FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

Seismic Strengthening Program / Measure E Bond Program

COMBINED INVESTIGATION & CONCEPT DESIGN REPORTS

FINAL REPORT

March 18, 2008

R. P. Gallagher Associates, Inc.
Structural Engineering

murakami Nelson
ARCHITECTURAL CORPORATION

FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

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CONCEPT DESIGN REPORT / ALTERNATIVE SOLUTIONS

FINAL REPORT

March 18, 2008

Building A - Kindergarten / Administration

Building B - Second Grade

Building C - Ellen Driscoll Theatre

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1. APRIL 25, 2007: CONCEPT DESIGN / ALTERNATIVE SOLUTIONS REPORT

FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

Seismic Strengthening Program / Measure E Bond Program

CONCEPT DESIGN / ALTERNATIVE SOLUTIONS

April 25, 2007

Building A - Kindergarten / Administration

Building B - Second Grade

Building C - Ellen Driscoll Theatre

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i. EXECUTIVE SUMMARY

The Concept Designs contained in this report address the structural, accessibility and life-safety deficiencies at the three priority buildings at Havens Elementary School. It follows an investigative report, dated February 14, 2007.

In many instances, more than one design solution is offered. These options propose a broad range of possibilities, from very specific remediation (ex. providing accessible hardware on a given door) to partial building replacement. The first option illustrated for each building is the all-inclusive base scheme that remedies common area deficiencies and readily available deficiencies within classrooms. Subsequent schemes show specific solutions that vary from the base scheme. These options are not always mutually exclusive from one another.

Once a design concept is selected, there may be an opportunity to negotiate alternative solutions with DSA (Department of the State Architect), the office having jurisdiction over public school construction.

Seismic strengthening options are illustrated following architectural design solutions. Where structural schemes require modifications to architectural features (primarily removing and replacing existing finishes), those changes are noted on the architectural plans.

A cost estimate was developed as part of this phase of work. It is contained under separate cover. The estimate is based on conceptual plans and therefore presents the project as having a range of costs covering the various options presented herein. While the scope of work addressed by these concept designs is limited, the estimate has assigned values for non-structural seismic hazards, hazardous materials abatement, general modernization, maintenance, sustainable design, etc. In addition, a value based on cost/square foot has been assigned for a new building to replace buildings A, B, D & E.

This report will serve as the background for the next phase of work which will be to develop a schematic design.

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1. SUMMARY OF ACCESSIBILITY & FIRE/LIFE-SAFETY SCHEMES

Site:

The main entry to the Havens campus is adjacent to the administration area in Building A on the Oakland Avenue side of the school. Accessible parking and a barrier-free path of travel are required to this entry and all main building entries. In addition, an accessible path of travel between all buildings and to exterior restroom doors is required.

General site accessibility:
Provide new concrete access ramp from sidewalk to yard at Bonita Avenue.
Provide new accessible gate hardware at all locations.
Provide new concrete access ramps to replace existing on-site non-compliant ramps.

Accessible Parking Option 1:
Provide a new van accessible off-street parking space at the existing service driveway. Provide new curb cut, level parking pad with retaining wall, and concrete access ramp to main doors.

Accessible Parking Option 2:
Relocate existing accessible on-street parking space further East on Oakland Avenue (where street levels out). Provide new concrete access ramp to main doors.

Accessible Parking Option 3:
Provide a pull-out and drop-off area on Oakland Avenue. This work will have to be coordinated by the City of Piedmont Public Works Department.

Buildings A & B:

These two buildings are physically connected and are considered as one building for the purposes of accessibility & fire/life-safety analysis. While architectural solutions for Building B and the Classroom wings of Building A are fairly straight forward, the Administration & Library portions of Building A are complex. Therefore, this report provides simplified diagrams (pages 0.20 & 0.21) as well as detailed plans to illustrate the options in this area. These buildings exceed allowable areas and are too close to adjacent property lines for the type of construction used. In addition, there are no sprinklers and no rated corridors which are required for exiting.

Option 1

Accessibility:
This base scheme illustrates localized solutions that remove barriers to accessibility. Included are replacement of all interior non-compliant ramps with three new ramps and two new stairs. A small addition adjacent to the Library to accommodate one of the ramps is required.

Fire/Life-Safety:
This base scheme provides 2-hour area separation walls to compartmentalize the building and essentially divide it into 5 separate smaller buildings to meet allowable area requirements. These area separation walls also allow the building to fall under a code exception which negates the requirement for sprinklers. 1-hour walls with protected openings are provided at the east property line. Rated corridors are provided where the number of occupants exiting into them exceeds allowable numbers.

Option 2

This scheme requires partial demolition and replacement of Building A between gridlines 5 and 8. This allows most of the accessibility and life-safety deficiencies to be resolved together.

Accessibility:
This scheme provides a new on-street accessible parking space, a new at-grade main building entry, and a new centralized hallway system that will provide organized circulation. The floor elevation is raised to match the Library and Building B. In addition, exterior grade is raised at the main entry on Oakland Avenue as well as at the playground to provide at grade entries. Elevation change within the Building A is made via a single grand stair with an adjacent platform lift.

Fire/Life-Safety:
New fire sprinklers allow for no area separation walls and provide a means for achieving protected openings at the property line. Because all classrooms exit directly to the exterior, no rated corridors are required.

Option 3

This scheme requires a partial interior remodel. Special Education & Science classrooms are reconfigured to exit directly to the exterior.

Accessibility:
In this scheme, hallways are reconfigured. Grade change is made via a new ramp and stair to the lower level, and a stair and platform lift to the upper level.

Fire/Life-Safety:
Because all classrooms then exit directly to the exterior, no rated corridors are required. New fire sprinklers allow for no area separation walls and provide a means for achieving protected openings at the property line.

Building C:

Construction on The Ellen Driscoll Theatre should be guided by the Secretary of the Interior's Standards for Historic Preservation. All concept design solutions presented herein preserve the existing building features, finishes, materials, etc. as much as possible.

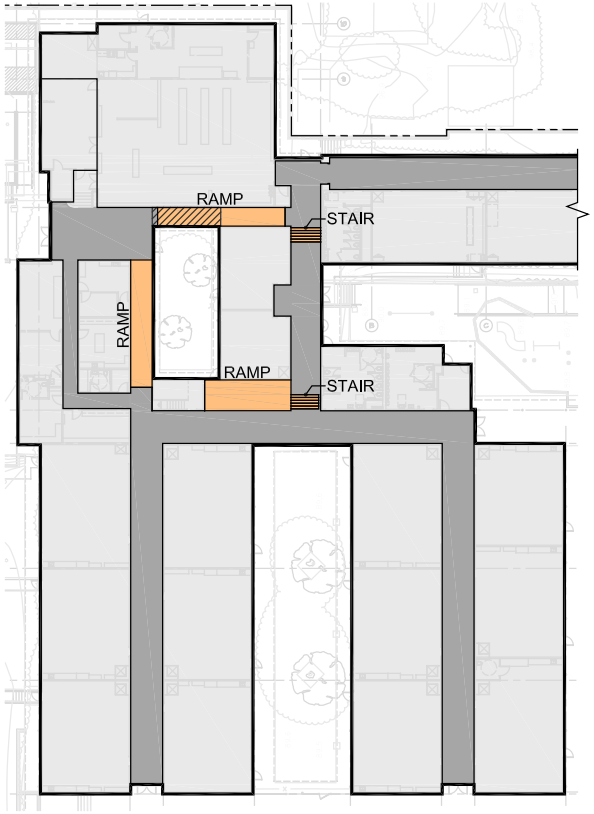
Option 1

Accessibility:
Accessible entry is provided via existing retrofitted entry doors equipped with automatic door openers. Restrooms are modified as two single accommodation toilet rooms. Stage access is provided by platform lift in front of the proscenium wall. Access to the Occupational Therapy/Music room is from a new entry, stair and platform lift.

Fire/Life-Safety:
Assembly buildings are required to be of 1-Hour construction throughout. Sprinklers are provided in lieu of the 1-Hour rating.

Option 2

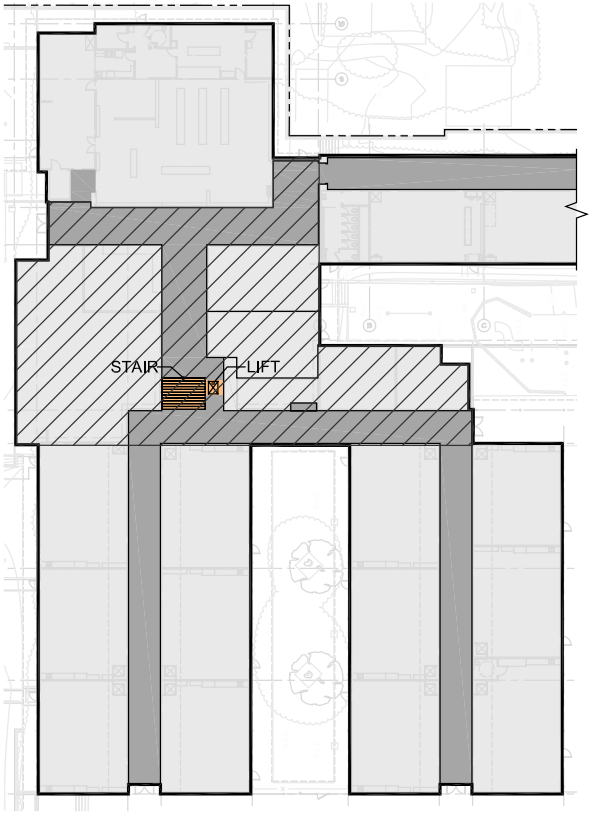
Accessibility:
Restrooms and kitchen are reconstructed to provide men's multiple accommodation toilet rooms to the south of the entry and women's multiple accommodation toilet rooms to the north. Stage access is provided by platform lift behind the proscenium wall. This scheme only works with seismic strengthening option 2.



OPTION 1

Replace Existing Interior Ramps

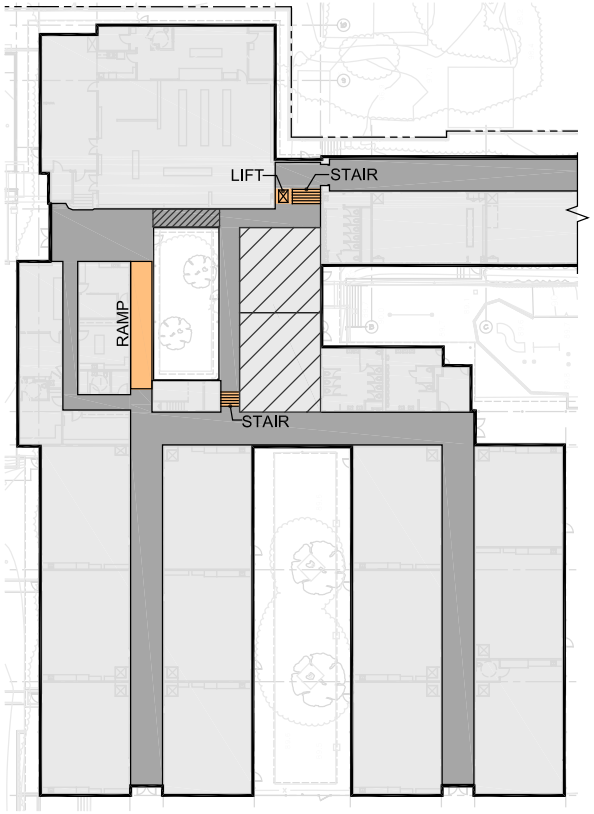
- 3 New Ramps
- 2 New Stairs



OPTION 2

New Infill Builidng

- Central Hallway
- 1 New Stair
- 1 Platform Lift



OPTION 3

Partial Interior Remodel

- 1 New Ramp
- 2 New Stairs
- 1 Platform Lift

Building A & B - Accessibility

Note:
1. All solutions are subject to DSA review and approval.
2. These strategies designed to meet accessibility code are not neccesarily exclusive from one another.

Legend:

New ramp, stairs, or lift.

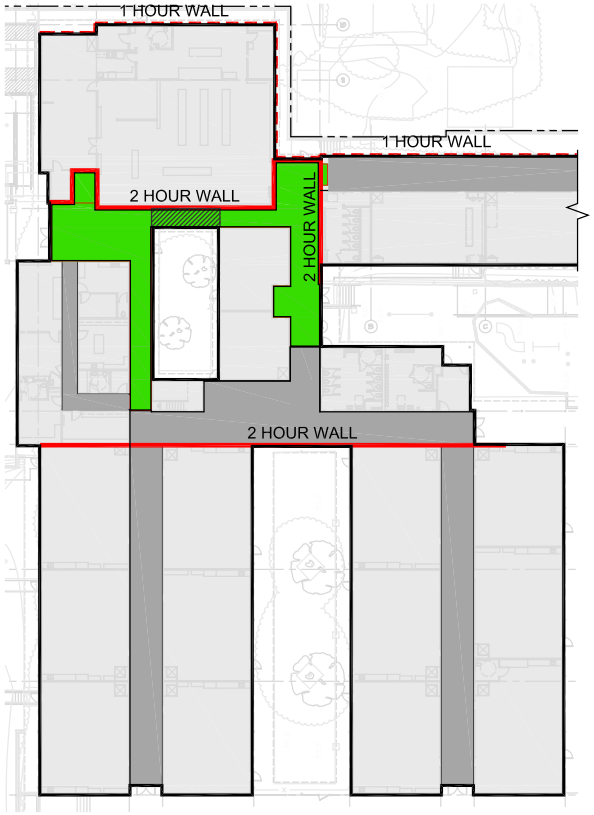
Area of addition or major remodel.

TRUE NORTH
REFERENCE NORTH

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: accessibility

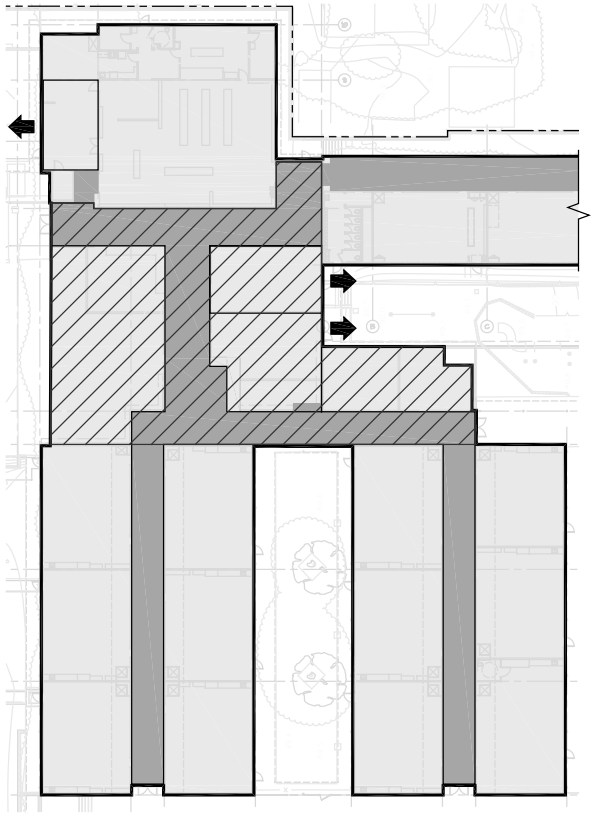
0.20



OPTION 1

Base Scheme - Localized Solutions

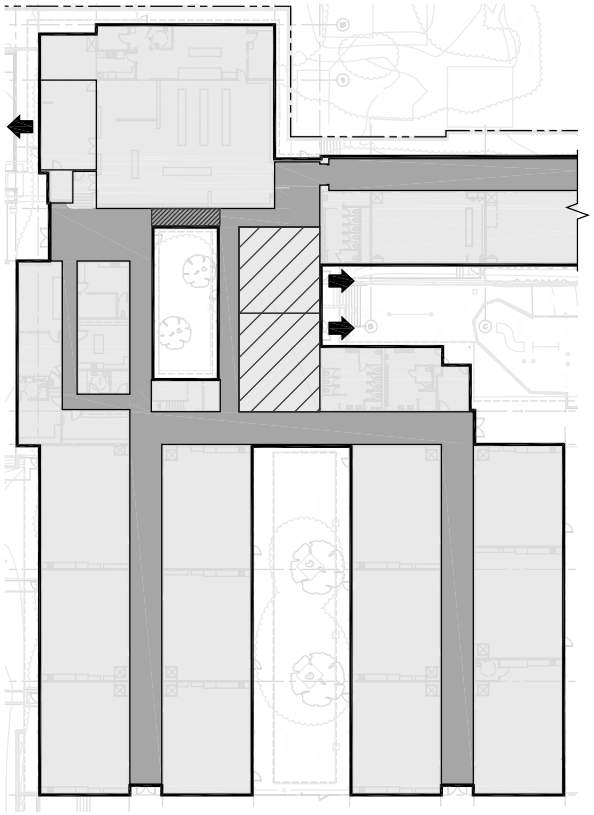
- Area Separation Walls Required.
- 1 Hour Wall at Property Line Required.
- Rated Corridors Required.
- No Sprinklers Required.



OPTION 2 *All classroom exit to exterior

New Infill Building

- No Area Separation Walls Required.
- Sprinklers at Property Line Required.
- No Rated Corridors Required.
- Sprinklers Required.



OPTION 3 *All classroom exit to exterior

Partial Interior Remodel

- No Area Separation Walls Required.
- Sprinklers at Property Line Required.
- No Rated Corridors Required.
- Sprinklers Required.

Building A & B - Fire / Life-Safety

Note:
1. All solutions are subject to DSA review and approval.
1. These strategies desinged to meet fire / life-safety code are not neccesarily exclusive from one another.

Legend:

- 1 hour rated corridor.
- 1 hour wall @ property line.
- 2 hour rate wall @ area separation.
- New classroom exit.
- Area of addition or major remodel.

TRUE NORTH
REFERENCE NORTH

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: life safety

0.21

CONCEPT DESIGN NOTES:

GENERAL NOTES:
1. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR).
2. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

01 (N) VAN ACCESSIBLE OFFSTREET PARKING SPACES.

02 RE-GRADE ASPHALT SURFACE TO REDUCE SLOPE OF LESS THAN 2%.

03 MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE 44" MIN. CLEAR PATH OF TRAVEL.

04 (N) OR MODIFIED 1 HR. RATED CORRIDOR WALL.

05A (N) ACCESSIBLE PAINTED DOOR, FRAME, & HARDWARE IN RESIZED OPENING.

05B (N) HARDWARE PACKAGE INCLUDING: OPERATING HARDWARE (LEVER, LATCH OR PANIC BAR), CLOSER, THRESHOLD, ETC.

05C (N) 3'-0" WIDE DOOR & SIDELIGHT IN (E) MODIFIED STEEL FRAME.

05D MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE CLEAR SPACE ON PUSH / PULL SIDE OF DOOR (24" MIN. EXTERIOR PULL, 18" MIN. INTERIOR PULL, 12" MIN. PUSH SIDE OF DOOR).

05E PROVIDE AUTOMATIC DOOR OPENER FOR PAIR OF (E) DOORS @ (E) 5'0" OPENING. NOTE: MAY REQUIRE INTERPRETATION FROM DSA.

06 (N) 2-RAIL ELEMENTARY SCHOOL TYPE STAINLESS STEEL HANDRAILS.

07 (N) ACCESSIBLE GATE HARDWARE.

08 (N) ACCESSIBLE CONCRETE RAMP WITH CURB & HANDRAILS 1:20 MAXIMUM SLOPE.

09 (N) HI-LO TYPE DRINKING FOUNTAIN WITH STAINLESS STEEL GUARD RAILS.

10 (N) 42" HIGH STAINLESS STEEL GUARDRAILS.

11 INFILL (E) DOOR OR WINDOW OPENING WITH FIRE RATED CONSTRUCTION TO MATCH WALL TYP.

12 (N) ACCESSIBLE PAY PHONE.

13A MODIFY (E) CABINETRY & COUNTERS FOR ACCESSIBILITY.

13B (N) ACCESSIBLE CABINETS & COUNTERS.

14 MODIFY RESTROOM TO PROVIDE ACCESSIBILITY
STAFF: SINGLE ACCOMMODATION, NO PARTITIONS, REVERSE DOOR SWING, HARDWARE, ACCESSORIES, ETC.
STUDENT: MULTIPLE ACCOMMODATION, ADEQUATE CLEAR SPACE, HARDWARE, ACCESSORIES, ETC.

15 PROVIDE (N) ACCESSIBLE COUNTERS, CABINETRY, ETC. @ STAFF KITCHEN.

16 (N) CONCRETE STAIR WITH STAINLESS STEEL HANDRAIL/GUARDRAIL.

17 (N) ACCESSIBLE SINK, FAUCETS & ACCESSORIES.

18 (N) ACCESSIBLE SIGNAGE.

19 (N) ASSISTED LISTENING DEVICE.

CONCEPT DESIGN NOTES CONTINUED:

20 (N) PIT MOUNTED PLATFORM LIFT.

21 (N) FIRE RATED STEEL DOORS ON MAGNETIC HOLD OPENERS @ MODIFIED CORRIDORS.

22 MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE CLEAR SPACE @ SINK.

23 "NOT AN ACCESSIBLE ENTRY" SIGNAGE.

24 CONSTRUCTION TYPE:
OPTION 1 - PROVIDE SPRINKLERS THROUGHOUT BUILDING IN LIEU OF 1 HR. RATED CONSTRUCTION.
OPTION 2 - MODIFY (E) BUILIDNG TO PROVIDE 1 HR. CONSTRUCTION THROUGHOUT.

25 PATCH SHEATHING & FINISH TO MATCH (E) @ (N) STRUCTURAL IMPROVEMENT, SEE STRUCTURAL DRAWINGS.

26 REPLACE ALL WALL & CEILING FINISHES WITH (N) 5/8" GYP. BOARD & PAINTED WOOD WAINSCOT, SEE STRUCTURAL DRAWINGS.

27 (N) RETAINING WALL.

28 PROTECTED OPENINGS:
OPTION 1 - PROVIDE EXTERIOR SPRINKLERS TO PROTECT OPENINGS. NOTE: MAY REQUIRE INTERPRETATION FROM DSA.
OPTION 2 - (N) 3/4 HR. PROTECTED WINDOW & FRAME IN (E) OPENINGS.

29 ALLOWABLE AREA:
OPTION 1 - PROVIDE FIRE SPRINKLERS THROUGHOUT BUILDING.
OPTION 2 - MODIFY (E) WALLS TO PROVIDE 2 HR. AREA SEPARATION WHERE SHOWN.

30 (N) 20 MIN. RATED DOOR @ CORRIDOR.

31 REMOVE (E) CONCRETE CANOPY & COLUMNS TO ACCOMODATE (N) STRUCTURAL WORK, SEE STRUCTURAL DRAWINGS.

32 PROVIDE (N) LIGHTWEIGHT TRANSPARENT CANOPY @ WALKWAY.

33 REPLACE (E) BUILDING STUCCO, FLASHING, TRIM, ETC. TO MATCH (E), SEE STRUCTURAL DRAWINGS.

34 REMOVE (E) FLOOR FINISH MATERIALS (OR LANDSCAPE / FLATWORK) REPLACE TO MATCH (E), SEE STRUCTURAL DRAWINGS.

35 (N) STEEL BRACED FRAME, SEE STRUCTURAL DRAWINGS.

36 (N) NON RATED WALLS.

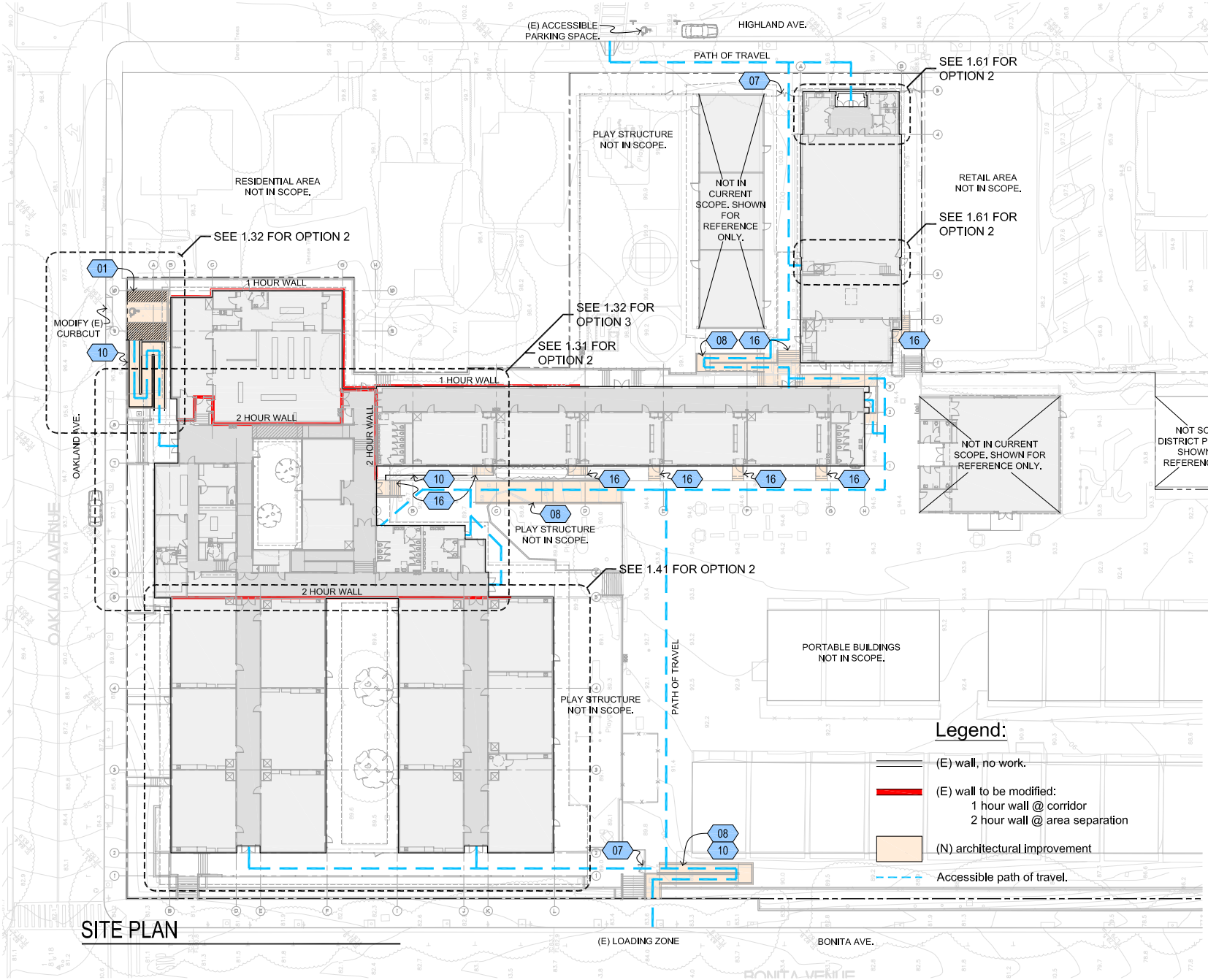
37 (N) ACCESSIBLE CURB RAMP.

38 RELOCATED ACCESSIBLE ON STREET PARKING.

39 (N) ACOUSTIC TILE CEILING ABOVE.

40 (N) RIDGE MOUNTED SKYLIGHT ABOVE, TYPICAL @ 6 LOCATIONS.

41 REMOVE AND REPLACE STAGE AS REQUIRED.



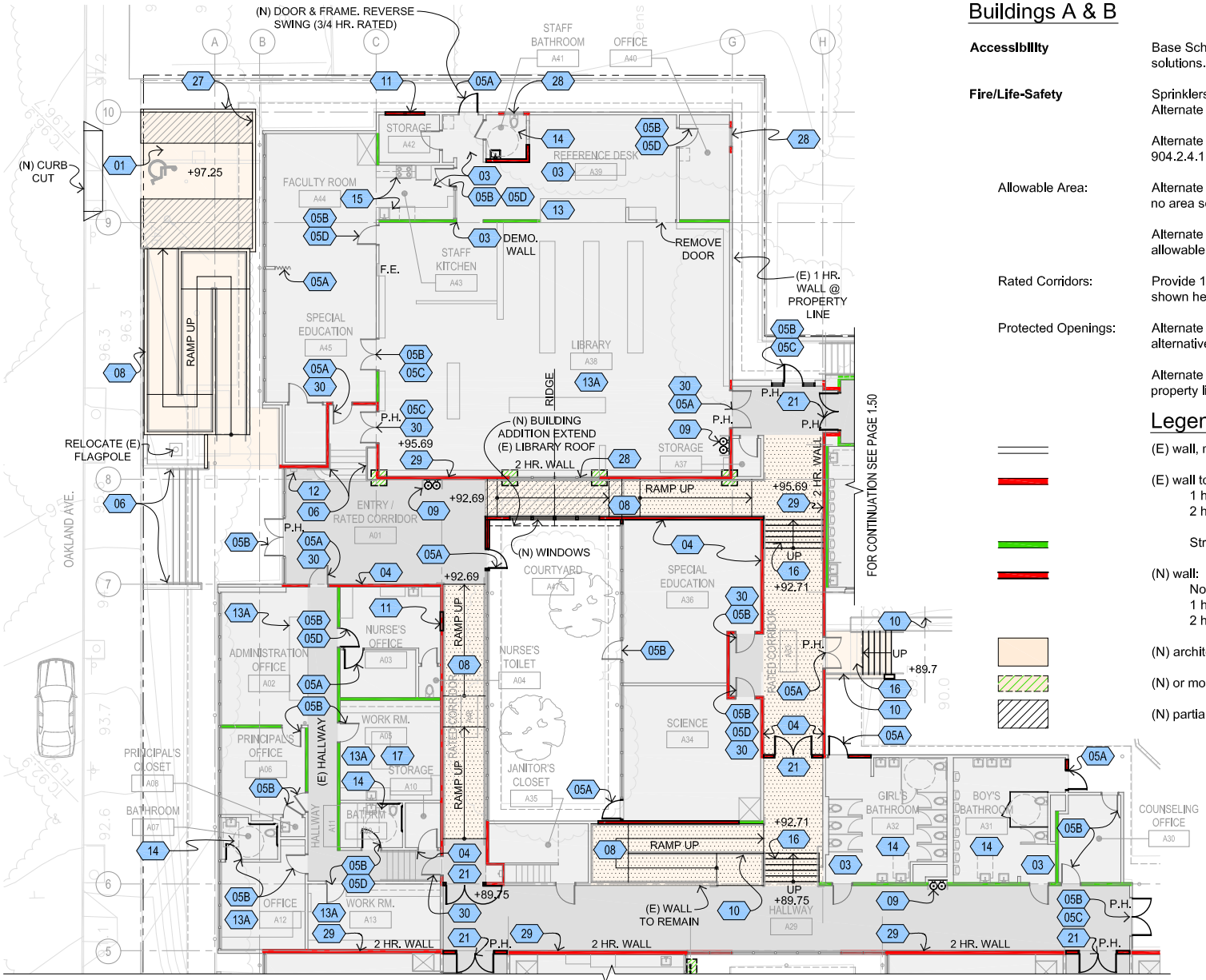
SITE PLAN

HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 1

1.20



BUILDING A EAST - FLOOR PLAN OPTION NO. 1

Buildings A & B

Accessibility	Base Scheme. Modify existing conditions with localized solutions.
Fire/Life-Safety	Sprinklers required for E occupancy. Alternate 1. Provide sprinklers Alternate 2. Provide area separation walls. Chapter 904.2.4.1, exception 2. (As shown here)
Allowable Area:	Alternate 1. Provide sprinklers to increase allowable area - no area separation walls required. Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (As shown here)
Rated Corridors:	Provide 1-Hour rated corridors where required for exiting. (As shown here)
Protected Openings:	Alternate 1. Provide sprinklers on exterior of building as an alternative method of protecting openings. Alternate 2. Provide protected openings within 10 feet of property line. (As shown here)

Legend:

(E) wall, no work.

(E) wall to be modified:
- 1 hour wall @ corridor
- 2 hour wall @ area separation

Structural improvement, see structural drawings.

(N) wall:
- Not rated
- 1 hour wall @ corridor
- 2 hour wall @ area separation

(N) architectural improvement

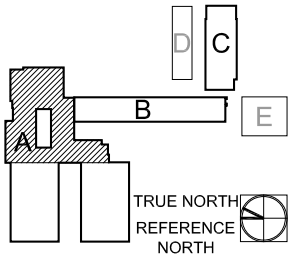
(N) or modified foundation, see structural drawings.

(N) partial building replacement.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

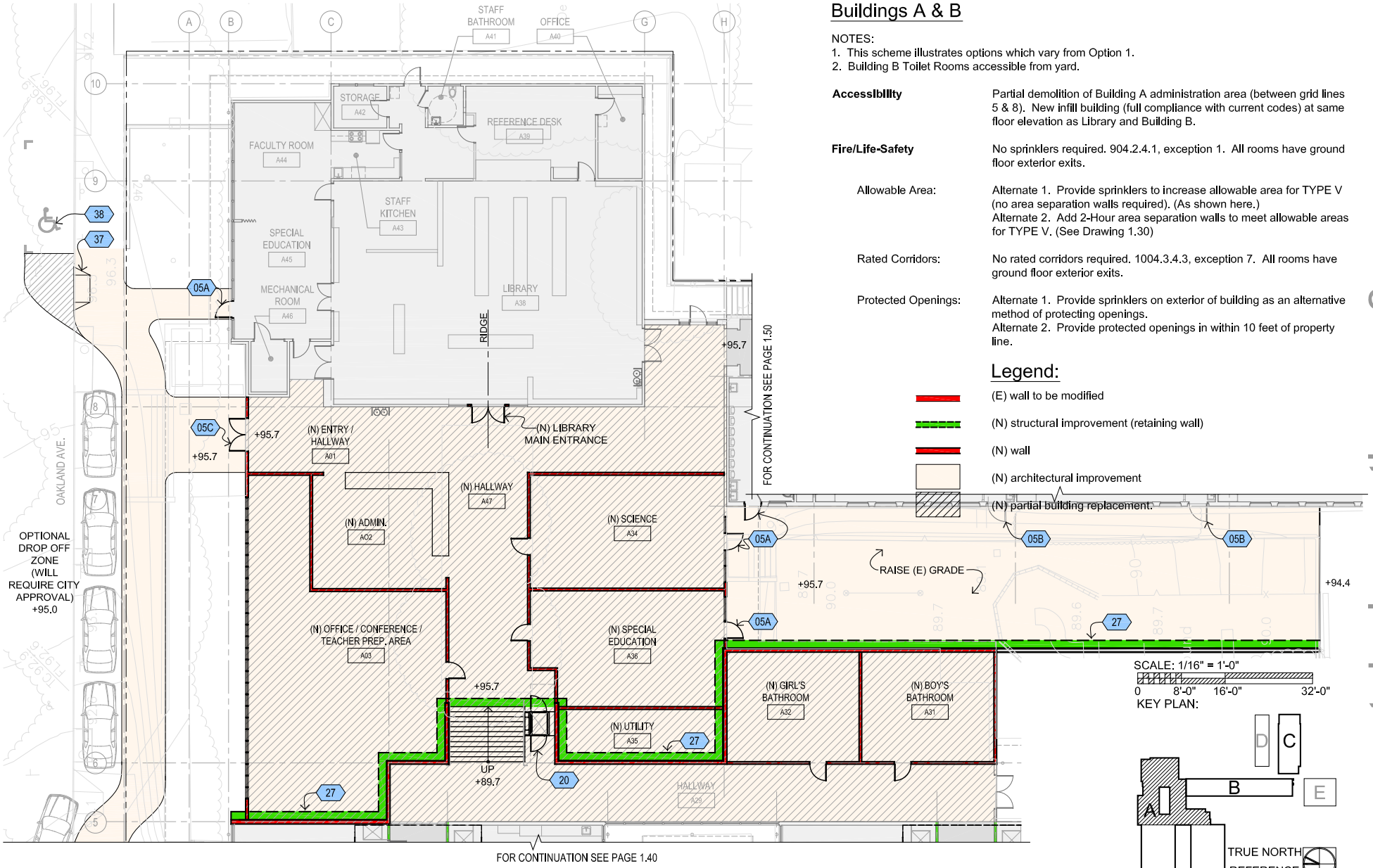
KEY PLAN:



HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 1

1.30



Buildings A & B

NOTES:
1. This scheme illustrates options which vary from Option 1.
2. Building B Toilet Rooms accessible from yard.

Accessibility — Partial demolition of Building A administration area (between grid lines 5 & 8). New infill building (full compliance with current codes) at same floor elevation as Library and Building B.

Fire/Life-Safety — No sprinklers required. 904.2.4.1, exception 1. All rooms have ground floor exterior exits.

Allowable Area: Alternate 1. Provide sprinklers to increase allowable area for TYPE V (no area separation walls required). (As shown here.)
Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (See Drawing 1.30)

Rated Corridors: No rated corridors required. 1004.3.4.3, exception 7. All rooms have ground floor exterior exits.

Protected Openings: Alternate 1. Provide sprinklers on exterior of building as an alternative method of protecting openings.
Alternate 2. Provide protected openings in within 10 feet of property line.

Legend:

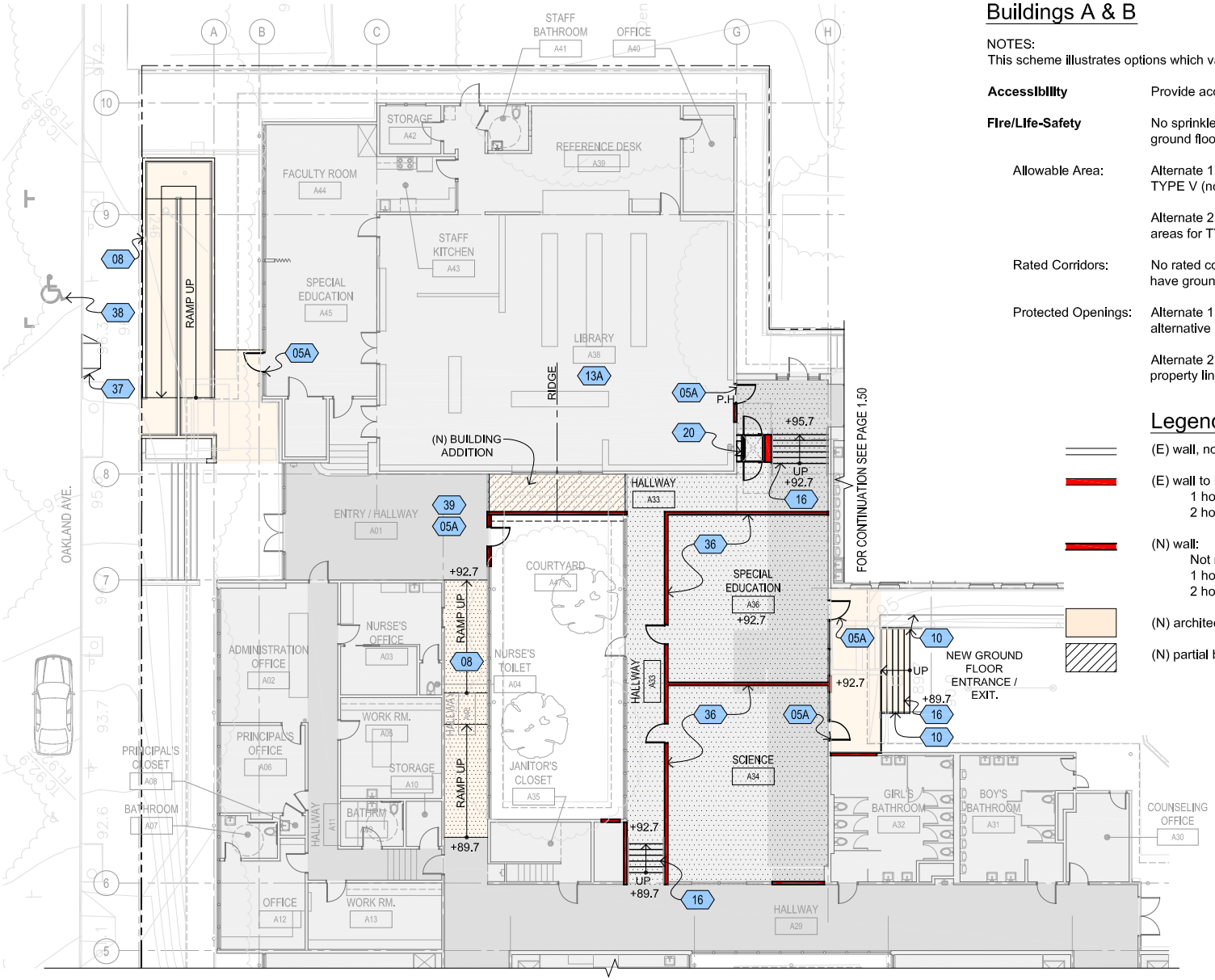
- (E) wall to be modified
- (N) structural improvement (retaining wall)
- (N) wall
- (N) architectural improvement
- (N) partial building replacement.

BUILDING A EAST - FLOOR PLAN OPTION NO. 2

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 2

1.31



BUILDING A EAST - FLOOR PLAN OPTION NO. 3

Buildings A & B

NOTES:
This scheme illustrates options which vary from Option 1.

Accessibility	Provide access via new ramp, lift & stairs.
Fire/Life-Safety	No sprinklers required. 904.2.4.1, exception 1. All rooms have ground floor exterior exits.
Allowable Area:	Alternate 1. Provide sprinklers to increase allowable area for TYPE V (no area separation walls required). (As shown here.)
	Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (See drawing 1.30)
Rated Corridors:	No rated corridors required. 1004.3.4.3, exception 7. All rooms have ground floor exterior exits.
Protected Openings:	Alternate 1. Provide sprinklers on exterior of building as an alternative method of protecting openings.
	Alternate 2. Provide protected openings in within 10 feet of property line.

Legend:

(E) wall, no work.

(E) wall to be modified:
1 hour wall @ corridor
2 hour wall @ area separation

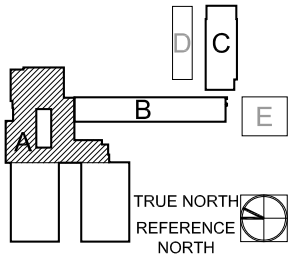
(N) wall:
Not rated
1 hour wall @ corridor
2 hour wall @ area separation

(N) architectural improvement

(N) partial building replacement.

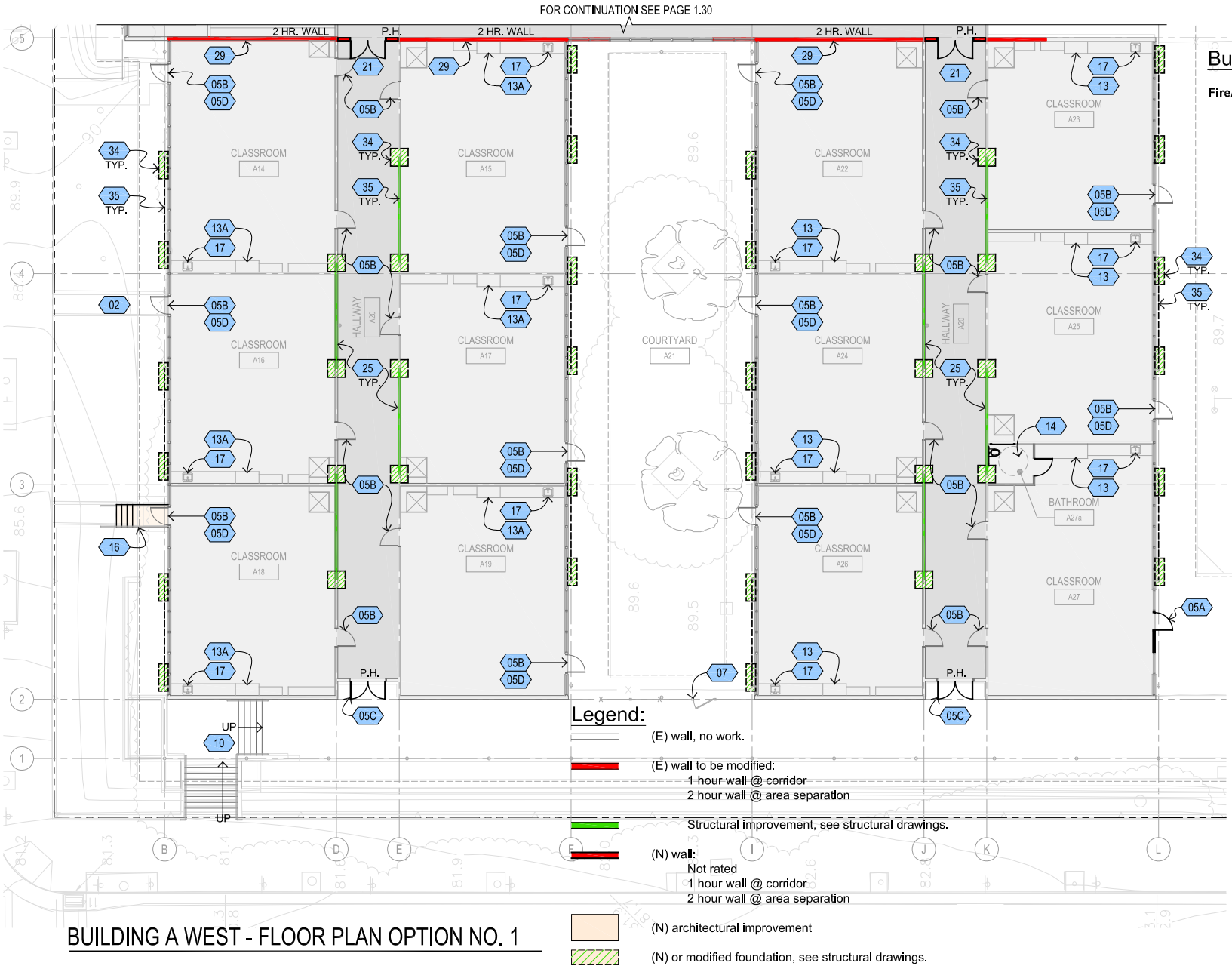
SCALE: 1/16" = 1'-0"
0 8'-0" 16'-0" 32'-0"

KEY PLAN:



HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 3



Buildings A & B

Fire/Life-Safety - No sprinklers required. 904.2.4.1, exception 1. All rooms have ground floor exterior exits.

Allowable Area:
Alternate 1. Provide sprinklers to increase allowable area for TYPE V (no area separation walls required).

Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (As shown here)

Rated Corridors: No rated corridors required. 1004.3.4.3, exception 7. All rooms have ground floor exterior exits.

Legend:

(E) wall, no work.

(E) wall to be modified:
1 hour wall @ corridor
2 hour wall @ area separation

Structural improvement, see structural drawings.

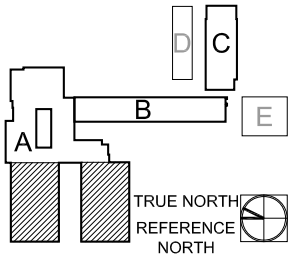
(N) wall:
Not rated
1 hour wall @ corridor
2 hour wall @ area separation

(N) architectural improvement

(N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"
0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING A WEST - FLOOR PLAN OPTION NO. 1

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 1

1.40

Buildings A & B

NOTE:
1. This scheme illustrates options which vary from Option 1.

2. New built-up roof required for Structural Option 2. See Structural Drawings.

Fire/Life-Safety - No sprinklers required. 904.2.4.1, exception 1. All rooms have ground floor exterior exits.

Allowable Area:
Alternate 1. Provide sprinklers to increase allowable area for TYPE V (no area separation walls required). (As shown here.)

Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (See Drawing 1.30)

Rated Corridors: No rated corridors required. 1004.3.4.3, exception 7. All rooms have ground floor exterior exits.

Legend:

(E) wall, no work.

(E) wall to be modified:
1 hour wall @ corridor
2 hour wall @ area separation

(N) structural improvement, see structural drawings.

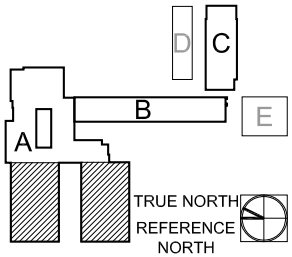
(N) wall:
Not rated
1 hour wall @ corridor
2 hour wall @ area separation

(N) architectural improvement

(N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"
0 8'-0" 16'-0" 32'-0"

KEY PLAN:

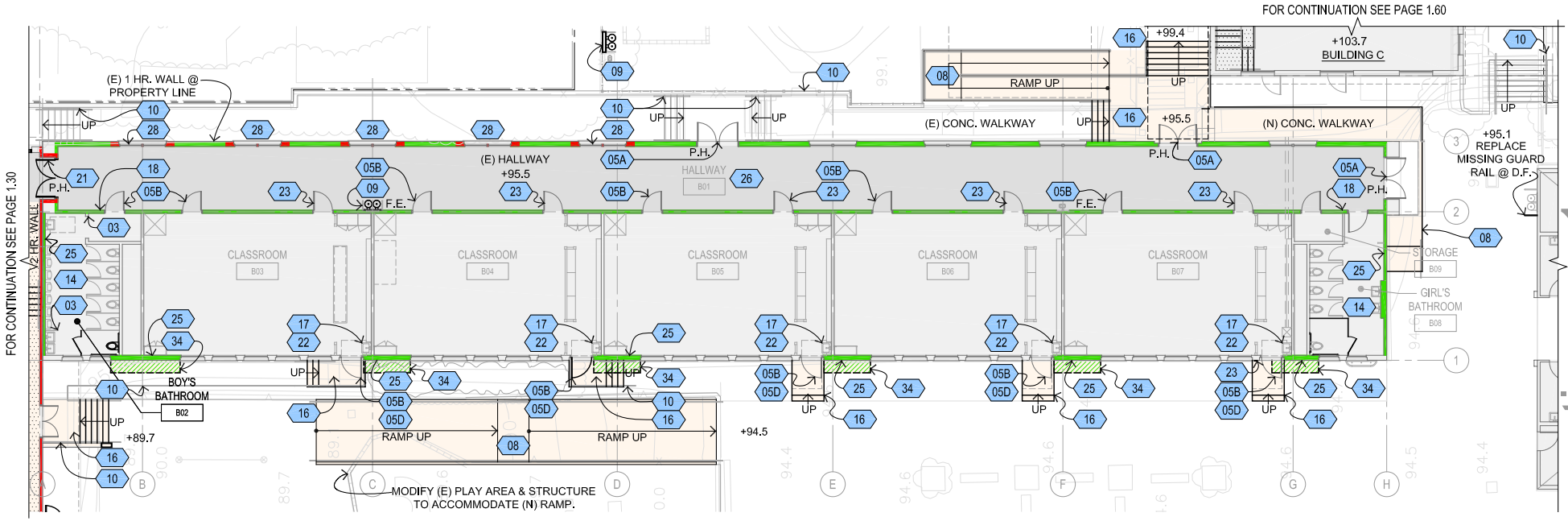


BUILDING A WEST- FLOOR PLAN OPTION NO. 2

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 2

1.41



Legend:

- (E) wall, no work.
- (E) wall to be modified:
  - 1 hour wall @ corridor
  - 2 hour wall @ area separation
- (N) structural improvement, see structural drawings.
- (N) wall:
  - Not rated
  - 1 hour wall @ corridor
  - 2 hour wall @ area separation
- (N) architectural improvement
- (N) or modified foundation, see structural drawings.

Buildings A & B

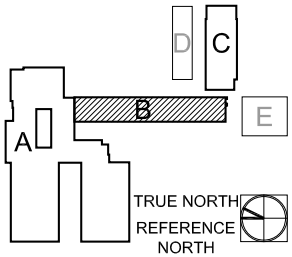
NOTE:
1. New built-up roof. Required for all Structural Options at Building B.

Accessibility	Modify existing systems as localized solutions.
Fire/Life-Safety	Sprinklers required for E occupancy.
	Alternate 1. Provide sprinklers
	Alternate 2. Provide area separation walls. Chapter 904.2.4.1, exception 2. (As shown here)
Allowable Area:	Alternate 1. Provide sprinklers to increase allowable area - no area separation walls required.
	Alternate 2. Add 2-Hour area separation walls to meet allowable areas for TYPE V. (As shown here)

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:

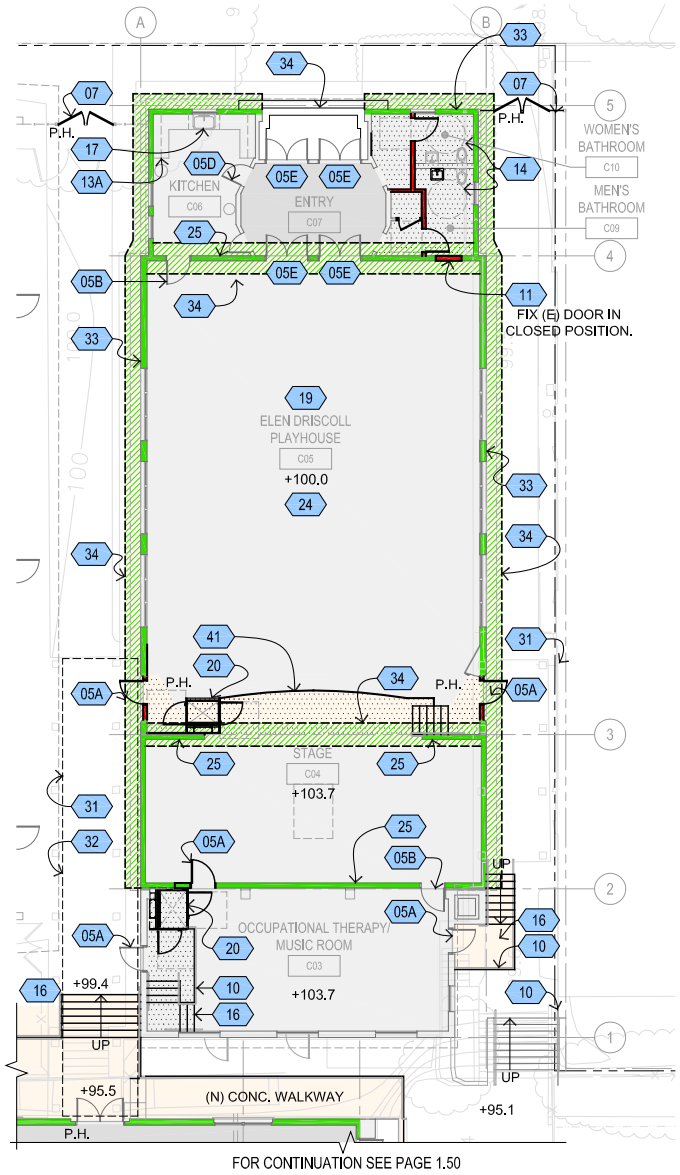


BUILDING B - FLOOR PLAN OPTION NO. 1

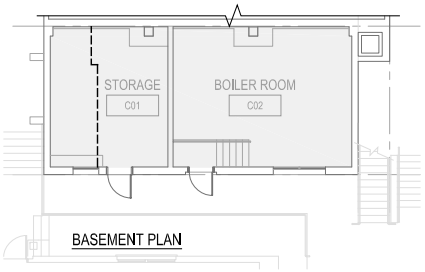
HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 1

1.50



FOR CONTINUATION SEE PAGE 1.50



BASEMENT PLAN

Building C

NOTE:
1. Work on this building should be guided by the Secretary of the Interior's Standards for Historic Rehabilitation.

Accessibility — Modify existing conditions with localized solutions.

Fire/Life-Safety
Construction Type: Alternate 1. Modify existing building to provide 1-Hour construction throughout.

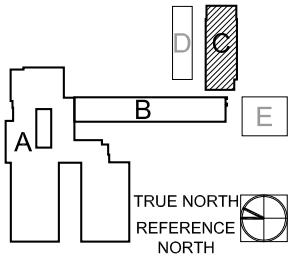
Alternate 2. Provide fire sprinklers in lieu of 1-Hour rating. (As shown here)

Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall:
  - Not rated
  - 1 hour wall
- (N) architectural improvement
- (N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"
0 8'-0" 16'-0" 32'-0"

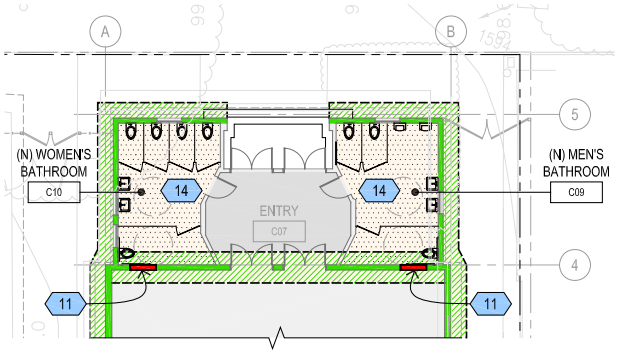
KEY PLAN:



BUILDING C - FLOOR PLAN OPTION NO. 1

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 1



BATHROOMS PARTIAL PLAN

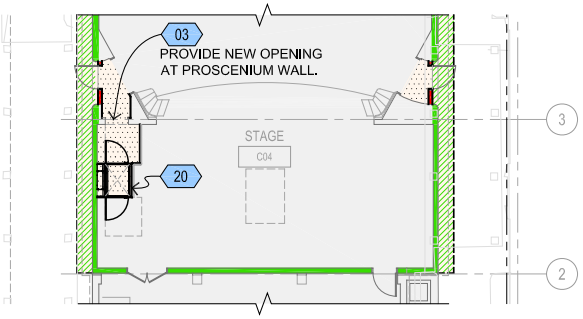
REMOVE EXISTING KITCHEN, PROVIDE NEW MULTIPLE ACCOMODATION, ACCESSIBLE TOILET ROOMS.

Legend:

NOTE:
1. Work on this building should be guided by the Secretary of the Interior's Standards for Historic Rehabilitation.

2. Remove & replace existing clay tile roof for Structural Option 2. See Structural Drawings.

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall:
- (N) architectural improvement
- (N) or modified foundation, see structural drawings.



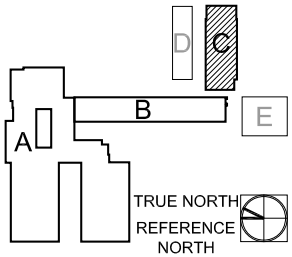
STAGE ACCESS PARTIAL PLAN

PROVIDE ACCESS TO NEW PLATFORM LIFT THROUGH PROSCENIUM WALL. THIS OPTION ONLY AVAILABLE WITH STRUCTURAL OPTION 2.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING C - FLOOR PLAN OPTION NO. 2

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: option no. 2

1.61

Summary of Seismic Strengthening Schemes for Three Buildings at Havens Elementary School

Seismic evaluations of the three Havens building were performed using the Tier 2 procedures of ASCE 31. Significant deficiencies were found, and strengthening concepts have been developed. These are summarized below for each building. Only the major components of each scheme are presented below, and the actual strengthening of each building will include other lesser yet important components not discussed below.

Criteria

The strengthening concepts were developed using the provisions of FEMA 356 for the Life Safety performance level. The BSE-1 site-specific spectra was used as the ground shaking hazard.

Building A - East (Kindergarten/Administration Area)

In the ASCE 31 Tier 2 evaluations of the building, a number of shear walls were found to be overstressed. The following two options fix these deficiencies.

Option 1: Major strengthening consists of adding plywood sheathing to these walls. Specifically, the walls on Lines 9, 8, 6, 6.3, 6.5, B.4, B.5, and I.9 are to be strengthened, with the wall on Line 8 to receive plywood sheathing on both sides. The concrete block walls at the main entrance will be anchored to the roof. The roof will be strengthen by the addition of steel straps on Lines 10, 9, 8, B, E.3, and H. The foundation on Line 8 will be strengthened in places.

Option 2: This option, which primarily addresses ADA requirements but also addresses the seismic deficiencies, consists of the demolition of the central core of the Kindergarten/ Administration area and constructing a new core structure. (See the architectural section for a further discussion of this option.) The remaining portions of the structure will be strengthened as for Option 1.

Building A - West (Classroom Wings)

The two classroom wings had greatly overstressed corridor x-bracing and were closed as a precaution. Two options were developed to fix this deficiency.

Option 1: The weak existing corridor rod bracing is to be replaced with new, stronger high-strength steel bracing. In addition, a new steel bracing system is to be added on the exterior window lines of each wing. No major alterations are to be made to either the roof diaphragm or the transverse wood shear walls.

Option 2: The weak existing corridor bracing is to be removed and replaced by new plywood sheathed shear walls on either side of the corridors. The existing skylights and horizontal rod bracing over the corridors are to be removed. The area previously occupied by the skylights is to be covered over with wood framing and plywood sheathing. This will result in a traditional plywood roof diaphragm. The connection of the transverse shear walls to the foundation will be strengthened. No strengthening along the window walls of the two wings is required under this option.

Building B (Second Grade)

The principal weakness in this building is the shear wall on the west side. This is penetrated by many windows and doors. Two schemes to fix this deficiency were developed.

Option 1: The weakness caused by the many windows on the west side of the building is to be fixed by installing five new braced steel frames on this side of the building. Deficient longitudinal shear walls on Lines 2 and 3 are to be strengthened by adding new plywood sheathing. The existing diagonal wood sheathed ceiling diaphragm is not required to be strengthened under this option.

