Washington State School Seismic Safety Assessments Project

SEISMIC UPGRADES CONCEPT DESIGN REPORT

Lincoln Elementary School

Mount Vernon School District

June 2019

PREPARED FOR

Washington Department of Natural Resources

Superintendent of Public Instruction Washington

PREPARED BY

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EXECUTIVE SUMMARY

This report documents the findings of a preliminary seismic evaluation of the Lincoln Elementary School main building in Mount Vernon, Washington. The school is a K-5 elementary school for more than 370 students. The building is a 40,000-square-foot, three-story building with a daylight basement and an attic above the main roof. The building has cafeteria, faculty lounge, gymnasium, storage, and mechanical rooms at the first floor; performing arts space above the gymnasium at the third floor; and classrooms on all three levels. The building was originally constructed in 1938, and subsequent architectural modernization was done in 1982. Lincoln Elementary School is a reinforced concrete structure with a wood-framed attic. The cast-in-place elevated concrete floors are supported with reinforced concrete beams spanning between exterior and interior concrete walls and columns. The attic roof is constructed with plywood sheathing over wood frame systems supported on wood posts that are bearing on the concrete beams at the main roof level. The foundation system for the building is comprised of shallow continuous wall footings under exterior and interior concrete walls and shallow spread footings below concrete columns and exterior pilasters.

Reid Middleton performed a Tier 1 screening in accordance with ASCE 41-17. 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 overstressed concrete walls, inadequate horizontal and vertical reinforcements at the concrete walls, and soft and weak stories at the two-story-high gymnasium. Other deficient items include insufficient exterior wall anchorage to transfer wall out-of-plane loading and an unblocked diaphragm at the attic roof.

Conceptual seismic upgrade recommendations for structural and nonstructural systems are provided to improve the performance of the building to meet the designated performance criteria per ASCE 41-17. Sketches for the concept-level seismic upgrades are provided in Appendix B.

The structural upgrades include installing supplemental concrete shotcrete walls, adding new concrete walls along transverse directions, providing foundation upgrades at supplemental concrete walls, and upgrading the attic. Upgrades to the attic include installing additional wall anchorages at the roof diaphragm, adding blocking and panel nailing at the roof sheathing, and installing new wood shear walls.

The recommendations for nonstructural upgrades include upgrading sprinkler systems to comply with NFPA 13, restraining containers holding hazardous materials, bracing suspended ceilings, providing independent supports for light fixtures, laminating overhead glazing to prevent glass from shattering, installing steel framing at glass block panels at the west stair well, anchoring storage cabinets and shelving to adjacent floors or walls, and providing seismic bracing for mechanical equipment.

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Acronyms

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
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.

Drawings

Arch N. Torbitt Architects, November 1937, existing drawings titled “Lincoln Elementary School,” Eleventh and Skagit Streets, Mount Vernon, Washington.

Larry Erickson and Associates, June 1982, existing drawings titled “Modernization of Lincoln Elementary School,” Mount Vernon School District No. 320, Mount Vernon, Washington.

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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 220 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 included 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, etc.) 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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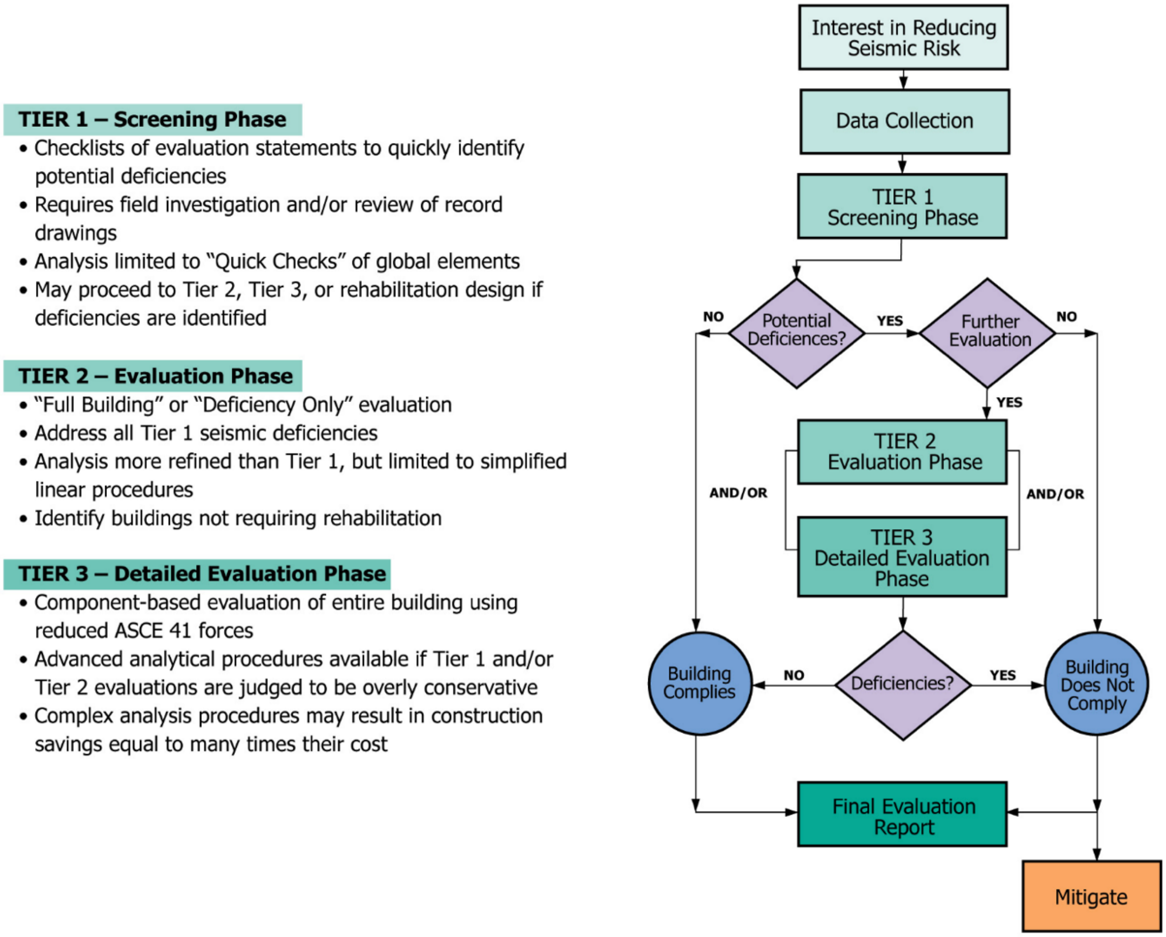
2.0 Seismic Evaluation Procedures and Criteria

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. See Figure 2.1 for a flow chart describing 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 shear walls and wall anchorage. 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 Performance-Based Earthquake Engineering 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 Lincoln Elementary 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 upon 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 0.725 g, and the design 1-second period spectral acceleration, S_{D1} is 0.389 g. Based on ASCE 41 Table 2-4, the Level of Seismicity for this building is classified as **High**.

The ASCE 41 Basic Performance Objective for Existing Buildings (BPOE) makes use of the BSE-1E (Basic Safety Earthquake – 1E) seismic hazard level and the BSE-2E (Basic Safety Earthquake – 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 2.3-1 provides the spectral accelerations for the 225-year, 975-year, and 2,475-year return interval events specific to Lincoln Elementary School that are considered in this study.

Table 2.3-1. 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	0.38 g	0.2 Seconds	0.72 g	0.2 Seconds	0.76 g	0.2 Seconds	1.09 g
1.0 Seconds	0.14 g	1.0 Seconds	0.28 g	1.0 Seconds	0.30 g	1.0 Seconds	0.43 g

2.2.2 Lincoln Elementary 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. Per 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-1N** 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 a 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 Concrete Shear Wall Building with Rigid Diaphragms, **C2**. Concrete Shear Wall (C2) buildings include those that have bearing walls, wall piers, columns, and exterior spandrel beams constructed of reinforced concrete, with elevated floor and roof framing structural systems consisting of reinforced concrete slabs and girders.

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: 1938
Building Code: Unknown

Architectural Modernization Year: 1982

Number of Stories: 3
Attic Below Roof: 1
Floor Area: 40,000 SF

FEMA Building Type: C2
ASCE 41 Level of Seismicity: High
Site Class: C

The building is a three-story 1930s-era elementary school building with a daylight basement. The building has a rectangular floor plan with a ground floor gymnasium, performing arts space above the gymnasium, and classrooms on all three levels. The building has a 5-foot 6-inch-high attic space above the main roof level.

The structural system consists of a non-ductile concrete structure constructed on a sloping site. The roof deck consists of a 3-inch-thick cast-in-place reinforced concrete roof slab supported by integral cast-in-place reinforced concrete beams at 12 feet on center. The floor framing systems consist of a 4- to 5-inch-thick cast-in-place reinforced concrete slab supported by reinforced concrete beams supported by concrete columns, pilasters, and walls. The roof framing over the attic space appears to consist of plywood sheathing supported by wood joists spanning north-south between 4x6 wood beams that are spaced approximately 10 feet on center. The 4x6 beams are supported on 4x4 wood posts at 6 feet on center along concrete beams at attic level. The lateral force resisting system of the building is concrete shear walls with concrete diaphragm at floor levels, including the attic, and wood diaphragm at the roof level.

The foundation system for the building is comprised of shallow continuous wall footings under exterior and interior concrete walls and shallow spread footings below concrete columns and exterior pilasters.

3.1.2 Building Use

The school is a K-5 elementary school for more than 370 students. The first floor consists of cafeteria, faculty lounge, storage and mechanical rooms, two classrooms, and a two-story-high gymnasium. The second and third floors consist predominantly of classrooms, with the third floor also having a library and study hall and performing arts spaces above the gymnasium.

3.1.3 Structural System

Table 3.1.3-1. Structural System Descriptions.

Structural System	Description
Roof Over Attic	The roof over the attic appears to be 3/4-inch-thick plywood sheathing over 2x6 wood joists at 24 inches on center spanning north-south and supported on 4x6 wood beams that are spaced approximately 10 feet on center. The 4x6 beams are supported on 4x4 wood posts at 6 feet on center along concrete beams at attic level.
Main Roof	The roof deck consists of a 3-inch-thick cast-in-place reinforced concrete slab supported by reinforced concrete beams that are spaced at 12 feet on center. The concrete beams are cast integrally with the slab.
First and Second Floor	Elevated floors consist of 3- to 4-inch-thick cast-in-place reinforced concrete slabs supported by cast-in-place reinforced concrete beams spaced 12 feet on center spanning from exterior wall piers to interior bearing walls and columns. The concrete beams are cast integrally with the floor slab.
Foundation	Foundations consist of cast-in-place reinforced concrete shallow spread footings supporting wall piers and columns and concrete strip footings supporting concrete bearing walls.
Gravity System	The gravity system consists of concrete roof and floors supported by concrete roof and floor beams supported by wall piers, bearing walls, and columns. The wall piers, columns, and bearing walls are supported on shallow concrete spread footings.
Lateral System	The lateral system consists of concrete roof and floors diaphragms, laterally supported by concrete shear walls, wall piers, and columns. Sliding and overturning forces from lateral loads are resisted by concrete spread footings.

Table 3.2.3-2. Structural System Condition Descriptions.

Structural System	Description
Roof	The roof appeared to be in good condition. No cracking was observed. Some peeled paint was observed at the underside of the roof slab.
Attic Floor	The attic floor appeared to be in good condition. No cracking was observed. Some peeled paint was observed at the underside of the roof slab.
Foundations Condition	The foundation wall was observed on the ground level in the boiler room and it appeared to be in good condition. No other foundations were observable.
Gravity System Condition	The condition of the gravity system appears to be functional and intact.
Lateral System Condition	The condition of the lateral system appeared to be intact; however, it should be noted that the lateral system consisting of wall piers along the longitudinal axis of the building is not reliable. Also, considering the building's age and era, there are concerns about lateral system performance.

3.2 Seismic Evaluation Findings

3.2.1 Structural Seismic Deficiencies

Table 3.2.1-1 summarizes the seismic deficiencies in the structural systems. See Appendix A for the Tier 1 screening checklists.

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

Deficiency	Description
Load Path	1930's-era concrete construction has an unreliable load path through non-ductile concrete wall piers.
Weak Story	The building appears to be compliant; however, the gymnasium has a first story that is approximately twice as tall as the second story. Due to the year of original construction (1938), it is assumed that weak story effects may not have been considered in the design of the gymnasium.
Soft Story	The gymnasium at the first floor is open to the second floor. Due to the year of original construction (1938) it is assumed that soft story effects may not have considered in the design of the gymnasium.
Shear Stress Check	Shear stresses at first floor and second floor are greater than 100 psi.

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

Deficiency	Description
Liquefaction and Slope Failure	Geotechnical investigation should be performed to determine the geological hazard to the building during an earthquake.
Reinforcing Steel	The reinforcing steel spacing for concrete and CMU walls is insufficient in both the vertical and horizontal directions, based on the Tier 1 checklist. Concrete and CMU walls with insufficient reinforcing steel behave in a non-ductile manner and have limited capacity in resisting seismic forces. Tier 1 requirements indicate that lightly reinforced concrete and CMU walls, such as these, will behave as unreinforced masonry walls.
Wall Anchorage at Flexible Diaphragms	Attic roof to exterior concrete wall connections types and extent are unknown. Based on the age of the building, it is assumed that the wall anchorage is insufficient.
Transfer to Shear Walls	Attic roof diaphragm to exterior wall anchorage connections may be insufficient to transfer roof diaphragm loads to concrete shear walls.
Straight Sheathing	The attic roof diaphragm aspect ratio is greater than 2-to-1.

3.2.2 Nonstructural Seismic Deficiencies

Table 3.2.2-1 summarizes the seismic deficiencies in the nonstructural systems. See Appendix A for the Tier 1 screening checklists.

Table 3.2.2-1. Identified Nonstructural Seismic Deficiencies based on Tier 1 Checklists.

Deficiency	Description
LSS-1 Fire Suppression Piping	Available record drawings do not have information pertaining to fire suppression piping, and it was not able to be verified during site investigation. Based on the age of the building, it is assumed that seismic bracing for fire suppression piping does not comply with NFPA 13.
LSS-2 Flexible Couplings	Available record drawings do not have information pertaining to fire suppression piping and it was not able to be verified during the site investigation. Based on the age of the building, it is assumed the flexible couplings on the fire suppression piping do not comply with NFPA 13.
LSS-3 Emergency Power	Available record drawings do not have information on anchorage or bracing for emergency power equipment, and it was not able to be verified during the site investigation. Based on the age of the building, emergency power equipment is either nonexistence or noncompliant. Emergency power is critical to post-earthquake recovery; therefore, proper mounting of the components of the emergency power system is

Table 3.2.2-1. Identified Nonstructural Seismic Deficiencies based on Tier 1 Checklists.

Deficiency	Description
	required for reliable performance.
LSS-4 Stair and Smoke Ducts	Available record drawings do not have information on stair pressurization and smoke ducts, and it was not able to be verified during the site investigation. Based on the age of the building, duct bracings are assumed nonexistent.
HM-5 Flexible Couplings	Gas piping connections observed to have welded connections.
LF-1 Independent Support	The weight of existing light fixtures is not known. However, the light fixtures were observed to be supported from the ceiling grid systems and do not have independent supports.
CF-2 Tall Narrow Contents	Tall bookshelves do not appear to be anchored to floors or adjacent walls. Content more than 6 feet high with height-to-depth or height-to width ratio greater than 3-to-1 should be anchored to prevent from overturning and falling during an earthquake.
CF-3 Fall-Prone Contents	Overhead projectors that may weigh more than 20 pounds do not appear to be seismically braced or restrained.
CG-8 Overhead Glazing	Based on the age of the building, the glazing panes do not appear to be laminated annealed or laminated heat-strengthened glass.
ME-1 Fall-Prone Equipment	Mechanical equipment in the mechanical room weighing more than 20 pounds does not appear braced or restrained. Mechanical equipment with a center-of-mass more than 4 feet off the ground should be restrained to prevent falling.

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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. See Appendix B for sketches depicting 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 Concrete Shotcrete Walls

Concrete shotcrete walls are recommended along the interior and at select locations at exterior walls. The proposed shotcrete walls are recommended over the full height, from the foundation to the roof level, with sufficient strength and stiffness to resist seismic loads in the plane of the wall. A drag strut beam should be added at the end of the concrete wall to transfer diaphragm loading to the new concrete shear walls. Where existing beams occur on the drag strut line, the connections should be upgraded to reliably transfer the seismic loads.

4.1.2 New Transverse Concrete Shear Walls

The building has concrete shear walls at north and south ends of the building to resist the seismic forces along east-west direction creating a long span diaphragm at the middle of the building. The lateral-force-resisting system of the building can be improved by adding a new transverse concrete shear wall along east-west direction at the ground floor and the first floor. The new concrete shear walls should extend from the foundation to the first floor.

4.1.3 Foundation Systems

At the supplemental concrete shotcrete wall locations, foundations should be upgraded to support the lateral load-carrying capacity of the new concrete shear walls. The existing foundation system consists of shallow spread footings. Based on the design of the existing shallow foundation system, the foundation upgrades should be shallow concrete spread footings to match the existing foundation system.

4.1.4 Roof Diaphragm Blocking

The plywood diaphragm at the roof appears to be unblocked. The diaphragm seismic strength and stiffness capacity can be enhanced by adding blocking at the panel edges. Blocked diaphragms at panel edges have more strength to transfer lateral forces than those that are unblocked. Added blocking should be nailed through the existing diaphragm. This may necessitate the installation of a new roof membrane.

4.1.5 Wall Anchorage at Roof

Exterior concrete wall-to-roof diaphragm anchors should be added. These will consist of tension ties between exterior concrete walls and wood roof diaphragms. The tension ties can be Simpson Strong-Tie LTTI31 ties with post-installed embedded concrete anchors or a similar product.

4.1.6 Wood Shear Walls at Attic Level

Additional wood shear walls should be installed within the attic space to provide adequate seismic bracing at this level. Exterior concrete wall-to-roof diaphragm anchors should be installed to transfer seismic loads.

4.2 Nonstructural Upgrade Recommendations

Table 3.2.1.2 identifies several nonstructural deficiencies that do not meet the performance objective selected for Lincoln Elementary School. It is recommended that these deficiencies be addressed to provide nonstructural performance consistent with the performance of the upgraded structural lateral force resisting system. As-built information for the existing nonstructural systems such as fire sprinklers, mechanical ductworks, and piping are not available for review. Only limited visual observation of the systems was performed during field investigation due to limited access or visibility to observe existing conditions. The conceptual mitigation strategies provided in this study are preliminary only. The final analysis and design for seismic rehabilitation should include a detailed field investigation.

4.2.1 Life Safety Systems

Life safety systems are responsible for protecting and evacuating occupants of a building during emergencies or disasters. These systems include, but are not limited to, fire suppression piping, emergency lighting, and stair and smoke ducts. Proper bracing, coupling, and clearances of fire suppression piping not only increase reliability of performance but also help minimize the damage to pipes and sprinkler heads. Based on the age of the building, it is likely that the sprinkler systems in the building do not meet the requirements of current NFPA 13 seismic bracing and flexible coupling.

The recommended seismic mitigation for the life safety systems are:

- Provide bracing and flexible couplings of risers, feed mains, cross-mains, and branch lines in accordance with NFPA 13.
- Provide 1-inch sprinkler head clearance holes in ceiling finishes.
- Provide seismic bracing or anchor the emergency power system to the structure.

4.2.2 Hazardous Materials

The extent of hazardous material contents in the building is unknown. The following recommendations should be implemented to prevent the release of hazardous materials:

- Breakable containers that hold hazardous material, including gas cylinders, should be restrained by latched doors, shelf lips, wires, or other methods.
- Piping or ductwork conveying hazardous materials should be braced or otherwise protected from damage resulting in hazardous material release.
- Piping containing hazardous material, including natural gas, should have shutoff valves or other devices to limit spills or leaks.
- Hazardous material ductwork and piping, including natural gas piping, should have flexible couplings.

4.2.3 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 any remodel project of an existing building, the International Existing Building Code (IEBC) would be 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.

Ceiling

The suspended ceilings in the building appear to be integrated acoustical ceiling tiles supported by steel channel systems. It is common to have lath and plaster ceilings at the main entrance and the bathrooms. The recommended seismic mitigation for the architectural systems are:

- Provide ceiling attachments that resist seismic forces to suspended gypsum board and suspended lath and plaster ceilings for every 12 square feet of area. Suspended acoustical ceilings have suffered significant damage in past earthquakes causing a falling hazard to the occupants during an earthquake.

- Provide independent support with a minimum of two wires diagonally at opposite corners of each fixture for the light fixtures that weigh more per square foot than the suspended ceiling they penetrate. Fluorescent light fixtures are often supported by the suspended ceiling system causing the light fixtures to become overhead falling hazards during an earthquake. Therefore, light fixtures within the integrated suspended ceilings are required to be independently supported to the structure above with a minimum of two wires at opposite corners.

Overhead Glazing

For interior and exterior glazing panes more than 16 square feet in area, provide laminated annealed or laminated heat-strengthened glass that is detailed to remain in the frame when cracked. Non-laminated glazing that shatters during an earthquake can pose a severe life safety threat to occupants. Shattered exterior windows also compromise the exterior weather barrier, which can become disruptive to the operation of the building after an earthquake.

Stairs

The stair well at the Gymnasium in the west façade of the building has 6.5-foot-wide by 24-foot-tall glass block panels. Glass block walls can pose a severe falling hazard during an earthquake. The recommended seismic mitigation for the glass block panels are:

- Install horizontal out-of-plane steel framing across the exterior and interior faces of the glass block at the top and bottom to provide lateral restraint.

Contents and Furnishings

The building contains various tall and narrow furniture, such as shelving and storage units, that are freestanding away from any backing walls. This furniture is highly susceptible to toppling if not anchored properly and can become a life safety hazard or adversely affect post-earthquake operations. The recommended seismic mitigation for tall and narrow furniture is:

- Anchor storage cabinets or shelving units that are more than 6 feet high and with a height-to-depth or height-to-width ratio greater than 3-to-1 to the structure or to each other to prevent toppling during an earthquake.
- Provide bracing or restraint for equipment, stored items, or other contents weighing more than 20 pounds and with a center of mass that is more than 4 feet above the adjacent floor level.

4.2.4 Mechanical/Electrical/Plumbing (MEP) Systems

The main seismic concerns for mechanical equipment, ducting, and piping are sliding, swinging, and overturning. Inadequate lateral restraint or anchorage can shift equipment off its supports or topple equipment to the ground or on to other equipment. Inadequate bracing of piping and ducting, or the inability for piping to tolerate differential movement from the equipment it is attached to, can damage or dislodge connections. Such damage in fluid piping can potentially lead to major leaks or loss and disruption by damaging contents. The recommended seismic mitigation for MEP systems is:

- Provide seismic bracing for equipment weighing more than 20 pounds and which has a center of mass more than 4 feet above the adjacent floor level and which is not in-line equipment.

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 Lincoln Elementary School ranges between approximately $4M and $7.5M (-20 percent/+50 percent). The estimated construction cost to seismically upgrade this building is approximately $5M. On a per-square-foot basis, the seismic upgrade construction cost is estimated to be approximately $125 per square foot in 2019 dollars, with a variance range between $101 per square foot and $188 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 and 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)
Lincoln Elementary School	C2	High / C	**Structural**			
			Life Safety	40,000 SF	$44 - $82 ($1.74M) ($3.27M)	$54 ($2.18M)
			Nonstructural			
			Life Safety	40,000 SF	$57 - $106 ($2.27M) ($4.25M)	$71 ($2.83M)
			Total			
				40,000 SF	$101 - $188 ($4.01M) ($7.52M)	$125 ($5.01M)

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

Appendix A: Field Investigation Report and Tier 1 Checklists

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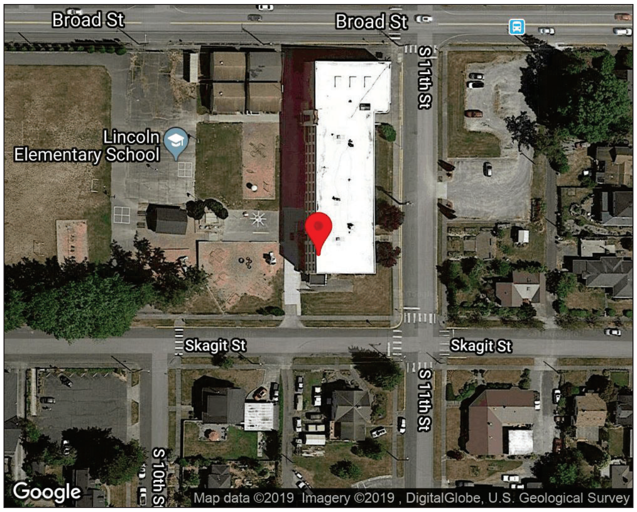
1. Mount Vernon, Lincoln Elementary School, Main Building

1.1 Building Description

Building Name:	Main Building
Facility Name:	Lincoln Elementary School
District Name:	Mount Vernon
ICOS Latitude:	48.415
ICOS Longitude:	-122.328
ICOS County/District ID:	29320
ICOS Building ID:	12009
ASCE 41 Bldg Type:	C2
Enrollment:	373
Gross Sq. Ft. :	40,002
Year Built:	1938
Number of Stories:	3
$S_{XS\ BSE\text{-}2E}$:	0.835
$S_{X1\ BSE\text{-}2E}$:	0.452
ASCE 41 Level of Seismicity:	High
Site Class:	C
V_{S30}(m/s):	463
Liquefaction Potential:	low to moderate
Tsunami Risk:	None
Structural Drawings Available:	Yes
Evaluating Firm:	Reid Middleton, Inc.



The main building is a three story daylight basement 1930s-era historic elementary school building. The building has a rectangular floor plan with a ground floor gymnasium and performing arts space above the gymnasium. The footprint of the building is approximately 219 feet by 85 feet with a total floor area of 40,002 square feet.

The building is a non-ductile concrete structure constructed on a sloping site. The floor system consists of a reinforced concrete slab supported by reinforced concrete beams. The roof system also consists of a reinforced concrete slab supported by reinforced concrete beams. The lateral-force-resisting system is concrete shear walls. The gymnasium at the first floor is open to the second floor, which creates a soft-story irregularity. There are short piers at the exterior lower level of the structure. The exterior wall consists of structural concrete and is not covered by veneer or cladding.

1.1.1 Building Use

The school is a K-5 elementary school for over 370 students. The first floor consists of a cafeteria, storage, mechanical rooms and two classrooms. The second and third floors consist of mainly classrooms, and there is a library on the third floor. The school has an attached gymnasium that is the same height as the 3 story school. The gymnasium has a study hall and performing arts space above it.

1.1.2 Structural System

Table 1.1-1. Structural System Description of Lincoln Elementary School

Structural System	Description
Structural Roof	The roof deck consists of 3-inch-thick cast-in-place reinforced concrete roof slab supported by integral cast-in-place reinforced concrete beams at 12-feet (nominal) on center.
Structural Floor(s)	Elevated floors consist of 3-inch to 4-inch thick cast-in-place reinforced concrete floor slabs supported by integral cast-in-place reinforced concrete beams at 12-feet (nominal) on center that span from exterior wall piers to interior bearing walls and columns.
Foundations	Foundations consist of cast-in-place reinforced concrete spread footings supporting wall piers and columns and concrete strip footings supporting concrete bearing walls.
Gravity System	The gravity system consists of concrete roof and floors supported by concrete roof and floor beams, supported by wall piers, bearing walls and columns. The wall piers, columns and bearing walls, are supported on concrete spread footings.
Lateral System	The lateral system consists of concrete roof and floor diaphragms, laterally supported by concrete shear walls, wall piers, and columns. The sliding and overturning forces from lateral loads are resisted by concrete spread footings.

1.1.3 Structural System Visual Condition

Table 1.1-2. Structural System Condition Description of Lincoln Elementary School

Structural System	Description
Structural Roof	Good condition. No cracking was observed. Some peeled paint was observed at the underside of the roof slab.
Structural Floor(s)	Good condition. No cracking was observed.
Foundations	The foundation wall was observed in the ground level boiler room and it appeared to be in good condition. No other foundations were observable.
Gravity System	The condition of the gravity system appears functional and intact.
Lateral System	The condition of the lateral system appears to be intact.

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 Mount Vernon Lincoln Elementary School Main Building

Deficiency	Description
Load Path	1930s-era concrete construction has an unreliable load path through wall piers. Lateral system strengthening or addition of new shear walls may be appropriate to mitigate seismic risk.
Weak Story	The main building appears to be compliant, however, the gymnasium has a first story that is approximately twice as tall as the second story. Due to the year of original construction (1938) it is assumed that weak story effects were not taken into account in the design of the gymnasium. Requires further investigation to determine building behavior. Additional shear walls or bracing may be appropriate to mitigate seismic risk.
Soft Story	The gymnasium at the first floor is open to the second floor. Due to the year of original construction (1938) it is assumed that soft story effects may not have taken into account in the design of the gymnasium. Requires further investigation to determine building behavior. Additional shear walls or bracing may be appropriate to mitigate seismic risk.
Shear Stress Check	Shear stresses at first floor and second floor is greater than 100 psi. Building likely requires concrete shear wall strengthening. Further investigation should be completed. Lateral system strengthening or shear wall addition may be appropriate to mitigate seismic risk.
Reinforcing Steel	Reinforcing ratio for vertical direction is less than 0.0012 (#4 at 18\ o.c.). Reinforcing ratio for horizontal direction is less than 0.0020 (#3 at 18\ o.c.). Further investigation should be completed. Lateral system strengthening or shear wall addition may be appropriate to mitigate seismic risk.
Wall Anchorage at Flexible Diaphragms	Attic roof to exterior concrete wall anchorage is unknown. Based on the age of the building, it is assumed that the wall anchorage is insufficient. Further investigation should be performed. Additional diaphragm shear wall anchoring may be appropriate to mitigate seismic risk.
Transfer to Shear Walls	Attic roof diaphragm to exterior wall anchorage is insufficient to transfer roof diaphragm to concrete shear walls. Further investigation should be performed. Additional diaphragm shear wall anchoring 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 Mount Vernon Lincoln Elementary School Main Building

Unknown Item	Description
Liquefaction	The liquefaction potential of site soils is unknown at this time given available information. \low to moderate\ 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 Mount Vernon Lincoln Elementary School Main Building

Deficiency	Description
LSS-1 Fire Suppression Piping. HR-not required; LS-LMH; PR-LMH.	No available record drawing information on fire suppression piping and unable to verify during site investigation. Based on age of the building, it is assumed that seismic bracing for fire suppression piping do not comply with NFPA 13. Bracing for fire suppression piping may be appropriate to mitigate seismic risk.
LSS-2 Flexible Couplings. HR-not required; LS-LMH; PR-LMH.	No available record drawing information on fire suppression piping and unable to verify during site investigation. Based on age of the building, it is assumed the flexible couplings on the fire suppression piping do not comply with NFPA 13. Flexible coupling for fire suppression piping may be appropriate to mitigate seismic risk.
LSS-4 Stair and Smoke Ducts. HR-not required; LS-LMH; PR-LMH.	No available record drawing information on stair pressurization and smoke duct and unable to verify during site investigation. Based on age of the building, it is assumed that the duct bracings are nonexistent. Evaluation of duct bracing may be appropriate to mitigate seismic risk.
HM-5 Flexible Couplings. HR-LMH; LS-LMH; PR-LMH.	Gas piping connections appear to be welded, not flexible. Replacing gas piping connections with flexible couplings may be appropriate to mitigate seismic risk.
LF-1 Independent Support. HR-not required; LS-MH; PR-MH.	It is unknown how much the light fixtures weigh. Based on the age of the building, it is unlikely that they are independently supported by the structure. Further investigation should be completed. Adding wires for suspending the light fixtures may be appropriate to mitigate seismic risk.
CF-2 Tall Narrow Contents. HR-not required; LS-H; PR-MH.	Tall shelving units are not anchored to floor or wall. Brace tops of shelves taller than 6 feet to nearest backing wall or provide overturning base restraint.
CF-3 Fall-Prone Contents. HR-not required; LS-H; PR-H.	Projector that appears to weigh more than 20-lbs is not braced. Heavy items on upper shelves or otherwise with a center of mass more than 4 ft above the adjacent floor should be restrained by netting or cabling to avoid becoming falling hazards.
ME-1 Fall-Prone Equipment. HR-not required; LS-H; PR-H.	Some equipment in the mechanical room whose center of mass appears to be more than 4ft off the ground is not braced. Bracing or anchoring of equipment may be appropriate to mitigate seismic risk.

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 Mount Vernon Lincoln Elementary School Main Building

Unknown Item	Description
LSS-3 Emergency Power. HR-not required; LS-LMH; PR-LMH.	Use of emergency power was not verified with maintenance or facility staff. Evaluation of emergency power equipment may be appropriate to mitigate seismic risk.
LSS-5 Sprinkler Ceiling Clearance. HR-not required; LS-MH; PR-MH.	No available record drawing information on sprinkle head clearance and unable to verify during site investigation. Evaluation of penetrations may be appropriate to mitigate seismic risk.
HM-2 Hazardous Material Storage. HR-LMH; LS-LMH; PR-LMH.	Unknown whether the building has hazardous materials. Further investigation may be appropriate to mitigate seismic risk. Restraining breakable containers that hold hazardous material by latched doors, shelf lips, wires, or other methods may be appropriate
HM-3 Hazardous Material Distribution. HR-MH; LS-MH; PR-MH.	Unknown whether the building has hazardous materials. There may be gas lines present. Further investigation of mechanical piping should be performed. Bracing and anchoring of piping may be appropriate to mitigate seismic risk.
C-1 Suspended Lath and Plaster. HR-H; LS-MH; PR-LMH.	It is unknown if the building has a lath and plaster ceiling. It is unlikely that the ceiling is braced for seismic forces. Further investigation should be performed. Bracing for ceilings may be appropriate to mitigate seismic risk.
C-2 Suspended Gypsum Board. HR-not required; LS-MH; PR-LMH.	It is unknown if the building has a gypsum board ceiling. It is unlikely that the ceiling is braced for seismic forces. Further investigation should be performed. Bracing for ceilings may be appropriate to mitigate seismic risk.
CG-8 Overhead Glazing. HR-not required; LS-MH; PR-MH.	Glazing information is unknown. Based on the age of the building, it is likely that the glazing on the windows are laminated or detailed to remain in the frame. Many individual panes are likely to be below this threshold. Further investigation should be completed. Replacing applicable glazing planes may be appropriate to mitigate seismic risk.

Photos:

Figure 1-1. East elevation concrete wall. Notice short wall piers at lowest level.

Figure 1-2. Typical interior main central corridor with suspended ceiling.

Figure 1-3. Lunchroom. Note hard ceiling, surface mounted light fixtures, with exposed unbraced plumbing and fire protection piping.

Figure 1-4. Basement level gymnasium with cast-in-place concrete walls and pilasters. The performing arts space is on level 3 above the gym.

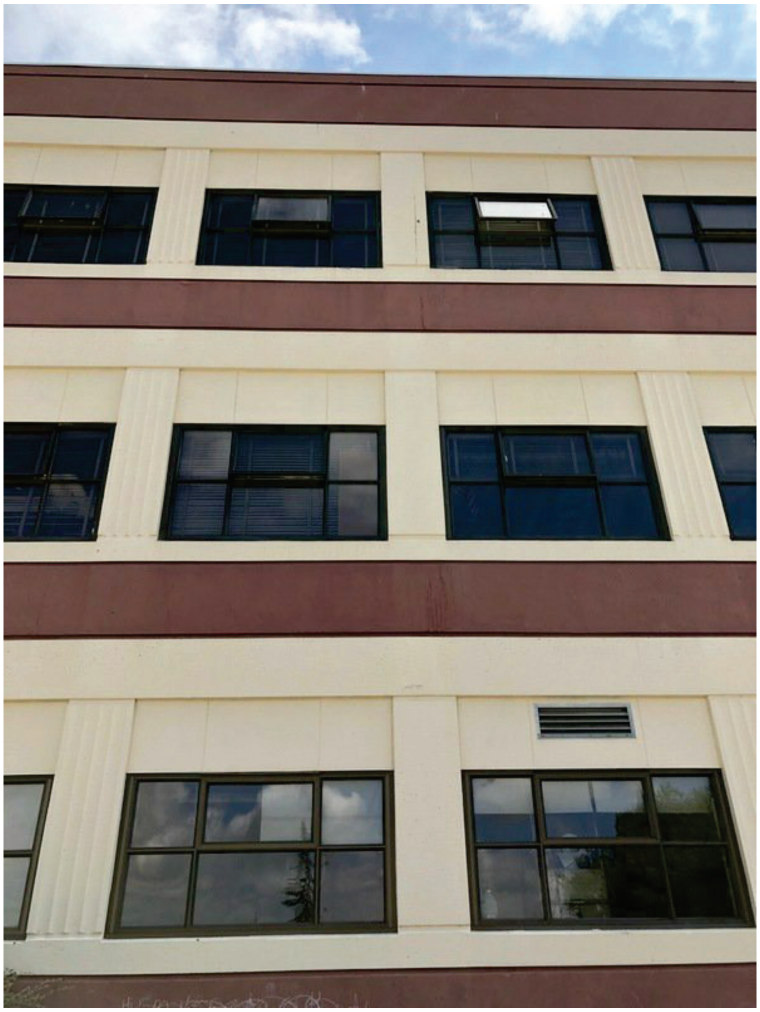


Figure 1-5. Exterior non-ductile concrete wall. Deep spandrel beams and narrow non-ductile concrete wall piers.

Figure 1-6. Exterior south side of building. Note concrete exterior walls and gently sloping site.

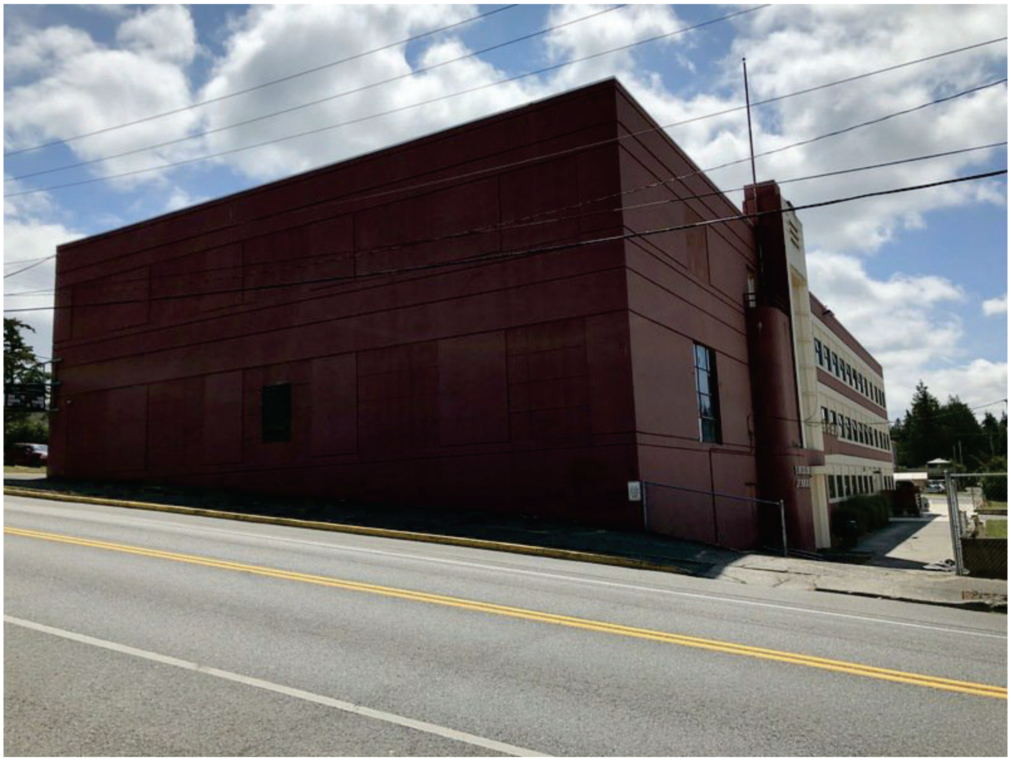


Figure 1-7. Exterior north side of building. Note high bay gymnasium with a performing arts space above the gym.

Figure 1-8. Exterior west side of building.

Figure 1-9. Exterior northwest corner of building.

Figure 1-10. Exterior east side of building.

Mount Vernon, Lincoln Elementary School, Main Building

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			1930s-era concrete construction has an unreliable load path through wall piers. Lateral system strengthening or addition of new shear walls may be appropriate to mitigate seismic risk.
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		There are no adjacent buildings on the school site.
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		There are no interior mezzanine levels.

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			The main building appears to be compliant, however, the gymnasium has a first story that is approximately twice as tall as the second story. Due to the year of original construction (1938) it is assumed that weak story effects were not taken into account in the design of the gymnasium. Requires further investigation to determine building behavior. Additional shear walls or bracing may be appropriate to mitigate seismic risk.
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			The gymnasium at the first floor is open to the second floor. Due to the year of original construction (1938) it is assumed that soft story effects may not have taken into account in the design of the gymnasium. Requires further investigation to determine building behavior. Additional shear walls or bracing may be appropriate to mitigate seismic risk.
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				All the shear walls are continous from roof to foundation.
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 building is rectangular and the geometry is consistent through all three stories.
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				The building is rectangular with consistent geometry through all three stories. There does not appear to be any changes in effective mass from one story to the next.

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				There does not appear to be any torsion irregularity.

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. Low to moderate 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				Base/height of building is greater than 0.6Sa and the seismic-force-resistance system appears to be well connected.
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		Site Class C.

17-24 Collapse Prevention Structural Checklist for Building Types C2 and C2a

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 and Moderate Seismicity

Seismic-Force-Resisting System

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Complete Frames	Steel or concrete frames classified as secondary components form a complete vertical-load-carrying system. (Tier 2: Sec. 5.5.2.5.1; Commentary: Sec. A.3.1.6.1)	X				Secondary components consisting of steel or concrete frames form a complete vertical-load-carrying system.
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				There are at least two lines of shear walls in each principal direction.
Shear Stress Check	The shear stress in the concrete shear walls, 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.3.2.2.1)		X			Shear stresses at first floor and second floor is greater than 100 psi. Building likely requires concrete shear wall strengthening. Further investigation should be completed. Lateral system strengthening or shear wall addition may be appropriate to mitigate seismic risk.
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.3.2.2.2)		X			Reinforcing ratio for vertical direction is less than 0.0012 (#4 at 18 inches o.c.). Reinforcing ratio for horizontal direction is less than 0.0020 (#3 at 18 inches o.c.). Further investigation should be completed. Lateral system strengthening or shear wall addition may be appropriate to mitigate seismic risk.

Connections

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT

Wall Anchorage at Flexible Diaphragms	Exterior concrete or masonry walls that are dependent on flexible diaphragms 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			Attic roof to exterior concrete wall anchorage is unknown. Based on the age of the building, it is assumed that the wall anchorage is insufficient. Further investigation should be performed. Additional diaphragm shear wall anchoring may be appropriate to mitigate seismic risk.
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			Attic roof diaphragm to exterior wall anchorage is insufficient to transfer roof diaphragm to concrete shear walls. Further investigation should be performed. Additional diaphragm shear wall anchoring may be appropriate to mitigate seismic risk.
Foundation Dowels	Wall reinforcement is doweled into the foundation with vertical bars equal in size and spacing to the vertical wall reinforcing directly above the foundation. (Tier 2: Sec.5.7.3.4; Commentary: Sec. A.5.3.5)	X				Wall reinforcement is doweled into the foundation with vertical wall reinforcing with equal size and spacing to the vertical wall.

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	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		No secondary components.
Flat Slabs	Flat slabs or plates not part of the seismic-force-resisting system have continuous bottom steel through the column joints. (Tier 2: Sec.5.5.2.5.3; Commentary: Sec. A.3.1.6.3)	X				Flat slabs have continuous bottom steel through column joints.
Coupling Beams	The ends of both walls to which the coupling beam is attached are supported at each end to resist vertical loads caused by overturning. (Tier 2: Sec.5.5.3.2.1; Commentary: Sec. A.3.2.2.3)			X		No coupling beam

Diaphragms (Stiff or Flexible)

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT

Diaphragm Continuity	The diaphragms are not composed of split-level floors and do not have expansion joints. (Tier 2: Sec.5.6.1.1; Commentary: Sec. A.4.1.1)	X				There are not split-level floors in the building. Based on available drawings the diaphragms do not appear to have expansion joints.
Openings at Shear Walls	Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Tier 2: Sec.5.6.1.3; Commentary: Sec. A.4.1.4)	X				There are no diaphragm openings immediately adjacent to shear walls that are greater than 25% of the wall length.

Flexible Diaphragms

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
Cross Ties	There are continuous cross ties between diaphragm chords. (Tier 2: Sec.5.6.1.2; Commentary: Sec. A.4.1.2)	X				The roof is continually tied.
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		There is no straight-sheathed diaphragm.
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				Roof diaphragm likely consists of wood structural panels.
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		Attic diaphragm appears to be concrete.
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 is concrete or wood.

Connections

EVALUATION ITEM	EVALUATION STATEMENT	C	NC	N/A	U	COMMENT
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		This building does not have pile foundation.

Mount Vernon, Lincoln Elementary School, Main Building

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 available record drawing information on fire suppression piping and unable to verify during site investigation. Based on age of the building, it is assumed that seismic bracing for fire suppression piping do not comply with NFPA 13. Bracing for fire suppression piping may be appropriate to mitigate seismic risk.
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			No available record drawing information on fire suppression piping and unable to verify during site investigation. Based on age of the building, it is assumed the flexible couplings on the fire suppression piping do not comply with NFPA 13. Flexible coupling for fire suppression piping may be appropriate to mitigate seismic risk.
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	Use of emergency power was not verified with maintenance or facility staff. Evaluation of emergency power equipment may be appropriate to mitigate seismic risk.

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			No available record drawing information on stair pressurization and smoke duct and unable to verify during site investigation. Based on age of the building, it is assumed that the duct bracings are nonexistent. Evaluation of duct bracing may be appropriate to mitigate seismic risk.
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	No available record drawing information on sprinkle head clearance and unable to verify during site investigation. Evaluation of penetrations may be appropriate to mitigate seismic risk.
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		Not required for life safety performance level.

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		No equipment appears to be mounted on vibration isolators.
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	Unknown whether the building has hazardous materials. Further investigation may be appropriate to mitigate seismic risk. Restraining breakable containers that hold hazardous material by latched doors, shelf lips, wires, or other methods may be appropriate

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	Unknown whether the building has hazardous materials. There may be gas lines present. Further investigation of mechanical piping should be performed. Bracing and anchoring of piping may be appropriate to mitigate seismic risk.
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				Gas piping appears to have a shutoff valve. This item is likely compliant.
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			Gas piping connections appear to be welded, not flexible. Replacing gas piping connections with flexible couplings may be appropriate to mitigate seismic risk.
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		The building does not appear to contain seismic joints, isolation planes, or independent structures.

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		No unreinforced masonry partitions in the building.
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		No masonry or hollow-clay-tile partitions in the building.
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		No rigid cementitious partitions in the building.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.

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	It is unknown if the building has a lath and plaster ceiling. It is unlikely that the ceiling is braced for seismic forces. Further investigation should be performed. Bracing for ceilings may be appropriate to mitigate seismic risk.
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	It is unknown if the building has a gypsum board ceiling. It is unlikely that the ceiling is braced for seismic forces. Further investigation should be performed. Bracing for ceilings may be appropriate to mitigate seismic risk.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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			It is unknown how much the light fixtures weigh. Based on the age of the building, it is unlikely that they are independently supported by the structure. Further investigation should be completed. Adding wires for suspending the light fixtures may be appropriate to mitigate seismic risk.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		The building does not appear to have any cladding components.
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		The building is not a steel or concrete moment frame building.
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		The building does not have any multi-story panels.
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		The building does not have any panel connections.
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		The building does not have any cladding panels.

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		The building does not have any cladding panels.
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		The building does not have any concrete cladding.
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	Glazing information is unknown. Based on the age of the building, it is likely that the glazing on the windows are laminated or detailed to remain in the frame. Many individual panes are likely to be below this threshold. Further investigation should be completed. Replacing applicable glazing planes may be appropriate to mitigate seismic risk.

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		The building does not have any 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		The building does not have any 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		The building does not have any 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		The building does not have any 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		The building does not have any 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		The building does not have any 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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		The building does not contain unreinforced masonry parapets or cornices.
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				Canopies appear to be connected to the structure.
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				Height to thickness ratio for parapet is 1.5.
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				Parapet is cast integral with building wall and reinforcing steel is continuous from wall through parapet.

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				No unreinforced masonry chimney in the building.
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		Chimney is constructed of reinforced concrete, no masonry chimney exists in the building.

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		This is a one story building without stairs.
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		This is a one story building without stairs.

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		No industrial storage unit in the building.
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			Tall shelving units are not anchored to floor or wall. Brace tops of shelves taller than 6 feet to nearest backing wall or provide overturning base 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			Projector that appears to weigh more than 20-lbs is not braced. Heavy items on upper shelves or otherwise with a center of mass more than 4 ft above the adjacent floor should be restrained by netting or cabling to avoid becoming falling hazards.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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			Some equipment in the mechanical room whose center of mass appears to be more than 4ft off the ground is not braced. Bracing or anchoring of equipment may be appropriate to mitigate seismic risk.
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				The equipment does not appear to weigh more than 75lbs.
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 and narrow equipment in the building.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		The building does not have any elevators.
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		The building does not have any elevators.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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		Not required for life safety performance level.
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		Not required for life safety performance level.
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		Not required for life safety performance level.

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Appendix B: Concept-Level Seismic Upgrade Figures

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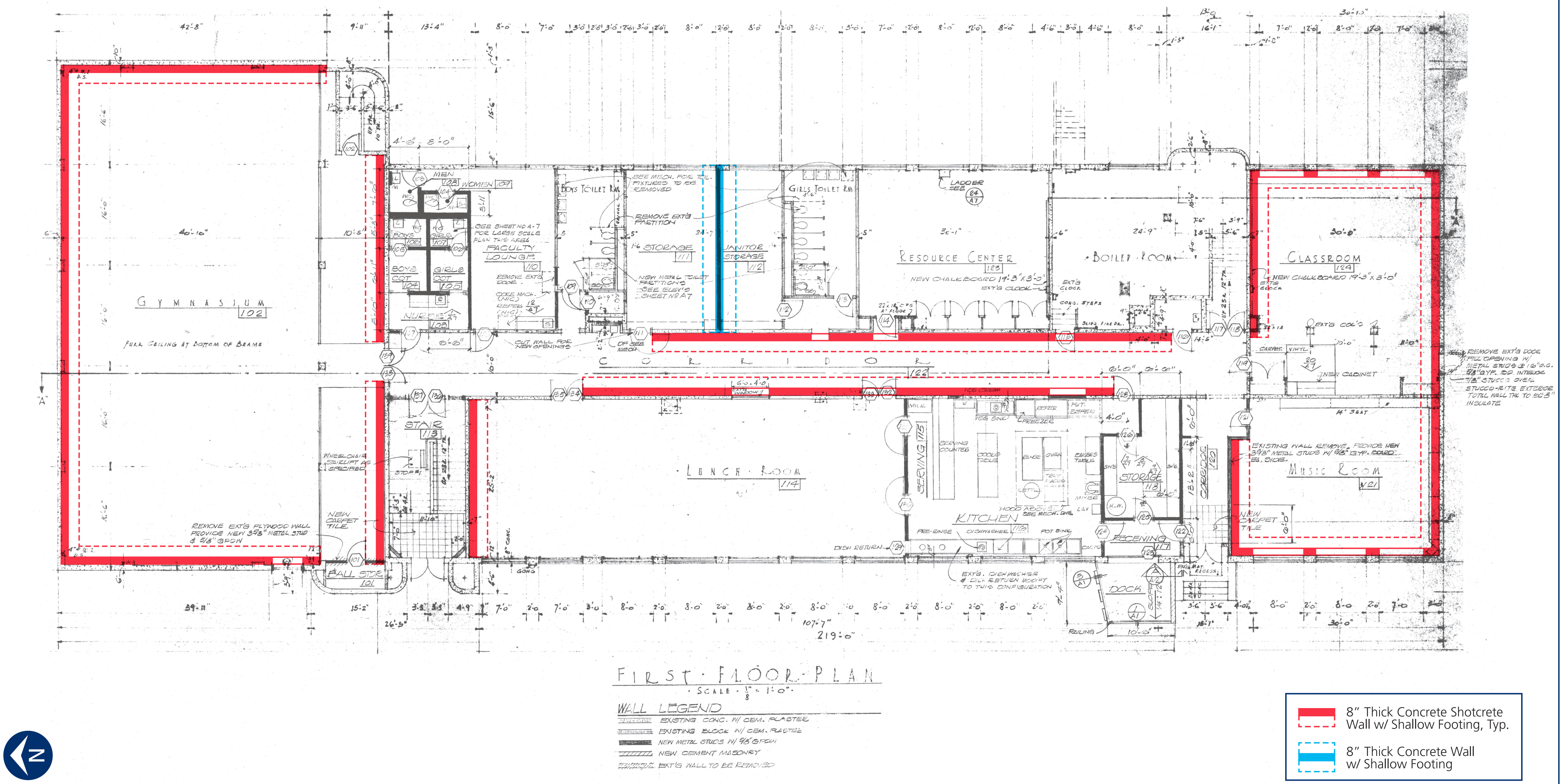


🟥 8" Thick Concrete Shotcrete Wall w/ Shallow Footing, Typ.

