ELIGIBILITY EVALUATION REPORT

School District:	Bakersfield City School District	Original Report Date:	August 27, 2018
School Campus:	Horace Mann Elementary School		
School Address:	2710 Niles Street, Bakersfield, CA 93306	Last Revision Date:	
Building Name/ID:	A-3234 1940 Classroom Addition		
Project Tracking No.:			

The purpose of this evaluation report is to establish eligibility for retrofit funding under Proposition 1D (AB 127, 2006). It is not the intent of this evaluation to provide a complete Life Safety evaluation.
The evaluation is complete when eligibility has been determined.

Report Outline

1. Eligibility check summary
2. Evaluation process
3. Site and building description
4. Deficiency list
5. ASCE 31 Evaluation statements

Appendix A.1. Structural calculations
Appendix A.2. Evaluation statement notes
Appendix A.3 Photographs and details

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1. Eligibility Check Summary

YES NO

1.1 Building Occupancy: The building's current or planned use involves regular occupancy by students and staff, as detailed in Section 3.2. ☒ ☐

1.2 Structural System: The building's seismic force-resisting system includes at least one of the types listed in Section 3.5. ☒ ☐

1.3 Collapse Potential: The building has deficiencies associated with a high potential for local or global collapse in the evaluation earthquake. See Sections 4 and 5 for a list of identified deficiencies. Among the identified deficiencies are the critical items checked in Section 1.3.3: ☒ ☐

1.3.1 ☒ Collapse Potential Due to Ground Shaking: Ss = 1.18g ASCE 7-05
Occupancy III, Site Class D

1.3.2 Collapse Potential Due to One of the Following Geologic Hazards (CGS Approved Geologic Hazard Report Required):

☐ LIQUEFACTION ☐ SLOPE STABILITY FAILURE ☐ SURFACE FAULT RUPTURE

UNKNOWN AT THIS TIME

1.3.3 Identified Deficiencies:

☒ LOAD PATH
☐ WEAK STORY
☐ SOFT STORY
☐ VERTICAL DISCONTINUITIES
☐ MASS
☐ TORSION
☒ ADJACENT BUILDINGS
☐ MEZZANINES

☐ SHEAR STRESS CHECK (COLUMN)
☐ AXIAL STRESS CHECK
☐ FLAT SLAB FRAMES
☐ CAPTIVE COLUMNS
☐ BEAM BARS
☐ DEFLECTION COMPATIBILITY
☐ FLAT SLABS
☐ REDUNDANCY

☐ UNREINFORCED MASONRY BEARING WALLS
☐ SHEAR STRESS CHECK (SHEAR WALL OR INFILL)
☐ REDUNDANCY (SHEAR WALL)
☒ OPENINGS AT SHEAR WALLS
☐ TOPPING SLAB
☒ WALL ANCHORAGE
☐ OTHER *

2. Evaluation Process

2.1 Purpose and Scope

As described in DSA Procedure 08-03, the primary purpose of this evaluation is to confirm the subject building's eligibility for Proposition 1D (AB 127, 2006) retrofit funding.

As noted in DSA Procedure 08-03, the intent of this evaluation is to identify conditions that represent "a high potential for catastrophic collapse." As described further in Sections 2.2 through 2.4, the evaluation includes:

- Completion of a standardized checklist developed specially for this project (Section 2.2). As described in Section 2.2, once a critical deficiency is confirmed, the balance of the checklist need not be completed.
- A site visit (Section 2.3)
- Document review (Section 2.4)

It is not the intent of this evaluation to provide a complete Life Safety evaluation; earthquake safety hazards other than those listed in this report might exist. Further, it is not the intent of this evaluation to identify deficiencies with respect to post-earthquake use or recovery feasibility. In particular, except where specifically noted, the scope of this evaluation does not include:

- Material testing or destructive investigation
- Comprehensive condition assessment or verification of construction documents
- Assessment of code compliance, either at present or at the time of construction
- Assessment for load combinations not including earthquake effects
- Consideration of Life Safety hazards related to egress
- Consideration of Life Safety hazards related to hazardous materials

- Consideration of the effects of damage to nonstructural components or contents.

Building located on sites with geologic hazards (liquefaction, slope failure, faulting) may be eligible for the Proposition 1D funding if it can be demonstrated that the geologic hazard may cause the building to have a high potential for catastrophic collapse. In this case, a geologic hazard report shall be prepared and submitted to CGS for approval and a copy included with evaluation report. The geologic hazard report shall identify the resulting displacements that will be imposed on the structure so a structural analysis can be performed. If eligibility is being sought for a deficiency that is not related to geologic hazards, then a geologic hazard report does not need to be prepared for the purpose of this evaluation report.
With respect to DSA Procedure 08-03, this report fulfills the intent of its Section 1. The remaining sections of Procedure 08-03 are outside the scope of this evaluation and report:

2.2 Evaluation criteria: Modifications to ASCE 31

As noted in DSA Procedure 08-03, the evaluation applies ASCE 31[1], an engineering standard that allows the user to choose a performance level of either Life Safety or Immediate Occupancy. Procedure 08-03 suggests that Life Safety is the performance level of interest, but the Procedure also focuses on collapse, a lesser performance level not explicitly addressed by ASCE 31. For this evaluation, DSA has clarified that only collapse-prone conditions need to be identified. Further, because the focus of this evaluation is on checking eligibility for retrofit funding, as opposed to producing a comprehensive list of potential deficiencies, the full evaluation need not be completed once a critical deficiency is identified.

ASCE 31 involves three “tiers” of evaluation. Tier 1 uses a set of generic, mostly qualitative “evaluation statements” (also called checklists) to identify potential deficiencies. Tier 2 applies more quantitative checks to confirm or correct the Tier 1 findings. Tier 3 involves a more thorough structural analysis. For this evaluation, DSA has clarified that only Tier 1 is required for most issues, with Tier 2 evaluation for specific issues.

The criteria used for this evaluation therefore are based on the ASCE 31 Tier 1 checklists, with the following modifications:

- Basic Structural, Supplemental Structural, and Foundations checklists are considered.
- Nonstructural checklists are excluded. While some issues addressed by these checklists are relevant to nonstructural collapse potential, their completion is beyond the scope of this evaluation. While not considered for purposes of establishing funding eligibility, relevant deficiencies will be investigated and addressed during a retrofit design phase.
- Evaluation statements required by ASCE 31 for Immediate Occupancy only are excluded.
- Evaluation statements not associated with one of the eligible structure types are excluded.
- Certain evaluation statements related to “critical deficiencies” indicative of a high potential for structural collapse are identified. If a critical deficiency is confirmed, the balance of the evaluation need not be completed. The critical deficiencies are those listed in Section 1. They were selected by DSA for this project based in part on precedents set by the California Office of Statewide Health Planning and Development.[2]

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[1] *Seismic Evaluation of Existing Buildings* (ASCE/SEI 31-03), American Society of Civil Engineers, 2003.

[2] *2007 California Building Standards Administrative Code (California Code of Regulations, Title 24 Part 1)*, Chapter 6, “Seismic Evaluation Procedures for Hospital Buildings,” Section 1.4.5.1.2, October 23, 2008 Emergency Supplement.

- For Quick Checks and Tier 2 evaluations, the ASCE 31 criteria for Life Safety performance are used, except that *m* values, where needed, are increased by an additional factor of 1.33.
- The Tier 1 evaluation statements are modified to reflect emphasis on collapse-level performance:
    - Since the presence of an unreinforced masonry bearing wall system is deemed a critical deficiency, an evaluation statement to that effect is added, and detailed ASCE 31 evaluation statements specific to that system are omitted.
    - Condition of Materials: Evaluation statements are edited to focus less on presence of damage and more on significance of damage. Note that Masonry Lay-up and Foundation Performance evaluation statements are relocated to the Condition of Materials subsection of Section 5.
    - Except for cracks in certain concrete members, Condition of Materials evaluation statements related to existing cracks are omitted.
    - Beam Bars: The requirement for 25 percent of the joint bars to be continuous for the length of the member is removed.
    - Redundancy (Moment frame and Braced frame): The requirement for two bays per frame line is removed.
    - Stiffness of wall anchors: The limitation of 1/8-inch gap prior to anchor engagement is removed.
    - Overturning: This statement is removed.
    - In general, statements are modified for clarity and consistency with this DSA program.
- Tier 2 evaluation is required for any critical item (see Section 1) found to be non-compliant by Tier 1. The potential requirement for full-building Tier 2 evaluation found in ASCE 31 Table 3-3 is waived.

2.3 Document review

The following documents were provided for use in completing the evaluation, in general compliance with ASCE 31, Section 2.2. The Set ID is used to identify the documents cited in Section 5 of this report.

SETID	DATE	DESCRIPTION
1	1940	Additions to Horace Mann School, Charles H Biggar Architect, 6 sheets, Original Construction of Classroom Addition
2	1989	A-51532 - Horace Mann Modernization, BFGC Architects-Planners, 42 sheets (Classroom Addition Building is referred to as Building 700)

2.4 Site visit

In general compliance with ASCE 31, Sections 2.2 and 2.3, a site visit shall be made to verify the building configuration and conditions and to assist in completing the evaluation.

Date of site visit:	July 5, 2018
Visiting engineer(s) and staff:	Jessica Napier, Deryk Izuo
School district contact person:	Randy Rowles
School campus representative (if different than above):	same as above

The scope of the site visit was based on our judgment, accessibility of certain areas, and convenience of the school on-site liaison. The purpose of the following list is merely to record the work that was done. The site visit included (check all applicable boxes):

☒ INTERVIEW W/ ON-SITE LIAISON
☒ GROUNDS, FOR OBSERVATION OF SOIL, SLOPES, DRAINAGE, GENERAL CONDITION
☒ EXTERIOR OBSERVATION TO VERIFY BASIC MASSING, CONFIGURATION, GENERAL CONDITION
☒ INTERIOR OBSERVATION TO VERIFY USE, WALL LINE CONFIGURATION, GENERAL CONDITION
☐ ROOF
☐ BASEMENT
☐ CEILING PLENUM
☒ UNFINISHED SPACES (MECHANICAL ROOMS, CLOSETS, CRAWL SPACES, ETC.)
☐ DETAILS OF STRUCTURE-ARCHITECTURE INTERACTION
☒ ROOF-TO-WALL CONNECTIONS
☒ GRAVITY SYSTEM FRAMING
☒ SEISMIC FORCE RESISTING SYSTEM ELEMENTS OR COMPONENTS
☒ ADJACENT BUILDINGS SUBJECT TO POUNDING
☐ OTHER:

The site visit confirmed that the existing structure generally conforms to the available drawings listed in Section 2.3.

3. Site and Building Description

3.1 Building description

General

Year originally built: 1940

DSA Application number A-3234 ☒ Original Construction ☐ Work done pursuant to the Garrison Act (Ed Code 17367)

Number of stories above grade: 1

Number of stories below grade: 1

Total floor area (sq ft, approx): 7,300 sq. ft.

Other essentially identical buildings on this campus? ☐ Yes ☒ No

Multipurpose building is of similar construction, designed in 1940. This building is being evaluated with a separate report, as is the URM classroom wing from 1930.