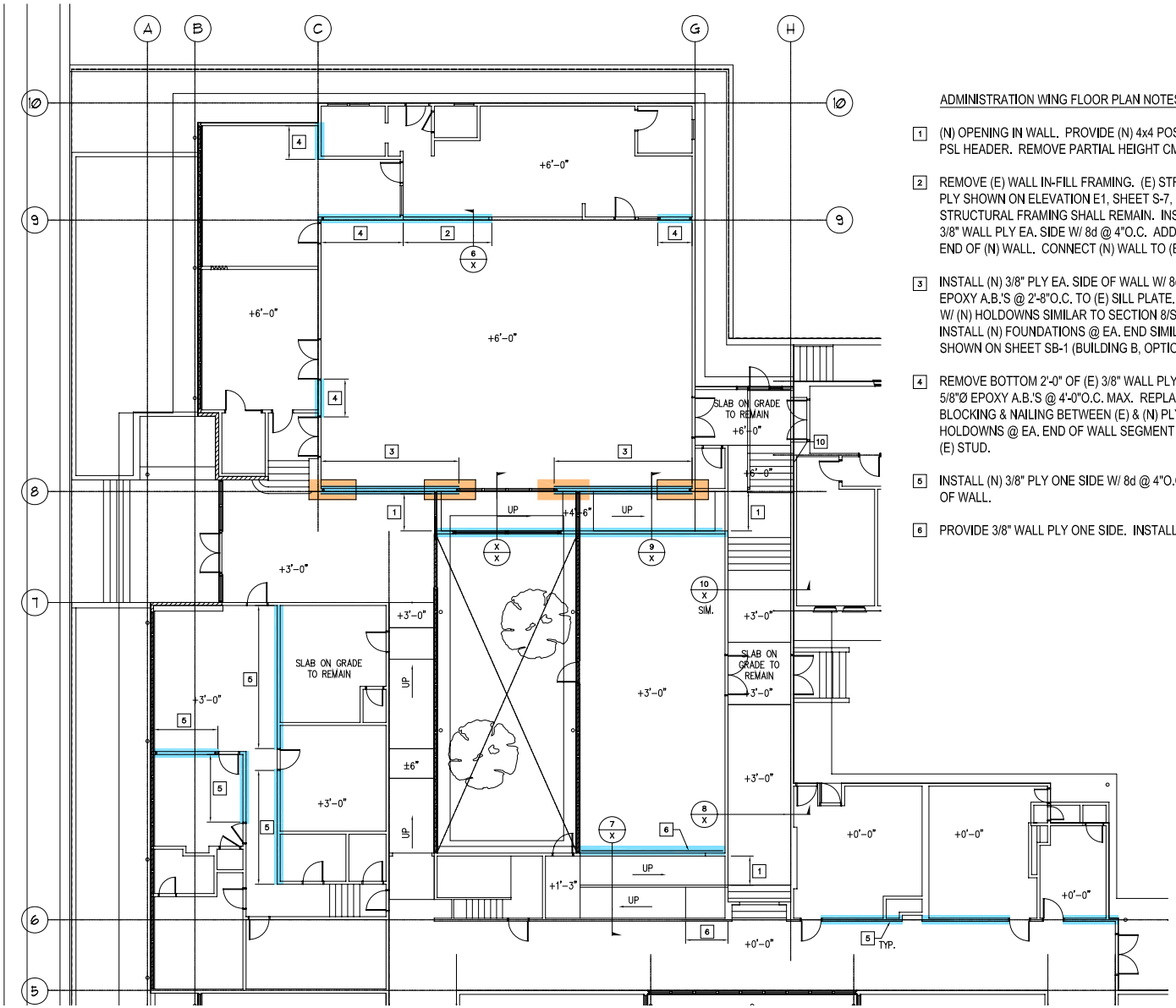
Option 2: Under this option the west exterior wall is not strengthened but the ceiling diaphragm is. (In this building the ceiling diaphragm acts as the “roof diaphragm”.) The ceiling diaphragm is strengthened by overlaying new plywood sheathing on top of the existing diagonal sheathing. The longitudinal shear walls on Lines 2 and 3 are to be strengthened as for Option 1.

Building C (Ellen Driscoll Auditorium)

The Driscoll Auditorium has a heavy Spanish tile roof. This caused a number of shear walls to be overstressed. Two options were developed to fix these deficiencies.

Option 1: This option involves fixing the seismic deficiencies without removing the tile roof. However, to do this the shear walls on either side of the proscenium arch must be greatly strengthened and their foundations considerably enlarged. This will require removal of the front part of the stage to achieve the necessary foundation access. The deficiencies in the building’s shear walls will be fixed by removing the existing diagonal sheathing and installing new plywood. This will be done for the exterior walls on Lines A, B, and 5 and the interior walls on Lines 2, 3, and 4. Except for Line 2, the footings under these walls will be strengthened by the addition of concrete and reinforcement.

Option 2: This option involves fixing the seismic deficiencies without costly interior work on the proscenium arch. Because the roof diaphragm must span between Lines 2 and 4, the roof tile must be removed and then reinstalled so that plywood sheathing can be added to the roof. The weaknesses in exterior walls on Lines A, B, and 5 and the interior walls on Lines 2 and 4 are to be fixed by removing the diagonal wood sheathing and installing plywood. Walls on Lines 2 and 4 will be made stronger than under Option 1. All footings under the strengthened walls (except the footing on Line 2) are to be strengthened by the addition of additional concrete and reinforcement. The footing for the wall on Line 4 will be made considerably stronger than under Option 1.



BUILDING A EAST - FLOOR PLAN

ADMINISTRATION WING FLOOR PLAN NOTES

1. (N) OPENING IN WALL. PROVIDE (N) 4x4 POSTS EA. SIDE W/ (N) 3-1/2 x 11-1/4 PSL HEADER. REMOVE PARTIAL HEIGHT CMU WALL WHERE OCCURS.
2. REMOVE (E) WALL IN-FILL FRAMING. (E) STRUCTURAL FRAMING & WALL PLY SHOWN ON ELEVATION E1, SHEET S-7, OF THE ORIGINAL STRUCTURAL FRAMING SHALL REMAIN. INSTALL (N) 2x6 WALL FRAMING W/ 3/8" WALL PLY EA. SIDE W/ 8d @ 4"O.C. ADD (N) PHD6 HOLDOWN AT SOUTH END OF (N) WALL. CONNECT (N) WALL TO (E) SHEARWALL.
3. INSTALL (N) 3/8" PLY EA. SIDE OF WALL W/ 8d @ 4"O.C. INSTALL (N) 5/8"Ø EPOXY A.B.'S @ 2'-8"O.C. TO (E) SILL PLATE. INSTALL (N) 4x6 END POSTS W/ (N) HOLDOWNS SIMILAR TO SECTION 8/SB-4 (BUILDING B, OPTION 2). INSTALL (N) FOUNDATIONS @ EA. END SIMILAR TO (N) FOUNDATIONS SHOWN ON SHEET SB-1 (BUILDING B, OPTION 1).
4. REMOVE BOTTOM 2'-0" OF (E) 3/8" WALL PLY ON ONE SIDE & INSTALL (N) 5/8"Ø EPOXY A.B.'S @ 4'-0"O.C. MAX. REPLACE & RE-NAIL WALL PLY W/ BLOCKING & NAILING BETWEEN (E) & (N) PLY. INSTALL (N) PHD6 HOLDOWNS @ EA. END OF WALL SEGMENT W/ (N) 2x6 KD INTERNAILED TO (E) STUD.
5. INSTALL (N) 3/8" PLY ONE SIDE W/ 8d @ 4"O.C. INSTALL (N) PHD6 @ EA. END OF WALL.
6. PROVIDE 3/8" WALL PLY ONE SIDE. INSTALL (N) PHD6 @ EA. END.

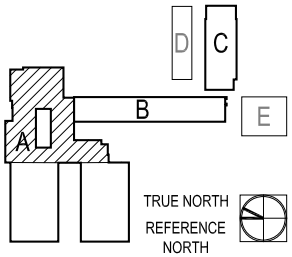
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:

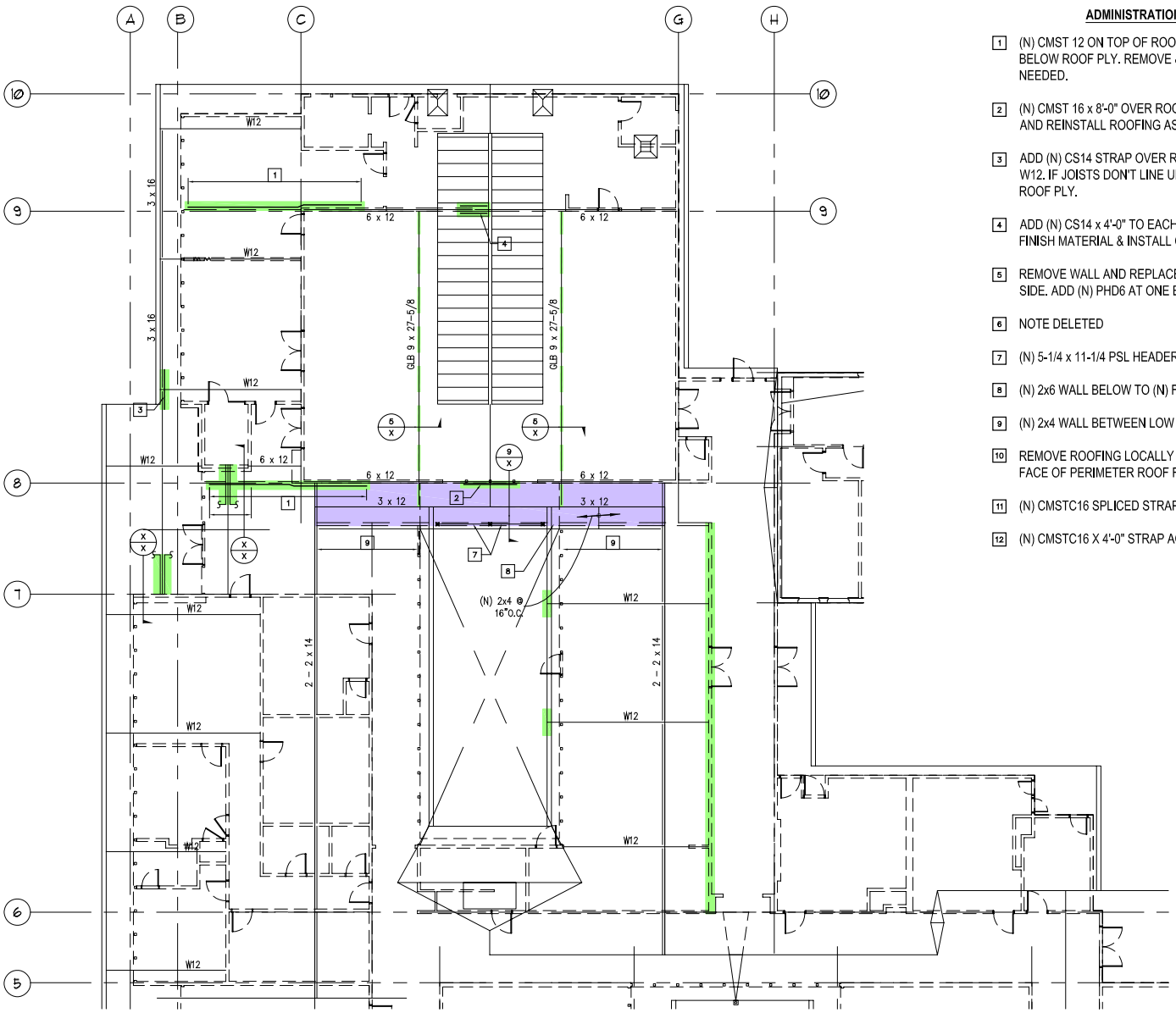


HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-A1



BUILDING A EAST - ROOF PLAN

ADMINISTRATION WING ROOF PLAN NOTES

1. (N) CMST 12 ON TOP OF ROOF W/ (N) 4x4 BLOCKING BETWEEN LINES B & C BELOW ROOF PLY. REMOVE & REINSTALL ROOFING AND CEILING AS NEEDED.
2. (N) CMST 16 x 8'-0" OVER ROOF PLY CENTERED ON SKYLIGHT. REMOVE AND REINSTALL ROOFING AS NEEDED.
3. ADD (N) CS14 STRAP OVER ROOF PLY TO (E) 3x JOISTS ON EITHER SIDE OF W12. IF JOISTS DON'T LINE UP, ADD (N) 2x4 CONTINUOUS ON SIDE BELOW ROOF PLY.
4. ADD (N) CS14 x 4'-0" TO EACH SIDE OF 6x'S CENTERED ON JOINT. REMOVE FINISH MATERIAL & INSTALL OVER WALL PLY W/ FULL LENGTH NAILS.
5. REMOVE WALL AND REPLACE WALL FRAMING W/ (N) 3/8" WALL PLY EACH SIDE. ADD (N) PHD6 AT ONE END AS SHOWN.
6. NOTE DELETED
7. (N) 5-1/4 x 11-1/4 PSL HEADER W/ (N) 6x6 END POSTS.
8. (N) 2x6 WALL BELOW TO (N) FDN.
9. (N) 2x4 WALL BETWEEN LOW ROOF AND (N) HIGH ROOF.
10. REMOVE ROOFING LOCALLY AND CUT ROOF PLY BACK 2 IN. TO SOUTH FACE OF PERIMETER ROOF FRAMING MEMBER. REPLACE ROOFING.
11. (N) CMSTC16 SPLICED STRAP FULL LENGTH ON ROOF PLY.
12. (N) CMSTC16 X 4'-0" STRAP ACROSS JOINT IN 3X'S.

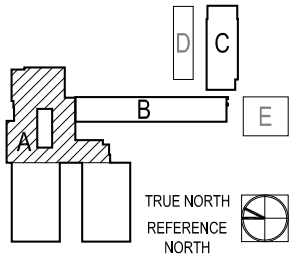
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:

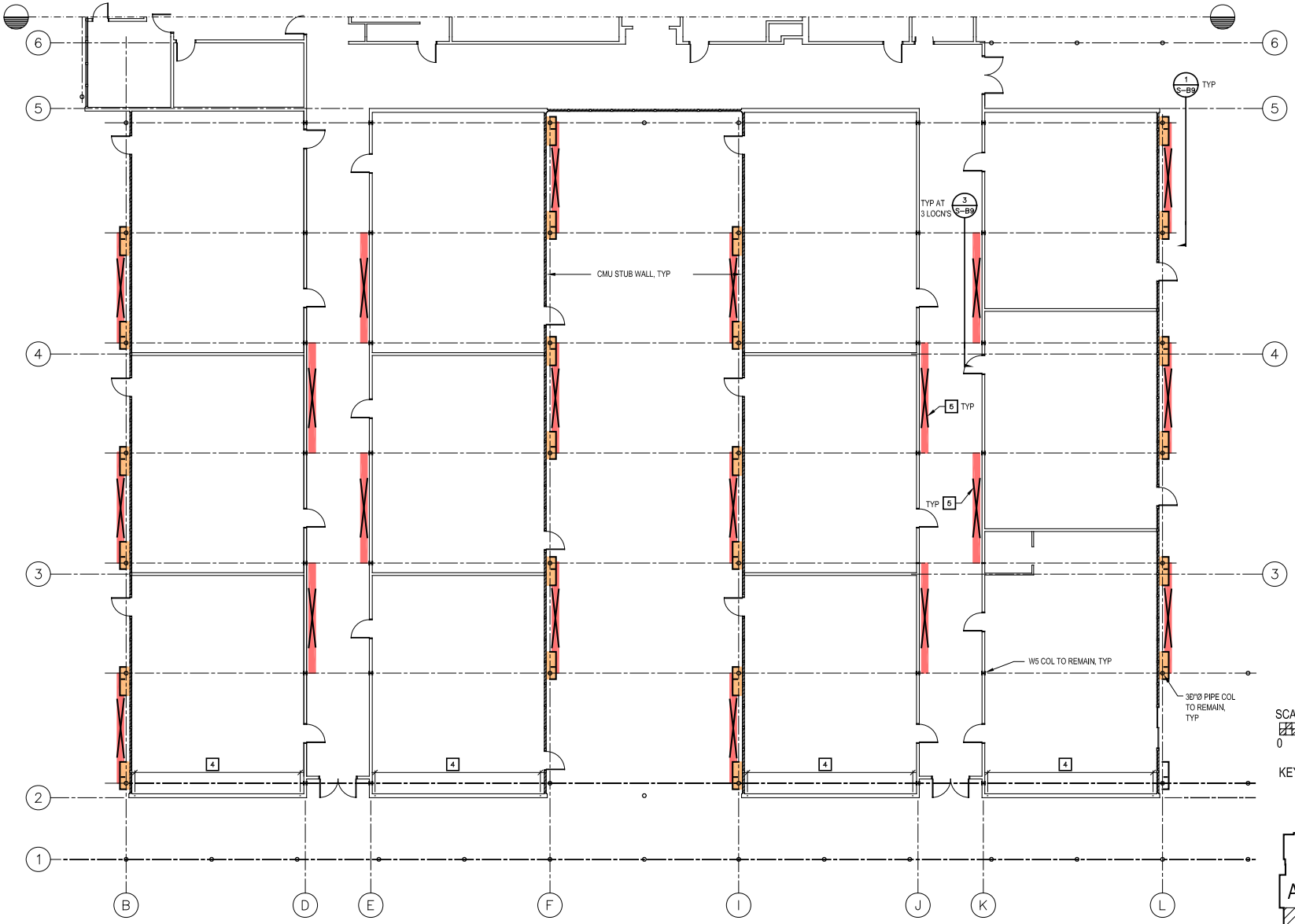


HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-A2



BUILDING A WEST - FLOOR PLAN

NOTES FOR OPTION 1

1. (N) PL 3/8 X 1 DIAGONAL BRACES BTWN. PIPE COLS.
2. (N) CONCRETE FOUNDATIONS WHERE SHOWN.
3. REMOVE NON-STRUCTURAL WALL FRAMING & REPLACE ROD BRACES W/ (N) WELDED PLATE DIAGONALS. INSTALL (N) NON-STRUCTURAL WALL FRAMING & FINISH PER ARCHITECT.
4. INSTALL ADD'L. (N) 5/8 IN. ∅ EPOXY BOLTS IN SILL PL @ 4'-0" O.C. FROM INTERIOR SIDE. INSTALL (N) PHD6 @ EA. END OF WALL W/ (N) 2X STUD INTERNAILED TO (E) STUD.
5. REMOVE 7/8 IN. ∅ VERTICAL ROD BRACES & INSTALL (N) WELDED PL 3/8 X 1 1/4 DIAGONAL BRACES.

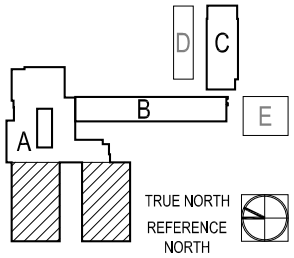
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:

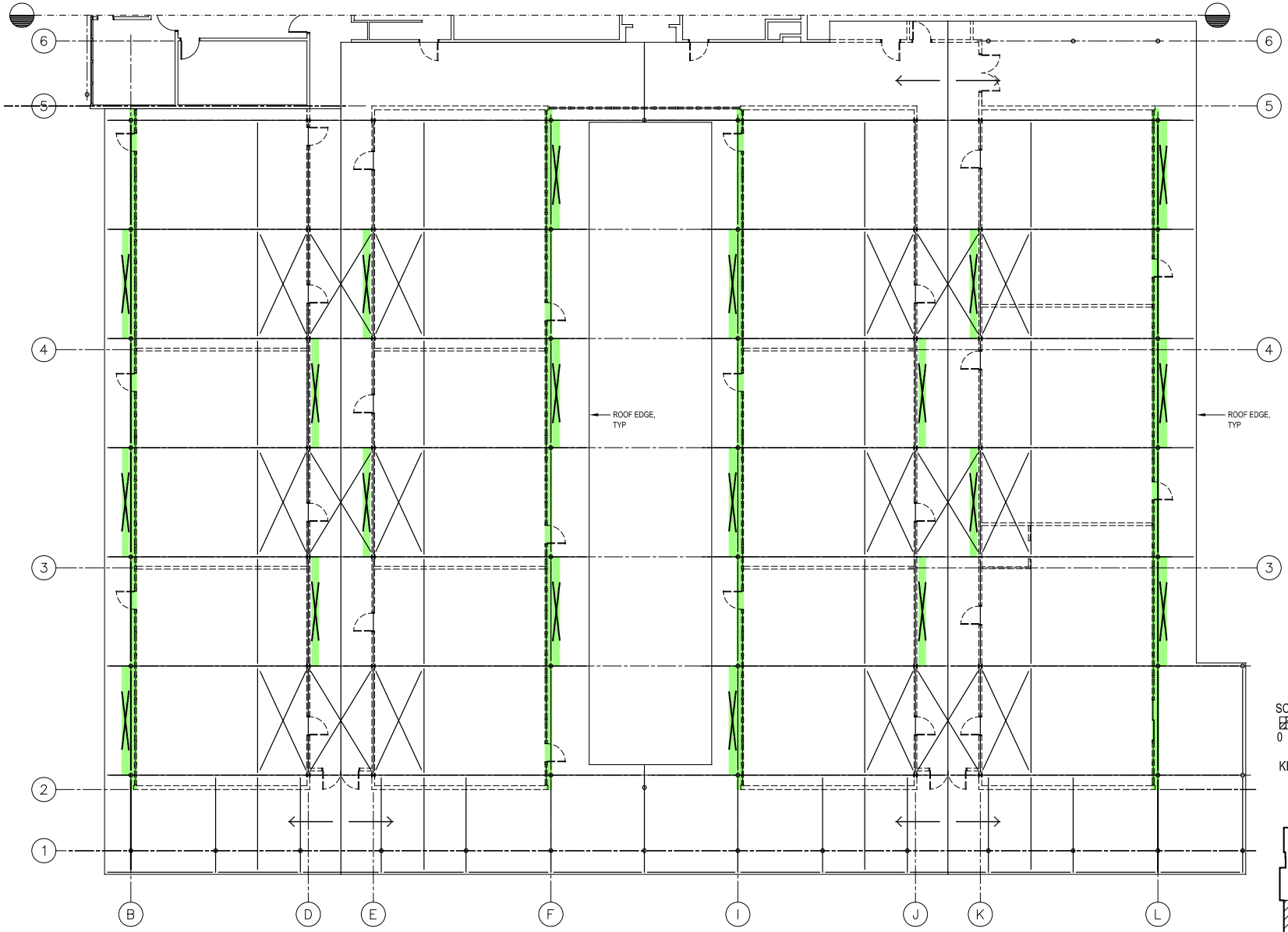


HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-A5



BUILDING A WEST -ROOF PLAN

NOTES FOR OPTION 1

1. (N) TS 5 X 5 X 1/4 ALONG LINES B, F, I, & L.
2. (N) DIAG. BRACES BTWN. PIPE COLS. WHERE SHOWN.
3. REMOVE 7/8 IN. & DIAGONALS W/ TURNBUCKLE & CLEVISES. REPLACE W/ (N) PL 3/8 X 1 1/4 GR. 50 (FY = 60 KSI MAX.) WELDED DIAGONALS. INSTALL (N) DIAGONALS W/ 600 LBS. PRETENSION.
4. BUTT WELD (N) PL 3/8 EXTENSION ONTO GUSSET PL.. VERIFY WELDS OF CURRENT GUSSET PL.
5. REMOVE CONCRETE TO EXPOSE TOP OF 3'-0" SQ. FDN. W/O DAMAGE TO FDN. BELOW. INSTALL (N) CONCRETE W/ 4 - #4 EA. WAY, TOP, & 4 VERTICAL #4 EPOXY BARS TO CURRENT FDN. AFTER COMPLETION OF OTHER WORK. PROVIDE EPOXY DOWELS INTO EDGE OF FLOOR SLAB.

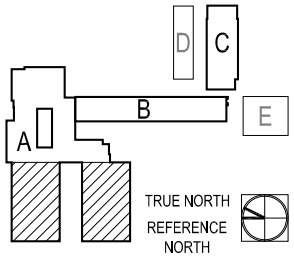
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:

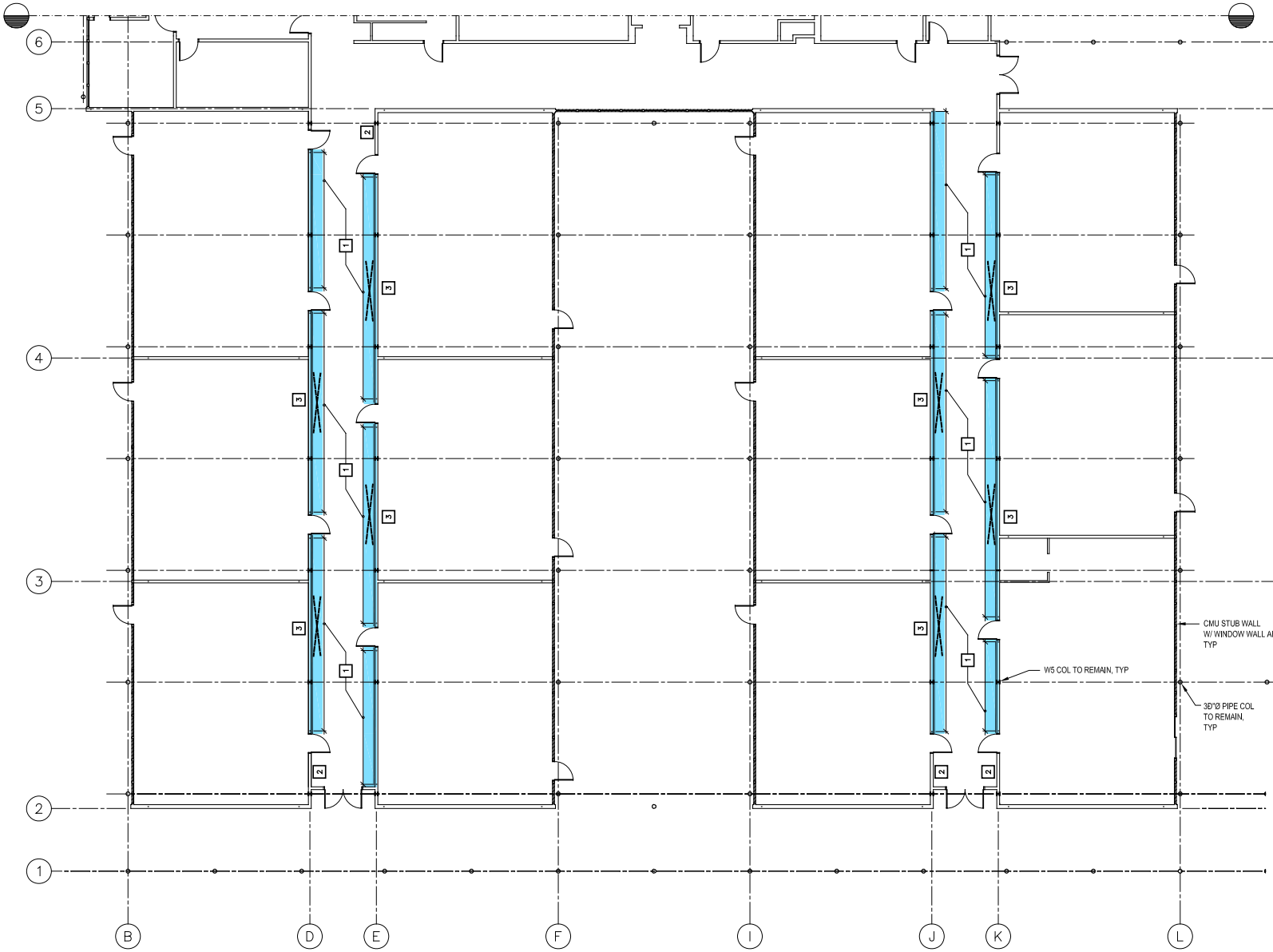


HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-A6



NOTES FOR OPTION 1

1. REMOVE NON-STRUCTURAL WALL FRAMING. REMOVE 3 HORIZ. C9 MEMBERS SPANNING BTWN. W5 COLS. SEE ORIGINAL SECTION 65. INSTALL (N) 2X6 @WALL FRAMING W/ 2X6 PT SILL PL & TOP PL. PROVIDE 5/8 IN. & EPOXY A.B.'S @ 2'-8" O.C. SHEATH ON ONE SIDE W/ 3/8 IN. PLY W/ 8D @ 4 IN. O.C. EDGE NAILING. BLOCK HORIZONTAL JOINTS & OFFSET ADJACENT SHEETS BY 4'-0" VERTICALLY. INSTALL (N) PHD6 @ EA. END.
2. REMOVE NON-STRUCTURAL WALL FRAMING & INSTALL (N) WALL FRAMING SIMILAR TO NOTE 1, ABOVE, W/O HOLDOWNS, & W/ EPOXY A.B.'S @ 6'-0" O.C MAX.
3. REMOVE 7/8 IN. & VERTICAL ROD BRACING FULL HEIGHT.

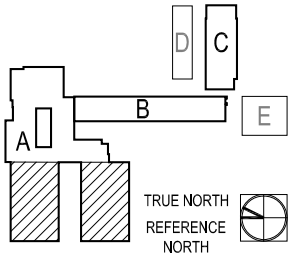
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



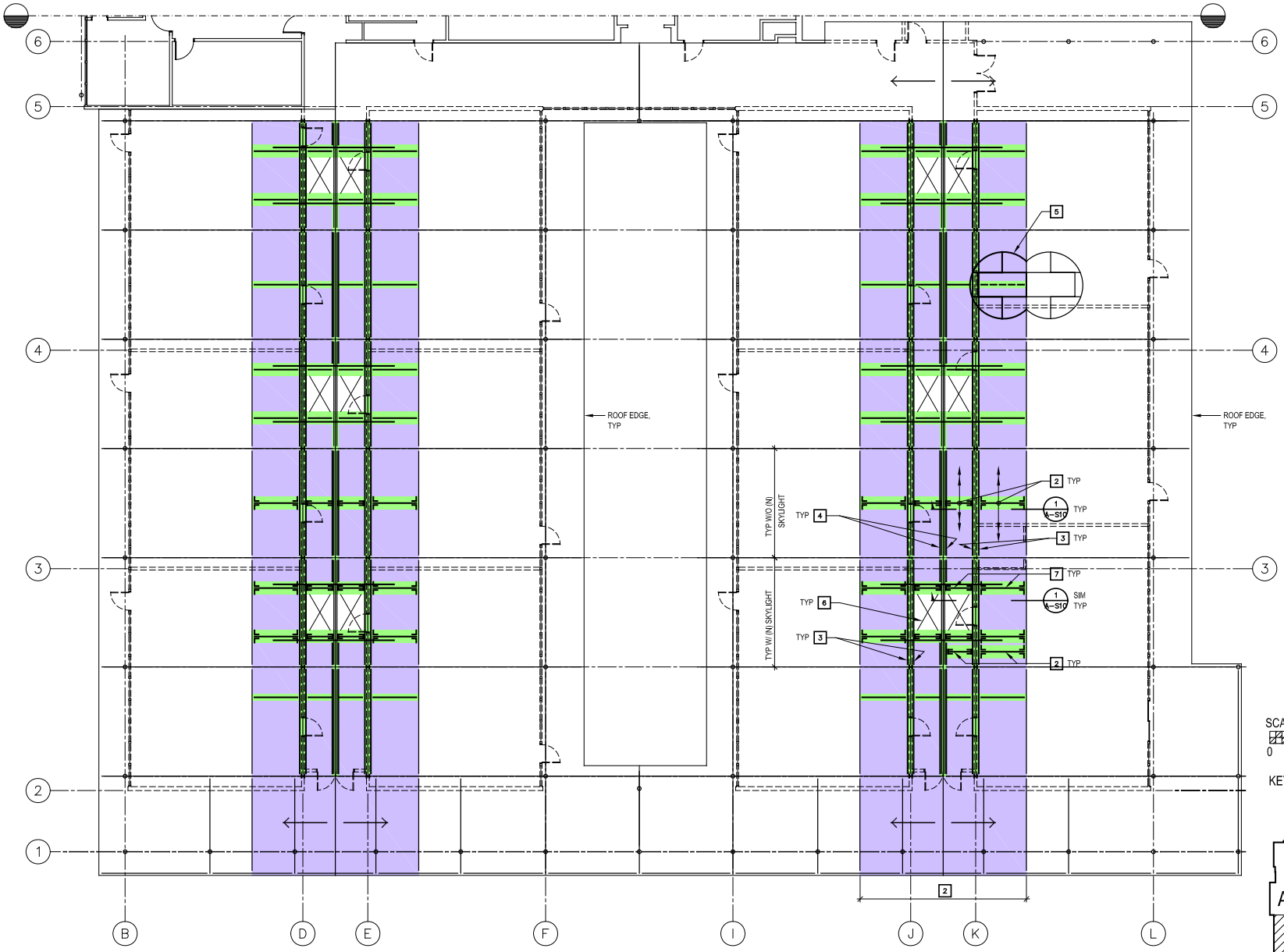
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 2

BUILDING A WEST -FLOOR PLAN

S-A7



BUILDING A WEST -ROOF PLAN

NOTES FOR OPTION 1

1. REMOVE 27'-5" X 108'-1 1/2" SKYLIGHT & SKYLIGHT FRAMING. REMOVE 7/8 IN. & HORIZONTAL ROD BRACING WHERE OCCURS. REMOVE SKYLIGHT SCREEN LOCATED BELOW SKYLIGHT.
2. (N) 2X6 @ 24 IN. O.C. W/ LUS26 EA. END.
3. (N) PSL 2 11/6 X 11 1/4 EA. SIDE OF W10, TYP. PROVIDE (N) FIELD WELDED VERT. PL STIFF. TO W12 FOR (N) BOLTED PSL END CONN.
4. (N) LVL 1 3/4 X 11 1/4 CONT. SCAB ATTACHED TO EA. 3X12 W/ 2 ROWS SDS 1/4 X 3 1/2 @ 12 IN. O.C.
5. (N) 1/2 IN. PLY W/ 8D @ 4 IN. O.C. EDGE NAILING.
6. (N) ROOF MOUNTED SKYLIGHT. S.A.D.
7. (N) 3 1/2 X 9 1/2 PSL W/ CONT. CMSTC16 STRAP, 20 FT. LONG ACROSS RIDGE.

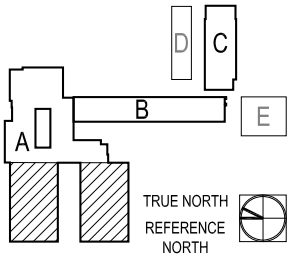
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 2

S-A8

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

GENERAL NOTES

1. ALL CONSTRUCTION IS EXISTING UNLESS SPECIFICALLY NOTED AS NEW OR (N).

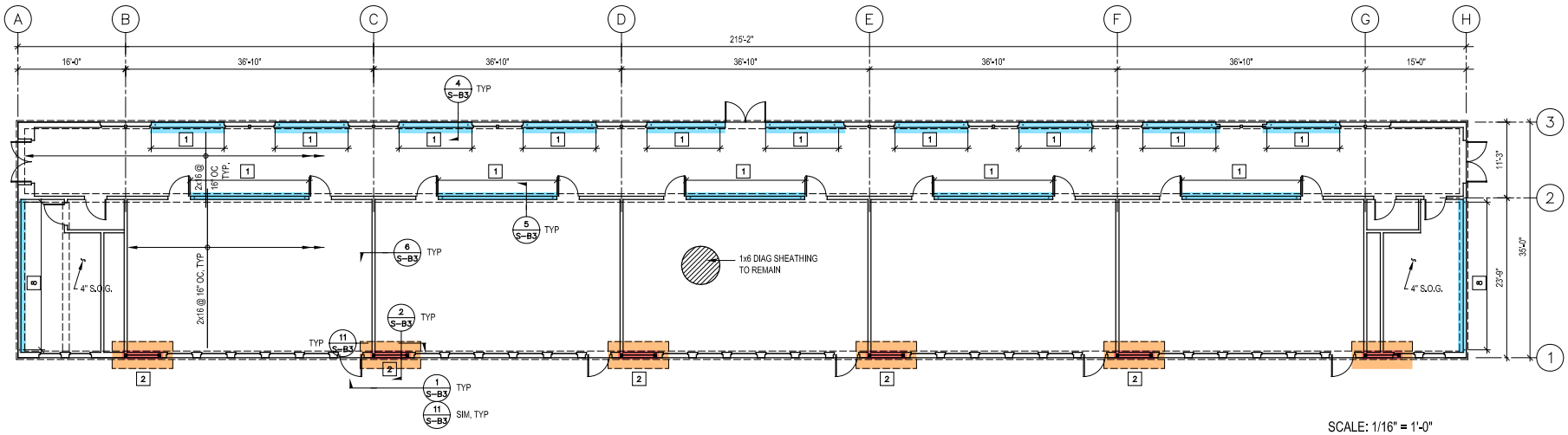
2. THESE DRAWINGS SHOW TWO SEISMIC UPGRADE OPTIONS. THESE ARE DESIGNATED OPTIONS 1 AND 2.

STRUCTURAL NOTES

1 REMOVE INTERIOR WALL FINISH IN AREAS SHOWN. INSTALL (N) 1" WALL PLY W/ 8d @ 4" O.C. EDGE NAILING. INSTALL (N) PHD6 HOLDOWNS AT EA. END. INSTALL ONE (N) FULL HEIGHT 2x KD FULL HEIGHT STUD AT EA. HOLDOWN, INTERNAILED TO (E) STUD.

2 INSTALL (N) CONCRETE FDNS. ON EA. SIDE OF FDNS AS SHOWN. SHORE CEILING FRAMING. REMOVE WALL BELOW CEILING JOISTS. REMOVE EXTERIOR FINISH & DIAGONAL SHEATHING TO TOP OF CEILING JOISTS. REMOVE SILL PLATE & CUT OFF ANCHOR BOLTS. INSTALL (N) STEEL BRACED FRAME W/ (N) STUDS ON BOTH SIDES OF (N) DIAGONALS W/ SHEATHING & FINISH TO MATCH.

8 REMOVE INTERIOR WALL FINISH LOCALLY & INSTALL (N) 5/8 " Ø EPOXY BOLTS IN 2x SILL PLATE @ 2'-0" O.C.



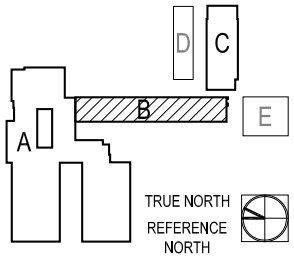
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

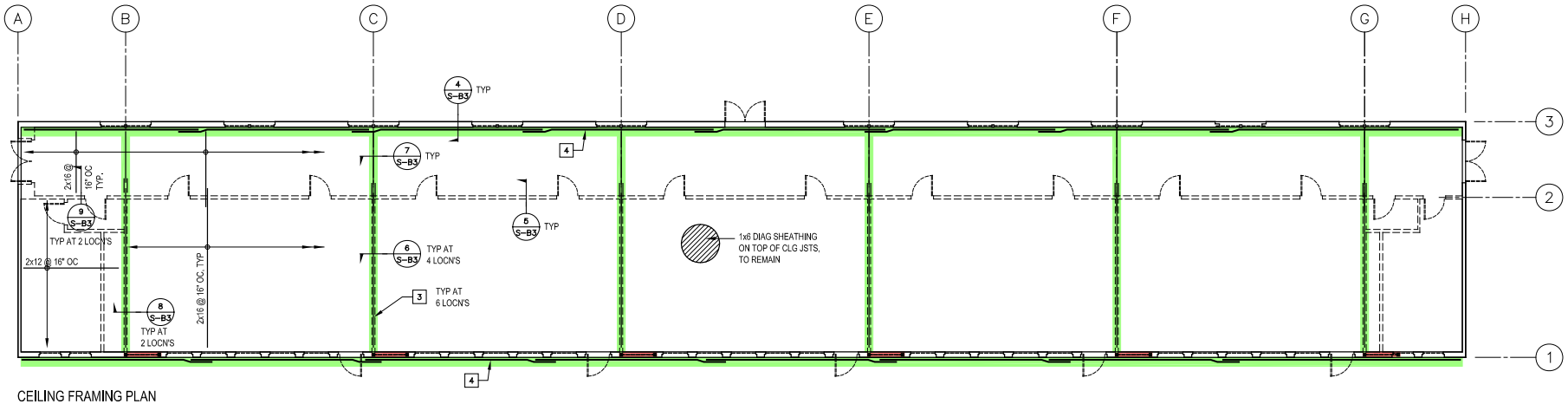
KEY PLAN:



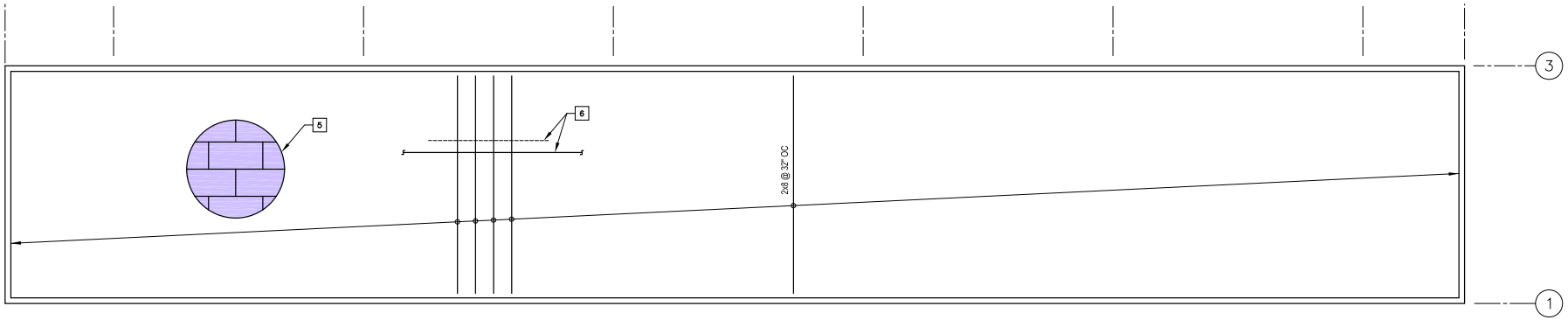
BUILDING B - FLOOR PLAN

concept design: structural option 1

S-B1.1



CEILING FRAMING PLAN



ROOF PLAN

LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

GENERAL NOTES

1. ALL CONSTRUCTION IS EXISTING UNLESS SPECIFICALLY NOTED AS NEW OR (N).

2. THESE DRAWINGS SHOW TWO SEISMIC UPGRADE OPTIONS. THESE ARE DESIGNATED OPTIONS 1 AND 2.

STRUCTURAL NOTES

3 REMOVE 2x4 FLAT WHERE OCCURS, PROTECT M.B'S & INSTALL (N) 2x4 FLAT ON TOP OF HORIZ. DIAG. SHEATHING. SPLICE (N) 2x4'S W/ 2 CS14 x 2'-8" ON TOP OF 2x. PLACE 2x'S TO BUTT TIGHT.

4 (N) CONTINUOUS CMSTC STRAP.

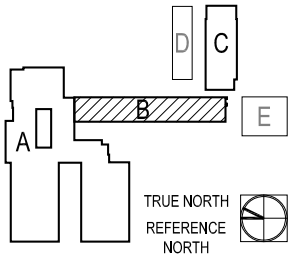
5 REMOVE 1x STRAIGHT SHEATHING AT START OF CONSTRUCTION, REPLACE W/ (N) 5/8 " UN-BLOCKED PLY W/ 10d @ 6" O.C. EDGE NAILING AS SHOWN AFTER COMPLETION OF ALL OTHER WORK. USE PLY CLIPS AT UNSUPPORTED EDGES.
ALTERNATE: REMOVE 2x8 ROOF JOISTS @ 32" O.C. & REPLACE W/ (N) 2x8 JOISTS @ 24" O.C. & (N) PLY PER ABOVE AFTER COMPLETION OF ALL OTHER WORK.

6 REMOVE 2x4 STUDS @ 32" O.C. & BOTTOM PLATE & INSTALL (N) 2x4'S TO MATCH AS SHOWN.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING B - CEILING FRAMING AND ROOF PLANS

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-B1.2

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 2

GENERAL NOTES

1. ALL CONSTRUCTION IS EXISTING UNLESS SPECIFICALLY NOTED AS NEW OR (N).

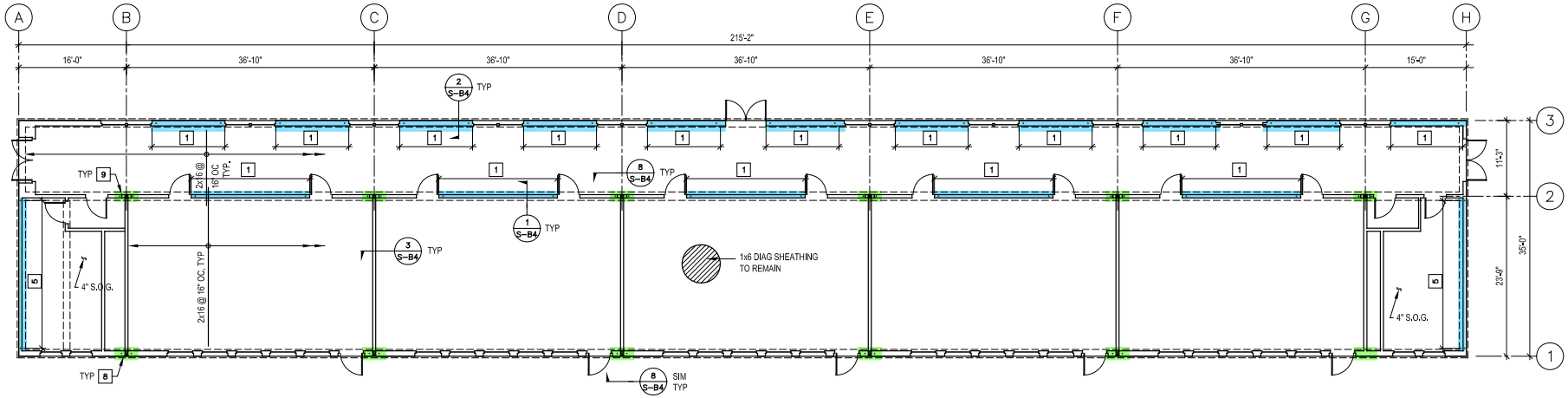
2. THESE DRAWINGS SHOW TWO SEISMIC UPGRADE OPTIONS. THESE ARE DESIGNATED OPTIONS 1 AND 2.

STRUCTURAL NOTES

1. REMOVE INTERIOR WALL FINISH. INSTALL (N) PHD6 W/ (N) 2x6 KD INTERNAILED TO STUD AT EA. END. INSTALL (N) 1" WALL PLY. W/ Bd @ 4" O.C. EDGE NAILING.

5. REMOVE INTERIOR WALL FINISH LOCALLY & INSTALL (N) 5/8 Ø EPOXY BOLTS THRU SILL PLATE @ 2'-0" O.C.

8. REMOVE 2-2x10 STUDS & INSTALL (N) 4x10 x 12'-0" W/ 2 (N) HD5A'S SIMILAR TO SECT. /S3 W/O THE SIDE 4x4'S. TYP. AT 6 LOCATIONS



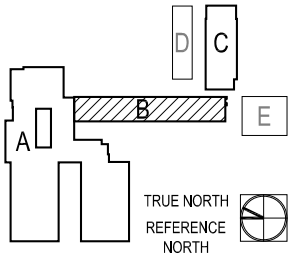
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

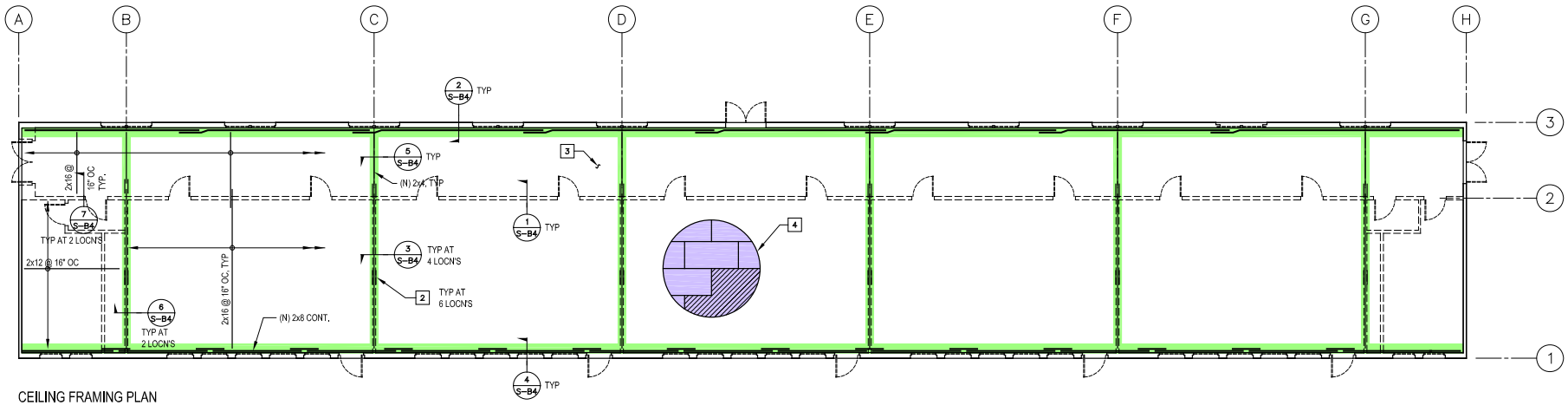
0 8'-0" 16'-0" 32'-0"

KEY PLAN:

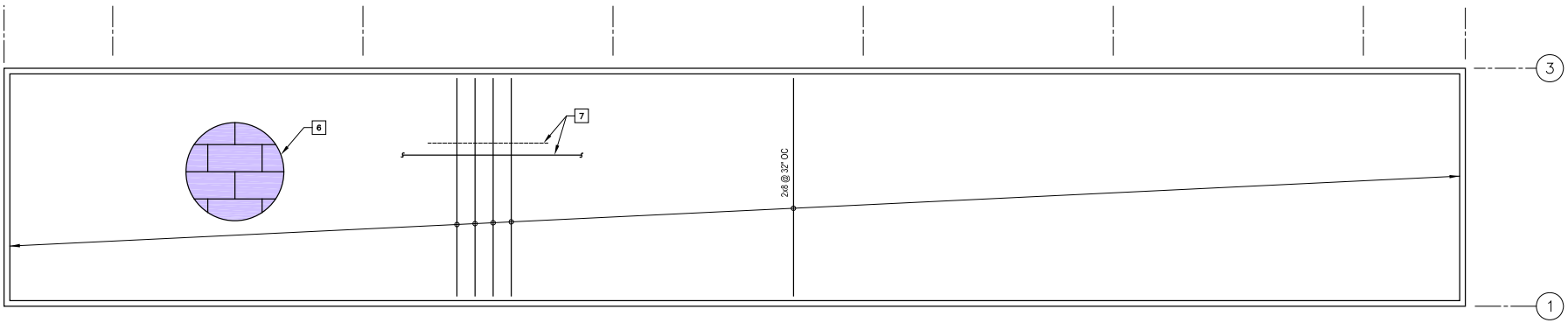


BUILDING B - FLOOR PLAN

S-B2.1



CEILING FRAMING PLAN



ROOF PLAN

LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

GENERAL NOTES

1. ALL CONSTRUCTION IS EXISTING UNLESS SPECIFICALLY NOTED AS NEW OR (N).
2. THESE DRAWINGS SHOW TWO SEISMIC UPGRADE OPTIONS. THESE ARE DESIGNATED OPTIONS 1 AND 2.

STRUCTURAL NOTES

2 REMOVE 2x4 FLAT WHERE OCCURS, PROTECT M.B.'S & INSTALL (N) 2x4 FLAT ON TOP OF HORIZ. DIAGONAL SHEATHING. SPLICE (N) 2x4'S W/ 2 CS14 x 2'-8" ON TOP OF 2x. PLACE 2x'S TO BUTT TIGHT.

3 REMOVE CEILING FINISH & FURRING THROUGHOUT CORRIDOR & REPLACE W/ 5/8" GYP. CEILING.

4 INSTALL (N) 1" PLY. W/ 8d @ 4" O.C. EDGE NAILING & 2 ROWS 8d @ 12" O.C. INTERIOR LENGTHWISE NAILING OVER 1x DIAGONAL SHEATHING, CONTINUOUS ON TOP OF CEILING LEVEL FRAMING.

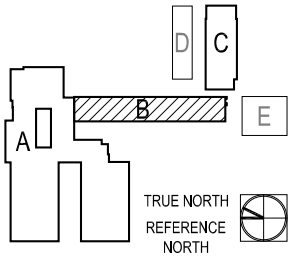
6 REMOVE 1x STRAIGHT SHEATHING AT START OF CONSTRUCTION. REPLACE W/ (N) 5/8 " UN-BLOCKED PLY. W/ 10d @ 6" O.C. EDGE NAILING AS SHOWN AFTER COMPLETION OF ALL OTHER WORK. USE PLY CLIPS AT UNSUPPORTED EDGES. ALTERNATE: REMOVE 2x8 ROOF JOISTS @ 32" O.C. & REPLACE W/ (N) 2x8 JOISTS @ 24" O.C. & PLY PER ABOVE AFTER COMPLETION OF ALL OTHER WORK.

7 REMOVE 2x4 STUDS @ 32" O.C. & BOTTOM PLATE. INSTALL (N) 2x4 STUDS W/ TOP & BOTTOM PLATES NEARBY. SHORE JOISTS AS NEEDED.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



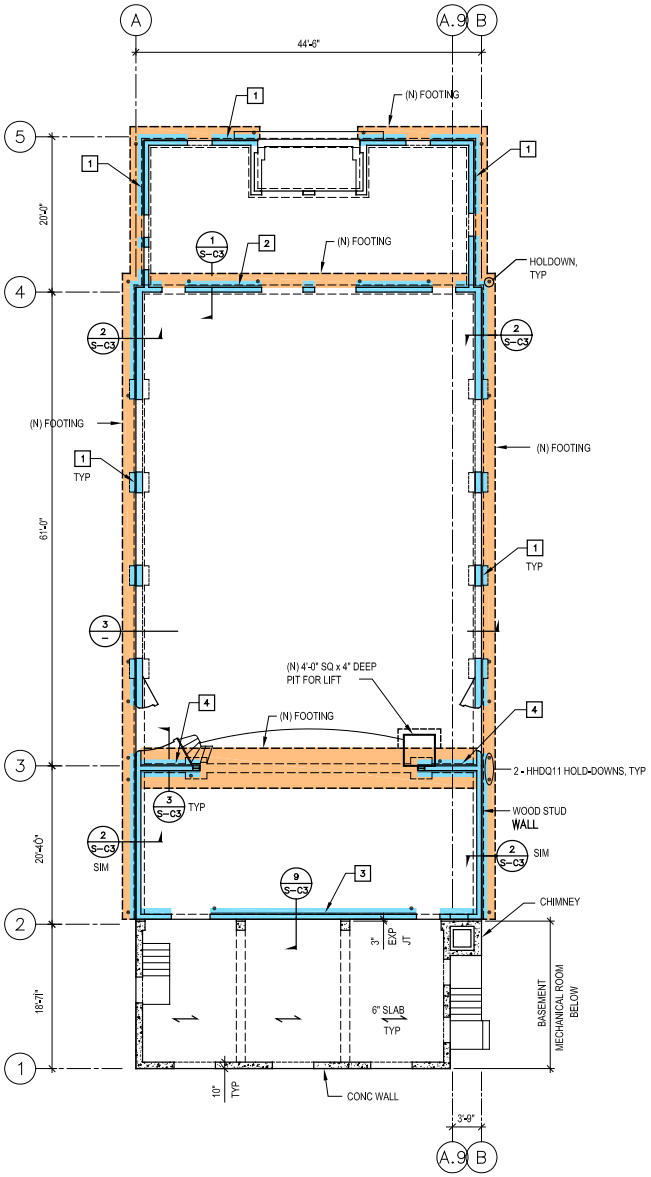
BUILDING B - CEILING FRAMING AND ROOF PLANS

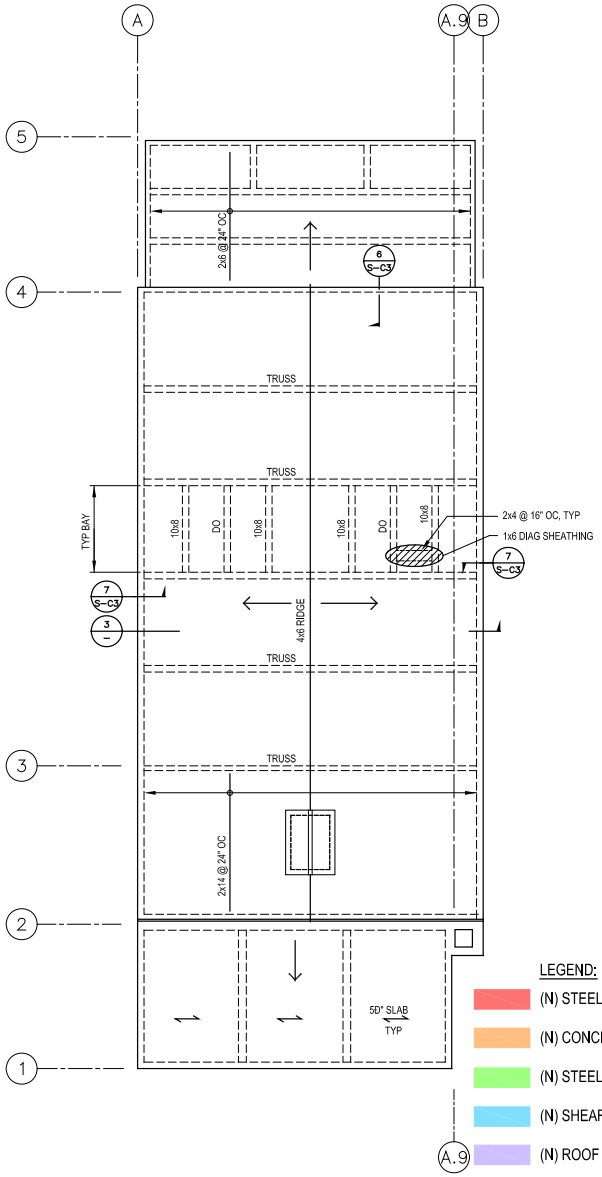
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 2

S-B2.2





NOTES FOR OPTION 1

1. REMOVE EXTERIOR WALL FINISH AND WALL SHEATHING ON LINES A, B AND 5, FULL HEIGHT. INSTALL NEW 5/8" CDX PLYWOOD WITH 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING. AT LOCATION SHOWN ON PLAN, INSTALL PHD6 HOLD-DOWN DEVICES. INSTALL 2x10 BLOCKING AT PLYWOOD EDGES AND NEW 2x10 STUDS, FULL HEIGHT, AT EACH HOLD-DOWN, INTERNAILED TO STUD. WIDEN EXISTING FOOTING AS SHOWN IN SECTION.

2. REMOVE INTERIOR WALL FINISH AND WALL SHEATHING ON BUILDING LINE 4 AS DEFINED IN SECTIONS 1 AND 6, SHEET S-C3. INSTALL NEW 5/8 " CDX PLYWOOD WITH 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING. INSTALL PHD6 HOLD-DOWNS, AS SHOWN IN PLAN. AT PLYWOOD EDGES AND AT HOLD-DOWNS, INSTALL NEW 2x8 STUD & BLOCKING. WIDEN EXISTING FOOTING AS SHOWN IN SECTION.

3. REMOVE INTERIOR WALL FINISH ON LINE 2 AS DEFINED IN SECTION 7, SHEET S-C3. INSTALL NEW 5/8 " CDX PLYWOOD WITH 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING. INSTALL SIMPSON PHD6 HOLD-DOWNS, AS SHOWN IN PLAN. AT PLYWOOD EDGES AND AT HOLD-DOWNS, INSTALL NEW 2x8 STUDS AND BLOCKING.

4. REMOVE INTERIOR WALL FINISH AND SHEATHING FROM BOTH SIDES OF PROSCENIUM WALL ON BUILDING LINE 3. ADD 5/8 " CDX PLYWOOD W/ 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING TO BOTH SIDES OF THE WALL. INSTALL SIMPSON HHDQ11 HOLD-DOWNS ALONG BUILDING LINES A AND B AS SHOWN IN PLAN.

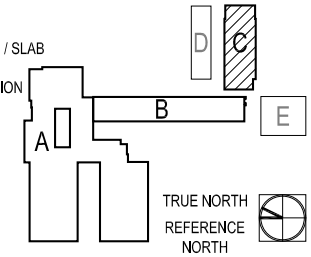
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



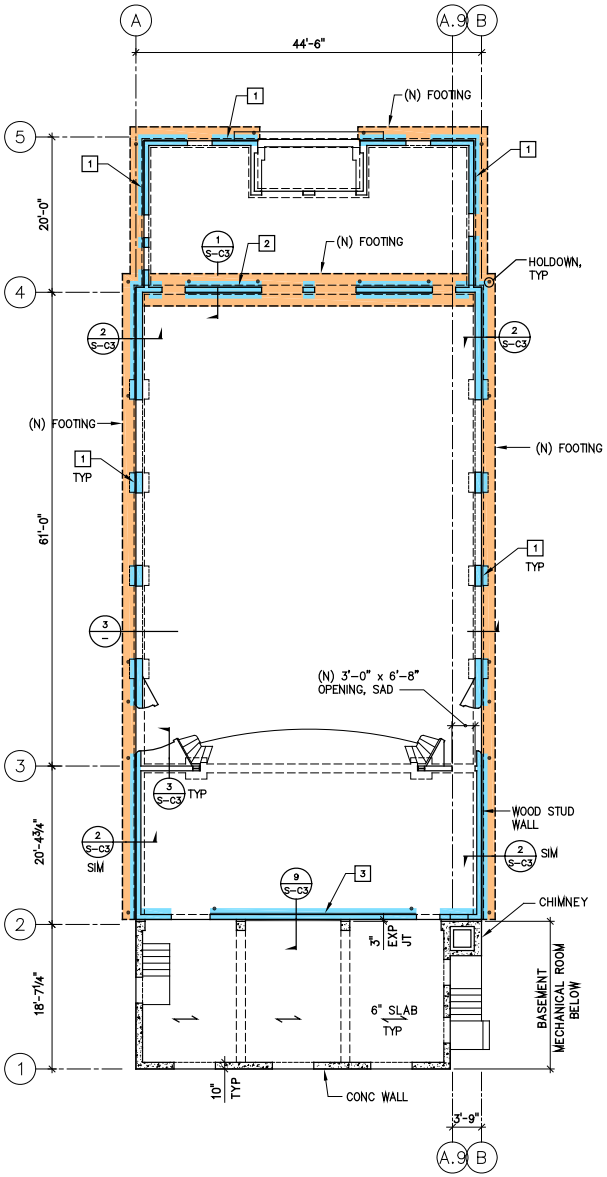
BUILDING C - FLOOR AND ROOF PLANS

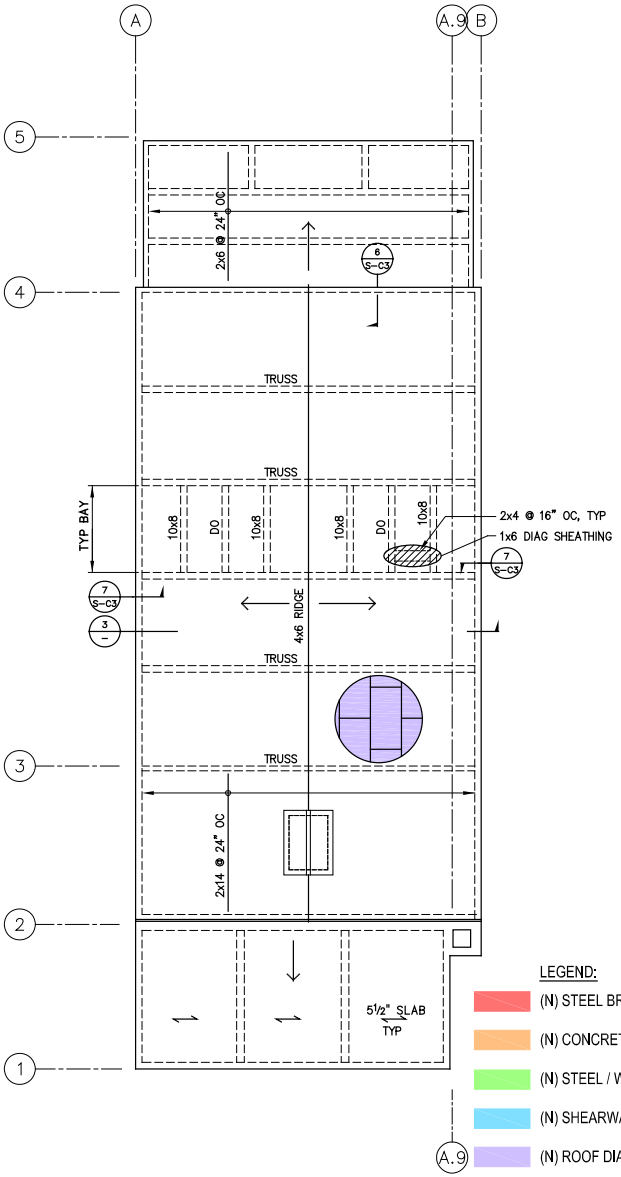
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 1

S-C1





BUILDING C - FLOOR AND ROOF PLANS

NOTES FOR OPTION 2

1. REMOVE EXTERIOR WALL FINISH AND WALL SHEATHING ON LINES A, B AND 5, FULL HEIGHT. INSTALL NEW 5/8" CDX PLYWOOD WITH 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING. AT LOCATION SHOWN ON PLAN, INSTALL PHD6 HOLD-DOWN DEVICES. INSTALL 2x10 BLOCKING AT PLYWOOD EDGES AND NEW 2x10 STUDS, FULL HEIGHT, AT EACH HOLD-DOWN, INTERNAILED TO STUD. WIDEN EXISTING FOOTING AS SHOWN IN SECTION.