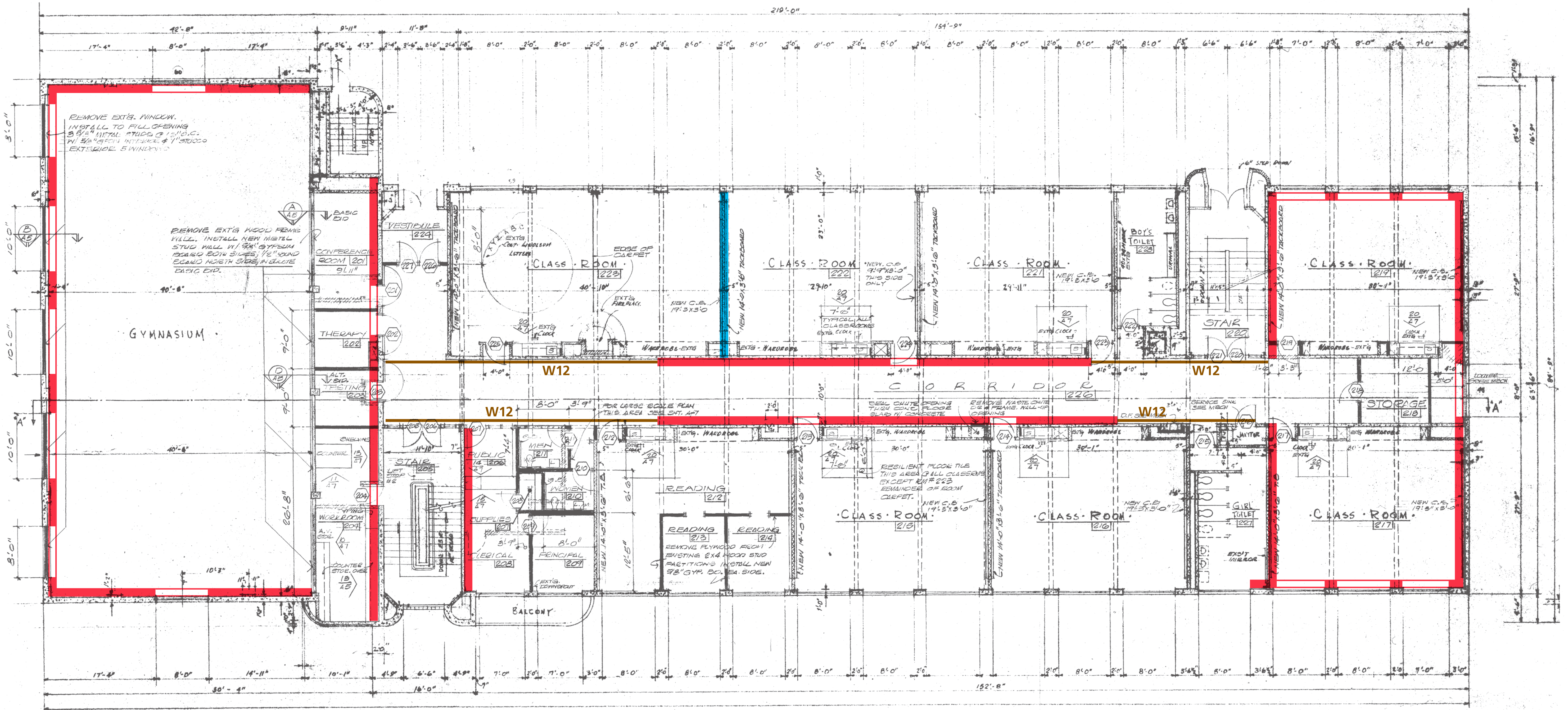
🟦 8" Thick Concrete Wall w/ Shallow Footing

ReidMiddleton

Lincoln Elementary School Seismic Upgrades

Washington State School Seismic Safety Assessments Project – Mount Vernon School District – June 2019

Figure 1 - First Floor



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

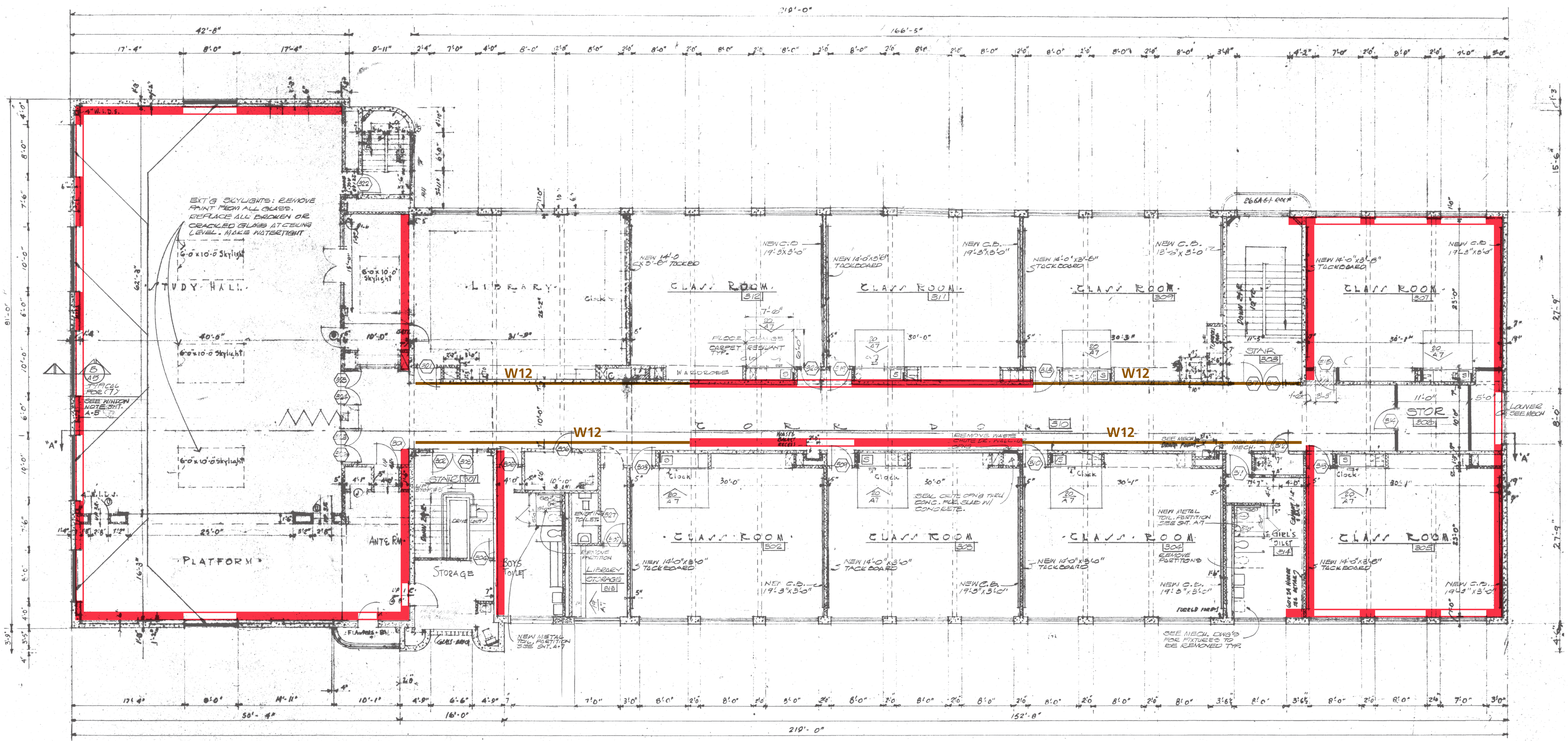
WALL LEGEND
- ▤ EXISTING CONC. W/ CEM. PLASTER
- ▨ EXISTING GYPSUM BLOCK W/ CEMENT PLASTER
- ▩ NEW METAL STUDS W/ 5/8" G.PDW, INSULATED, & SOUND BOARD
- ▩ NEW METAL STUDS W/ 5/8" GPDW. - AT EXTERIOR WALL, 7/8" STUCCO EXTERIOR FINISH.
- ┅ EXISTING WALL TO BE REMOVED

W12 Steel Drag Strut Beam
🟥 8" Thick Concrete Shotcrete Wall, Typ.
🟦 8" Thick Concrete Wall

ReidMiddleton

Lincoln Elementary School Seismic Upgrades
Washington State School Seismic Safety Assessments Project – Mount Vernon School District – June 2019

Figure 2 - Second Floor



THIRD FLOOR PLAN.
SCALE 1/8" = 1'-0"

WALL LEGEND
- EXISTING CONCRETE W/ CEMENT PLASTER
- EXISTING GYPSUM BLOCK W/ CEMENT PLASTER
- NEW METAL STUD W/ 5/8" GPDW.
- EXISTING TO BE REMOVED

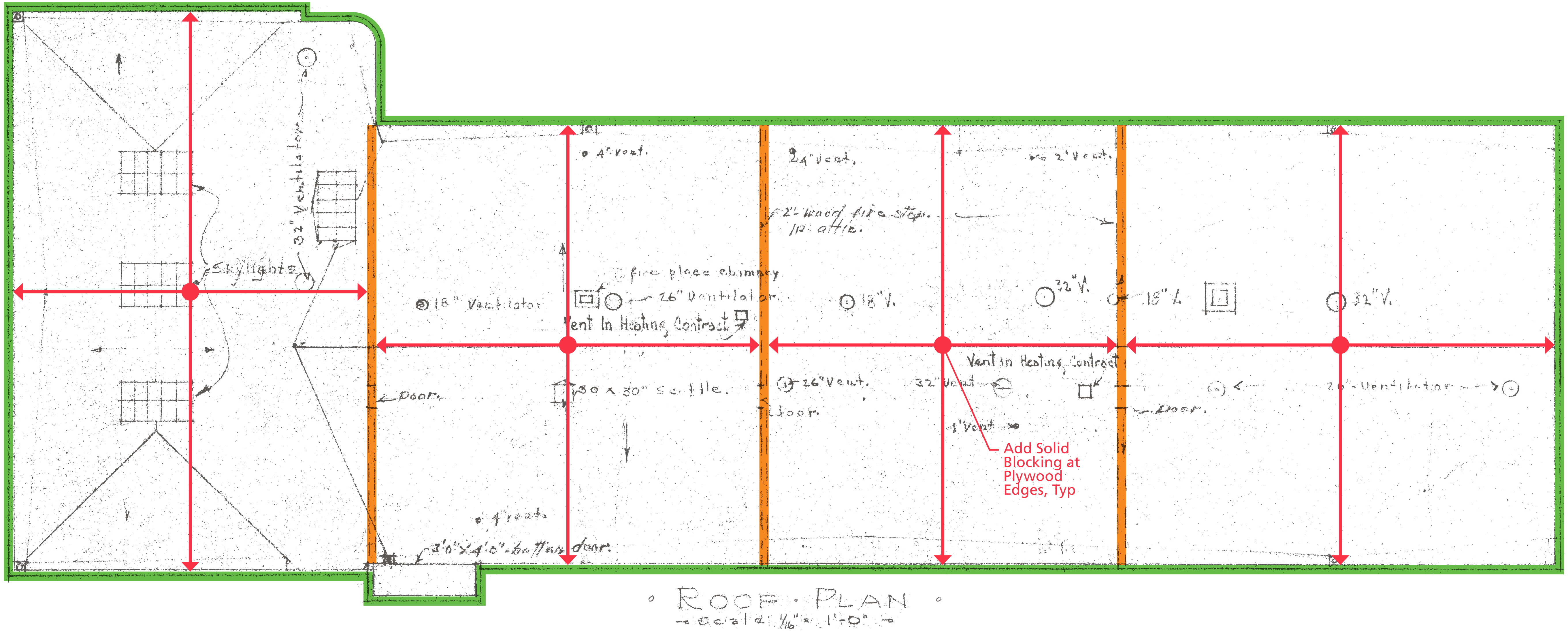
W12	Steel Drag Strut Beam
🟥	8" Thick Concrete Shotcrete Wall, Typ.

ReidMiddleton

Lincoln Elementary School Seismic Upgrades

Washington State School Seismic Safety Assessments Project – Mount Vernon School District – June 2019

Figure 3 - Third Floor



🟧 Upgrade Wood Shear Wall. Add Hold Own at Each End

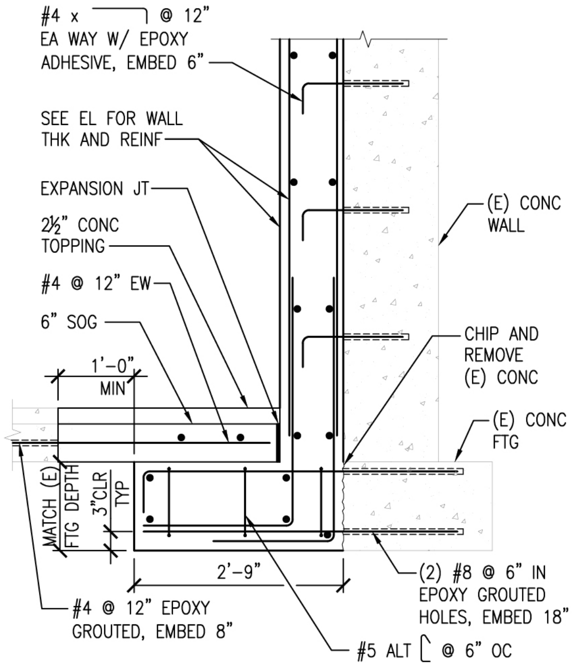
🟩 Additional Out of Plane Tie Connections Between Existing Concrete Wall to Roof Diaphragm

ReidMiddleton

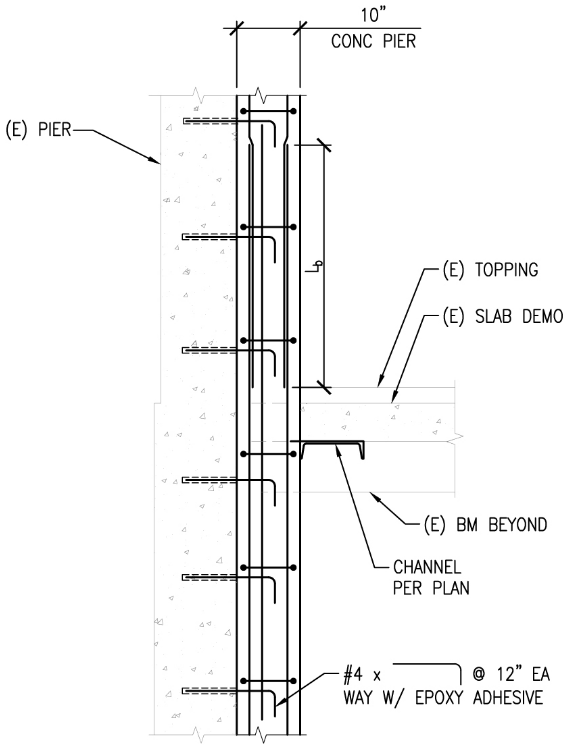
Lincoln Elementary School Seismic Upgrades

Washington State School Seismic Safety Assessments Project – Mount Vernon School District – June 2019

Figure 4 - Roof Floor



Conceptual Section Through Shocrete Shear Wall & Foundation Upgrades



Conceptual Section Through Shocrete Shear Wall At Elevated Floors

Lincoln Elementary School Seismic Upgrades

Washington State School Seismic Safety Assessments Project – Mount Vernon School District – June 2019

Figure 5 - Conceptual Sections

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Appendix C: Opinion of Probable Construction Costs

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PRODIMS

520 Kirkland Way, Suite 201
Kirkland, WA 98033
Phone: 425-828-0500 Fax: 425-828-0700
www.prodims.com

Name: **Wa State School Seismic Safety Assessment**
Second Name: **Lincoln Elementary School**
Location: **Mount Vernon, WA**

Design Phase: **ROM Cost Estimates**
Date of Estimate: **October 17, 2018**
Date of Revision:
Month of Cost Basis: **4Q, 2018**

Areas	**sqft**
Building Area	40,002
Total Areas	**40,002**

Lincoln Elementary School

Construction Cost Estimate

Subtotal Direct Cost From the Estimate Detail Below $ 3,581,579

	Percentage of Previous Subtotal	Amount	Running Subtotal
Scope Contingency	10.0%	$ 358,158	$ 3,939,737
General Conditions	10.0%	$ 358,158	$ 4,297,895
Home Office Overhead	5.0%	$ 179,079	$ 4,476,974
Profit	6.0%	$ 214,895	$ 4,691,868
Escalation Not Included-Costs in 4Q, 2018 Dollars	0.0%	$ -	$ 4,691,868
Washington State Sales Tax	9.0%	$ 322,342	$ 5,014,211

Total Markups Applied to the Direct Cost 40.00%
Markups are multiplied from each subtotal- They are not multiplied from the direct cost

		$/sqft
TOTAL ESTIMATED CONSTRUCTION COST--→	**$ 5,014,211**	**$ 125.35**
-20% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --→	**$ 4,011,368**	
+50% TOTAL ESTIMATED CONSTRUCTION COST VARIANCE --→	**$ 7,521,316**	

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										
	Concrete Shear Wall System	40,002	sqft	$ 11.65	$ 465,849.85	$ 9.92	$ 396,835.06	$ 1.29	$ 51,761.09	$ 22.86	$ 914,446.00

WBS	Description	Quantity	U of M	Labor	Labor Total	Material	Material Total	Equipment	Equipment Total	Total $/U of M	Direct Cost
	Collector Beams	40,002	sqft	$ 8.14	$ 325,646.49	$ 6.93	$ 277,402.57	$ 0.90	$ 36,182.94	$ 15.98	$ 639,232.00
2- Non- Structural Demo/Restoration*											
Interiors and M/E/P/FP systems											
	Ceilings and Finishes	40,002	sqft	$ 16.88	$ 675,184.67	$ 13.81	$ 552,423.82	$ 1.84	$ 73,656.51	$ 32.53	$ 1,301,265.00
	Mechanical/Electrical/Plumbing	40,002	sqft	$ 9.43	$ 377,028.11	$ 7.71	$ 308,477.55	$ 1.03	$ 41,130.34	$ 18.16	$ 726,636.00
*Allows 50 percent of existing nonstructural systems require upgrades/replacement.											$ -
Subtotal of the Direct Cost of Construction				**Lincoln Elementary School**							**$ 3,581,579**

Appendix D: Earthquake Performance Assessment Tool (EPAT) Worksheet

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Washington Schools Earthquake Performance Assessment Tool (EPAT)
MAIN PAGE

Full District Name	Mount Vernon		
Point of Contact	Bill Nutting		
Telephone	360-428-6113		
E-Mail	bnutting@mvsd320.org		
File Name	Mount Vernon, Lincoln Elementary School, Main Building EPAT.xlsm	**File Date:**	9/26/2018

District	Mount Vernon
Facility Name	Lincoln Elementary School
Building Part Name	Main Building

Earthquake Ground Motion (% g)		**Earthquake Hazards**	
20% in 50 year PGA	18.6%	**Site Class**	C
10% in 50 year PGA	26.8%	**Ground Shaking Hazard**	High
2% in 50 year PGA	47.7%	**Liquefaction Potential**	Low to Moderate
Percentile S_s *Among all WA Campuses*	48%	**Combined Earthquake Hazard Level**	High

Total Building Part Area (Square Feet)	**Building Evaluated By**	**Input Data by Person(s)**
40,002	DNR, Reid Middleton	Tim Green, 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	Lincoln Elementary School
Building Name	Main Building
Building Use	Assembly

Data Entry Item	User Entered Values	Default Values	Used for BCA
Seismic Data			
Decimal Latitude	48.41525	48.41525	48.41525
Decimal Longitude	-122.327569	-122.327569	-122.327569
Site Class (Soil/Rock Type)	C	D	C
Liquefaction Potential	Low to Moderate	Low to Moderate	Low to Moderate
Geographic Region for Seismic Zones	Puget Sound	Puget Sound	Puget Sound
Building Structural Data			
HAZUS Building Type***	C2	Concrete Shear Walls	C2
Number of Stories (Excluding Basement)***	3		3
Year Built***	1938		1938
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)	<1973		<1973
Severe Vertical Irregularity***	Yes		Yes
Moderate Vertical Irregularity***	No		No
Plan (Horizontal) Irregularity***	No		No

***** Mandatory Data Entry**

Washington Schools Earthquake Performance Assessment Tool (EPAT)
RESULTS SUMMARY

District Name	Mount Vernon	**Existing Building Life Safety Risk & Priority for Retrofit or Replacement**
School Name	Lincoln Elementary School	
Building Name	Main Building	Very High

Building Data

HAZUS Building Type	C2	Concrete Shear Walls
Year Built	1938	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	Puget Sound	
Severe Vertical Irregularity	Yes	Buildings with irregularities have greater earthquake damage than otherwise similar buildings that are regular.
Moderate Vertical Irregularity	No	
Plan Irregularity	No	

Seismic Data

Earthquake Ground Shaking Hazard Level	High	Frequency and severity of earthquakes at this site
Percentile S_s Among WA K-12 Campuses	48%	Earthquake ground shaking hazard is higher than 48% of WA campuses.
Site Class (Soil or Rock Type)	C	Very Dense Soil and Soft Rock
Liquefaction Potential	Low to Moderate	Liquefaction increases the risk of major damage to a building
Combined Earthquake Hazard Level	High	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	75%	75%	Very High	Red
Life Safety Retrofit Building	14%	6.6%	Very Low	Green
Current Code Building	11%	4.1%	Very Low	Green

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:	Tim Green, Reid Middleton
User Overrides of Default Parameters:	Building Design Code Year, Latitude, Longitude, Site Class, Liquefaction, Geographic Region

Appendix E: Lincoln Elementary School Existing Drawings

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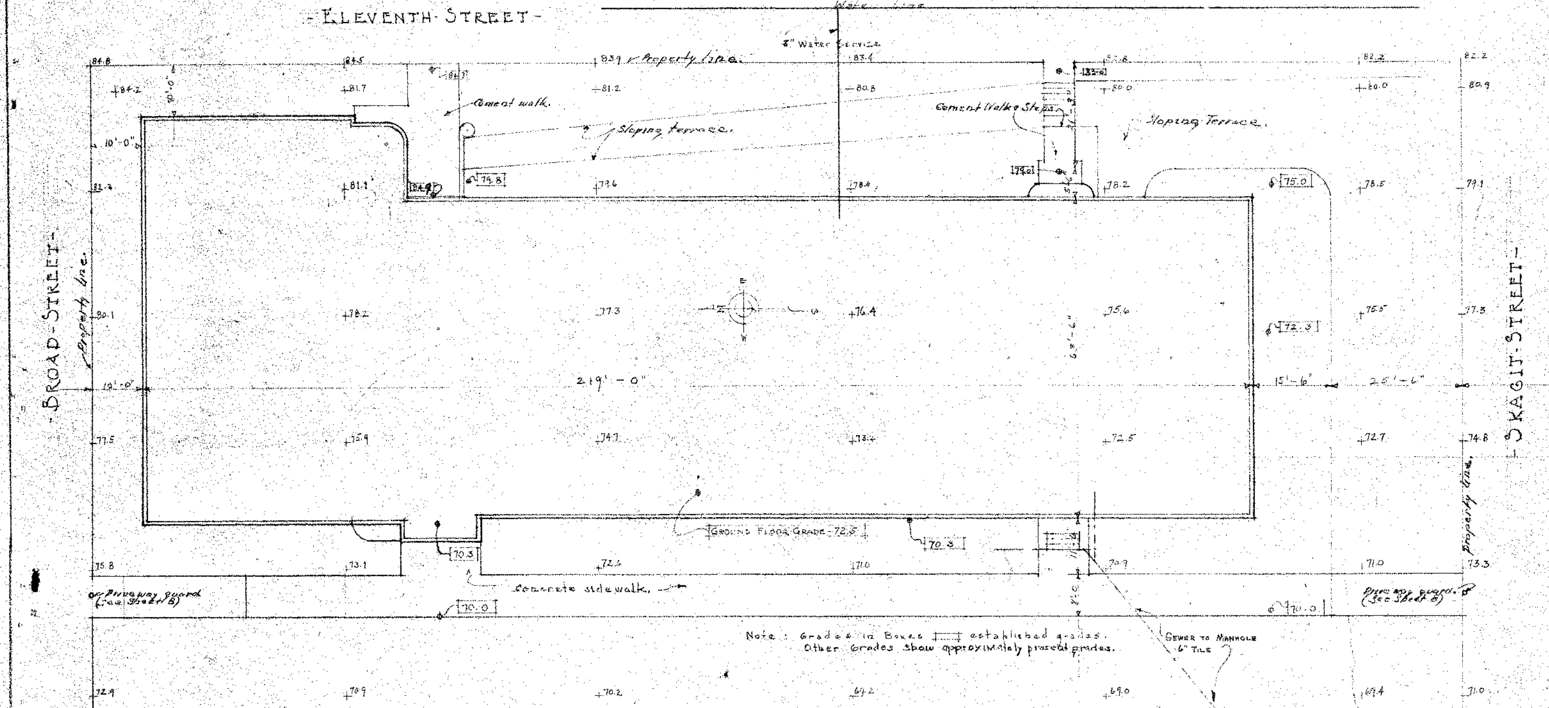
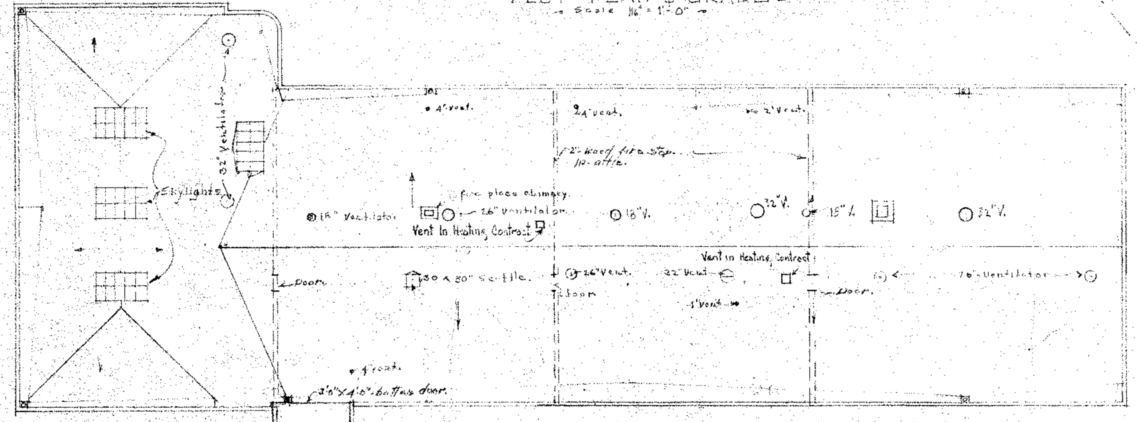
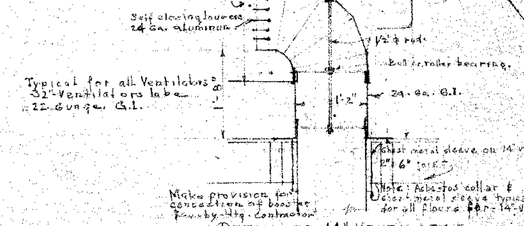


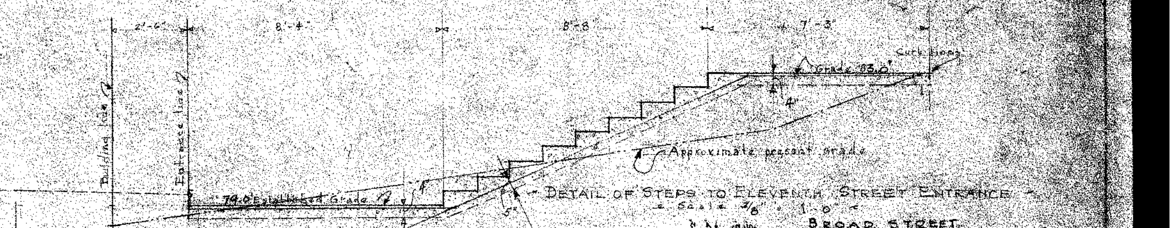
PLOT · PLAN & GRADES
Scale 1/16" = 1'-0"



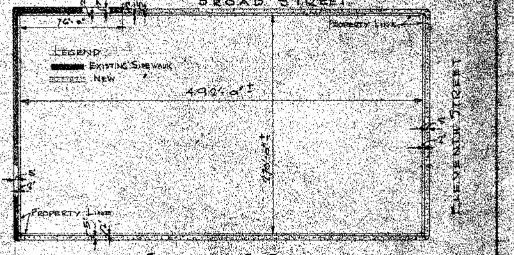
ROOF · PLAN
Scale 1/16" = 1'-0"



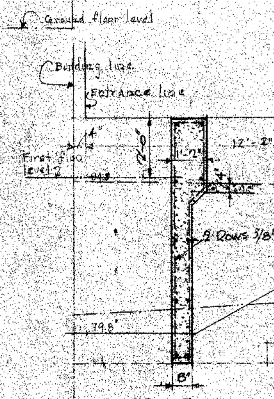
DETAIL OF 14" VENTILATOR
Scale 3/4" = 1'-0"



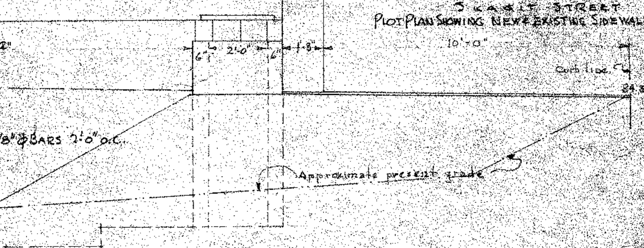
DETAIL OF STEPS TO ELEVENTH STREET ENTRANCE
Scale 1/8" = 1'-0"



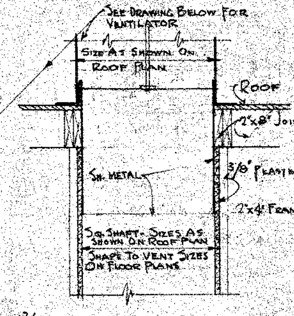
PLOT PLAN SHOWING NEW & EXISTING SIDEWALK - SCALE 1" = 100'-0"



SECTION

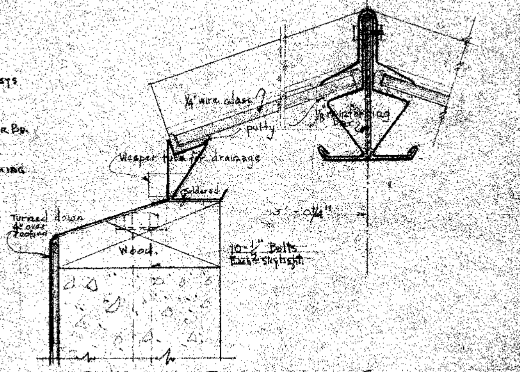


DETAIL OF RETAINING WALL & POST SHOWING GRADES
Scale 3/8" = 1'-0"

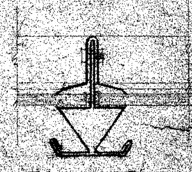


3/4" VENTILATOR SHAFT DETAIL
3/4" = 1'-0"

NOTE:
ALL VENTILATORS ON THE ROOF AND THE PLASTERBOARD DUCTS ARE IN THE GENERAL CONTRACT. ALL METAL DUCT WORK BELOW THE ROOF LINE IS IN THE PLUMBING & HEATING CONTRACT.



SECTION DETAIL OF SKYLIGHTS
Scale 6" = 1'-0"

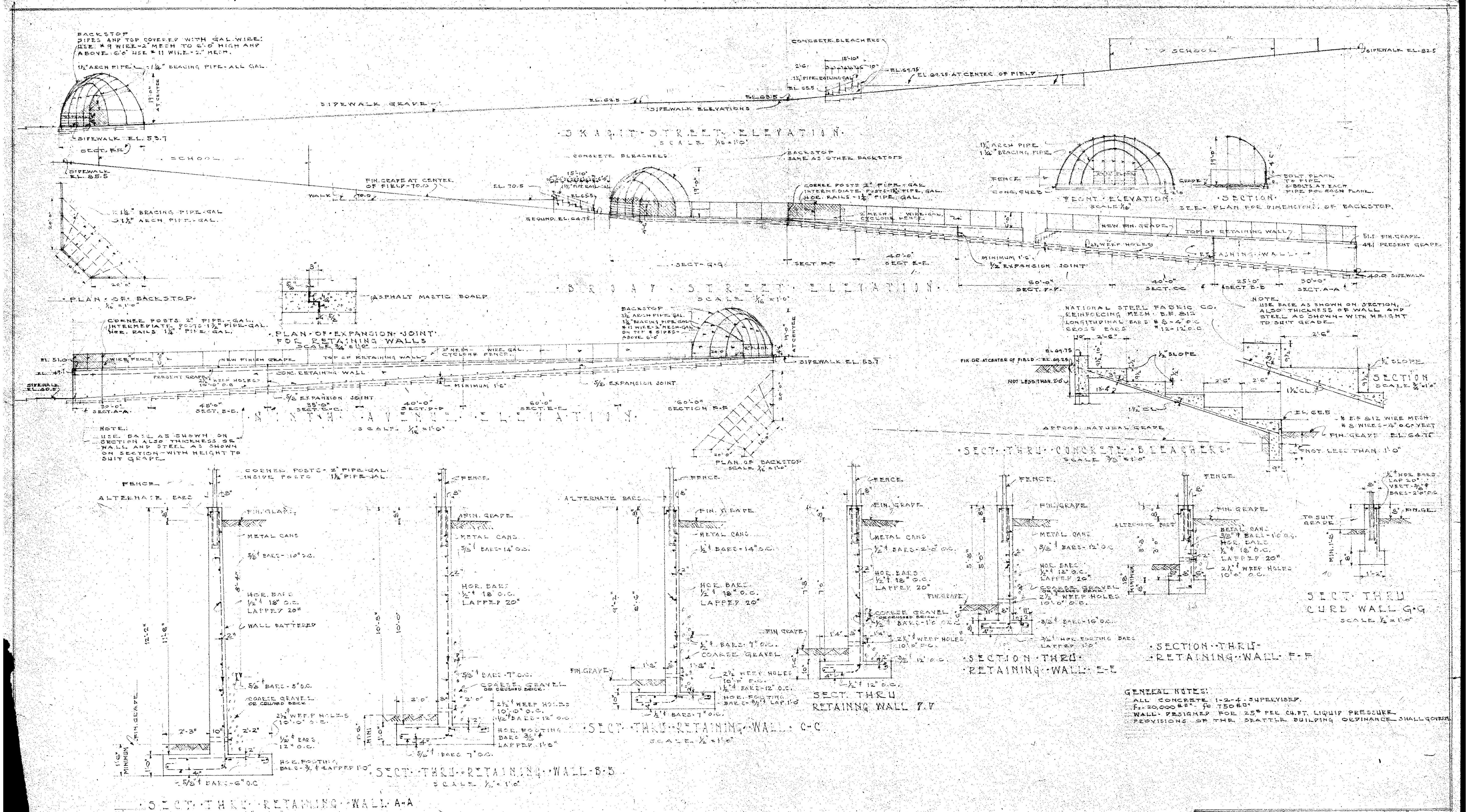


TYPICAL BAR

· P · W · A · DOCKET · WASH · 1350 · DS

· LINCOLN · ELEMENTARY · SCHOOL ·
· ELEVENTH · BROAD & SKAGIT · STREETS ·
· MOUNT · VERNON · WASHINGTON ·
· ARCH · N · TORBITT · ARCHITECTS ·
· 401 · LLOYD · BLDG · · SEATTLE · WASHINGTON ·

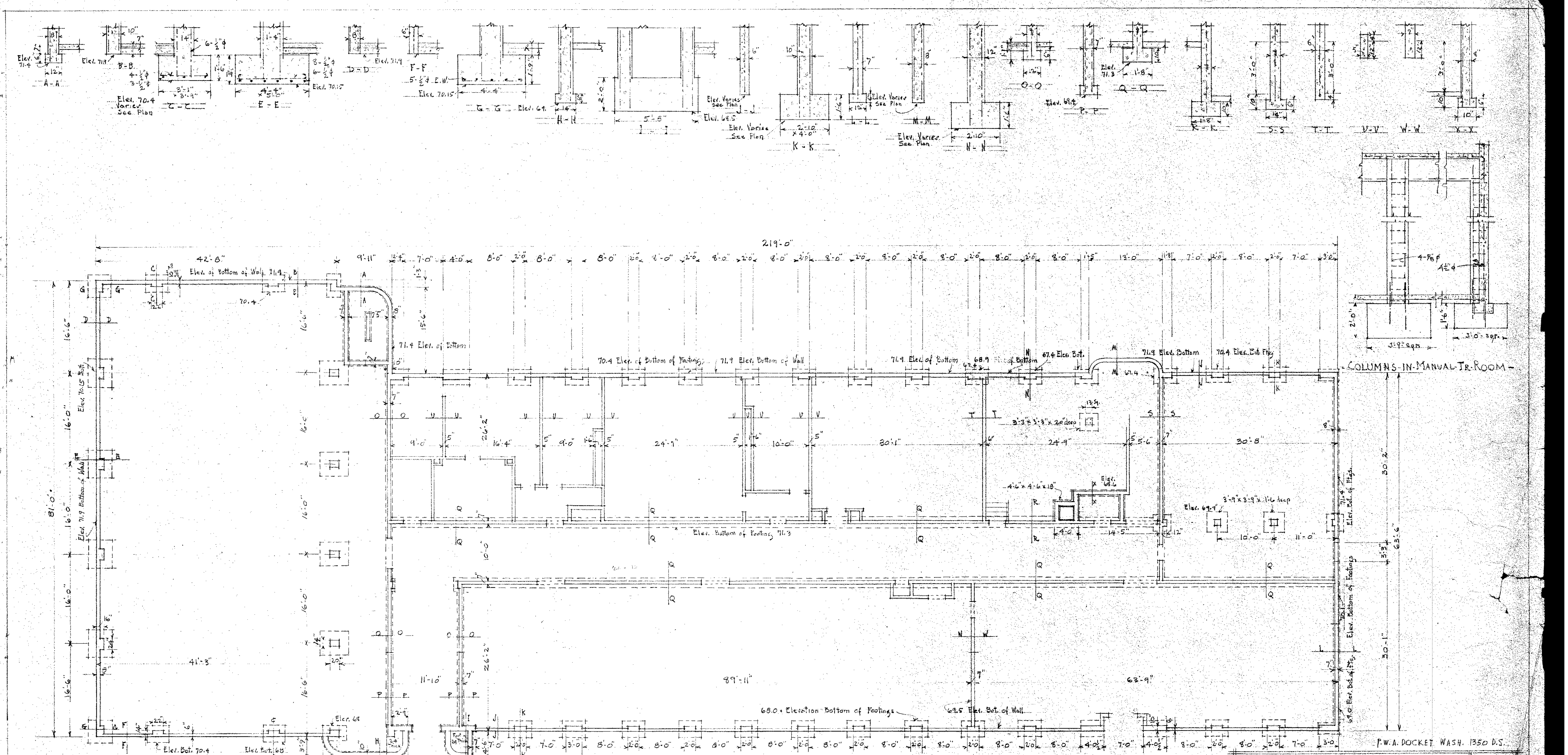
Job No. 605
Sheet No. 1
Made Nov. 1937



GENERAL NOTES:
ALL CONCRETE 1-2-4 - SUPERVISED.
fs = 20,000 #□" - fc 750 #□"
WALL DESIGNED FOR 25# PER CU.FT. LIQUID PRESSURE
PROVISIONS OF THE SEATTLE BUILDING ORDINANCE SHALL GOVERN.

LINCOLN ELEMENTARY SCHOOL
ELEVENTH - BROAD & SKAGIT - STREET
MOUNT VERNON · WASHINGTON ·
ARCH N. TORBITT · ARCHITECT
704 LLOYD BLDG. SEATTLE, WASHINGTON.

JOB NO 605
SHEET NO. 2 - CONT. 4
DATE. MAR. 9-35.



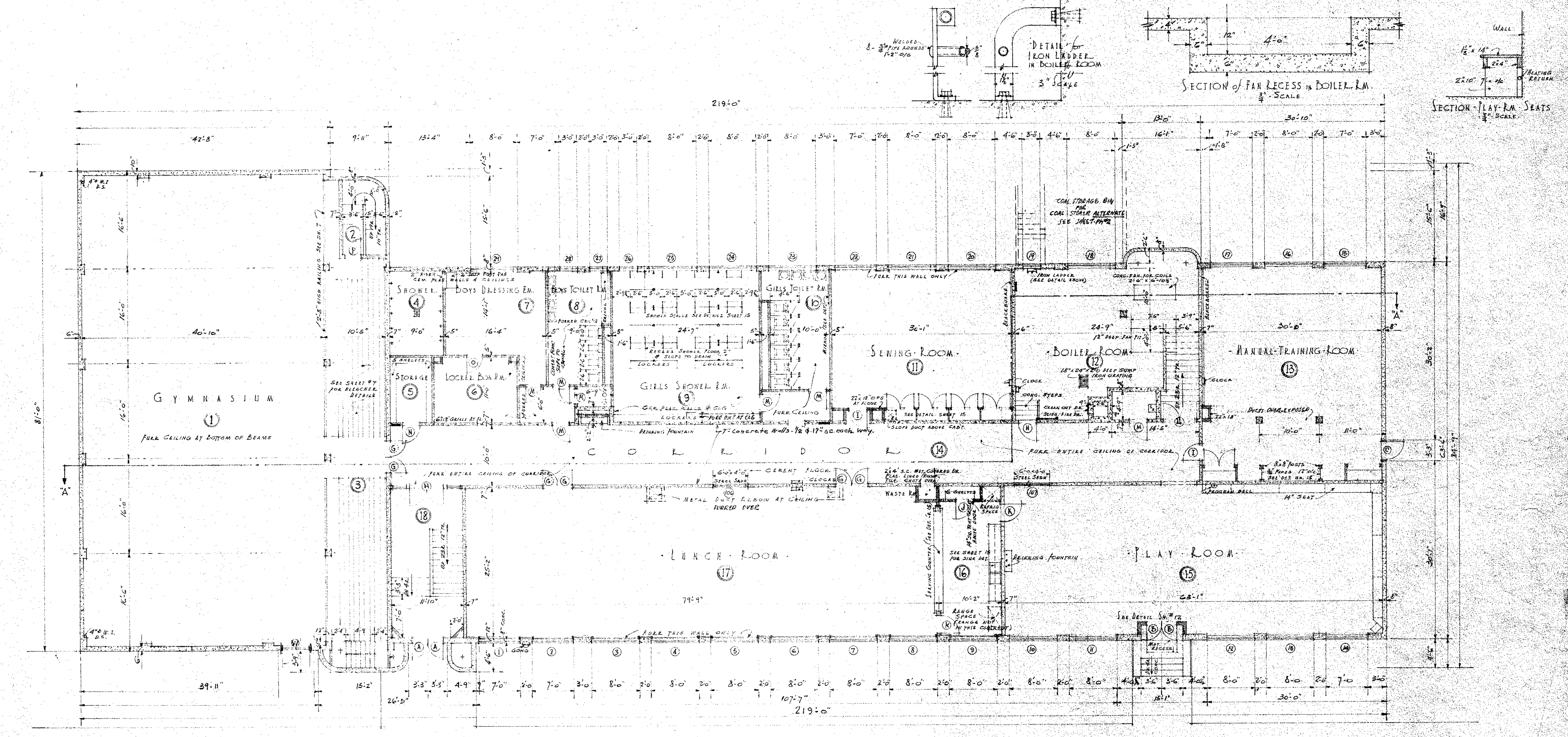
P.W.A. DOCKET WASH. 1350 D.S.

FOUNDATION PLAN

Scale 1/8" = 1'-0"

LINCOLN ELEMENTARY SCHOOL
ELEVENTH BROAD & SKAGIT STREETS
MOUNT VERNON WASHINGTON.
ARCH N. TORGITT ARCHITECT

Job No. -605-
Sheet No. 2 of 28
Made Dec. 1937



GROUND FLOOR PLAN

SCALE ⅛" = 1'-0"

P.W.A. DOCKET WASH. 1350 DS.

LINCOLN ELEMENTARY SCHOOL ELEVENTH BROAD & SKAGIT STREETS MOUNT VERNON · WASHINGTON · ARCH N. TORBITT ARCHITECT 401 LLOYD BUILDING SEATTLE WASHINGTON	JOB. NO. 605 SHEET NO. 3 MADE NOV. 1937

General Notes

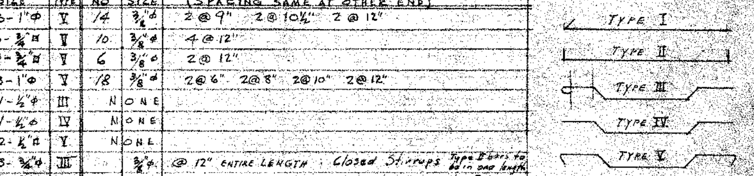
All concrete 1 : 2 : 4 Supervised
fs 20.000 #/□" fc 750 #/□" Assumed Live Load 50 #/□'
All columns to be lapped 20 diameters Minimum 1'-0"
All footings to have stubs with same lap as noted above
All wall steel to be lapped 40 diameters, Ends hooked 1'-0" at corners
All columns to have 1/4" □ bands, 8" centers with 1/4" □ cross bands every 3rd band so arranged as to catch steel
All openings in concrete walls to have 2-5/8" ϕ bars on all sides extending 1'-0" beyond corner.
Place 2 1/2" ϕ - 3'-0" diagonally at each corner.
All slab steel shall have a clearance of 1/2" top & bottom & shall be properly supported on steel or concrete chairs
Beam steel shall have a clearance of 1 1/2" from bottom & 1" from top. Provide proper support. The two layers of bottom steel shall have a clearance of 1" seperated by spreaders
Unless otherwise noted the provisions of the Seattle Building Ordinance shall apply & govern
Where slab steel runs parallel to a beam or wall, provide 1/2" ϕ steel 4'-0" long, in top across slab.
When slab is on only one side of said wall or beam, bend bars down in outside face
All slab steel to be properly supported on 1/2" ϕ raising bars
All slabs to have 3/8" ϕ shrinkage steel 18" ctrs. lapped 1'-0"

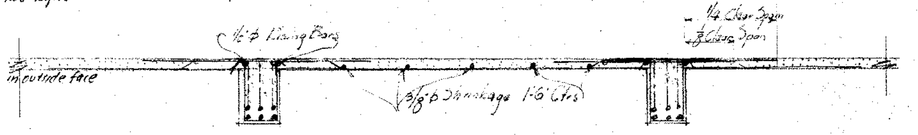
SLAB SCHEDULE

SLAB No.	THICKNESS	STEEL		REMARKS
		SIZE	SPACING	
1	3"	3/8"	4"	
2	3"	3/8"	7 1/4"	
3	3 1/2"	3/8"	4 1/2"	
4	4"	3/8"	4"	
5	4"	3/8"	5"	
6	4"	3/8"	5 1/4"	

BEAM SCHEDULE

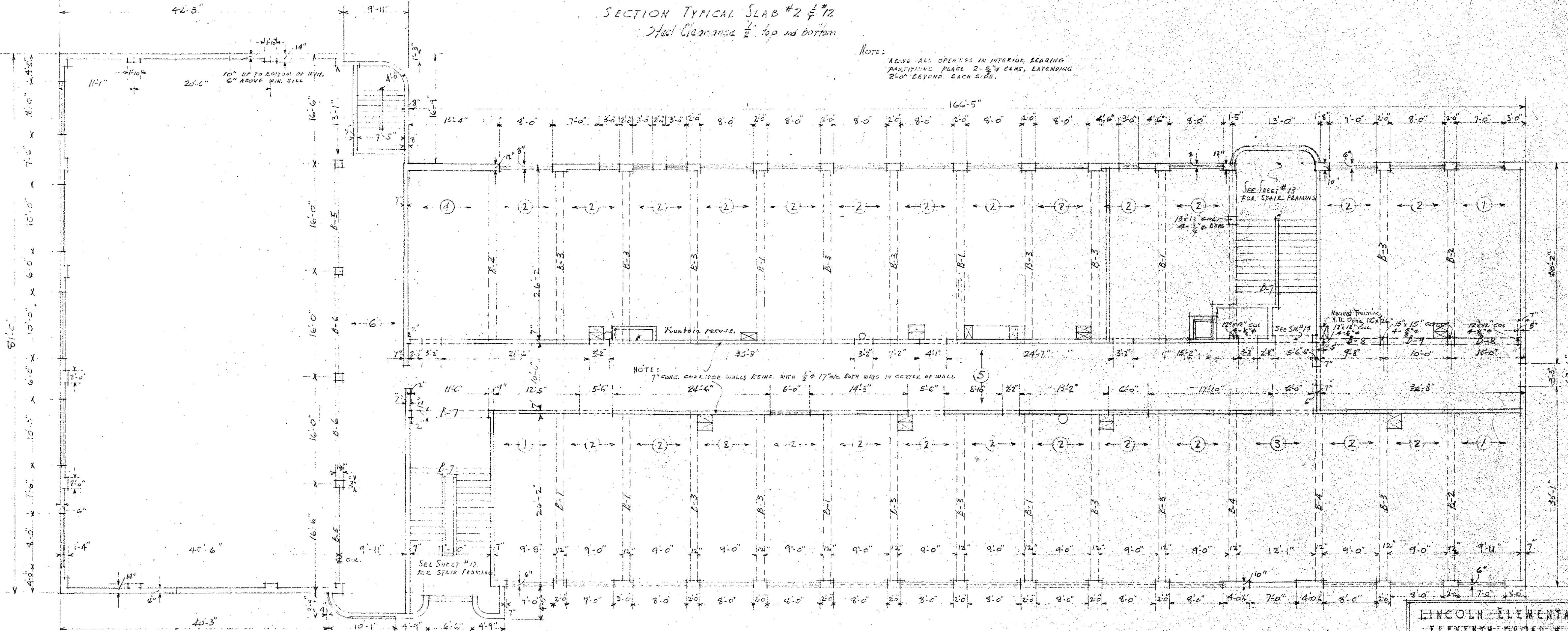
B. No.	SIZE	BOTTOM BARS				STIRRUPS		
		SIZE	TYPE	SIZE	TYPE	NO	SIZE	(SPACING SAME AT OTHER END)
1	12"x 19"	3-1"ϕ	II	3-1"ϕ	V	14	3/8"ϕ	2 @ 9" 2 @ 10 1/2" 2 @ 12"
2	12"x 19"	1-1"ϕ 2-7/8"ϕ	II	3-3/4"□	V	10	3/8"ϕ	4 @ 12"
3	12"x 19"	3-7/8"ϕ	II	3-3/4"□	V	6	3/8"ϕ	2 @ 12"
4	14"x 19"	3-1 1/8"ϕ	II	3-1"ϕ	V	18	3/8"ϕ	2 @ 6" 2 @ 8" 2 @ 10" 2 @ 12"
5	6"x 30"	1-1/2"ϕ	I	1-1/2"ϕ	III	NONE		
6	6"x 30"	1-1/2"ϕ 15'-9"	ST.	1-1/2"ϕ	IV	NONE		
7	12"x 19"	2-1/2"□	II	2-1/2"□	V	NONE		
8	12"x 24"	3-3/4"ϕ	II	3-3/4"ϕ	III		3/8"ϕ	@ 12" ENTIRE LENGTH Closed Stirrups Type II bars to be in one length
9	12"x 24"		ST.	3-3/4"ϕ	IV		3/8"ϕ	@ 12" ENTIRE LENGTH do thru B-8 + B-9





SECTION TYPICAL SLAB #2 & #12
Steel Clearance 1/2" top and bottom

NOTE:
ABOVE ALL OPENINGS IN INTERIOR BEARING PARTITIONS PLACE 2-5/8" ϕ BARS, EXTENDING 2'-0" BEYOND EACH SIDE.

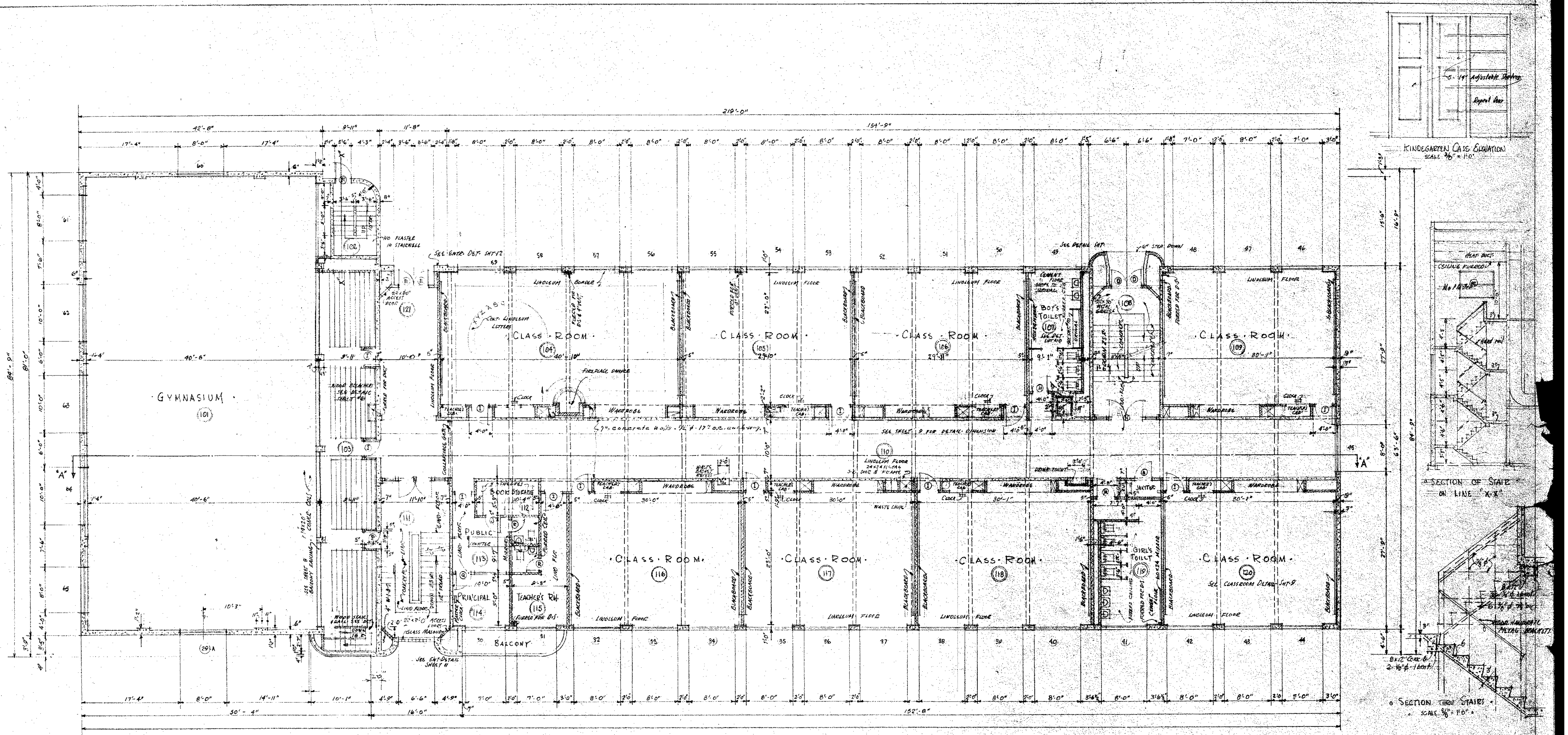


FIRST FLOOR FRAMING PLAN
Scale 1/8" = 1'-0"
219'-0"

P.W.A. DOCKET WASH. 1350 D.S.

LINCOLN ELEMENTARY SCHOOL
ELEVENTH BROAD & SKAGIT STREETS
MOUNT VERNON, WASHINGTON
ARCH N. TORBITT ARCHITECT
401 LLOYD BUILDING SEATTLE WASHINGTON

JOB No. 605
SHEET No. 3S
MADE NOV. 1937



Note – All dimensions on outside walls include 2" furring unless otherwise indicated. Gymnasium outside walls not furred.

FIRST FLOOR PLAN

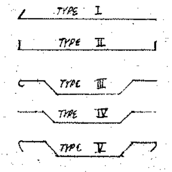
SCALE 1/8" = 1'-0"

P.W.A. DOCKET WASH. 1350 D.S.

LINCOLN · ELEMENTARY · SCHOOL · · ELEVENTH · BROAD & SKAGIT · STREETS · · MOUNT · VERNON · WASHINGTON · · ARCH · N · TORBITT – ARCHITECT · · 401 · LLOYD BLDG · · SEATTLE · WASHINGTON ·	Job No. 605 Sheet No. 4 Made Nov 1937

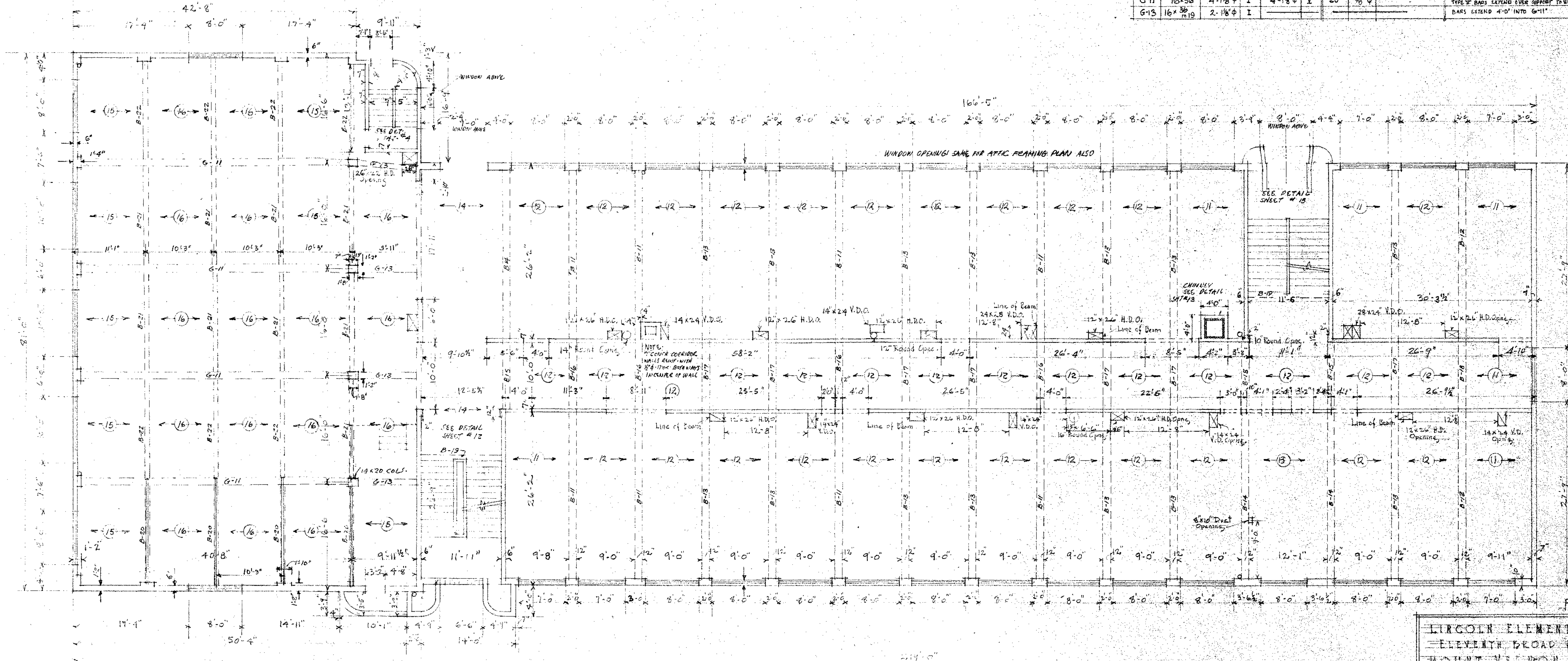
SLAB SCHEDULE

SLAB No.	THICKNESS	STEEL		REMARKS
		SIZE	SPACING	
11	3"	⅜" φ	4"	
12	3"	⅜" φ	7¼"	
13	3½"	⅜" φ	4½"	
14	4"	⅜" φ	4"	
15	3½"	⅜" φ	5½"	
16	3"	⅜" φ	6	
17	3"	⅜" φ	7½"	

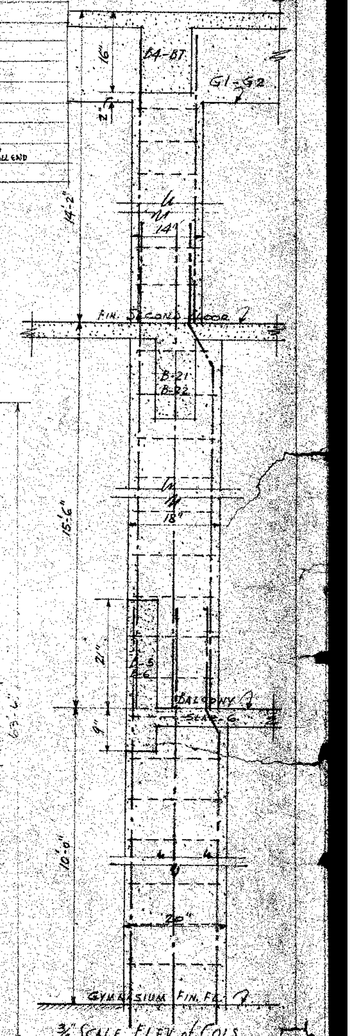


BEAM SCHEDULE

B. No.	SIZE.	BOTTOM BARS				STIRRUPS			REMARKS.
		SIZE	TYPE	SIZE	TYPE	No.	SIZE	SPACING (EACH END)	
B-11	12×19	2-⅞"φ 1-1"φ	I	3-⅞"φ	IV	14	⅜"φ	3@9"-3@10½"-3@12"	TYPE I BARS EXTEND 2'-0" THRU WALL INTO B-16 TYPE IV BARS EXTEND ENTIRELY OVER B-16 TO ¼ PT OF OPPOSITE B-11
B-12	12×19	3-¾"φ	I	3-⅞"φ	IV	10	⅜"φ	4@12"	TYPE I BARS EXTEND 2'-0" THRU WALL INTO B-18 TYPE IV BARS EXTEND ENTIRELY OVER B-18 TO ¼ PT OF OPPOSITE B-12
B-13	12×19	3-¾"φ	I	1-¾φ 1-⅞"φ	IV	6	⅜"φ	2@12"	TYPE I BARS EXTEND 2'-0" THRU WALL INTO B-17 TYPE IV BARS EXTEND ENTIRELY OVER B-17 TO ¼ PT. OF OPPOSITE B-13
B-14	12×19	3-1"φ	I	1-1"φ 2-⅞"φ	III	18	⅜"φ	2@6"-2@8"-2@10"-2@12"	TYPE I BARS EXTEND 2'-0" THRU WALL INTO B-15 TYPE III BARS EXTEND ENTIRELY OVER B-15 TO OPPOSITE END
B-15	12×19	3-1"φ	I	—		—			TYPE I BARS EXTEND 3'-0" INTO B-14
B-16	12×19	2-1"φ×17'-0" 1-⅞"φ×17'-0"	Straight			—			BARS EXTEND 3'-0" INTO B-11
B-17	12×19	2-¾"φ×17'-0"	Straight			—			BARS EXTEND 3'-0" INTO B-13
B-18	12×19	3-¾"φ×17'-0"	Straight			—			BARS EXTEND 3'-0" INTO B-12
B-19	12×19	2-½"□	II	2-½"□	V	—			
B-20	8×24	2-⅝ φ	II	2-½"□	V	—			
B-21	8×19	2-½"□×15'-9"	Straight	2-½"□	IV	4	⅜"φ		
B-22	8×19	2-⅝"φ	I	2-⅝"φ	III	4	⅜"φ		
G-11	16×36	4-1⅛"φ	I	4-1⅛"φ	V	20	⅜"φ		TYPE I BARS EXTEND 1'-0" INTO G-13 TYPE V BARS EXTEND OVER SUPPORT TO WALL END
G-13	16×36 to 19	2-1⅛"φ	I	—		—			BARS EXTEND 4'-0" INTO G-11"



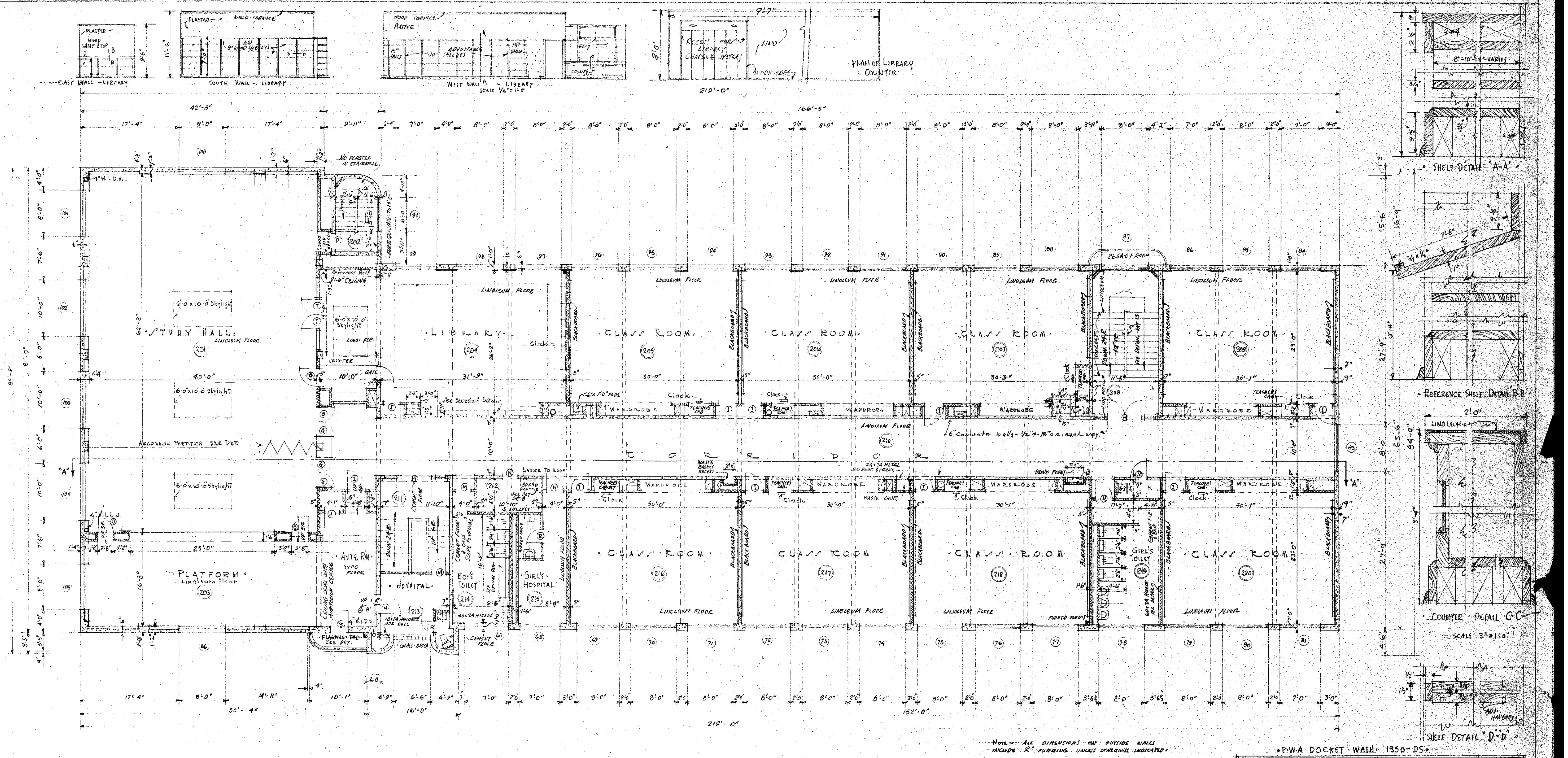
SECOND FLOOR FRAMING PLAN
Scale ⅛"=1'-0"



¾" SCALE ELEV. of COLS. IN GYMNASIUM

P.W.A. DOCKET WASH. 1350 D.S.