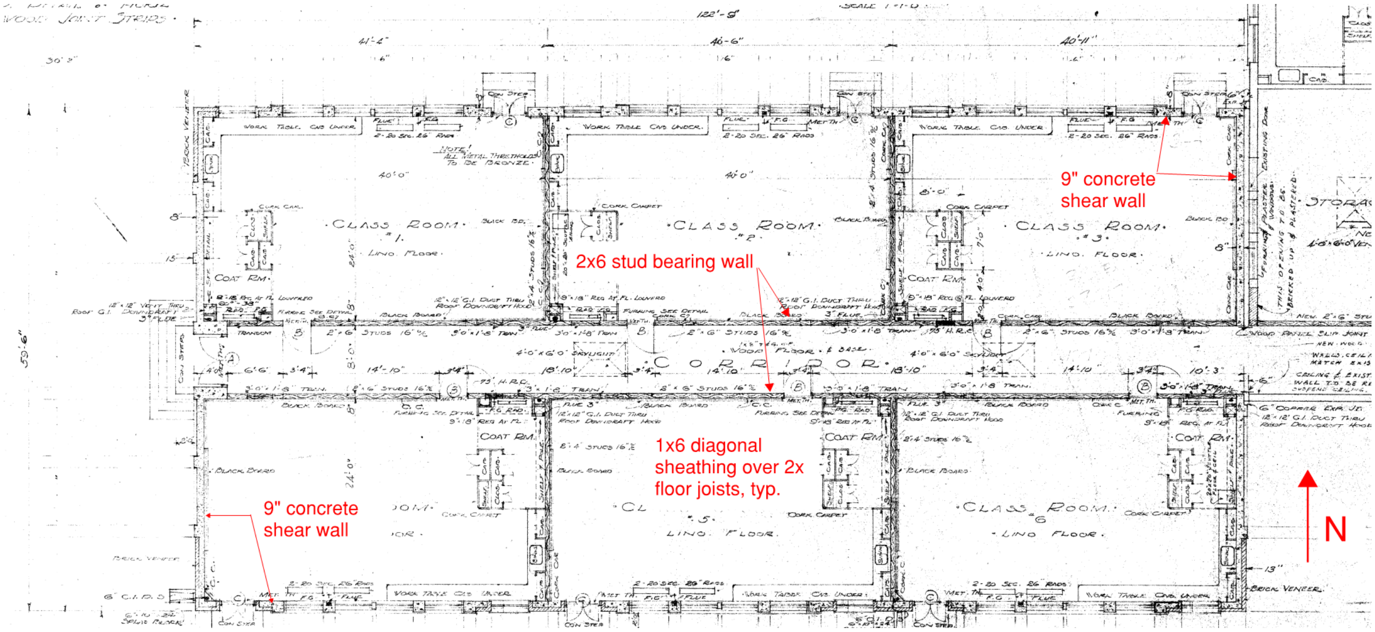
Overhead view of Horace Mann Elementary, taken: July 26, 2018 using Google Earth

Photographs

Exterior elevation photograph, looking north, taken August 2, 2018 with Google Earth:

Exterior elevation photograph, looking east, taken August 2, 2018 with Google Earth:

Ground floor plan



3.2 Building Occupancy

Original, current, and planned uses of the building include those indicated here:

	Original Use	Current Use	Planned Future Use
Office / Administration	☐	☐	☐
Classrooms / Instruction Areas	☒	☒	☒
Kitchen	☐	☐	☐
Assembly: Dining	☐	☐	☐
Assembly: Auditorium	☐	☐	☐
Assembly: Gymnasium	☐	☐	☐
Locker rooms	☐	☐	☐
Patio cover / bus shelter / walkway cover	☐	☐	☐
Bleachers / stadium structure	☐	☐	☐
Other occupied: ***complete as appropriate***	☐	☐	☐
Mechanical / utility rooms or enclosures	☐	☐	☐
Bulk storage	☐	☐	☐
Vacant / unused	☐	☐	☐
Other unoccupied:	☐	☐	☐

3.3 Seismicity

Latitude: 35.3769081

Longitude: -118.9574422

Site Class per ASCE 31, Section 3.5.2.3: D

Basis for Site Class determination: Default

Period [sec]	Mapped MCE values from ASCE 7-05 [g]	Site Coefficients from ASCE 31 Tables 3-5, 3-6	Design values per ASCE 31 section 3.5.2.3.1 [g]	S_a per ASCE 31 section 3.5.2.3.1, [g]
0.2	$S_S = 1.18$	$F_a = 1.028$	$S_{DS} = (2/3)\, S_S\, F_a = 0.809$	$S_{a,0.2} = S_{DS} = 0.809$
1.0	$S_1 = 0.419$	$F_v = 1.581$	$S_{D1} = (2/3)\, S_1\, F_v = 0.441$	$S_{a,1.0} = \min(S_{DS}, S_{D1}/T) = 0.441$

3.4 Gravity System

Roof diaphragm and framing:

- Roof diaphragm 1x6 straight sheathing, see Section C on Sheet A10 of Set 2.
- Trussed 2x rafters, see Section C on Sheet A10 of Set 2.
- Trussed roof rafters perpendicular to shear walls are either seated on a concrete ledge or a wood ledger.
    - For OOP loads, no anchorage exists.
    - For IP loads, sheathing is nailed to ledger or blocking, and the ledger or blocking is attached to the concrete with 5/8” diameter bolts at 48” o.c or 60” o.c. See Section C on Sheet A10 of Set 2, as well as Appendix A.3, WALL ANCHORAGE section.
- Where roof rafters are parallel to shear walls
    - For OOP loads, no anchorage exists and there is no corresponding blocking.
    - For IP loads, sheathing is nailed to ledger, and ledger is attached to concrete with 5/8” diameter bolts at 48” or 60” o.c. See Section C on Sheet A10 of Set 2, as well as Appendix A.3, WALL ANCHORAGE section.

Typical floor diaphragm and framing: N/A

Ground floor framing:

- 1 layer of 1x diagonal sheathing with wood finish floor over top (1x straight). See “Cross Section” on Sheet 3 of Set 1 as well as “Section C” on Sheet A10 of Set 2.
- 2x6 floor joists over cripple walls at interior and bearing on wood ledger at exterior concrete stem wall. See same references as above.

Vertical load-bearing elements:

- Exterior bearing walls are 8” reinforced concrete.
- Interior bearing walls are 2x6 wood stud-framed.

Basement walls: N/A, no basement.

Foundation:

- Continuous concrete footings under exterior walls
- Pad footings at interior, under wood cripple walls, see Sheet 1 of Set 1.

Snow load for use in load combinations involving earthquake: N/A, snow load not required.

3.5 Structural System per ASCE 31 Classifications (Category 2 Buildings Types per AB 300 Report)

		North-South	East-West
C1	Concrete Moment Frames	☐	☐
C1B*	Reinforced Concrete Cantilever Columns	☐	☐
C2A	Concrete Shear Walls, Flexible Diaphragm	☒	☒
C3A	Concrete Frame with Infill Masonry Shear Walls, Flexible Diaphragm	☐	☐
PC1	Precast/Tilt-up Concrete Shear Walls, Flexible Diaphragm	☐	☐
PC1A	Precast/Tilt-up Concrete Shear Walls, Rigid Diaphragm	☐	☐
PC2	Precast Concrete Frames with Shear Walls, Rigid Diaphragm	☐	☐
PC2A	Precast Concrete Frames without Shear Walls, Rigid Diaphragm	☐	☐
RM1	Reinforced Masonry Bearing Walls, Flexible Diaphragm	☐	☐
S1B*	Steel Cantilever Columns	☐	☐
S3	Steel Light Frames	☐	☐
URM	Unreinforced Masonry Bearing Walls, Flexible Diaphragm	☐	☐
URMA	Unreinforced Masonry Bearing Walls, Rigid Diaphragm	☐	☐
M*	Mixed Systems - construction containing at least one of the above lateral-force-resisting systems in at least one direction of seismic loading.	☐	☐
None of the above		☐	☐

* These structural systems are a subset of the classification in ASCE 31 and are defined in the Category 2 building types in the AB 300 Seismic Safety Inventory of California Public Schools report (2002).

Brief description of structural systems:

Horizontal system combinations	Roof • 1x6 diagonal sheathing • Trussed 2x rafters Floor • 1x6 diagonal sheathing • 2x8 floor joists @ 16" o.c.
Vertical system combinations	• 8" reinforced concrete walls • 2x6 wood stud walls, interior

SFRS foundation	Continuous concrete footings
Gravity loading	Approximately half of the gravity loads are carried by the exterior concrete walls, which also act as the SFRS. The remainder of the gravity load is carried by interior wood-framed stud walls. The exceptions to this are the north and south walls of the structure. These walls carry their own self weight, but little roof load.
System details	The SFRS in both directions consists of a wood-framed diaphragm with diagonal sheathing 8” reinforced concrete shear walls Walls are tied to diaphragm for in-plane loads with ledger anchor bolts. Walls are not tied to diaphragm for out-of-plane loads. Nor is there any blocking or other diaphragm support for out-of-plane loads.
Structural materials	1940 Project Specifications – (see Appendix A.3) 2,000-psi concrete A15-35 rebar (assume 33-ksi) No. 1 DF grade
Original design code	1937 Uniform Building Code (assumed)
History of seismic retrofit or significant alteration	None
Benchmark year check	Benchmark for C2A structure is 1994

4. Deficiency list

The following table summarizes the potential deficiencies identified in Section 5 of this report.

Non-compliant condition	Discussion	Additional evaluation recommended
DETERIORATION OF WOOD	• Seen in crawl space • Local collapse mechanism	None
DETERIORATION OF CONCRETE	• Seen in crawl space • Local collapse mechanism	None
DETERIORATION OF STEEL	• Rusted ledger anchor bolts in crawl space • Most likely widespread • Collapse would be local to anchors that fail. Not all anchors are likely to fail at once	Additional non-destructive investigation
LOAD PATH ***Critical Item***	• See “Cross Ties” and “Wall Anchorage” non-compliant conditions • Global collapse mechanisms	None
ADJACENT BUILDINGS ***Critical Item***	• Separation of 6” between adjacent structures is noted on the plans and verified in the field • Local collapse mechanism • It is most likely that pounding will not occur, as the SFRS is concrete shear walls, and a combination of URM and gunite (also very stiff) in the adjacent building	None
WALL OPENINGS	• Wall piers less than 2:1 ratio in most locations • Local collapse mechanism, but could extend to along length of wall with adjacent tall piers	None
CROSS TIES	• Cross ties do not exist where rafters are parallel to shear walls • Global collapse mechanism	None

UNBLOCKED DIAPHRAGMS	• Diaphragms are unblocked and 122’-9” max span • Global collapse mechanism	None
WALL ANCHORAGE ***Critical Item***	• No anchors to resist OOP forces • Global collapse mechanism	None
WOOD LEDGERS	• Cross grain bending under gravity loads is possible • Local collapse mechanism	None
TIES BETWEEN FOUNDATION ELEMENTS	• There are no ties between exterior wall continuous footings and interior shallow pier footings • Local collapse mechanism	None

Unknown condition	Discussion	Additional evaluation recommended
REINFORCING STEEL	• Reinforcing steel was used, according to the project specifications, but there are no notes stating what the reinforcement size and spacing is • Global collapse mechanism if walls are under-reinforced	Additional non-destructive testing
LIQUEFACTION	• If liquefaction is a hazard on this site, the foundation would not be adequate for supporting the structure • Global collapse mechanism	None
SURFACE FAULT RUPTURE	• If surface fault rupture is a hazard on this site, the foundation would not be adequate for the soil • Global collapse mechanism	None

5. ASCE 31 Evaluation Statements

Evaluation statements provided in this section are from ASCE 31. They have been modified for this project with DSA approval as described in Section 2.2 of this report. References within the evaluation statements to other section numbers are generally to sections of ASCE 31.

C = Compliant
NC = Non-compliant
U = Unknown or not investigated
NA = Not applicable to this building

Items marked NC or U are summarized in Section 4 of this report.

CONDITION OF MATERIALS	
C [✓ NC] U NA	DETERIORATION OF WOOD. There shall be no evidence of or reason to suspect structural capacity loss due to decay, shrinkage, splitting, fire damage, or sagging in wood members or deterioration, damage, or loosening in metal connection hardware. ***Some water intrusion in the crawl space.***
C [✓ NC] U NA	DETERIORATION OF CONCRETE. There shall be no evidence of or reason to suspect structural capacity loss due to cracking of concrete or deterioration of concrete or reinforcing steel in gravity or seismic force-resisting elements. ***Some deterioration in crawl space at stem wall adjacent to crawl space vent on north wall.***
C [✓ NC] U NA	DETERIORATION OF STEEL. There shall be no evidence of or reason to suspect structural capacity loss due to rusting, corrosion, cracking, or other deterioration in any of the steel elements or connections in the gravity or seismic force-resisting elements. ***Rust noted on anchor bolt in crawl space.***
C NC U [✓ NA]	POST-TENSIONING ANCHORS. There shall be no evidence of or reason to suspect structural capacity loss due to corrosion or spalling in the vicinity of post-tensioning or end fittings. Coil anchors shall not have been used. ***(Post-tensioning not used)***

C NC U [✓ NA]	PRECAST CONCRETE WALLS. There shall be no evidence of or reason to suspect structural capacity loss due to deterioration of concrete or reinforcing steel or distress, especially at connections. ***(Precast concrete not used)***
C NC U [✓ NA]	MASONRY UNITS. There shall be no evidence of or reason to suspect structural capacity loss due to deterioration of masonry units. ***(Structural masonry not used)***
C NC U [✓ NA]	MASONRY JOINTS. The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no evidence of or reason to suspect structural capacity loss due to eroded mortar. ***(Structural masonry not used)***
C NC U [✓ NA]	MASONRY LAY-UP. Filled collar joints of multi-wythe masonry infill walls shall have negligible voids. ***(Structural masonry not used)***
[✓ C] NC U NA	FOUNDATION PERFORMANCE. There shall be no evidence of or reason to suspect existing foundation movement (due to settlement, heave, or other causes) that would affect the integrity or strength of the structure. ***Limited cracks in exterior walls***
BUILDING CONFIGURATION	
C [✓ NC] U NA **Critical Item**	LOAD PATH. The structure shall contain a minimum of one complete load path for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. ***See WALL ANCHORAGE and CROSS-TIES items in this report.***
C NC U [✓ NA] **Critical Item**	WEAK STORY. The strength of the seismic force-resisting system in any story shall not be less than 80% of the strength in an adjacent story, above or below. ***One story***