2. REMOVE INTERIOR WALL FINISH AND WALL SHEATHING ON BUILDING LINE 4 AS DEFINED IN SECTIONS 1 AND 6, SHEET S-C3. INSTALL NEW 5/8 " CDX PLYWOOD WITH 10d @ 4" OC EDGE NAILING AND 10d @ 6" OC FIELD NAILING. INSTALL PHD6 HOLD-DOWNS, AS SHOWN IN PLAN. AT PLYWOOD EDGES AND AT HOLD-DOWNS, INSTALL NEW 2x8 STUD & BLOCKING. WIDEN EXISTING FOOTING AS SHOWN IN SECTION. ADD 5/8 " DIAMETER ANCHOR BOLTS @ 3'-0" O.C.

3. REMOVE INTERIOR WALL FINISH AND SHEATHING. ASS NEW 5/8 " CDX PLYWOOD ON BOTH SURFACES AS SHOWN IN PLAN AND IN SECTION 9, SHEET S-C3. PLYWOOD NAILING TO BE 10d @ 4" OC EDGE AND 10d @ 5" ON FIELD. INSTALL PHD5 HOLD-DOWNS AS SHOWN IN PLAN. AT PLYWOOD EDGES AND AT HOLD-DOWNS, INSTALL NEW 2x8 STUDS & BLOCKING. ADD 5/8 " DIAMETER ANCHOR BOLTS @ 4'-0" OC.

4. REMOVE EXISTING ROOFING MATERIAL FOR ROOF AREA SHOWN IN PLAN. ADD 1/2 " CDX PLYWOOD OVER EXISTING 1x6 DIAGONAL SHEATHING. NAIL PLYWOOD EDGES AT 2x4 RAFTERS WITH 8d @ 4" OC (1 1/2" LONG NAILS) AND FILED NAILING 8d @ OC (1 1/2" LONG NAILS).

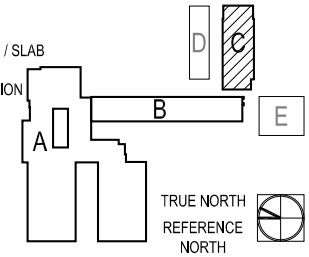
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design: structural option 2

S-C2

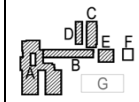
APPENDIX A:

PIEDMONT SEISMIC SAFETY PROGRAM

PIEDMONT UNIFIED SCHOOL DISTRICT

PROJECT STATUS & INFORMATION AVAILABILITY MATRIX

APRIL 6, 2007



School / Site	Abbreviation	Building Designation	Building Name	Seismic Tier 1	Letter From Forell & Elsesser on Seismic Performance	ATI Report (Accessibility / Seismic Performance)	Included in Scope Of Work (for m/N)	Qualitative Seismic Assessment by R.P. Gallagher	Benchmark Building	Seismic Tier 2	Seismic Non-Structural Hazard Report	ADA / Access Evaluation	Life Safety Evaluation	Materials Testing	Destructive Testing	Slope Stability Analysis / Site Specific Spectra	Peer Review at Investigation and Analysis	Peer Review at Concept Design	Peer Review at Schematic Design	Peer Review at Design Development	Peer Review at 100% CDs	Existing Hazardous Materials Reports in m/N possession	Topographical Survey	Property Survey / Title Report	Existing Geotechnical Reports	Existing Structural Calculations in m/N possession	Existing Specifications in m/N possession	Measured Drawings	DSA Dwg. in m/N possession	DSA Drawing Date	DSA Number for Drawings	Drawings	Architect	Cost Estimate	Comments
Havens Elementary School	HES																																		
		A	Admin. / Kindergarten Wings	●		●	●	×		●	●	●	●	●	●	●	●	○	○	○	○	●	○	●	○	×	×	×	×	●	5/29/1954	11628	original	Warnecke & Warnecke	○	○	
																														●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.			
																														●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect			
		B	Second Grade	●		●	●	×		●	●	●	●	●	●	●	●	○	○	○	○	●	○	●	○	×	×	×	×	●	2/27/1936	1444	original	John J. Donovan, Architect	○	○	
																														●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Eng.			
																														●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.			
																														●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect			
		C	Ellen Driscoll Playhouse	●		●	●	×		●	●	●	●	○	○	●	●	○	○	○	○	●	○	●	○	×	×	×	×	●	9/23/1940	3415	original	John J. Donovan, Architect	○	○	
																														●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Engineers			
		D	First Grade	●		●	●				○	○	○	×	×	●	×					○	○	●	○	×	×	×	×	●	2/17/1961	20815	original	Clarence W. Mayhew	○	○	
		E	Multi-Purpose Gym	×		●	●		●		○	○	○	×	×	●	×					○	○	●	○	●	×	×	×	●	5/20/1998	67713	original - phase I	Byrens Associates	○	○	
																														●	9/24/1998	67713	original - phase II	Byrens Associates			
		F	After-School Program (City Owned)	×		×	●																	●	○												
		G	Portables	×		×	●																	●	○												

LEGEND

- ○ NEEDED/IN PROGRESS
- ● YES / OK / COMPLETE
- ○ DO NOT HAVE
- ● NON CONCLUSIVE
- × NOT NECESSARY
- ○ Pending Authorization
- ● NO

Shaded Area Indicates Tier 2 Seismic Analysis.

2. MAY 9, 2007:
DESIGN CONCEPTS & COST ANALYSIS
SCHOOL BOARD PRESENTATION

FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

Seismic Strengthening Program / Measure E Bond Program

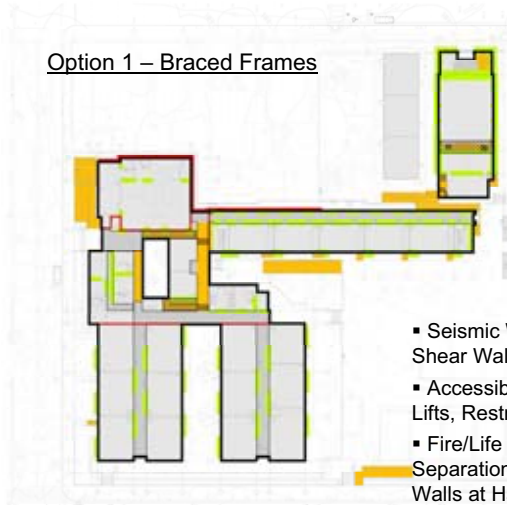
DESIGN CONCEPTS & COST ANALYSIS

May 9, 2007

R. P. Gallagher Associates, Inc.
Structural Engineering

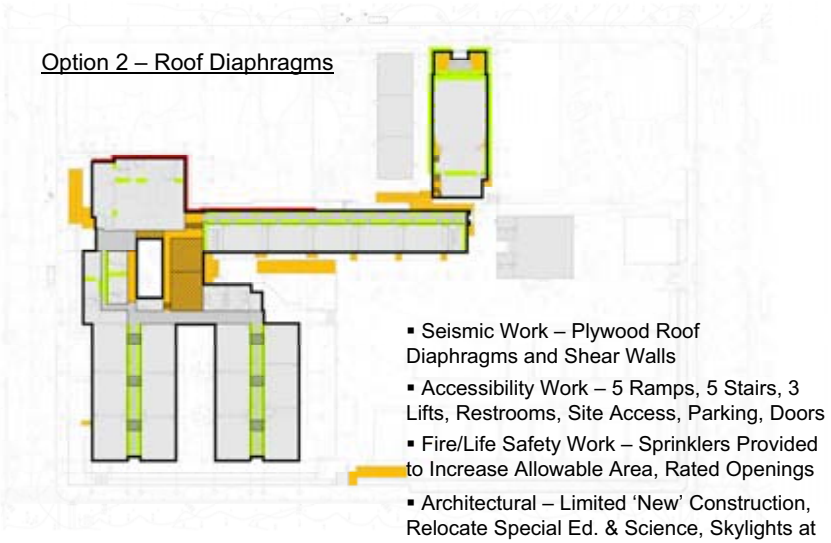
murakami Nelson
ARCHITECTURE | DESIGN

Option 1 – Braced Frames



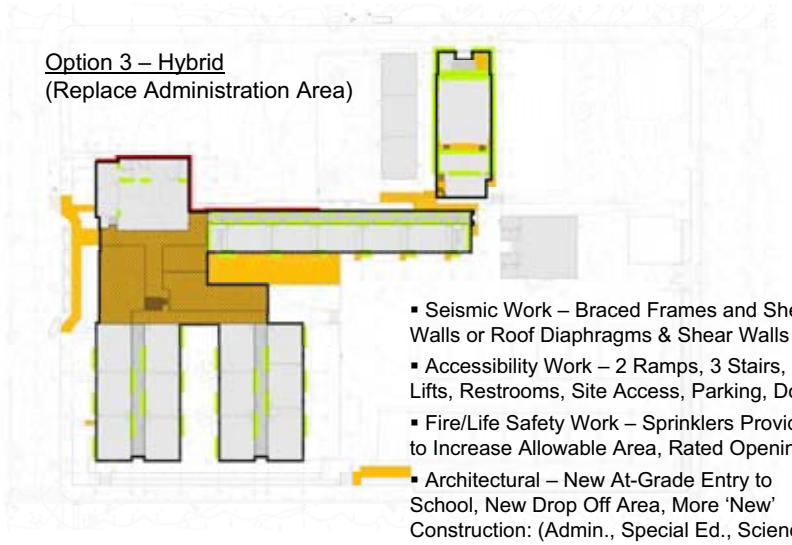
- Seismic Work – Braced Frames and Shear Walls, Limited Work at Roof
- Accessibility Work – 7 Ramps, 4 Stairs, 2 Lifts, Restrooms, Site Access, Parking, Doors
- Fire/Life Safety Work – 2 Hr. Area Separation Walls, Rated Openings, 1 Hr. Walls at Hallways at Administration Area
- Architectural – Limited 'New' Construction, Special Ed. & Science Get Smaller, Impact on Stage & Proscenium Wall at Theater

Option 2 – Roof Diaphragms



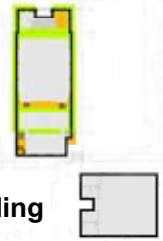
- Seismic Work – Plywood Roof Diaphragms and Shear Walls
- Accessibility Work – 5 Ramps, 5 Stairs, 3 Lifts, Restrooms, Site Access, Parking, Doors
- Fire/Life Safety Work – Sprinklers Provided to Increase Allowable Area, Rated Openings
- Architectural – Limited 'New' Construction, Relocate Special Ed. & Science, Skylights at K-1 get much Smaller

Option 3 – Hybrid
(Replace Administration Area)



- Seismic Work – Braced Frames and Shear Walls or Roof Diaphragms & Shear Walls
- Accessibility Work – 2 Ramps, 3 Stairs, 3 Lifts, Restrooms, Site Access, Parking, Doors
- Fire/Life Safety Work – Sprinklers Provided to Increase Allowable Area, Rated Openings
- Architectural – New At-Grade Entry to School, New Drop Off Area, More 'New' Construction: (Admin., Special Ed., Sciences & Restrooms), New Entry to Library

Option 4 – Replacement



New 40,000 square foot Building

- Architectural – New Program, Design and Siting of School, Only Ellen Driscoll Theater and Multipurpose Building Would Remain
- Seismic Work – Only at Ellen Driscoll Theater (Braced Frame & Shear Walls or Roof Diaphragm & Shear Walls)
- Accessibility Work – 1 Stairs, 2 Lifts, Restrooms, Doors
- Fire/Life Safety Work – Limited

Cost Analysis

Project Soft Costs - Upgrade

Architectural/Engineering Fee for Construction	9.9%
Furniture and Equipment	20.0%
Consultant Fee for Furniture and Equipment	1.0%
City Design Review Fee	0.1%
Plan Check/DSA Fee	0.6%
Reports (Soils/Seismic/Geology/Environmental)	0.2%
Tests and Inspections	2.0%
Inspector	1.2%
Site Survey	0.1%
Land	0.0%
Advertising, Legal, Bidding, Reimbursables	0.4%
Subtotal	**35.5%**
Project Contingency (change orders, claims, etc.)	**20.3%**
Total Project Soft Cost Multiplier	**55.8%**

Project Soft Costs - New Construction

Architectural/Engineering Fee for Construction	5.9%
FF&E; Data/Telecom; Security; AV	20.0%
Consultant Fee for Furniture and Equipment	1.0%
City Design Review Fee	0.1%
Plan Check/DSA Fee	0.3%
Reports (Soils/Seismic/Geology/Environmental)	0.2%
Tests and Inspections	2.0%
Inspector	0.9%
Site Survey	0.1%
Land	0.0%
Advertising, Legal, Bidding, Reimbursables	0.3%
Subtotal	**30.8%**
Relocation Cost Allowances	
Portable Classrooms, 30 each	15.0%
Land	2.9%
Site development	5.1%
Relocation, move expense, two ways	1.3%
Subtotal	**24.3%**
Project Contingency (change orders, claims, etc.)	**15.5%**
Total Project Soft Cost Multiplier	**70.6%**

Option 1 – Braced Frames

	Low (000)	High (000)
Structural Upgrades	1,600	1,900
Fire Life-Safety	600	700
ADA Upgrades	1,900	2,300
Non-Structural Hazards	500	600
Hazardous Materials	500	600
Escalation to 2010	1,000	1,200
Subtotal	6,100	7,300
Soft Costs	3,400	4,000
Total	**9,500**	**11,300**

Option 2 – Roof Diaphragms

	Low (000)	High (000)
Structural Upgrades	3,400	4,200
Fire Life-Safety	800	900
ADA Upgrades	2,600	3,100
Non-Structural Hazards	500	700
Hazardous Materials	700	900
Escalation to 2010	1,600	1,900
Subtotal	9,600	11,700
Soft Costs	5,300	6,500
Total	**14,900**	**18,200**

Option 3 – Hybrid
(Replace Administration Area)

	Low (000)	High (000)
Building A - Partial Reconstruction	2,600	3,200
Subtotal	2,600	3,200
Soft Costs	1,400	1,800
Total	**4,000**	**5,000**
With Option 1	**13,500**	**16,300**
With Option 2	**18,900**	**23,200**

Option 4 – Replacement

	Low (000)	High (000)
New Construction (Replacement Buildings A & B)	18,000	22,000
Building C (Theater) Upgrade	1,700	2,500
Subtotal	**19,700**	**22,500**
Soft Costs	**15,300**	**19,300**
Total	**35,000**	**41,800**

Overall Cost Summary

	OPTION 1 Braced Frames		OPTION 2 Roof Diaphragms		OPTION 3 Hybrid		OPTION 4 Replacement	
	Low	High	Low	High	Low	High	Low	High
Total Construction Costs	6,100	7,300	9,600	11,700	2,600	3,200	19,700	22,500
Soft Costs	3,400	4,000	5,300	6,500	1,400	1,800	15,300	19,300
Total Project Costs	**9,500**	**11,300**	**14,900**	**18,200**	4,000	5,000	**35,000**	**41,800**
With Option 1					**13,500**	**16,300**		
With Option 2					**18,900**	**23,200**		

3. JUNE 13, 2007:

REHABILITATION & COST ANALYSIS SCHOOL BOARD PRESENTATION

Piedmont Unified School District
Measure E Bond Program
Rehabilitation and Development Options
Havens Elementary School

Board Presentation
June 13, 2007

murakami Nelson
ARCHITECTURAL / CORPORATION

CPM

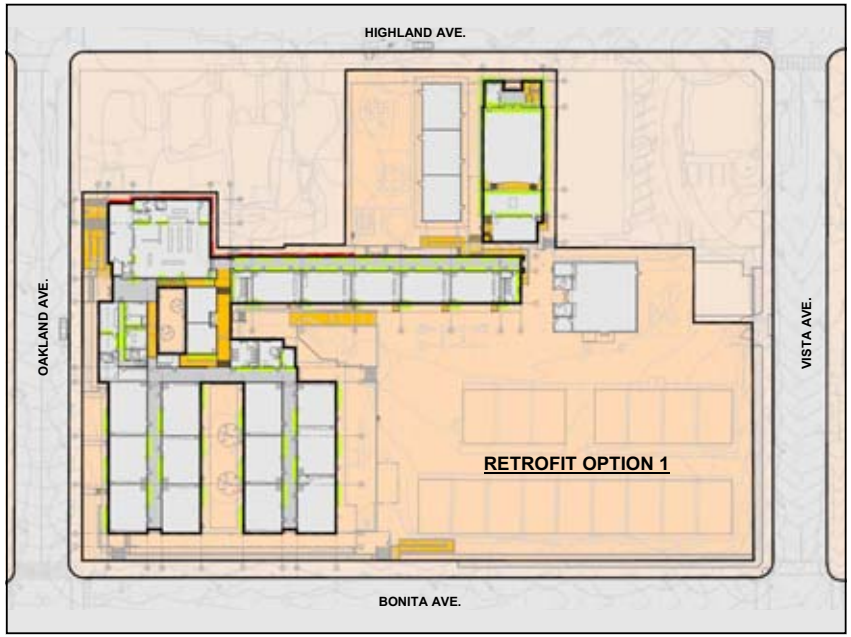
Purpose of Presentation

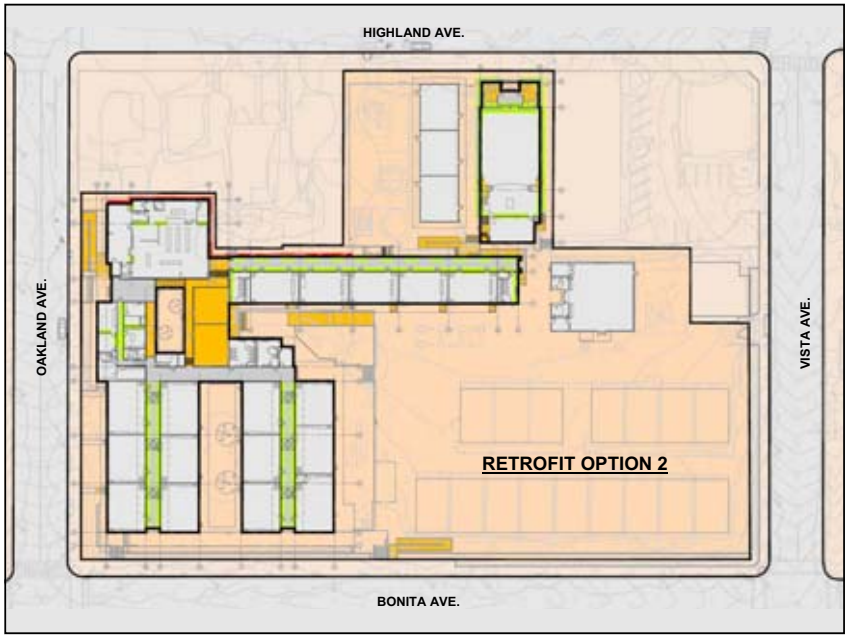
- Introduction
- General Concept Overview
- Differences Between Options
- Costs
- Recommendation
- Questions and Answers

General Concept Overview

- All Structural Options Yield Similar Structural Performance
- All Accessibility and Fire/Life Safety Options Meet Code Requirements
- There Are Differences Between Options

3





Retrofit Options (Option 1or 2)

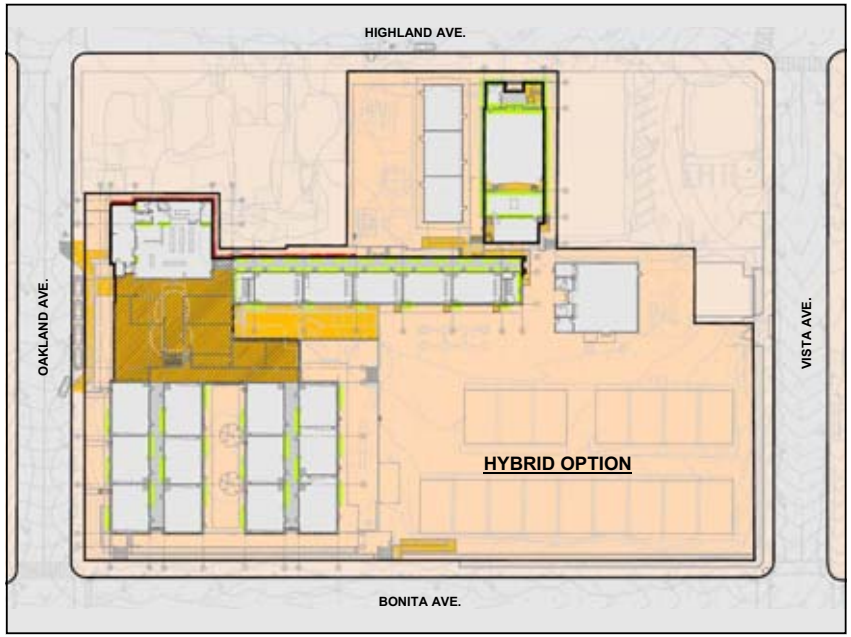
- Quickest to implement
- Least disruptive
- Steel braces or roof diaphragms would provide required Life Safety performance
- Plywood roof diaphragms may result in less damage
- Plywood roof diaphragm at Building A West would result in significant reduction of natural light

6

Retrofit Options (Option 1or 2) – cont.

- No programmatic or functional improvements
- Circulation and accessibility remain inefficient and complex
- Classrooms A34 and A36 become significantly smaller than State standards
- Interim housing would remain as is currently

7



Hybrid Option (Retrofit and Partial Replacement)

- Seismic strengthening is similar to Retrofit Options, but also requires major demolition, grading, retaining walls and new construction
- Significantly improves accessibility and circulation with a single floor level
- Provides a central hallway adjacent to Administration Area
- Provides new, centrally located entry to Library
- Has level access from Oakland Avenue through Building A to Building B and playground

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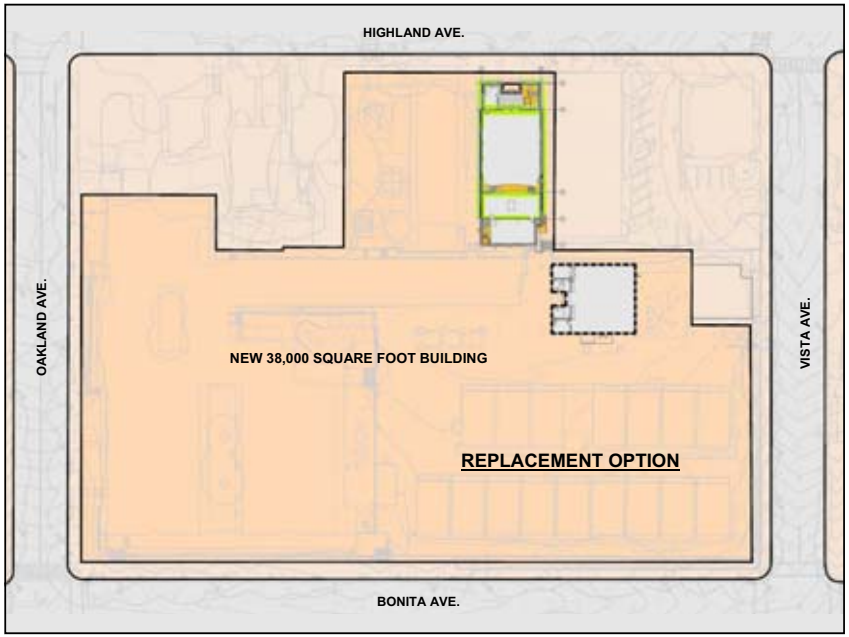
Hybrid Option (Retrofit and Partial Replacement) – cont.

- Resolves exiting at Building B
- Provides the opportunity for programmatic/functional improvements
- Provides the opportunity to reorient entry to the school, relocate Administration Area or even add science, computer and art rooms
- Longer to design and build
- Interim housing would remain as is currently

10



Replacement Option (While Preserving Ellen Driscoll Theater)

- New buildings will meet all current codes in the simplest manner
- Provides an opportunity to:
  - Improve use of site, access, open space, parking, security, etc.
  - Construct a sustainable, high performance school (CHPS)
  - Reconcile site grade/elevation changes
  - Provide more efficient design
  - Address programmatic/functional needs
- Interim housing would be required for the entire school
- Additional time is required for programming, planning, designing, permitting and construction

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Cost Components

- Hard (Construction) Costs
- Soft Costs
- Other Project Costs
  - Escalation
  - Interim Housing
- Hard + Soft + Other Project = TOTAL PROJECT COST
- Overall Program Costs (in addition to total, individual project costs)

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Hard (Construction) Costs

- The actual Bid cost plus all Change Orders through project closeout
  - Construction Materials and Labor
  - Bonds and Insurance
  - General Contractor and Sub-Contractor Overhead and Profit
  - All the “brick and mortar”

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Soft Costs

- Agency and Plan Check Fees (DSA, CDE, City, County, Utility, etc.)
- Geotechnical/Geohazard Fees
- CEQA Fees
- Survey Fees
- Underground Locating Fees
- Architectural and Engineering Fees and Reimbursables
- Pre-Construction Project Management Fees and Reimbursables
- Hazardous Material Consulting Fees and Reimbursables

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Soft Costs – cont.

- Construction Manager Fees and Reimbursables During Pre-Construction
- Bidding Expenses
- Inspection and Testing Fees
- Construction Management
- Furniture and Equipment (Non-fixed)
- Moving and Storage
- Construction and Project Contingencies

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New Construction Cost Comparison

- 8 Middle and High Schools in Northern California
- Bid Since Mid-2006
- Projects Ranged from 88,000-133,000 Square Feet
- Bid Amounts Ranged from $33,400,000-$132,500,000 (netting a cost of $340-$530 per square foot hard construction cost)
- Assumed 12% Escalation Cost From Bid Time Through June 2007
- Assumed 43% Soft Costs, Other Project Costs and Overall Program Costs Mark-Up
- Assumed 30% Cumulative Escalation Through 2010 (9% per year)

Total Project Square Foot Cost for New School Construction =

$710 – $1,100 per square foot

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Cost Comparison of Various Options

	Construc-tion Cost Range	Soft Costs (43% Mark-up)	Sub-Total Project Costs	Escalation to Mid-Point (9% Per Year)	Interim Housing*	Conceptual Total
Retrofit Options (1 or 2)	**$5 - 8M**	**$2 - 3.5M**	**$7 - 11.5M**	**$1.5 - 2M**	**$2M***	**$10.5 - 15.5M**
Per Square Foot	$110 - 175		$150 - 250			$225 - 335
Hybrid Option	**$6.5 - 10M**	**$3 – 4.5M**	**$9.5 – 14.5M**	**$2.5 – 3.5M**	**$2.5M***	**$14.5 - 20.5M**
Per Square Foot	$140 - 215		$200 - 310			$315 – 440
Replacement Option	**$16.5 - 25M**	**$7 - 10.5M**	**$23.5 - 35.5M**	**$7 - 10.5M**	**$4M***	**$34.5 - 50M**
Per Square Foot	$355 - 540		$505 - 765			$745 - 1,070

* Interim Housing costs include current expenditures.

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Retrofit Options Verses Hybrid Option

- Lowest Cost Retrofit Option May Not Be Possible Due to Programmatic Impact – More Costly Retrofit Option Would Be Most Likely
- Much of Same Work Scope in Both Options
- Both Options Would Have Similar Solutions to ADA and Fire/Life Safety Code Requirements – DSA Input Would Be Similar for the Majority of Work Scope
- Most Costly Section (Administration Area) Replaced Within Hybrid Option
- May Be Able to Complete Hybrid Option Within Cost of Retrofit Options

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CPM Recommendation

- At June 27, 2007 Board Meeting Authorize Amendment to m/N Initial Contract to Further Develop Hybrid Concept Including Refinement of Cost Estimate
- Proceed with Development of Hybrid Concept Including Reviews with TAC, Bond Steering, District Faculty and Staff, and Other Groups/Outside Agencies (such as DSA) as Appropriate
- Allow for Long-Term Plans During Concept Development
- CPM and m/N to Bring to Board Refined Concept with Validated Cost Estimate

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Questions and Answers

- John Nelson – murakami/Nelson
- Mike Wassermann – CPM
- Priscilla Meckley – CPM

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4. OCTOBER 9, 2007: CONCEPT DESIGN II REPORT (HYBRID OPTION)

FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

Seismic Strengthening Program / Measure E Bond Program

CONCEPT DESIGN II

October 2, 2007 (Updated October 9, 2007)

TAC Review

Building A - Kindergarten / Administration

Building B - Second Grade

Building C - Ellen Driscoll Theatre

R. P. Gallagher Associates, Inc.
Structural Engineering

murakami Nelson
ARCHITECTURAL CORPORATION

i. EXECUTIVE SUMMARY

The Concept Designs contained in this report address the structural, accessibility and life-safety deficiencies at Havens Elementary School. It is a distillation of the concept options proposed in the "Concept Design/Alternative Solutions" draft report dated April 25th, 2007. These concepts are based on an investigative report, dated July 13, 2007, which identified deficiencies throughout the campus.

Seismic strengthening concepts are illustrated following architectural design concepts. Where structural schemes require modifications to architectural features (primarily removing and replacing existing finishes), those changes are noted on the architectural plans.

A cost estimate was developed as part of this phase of work. It is summarized herein and contained in full under separate cover, dated October 1, 2007.

This report will serve as the background for the next phase of work which will be to develop a schematic design.

TABLE OF CONTENTS

1. SUMMARY OF ACCESSIBILITY & FIRE/LIFE-SAFETY C ONCEPT DESIGN

Site:

The main entry to the Havens campus is adjacent to the administration area in Building A on the Oakland Avenue side of the school. Accessible parking and a barrier-free path of travel are required to this entry and all main building entries. In addition, an accessible path of travel between all buildings and to exterior restroom doors is required.

Site Accessibility:

- Relocate existing accessible on-street parking space further East on Oakland Avenue, where street levels out. Provide new at-grade entry to main doors. This is achieved by raising the grade of Building A central to be flush with sidewalk.
- Provide new concrete access ramp from sidewalk to yard at Bonita Avenue.
- Provide new accessible gate hardware at all locations.
- Provide new concrete access ramps to replace existing on-site non-compliant ramps.

Buildings A & B:

These two buildings are physically connected and are considered as one building for the purposes of accessibility & fire/life-safety analysis. These buildings exceed allowable areas and are too close to adjacent property lines for the type of construction used. In addition, there are no sprinklers no centralized, addressable alarm system and no rated corridors which are required for exiting.

Accessibility:

- The East & West portions of Building A and Building B provide localized solutions that remove barriers to accessibility.
- The Central portion of Building A, (roughly between gridlines 5 & 8) will be replaced with a new infill building at the same elevation as Building A-East and Building B. This will mitigate the many elevation changes that currently exist. Exterior grade is raised at the main entry on Oakland Avenue as well as at the playground to provide at-grade entries. Elevation change within Building A is made via a single grand stair with an adjacent platform lift.

Fire/Life-Safety:

- New fire sprinklers allow for no area separation walls and provide a means for achieving protected openings at the property line. Because all classrooms exit directly to the exterior, no rated corridors are required.

Building C:

Construction on The Ellen Driscoll Theatre should be guided by the Secretary of the Interior's Standards for Historic Preservation. All concept design solutions presented herein preserve the existing building features, finishes, materials, etc. as much as possible.

Accessibility:

- An accessible entry is provided via existing retrofitted entry doors equipped with automatic door openers.
- Restrooms are modified as two single accommodation toilet rooms.
- Kitchen is modified to provide accessible counters, appliances, etc.
- Stage access is provided via platform lift in behind the proscenium wall.
- Access to the Occupational Therapy/Music room is from a new entry, stair and platform lift.

Fire/Life-Safety:

- Assembly buildings are required to be of 1-Hour construction throughout - sprinklers are provided in lieu of the 1-Hour rating.
- Sprinklers will be integrated into the historic fabric of the ceiling.

Building D

Accessibility:

- Minor modifications to doors and casework.

Fire/Life-Safety:

- Provide new fire sprinklers and an addressable fire alarm system. All classrooms exit directly to the exterior.

Building E

Accessibility:

- No work

Fire/Life-Safety:

- Provide new fire sprinklers and an addressable fire alarm system. All rooms exit directly to the exterior.

ARCHITECTURAL CONCEPT DESIGN NOTES:

01 (N) LANDSCAPED AREA.

02 (N) EXIT DOOR(S).

03 MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE 44" MIN. CLEAR PATH OF TRAVEL.

04 (N) OR MODIFIED 1 HR. RATED CORRIDOR WALL.

05A (N) ACCESSIBLE PAINTED DOOR, FRAME, & HARDWARE IN RESIZED OPENING.

05B (N) HARDWARE PACKAGE INCLUDING: OPERATING HARDWARE (LEVER, LATCH OR PANIC BAR), CLOSER, THRESHOLD, ETC.

05C (N) 3'-0" WIDE DOOR & SIDELIGHT IN (E) MODIFIED STEEL FRAME.

05D MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE CLEAR SPACE ON PUSH / PULL SIDE OF DOOR (24" MIN. EXTERIOR PULL, 18" MIN. INTERIOR PULL, 12" MIN. PUSH SIDE OF DOOR).

05E PROVIDE AUTOMATIC DOOR OPENER FOR PAIR OF (E) DOORS @ (E) 5'0" OPENING. (NOTE: MAY REQUIRE INTERPRETATION FROM DSA.)

06 (N) CONCRETE WALKWAY.

07 (N) ACCESSIBLE GATE HARDWARE.

08 (N) ACCESSIBLE CONCRETE RAMP WITH CURB & HANDRAILS 1:12 MAXIMUM SLOPE.

09 (N) HI-LO TYPE DRINKING FOUNTAIN WITH STAINLESS STEEL GUARD RAILS.

10 (N) 42" HIGH STAINLESS STEEL GUARDRAILS.

11 INFILL (E) DOOR OR WINDOW OPENING WITH FIRE RATED CONSTRUCTION TO MATCH WALL TYP.

12 (N) PLAY STRUCTURE (TO BE PHASED AFTER REMOVAL OF INTERIM HOUSING).

13A MODIFY (E) CABINETRY & COUNTERS FOR ACCESSIBILITY.

13B (N) ACCESSIBLE CABINETS & COUNTERS.

14 MODIFY RESTROOM TO PROVIDE ACCESSIBILITY: MULTIPLE ACCOMMODATION, ADEQUATE CLEAR SPACE, HARDWARE, ACCESSORIES, ETC.

15 NEW SHADED PICNIC TABLES.

16 (N) CONCRETE STAIR WITH STAINLESS STEEL HANDRAIL/GUARDRAIL.

17 (N) ACCESSIBLE SINK, FAUCETS & ACCESSORIES.

18 REMOVE (E) DOME PLAYSTRUCTURE.

19 (N) ASSISTED LISTENING DEVICE.

20 (N) PIT MOUNTED PLATFORM LIFT.

21 REPLACE EXTERIOR GLAZING WITH NEW HIGH PERFORMANCE THERMAL SAFETY GLAZING, TYP.

22 MODIFY (E) WALLS, CASEWORK, ETC. TO PROVIDE CLEAR SPACE @ SINK.

23 NEW ASPHALT PAVING.

24 NEW SHADE TREES.

25 PATCH SHEATHING & FINISH TO MATCH (E) @ (N) STRUCTURAL IMPROVEMENT, SEE STRUCTURAL DRAWINGS.

26 REPLACE ALL WALL & CEILING FINISHES WITH (N) 5/8" GYP. BOARD & PAINTED WOOD WAINSCOT, SEE STRUCTURAL DRAWINGS.

27 (N) CONCRETE RETAINING WALL.

28 PROTECTED OPENINGS:
PROVIDE EXTERIOR SPRINKLERS TO PROTECT OPENINGS. (NOTE: MAY REQUIRE INTERPRETATION FROM DSA.)

29 REPLACE EXISTING SKYLIGHTS WITH NEW HIGH PERFORMANCE (THERMAL) SAFETY GLAZING WITH INTEGRATED SHADING AND VENTILATION.

30 (N) 20 MIN. RATED DOOR @ CORRIDOR.

31 REMOVE (E) CONCRETE CANOPY & COLUMNS TO ACCOMMODATE (N) STRUCTURAL WORK, SEE STRUCTURAL DRAWINGS.

32 PROVIDE (N) LIGHTWEIGHT TRANSPARENT CANOPY @ WALKWAY.

33 REPLACE (E) BUILDING STUCCO, FLASHING, TRIM, ETC. TO MATCH (E), SEE STRUCTURAL DRAWINGS.

34 REMOVE (E) FLOOR FINISH MATERIALS (OR LANDSCAPE / FLATWORK) REPLACE TO MATCH (E), SEE STRUCTURAL DRAWINGS.

35 (N) PAINTED STEEL BRACED FRAME, SEE STRUCTURAL DRAWINGS.

36 NOT USED.

37 (N) ACCESSIBLE CONCRETE CURB RAMP.

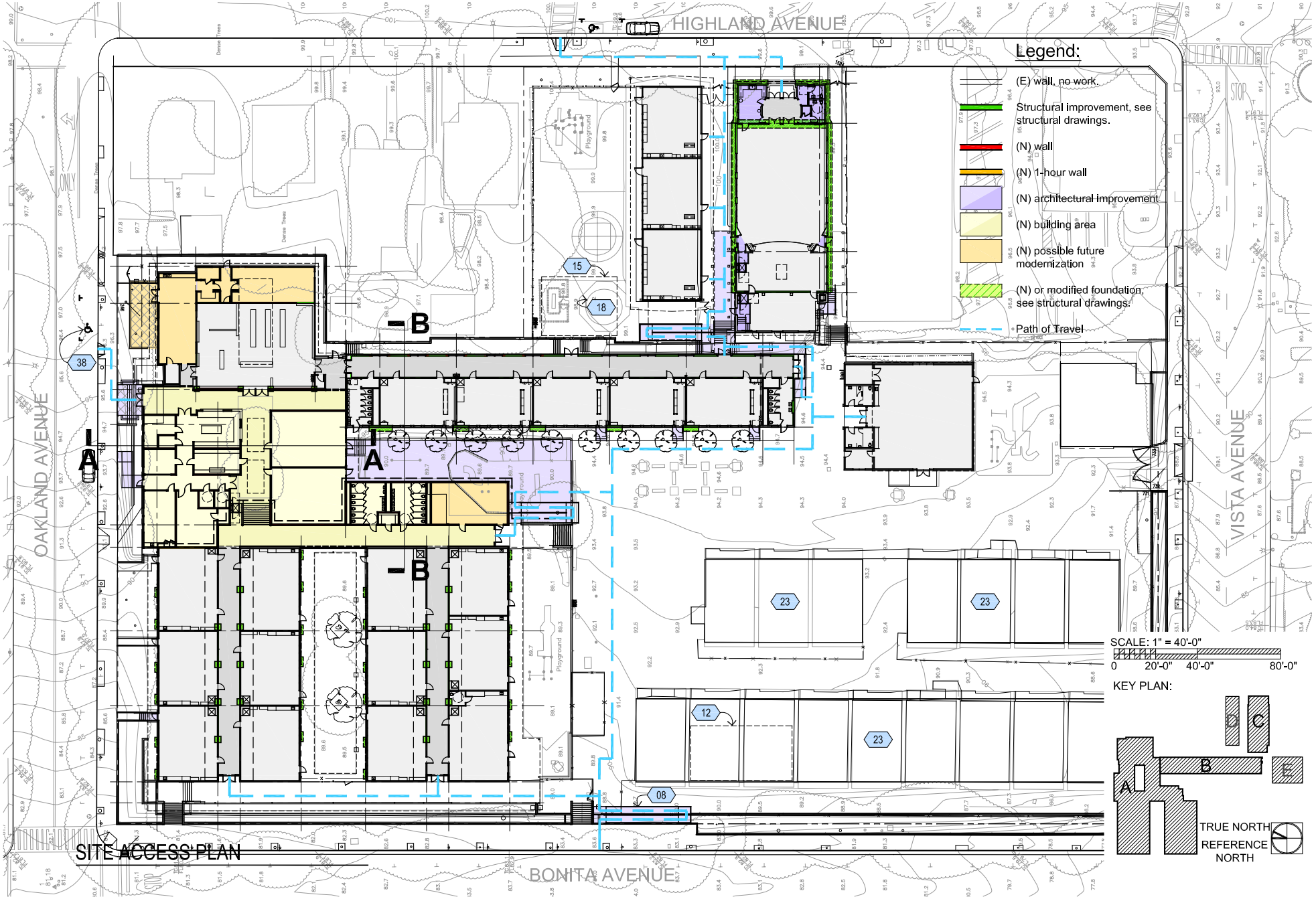
38 RELOCATED ACCESSIBLE ON STREET PARKING.

39 REMOVE SUSPENDED PLASTIC CEILING UNDER SKYLIGHTS.

40 (N) SKYLIGHT ABOVE.

41 REPLACE ALL HALLWAY GLAZING WITH CLEAR SAFETY GLASS.

42 REPLACE ALL SINK CABINETS WITH ACCESSIBLE COUNTERS, SINKS AND TRIM.



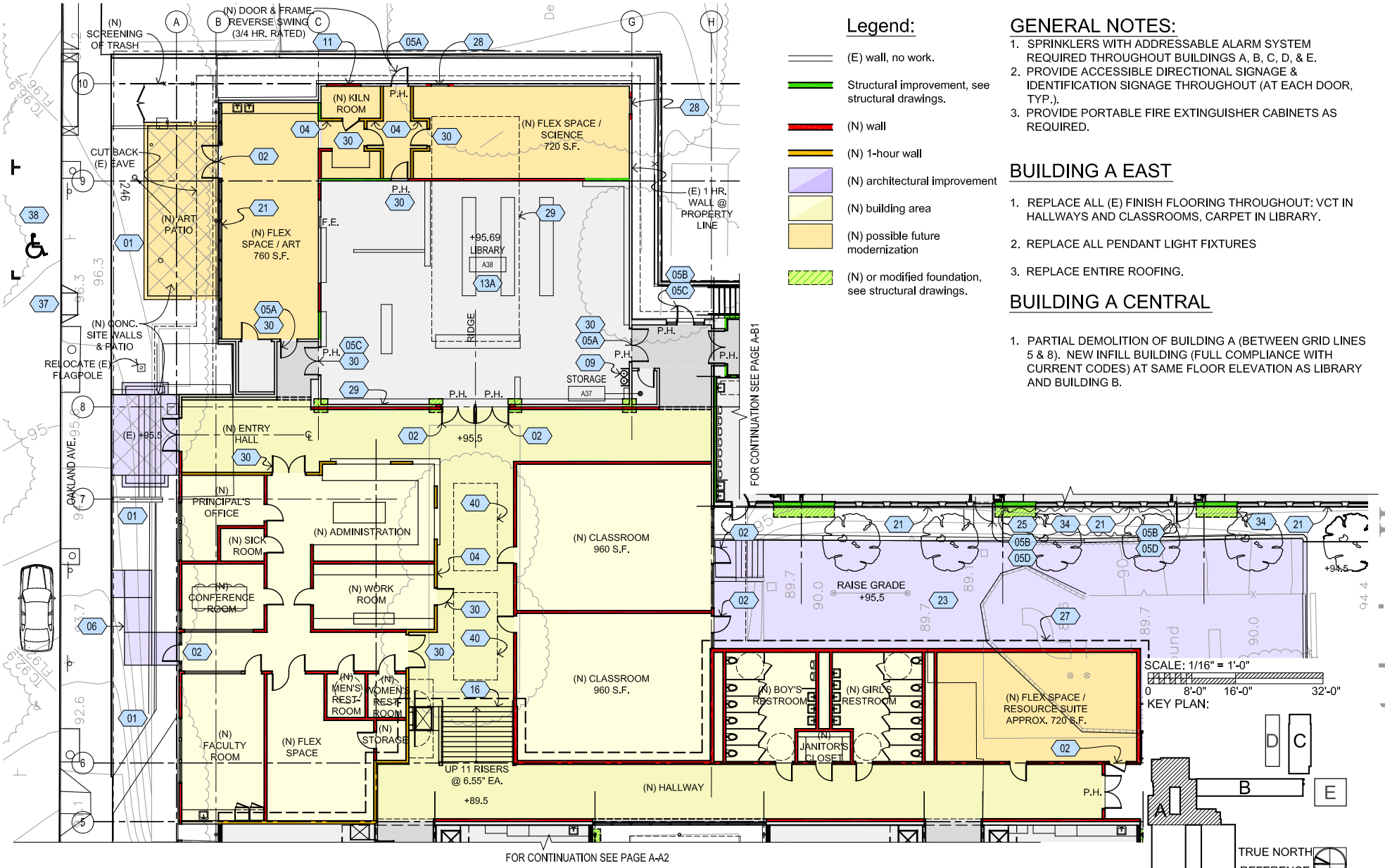
SITE ACCESS PLAN

HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design II

A-02



Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall
- (N) 1-hour wall
- (N) architectural improvement
- (N) building area
- (N) possible future modernization
- (N) or modified foundation, see structural drawings.

GENERAL NOTES:

1. SPRINKLERS WITH ADDRESSABLE ALARM SYSTEM REQUIRED THROUGHOUT BUILDINGS A, B, C, D, & E.
2. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR, TYP.).
3. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

BUILDING A EAST

1. REPLACE ALL (E) FINISH FLOORING THROUGHOUT: VCT IN HALLWAYS AND CLASSROOMS, CARPET IN LIBRARY.
2. REPLACE ALL PENDANT LIGHT FIXTURES
3. REPLACE ENTIRE ROOFING.

BUILDING A CENTRAL

1. PARTIAL DEMOLITION OF BUILDING A (BETWEEN GRID LINES 5 & 8). NEW INFILL BUILDING (FULL COMPLIANCE WITH CURRENT CODES) AT SAME FLOOR ELEVATION AS LIBRARY AND BUILDING B.

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

BUILDING A EAST / BUILDING A CENTRAL - FLOOR PLAN

concept design II

A-A1

GENERAL NOTES:

1. SPRINKLERS WITH ADDRESSABLE ALARM SYSTEM REQUIRED THROUGHOUT BUILDINGS A, B, C, D, & E.
2. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR, TYP.).
3. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

BUILDING A WEST

1. REPLACE ALL FINISH FLOORING THROUGHOUT: VCT IN HALLWAYS, CARPET IN CLASSROOMS, TYP.
2. REPLACE ALL PENDANT LIGHT FIXTURES.
3. REPLACE ENTIRE ROOFING.

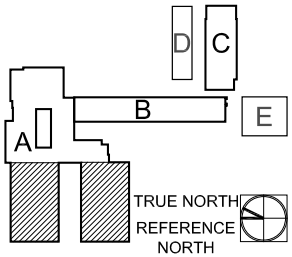
Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall
- (N) 1-hour wall
- (N) architectural improvement
- (N) building area
- (N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



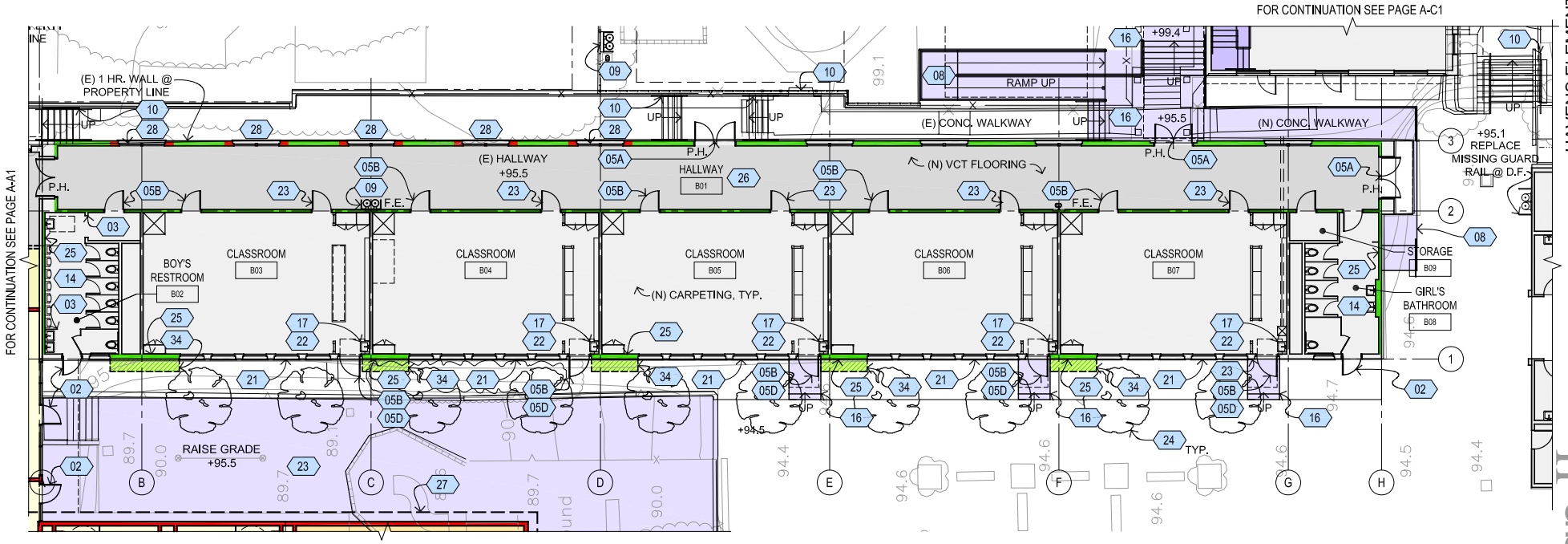
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design II

BUILDING A WEST - FLOOR PLAN

A-A2



Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall
- (N) 1-hour wall
- (N) architectural improvement
- (N) building area
- (N) possible future modernization
- (N) or modified foundation, see structural drawings.

GENERAL NOTES:

1. SPRINKLERS WITH ADDRESSABLE ALARM SYSTEM REQUIRED THROUGHOUT BUILDINGS A, B, C, D, & E.
2. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR, TYP.).
3. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

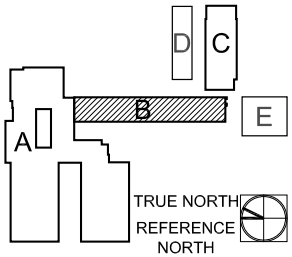
BUILDING B

1. TOILET ROOMS TO BE MADE ACCESSIBLE FROM YARD.
2. STRUCTURAL WORK WILL REQUIRE REMOVAL & REPLACEMENT OF ROOF FOR ACCESS.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



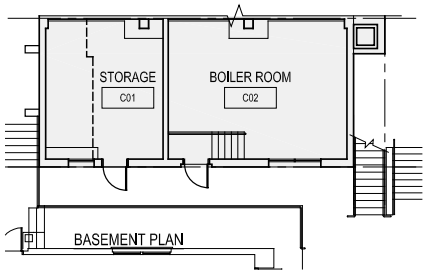
BUILDING B - FLOOR PLAN

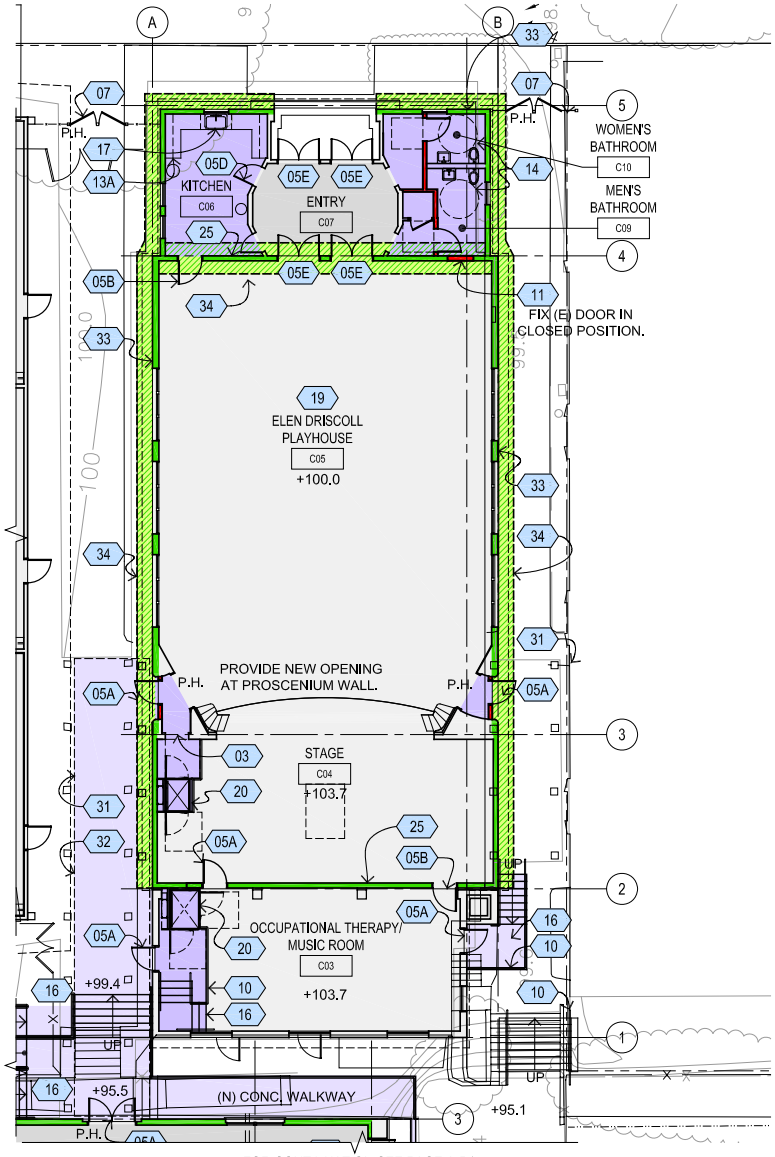
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design II

A-B1





FOR CONTINUATION SEE PAGE A-B1

GENERAL NOTES:

1. SPRINKLERS WITH ADDRESSABLE ALARM SYSTEM REQUIRED THROUGHOUT BUILDINGS A, B, C, D, & E.
2. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR, TYP.).
3. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

BUILDING C

1. WORK ON BUILDING C SHOULD BE GUIDED BY THE SECRETARY OF THE INTERIOR'S STANDARDS FOR HISTORIC REHABILITATION.
2. STRUCTURAL WORK WILL REQUIRE REMOVAL & REPLACEMENT OF EXISTING CLAY TILE ROOF. SEE STRUCTURAL DRAWINGS.
3. PROVIDE ACCESS TO NEW PLATFORM LIFT THROUGH PROSCENIUM WALL FOR STAGE ACCESS.
4. PROVIDE FIRE SPRINKLERS IN LIEU OF 1-HOUR RATING. SPRINKLER PIPING TO BE CONCEALED IN CEILING CAVITY. SPRINKLER HEADS TO BE INTEGRATED INTO HISTORIC CEILING.

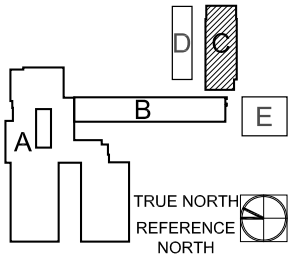
Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall
- (N) 1-hour wall
- (N) architectural improvement
- (N) building area
- (N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



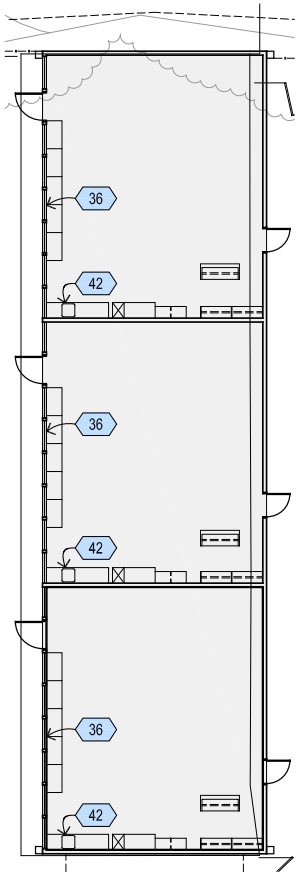
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

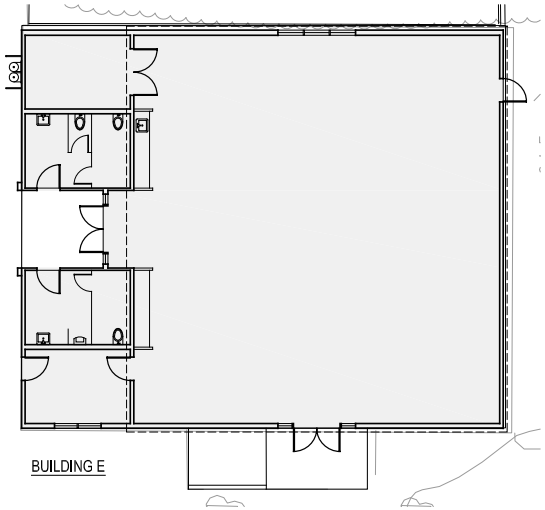
concept design II

BUILDING C - FLOOR PLAN

A-C1



BUILDING D



BUILDING E

GENERAL NOTES:

1. SPRINKLERS WITH ADDRESSABLE ALARM SYSTEM REQUIRED THROUGHOUT BUILDINGS A, B, C, D, & E.
2. PROVIDE ACCESSIBLE DIRECTIONAL SIGNAGE & IDENTIFICATION SIGNAGE THROUGHOUT (AT EACH DOOR, TYP.).
3. PROVIDE PORTABLE FIRE EXTINGUISHER CABINETS AS REQUIRED.

BUILDING D

1. PROVIDE COMPLETE FIRE SPRINKLER AND ALARM SYSTEM.
2. REPLACE ALL PENDANT LIGHT FIXTURES.

BUILDING E

1. PROVIDE COMPLETE FIRE SPRINKLER AND ALARM SYSTEM.

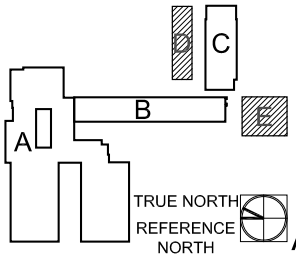
Legend:

- (E) wall, no work.
- Structural improvement, see structural drawings.
- (N) wall
- (N) 1-hour wall
- (N) architectural improvement
- (N) building area
- (N) possible future modernization
- (N) or modified foundation, see structural drawings.

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



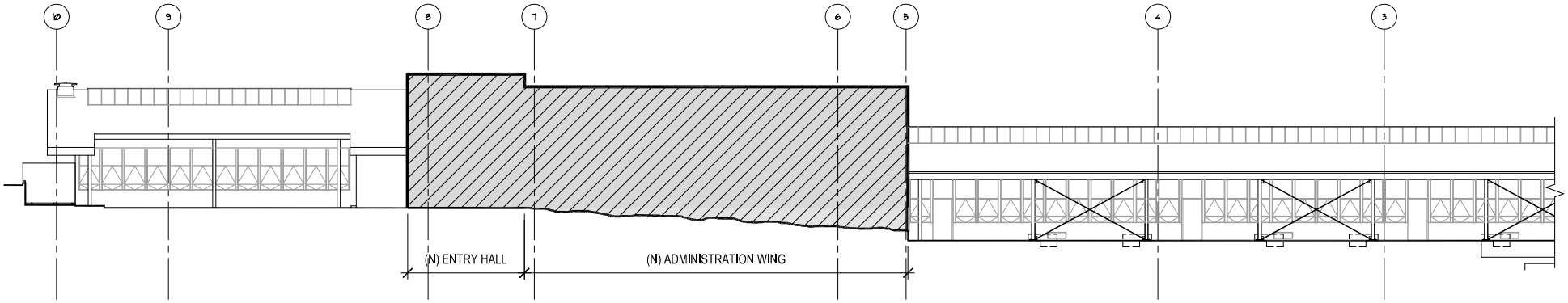
HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

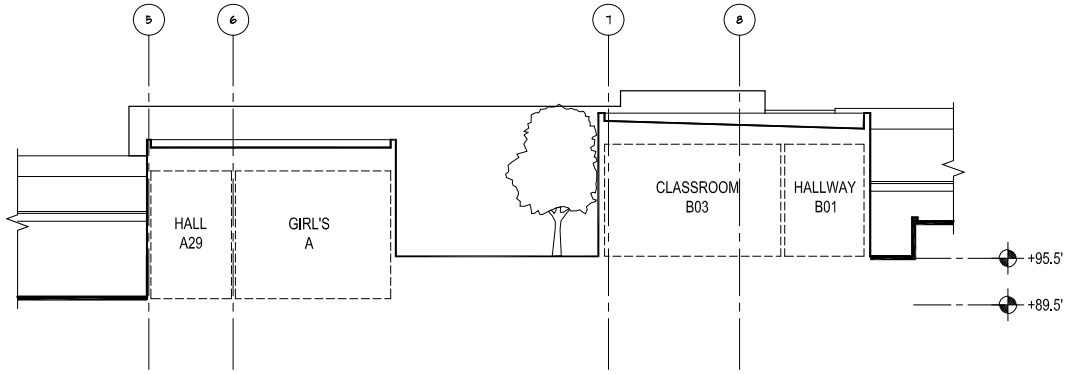
concept design II

BUILDING D AND E - FLOOR PLAN

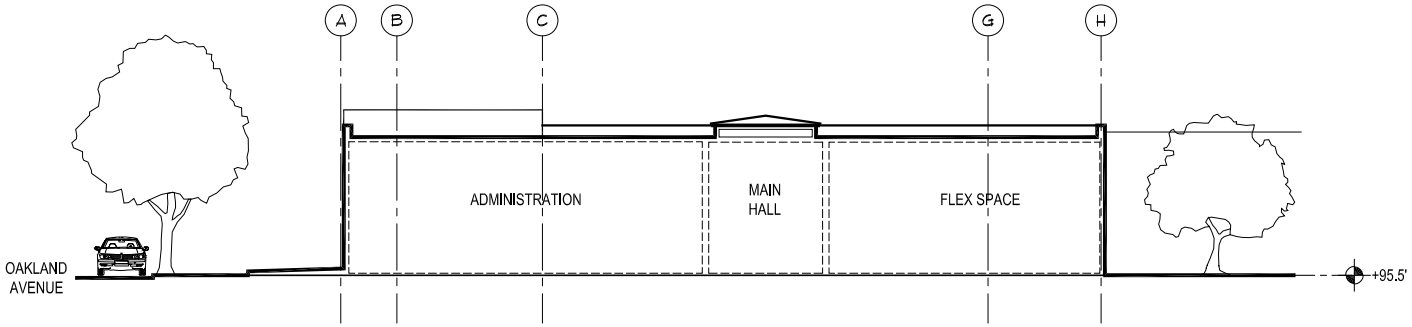
A-DE1



BUILDING A - NORTH ELEVATION



BUILDING A - SECTION BB

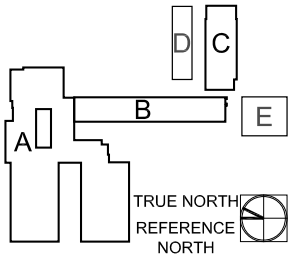


BUILDING A - SECTIONS AA

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

concept design II

A-20

Summary of Seismic Strengthening Schemes for Three Buildings at Havens ES

Seismic evaluations of the three Havens buildings were performed using the Tier 2 procedures of ASCE 31. Significant deficiencies were found, and strengthening concepts have been developed. These are summarized below for each building. Only the major components of each scheme are presented below, and the actual strengthening of each building will include other lesser yet important components not discussed below.