LINCOLN ELEMENTARY SCHOOL ELEVENTH BROAD & SKAGIT STREETS MOUNT VERNON WASHINGTON ARCH N. TORBITT ARCHITECT 401 LLOYD BUILDING SEATTLE WASHINGTON	JOB No. 605
	SHEET No. 45
	MADE NOV. 1937



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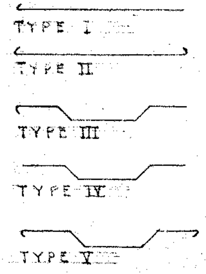
Sheet No •	5
Made	Nov. 1937

• SECOND FLOOR PLAN •
SCALE 1/8" = 1'-0"

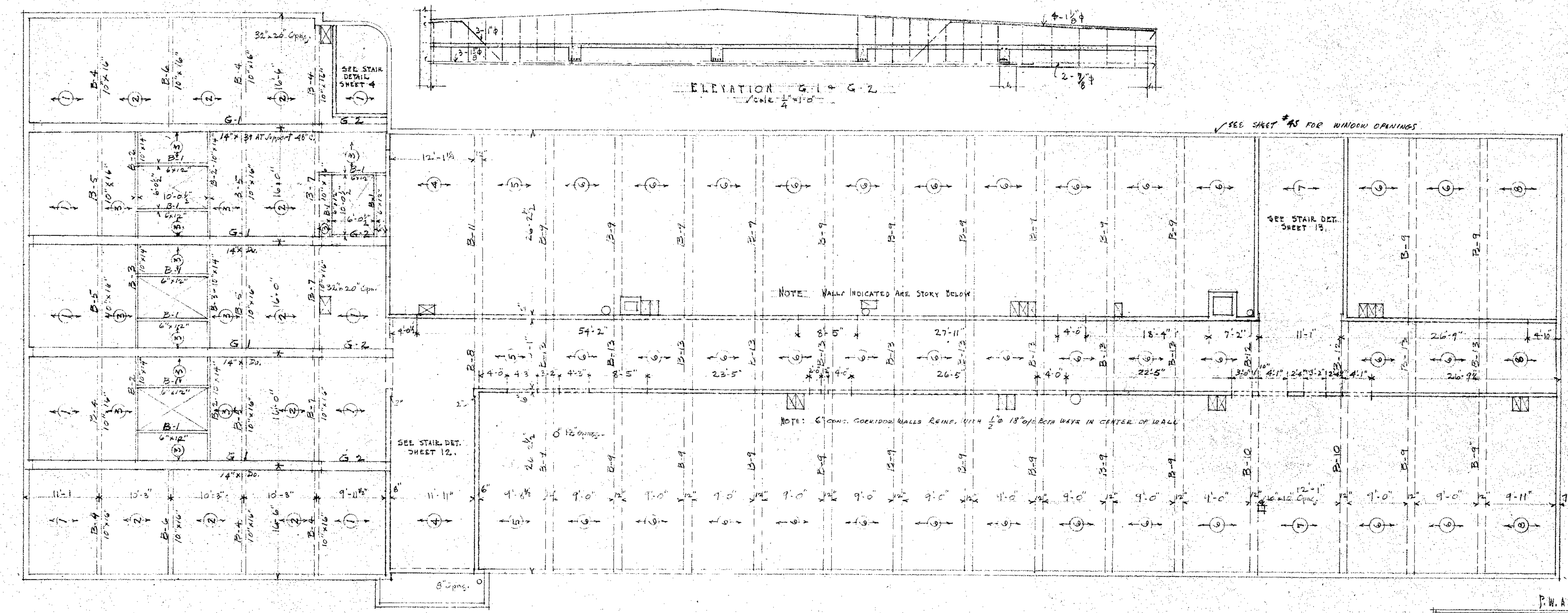
BEAM SCHEDULE

BEAM NO.	SIZE	BOTTOM STEEL SIZE	TYPE	SIZE	TYPE	STIRRUPS NO.	SIZE	SPACING FROM ONE END Other End Same Or Else Noted	REMARKS
B-1.	6"x12"	2-½"φ-10'-9"	ST.	———	———		NONE		
B-2	10"x14"	2-½"φ	I	2-½"φ	III		"		
B-3	10"x14"	2-½"φ-15'-9"	ST.	2-½"φ	IV		"		
B-4	10"x16"	2-⅝"φ	I	2-⅝"φ	III		"		
B-5	10"x16"	2-½"φ-15'-9"	ST.	2-½"φ	IV		"		
B-6	10"x16"	2-¾"φ	II	2-⅝"φ	V		"		
B-7	10"x16"	2-½"φ 15'-9"	ST.	2-½"φ	IV		"		
G-1	14"x39" To 48" Centrs.	3-1"φ	I	3-1⅛"φ	V	18	⅜"φ	8@15"	Type I Bars carried into G-2 1'-0" Type V Bars carried To Support Beyond G-2.
G-2		2-⅞"φ	I	4-1⅛"φ Top.	I	5	⅜"φ	2@24"	Bottom Type I Bars Carried Thru Support into G-1 4'-0" Top Type I " " " " " G-1 10'-0"
B-8	12"x19"	3-¾"φ 17'-0"	ST				NONE		
B-9	12"x19"	3-¾"φ	I	3-¾"φ	III	6	⅜"φ	2@12"	Type I Bars carried Into Support At B-13 - 2'-0" Type III " " Over " Thru B-13 Into Opposite B-9 6'6"
B-10	12"x19"	3-¾"φ	I	3-¾"φ	V	8	⅜"φ	3@12"	Type I Bars Carried Into Support At B-12 - 2'-0" Type V " " Over " To Other End Of B-12
B-11	12"x19"	1-¾"φ 2-¾"φ	I	3-¾"φ	V	8	⅜"φ	3@12"	Type I " " Into " At B-8 - 2'-0" Type V " " Over " To Other End of B-8
B-12	12"x19"	3-¾"φ-17'-0"					NONE		
B-13	12"x19"	2-¾"φ-17'-0"					NONE		



SLAB SCHEDULE

SLAB NO.	THICKNESS	STEEL SIZE	STEEL SPACING	REMARKS
1.	3"	¼"φ	4¾"	
2.	3"	¼"φ	6¾"	
3.	3"	¼"φ	7½"	
4.	3"	⅜"φ	5¾"	
5.	3"	¼"φ	6¾"	
6	3"	¼"φ	7½"	
7	3"	⅜"φ	7"	
8	3"	⅜"φ	5"	

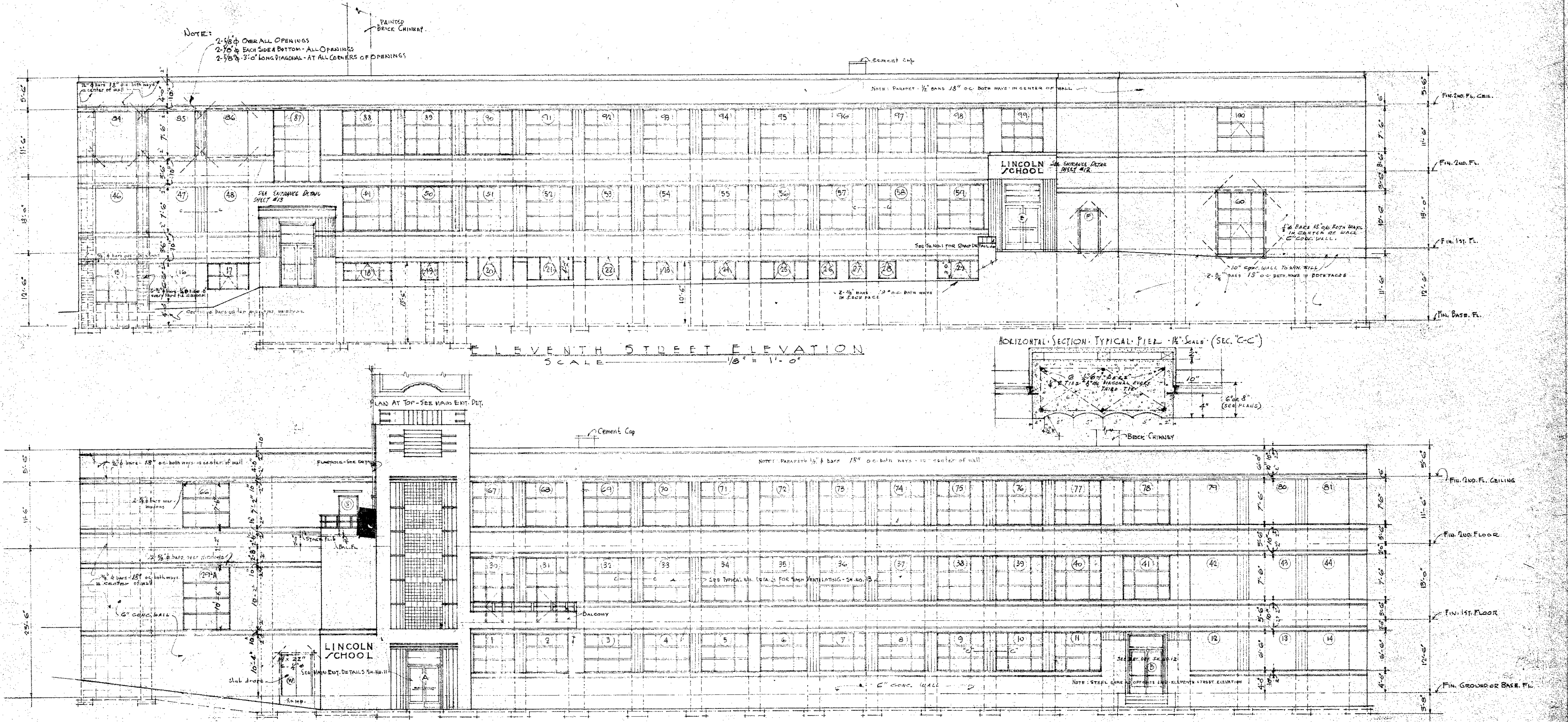


ELEVATION G-1 & G-2
Scale ¼"=1'0"

ATTIC FRAMING PLAN
Scale ⅛"=1'0"

P.W.A. DOCKET WASH. 1350 D.S.

LINCOLN ELEMENTARY SCHOOL ELEVENTH BROAD & SKAGIT STREETS MOUNT VERNON WASHINGTON ARCH N TORBITT ARCHITECT 401 LLOYD BUILDING SEATTLE WASHINGTON	Job No. 605 Sheet No. 55 Made Nov. 1937



ELEVENTH STREET ELEVATION
SCALE 1/8" = 1'-0"

HORIZONTAL · SECTION · TYPICAL · PIER · 1½" · SCALE · (SEC. "C-C")

PLAYGROUND ELEVATION
SCALE 1/8" = 1'-0"

NOTE FOR WALL REINFORCING:
- ALL 10" CONC. WALLS TO HAVE 3/8"ϕ BARS BOTH WAYS IN EACH FACE
- ALL 8" CONC. WALLS TO HAVE 3/8"ϕ BARS BOTH WAYS IN EACH FACE
- ALL 6" CONC. WALLS TO HAVE 1/2"ϕ BARS BOTH WAYS IN CENTER OF WALL
- ALL PIERS & PILASTERS 6-1/2"ϕ BARS VERT. AND 1/4"ϕ TIES 8" o/c DIAGONAL EVERY THIRD TIE

P.W.A. DOCKET WASH. 1350 D.S.

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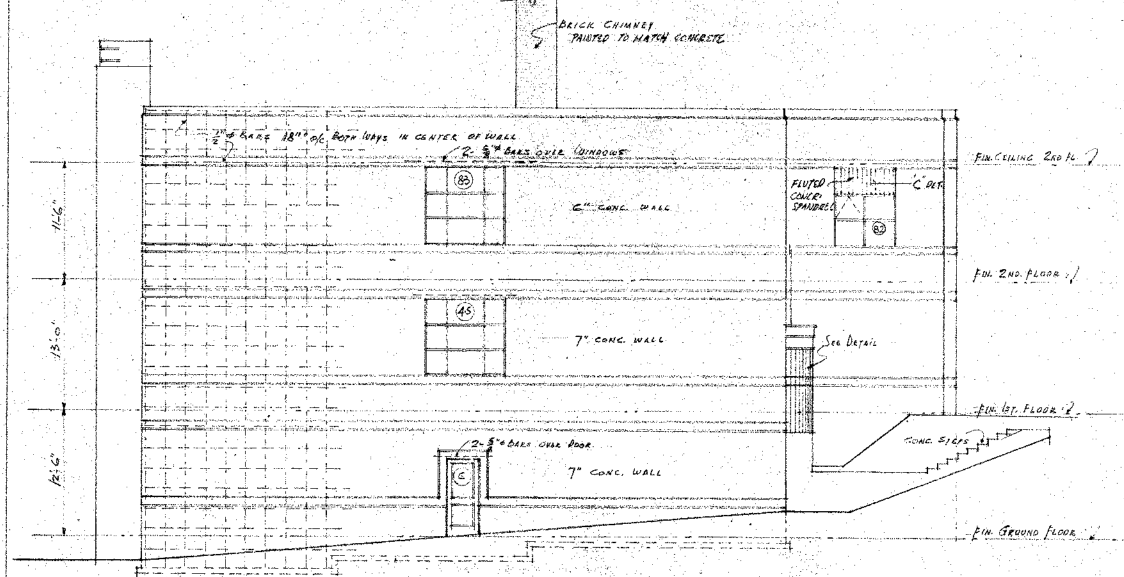
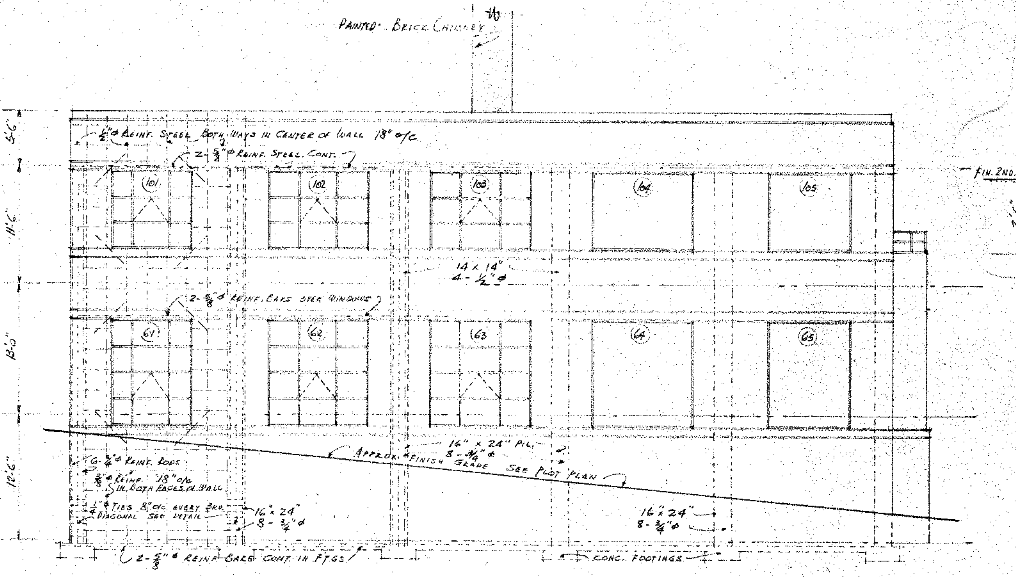
·ELEVENTH · BROAD & SKAGIT · STREETS·
·MOUNT · VERNON · WASHINGTON·
·ARCH · N · TORBITT · ARCHITECT·
·401 · LLOYD BLDG· ·SEATTLE · WASHINGTON·

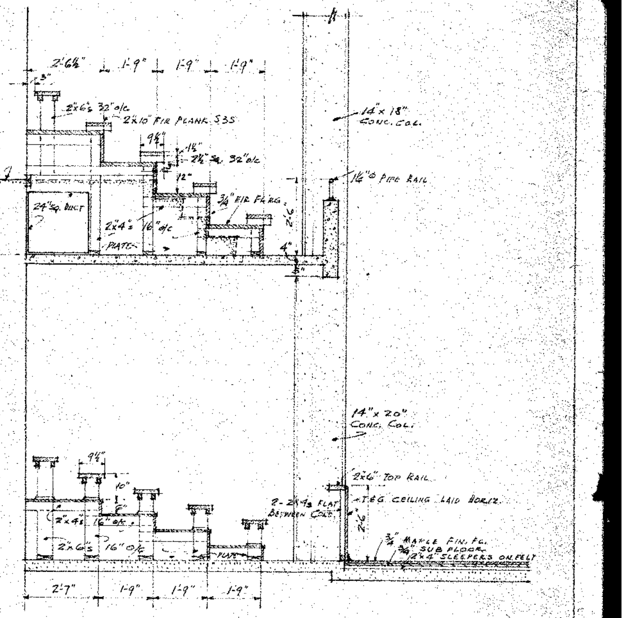
Job No. 605
Sheet No. 6
Made - Nov. 1937



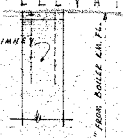
S K A G I T · STREET · ELEVATION ·
· Scale · 1/8" = 1'-0" ·



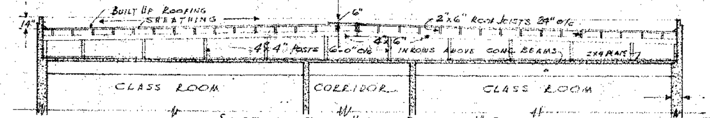
· B R O A D · STREET · ELEVATION ·
· Scale · 1/8" = 1'-0"



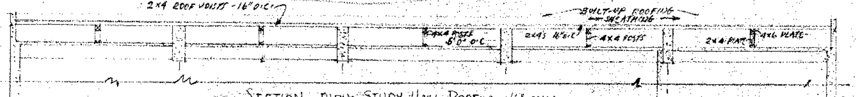
DETAILS OF BLEACHERS ON GYMNASIUM FLOOR & BALCONY
· Scale · 3/8" = 1'-0" ·



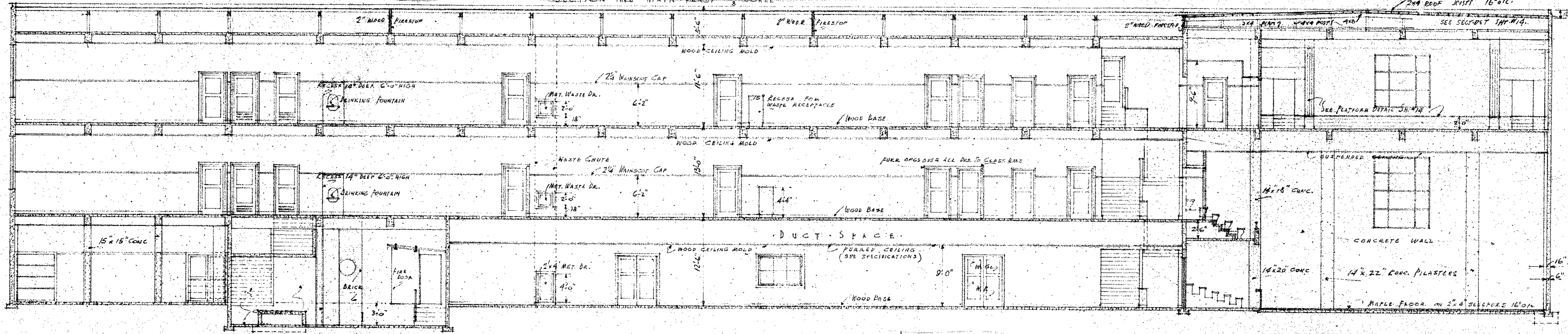
Painted Brick Chimney to match concrete



SECTION · THRU · MAIN · ROOF · 1/8" SCALE

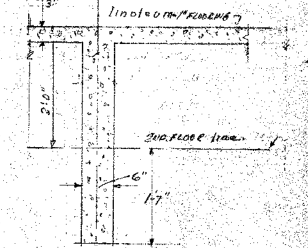


SECTION · THRU · STUDY · HALL ROOF · 1/8" SCALE



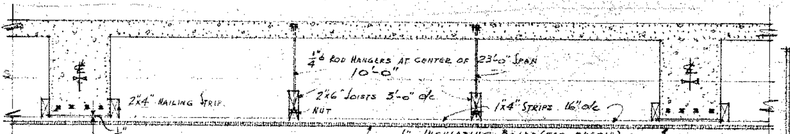
SECTION "A-A"
· Scale · 1/8" = 1'-0" ·

SEE SECTION LINES "A-A" ON GROUND · FIRST · & · SECOND FLOOR PLANS



DETAIL OF PLATFORM FRAMING & FLOOR IN STUDY HALL
SCALE 3/4" = 1'-0"

[illegible]

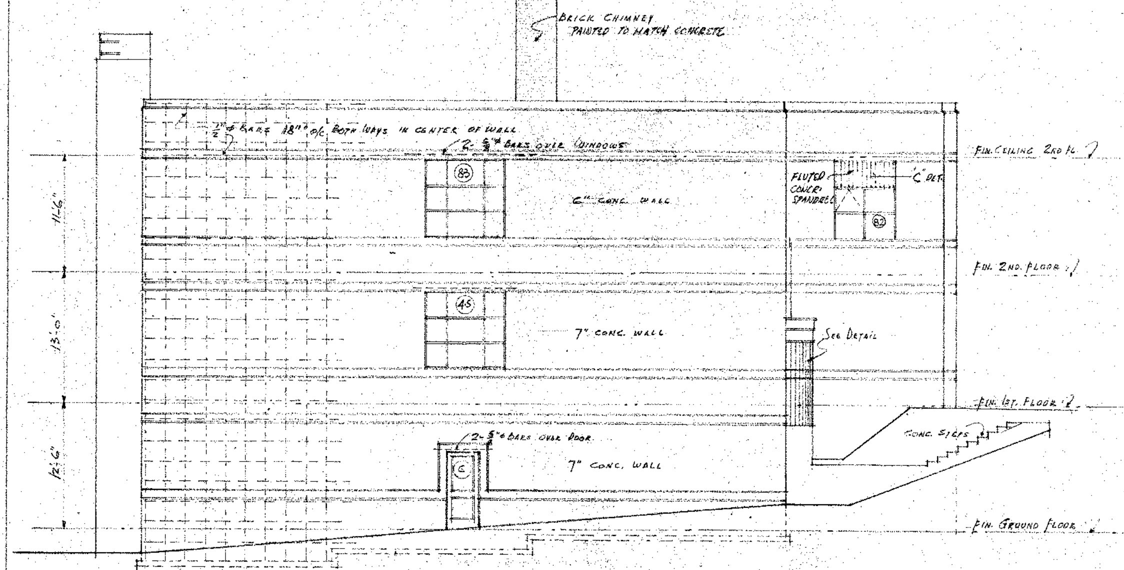


3/4" SCALE · SECTION · of · TYPICAL · BAY · for · SUSPENDED · CEILINGS ·

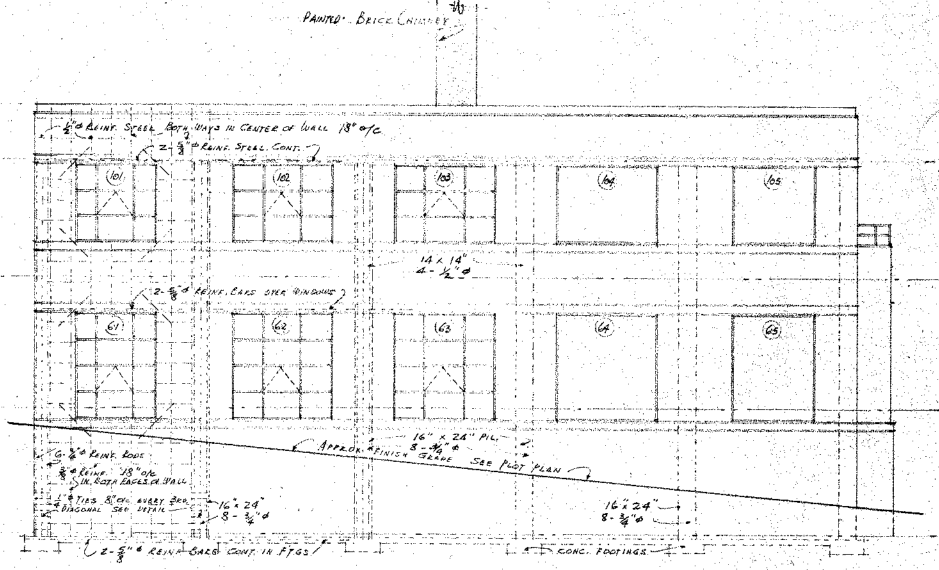
· P·W·A · DOCKET · WASH · 1350 - DS ·

LINCOLN · ELEMENTARY · SCHOOL
ELEVENTH · BROAD · & · SKAGIT · STREETS
· MOUNT VERNON · WASHINGTON ·
ARCH N. TORBITT ARCHITECT
401 LLOYD BUILDING SEATTLE · WASHINGTON ·

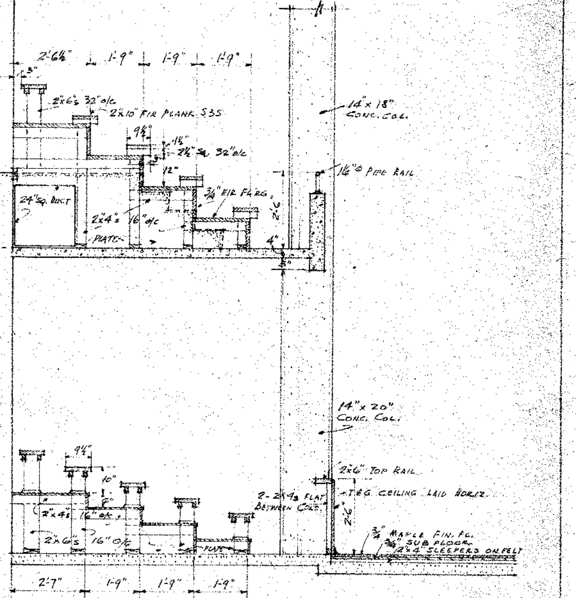
Job No. 605
Sheet No. 7
Made Nov. 1937



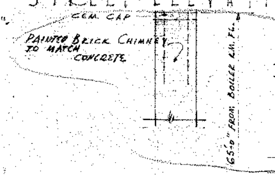
·SKAGIT·STREET·ELEVATION·
·Scale·⅛"=1'-0"·

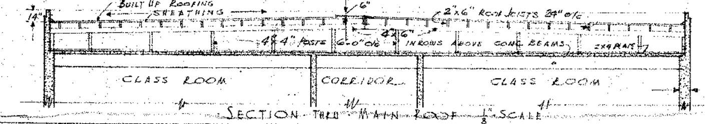


·BROAD·STREET·ELEVATION·
·Scale·⅛"=1'-0"

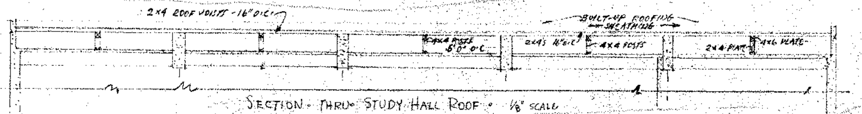


DETAILS OF BLEACHERS ON GYMNASIUM FLOOR & BALCONY
·Scale·⅜"=1'-0"·

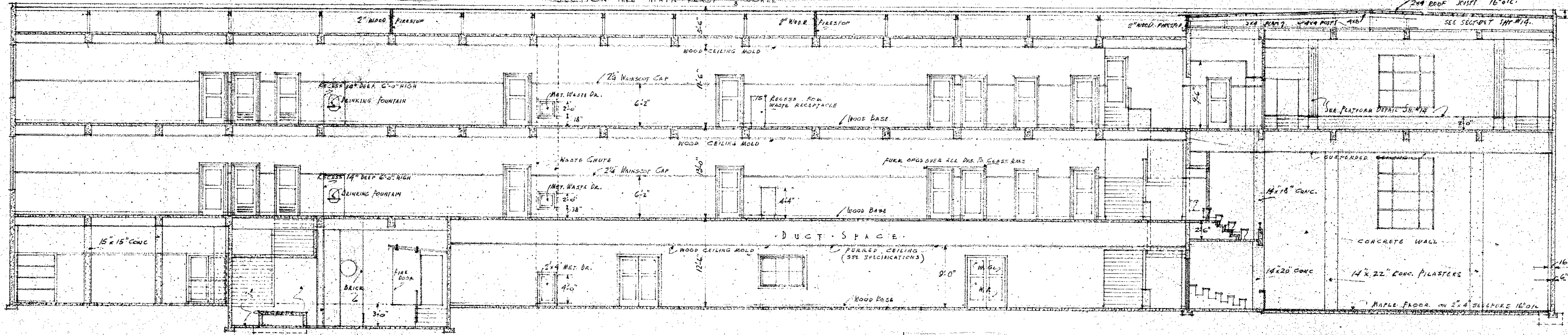




SECTION THRU MAIN ROOF ⅛" SCALE

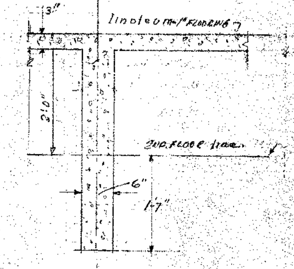


SECTION· THRU· STUDY HALL ROOF · ⅛" SCALE

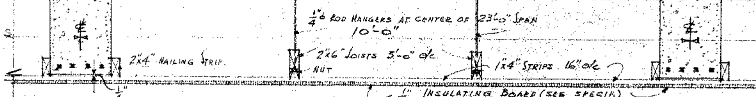


SECTION "A-A"
·Scale·⅛"=1'-0"·

SEE SECTION LINES "A-A" ON GROUND · FIRST · & · SECOND FLOOR PLANS



DETAIL OF PLATFORM FRAMING & FLOOR IN STUDY HALL
SCALE ¾"=1'-0"



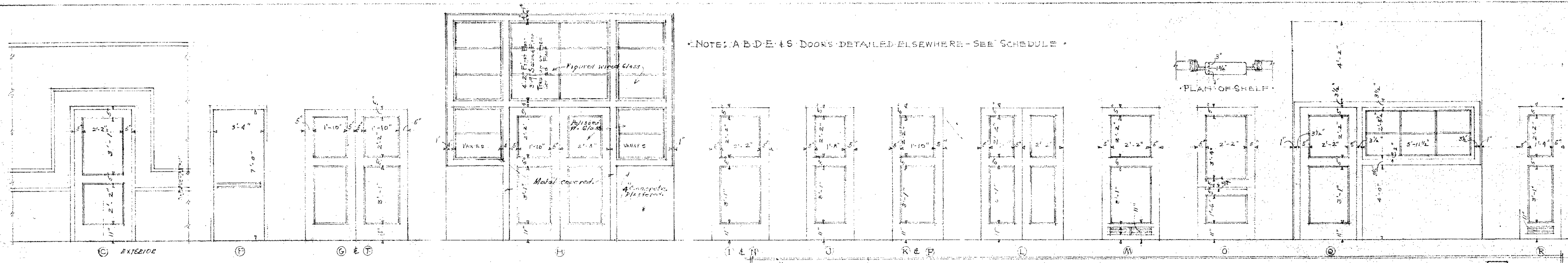
¾" SCALE · SECTION · of · TYPICAL · BAY · for · SUSPENDED · CEILINGS ·

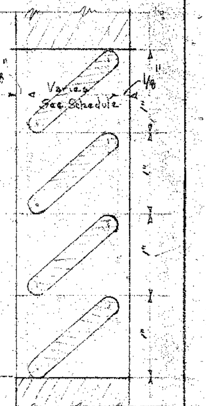
·P·W·A· DOCKET ·WASH· 1350-DS·

LINCOLN · ELEMENTARY · SCHOOL
ELEVENTH · BROAD · & · SKAGIT · STREETS
·MOUNT VERNON · WASHINGTON·
ARCH N. TORBITT ARCHITECT
401 LLOYD BUILDING SEATTLE · WASHINGTON ·

JOB No	605
SHEET No.	7
MADE	NOV. 1937

·NOTE: A·B·D·E·& S· DOORS· DETAILED ELSEWHERE - SEE SCHEDULE ·

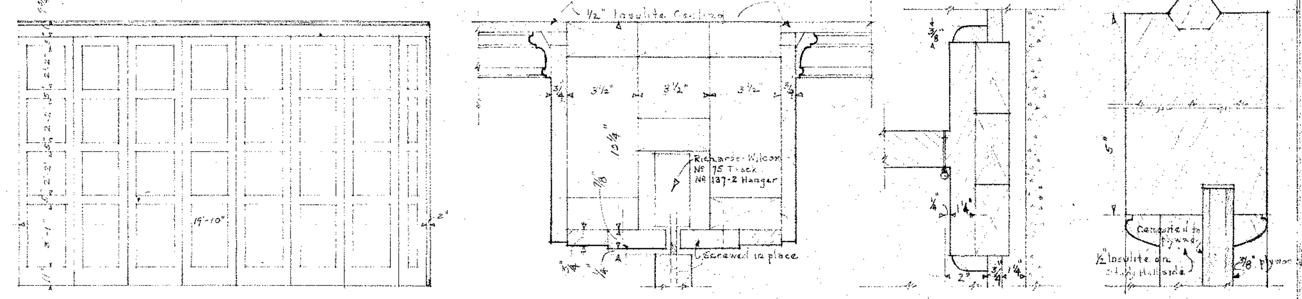




·DOOR· SCHEDULE·

SYMBOL	DETAILED	SIZE	Number of Doors	·REMARKS·
Ⓐ	Sheet No 11	2'-8" x 7'-0" x 2¼"	1 Pair	E.G. Fir - Solid Stiles & Rails - Metal Threshold Chrome Plated Hdw. Bars. Polished Wired Plate Glass
Ⓑ	" " 12	2'-8" x 7'-0" x 2¼"	1 Pair	" " " " " " " " " " " " " "
©	Above	3'-0" x 7'-0" x 2¼"	1	" " " " " " " " - 2 Panels - Top Polished Wire Plate - Bottom 3 Ply Wood -
Ⓓ	Sheet No 13	2'-8" x 7'-0" x 2¼"	1 Pair	" " " " " " " " " " " " " "
Ⓔ	" " 12	2'-8" x 7'-0" x 2¼"	1 Pair	" " " " " " " " Chrome Plated Push Bars Polished Wired Plate Glass
Ⓕ	Above	3'-4" x 7'-0" x 1¾"	1	" " " - Slab Door - Metal Threshold - " " " "
Ⓖ	"	2'-8" x 7'-0" x 1¾"	5 Pair	" " " Solid Stiles & Rails - No Threshold - 2 Panels Top - Pol. Wire Glass Bottom 3 Ply Wood -
Ⓗ	"	2'-8" x 7'-0" x 1¾"	5 - "	Metal covered Stiles - Rails & Panels and frame " " Top & Side Lights Pol. Wire Glass - Transoms - figured wired glass.
Ⓘ	"	3'-0" x 7'-0" x 1¾"	24	E. G. Fir Solid Stiles & Rails. No Threshold. " " " Pol. Wire Glass. Bottom 3 Ply wood.
Ⓙ	"	2'-6" x 7'-0" x 1⅜"	3	" " " " " " " " " " " 3 Ply Wood -
Ⓚ	"	2'-8" x 7'-0" x 1¾"	2	" " " " " " " " " " " - Top Figured Wire Glass - - Bottom 3 Ply Wood -
Ⓛ	"	9'-6" x 7'-0" x 1¾"	1 Pair	Metal covered Stiles - Rails & panels and frame " " Top polished Wire Glass.
Ⓜ	"	3'-0" x 7'-0" x 1¾"	15	E. G. Fir Solid Stiles & Rails No " " " " Figured " " Bottom 3 Ply Wood - Louvered -
Ⓝ	"	3'-0" x 7'-0" x 1¾"	4	" " " " " " " " " " 3 Ply Wood -
Ⓞ	"	3'-0" x 7'-0" x 1¾"	2	" " " " " " " " " " Top - Pol. Wire Glass - Bottom 3 Ply Wood - Dutch Doors as Shown
Ⓟ	"	2'-8" x 6'-8" x 1¾"	3	Metal covered Stiles - Rails - panels and frame " " " " " "
Ⓠ	"	3'-0" x 7'-0" x 1¾"	1	E. G. Fir Solid Stiles & Rails No Threshold " " Top Figured - Wire Glass Bottom 3 Ply Wood & Side Light -
Ⓡ	"	2'-2" x 7'-0" x 1⅜"	4	" " " " " " " " " " " Bottom 3 Ply Wood - Louvered -
Ⓢ	Sheet No 11	3'-0" x 6'-8" x 1¾"	1	" " " - Slab Door 2'-0" ϕ Glass as shown - Metal Threshold -
Ⓣ	Above	2'-8" x 7'-0" x 1¾"	1 Pair	" " " Solid Stiles & Rails - No Threshold - 2 Panels Top Pol. Wire Glass, - Bottom 3 Ply Wood & Sidelights as Shown
Ⓤ		3'-0" x 7'-0" x 1¾	2	" " " Slab Door
W		2'-6" x 7'-0" x 1¾	1 pair.	" " " " Doors - Metal Threshold.

NOTE: WARDROBE & CABINET DOORS · TOILET STALL DOORS · ACCORDIAN PARTITION ETC · NOT IN SCHEDULE · AS DETAILED ·



·HALF · ELEVATION·
Scale ¼" = 1'-0"

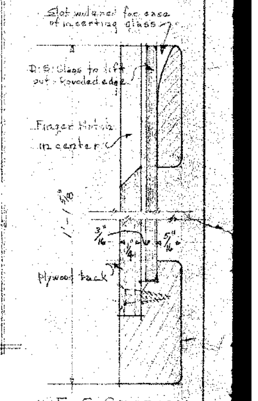
·SECTION·AT·HEAD·
·Scale 3" = 1'-0"·

·SECTION·AT·JAMB·
·Scale 3" = 1'-0"·

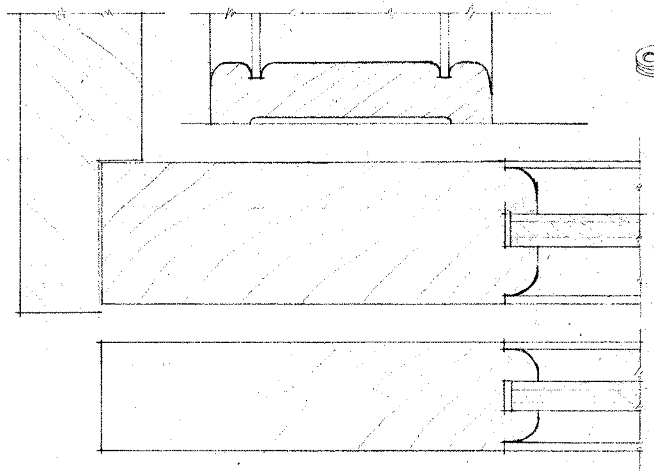
·F·S·SECTION·
·OF DOORS·

·DETAIL · OF · ACCORDION · PARTITION · IN · STUDY · HALL - AUDITORIUM ·

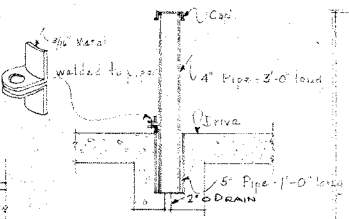
F·S·SECTION LOUVER S· ·M· & R·DOORS·



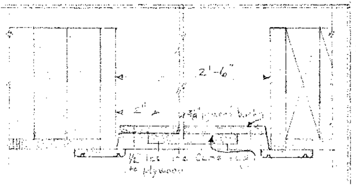
·F·S·SECTION·



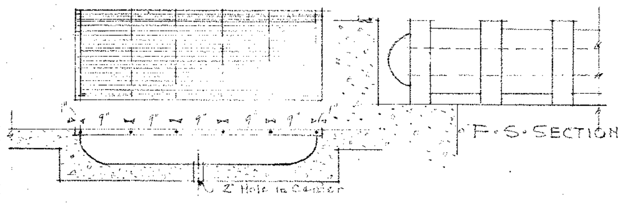
·F·S·SECTIONS · TYPICAL DOORS & TRIM·



·DRIVEWAY GUARDS - 2 REQUIRED·
· Scale ¾" = 1'-0" ·

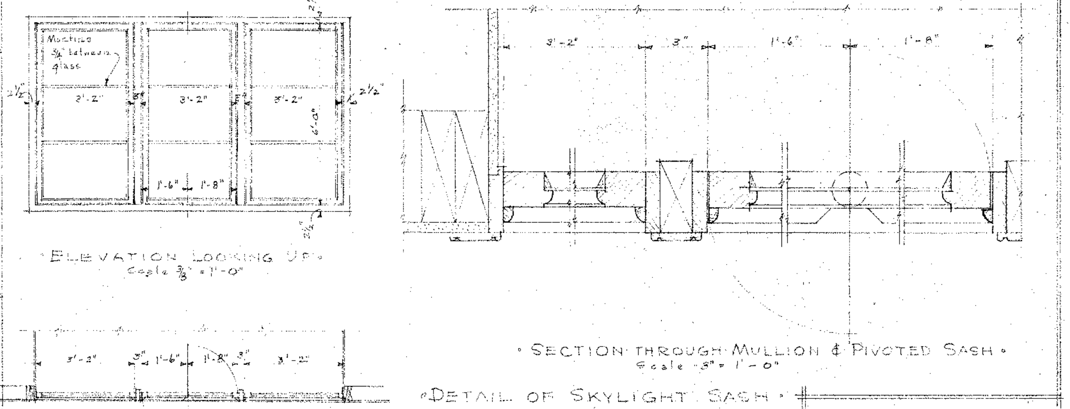


SECTION THRU SCUTTLE
Scale 3" = 1'-0"



·F·S·SECTION·

·FOOT SCRAPER ·4· REQUIRED·
Scale ¾" = 1'-0"

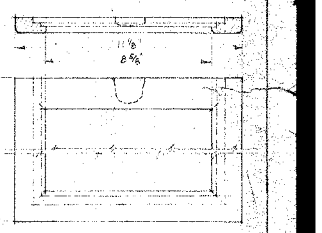


·ELEVATION LOOKING UP·
Scale ⅜" = 1'-0"

·SECTION·
Scale ⅜" = 1'-0"

·SECTION·THROUGH·MULLION & PIVOTED SASH·
Scale 3" = 1'-0"

·DETAIL OF SKYLIGHT SASH·
· 4 · REQUIRED ·

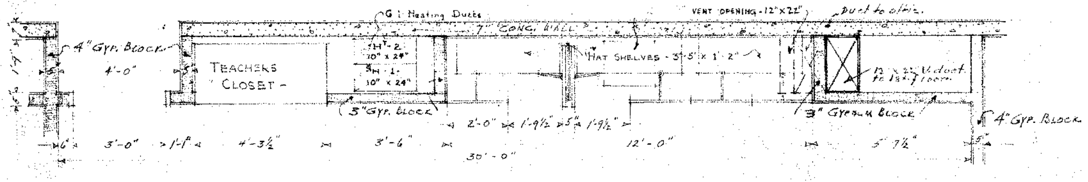


·PLAN & ELEVATION·
Scale 3" = 1'-0"

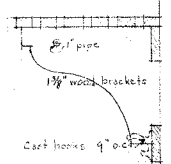
·DETAIL·OF PROGRAM BOARD·
· ONE REQUIRED FOR EACH CLASS ROOM ·

P. W. A. DOCKET WASH. 1350 D.S.

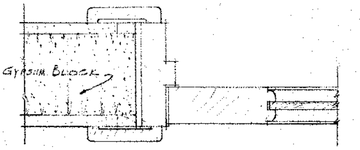
·LINCOLN·ELEMENTARY·SCHOOL· ·ELEVENTH·BROAD & SKAGIT·STREETS· ·MOUNT·VERNON·WASHINGTON· ·ARCH·N·TORBITT·ARCHITECT· ·401 LLOYD·BLDG· ·SEATTLE·WASHINGTON·	Job No· -605- Sheet No· ·8· Made - Nov. 1937



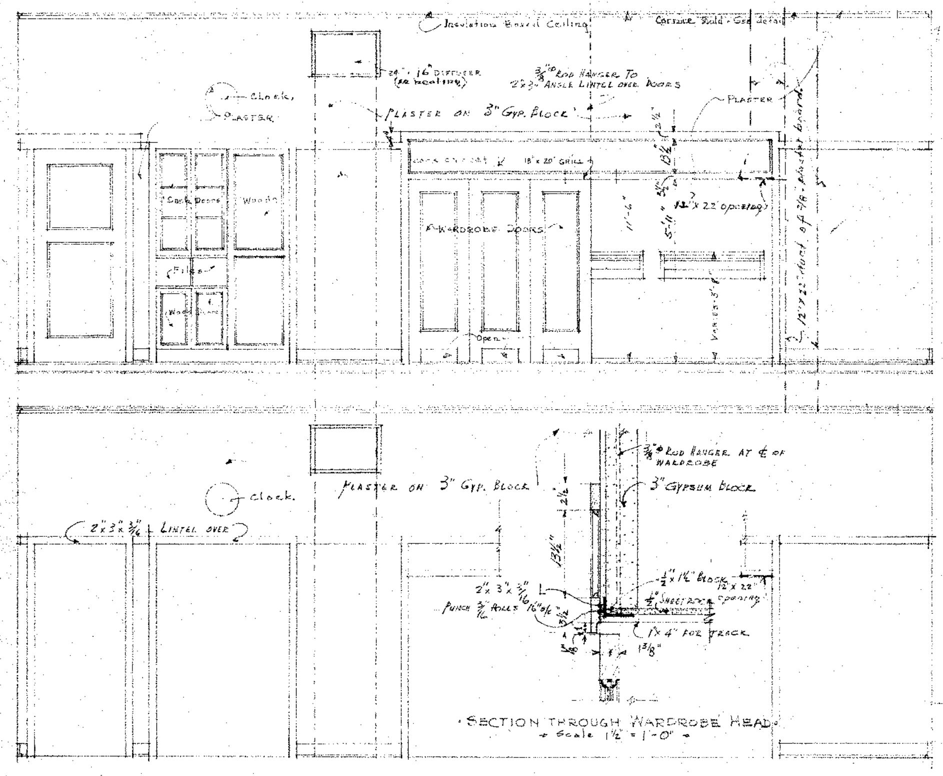
- Plan - Typical Closets - Wardrobe & Heating Ducts -



Detail of Wardrobe Hat Shelf
Scale 1½ = 1'-0"

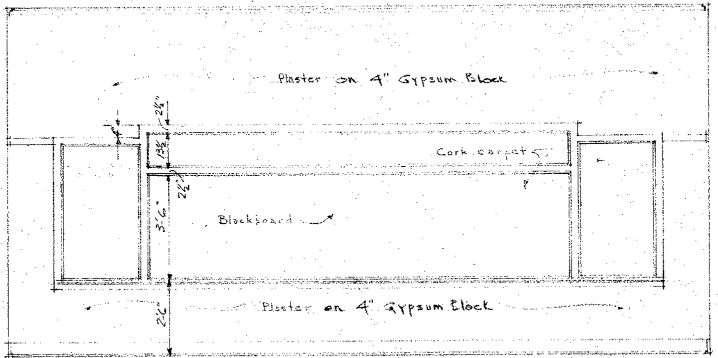


- Detail of Interior Doors -
- Scale 3" = 1'-0" -

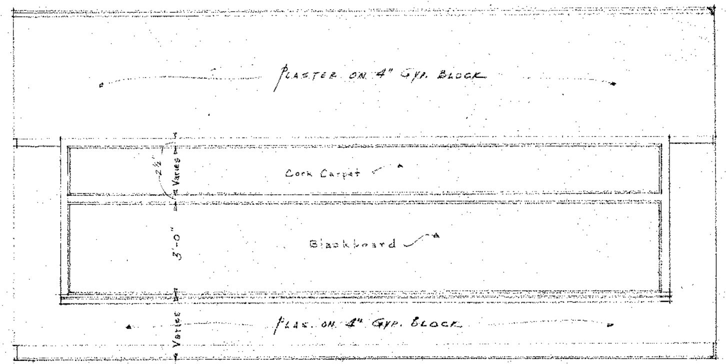


· Section through Wardrobe Head ·
Scale 1½" = 1'-0"

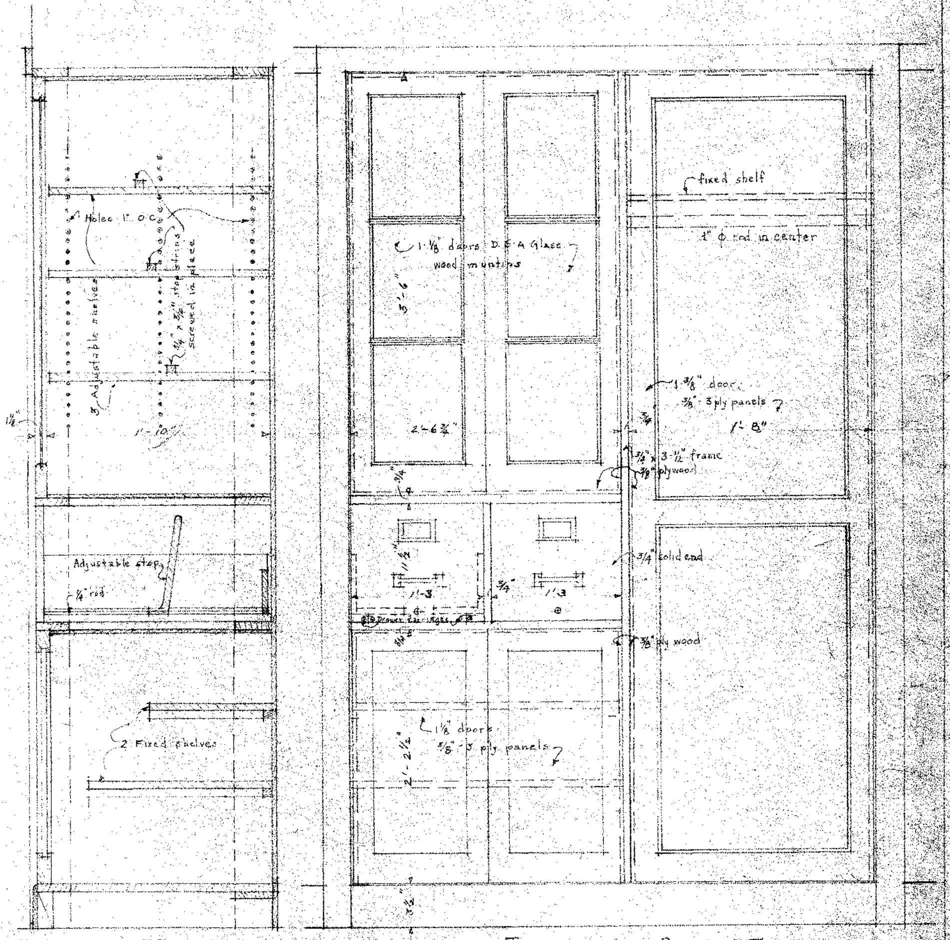
- Elevation of Walls - First & Second Floor Classrooms -
· Showing Entrance - Closets - Wardrobe - Heating & Ventilating Ducts ·
scale - ⅜" = 1'-0"



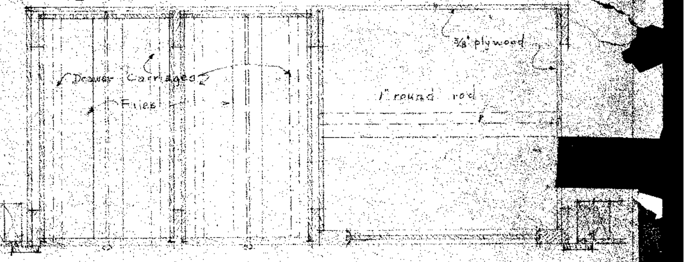
Typical Front Wall Elevation (Teachers).



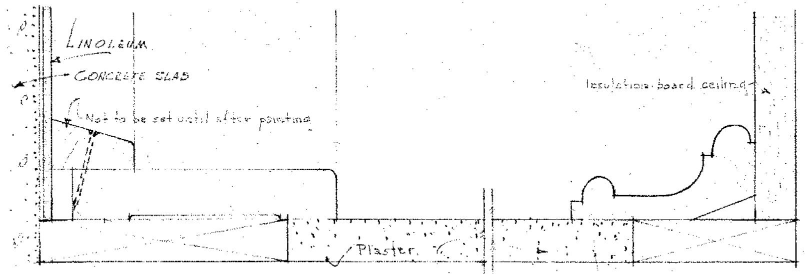
Typical Rear Wall Elevation (Pupils)
scale - ⅜" = 1'-0"



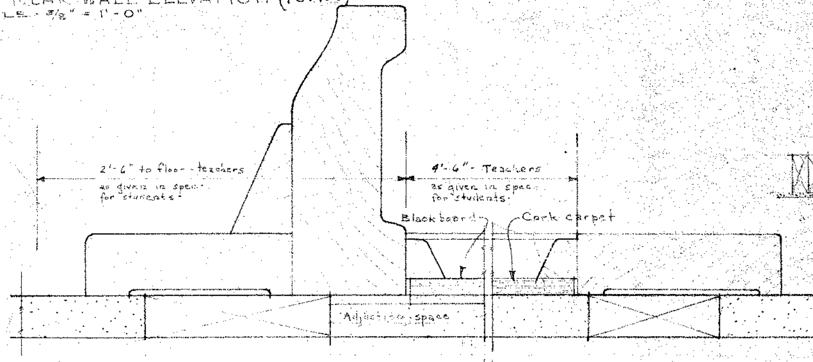
Section & Elevation of Teachers Cabinet
scale 1½" = 1'-0"



Plan of Teachers Cabinet
Scale 1½" = 1'-0"



- F. S. Detail of Cornice Mold & Base -

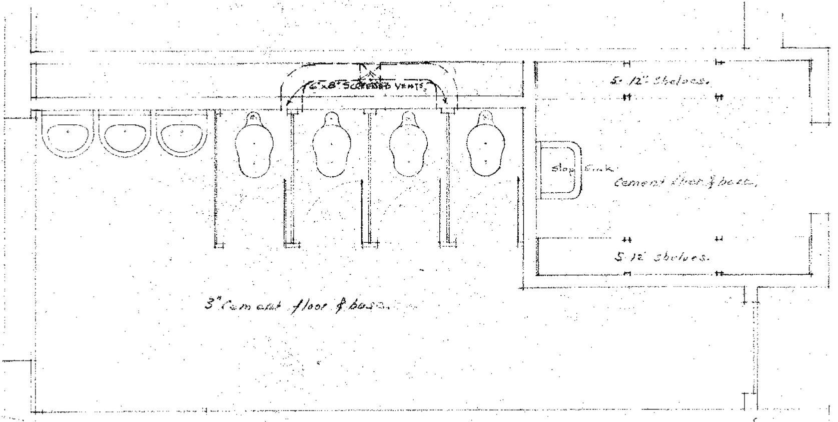


- F. S. Detail of Blackboard Trim -

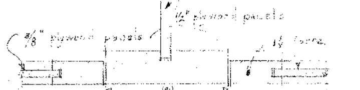
P.W.A. Docket Wash. 1350 D.S.