C NC U [✓ NA] **Critical Item**	SOFT STORY. The stiffness of the seismic force-resisting system in any story shall not be less than 70% of the seismic force-resisting system stiffness in an adjacent story above or below, or less than 80% of the average seismic force-resisting system stiffness of the three stories above or below. ***One story***
C NC U [✓ NA]	GEOMETRY. There shall be no changes in 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. ***One story***
[✓ C] NC U NA **Critical Item**	VERTICAL DISCONTINUITIES. All vertical elements of the seismic force-resisting system shall be continuous to the foundation. ***One story***
C NC U [✓ NA] **Critical Item**	MASS. There shall be no change in effective mass more than 50% from one story to the next. Light roofs, penthouses and mezzanines need not be considered. ***One story***
[✓ C] NC U NA **Critical Item**	TORSION. The estimated distance between the story center of mass and the story center of rigidity shall be less than 20% of the building width in either plan dimension. ***Building has a flexible diaphragm, and is fairly well balanced with shear wall layout all around the exterior. Openings in the shear walls are consistent, as well.***

C [✓ NC] U NA **Critical Item**	ADJACENT BUILDINGS. The clear distance between the building being evaluated and any adjacent building shall be greater than 4% of the height of the shorter building. Alternatively, if the 4% separation does not exist, the two buildings shall be configured such that pounding would not damage the columns of the subject building within the clear span of the columns. ***Roof height of original classroom building at west end is 15’-10”, and aligns vertically within 12” of 1940 classroom building. There is a 6” separation between the two structures.*** ***15.83’ x 4% = 0.63’, or 7.6” separation required per this check*** ***Deflection of concrete shear wall structure and the URM/gunite structure would be much lower than other SFRS systems. Therefore, although the buildings may move toward each other in a seismic event, the chance of them pounding with the current 6” separation is very low. Tier 2 check not performed.***
C NC U [✓ NA] **Critical Item**	MEZZANINES. Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the seismic force-resisting elements of the main structure. ***(Mezzanines not used)***
MOMENT FRAMES	
C NC U [✓ NA] **Critical Item**	SHEAR STRESS CHECK (Columns). The shear stress in concrete columns of the seismic force-resisting system, calculated using the Quick Check procedure of Section 3.5.3.2, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***(Moment frames not used)***
C NC U [✓ NA] **Critical Item**	AXIAL STRESS CHECK (Concrete columns). The axial stress due to gravity loads in columns subjected to seismic overturning forces shall be less than $0.10f'_c$. Alternatively, the axial stresses due to overturning forces alone, calculated using the Quick Check procedure of Section 3.5.3.6, shall be less than $0.30f'_c$. ***(Moment frames not used)***
C NC U [✓ NA]	AXIAL STRESS CHECK (Steel columns). The axial stress due to gravity loads in steel columns subjected to seismic overturning forces shall be less than $0.10F_y$. Alternatively, the axial stresses due to overturning forces alone, calculated using the Quick Check procedure of Section 3.5.3.6, shall be less than $0.30F_y$. ***(Moment frames not used)***

C NC U [✓ NA] **Critical Item**	FLAT SLAB FRAMES. The seismic force-resisting system shall not be a frame consisting of columns and a flat slab/plate without beams. ***(Moment frames not used)***
C NC U [✓ NA]	PRESTRESSED FRAME ELEMENTS. The seismic force-resisting frames shall not include any prestressed or post-tensioned elements where the average prestress exceeds the lesser of 700 psi or $f'_c/6$ at potential hinge locations. The average prestress shall be calculated in accordance with the Quick Check Procedure of Section 3.5.3.8. ***(Moment frames not used)***
C NC U [✓ NA] **Critical Item**	CAPTIVE COLUMNS. There shall be no columns at a level with height/depth ratios less than 50% of the nominal height/depth ratio of the typical columns at that level. ***(Moment frames not used)***
C NC U [✓ NA]	NO SHEAR FAILURES. The shear capacity of frame members in the seismic force-resisting system shall be able to develop the moment capacity at the ends of the members. ***(Moment frames not used)***
C NC U [✓ NA]	STRONG COLUMN/WEAK BEAM. The sum of the moment capacity of the columns shall be 20% greater than that of the beams at concrete frame joints. ***(Moment frames not used)***
C NC U [✓ NA]	STRONG COLUMN/WEAK BEAM. The percent of strong column/weak beam joints in each story of each line of steel moment-resisting frames shall be greater than 50%. This check need not apply for 1-story structures. ***(Moment frames not used)***
C NC U [✓ NA] **Critical Item**	BEAM BARS. At least two longitudinal top and two longitudinal bottom bars shall extend continuously throughout the length of each frame beam. ***(Moment frames not used)***

C NC U [✓ NA]	COLUMN BAR SPLICES. All column bar lap splice lengths shall be greater than $35d_b$, and shall be enclosed by ties spaced at or less than $8d_b$. Alternatively, column bars shall be spliced with mechanical couplers with a capacity of at least 1.25 times the nominal yield strength of the spliced bar. ***(Moment frames not used)***
C NC U [✓ NA]	BEAM BAR SPLICES. The lap splices or mechanical couplers for longitudinal beam reinforcing shall not be located within $l_b/4$ of the joints and shall not be located in the vicinity of potential plastic hinge locations. ***(Moment frames not used)***
C NC U [✓ NA]	COLUMN TIE SPACING. Frame columns shall have ties spaced at or less than d/4 throughout their length and at or less than $8d_b$ at all potential plastic hinge locations. ***(Moment frames not used)***
C NC U [✓ NA]	STIRRUP SPACING. All beams shall have stirrups spaced at or less than d/2 throughout their length. At potential plastic hinge locations stirrups shall be spaced at or less than the minimum of $8d_b$ or d/4. ***(Moment frames not used)***
C NC U [✓ NA]	JOINT REINFORCING. Beam-column joints shall have ties spaced at or less than $8d_b$. ***(Moment frames not used)***
C NC U [✓ NA]	COMPLETE FRAMES. Concrete frames that are not part of the seismic force-resisting system shall form a complete gravity load carrying system. ***(Moment frames not used)***
C NC U [✓ NA] **Critical Item**	DEFLECTION COMPATIBILITY. Elements of concrete frames that are not part of the seismic force-resisting system shall have the shear capacity to develop the flexural strength of the components. ***(Moment frames not used)***

C NC U [✓ NA] **Critical Item**	FLAT SLABS. Flat slabs/plates that are not part of the seismic force-resisting system shall have continuous bottom steel through the column joints. ***(Moment frames not used)***
C NC U [✓ NA] **Critical Item**	REDUNDANCY (Moment frame). The number of lines of moment frames in each principal direction shall be greater than or equal to 2. ***(Moment frames not used)***
C NC U [✓ NA]	INTERFERING WALLS. All concrete and masonry infill walls placed in moment frames shall be isolated from structural elements. (This evaluation statement does not apply to seismic force-resisting system type C3A or others where the infill is being evaluated as a shear wall or force-resisting element.) ***(Moment frames not used)***
C NC U [✓ NA]	PRECAST CONNECTION CHECK. The connections at joints of precast concrete frames shall have the capacity to resist the shear and moment demands calculated using the Quick Procedure of Section 3.5.3.5 ***(Moment frames not used)***
C NC U [✓ NA]	PRECAST FRAMES. For buildings with concrete shear walls, precast concrete frame elements shall not be necessary as primary components for resisting seismic forces. ***(Moment frames not used)***
C NC U [✓ NA]	PRECAST CONNECTIONS. For buildings with concrete shear walls, the connections between precast frame elements such as chords, ties, and collectors in the seismic force-resisting system shall develop the capacity of the connected members. ***(Moment frames not used)***
C NC U [✓ NA]	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 3.5.3.1, shall be less than 0.025. ***(Moment frames not used)***

C NC U [✓ NA]	MOMENT-RESISTING CONNECTIONS: All moment connections shall be able to develop the strength of the adjoining members or panel zones. ***(Moment frames not used)***
C NC U [✓ NA]	PANEL ZONES: All panel zones shall have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. ***(Moment frames not used)***
C NC U [✓ NA]	COLUM SPLICES: All column splice details located in moment-resisting frames shall include connection of both flanges and the web. ***(Moment frames not used)***
C NC U [✓ NA]	COMPACT MEMBERS: All frame elements shall meet section requirements set forth by Table I-9-1 of Seismic Provisions for Structural Steel Buildings (AISC, 1997). ***(Moment frames not used)***
SHEAR WALLS	
C NC U [✓ NA] **Critical Item**	UNREINFORCED MASONRY BEARING WALLS. The seismic force-resisting system in any direction shall not rely on or consist primarily of unreinforced masonry bearing walls. ***(URM not used)***
[✓ C] NC U NA **Critical Item**	SHEAR STRESS CHECK (Shear wall). The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***See Appendix A.1 for load take-off and Appendix A.2 for calculations. The concrete passes this shear stress check.***

C NC [✓ U] NA	REINFORCING STEEL. In concrete or precast shear walls, the ratio of reinforcing steel area to gross concrete area shall be not less than 0.0015 in the vertical direction and 0.0025 in the horizontal direction. The spacing of reinforcing steel shall be equal to or less than 18 inches. ***Specifications found in DSA archives do give instructions for reinforcement. However, drawings do not indicate size and spacing.***
C NC U [✓ NA]	COUPLING BEAMS. The stirrups in coupling beams over means of egress shall be spaced at or less than d/2 and shall be anchored into the confined core of the beam with hooks of 135º or more. ***One story***
[✓ C] NC U NA **Critical Item**	REDUNDANCY (Shear wall). The number of lines of shear walls in each principal direction shall be greater than or equal to 2. ***Shear walls at all exterior walls.***
C NC U [✓ NA]	PROPORTIONS. The height-to-thickness ratio of masonry infill walls at each story shall be less than 9. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.) ***(Masonry infill not used)***
C NC U [✓ NA]	SOLID WALLS. The masonry infill walls shall not be of cavity construction. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.) ***(Masonry infill not used)***
C NC U [✓ NA]	INFILL WALLS. The infill walls shall be continuous to the soffits of the frame beams and to the columns to either side. (This evaluation statement applies only to seismic force-resisting system type C3A and others where the infill is being evaluated as a shear wall or force-resisting element.) ***(Masonry infill not used)***

C NC U [✓ NA] **Critical Item**	SHEAR STRESS CHECK (Precast concrete shear walls). The shear stress in the precast panels, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the greater of 100 psi or $2\sqrt{f'_c}$. ***(Precast concrete not used)***
C [✓ NC] U NA	WALL OPENINGS. The total width of openings along any perimeter wall line shall constitute less than 75% of the length of any perimeter shear wall, with the wall piers having height-to-width ratios of less than 2 to 1. ***Typical wall pier height-to-width ratio is 6.4, between windows on the east and west exterior walls.***
[✓ C] NC U NA	CORNER OPENINGS. Walls with openings at a building corner larger than the width of a typical panel shall be connected to the remainder of the wall with collector reinforcing.
C NC U [✓ NA] **Critical Item**	SHEAR STRESS CHECK (Brick or hollow clay masonry infill). The shear stress in the masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units. ***(Masonry shear walls not used)***
C NC U [✓ NA] **Critical Item**	SHEAR STRESS CHECK (Concrete block infill and reinforced masonry shear walls). The shear stress in the masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 70 psi for concrete units. ***(Masonry shear walls not used)***
C NC U [✓ NA]	PROPORTIONS. The height-to-thickness ratio of unreinforced masonry infill shear walls shall be less than the following: Top story of multi-story building: 9, First story of multi-story building: 15, All other conditions: 13 ***(Masonry shear walls not used)***
C NC U [✓ NA]	REINFORCING STEEL. In reinforced masonry shear walls, the total vertical and horizontal reinforcing steel ratio shall be greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel shall be less than 48”; and all vertical bars shall extend to the top of the walls. ***(Masonry shear walls not used)***

BRACED FRAMES	
C NC U [✓ NA] **Critical Item**	REDUNDANCY: The number of lines of braced frames in each principal direction shall be greater than or equal to 2. ***(Braced frames not used)***
C NC U [✓ NA] **Critical Item**	AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check Procedure of Section 3.5.3.4, shall be less than $0.50F_y$. ***(Braced frames not used)***
C NC U [✓ NA]	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression shall have Kl/r ratios less than 120. ***(Braced frames not used)***
C NC U [✓ NA]	CONNECTION STRENGTH: All the brace connections shall develop the yield capacity of the diagonals. ***(Braced frames not used)***
C NC U [✓ NA]	K-BRACING: The bracing system shall not include K-braced bays. ***(Braced frames not used)***
DIAPHRAGMS	
[✓ C] NC U NA	DIAPHRAGM CONTINUITY. The diaphragm shall not be composed of split-level floors and shall not have expansion joints.
C [✓ NC] U NA	CROSS TIES. There shall be continuous cross ties between diaphragm chords. ***Cross ties do not appear to exist where roof rafters are parallel to shear walls.***