Criteria

The strengthening concepts were developed using the provisions of FEMA 356 for the Life Safety performance level. The BSE-1 site-specific spectra was used as the ground shaking hazard.

Building A - East (Library /Administration Area)

In the ASCE 31 Tier 2 evaluations of the building, a number of shear walls were found to be overstressed, constituting the major deficiencies for this area. Strengthening consists of adding plywood sheathing to the walls on lines 8 and 9 with the wall on Line 8 to receive plywood sheathing on both sides. The foundation for line 8 will require strengthening with new concrete foundations on both sides of the existing foundation. The concrete block walls at the existing main entrance will be anchored to the roof. The roof will be strengthened by the addition of steel straps on the roof framing above lines 9, 8, and A.5. The roof plywood will be cut back to create a seismic joint between Buildings A and B locally along line H.

The existing construction between lines 5, 8, A, and K will be replaced with new single story construction as shown on the architectural drawings. It is anticipated that the new construction will basically utilize standard wood framing with conventional concrete foundations. This new construction will be separated structurally from the remaining existing construction. The existing walls along lines 5 and 8 will be left in place and line 8 will be strengthened as described above.

Building A - West (Classroom Wings)

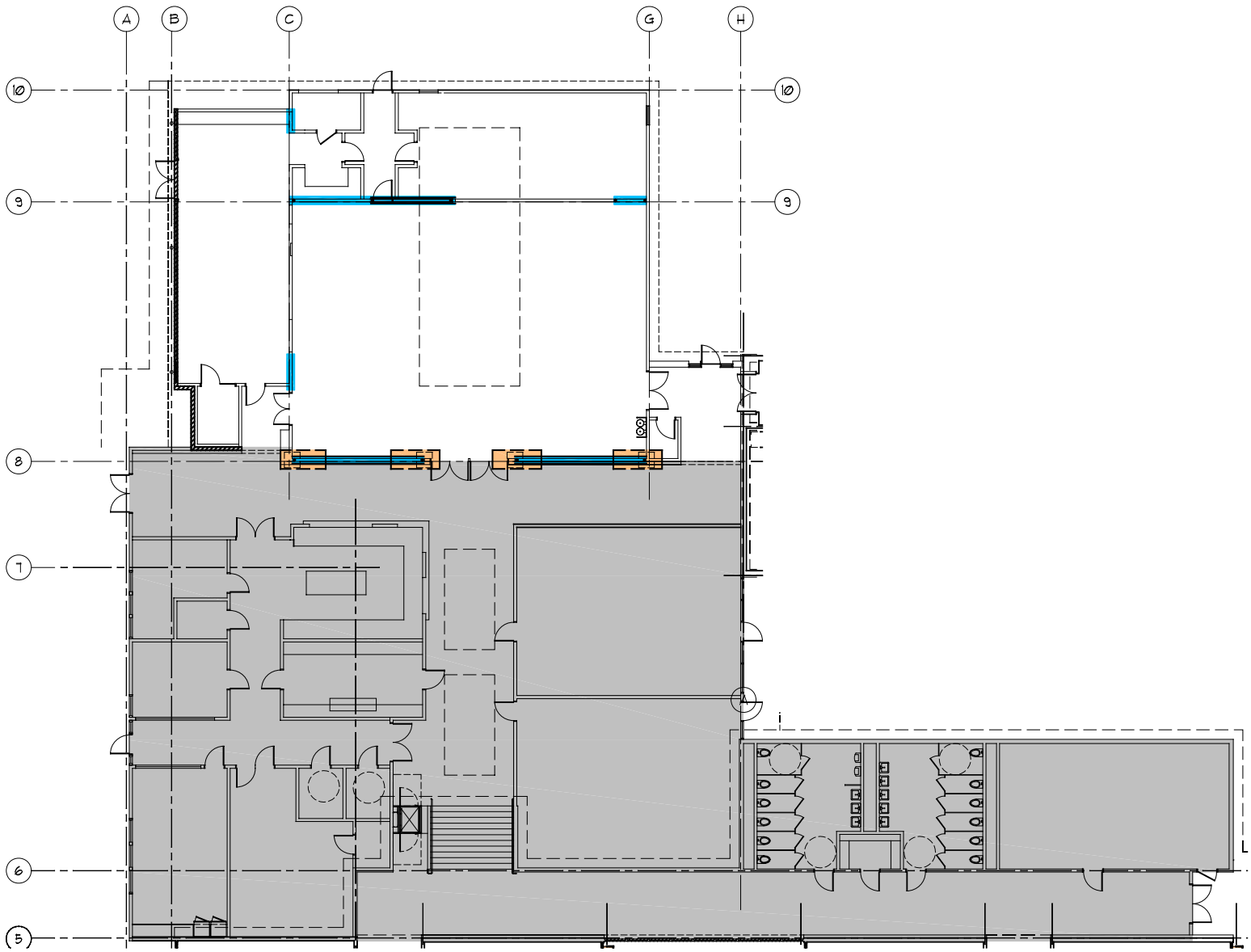
The two classroom wings had greatly overstressed corridor x-bracing and were closed as a precaution. The weak existing corridor rod bracing is to be replaced with new, stronger high-strength steel bracing. In addition, a new steel bracing system is to be added on the exterior window lines of each wing. No major alterations are to be made to the roof diaphragm. Only minor strengthening is anticipated for the wood shear walls along lines 2 and 5.

Building B

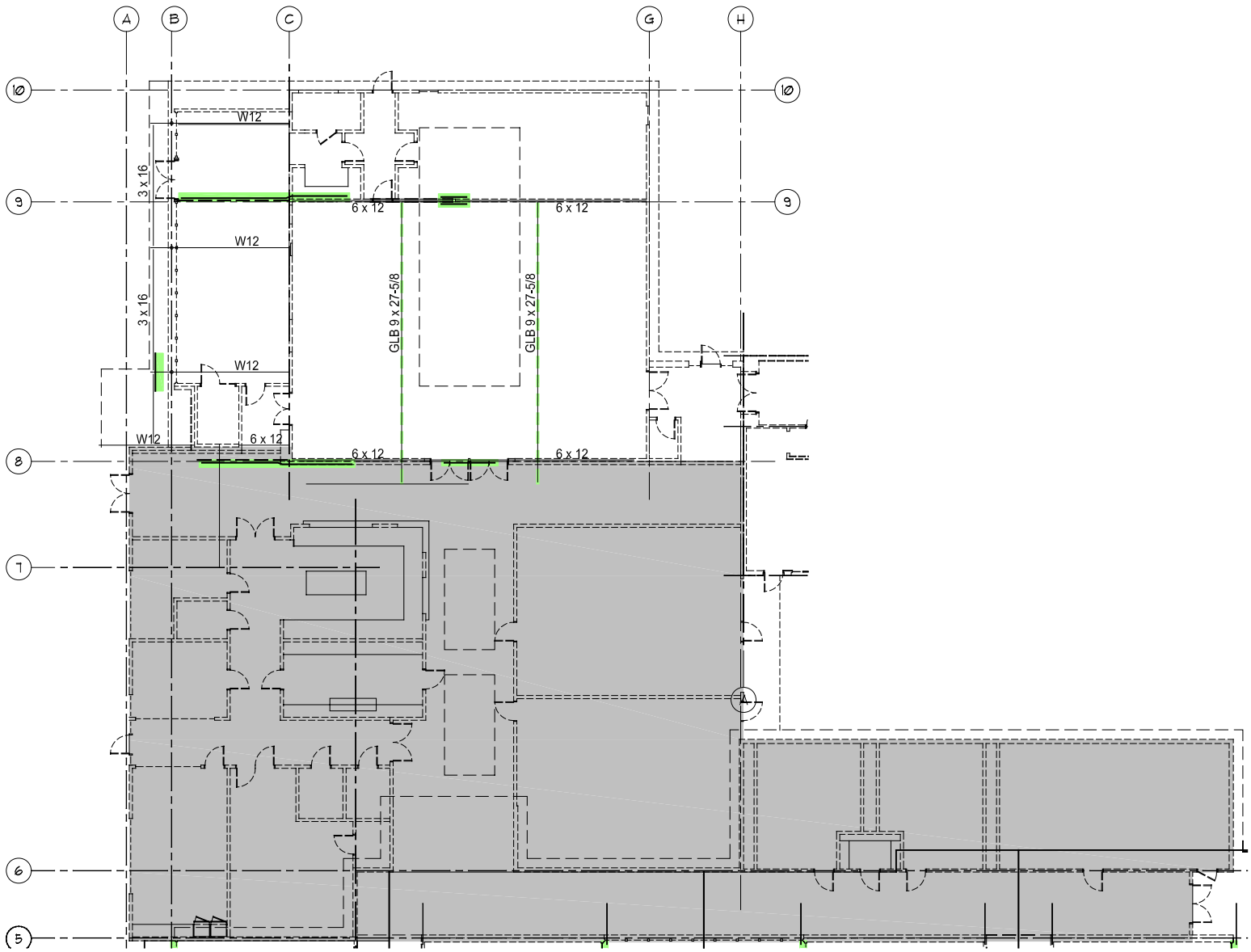
The principal weakness in this building is the shear wall on the west side. This is penetrated by many windows and doors. The weakness caused by the many windows on the west side of the building is to be fixed by installing five new braced steel frames on this side of the building. Deficient longitudinal shear walls on Lines 2 and 3 are to be strengthened by adding new plywood sheathing. The existing diagonal wood sheathed ceiling diaphragm is not required to be strengthened under this option.

Building C (Ellen Driscoll Auditorium)

The Driscoll Auditorium has a heavy Spanish tile roof. This caused a number of shear walls to be overstressed. The weaknesses in exterior walls on Lines A, B, and 5 and the interior walls on Lines 2 and 4 are to be fixed by removing the diagonal wood sheathing and installing plywood. Walls on Lines 2 and 4 get new sheathing on both sides. All footings under the strengthened walls (except the footing on Line 2) are to be strengthened by the addition of concrete footings with reinforcement. The wall on Line 4 gets new foundations on both sides. Also, because the roof diaphragm must span between Lines 2 and 4, the roof tile must be removed and then reinstalled after plywood sheathing has been added to the roof.



BUILDING A EAST - FLOOR PLAN



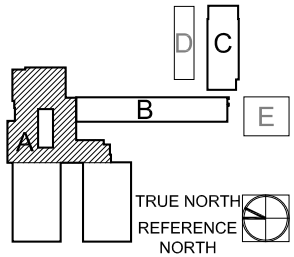
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

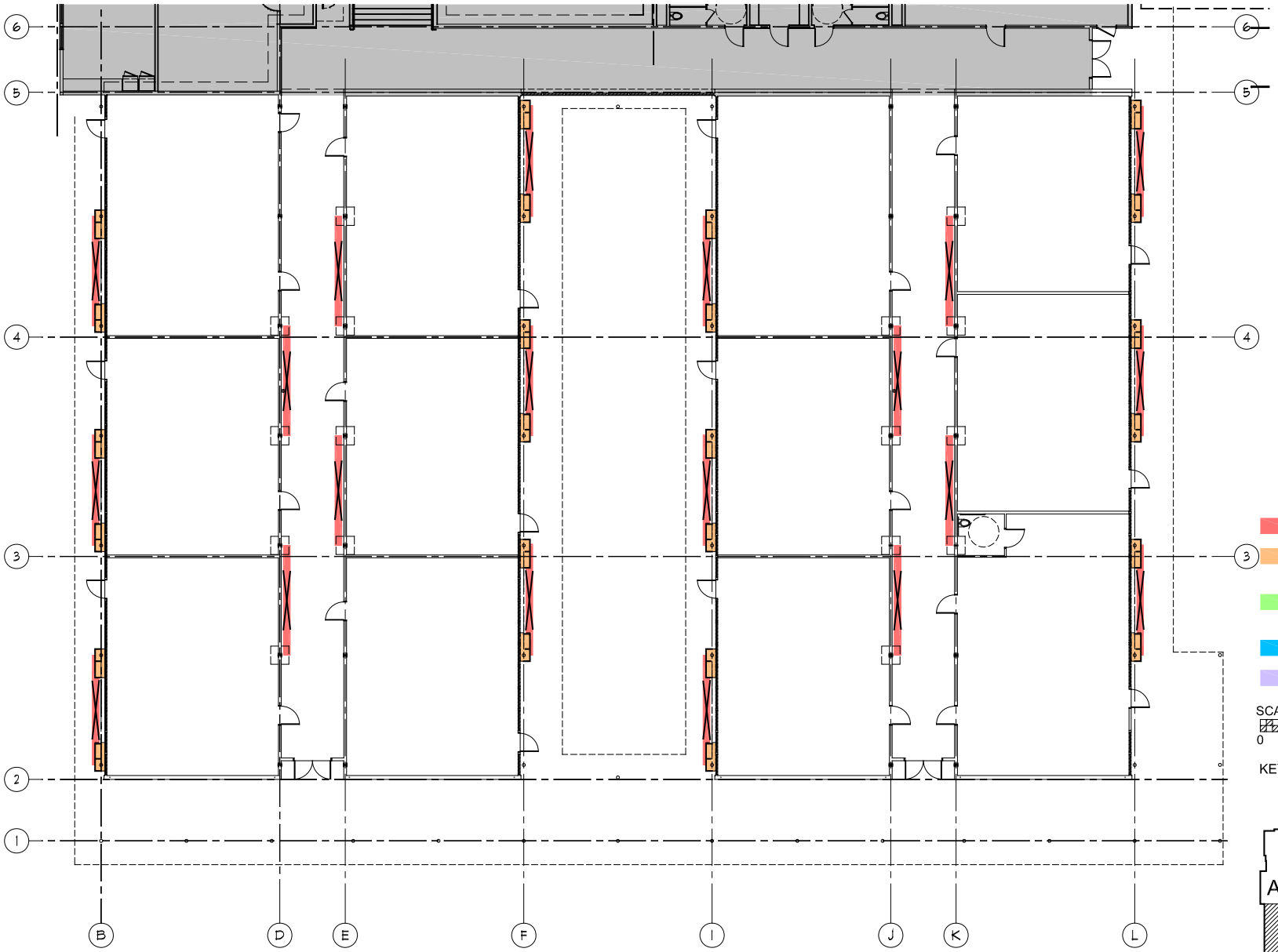
SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING A EAST - ROOF PLAN



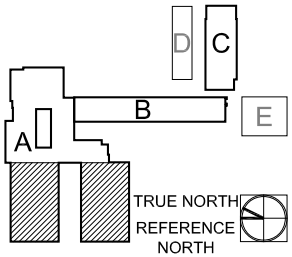
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

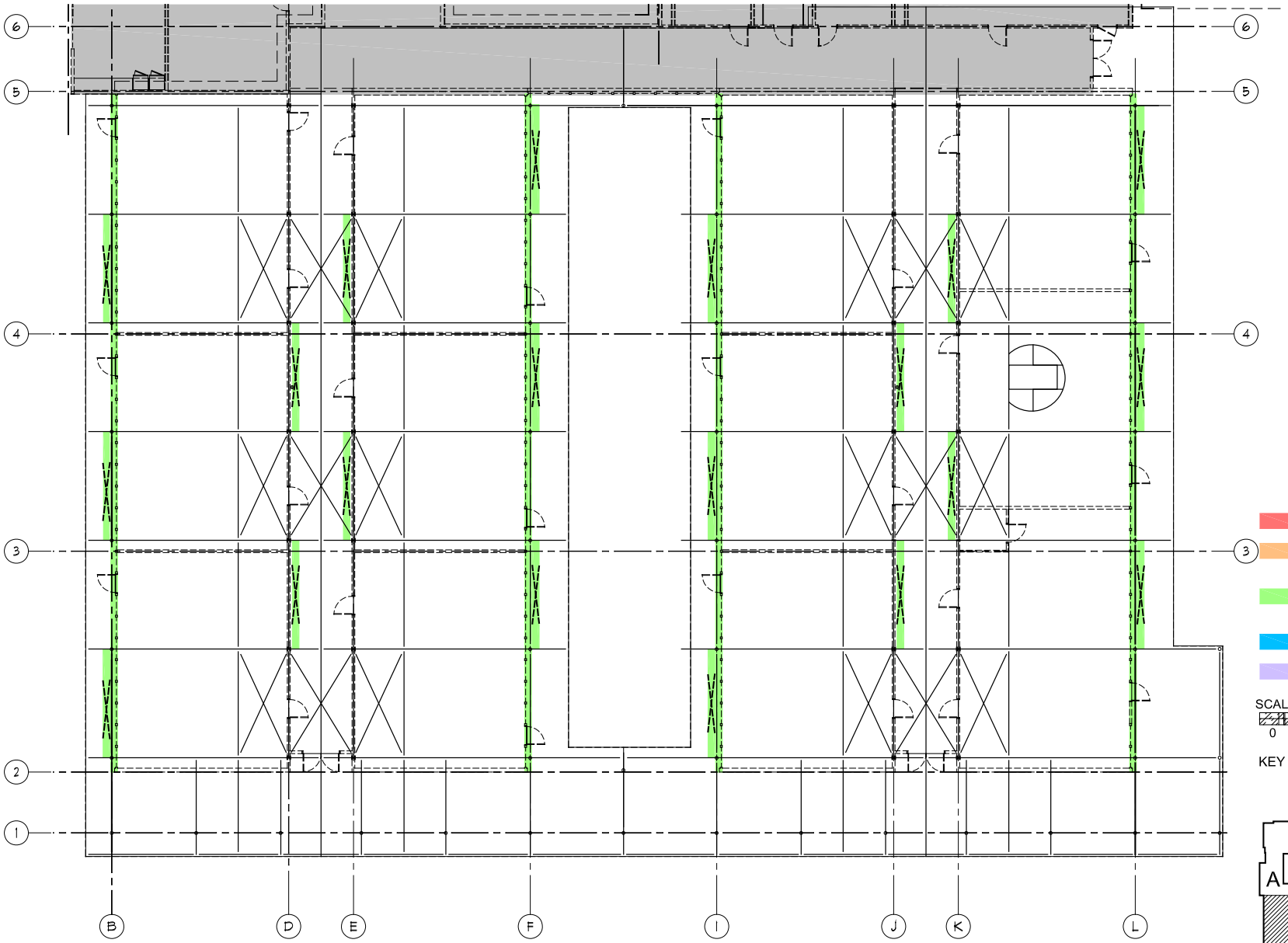
SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING A WEST - FLOOR PLAN



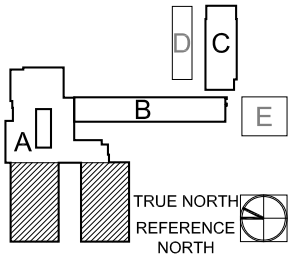
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

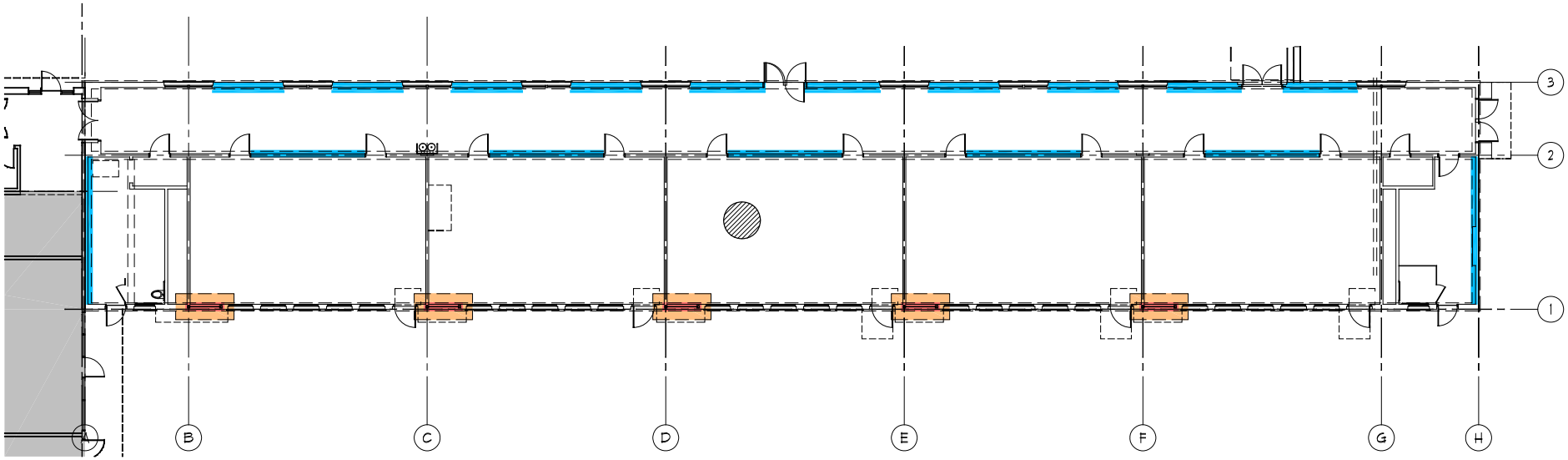
SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING A WEST - ROOF PLAN



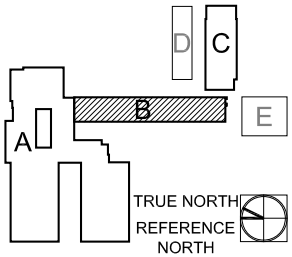
SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

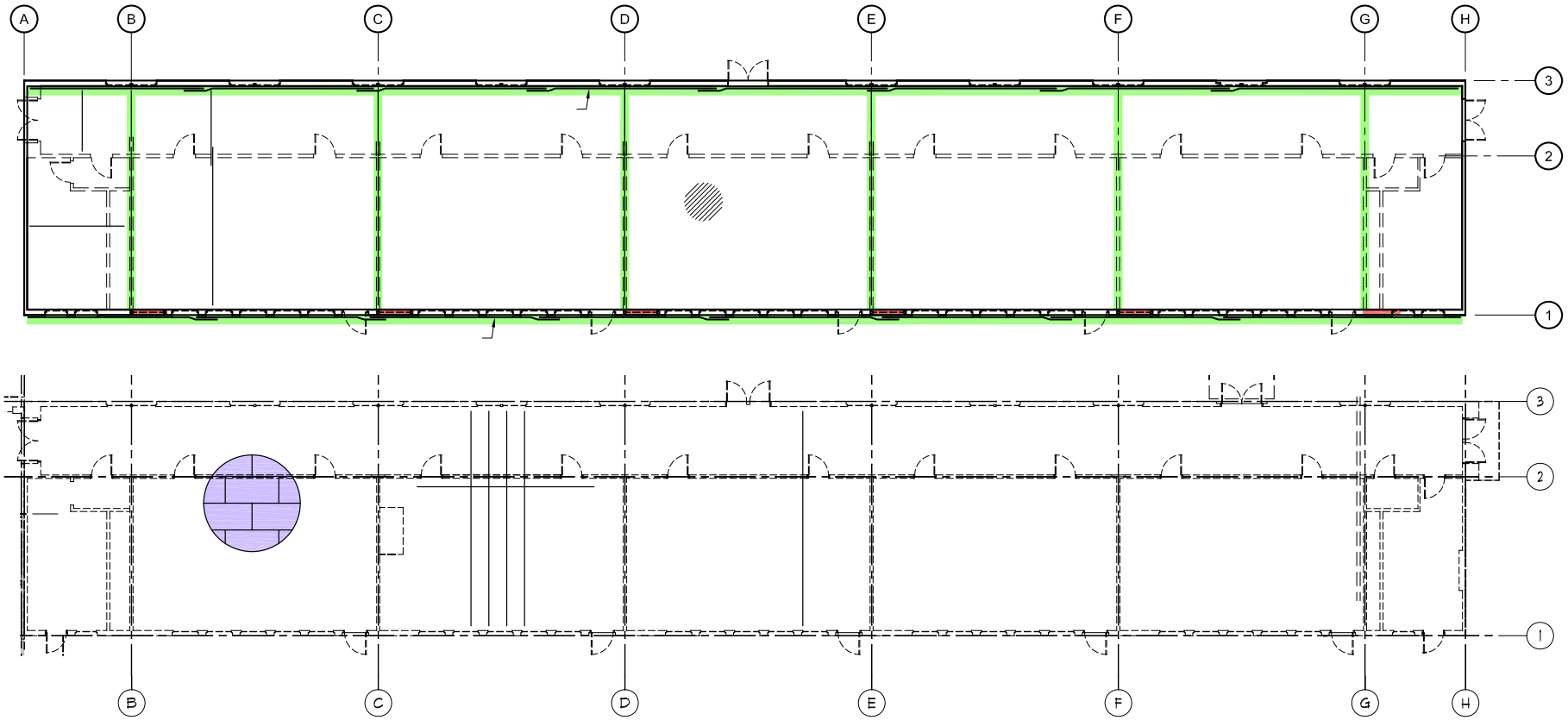
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

KEY PLAN:



BUILDING B - FLOOR PLAN



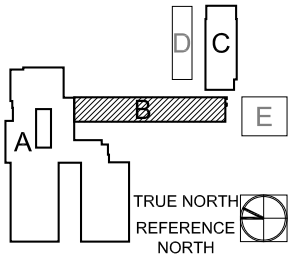
SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

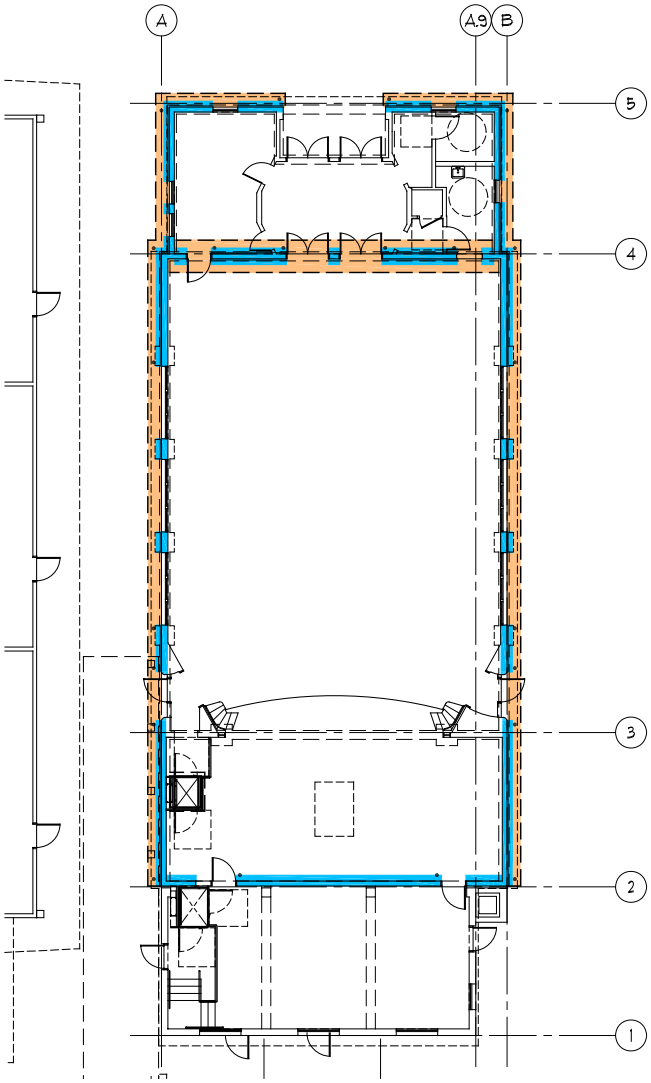
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

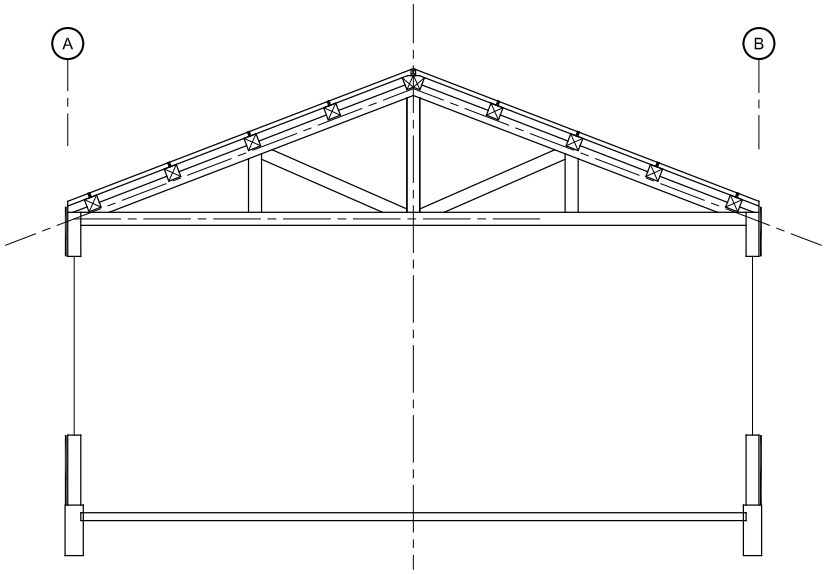
KEY PLAN:



BUILDING B - CEILING FRAMING & ROOF PLAN



BUILDING C - FLOOR PLAN



BUILDING C - SECTION

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

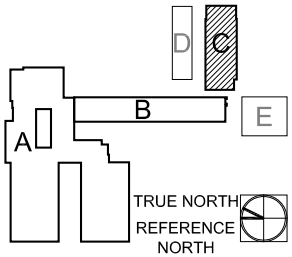
SCALE: 1/16" = 1'-0"

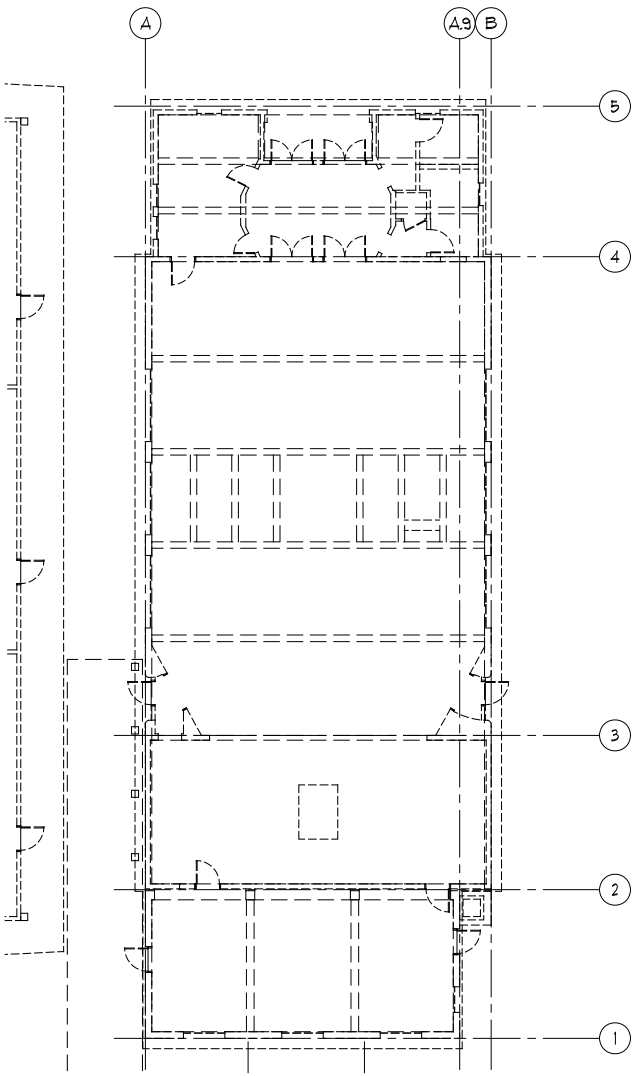
0 8'-0" 16'-0" 32'-0"

LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

KEY PLAN:





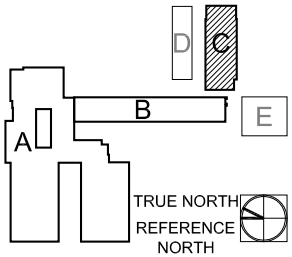
LEGEND:

- (N) STEEL BRACE FRAME
- (N) CONCRETE FOUNDATION / SLAB
- (N) STEEL / WOOD CONNECTION
- (N) SHEARWALL
- (N) ROOF DIAPHRAGM

SCALE: 1/16" = 1'-0"

0 8'-0" 16'-0" 32'-0"

KEY PLAN:



BUILDING C - ROOF PLAN

Overall Summary

M5-07-181
October 1, 2007

mack5

	GFA	$/SF	$,000
Building A West	18,478	153	2,834
Building C	6,330	295	1,868
Building A East	4,888	123	602
Building B	7,740	184	1,428
Building D	3,748	53	199
Building A Central	9,770	416	4,061
Sitework	140,061	6	868
Subtotal Construction and Sitework			**11,860**
Premium for phasing	5.00%		593
TOTAL CONSTRUCTION AND SITEWORK			**12,453**

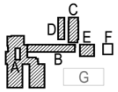
APPENDIX A:

PIEDMONT SEISMIC SAFETY PROGRAM

PIEDMONT UNIFIED SCHOOL DISTRICT

PROJECT STATUS & INFORMATION AVAILABILITY MATRIX

SEPTEMBER 4, 2007

School / Site	Abbreviation	Building Designation	Building Name	Seismic Tier 1	Letter From Forell & Elsesser on Seismic Performance	ATC Report (Accessibility - Seismic Performance)	Included in Scope Of Work (for mN)	Qualitative Seismic Assessment by R.P. Gallagher	Qualitative Seismic Assessment by R.P. Gallagher and Peer Reviewer	Benchmark Building	Seismic Tier 2	Seismic Non-Structural Hazard Report	ADA / Access Evaluation	UBC Safety Evaluation	Materials Testing	Destructive Testing	Slope Stability Analysis / Site Specific Spectra	Peer Review at Investigation and Analysis	Peer Review Non-Structural	Peer Review at Concept Design	Peer Review at Schematic Design	Peer Review at Design Development	Peer Review at 100% CDs	Existing Hazardous Materials Reports in mN possession	Hazardous Materials Report	Topographical Survey	Property Survey / Title Report	Existing Geotechnical Reports	Existing Structural Calculations in mN possession	Existing Specifications in mN possession	Measured Drawings - Architectural	Measured Drawings - Structural	DSA Drawing Date	DSA Drawing Date	DSA Number for Drawings	Drawings	Architect	Concept Plan	Cost Estimate (1)	Refined Concept Plan - Vision	Cost Estimate (2)	Comments
Havens Elementary School	HES																																									
		A	Admin. / Kindergarten Wings	●		●	●	×			●	●	●	●	●	●	●	●	●	○	○	○	●	●	●	●	×	×	×	×	×	●	5/29/1954	11628	original	Warnecke & Warnecke	●	●	●	●	
																																●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.					
																																●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect					
		B	Second Grade	●		●	●	×			●	●	●	●	●	●	●	●	●	○	○	○	●	●	●	●	×	×	×	×	×	●	2/27/1936	1444	original	John J. Donovan, Architect	●	●	●	●	
																																●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Eng.					
																																●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.					
																																●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect					
		C	Ellen Driscoll Playhouse	●		●	●	×			●	●	●	●	●	●	●	●	●	○	○	○	●	●	●	●	×	×	×	×	×	●	9/23/1940	3415	original	John J. Donovan, Architect	●	●	●	●	
																																●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Engineers					
		D	First Grade	●		●	●					●	●	●	×	×	●	×	●		○	○	○	○	●	●	●	×	×	×	×	×	●	2/17/1961	20815	original	Clarence W. Mayhew	●	●	●	●	
		E	Multi-Purpose Gym	×		●	●			●		●	●	●	×	×	●	×	●		○	○	○	○	●	●	●	●	×	×	×	×	●	5/20/1998	67713	original - phase I	Byrens Associates	●	●	●	●	
																																●	9/24/1998	67713	original - phase II	Byrens Associates					
		F	After-School Program (City Owned)	×		×	●																			●	●															
		G	Portables	×		×	●																			●	●															

LEGEND

- ○ NEEDED/IN PROGRESS
- ● YES / OK / COMPLETE
- ○ DO NOT HAVE
- ● NON CONCLUSIVE
- × NOT NECESSARY
- ○ Pending Authorization
- ● NO
- Shaded Area Indicates Tier 2 Seismic Analysis.

5. OCTOBER 24, 2007:

SCHOOL BOARD PRESENTATION (HYBRID OPTION)

Frank c. havens elementary school

CONCEPT DESIGN II
Refinement of hybrid

October 24, 2007

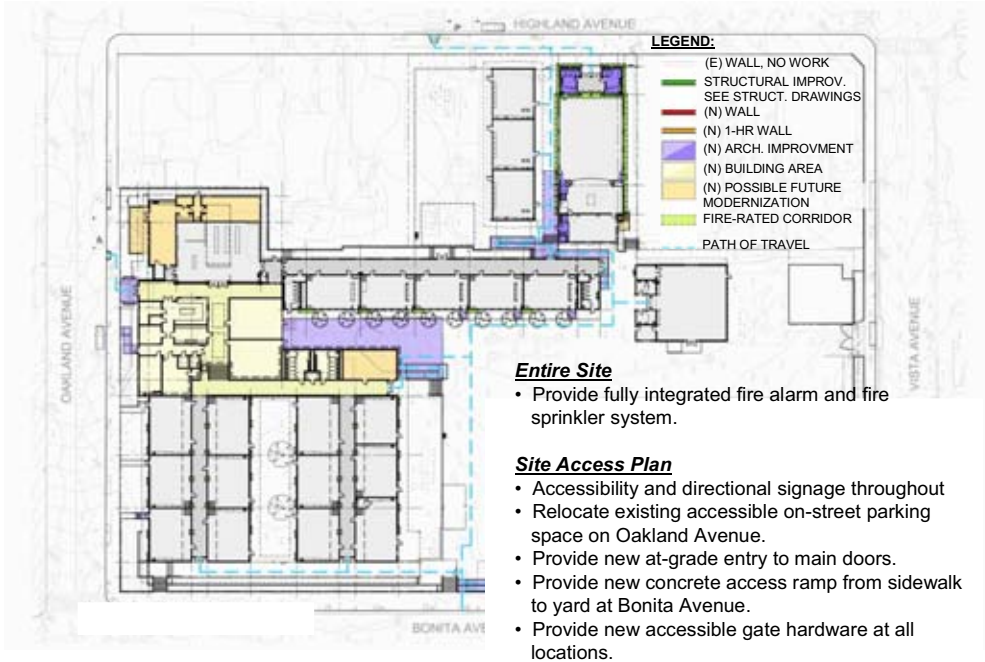
murakami/Nelson
ARCHITECTURAL CORPORATION

CPM

R. P. Gallagher Associates
Structural Engineers

PURPOSE OF PRESENTATION

- SUMMARY OF PREVIOUS HAVENS CONCEPT
- SUMMARY OF HYBRID REFINEMENT PROCESS
- INTRODUCTION OF HYBRID REFINEMENT WORK

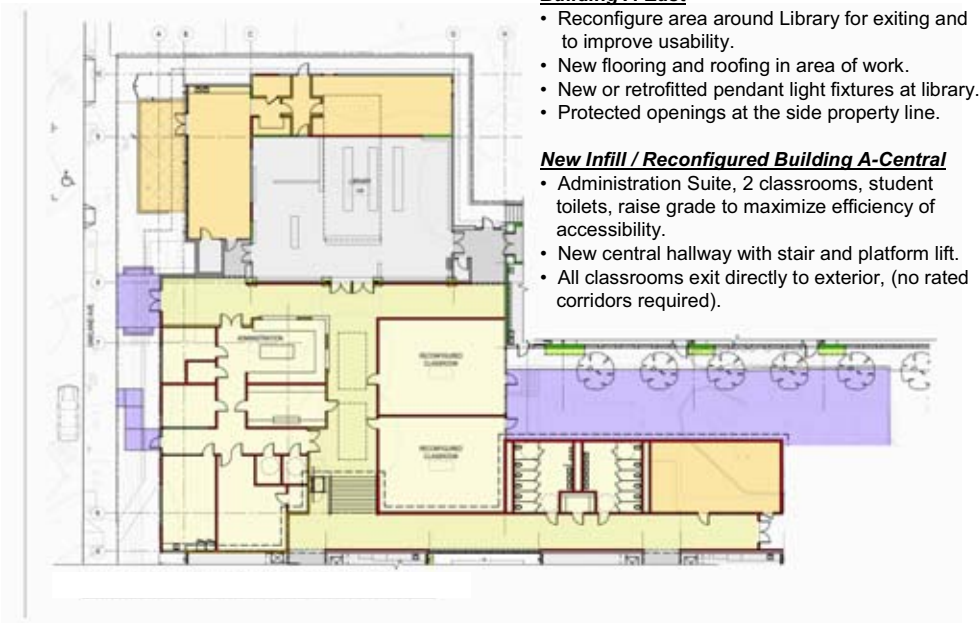


Entire Site

- Provide fully integrated fire alarm and fire sprinkler system.

Site Access Plan

- Accessibility and directional signage throughout
- Relocate existing accessible on-street parking space on Oakland Avenue.
- Provide new at-grade entry to main doors.
- Provide new concrete access ramp from sidewalk to yard at Bonita Avenue.
- Provide new accessible gate hardware at all locations.
- Provide new concrete access ramps to replace existing on-site non-compliant ramps.



Building A-East

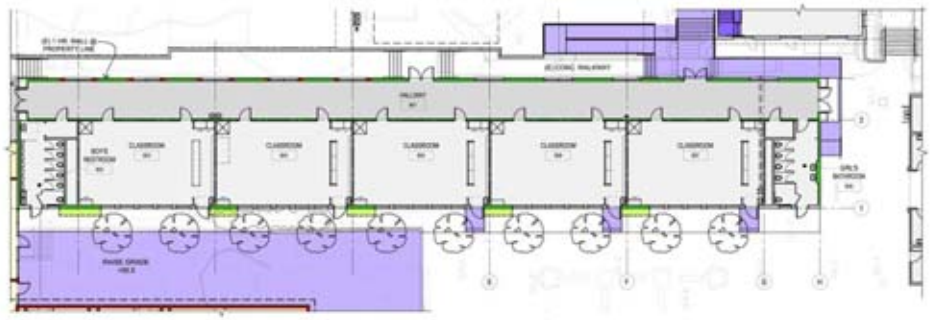
- Reconfigure area around Library for exiting and to improve usability.
- New flooring and roofing in area of work.
- New or retrofitted pendant light fixtures at library.
- Protected openings at the side property line.

New Infill / Reconfigured Building A-Central

- Administration Suite, 2 classrooms, student toilets, raise grade to maximize efficiency of accessibility.
- New central hallway with stair and platform lift.
- All classrooms exit directly to exterior, (no rated corridors required).

Building A-West

- New glazing, flooring and roofing in area of work.
- Modify doors, casework, etc. for accessibility.
- New pendant light fixtures.
- Skylight retrofit of replacement.

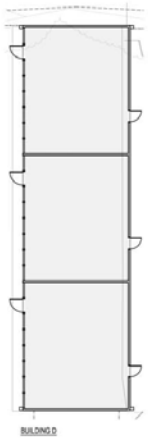


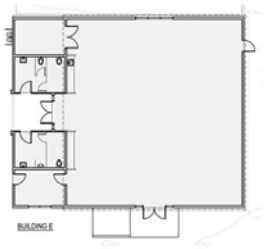
Building B

- New glazing at south wall.
- New flooring and roofing in area of work.
- Modify doors, casework, etc. for accessibility.
- Protected openings at the property line.
- Bathrooms accessible from exterior.

Building C

- Construction currently guided by the Secretary of the Interior's Standards.
- New fire sprinklers integrated into the historic fabric of the ceiling.
- Modify entries to provide accessibility throughout.
- Restrooms are modified as two separate toilet rooms.
- Stage access via platform lift behind the proscenium wall.
- New exterior canopy over walkway.





BUILDING D

- Modify doors, casework, etc. for accessibility.
- New glazing throughout.
- New pendant light fixtures.

BUILDING E

KEY STRUCTURAL STRENGTHENING ELEMENTS

- **BRACE FRAMES AT BUILDING A WEST.**
- **NEW CONSTRUCTION AT BUILDING A CENTRAL.**
- **MINOR STRENGTHENING AT BUILDING A EAST.**
- **ROOF DIAPHRAGM, EXTERIOR WALL BRACES AND CORRIDOR WALL STRENGTHENING AT BUILDING B.**
- **FOUNDATION, EXTERIOR WALL, AND ROOF DIAPHRAGM AT BUILDING C (ELLEN DRISCOLL THEATRE).**

COST ESTIMATE SUMMARY

	GFA	$/SF	In $,000
Building A West	18,478	153	2,834
Building C (Ellen Driscoll Theater)	6,330	295	1,868
Building A East	4,888	123	602
Building B	7,740	184	1,428
Building D	3,748	53	199
Building A Central	9,770	416	4,061
Sitework	140,061	6	868
Subtotal Construction and Sitework			**11,860**
Premium for phasing	5.00%		593
TOTAL CONSTRUCTION AND SITEWORK (current dollars)			**12,453**

PROJECT COST SUMMARY

CONSTRUCTION COST ESTIMATE
(24 Month Construction Period with 2 phases)

	In $,000 *
CONSTRUCTION COST ESTIMATE:	$ 12,500
SOFT COSTS:	$ 3,300
CONTINGENCIES:	
Construction	$ 1,200
Project	$ 500
SUBTOTAL:	$ 17,500
ESCALATION: (start construction march 2009)	$ 3,200
INTERIM HOUSING: (including previously committed expenses)	$ 2,200
TOTAL PROJECT CONCEPTUAL COST ESTIMATE	**$ 22,900**

**rounded to nearest $ 100,000*

Frank c. havens elementary school

PRISCILLA MECKLEY-ARCHULETA

MIKE WASSERMANN

JOHN NELSON

** For more information, visit http://www.pusdbond.org*

murakami Nelson
ARCHITECTURAL CORPORATION

CPM

R. P. Gallagher Associates
Structural Engineers

6. DECEMBER 8, 2007:

RETROFIT, HYBRID & REPLACEMENT OPTIONS COMMUNITY WORKSHOP PRESENTATION

Havens Elementary School

Havens Elementary School
COMMON IMPROVEMENTS

STRUCTURAL

- Building A west
  - Strengthen interior rod bracing
  - Add perimeter steel braced frames
  - Strengthen roof diaphragms
  - Strengthen footings
- Building A east
  - Strengthen shear walls
  - Isolated roof strengthening
- Building A central
  - See options slides
- Building B
  - New brace frames at west wall
  - Shear wall at hallways
  - Roof strengthening
- Building C (Ellen Driscoll Theater)
  - Strengthen exterior walls
  - Upgrade roof and foundations

NON STRUCTURAL HAZARDS

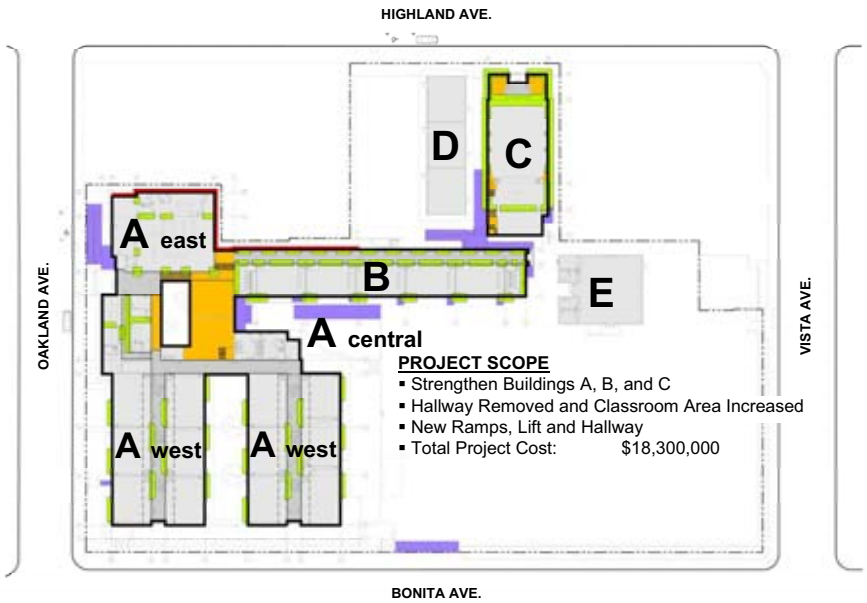
- New pendant light fixtures
- New safety glazing
- Secure fixtures and furnishings

ACCESSIBILITY

- Site
  - Ramps, stairs, handrails, gates
- Buildings A, B, C, & D
  - Upgrade toilet rooms, doors, stairs, railings, gates, sinks, casework, lift, signage, etc.

FIRE & LIFE SAFETY

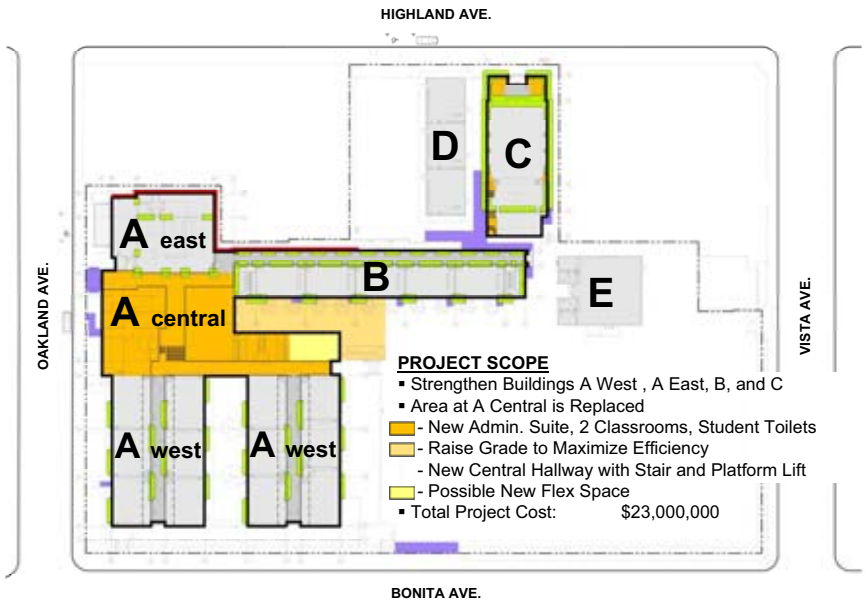
- Fire sprinklers
- Provide integrated Fire Alarm System



PROJECT SCOPE

- Strengthen Buildings A, B, and C
- Hallway Removed and Classroom Area Increased
- New Ramps, Lift and Hallway
- Total Project Cost: $18,300,000

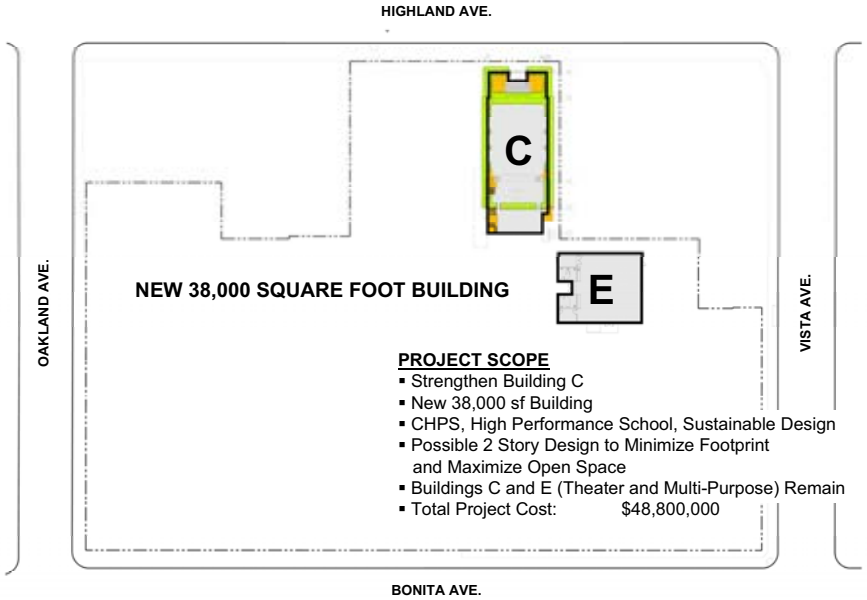
RETROFIT SCHEME



PROJECT SCOPE

- Strengthen Buildings A West , A East, B, and C
- Area at A Central is Replaced
  - New Admin. Suite, 2 Classrooms, Student Toilets
  - Raise Grade to Maximize Efficiency
  - New Central Hallway with Stair and Platform Lift
  - Possible New Flex Space
- Total Project Cost: $23,000,000

HYBRID SCHEME



PROJECT SCOPE

- Strengthen Building C
- New 38,000 sf Building
- CHPS, High Performance School, Sustainable Design
- Possible 2 Story Design to Minimize Footprint and Maximize Open Space
- Buildings C and E (Theater and Multi-Purpose) Remain
- Total Project Cost: $48,800,000

REPLACEMENT SCHEME

SECTION II : COST ESTIMATES

1. JUNE 19, 2007:

COST ESTIMATE
W / REPLACEMENT COST

mack5

Final Concept Design Cost Estimate

for

Havens Elementary School Modernization

June 19, 2007

1900 Powell Street, Suite 470
Emeryville, CA 94608
ph: 510.595.3020
www.mack5.com

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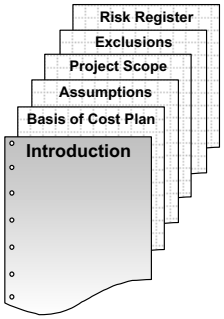
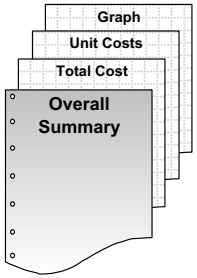
Page

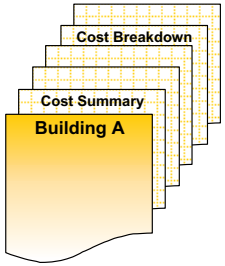


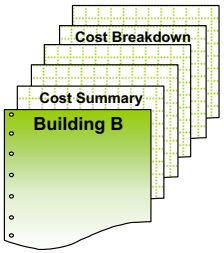
Mack5 was requested to carry out a Conceptual Cost Estimate for the proposed modernization of Haven Elementary School for the Piedmont Unified School District.

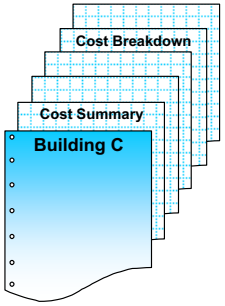
The first part of the Report contains the basis of the report, the assumptions made, description of the project scope, the exclusions to the costs and a risk register which contain items that have potential to impact cost at some point in the future.



Each detail section includes options for seismic upgrades (brace frame v. roof diaphragm), fire/life safety upgrades (rated walls v. sprinklers), and ADA upgrades (low and high). Additional detail is included for a "hybrid" option which involves the reconstruction of the Central portion of Building A. A range of costs is included in summary form for complete building replacement.







PROJECT INTRODUCTION:	The project consists of making improvements to Buildings A, B, and C and sitework improvements to the existing Haven Elementary School.
ITEMS USED FOR COST ESTIMATE:	Concept drawings dated April 13, 2007.
civil drawings	None
architectural drawings	By Murakami Nelson, Sheets 1.10, 1.11, 1.20, 1.30, 1.31, 1.32, 1.40, 1.41, 1.50, 1.60, and 1.61.
structural narrative and sketches	By R.P. Gallagher Associates, Inc., Sheets SA-1, SA-2, S-A5 - S-A8, S-B1 - S-B4, and S-C1 - S-C3.
mechanical narrative and plans	None
electrical narrative and plans	None
telecommunication drawings	None
specifications	None
project team meetings	Meeting and comments dated May 4, 2007; discussions with project Architect and Engineers.

ASSUMPTIONS

(a) The start date has not yet been determined for this project.

(b) The construction period varies by proposed scheme. The minimum duration will be 12 months.

(c) The general contract may be bid or negotiated with qualified contractors.

(d) The general contractor will have full access to the site during business hours.

(e) There are no phasing requirements.

(f) The existing electrical power, fire/life saftey systems are adequate for the increased loads.

(g) Owner provide materials in a timely fashion.

PROJECT SCOPE

The project consists of modernizing the existing Buildings A, B, and C of Haven Elementary School. The modernization is detailed with options for seismic upgrades, fire life safety upgrades, and ADA upgrades. Costs are also included for reference for replacement value of the buildings.

modernization

The following contains a general description of the scope of work included in each element of the estimate.

substructure

New foundations tied to existing for structural upgrades.

structure

Structural upgrades include selective demolition and upgrade of existing wall and roof framing and sheathing.

exterior enclosure

Exterior enclosure work is limited to replacement of finishes as required for structural upgrades.

roof

Roofing work is limited to the replacement of finishes as required for structural upgrades.

interiors

Interiors include new framing and sheathing as required to achieve fire life safety and structural upgrades. Allowances are included for ADA upgrades of doors, frames, and hardware.

finishes

Allowances are included for patching and repairing of finishes as required by structural, fire life safety and ADA upgrades.

equipment

Equipment includes new and modified casework as required for ADA upgrades.

stairs and vertical transportation

Concrete ramps, steps, and wheelchair lifts as required for ADA upgrades.

plumbing

Demolition and re-piping of waste and water service piping. Includes sanitary fixtures with associated waste, vent and service piping, domestic cold and hot water piping system.

hvac

HVAC work only takes place in the "Hybrid" option which calls for the complete replacement of the central portion of Building A.

fire protection

One Fire/Life Safety option calls for a new wet sprinkler system in existing buildings. Please note that if this option is chosen, then sprinklers must be added to all of Buildings A and B.

site preparation

Selective demolition as required for modernization work.

electrical

Electrical costs are included as an allowance for work that may be completed or affected as part of the modernization.

sitework

Sitework includes path of travel and parking improvements as required for ADA upgrades.

site utilities

No site utilities are anticipated for the project.

EXCLUSIONS

(a) Owner supplied and installed furniture, fixtures and equipment

(b) Cost escalation

(c) Security equipment and devices

(d) Design, testing, inspection or construction management fees

(e) Utility and connection fees

(f) Scope change and post contract contingencies

(g) Assessments, taxes, finance, legal and development charges

(h) Builder's risk, project wrap-up and other owner provided insurance program

(i) Electrical transformer, primary and secondary cabling

(j) Telephone / data active equipment and switch, sound systems, audio visual equipment and cabling

(k) Modification to existing HVAC

(l) Schedule compression

(m) CHPs, LEED Certification and sustainable costs

(n) Deferred maintenance

(o) Programmatic changes

(p) Complete replacement of building finishes (costs for selective replacement of finishes as required for modernization work is included in the estimate)

risk register

In the course of preparing the Cost Estimate, the following items were noted as areas of possible exposure.

(a) The existing electrical and fire-life safety systems may not have adequate capacity for the proposed work

(b) The project is relatively small and the scope limited within a larger area. Consequently contractors bids can vary widely.

(c) Current market conditions are driven by limited supply of select materials and labor capacity. Consequently, cost escalation and bids are unstable and additional funding could be required.

(d) The design process is early in the conceptual stage. As ideas are more fully developed there may be scope which was not anticipated in this cost estimate.

