centers, or Switchgear.
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

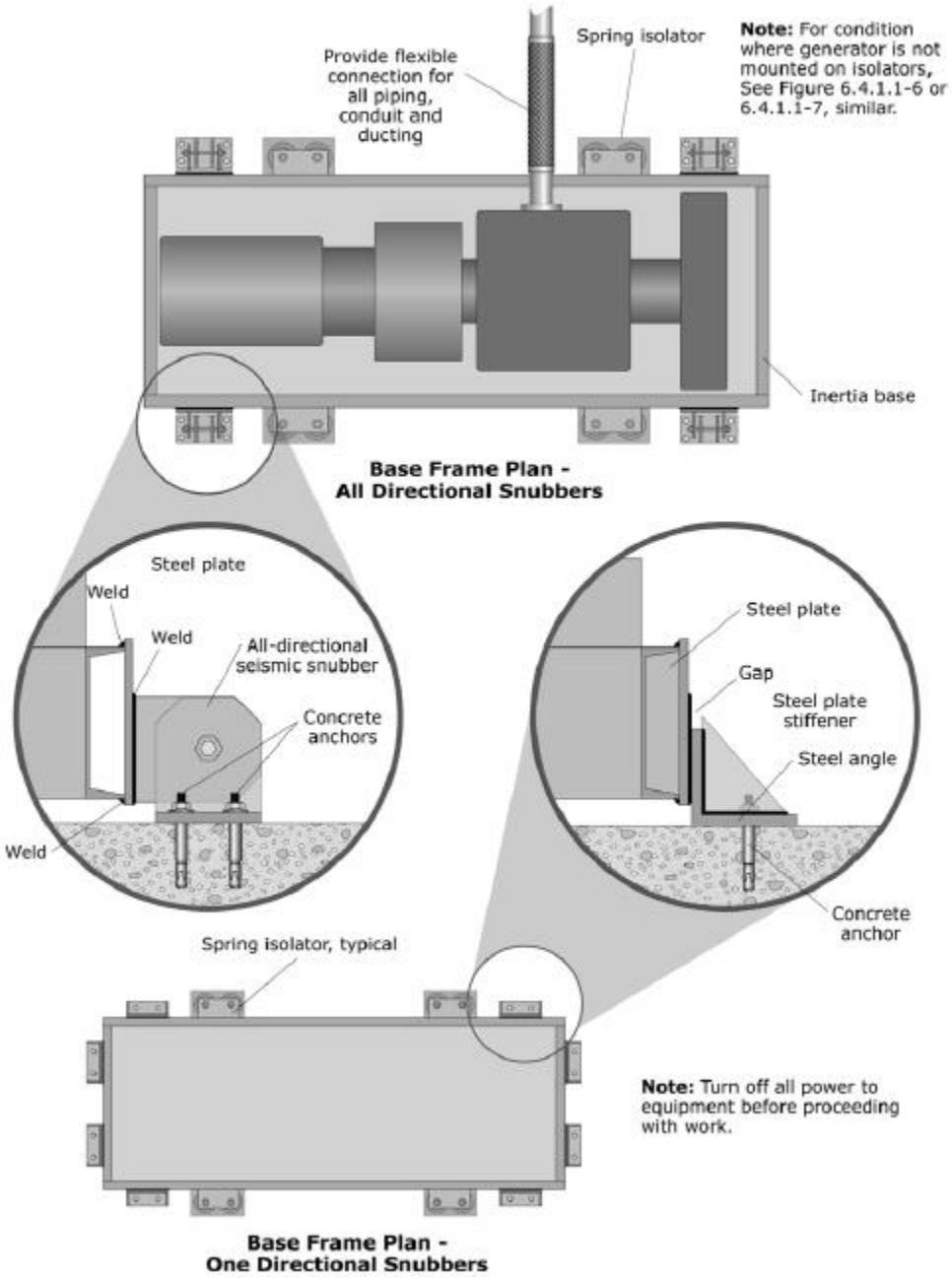


Figure G-40. Emergency Generator.
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)

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