[✓ C] NC U NA	ROOF CHORD CONTINUITY. All roof chord elements shall be continuous, regardless of changes in roof elevation. ***Although the reinforcement size and spacing is unknown, it is highly likely that horizontal rebar is placed consistently close to the diaphragm level, and therefore, the roof chord elements are continuous.***
C NC U [✓ NA] **Critical Item**	OPENINGS AT SHEAR WALLS. Diaphragm openings immediately adjacent to the shear walls shall be less than 25% of the wall length, and diaphragm openings immediately adjacent to exterior masonry shear walls shall not be greater than 8 ft long. ***Skylights are not immediately adjacent to shear walls. See "Roof Plan" on Sheet 1 of Set 1.***
C NC U [✓ NA]	OPENINGS AT BRACED FRAMES. Diaphragm openings immediately adjacent to the braced frames shall extend less than 25% of the frame length. ***(Braced frames not used)***
C NC U [✓ NA]	OTHER DIAPHRAGMS. The diaphragm shall not consist of a system other than wood, metal deck, concrete or horizontal bracing. ***Wood diaphragms used***
C NC U [✓ NA] **Critical Item**	TOPPING SLAB. Precast concrete diaphragm elements shall be interconnected by a continuous reinforced concrete topping slab. ***(Topping slab not used)***
C NC U [✓ NA]	STRAIGHT SHEATHING. All straight sheathed diaphragms shall have aspect ratios less than 2 to 1 in the direction being considered. ***Diagonal sheathing is used***
[✓ C] NC U NA	SPANS. All wood diaphragms with spans greater than 24 ft shall consist of wood structural panels or diagonal sheathing. ***Diagonal sheathing is used***

C [✓ NC] U NA	UNBLOCKED DIAPHRAGMS. All diagonally sheathed or unblocked wood structural panel diaphragms shall have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4 to 1. ***In north-south loading direction, diaphragm spans 122'-9". See Sheet 2 of Set 1.***
CONNECTIONS	
C [✓ NC] U NA **Critical Item**	WALL ANCHORAGE. Exterior concrete or masonry walls shall be anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 3.5.3.7. ***Walls are not anchored for OOP forces. Anchorage is used in the wood ledgers to provide gravity load and in-plane load transfer. See "Wood Ledgers" topic, below. There is no indication of OOP anchorage in Set 1, Set 2, the Specifications, or the DSA review. Furthermore, the 1930 and 1937 structures by the same architect did not have OOP anchorage.***
C [✓ NC] U NA	WOOD LEDGERS. The connection between the wall panels and the diaphragm shall not induce cross-grain bending or tension in the wood ledgers. ***Wood ledgers are attached with 5/8" diameter bolts at 48" o.c. or 60" o.c., as stated in the DSA Structural Engineer's Correction List from April 6, 1940. Please see Appendix A.3. and Item #9.b. It is not likely in this configuration that the anchor bolts were staggered so as to avoid cross-grain bending.***
C NC U [✓ NA]	PRECAST PANEL CONNECTIONS. There shall be at least two anchors from each precast wall panel into the diaphragm elements. ***(Precast panels not used)***
C NC [✓ U] NA	STIFFNESS OF WALL ANCHORS. Anchors of concrete or masonry walls to wood structural elements shall be installed taut and shall be stiff enough to limit the relative movement between the wall and the diaphragm prior to engagement of the anchors, as needed for reliable bearing.
C NC U [✓ NA]	GIRDER/COLUMN CONNECTION. There shall be a positive connection utilizing plates, connection hardware, or straps between girders and their supporting columns. (This evaluation statement applies primarily to precast concrete and masonry systems.)

C NC U [✓ NA]	GIRDERS. Girders supported by walls or pilasters shall have at least two additional column ties securing the anchor bolts. (This evaluation statement applies primarily to precast concrete systems.) ***(Precast frame not used)***
C NC U [✓ NA]	CORBEL BEARING. If precast concrete frame girders bear on column corbels, the length of bearing shall be greater than 3”. ***(Precast frame not used)***
C NC U [✓ NA]	CORBEL CONNECTIONS. Precast concrete frame girders shall not be connected to corbels with welded elements. ***(Precast frame not used)***
[✓ C] NC U NA	TRANSFER TO SHEAR WALLS. Diaphragms shall be connected for transfer of loads to shear walls. ***It can reasonably be assumed that the diagonal sheathing is nailed to the ledger and that the ledger is bolted to the concrete shear wall. This is the method used in the adjacent 1930 URM building and the adjacent 1937 C2A building by the same architect. Section C, Sheet A10 of Set 2 does show ledgers.***
C NC U [✓ NA]	TRANSFER TO STEEL FRAMES. Diaphragms shall be connected for transfer of loads to the steel frames. ***(Steel frames not used)***
C NC U [✓ NA]	TOPPING SLAB TO WALLS OR FRAMES. Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements shall be doweled for transfer of forces into shear wall or frame elements. ***(Topping slab not used)***
C NC U [✓ NA]	CONCRETE COLUMNS. All concrete columns shall be doweled into the foundation. ***(Concrete columns not used)***

[✓ C] NC U NA	FOUNDATION DOWELS. Wall reinforcement shall be doweled into the foundation. ***This detail is unknown, but it can reasonably be assumed that the concrete wall is doweled to the footings. This is the method used in the adjacent 1937 C2A building by the same architect.***
C NC U [✓ NA]	PRECAST WALL PANELS. Precast wall panels shall be connected to the foundation. ***(Precast panels not used)***
C NC U [✓ NA]	UPLIFT AT PILE CAPS. Pile caps shall have top reinforcement and piles shall be anchored to the pile caps. ***(Piles not used)***
C NC U [✓ NA]	STEEL COLUMNS: The columns in lateral-force-resisting frames shall be anchored to the building foundation. ***(Steel frames not used)***
C NC U [✓ NA]	WALL PANELS: Metal, fiberglass or cementitious wall panels shall be positively attached to the foundation. ***(Cladding panels not used)***
C NC U [✓ NA]	ROOF PANELS: Metal, plastic, or cementitious roof panels shall be positively attached to the roof framing to resist seismic forces. ***(Cladding panels not used)***
C NC U [✓ NA]	WALL PANELS: Metal, fiberglass or cementitious wall panels shall be positively attached to the framing to resist seismic forces. ***(Cladding panels not used)*** ***The brick veneer is most likely anchored per the requirements in the project specifications. See Appendix A.3.***

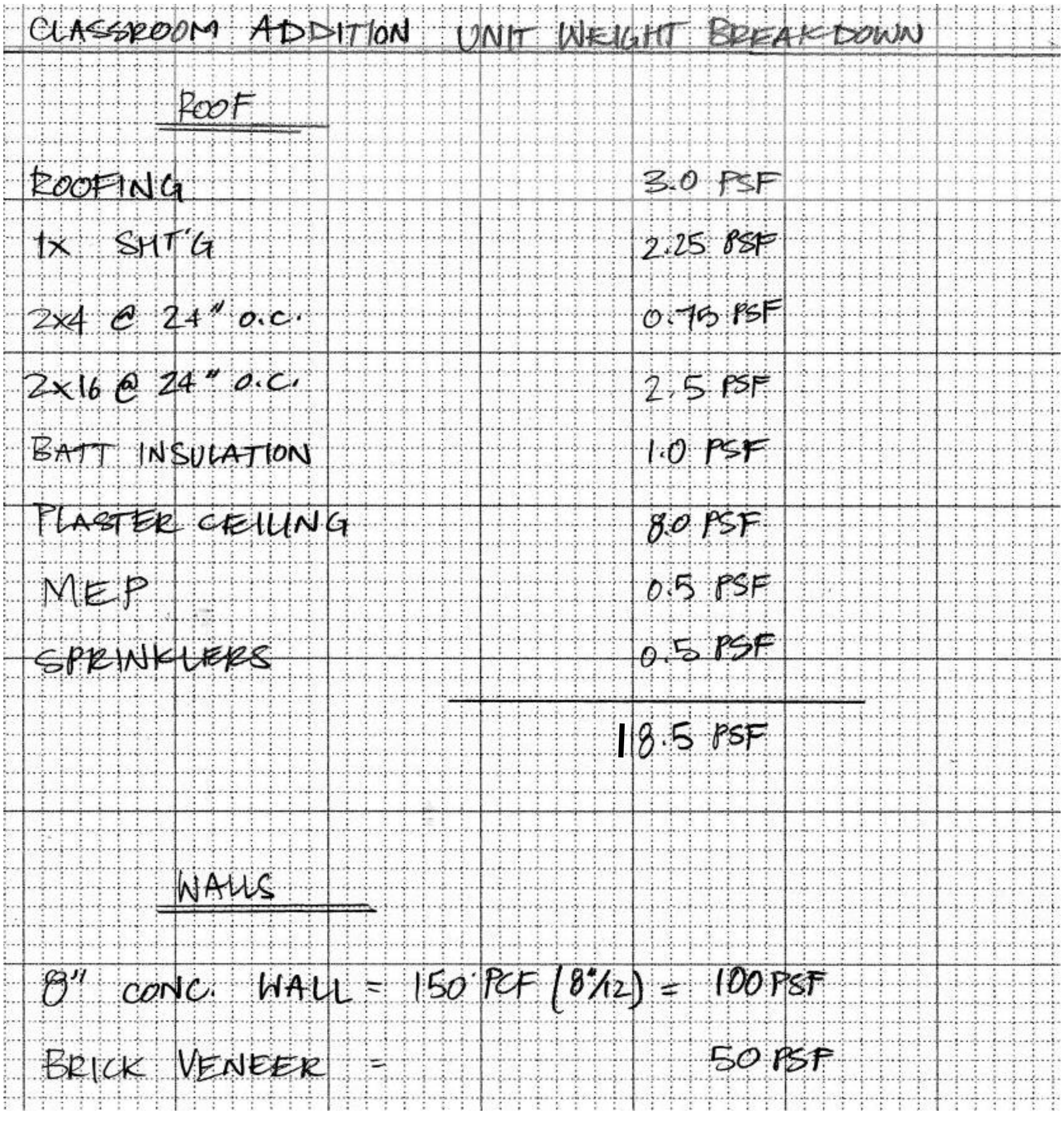
FOUNDATION	
C NC U [✓ NA]	POLE FOUNDATIONS. Pole foundations shall have a minimum embedment depth of 4 ft. ***Foundations are conventional concrete continuous and pad footings as well as shallow piers.***
C [✓ NC] U NA	TIES BETWEEN FOUNDATION ELEMENTS. The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils in Site Class A, B, or C. ***Interior pier footings not tied.***

GEOLOGIC SITE HAZARDS	
C NC [✓ U] NA **Critical Item**	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet.
C NC U [✓ NA] **Critical Item**	SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure.
C NC [✓ U] NA **Critical Item**	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated.