· Lincoln · Elementary · School ·
· Eleventh · Broad & Skagit · Streets ·
· Mount · Vernon · Washington ·
· Arch · N · Torbitt · Architect ·
· 401 · Lloyd Bldg. · Seattle · Washington ·

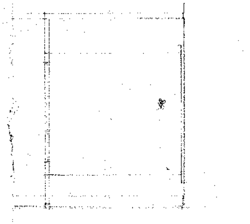
Job No. 605
Sheet No. 9
Made - June 1937



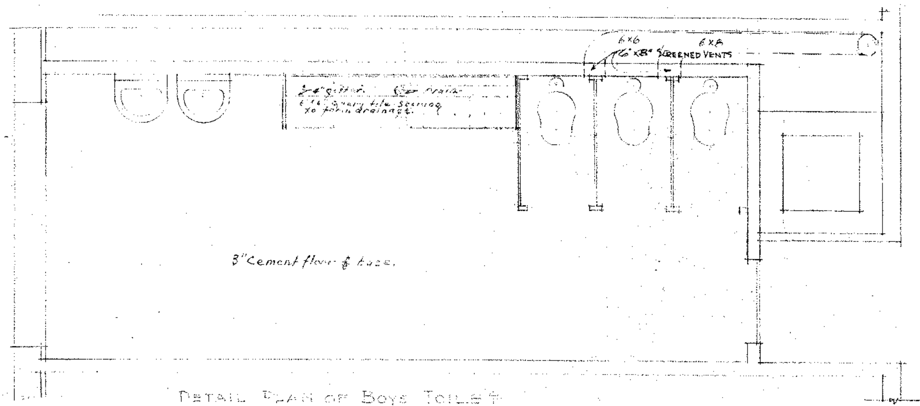
DETAIL PLAN OF GIRLS TOILET & JANITOR'S CLOSET
Scale - 3/8" = 1'-0"



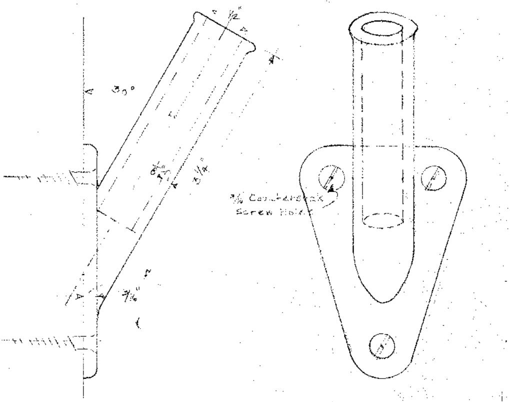
- DETAIL OF PARTITIONS FOR TOILETS -
- GIRLS AS SHOWN - BOYS WITHOUT DOORS & DIMENSION (A) - 4" -
Scale - 3" = 1'-0"



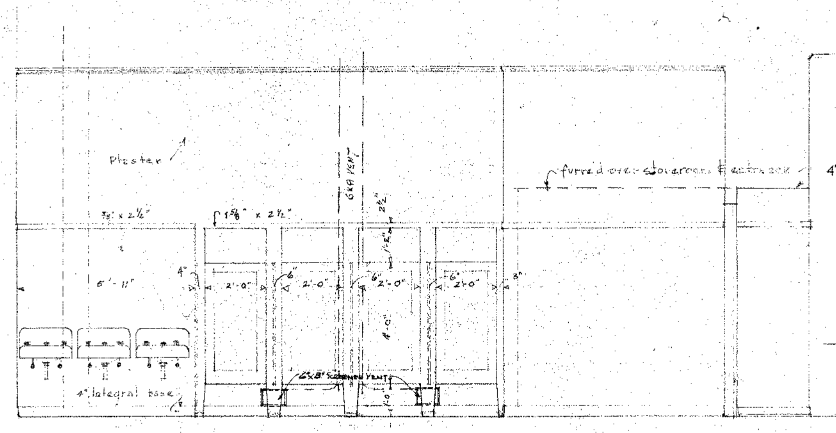
- SECTION THROUGH STALLS -
Scale 3/8" = 1'-0"



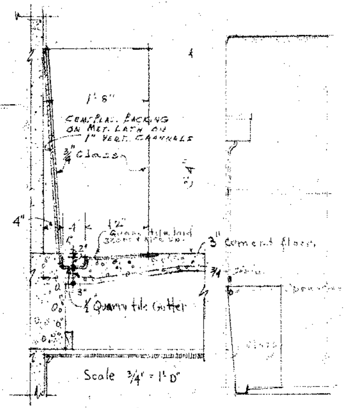
DETAIL PLAN OF BOYS TOILET
Scale - 3/8" = 1'-0"



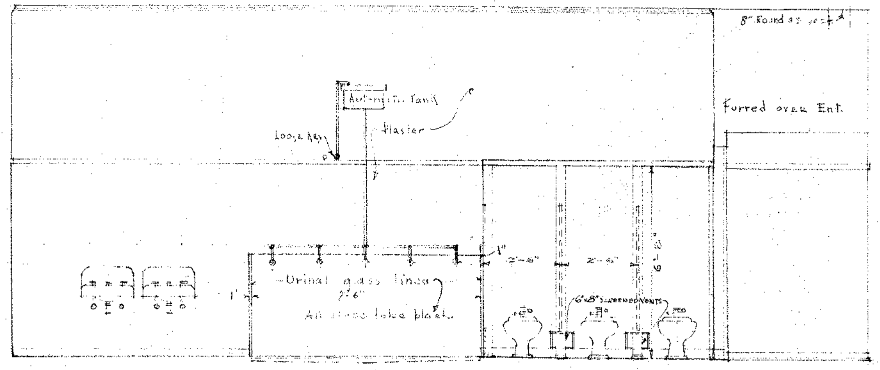
- F.S. DETAIL OF FLAG STAFF SOCKET -
- Cast Iron - 1 required in each Class Room -



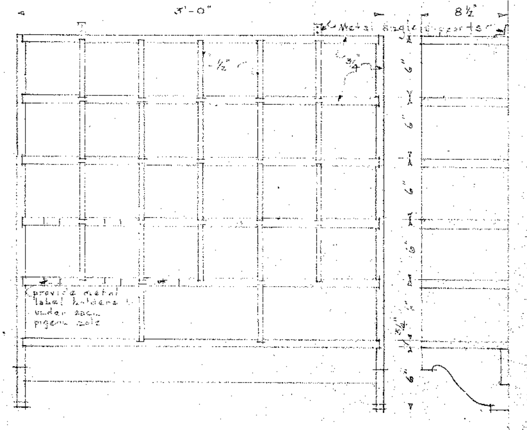
- DETAIL ELEVATION OF GIRLS TOILET -
Scale - 3/8" = 1'-0"



- SECTION THROUGH URINAL -
Scale - 3/8" = 1'-0"

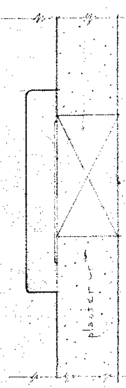


- DETAIL ELEVATION OF BOYS TOILET -
Scale 3/8" = 1'-0"

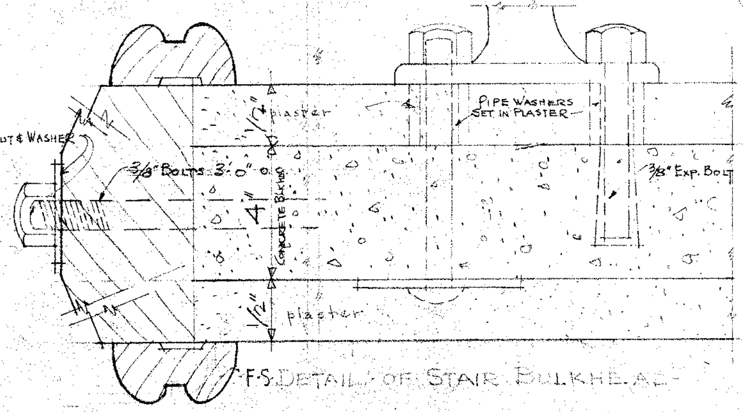


- ELEVATION -
- SECTION -

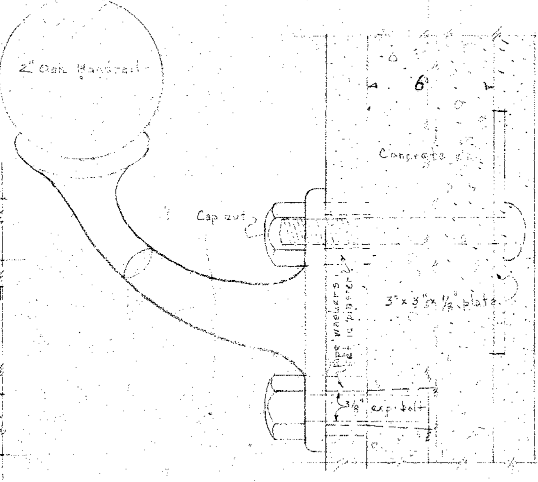
- TEACHERS' MAIL BOX IN OFFICE -
- Scale 1 1/2" = 1'-0" -



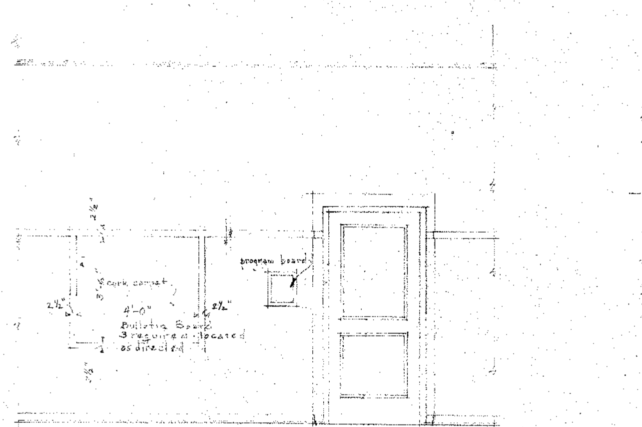
- F.S. DETAIL OF WAINSCOT CAP -



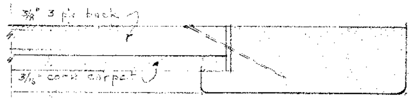
- F.S. DETAIL OF STAIR BULKHEAD -



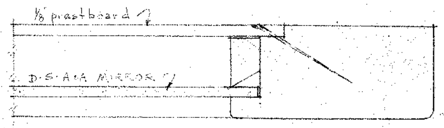
- F.S. DETAIL OF STAIR RAIL BRACKET -



TYPICAL CORRIDOR ELEVATION -
Scale 3/8" = 1'-0" -



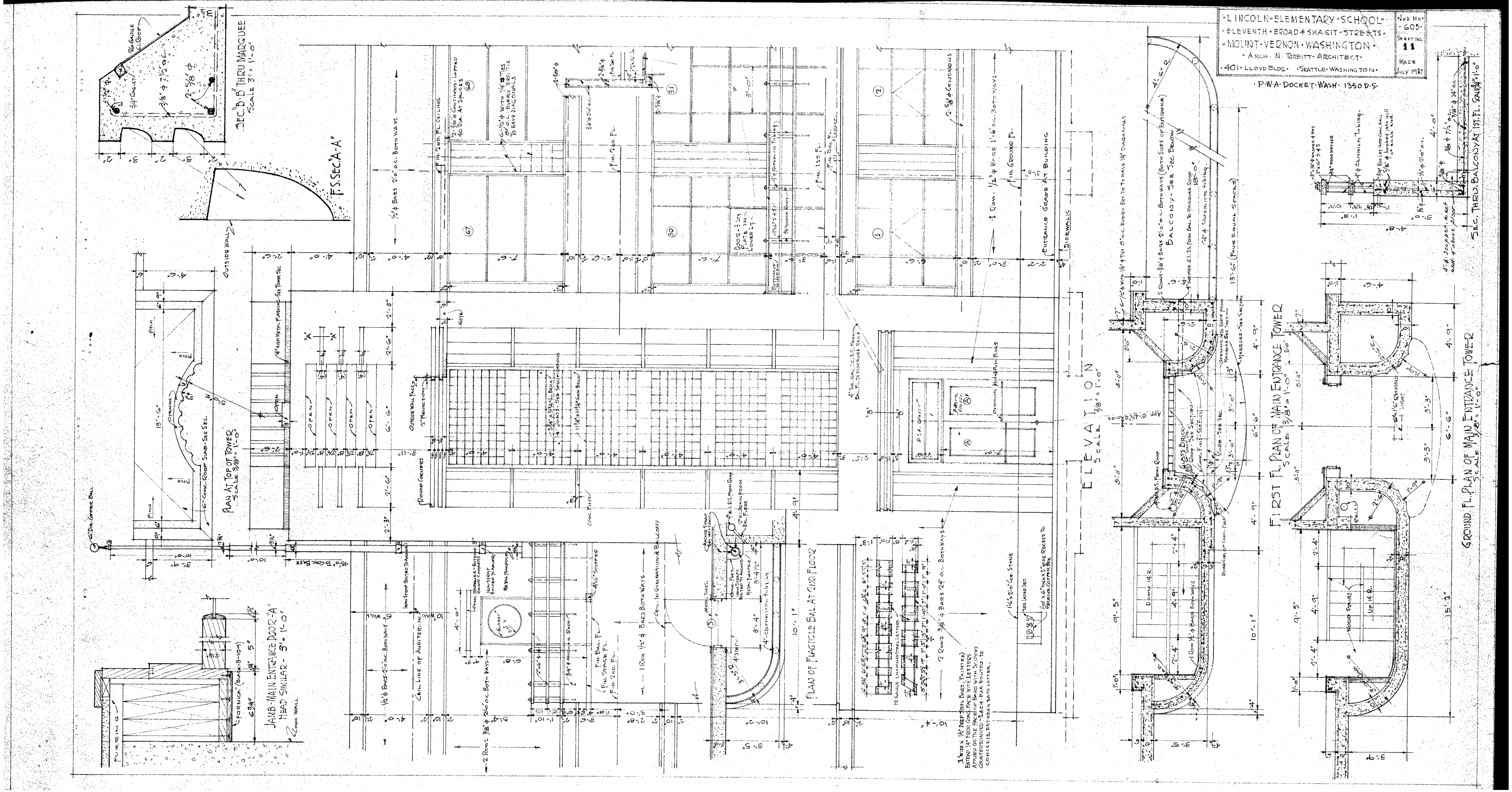
- F.S. DETAIL OF BULLETIN BOARD -



- F.S. DETAIL OF MIRRORS -

P.W.A. DOCKET WASH. 1350 D.S.

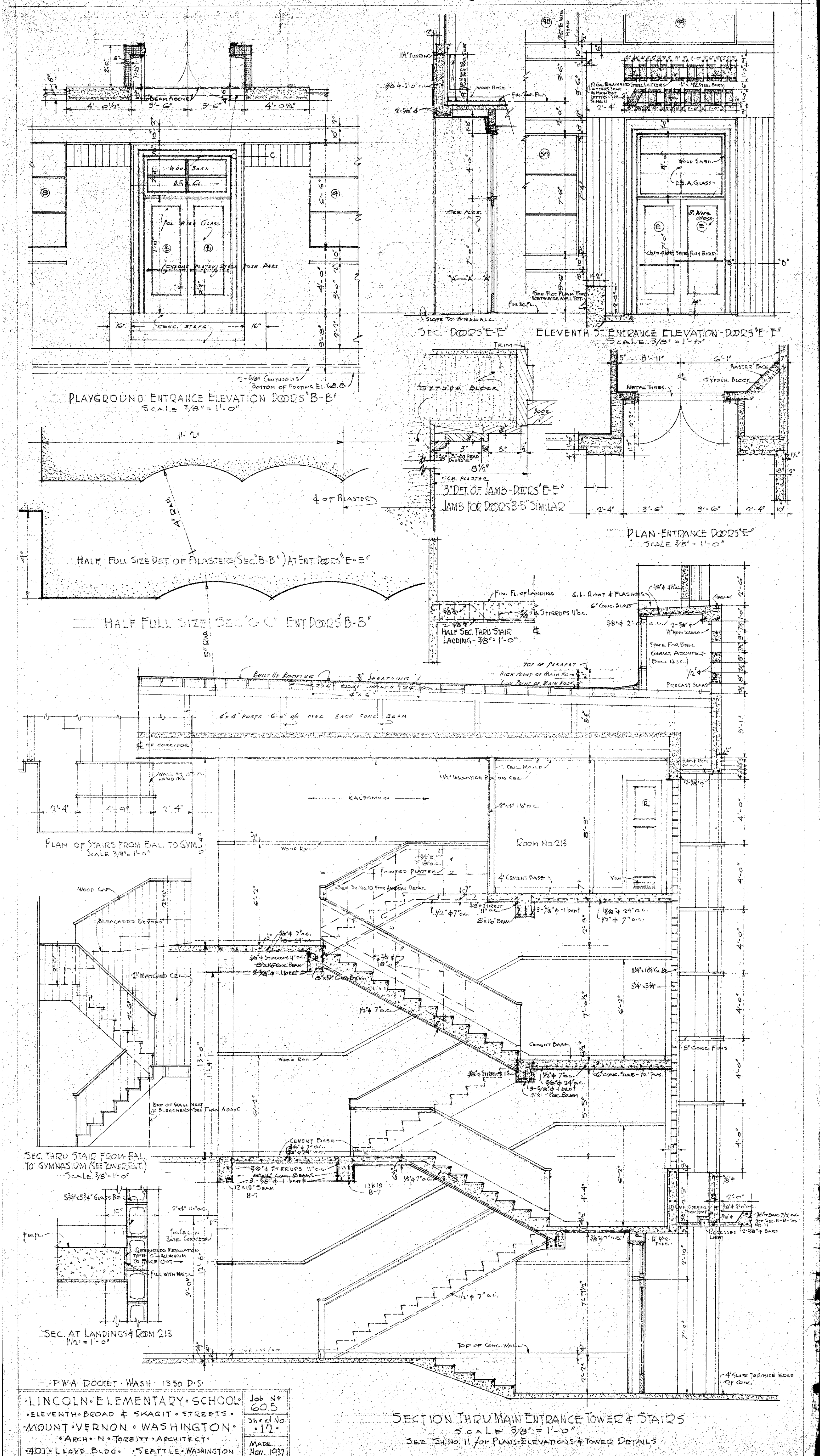
LINCOLN ELEMENTARY SCHOOL ELEVENTH BROAD & SKAGIT STREETS MOUNT VERNON WASHINGTON	Job No. 605 Sheet No. 10
ARCH. N. TORBITT ARCHITECT 401 LLOYD BLDG. SEATTLE WASHINGTON	Made - June 1937



·LINCOLN·ELEMENTARY·SCHOOL·
·ELEVENTH·BROAD & SKAGIT·STREETS·
·MOUNT·VERNON·WASHINGTON·
·ARCH·N·TORBITT·ARCHITECT·
·401·LLOYD BLDG· ·SEATTLE·WASHINGTON·

·Job No·
·605·
Sheet No.
11
Made
July 1937

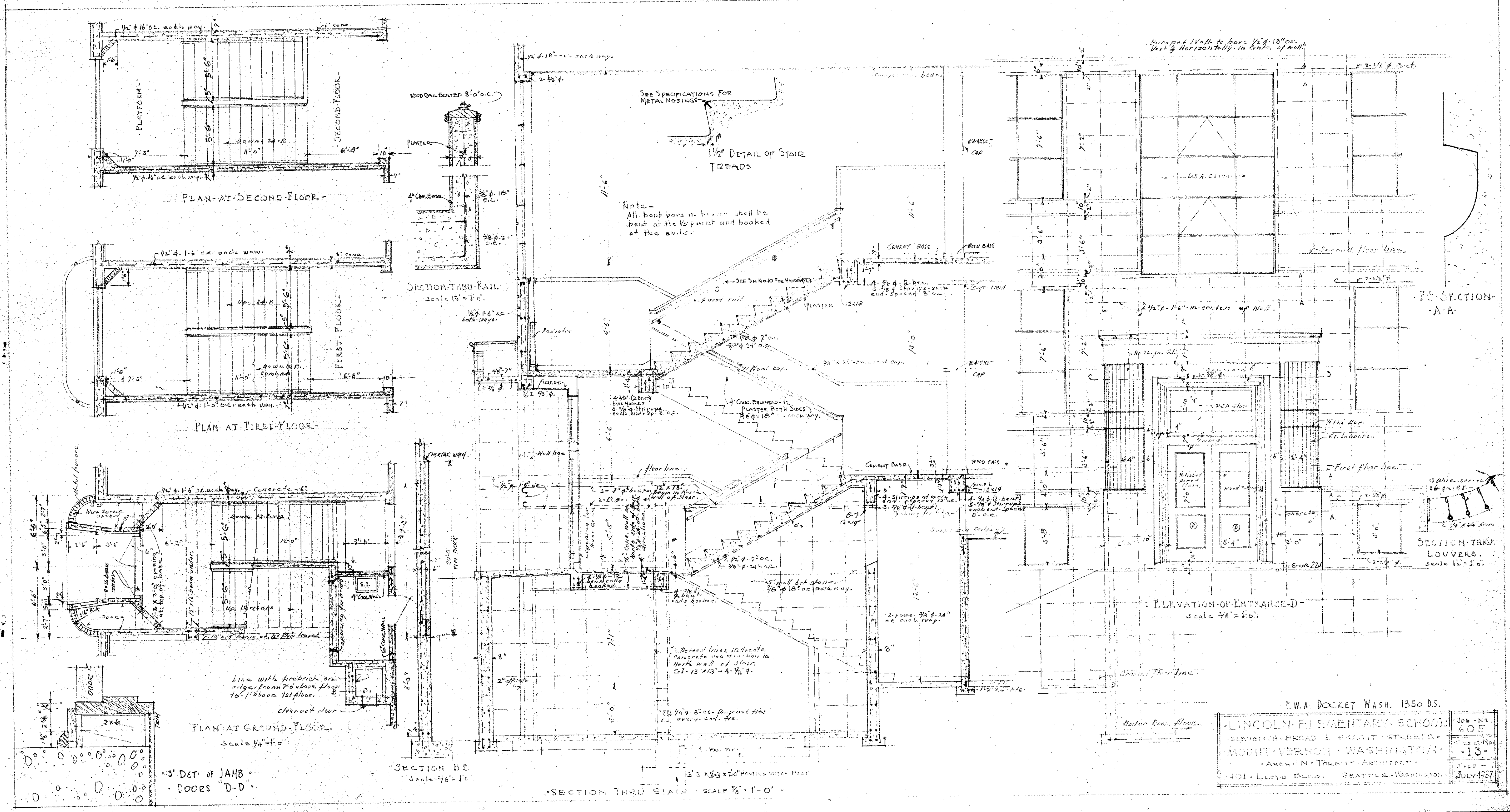
·P·W·A·DOCKET·WASH·1350 D·S·



SECTION THRU MAIN ENTRANCE TOWER & STAIRS
SCALE 3/8" = 1'-0"
SEE SH. NO. 11 FOR PLANS - ELEVATIONS & TOWER DETAILS

· P.W.A. DOCKET · WASH · 1350 D.S.

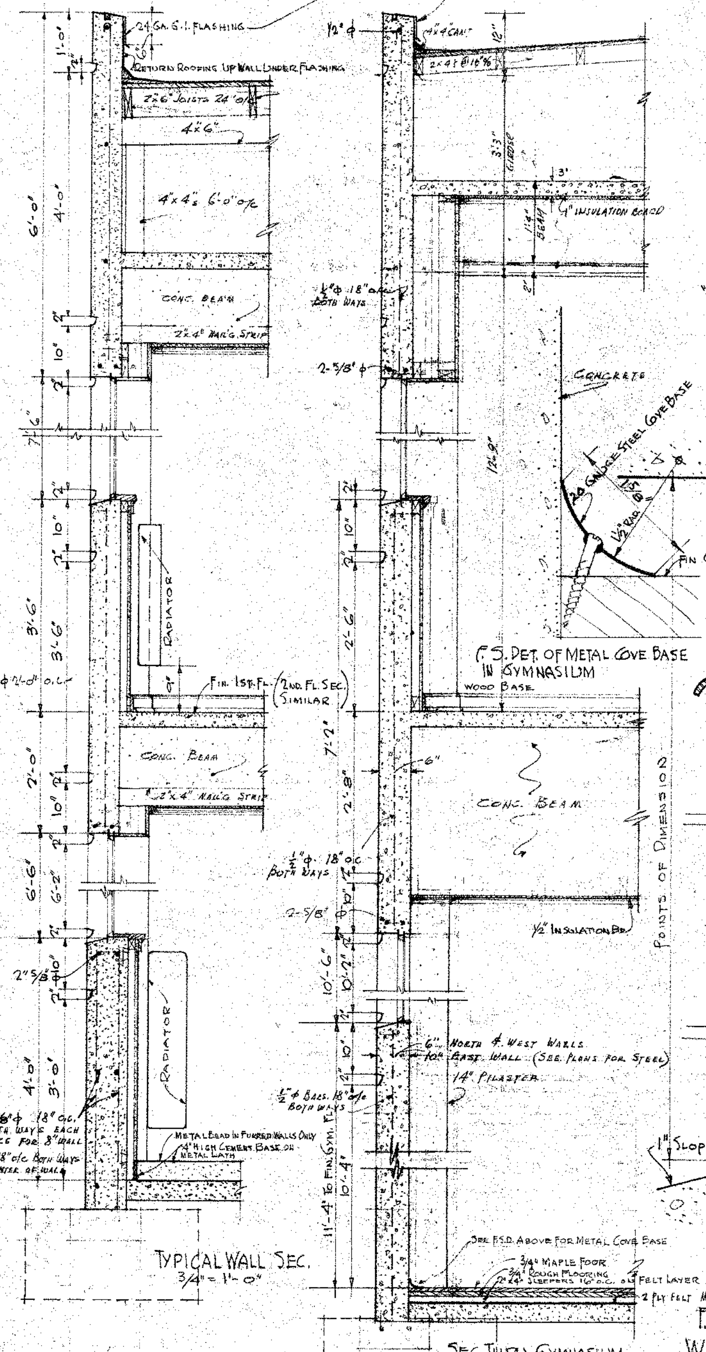
·LINCOLN· ELEMENTARY · SCHOOL· ·ELEVENTH · BROAD & SKAGIT · STREETS · ·MOUNT · VERNON · WASHINGTON · ·ARCH · N · TORBITT · ARCHITECT · ·401 · LLOYD BLDG · ·SEATTLE · WASHINGTON	Job Nº 605
	Sheet No ·12·
	Made Nov. 1937



P.W.A. DOCKET WASH. 1350 D.S.

LINCOLN · ELEMENTARY · SCHOOL
· ELEVENTH · BROAD & SKAGIT · STREETS ·
MOUNT · VERNON · WASHINGTON ·
· ARCH · N · TORBITT · ARCHITECT ·
401 · LLOYD BLDG · SEATTLE · WASHINGTON ·

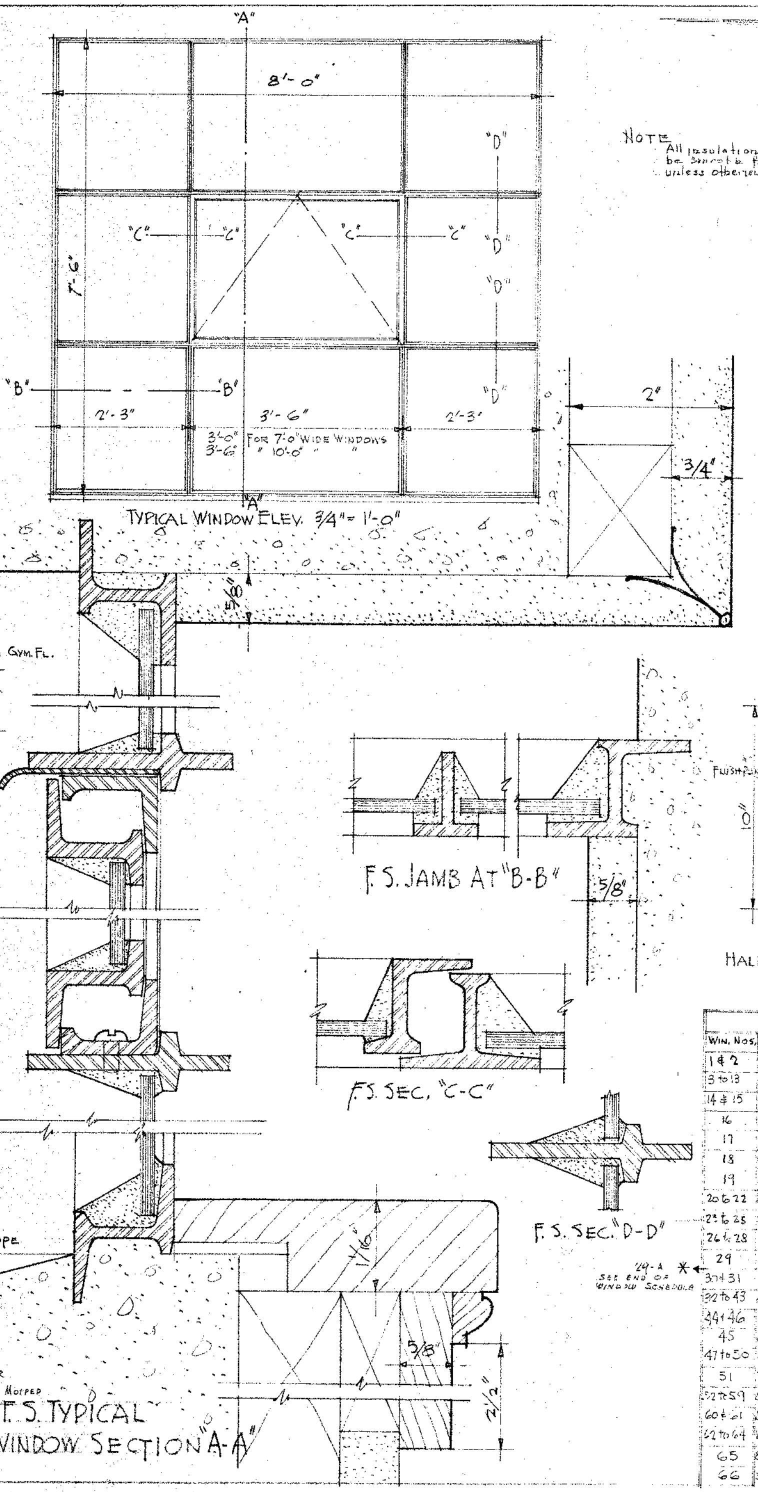
Job - No. 605
Sheet No. - 13 -
Date - JULY 1937



TYPICAL WALL SEC.
3/4" = 1'-0"

F.S. DET. OF METAL COVE BASE IN GYMNASIUM

SEC. THRU. GYMNASIUM
Scale 3/4" = 1'-0"



TYPICAL WINDOW ELEV. 3/4" = 1'-0"

F.S. TYPICAL WINDOW SECTION "A-A"

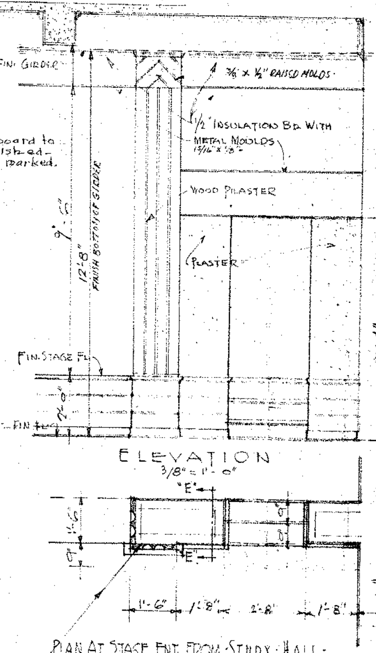
F.S. JAMB AT "B-B"

F.S. SEC. "C-C"

F.S. SEC. "D-D"

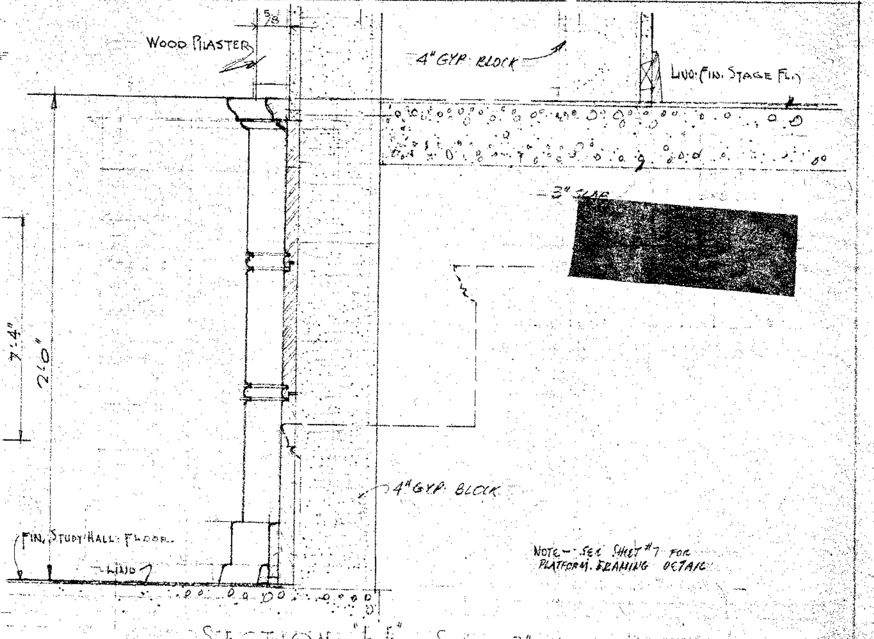
29-A * See end of Window Schedule

NOTE
All insulation board to be smooth finished unless otherwise marked.



ELEVATION
3/8" = 1'-0"

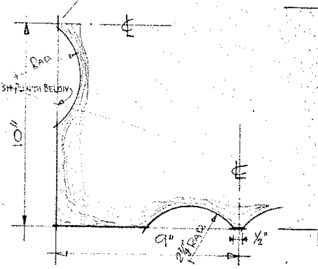
PLAN AT STAGE ENT. FROM STUDY · HALL ·
Scale 3/8" = 1'-0"



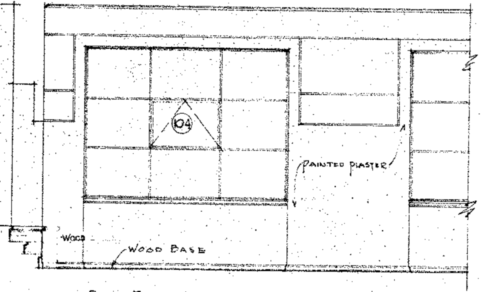
[redacted]

Note — See Sheet #7 for Platform Framing Detail

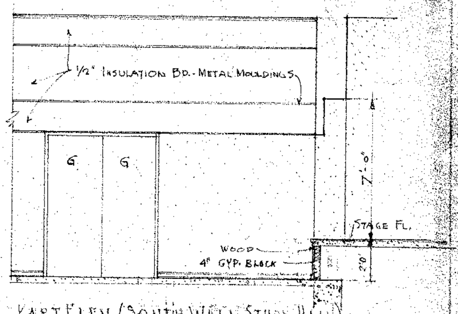
SECTION "E-E" Scale 3" = 1'-0"



HALF PLAN OF PILASTER
3" = 1'-0"



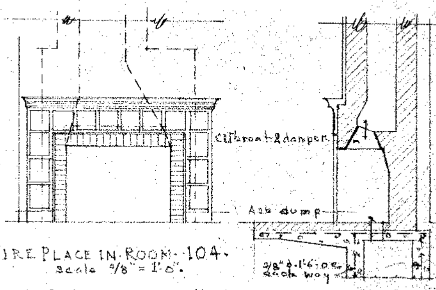
PART ELEV. (NO. WALL STUDY HALL)
Scale 1/4" = 1'-0"



PART ELEV. (SOUTH WALL STUDY HALL)

WINDOW SCHEDULE

Win. Nos.	Width - Height	No. Lts.	Type	Glass	Remarks	Win. Nos.	Width-Height	No. Lts.	Type	Glass	Remarks
1 & 2	7'-0"x6'-6	9	Projected Type	D.S.B.		67 & 68	7'-0"x7'-6"	9	Projected Type	D.S.B.	
3 to 13	8'-0"x6'-6"	9	"	"		69 to 80	8'-0"x7'-6"	9	"	"	
14 & 15	7'-0"x6'-6"	9	"	"		81	7'-0"x7'-6"	9	"	"	
16	8'-0"x6'-6"	9	"	"		82	6'-0"x5'-0	4	"	"	
17	7'-0"x4'-4"	6	"	"		83	8'-0"x7'-6"	9	"	"	
18	8'-0"x3'-0"	6	"	"	Underwriters Label Metal Stops-Automatic Closing	84	7'-0"x7'-6"	9	"	"	
19	3'-0"x3'-0"	2	"	"	" "	85	8'-0"x7'-6"	9	"	"	
20 to 22	3'-0"x4'-2"	3	"	"	Wired Glass	86	7'-0"x7'-6"	9	"	"	
23 to 25	8'-0"x3'-0"	3	"	"	" "	87	8'-0"x12'-2"	15	"	"	
26 to 28	3'-0"x3'-0"	1	"	"	" "	88 to 98	8'-0"x7'-6"	9	"	"	
29	8'-0"x3'-0"	3	"	"	" "	99	7'-0"x7'-6"	9	"	"	
30 & 31	7'-0"x7'-6"	7	"	"	1 Door Each-3'-0"x6'-0" See Det. Sh. No. 11	100 & 101	8'-0"x7'-6"	9	"	"	
32 to 43	8'-0"x7'-6"	9	"	"		102 to 104	10'-0"x7'-6"	9	"	"	
44 & 46	7'-0"x7'-6"	9	"	"		105	8'-0"x7'-6"	9	"	"	
45	8'-0"x7'-6"	9	"	"		106 & 107	6'-0"x4'-0"	6	Fixed	Obsc. W.Gl.	In Ground Fl. Corridor
47 to 50	3'-4"x7'-6"	9	"	"							
51	7'-0"x7'-6"	9	"	"							
52 to 59	8'-0"x7'-6"	9	"	"							
60 & 61	8'-0"x10'-6"	12	"	"	Chain Operated	29-A	8'-0"x10'-6"	12	"	"	
62 to 64	8'-0"x10'-6"	12	"	"	" "						
65	8'-0"x10'-6"	12	"	"	" "						
66	3'-0"x7'-6"	9	"	"							



FIRE PLACE IN ROOM 104.
Scale 3/8" = 1'-0".

· P·W·A· DOCKET · WASH · 1350 DS ·

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· MOUNT · VERNON · WASHINGTON ·
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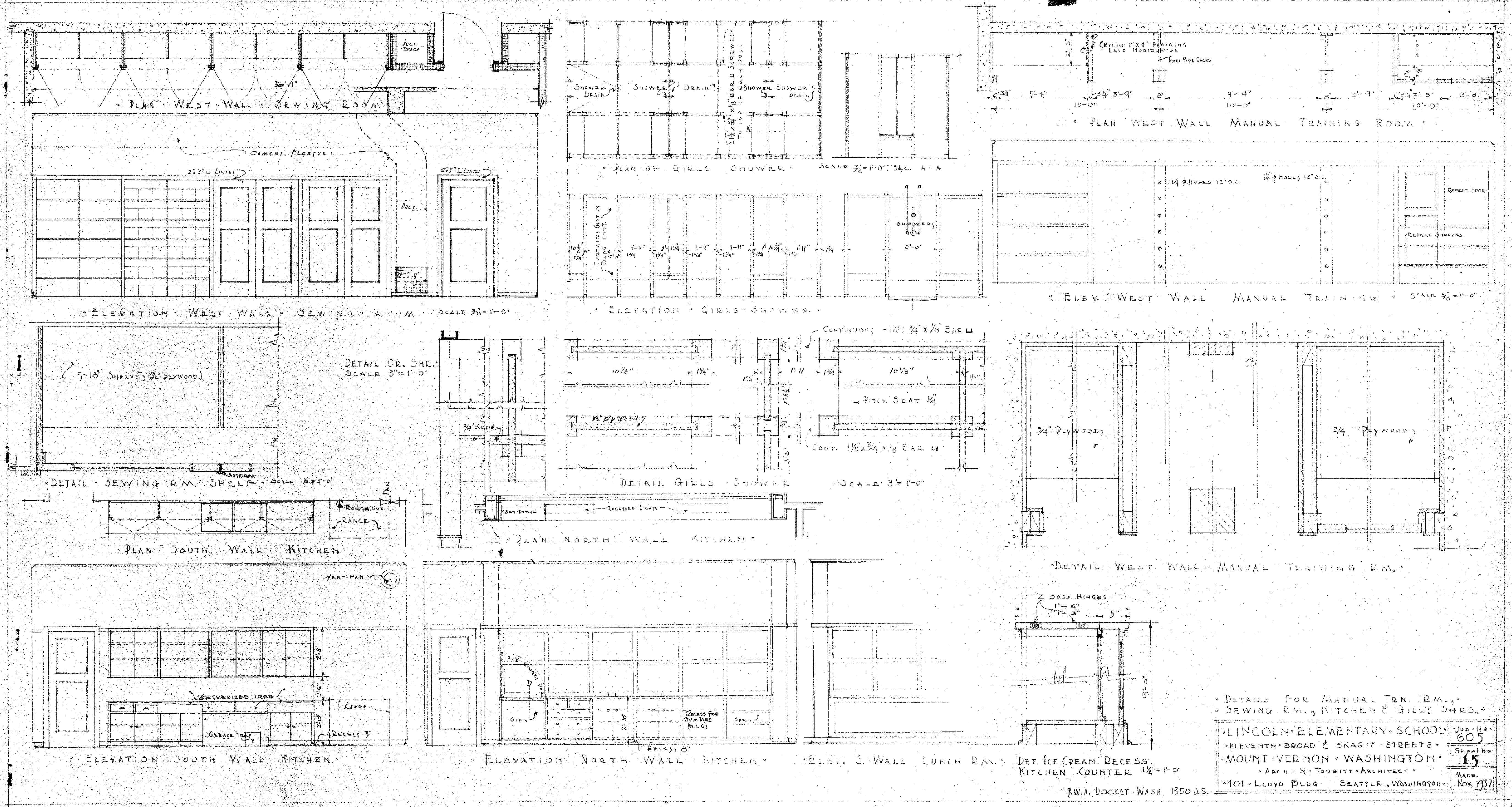
401 · LLOYD BLDG. · SEATTLE · WASHINGTON ·

Job · No. · 605 ·
Sheet · No. 14
Made — Nov., 1937

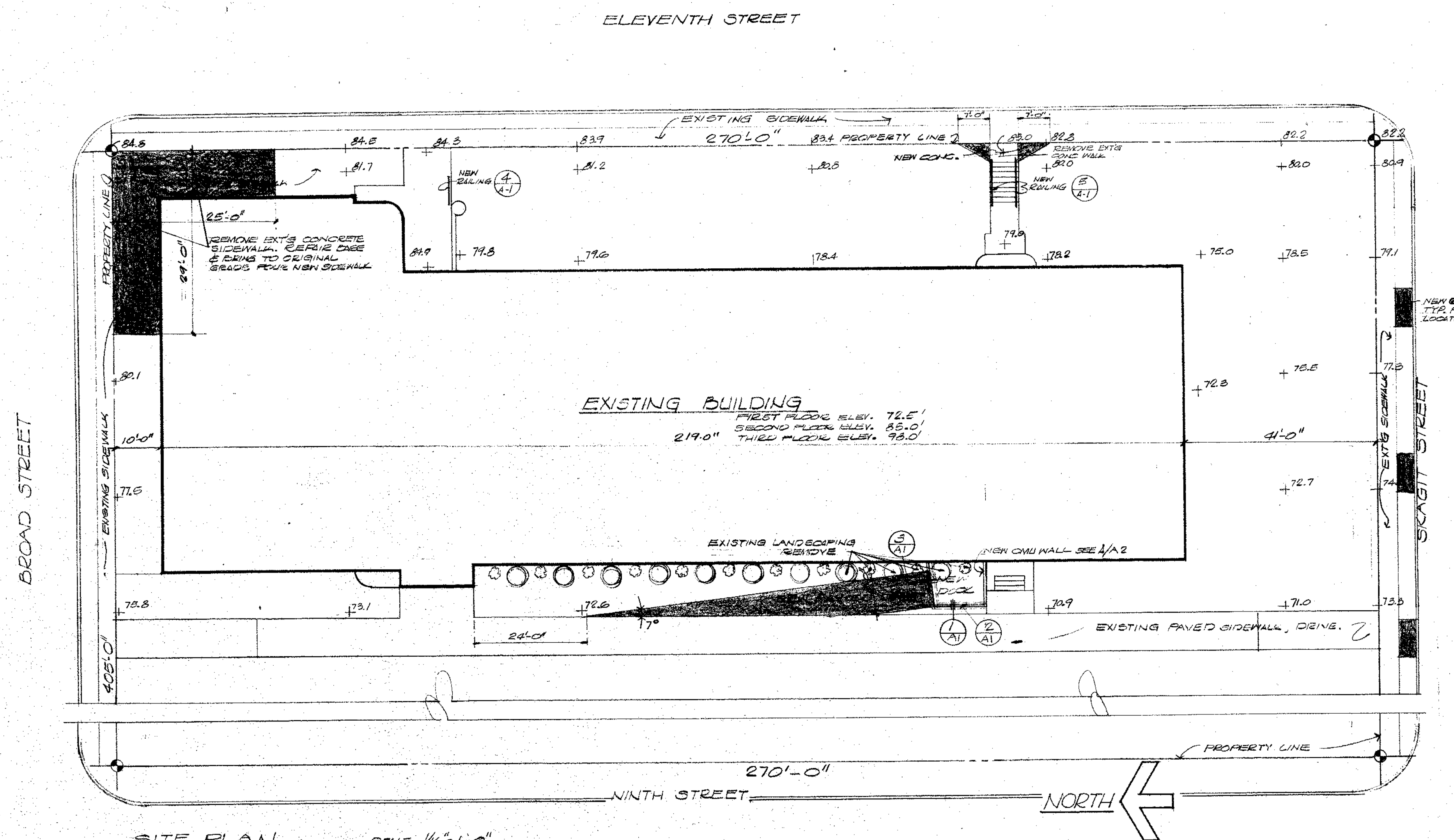


Details for Manual Trn. Rm., Sewing Rm., Kitchen & Girls Shrs.

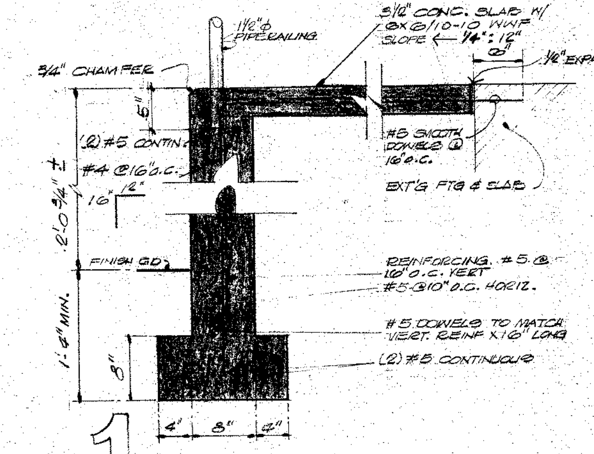
LINCOLN ELEMENTARY SCHOOL
Eleventh Broad & Skagit Streets
Mount Vernon Washington
Arch. N. Torbitt Architect
401 Lloyd Bldg. Seattle, Washington

Job No. 605
Sheet No. 15
Made Nov. 1937

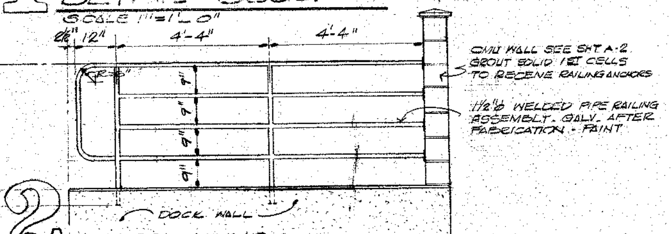
P.W.A. Docket Wash 1350 D.S.



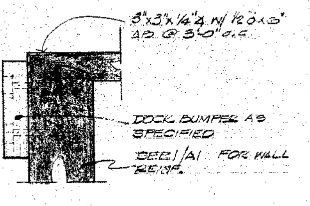
SITE PLAN SCALE 1/16"=1'-0"



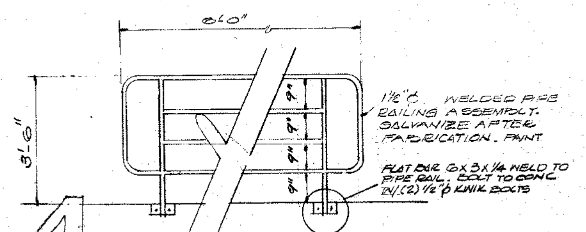
1 DETAIL DOCK.
SCALE 1"=1'-0"



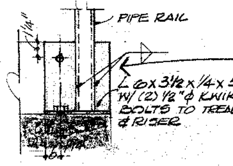
2 GUARDRAILING AT NEW LOADING DOCK
SCALE 3/8"=1'-0"



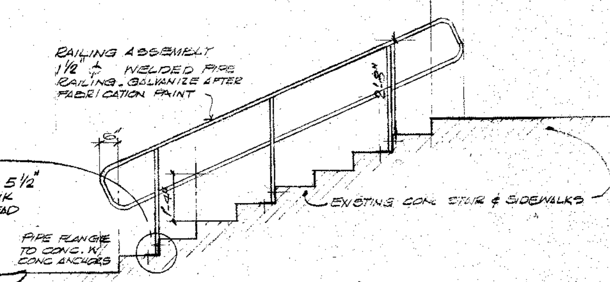
3 DETAIL DOCK BUMPER
SCALE 1"=1'-0"



4 GUARDRAIL NORTHEAST ENTRY ELEVENTH STREET
SCALE 3/8"=1'-0"



DETAIL RAIL ATTACHMENT
SCALE 1 1/2"=1'-0"



5 STAIR RAILING SOUTHEAST ENTRY ELEVENTH STREET
SCALE 3/8"=1'-0"

INDEX TO THE DRAWINGS

SHEET NO.	TITLE
A-1	SITE PLAN & DETAILS
A-2	FIRST FLOOR PLAN
A-3	SECOND FLOOR PLAN
A-4	THIRD FLOOR PLAN
A-5	ROOM FINISH SCHEDULE & DETAILS
A-6	DOOR SCHEDULE & DETAILS
A-7	EXTERIOR ELEVATIONS
A-8	EXTERIOR ELEVATIONS & SECTION.
A-9	INTERIOR ELEVATIONS.

LEGAL DESCRIPTION

ALL OF BLOCK 16 & LOTS NUMBERED FROM 1 TO 12 INCLUSIVE IN BLOCK 17 OF MILLETTS ADDITION TO THE TOWN OF MOUNT VERNON WASHINGTON.

GOVERNING AGENCIES

STATE OF WASHINGTON
DEPARTMENT OF LABOR & INDUSTRIES - ELECTRICAL DIVISION.
SUPERINTENDENT OF PUBLIC INSTRUCTION
DEPARTMENT OF ECOLOGY
WASHINGTON STATE ENERGY OFFICE
COUNTY OF SKAGIT
SKAGIT COUNTY HEALTH DEPARTMENT
CITY OF MOUNT VERNON
FIRE MARSHAL
BUILDING DEPARTMENT

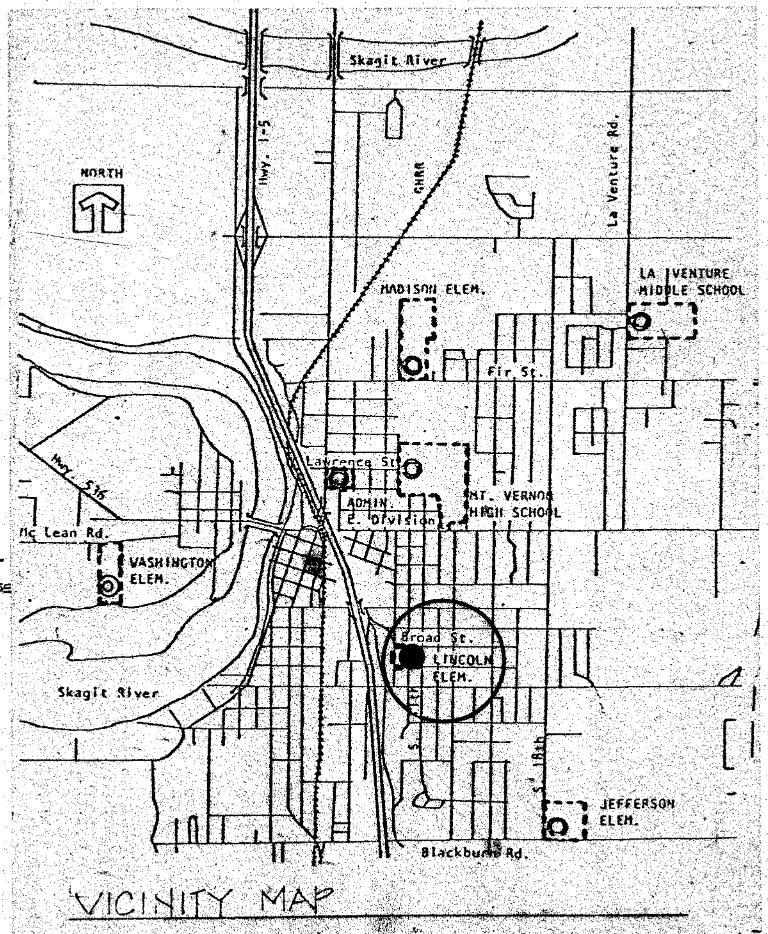
BUILDING CLASSIFICATION

TYPE OF CONSTRUCTION	I
OCCUPANCY	E I
NUMBER OF STORIES	3
BUILDING HEIGHT	42'-6"
FLOOR AREA	
FIRST FLOOR: EXT'G	14,301.9 SF
SECOND FLOOR:	10729.2 SF
THIRD FLOOR:	14,301.9 SF
TOTAL	39,333.0 SF
UNIFORM BUILDING CODE	1979 EDITION

NOTE: SEE SHT A-3 FOR GENERAL NOTES

DEMOLITION NOTES

1. ALL ITEMS SHOWN HATCHED OR NOTED ARE TO BE REMOVED, UNLESS NOTED OTHERWISE.
2. EXTENT OF DEMOLITION IS LIMITED THAT SHOWN ON THE PLANS OR NOTED.
3. PROTECT ALL LANDSCAPING.
4. REMOVE EXISTING CEILINGS IN EXT'G KITCHEN, FOOD STORAGE, JANITOR STORAGE AND KITCHEN SERVICE CORRIDOR.