	Enclosed	Covered	Covered (included at 50%)	Sub-Total	GFA
Renovated Buildings					
Building A - East	4,470	0	0	4,470	
Building A - Central	8,760	0	0	8,760	
Building A - West	14,370	0	0	14,370	
Building B	7,560	0	0	7,560	
Building C	5,208	0	0	5,208	
	40,368	0	0	40,368	**40,368 SF**
Buildings Not Being Renovated					
Building D	2,987	0	0	2,987	
Building E	3,062	0	0	3,062	
Portables	15,360	0	0	15,360	
	21,409	0	0	21,409	**21,409 SF**
All Buildings					**61,777 SF**
Sitework					**177,475 SF**

Scheme Comparison

M5-07-181
June 19, 2007

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Proposed Project	TOTAL LOW	TOTAL HIGH
	Dollars in Thousands	
Upgrade of Seismic, Fire/Life Safety and Accessibility	5,412	7,895
Upgrade of Seismic, Fire/Life Safety and Accessibility with Replacement of Building A - Central "Hybrid Option"	7,160	10,516
Replacement of Buildings A, B & D with New Construction and Upgrade of Buildings C & E	16,584	25,179

*Costs above do not include cost escalation

Design Solutions Comparison

M5-07-181
June 19, 2007

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	Seismic Upgrades		Fire/Life Safety Upgrades		Accessibility Options		Repair of Non-Structural Seismic Hazards - Allow		Building Replacement	
	Brace Frame	Roof Diaphragm	Sprinklers	Wall Rating	Low	High	Low	High	Low	High
	Dollars in Thousands									
Building A - East	263	263	98	74	289	325	90	135		
Building A - Central	319	393	168	210	398	628	250	375		
Building A - West	554	892	276	318	131	223	175	265		
Building B	457	772	237	30	250	383	5	15		
Building C	742	1,432	126	126	412	613	20	70	1,300	2,241
Sitework	N/A	N/A	N/A	N/A	127	303	N/A	N/A		
Buildings D/E	5	10	5	10	5	10	10	20	25	50
Replace Buildings A, B and D with New Construction									15,259	22,888
Total Current Construction Costs*	2,340	3,762	910	767	1,612	2,485	550	880	16,584	25,179
Replace Building A Central "Hybrid" Option									1,747	2,621

*Costs above do not include cost escalation

SEISMIC - BRACE FRAME	Quantity	Unit	Rate	Total ($)
This scheme was not presented by the Structural Engineer, so please refer to the costs for the Roof Diaphragm scheme.				
Sub-Total for Seismic - Brace Frame:				

SEISMIC - ROOF DIAPHRAGM	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove floor and ceiling finishes	744	SF	10.00	7,440
Remove portion of interior partition finish	1,904	SF	2.00	3,808
Remove roof finish as required for new structural work	4,470	SF	3.00	13,410
New structural work				
New plywood wall sheathing	1,904	SF	5.00	9,520
New wood posts	56	LF	10.00	560
New PSL header	44	SF	35.00	1,540
New wall framing, 2x6	658	SF	8.00	5,264
Wood rafters	118	LF	10.00	1,180
Plywood roof sheathing	4,470	SF	4.00	17,880
Miscellaneous structural - allow	4,470	SF	1.50	6,705
New architectural work required to complete structural upgrades				
New roof finish	4,470	SF	15.00	67,050
Patch and replace interior partition finish at new braced frames	1,904	SF	5.00	9,520
Patch and replace floor and ceiling finish at new wall sheathing	744	SF	15.00	11,160
Electrical work - allow	4,470	SF	3.00	13,410
Mark-Ups				
Allow	1	LS	94,926.62	94,927
Sub-Total for Seismic - Roof Diaphragm:				**263,374**

FIRE/LIFE SAFETY - FIRE SPRINKLERS	Quantity	Unit	Rate	Total ($)
Fire sprinklers, mostly exposed				
Modify ceiling finish	4,470	SF	1.50	6,705
Wet sprinkler system	4,470	SF	4.27	19,087
Riser for sprinkler system	1	EA	6,745.20	6,745
New rated openings	1	EA	1,031.80	1,032
Electrical work - allow	4,470	SF	2.50	11,175
Underground infrastructure - allow	4,470	SF	4.00	17,880
Mark-Ups				
Allow	1	LS	35,291.07	35,291
Sub-Total for Fire/Life Safety - Fire Sprinklers:				**97,915**

FIRE LIFE SAFETY - RATED WALLS		Unit	Rate	Total ($)
Fire life safety work				
Modify existing exterior wall as required for upgrade to protected openings	1,800	SF	10.00	18,000
Remove existing window and provide new rated window and frame in existing opening	54	SF	100.00	5,400
New rated exterior door, frame, and hardware	2	EA	3,000.00	6,000
Electrical - allow	4,470	SF	4.00	17,880
Mark-Ups				
Allow	1	LS	26,644.17	26,644
Sub-Total for Fire Life Safety - Rated Walls:				**73,924**

ACCESSIBILITY OPTIONS - LOW		Unit	Rate	Total ($)
Concrete ramps				
Remove existing improvements as required	540	SF	5.00	2,700
Ramp paving	540	SF	30.00	16,200
Guardrails, stainless steel	140	LF	450.00	63,000
Handrails, stainless steel	50	LF	275.00	13,750
Concrete steps				
Modify handrails as required	1	LS	3,500.00	3,500
Accessible parking				
Remove existing improvements as required	499	SF	5.00	2,495
New driveway access and curb cut	85	SF	45.00	3,825
Concrete retaining wall including footing	205	SF	75.00	15,375
New paving as required for accessible parking space	414	SF	10.00	4,140
Striping	308	LF	1.00	308
Painted accessible symbol	1	EA	75.00	75
Concrete wheel stop	1	EA	100.00	100
Parking sign, wall mounted	1	EA	150.00	150
Doors, frames, and hardware				
New hardware to existing door	10	LVS	750.00	7,500
Premium for panic hardware	4	LVS	950.00	3,800
Remove and replace operable partition	180	SF	75.00	13,500
Drinking fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596

Casework and sinks				
Modify existing base cabinet for accessibility	15	LF	150.00	2,250
Modify existing circulation/ reception counter for accessibility	28	LF	250.00	7,000
Modify existing library stacks for accessibility	78	LF	75.00	5,850
Kitchen sink, remove and replace	1	EA	734.30	734
Restrooms				
Modify staff restrooms as required	56	SF	25.00	1,400
New lavatory with new rough-in	1	EA	2,282.70	2,283
New water closet with new rough-in	1	EA	4,564.00	4,564
Plumbing trade demolition and cleaning	1	LS	500.00	500
Electrical - allow	4,470	SF	0.50	2,235
Mark-Ups				
Allow	1	LS	104,102.63	104,103
Sub-Total for Accessibility Options - Low:				**288,832**

ACCESSIBILITY OPTIONS - HIGH		Unit	Rate	Total ($)
Concrete ramps				
Remove existing improvements as required	540	SF	5.00	2,700
Ramp paving	540	SF	30.00	16,200
Guardrails, stainless steel	140	LF	450.00	63,000
Handrails, stainless steel	50	LF	275.00	13,750
Concrete steps				
Remove and replace existing handrails, stainless steel	18	LF	325.00	5,850

Accessible parking				
Remove existing improvements as required	499	SF	5.00	2,495
New driveway access and curb cut	85	SF	45.00	3,825
Concrete retaining wall including footing	205	SF	75.00	15,375
New paving as required for accessible parking space	414	SF	10.00	4,140
Striping	308	LF	1.00	308
Painted accessible symbol	1	EA	75.00	75
Concrete wheel stop	1	EA	100.00	100
Parking sign, wall mounted	1	EA	150.00	150
Doors, frames, and hardware				
Remove and replace existing door, frame, and hardware	10	LVS	2,000.00	20,000
Premium for panic hardware	4	LVS	950.00	3,800
Remove and replace operable partition	180	SF	75.00	13,500
Drinking fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596
Casework				
Remove and replace existing base cabinet for accessibility	15	LF	300.00	4,500
Modify existing circulation/ reception counter for accessibility	28	LF	300.00	8,400
Modify existing library stacks for accessibility	78	LF	85.00	6,630
Kitchen sink, remove and replace	1	EA	734.30	734

Restrooms				
Modify staff restrooms as required	56	SF	70.00	3,920
New lavatory with new rough-in	1	EA	2,282.70	2,283
New water closet with new rough-in	1	EA	4,564.00	4,564
Plumbing trade demolition and cleaning	1	LS	500.00	500
Electrical - allow	4,470	SF	0.75	3,353
Mark-Ups				
Allow	1	LS	117,017.56	117,018
Sub-Total for Accessibility Options - High:				**324,665**

SEISMIC - BRACE FRAME	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove floor and ceiling finishes	1,248	SF	10.00	12,480
Modify slab on grade as required for new footings	1,248	SF	25.00	31,200
Remove portion of interior partition finish	2,912	SF	2.00	5,824
Remove roof finish as required for new structural work	1,248	SF	3.00	3,744
New structural work				
New concrete foundations, epoxy doweled to existing	23	CY	1,250.00	28,750
New plywood wall sheathing	1,456	SF	5.00	7,280
New wood posts	56	LF	10.00	560
Patch roof framing as required	1	LS	10,000.00	10,000
New steel braced frames	6,500	LB	4.00	26,000
Miscellaneous structural - allow	6,110	SF	1.50	9,165
New architectural work required to complete structural upgrades				
Patch and replace roof finish as required	1,248	SF	3.00	3,744
Patch and replace interior partition finish at new braced frames	2,912	SF	10.00	29,120
Patch and replace floor and ceiling finish at new braced frames	1,248	SF	15.00	18,720
Electrical work - allow	8,760	SF	2.00	17,520
Mark-Ups				
Allow	1	LS	115,022.46	115,022
Sub-Total for Seismic - Brace Frame:				**319,129**

SEISMIC - ROOF DIAPHRAGM	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove floor and ceiling finishes	1,248	SF	10.00	12,480
Remove portion of interior partition finish	2,912	SF	2.00	5,824
Remove roof finish as required for new structural work	6,110	SF	3.00	18,330
New structural work				
New plywood wall sheathing	2,912	SF	5.00	14,560
New wood posts	56	LF	10.00	560
New PSL header	44	SF	35.00	1,540
New wall framing, 2x6	1,456	SF	8.00	11,648
Wood rafters	140	LF	10.00	1,400
Plywood roof sheathing	6,110	SF	4.00	24,440
Miscellaneous structural - allow	6,110	SF	1.50	9,165
New architectural work required to complete structural upgrades				
New roof finish	6,110	SF	15.00	91,650
Patch and replace interior partition finish at new braced frames	2,912	SF	5.00	14,560
Patch and replace floor and ceiling finish at new wall sheathing	1,248	SF	15.00	18,720
Electrical work - allow	8,760	SF	3.00	26,280
Mark-Ups				
Allow	1	LS	141,537.02	141,537
Sub-Total for Seismic - Roof Diaphragm:				**392,694**

FIRE/LIFE SAFETY - FIRE SPRINKLERS	Quantity	Unit	Rate	Total ($)
Fire sprinklers, mostly exposed				
Modify ceiling finish	8,760	SF	1.50	13,140
Wet sprinkler system	8,760	SF	4.27	37,405
Electrical work - allow	8,760	SF	2.50	21,900

Underground infrastructure	8,760	SF	4.00	35,040
Mark-Ups				
Allow	1	LS	60,572.21	60,572
Sub-Total for Fire/Life Safety - Fire Sprinklers:				**168,057**

FIRE LIFE SAFETY - 2 HR RATED WALLS		Unit	Rate	Total ($)
Fire life safety work				
Modify existing interior partition for 2 hour rating	1,568	SF	25.00	39,200
New interior partition framing and sheathing, 2 hour rating	1,281	SF	35.00	44,835
New interior steel door, frame, and hardware with hold opens, double	4	PR	3,500.00	14,000
Premium for 20 minute rating at door	8	LVS	150.00	1,200
Electrical - allow	8,760	SF	4.00	35,040
Mark-Ups				
Allow	1	LS	75,669.33	75,669
Sub-Total for Fire Life Safety - 2 Hr Rated Walls:				**209,944**

ACCESSIBILITY OPTIONS - LOW		Unit	Rate	Total ($)
Concrete ramps				
Remove existing improvements as required	1,600	SF	5.00	8,000
Ramp paving	1,600	SF	30.00	48,000
Guardrails, stainless steel	28	LF	450.00	12,600
Handrails, stainless steel	240	LF	275.00	66,000
Concrete steps				
Remove existing improvements as required	130	SF	5.00	650
Form concrete steps, per LF of nosing	108	LF	45.00	4,860
Handrails, stainless steel	39	LF	275.00	10,725

Doors, frames, and hardware				
New door, frame, and hardware in resized opening	5	LVS	2,500.00	12,500
New hardware to existing door	15	LVS	750.00	11,250
Premium for panic hardware	10	LVS	950.00	9,500
Drinking fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596
Casework and sinks				
Remove existing casework	20	LF	35.00	700
New base cabinet and countertop	20	LF	275.00	5,500
New sink with new rough-in	12	EA	2,306.50	27,678
New sink with new rough-in at nurse's office	1	EA	2,306.50	2,307
Restrooms				
Modify staff restrooms as required	169	SF	25.00	4,225
Modify student restrooms as required	720	SF	20.00	14,400
Plumbing trade demolition and cleaning	1	LS	4,000.00	4,000
Electrical - allow	8,760	SF	0.50	4,380
Mark-Ups				
Allow	1	LS	143,573.25	143,573
Sub-Total for Accessibility Options - Low:				**398,344**

ACCESSIBILITY OPTIONS - HIGH		Unit	Rate	Total ($)
Concrete ramps				
Remove existing improvements as required	1,600	SF	5.00	8,000
Ramp paving	1,600	SF	30.00	48,000
Guardrails, stainless steel	28	LF	450.00	12,600
Handrails, stainless steel	240	LF	275.00	66,000
Concrete steps				
Remove existing improvements as required	130	SF	5.00	650
Form concrete steps, per LF of nosing	108	LF	45.00	4,860
Handrails, stainless steel	39	LF	275.00	10,725
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	5	LVS	2,500.00	12,500
Remove and replace existing door, frame, and hardware	15	LVS	2,000.00	30,000
Premium for panic hardware	10	LVS	950.00	9,500
Drinking fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596
Casework				
Remove existing casework	20	LF	35.00	700
New base cabinet and countertop	20	LF	275.00	5,500
New sink with new rough-in	12	EA	2,306.50	27,678
New sink with new rough-in at nurse's office	1	EA	2,306.50	2,307
Elevator lift - allow	1	EA	25,000.00	25,000

Restrooms				
Modify staff restrooms as required	169	SF	70.00	11,830
Modify student restrooms as required	720	SF	150.00	108,000
Plumbing trade demolition and cleaning	1	LS	4,000.00	4,000
Electrical - allow	8,760	SF	0.75	6,570
Mark-Ups				
Allow	1	LS	226,495.35	226,495
Sub-Total for Accessibility Options - High:				**628,411**

RECONSTRUCT CENTRAL SEGMENT	Quantity	Unit	Rate	Total ($)
Remove costs from base scheme (average of both low & high options)				
Seismic - allow	1	LS	355,911.74	(355,912)
Fire/Life Safety - allow	1	LS	189,000.87	(189,001)
Accessibility - allow	1	LS	513,377.10	(513,377)
Selective demolition				
Remove portion of existing building	8,760	SF	20.00	175,200
Remove plaza paving and improvements	2,860	SF	3.00	8,580
New work				
Raise existing grade at courtyard	318	CY	50.00	15,900
New retaining wall and footing tied to existing	750	SF	150.00	112,500
New exterior paving	2,860	SF	10.00	28,600
Concrete foundations for new work	8,760	SF	5.00	43,800
New slab on grade, tied to existing	8,760	SF	12.00	105,120
New structure as required	8,760	SF	35.00	306,600
Concrete steps, per LF of nosing	168	LF	95.00	15,960
Wheelchair lift	1	EA	25,000.00	25,000
New exterior wall framing, sheathing, and finish	3,108	SF	35.00	108,780
Exterior storefront glazing	560	SF	85.00	47,600
New roof framing and finish	8,760	SF	35.00	306,600
Interior partition framing and sheathing	6,090	SF	15.00	91,350
Doors, frames, and hardware	8,760	SF	3.00	26,280
Toilet and bath compartments and accessories	1	LOT	35,000.00	35,000
Classroom casework, science	1	LOT	30,000.00	30,000
Classroom casework, special education	1	LOT	20,000.00	20,000
Reception casework	31	LF	500.00	15,500
Floor, wall, and ceiling finishes	8,760	SF	15.00	131,400
Mechanical and electrical - allow	8,760	SF	45.00	394,200
Miscellaneous equipment and fittings	8,760	SF	3.00	26,280
Modify exterior for drop-off zone	3,520	SF	30.00	105,600

Mark-Ups				
Allow	1	LS	629,789.93	629,790
Sub-Total for Reconstruct Central Segment:				**1,747,350**

SEISMIC - BRACE FRAME	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove floor and ceiling finishes	576	SF	10.00	5,760
Modify portion of exterior paving	576	SF	15.00	8,640
Modify slab on grade as required for new footings	576	SF	25.00	14,400
Remove portion of exterior wall finish	3,024	SF	5.00	15,120
Remove portion of interior partition finish	1,728	SF	4.00	6,912
Remove roof finish as required for new structural work	1,152	SF	3.00	3,456
New structural work				
New concrete foundations, epoxy doweled to existing	27	CY	1,250.00	33,750
New plywood wall sheathing	1,728	SF	5.00	8,640
Patch roof framing as required	1	LS	7,500.00	7,500
New steel braced frames	20,000	LB	4.00	80,000
Miscellaneous structural - allow	14,370	SF	1.50	21,555
New architectural work required to complete structural upgrades				
Patch and replace roof finish as required	1,152	SF	3.00	3,456
Patch and replace exterior wall finish at new braced frames	3,024	SF	30.00	90,720
Patch and replace interior partition finish at new braced frames	1,728	SF	10.00	17,280
Patch and replace floor and ceiling finish at new braced frames	576	SF	15.00	8,640
Electrical work - allow	14,370	SF	2.00	28,740
Mark-Ups				
Allow	1	LS	199,813.81	199,814
Sub-Total for Seismic - Brace Frame:				**554,383**

SEISMIC - ROOF DIAPHRAGM	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove floor and ceiling finishes	904	SF	10.00	9,040
Remove portion of interior partition finish	5,424	SF	3.00	16,272
Remove roof finish as required for new structural work	14,370	SF	3.00	43,110
Remove skylights	480	SF	10.00	4,800
New structural work				
New plywood wall sheathing	2,712	SF	5.00	13,560
New wood posts	336	LF	10.00	3,360
New PSL header	240	SF	35.00	8,400
New wall framing, 2x6	2,712	SF	8.00	21,696
Plywood roof sheathing	14,370	SF	4.00	57,480
Miscellaneous structural - allow	14,370	SF	1.50	21,555
New architectural work required to complete structural upgrades				
New roof finish	14,370	SF	15.00	215,550
Patch and replace interior partition finish at new braced frames	5,424	SF	5.00	27,120
Patch and replace floor and ceiling finish at new wall sheathing	904	SF	15.00	13,560
New skylights	480	SF	150.00	72,000
Electrical work - allow	14,370	SF	3.00	43,110
Mark-Ups				
Allow	1	LS	321,563.25	321,563
Sub-Total for Seismic - Roof Diaphragm:				**892,176**

FIRE/LIFE SAFETY - FIRE SPRINKLERS	Quantity	Unit	Rate	Total ($)
Fire sprinklers, mostly exposed				
Modify ceiling finish	14,370	SF	1.50	21,555
Wet sprinkler system	14,370	SF	4.27	61,360
Electrical work - allow	14,370	SF	2.50	35,925

Underground infrastructure - allow	14,370	SF	4.00	57,480
Mark-Ups				
Allow	1	LS	99,363.32	99,363
Sub-Total for Fire/Life Safety - Fire Sprinklers:				**275,683**

FIRE/LIFE SAFETY - 2 HR RATED WALLS		Unit	Rate	Total ($)
Fire life safety work				
Modify existing interior partition for 2 hour rating - included with Building A Central				
New interior partition framing and sheathing, 2 hour rating	3,164	SF	35.00	110,740
Replace cross corridor doors	14	EA	2,500.00	35,000
Electrical work - allow	14,370	SF	4.00	57,480
Mark-Ups				
Allow	1	LS	114,522.60	114,523
Sub-Total for Fire/Life Safety - 2 Hr Rated Walls:				**317,743**

ACCESSIBILITY OPTIONS - LOW		Unit	Rate	Total ($)
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	2	LVS	2,500.00	5,000
New hardware to existing door	29	LVS	750.00	21,750
Premium for panic hardware	4	LVS	950.00	3,800
Casework and sinks				
Modify existing base cabinet for accessibility	106	LF	150.00	15,900
New sink with new rough-in	12	EA	2,306.50	27,678

Restrooms				
Modify staff restrooms as required	72	SF	25.00	1,800
Plumbing trade demolition and cleaning	1	LS	500.00	500
Electrical - allow	14,370	SF	0.50	7,185
Mark-Ups				
Allow	1	LS	47,119.27	47,119
Sub-Total for Accessibility Options - Low:				**130,732**

ACCESSIBILITY OPTIONS - HIGH		Unit	Rate	Total ($)
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	2	LVS	2,500.00	5,000
Remove and replace existing door, frame, and hardware	29	LVS	2,000.00	58,000
Premium for panic hardware	4	LVS	950.00	3,800
Casework				
Remove and replace existing base cabinet for accessibility	106	LF	300.00	31,800
New sink with new rough-in	12	EA	2,306.50	27,678
Restrooms				
Modify staff restrooms as required	72	SF	70.00	5,040
Plumbing trade demolition and cleaning	1	LS	500.00	500
Electrical - allow	14,370	SF	0.75	10,778
Mark-Ups				
Allow	1	LS	80,358.27	80,358
Sub-Total for Accessibility Options - High:				**222,954**

SEISMIC - BRACE FRAME	Quantity	Unit	Rate	Total ($)
Selective demolition				
Modify portion of exterior paving	200	SF	15.00	3,000
Remove floor finishes	200	SF	5.00	1,000
Remove ceiling finishes at corridor	2,130	SF	4.00	8,520
Remove portion of interior partition finish	2,676	SF	3.00	8,028
Remove roof finish as required for new structural work	7,560	SF	3.00	22,680
New structural work				
New concrete foundations, epoxy doweled to existing	19	CY	1,250.00	23,750
Patch roof framing as required	1	LS	7,500.00	7,500
New steel braced frames	10,000	LB	4.00	40,000
Miscellaneous structural - allow	7,560	SF	1.50	11,340
New architectural work required to complete structural upgrades				
New roof finish	7,560	SF	15.00	113,400
Patch and replace interior partition finish at new braced frames	2,676	SF	5.00	13,380
Patch and replace floor finish	200	SF	15.00	3,000
New ceiling finish at corridor	2,130	SF	10.00	21,300
Electrical - allow	7,560	SF	2.00	15,120
Mark-Ups				
Allow	1	LS	164,563.82	164,564
Sub-Total for Seismic - Brace Frame:				**456,582**

SEISMIC - ROOF DIAPHRAGM	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove ceiling finishes at corridor	2,130	SF	4.00	8,520
Remove posts and framing	12	EA	350.00	4,200
Remove portion of interior partition finish	2,952	SF	3.00	8,856
Remove roof finish as required for new structural work	7,560	SF	10.00	75,600
New structural work				
Epoxy bolts in sill plate	23	EA	250.00	5,750
New plywood wall sheathing	2,952	SF	5.00	14,760
New plywood sheathing at ceiling	7,560	SF	3.00	22,680
New 2x8 at ceiling	502	LF	35.00	17,570
New wood posts	168	LF	50.00	8,400
New 2x4 framing tied to existing	2,184	SF	6.50	14,196
New 2x4 framing at roof	7,560	SF	8.00	60,480
Plywood roof sheathing	7,560	SF	4.00	30,240
Miscellaneous structural - allow	7,560	SF	1.50	11,340
New architectural work required to complete structural upgrades				
New roof finish	7,560	SF	15.00	113,400
Patch and replace interior partition finish	2,952	SF	5.00	14,760
New ceiling finish	7,560	SF	8.00	60,480
Electrical - allow	7,560	SF	3.00	22,680
Mark-Ups				
Allow	1	LS	278,339.17	278,339
Sub-Total for Seismic - Roof Diaphragm:				**772,251**

FIRE/LIFE SAFETY - 2 HR RATED WALLS	Quantity	Unit	Rate	Total ($)
Fire life safety work				
Modify existing interior partition for 2 hour rating - included with Building A Central				
Electrical - allow	7,560	SF	2.50	18,900
Mark-Ups				
Allow	1	LS	10,650.91	10,651
Sub-Total for Fire/Life Safety - 2 Hr Rated Walls:				**29,551**

FIRE/LIFE SAFETY - FIRE SPRINKLERS		Unit	Rate	Total ($)
Fire sprinklers				
Modify ceiling finish	7,560	SF	3.00	22,680
Wet sprinkler system, including attic	7,560	SF	6.41	48,422
Deluge system at exterior wall openings or 5 new rated window openings	1	LS	20,000.00	20,000
Electrical - allow	7,560	SF	4.00	30,240
Underground infrastructure	7,560	SF	4.00	30,240
Mark-Ups				
Allow	1	LS	85,422.41	85,422
Sub-Total for Fire/Life Safety - Fire Sprinklers:				**237,004**

ACCESSIBILITY OPTIONS - LOW		Unit	Rate	Total ($)
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	6	LVS	2,500.00	15,000
New hardware to existing door	11	LVS	750.00	8,250
Premium for panic hardware	21	LVS	950.00	19,950
Modify clear space at door as required	5	LOC	250.00	1,250
Signage, "Not Accessible"	6	EA	150.00	900
Exterior landings, steps, and guardrails	1	LS	45,000.00	45,000
Drinking Fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596
Casework and Sinks				
Modify existing base cabinet for accessibility	15	LF	150.00	2,250
New sink with new rough-in	5	EA	2,306.50	11,533
Restrooms				
Modify student restrooms as required	480	SF	20.00	9,600
New lavatory with new rough-in	3	EA	2,282.70	6,848
New water closet with new rough-in	1	EA	4,564.00	4,564
New urinal with new rough-in	7	EA	2,970.80	20,796
Plumbing trade demolition and cleaning	1	LS	2,639.70	2,640
Electrical - allow	7,560	SF	0.50	3,780
Mark-Ups				
Allow	1	LS	90,085.08	90,085
Sub-Total for Accessibility Options - Low:				**249,941**

ACCESSIBILITY OPTIONS - HIGH		Unit	Rate	Total ($)
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	6	LVS	2,500.00	15,000
New hardware to existing door	11	LVS	750.00	8,250
Premium for panic hardware	21	LVS	950.00	19,950
Modify clear space at door as required	5	LOC	250.00	1,250
Signage, "Not Accessible"	6	EA	150.00	900
Exterior landings, steps, and guardrails	1	LS	65,000.00	65,000
Drinking fountains				
Guardrails at drinking fountain, stainless steel	1	PR	950.00	950
Patch floor and wall finishes as required	1	LOC	950.00	950
New drinking fountain with rough-in and distribution	1	EA	5,595.80	5,596
Casework				
Modify existing base cabinet for accessibility	15	LF	200.00	3,000
New sink with new rough-in	5	EA	2,306.50	11,533
Restrooms				
Modify student restrooms as required	480	SF	150.00	72,000
New lavatory with new rough-in	3	EA	2,282.70	6,848
New water closet with new rough-in	1	EA	4,564.00	4,564
New urinal with new rough-in	7	EA	2,970.80	20,796
Plumbing trade demolition and cleaning	1	LS	2,639.70	2,640
Electrical - allow	7,560	SF	0.75	5,670
Mark-Ups				
Allow	1	LS	138,008.52	138,009
Sub-Total for Accessibility Options - High:				**382,904**

SEISMIC UPGRADES - LOW	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove exterior wall finish and sheathing	5,660	SF	10.00	56,600
Remove exterior paving and landscaping as required	777	SF	3.00	2,331
Remove floor finishes	530	SF	5.00	2,650
Remove portion of interior partition finish	2,320	SF	2.00	4,640
New structural work				
New concrete foundations, epoxy doweled to existing	89	CY	1,250.00	111,250
Pit for lift	2	EA	5,000.00	10,000
New plywood wall sheathing	7,980	SF	5.00	39,900
Infill existing wood stud wall framing and blocking as required	7,980	SF	5.00	39,900
Miscellaneous structural - allow	5,208	SF	1.50	7,812
New architectural work required to complete structural upgrades				
New exterior wall finish	5,660	SF	20.00	113,200
Patch and replace interior partition finish	7,980	SF	5.00	39,900
Modify stage as required	1	LS	20,000.00	20,000
Patch and replace floor finish	530	SF	15.00	7,950
Patch and repair landscaping and paving as required	777	SF	10.00	7,770
Electrical - allow	5,208	SF	2.00	10,416
Mark-Ups				
Allow	1	LS	267,297.73	267,298
Sub-Total for Seismic Upgrades - Low:				**741,617**

SEISMIC UPGRADES - HIGH	Quantity	Unit	Rate	Total ($)
Selective demolition				
Remove exterior wall finish and sheathing	5,660	SF	10.00	56,600
Remove exterior paving and landscaping as required	777	SF	3.00	2,331
Remove roof finish as required for new structural work	5,208	SF	15.00	78,120
Remove floor finishes	530	SF	5.00	2,650
Remove portion of interior partition finish	2,320	SF	2.00	4,640
Remove canopy	1,984	SF	10.00	19,840
New structural work				
New concrete foundations, epoxy doweled to existing	89	CY	1,250.00	111,250
Pit for lift	2	EA	5,000.00	10,000
New plywood wall sheathing	7,980	SF	5.00	39,900
Infill existing wood stud wall framing and blocking as required	7,980	SF	5.00	39,900
Plywood roof sheathing	5,208	SF	4.00	20,832
Miscellaneous structural - allow	5,208	SF	1.50	7,812
New architectural work required to complete structural upgrades				
New roof finish	5,208	SF	15.00	78,120
New exterior wall finish	5,660	SF	20.00	113,200
New transparent canopy	1,984	SF	65.00	128,960
Patch and replace interior partition finish	7,980	SF	5.00	39,900
Patch and replace floor finish	530	SF	15.00	7,950
Patch and repair landscaping and paving as required	777	SF	10.00	7,770
Miscellaneous finish work, historic premiums	5,208	SF	25.00	130,200
Electrical - allow	5,208	SF	3.00	15,624
Mark-Ups				
Allow	1	LS	515,976.66	515,977
Sub-Total for Seismic Upgrades - High:				**1,431,576**

FIRE/LIFE SAFETY - FIRE SPRINKLERS		Unit	Rate	Total ($)
Fire life safety work				
Modify building for 1 hour construction throughout	5,208	SF	7.50	39,060
Electrical - allow	5,208	SF	4.00	20,832
Underground infrastructure	5,208	SF	4.00	20,832
Mark-Ups				
Allow	1	LS	45,491.20	45,491
Sub-Total for Fire/Life Safety - Fire Sprinklers:				**126,215**

ACCESSIBILITY OPTIONS - LOW		Unit	Rate	Total ($)
Lifts				
Wheelchair lift	1	EA	25,000.00	25,000
Concrete steps				
Remove existing improvements as required	130	SF	5.00	650
Form concrete steps, per LF of nosing	70	LF	45.00	3,150
Handrails, stainless steel	40	LF	275.00	11,000
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	5	LVS	2,500.00	12,500
New hardware to existing door	2	LVS	750.00	1,500
Modify existing frame and add new door, side lite, and hardware	7	LVS	2,500.00	17,500
Automatic openers to existing doors	8	LVS	3,500.00	28,000
Premium for panic hardware	2	LVS	950.00	1,900
Modify clear space at door as required	1	LOC	250.00	250
Restrooms				
New restrooms in existing kitchen/restroom locations	456	SF	350.00	159,600

Electrical - allow	5,208	SF	0.50	2,604
Mark-Ups				
Allow	1	LS	148,579.58	148,580
Sub-Total for Accessibility Options - Low:				**412,234**

ACCESSIBILITY OPTIONS - HIGH		Unit	Rate	Total ($)
Lifts				
Wheelchair lift	2	EA	25,000.00	50,000
Concrete steps				
Remove existing improvements as required	130	SF	5.00	650
Form concrete steps, per LF of nosing	70	LF	45.00	3,150
Handrails, stainless steel	40	LF	275.00	11,000
Doors, frames, and hardware				
New door, frame, and hardware in resized opening	5	LVS	2,500.00	12,500
New hardware to existing door	2	LVS	750.00	1,500
Modify existing frame and add new door, side lite, and hardware	7	LVS	2,500.00	17,500
Automatic openers to existing doors	8	LVS	3,500.00	28,000
Premium for panic hardware	2	LVS	950.00	1,900
Modify clear space at door as required	1	LOC	250.00	250
Rebuild stage - allow	1	LS	100,000.00	100,000
Restrooms				
Modify restrooms as required	133	SF	20.00	2,660
New lavatory with new rough-in	1	EA	2,282.70	2,283
Plumbing trade demolition and cleaning	1	LS	674.80	675
Miscellaneous finish work				
Allow for historical building	5,208	SF	30.00	156,240

Electrical - allow	5,208	SF	0.75	3,906
Mark-Ups				
Allow	1	LS	221,028.00	221,028
Sub-Total for Accessibility Options - High:				**613,241**

STRUCTURAL UPGRADES - LOW	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Structural Upgrades - Low:				

STRUCTURAL UPGRADES - HIGH	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Structural Upgrades - High:				

FIRE LIFE SAFETY - LOW	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Fire Life Safety - Low:				

FIRE LIFE SAFETY - HIGH		Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Fire Life Safety - High:				

ADA UPGRADES - LOW		Unit	Rate	Total ($)
Vehicular Paving				
Included with Building A - West				

Pedestrian Paving				
Concrete sidewalk/path of travel paving				
Remove existing improvements as required	385	SF	5.00	1,925
New concrete paving to match existing	385	SF	10.00	3,850
Guardrails, stainless steel	100	LF	450.00	45,000
Modify handrails at existing stairs	14	LF	150.00	2,100
Site Development				
Add accessible/panic hardware to existing gates	5	EA	2,050.00	10,250
Relocate existing flag pole	1	EA	850.00	850
Miscellaneous site signage - allow	1	LS	10,000.00	10,000
Electrical - allow	1	LS	7,500.00	7,500
Mark-Ups				
Allow	1	LS	45,914.42	45,914
Sub-Total for Ada Upgrades - Low:				**127,389**

ADA UPGRADES - HIGH		Unit	Rate	Total ($)
Vehicular paving				
Modify drop-off - allow	1	LS	100,000.00	100,000
Pedestrian paving				
Concrete sidewalk/path of travel paving				
Remove existing improvements as required	385	SF	5.00	1,925
New concrete paving to match existing	385	SF	10.00	3,850
Guardrails, stainless steel	100	LF	450.00	45,000
Modify handrails at existing stairs	14	LF	150.00	2,100

Site development				
Add accessible/panic hardware to existing gates	5	EA	2,050.00	10,250
Relocate existing flag pole	1	EA	850.00	850
Miscellaneous site signage - allow	1	LS	15,000.00	15,000
Electrical - allow	1	LS	15,000.00	15,000
Mark-Ups				
Allow	1	LS	109,312.94	109,313
Sub-Total for Ada Upgrades - High:				**303,288**

2. OCTOBER 1, 2007:

COST ESTIMATE
HYBRID OPTION

mack5

Conceptual Cost Plan

for

Havens Elementary School
Piedmont Unified School District

October 1, 2007
(hybrid option)

mack5
1900 Powell Street, Suite 470
Emeryville, CA 94608
ph: 510.595.3020
www.mack5.com

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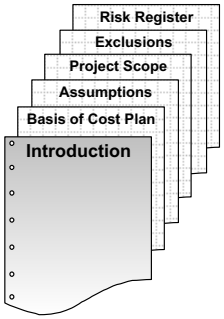
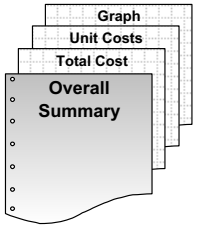
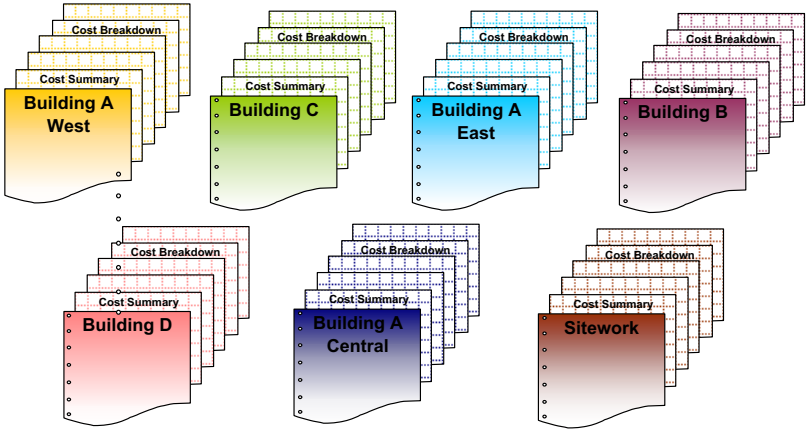


Mack5 was requested to carry out a Conceptual Cost Estimate for the proposed modernization of Haven Elementary School for the Piedmont Unified School District.

The first part of the Report contains the basis of the report, the assumptions made, description of the project scope, the exclusions to the costs and a risk register which contain items that have potential to impact cost at some point in the future.



Each detail section includes a Cost Summary and a Cost Breakdown with the detail of the scope included within the estimate.



PROJECT INTRODUCTION:	The project consists of making seismic improvements to the existing Havens Elementary School including costs for structural and non-structural seismic hazards and minor accessibility and fire life safety upgrades. New construction is included in the central portion of Building A to replace an existing non-compliant portion of the building.
ITEMS USED FOR COST PLAN:	Undated drawings
civil drawings	None
architectural drawings	By murakami/Nelson, Sheets A1.0 and A2.0
structural narrative and sketches	By R.P. Gallagher Associates, Inc., Sheets S-A1, S-A2, S-A5, S-A6, S-A7, S-A8, S-A10, S-B1, S-B2, S-B3, S-B4, S-C1, S-C2, and S-C3
mechanical narrative and plans	None
electrical narrative and plans	None
telecommunication drawings	None
specifications	None
project team meetings	Site Visit on August 24, 2007

ASSUMPTIONS

(a) The construction start date is unknown

(b) A construction period of 24 months

(c) The general contract may be bid or negotiated with qualified contractors.

(d) The general contractor will have limited access to the occupied site during business hours.

(e) Construction will be phased.

(f) The existing electrical power, fire/life safety systems are adequate for the increased loads.

(g) Owner provide materials in a timely fashion.

PROJECT SCOPE

The project consists of making seismic improvements to the existing Havens Elementary School including costs for structural and non-structural seismic hazards and minor accessibility and fire life safety upgrades. New construction is included in the central portion of Building A to replace an existing non-compliant portion of the building.

modernization

The following contains a general description of the scope of work included in each element of the estimate.

substructure

Foundation work as required for the new construction and modifications to structural systems throughout the building.

structure

Structural upgrades include upgrade of existing wall and roof framing and sheathing. Allowances are included for structure at the new construction portion of the work.

exterior enclosure

Exterior enclosure work includes patching and repair of finishes disturbed by the structural work and accessibility upgrades to doors as required. All exterior windows will be replaced. New exterior wall framing, finish, and glazing are included at the new central addition to Building A.

roof

Roofing includes new roofing throughout the affected buildings and reinstallation of the existing clay tile roof at the auditorium.

interiors

Interiors include new framing and sheathing as required to achieve fire lire safety and structural upgrades. Allowances are included for ADA upgrades of doors, frames, and hardware.

finishes

Allowances are included for patching and repairing of finishes as required by structural, fire life safety and ADA upgrades.

equipment

Equipment includes new and modified casework as required for ADA upgrades and toilet and bath accessories.

stairs and vertical transportation
Concrete ramps, steps, and wheelchair lifts as required for ADA upgrades.

plumbing
Demolition and re piping of waste and water service piping. Includes sanitary fixtures with associated waste, vent and service piping, domestic cold and hot water piping system.

hvac
HVAC work includes seismic bracing of existing systems and new HVAC work at the new central portion of Building A.

fire protection
New wet fire sprinkler system to all buildings with a premium for installation in the historic ceiling of Building C.

site preparation
Selective demolition as required for modernization work. Premiums are included for hazardous materials abatement.

electrical
Electrical includes removal and replacement necessary to facilitate seismic and fire requirements, new work as detailed on the drawings, and a new fire alarm system.

sitework
Sitework includes path of travel and parking improvements as required for ADA upgrades.

site utilities
No site utilities are anticipated for the project.

EXCLUSIONS

(a) Owner supplied and installed furniture, fixtures and equipment

(b) Security equipment and devices

(c) Design, testing, inspection or construction management fees

(d) Utility and connection fees

(e) Scope change and post contract contingencies

(f) Assessments, taxes, finance, legal and development charges

(g) Builder's risk, project wrap-up and other owner provided insurance program

(h) New electrical main service and distribution system and security systems

(i) Telephone / data active equipment and switch, sound systems, audio visual equipment and cabling

(j) Modification to existing HVAC

(k) Schedule compression

(l) Commissioning costs associated with CHPs, LEED Certification, or other programs (construction cost included as required)

(m) Deferred maintenance

(n) Programmatic changes

(o) Complete replacement of building finishes except as specifically noted (costs for selective replacement of finishes as required for modernization work is included in the estimate)

(p) Cost escalation

risk register

In the course of preparing the Cost Estimate, the following items were noted as areas of possible exposure.

(a) The existing electrical systems may not have adequate capacity for the proposed work

(b) This is a complex phased project on an occupied site which may reduce interest from potential bidders and limit the number of bidders on the project.

(c) Current market conditions are driven by limited supply of metal and consequently cost escalation and bids are unstable.

(d) The design process is early in the conceptual stage. As ideas are more fully developed there may be scope which was not anticipated in this cost estimate.

BUILDING A WEST

Floors	Enclosed	Covered	Covered (included at 50%)	Sub-Total	GFA
Building A West	15,390	6,175	3,088	18,478	
Building C	5,340	1,980	990	6,330	
Building A East	4,692	392	196	4,888	
Building B	7,740	0	0	7,740	
Building D	3,016	1,464	732	3,748	
Building A Central	9,770	0	0	9,770	
	45,948	10,011	5,006		50,954 SF

Total Site Area 140,061 SF

Overall Summary

M5-07-181
October 1, 2007

mack5

	GFA	$/SF	$,000
Building A West	18,478	153	2,834
Building C	6,330	295	1,868
Building A East	4,888	123	602
Building B	7,740	184	1,428
Building D	3,748	53	199
Building A Central	9,770	416	4,061
Sitework	140,061	6	868
Subtotal Construction and Sitework			**11,860**
Premium for phasing	5.00%		593
TOTAL CONSTRUCTION AND SITEWORK			**12,453**

Building A West Summary

M5-07-181
October 1, 2007

mack5

	GFA: 18,478 SF	%	$/SF	$,000
Substructure		2%	2.84	53
Structure		3%	4.40	81
Exterior Enclosure		18%	27.68	512
Roofing		15%	22.33	413
Sub-total - Shell & Core		*37%*	*57.26*	*1,058*
Interior Walls		6%	9.67	179
Floor, Wall & Ceiling Finishes		5%	7.15	132
Sub-total - Internal Finishes		*11%*	*16.82*	*311*
Equipment & Specialties		2%	2.43	45
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*2%*	*2.43*	*45*
Plumbing		1%	2.14	40
Heating, Ventilating & Air Conditioning		1%	1.53	28
Electrical		7%	10.20	188
Fire Protection		3%	4.74	88
Sub-total - Mechanical and Electrical		*12%*	*18.62*	*344*
Sub-total - Construction		*62%*	*95.12*	*1,758*
Site Preparation & Demolition		13%	20.46	378
Site Development		0%	0.26	5
Site Utilities		0%	0.00	0
Sub-total - Sitework		*14%*	*20.72*	*383*
Total - Construction and Sitework		*76%*	*115.84*	*2,140*
General Conditions	12.50%	9%	14.48	268
Contractor's Overhead & Profit or Fee	7.00%	6%	9.12	169
Sub-total		*91%*	*139.44*	*2,577*
Contingency for Design Development	10.00%	9%	13.94	258
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***153.39***	***2,834***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation in two pours				
Excavation, by hand	25	CY	50.00	1,250
Formwork	240	SF	15.00	3,600
Reinforcing steel	1,000	LB	1.50	1,500
Steel plate with non-shrink grout, anchored to existing foundation	48	EA	500.00	24,000
Epoxy rods to existing foundation	72	EA	65.00	4,680
Concrete	10	CY	350.00	3,500
Epoxy bolts in sill plate	24	EA	250.00	6,000
Connect new wall brace to existing foundation	16	LOC	500.00	8,000
Sub-Total for Substructure:				**52,530**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
Patch slab on grade as required	16	LOC	250.00	4,000
New diagonal braces at exterior wall between existing pipe columns	288	LF	75.00	21,600
New wall braces; welded plate diagonals	320	LF	50.00	16,000
New 2x stud with holdown internailed to existing framing	8	EA	350.00	2,800
Miscellaneous structural work	18,478	SF	2.00	36,956
Sub-Total for Structure:				**81,356**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
New soffit finish	6,175	SF	30.00	185,250

Exterior windows				
New windows in existing openings, high performance thermal safety glazing	3,584	SF	85.00	304,640
Exterior doors				
New door, frame, and hardware in resized opening	1	LVS	2,500.00	2,500
New door in modified frame with sidelite	2	PR	3,000.00	6,000
New hardware to existing door	11	LVS	850.00	9,350
Premium for panic hardware	4	LVS	950.00	3,800
Sub-Total for Exterior Enclosure:				**511,540**

ROOFING		Unit	Rate	Total ($)
Roof coverings				
Patch and repair underlayment/ sheathing as required	20,637	SF	1.50	30,956
Flashings and sheetmetal	20,637	SF	5.00	103,185
New roof covering, premium single ply	20,637	SF	10.00	206,370
New skylights in existing openings, high performance thermal safety glazing with integrated shading and ventilation	480	SF	150.00	72,000
Sub-Total for Roofing:				**412,511**

INTERIOR WALLS		Unit	Rate	Total ($)
Interior partitions				
Non-structural framing and sheathing at new diagonal bracing	2,304	SF	10.00	23,040
Guardrail for drinking fountain	1	PR	850.00	850
Interior glazing				
Clear safety glass in existing openings	2,240	SF	65.00	145,600

Interior doors				
New hardware to existing door	14	LVS	650.00	9,100
Sub-Total for Interior Walls:				**178,590**

FLOOR, WALL & CEILING FINISHES		Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	15,390	SF	6.00	92,340
Wall finishes				
Paint to walls	12,224	SF	2.00	24,448
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 25%	3,848	SF	4.00	15,392
Sub-Total for Floor, Wall & Ceiling Finishes:				**132,180**

EQUIPMENT & SPECIALTIES		Unit	Rate	Total ($)
Cabinets and casework				
Base cabinet and countertop	132	LF	300.00	39,600
Code required signage	18,478	SF	0.25	4,620
Toilet and bath accessories				
Allow for single occupancy toilet	1	LS	750.00	750
Sub-Total for Equipment & Specialties:				**44,970**

STAIRS & VERTICAL TRANSPORTATION		Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING		Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in				
Classrooms				
Sink(N) w/(N) rough-in	12	EA	2,378.40	28,541
Bathroom				
WC(N) w/(N) rough-in	1	EA	4,668.00	4,668
Drinking fountain, (N) w/(N) rough-in	1	EA	4,814.40	4,814
Demolition and cleaning	1	LS	1,600.80	1,601
Sub-Total for Plumbing :				**39,624**

HEATING, VENTILATING & AIR CONDITIONING		Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	10,536.00	10,536
Cleaning (E) ductwork	1	LS	8,721.60	8,722
Testing and rebalancing (E) ductwork	1	LS	9,072.00	9,072
Sub-Total for Heating, Ventilating & Air Conditioning:				**28,330**

ELECTRICAL		Unit	Rate	Total ($)
Electrical systems within building				
Provide new fire alarm system - allow	18,478	SF	2.75	50,815
Electrical work necessary to facilitate exterior steel brace frame additions				N/A
Electrical work necessary to facilitate interior steel brace frame addition	8	EA	1,260.00	10,080
Relocate devices at backsplash of modified cabinets and counters	12	EA	630.00	7,560
Replace pendant light fixtures	12	RM	10,000.00	120,000
Sub-Total for Electrical:				**188,455**

FIRE PROTECTION		Unit	Rate	Total ($)
Fire protection system-wet	18,478	SF	4.37	80,712
Fire protection system riser	1	LS	6,854.40	6,854
Sub-Total for Fire Protection:				**87,566**

SITE PREPARATION & DEMOLITION		Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	240	SF	10.00	2,400
Portion of slab on grade	144	SF	15.00	2,160
Exterior windows	3,584	SF	5.00	17,920
Soffit finish	6,175	SF	5.00	30,875
Skylights	480	SF	10.00	4,800
Roofing	20,637	SF	3.00	61,911
Cut back roof eave - allow	224	LF	35.00	7,840
Door, frame, and hardware	5	LVS	115.00	575
Hardware from existing door	25	LVS	100.00	2,500
Wall finish and non-structural framing as required to accommodate structural work	1,152	SF	7.50	8,640
Interior glazing	2,240	SF	5.00	11,200
Floor finish	15,390	SF	2.00	30,780
Plastic ceiling at skylights	480	SF	5.00	2,400

Non-compliant base cabinet	132	LF	35.00	4,620
General demolition and preparation	18,478	SF	0.25	4,620
Premium for hazmat abatement	18,478	SF	10.00	184,780
Sub-Total for Site Preparation & Demolition:				**378,021**

SITE DEVELOPMENT		Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required	240	SF	20.00	4,800
Sub-Total for Site Development:				**4,800**

SITE UTILITIES		Unit	Rate	Total ($)
No work included				
Sub-Total for Site Utilities:				

	GFA: 6,330 SF	%	$/SF	$,000
Substructure		3%	8.41	53
Structure		5%	13.70	87
Exterior Enclosure		13%	39.17	248
Roofing		11%	31.08	197
Sub-total - Shell & Core		*31%*	*92.36*	*585*
Interior Walls		2%	5.12	32
Floor, Wall & Ceiling Finishes		16%	45.85	290
Sub-total - Internal Finishes		*17%*	*50.97*	*323*
Equipment & Specialties		0%	0.63	4
Stairs & Vertical Transportation		3%	10.27	65
Sub-total - Equipment and Stairs		*4%*	*10.90*	*69*
Plumbing		1%	3.25	21
Heating, Ventilating & Air Conditioning		0%	1.42	9
Electrical		2%	7.21	46
Fire Protection		5%	15.09	95
Sub-total - Mechanical and Electrical		*9%*	*26.97*	*171*
Sub-total - Construction		*61%*	*181.20*	*1,147*
Site Preparation & Demolition		14%	40.08	254
Landscaping		1%	1.58	10
Site Utilities		0%	0.00	0
Sub-total - Sitework		*14%*	*41.66*	*264*
Total - Construction and Sitework		*76%*	*222.85*	*1,411*
General Conditions	12.50%	9%	27.86	176
Contractor's Overhead & Profit or Fee	7.00%	6%	17.55	111
Sub-total		*91%*	*268.26*	*1,698*
Contingency for Design Development	10.00%	9%	26.83	170
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***295.09***	***1,868***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation tied to existing				
Excavation, by hand	47	CY	50.00	2,350
Formwork	640	SF	15.00	9,600
Reinforcing steel	6,450	LB	1.50	9,675
Epoxy rods to existing foundation	320	EA	65.00	20,800
Concrete	36	CY	300.00	10,800
Sub-Total for Substructure:				**53,225**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
New 2x12 studs with holdowns	26	EA	350.00	9,100
Plywood over existing wall framing, with edge nailing, around existing wall openings, 3/4"	4,548	SF	5.25	23,877
Install continuous strap with new 3x blocking at top of sill from exterior	204	LF	50.00	10,200
New plywood roof sheathing over existing 1x6 diagonal sheathing	5,303	SF	4.00	21,212
New slab on grade tied to existing	276	SF	35.00	9,660
Miscellaneous structural work	6,330	SF	2.00	12,660
Sub-Total for Structure:				**86,709**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
Exterior wall framing and sheathing	210	SF	25.00	5,250
New exterior finish to match existing	5,832	SF	25.00	145,800
Exterior windows				
Reglaze existing historic windows	576	SF	125.00	72,000

Exterior doors				
Install automatic opener on existing historic pair entry door	2	PR	6,500.00	13,000
New door, frame, and hardware in resized opening	4	LVS	2,500.00	10,000
Premium for panic hardware	2	LVS	950.00	1,900
Sub-Total for Exterior Enclosure:				**247,950**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Reinstall salvaged roof tiles at auditorium, allow for 10% breakage	5,303	SF	10.00	53,030
Repair or replace to match historic copper gutters and downspouts as required - allow	1	LOT	15,000.00	15,000
New lightweight transparent canopy, complete	1,980	SF	65.00	128,700
Sub-Total for Roofing:				**196,730**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Interior partition framing and sheathing at toilet room	570	SF	17.50	9,975
Modify partition as required for clear space	1	LOC	150.00	150

Interior doors				
New door, frame, and hardware	3	EA	1,750.00	5,250
New door, frame, and hardware in resized openings	1	LVS	2,500.00	2,500
Install automatic opener on existing historic pair entry door	2	PR	6,500.00	13,000
New hardware to existing door	2	LVS	650.00	1,300
Fix existing interior door in closed position	1	EA	250.00	250
Sub-Total for Interior Walls:				**32,425**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Patch floor finishes as required at structural work	210	SF	50.00	10,500
Premium for modifying terrazzo	240	SF	30.00	7,200
New floor finishes at modified restrooms	144	SF	20.00	2,880
Wall finishes				
Miscellaneous finish work, historic premiums - allow	6,330	SF	35.00	221,550
Paint to new walls	1,500	SF	1.50	2,250
Ceiling finishes				
Reinstall auditorium ceiling panels	2,184	SF	20.00	43,680
Gypsum board ceiling at modified restrooms	144	SF	15.00	2,160
Sub-Total for Floor, Wall & Ceiling Finishes:				**290,220**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Cabinets and casework				
Modify base cabinet at sink	3	LF	300.00	900
Code required signage	6,330	SF	0.25	1,583

Toilet partitions and accessories				
Accessories for single-occupancy toilet	2	LS	750.00	1,500
Sub-Total for Equipment & Specialties:				**3,983**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
Short stair flights				
New concrete stair flight and landing with stainless steel guardrails	2	FLT	7,500.00	15,000
Elevators and lifts				
Wheelchair lift, complete	2	EA	25,000.00	50,000
Sub-Total for Stairs & Vertical Transportation:				**65,000**

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in				
Modify restroom				
WC(N) w/(N) rough-in	2	EA	5,121.60	10,243
Lav.(N) w/(N) rough-in	2	EA	2,717.28	5,435
Kitchen				
Kitchen Sink - (N) w/ (N) rough-in	1	EA	4,005.60	4,006
Demolition and cleaning	1	LS	920.40	920
Sub-Total for Plumbing :				**20,604**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	2,352.96	2,353
Cleaning (E) ductwork	1	LS	3,921.60	3,922
Testing and rebalancing (E) ductwork	1	LS	2,721.60	2,722
Sub-Total for Heating, Ventilating & Air Conditioning:				**8,996**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical work within building				
Stage lift connection	1	EA	2,500.00	2,500
Electrified door connections	4	EA	2,750.00	11,000
Rework historic pendant light fixtures	1	LS	10,000.00	10,000
Electrical work necessary to facilitate interior seismic modifications	200	LF	23.60	4,720
Fire alarm system	6,330	SF	2.75	17,408
Sub-Total for Electrical:				**45,628**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet, concealed in historic ceiling	6,330	SF	15.09	95,497
Sub-Total for Fire Protection:				**95,497**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	472	SF	10.00	4,720
Portion of slab on grade	168	SF	15.00	2,520
Exterior wall finish and sheathing to accommodate structural work	5,832	SF	10.00	58,320
Door, frame, and hardware	2	LVS	115.00	230
Hardware from existing door	2	LVS	100.00	200
Interior partition	16	LF	25.00	400
Wall finish as required to accommodate structural work	1,512	SF	3.00	4,536
Floor finish	210	SF	5.00	1,050
Portion of stage for new lift	1	LS	1,500.00	1,500
Concrete canopy and columns	880	SF	25.00	22,000

Remove, salvage, and store existing				
Wood wall paneling for reinstallation	720	SF	25.00	18,000
Auditorium ceiling panels for reinstallation	2,184	SF	10.00	21,840
Clay roof tiles for reinstallation	5,303	SF	8.00	42,424
General demolition and preparation	6,330	SF	2.00	12,660
Premium for hazmat abatement	6,330	SF	10.00	63,300
Sub-Total for Site Preparation & Demolition:				**253,700**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required at removed canopies	1	LS	10,000.00	10,000
Sub-Total for Landscaping:				**10,000**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 4,888 SF	%	$/SF	$,000
Substructure		2%	2.41	12
Structure		3%	3.98	19
Exterior Enclosure		7%	8.93	44
Roofing		16%	19.62	96
Sub-total - Shell & Core		*28%*	*34.94*	*171*
Interior Walls		7%	8.67	42
Floor, Wall & Ceiling Finishes		9%	11.22	55
Sub-total - Internal Finishes		*16%*	*19.89*	*97*
Equipment & Specialties		0%	0.25	1
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*0.25*	*1*
Plumbing		1%	1.57	8
Heating, Ventilating & Air Conditioning		1%	1.23	6
Electrical		11%	13.86	68
Fire Protection		4%	4.58	22
Sub-total - Mechanical and Electrical		*17%*	*21.25*	*104*
Sub-total - Construction		*62%*	*76.33*	*373*
Site Preparation & Demolition		14%	16.69	82
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*14%*	*16.69*	*82*
Total - Construction and Sitework		*76%*	*93.02*	*455*
General Conditions	12.50%	9%	11.63	57
Contractor's Overhead & Profit or Fee	7.00%	6%	7.33	36
Sub-total		*91%*	*111.97*	*547*
Contingency for Design Development	10.00%	9%	11.20	55
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***123.17***	***602***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation				
Excavation, by hand	12	CY	50.00	600
Formwork	190	SF	15.00	2,850
Reinforcing steel	1,300	LB	1.50	1,950
Epoxy rods to existing foundation	8	EA	350.00	2,800
Concrete	12	CY	300.00	3,600
Sub-Total for Substructure:				**11,800**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
Infill existing openings in wall and sheath with plywood	276	SF	35.00	9,660
Miscellaneous structural work	4,888	SF	2.00	9,776
Sub-Total for Structure:				**19,436**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
Infill exterior wall opening to match existing - allow	56	SF	50.00	2,800
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	352	SF	85.00	29,920

Exterior doors				
New door, frame, and hardware in resized opening	3	LVS	2,500.00	7,500
New door in modified frame with sidelite	1	EA	2,500.00	2,500
Premium for panic hardware	1	LVS	950.00	950
Sub-Total for Exterior Enclosure:				**43,670**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Patch and repair underlayment/ sheathing as required	5,084	SF	1.50	7,626
Flashings and sheetmetal	5,084	SF	5.00	25,420
New roof covering, premium single ply	5,084	SF	10.00	50,840
New skylights in existing openings, high performance thermal safety glazing with integrated shading and ventilation	80	SF	150.00	12,000
Sub-Total for Roofing:				**95,886**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Interior partition framing and sheathing	1,164	SF	17.50	20,370
Gypsum board over new structural sheathing	552	SF	3.00	1,656
Guardrail for drinking fountain	1	PR	850.00	850
Interior doors				
New door, frame, and hardware	4	EA	1,750.00	7,000
New door, frame, and hardware in resized openings	5	LVS	2,500.00	12,500
Sub-Total for Interior Walls:				**42,376**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	4,692	SF	6.00	28,152
Wall finishes				
Paint to walls	2,492	SF	2.00	4,984
Plywood wall paneling to match existing	680	SF	25.00	17,000
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 25%	1,173	SF	4.00	4,692
Sub-Total for Floor, Wall & Ceiling Finishes:				**54,828**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Code required signage	4,888	SF	0.25	1,222
Sub-Total for Equipment & Specialties:				**1,222**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
DF (N) w/(N) rough-in	1	EA	4,814.40	4,814
Sink Dbl(N) w/(N) rough-in (Art)	1	EA	2,594.40	2,594
Demolition and cleaning	1	LS	274.80	275
Sub-Total for Plumbing :				**7,684**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	2,140.80	2,141
Cleaning (E) ductwork	1	LS	2,080.80	2,081
Testing and rebalancing (E) ductwork	1	LS	1,814.40	1,814
Sub-Total for Heating, Ventilating & Air Conditioning:				**6,036**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Recircuit existing panels	2	EA	1,050.00	2,100
Test and balance existing distribution	1	LS	840.00	840
Test existing fire alarm system	1	LS	1,680.00	1,680
Kiln connection	1	EA	3,500.00	3,500
Receptacles at new classrooms	25	EA	350.00	8,750
Linear lighting at new classrooms	160	LF	125.00	20,000
Light fixtures at library area	10	EA	475.00	4,750
Exit lights	3	E	725.00	2,175
Modifications to library lighting	1	LS	6,400.00	6,400
Lighting controls	1	LS	3,500.00	3,500
Provide new fire alarm system - allow	4,888	SF	2.75	13,442
Relocate devices at cabinets and modified cabinets and counters	1	EA	630.00	630
Sub-Total for Electrical:				**67,767**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection system-wet	4,888	SF	4.37	21,351
FP system-wet:exterior openings	1	EA	1,053.60	1,054
Sub-Total for Fire Protection:				**22,404**

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SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Exterior windows	352	SF	5.00	1,760
Roofing	5,084	SF	3.00	15,252
Skylights	80	SF	10.00	800
Cut back roof eave - allow	96	LF	35.00	3,360
Door, frame, and hardware	8	LVS	115.00	920
Floor finish	4,692	SF	2.00	9,384
General demolition and preparation	4,888	SF	0.25	1,222
Premium for hazmat abatement	4,888	SF	10.00	48,880
Sub-Total for Site Preparation & Demolition:				**81,578**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

Building B Summary

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	GFA: 7,740 SF	%	$/SF	$,000
Substructure		3%	4.62	36
Structure		10%	17.98	139
Exterior Enclosure		10%	19.33	150
Roofing		7%	13.00	101
Sub-total - Shell & Core		*30%*	*54.93*	*425*
Interior Walls		2%	4.35	34
Floor, Wall & Ceiling Finishes		10%	18.98	147
Sub-total - Internal Finishes		*13%*	*23.33*	*181*
Equipment & Specialties		0%	0.90	7
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*0.90*	*7*
Plumbing		7%	13.45	104
Heating, Ventilating & Air Conditioning		1%	1.23	10
Electrical		6%	11.31	88
Fire Protection		3%	5.05	39
Sub-total - Mechanical and Electrical		*17%*	*31.04*	*240*
Sub-total - Construction		*60%*	*110.19*	*853*
Site Preparation & Demolition		15%	28.49	221
Landscaping		0%	0.62	5
Site Utilities		0%	0.00	0
Sub-total - Sitework		*16%*	*29.11*	*225*
Total - Construction and Sitework		*76%*	*139.30*	*1,078*
General Conditions	12.50%	9%	17.41	135
Contractor's Overhead & Profit or Fee	7.00%	6%	10.97	85
Sub-total		*91%*	*167.68*	*1,298*
Contingency for Design Development	10.00%	9%	16.77	130
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***184.45***	***1,428***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation				
Excavation, by hand	25	CY	50.00	1,250
Formwork	390	SF	15.00	5,850
Reinforcing steel	2,650	LB	1.50	3,975
Epoxy rods to existing foundation	21	EA	65.00	1,365
Concrete	19	CY	850.00	16,150
Epoxy bolts in sill plate	72	EA	100.00	7,200
Sub-Total for Substructure:				**35,790**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
New 2x12 studs with holdowns	30	EA	350.00	10,500
Plywood over existing wall framing, with edge nailing, around existing wall openings, 3/8"	3,124	SF	4.50	14,058
Install continuous strap with new 3x blocking at top of sill from exterior	430	LF	50.00	21,500
New plywood ceiling sheathing over existing diagonal framing	7,740	LF	4.00	30,960
New plywood roof sheathing to existing joists	7,740	SF	3.75	29,025
New 2x4 framing between ceiling and roof	516	SF	8.00	4,128
Replace and/or modify existing bolts from sheathing to framing above ceiling line - allow	6	LOC	750.00	4,500
Tube steel braced frame	2,686	LB	2.50	6,716
Steel channel	30	LF	37.50	1,125
Composite wood member at head of braced frames, bolted to existing	30	LF	100.00	3,000
New sill plate	30	LF	75.00	2,250
New slab on grade tied to existing	104	SF	35.00	3,640
Miscellaneous structural work	7,740	SF	1.00	7,740
Sub-Total for Structure:				**139,142**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
New exterior finish to match existing	1,174	SF	35.00	41,090
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	924	SF	85.00	78,540
Exterior doors				
New door, frame, and hardware in resized opening	8	LVS	2,500.00	20,000
Premium for panic hardware	6	LVS	950.00	5,700
New hardware on existing door	5	EA	850.00	4,250
Sub-Total for Exterior Enclosure:				**149,580**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Flashings and sheetmetal	7,740	SF	5.00	38,700
New roof covering	7,740	SF	8.00	61,920
Sub-Total for Roofing:				**100,620**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Non-bearing stud wall infill and sheathing at new braces	480	SF	14.50	6,960
Gypsum board over new structural sheathing	6,720	SF	3.00	20,160
Modify existing walls as required for clear space at doors and sinks	12	LOC	150.00	1,800
Guardrail for drinking fountain	1	PR	850.00	850

Interior doors				
New hardware on existing door	6	EA	650.00	3,900
Sub-Total for Interior Walls:				**33,670**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	7,740	SF	6.00	46,440
Wall finishes				
Paint to walls	4,288	SF	2.00	8,576
Wood wainscot, painted	2,712	SF	20.00	54,240
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 10%	538	SF	4.00	2,150
New gypsum board ceiling, painted	2,365	SF	15.00	35,475
Sub-Total for Floor, Wall & Ceiling Finishes:				**146,881**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Code required signage	7,740	SF	0.25	1,935
Toilet partitions and accessories as required	1	LS	5,000.00	5,000
Sub-Total for Equipment & Specialties:				**6,935**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
DF (N) w/(N) rough-in	1	EA	4,814.40	4,814
Classroom sink(N) w/(N) rough-in	5	EA	2,378.40	11,892
Bathroom				
WC(N) w/(N) rough-in	11	EA	4,668.00	51,348
UR(N) w/(N) rough-in	7	EA	3,045.00	21,315
LAV(N) w/(N) rough-in	5	EA	2,207.40	11,037
Demolition and cleaning	1	LS	3,679.20	3,679
Sub-Total for Plumbing :				**104,086**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	3,014.40	3,014
Cleaning (E) ductwork	1	LS	3,468.00	3,468
Testing and rebalancing (E) ductwork	1	LS	3,024.00	3,024
Sub-Total for Heating, Ventilating & Air Conditioning:				**9,506**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Recircuit existing panels	2	EA	1,050.00	2,100
Test and balance existing distribution	1	LS	840.00	840
Test existing fire alarm system	1	LS	1,680.00	1,680
Provide new fire alarm system	7,740	SF	2.75	21,285
Electrical work necessary to facilitate interior seismic modifications	360	LF	23.60	8,496
Relocate devices at backsplash of modified cabinets and counters	5	EA	630.00	3,150
Replace pendant light fixtures	5	RM	10,000.00	50,000
Sub-Total for Electrical:				**87,551**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	7,740	SF	4.37	33,808
FP system-wet:exterior openings	5	EA	1,053.60	5,268
Sub-Total for Fire Protection:				**39,076**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	104	SF	10.00	1,040
Portion of slab on grade	104	SF	15.00	1,560
Remove sill plate and cut anchor bolts	30	LF	50.00	1,500
Remove 2x4 studs and 2x4 flat above ceiling line	204	LF	15.00	3,060
Exterior wall finish to accommodate structural work	1,174	SF	15.00	17,610
Door, frame, and hardware	6	LVS	115.00	690
Hardware from existing door	11	LVS	100.00	1,100
Wall finish as required to accommodate structural work	6,720	SF	3.00	20,160
Floor finish	7,740	SF	5.00	38,700
Ceiling finish	2,365	SF	5.00	11,825
Cut opening in exterior wall for new door	2	EA	300.00	600
Exterior windows	924	SF	5.00	4,620
Roofing and roof sheathing	7,740	SF	5.00	38,700
General demolition and preparation	7,740	SF	0.25	1,935
Premium for hazmat abatement	7,740	SF	10.00	77,400
Sub-Total for Site Preparation & Demolition:				**220,500**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required	104	SF	20.00	2,080
Modify thresholds as required	275	SF	10.00	2,750
Sub-Total for Landscaping:				**4,830**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

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	GFA: 3,748 SF	%	$/SF	$,000
Substructure		0%	0.00	0
Structure		0%	0.00	0
Exterior Enclosure		35%	18.51	69
Roofing		0%	0.00	0
Sub-total - Shell & Core		*35%*	*18.51*	*69*
Interior Walls		0%	0.00	0
Floor, Wall & Ceiling Finishes		0%	0.00	0
Sub-total - Internal Finishes		*0%*	*0.00*	*0*
Equipment & Specialties		4%	1.92	7
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*4%*	*1.92*	*7*
Plumbing		4%	2.30	9
Heating, Ventilating & Air Conditioning		2%	0.80	3
Electrical		22%	11.80	44
Fire Protection		8%	4.37	16
Sub-total - Mechanical and Electrical		*36%*	*19.28*	*72*
Sub-total - Construction		*75%*	*39.70*	*149*
Site Preparation & Demolition		1%	0.47	2
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*1%*	*0.47*	*2*
Total - Construction and Sitework		*76%*	*40.18*	*151*
General Conditions	12.50%	9%	5.02	19
Contractor's Overhead & Profit or Fee	7.00%	6%	3.16	12
Sub-total		*91%*	*48.36*	*181*
Contingency for Design Development	10.00%	9%	4.84	18
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***53.20***	***199***

NOTE: Inclusions and Exclusions.