Appendices

A.1 Structural calculations

UNIT WEIGHTS



CLASSROOM ADDITION UNIT WEIGHT BREAKDOWN

ROOF

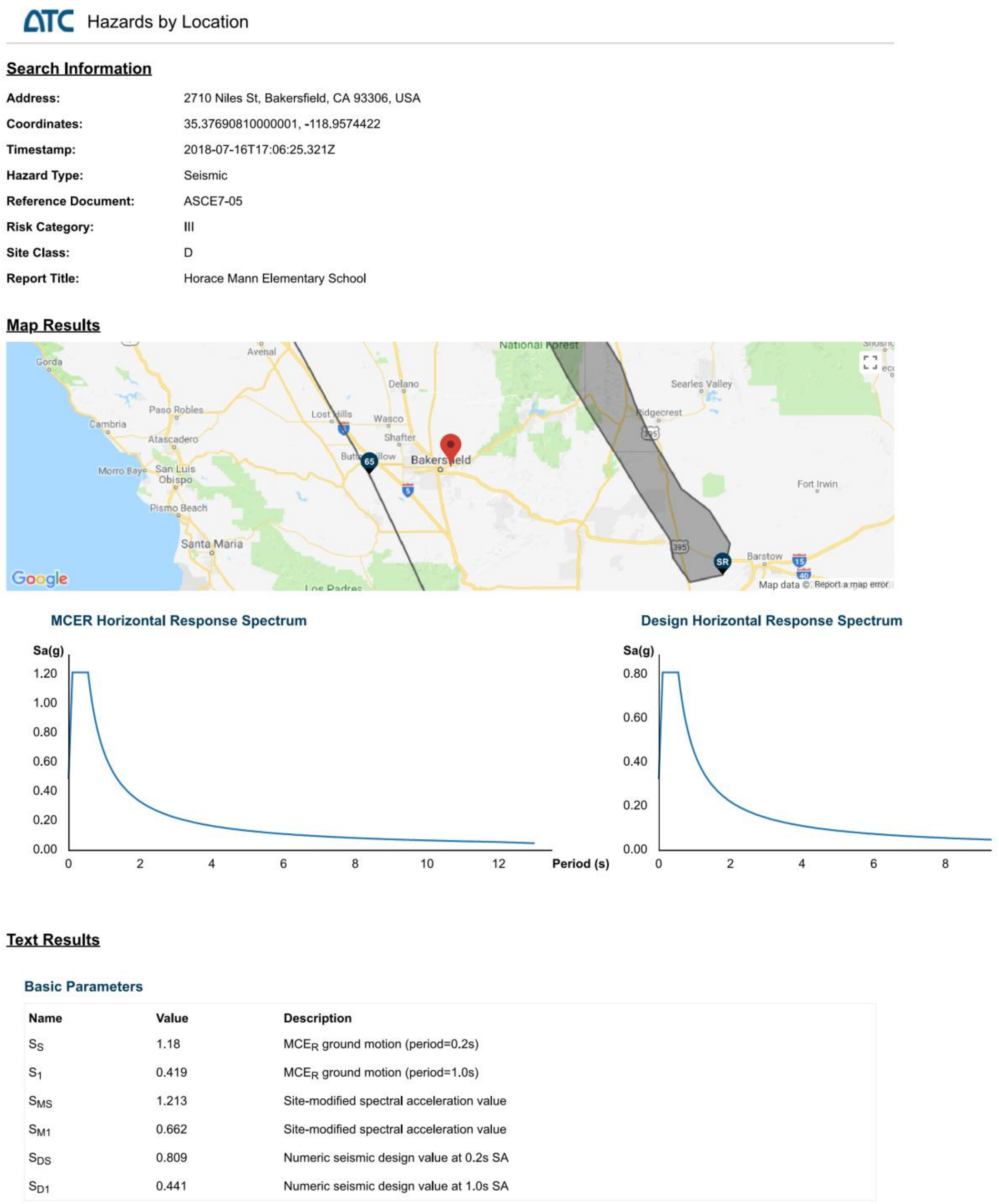
ROOFING	3.0 PSF
1x SHT'G	2.25 PSF
2x4 @ 24" o.c.	0.75 PSF
2x16 @ 24" o.c.	2.5 PSF
BATT INSULATION	1.0 PSF
PLASTER CEILING	8.0 PSF
MEP	0.5 PSF
SPRINKLERS	0.5 PSF
	18.5 PSF

WALLS

8" CONC. WALL = 150 PCF (8"/12) = 100 PSF

BRICK VENEER = 50 PSF

ATC HAZARDS RESPONSE SPERCTRUM INFORMATION



ATC Hazards by Location

Search Information

Address:	2710 Niles St, Bakersfield, CA 93306, USA
Coordinates:	35.37690810000001, -118.9574422
Timestamp:	2018-07-16T17:06:25.321Z
Hazard Type:	Seismic
Reference Document:	ASCE7-05
Risk Category:	III
Site Class:	D
Report Title:	Horace Mann Elementary School

Map Results

MCER Horizontal Response Spectrum

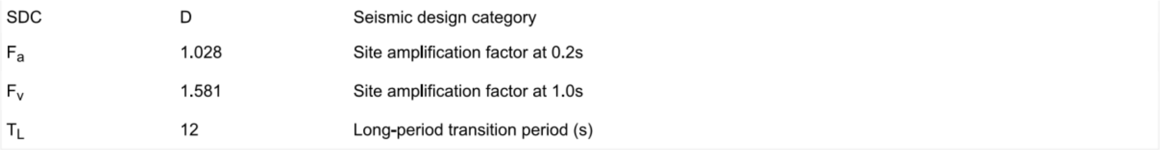
Design Horizontal Response Spectrum

Text Results

Basic Parameters

Name	Value	Description
S_S	1.18	MCE_R ground motion (period=0.2s)
S_1	0.419	MCE_R ground motion (period=1.0s)
S_{MS}	1.213	Site-modified spectral acceleration value
S_{M1}	0.662	Site-modified spectral acceleration value
S_{DS}	0.809	Numeric seismic design value at 0.2s SA
S_{D1}	0.441	Numeric seismic design value at 1.0s SA

ATC HAZARDS RESPONSE SPERCTRUM INFORMATION (continued)



SDC	D	Seismic design category
F_a	1.028	Site amplification factor at 0.2s
F_v	1.581	Site amplification factor at 1.0s
T_L	12	Long-period transition period (s)

BASE SHEAR/PSEUDO-LATERAL FORCE

PSEUDO LATERAL FORCE

$V = C S_a W$ ASCE 31, EQN. 3-1

$S_a = \frac{S_{D1}}{T}$, BUT $\leq S_{DS}$ § EQN. 3-4

$= 2.44$

$\therefore S_a = S_{DS} = 0.773g$

$S_{DS} = 0.773g$

$S_{D1} = 0.427g$

$T = C_t h_n^{\beta}$ § EQN. 3-8

$C_t = 0.020$

$h_n = 18'$

$\beta = 0.75$

§ SEC. 3.5.2.4

$T = 0.175s$

$C = 1.0$ § TABLE 3-4

W = EFFECTIVE SEISMIC WEIGHT

$W_{ROOF} = 7{,}000\,ft^2 (18.5\,PSF) = 129.5^K$

$W_{WALLS} = 6'(100PSF) \times 360' + 5'(100PSF)(0.7) \times 360'$

$= 162^K$

$W_{BRICK\ VEN.} = 6'(50\,PSF) \times 240' + 5'(50PSF)(0.7) \times 240'$

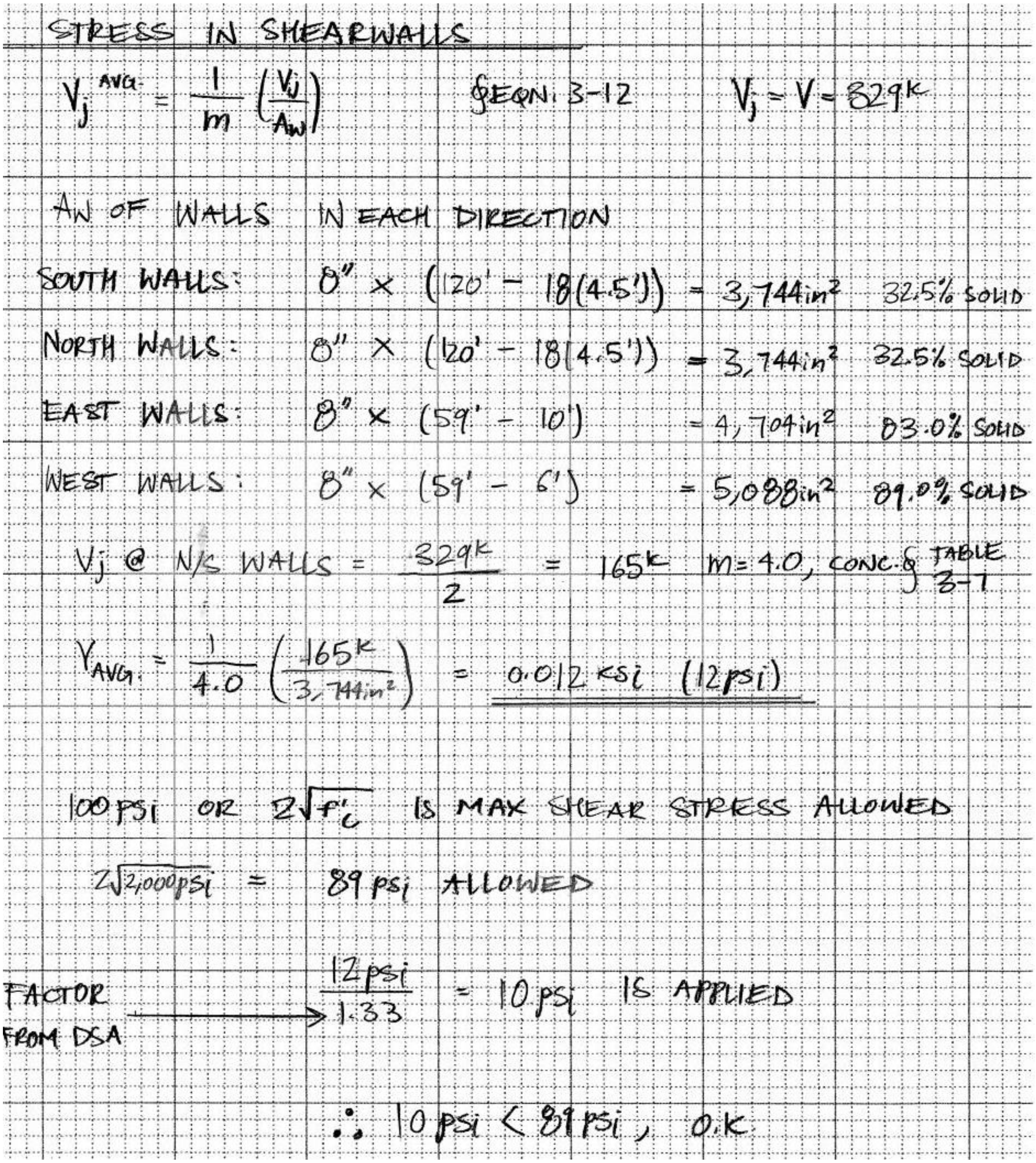
$= 114^K$

$W_{TOTAL} = 406^K$

$V = 1.0(0.809)(406^K) \longrightarrow \underline{\underline{V = 329^K}}$

A.2 Evaluation statement notes

SHEAR STRESS (Concrete)



STRESS IN SHEARWALLS

$V_j^{AVG} = \frac{1}{m}\left(\frac{V_j}{A_w}\right)$ § EQN. 3-12 $V_j = V = 329^k$

A_W OF WALLS IN EACH DIRECTION

SOUTH WALLS: 8" × (120' − 18(4.5')) = 3,744in² 32.5% SOLID

NORTH WALLS: 8" × (120' − 18(4.5')) = 3,744in² 32.5% SOLID

EAST WALLS: 8" × (59' − 10') = 4,704in² 83.0% SOLID

WEST WALLS: 8" × (59' − 6') = 5,088in² 89.0% SOLID

V_j @ N/S WALLS = $\frac{329^k}{2}$ = 165^k m = 4.0, CONC. § TABLE 3-7

$V_{AVG.} = \frac{1}{4.0}\left(\frac{165^k}{3,744 in^2}\right) = \underline{\underline{0.012 \text{ ksi} \quad (12 psi)}}$