VICINITY MAP

REGISTERED ARCHITECT
1339
LARRY NEIL ERICKSON
STATE OF WASHINGTON

56

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2900 eastlake avenue east • suite 200
seattle, wa 98102 • (206) 322-0810

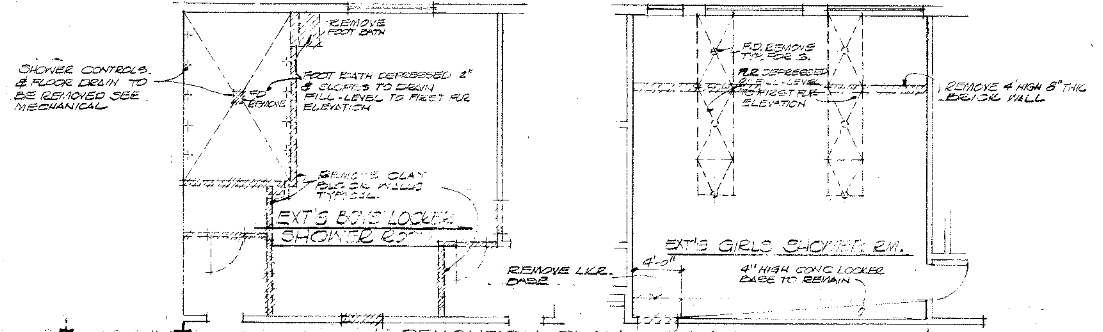
ALEA-CMB
ARCHITECTS IN ASSOCIATION

SITE PLAN
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

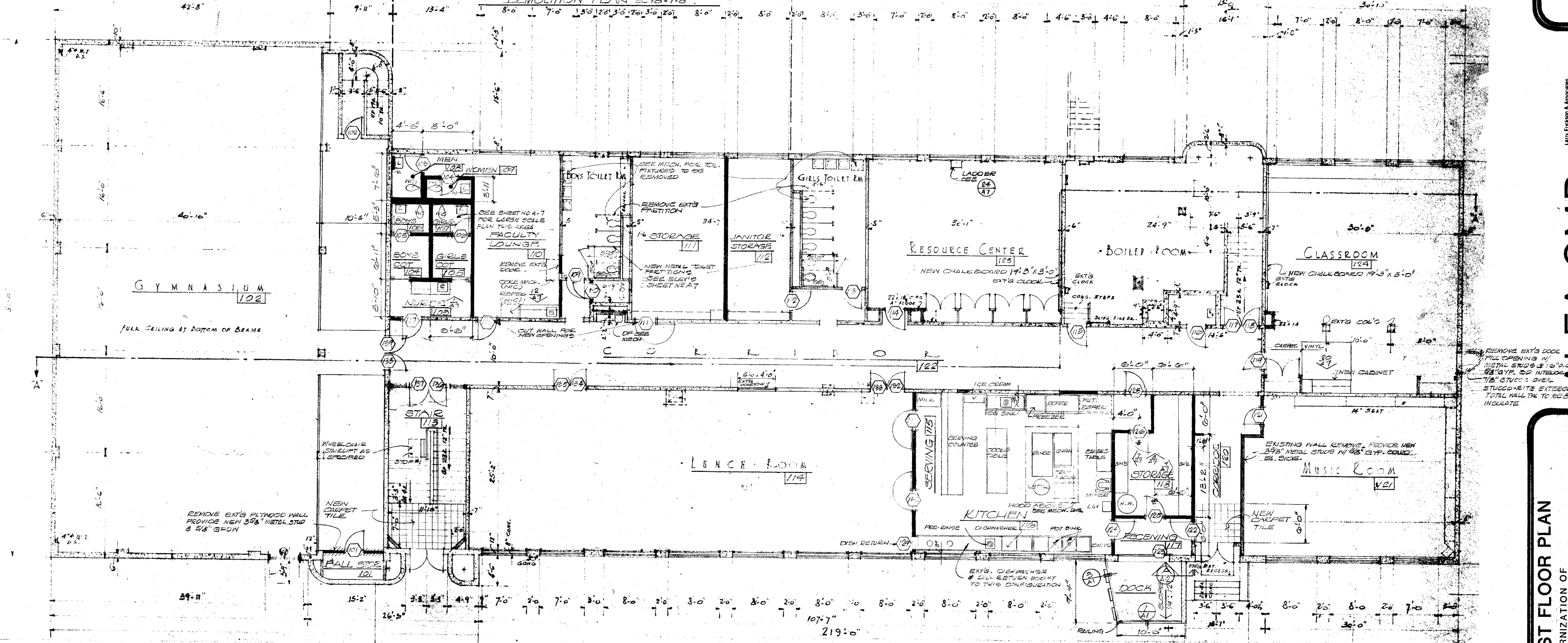
date 6/1/82
drawn A
checked
revised
approved

412-1

A 1



DEMOLITION PLAN SC 1/8" = 1'-0"

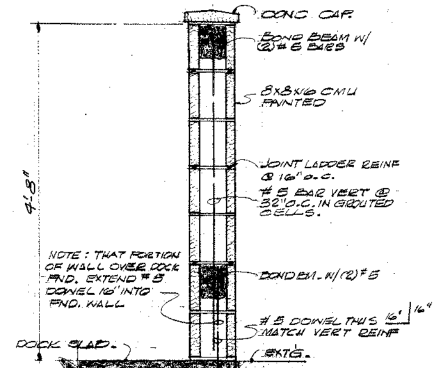


FIRST · FLOOR · PLAN

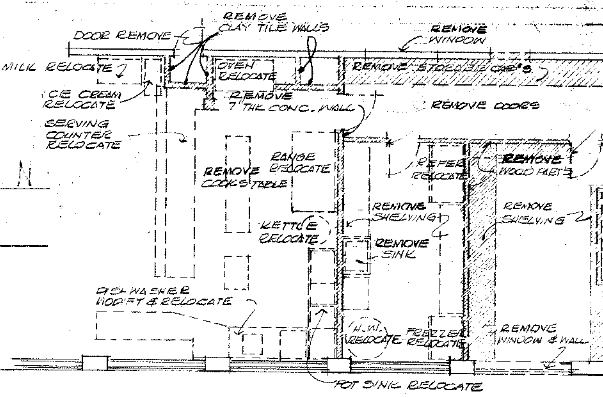
· SCALE · 1/8" = 1'-0" ·

WALL LEGEND

- ▨ EXISTING CONC. W/ CEM. PLASTER
- ▤ EXISTING BLOCK W/ CEM. PLASTER
- ■ NEW METAL STUDS W/ 5/8" GPDW
- ▧ NEW CEMENT MASONRY
- ▨ EXT'G WALL TO BE REMOVED



A SECTION CMU WALL @ NEW DOCK
SCALE 3/4" = 1'-0"



KITCHEN DEMOLITION PLAN
SCALE 1/8" = 1'-0"

REGISTERED ARCHITECT
LARRY NOEL ERICKSON
STATE OF WASHINGTON

Larry Erickson & Associates
p.o. box 1125 • mount vernon, wa 98273
(206) 336-5765
Chisom • Murakami • Brummitt Inc.
2900 eastlake avenue east • suite 200
seattle, wa 98102 • (206) 322-0810

ALEA-CMB
ARCHITECTS IN ASSOCIATION

FIRST FLOOR PLAN
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA

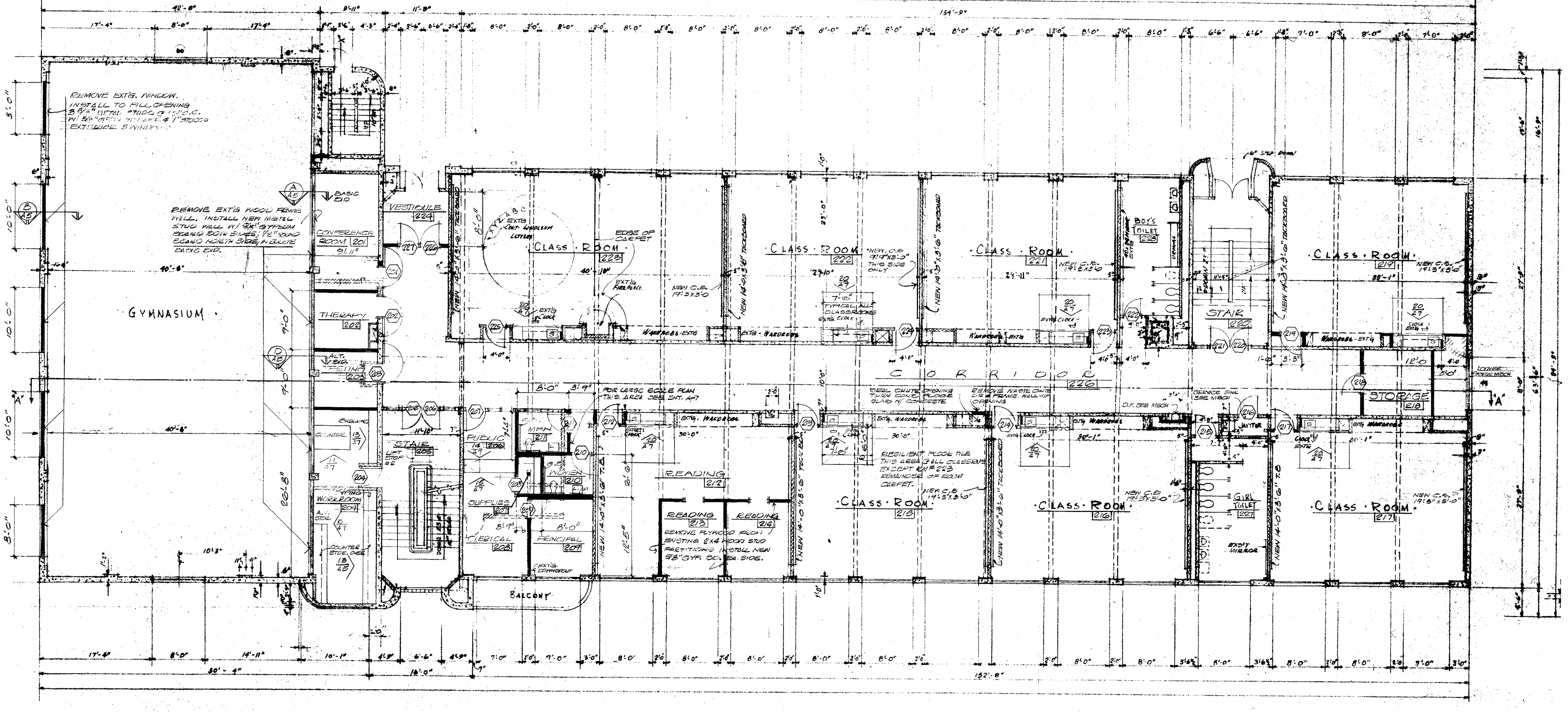
date 6/1/82
drawn A
checked ≡
revised
approved

412-1

A2

GENERAL NOTES

1. All work to conform to applicable codes, ordinances and regulations.
2. These drawings are only part of the contract documents, which includes the contract document book with the specifications.
3. Refer to mechanical and electrical drawings for additional work not described on architectural drawings.
4. Verify all grades, dimensions and existing conditions on job and notify Architect of any conflicts prior to proceeding with the work.
5. Dimensions noted take precedence over scaled dimensions.
6. Dimensions are to the face of concrete and face of studs, and to centerline of interior stud partitions unless noted otherwise.
7. Contractor shall consult drawings of all trades for ducts, piping, conduits, lighting, cabinets & equipment, and shall verify size and location of openings through floors, walls, ceilings and roofs with other trades, resolving any conflicts with the Architect.
8. Contractor shall verify all rough-in dimensions for equipment by self and others. Provide blocking as required; and resolve any conflicts with Architect.
9. Contractor shall provide furring, curbs, anchors, inserts, rough bucks, blocking, backings, etc. as required to complete the work.
10. All stud partitions are 3-5/8" metal stud at 16" O.C. with 5/8" GWB both sides except as noted.
11. Refer to interior elevations and cabinet details for casework size and materials. Verify all dimensions with job conditions.
12. All materials indicated to match existing shall do so in respect to size, shape, & color; and shall be approved by the Architect before use. Existing materials shall be reused where indicated on the drawings or authorized by Architect. Existing materials not reused remain the property of the Owner at his option. Contractor to dispose of remainder.
13. Repetitive features are drawn only once and shall be completely provided as if drawn in full.
14. Install dust barriers as required to protect existing equipment and facilities. Coordinate location with Owner. Maintain required exist at all times.
15. Repair and patch all portions of building and site disturbed during construction operations to match original finish.
16. Provide access panels (Milcor or equal) in walls, ceiling, etc. as required for access to work installed for architectural.



SECOND FLOOR PLAN
SCALE 1/8" = 1'-0"

WALL LEGEND

▤ EXISTING CONC. W/ CEM. PLASTER
▨ EXISTING GYPSUM BLOCK W/ CEMENT PLASTER
■ NEW METAL STUDS W/ 5/8" G.P.DW, INSULATED, & SOUND BOARD
■ NEW METAL STUDS W/ 5/8" GPDW. - AT EXTERIOR WALL, 7/8" STUCCO EXTERIOR FINISH.
▭ EXISTING WALL TO BE REMOVED

REGISTERED ARCHITECT
1328
LARRY NEAL ERICKSON
STATE OF WASHINGTON

ALEA-CMB
ARCHITECTS IN ASSOCIATION

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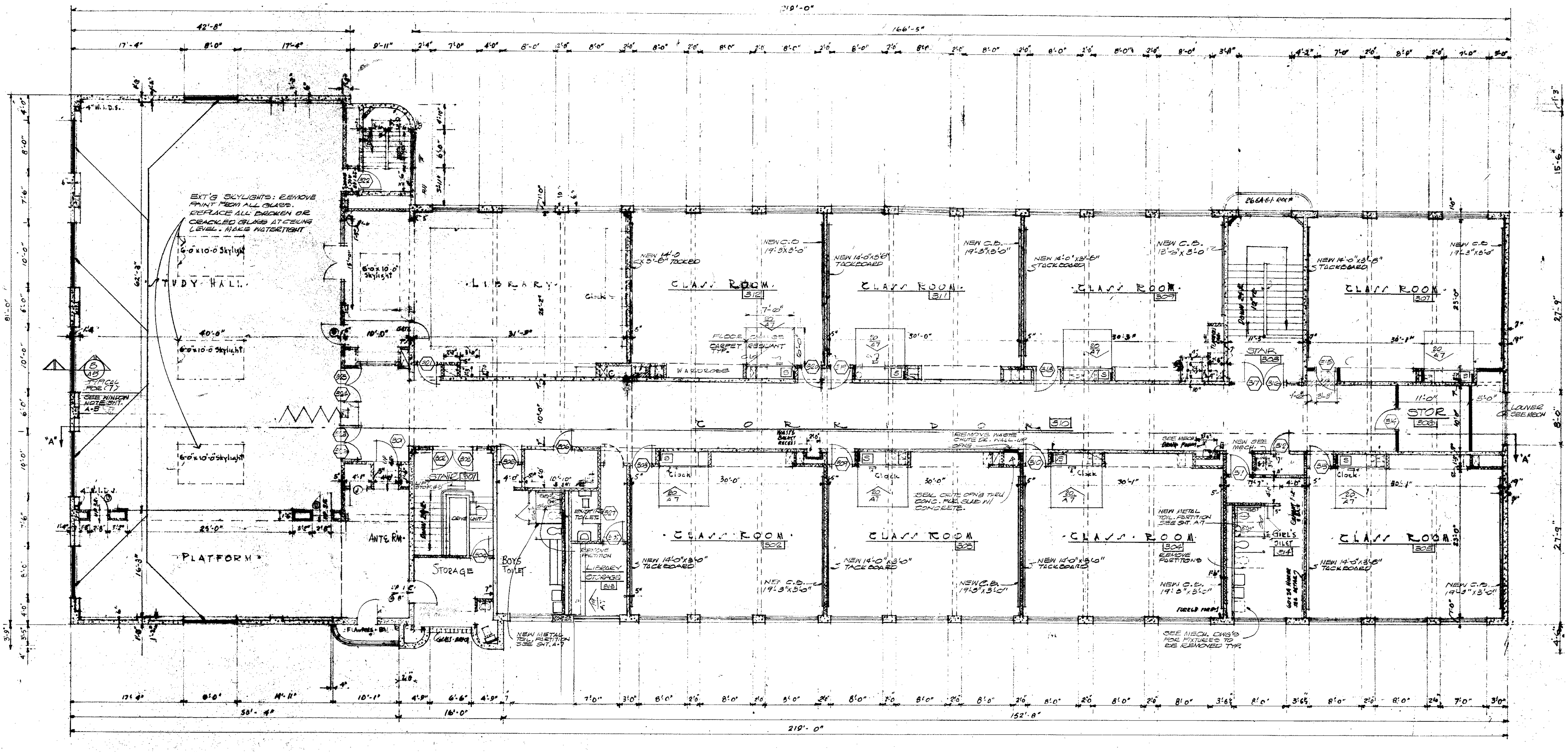
SECOND FLOOR PLAN
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

date 6/11/82
drawn A
checked E
revised
approved

412-1

A 3



THIRD FLOOR PLAN.

SCALE 1/8" = 1'-0"

WALL LEGEND

▤ EXISTING CONCRETE W/ CEMENT PLASTER
▨ EXISTING GYPSUM BLOCK W/ CEMENT PLASTER
■ NEW METAL STUD W/ 5/8" GPDW.
▥ EXISTING TO BE REMOVED

LARRY NEIL ERICKSON

ALEA-CMB
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THIRD FLOOR PLAN
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

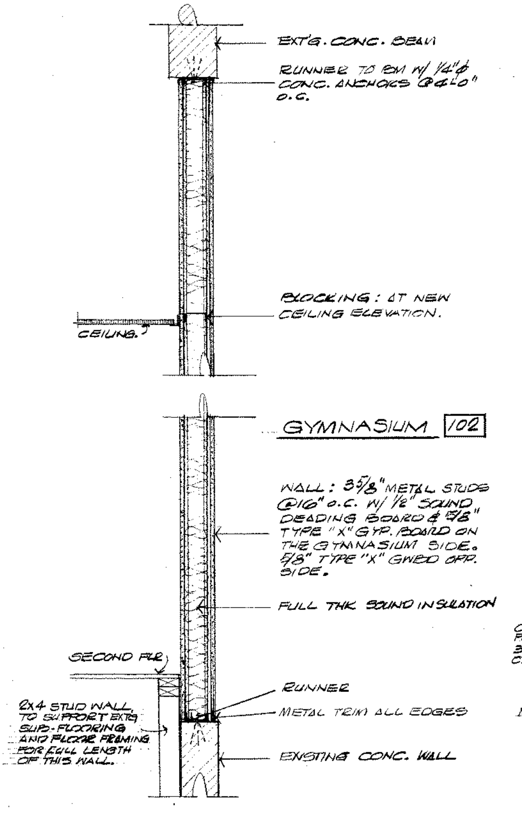
date 6/1/82
drawn
checked
revised
approved

412-1

A 4

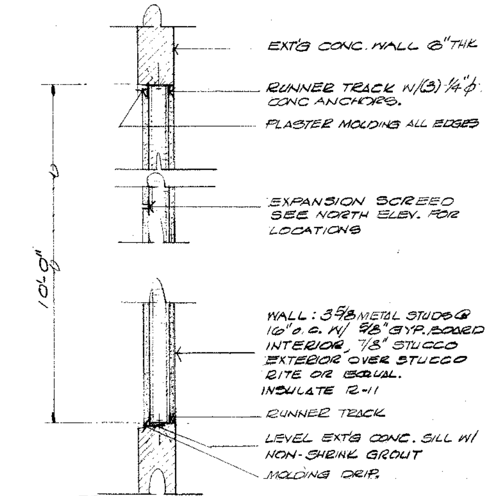
ROOM FINISH SCHEDULE

	NO	DESIGNATION	FLOOR					BASE			WALLS			CEILINGS				REMARKS
			EXISTING RESILIENT	NEW RESILIENT	NEW CARPET	EXISTING CONC		EXISTING	NEW WOOD	NEW TOP SET VINYL	EXISTING PLASTER	NEW 5/8" GYPSUM BOARD	NEW W.R.GPDW	EXISTING	NEW SUSPENDED AC TILE	NEW GYP. BOARD	HEIGHT	E N ⊗ S WALL LOCATION W ● FINISH ALL WALL ⊗ FINISH WALL SHOWN SHADED
first floor	101	BALL STORAGE	●					⊗	⊗		⊗	⊗		●				
	102	GYMNASIUM	●					●			⊗	⊗		●				PAINT NEW GPDW. NORTH WALL @ WINDOWS SOUTH WALL SECOND FLOOR ELEVATION.
	103	NURSE			●					●	⊗	⊗			●		8'-0"	
	104	BOYS COT			●					●	⊗	⊗			●		8'-0"	
	105	GIRLS COT			●					●		●			●		8'-0"	
	106	BOYS		●						●			●		●		8'-0"	NORTH WALL GPDW OVER 7/8" FURRING C'S
	107	GIRLS		●						●			●		●		8'-0"	
	108	MEN		●						●			●		●		8'-0"	NORTH & EAST WALLS OVER 7/8" FURRING CHANNELS
	109	WOMEN		●						●			●		●		8'-0"	
	110	FACULTY LOUNGE			●					●	⊗	⊗			●		8'-6"	
	111	STORAGE				●			●		⊗	⊗		●				
	112	JANITOR STORAGE				●			●		⊗	⊗		●				
	113	STAIR		●				●			●			●				NEW RESILIENT FLR. @ LANDINGS ONLY
	114	LUNCH ROOM	●					⊗	⊗		⊗	⊗		●				NEW SOUTH WALL 1 HR CONSTRUCTION
	115	SERVING	●							●	⊗	⊗			●		9'-6"	
	116	KITCHEN		●						●	⊗	⊗			●		9'-6"	
	117	RECEIVING				●				●	⊗	⊗			●		10'-6"	
	118	STORAGE				●				●		●			●		8'-6"	
	119	DELETED																
	120	CORRIDOR			●			●			⊗	⊗		●				
	121	MUSIC ROOM			●					●	⊗	⊗			●		8'-6"	
	122	CORRIDOR			●			●			●			●				
	123	RESOURCE CENTER	●	●				●			●				●		8'-6	
	124	CLASSROOM	●	●				●			●				●		9'-0	
second floor	201	CONFERENCE ROOM			●					●	⊗	⊗			●		8'-6	
	202	THERAPY			●					●	⊗	⊗			●		8'-0"	
	203	TESTING			●					●	⊗	⊗			●		8'-0"	
	204	WORKROOM			●					●	⊗	⊗			●		8'-0"	
	205	STAIR		●				●			●			●				NEW RESILIENT FLR @ LANDINGS ONLY
	206	PUBLIC			●					●	⊗	⊗			●		8'-6"	
	207	SUPPLIES			●					●		●			●		8'-0"	
	208	CLERICAL			●					●	⊗	⊗			●		8'-6"	NO. WALL REMOVE CEDAR PANELING PATCH PLASTER AS REQ'D.
	209	PRINCIPAL			●					●	⊗	⊗			●		8'-6"	NO. WALL REMOVE CEDER PANELING PATCH PLASTER AS REQ'D.
	210	WOMEN		●						●	●		●		●		8'-0"	SO. WALL GPDW OVER FURRING CHANNELS
	211	MEN		●						●	●		●		●		8'-0"	NO. WALL GPDW OVER FURRING CHANNELS
	212	READING			●					●	⊗	⊗			●		8'-6	
	213	READING			●					●	⊗	⊗			●		8'-6	
	214	READING			●					●	⊗	⊗			●		8'-6	
	215	CLASSROOM		●	●			●			●				●		8'-6"	
	216	CLASSROOM		●	●			●			●				●		8'-6"	
	217	CLASSROOM		●	●			●			●				●		8'-6"	
	218	STORAGE	●					⊗	⊗		⊗	⊗		●			7'-4	
	219	CLASSROOM		●	●			●			●				●		8'-6"	
	220	STAIR		●				●			●			●				NEW RESILIENT FLR. @ LANDINGS ONLY
	221	CLASSROOM		●	●			●			●				●		8'-6"	
	222	CLASSROOM		●	●			●			●				●		8'-6"	
	223	CLASSROOM		●	●			●			●				●		8'-6"	
	224	CLASSROOM		●	●			●			●				●		8'-6"	
	225	VESTIBULE	●					⊗	⊗		⊗	⊗			●		8'-0"	
	226	CORRIDOR			●			⊗	⊗		⊗	⊗			●		9'-0"	
	227	GIRLS TOILET									⊗							REPAIR & PAINT NORTH WALL TO MATCH EXT'G
	228	BOYS TOILET									⊗							REPAIR & PAINT SOUTH WALL TO MATCH EXTG.
third floor	301	STAIR		●				●			●			●				NEW RESILIENT FLR. @ LANDINGS ONLY
	302	CLASSROOM		●	●			●			●				●		8'-6"	
	303	CLASSROOM		●	●			●			●				●		8'-6	
	304	CLASSROOM		●	●			●			●				●		8'-6	
	305	CLASSROOM		●	●			●			●				●		8'-6	
	306	STORAGE	●					⊗	⊗		⊗	⊗		●				
	307	CLASSROOM		●	●			●			●				●		8'-6	
	308	STAIR		●				●			●			●				NEW RESILIENT FLR. @ LANDINGS ONLY
	309	CLASSROOM		●	●			●			●				●		8'-6	
	310	CORRIDOR			●		⊗	⊗			⊗	⊗			●		9'-0"	
	311	CLASSROOM		●	●			●			●				●		8'-6	
	312	CLASSROOM		●	●			●			●				●		8'-6"	
	313	LIBRARY STORAGE	●					⊗		⊗	●			●				TOP SET BASE AT NEW CABINET TOE SPACE
	314	GIRLS TOILET									⊗							REPAIR & PAINT NORTH WALL TO MATCH EXT'G.



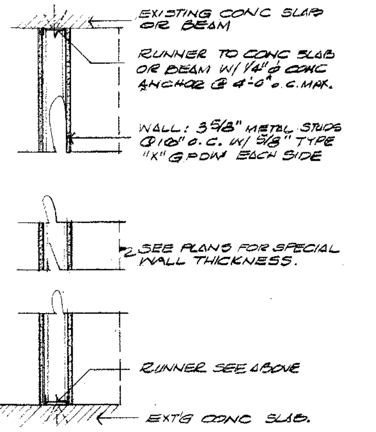
A SECTION GYM. SOUTH WALL (BASIC BID) SECOND FLOOR

SCALE 3/4"=1'-0"



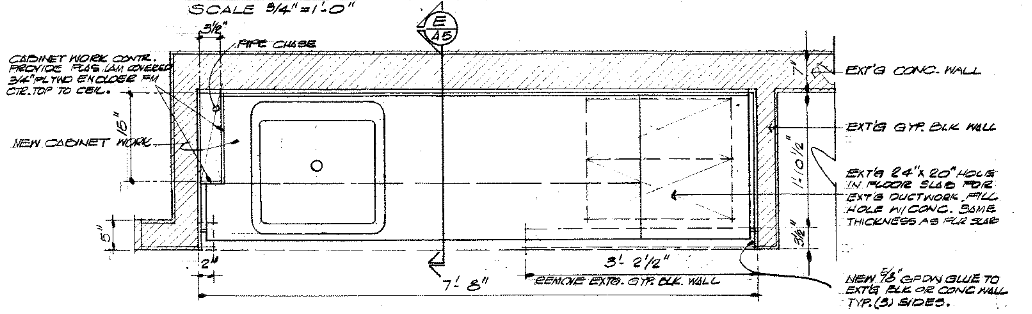
B SECTION GYM. NORTH WALL

SCALE 3/4"=1'-0"



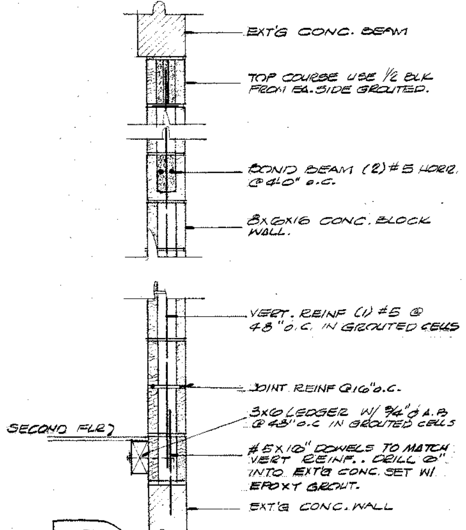
C SECTION TYPICAL INTERIOR PARTITION

SCALE 3/4"=1'-0"



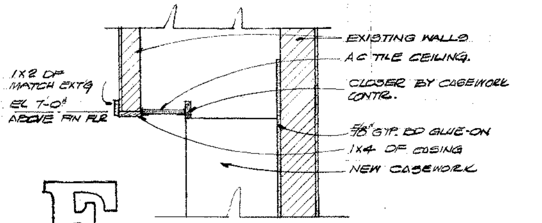
PLAN CLASSROOM CABINETS TYPICAL.

SCALE 3/4"=1'-0" NOTE: ALL CLASSROOMS TO RECEIVED THIS CABINET EXCEPT CLASSROOM #124. SUPPLY CABINET WITHOUT SINK.



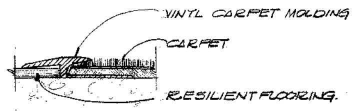
D SECTION GYM. SOUTH WALL ALT. BID #5

SCALE 3/4"=1'-0"



E SECTION TOP OF NEW CLASSRM CABINETS

SCALE 3/4"=1'-0"

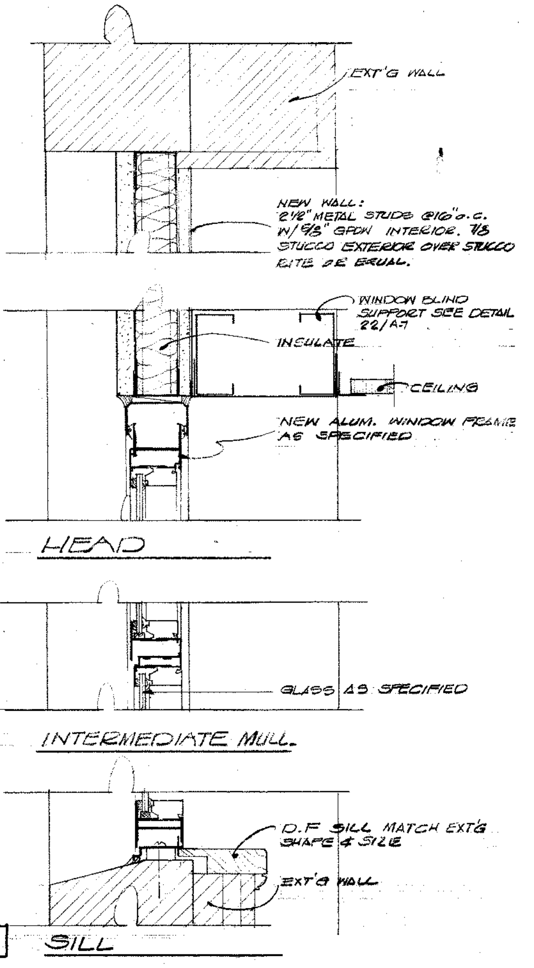


1 DETAIL FLOOR CHANGE.

NO SCALE.

NOTES:

1. ROOMS NO. 201, 202, 203, 204 PROVIDE WOOD FLOOR UNDERLAY TO LEVEL FLOORS WITH EXISTING CONC SLAB ELEVATION 3/4"±.
2. STAIR NO. 205, & 301 REMOVE TRANSOM FRAME & GLASS PROVIDE & INSTALL TYPICAL INTERIOR PARTITION (SEE SECTION "C" THIS SHEET) FLUSH GPDW WITH EXISTING PLASTER ON THE CORRIDOR SIDE. PAINT BOTH SIDES.
3. ALL NEW INTERIOR PARTITIONS SHALL EXTEND FROM FINISH FLOOR TO UNDERSIDE OF SLAB ABOVE. PROVIDE 5/8" GWBD TAPED ABOVE THE FINISH CEILINGS.
4. EXISTING WOOD BASE ALL ROOMS SCHEDULED FOR NEW FLOOR COVERING REMOVE WOOD BASE SHOE. INSTALL NEW FLOOR COVERING, INSTALL NEW WOOD SHOE SHAPE TO MATCH EXISTING.
5. REMOVE EXT'G LINOLEUM FLOOR COVERING FROM ALL AREAS WHERE NEW RESILIANT FLOORING IS SCHEDULED.
6. ALL ROOMS WHERE NEW CHALKBOARD, TACKBOARDS ARE INDICATED. REMOVE EXT'G. WOOD TRIM AROUND EXISTING CHALKBOARDS INSTALL NEW CHALKBOARDS & NEW TACKBOARDS. W/ ADHESIVE AS SPECIFIED TO EXISTING SLATE CHALKBOARDS INSTALL NEW WOOD TRIM PAINT TO MATCH ALL OTHER TRIM.
7. EXISTING BOYS & GIRLS TOILET ROOMS ALL FLOORS; SEE ALTERNATE BID #3 FOR NEW CEILINGS. CEILING HEIGHT 8'-6".
8. SEE ALTERNATE BID #1 FOR STUDY HALL, PLATFORM CEILING.
9. SEE ALTERNATE BID #2 FOR LIBRARY CEILING.
10. CUT, PATCH & REPAIR & LEVEL FLOORS WHERE WALLS ARE REMOVED AND PREPARE FOR NEW FLOORING.
11. WHERE CARPET IS INSTALLED OVER EXT'G LINOLEUM OR VAT, STRIP ALL WAX FINISH WITH LIQUID STRIPPER & PREPARE SURFACE FOR ADHESIVE INSTALLATION.
12. WHERE WALLS ARE REMOVED TO INSTALL PLUMBING FIXTURES, PATCH BACK TO MATCH EXT'G.
13. PAINT, OR STAIN & VARNISH NEW WOOD TRIM (OR PATCHES) TO MATCH EXISTING.
14. PAINT ENTIRE WALL WHERE PATCHING OCCURES NEW WALL IS ADDED, OR IF ANY WORK IS SCHEDULED ON AN EXISTING WALL.
15. STUDY HALL & LIBRARY SUSPENDED CEILINGS ALT. BID #1 & #2. NEW CEILING TO BE 4" MAX BELOW EXISTING CEILINGS. PAINT EXT'G BEAM WHERE TRIM IS REMOVED.



F SECTION CLASSROOM WINDOW ALT. BID #4

SCALE 3"=1'-0" SEE WINDOW ELEV. SHEET A-6

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ALEA-CMB
ARCHITECTS IN ASSOCIATION

ROOM FINISH SCHEDULE
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

date 6/11/82
drawn A
checked
revised
approved

412-1

A 5

DOOR SCHEDULE

first floor

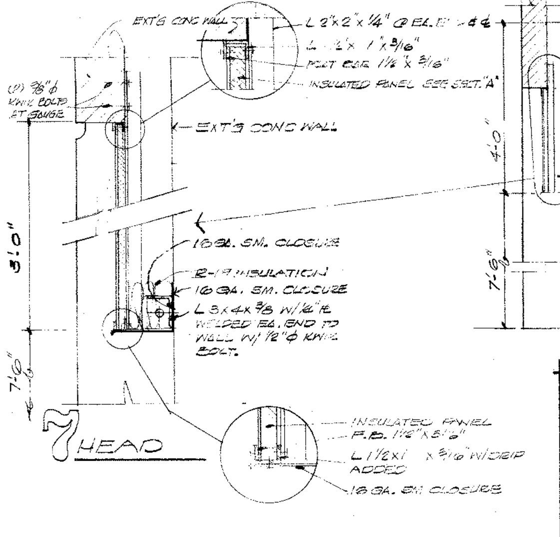
NO	TYPE	WIDTH	DOOR		FRAME		DETAILS			REMARKS
			MATERIAL	FINISH	MATERIAL	FINISH	HEAD	JAMB	SILL	
101	A	3'-0"	WOOD	PAINT	H.M.	PAINT	5/A6	5/A6		1 HR "B" LABEL
102	A	2'-8"					6/A6	6/A6		1 HR "B" LABEL
103	A	2'-8"					5/A6	5/A6		
104	A	2'-8"					5/A6	5/A6		
105	A	2'-8"					5/A6	5/A6		
106	A	2'-8"					5/A6	5/A6		
107	A	3'-0"			↓		6/A6	6/A6		20 MIN. LABEL
108	B	3'-0"			H.M.		6/A6	6/A6		20 MIN. LABEL
109	A	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
110	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
111	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
112	A	3'-0			H.M.		6/A6	6/A6		1 HR "B" LABEL
113	A	3'-0			WOOD		11/A6	11/A6		20 MIN
114	B	3'-0"			WOOD		11/A6	11/A6		20 MIN
115	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
116	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
117	—	2'-8"			WOOD					EXT'G DR SEE HDWD SCHEDULE
118	—	2'-8"								EXT'G DR. SEE HDWD. SCHEDULE
119	B	3'-0"			↓		11/A6	11/A6		20 MIN LABEL
120	A	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
121	B	3'-0"	↓		H.M.		5/A6	5/A6		20 MIN LABEL
122	A	3'-0	WOOD		H.M.		6/A6	6/A6		1 HR "B" LABEL
123	C	8'-0"	METAL		STEEL		7/A6			
124	A	3'-0"	WOOD		H.M.		5/A6	5/A6		
125	A	3'-0"	WOOD	↓	H.M.	↓	5/A6	5/A6		1 HR. "B" LABEL
126	A	3'-0	WOOD	PAINT	H.M.	PAINT	5/A6	5/A6		1 HR "B" LABEL
127		—	D	E	L	E	T	E	D	—
128	A	3'-0"	WOOD	PAINT	H.M.	PAINT	6/A6	6/A6		1 HR "B" LABEL
129	D	1'-8"	SS. STL	FACTORY	H.M		7/A6		10/A6	1 HR "B" LABEL
130	A	3'-0"	WOOD	PAINT	H.M		5/A6	5/A6		1 HR "B" LABEL
131	A	3'-0"			H.M		5/A6	5/A6		1 HR "B" LABEL
132	B	2'-8"			WOOD		11/A6	11/A6		20 MIN LABEL
133	B	2'-8"					11/A6	11/A6		20 MIN LABEL
134	B	2'-8"					11/A6	11/A6		20 MIN LABEL
135	B	2'-8"					11/A6	11/A6		20 MIN LABEL
136	—	2'-8"								EXT'G DR SEE HDWD SCHEDULE
137	—	2'-8"								EXT'G DR. SEE HDWD SCHEDULE
138	B	2'-8"	↓	↓	↓	↓	11/A6	11/A6		20 MIN LABEL
139	B	2'-8"	WOOD	PAINT	WOOD	PAINT	11/A6	11/A6		20 MIN LABEL

second floor

NO	TYPE	WIDTH	DOOR		FRAME		DETAILS			REMARKS
			MATERIAL	FINISH	MATERIAL	FINISH	HEAD	JAMB	SILL	
201	B	3'-0"	WOOD	PAINT	H.M.	PAINT	6/A6	6/A6		20 MIN. LABEL
202	B	3'-0"			H.M.		6/A6	6/A6		20 MIN. LABEL
203	B	3'-0"			H.M.		6/A6	6/A6		20 MIN. LABEL
204	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
205	—	2'-8"			WOOD					EXT'G. DR. SEE HDWD SCHEDULE
206	—	2'-8"			WOOD					EXT'G. DR. SEE HDWD. SCHEDULE
207	B	3'-0'			H.M.		6/A6	6/A6		20 MIN. LABEL
208	A	2'-6"					5/A6	5/A6		
209	A	3'-0"					5/A6	5/A6		
210	A	3'-0"			↓		5/A6	5/A6		20 MIN LABEL
211	A	3'-0"			H.M		5/A6	5/A6		20 MIN. LABEL
212	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
213	B	3'-0"					11/A6	11/A6		20 MIN LABEL
214	B	3'-0'			↓		11/A6	11/A6		20 MIN LABEL
215	A	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
216	A	3'-0"			H.M		6/A6	6/A6		1 HR. "B" LABEL
217	B	3'-0"			WOOD		5/A6	5/A6		20 MIN. LABEL
218	A	3'-0"			H.M.		5/A6	5/A6		1 HR. "B" LABEL
219	B	2'-8"			H.M.		5/A6	5/A6		20 MIN. LABEL
220	—	2'-8"			WOOD					EXT'G. DR. SEE HDWD SCHEDULE
221	—	3'-0"								EXT'G. DR. SEE HDWD SCHEDULE
222	A	3'-0"					11/A6	11/A6		20 MIN LABEL
223	B	3'-0"					11/A6	11/A6		20 MIN LABEL
224	B	3'-0"			↓		11/A6	11/A6		20 MIN LABEL
225	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
226	E	2'-8"	↓	↓	H.M.	↓	5/A6	5/A6		
227	E	2'-8"	WOOD	PAINT	H.M.	PAINT	5/A6	5/A6		

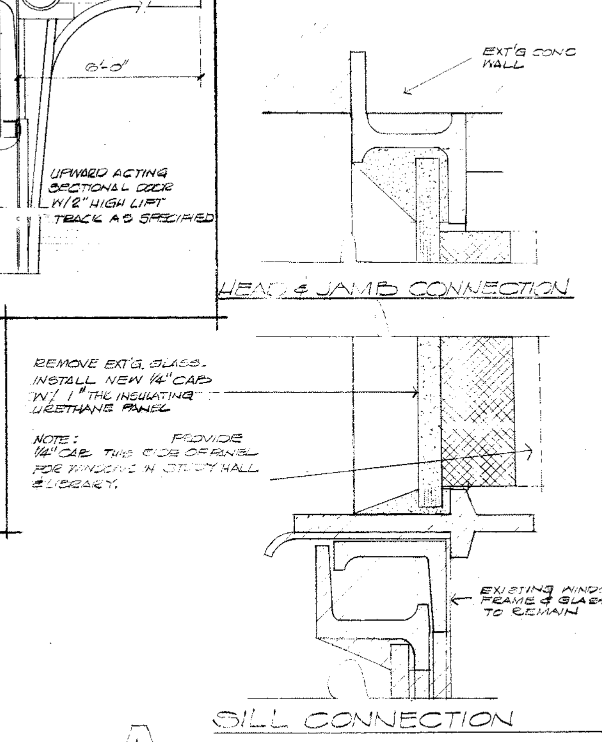
third floor

NO	TYPE	WIDTH	DOOR		FRAME		DETAILS			REMARKS
			MATERIAL	FINISH	MATERIAL	FINISH	HEAD	JAMB	SILL	
301	B	3'-0"	WOOD	PAINT	WOOD	PAINT	11/A6	11/A6		20 MIN LABEL
302	—	2'-8"			WOOD					EXT'G. DR. SEE HDWD SCHEDULE
303	—	2'-8"			WOOD					EXT'G DR. SEE HDWD. SCHEDULE
304	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
305	A	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
306	A	3'-0"			H.M.		5/A6	5/A6		1 HR "B" LABEL
307	A	3'-0"			H.M.		11/A6	11/A6		20 MIN LABEL
308	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
309	B	3'-0"					11/A6	11/A6		20 MIN LABEL
310	B	3'-0"			↓		11/A6	11/A6		20 MIN LABEL
311	A	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
312	A	3'-0"			H.M.		6/A6	6/A6		1 HR "B" LABEL
313	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
314	A	3'-0"			H.M.		5/A6	5/A6		1 HR "B" LABEL
315	B	3'-0"			H.M		5/A6	5/A6		20 MIN LABEL
316	—	2'-8"			WOOD					EXT'G. DR. SEE HDWD SCHEDULE
317	—	2'-8								EXT'G. DR. SEE HDWD. SCHEDULE
318	B	3'-0"					11/A6	11/A6		20 MIN LABEL
319	B	3'-0"					11/A6	11/A6		20 MIN LABEL
320	B	3'-0"			↓		11/A6	11/A6		20 MIN LABEL
321	B	3'-0"			WOOD		11/A6	11/A6		20 MIN LABEL
322	A	2'-8"			H.M		6/A6	6/A6		1 HR "B" LABEL
323	B	2'-8"			WOOD		11/A6	11/A6		20 MIN LABEL
324	B	2'-8"					11/A6	11/A6		20 MIN LABEL
325	B	2'-8"					11/A6	11/A6		20 MIN LABEL
326	B	2'-8"	↓	↓	↓	↓	11/A6	11/A6		20 MIN LABEL
327	A	2'-2"	WOOD	PAINT	WOOD	PAINT	11/A6	11/A6		20 MIN LABEL

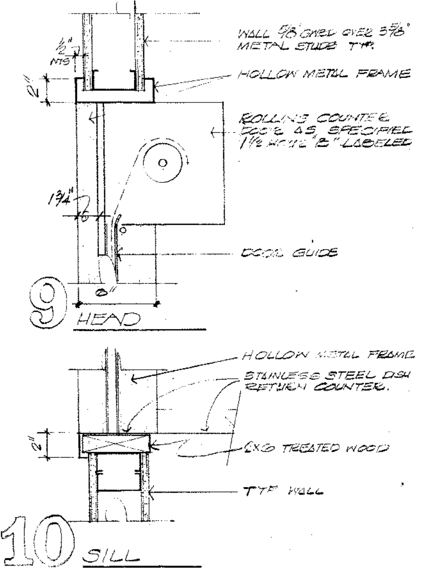


7 HEAD

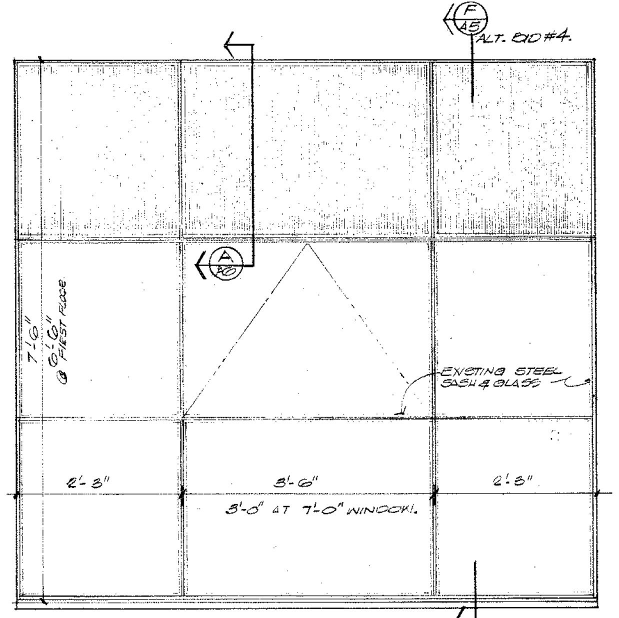
UPWARD ACTING SECTIONAL DOOR
SCALE 1"=1'-0"



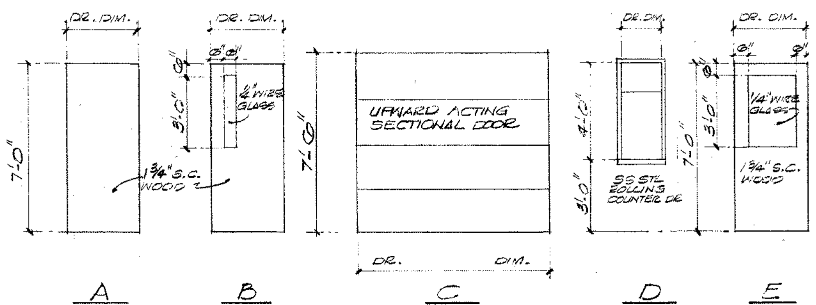
A WINDOW SECTION (PARTIAL)
FULL SCALE
BASIC BID



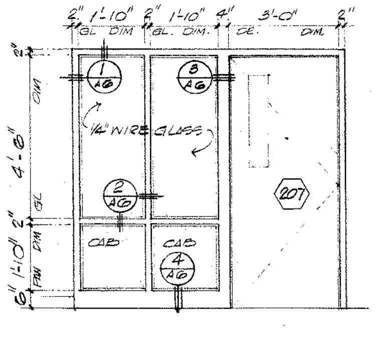
ROLLING COUNTER DOOR
SCALE 1 1/2"=1'-0"



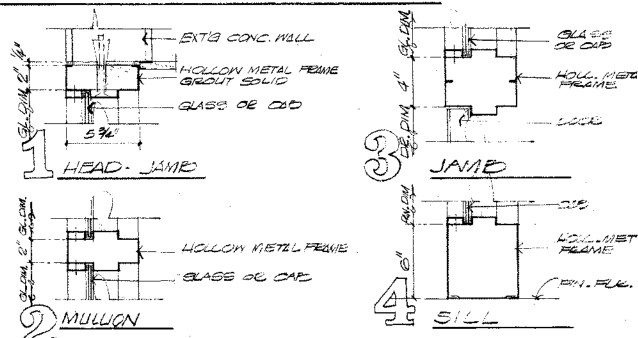
TYPICAL WINDOW ELEVATION SCALE 3/4"=1'-0"



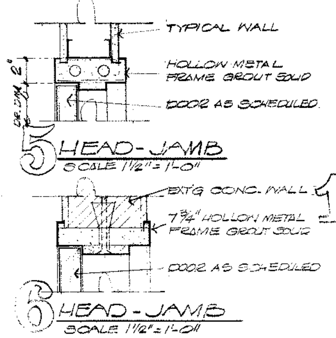
DOOR TYPES
SCALE 1/4"=1'-0"

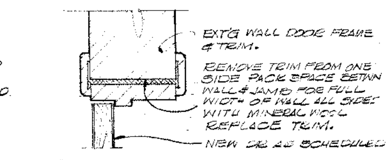


RELITE ELEVATION
SCALE 3/8"=1'-0"



RELITE DETAILS
SCALE 1 1/2"=1'-0"





11 HEAD-JAMB
SCALE 1 1/2"=1'-0"

REGISTERED ARCHITECT
1339
LARRY NEIL ERICKSON
STATE OF WASHINGTON

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(206) 336-5765
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seattle, wa 98102 • (206) 322-0810

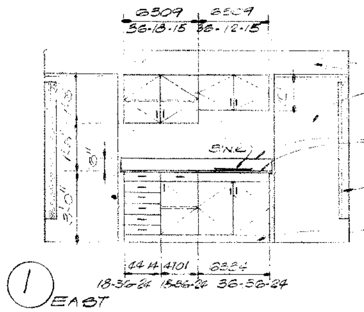
ALEA-CMB
ARCHITECTS IN ASSOCIATION

DOOR SCHEDULE DETAILS
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

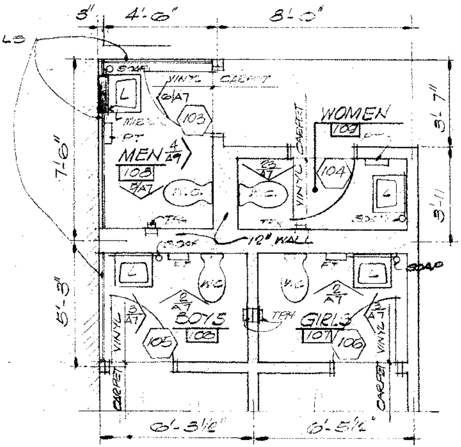
date 6/1/82
drawn A
checked E
revised
approved

412-1

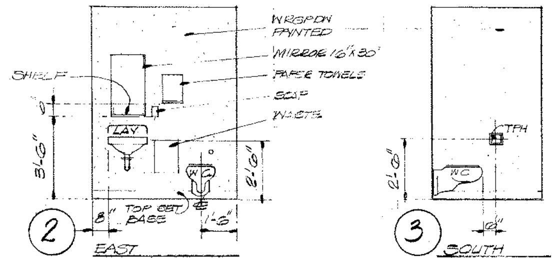
A 6



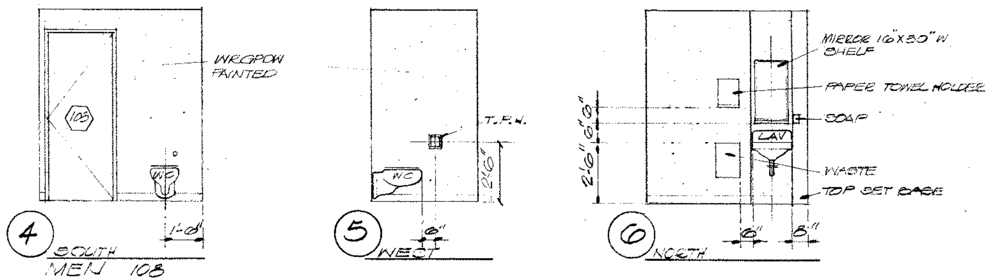
1 EAST
NURSE 105



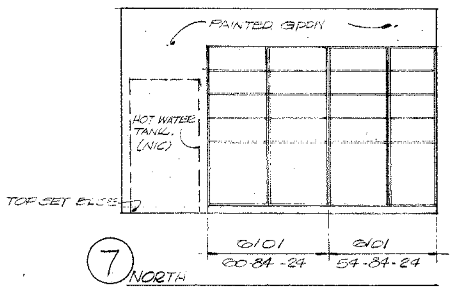
PARTIAL FIRST FLOOR PLAN NORTH
SCALE 1/4"=1'-0"



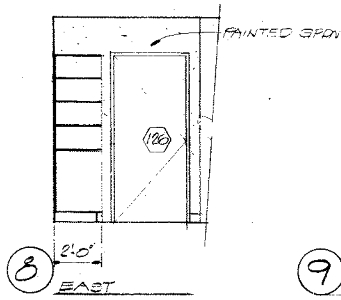
2 EAST
3 SOUTH
BOYS 106 GIRLS 107 OPP. HAND



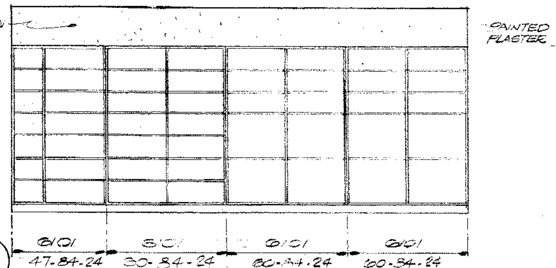
4 SOUTH
5 WEST
6 NORTH
MEN 108



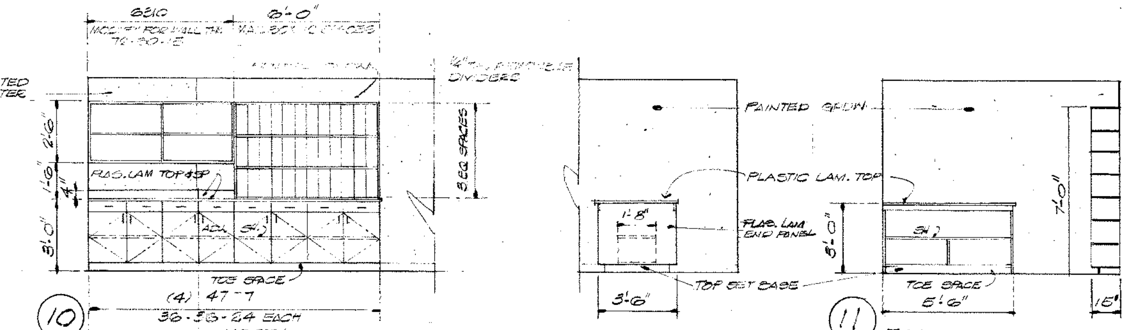
7 NORTH
STORAGE 118



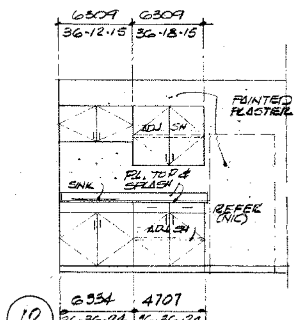
8 EAST



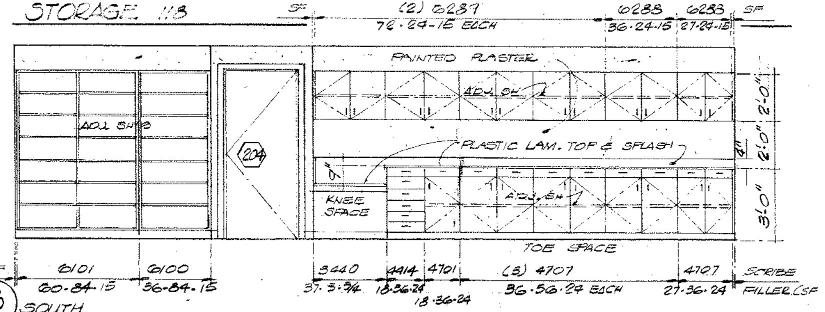
9 SOUTH



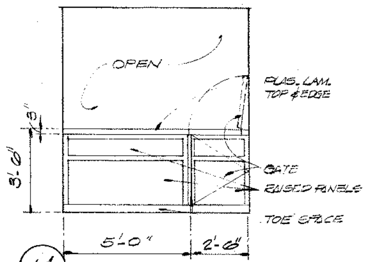
10 NORTH
WORKROOM 204
11 EAST



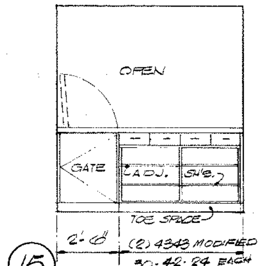
12 WEST
FACULTY LOUNGE



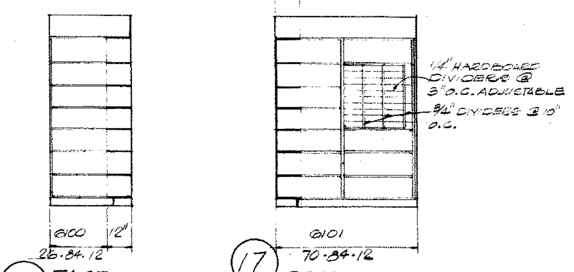
13 SOUTH
WORKROOM 204 CONTINUED



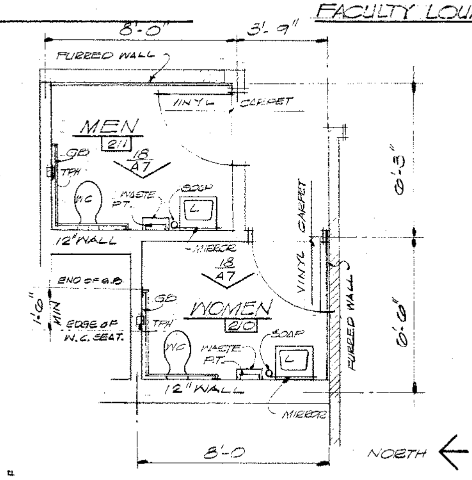
14 WEST
PUBLIC 206



15 EAST
CLERICAL 208

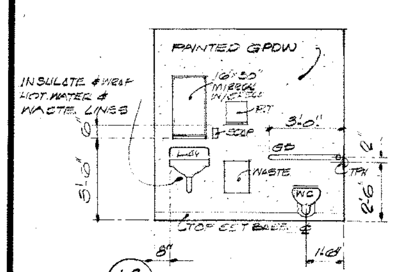


16 EAST
17 SOUTH
SUPPLIES 207

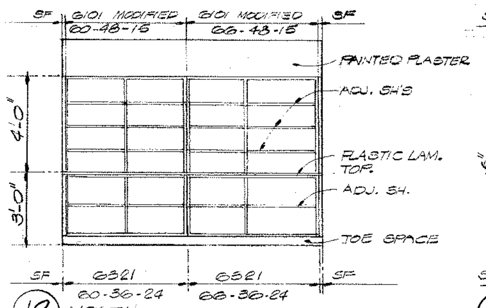


PARTIAL SECOND FLOOR PLAN NORTH
SCALE 1/4"=1'-0"

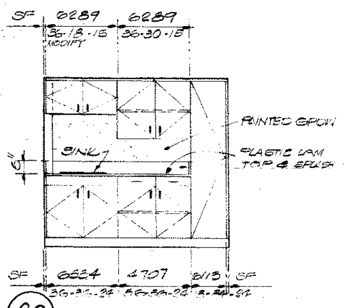
NOTES:
1. ALL ROOM ELEVATIONS THIS SHEET SCALE 1/4"=1'-0"
2. ALL CABINET NUMBERS SHOWN ARE "MONITOR" 770 SERIES.



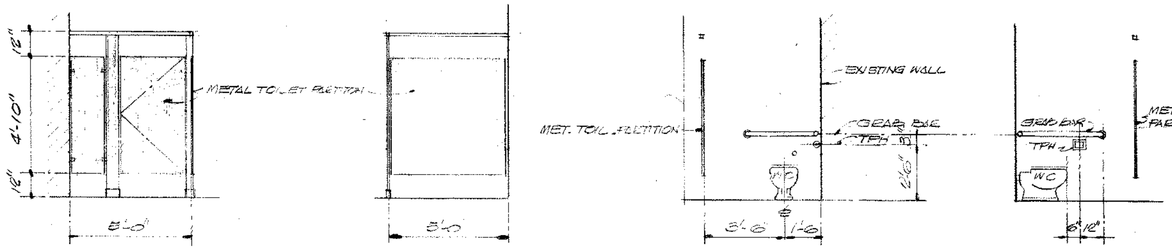
18 WEST
WOMEN 210 - MEN 211



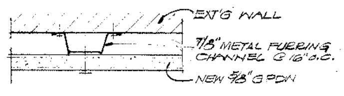
19 NORTH
LIBRARY STORAGE



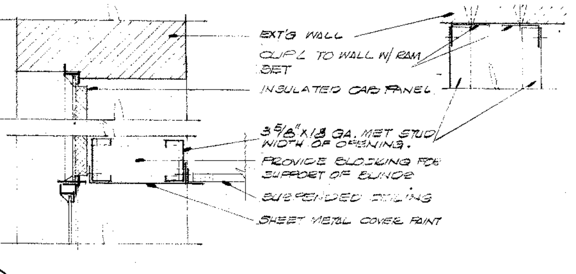
20 TYPICAL CLASSROOM



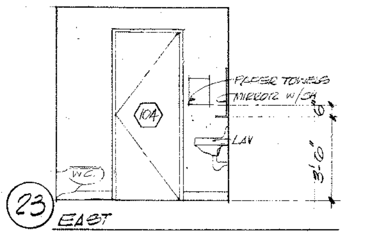
TYPICAL BOYS & GIRLS TOILETS FIRST & THIRD FLOORS



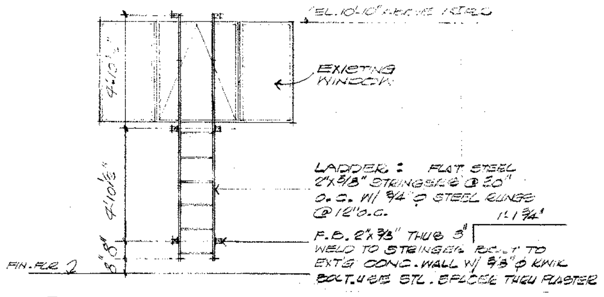
21 DETAIL FURRED WALL
SCALE 3"=1'-0"



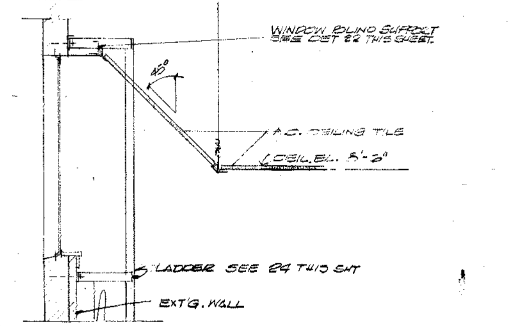
22 DETAIL WINDOW BLIND SUPPORT
SCALE 1 1/2"=1'-0"



23 EAST
WOMEN 109



24 LADDER - RESOURCE CENTER 123
SCALE 1/4"=1'-0"



25 DETAIL CEILING @ RESOURCE CENTER

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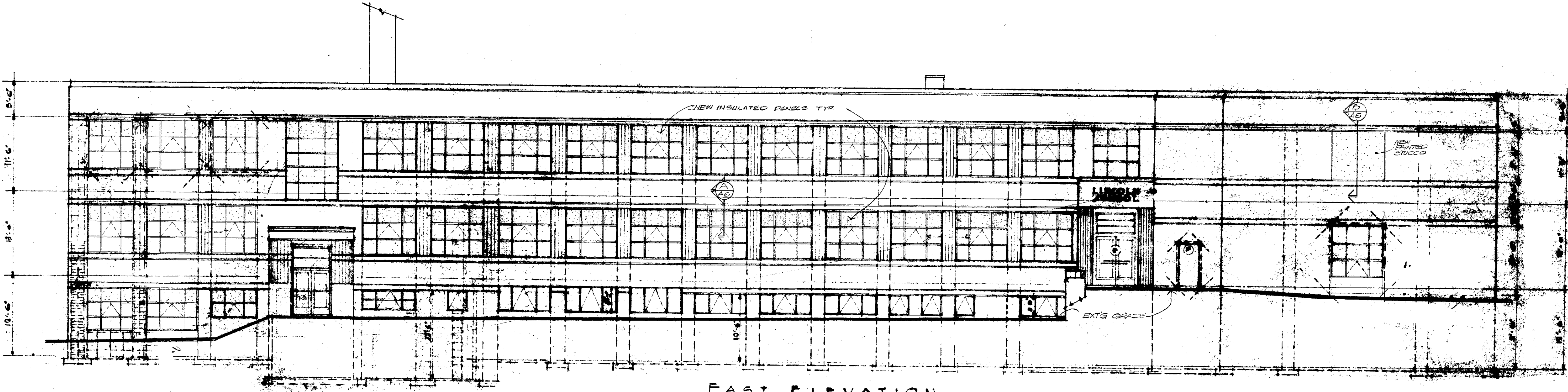
ROOM ELEVATIONS
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

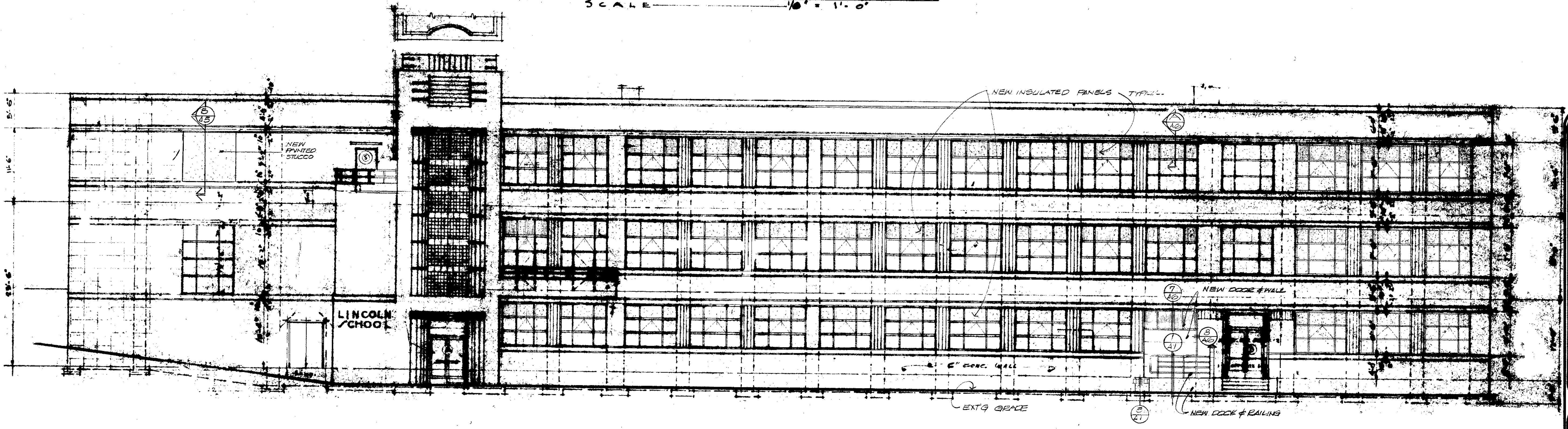
date 6/1/82
drawn
checked
revised
approved

412-1

A7



EAST ELEVATION
SCALE 1/8" = 1'-0"



WEST ELEVATION
SCALE 1/8" = 1'-0"

REGISTERED ARCHITECT
1332
LARRY DALE ERICKSON
STATE OF WASHINGTON

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EXTERIOR ELEVATIONS
MODERNIZATION OF
LINCOLN Elementary School
MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNON, WA.