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SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Substructure:				

STRUCTURE	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Structure:				

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	816	SF	85.00	69,360
Sub-Total for Exterior Enclosure:				**69,360**

ROOFING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Roofing:				

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Interior Walls:				

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Floor, Wall & Ceiling Finishes:				

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Cabinets and casework				
Base cabinet and countertop	24	LF	300.00	7,200
Sub-Total for Equipment & Specialties:				**7,200**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
Classroom sink(N) w/(N) rough-in	3	EA	2,378.40	7,135
Demolition and cleaning	1	LS	1,500.00	1,500
Sub-Total for Plumbing :				**8,635**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
No work anticipated	1	LS	3,014.40	3,014
Sub-Total for Heating, Ventilating & Air Conditioning:				**3,014**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Provide a fire alarm installation compatible with the existing system	3,748	SF	3.80	14,242
Provide new linear fluorescent lighting	3,748	SF	8.00	29,984
Sub-Total for Electrical:				**44,226**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	3,748	SF	4.37	16,371
Sub-Total for Fire Protection:				**16,371**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Non-compliant base cabinet	24	LF	35.00	840
General demolition and preparation	3,748	SF	0.25	937
Sub-Total for Site Preparation & Demolition:				**1,777**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 9,770 SF	%	$/SF	$,000
Substructure		9%	37.79	369
Structure		15%	61.26	599
Exterior Enclosure		7%	30.29	296
Roofing		4%	15.81	155
Sub-total - Shell & Core		*35%*	*145.16*	*1,418*
Interior Walls		5%	20.64	202
Floor, Wall & Ceiling Finishes		6%	26.50	259
Sub-total - Internal Finishes		*11%*	*47.14*	*461*
Equipment & Specialties		3%	11.71	114
Stairs & Vertical Transportation		1%	3.16	31
Sub-total - Equipment and Stairs		*4%*	*14.88*	*145*
Plumbing		2%	9.92	97
Heating, Ventilating & Air Conditioning		5%	22.56	220
Electrical		7%	28.01	274
Fire Protection		1%	4.37	43
Sub-total - Mechanical and Electrical		*16%*	*64.86*	*634*
Sub-total - Construction		*65%*	*272.04*	*2,658*
Site Preparation & Demolition		10%	41.88	409
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*10%*	*41.88*	*409*
Total - Construction and Sitework		*76%*	*313.92*	*3,067*
General Conditions	12.50%	9%	39.24	383
Contractor's Overhead & Profit or Fee	7.00%	6%	24.72	242
Sub-total		*91%*	*377.88*	*3,692*
Contingency for Design Development	10.00%	9%	37.79	369
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***415.67***	***4,061***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
Reinforced concrete spread footings and stem walls, tied to existing	229	CY	1,250.00	286,250
Gravel infill	1,276	CY	65.00	82,940
Sub-Total for Substructure:				**369,190**

STRUCTURE	Quantity	Unit	Rate	Total ($)
New structure				
Reinforced concrete raised slab, tied to existing	9,770	SF	25.00	244,250
Roof framing and sheathing, tied to existing - allow	9,770	SF	30.00	293,100
Seismic joint and cover	245	LF	150.00	36,750
Miscellaneous metals and rough carpentry - allow	9,770	SF	2.50	24,425
Sub-Total for Structure:				**598,525**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
Wood stud wall framing, 2x6	3,514	SF	11.50	40,411
Wood stud wall framing, against existing walls, 2x4	3,430	SF	8.50	29,155
Plywood sheathing	3,514	SF	4.50	15,813
Batt insulation	6,944	SF	1.50	10,416
Gypsum board sheathing to interior face of exterior wall	6,944	SF	3.00	20,832
Plaster finish to exterior wall, to match existing exterior surfaces	3,514	SF	20.00	70,280
Entry canopy, timber framed	180	SF	75.00	13,500
Metal trim over extended walls by offices	1	LS	10,000.00	10,000
Miscellaneous trim and fascia - allow	3,514	SF	5.00	17,570
Modify window sill at connection with A-West	32	LF	50.00	1,600

Exterior windows				
Aluminum framed high performance thermal safety glazing	272	SF	80.00	21,760
Storefront glazing	384	SF	85.00	32,640
Exterior doors				
Hollow metal doors, frame and hardware, double	2	PR	2,800.00	5,600
Hollow metal doors, frame and hardware, single	3	EA	1,500.00	4,500
Premium for panic hardware	2	LVS	950.00	1,900
Sub-Total for Exterior Enclosure:				**295,977**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Flashings and sheetmetal	7,740	SF	5.00	38,700
New roof covering, premium single ply	7,740	SF	10.00	77,400
Skylights	256	SF	150.00	38,400
Sub-Total for Roofing:				**154,500**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Wood stud partition framing, 2x4	11,662	SF	7.50	87,465
Batt sound insulation in partitions	11,662	SF	1.00	11,662
Gypsum board partition sheathing	21,588	SF	3.00	64,764
Interior doors				
Hollow metal doors, frame and hardware, double	5	PR	2,800.00	14,000
Hollow metal doors, frame and hardware, single	17	EA	1,400.00	23,800
Coiling counter doors, fire rated				
Sub-Total for Interior Walls:				**201,691**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Ceramic floor tile and base	891	SF	21.25	18,934
Upgraded floor finish at entry	1,788	SF	17.50	31,290
Vinyl composition tile and carpet with topset rubber base	7,091	SF	5.00	35,455
Wall finishes				
Ceramic wall tile	2,184	SF	14.00	30,576
Upgraded wall finish at entry and halls	3,600	SF	10.00	36,000
Paint to walls	19,318	SF	1.00	19,318
Ceiling finishes				
Gypsum board ceiling, painted	2,788	SF	15.00	41,820
Suspended acoustic ceiling tile and grid, 2'-0" x 2'-0"	4,342	SF	4.50	19,539
Suspended acoustic ceiling tile and grid, 2'-0" x 4'-0"	2,640	SF	4.15	10,956
Gypsum board soffits, painted	1	LS	15,000.00	15,000
Sub-Total for Floor, Wall & Ceiling Finishes:				**258,888**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Signage - allow	9,770	SF	0.40	3,908
Toilet partitions and accessories	1	LS	5,000.00	5,000
Toilet accessories	1	LS	10,000.00	10,000
Toilet partitions	12	EA	1,100.00	13,200
Urinal screens	1	EA	600.00	600
Grab bars	4	PR	300.00	1,200
Mirrors	10	EA	250.00	2,500
Janitor's shelf and mop rack	1	EA	350.00	350
Fire extinguisher cabinets	1	LOT	500.00	500

Cabinets and casework				
Base cabinet and countertop	76	LF	300.00	22,800
Island cabinet	10	LF	450.00	4,500
Reception desk	34	LF	500.00	17,000
Classroom casework	60	LF	400.00	24,000
Markerboards	192	SF	15.00	2,880
Audiovisual equipment				
Projection screens and overhead projector mounts	4	EA	1,500.00	6,000
Sub-Total for Equipment & Specialties:				**114,438**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
Short stair flights				
Concrete steps including railings	168	LF	65.00	10,920
Elevators and lifts				
Wheelchair lift	1	EA	20,000.00	20,000
Sub-Total for Stairs & Vertical Transportation:				**30,920**

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
Water Closet WM	14	EA	2,140.80	29,971
Urinal	2	EA	2,077.50	4,155
Lavatory WM	10	EA	1,797.30	17,973
Janitorial Sink	1	EA	2,374.20	2,374
FCO	3	EA	285.75	857
COTG	1	EA	562.80	563
FD w/TP	2	EA	1,184.40	2,369
Pipework and accessories				
Sewer, waste and vent:				
-under slab w/ excavation	180	LF	62.82	11,308
-above slab	100	LF	52.35	5,235

Domestic water				
- water above w/ insulation to 2"	430	LF	34.94	15,026
-POC	1	EA	346.80	347
Valves and specialties	1	LS	1,280.40	1,280
Demolition and cleaning	1	LS	5,428.80	5,429
Sub-Total for Plumbing :				**96,887**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC	9,770	SF	22.41	218,946
Connect to (E)	1	LS	1,507.20	1,507
Sub-Total for Heating, Ventilating & Air Conditioning:				**220,453**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Provide new panels and feeders	2	EA	5,500.00	11,000
Test and balance existing distribution	1	LS	840.00	840
Machine and equipment power	9,770	SF	0.95	9,282
User convenience power - receptacles	9,770	SF	3.35	32,730
Lighting	9,770	SF	10.50	102,585
Specialties, grounding and dimming	9,770	SF	1.25	12,213
Telephone and communications	9,770	SF	7.00	68,390
Fire alarm system	9,770	SF	3.75	36,638
Sub-Total for Electrical:				**273,676**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	9,770	SF	4.37	42,675
Sub-Total for Fire Protection:				**42,675**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Building, complete	7,808	SF	15.00	117,120
Cut back existing roof eaves (A east & A west)	256	LF	50.00	12,800
Remove exterior window wall at library	1	LS	3,500.00	3,500
Premium for hazmat abatement	7,808	SF	10.00	78,080
Temporary utilities - allow	1	LS	100,000.00	100,000
Site preparation				
Regrade and prepare building pad as necessary	9,770	SF	10.00	97,700
Sub-Total for Site Preparation & Demolition:				**409,200**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 140,061 SF	%	$/SF	$,000
Substructure		0%	0.00	0
Structure		0%	0.00	0
Exterior Enclosure		0%	0.00	0
Roofing		0%	0.00	0
Sub-total - Shell & Core		*0%*	*0.00*	*0*
Interior Walls		0%	0.00	0
Floor, Wall & Ceiling Finishes		0%	0.00	0
Sub-total - Internal Finishes		*0%*	*0.00*	*0*
Equipment & Specialties		0%	0.00	0
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*0.00*	*0*
Plumbing		0%	0.00	0
Heating, Ventilating & Air Conditioning		0%	0.00	0
Electrical		0%	0.00	0
Fire Protection		0%	0.00	0
Sub-total - Mechanical and Electrical		*0%*	*0.00*	*0*
Sub-total - Construction		*0%*	*0.00*	*0*
Site Preparation & Demolition		6%	0.35	49
Landscaping		57%	3.54	497
Site Utilities		13%	0.78	110
Sub-total - Sitework		*76%*	*4.68*	*655*
Total - Construction and Sitework		*76%*	*4.68*	*655*
General Conditions	12.50%	9%	0.58	82
Contractor's Overhead & Profit or Fee	7.00%	6%	0.37	52
Sub-total		*91%*	*5.63*	*789*
Contingency for Design Development	10.00%	9%	0.56	79
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***6.19***	***868***

NOTE: Inclusions and Exclusions.

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective Demolition and removal				
Remove existing				
Paving at courtyard	2,617	SF	3.00	7,851
Play structure	1	LS	5,000.00	5,000
General demolition and preparation	140,061	SF	0.05	7,003
Infill courtyard - allow	582	CY	50.00	29,100
Sub-Total for Site Preparation & Demolition:				**48,954**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Regrade existing asphalt walk as required	80	SF	10.00	800
New concrete walk	404	SF	15.00	6,060
Concrete entry paving	180	SF	20.00	3,600
New concrete stair, including stainless steel railings	150	LF	135.00	20,250
New concrete ramp, including curbs and stainless steel railings	1,452	SF	175.00	254,100
New stainless steel rails to existing stairs	142	LF	200.00	28,400
Stainless steel guardrail	53	LF	300.00	15,900
Site walls				
Retaining wall at courtyard infill, including footing	186	SF	100.00	18,600
New site walls at building entry, including footing	144	SF	125.00	18,000
Site improvements				
Guardrail at site drinking fountain	2	PR	850.00	1,700
Relocate flag pole	1	EA	1,500.00	1,500
New accessible gate hardware	6	LVS	500.00	3,000
Premium for panic hardware	4	LVS	950.00	3,800
Covered lunch shelter	500	SF	75.00	37,500

New play structure to replace removed structure at raised play area	1	LS	50,000.00	50,000
Landscaping				
New landscaping and irrigation at entry	1,332	SF	25.00	33,300
Sub-Total for Landscaping:				**496,510**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
New site drinking fountain	2	EA	4,814.40	9,629
Demolition and cleaning	1	LS	173.40	173
Site fire water service for sprinklers	1	LS	100,000.00	100,000
Sub-Total for Site Utilities:				**109,802**

3. NOVEMBER 19, 2007:

COST ESTIMATE, RETROFIT OPTION

mack5

Conceptual Cost Plan

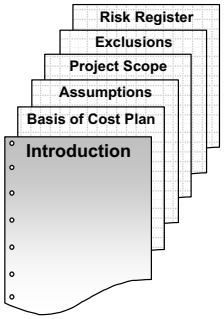
for

Havens Elementary School
Piedmont Unified School District

October 1, 2007
revised November 19, 2007
(low-cost option)

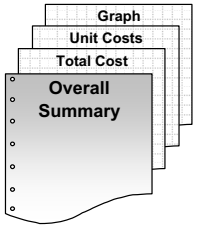
1900 Powell Street, Suite 470
Emeryville, CA 94608
ph: 510.595.3020
www.mack5.com

Page

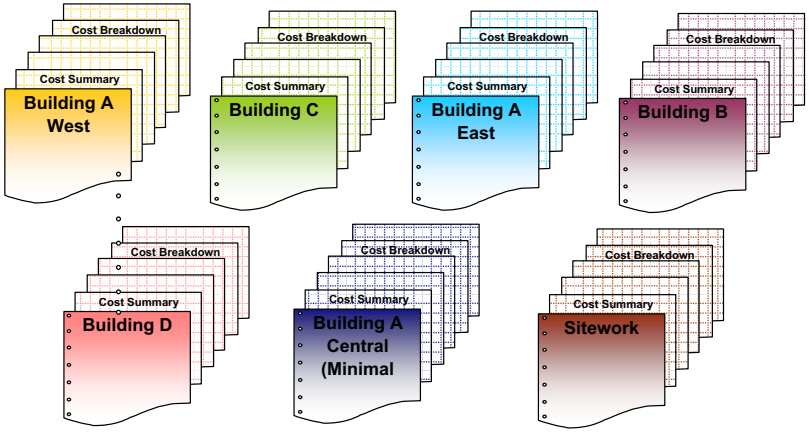


Mack5 was requested to carry out a Conceptual Cost Estimate for the proposed modernization of Haven Elementary School for the Piedmont Unified School District.

The first part of the Report contains the basis of the report, the assumptions made, description of the project scope, the exclusions to the costs and a risk register which contain items that have potential to impact cost at some point in the future.



Each detail section includes a Cost Summary and a Cost Breakdown with the detail of the scope included within the estimate.



PROJECT INTRODUCTION:	The project consists of making seismic improvements to the existing Havens Elementary School including costs for structural and non-structural seismic hazards and minor accessibility and fire life safety upgrades. New construction is included in the central portion of Building A to replace an existing non-compliant portion of the building.
ITEMS USED FOR COST PLAN:	Undated drawings
civil drawings	None
architectural drawings	By murakami/Nelson, Sheets A1.0 and A2.0
structural narrative and sketches	By R.P. Gallagher Associates, Inc., Sheets S-A1, S-A2, S-A5, S-A6, S-A7, S-A8, S-A10, S-B1, S-B2, S-B3, S-B4, S-C1, S-C2, and S-C3
mechanical narrative and plans	None
electrical narrative and plans	None
telecommunication drawings	None
specifications	None
project team meetings	Site Visit on August 24, 2007

ASSUMPTIONS

(a) The construction start date is unknown

(b) A construction period of 24 months

(c) The general contract may be bid or negotiated with qualified contractors.

(d) The general contractor will have limited access to the occupied site during business hours.

(e) Construction will be phased.

(f) The existing electrical power, fire/life safety systems are adequate for the increased loads.

(g) Owner provide materials in a timely fashion.

PROJECT SCOPE

The project consists of making seismic improvements to the existing Havens Elementary School including costs for structural and non-structural seismic hazards and minor accessibility and fire life safety upgrades. New construction is included in the central portion of Building A to replace an existing non-compliant portion of the building.

modernization

The following contains a general description of the scope of work included in each element of the estimate.

substructure

Foundation work as required for the new construction and modifications to structural systems throughout the building.

structure

Structural upgrades include upgrade of existing wall and roof framing and sheathing. Allowances are included for structure at the new construction portion of the work.

exterior enclosure

Exterior enclosure work includes patching and repair of finishes disturbed by the structural work and accessibility upgrades to doors as required. All exterior windows will be replaced. New exterior wall framing, finish, and glazing are included at the new central addition to Building A.

roof

Roofing includes new roofing throughout the affected buildings and reinstallation of the existing clay tile roof at the auditorium.

interiors

Interiors include new framing and sheathing as required to achieve fire lire safety and structural upgrades. Allowances are included for ADA upgrades of doors, frames, and hardware.

finishes

Allowances are included for patching and repairing of finishes as required by structural, fire life safety and ADA upgrades.

equipment

Equipment includes new and modified casework as required for ADA upgrades and toilet and bath accessories.

stairs and vertical transportation

Concrete ramps, steps, and wheelchair lifts as required for ADA upgrades.

plumbing

Demolition and re piping of waste and water service piping. Includes sanitary fixtures with associated waste, vent and service piping, domestic cold and hot water piping system.

hvac

HVAC work includes seismic bracing of existing systems and new HVAC work at the new central portion of Building A.

fire protection

New wet fire sprinkler system to all buildings with a premium for installation in the historic ceiling of Building C.

site preparation

Selective demolition as required for modernization work. Premiums are included for hazardous materials abatement.

electrical

Electrical includes removal and replacement necessary to facilitate seismic and fire requirements, new work as detailed on the drawings, and a new fire alarm system.

sitework

Sitework includes path of travel and parking improvements as required for ADA upgrades.

site utilities

No site utilities are anticipated for the project.

EXCLUSIONS

(a) Owner supplied and installed furniture, fixtures and equipment

(b) Security equipment and devices

(c) Design, testing, inspection or construction management fees

(d) Utility and connection fees

(e) Scope change and post contract contingencies

(f) Assessments, taxes, finance, legal and development charges

(g) Builder's risk, project wrap-up and other owner provided insurance program

(h) New electrical main service and distribution system and security systems

(i) Telephone / data active equipment and switch, sound systems, audio visual equipment and cabling

(j) Modification to existing HVAC

(k) Schedule compression

(l) Commissioning costs associated with CHPs, LEED Certification, or other programs (construction cost included as required)

(m) Deferred maintenance

(n) Programmatic changes

(o) Complete replacement of building finishes except as specifically noted (costs for selective replacement of finishes as required for modernization work is included in the estimate)

(p) Cost escalation

risk register

In the course of preparing the Cost Estimate, the following items were noted as areas of possible exposure.

(a) The existing electrical systems may not have adequate capacity for the proposed work

(b) This is a complex phased project on an occupied site which may reduce interest from potential bidders and limit the number of bidders on the project.

(c) Current market conditions are driven by limited supply of metal and consequently cost escalation and bids are unstable.

(d) The design process is early in the conceptual stage. As ideas are more fully developed there may be scope which was not anticipated in this cost estimate.

Floors	Enclosed	Covered	Covered (included at 50%)	Sub-Total	GFA
Building A West	15,390	6,175	3,088	18,478	
Building C	5,340	1,980	990	6,330	
Building A East	4,692	392	196	4,888	
Building B	7,740	0	0	7,740	
Building D	3,016	1,464	732	3,748	
Building A Central (Minimal Work)	6,110	0	0	6,110	
	42,288	10,011	5,006		47,294 SF

Total Site Area 140,061 SF

	GFA	$/SF	$,000
Building A West	18,478	153	2,834
Building C	6,330	295	1,868
Building A East	4,888	123	602
Building B	7,740	184	1,428
Building D	3,748	53	199
Building A Central (Minimal Work)	6,110	225	1,376
Sitework	140,061	6	868
Subtotal Construction and Sitework			**9,175**
Premium for phasing	5.00%		459
TOTAL CONSTRUCTION AND SITEWORK			**9,634**

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		GFA: 18,478 SF	%	$/SF	$,000
Substructure			2%	2.84	53
Structure			3%	4.40	81
Exterior Enclosure			18%	27.68	512
Roofing			15%	22.33	413
Sub-total - Shell & Core			*37%*	*57.26*	*1,058*
Interior Walls			6%	9.67	179
Floor, Wall & Ceiling Finishes			5%	7.15	132
Sub-total - Internal Finishes			*11%*	*16.82*	*311*
Equipment & Specialties			2%	2.43	45
Stairs & Vertical Transportation			0%	0.00	0
Sub-total - Equipment and Stairs			*2%*	*2.43*	*45*
Plumbing			1%	2.14	40
Heating, Ventilating & Air Conditioning			1%	1.53	28
Electrical			7%	10.20	188
Fire Protection			3%	4.74	88
Sub-total - Mechanical and Electrical			*12%*	*18.62*	*344*
Sub-total - Construction			*62%*	*95.12*	*1,758*
Site Preparation & Demolition			13%	20.46	378
Site Development			0%	0.26	5
Site Utilities			0%	0.00	0
Sub-total - Sitework			*14%*	*20.72*	*383*
Total - Construction and Sitework			*76%*	*115.84*	*2,140*
General Conditions	12.50%		9%	14.48	268
Contractor's Overhead & Profit or Fee	7.00%		6%	9.12	169
Sub-total			*91%*	*139.44*	*2,577*
Contingency for Design Development	10.00%		9%	13.94	258
Cost Escalation (to midpoint of construction)	0.00%		0%	0.00	0
TOTAL CONSTRUCTION BUDGET		***August, 2007***	***100%***	***153.39***	***2,834***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation in two pours				
Excavation, by hand	25	CY	50.00	1,250
Formwork	240	SF	15.00	3,600
Reinforcing steel	1,000	LB	1.50	1,500
Steel plate with non-shrink grout, anchored to existing foundation	48	EA	500.00	24,000
Epoxy rods to existing foundation	72	EA	65.00	4,680
Concrete	10	CY	350.00	3,500
Epoxy bolts in sill plate	24	EA	250.00	6,000
Connect new wall brace to existing foundation	16	LOC	500.00	8,000
Sub-Total for Substructure:				**52,530**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
Patch slab on grade as required	16	LOC	250.00	4,000
New diagonal braces at exterior wall between existing pipe columns	288	LF	75.00	21,600
New wall braces; welded plate diagonals	320	LF	50.00	16,000
New 2x stud with holdown internailed to existing framing	8	EA	350.00	2,800
Miscellaneous structural work	18,478	SF	2.00	36,956
Sub-Total for Structure:				**81,356**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
New soffit finish	6,175	SF	30.00	185,250

Exterior windows				
New windows in existing openings, high performance thermal safety glazing	3,584	SF	85.00	304,640
Exterior doors				
New door, frame, and hardware in resized opening	1	LVS	2,500.00	2,500
New door in modified frame with sidelite	2	PR	3,000.00	6,000
New hardware to existing door	11	LVS	850.00	9,350
Premium for panic hardware	4	LVS	950.00	3,800
Sub-Total for Exterior Enclosure:				**511,540**

ROOFING		Unit	Rate	Total ($)
Roof coverings				
Patch and repair underlayment/ sheathing as required	20,637	SF	1.50	30,956
Flashings and sheetmetal	20,637	SF	5.00	103,185
New roof covering, premium single ply	20,637	SF	10.00	206,370
New skylights in existing openings, high performance thermal safety glazing with integrated shading and ventilation	480	SF	150.00	72,000
Sub-Total for Roofing:				**412,511**

INTERIOR WALLS		Unit	Rate	Total ($)
Interior partitions				
Non-structural framing and sheathing at new diagonal bracing	2,304	SF	10.00	23,040
Guardrail for drinking fountain	1	PR	850.00	850
Interior glazing				
Clear safety glass in existing openings	2,240	SF	65.00	145,600

Interior doors				
New hardware to existing door	14	LVS	650.00	9,100
Sub-Total for Interior Walls:				**178,590**

FLOOR, WALL & CEILING FINISHES		Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	15,390	SF	6.00	92,340
Wall finishes				
Paint to walls	12,224	SF	2.00	24,448
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 25%	3,848	SF	4.00	15,392
Sub-Total for Floor, Wall & Ceiling Finishes:				**132,180**

EQUIPMENT & SPECIALTIES		Unit	Rate	Total ($)
Cabinets and casework				
Base cabinet and countertop	132	LF	300.00	39,600
Code required signage	18,478	SF	0.25	4,620
Toilet and bath accessories				
Allow for single occupancy toilet	1	LS	750.00	750
Sub-Total for Equipment & Specialties:				**44,970**

STAIRS & VERTICAL TRANSPORTATION		Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING		Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in				
Classrooms				
Sink(N) w/(N) rough-in	12	EA	2,378.40	28,541
Bathroom				
WC(N) w/(N) rough-in	1	EA	4,668.00	4,668
Drinking fountain, (N) w/(N) rough-in	1	EA	4,814.40	4,814
Demolition and cleaning	1	LS	1,600.80	1,601
Sub-Total for Plumbing :				**39,624**

HEATING, VENTILATING & AIR CONDITIONING		Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	10,536.00	10,536
Cleaning (E) ductwork	1	LS	8,721.60	8,722
Testing and rebalancing (E) ductwork	1	LS	9,072.00	9,072
Sub-Total for Heating, Ventilating & Air Conditioning:				**28,330**

ELECTRICAL		Unit	Rate	Total ($)
Electrical systems within building				
Provide new fire alarm system - allow	18,478	SF	2.75	50,815
Electrical work necessary to facilitate exterior steel brace frame additions				N/A
Electrical work necessary to facilitate interior steel brace frame addition	8	EA	1,260.00	10,080
Relocate devices at backsplash of modified cabinets and counters	12	EA	630.00	7,560
Replace pendant light fixtures	12	RM	10,000.00	120,000
Sub-Total for Electrical:				**188,455**

FIRE PROTECTION		Unit	Rate	Total ($)
Fire protection system-wet	18,478	SF	4.37	80,712
Fire protection system riser	1	LS	6,854.40	6,854
Sub-Total for Fire Protection:				**87,566**

SITE PREPARATION & DEMOLITION		Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	240	SF	10.00	2,400
Portion of slab on grade	144	SF	15.00	2,160
Exterior windows	3,584	SF	5.00	17,920
Soffit finish	6,175	SF	5.00	30,875
Skylights	480	SF	10.00	4,800
Roofing	20,637	SF	3.00	61,911
Cut back roof eave - allow	224	LF	35.00	7,840
Door, frame, and hardware	5	LVS	115.00	575
Hardware from existing door	25	LVS	100.00	2,500
Wall finish and non-structural framing as required to accommodate structural work	1,152	SF	7.50	8,640
Interior glazing	2,240	SF	5.00	11,200
Floor finish	15,390	SF	2.00	30,780
Plastic ceiling at skylights	480	SF	5.00	2,400

Non-compliant base cabinet	132	LF	35.00	4,620
General demolition and preparation	18,478	SF	0.25	4,620
Premium for hazmat abatement	18,478	SF	10.00	184,780
Sub-Total for Site Preparation & Demolition:				**378,021**

SITE DEVELOPMENT		Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required	240	SF	20.00	4,800
Sub-Total for Site Development:				**4,800**

SITE UTILITIES		Unit	Rate	Total ($)
No work included				
Sub-Total for Site Utilities:				

	GFA: 6,330 SF	%	$/SF	$,000
Substructure		3%	8.41	53
Structure		5%	13.70	87
Exterior Enclosure		13%	39.17	248
Roofing		11%	31.08	197
Sub-total - Shell & Core		*31%*	*92.36*	*585*
Interior Walls		2%	5.12	32
Floor, Wall & Ceiling Finishes		16%	45.85	290
Sub-total - Internal Finishes		*17%*	*50.97*	*323*
Equipment & Specialties		0%	0.63	4
Stairs & Vertical Transportation		3%	10.27	65
Sub-total - Equipment and Stairs		*4%*	*10.90*	*69*
Plumbing		1%	3.25	21
Heating, Ventilating & Air Conditioning		0%	1.42	9
Electrical		2%	7.21	46
Fire Protection		5%	15.09	95
Sub-total - Mechanical and Electrical		*9%*	*26.97*	*171*
Sub-total - Construction		*61%*	*181.20*	*1,147*
Site Preparation & Demolition		14%	40.08	254
Landscaping		1%	1.58	10
Site Utilities		0%	0.00	0
Sub-total - Sitework		*14%*	*41.66*	*264*
Total - Construction and Sitework		*76%*	*222.85*	*1,411*
General Conditions	12.50%	9%	27.86	176
Contractor's Overhead & Profit or Fee	7.00%	6%	17.55	111
Sub-total		*91%*	*268.26*	*1,698*
Contingency for Design Development	10.00%	9%	26.83	170
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***295.09***	***1,868***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation tied to existing				
Excavation, by hand	47	CY	50.00	2,350
Formwork	640	SF	15.00	9,600
Reinforcing steel	6,450	LB	1.50	9,675
Epoxy rods to existing foundation	320	EA	65.00	20,800
Concrete	36	CY	300.00	10,800
Sub-Total for Substructure:				**53,225**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
New 2x12 studs with holdowns	26	EA	350.00	9,100
Plywood over existing wall framing, with edge nailing, around existing wall openings, 3/4"	4,548	SF	5.25	23,877
Install continuous strap with new 3x blocking at top of sill from exterior	204	LF	50.00	10,200
New plywood roof sheathing over existing 1x6 diagonal sheathing	5,303	SF	4.00	21,212
New slab on grade tied to existing	276	SF	35.00	9,660
Miscellaneous structural work	6,330	SF	2.00	12,660
Sub-Total for Structure:				**86,709**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
Exterior wall framing and sheathing	210	SF	25.00	5,250
New exterior finish to match existing	5,832	SF	25.00	145,800
Exterior windows				
Reglaze existing historic windows	576	SF	125.00	72,000

Exterior doors				
Install automatic opener on existing historic pair entry door	2	PR	6,500.00	13,000
New door, frame, and hardware in resized opening	4	LVS	2,500.00	10,000
Premium for panic hardware	2	LVS	950.00	1,900
Sub-Total for Exterior Enclosure:				**247,950**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Reinstall salvaged roof tiles at auditorium, allow for 10% breakage	5,303	SF	10.00	53,030
Repair or replace to match historic copper gutters and downspouts as required - allow	1	LOT	15,000.00	15,000
New lightweight transparent canopy, complete	1,980	SF	65.00	128,700
Sub-Total for Roofing:				**196,730**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Interior partition framing and sheathing at toilet room	570	SF	17.50	9,975
Modify partition as required for clear space	1	LOC	150.00	150

Interior doors				
New door, frame, and hardware	3	EA	1,750.00	5,250
New door, frame, and hardware in resized openings	1	LVS	2,500.00	2,500
Install automatic opener on existing historic pair entry door	2	PR	6,500.00	13,000
New hardware to existing door	2	LVS	650.00	1,300
Fix existing interior door in closed position	1	EA	250.00	250
Sub-Total for Interior Walls:				**32,425**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Patch floor finishes as required at structural work	210	SF	50.00	10,500
Premium for modifying terrazzo	240	SF	30.00	7,200
New floor finishes at modified restrooms	144	SF	20.00	2,880
Wall finishes				
Miscellaneous finish work, historic premiums - allow	6,330	SF	35.00	221,550
Paint to new walls	1,500	SF	1.50	2,250
Ceiling finishes				
Reinstall auditorium ceiling panels	2,184	SF	20.00	43,680
Gypsum board ceiling at modified restrooms	144	SF	15.00	2,160
Sub-Total for Floor, Wall & Ceiling Finishes:				**290,220**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Cabinets and casework				
Modify base cabinet at sink	3	LF	300.00	900
Code required signage	6,330	SF	0.25	1,583

Toilet partitions and accessories				
Accessories for single-occupancy toilet	2	LS	750.00	1,500
Sub-Total for Equipment & Specialties:				**3,983**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
Short stair flights				
New concrete stair flight and landing with stainless steel guardrails	2	FLT	7,500.00	15,000
Elevators and lifts				
Wheelchair lift, complete	2	EA	25,000.00	50,000
Sub-Total for Stairs & Vertical Transportation:				**65,000**

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in				
Modify restroom				
WC(N) w/(N) rough-in	2	EA	5,121.60	10,243
Lav.(N) w/(N) rough-in	2	EA	2,717.28	5,435
Kitchen				
Kitchen Sink - (N) w/ (N) rough-in	1	EA	4,005.60	4,006
Demolition and cleaning	1	LS	920.40	920
Sub-Total for Plumbing :				**20,604**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	2,352.96	2,353
Cleaning (E) ductwork	1	LS	3,921.60	3,922
Testing and rebalancing (E) ductwork	1	LS	2,721.60	2,722
Sub-Total for Heating, Ventilating & Air Conditioning:				**8,996**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical work within building				
Stage lift connection	1	EA	2,500.00	2,500
Electrified door connections	4	EA	2,750.00	11,000
Rework historic pendant light fixtures	1	LS	10,000.00	10,000
Electrical work necessary to facilitate interior seismic modifications	200	LF	23.60	4,720
Fire alarm system	6,330	SF	2.75	17,408
Sub-Total for Electrical:				**45,628**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet, concealed in historic ceiling	6,330	SF	15.09	95,497
Sub-Total for Fire Protection:				**95,497**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	472	SF	10.00	4,720
Portion of slab on grade	168	SF	15.00	2,520
Exterior wall finish and sheathing to accommodate structural work	5,832	SF	10.00	58,320
Door, frame, and hardware	2	LVS	115.00	230
Hardware from existing door	2	LVS	100.00	200
Interior partition	16	LF	25.00	400
Wall finish as required to accommodate structural work	1,512	SF	3.00	4,536
Floor finish	210	SF	5.00	1,050
Portion of stage for new lift	1	LS	1,500.00	1,500
Concrete canopy and columns	880	SF	25.00	22,000

Remove, salvage, and store existing				
Wood wall paneling for reinstallation	720	SF	25.00	18,000
Auditorium ceiling panels for reinstallation	2,184	SF	10.00	21,840
Clay roof tiles for reinstallation	5,303	SF	8.00	42,424
General demolition and preparation	6,330	SF	2.00	12,660
Premium for hazmat abatement	6,330	SF	10.00	63,300
Sub-Total for Site Preparation & Demolition:				**253,700**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required at removed canopies	1	LS	10,000.00	10,000
Sub-Total for Landscaping:				**10,000**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 4,888 SF	%	$/SF	$,000
Substructure		2%	2.41	12
Structure		3%	3.98	19
Exterior Enclosure		7%	8.93	44
Roofing		16%	19.62	96
Sub-total - Shell & Core		*28%*	*34.94*	*171*
Interior Walls		7%	8.67	42
Floor, Wall & Ceiling Finishes		9%	11.22	55
Sub-total - Internal Finishes		*16%*	*19.89*	*97*
Equipment & Specialties		0%	0.25	1
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*3 0.25*	*1*
Plumbing		1%	1.57	8
Heating, Ventilating & Air Conditioning		1%	1.23	6
Electrical		11%	13.86	68
Fire Protection		4%	4.58	22
Sub-total - Mechanical and Electrical		*17%*	*21.25*	*104*
Sub-total - Construction		*62%*	*76.33*	*373*
Site Preparation & Demolition		14%	16.69	82
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*14%*	*16.69*	*82*
Total - Construction and Sitework		*76%*	*93.02*	*455*
General Conditions	12.50%	9%	11.63	57
Contractor's Overhead & Profit or Fee	7.00%	6%	7.33	36
Sub-total		*91%*	*111.97*	*547*
Contingency for Design Development	10.00%	9%	11.20	55
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***123.17***	***602***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation				
Excavation, by hand	12	CY	50.00	600
Formwork	190	SF	15.00	2,850
Reinforcing steel	1,300	LB	1.50	1,950
Epoxy rods to existing foundation	8	EA	350.00	2,800
Concrete	12	CY	300.00	3,600
Sub-Total for Substructure:				**11,800**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
Infill existing openings in wall and sheath with plywood	276	SF	35.00	9,660
Miscellaneous structural work	4,888	SF	2.00	9,776
Sub-Total for Structure:				**19,436**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
Infill exterior wall opening to match existing - allow	56	SF	50.00	2,800
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	352	SF	85.00	29,920

Exterior doors				
New door, frame, and hardware in resized opening	3	LVS	2,500.00	7,500
New door in modified frame with sidelite	1	EA	2,500.00	2,500
Premium for panic hardware	1	LVS	950.00	950
Sub-Total for Exterior Enclosure:				**43,670**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Patch and repair underlayment/ sheathing as required	5,084	SF	1.50	7,626
Flashings and sheetmetal	5,084	SF	5.00	25,420
New roof covering, premium single ply	5,084	SF	10.00	50,840
New skylights in existing openings, high performance thermal safety glazing with integrated shading and ventilation	80	SF	150.00	12,000
Sub-Total for Roofing:				**95,886**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Interior partition framing and sheathing	1,164	SF	17.50	20,370
Gypsum board over new structural sheathing	552	SF	3.00	1,656
Guardrail for drinking fountain	1	PR	850.00	850
Interior doors				
New door, frame, and hardware	4	EA	1,750.00	7,000
New door, frame, and hardware in resized openings	5	LVS	2,500.00	12,500
Sub-Total for Interior Walls:				**42,376**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	4,692	SF	6.00	28,152
Wall finishes				
Paint to walls	2,492	SF	2.00	4,984
Plywood wall paneling to match existing	680	SF	25.00	17,000
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 25%	1,173	SF	4.00	4,692
Sub-Total for Floor, Wall & Ceiling Finishes:				**54,828**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Code required signage	4,888	SF	0.25	1,222
Sub-Total for Equipment & Specialties:				**1,222**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
DF (N) w/(N) rough-in	1	EA	4,814.40	4,814
Sink Dbl(N) w/(N) rough-in (Art)	1	EA	2,594.40	2,594
Demolition and cleaning	1	LS	274.80	275
Sub-Total for Plumbing :				**7,684**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	2,140.80	2,141
Cleaning (E) ductwork	1	LS	2,080.80	2,081
Testing and rebalancing (E) ductwork	1	LS	1,814.40	1,814
Sub-Total for Heating, Ventilating & Air Conditioning:				**6,036**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Recircuit existing panels	2	EA	1,050.00	2,100
Test and balance existing distribution	1	LS	840.00	840
Test existing fire alarm system	1	LS	1,680.00	1,680
Kiln connection	1	EA	3,500.00	3,500
Receptacles at new classrooms	25	EA	350.00	8,750
Linear lighting at new classrooms	160	LF	125.00	20,000
Light fixtures at library area	10	EA	475.00	4,750
Exit lights	3	E	725.00	2,175
Modifications to library lighting	1	LS	6,400.00	6,400
Lighting controls	1	LS	3,500.00	3,500
Provide new fire alarm system - allow	4,888	SF	2.75	13,442
Relocate devices at cabinets and modified cabinets and counters	1	EA	630.00	630
Sub-Total for Electrical:				**67,767**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection system-wet	4,888	SF	4.37	21,351
FP system-wet:exterior openings	1	EA	1,053.60	1,054
Sub-Total for Fire Protection:				**22,404**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Exterior windows	352	SF	5.00	1,760
Roofing	5,084	SF	3.00	15,252
Skylights	80	SF	10.00	800
Cut back roof eave - allow	96	LF	35.00	3,360
Door, frame, and hardware	8	LVS	115.00	920
Floor finish	4,692	SF	2.00	9,384
General demolition and preparation	4,888	SF	0.25	1,222
Premium for hazmat abatement	4,888	SF	10.00	48,880
Sub-Total for Site Preparation & Demolition:				**81,578**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 7,740 SF	%	$/SF	$,000
Substructure		3%	4.62	36
Structure		10%	17.98	139
Exterior Enclosure		10%	19.33	150
Roofing		7%	13.00	101
Sub-total - Shell & Core		*30%*	*54.93*	*425*
Interior Walls		2%	4.35	34
Floor, Wall & Ceiling Finishes		10%	18.98	147
Sub-total - Internal Finishes		*13%*	*23.33*	*181*
Equipment & Specialties		0%	0.90	7
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*0.90*	*7*
Plumbing		7%	13.45	104
Heating, Ventilating & Air Conditioning		1%	1.23	10
Electrical		6%	11.31	88
Fire Protection		3%	5.05	39
Sub-total - Mechanical and Electrical		*17%*	*31.04*	*240*
Sub-total - Construction		*60%*	*110.19*	*853*
Site Preparation & Demolition		15%	28.49	221
Landscaping		0%	0.62	5
Site Utilities		0%	0.00	0
Sub-total - Sitework		*16%*	*29.11*	*225*
Total - Construction and Sitework		*76%*	*139.30*	*1,078*
General Conditions	12.50%	9%	17.41	135
Contractor's Overhead & Profit or Fee	7.00%	6%	10.97	85
Sub-total		*91%*	*167.68*	*1,298*
Contingency for Design Development	10.00%	9%	16.77	130
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***184.45***	***1,428***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
New concrete foundation				
Excavation, by hand	25	CY	50.00	1,250
Formwork	390	SF	15.00	5,850
Reinforcing steel	2,650	LB	1.50	3,975
Epoxy rods to existing foundation	21	EA	65.00	1,365
Concrete	19	CY	850.00	16,150
Epoxy bolts in sill plate	72	EA	100.00	7,200
Sub-Total for Substructure:				**35,790**

STRUCTURE	Quantity	Unit	Rate	Total ($)
Strengthen existing structure				
New 2x12 studs with holdowns	30	EA	350.00	10,500
Plywood over existing wall framing, with edge nailing, around existing wall openings, 3/8"	3,124	SF	4.50	14,058
Install continuous strap with new 3x blocking at top of sill from exterior	430	LF	50.00	21,500
New plywood ceiling sheathing over existing diagonal framing	7,740	LF	4.00	30,960
New plywood roof sheathing to existing joists	7,740	SF	3.75	29,025
New 2x4 framing between ceiling and roof	516	SF	8.00	4,128
Replace and/or modify existing bolts from sheathing to framing above ceiling line - allow	6	LOC	750.00	4,500
Tube steel braced frame	2,686	LB	2.50	6,716
Steel channel	30	LF	37.50	1,125
Composite wood member at head of braced frames, bolted to existing	30	LF	100.00	3,000
New sill plate	30	LF	75.00	2,250
New slab on grade tied to existing	104	SF	35.00	3,640
Miscellaneous structural work	7,740	SF	1.00	7,740
Sub-Total for Structure:				**139,142**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior walls				
New exterior finish to match existing	1,174	SF	35.00	41,090
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	924	SF	85.00	78,540
Exterior doors				
New door, frame, and hardware in resized opening	8	LVS	2,500.00	20,000
Premium for panic hardware	6	LVS	950.00	5,700
New hardware on existing door	5	EA	850.00	4,250
Sub-Total for Exterior Enclosure:				**149,580**

ROOFING	Quantity	Unit	Rate	Total ($)
Roof coverings				
Flashings and sheetmetal	7,740	SF	5.00	38,700
New roof covering	7,740	SF	8.00	61,920
Sub-Total for Roofing:				**100,620**

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Non-bearing stud wall infill and sheathing at new braces	480	SF	14.50	6,960
Gypsum board over new structural sheathing	6,720	SF	3.00	20,160
Modify existing walls as required for clear space at doors and sinks	12	LOC	150.00	1,800
Guardrail for drinking fountain	1	PR	850.00	850

Interior doors				
New hardware on existing door	6	EA	650.00	3,900
Sub-Total for Interior Walls:				**33,670**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Vinyl composition tile and carpet with topset rubber base, including preparation of floor to receive new finish	7,740	SF	6.00	46,440
Wall finishes				
Paint to walls	4,288	SF	2.00	8,576
Wood wainscot, painted	2,712	SF	20.00	54,240
Ceiling finishes				
Replace damaged ceiling tiles as required - allow 10%	538	SF	4.00	2,150
New gypsum board ceiling, painted	2,365	SF	15.00	35,475
Sub-Total for Floor, Wall & Ceiling Finishes:				**146,881**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Code required signage	7,740	SF	0.25	1,935
Toilet partitions and accessories as required	1	LS	5,000.00	5,000
Sub-Total for Equipment & Specialties:				**6,935**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
DF (N) w/(N) rough-in	1	EA	4,814.40	4,814
Classroom sink(N) w/(N) rough-in	5	EA	2,378.40	11,892
Bathroom				
WC(N) w/(N) rough-in	11	EA	4,668.00	51,348
UR(N) w/(N) rough-in	7	EA	3,045.00	21,315
LAV(N) w/(N) rough-in	5	EA	2,207.40	11,037
Demolition and cleaning	1	LS	3,679.20	3,679
Sub-Total for Plumbing :				**104,086**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
HVAC - seismic upgrading	1	LS	3,014.40	3,014
Cleaning (E) ductwork	1	LS	3,468.00	3,468
Testing and rebalancing (E) ductwork	1	LS	3,024.00	3,024
Sub-Total for Heating, Ventilating & Air Conditioning:				**9,506**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Recircuit existing panels	2	EA	1,050.00	2,100
Test and balance existing distribution	1	LS	840.00	840
Test existing fire alarm system	1	LS	1,680.00	1,680
Provide new fire alarm system	7,740	SF	2.75	21,285
Electrical work necessary to facilitate interior seismic modifications	360	LF	23.60	8,496
Relocate devices at backsplash of modified cabinets and counters	5	EA	630.00	3,150
Replace pendant light fixtures	5	RM	10,000.00	50,000
Sub-Total for Electrical:				**87,551**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	7,740	SF	4.37	33,808
FP system-wet:exterior openings	5	EA	1,053.60	5,268
Sub-Total for Fire Protection:				**39,076**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Portion of exterior slab	104	SF	10.00	1,040
Portion of slab on grade	104	SF	15.00	1,560
Remove sill plate and cut anchor bolts	30	LF	50.00	1,500
Remove 2x4 studs and 2x4 flat above ceiling line	204	LF	15.00	3,060
Exterior wall finish to accommodate structural work	1,174	SF	15.00	17,610
Door, frame, and hardware	6	LVS	115.00	690
Hardware from existing door	11	LVS	100.00	1,100
Wall finish as required to accommodate structural work	6,720	SF	3.00	20,160
Floor finish	7,740	SF	5.00	38,700
Ceiling finish	2,365	SF	5.00	11,825
Cut opening in exterior wall for new door	2	EA	300.00	600
Exterior windows	924	SF	5.00	4,620
Roofing and roof sheathing	7,740	SF	5.00	38,700
General demolition and preparation	7,740	SF	0.25	1,935
Premium for hazmat abatement	7,740	SF	10.00	77,400
Sub-Total for Site Preparation & Demolition:				**220,500**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Patch and repair courtyard paving as required	104	SF	20.00	2,080
Modify thresholds as required	275	SF	10.00	2,750
Sub-Total for Landscaping:				**4,830**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 3,748 SF	%	$/SF	$,000
Substructure		0%	0.00	0
Structure		0%	0.00	0
Exterior Enclosure		35%	18.51	69
Roofing		0%	0.00	0
Sub-total - Shell & Core		*35%*	*18.51*	*69*
Interior Walls		0%	0.00	0
Floor, Wall & Ceiling Finishes		0%	0.00	0
Sub-total - Internal Finishes		*0%*	*0.00*	*0*
Equipment & Specialties		4%	1.92	7
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*4%*	*1.92*	*7*
Plumbing		4%	2.30	9
Heating, Ventilating & Air Conditioning		2%	0.80	3
Electrical		22%	11.80	44
Fire Protection		8%	4.37	16
Sub-total - Mechanical and Electrical		*36%*	*19.28*	*72*
Sub-total - Construction		*75%*	*39.70*	*149*
Site Preparation & Demolition		1%	0.47	2
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*1%*	*0.47*	*2*
Total - Construction and Sitework		*76%*	*40.18*	*151*
General Conditions	12.50%	9%	5.02	19
Contractor's Overhead & Profit or Fee	7.00%	6%	3.16	12
Sub-total		*91%*	*48.36*	*181*
Contingency for Design Development	10.00%	9%	4.84	18
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***53.20***	***199***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Substructure:				

STRUCTURE	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Structure:				

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior windows				
New windows in existing openings, high performance thermal safety glazing	816	SF	85.00	69,360
Sub-Total for Exterior Enclosure:				**69,360**

ROOFING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Roofing:				

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Interior Walls:				

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Floor, Wall & Ceiling Finishes:				

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Cabinets and casework				
Base cabinet and countertop	24	LF	300.00	7,200
Sub-Total for Equipment & Specialties:				**7,200**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Stairs & Vertical Transportation:				

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
Classroom sink(N) w/(N) rough-in	3	EA	2,378.40	7,135
Demolition and cleaning	1	LS	1,500.00	1,500
Sub-Total for Plumbing :				**8,635**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
No work anticipated	1	LS	3,014.40	3,014
Sub-Total for Heating, Ventilating & Air Conditioning:				**3,014**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Provide a fire alarm installation compatible with the existing system	3,748	SF	3.80	14,242
Provide new linear fluorescent lighting	3,748	SF	8.00	29,984
Sub-Total for Electrical:				**44,226**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	3,748	SF	4.37	16,371
Sub-Total for Fire Protection:				**16,371**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Non-compliant base cabinet	24	LF	35.00	840
General demolition and preparation	3,748	SF	0.25	937
Sub-Total for Site Preparation & Demolition:				**1,777**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 6,110 SF	%	$/SF	$,000
Substructure		4%	9.81	60
Structure		5%	10.68	65
Exterior Enclosure		2%	5.24	32
Roofing		0%	0.00	0
Sub-total - Shell & Core		*11%*	*25.72*	*157*
Interior Walls		10%	21.68	132
Floor, Wall & Ceiling Finishes		5%	10.50	64
Sub-total - Internal Finishes		*14%*	*32.18*	*197*
Equipment & Specialties		5%	11.43	70
Stairs & Vertical Transportation		2%	5.32	33
Sub-total - Equipment and Stairs		*7%*	*16.75*	*102*
Plumbing		9%	20.27	124
Heating, Ventilating & Air Conditioning		8%	17.50	107
Electrical		11%	25.00	153
Fire Protection		3%	7.50	46
Sub-total - Mechanical and Electrical		*31%*	*70.27*	*429*
Sub-total - Construction		*64%*	*144.93*	*886*
Site Preparation & Demolition		11%	25.17	154
Landscaping		0%	0.00	0
Site Utilities		0%	0.00	0
Sub-total - Sitework		*11%*	*25.17*	*154*
Total - Construction and Sitework		*76%*	*170.09*	*1,039*
General Conditions	12.50%	9%	21.26	130
Contractor's Overhead & Profit or Fee	7.00%	6%	13.39	82
Sub-total		*91%*	*204.75*	*1,251*
Contingency for Design Development	10.00%	9%	20.48	125
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***225.23***	***1,376***

NOTE: Inclusions and Exclusions.

SUBSTRUCTURE	Quantity	Unit	Rate	Total ($)
Foundations				
Modify slab on grade as required for new footings	1,248	SF	25.00	31,200
New concrete foundations, epoxy doweled to existing	23	CY	1,250.00	28,750
Sub-Total for Substructure:				**59,950**

STRUCTURE	Quantity	Unit	Rate	Total ($)
New structure				
New plywood wall sheathing	1,456	SF	5.00	7,280
New wood posts	56	LF	10.00	560
Patch roof framing as required	1	LS	10,000.00	10,000
New steel braced frames	6,500	LB	4.00	26,000
Miscellaneous structural - allow	6,110	SF	3.50	21,385
Sub-Total for Structure:				**65,225**

EXTERIOR ENCLOSURE	Quantity	Unit	Rate	Total ($)
Exterior windows				
Replace existing glazing with tempered - allow	400	SF	80.00	32,000
Sub-Total for Exterior Enclosure:				**32,000**

ROOFING	Quantity	Unit	Rate	Total ($)
Sub-Total for Roofing:				

INTERIOR WALLS	Quantity	Unit	Rate	Total ($)
Interior partitions				
Modify existing interior partition for 2 hour rating	1,568	SF	25.00	39,200
New interior partition framing and sheathing, 2 hour rating	1,281	SF	35.00	44,835
Interior doors				
New interior steel door, frame, and hardware with hold opens, double	4	PR	3,500.00	14,000
Premium for 20 minute rating at door	8	LVS	150.00	1,200
New door, frame, and hardware in resized opening	5	LVS	2,500.00	12,500
New hardware to existing door	15	LVS	750.00	11,250
Premium for panic hardware	10	LVS	950.00	9,500
Sub-Total for Interior Walls:				**132,485**

FLOOR, WALL & CEILING FINISHES	Quantity	Unit	Rate	Total ($)
Floor finishes				
Patch and repair as required	6,110	SF	4.00	24,440
Wall finishes				
Patch and repair as required	6,110	SF	2.00	12,220
Ceiling finishes				
Patch and repair as required	6,110	SF	4.50	27,495
Sub-Total for Floor, Wall & Ceiling Finishes:				**64,155**

EQUIPMENT & SPECIALTIES	Quantity	Unit	Rate	Total ($)
Signage - allow	6,110	SF	0.40	2,444
Toilet partitions and accessories				
Toilet accessories	1	LS	10,000.00	10,000
Toilet partitions	12	EA	1,100.00	13,200
Urinal screens	1	EA	600.00	600
Grab bars	4	PR	300.00	1,200
Mirrors	10	EA	250.00	2,500
Janitor's shelf and mop rack	1	EA	350.00	350
Fire extinguisher cabinets	1	LOT	500.00	500
Cabinets and casework				
Remove existing casework	20	LF	35.00	700
New base cabinet and countertop	20	LF	275.00	5,500
New sink with new rough-in	12	EA	2,306.50	27,678
New sink with new rough-in at nurse's office	1	EA	2,306.50	2,307
Markerboards	192	SF	15.00	2,880
Sub-Total for Equipment & Specialties:				**69,859**

STAIRS & VERTICAL TRANSPORTATION	Quantity	Unit	Rate	Total ($)
Short stair flights				
Modify existing as required	1	LS	7,500.00	7,500
Elevators and lifts				
Wheelchair lift	1	EA	25,000.00	25,000
Sub-Total for Stairs & Vertical Transportation:				**32,500**

PLUMBING	Quantity	Unit	Rate	Total ($)
Sanitary fixtures, connection piping, including rough-in:				
Modify staff restrooms as required	169	SF	70.00	11,830
Modify student restrooms as required	720	SF	150.00	108,000
Plumbing trade demolition and cleaning	1	LS	4,000.00	4,000
Sub-Total for Plumbing :				**123,830**

HEATING, VENTILATING & AIR CONDITIONING	Quantity	Unit	Rate	Total ($)
Modify existing as required	6,110	SF	17.50	106,925
Sub-Total for Heating, Ventilating & Air Conditioning:				**106,925**

ELECTRICAL	Quantity	Unit	Rate	Total ($)
Electrical systems within building				
Modify existing as required	6,110	SF	25.00	152,750
Sub-Total for Electrical:				**152,750**

FIRE PROTECTION	Quantity	Unit	Rate	Total ($)
Fire protection				
Fire protection system-wet	6,110	SF	7.50	45,825
Sub-Total for Fire Protection:				**45,825**

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective demolition and removal				
Remove existing				
Building interior, selective	6,110	SF	12.50	76,375
Cut back existing roof eaves (A east & A west)	256	LF	50.00	12,800
Remove exterior window wall at library	1	LS	3,500.00	3,500
Premium for hazmat abatement	6,110	SF	10.00	61,100
Sub-Total for Site Preparation & Demolition:				**153,775**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Landscaping:				

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
No work anticipated				
Sub-Total for Site Utilities:				

	GFA: 140,061 SF	%	$/SF	$,000
Substructure		0%	0.00	0
Structure		0%	0.00	0
Exterior Enclosure		0%	0.00	0
Roofing		0%	0.00	0
Sub-total - Shell & Core		*0%*	*0.00*	*0*
Interior Walls		0%	0.00	0
Floor, Wall & Ceiling Finishes		0%	0.00	0
Sub-total - Internal Finishes		*0%*	*0.00*	*0*
Equipment & Specialties		0%	0.00	0
Stairs & Vertical Transportation		0%	0.00	0
Sub-total - Equipment and Stairs		*0%*	*0.00*	*0*
Plumbing		0%	0.00	0
Heating, Ventilating & Air Conditioning		0%	0.00	0
Electrical		0%	0.00	0
Fire Protection		0%	0.00	0
Sub-total - Mechanical and Electrical		*0%*	*0.00*	*0*
Sub-total - Construction		*0%*	*0.00*	*0*
Site Preparation & Demolition		6%	0.35	49
Landscaping		57%	3.54	497
Site Utilities		13%	0.78	110
Sub-total - Sitework		*76%*	*4.68*	*655*
Total - Construction and Sitework		*76%*	*4.68*	*655*
General Conditions	12.50%	9%	0.58	82
Contractor's Overhead & Profit or Fee	7.00%	6%	0.37	52
Sub-total		*91%*	*5.63*	*789*
Contingency for Design Development	10.00%	9%	0.56	79
Cost Escalation (to midpoint of construction)	0.00%	0%	0.00	0
TOTAL CONSTRUCTION BUDGET	***August, 2007***	***100%***	***6.19***	***868***

NOTE: Inclusions and Exclusions.