100 psi OR $2\sqrt{f'_c}$ IS MAX SHEAR STRESS ALLOWED

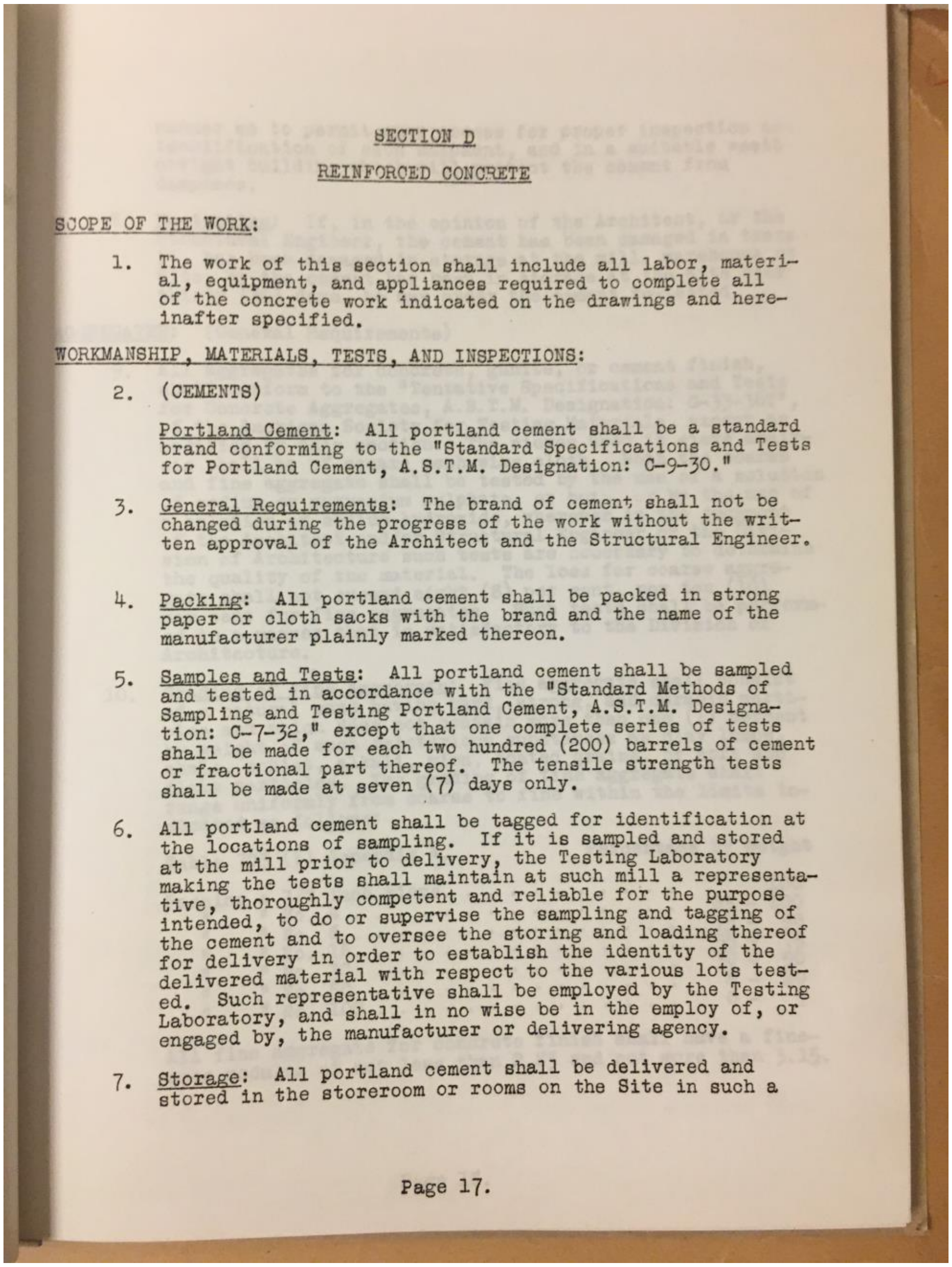
$2\sqrt{2,000 psi}$ = 89 psi ALLOWED

FACTOR FROM DSA → $\frac{12 psi}{1.33}$ = 10 psi IS APPLIED

∴ 10 psi < 89 psi, O.K.

A.3 Photographs and details (not used)

Structural Materials (Reinforced Concrete Specification, first page)



SECTION D

REINFORCED CONCRETE

SCOPE OF THE WORK:

1. The work of this section shall include all labor, material, equipment, and appliances required to complete all of the concrete work indicated on the drawings and hereinafter specified.

WORKMANSHIP, MATERIALS, TESTS, AND INSPECTIONS:

2. (CEMENTS)

   Portland Cement: All portland cement shall be a standard brand conforming to the "Standard Specifications and Tests for Portland Cement, A.S.T.M. Designation: C-9-30."

3. General Requirements: The brand of cement shall not be changed during the progress of the work without the written approval of the Architect and the Structural Engineer.

4. Packing: All portland cement shall be packed in strong paper or cloth sacks with the brand and the name of the manufacturer plainly marked thereon.

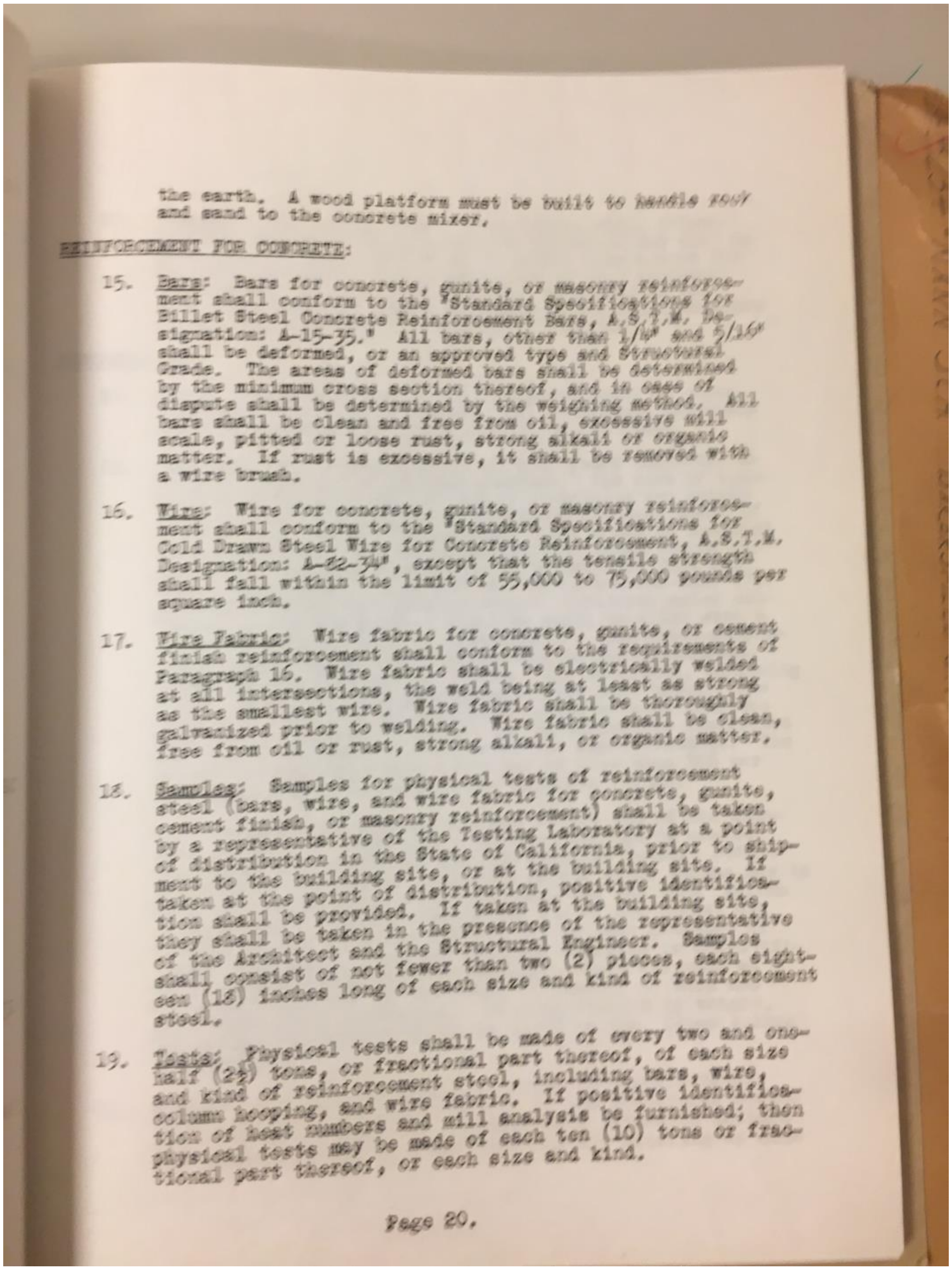
5. Samples and Tests: All portland cement shall be sampled and tested in accordance with the "Standard Methods of Sampling and Testing Portland Cement, A.S.T.M. Designation: C-7-32," except that one complete series of tests shall be made for each two hundred (200) barrels of cement or fractional part thereof. The tensile strength tests shall be made at seven (7) days only.

6. All portland cement shall be tagged for identification at the locations of sampling. If it is sampled and stored at the mill prior to delivery, the Testing Laboratory making the tests shall maintain at such mill a representative, thoroughly competent and reliable for the purpose intended, to do or supervise the sampling and tagging of the cement and to oversee the storing and loading thereof for delivery in order to establish the identity of the delivered material with respect to the various lots tested. Such representative shall be employed by the Testing Laboratory, and shall in no wise be in the employ of, or engaged by, the manufacturer or delivering agency.

7. Storage: All portland cement shall be delivered and stored in the storeroom or rooms on the Site in such a

Page 17.

Structural Materials (Reinforced Concrete Specification, fourth page)



the earth. A wood platform must be built to handle rock and sand to the concrete mixer.

REINFORCEMENT FOR CONCRETE:

15. **Bars:** Bars for concrete, gunite, or masonry reinforcement shall conform to the "Standard Specifications for Billet Steel Concrete Reinforcement Bars, A.S.T.M. Designation: A-15-35." All bars, other than 1/4" and 5/16" shall be deformed, or an approved type and Structural Grade. The areas of deformed bars shall be determined by the minimum cross section thereof, and in case of dispute shall be determined by the weighing method. All bars shall be clean and free from oil, excessive mill scale, pitted or loose rust, strong alkali or organic matter. If rust is excessive, it shall be removed with a wire brush.

16. **Wire:** Wire for concrete, gunite, or masonry reinforcement shall conform to the "Standard Specifications for Cold Drawn Steel Wire for Concrete Reinforcement, A.S.T.M. Designation: A-82-34", except that the tensile strength shall fall within the limit of 55,000 to 75,000 pounds per square inch.

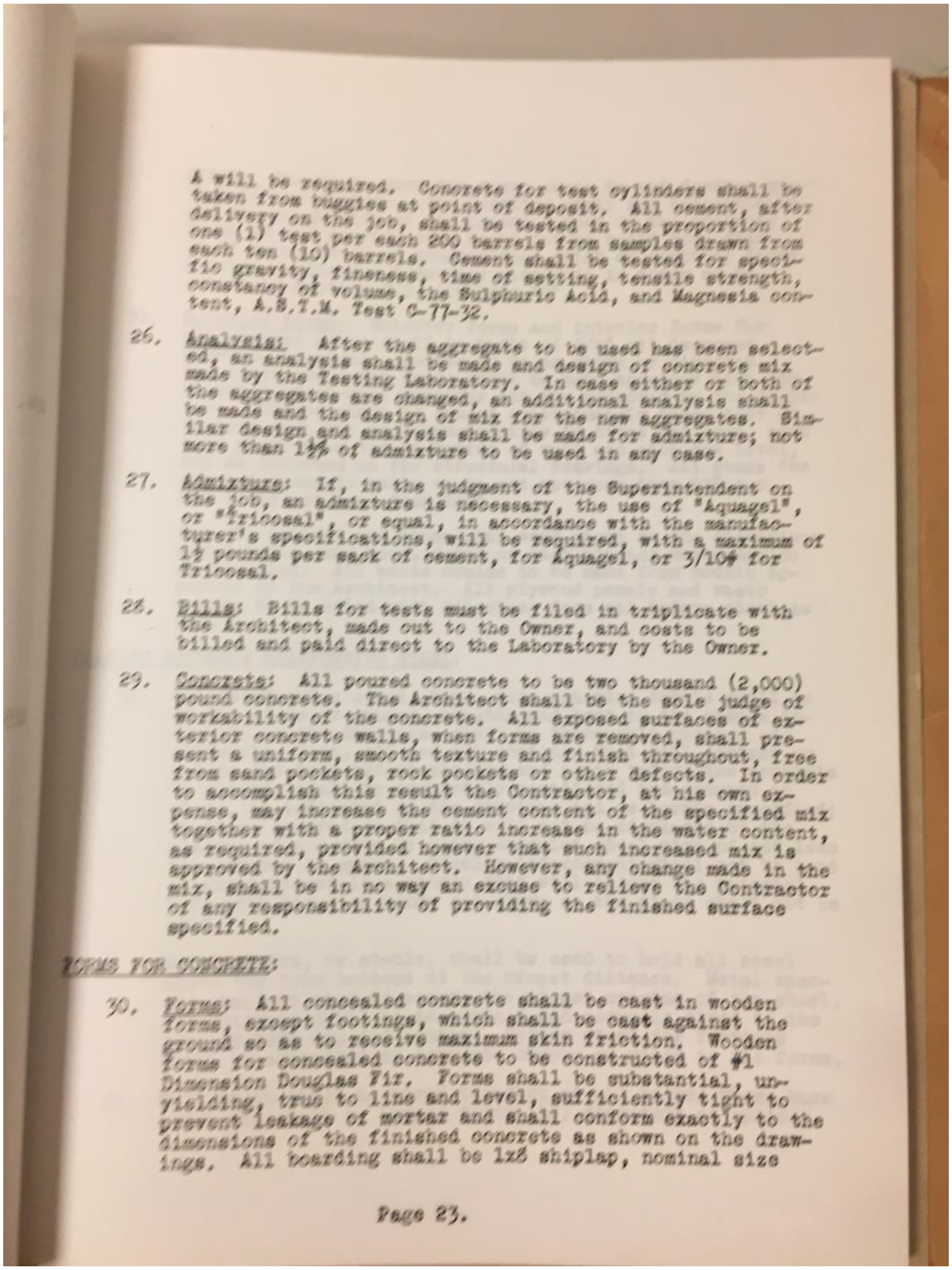
17. **Wire Fabric:** Wire fabric for concrete, gunite, or cement finish reinforcement shall conform to the requirements of Paragraph 16. Wire fabric shall be electrically welded at all intersections, the weld being at least as strong as the smallest wire. Wire fabric shall be thoroughly galvanized prior to welding. Wire fabric shall be clean, free from oil or rust, strong alkali, or organic matter.