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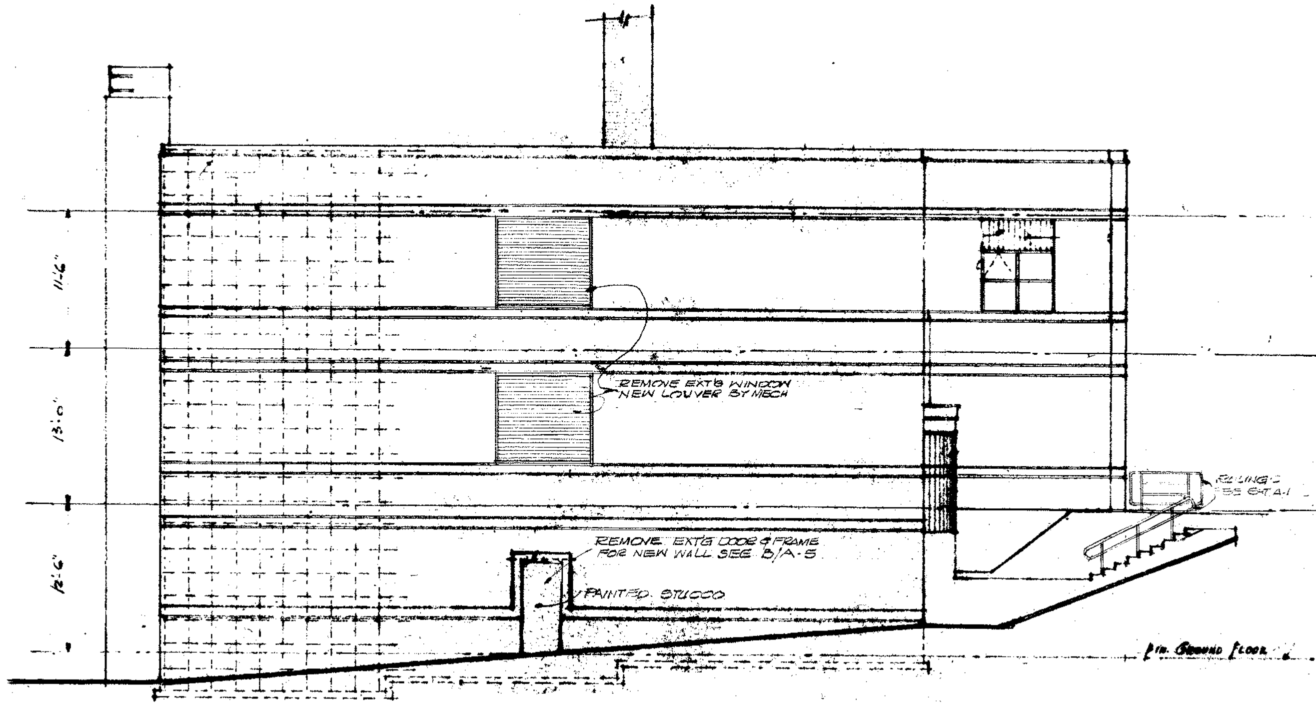
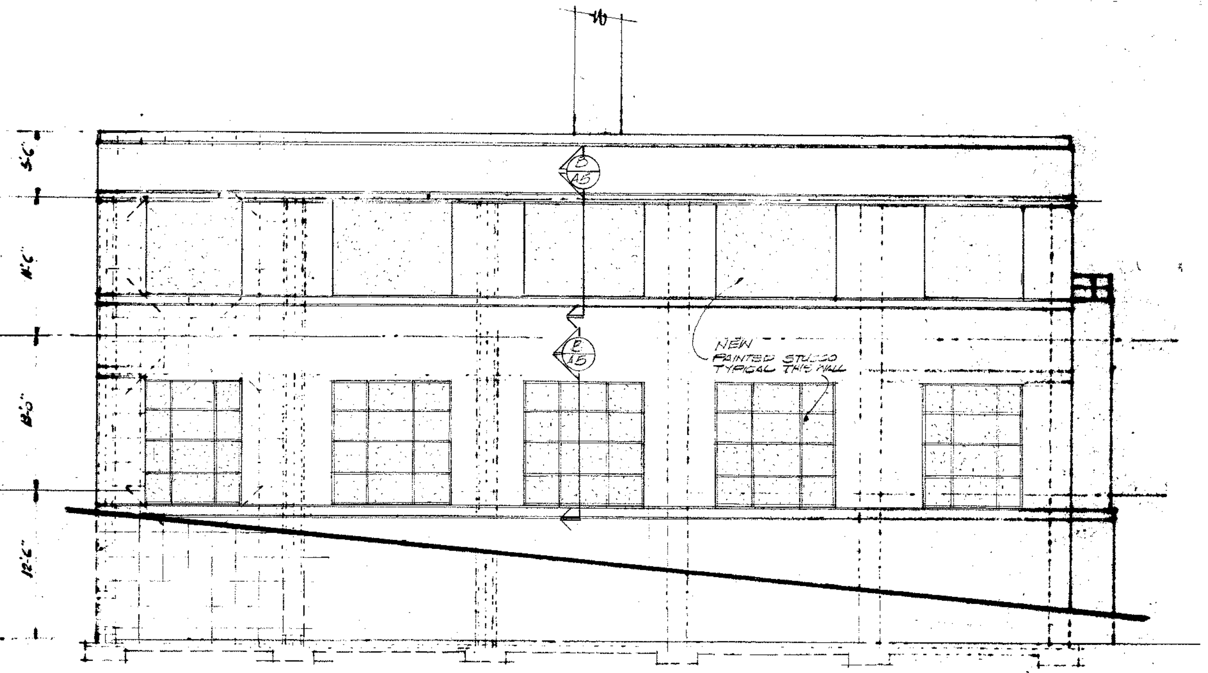
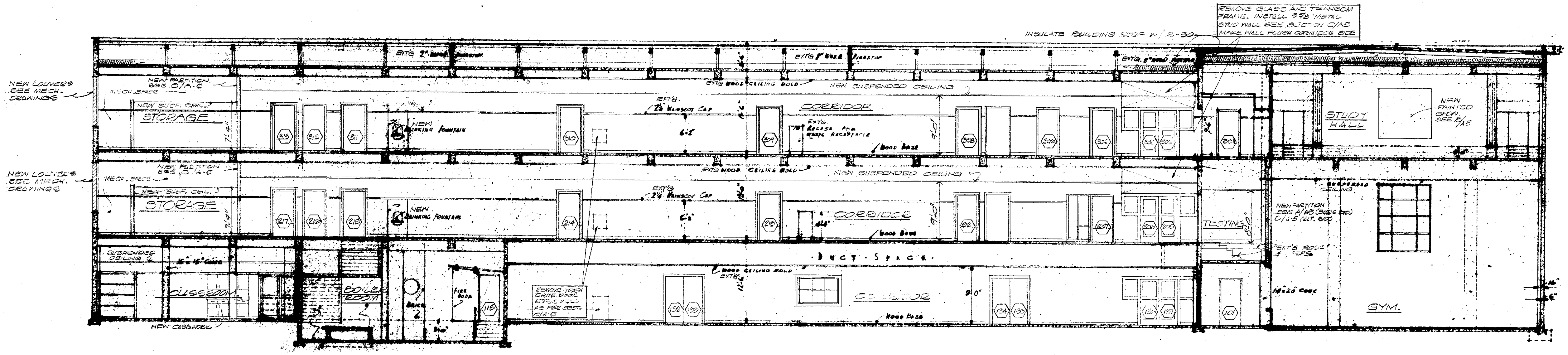
A8



·SKAGIT·STREET·ELEVATION·
·Scale-⅛"=1'-0"·



·BROAD·STREET·ELEVATION·
·SCALE·⅛"=1'-0"



SECTION "A-A"
·SCALE-⅛"=1'-0"·

REGISTERED ARCHITECT
1398
LARRY REX ERICKSON
STATE OF WASHINGTON

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SECTION & ELEVATIONS
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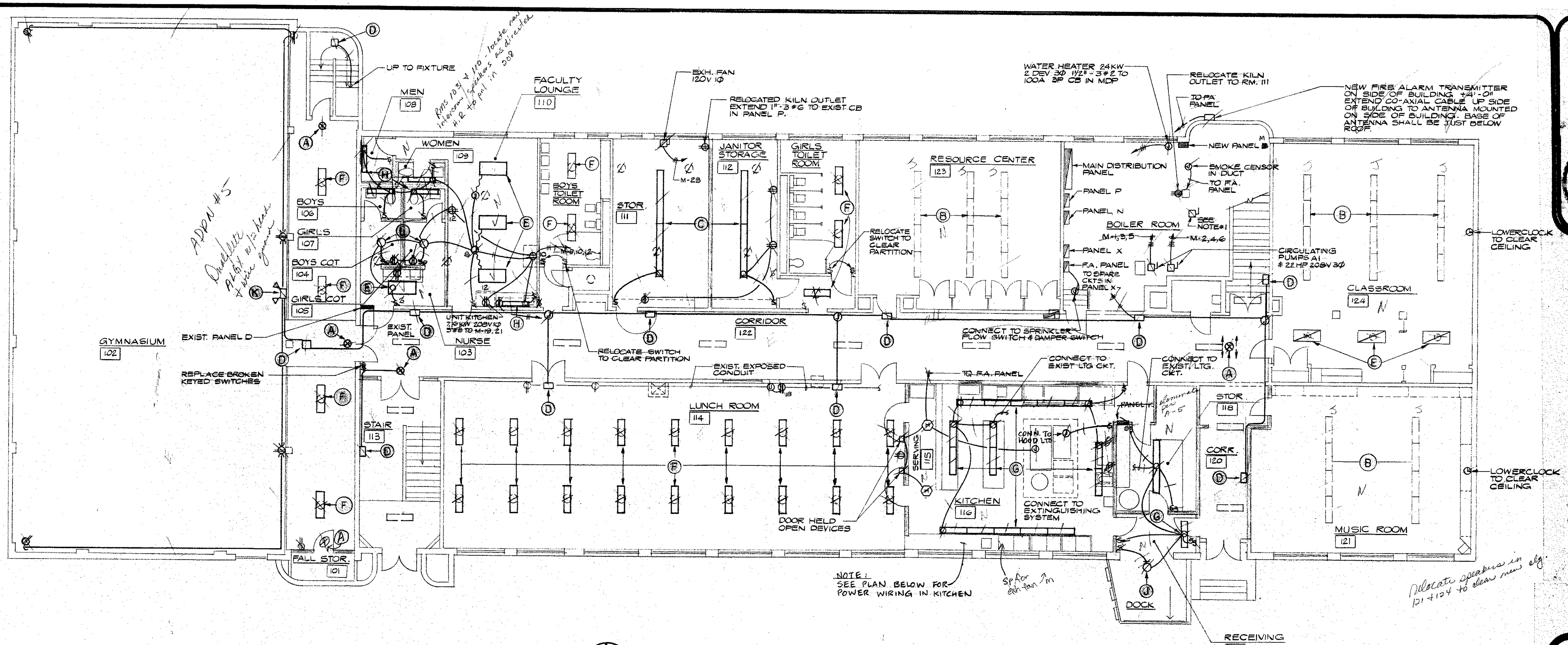
A 9



FIRST FLOOR PLAN - ELECTRICAL

SCALE: 1/8" = 1'-0"

Provide conn from smoke in A/N #1, 2+3 to f.a. syst.

LIGHT FIXTURE SCHEDULE			
TYPE	MAKE & MODEL	LAMPS	REMARKS
(A)	DUAL LITE WRWWSG	SUPPLIED W/FIXTURE	REMOVE EXIST. EXIT LIGHT & MOUNT NEW FIXTURE
(B)	EXISTING		REMOUNT EXIST. FIXTURE ON NEW SUSPENDED CEILING
(C)	LITHONIA 8TC 240	2F40T12 CW	CHAIN HUNG STRIP FLUORESCENT
(D)	DUAL LITE SDG	SUPPLIED W/FIXTURE	SELF-CONTAINED EMERGENCY PATHWAY LIGHT
(E)	LITHONIA 2GS 340 A	3F40T12 CW	2×4 RECESSED FLUORESCENT
(F)	VC 240	2F40T12 CW	REMOVE EXIST. FIXTURE - CONNECT TO EXIST. CKT
(G)	DL 240A	2F40T12 CW	SURFACE MOUNTED
(H)	ALKCO 3245	2F40T12 CW	MOUNT AT CEILING OR UNDER CABINET
(J)	GUTH B18604/120	70W HPS	WALL MOUNT ABOVE DOOR
(K)	B15-211/120-WG-ISL-FF-SQ-GRC	250W METAL HALIDE	REMOVE EXIST. FIXTURE. PROVIDE METAL PLATE OVER CEILING.
(L)	Prescolite 488-3 w/ 100W - A-19 lamp		

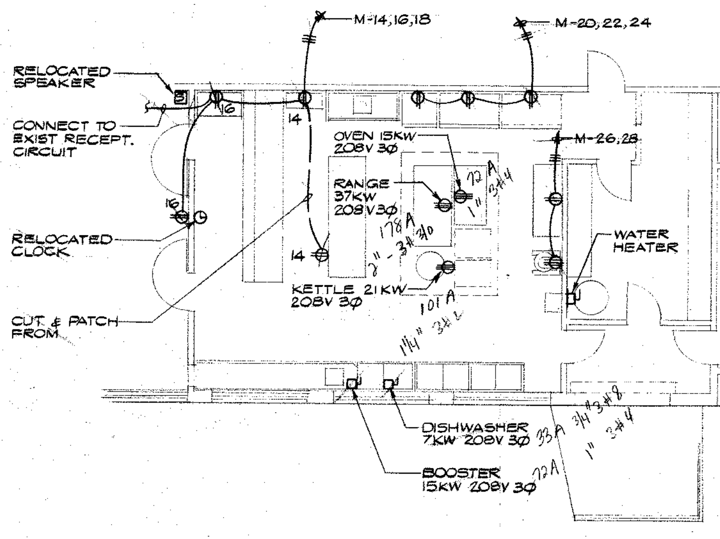
2.

Dual lite AHA w/2 heads + wire guard

Addn #3
A.E.
Emergi-lite A+D
Keene C E F G
Lith A+D
Addn #5
A E
Metalux C E G
Gibson F

NOTES:

1. CHANGE 30A 3P C.B. SEWING FAN MOTOR IN BOILER ROOM TO 70A 3P. RUN 3/4" - 3#8 FROM 30A 3P DISC TO THIS C.B.



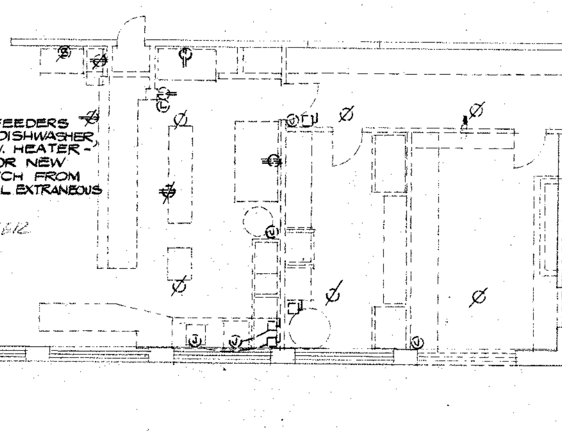
KITCHEN PLAN

SCALE: 1/8" = 1'-0"

NOTES:

REMOVE & RELOCATE FEEDERS TO RANGE, KETTLER, DISHWASHER, BOOSTER, OVEN & H.W. HEATER - SEE PLAN AT LEFT FOR NEW LOCATIONS. CUT & PATCH FROM AS REQ'D. REMOVE ALL EXTRANEOUS WIRING.

1 Day Conc Entire
8 HR
3150 Bonc



KITCHEN DEMOLITION PLAN

SCALE: 1/8" = 1'-0"

No lamp guard

ALEX N. HARGIS
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

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MODERNIZATION OF
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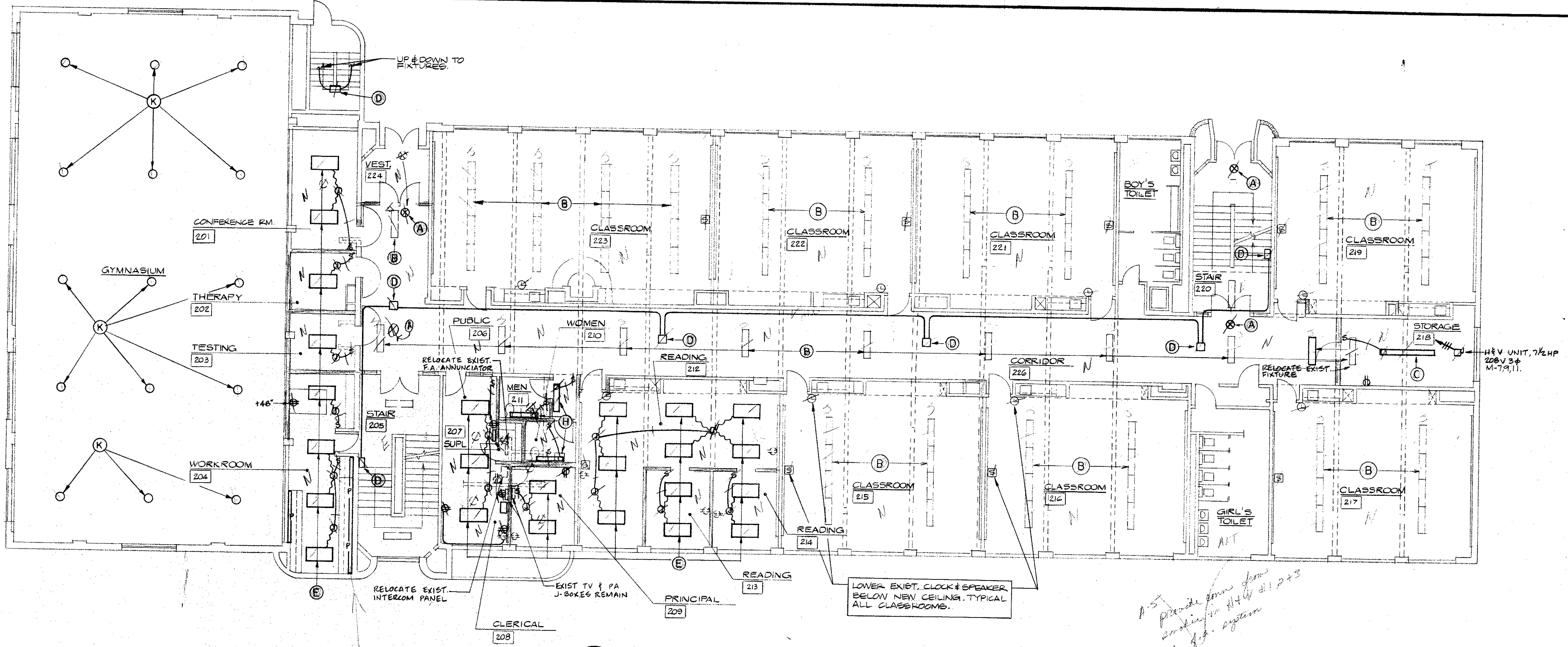
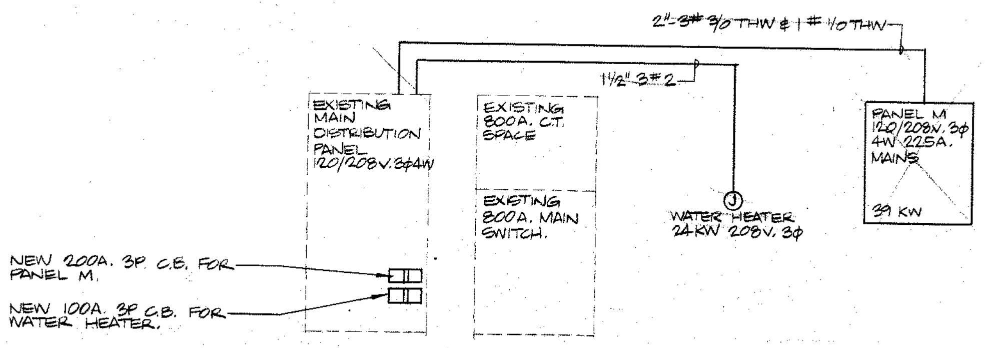


A-5 provide power from breaker in H&V #1,2 & 3 to f.a. system

SECOND FLOOR PLAN - ELECTRICAL

SCALE: 1/8" = 1'-0"

NOTE:
POWER CO. RECORDS INDICATE THE MAXIMUM DEMAND AT THE SCHOOL IN THE LAST YEAR HAS BEEN 70 KW OR 194 AMPS. THE ADDED LOAD IS 63 KW FOR A TOTAL OF 369 AMPS



RISER DIAGRAM

NO SCALE

PANEL M SCHEDULE

120/208V. 3Φ 4W. — 225A. MAINS

CIRC.	AMPS	POLE	SERVICE	WATTS A	WATTS B	WATTS C	SERVICE	AMPS	POLE	CIRC.
1	20	3	PUMP #1	770/770			PUMP #2	20	3	2
3					770/770					4
5						770/770				6
7	50	3	H&V #1 & 2	2920/1000			LIGHTING	20	1	8
9					2920/800		COKE MACHINE			10
11						2920/1000	RECEPTACLES			12
13	50	3	H&V #3	2920/800						14
15					2920/800					16
17						2920/800				18
19	40	2	UNIT KITCHEN	3800/800						20
21					3800/800					22
23	20	1	EXH. FAN			200/800				24
25			SPARE	/800						26
27					/800					28
29							SPACE			30
31										32
33										34
35										36
			TOTAL WATTS	14,580	14,380	9,980				
			AMPS	122	120	83				

ALEXANDER HARGIS PROFESSIONAL ENGINEER

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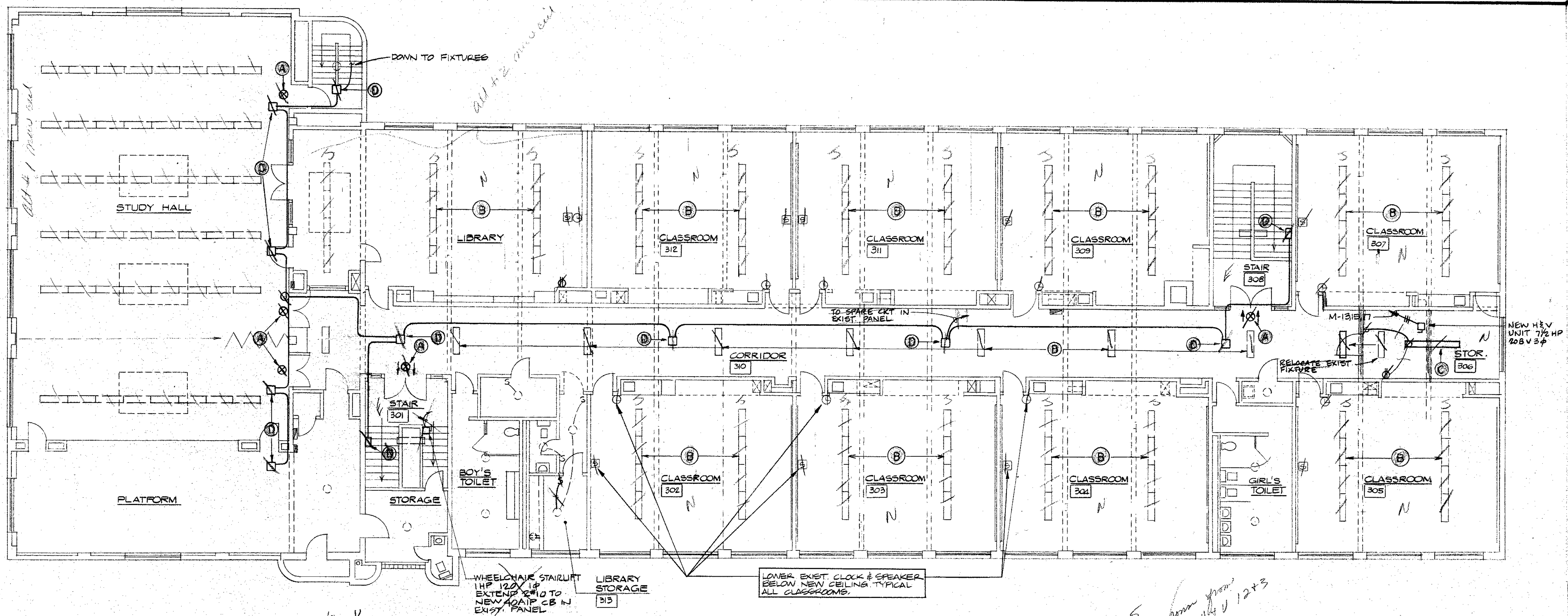
E-2



Delete

THIRD FLOOR PLAN - ELECTRICAL
SCALE: 1/8" = 1'-0"

Verify exact location of mic outlets on stage Addm #3

A-5 provide conn from smokes in H&V 1, 2 + 3 to f.a. system

ALEXANDER H. HARGIS

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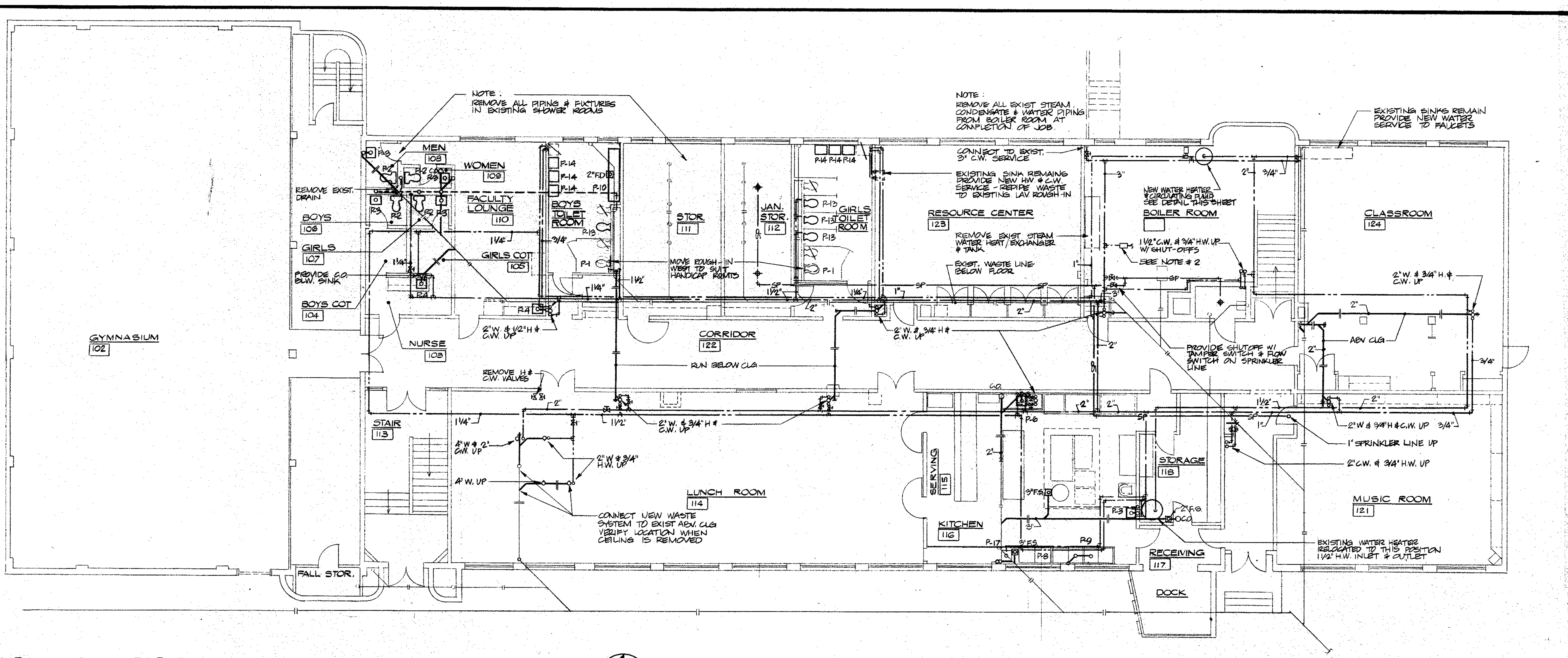
E-3



FIRST FLOOR PLAN - PLUMBING

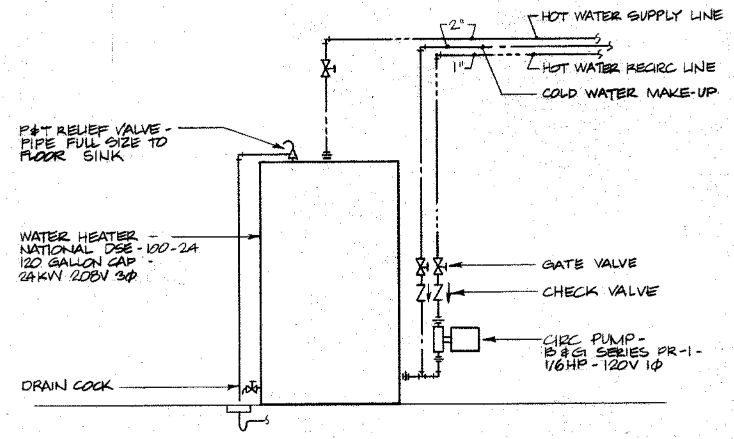
SCALE: 1/8" = 1'-0"

MECHANICAL LEGEND

—┼—	WASTE PIPING
— — —	VENT PIPING
—— - ——	COLD WATER PIPING
—— - - ——	HOT WATER PIPING
—— - - - ——	RECIRCULATING HOT WATER PIPING
┼⊡ F.D.	FLOOR DRAIN
—SP—	SPRINKLER PIPING
←☒→	CEILING SUPPLY DIFFUSER (ARROWS DENOTE THROW)
←⧄→	CEILING EXHAUST OR RETURN GRILLE
⊏□→	WALL SUPPLY REGISTER
⊏□←	WALL EXHAUST OR RETURN GRILLE
—┬—	VOLUME DAMPER
∿∿∿	FLEXIBLE DUCT RUNOUT
▨	SOUNDLINED DUCT
☒	SECTION THRU SUPPLY DUCT
⧄	SECTION THRU EXHAUST OR RETURN DUCT
Ⓣ	THERMOSTAT
┬ F.D.	FIRE DAMPER
—HWS—	HEATING WATER SUPPLY PIPING
—HWR—	HEATING WATER RETURN PIPING

NOTES:

1. RELOCATE EXISTING FIRE HYDRANT AT THE CORNER OF 9TH & BROAD STREETS TO PROVIDE 3' CLEARANCE AROUND HYDRANT FOR PROPER OPERATION.
2. PROVIDE NEW COLD WATER FEED FOR BOILER SEE DETAIL SHEET M-2.



WATER HEATER PIPING DIAGRAM

NO SCALE

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FIRST FLOOR PLAN - PLUMBING
MODERNIZATION OF
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MOUNT VERNON SCHOOL DISTRICT NO 320
MOUNT VERNOM, WA.

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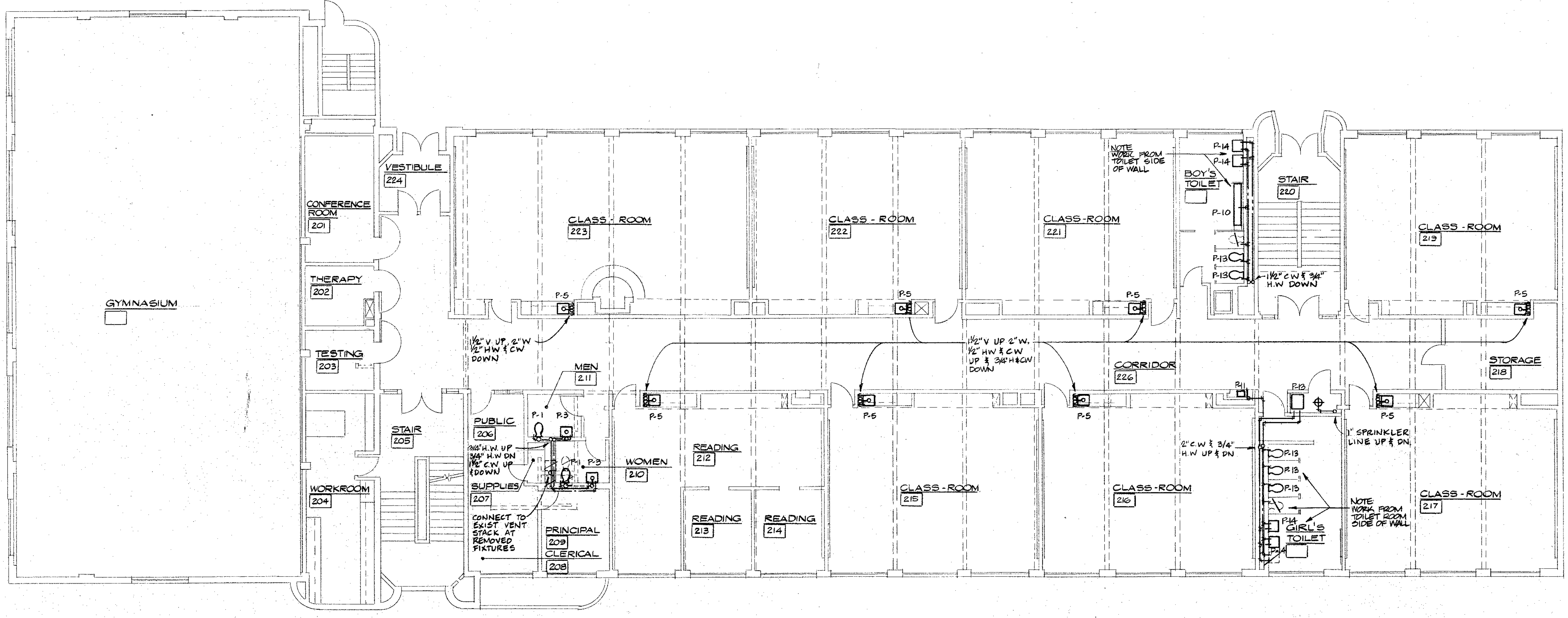
M-1

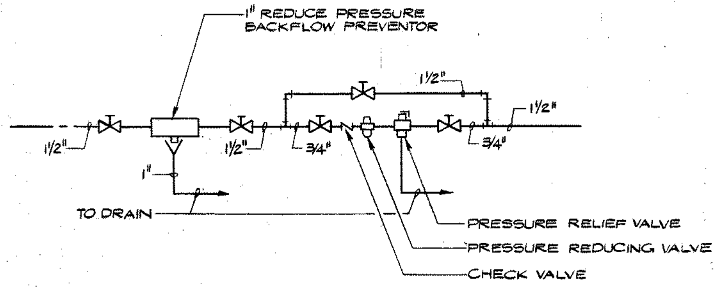


SECOND FLOOR PLAN – PLUMBING

SCALE: 1/8" = 1'-0"

FIXTURE CONNECTION SCHEDULE

P. NO	FIXTURE	WASTE	VENT	COLD WATER	HOT WATER	REMARKS
1	WATER CLOSET (FLUSH VALVE)	4"	2"	1"	—	
2	WATER CLOSET (FLUSH TANK)	4"	2"	1/2"	—	
3	LAVATORY	1½"	1½"	1/2"	1/2"	
4	SINK	2"	1½"	1/2"	1/2"	
5	CLASSROOM SINK	2"	1½"	1/2"	1/2"	
6	VEGETABLE SINK	2" F.S.	2"	1/2"	1/2"	
7	RINSE SINK	2"	2"	1/2"	1/2"	
8	DISHWASHER	3" F.S	2"	1/2"	3/4"	
9	POT SINK	2-2"	2-2"	1/2"	1/2"	
10	URINAL - REPLACEMENT	—	—	1"	—	
11	DRINKING FOUNTAIN - REPLACEMENT	—	—	1/2"	—	
12	SERVICE SINK - REPLACEMENT	—	—	3/4"	3/4"	
13	WATER CLOSET - REPLACEMENT	—	—	1"	—	
14	LAVATORY - REPLACEMENT	—	—	1/2"	1/2"	



HEATING SYSTEM WATER SUPPLY DETAIL

NO SCALE

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SECOND FLOOR PLAN – PLUMBING
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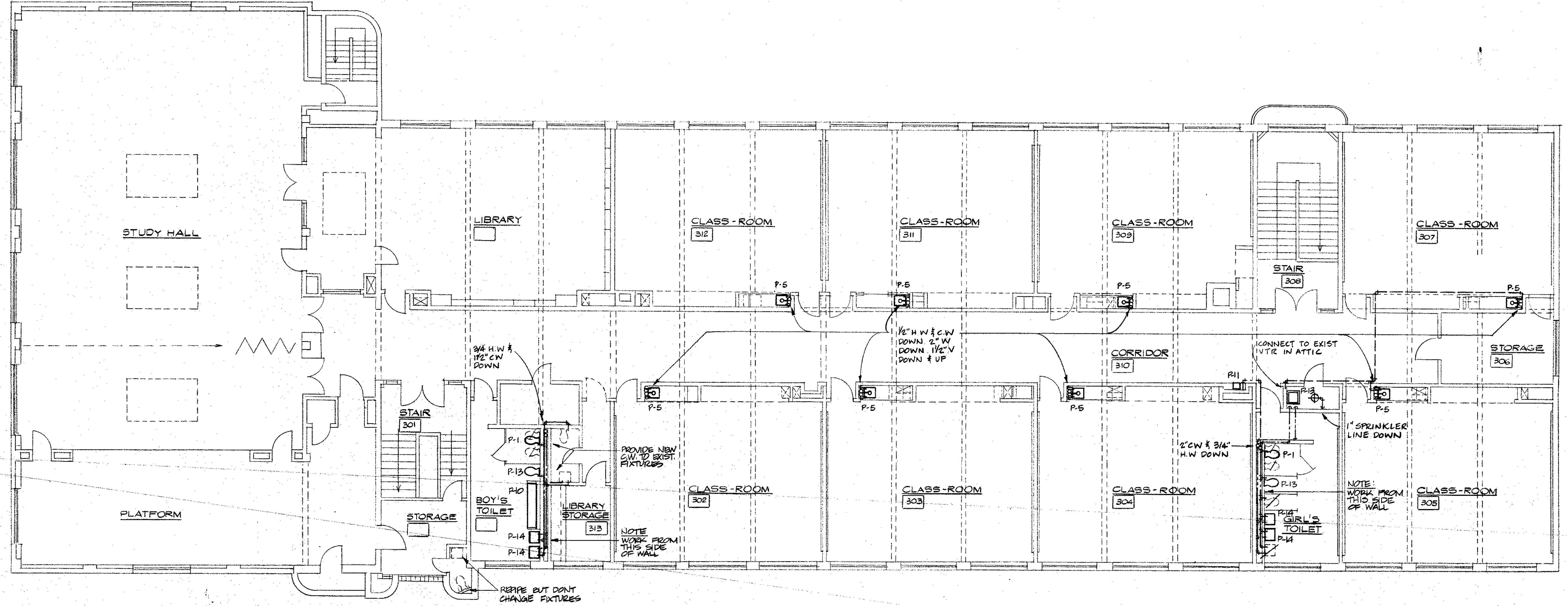
M-2



N

THIRD FLOOR PLAN – PLUMBING

SCALE: 1/8" = 1'-0"

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THIRD FLOOR PLAN – PLUMBING
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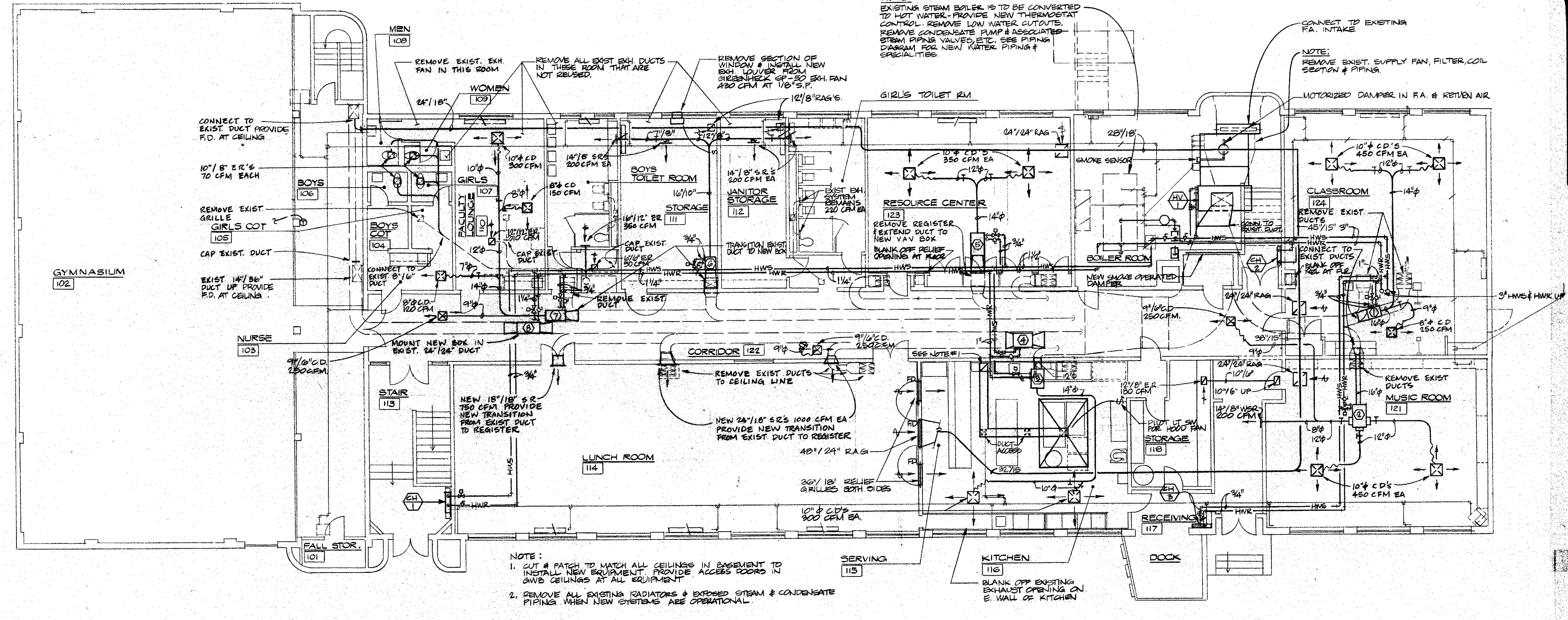
M-3



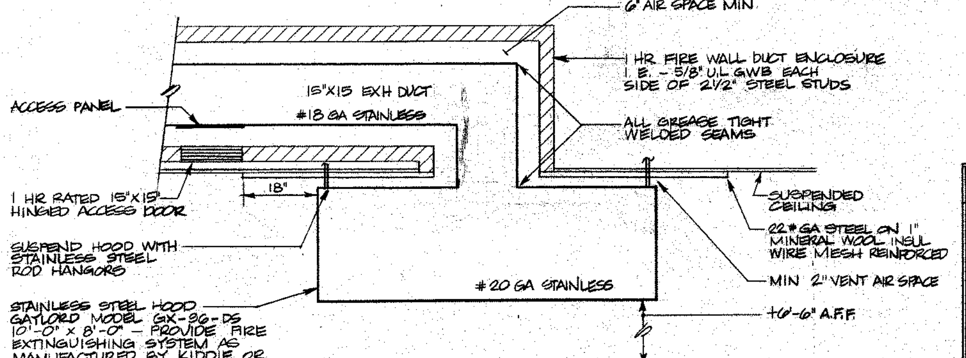
NOTE:
EXISTING STEAM BOILER IS TO BE CONVERTED TO HOT WATER - PROVIDE NEW THERMOSTAT CONTROL. REMOVE LOW WATER CUTOUTS, REMOVE CONDENSATE PUMP & ASSOCIATED STEAM PIPING VALVES, ETC. SEE PIPING DIAGRAM FOR NEW WATER PIPING & SPECIALITIES.

NOTE:
REMOVE EXIST. SUPPLY FAN, FILTER, COIL SECTION & PIPING.

NOTE:
1. CUT & PATCH TO MATCH ALL CEILINGS IN BASEMENT TO INSTALL NEW EQUIPMENT. PROVIDE ACCESS DOORS IN GWB CEILINGS AT ALL EQUIPMENT
2. REMOVE ALL EXISTING RADIATORS & EXPOSED STEAM & CONDENSATE PIPING WHEN NEW SYSTEMS ARE OPERATIONAL.

FIRST FLOOR PLAN - HEATING

SCALE: 1/8" = 1'-0"



STAINLESS STEEL HOOD GAYLORD MODEL GX-96-DS 10'-0" x 8'-0" - PROVIDE FIRE EXTINGUISHING SYSTEM AS MANUFACTURED BY KIDDIE OR APPROVED EQUAL. FIRE MARSHALL APPROVAL ON DESIGN REQUIRED INCLUDE STORAGE BOTTLE, NOZZELS PIPING, ETC. PROVIDE LIGHTS.

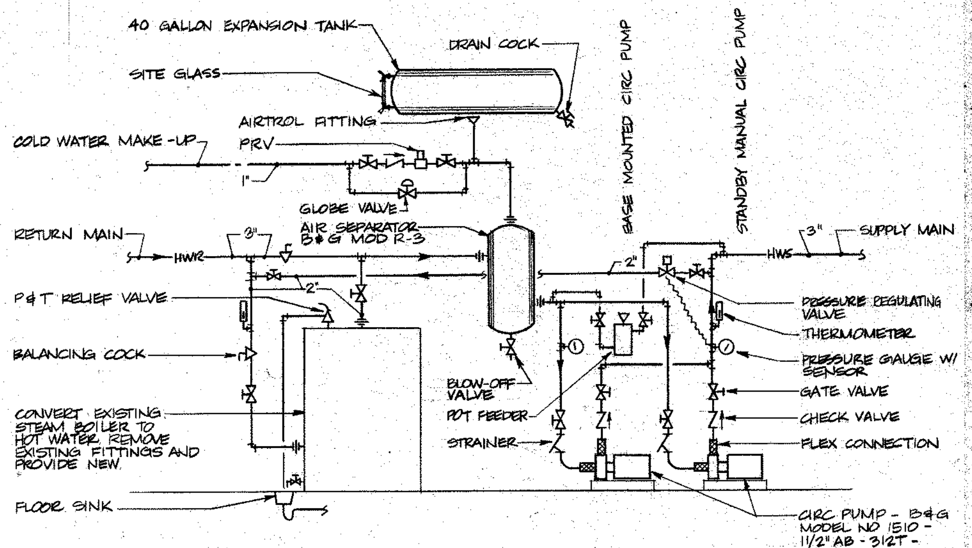
KITCHEN HOOD DETAIL

NO SCALE

CABINET HEATER SCHEDULE

HTR. NO.	MAKE & MODEL	HEATING CAPACITY @ 180° E.W.T.	GPM	CFM	REMARKS
CH 1	STERLING F-C30-2	14.5 MBH	2.0	200	18.7° WATER TEMP DROP
CH 2	↓ F-C30-2	14.5 MBH	2.0	200	↓
CH 3	F-C30-1	7.0 MBH	0.5	200	36.4°
CH 4	↓ F-C30-1	7.0 MBH	0.5	200	↓ ↓ ↓ ↓

NOTES:
1. PROVIDE 15"/15" KITCHEN EXHAUST DUCT UP TO UPBLAST UTILITY FAN ON ROOF PROVIDE 18GA. STAINLESS STEEL DUCTWORK W/ ACCESS PANELS FOR CLEANING AS SHOWN ON PLAN AT EACH LEVEL.



BOILER PIPING DIAGRAM

NO SCALE

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MOUNT VERNOM, WA.

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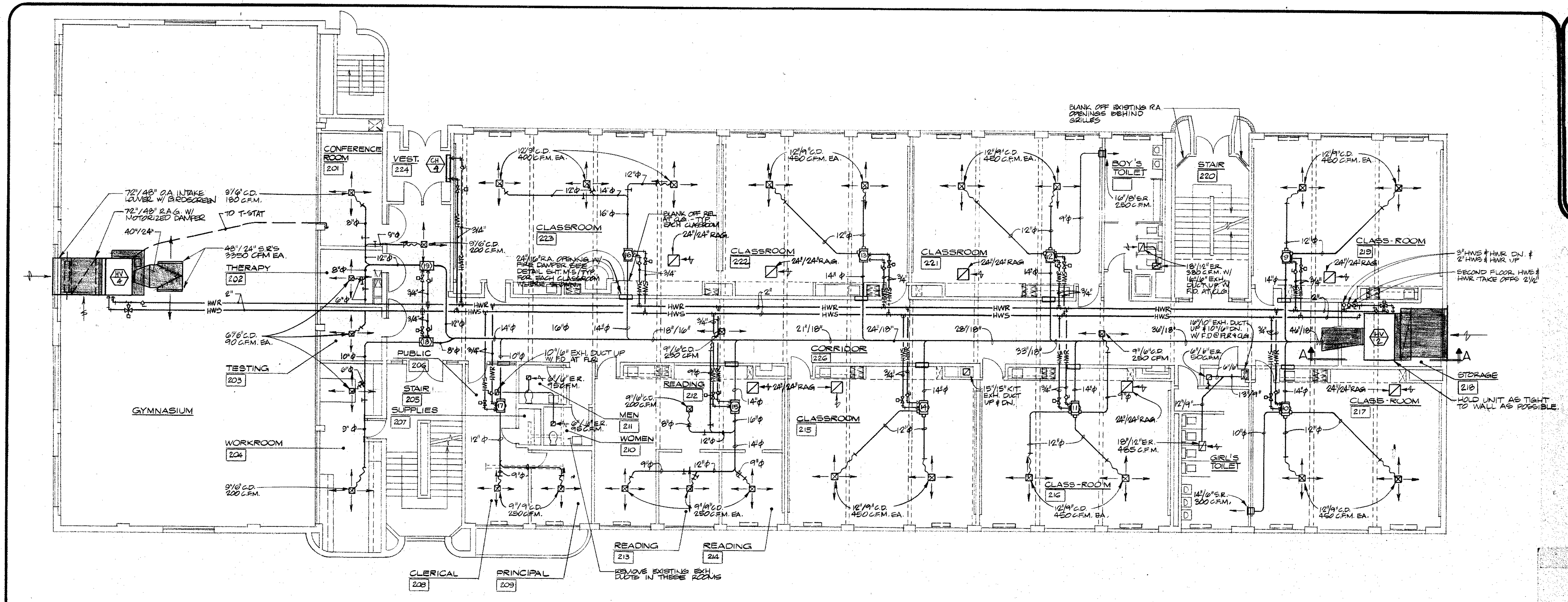
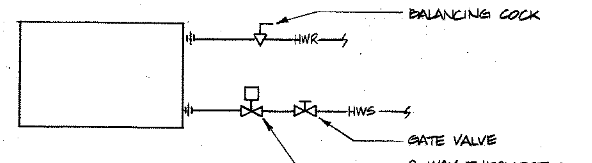
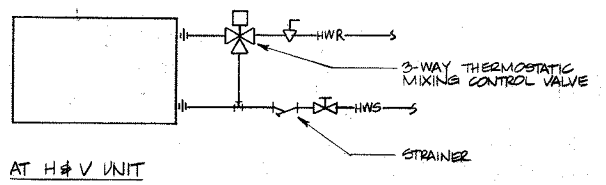


SECOND FLOOR PLAN - HEATING

SCALE: 1/8" = 1'-0"



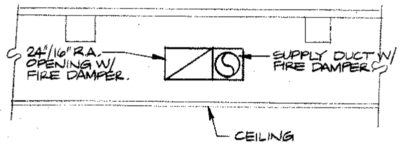
AT VAV BOX



AT H & V UNIT

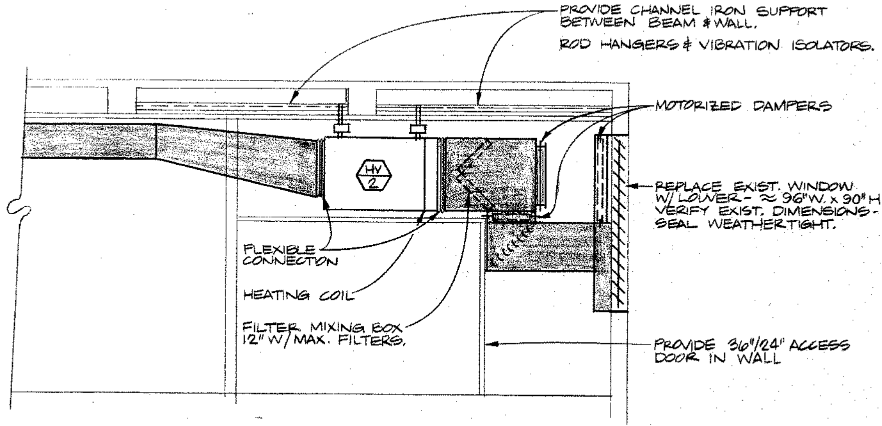
COIL PIPING DIAGRAMS

NO SCALE



TYPICAL CORRIDOR WALL PENETRATION DETAIL AT CLASSROOMS, OFFICES, ETC.