SITE PREPARATION & DEMOLITION	Quantity	Unit	Rate	Total ($)
Selective Demolition and removal				
Remove existing				
Paving at courtyard	2,617	SF	3.00	7,851
Play structure	1	LS	5,000.00	5,000
General demolition and preparation	140,061	SF	0.05	7,003
Infill courtyard - allow	582	CY	50.00	29,100
Sub-Total for Site Preparation & Demolition:				**48,954**

LANDSCAPING	Quantity	Unit	Rate	Total ($)
Pedestrian paving				
Regrade existing asphalt walk as required	80	SF	10.00	800
New concrete walk	404	SF	15.00	6,060
Concrete entry paving	180	SF	20.00	3,600
New concrete stair, including stainless steel railings	150	LF	135.00	20,250
New concrete ramp, including curbs and stainless steel railings	1,452	SF	175.00	254,100
New stainless steel rails to existing stairs	142	LF	200.00	28,400
Stainless steel guardrail	53	LF	300.00	15,900
Site walls				
Retaining wall at courtyard infill, including footing	186	SF	100.00	18,600
New site walls at building entry, including footing	144	SF	125.00	18,000
Site improvements				
Guardrail at site drinking fountain	2	PR	850.00	1,700
Relocate flag pole	1	EA	1,500.00	1,500
New accessible gate hardware	6	LVS	500.00	3,000
Premium for panic hardware	4	LVS	950.00	3,800
Covered lunch shelter	500	SF	75.00	37,500

New play structure to replace removed structure at raised play area	1	LS	50,000.00	50,000
Landscaping				
New landscaping and irrigation at entry	1,332	SF	25.00	33,300
Sub-Total for Landscaping:				**496,510**

SITE UTILITIES	Quantity	Unit	Rate	Total ($)
New site drinking fountain	2	EA	4,814.40	9,629
Demolition and cleaning	1	LS	173.40	173
Site fire water service for sprinklers	1	LS	100,000.00	100,000
Sub-Total for Site Utilities:				**109,802**

SECTION III: APPENDIX

1. MARCH 31, 2008:

PROJECT STATUS & INFORMATION AVAILABILITY MATRIX

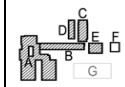
PIEDMONT SEISMIC SAFETY PROGRAM

PIEDMONT UNIFIED SCHOOL DISTRICT

PROJECT STATUS

MARCH 31, 2008

murakami/Nelson Architectural Corp.
Job No.: 0629 - PUSD Seismic

School / Site	Abbreviation	Building Designation	Building Name	Seismic Tier 1	Revised Seismic Tier 1	Letter From Fitch & Fleisner on Seismic Performance*	ATI Report (Accessibility / Seismic Performance)	Included in Scope Of Work (for mN)	Qualitative Seismic Assessment by R.P. Gallagher	Qualitative Seismic Assessment by Peer Reviewer	Benchmark Building	Seismic Tier 2	Seismic Non-Structural Hazard Report	ADA / Access Evaluation	Life Safety Evaluation	Materials Testing Spring 2007	Materials Testing Summer 2007	Materials Testing Fall 2007	Materials Testing Winter 2007	Destructive Testing Spring 2007	Destructive Testing Summer 2007	Destructive Testing Fall 2007	Slope Stability Analysis	Peer Review and Investigation and Analysis	Peer Review Site Specific Spectra	Peer Review Non-Structural	Peer Review of Concept Design	Peer Review of Schematic Design	Peer Review of Design Development	Peer Review of 100% Construction Documents	Existing Hazardous Materials Reports in mN's possession	Hazardous Materials Report by Hazard Management Services, Inc.	Topographical Survey	Title Report	Boundary Survey	Existing Geotechnical Reports	Existing Structural Calculations in mN's possession	Existing Specifications in mN's possession	Measured Drawings - Architectural	Measured Drawings - Structural	DSA Drawings in mN's possession	DSA Drawing Date	DSA Number for Drawings	Drawings	Architect	Concept Plan	Cost Estimate (1)	Refined Concept Plan Vignes	Cost Estimate (2)	Comments
Havens Elementary School	HES																																																
		A	Admin. / Kindergarten Wings	●			●	●	×			●	●	●	●	●				●				●	●	●	●	○	○	○	●	○	●	●	●	×	×	×	×	×	●	5/29/1954	11628	original	Warnecke & Warnecke	●	●	●	●	
																																									●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.					
																																									●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect					
		B	Second Grade	●			●	●	×			●	●	●	●	●				●				●	●	●	●	○	○	○	●	○	●	●	●	×	×	×	×	×	●	2/27/1936	1444	original	John J. Donovan, Architect	●	●	●	●	
																																									●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Eng.					
																																									●	5/25/1970	851..?	Rehabilitation (not built)	Richard C. Marshall, Chester Bowles Jr.					
																																									●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architect					
		C	Ellen Driscoll Playhouse	●			●	●	×			●	●	●	●	●				●				●	●	●	●	○	○	○	●	○	●	●	●	×	×	×	×	×	●	9/23/1940	3415	original	John J. Donovan, Architect	●	●	●	●	
																																									●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Engineers					
		D	First Grade	●			●	●				○	●	●	●	×				×				●	×	●	●	○	○	○	●	○	●	●	●	×	×	×	×	×	●	2/17/1961	20815	original	Clarence W. Mayhew	●	●	●	●	
		E	Multi-Purpose Gym	×			●	●			●		●	●	●	×				×				●	×	●	●	○	○	○	●	×	●	●	●	●	×	×	×	×	●	5/20/1998	67713	original - phase I	Byrens Associates	●	●	×	×	
																																									●	9/24/1998	67713	original - phase II	Byrens Associates					
		F	After-School Program (City Owned)	×			×	●																								●											-	-	-						
		G	Portables	×			×	●																								●											-	-	-						

LEGEND

- ○ NEEDED/IN PROGRESS
- ● YES / OK / COMPLETE
- ○ DO NOT HAVE
- ● NON CONCLUSIVE
- × NOT NECESSARY
- ○ Pending Authorization
- ● NO
- Shaded Area Indicates Tier 2 Seismic Analysis.

FRANK C. HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

Seismic Strengthening Program / Measure E Bond Program

Final Investigation and Analysis Report for Three Priority Buildings:

STRUCTURAL, ADA/ACCESSIBILITY & FIRE/LIFE-SAFETY

July 13, 2007

Building A - Kindergarten / Administration

Building B - Second Grade

Building C - Ellen Driscoll Theatre

R. P. Gallagher Associates, Inc.
Structural and Earthquake Engineering

murakami Nelson
ARCHITECTURAL CORPORATION

Executive Summary

Havens Elementary School
Evaluation and Analysis

murakami/Nelson has been retained by the Piedmont Unified School District to evaluate buildings at the five school campuses and district corporation yard for seismic safety and related accessibility and fire & life safety deficiencies and to design corrections of those deficiencies as part of the Measure E Bond Program. As part of this global objective we have evaluated the three priority buildings at Haven's Elementary School for ADA/accessibility and Fire/Life-Safety. All three buildings, Kindergarten/ Administration (Building A), Second Grade (Building B), and The Ellen Driscoll Theatre (Building C) have major barriers to accessibility as well as life-safety deficiencies

The project is divided into three phases - Evaluation and Analysis, Concept Design and Design/Construction Document/Construction. This Evaluation and Analysis phase has identified deficiencies; later phases of the project will conceptualize and design corrections of those deficiencies.

To assist us in this effort we have assembled a consultant team comprised of R. P. Gallagher Associates for structural engineering, Geomatrix for geo-hazard and site spectra analysis, Applied Materials Engineering for materials testing and inspection and Sandis for surveying. We have been assisted by Capital Program Management (CPM), the District's Program Manager; School Superintendent Constance Hubbard and Assistant Superintendent Michael Brady; Principal Tery Susman; District staff and maintenance staff. In support of the Bond process we have met with the District's Technical Advisory Committee (TAC), the Structural Subcommittee of the TAC, the Steering Committee and the Citizen's Oversight Committee (COC). We also have met with the Division of the State Architect (DSA) and with Theodore Zsutty, the Peer Reviewer selected for Havens Elementary School Buildings.

Accessibility Evaluation

The three priority buildings were evaluated for accessibility conformance with the ADA and the related ADAAG regulations and the 2001 California Building Code. The evaluation process included review of applicable codes, review of existing documents and site investigations to verify actual field conditions. The buildings in general had a number of deficiencies and in particular have significant barriers to access that will likely have to be corrected as part of the seismic project.

Building A (Kindergarten/Administration building) – Designed to mitigate the grade change along the east side of the campus, this building has three distinct floor elevations connected by a series of ramps and stairs, none of which meet current accessibility codes. Many required exit doors are of insufficient width, have thresholds that are too high or lack compliant signage.

Building B (Second Grade building) – The oldest building on the campus, is a rectilinear building with classrooms on the west side, book ended by toilet rooms, with a hallway on the east. This building has had only minor alterations since its original construction in 1935 and has numerous accessibility barriers. Many required exit doors are of insufficient width.

Building C (Ellen Driscoll Auditorium) – The Auditorium is a free-standing building with its main entrance on Highland Avenue. All required exit doors are of insufficient width. There are essentially no provisions for people with disabilities. There is no permanent assistive listening system, the stage is not accessible and the toilet rooms do not meet fixture count for men or women, nor are they accessible.

Fire & Life Safety Evaluation

The buildings were evaluated for life safety in conformance with the 2001 California Building Code. In general the buildings have a number of life safety deficiencies. In addition, non-rated wood frame construction along with restricted exiting routes and no fire sprinklers has created life-safety deficiencies. The evaluation process included review of applicable codes, review of existing documents and site investigations to verify actual field conditions.

Building A (Kindergarten/Administration building) – This building exceeds the allowable area for Type V-N Construction. None of the hallways meet current fire-rated construction requirements for exit corridors. On the east side and a portion of the south side of the building the exterior walls are within 10 feet of the property line and are not of one-hour construction nor do they have protected openings. Many required exit doors are of insufficient width.

Building B (Second Grade building) – On the east side of the building the exterior walls are within 10 feet of the property line and are not of one-hour construction nor do they have protected openings. The hallway is not rated. Many required exit doors are of insufficient width.

Building C (Ellen Driscoll Auditorium) – This building is not of none-hour construction nor is it sprinklered. All required exit doors are of insufficient width.

Geo-Hazards and Site Spectra

Geomatrix has conducted a geo-hazards study for all five school campuses. That study states that the Hayward fault "dominates the ground motion hazard for the PUSD school sites." Their report noted that the school sites are all roughly the same distance from that fault and will experience similar ground motions during an earthquake. The sites were evaluated for site stability, liquefaction and surface rupture; none of these failure mechanisms will be a factor at these sites. All the sites have a thin layer of fill or soil deposits over rock; therefore, rock site conditions were used to characterize the ground motions at all sites. Geomatrix also developed site specific spectra for ground motions that will be used in the design of mitigations of the seismic deficiencies at Havens Elementary School.

Seismic Evaluation

This project is classified by DSA as a voluntary seismic upgrade which allows the School District to select the criteria for the evaluation and the upgrade in conformance with recognized standards and with DSA's concurrence. This process requires that a peer reviewer be retained to independently verify the results of the study and the proposed mitigations. The buildings were evaluated for life safety risk using ASCE Standard 31, a recognized standard.

Tier 2 Seismic Analyses and Tier 1 Non-Structural Seismic Hazards Studies have been completed for each of the buildings. None of the buildings meet the life safety criteria of ASCE 31. The findings of the structural study are as follows:

Building A (Kindergarten/Administration building) – The rod bracing system used to brace the longitudinal direction of the two classroom wings is greatly overstressed and will likely fail in a major earthquake, jeopardizing the safety of the two wings. The administration/library portion of the building has some structural deficiencies, but these are not believed to result in serious life safety risks.

Building B (Second Grade building) – The building has very weak longitudinal shear walls and is very damageable in this direction. This is because walls on both the east and west sides of the building are penetrated with many windows and doors, and the remaining solid walls (i.e., shear walls) have insufficient strength.

Building C (Ellen Driscoll Auditorium) – The Auditorium has weak shear walls on the north and south sides of the building and the proscenium shear wall at the stage is greatly overstressed. The footings for the proscenium shear walls are too small for the forces imposed on them. Both concrete canopies have overstressed columns and footings that are too small.

The three buildings, plus Buildings D and E (First Grade and Mulit-Use), were also surveyed for nonstructural hazards, and several significant hazards were found. These include unanchored gas ranges and ovens and overhead ordinary glass in hallways and at exit doors. With a few exceptions, tall bookcases and storage cabinets throughout the three buildings are anchored.

Conclusions

- It is recommended that the buildings be seismically strengthened to correct the structural deficiencies found. FEMA 356 criteria will be used for the initial strengthening design. This was the generally recognized criteria for strengthening existing buildings when this report was prepared.

- Based on structural, accessibility and fire & life safety evaluations, we believe it is feasible to strengthen and mitigate the deficiencies in the buildings and at the same time preserve their basic functional and architectural character.

- This report summarizes the investigative phase of work at Havens. The results of the structural investigation have been peer reviewed and the reviewer concurs with the results of the evaluation and related conclusions. This report will serve as the background for the next phase of work, the concept design, which will explore solutions.

Building A - hallway A48

Building A - room A36 looking north

Building A - classroom A15 looking south

Building A - hallway A20 looking west

Building A - science room A34 looking northwest

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Building C - painted paneled ceiling

1. INTRODUCTION

1. INTRODUCTION

A. Project Scope

In March of 2006, the City of Piedmont voters passed Measure E, a $56 million bond to address seismic safety in the Piedmont Unified School District (PUSD).

To assist the District in managing the seismic program, the PUSD engaged Capital Program Management, Inc. (CPM), to oversee program planning and implementation. The School Board has formed a Steering Committee to oversee the management of all bond projects and serve as a communications hub; a Technical Advisory Committee to advise the Steering Committee about the technical aspects of the project; and a Citizens Oversight Committee to ensure that funds are appropriately and prudently spent. Additionally, an extensive public engagement effort has been set up to both educate the community about the progress of the project and to elicit comments and feedback.

murakami/Nelson was selected to evaluate school buildings, develop design solutions, prepare construction documents and oversee construction projects. Assisting us in this effort is R. P. Gallagher Associates, structural engineers. The initial work effort has focused on three priority buildings at Havens Elementary School. They are the Kindergarten/Administration/Library (Building A), the Second Grade wing (Building B) and the Ellen Driscoll Theatre (Building C). R. P. Gallagher Associates has completed their Tier 2 seismic and Tier 1 non-structural hazards analysis of these buildings and provided that information to the School Board and design team. This Accessibility and Life-Safety report is the second part of a multi-phased effort to define the seismic, accessibility and life-safety deficiencies at Havens.

The basis of this report are the existing approved drawings from the Department of the State Architect (DSA), field investigations conducted by *murakami*/Nelson, the ATI "Accessibility Review" dated 10/6/05 provided by the District, and an existing conditions topographic survey by Sandis. After reviewing existing documentation and verifying existing conditions *murakami*/Nelson created electronic drawing base files to serve as the framework for the project.

Building C - looking east toward Highland Ave.

Building B - looking north toward Building A

Building A - library looking west

B. Application of California Building Code

Since there are often varied interpretations with use of the California Building Code (CBC), the School District has engaged DSA in a discussion about the PUSD Voluntary Seismic Upgrade Program. In May 2006 DSA representatives attended a special meeting of the School Board to discuss the District's program and how individual projects would involve compliance with fire, life safety and accessibility requirements of the (CBC). *murakami*/Nelson continued that discussion with a follow on meeting with DSA on February 9, 2007. At that meeting DSA indicated a willingness to work with the District on the extent of compliance with the current (CBC). Such determinations would be made on a case by case basis and relate to the specifics of each project. It should be mentioned that the (CBC) has been rewritten in its entirety and is based on the ICC code with California amendments. This new code will be published in July, 2007 and will be enforceable in January, 2008. Once published, the new California Building Code will will be the basis of evaluating PUSD buildings. Until that time, we are using the current CBC.

C. Future Considerations

During the next phase of the project programmatic, maintenance and sustainability issues will be considered as an integral part of the Bond project. Where those issues are not integrally linked to the seismic work, then the District may decide to use Modernization or other funding sources to implement changes.

Key Plan:

D. Building Descriptions

Haven's Elementary School is made up of five buildings which have been constructed over the past 70 years. Three of these buildings, (referred to as Buildings A, B & C in this report), were identified as "priority buildings" during the District's Tier 1 seismic safety evaluation process.

Building A	**The Administrative/Kindergarten Building**, built in 1954, houses the main school entrance on Oakland Avenue, the administration offices, the library (which was originally designed as a cafetorium), and twelve classrooms. The design of this building attempted to resolve the difference in elevation across the site by having three distinct levels, connected by ramps. Currently, the classroom wings of this building have been vacated and classes have been relocated to new portable buildings on site to address seismic safety concerns.
Building B	**The Second Grade Building**, built in 1935, is a long linear classroom building with bathrooms at each end.
Building C	**The Ellen Driscoll Theatre**, built in 1940, is a performing arts auditorium with stage. Similar auditoriums by the same architect and built about the same time are located at Beach Elementary School and Wildwood Elementary School. The mission revival building has architectural merit including hand painted ceiling panels.
Building D	The Third Grade Building, built in 1961 is a non-priority building and will be analyzed for non-structural seismic hazards, accessibility and life-safety during the next phase of the project (concept design).
Building E	The Multipurpose Building, built in 1998 is a non-priority building and will be analyzed for non-structural seismic hazards, accessibility and life-safety during the next phase of the project (concept design).

Note: An after school program is located in a portable building owned by the City of Piedmont and is not part of this study.

Building A - main entry

Building A - lower courtyard

2. ADA / ACCESIBILITY

2. ADA /ACCESSIBILITY.

A. Background:

School facilities in California are required by law to provide equal access for students, teachers, staff and visitors. At the Federal level the empowering legislation is the Americans with Disabilities Act or ADA. Under that law ADAAG regulations were written to describe the accessibility requirements for the entire country. The ADAAG regulations are enforced by civil action. At the State level accessibility is governed by the California Building Code. In the case of public school buildings the California Building Code is enforced by the Division of the State Architect or DSA.

The State of California is in the process of getting the California Building Code certified by the Department of Justice as meeting ADAAG. Until that occurs architects must comply with both the ADAAG and the California Building Code. *murakami*/Nelson has used both documents in evaluating the priority buildings at Havens.

The California Building Code requires whenever more than $120,000 (*adjusted for inflation each year*) worth of work other than for maintenance or replacement of finishes is done in any three year period for an existing building, that access compliance work be included as part of that project. Section 1134B of the California Building Code requires that alteration work within an existing building comply with the current Code and that additional access work, as stipulated in the Code, be done in areas outside the alteration.

Because seismic upgrade projects often affect areas throughout a school the State Attorney General has issued an interpretation (DSA Document 96-01) that access work triggered by a seismic strengthening project need only provide an accessible primary entrance, sanitary facilities, signs, telephone (if provided), drinking fountain and an accessible path of travel to those facilities, but not an accessible path of travel to the area of all the alterations as Section 1134B.2 of the Building Code requires. Use of this interpretation by DSA for the Piedmont Seismic project remains to be resolved.

The voluntary seismic strengthening work the District is planning will trigger substantial compliance with the access requirements of Section 1134. Furthermore, if State modernization funds are used for the projects, then all the requirements of Section 1134 would be triggered.

B. Summary & Analysis:

This report has made use of the ATI report and its precursor the Hiserman & Mead Access Survey, with field verification of existing conditions.

Havens Elementary School has major barriers to an accessible path of travel from the public way to the school on site and within the buildings. Building A and Building B are connected via hallway, while Building C is essentially a distinct building. Although ultimately, the scope of construction will trigger what areas need to be brought into compliance with current codes, this report focuses on a comprehensive look at deficiencies. It should be noted that although Building C is not a designated landmark, it may qualify for hardship if a case can be made that accessibility upgrades will harm the fabric of the building.

Site:

The site is bounded by streets on all four sides and has loading and unloading provisions on at least three. There is a grade change of over fourteen feet from one end of the site to the other. There are at least four distinct building floor elevations whose primary connections are by stair or ramp. None of the stairs or ramps (with the exception of some temporary aluminum ramps) fully meets code. Examples are ramps that are too steep, landings are too small and handrails that don't extend far enough.

The main campus entry is on Oakland Avenue. There is a designated accessible on-street parking space adjacent to the main entry. However, the cross surface slope exceeds allowable limits, and there are other barriers along the path to the main doors. On Bonita Avenue there is a student drop-off zone which has no accessible parking space, or accessible path of travel: a grade change of over six feet is accessed by stairs only. On Highland Aveenue which is adjacent to the Ellen Driscoll Theatre, there is an accessible parking space and a clear path of travel to Building C, but not to other buildings. Access to the rest of the campus from Highland Avenue has multiple barriers.

There is very little directional or informational signage throughout the site.

Buildings:

There are numerous barriers to the path of travel within the buildings. Most door assemblies are not accessible. Examples of deficiencies include the width of openings, required clearspace and landing size, elevation change at thresholds, improper door hardware, etc. Hallways have both interrupting stairways and non-compliant ramps, both of which present barriers to people with disabilities. Examples are stairways with landings that are too small and/or have encroachments (door swings), handrails that don't extend far enough, tread nosings not identified, etc. Ramps are too steep, too long, do not provide proper landings, have handrails that don't extend far enough, etc.

All bathrooms have significant barriers to accessibility. In building A there has been a recent renovation with an attempt to provide one accessible toilet stall and one accessible lavatory in both the Boys and Girls rooms. We could not locate DSA approved plans for this work. There is no path of travel to or within these two bathrooms. The upgrades do not meet full accessibility. Bathrooms in buildings B and C appear to be in original condition and do not comply with current codes.

Neither one of the kitchens in buildings A nor C is accessible. Sinks, counters and work surfaces do not provide adequate heights, knee space, reach range, etc. Faucets are not accessible. In almost all classrooms, where sinks, counters and work surfaces are provided, they do not provide adequate heights, knee space, reach range, etc.

There is very little directional or informational signage throughout the campus. Directional path of travel signage, where occurs, is difficult to follow. Room identification signage is minimal and does not include Braille or properly mounted heights and locations.

ACCESSIBILITY NOTES:

GENERAL NOTES:

1. ALMOST ALL DOOR ASSEMBLIES ARE NOT ACCESSIBLE. OPERATING HARDWARE, CLOSING FORCE, THRESHOLD & BARRIERS, CLEARSPACE, LANDINGS & IN SOME INSTANCES WIDTH OF OPENING ARE DEFICIENT.

2. SIGNAGE THROUGHOUT IS NOT COMPLIANT. DIRECTIONAL SIGNAGE IS MISSING. ALL ROOM IDENTIFICATION SIGNAGE WHERE PROVIDED IS NON COMPLIANT.

3. NO ACCESSIBLE PATH OF TRAVEL SIGNAGE.

01 NO ACCESSIBLE DROP-OFF / LOADING SPACE.

02 SURFACE SLOPE EXCEEDS 20%.

03 PATH OF TRAVEL TOO NARROW.

04 NO ACCESSIBLE ROUTE (RAMP) @ STAIR.

05A ENTRANCE / EXIT DOOR ASSEMBLY NOT ACCESSIBLE: MAJOR BARRIERS SUCH AS INSUFFICIENT WIDTH OF OPENING, LANDINGS TOO SMALL, INSUFFICIENT CLEAR SPACE, ETC. MAY ALSO INCLUDE 05B DEFICIENCIES.

05B ENTRANCE / EXIT DOOR ASSEMBLY NOT ACCESSIBLE: MINOR BARRIER SUCH AS OPERATING HARDWARE, EXCESSIVE CLOSING FORCE, THRESHOLD, ETC.

06 HANDRAILS NOT ACCESSIBLE.

07 GATE NOT ACCESSIBLE.

08 RAMP EXCEEDS MAX. ALLOWABLE SLOPE (1:12).

09 DRINKING FOUNTAIN NOT ACCESSIBLE.

10 STAIR & HANDRAILS NOT ACCESSIBLE.

11 SLIDING DOOR NOT ACCESSIBLE.

12 TELEPHONE NOT ACCESSIBLE.

13 CABINETRY & COUNTERS NOT ACCESSIBLE.

14 BATHROOM NOT ACCESSIBLE.

15 KITCHEN NOT ACCESSIBLE.

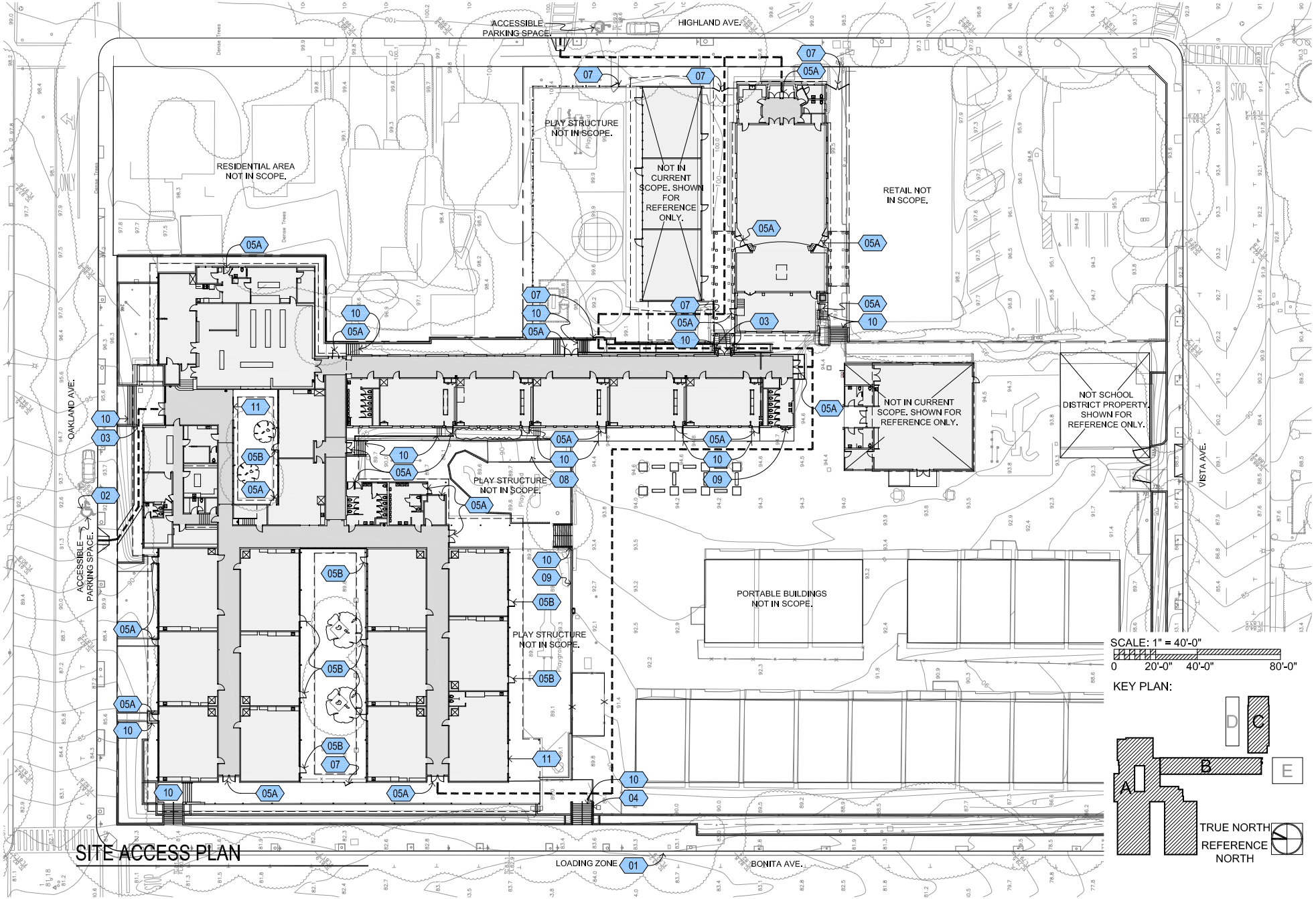
16 LANDING TOO SMALL.

17 SINK NOT ACCESSIBLE.

18 SIGNAGE NOT COMPLIANT.

19 NO ASSISTED LISTENING PROVIDED.

20 STAGE NOT ACCESSIBLE.

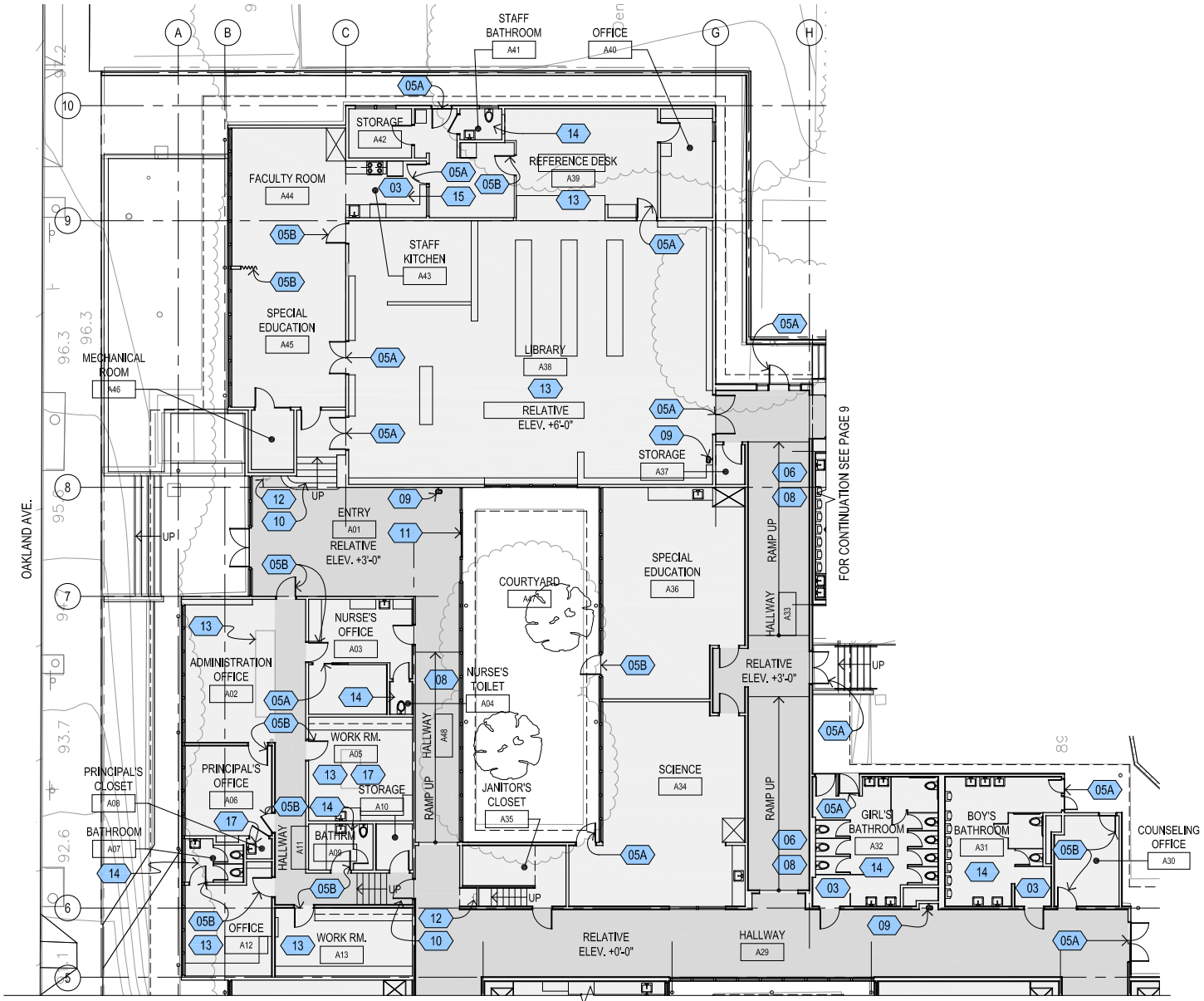


SITE ACCESS PLAN

HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

ada / accessibility



BUILDING A - FLOOR PLAN (1 OF 2)

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0 8'-0" 16'-0" 32'-0"

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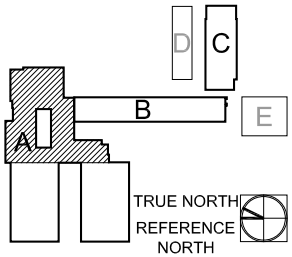
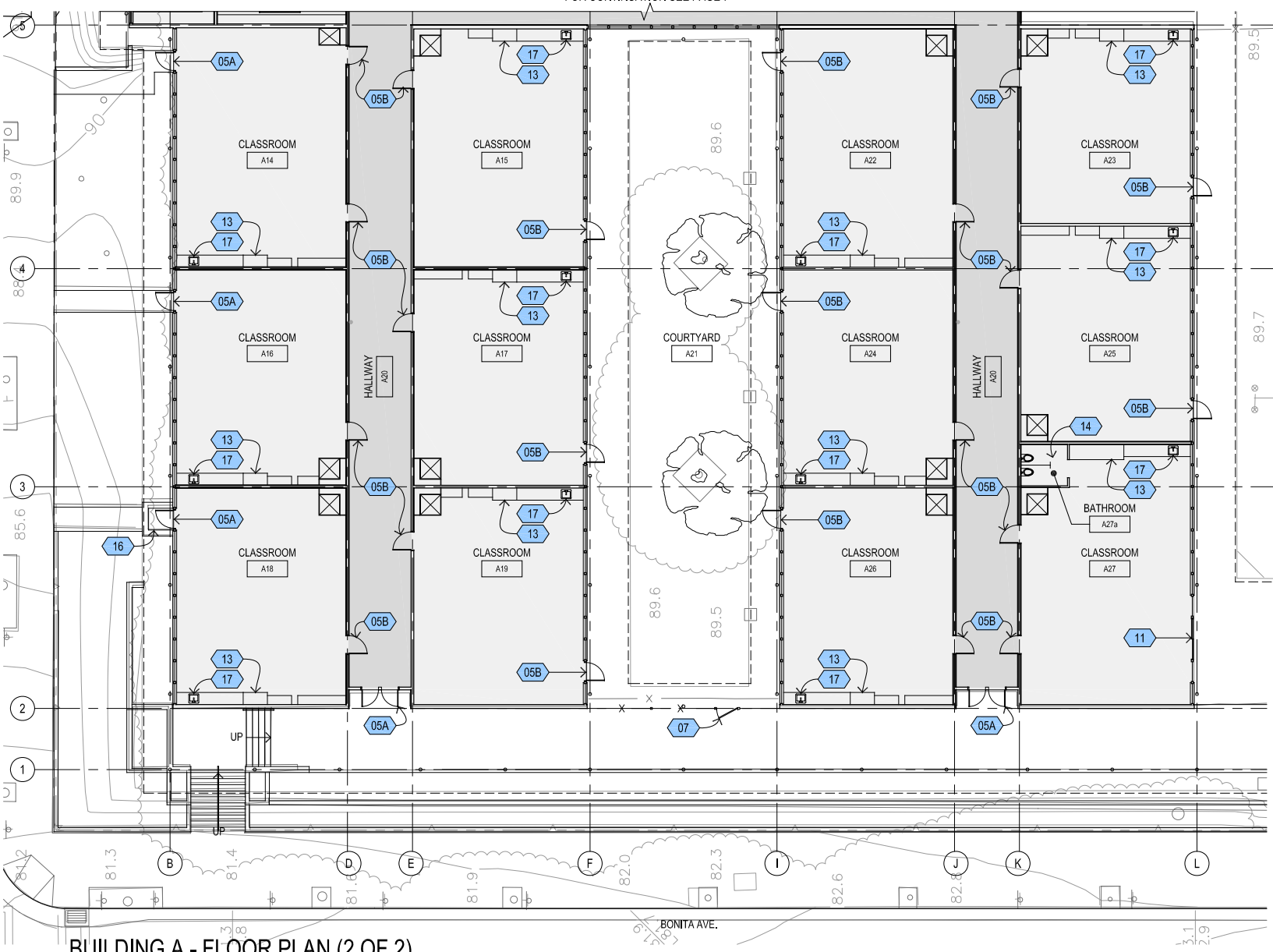


ada / accessibility

FOR CONTINUATION SEE PAGE 7



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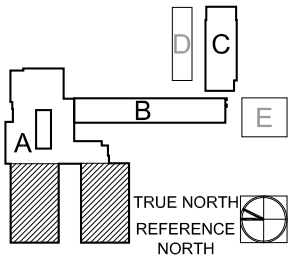
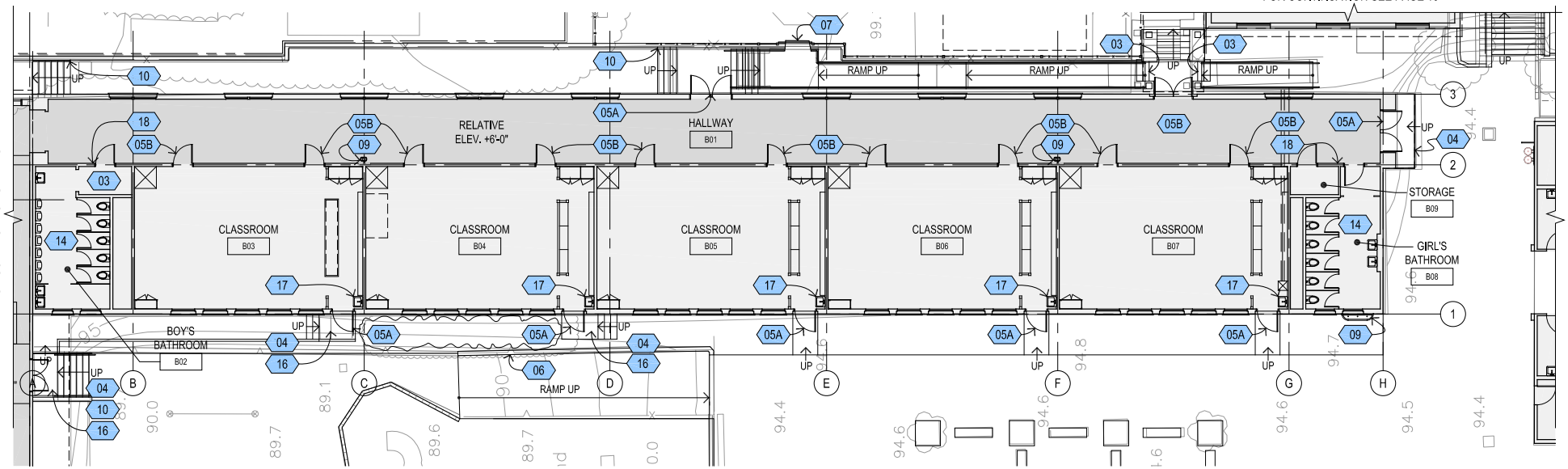


BUILDING A - FLOOR PLAN (2 OF 2)

ada / accessibility

FOR CONTINUATION SEE PAGE 10

FOR CONTINUATION SEE PAGE 7



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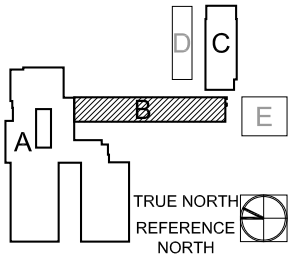
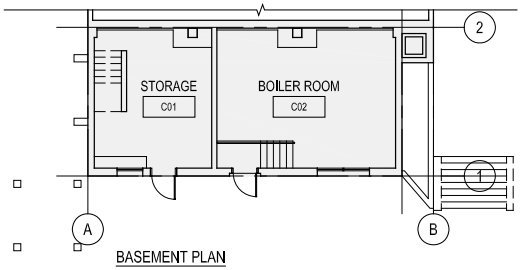
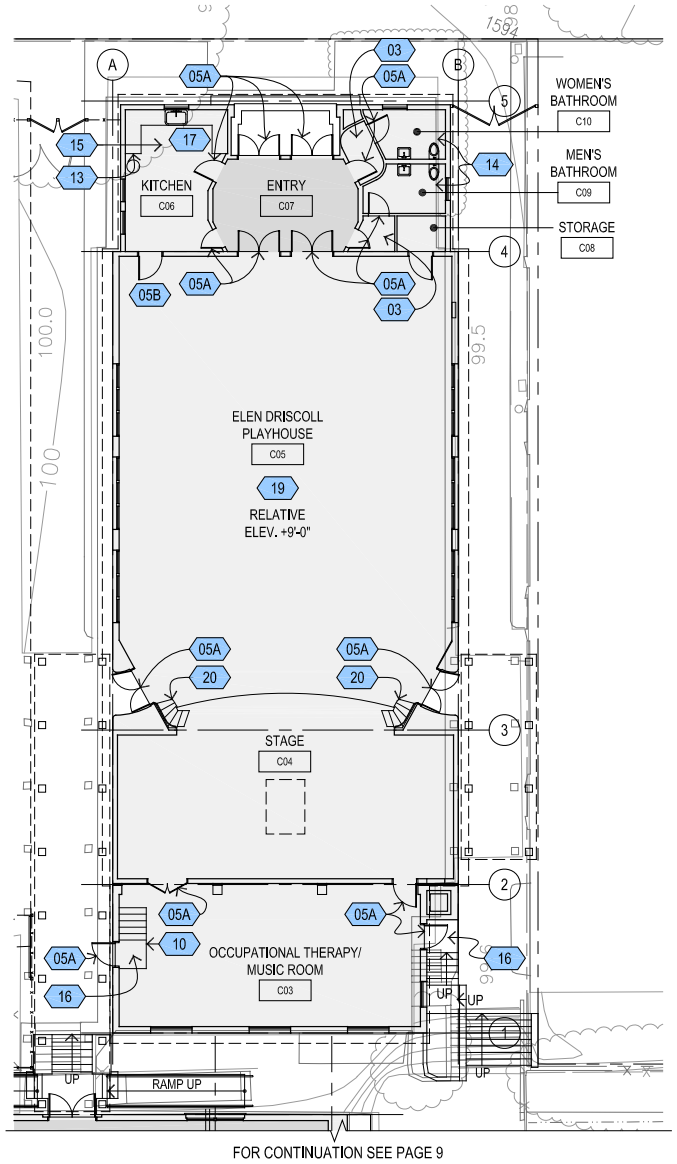
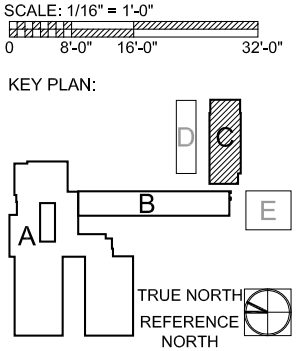


BUILDING B - FLOOR PLAN







BUILDING C - FLOOR PLAN

3. FIRE / LIFE SAFETY

3. FIRE/LIFE-SAFETY

A. Background:

As with accessibility, fire and life-safety is governed by the California Building Code and is enforced by the Division of the State Architect (DSA). Fire and life-safety regulations are spread throughout the Code; however, most of the pertinent regulations are in Chapters 5 and 10. There is no overarching life safety regulation like ADAAG for fire and life safety. Life Safety is not an area where the School District, the design professional or DSA would compromise; however, there will be areas of negotiation about what is acceptable given the fact that the existing buildings may be constructed different from what would be built today under current codes. Nonetheless, a primary objective of the project, in addition to seismic safety and accessibility will be to increase safety at the schools.

B. Summary & Analysis

The three priority buildings at Havens Elementary were also analyzed for fire/life safety code compliance. These findings are summarized in Appendix B: Code Analysis, as well as on the drawings in this section. This report identifies deficiencies. The next phase of the project will offer conceptual solutions.

Of critical importance are construction type and allowable floor areas; individual and cumulative occupancies and occupant loads, which determine required exiting and area separations.

Buildings A and B are interconnected and for the purposes of this analysis are considered one building. These buildings, and in fact all three priority buildings, are TYPE V-N construction (conventional, unprotected wood framing) and exceed allowable square footage for this construction type. There are no conforming area separation walls separating the buildings into smaller increments. Hallways are not rated construction, and therefore not considered corridors for purposes of exiting. The exterior walls of Building A at the northeast property line are located closer than ten feet and are required to be of fire-rated construction with protected openings, but are not.

There are no fire sprinklers in any of the buildings. In an E occupancy (educational), when ground floor exits are provided at each classroom and assembly space, sprinklers are not required. The Havens campus is close to complying with this regulation, however there are a number of rooms which either do not have compliant ground floor exits, or require travel through intervening rooms. An example of this is the administrative offices which exit into the main entry. This “intervening room” is required to be a rated corridor, which it currently is not.

Building C is an A occupancy (Assembly) and is required to be of one-hour construction throughout, and it is not. The side exits are classified as “exit courts” and do not meet the requirements for exit courts.

A complete new fire alarm system was installed at Havens in 2006 as part of the temporary student “housing” project. This system may be reused or modified to incorporate any future building changes

Building A - looking west @ lower level hallway

Building B - hallway B01 looking north

Building B - east side at property line looking north

LIFE SAFETY NOTES:

01 EXTERIOR WALLS WITHIN 10 FT. OF PROPERTY LINE NOT ONE-HOUR CONSTRUCTION WITH PROTECTED OPENINGS. PROPERTY LINE LOCATION TO BE CONFIRMED BY TITLE REPORT.

02 BUILDING EXCEEDS ALLOWABLE AREA FOR TYPE V-N CONSTRUCTION.

03 BUILDING NOT ONE-HOUR CONSTRUCTION NOR SPRINKLERED.

04 NOT A RATED CORRIDOR.

05 NO PANIC HARDWARE PROVIDED.

06 DOOR (OR GATE) DOES NOT SWING IN DIRECTION OF EXIT.

07 NO PORTABLE FIRE EXTINGUISHER PROVIDED. (MAXIMUM TRAVEL DISTANCE IS 75 FT. FROM ANY LOCATION.)

08 INACCURATE ROOM CAPACITY SIGNAGE.

09 EXIT COURT. ONE-HOUR CONSTRUCTION WITH PROTECTED OPENINGS NOT PROVIDED WITHIN 10 FT. OF PROPERTY LINE. PROPERTY LINE LOCATION TO BE CONFIRMED BY TITLE REPORT.

10 DOOR WIDTH LESS THEN REQUIRED MINIMUM (3 FT.).

11 REQUIRED EXITS NOT SPACED FAR ENOUGH APART.

12 GUARDRAIL NOT TO CODE.

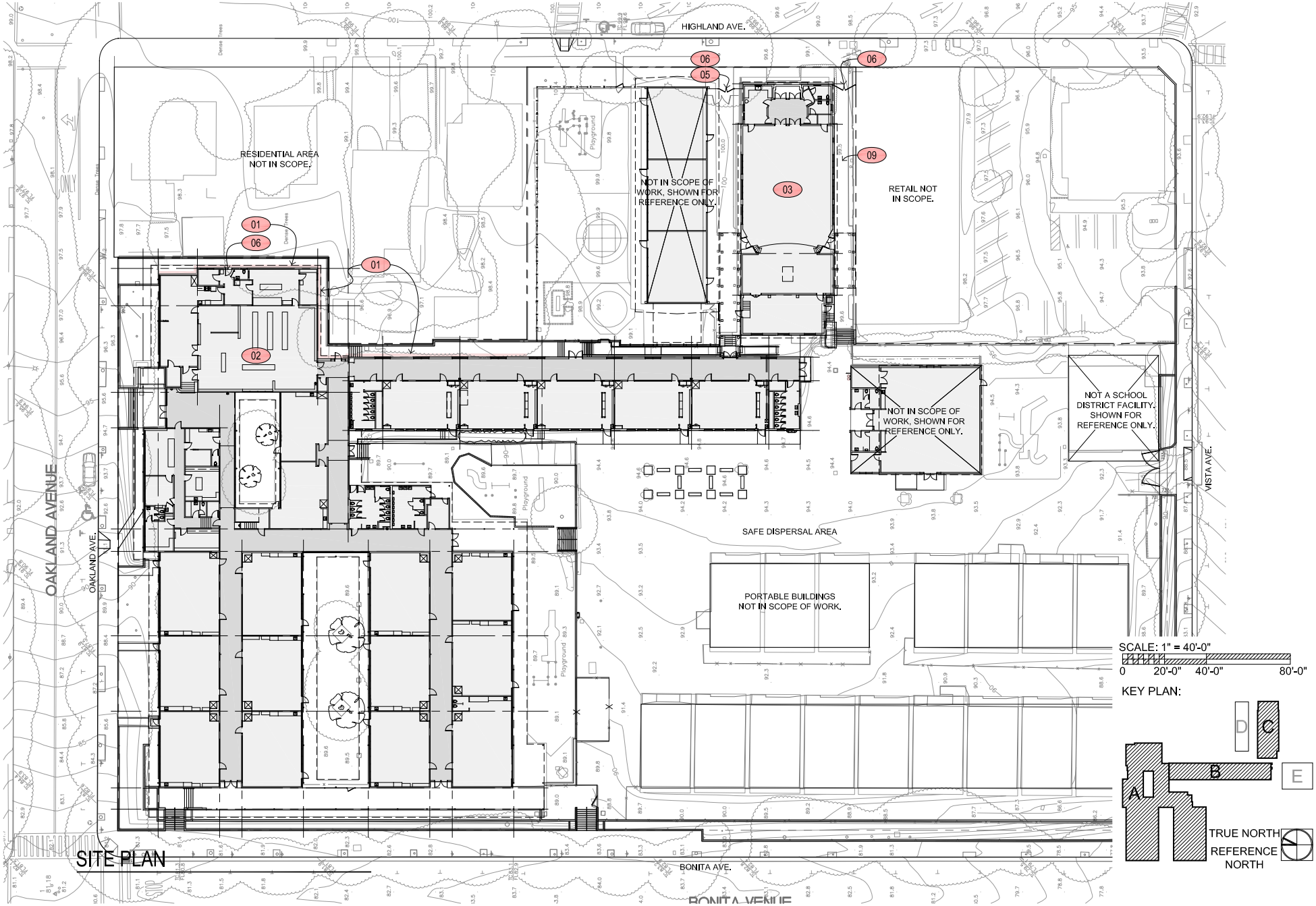
13 EXIT NOT TO CODE. INSUFFICIENT CLEARANCE, LANDINGS, STAIRS & HANDRAILS.

14 HANDRAIL EXTENSIONS NOT TO CODE.

ABBREVIATIONS:

F.E. EXISTING FIRE EXTINGUISHER

P.H. EXISTING PANIC HARDWARE

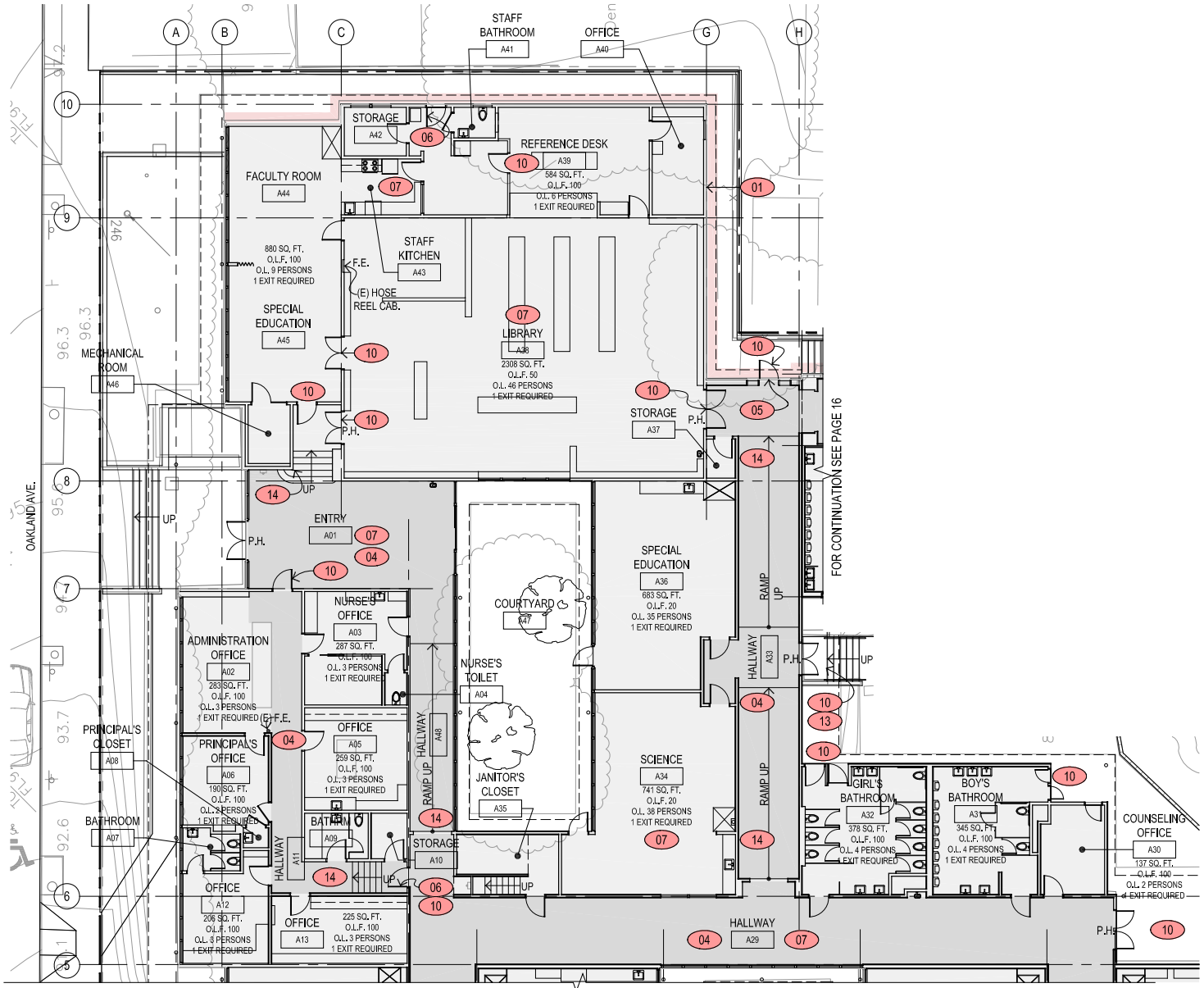


SITE PLAN

HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

life safety



BUILDING A - FLOOR PLAN (1 OF 2)

SCALE: 1/16" = 1'-0"

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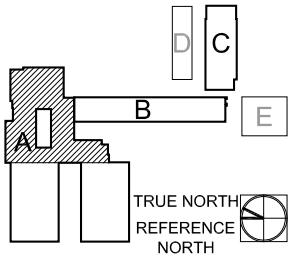
KEY PLAN:

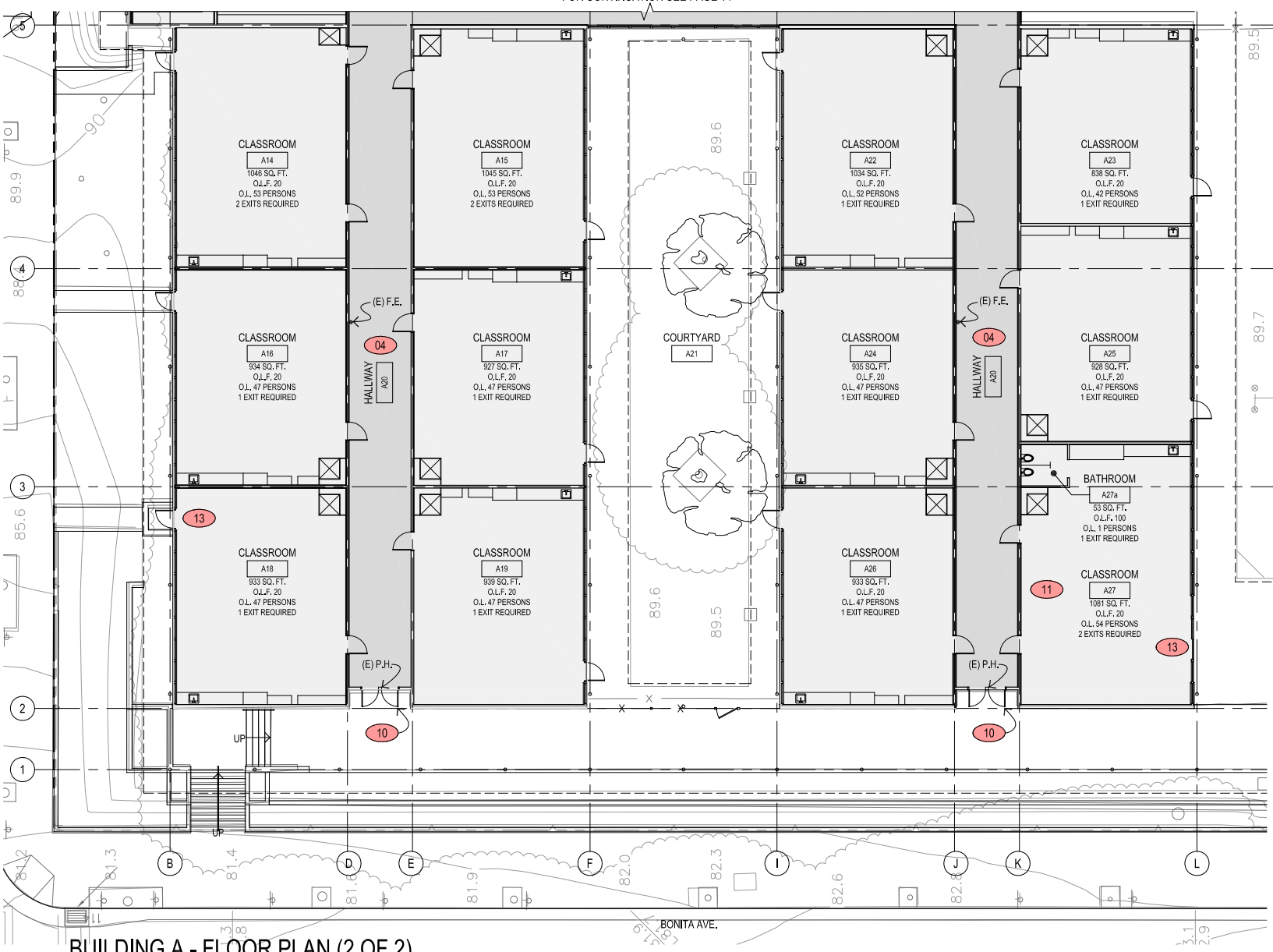


HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

life safety

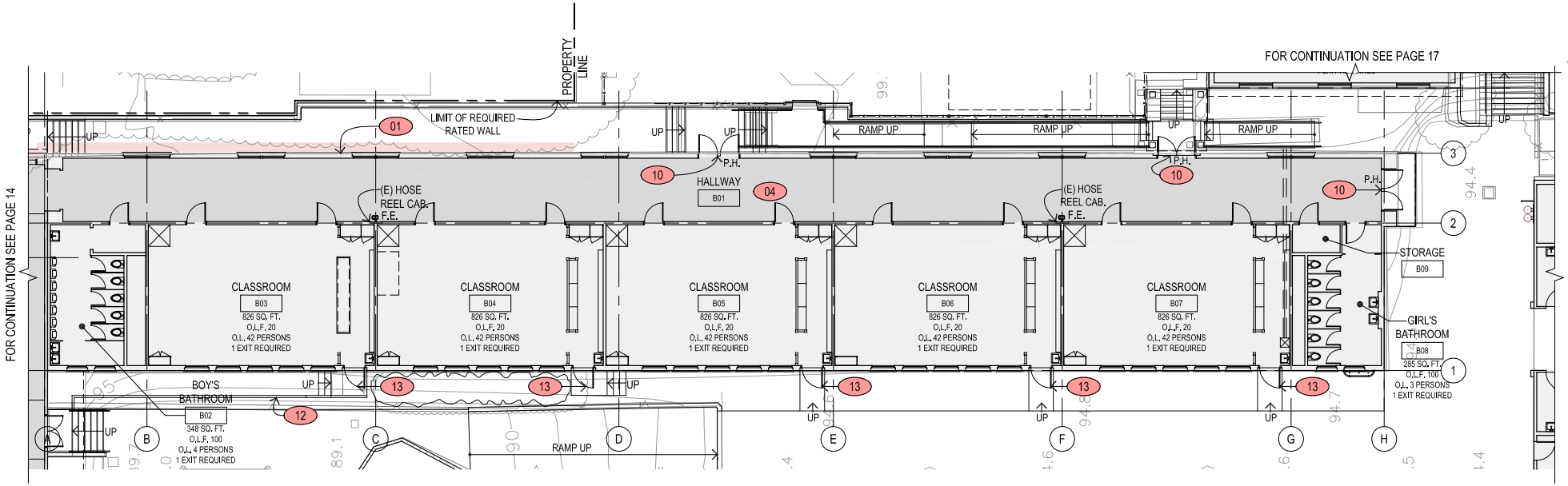
FOR CONTINUATION SEE PAGE 14



BUILDING A - FLOOR PLAN (2 OF 2)

HAVENS ELEMENTARY SCHOOL
PIEDMONT UNIFIED SCHOOL DISTRICT

life safety



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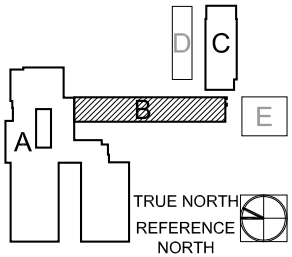
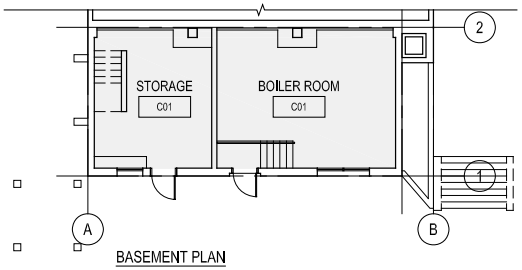
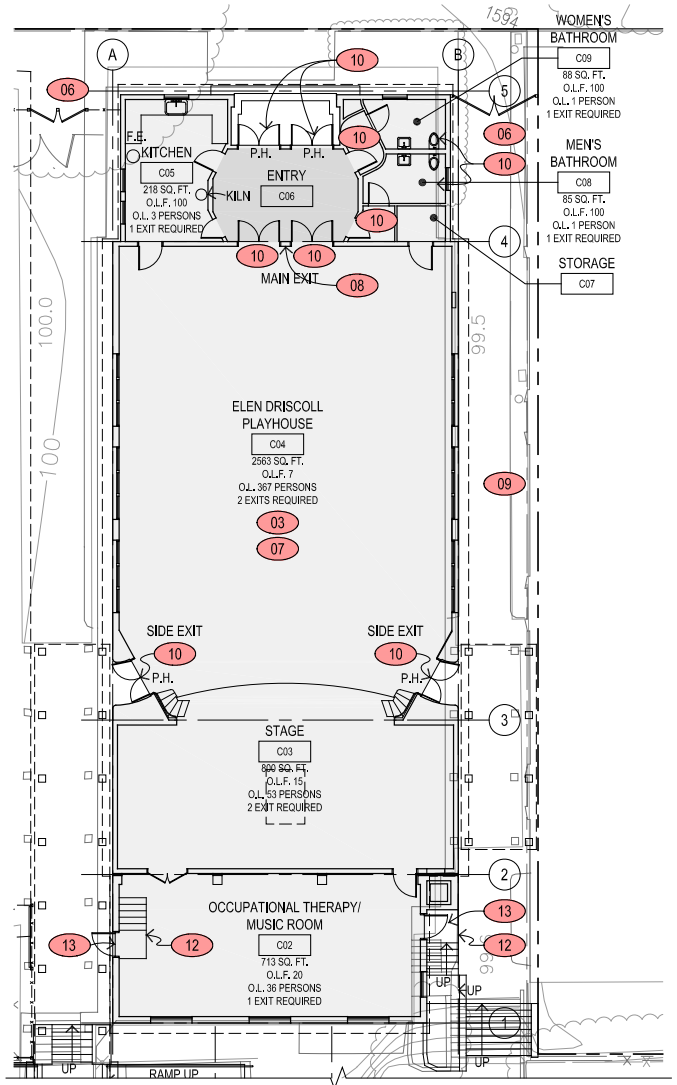


BUILDING B - FLOOR PLAN



BASEMENT PLAN



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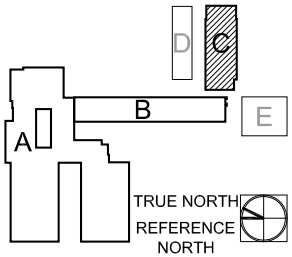


BUILDING C - FLOOR PLAN

HAVENS ELEMENTARY SCHOOL

PIEDMONT UNIFIED SCHOOL DISTRICT

life safety

4. STRUCTURAL TIER 2 REPORT

Seismic Evaluation of Three Buildings at Havens Elementary School, Piedmont Piedmont Unified School District

Prepared for
murakami/Nelson Architects, Inc.
Oakland, CA

June 11, 2007

Prepared by
R. P. Gallagher Associates, Inc.
Structural Engineers
Oakland, CA

Executive Summary

Buildings A, B, and C at Havens Elementary School were evaluated for life-safety risk in a major earthquake. The evaluation criteria used was ASCE Standard 31 "Seismic Evaluation of Existing Buildings," published in 2003 by the American Society of Civil Engineers. This document is the generally recognized criteria for assessing the life-safety risk of existing buildings.