18. **Samples:** Samples for physical tests of reinforcement steel (bars, wire, and wire fabric for concrete, gunite, cement finish, or masonry reinforcement) shall be taken by a representative of the Testing Laboratory at a point of distribution in the State of California, prior to shipment to the building site, or at the building site. If taken at the point of distribution, positive identification shall be provided. If taken at the building site, they shall be taken in the presence of the representative of the Architect and the Structural Engineer. Samples shall consist of not fewer than two (2) pieces, each eighteen (18) inches long of each size and kind of reinforcement steel.

19. **Tests:** Physical tests shall be made of every two and one-half (2½) tons, or fractional part thereof, of each size and kind of reinforcement steel, including bars, wire, column hooping, and wire fabric. If positive identification of heat numbers and mill analysis be furnished; then physical tests may be made of each ten (10) tons or fractional part thereof, or each size and kind.

Page 20.

Structural Materials (Reinforced Concrete Specification, seventh page)



A will be required. Concrete for test cylinders shall be taken from buggies at point of deposit. All cement, after delivery on the job, shall be tested in the proportion of one (1) test per each 200 barrels from samples drawn from each ten (10) barrels. Cement shall be tested for specific gravity, fineness, time of setting, tensile strength, constancy of volume, the Sulphuric Acid, and Magnesia content, A.S.T.M. Test C-77-32.

26. <u>Analysis:</u> After the aggregate to be used has been selected, an analysis shall be made and design of concrete mix made by the Testing Laboratory. In case either or both of the aggregates are changed, an additional analysis shall be made and the design of mix for the new aggregates. Similar design and analysis shall be made for admixture; not more than 1½% of admixture to be used in any case.

27. <u>Admixture:</u> If, in the judgment of the Superintendent on the job, an admixture is necessary, the use of "Aquagel", or "Tricosal", or equal, in accordance with the manufacturer's specifications, will be required, with a maximum of 1½ pounds per sack of cement, for Aquagel, or 3/10# for Tricosal.

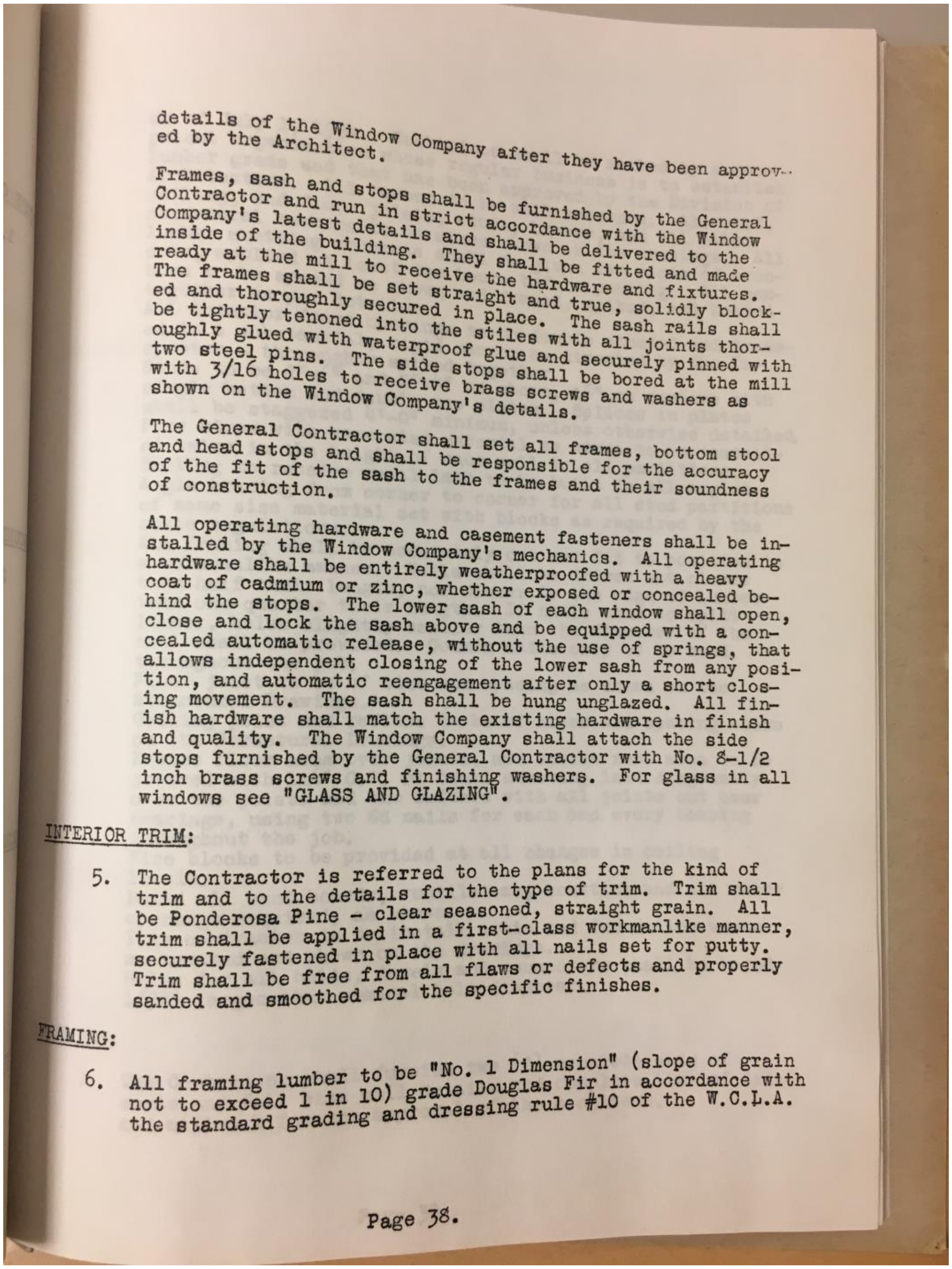
28. <u>Bills:</u> Bills for tests must be filed in triplicate with the Architect, made out to the Owner, and costs to be billed and paid direct to the Laboratory by the Owner.

29. <u>Concrete:</u> All poured concrete to be two thousand (2,000) pound concrete. The Architect shall be the sole judge of workability of the concrete. All exposed surfaces of exterior concrete walls, when forms are removed, shall present a uniform, smooth texture and finish throughout, free from sand pockets, rock pockets or other defects. In order to accomplish this result the Contractor, at his own expense, may increase the cement content of the specified mix together with a proper ratio increase in the water content, as required, provided however that such increased mix is approved by the Architect. However, any change made in the mix, shall be in no way an excuse to relieve the Contractor of any responsibility of providing the finished surface specified.

FORMS FOR CONCRETE:

30. <u>Forms:</u> All concealed concrete shall be cast in wooden forms, except footings, which shall be cast against the ground so as to receive maximum skin friction. Wooden forms for concealed concrete to be constructed of #1 Dimension Douglas Fir. Forms shall be substantial, unyielding, true to line and level, sufficiently tight to prevent leakage of mortar and shall conform exactly to the dimensions of the finished concrete as shown on the drawings. All boarding shall be 1x8 shiplap, nominal size

Structural Materials (Carpenter and Mill Work Specification, second page)



details of the Window Company after they have been approved by the Architect.

Frames, sash and stops shall be furnished by the General Contractor and run in strict accordance with the Window Company's latest details and shall be delivered to the inside of the building. They shall be fitted and made ready at the mill to receive the hardware and fixtures. The frames shall be set straight and true, solidly blocked and thoroughly secured in place. The sash rails shall be tightly tenoned into the stiles with all joints thoroughly glued with waterproof glue and securely pinned with two steel pins. The side stops shall be bored at the mill with 3/16 holes to receive brass screws and washers as shown on the Window Company's details.

The General Contractor shall set all frames, bottom stool and head stops and shall be responsible for the accuracy of the fit of the sash to the frames and their soundness of construction.

All operating hardware and casement fasteners shall be installed by the Window Company's mechanics. All operating hardware shall be entirely weatherproofed with a heavy coat of cadmium or zinc, whether exposed or concealed behind the stops. The lower sash of each window shall open, close and lock the sash above and be equipped with a concealed automatic release, without the use of springs, that allows independent closing of the lower sash from any position, and automatic reengagement after only a short closing movement. The sash shall be hung unglazed. All finish hardware shall match the existing hardware in finish and quality. The Window Company shall attach the side stops furnished by the General Contractor with No. 8-1/2 inch brass screws and finishing washers. For glass in all windows see "GLASS AND GLAZING".

INTERIOR TRIM:

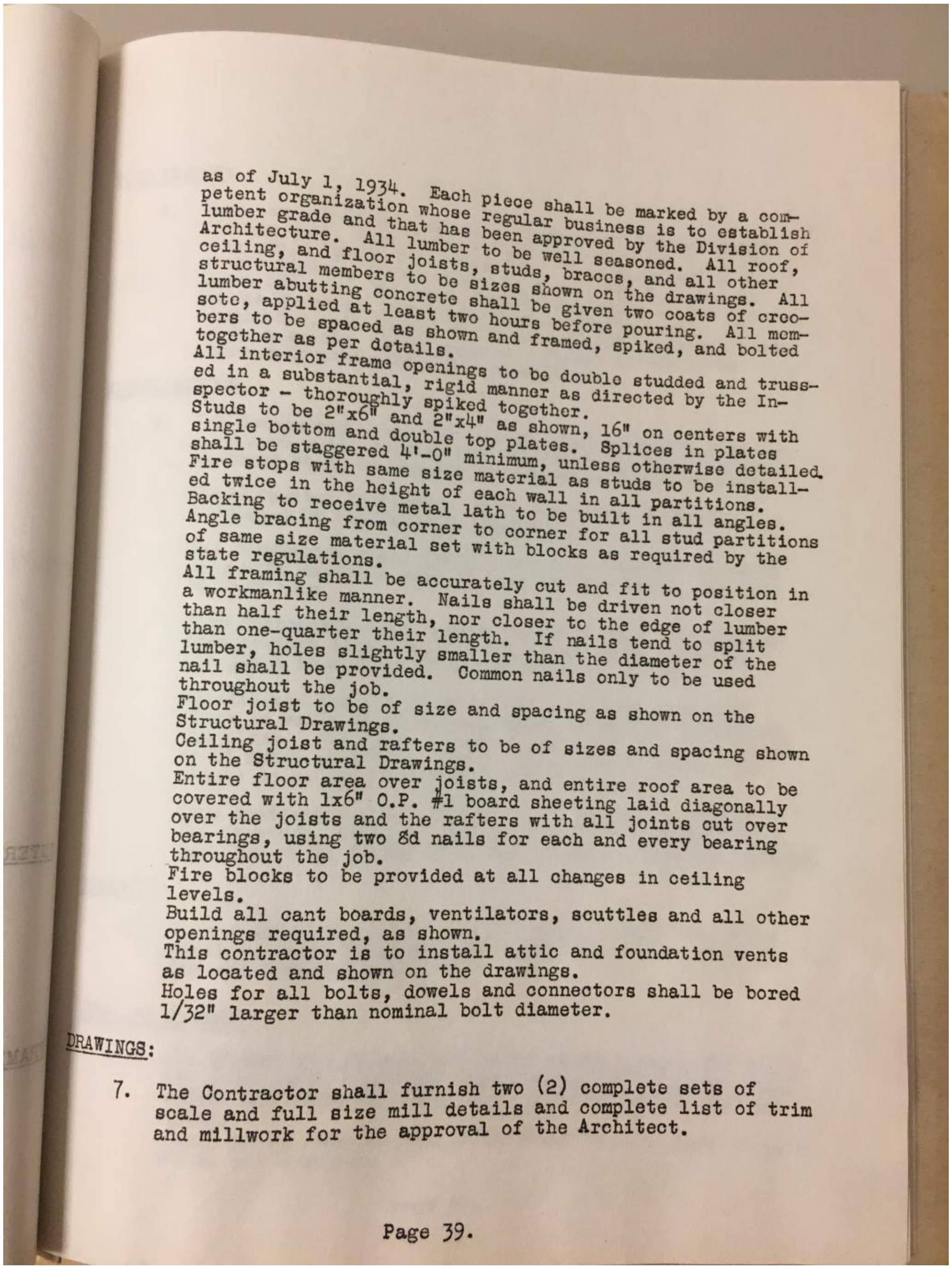
5. The Contractor is referred to the plans for the kind of trim and to the details for the type of trim. Trim shall be Ponderosa Pine - clear seasoned, straight grain. All trim shall be applied in a first-class workmanlike manner, securely fastened in place with all nails set for putty. Trim shall be free from all flaws or defects and properly sanded and smoothed for the specific finishes.

FRAMING:

6. All framing lumber to be "No. 1 Dimension" (slope of grain not to exceed 1 in 10) grade Douglas Fir in accordance with the standard grading and dressing rule #10 of the W.C.L.A.