SCALE: 1/4" = 1'-0"



SECTION A-A (HV-3 SIMILAR)

SCALE: 1/4" = 1'-0"

ALEXANDER K. HARRIS

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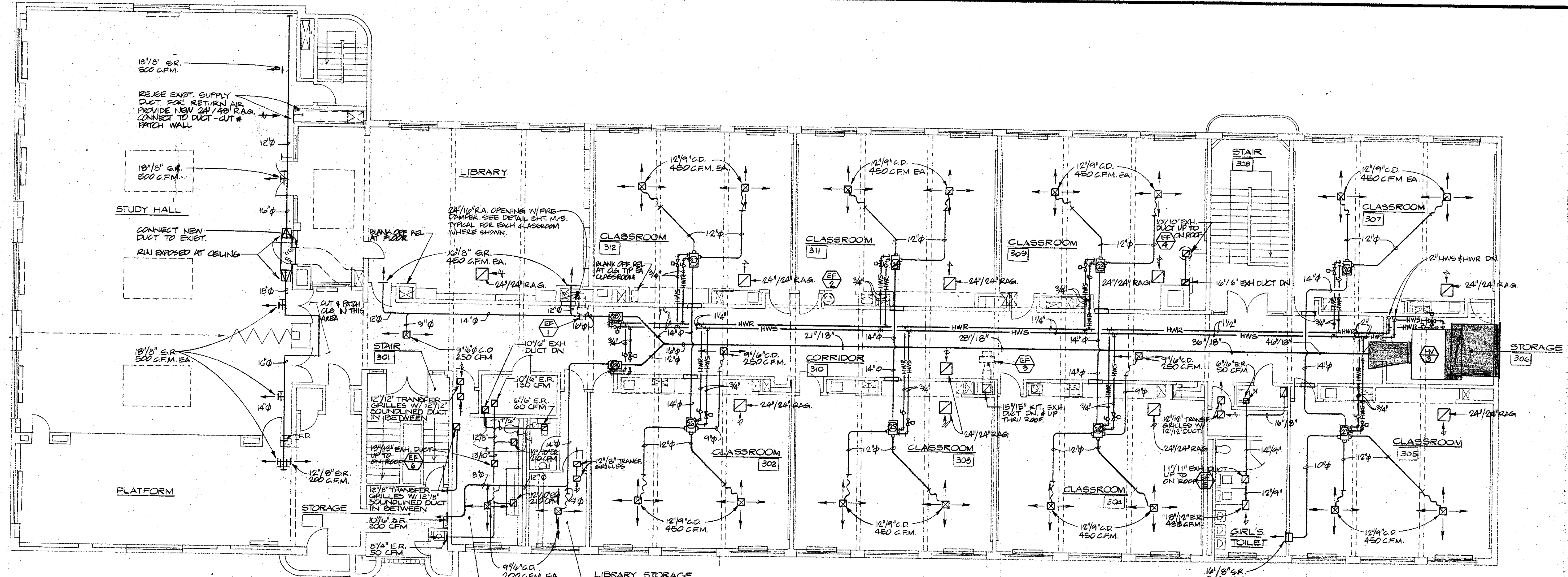


NOTE: PROVIDE MANUAL AIR VENTS AT HIGH POINT OF SYSTEM

THIRD FLOOR PLAN - HEATING

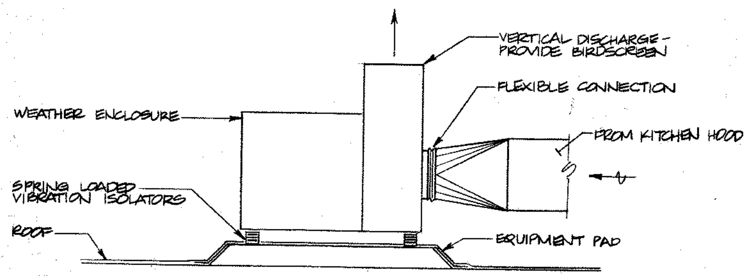
SCALE: 1/8" = 1'-0"

V A V TERMINAL BOX SCHEDULE

BOX NO.	SERVES	MAKE & MODEL	CFM	DUCT CONNECTION
1	CLSRM 124	TEMPMASTER TYPE S-51200	1150	10" OVAL
2	MUSIC 121	1600	1350	12" OVAL
3	KITCHEN 116	600	600	7" φ
4	LUNCHRM 114	3000	3000	16" OVAL
5	RESOURCE 123	800	700	8" φ
6	TOILETS BOYS, GIRLS 1ST FLOOR	↓	800	↓
7	FAC. LOUNGE 110	1200	820	10" OVAL
8	STUDY HALL 3RD FL	3000	2700	16" OVAL
9	CLSRM 219	1200	900	10" OVAL
10	CLSRM 217		1200	
11	CLSRM 216		1150	
12	CLSRM 221		1150	
13	CLSRM 222		900	
14	CLSRM 215		900	
15	READING 212-214		1250	
16	CLSRM 223	↓	1200	↓
17	CLERK 208 PRIN 209	600	500	7" φ
18	WKRM 204	400	290	6" φ
19	CONF 201 THER 202 TEST 203	600	560	7" φ
20	CLSRM 307	1200	900	10" OVAL
21	CLSRM 305		1200	
22	CLSRM 304		1150	
23	CLSRM 309		900	
24	CLSRM 311		900	
25	CLSRM 303		900	
26	CLSRM 302		1150	
27	CLSRM 312		900	
28	LIBRARY	↓	1150	↓
29	BOYS TOILET	600	600	7" φ

H & V UNIT SCHEDULE

UNIT NO	MAKE & MODEL	CFM	ESP	RPM	MOTOR	HEATING CAP AT 170° A.W.T.	GPM	REMARKS
HV 1	TRANE NO. 21C HDT	11120	2.5"	820	10HP 208V 3φ	160 MBH	16	TYPE W HEAT COIL 72"x30" -2 ROW 80 FINS/FT. 20° WTD
HV 2	NO. 17A HDT	9950	2.0"	740	7 1/2 HP 208V 3φ	85 MBH	8.5	TYPE W HEAT COIL 66x30" -2 ROW 85 FINS/FT 20° WTD
HV 3	NO. 17A HDT	9750	2.0"	735	7 1/2 HP 208V 3φ	85 MBH	8.5	
HV 4	↓ NO. 14A	6700	07"	440	2 HP 208V 3φ	167 MBH	16.7	



EXHAUST FAN #3 DETAIL

NO SCALE E.F. #1 SIMILAR W/ HORIZONTAL DISCHARGE

EXHAUST FAN SCHEDULE

FAN NO.	MAKE & MODEL	CFM	ESP	RPM	MOTOR	REMARKS
EF 1	GREENHECK 12 SWB	990	.6	1300	1/3 HP 120V 1φ	
EF 2	G-95D	440	.5	1550	1/8 HP 120V 1φ	PROVIDE SOLID STATE SPEED CONTROLLER MTD INSIDE FAN
EF 3	15 SWB	2500	.75	1500	1 HP 208V 3φ	
EF 4	G-85D	380	.3	1550	1/20 HP 120V 1φ	PROVIDE SOLID STATE SPEED CONTROLLER MTD INSIDE FAN
EF 5	GB-14-4	1285	.4	940	1/4 HP 120V 1φ	
EF 6	↓ GB-10-4	850	.4	1300	1/4 HP 120V 1φ	

PROFESSIONAL ENGINEER

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Appendix F: FEMA E-74 Nonstructural Seismic Bracing Excerpts

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Life Safety Systems

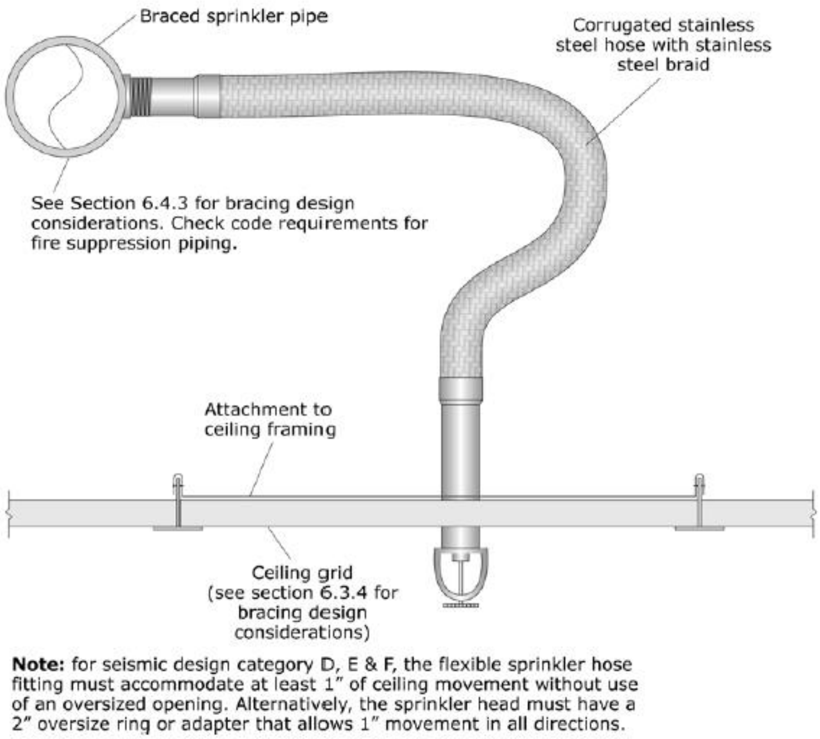


Figure G-1. Flexible Sprinkler Drop.

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

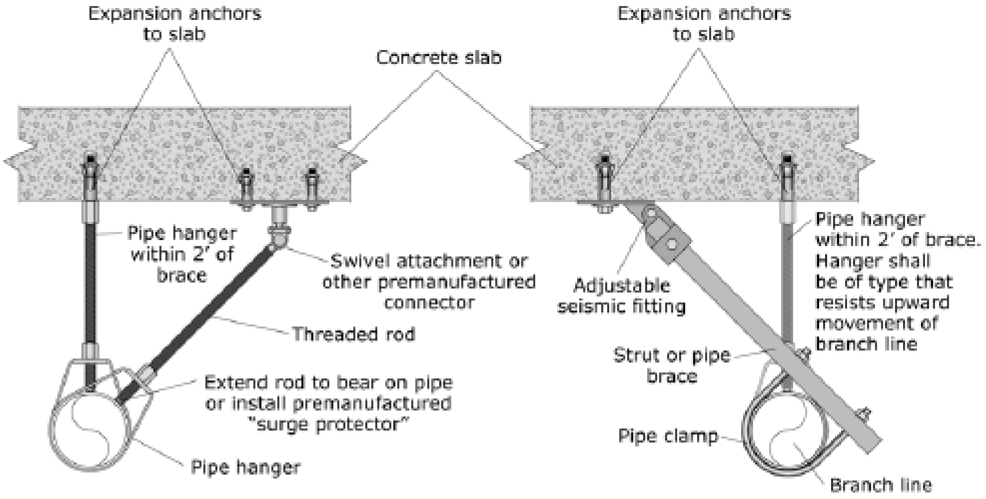


Figure G-2. End of Line Restraint.

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

Partitions

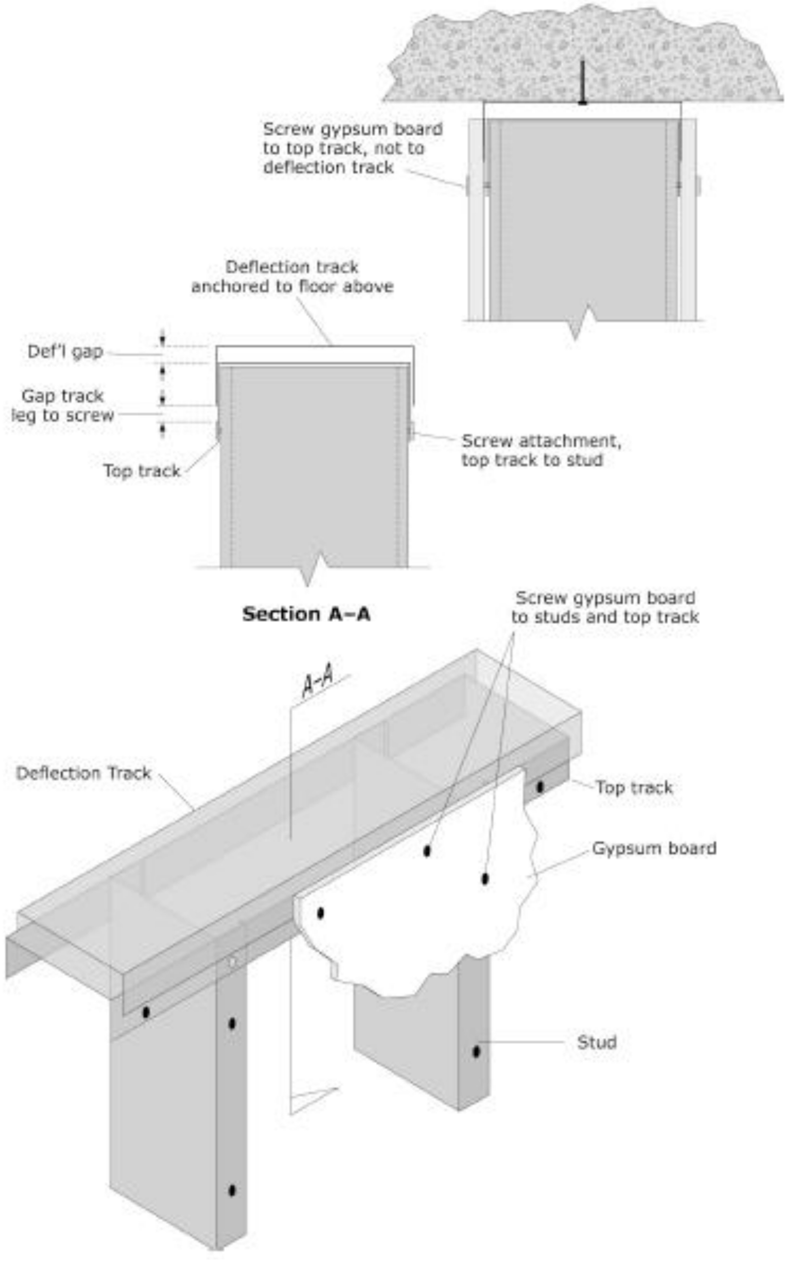


Figure G-3. Mitigation Schemes for Bracing the Tops of Metal Stud Partitions Walls.

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

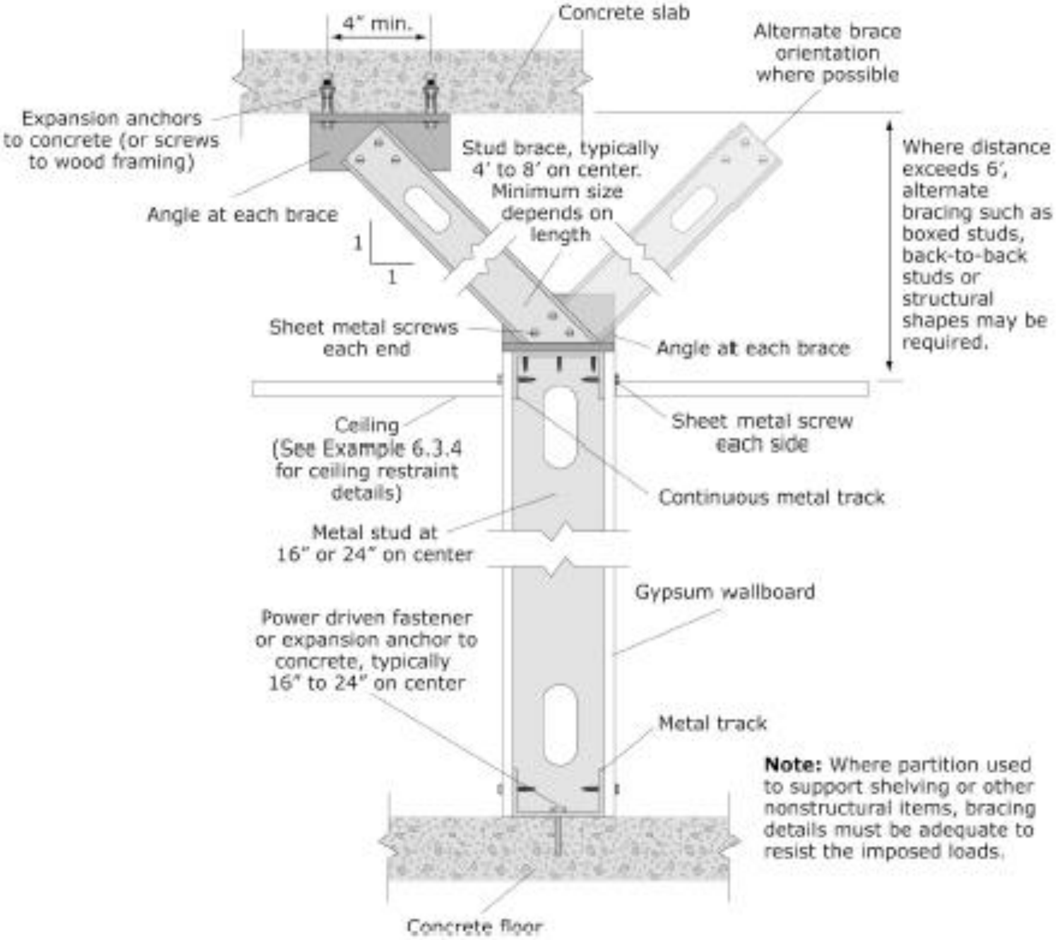
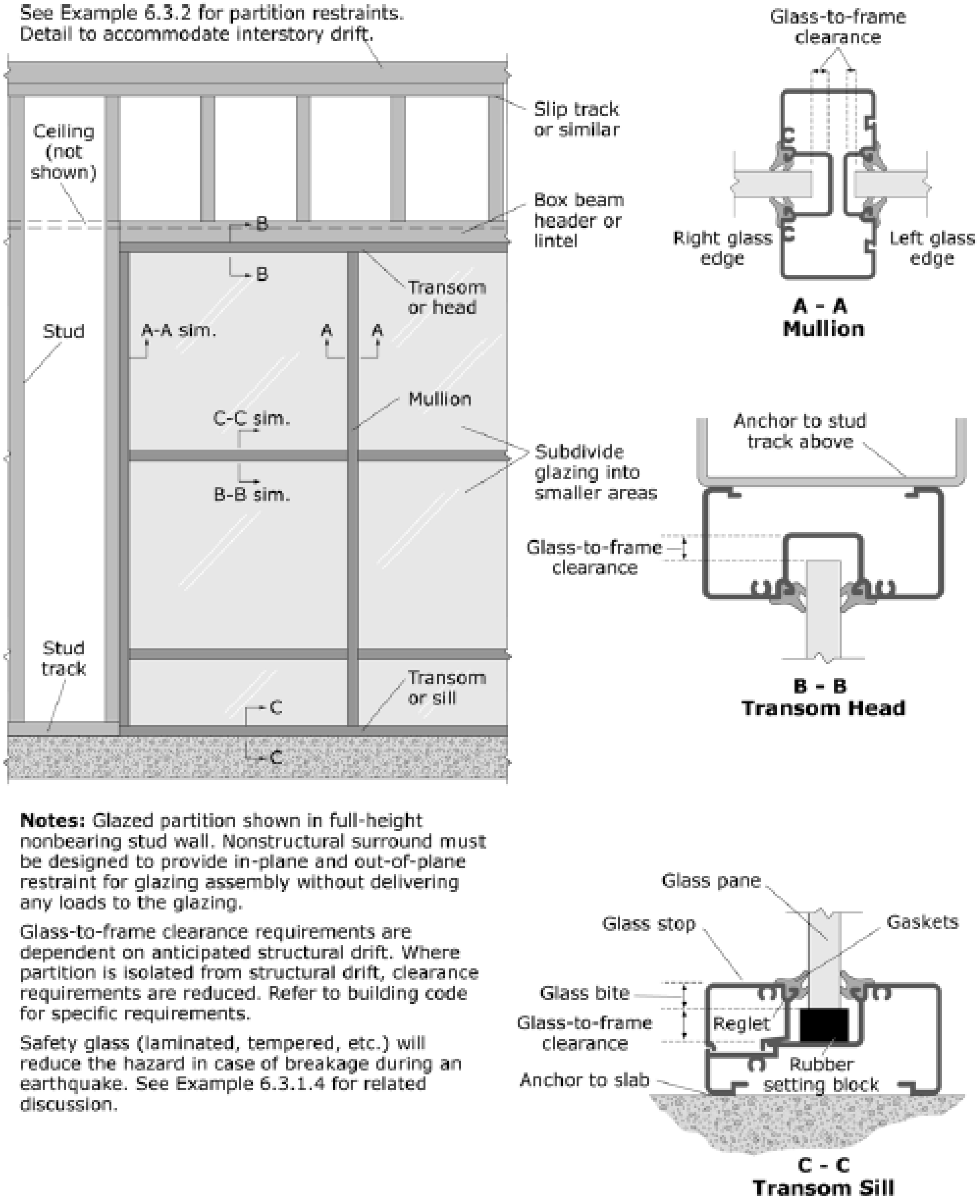


Figure G-4. Mitigation Schemes for Bracing the Tops of Metal Stud Partitions Walls.

(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)

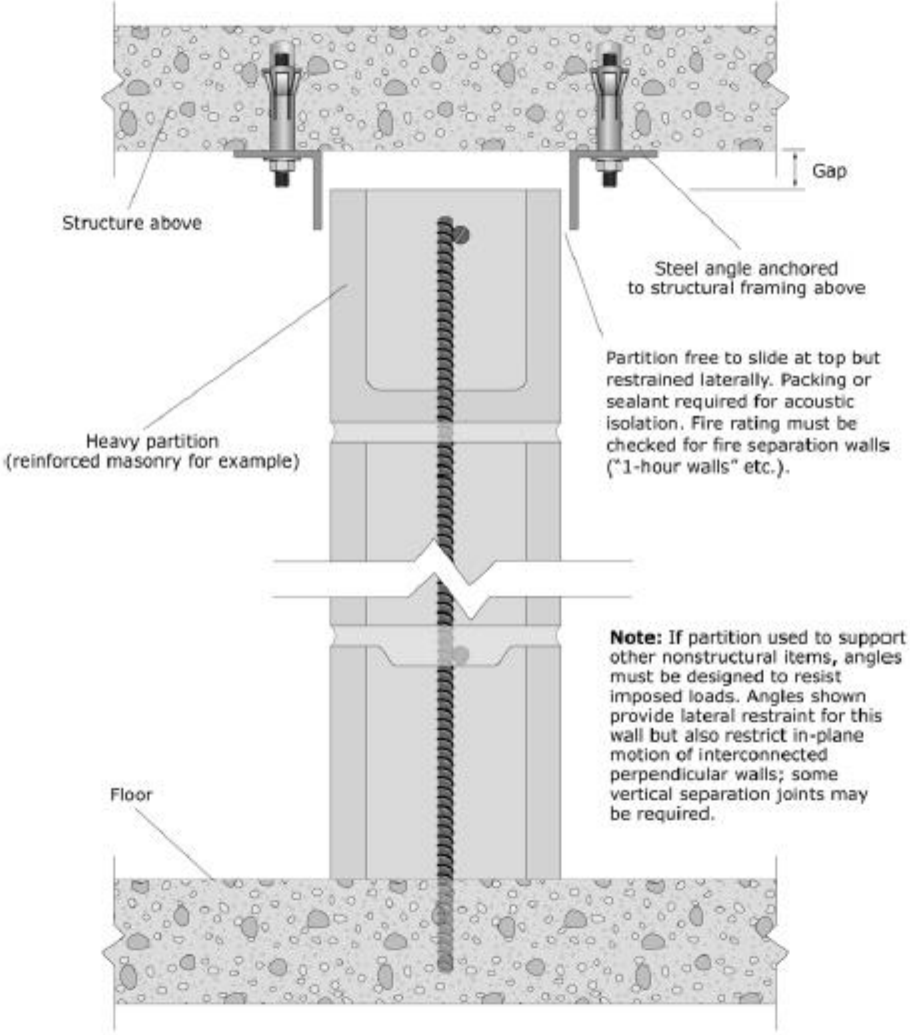


Figure G-6. Full-height Heavy Partition.

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

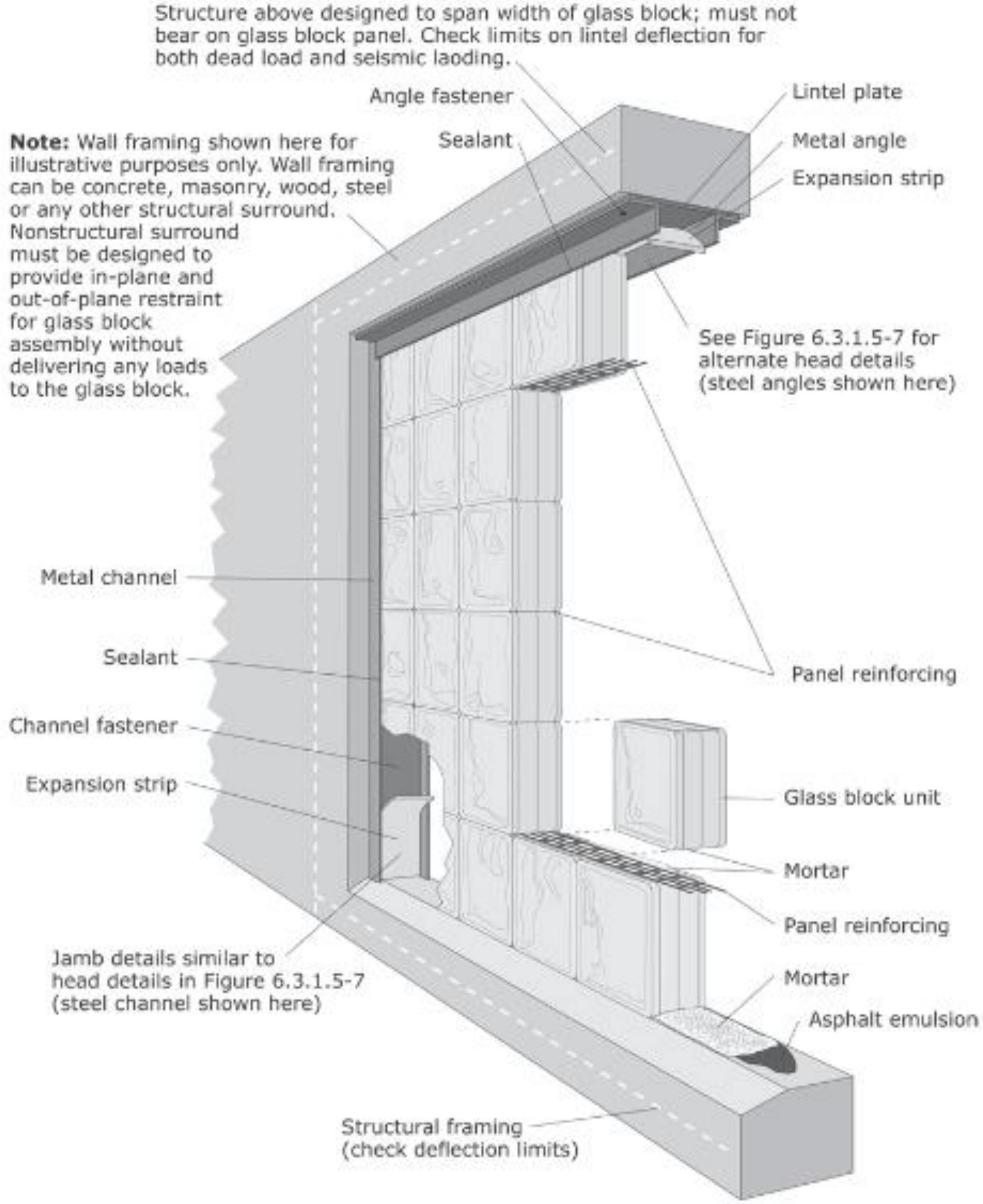


Figure G-7. Typical Glass Block Panel Details.

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

Ceilings

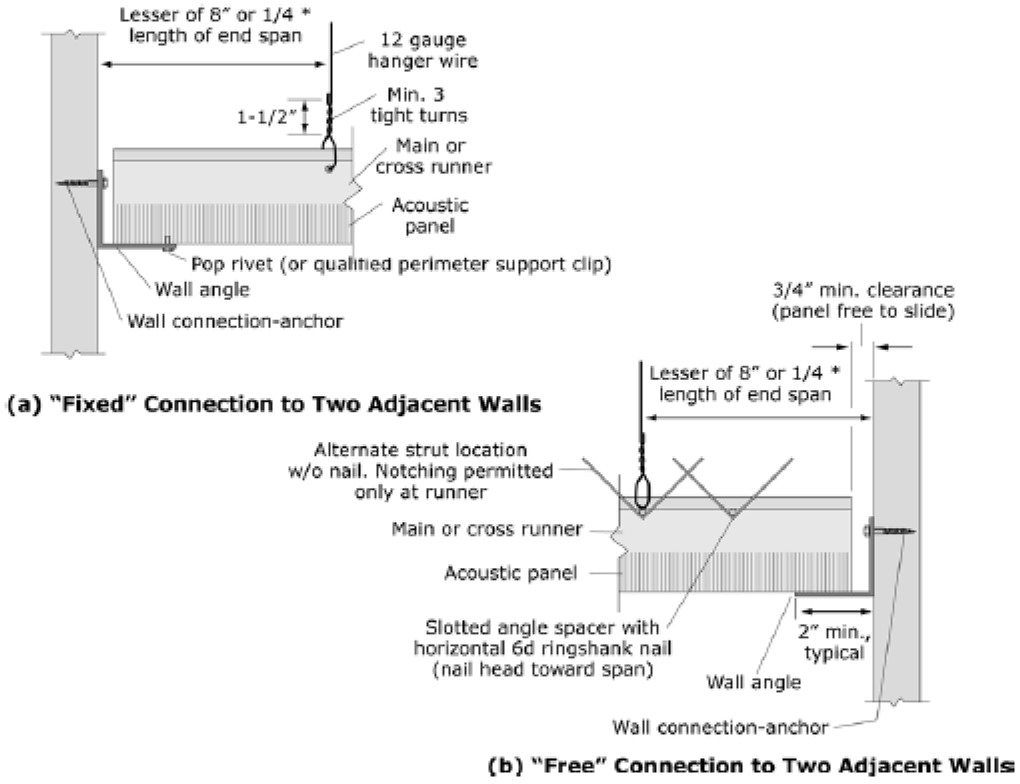
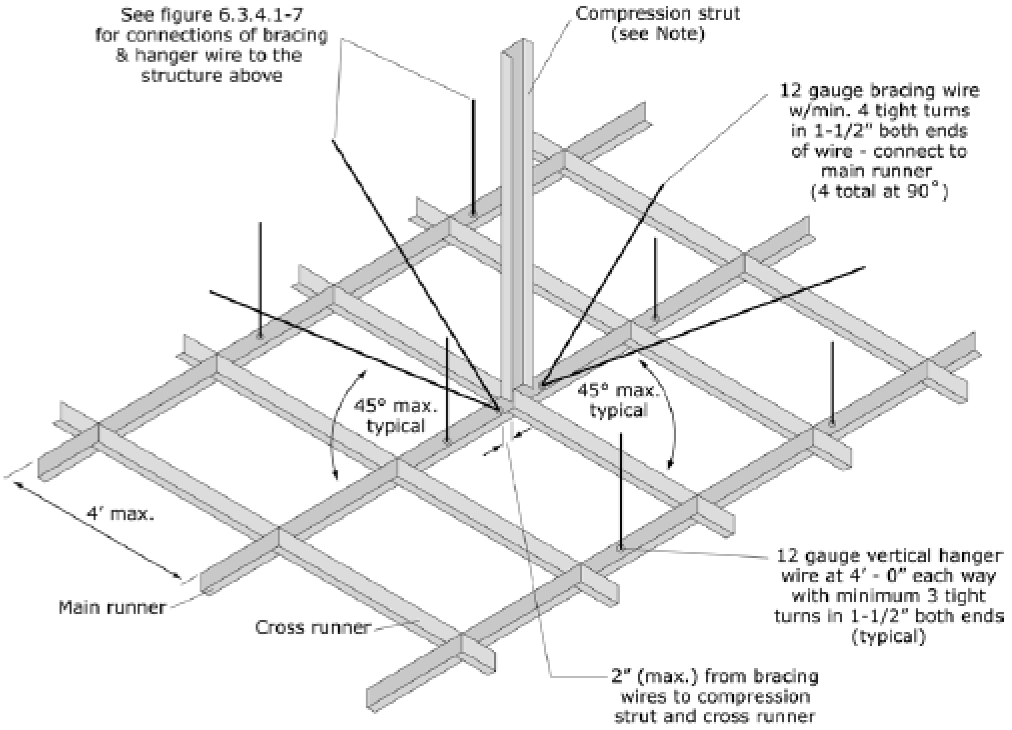


Figure G-8. Suspension System for Acoustic Lay-in Panel Ceilings – Edge Conditions.

(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)

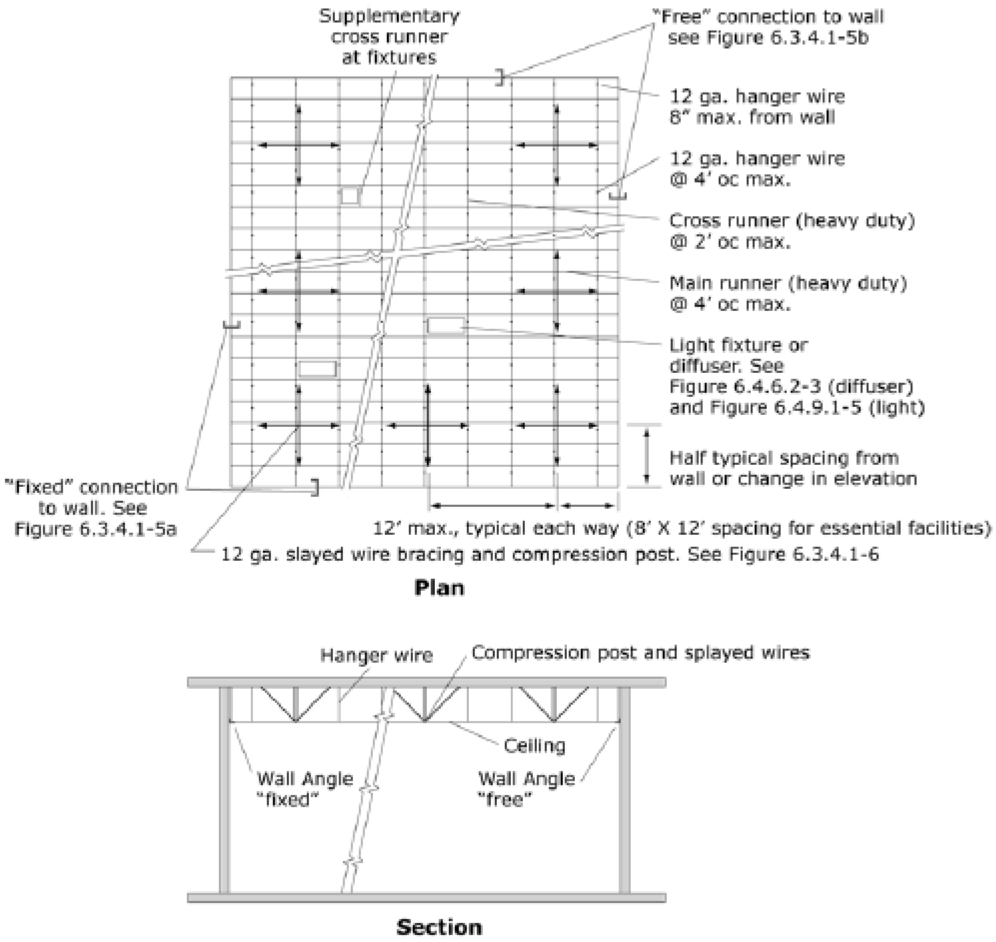
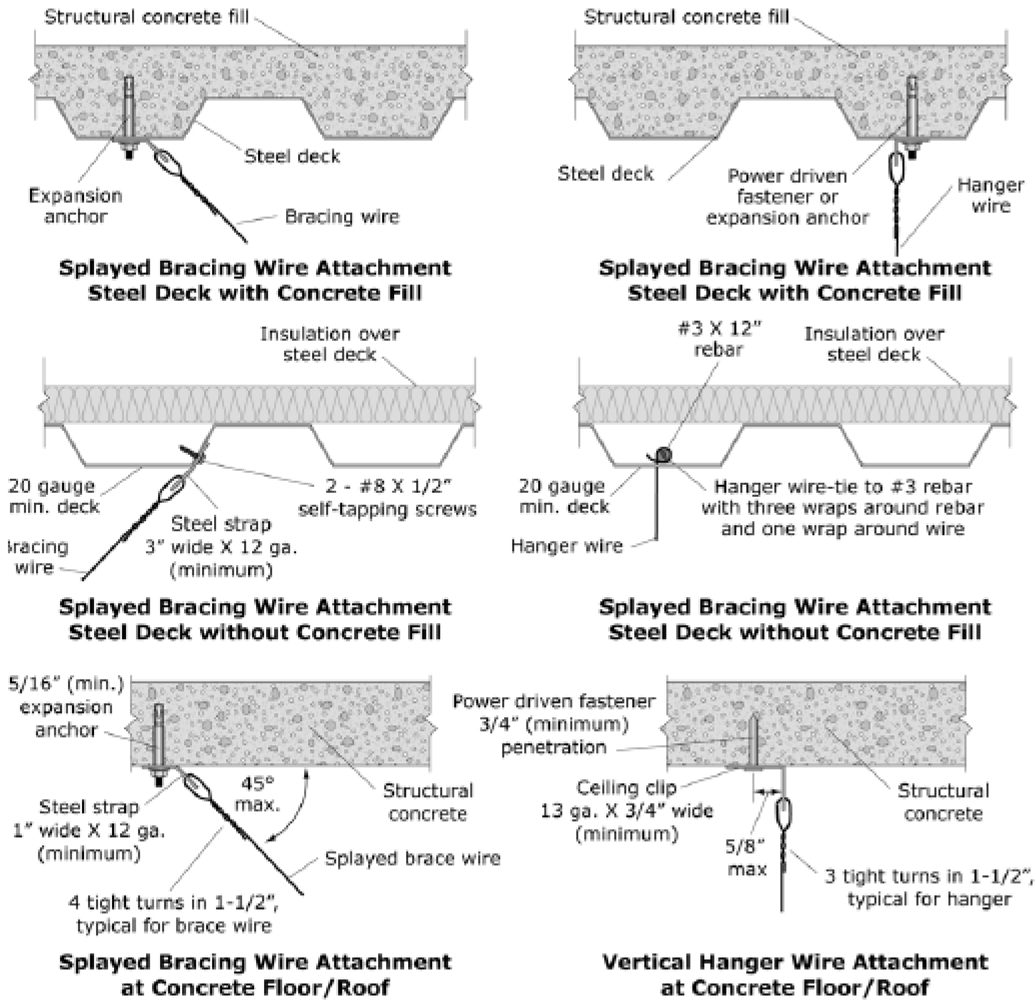


Figure G-10. Suspension System for Acoustic Lay-in Panel Ceilings – General Bracing Layout.

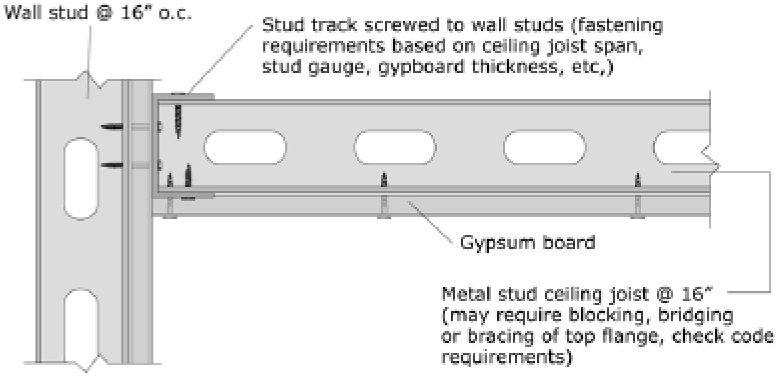
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



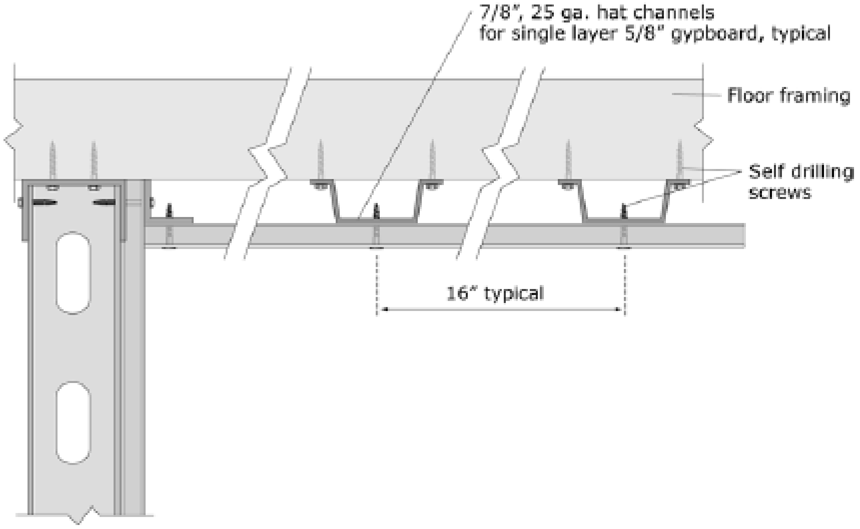
Note: See California DSA IR 25-5 (06-22-09) for additional information.

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)

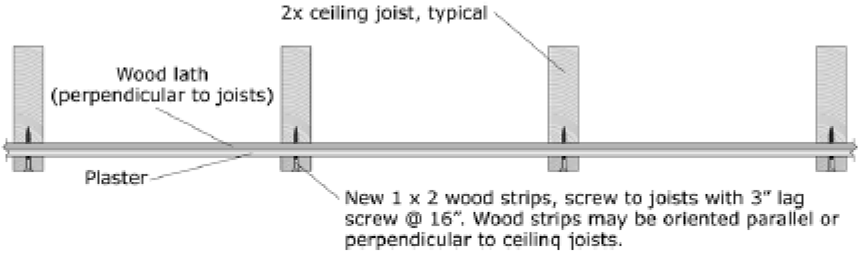


Figure G-13. Retrofit Detail for Existing Lath and Plaster.

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

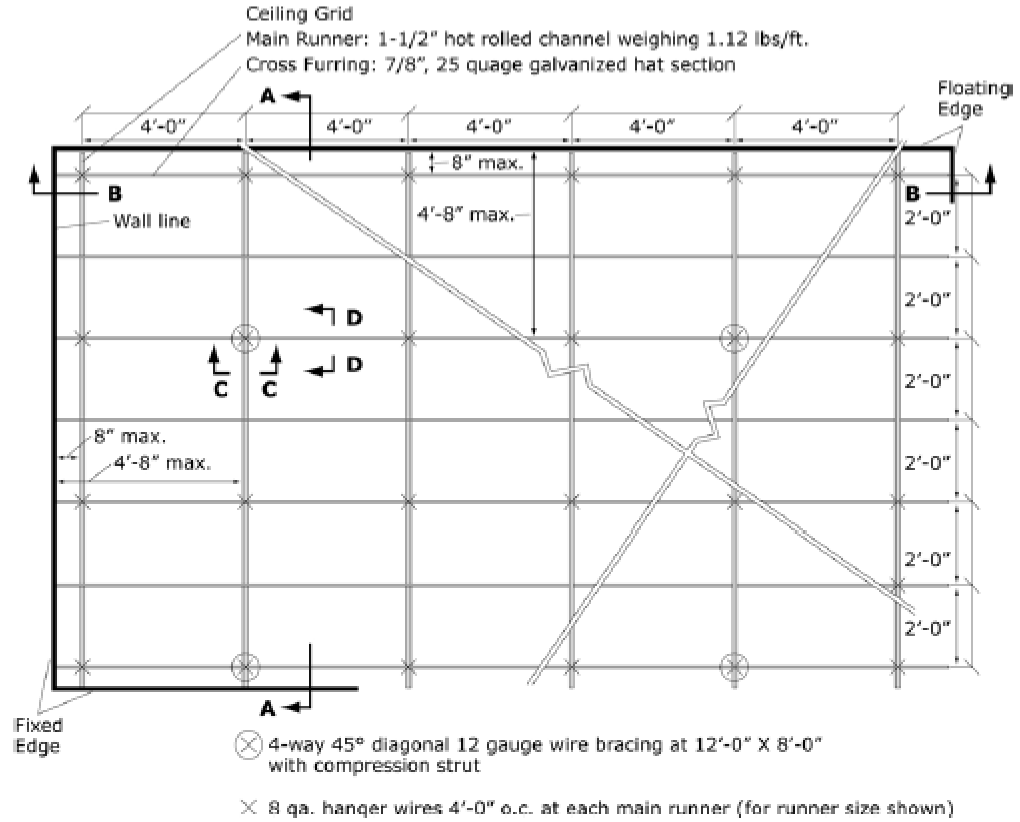
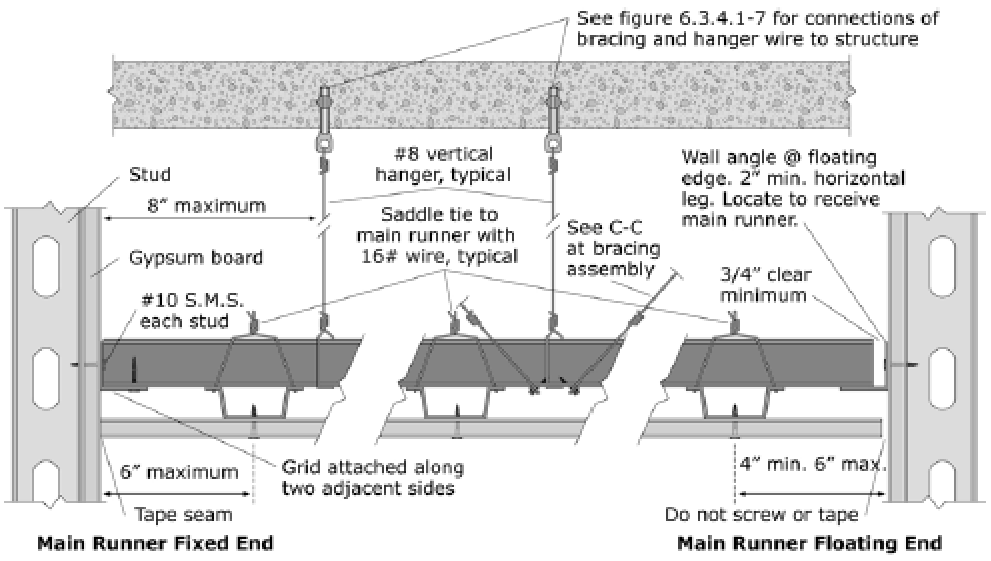
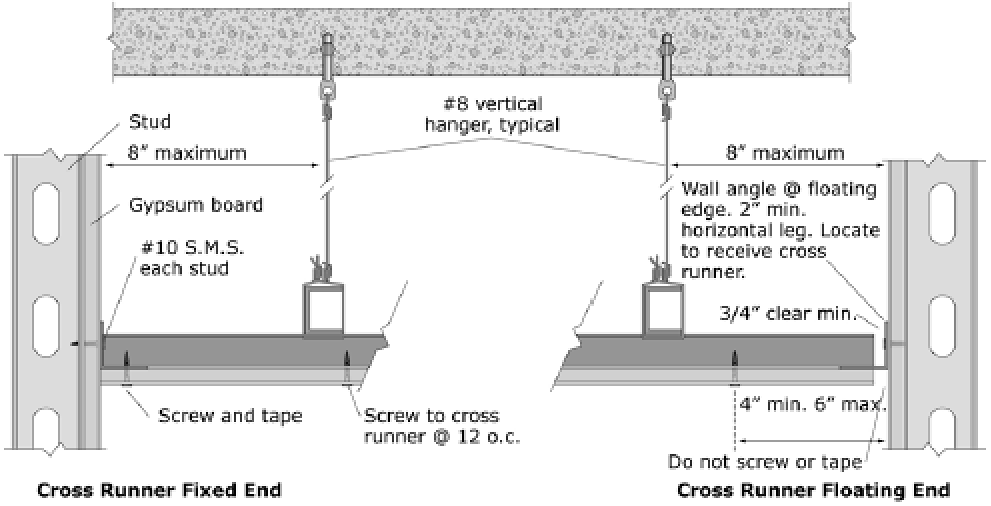


Figure G-14. Diagrammatic View of Suspended Heavy Ceiling Grid and Lateral Bracing.

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



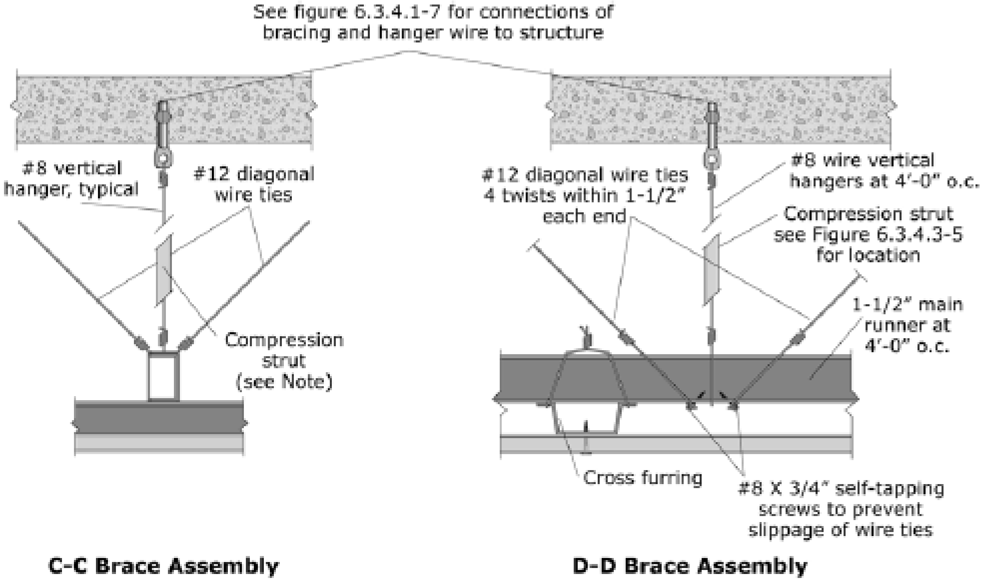
A-A Main Runner at Perimeter



B-B Cross Runner at Perimeter

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 ($l/r \le 200$). 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

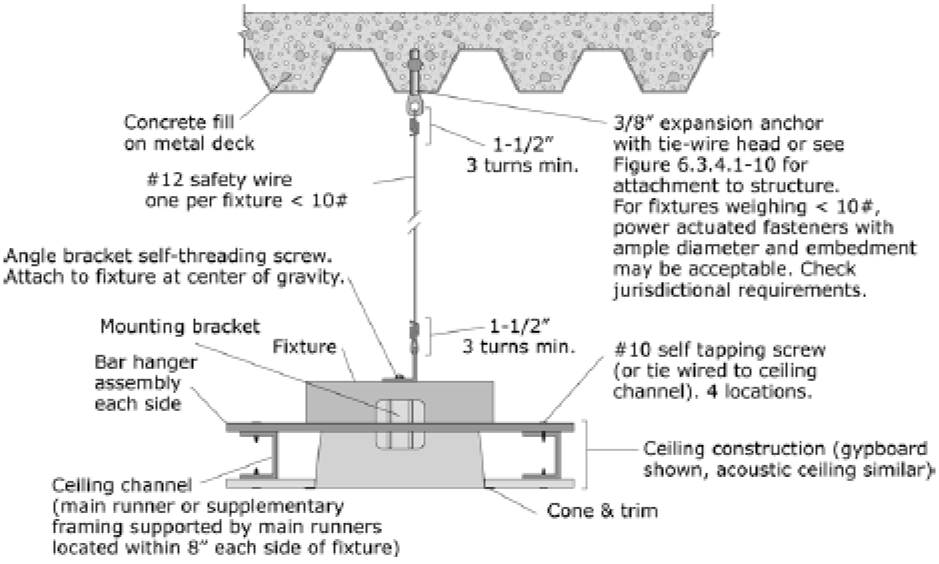


Figure G-17. Recessed Light Fixture in suspended Ceiling (Fixture Weight < 10 pounds).

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

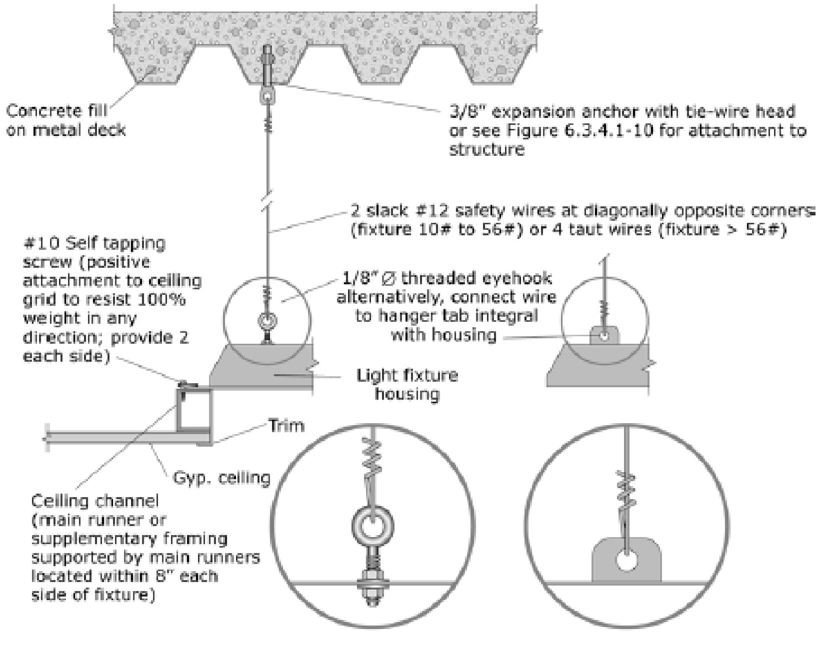
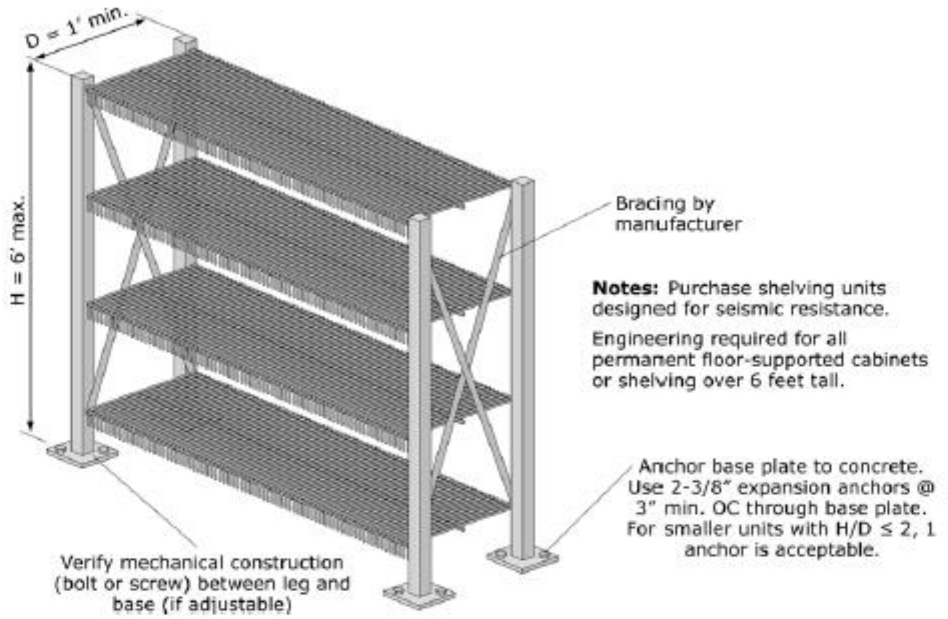


Figure G-18. Recessed Light Fixture in suspended Ceiling (Fixture Weight 10 to 56 pounds).

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

Contents and Furnishings



Bracing by manufacturer

Notes: Purchase shelving units designed for seismic resistance.

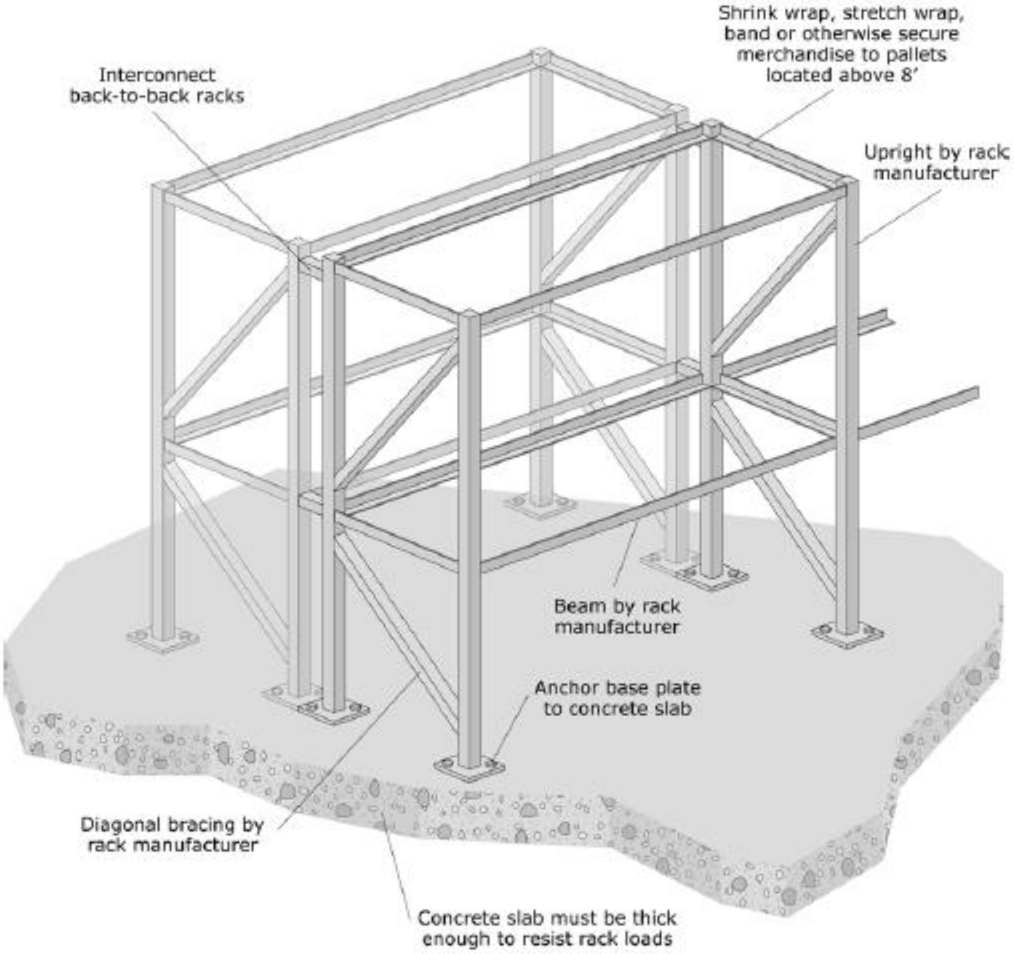
Engineering required for all permanent floor-supported cabinets or shelving over 6 feet tall.

Anchor base plate to concrete. Use 2-3/8" expansion anchors @ 3" min. OC through base plate. For smaller units with H/D ≤ 2, 1 anchor is acceptable.

Verify mechanical construction (bolt or screw) between leg and base (if adjustable)

Figure G-19. Light Storage Racks.

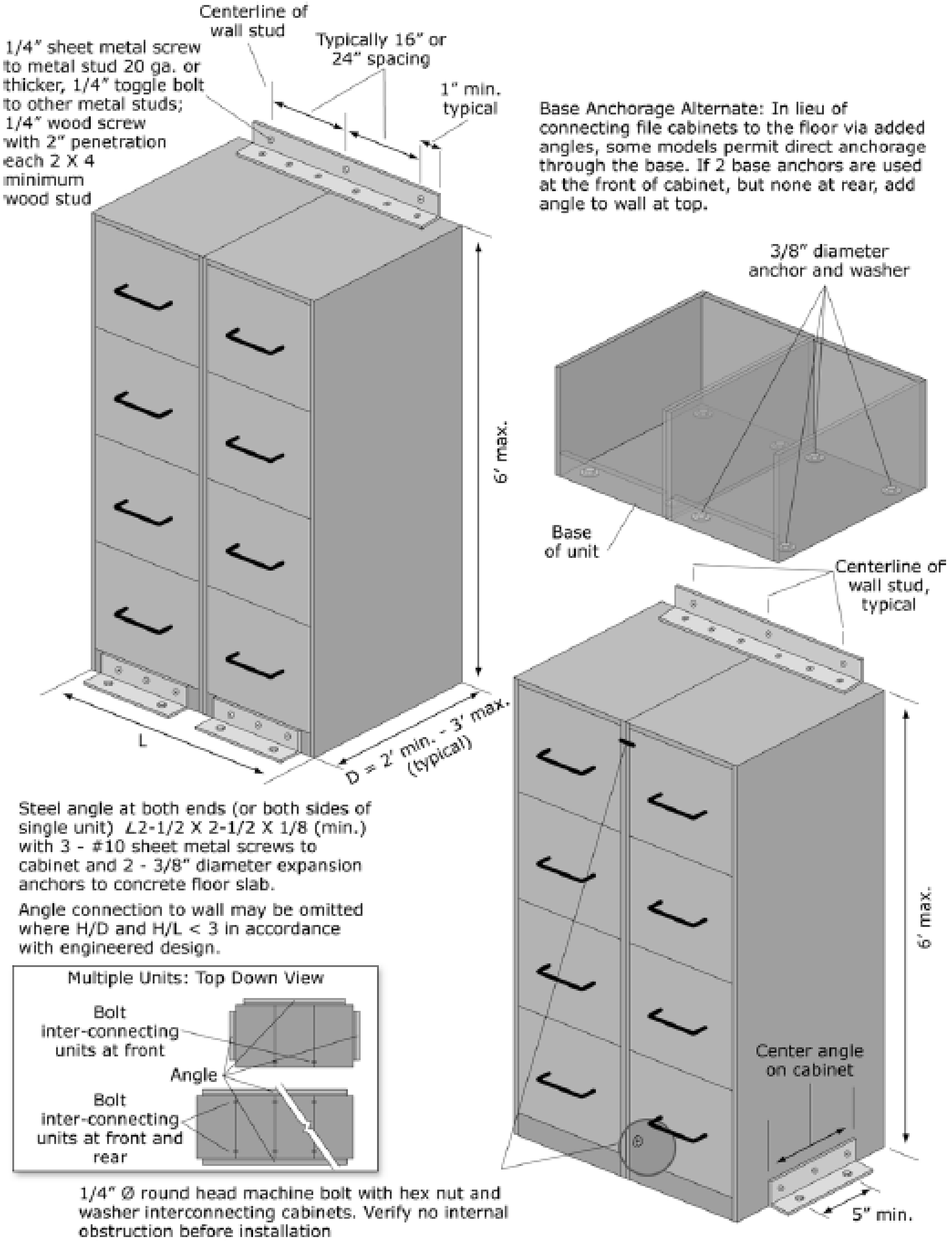
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



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)



1/4" sheet metal screw to metal stud 20 ga. or thicker, 1/4" toggle bolt to other metal studs; 1/4" wood screw with 2" penetration each 2 X 4 minimum wood stud

Base Anchorage Alternate: In lieu of connecting file cabinets to the floor via added angles, some models permit direct anchorage through the base. If 2 base anchors are used at the front of cabinet, but none at rear, add angle to wall at top.

Steel angle at both ends (or both sides of single unit) ∠2-1/2 X 2-1/2 X 1/8 (min.) with 3 - #10 sheet metal screws to cabinet and 2 - 3/8" diameter expansion anchors to concrete floor slab.

Angle connection to wall may be omitted where H/D and H/L < 3 in accordance with engineered design.

1/4" Ø round head machine bolt with hex nut and washer interconnecting cabinets. Verify no internal obstruction before installation

Figure G-21. Wall-mounted File Cabinets.

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

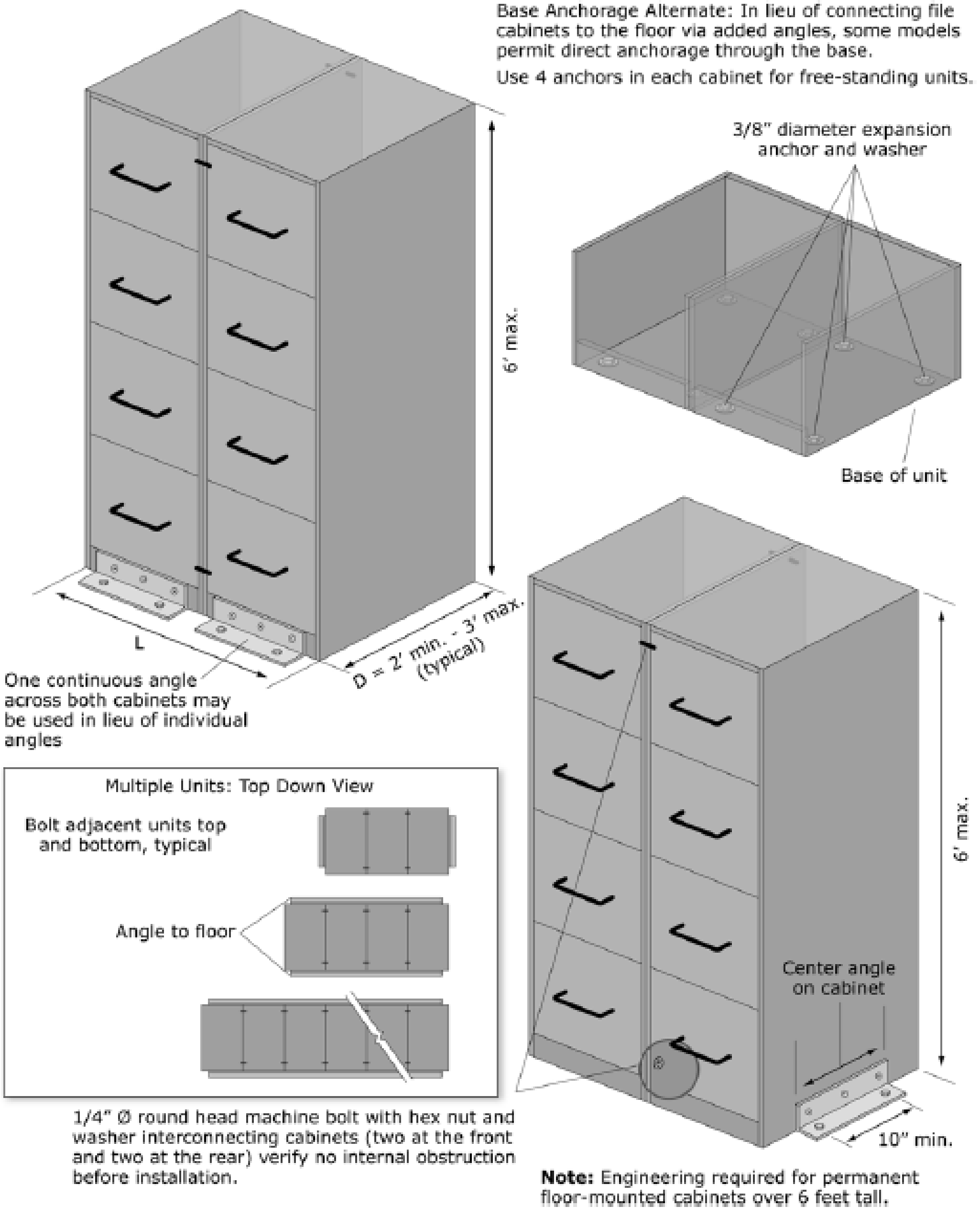
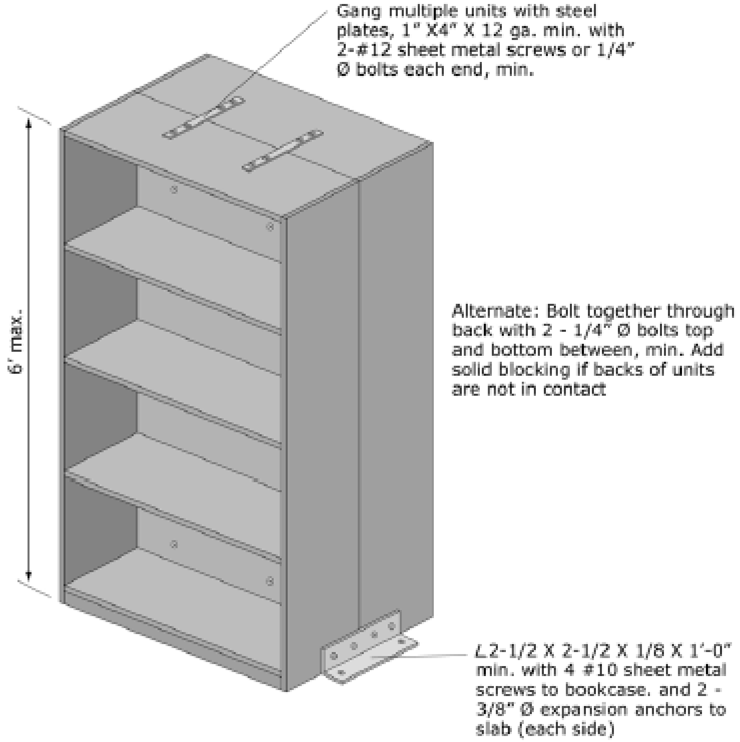


Figure G-22. Base Anchored File Cabinets.

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



Gang multiple units with steel plates, 1" X4" X 12 ga. min. with 2-#12 sheet metal screws or 1/4" Ø bolts each end, min.

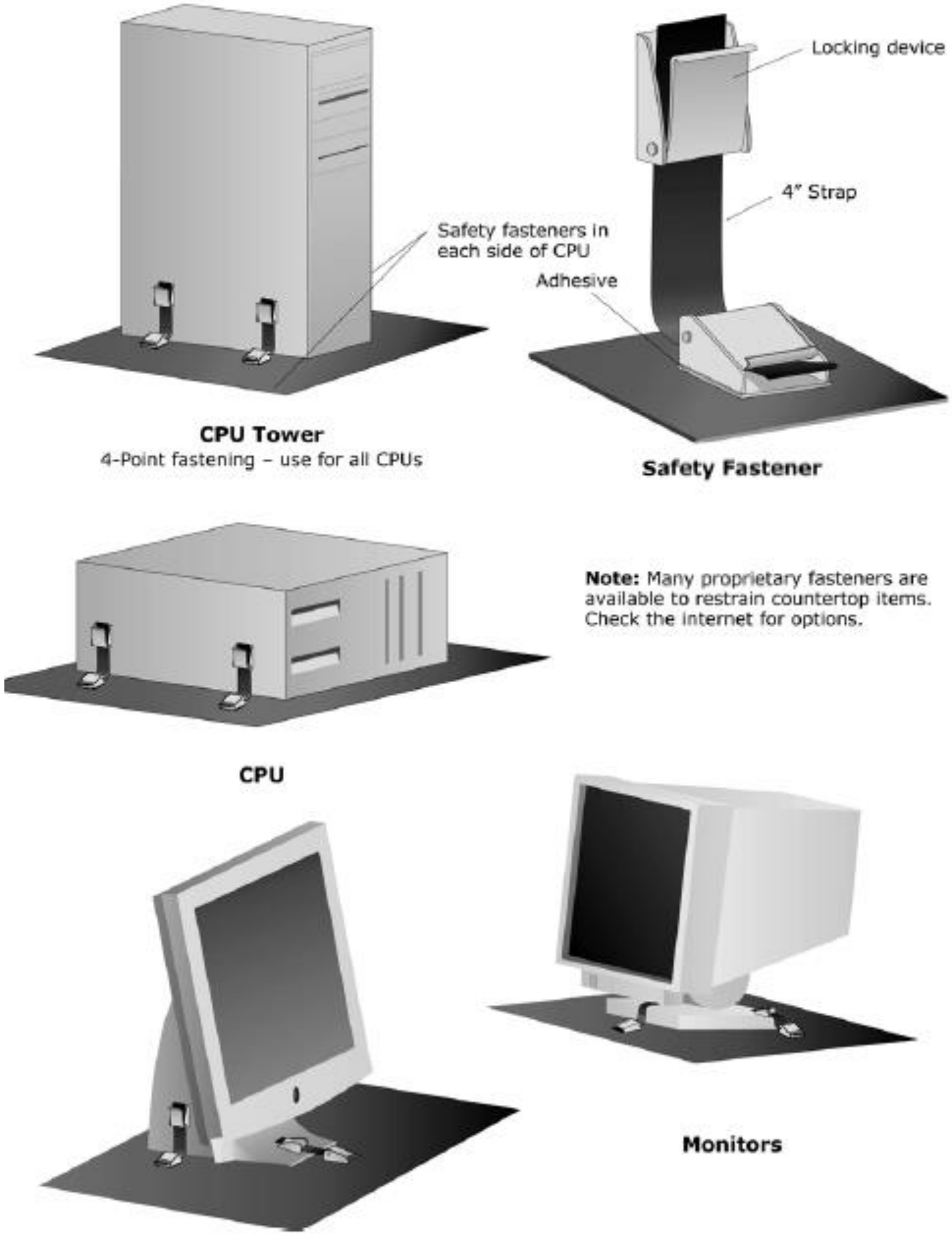
Alternate: Bolt together through back with 2 - 1/4" Ø bolts top and bottom between, min. Add solid blocking if backs of units are not in contact

∠2-1/2 X 2-1/2 X 1/8 X 1'-0" min. with 4 #10 sheet metal screws to bookcase. and 2 - 3/8" Ø expansion anchors to slab (each side)

Note: Engineering required for all permanent floor-supported cabinets or shelving over 6 feet tall. Details shown are adequate for typical shelving 6 feet or less in height.

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

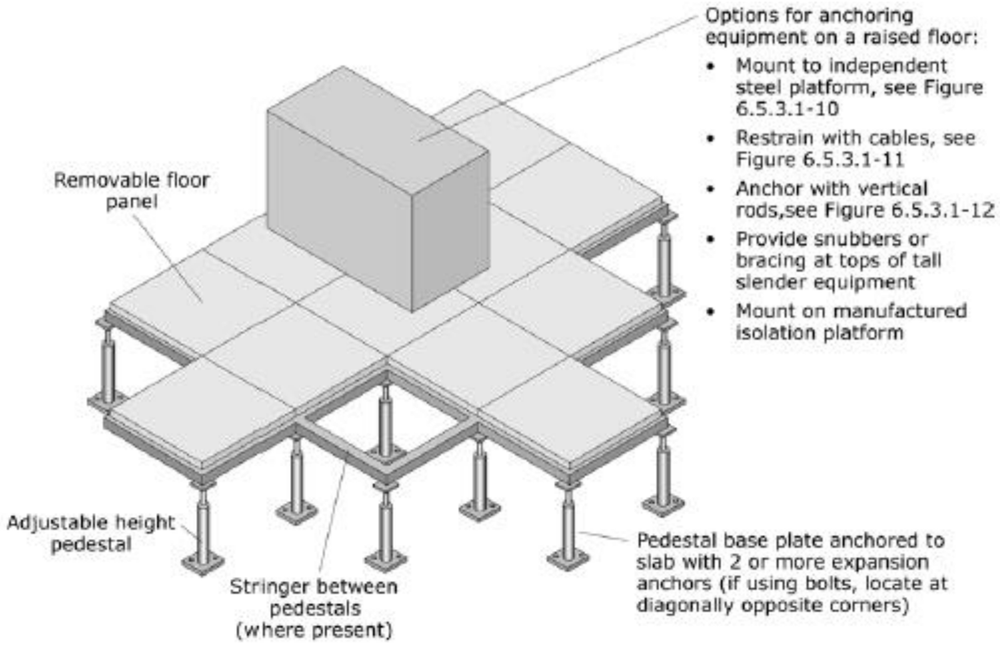
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



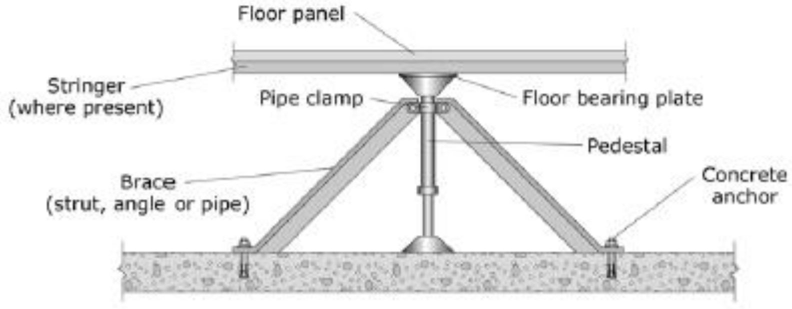
Note: Many proprietary fasteners are available to restrain countertop items. Check the internet for options.

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)

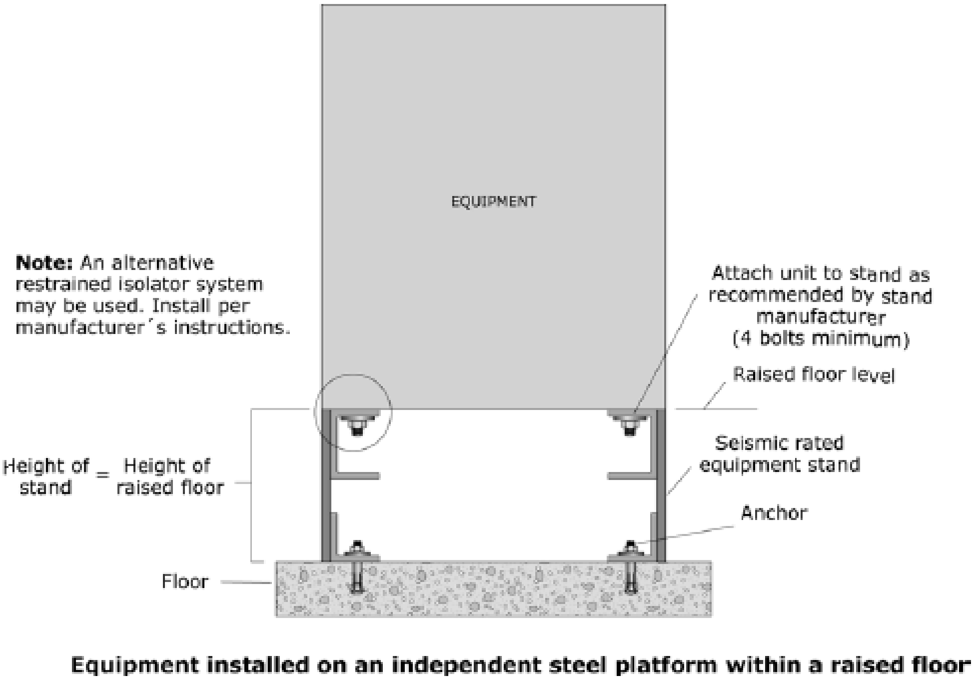


Figure G-26. Equipment Mounted on Access Floor – Independent Base.

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

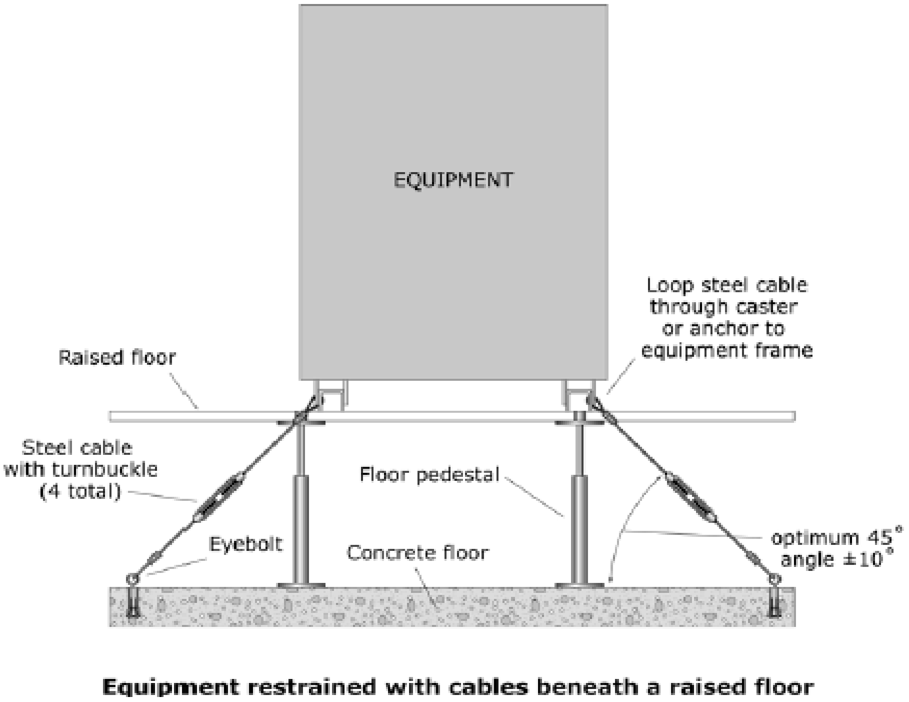
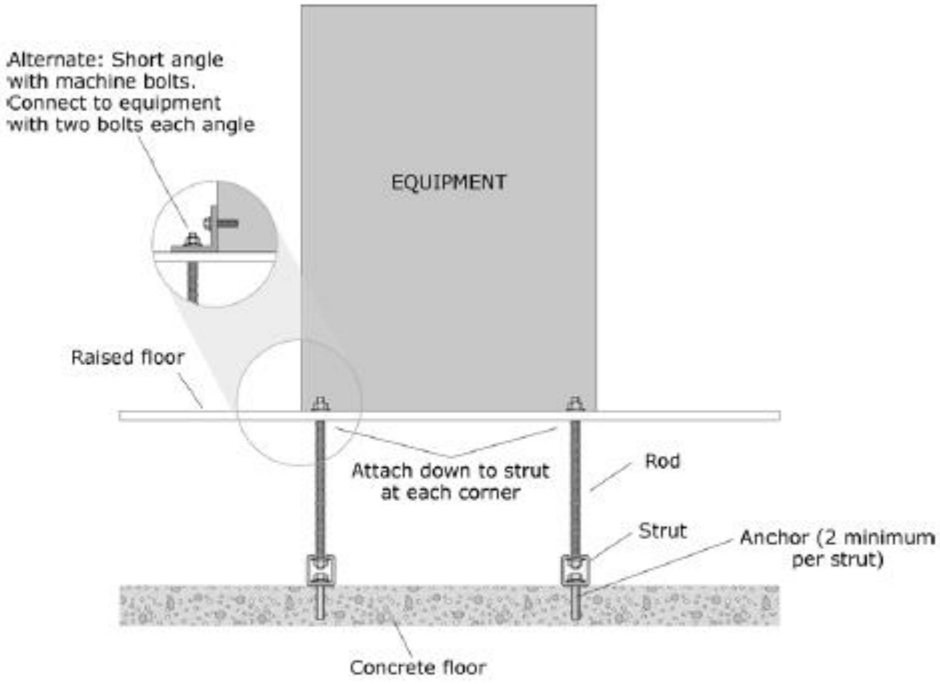


Figure G-27. Equipment Mounted on Access Floor – Cable Braced.

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

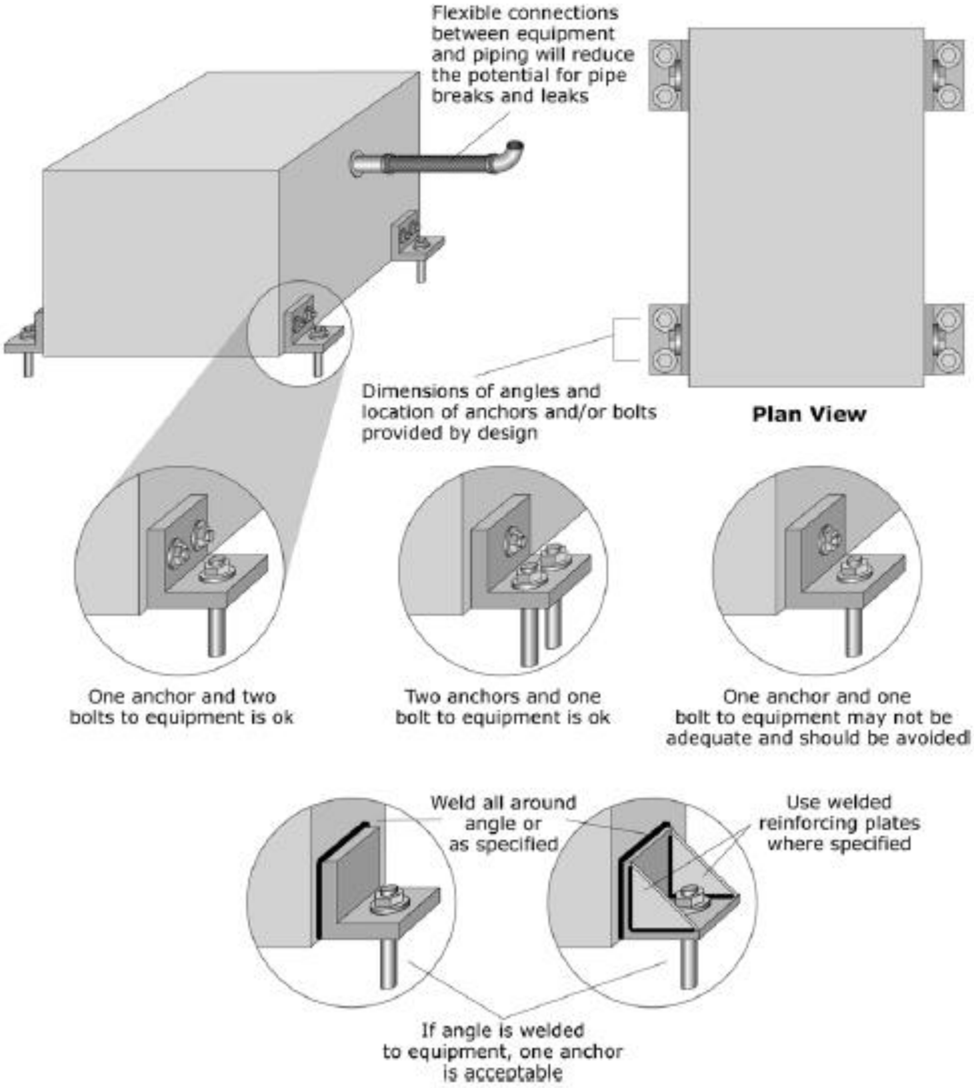


Equipment anchored with vertical rods beneath a raised floor

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

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

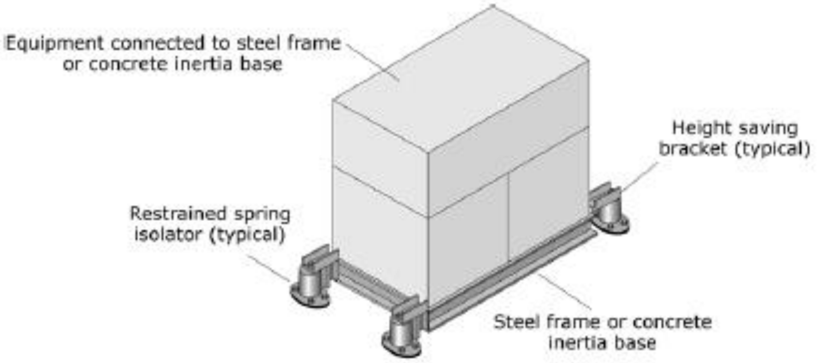
Mechanical and Electrical Equipment



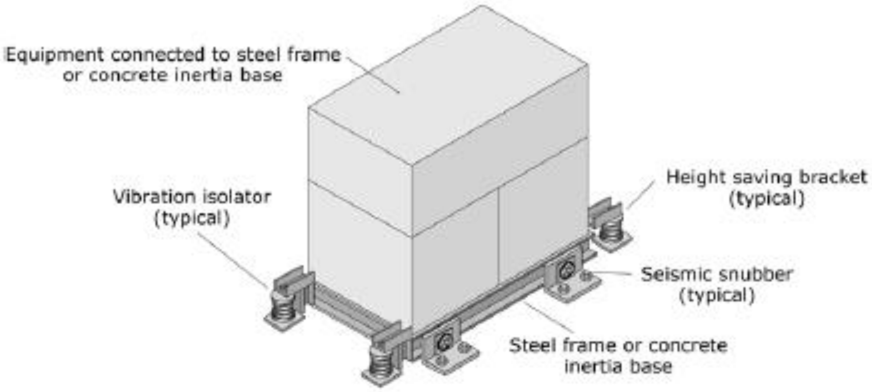
Note: Rigidly mounted equipment shall have flexible connections for the fuel lines and piping.

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

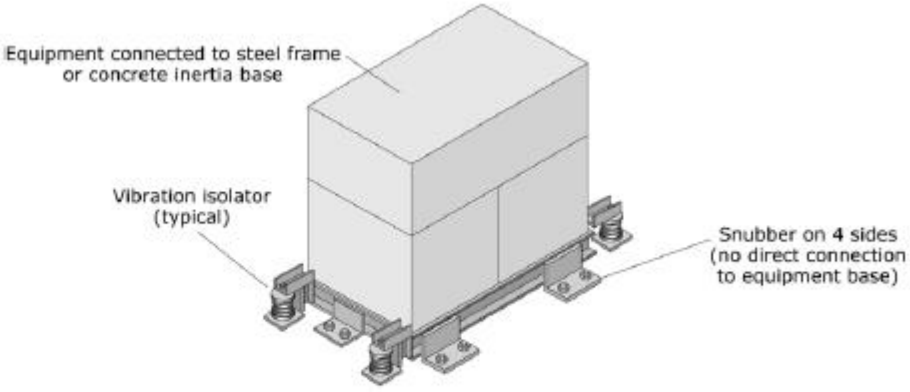
(FEMA E-74, 2012, Reducing the Risks of Nonstructural Earthquake Damage)



Supplemental base with restrained spring isolators



Supplemental base with open springs and all-directional snubbers



Supplemental base with open springs and one-directional snubbers

Figure G-30. HVAC Equipment with Vibration Isolation.

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

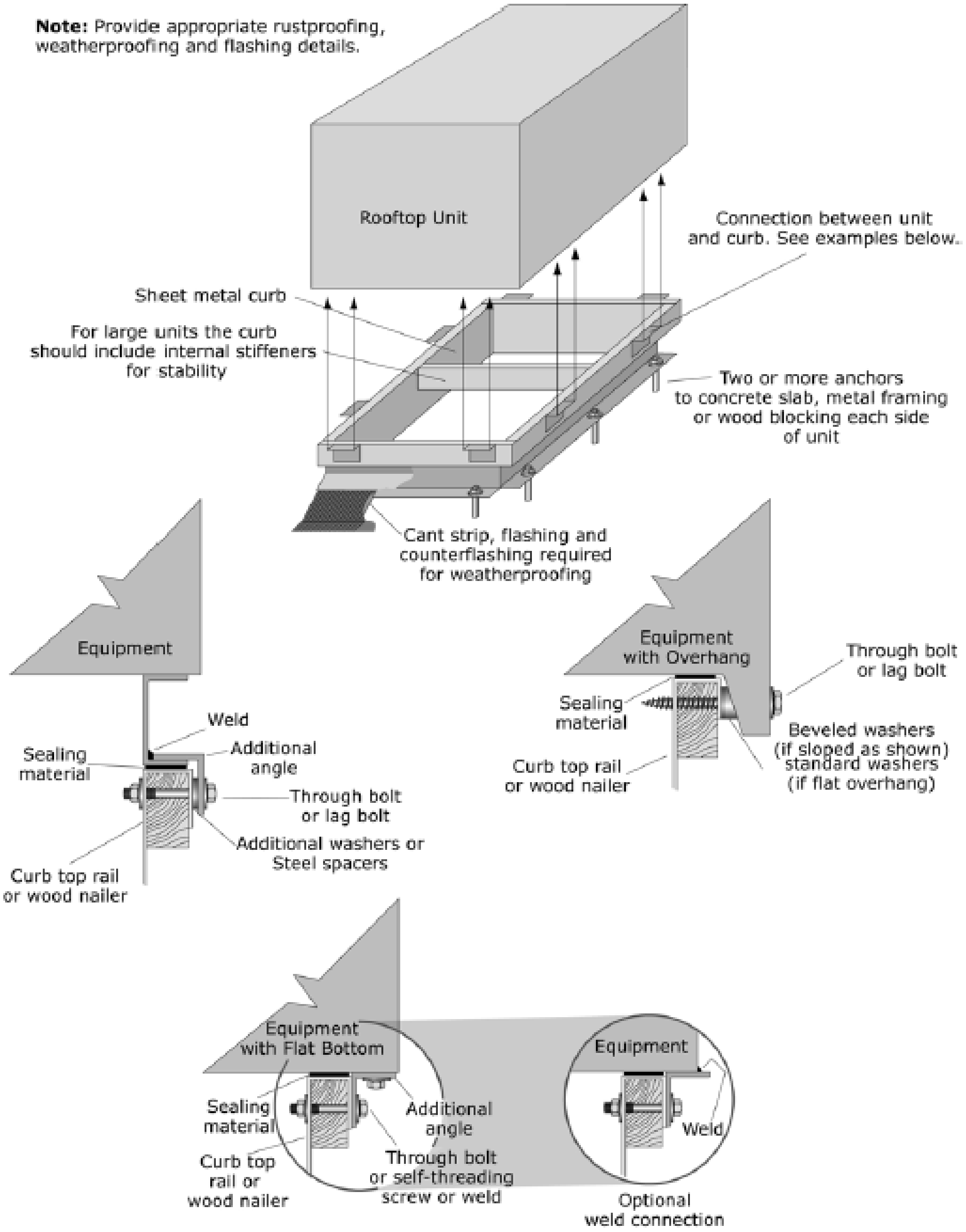


Figure G-31. Rooftop HVAC Equipment.

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

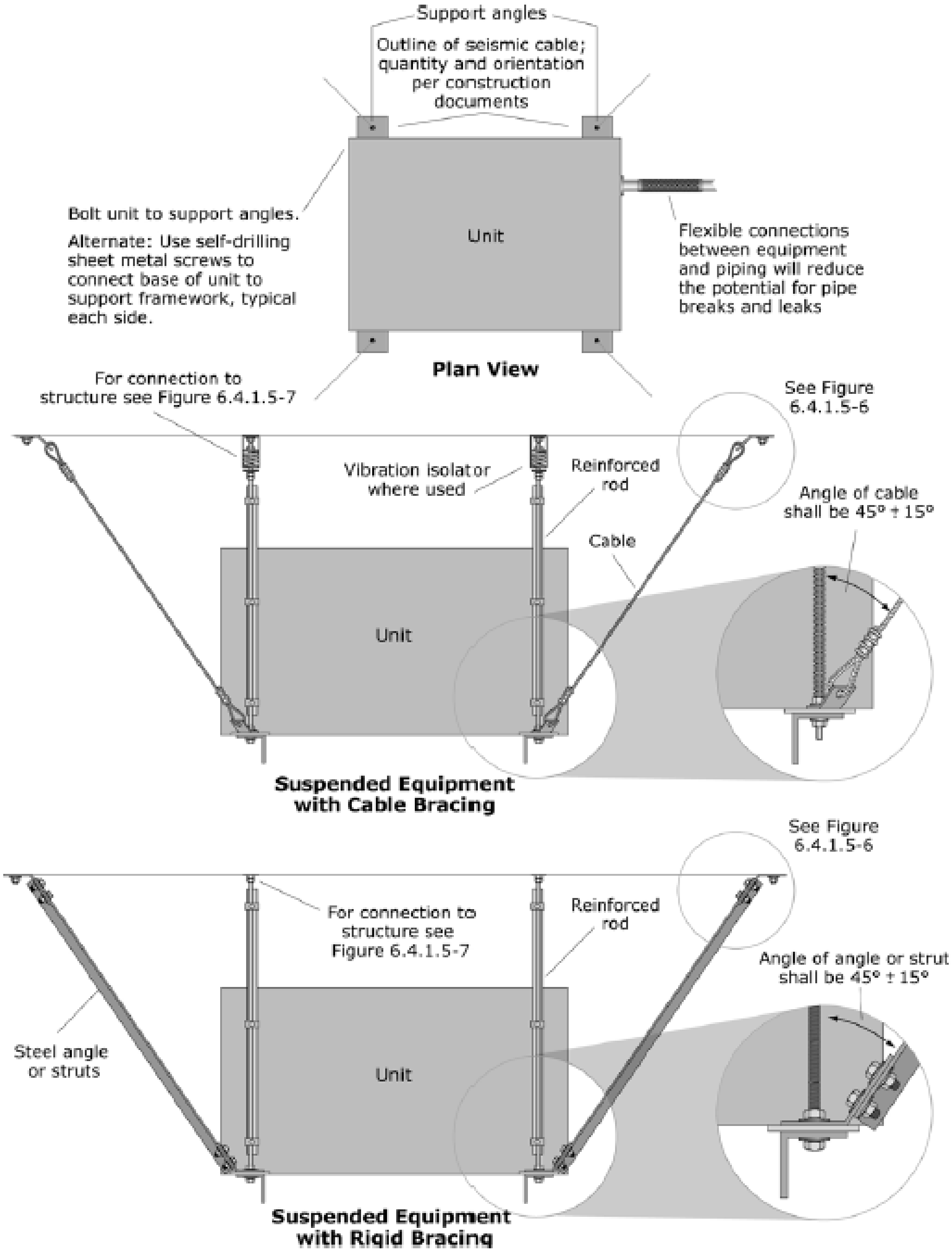


Figure G-32. Suspended Equipment.

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

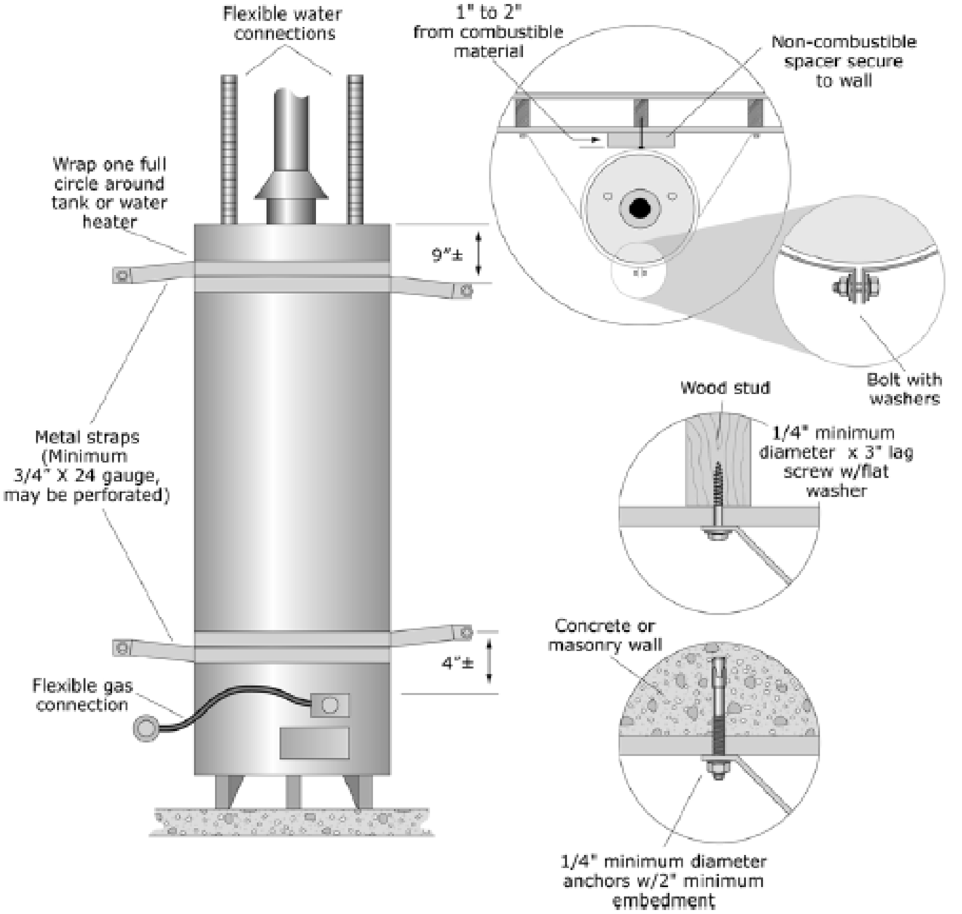


Figure G-33. Water Heater Strapping to Backing Wall.

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

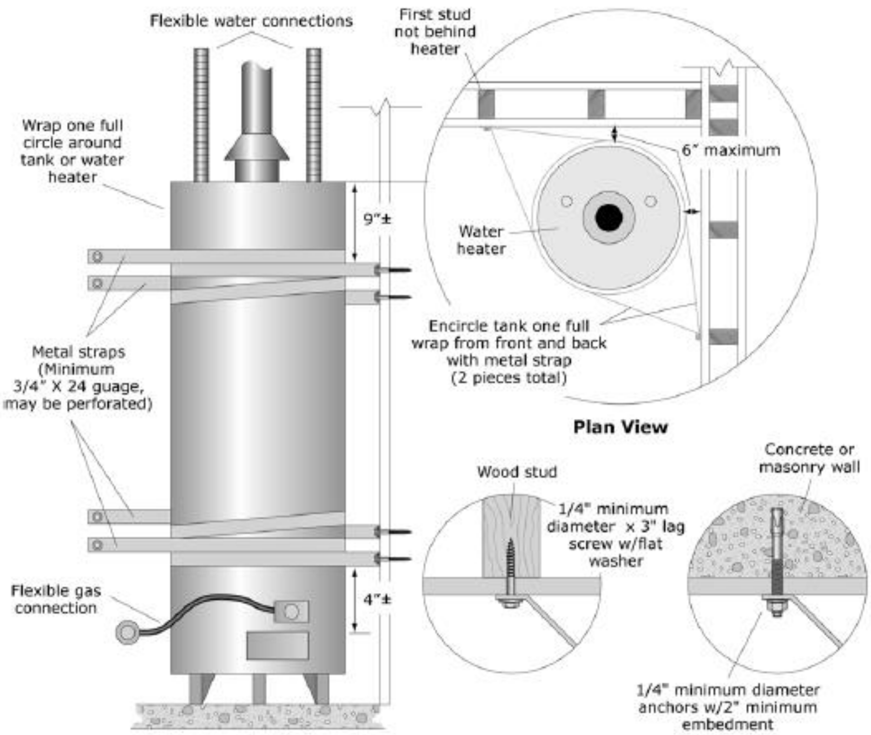


Figure G-34. Water Heater – Strapping at Corner Installation.

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

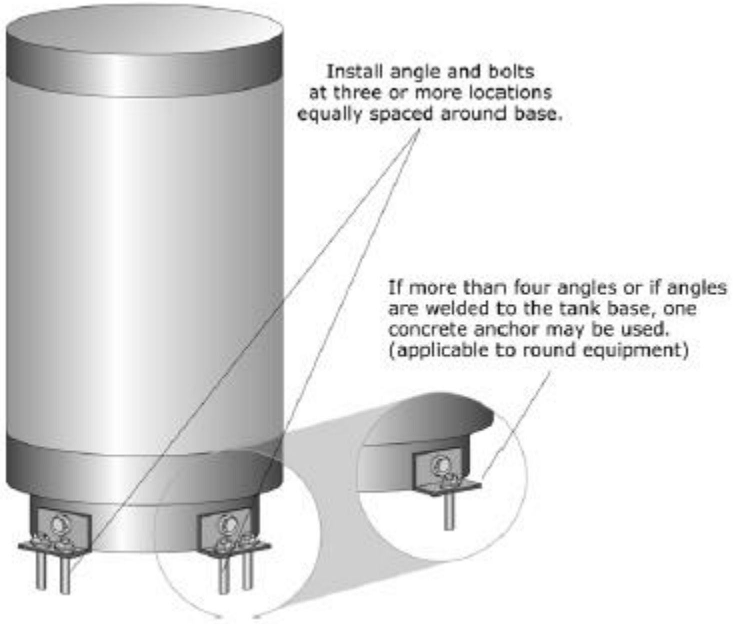


Figure G-35. Water Heater – Base Mounted.

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

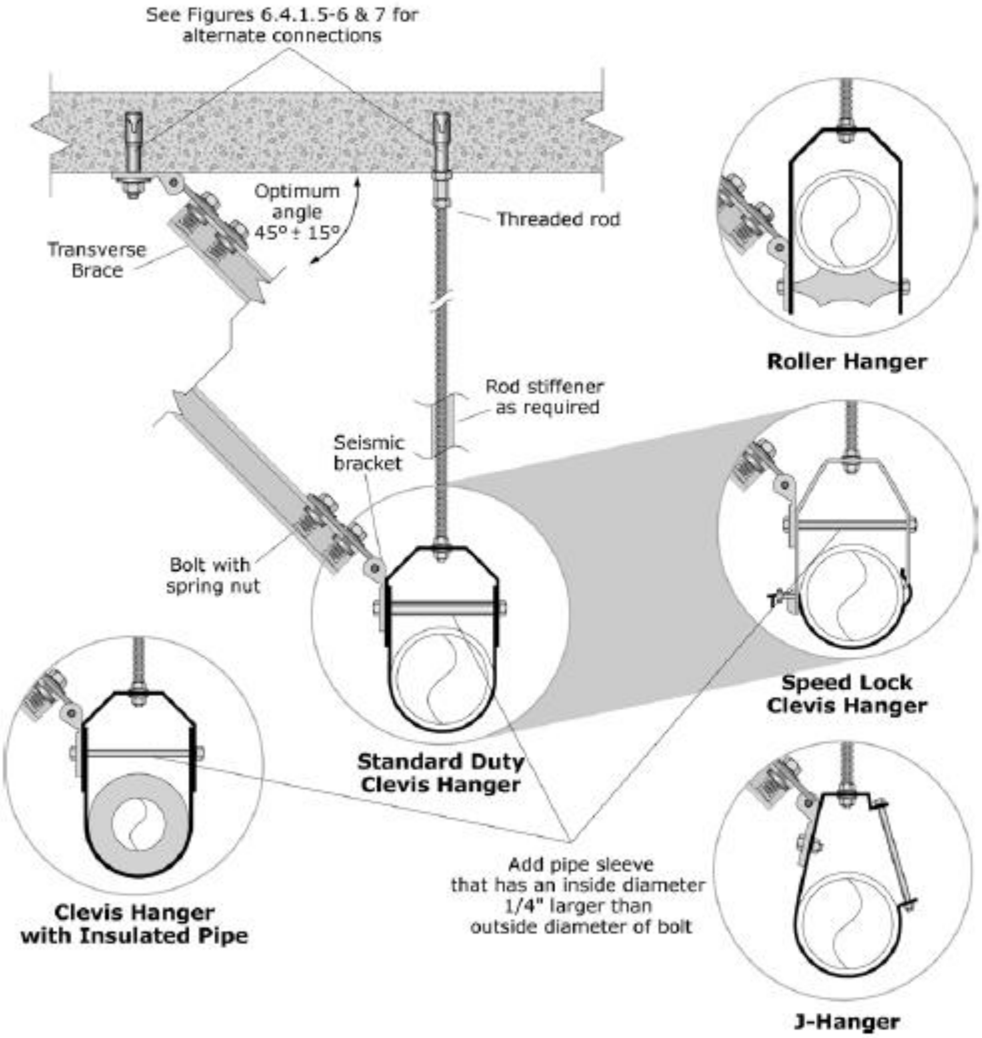


Figure G-36. Rigid Bracing – Single Pipe Transverse.

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

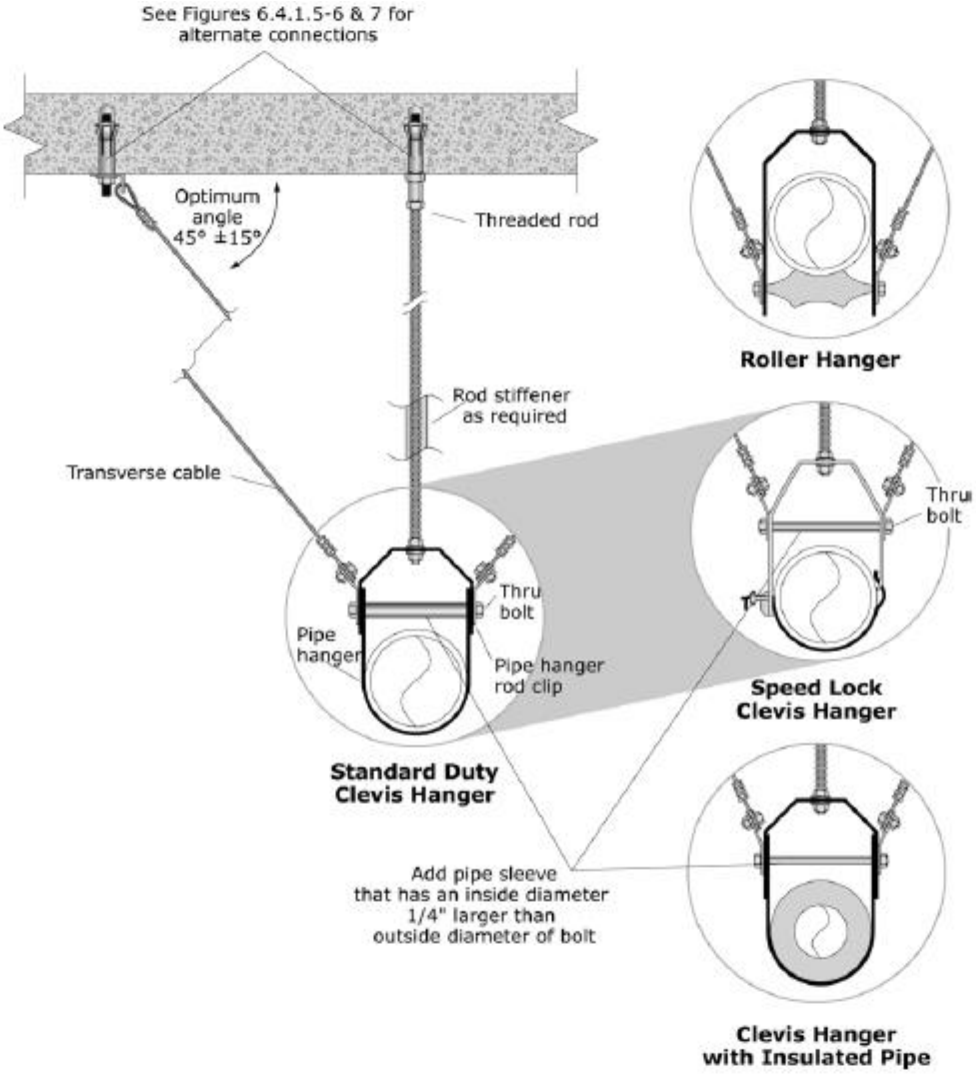


Figure G-37. Cable Bracing – Single Pipe Transverse.

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

Electrical and Communications

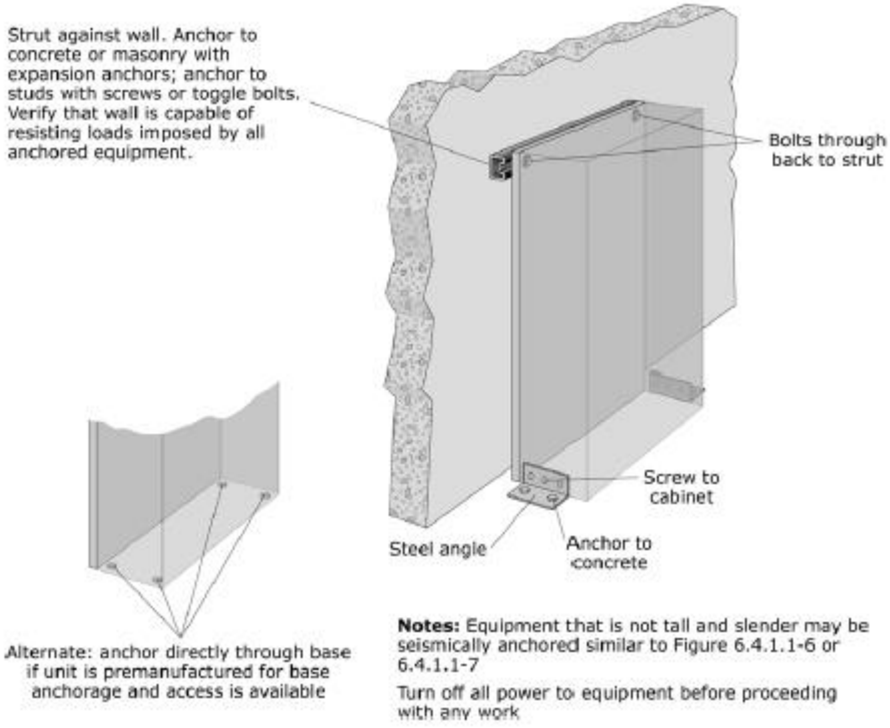


Figure G-38. Electrical Control Panels, Motor Controls Centers, or Switchgear.

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

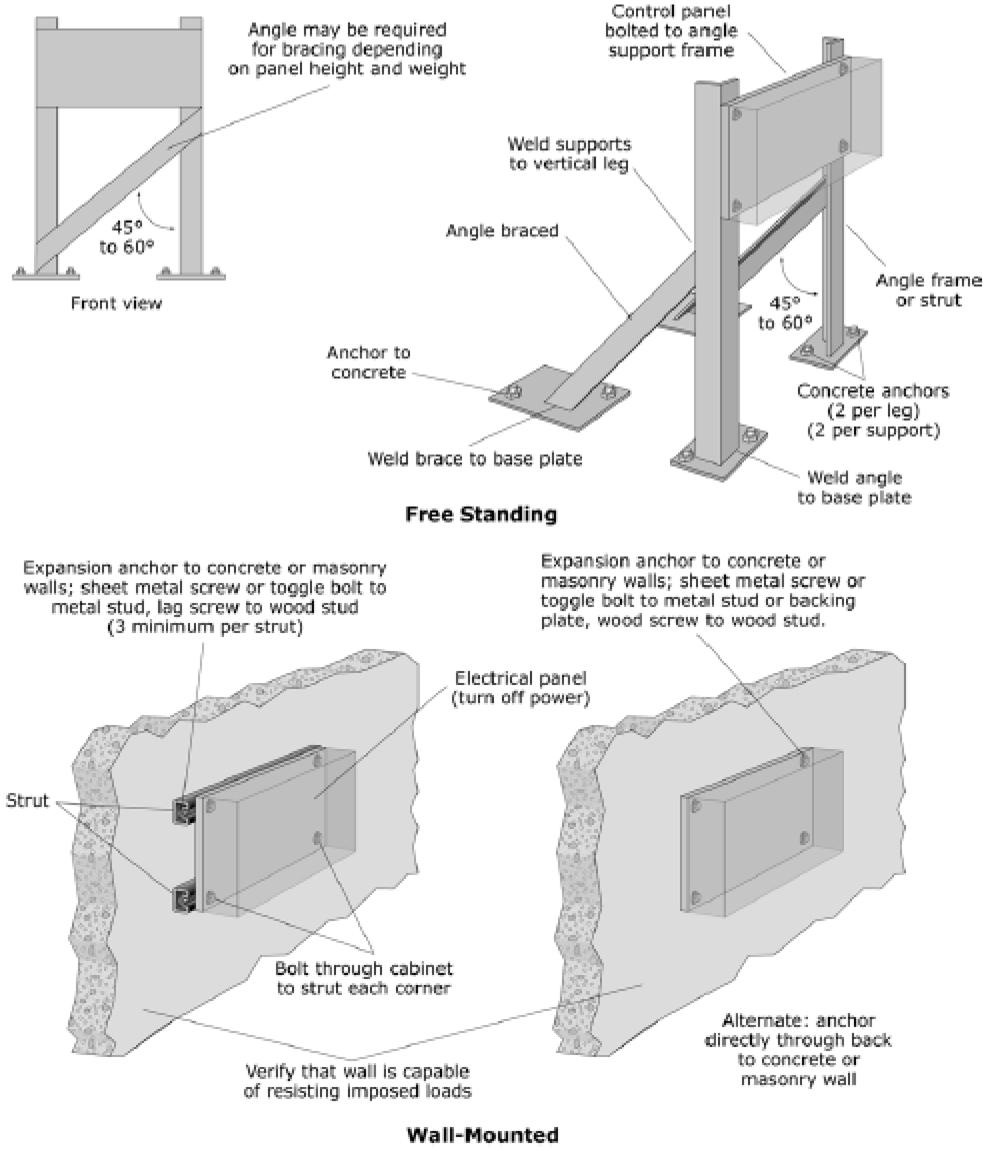


Figure G-39. Freestanding and Wall-mounted Electrical Control Panels, Motor Controls Centers, or Switchgear.

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

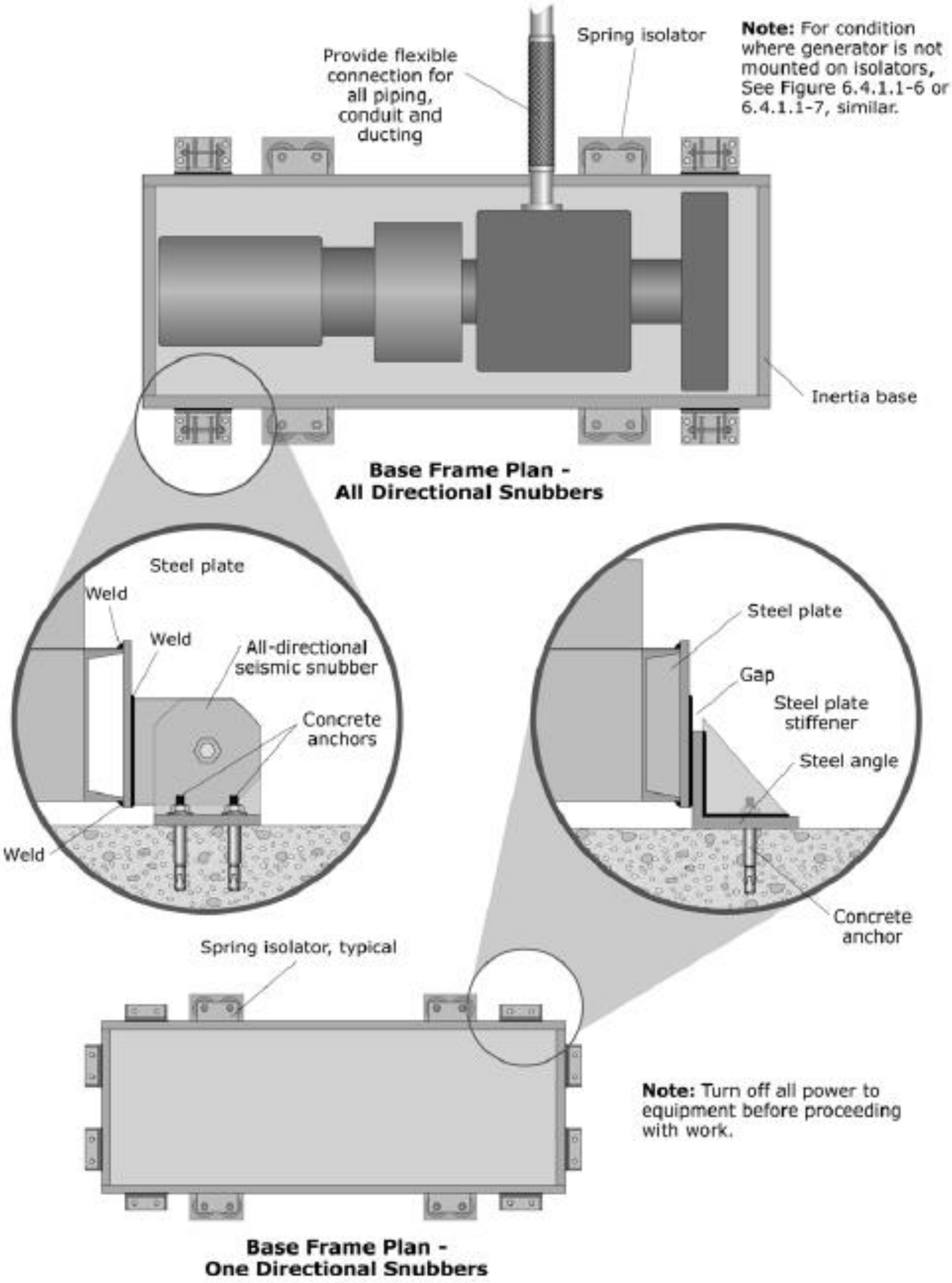


Figure G-40. Emergency Generator.

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

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