Page 38.

Structural Materials (Carpenter and Mill Work Specification, third page)



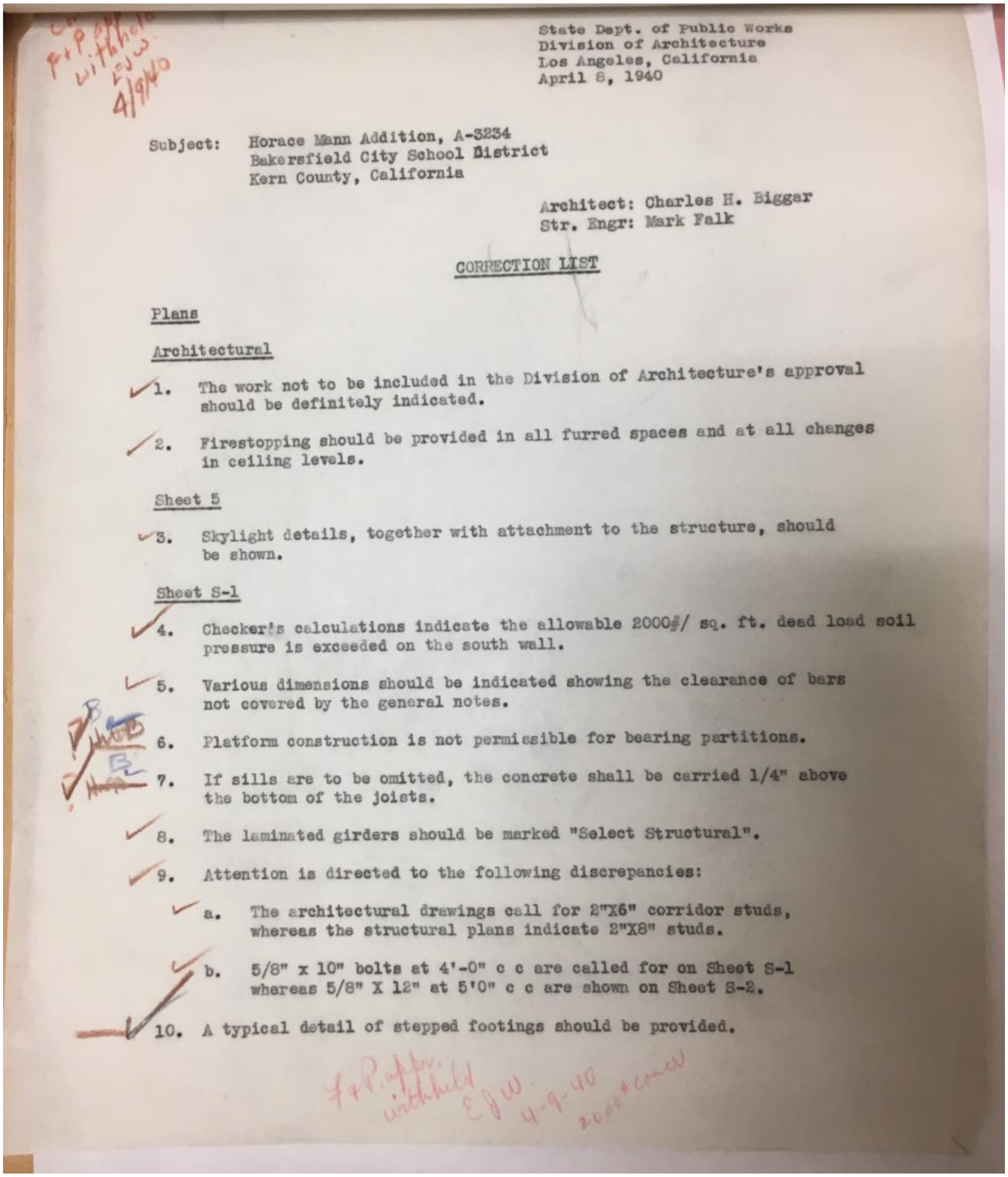
as of July 1, 1934. Each piece shall be marked by a com-
petent organization whose regular business is to establish
lumber grade and that has been approved by the Division of
Architecture. All lumber to be well seasoned. All roof,
ceiling, and floor joists, studs, braces, and all other
structural members to be sizes shown on the drawings. All
lumber abutting concrete shall be given two coats of creo-
sote, applied at least two hours before pouring. All mem-
bers to be spaced as shown and framed, spiked, and bolted
together as per details.
All interior frame openings to be double studded and truss-
ed in a substantial, rigid manner as directed by the In-
spector - thoroughly spiked together.
Studs to be 2"x6" and 2"x4" as shown, 16" on centers with
single bottom and double top plates. Splices in plates
shall be staggered 4'-0" minimum, unless otherwise detailed.
Fire stops with same size material as studs to be install-
ed twice in the height of each wall in all partitions.
Backing to receive metal lath to be built in all angles.
Angle bracing from corner to corner for all stud partitions
of same size material set with blocks as required by the
state regulations.
All framing shall be accurately cut and fit to position in
a workmanlike manner. Nails shall be driven not closer
than half their length, nor closer to the edge of lumber
than one-quarter their length. If nails tend to split
lumber, holes slightly smaller than the diameter of the
nail shall be provided. Common nails only to be used
throughout the job.
Floor joist to be of size and spacing as shown on the
Structural Drawings.
Ceiling joist and rafters to be of sizes and spacing shown
on the Structural Drawings.
Entire floor area over joists, and entire roof area to be
covered with 1x6" O.P. #1 board sheeting laid diagonally
over the joists and the rafters with all joints cut over
bearings, using two 8d nails for each and every bearing
throughout the job.
Fire blocks to be provided at all changes in ceiling
levels.
Build all cant boards, ventilators, scuttles and all other
openings required, as shown.
This contractor is to install attic and foundation vents
as located and shown on the drawings.
Holes for all bolts, dowels and connectors shall be bored
1/32" larger than nominal bolt diameter.

DRAWINGS:

7. The Contractor shall furnish two (2) complete sets of scale and full size mill details and complete list of trim and millwork for the approval of the Architect.

Page 39.

WOOD LEDGERS (see item #9.b)



F+P app withheld EJW 4/9/40

State Dept. of Public Works
Division of Architecture
Los Angeles, California
April 8, 1940

Subject: Horace Mann Addition, A-3234
Bakersfield City School District
Kern County, California

Architect: Charles H. Biggar
Str. Engr: Mark Falk

CORRECTION LIST

Plans

Architectural

✓1. The work not to be included in the Division of Architecture's approval should be definitely indicated.

✓2. Firestopping should be provided in all furred spaces and at all changes in ceiling levels.

Sheet 5

✓3. Skylight details, together with attachment to the structure, should be shown.

Sheet S-1

✓4. Checker's calculations indicate the allowable 2000#/ sq. ft. dead load soil pressure is exceeded on the south wall.

✓5. Various dimensions should be indicated showing the clearance of bars not covered by the general notes.

✓6. Platform construction is not permissible for bearing partitions.

✓7. If sills are to be omitted, the concrete shall be carried 1/4" above the bottom of the joists.

✓8. The laminated girders should be marked "Select Structural".

✓9. Attention is directed to the following discrepancies:

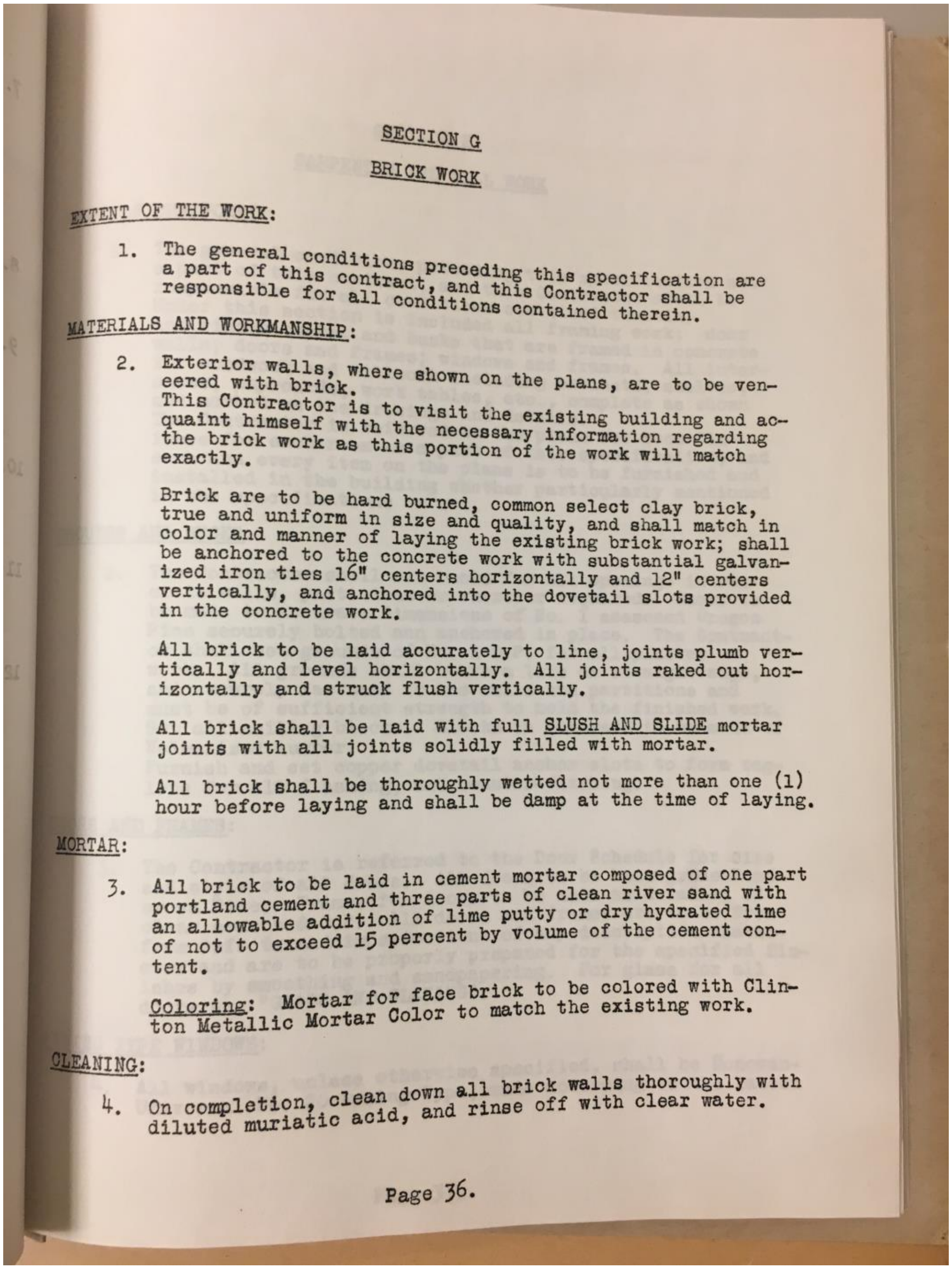
  ✓a. The architectural drawings call for 2"X6" corridor studs, whereas the structural plans indicate 2"X8" studs.

  ✓b. 5/8" x 10" bolts at 4'-0" c c are called for on Sheet S-1 whereas 5/8" X 12" at 5'0" c c are shown on Sheet S-2.

✓10. A typical detail of stepped footings should be provided.

F+P. appr. withheld EJW 4-9-40 2000# corr

WALL PANELS (from Project Specifications)



SECTION G

BRICK WORK

EXTENT OF THE WORK:

1. The general conditions preceding this specification are a part of this contract, and this Contractor shall be responsible for all conditions contained therein.

MATERIALS AND WORKMANSHIP:

2. Exterior walls, where shown on the plans, are to be veneered with brick.
This Contractor is to visit the existing building and acquaint himself with the necessary information regarding the brick work as this portion of the work will match exactly.

Brick are to be hard burned, common select clay brick, true and uniform in size and quality, and shall match in color and manner of laying the existing brick work; shall be anchored to the concrete work with substantial galvanized iron ties 16" centers horizontally and 12" centers vertically, and anchored into the dovetail slots provided in the concrete work.

All brick to be laid accurately to line, joints plumb vertically and level horizontally. All joints raked out horizontally and struck flush vertically.

All brick shall be laid with full SLUSH AND SLIDE mortar joints with all joints solidly filled with mortar.

All brick shall be thoroughly wetted not more than one (1) hour before laying and shall be damp at the time of laying.

MORTAR:

3. All brick to be laid in cement mortar composed of one part portland cement and three parts of clean river sand with an allowable addition of lime putty or dry hydrated lime of not to exceed 15 percent by volume of the cement content.

Coloring: Mortar for face brick to be colored with Clinton Metallic Mortar Color to match the existing work.

CLEANING:

4. On completion, clean down all brick walls thoroughly with diluted muriatic acid, and rinse off with clear water.