Results of the evaluation indicate that the three buildings do not meet the life-safety criteria of ASCE 31. The principal seismic deficiencies of each structure are summarized below:

(1) Building A (Kindergarten/Administration building) – The rod bracing system used to brace the longitudinal direction of the two classroom wings is greatly overstressed and will likely fail in a major earthquake, jeopardizing the safety of the two wings. The administration/library portion of the building has some structural deficiencies, but these are not believed to result in serious life safety risks.

(2) Building B (Second Grade building) – The building has very weak longitudinal shear walls and is very damageable in this direction. This is because walls on both the east and west sides of the building are penetrated with many windows and doors, and the remaining solid walls (i.e., shear walls) have insufficient strength.

(3) Building C (Ellen Driscoll Auditorium) – The Auditorium has weak shear walls on the north and south sides of the building and the proscenium shear wall at the stage is greatly overstressed. The footings for the proscenium shear walls are too small for the forces imposed on them. Both concrete canopies have overstressed columns and footings that are too small.

The three buildings, plus Buildings D and E (First Grade and Mulit-Use), were also surveyed for nonstructural hazards, and several significant hazards were found. These include unanchored gas ranges and ovens and overhead ordinary glass in hallways and at exit doors. With a few exceptions, tall bookcases and storage cabinets throughout the three buildings are anchored.

All three buildings have wood frame construction and are without fire sprinklers. Because there is no earthquake-activated automatic gas-shutoff valve, a postearthquake fire could result from a broken gas line (e.g., unanchored oven or range sliding and breaking its gas line).

It is recommended that the buildings be seismically strengthened to correct the deficiencies found. The criteria of FEMA 356 "Prestandard and Commentary for the Rehabilitation of Buildings" published by the Federal Emergency Management Agency can be used. This is the generally recognized criteria for strengthening existing buildings.

Based on structural considerations alone, we believe it is economically feasible to strengthen the buildings and at the same time preserve their basic functional and architectural character. However, the overall feasibility of this project remains to be evaluated during the next, conceptual phase of the work.

CONTENTS

1. Introduction

This report summarizes the seismic evaluation of three buildings at Havens Elementary School in Piedmont. The school is located at 1800 Oakland Avenue. The three buildings studied are Building A (Kindergarten/Administration building), Building B (Second Grade building), and Building C (Ellen Driscoll Auditorium). The purpose of the study was to assess the vulnerability of the buildings for life-safety risk in a major earthquake.

Construction of the three buildings was done under the jurisdiction of the California Division of State Architect (DSA) and occurred after passage of the landmark 1933 Field Act by the California legislature. The Field Act required that the buildings be designed for seismic forces. Since enactment of the Act, and particularly since the 1971 San Fernando, CA earthquake, the state-of-the art seismic design has improved substantially with contributions from new research, better materials, improved training of structural engineers, and knowledge gained from investigations of earthquake damaged buildings. It is now recognized that many older buildings, even post Field Act California school buildings, are seismically vulnerable.

The evaluations summarized in this report represent an assessment of the three buildings using the latest seismic evaluation methodology. The study consisted of a detailed structural evaluation of each building. This included preparation of structural calculations and evaluation of the structural system to withstand the imposed seismic forces without collapse or creation of a serious life safety risk.

The evaluation included a survey of nonstructural hazards. The purpose of this was to identity potential falling and other hazards that may be triggered by a major earthquake. In addition to Buildings A, B, and C, Buildings D and E (First Grade and Multi-use) were also included in this survey.

The report is organized as follows. The criteria used in the evaluation is described in Section 2. A description of each building and the results of the evaluation are presented in Sections 3, 4, and 5, respectively, for Buildings A, B, and C. Nonstructural hazards are discussed in Section 6. Section 7 provides a summary and recommendations.

2. Evaluation Criteria

Building Structural Systems

The buildings were evaluated using the criteria of ASCE Standard 31-03 "Seismic Evaluation of Existing Buildings" (Ref. 1). This is the state-of-the-art criteria used for the seismic evaluation of existing buildings. It is used to establish whether there is a significant life-safety risk.

Each building was given a Tier 2 evaluation for the Life Safety performance level using the Linear Static Procedure (LSP). This required a detailed seismic analysis of the building's structural system. In this approach, the ground shaking hazard at the site is first determined, and then the building is evaluated for its ability to withstand these motions without unacceptable behavior. The Tier 2 evaluation was recommended in an earlier Tier 1 study performed for Piedmont USD by Janiele Maffei, Structural Engineer (Ref. 2).

Nonstructural Components

Nonstructural elements and equipment were also investigated. These were evaluated in a site survey using the Tier 1 criteria of ASCE 31, supplemented by additional guidance developed by DSA and other state agencies (Ref. 3).

Earthquake Ground Motions

Earthquake ground motions for the site were obtained from the seismic ground shaking maps found on the CD-ROM Seismic Design Parameters (Ref. 4). These ground shaking maps were developed by the U. S. Geological Survey under the National Earthquake Hazards Reduction Program (NEHRP). Ground motions at the site were determined for the Maximum Considered Earthquake (MCE). This represents an earthquake with only 2-percent chance of being exceeded in 50 years (i.e., an earthquake with a 2,500 year return period). At this location, the MCE has a peak ground acceleration of 0.77g; however, only 2/3 of this level of motion (0.51g) is required to be used in the evaluations done under ASCE 31.

The school is located approximately 1 mile west of the Hayward fault. This is a large fault and believed capable of a magnitude 7.0 or larger earthquake. This would produce very strong shaking at the site.

Demand-Capacity Ratios

Results of the evaluation of each building are presented as demand to capacity ratios (D/C). These are provided for the main structural elements (i.e., structural members and connections) that make up the seismic force-resisting system of each building. A D/C ratio of 1.0 or less indicates that the element satisfies the ASCE 31 criteria. Demand is the combined earthquake and dead load force applied to a structural element, and capacity is the element's usable strength. D/C ratios greater than about 1.1 to 1.2 indicate a deficient element that may need to be strengthened or replaced. Elements with D/C ratios of 2.0 or greater are considered seriously overstressed. Generally, such large D/C ratios indicate a serious deficiency unless there are other structural elements present that can take up the slack when the element with the high D/C ratio fails or is no longer effective.

3. Building A

Description

Building A, also known as the Kindergarten/Administration building, is the largest building on campus and was built about 1955. It is a one story, irregularly shaped structure with a roughly U-shape in plan. There are two classroom wings, separated by a 30' wide courtyard. These are connected to the administration and library portion of the building by an interior corridor. Building A is separated from adjacent Building B by an approximate 2 inch separation joint. Overall plan dimensions are roughly 191' x 260'. The school was built on a sloping site, and there are ramps and stairs at the floor level inside the building as well as changes in elevation at the roof.

The two classroom wings have wood sheathed shear walls in the transverse direction and vertical braced frames utilizing tension-only rod bracing in the longitudinal direction. The bracing is located on both sides of the interior corridor and consists of 7/8-inch diameter steel rods. Roof construction is wood frame with plywood sheathing. There are large openings in the roofs of each wing for skylights. Horizontal rod bracing in portions of the skylights connect the plywood sheathed roof to the vertical rod bracing system.

The administration/library portion of the building has a fully enclosed 21' x 52' courtyard. Many walls in this portion of the building are diagonally sheathed with 1 x 6 lumber and a few walls have 3/8 inch plywood sheathing on both sides. These serve as shear walls. The roofs have typical wood frame construction and consist of several individual diaphragms at different elevations. In general, the roof of the entire building has a rather complicated geometry and is interconnected.

Foundations consist of reinforced concrete strip footings under all exterior and interior walls. In general, the foundation is well interconnected.

A site visit and inspection of the construction was made by two structural engineers from our office on November 20, 2006. In general, the building was found to be in good structural condition. No signs of settlement or structural deterioration were noted.

Both the original architectural and structural drawings for the building (Refs. 5 and 6) were available, and these were used in the evaluation. It is important to note that the structural drawings used (Ref. 6) were marked "preliminary" and did not have the DSA stamp and application number.

Figures 1 and 2 are photographs of the building, and Figure 3 shows a floor plan. Figure 3 is also used to show demand to capacity (D/C) ratios in the principal shear walls and vertical rod bracing.

Results of Evaluation

Application of the Tier 2 requirements revealed a number of significant deficiencies. These are discussed below.

The roof is very complicated, and the analyses performed mostly utilized the flexible diaphragm assumption. In some areas, however, both the flexible and rigid diaphragm assumptions were used to study probable behavior. Maximum D/C ratios for diaphragm shear

are 0.69 for the classroom wing roof and 1.05 for the library roof. While the diaphragms meet, or essentially meet, the Tier 2 shear strength criteria, some diaphragm chords and collectors do not.

Roof diaphragm collectors are missing on Lines 8 and 9 between B and C. Also, the chords and/or chord splices are overstressed in several places. The chord on Line H has a D/C of 2.40, the chord on Line E.5 has a D/C of 1.64, and the chord on Line 8 has a D/C of 1.71.

There is also no nailing shown on the drawings for connecting the roof diaphragms to the glulam beams over the library. While it is some-what doubtful that this is missing, these important connections must be verified or fixed.

Results of the shear wall and rod bracing evaluations are summarized in Figure 3. D/C ratios for walls and bracing are indicated next to each on the plan. The most deficient elements in the classroom wings are the rod bracing in the south wing. The D/C is 1.95 in tension. In the north wing, it is 1.70. Because the bracing is tension-only and can fail suddenly, this situation is very hazardous.

In the administration/library area, there are several shear walls with D/C ratios significantly larger than 1.0. The most highly stressed walls are the west wall of the library (on Line 8) with a D/C of 1.91 in shear and the two E/W walls in the office area (between Lines B and C) with D/C ratios of 1.43. Many shear walls, however, have D/C ratios less than one.

At the main entrance to the building there are full-height concrete block walls on Lines 7, 8, and B.1. While these walls are reinforced, there is no anchorage for the tops of the walls shown on the drawings. This is a potential significant deficiency and needs to be fixed unless exploration reveals adequate anchorage.

The foundations for several walls were checked, and no deficiencies were found. Bearing pressures are within allowables.

Discussion of Results

Building A does not comply with the ASCE 31 Tier 2 life safety criteria. The most seriously deficient structural elements are the rod bracing located on both sides of the corridor of each classroom wing. These are greatly overstressed and would very likely fail in a major earthquake, leaving the classroom wings vulnerable to collapse. The lack of vertical lateral force resisting elements (e.g., shear walls) along the north and south sides of the classroom wings could lead to damage to the glazing in these walls and loss of use of the classroom exit doors located in these walls.

The administration/library portion of the building has significant deficiencies, but it is unlikely to collapse in an earthquake and has much less life safety risk than the two classroom wings. This portion of the building has serious deficiencies in one major shear wall, but other mechanisms exist to provide secondary support. The other deficient or missing elements represent additional sources of damage. The full height masonry walls, if unanchored, represent localized sources of risk to life.

To fix the major deficiencies, the rod bracing system in the two classroom wings can be replaced by new full-height plywood shear walls, the deficient shear walls in the administration/library area can be resheathed with stronger sheathing, the missing collectors

installed on Lines 7 and 8, and the deficient roof diaphragm chords strengthened by adding steel straps. It would also be desirable to add vertical bracing elements along the north and south walls of the classroom wings to limit damage to those walls and maintain possible egress through them. There are also many lesser, yet still important elements that will require strengthening. These and alternate schemes would be defined in upgrade studies.

Figure 1 – South classroom wing of Building A.

Figure 2 – Interior of a classroom wing showing rod bracing adjacent a corridor. Four bays of bracing, two on each side of the corridor, provide the longitudinal seismic resistance. Note the overhead glass in the corridor wall.

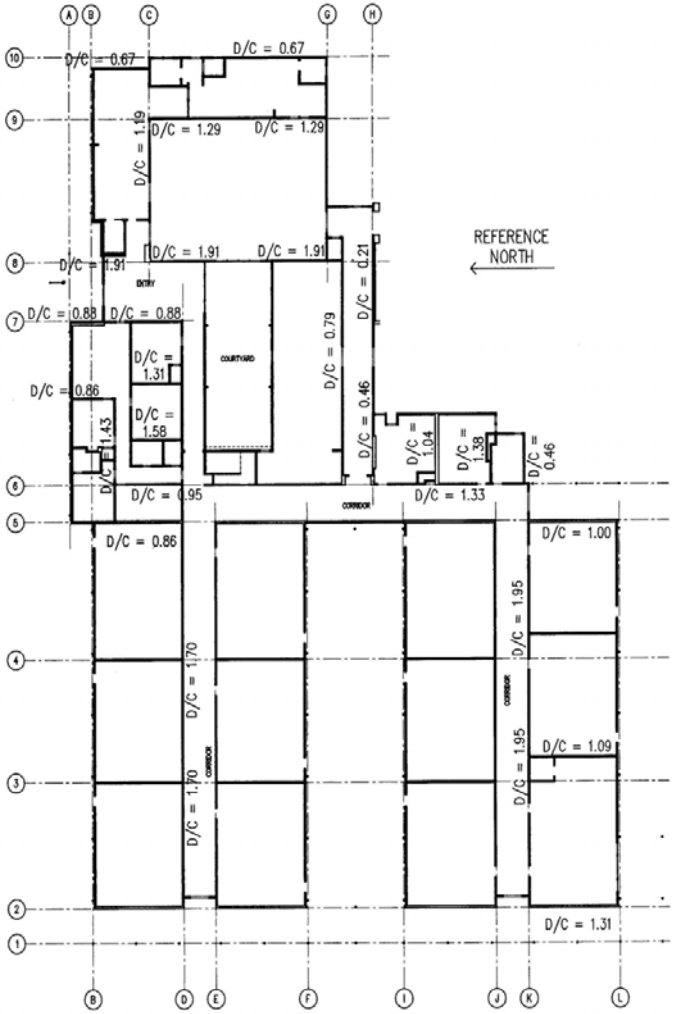


Figure 3 – Floor plan of Building A. Demand to capacity (D/C) ratios for the principal shear walls and the rod bracing are also shown.

4. Building B

Description

Building B, also called the Second Grade building, is the oldest building at Havens School. It was built in the mid-1930's. It is a long, narrow single story structure 35' wide and 215' long. Construction is wood frame with stucco exterior walls. The east side of the building has a long, relatively narrow corridor. The west side is occupied by five classrooms and two restrooms. Classroom ceilings are 12' high. The roof is slightly sloped and has composition roofing. There is a 2' to 3' high parapet around the roof perimeter. Building B is separated from adjacent Building A by an approximate 2 inch separation joint.

Figures 4 and 5 show views of the building, and Figure 6 provides a floor plan. Figure 6 also shows demand to capacity (D/C) ratios for the principal shear walls.

The drawings appear to indicate that the building was designed for a second story that was never built. The ceiling is framed with heavy joists that appear to be intended to form the floor for a second story. The 1x6 diagonal sheathing on top of these joists forms the structural diaphragm at the roof level. Additional framing approximately 1 foot above the ceiling diaphragm supports the present roof which was to be removed at a later time.

Lateral forces in both directions are resisted by diagonally sheathed shear walls. Interior transverse shear walls have 1 x 6 diagonal wood sheathing on both sides of the wall. Exterior walls have 1 x 6 sheathing only on the exterior. In the longitudinal direction, the two exterior walls are penetrated by many window and door openings (see Figure 4), reducing the effectiveness of these walls as shear walls. The original drawings indicate that the interior west wall of the corridor lacks diagonal sheathing.

Foundations are reinforced concrete strip footings located under both the longitudinal and transverse walls. There is a crawl space under the first floor.

The original DSA stamped architectural and structural drawings for the building were available (Refs. 7 and 8), and these were used in the evaluation. There does not appear to have been any significant alterations or modifications to the original construction.

A site visit and examination of the building was conducted on November 20, 2006. This was done by two structural engineers from our office. In general, the building seems to be in good structural condition. No wood rot, settlement or structural distress was observed. However, our examination was only of the exterior of the structure and limited parts of the interior, and no specific attempt was made to check for wood rot. We did observe some inadequate and improper structural nailing on wood framing in the crawl space below two of the interior transverse shear walls. This is discussed further below.

Results of Evaluation

The following is a summary of the results of the evaluation. The structural system of the building was found not to comply with the ASCE 31Tier 2 life safety criteria.

The diagonally sheathed ceiling diaphragm has satisfactory shear strength but has inadequate chord splices. The shear strength of the ceiling diaphragm has a D/C of 0.63. The

chord splice detail has a D/C of 2.57 (the exact location of chord splices is unknown, and the worst case was assumed). The floor diaphragm has adequate shear and chord strength with diaphragm D/C of 0.86 in shear.

Shear walls in the long direction of the building (N/S direction) are greatly overstressed in shear. The wall on Line 1 (on the west side of the building) has a D/C of 2.13 to 3.32 in shear depending on the assumptions made regarding ceiling diagram stiffness (i.e., rigid vs. flexible diaphragm assumption). No hold-downs have been provided to resist overturning forces. The shear wall on Line 3 has a D/C of 1.29 to 1.72 (depending on assumptions).

The evaluation results presented above for the perimeter shear walls in the long direction assumes that there is no resistance from the plaster wall on the interior corridor wall. A separate analysis of this wall indicates that it is greatly overstressed in shear (D/C of 2.95) if it is assumed to be acting as a shear wall. Since plaster is both weak and brittle, it will fail early in an earthquake leaving the diagonally sheathed perimeter walls as the primary seismic force-resisting elements. Hence, this wall was ignored in our analysis of the main, diagonally sheathed shear walls.

Shear walls in the transverse (E/W) direction generally meet criteria. Maximum D/C occurs in the interior transverse walls (Lines C through F) and is 1.02 in shear. All walls are without hold-downs. The sill bolts anchoring the walls to the foundations on Lines A and H are overstressed with a D/C of 1.17 in bolt bearing on wood.

The connection between the bottom of the interior transverse shear walls and the foundations at Lines C through F is shown as Connection A in Appendix A. The nailing between the 2x16 floor joists and the foundation sill plate is severely overstressed. If this nailing were installed at 8" o.c. as specified on the original drawings it would have D/C of 2.19. Limited observations at two walls indicated nails being spaced up to 24" o.c. In addition some nails were improperly installed toe nails having essentially no strength. The nailing between the wall sole plate and the 2x16 floor joists is even more overstressed with a D/C of 2.90. Since the original drawings indicate that all lateral force from the shear wall goes through this nailing, the connection is severely deficient.

The connection of the tops of the interior transverse shear walls to the ceiling diaphragm are shown as Connection B (walls on Lines C through F) and Connection C (wall on Lines B and G) in Appendix A. In some cases, the drawings are not clear as to the exact details that were to be constructed. Based on the assumptions made, the deficiencies could vary from D/C of 1.15 to 2.38. The former deficiency would be minor while the latter would be severe. In the next phase of the project, some destructive exploration will be required to determine the actual construction.

Discussion of Results

The longitudinal walls of Building B are seriously deficient in shear strength, particularly the west wall on the classroom side of the building. Large story drifts (horizontal displacement of the roof relative to the floor) will very likely cause extensive window damage and the possibility of overhead falling glass in the classroom areas. Doors in these walls and in the interior corridor wall could easily become unusable. It appears unlikely that the building will collapse in a major earthquake; however, we believe it is very damageable in the longitudinal direction, and it does not meet the Tier 2 life safety criteria. As mentioned above, there are

several key structural connections where the information shown on the original construction drawings is not complete, and exploration is needed to determine the actual construction.

With the relatively small separation joint (2 inches) between Buildings A and B, Building B may impact Building A under longitudinal movement. It appears that the roof plywood may not have the 2 inch separation joint that the framing does. However, this concern is secondary to the deficiencies of the longitudinal walls, particularly the exterior west wall.

To fix the major deficiencies found, much stronger shear walls will need to be installed on the east and west (long) sides of the building. This can probably be done by rebuilding the existing walls with double sided plywood, strong hold-downs, and possibly new foundations. Also, the roof chords can be strengthened with steel straps. The missing information of Connections A, B and C must be established and/or these important connections strengthened. There are also a number of lesser yet important other components that will have to be strengthened. These and alternative schemes would be defined in upgrade studies.

Figure 4 - West side of Building B. Note the many windows and doors.

Figure 5 - South end of Building B.

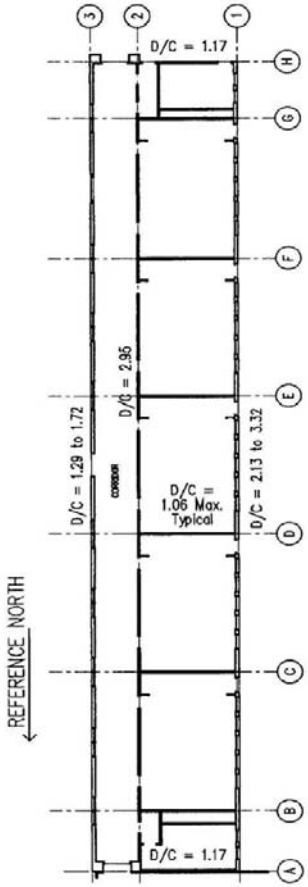


Figure 6– Floor plan of building B. Demand to capacity (D/C) ratios for the principal shear walls are also indicated.

5. Building C

Description

Building C, also known as the Ellen Driscoll Auditorium, is located on the Highland Avenue side of the school. It was built in the early 1940's. The building is about 45' wide and 120' long. Construction is mostly wood frame with stucco walls and heavy Spanish tile roof. Walls are framed with 2 x 8 and 2 x 10 studs. The roof over the auditorium is supported by four heavy timber trusses. These span 44 feet and are supported on 10 x 10 wood columns located in the exterior walls. The roofs over the stage area and the main entry area have conventional wood framing. At the rear of the building is a small one story portion of the structure that has a concrete roof, concrete walls and concrete first floor slab. This is separated from the wood framed portion of the auditorium by a gap. A modest size concrete basement, that is mostly below grade, is located under the first floor in this area.

Lateral forces in both directions are resisted by 1 x 6 diagonally sheathed wood shear walls. These are penetrated by many openings for windows and doors. The roof diaphragm also has 1 x 6 diagonal wood sheathing. Foundations consist of reinforced concrete strip footings.

The DSA stamped architectural and structural drawings for the original construction (Refs. 9 and 10) were available and were used in our evaluations. The original building construction quality is considered excellent. The large timber roof trusses show excellent craftsmanship. The auditorium does not appear to have had any significant modifications or additions to the original construction.

There are concrete canopies located on the north and south sides of the auditorium. These are independent structures separated by a gap from the auditorium walls. They are shown on the original drawings. These were also given a Tier 2 evaluation.

On November 20, 2006, two structural engineers from our office toured the building and examined the construction. In general, the structure appears to be in good condition. No signs of any structural deterioration or settlement were noted.

Figures 7 and 8 show views of the building, and Figure 9 provides a floor plan. Demand to capacity ratios (D/C) for the principal shear walls are also given on Figure 9.

Results of the Evaluation

The application of the Tier 2 requirements revealed a number of major and minor deficiencies in the wood framed portion of Building C. The major findings are discussed below.

At the roof level, the diagonal sheathed diaphragm over the auditorium has a D/C of 1.17 in shear for N/S seismic forces and 0.85 for E/W forces. The diaphragm chord runs along the north and south sides of the building and has a D/C of 2.00. This is due to the smallness of the 2 x 4 chord member. Diaphragms at the main entry and over the stage area meet criteria. The diaphragm chords at the entry on Lines 8 and 9 are presumed deficient due to lack of splices being shown on the drawings. The shear nailing of the diagonal roof sheathing to the top wall on Line 3 has a D/C of 1.87. Elsewhere the roof nailing is adequate.

Anchorage of the walls to the roof, for out-of-plane seismic forces, and the cross-ties of the roof both meet criteria. The large timber trusses are well connected to their supporting 10 x 10 columns. However, the roof diaphragm connection to the side walls is not by these, but by toe-nailing of the roof rafters to the wall top plate.

The diagonally sheathed shear walls throughout the building do not meet criteria. The walls on Lines 3 and 8 have D/C in shear of 2.55 and 2.48, respectively. The strength of the bolting of these walls to the foundation has a D/C of 3.11 for both walls. The side walls of the auditorium have a D/C in shear of 2.33 on Line A and 1.93 on Line C. The sill bolts connecting these walls to the foundation have a D/C of 1.27 for both walls. The walls on Lines 2 and 9 have D/C ratios of about half of the other walls, but these are still larger than 1.00.

The foundations were evaluated for bearing pressure, overturning stability, and reinforcing strength. No deficiencies regarding soil pressure were found. The proscenium wall footings on Line 3, situated on the sides of the stage, were found to be unstable when subjected to the ASCE 31 overturning forces. Other footings were adequate in this regard. The bending strength of the continuous footings was evaluated. These are overstressed in bending. Line C has a D/C of 2.89, Line A 2.30, and Line 8 1.27. Other foundations meet criteria for bending.

The concrete portion at the rear of the building was briefly investigated for the Tier 2 criteria and found acceptable. The concrete chimney located at the S/W corner of the structure was also found to meet criteria.

Discussion of Results

Building C does not meet the ASCE 31 Tier 2 life safety criteria, but it is not believed to be a collapse hazard. It can, however, be significantly damaged in a major earthquake. The principal weaknesses are the shear walls on the north and south sides of the building (Lines A and C) where large windows occur, and the proscenium wall at the stage (Line 3). Foundations under the north and south walls are significantly overstressed in bending, but this is not considered a life-safety concern. The proscenium wall-footing system has footings that are much too small, and the resulting flexibility will increase damage in this area of the building and cause the roof diaphragm to be overstressed in shear.

The major deficiencies can be fixed by rebuilding the major shear walls on Lines 3, 8, A and C. This would require resheathing all or portions of the walls, adding hold-downs, and strengthening the foundations. If the proscenium wall and footings on Line 3 is not strengthened, then the roof diaphragm between Lines 2 and 8 would have to be resheathed and the shear wall on Line 2 substantially strengthened. There are also a number of other, less substantial fixes required. Alternate strengthening schemes should be investigated in upgrade studies.

Concrete Canopies

Concrete canopies are located on the north and south sides of Building C. These are independent structures separated by a gap of a few inches from the auditorium walls.

The canopies consists of 9'-8" wide, 6 to 8 inch thick reinforced concrete roof slabs. These are supported on 11 inch square reinforced concrete columns spaced 7'-9" apart transversely and approximately 8'- 2" apart longitudinally. The columns are supported on very

small 1'-11" square footings. The north and south canopies are 59 feet and 27 feet, respectively, in length.

The canopies were given ASCE 31 Tier 2 evaluations and found not to meet the life safety criteria. There are at least three significant deficiencies: (1) there is no viable moment connection at the top of the column, where the column connects to the roof slab (the four columns bars are hooked into the 6 inch slab at mid-depth); (2) the D/C ratio of the columns in bending at their base (just above the slab on grade) is 1.87; and (3) many of the footings, especially on the south canopy, lack sufficient strength to provide the necessary fixity at the base of the columns.

Figure 7 - Front of Building C. The building has a heavy tile roof.

Figure 8 - Rear of Building C showing the concrete portion of the building. The chimney shown has reinforced concrete construction.

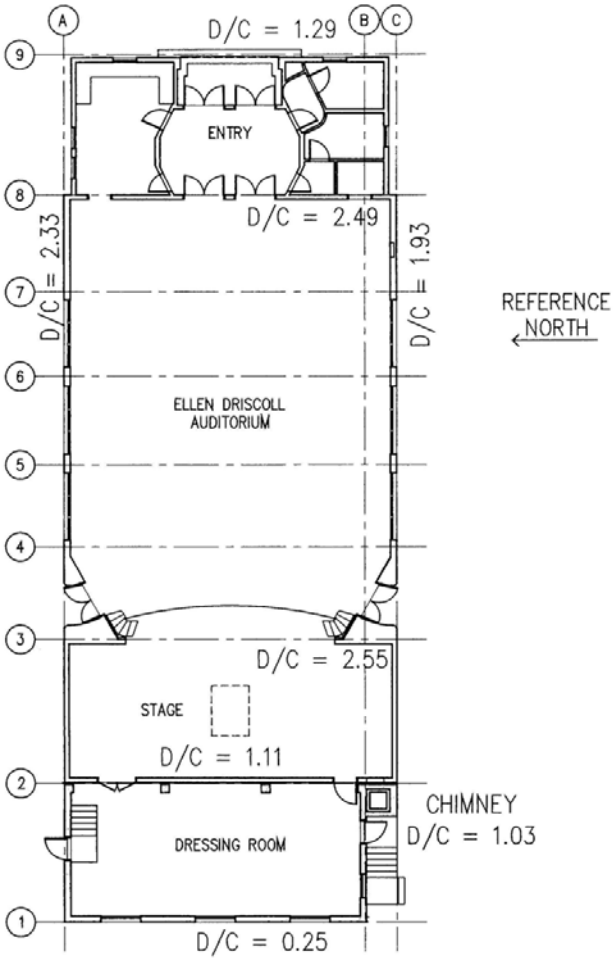


Figure 9 - Floor plan of Building C. Demand to capacity (D/C) ratios for the principal shear walls are also indicated.

6. Nonstructural Hazard Survey

Survey Methodology

This section describes the survey conducted for nonstructural hazards and presents the results. The purpose of the survey was to identify potential falling and other hazards.

Nonstructural components consist of things that are brought into a building after it has been constructed (e.g., furnishings, bookshelves, and building contents) as well as items that were installed when the building was built (e.g., mechanical and electrical equipment and fixtures, ceilings, glazing, and partitions). These can become hazards when they break, fall, slide or overturn. When this happens they can cause injury, block exits, and create secondary hazards such as chemical spills, gas leaks and postearthquake fires.

A nonstructural hazard survey of the three buildings was done using ASCE 31 Tier 1 procedures. The Basic, Intermediate and Supplement Nonstructural Component Checklists were used. The survey involved a room-by-room inspection of each building by a structural engineer experienced in seismic design. The survey was conducted on November 20 and December 19, 2006 for Buildings A, B, and C and on April 9, 2007 for Buildings D and E.

Tables 1, 2, 3, 4 and 5 summarize results for Buildings A, B, C, D and E, respectively. The tables identify the items examined, the estimated vulnerability of the item, and observations about each. The survey was entirely visual, and no drawings were reviewed or calculations prepared. The levels of vulnerability used are defined as follows:

Vulnerability	Characteristics
High (H)	Noncompliant under ASCE 31 Tier 1 procedures. Possesses little or no seismic resistance; item may break, fall, slide or overturn during strong shaking. High probability of damage under strong shaking. May cause injury to persons in vicinity.
Moderate (M)	Possesses some seismic resistance, but not as much as an item rated low.
Low (L)	Compliant under ASCE 31 Tier 1 procedures. Possesses good seismic resistance, should resist moderate shaking without damage. Low probability of damage under strong shaking. Unlikely to cause injury to persons in vicinity.

Building Contents on Tables and Shelves

In addition to the survey results given in Tables 1 through 5, it should be noted that in virtually all areas of the school there are unrestrained contents. These include such things as stored materials and books on shelves, and computer monitors on desks. While these are a threat to fall to the floor and may result in economic loss, in most instances they are generally not serious life-safety-hazards. Exceptions to this include things like computers and monitors stored on shelves above head height because these could cause injury.

Bookcases and Storage Cabinets

There are a number of bookcases and storage cabinets located throughout the school. The great majority of these are secured to walls and are unlikely to overturn, although contents may fall out. A few cabinets and bookcases are free-standing and unanchored. Those over 4 feet tall with height to depth ratios of 3.0 or greater are considered a hazard to overturn (Refs.1 and 3).

Pendant Fluorescent Light Fixtures

Building A has overhead pendant fluorescent light fixtures in a number of rooms, including classrooms and the library. There are also some in the Buildings C and D. These typically hang down from the ceiling on a metal tube stem of about 1 to 3 feet in length. Most of the fixtures have a partial ball and socket swivel at the top (Figure 10) and one-directional rotating socket at the bottom of the stem (Figure 11). These fixtures have capacity to move laterally in both horizontal directions. Some have wires that restrain movement in one horizontal direction but not in the other. Fixtures in Building D are similar to those in Buildings A and C, except the bottom stem connection is rigid and does not allow longitudinal movement.

The fixture lenses in Buildings A and C are secured in place by spring loaded pin locks, and these are unlikely to fall out under normal shaking. They could possibly come out in those fixtures situated close to walls if pounding occurs during the earthquake. Lenses on Building D fixtures are not positively secured.

Pendant fluorescent fixtures with rigidly connected stems (at their tops, bottoms or both) are the type most prone to fail and can be serious falling hazards in schools. Except for fixtures in Building D, the fixtures at Havens School are not in this category. The ASCE 31 Tier 1 criteria (Sec. 3.9.3 of Ref. 1) requires that pendant supports be spaced at 6-feet or less, and the Havens fixtures meet this criteria. They also meet the criteria to “be free to move with the structure to which they are attached”, but many do not meet the criteria of being able to swing “without damaging adjoining materials” (e.g., striking walls).

We believe that the fixtures that are free swing meet the ASCE 31 Tier 1 criteria. Those that can impact walls, or have stem bottoms rigidly connected, do not. Given the poor earthquake performance record of this type of fixture, we believe that even fixtures compliant with the Tier 1 criteria may possibly become hazardous. If these are to be left in place, then it may be desirable to do a further evaluation (e.g., Tier 2 study or shake test) to determine their seismic resistance.

Overhead Glass

There are several places where glass windows are overhead. ASCE 31 only mentions exterior glass above 10 feet as a concern. We feel that this is an unconservative criteria and believe anything over 5 or 6 feet should be considered potentially hazardous, particularly in an elementary school. Particularly troublesome are places were overhead glass is adjacent hallways and exit ways. Glass that is not tempered, laminated or otherwise designed to fail in a controlled manner may become a serious falling hazard as students and teachers try to exit the building during and after the earthquake.

The vulnerability of the skylights in the classroom wings and library of Building A should be investigated in a later phase of the seismic program. Because of access difficulties, these

could not be examined closely in this survey. We did, however view the underside of the skylights from the corridor between classrooms. Access was obtained by removing ceiling tiles.

Emergency Gas Shutoff

The three buildings studied have wood frame construction and are without fire sprinklers. Natural gas supply lines are 2½ to 4 inches in diameter and run on top of the roof on Buildings A and B. These penetrate through the roof in several locations with smaller diameter lines to bring gas to heaters and appliances. In the event of a postearthquake gas leak (from a cracked or broken pipe), a fire could breakout. The gas shut-off valve is located at the PG&E meter at the west end of Building C. This is a manual valve, and someone will need to manually shut off the gas in the event of a leak.

In general, most gas lines throughout the buildings have flexible connections to water heaters, ovens, ranges and heaters. However, some ovens and ranges are not anchored, and these could slide and break their lines, possibly starting a fire. The large roof top lines have a number of flexible joints and seem well anchored. Except for the unanchored appliances, the overall vulnerability of the gas fired equipment appears to be low.

Given that an earthquake can occur at any time and that the school has wood construction and is without sprinklers, it would be desirable to have an earthquake activated automatic gas-shut off valve installed. This would automatically shut off the flow of gas and could prevent a postearthquake fire caused by a broken gas line, particularly if the building was unattended at the time of the earthquake.

Room Numbering System

Tables 1 through 5 identity nonstructural elements by room number. Two numbering systems are presented: (1) the room numbering system in use at the time of the survey; and (2) the new room numbering system created by the architect for the seismic strengthening program. The latter has the building letter placed before the room number (e.g., A39).

Figure 10 – Typical ball and swivel top connection of pendant fluorescent light fixture in Havens ES classrooms.

Figure 11 – Typical unidirectional swivel used on the bottom of the pendant stem in Havens ES. This detail allows stem rotation in one direction.

Table 1 – Nonstructural Survey Results for Building A (Kindergarten/Administration Building)

Item	Vulnerability	Comments
Roof		
1. Trane HVAC unit	L	Unit anchored and gas line has flexible connection.
2. Sterling HVAC unit	L	Anchored, gas line has flexible connection.
3. Natural gas lines	L	Natural gas lines are 2½ to 4 inches in diameter. Lines run on top of roof and are anchored to roof. Lines originate from Building B. A number of flexible expansion joints are present, and these seem well placed.
4. Skylights over classroom wing corridors	Unknown	Glazing covered by fiberglass mesh on top. Viewed glass from underside of skylight. Skylights may be double glazed. Frames look reasonably sturdy. Could not determine if glass is tempered or laminated. An approximately 2½" diameter gas line runs the length of corridor. This is secured to ridge beam that supports one end of skylights. Drop-in ceiling below skylights has both translucent and acoustic tiles. No retaining clips or splay wires are present.
5. Skylights over janitor's closet	L	Tempered glass
Library (Room A38)		
1. Pendant fluorescent light fixtures	M	Five rows of these. See discussion in text.
2. Ceiling fans	L-M	Two of these, appear unlikely to fall.

Item	Vulnerability	Comments
3. Bookshelves against walls	L	These are apparently secured to wall, unable to move by hand.
4. Freestanding bookshelves	H	Three rows of 63" high x 19" deep shelves do not appear to be anchored. H/D = 3.3
5. Skylights	Unknown	Could not see construction details, but these are believed to be similar to skylights in corridor of two classroom wings.
Reference Desk Area (Room A39)		
1. Pendant fluorescent light fixtures	M	Four rows of these. See discussion in text.
2. Bookshelves against wall	L	Restrained
3. Freestanding bookshelves	H	Unrestrained, 84" high x 23" deep. H/D = 3.7
4. Metal shelves	L	Mostly restrained, but contents can spill.
5. Electronics cabinet	H	Tall, unrestrained unit 81" high x 30" deep x 23"wide.Contents unsecured. H/D = 3.5
Mechanical Mezzanine		
1. Water heater	L	Strapped top and bottom, has flexible gas line connection.
2. Heater	L	Large unit, anchored to floor.
Faculty/Staff Rooms (Rooms A44 and A43)		
1. Pendant fluorescent light fixtures	M	Two rows of these. See discussion in text.
2. Misc. kitchen equipment	M	Refrigerator and range/oven are not restrained. Oven is electric.

Item	Vulnerability	Comments
Special Education (Room A45)		
1. Pendant fluorescent light fixtures	M	See discussion in text.
2. TV on tall stand	H	TV and stand are both unrestrained. TV can fall off stand.
3. Storage cabinet		Unrestrained unit 72” high x 20” deep x 48” wide. H/D = 3.6
Entry/Hallway Area (Rooms A01 and A48)		
1. Light fixtures	L-M	Five large bowl-shaped light fixtures. These are supported by a tube with a swivel connection at the top. The fixtures are free to swing in any horizontal direction. Range of motion is at least 30 degrees.
2. Glass over entry door	H	Lower level glass has wire reinforcing, but upper level does not. Potentially serious falling hazard at exit doorway.
Administration/Office (Room A02)		
1. Pendant fluorescent light fixtures	M	Two rows of these. See discussion in text.
Classrooms 7, 8 ,9 ,10 ,11, 12 (Rooms A19,A18,A17,A16,A15,A14)		
1. Pendant fluorescent light fixtures	M	See discussion in text.
2. Corridor wall glass	H	Glazing 7’ above floor appears to be ordinary glass.
3. Room heaters	L	Anchored
4. Exterior windows	H	Three panes high, some plastic panes but mostly thin glass.
5. Wall cabinets	L	Secured to wall.

Item	Vulnerability	Comments
6. Suspended ceilings in corridor.	Unknown	See discussion under Roof Skylights.
7. Skylights	Unknown	See discussions under Roof Skylights.
Classrooms 1, 2, 3, 4, 5, 6 (Rooms A27, A26, A25, A24, A23, A22).		
1. Similar to Classrooms 7-12		
Counseling Office (Room A30)		
1. Fluorescent lights	L	Ceiling-mounted.
Classroom 22 (Room A34)		
1. Pendant fluorescent light fixtures	M-H	Bottom swivel oriented transversely. Restraining wire in one longitudinal direction only. See additional discussion in text.
2. Tall storage cabinet	L	Secured to wall.
3. Exterior windows	H	Four panes high. Appears to be ordinary glass.
4. Bookcase	L	Secured to wall
Classroom 21 (Room A36)		
1. Pendant fluorescent light fixtures	M	See discussion in text.
2. Storage cabinet	L	Secured to wall.
3. Bookshelves (next to heater closet)	H	Cabinet 72” high x 12” deep x 36” wide is not secured. H/D = 6.0
4. Exterior windows	H	Appears to be ordinary glass.

Item	Vulnerability	Comments
Janitor's Closet (Room A35)		
1. Water heater	M	Unrestrained small, short water heater on mezzanine, electric not gas.
2. Teradon electronics cabinet	H	Unrestrained tall electronics cabinet 69" high x 27" deep x 23" wide. H/D = 3.0
Work Room (Room A13)		
1. Tall storage shelves	L-M	A number of built-in units. These appear to be glued to wall.
2. Medium height storage shelves	L	Appear to be secured to wall.
Mezzanine (near roof access)		
1. Old blower	L	Anchored, unit apparently not in use.
Mezzanine		
1. American blower	L	Anchored

Table 2 – Nonstructural Survey Results for Building B (Second Grade Building)

Item	Vulnerability	Comments
Roof		
1. Natural gas line	L-M	A 4" diameter natural gas line originating from the PG&E meter at the west end of Building C runs along the roof of Building B. Line is anchored to roof parapet with unistrut braces. Provision for relative moment of adjacent buildings maybe questionable. This is difficult to visually assess.
Classrooms 13, 14, 15, 16, 17 (Rooms B03,B04,B05,B06,B07)		
1. Window over exit door	H	Overhead glass, probably not tempered.
2. Fluorescent light fixtures	L	Secured directly to ceiling.
3. Heaters (in closet)	L	Anchored and strapped.
4. Bookshelves and storage cabinets	L	Secured to walls or floor.
Hallway (Room B01)		
1. Storage cabinets	L-H	Most cabinets are secured to walls and rated (L). One cabinet (opposite Classroom 15/B05) is not secured and can overturn into the hallway. This is rated (H).

Table 3 – Nonstructural Survey Results for Building C (Ellen Driscoll Auditorium)

Item	Vulnerability	Comments
Grounds		
1. PG&E gas meter	L-M	Meter is located at the west end of the auditorium. It does not appear to be anchored; however, it is restrained by the attached piping. A manual gas shut-off valve is located on the PG&E side of the meter.
Main Roof		
1. Roof tile	L	Individual tiles connected by wire to nails in roof decking.
Boiler Room (Room C02)		
1. Sterling heater	L	Anchored
2. Witt HVAC unit	L	Anchored
Storage Room (Room C01)		
1. Shelf	M	Nominally anchored to wall.
Main Auditorium (Room C05)		
1. Light figures	Unknown	Six large light fixtures supported by approximately 6-foot length of conduit from roof framing. Each fixture is restrained by two horizontal cables connected to adjacent trusses. Difficult to visually assess.
2. Exit lights	L	Secured to wall.
3. Yamaha speakers	Unknown	Speakers on each side of stage. Difficult to assess, but speakers are secured to supporting brackets.

Item	Vulnerability	Comments
Kitchen (Room C06)		
1. Skutt kiln	H	Unanchored electric powered unit, can slide and possibly over-turn.
2. South Bend range	H	Unanchored gas range, can slide and break gas line.
3. Water heater	M-H	Gas water heater, restrained with plumber's tape at top but not at base. Flexible connection to gas line.
4. Hot Point oven/range	M	Unrestrained electric unit.
5. Refrigerators	M	Two of these, both unrestrained.
Music Room (Room C03)		
1. Pendant fluorescent light fixtures	M	See discussion in text.
2. Tall shelves	L	Anchored to wall.
3. Cabinets	H	Unrestrained, can overturn.
Entry (Room C07)		
1. Tile roof	L	Assumed similar to tile on main roof.
2. Light fixture	L-M	Single pendulum fixture, free to swing. Could not see details of top anchorage, but does not appear to be a hazard.

Table 4 – Nonstructural Survey Results for the Building D (First Grade Building)

Item	Vulnerability	Comments
Classroom 18, 19, 20 (Rooms D01 D02, D03)		
1. Pendant fluorescent light fixtures	H	Three longitudinal rows of these. Fixtures supported by metal tube stems about 18 inches long. Fixtures have partial ball and socket swivel at top, but stems are rigidly connected at bottom and do not permit the necessary longitudinal movement. Plastic lens not positively connected to fixture, but very light weight.
2. TV	L	Wall-mounted unit strapped to stand.
3. Windows	L-H	Wire glass at lowest level and rated low risk (L), but upper two panes appear to be ordinary glass and rated high risk (H).
4. Heater	Unknown	Built-in gas-fired unit, difficult to visually assess. Probably not a hazard, but could not see gas line or anchorage.
5. Bookshelves	L	Wall-mounted.
6. Cabinets	L	Two units apparently secured to wall, did not move when pulled.
7. Door	L	Wire-glass.

Table 5 – Nonstructural Survey Results for Building E (Multi-Use Building)

Item	Vulnerability	Comments
Main Room		
1. Fluorescent light fixtures	L	Ceiling-mounted.
2. Exit lights	L	Wall-mounted.
Office		
1. Fluorescent light fixtures	L	Ceiling-mounted.
2. Bookshelves	L	Wall-mounted.
Storage Room		
1. Fluorescent Light Fixtures	L	Ceiling-mounted.
2. Water heater	L	Small, electric unit on stand and strapped to wall.
3. Storage Shelves	L	Approx 7 foot high light-weight metal shelves, secured to wall.
4. Storage Shelves	L	Three wood shelves secured to wall.
5. Sound system equipment	H	Two very small electronic units, both not secured to shelf. These can fall to floor.
Men's Room		
1. Fluorescent light fixtures	L	Ceiling-mounted.
Women's Room		
1. Fluorescent light fixtures	L	Ceiling-mounted.

7. Summary and Recommendations

Summary

An ASCE 31 Tier 2 seismic evaluation of Buildings A, B, and C at Havens Elementary School was performed for the Life Safety performance level. A Tier 1 nonstructural seismic hazard survey was also conducted for these buildings, and also Buildings D and E. Results are briefly summarized below.

The three buildings do not meet the life safety criteria of ASCE 31. The primary findings for each are summarized below.

(1) Building A (Kindergarten/Administration building) –The two classroom wings lack sufficient strength in the longitudinal direction. Seismic forces in this direction are resisted by rod bracing consisting of 7/8-inch diameter steel rods and will likely fail in a major earthquake, jeopardizing the safety of the wings. The administration/library portion of the building has many well placed shear walls, but some of these walls are overstressed in shear, and parts of the building are not tied together property. This portion of the building has much less risk than the two classroom wings.

(2) Building B (Second Grade building) – The building has very weak shear walls in the longitudinal direction. While not considered an imminent collapse hazard, the building is very damageable in this direction under strong earthquake motions. It should also be noted that there are several important structural connections for which the information shown on the drawings is incomplete.

(3) Building C (Ellen Driscoll Auditorium) – The main shear walls on the north, south and east sides of the building have insufficient strength. Also, the proscenium wall/foundation system is greatly overloaded, and the relatively small footings under this wall are greatly overstressed. The concrete canopies on the north and south sides of the auditorium have overstressed columns and their footings are too small.

Some significant nonstructural hazards were found. These include unanchored gas appliances and ordinary glass used overhead in corridors and at exits. It should be noted that many nonstructural elements are anchored or otherwise secured. For example, the vast majority of tall bookcases and storage cabinets located throughout the school are secured against overturning. Many building contents, however, are unsecured and can topple to the floor, but the life safety risk of these is believed to be small.

Recommendations

To mitigate the seismic deficiencies found, we recommend that the following be done.

(1) It is recommended that the buildings be strengthened to the Life Safety performance level of FEMA 356 “Prestandard and Commentary for the Seismic Rehabilitation of Buildings” (Ref. 11). This document is the accepted standard for the seismic rehabilitation of existing buildings and has been accepted by DSA in the past. The FEMA 356 document represents the next step in an evaluation and rehabilitation process that starts with an ASCE 31 evaluation. Alternatively, if ASCE Standard 41-06 (Ref. 12) becomes finalized in time for the upgrade work, this and the 2007 changes proposed to Title 24 for seismic strengthening of existing buildings can be used as the upgrade criteria. ASCE 41 is an updated version of FEMA 356.

(2) Some important details of the construction of the three buildings are unknown or missing on available drawings. These will need to be determined in the next phase of the work. Examples are given below. For Building B, the missing information for connections A, B and C (see Appendix A) should be obtained. For Building A, exploration will be necessary to determine the connection of the roof diaphragm to the glulam beams over the library and the anchorage of the concrete block walls to the roof at the front entrance. For Building C, diaphragm chord splices are unknown, the end connections of the beam over the main entrance are not shown on the drawings, and the roof nailing in several locations will need to be verified. All of these will require some destructive exploration and subsequent repairs.

(3) The nonstructural hazards identified in Tables 1 through 5 should be given a Tier 2 evaluation and/or abated, particularly those designated as having a high (H) vulnerability that can cause injury to persons in the vicinity.

(4) The three buildings lack fire sprinklers, and an earthquake activated automatic gas shut off valve should be installed to minimize the possibility of postearthquake gas leak and resulting fire.

Finally, it should be noted that the above recommendations will need to be considered in light of ADA and fire and life safety considerations. These were not studied or considered in the work summarized in this report. This evaluation is being conducted by the architect for the project. Based on structural considerations alone, we believe it is economically feasible to strengthen the buildings and at the same time preserve their basic functional and architectural character.

8. References

1. ASCE/SEI Standard 31-03, "Seismic Evaluation of Existing Buildings," Structural Engineering Institute, American Society of Civil Engineers, 2003

2. "Piedmont High School and Havens Elementary School Seismic Evaluations", prepared by Janiele Maffei, Structural Engineer, Piedmont, August 1, 2004.

3. "Guide and Checklist for Nonstructural Earthquake Hazards in California Schools", a Project of the California Governor's Office of Emergency Services, Division of State Architect, Seismic Safety Commission, and Department of Education, January 2003.

4. "Seismic Design Parameters," prepared by U.S. Geological Survey, Federal Emergency Management Agency, and Building Seismic Safety Council, Version 3.10, February 2001 (CD-ROM).

5. Architectural drawings for Havens Elementary School (Building A), prepared by Warnecke & Warnecke Architects, San Francisco, Sheets 1 to 15, 1954, DSA Application No.11628.

6. Structural drawings for Havens Elementary School (Building A), prepared by Hall, Pregnoff & Mathew, Structural Engineers, San Francisco, Sheets S1-S8, 1954, DSA Application No.11628.

7. Architectural drawings for Proposed Building (Building B) at Havens School, prepared by John J. Donovan, Architect, Berkeley, Sheets 1, 2, and 3, 1935, DSA Application No. 1444.

8. Structural drawings for Proposed Building (Building B) at Havens School, prepared by R.J. Fisher, Structural Engineer, San Francisco, Sheets S-1and S-2, 1935, DSA Application No. 1444.

9. Architectural drawings for Auditorium Building (Building C) at Havens School prepared by John J. Donovan Architect, Berkeley, Sheets 1-4, 1940, DSA Application No. 3415.

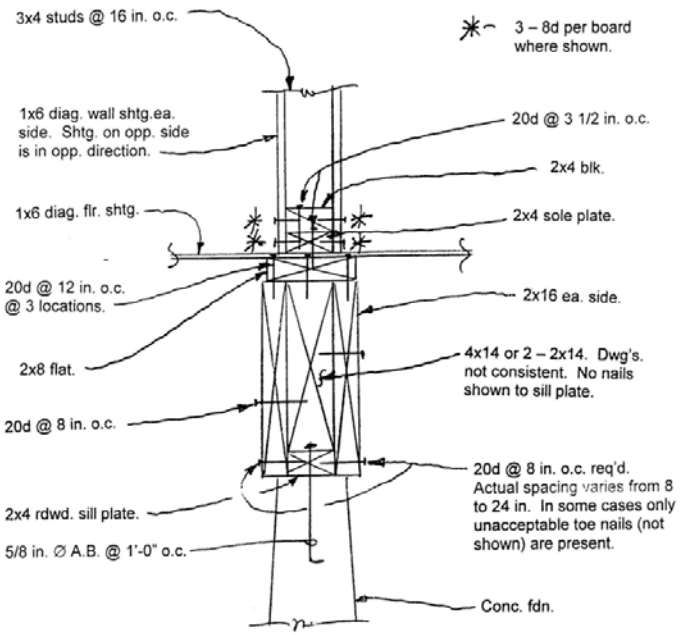
10. Structural drawings for Auditorium Building (Building C), prepared by R. J. Fisher, Structural Engineer, San Francisco, Sheets S1-to S-3, 1940, DSA Application No. 3415.

11. FEMA 356 "Prestandard and Commentary for the Seismic Rehabilitation of Buildings," Federal Emergency Management Agency, November 2000.

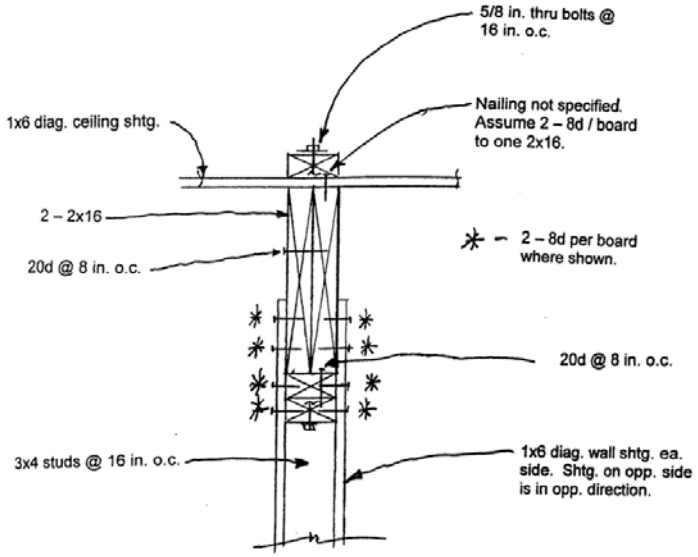
12. ASCE/SEI Standard 41-06, "Seismic Rehabilitation of Existing Buildings", prepublication edition, Structural Engineering Institute, American Society of Civil Engineers, 2006.

Appendix A

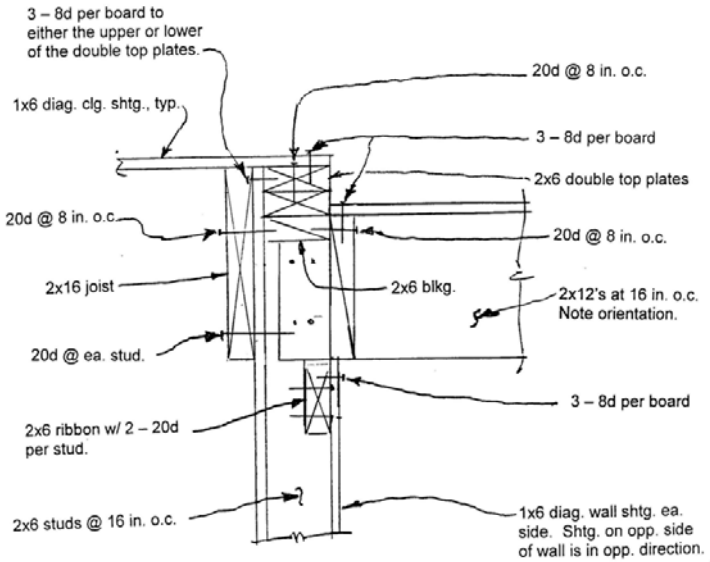
Drawings



Connection A
Interior Transverse Shearwall to Foundation
Lines C thru F



Connection B
Top of Interior Transverse Shearwalls
Lines C thru F



Connection C
Interior Transverse Shearwall at Ceiling
Walls B and G

5. SOILS ENGINEER'S DESIGN RESPONSE SPECTRA REPORT

Geomatrix

Memorandum

TO:	John Nelson murakami/Nelson	**DATE:**	May 10, 2007
FROM:	John Egan	**PROJECT NO.:**	12941.000
CC:		**PROJECT NAME:**	Piedmont Schools Seismic Evaluation

SUBJECT: Earthquake Design Response Spectra and Geohazards Assessment

SUMMARY

Earthquake ground shaking hazard at Piedmont Unified School District (PUSD) school sites was assessed for possible future earthquakes on active faults in the San Francisco Bay region. The Hayward fault, situated approximately 1¾ to 2¾ km [1 to 1¾ miles] east-northeast of the PUSD school sites dominates the earthquake ground shaking hazard; at this proximity to the fault, differences in the ground motion hazard amongst the school sites are not significant. Design-level response spectra were developed in general accordance with the structural design criteria being implemented by the PUSD for this project. For the design basis earthquake ground shaking level (designated as BSE-1), the response spectrum is characterized by a peak horizontal ground acceleration (PGA) of 0.67g. In comparison, we note that ground shaking recorded at the Piedmont Middle School during the M_W 6.9 1989 Loma Prieta earthquake was characterized by peak horizontal ground accelerations almost an order of magnitude lower than that of the BSE-1 level (i.e., PGAs of 0.07g to 0.08g).

In addition to earthquake ground shaking hazard, geologic hazards involving ground failure, including the potential for surface fault rupture, soil liquefaction, and slope instability, were assessed during this study for the PUSD school sites. This assessment is based on our interpretation of conditions at the school sites from published maps and data relevant to the sites, including information on topography, geology, seismicity, and faults, and unpublished geotechnical investigation reports prepared by others, as well as our ground reconnaissance of the sites conducted during the present study. Based on the available information and observations, we are of the opinion that hazard to the PUSD schools due to surface fault rupture, soil liquefaction, and site instability is very low to negligible.

INTRODUCTION

This memorandum presents recommendations for design-level response spectra for utilization in seismic safety and retrofit evaluations of Piedmont Unified School District (PUSD) school buildings being conducted by the murakami/Nelson team for future earthquakes in the

3101 Webster Street, 12th Floor
Oakland, California 94612-3066
Tel 510.663.4100
Fax 510.663.4141
www.geomatrix.com

San Francisco Bay region. We also have assessed the potential for experiencing effects at the school sites associated with earthquake-related geologic and geotechnical hazards (e.g., surface fault rupture, liquefaction-related phenomena, site instability).

Conditions at the school sites were interpreted based on available geologic and geotechnical information for the sites and vicinity, as well as ground reconnaissance of the sites conducted during our study. We reviewed published maps and data relevant to the sites, including information on topography, geology, seismicity, and faults, and unpublished geotechnical investigation reports by others provided by PUSD through murakami/Nelson; these latter reports included logs of exploratory borings drilled at some of the sites. Reports of ground shaking effects in the Piedmont vicinity from historical earthquakes in the region were also reviewed.

GENERAL APPROACH

We have developed design-level response spectra, designated as BSE-2 and BSE-1, to be in general accordance with the structural design criteria being implemented by the School District for this project; those criteria were provided to us by fax on January 18, 2007. In developing these spectra, we have considered results from both probabilistic ground motion analysis (commonly referred to as a probabilistic seismic hazard assessment or PSHA) and deterministic ground motion analysis. These analyses analytically combine information on the locations and geometries of the school sites relative to potential seismic sources (i.e., faults) in the San Francisco Bay region, the maximum earthquake magnitude capabilities interpreted for those seismic sources, spatial and temporal characteristics of earthquake occurrence on the sources, and source-to-site ground motion attenuation (based on published empirical relationships) appropriate to the tectonic environment and interpreted subsurface conditions at the sites, as well as uncertainties associated with each of these components.

REGIONAL FAULTS

The San Francisco Bay region is considered one of the more seismically active regions of the world, based on its record of historical earthquakes and its position astride the North American-Pacific plate boundary (i.e., the San Andreas fault zone and other active faults). The major faults that comprise the 80-km [50-mile] -wide plate boundary include, from west to east, the Seal Cove-San Gregorio, San Andreas, Hayward-Rodgers Creek, and Calaveras faults (see Figure 1). Each of these faults is a potential source of earthquakes that could produce significant ground shaking at the PUSD school sites. Other Holocene faults that may be sources for earthquakes capable of producing ground shaking at the sites include the Concord-Green Valley, Clayton-Marsh Creek-Greenville, and West Napa faults, as well as the Mount Diablo Thrust.

The Hayward fault, situated approximately 1¾ to 2¾ km [1 to 1¾ miles] to the east-northeast (see Figure 2), dominates earthquake ground motion hazard for the PUSD school sites. The San Andreas fault, situated approximately 27 km [17 miles] to the west-southwest of the site, also contributes significantly to seismic hazard at the sites because of its larger earthquake

magnitude capability and longer duration ground shaking associated with those larger magnitude events.

HISTORICAL SEISMICITY

During the past 200 years, numerous small-magnitude and at least fifteen moderate- to large-magnitude (i.e., M6+) earthquakes have occurred in the San Francisco Bay region (Toppozada and Parke, 1982a, 1982b; Ellsworth, 1990; Working Group on Northern California Earthquake Potential [WGNCEP], 1996; Working Group on California Earthquake Probabilities [WGCEP], 1999, 2003). Ground shaking experienced in Piedmont from most of the historic earthquakes in the region has been of generally imperceptible or quite small amplitude and produced effects observed in the Piedmont vicinity that may be categorized as I through V on the Modified Mercalli Intensity (MMI) scale. There have been, however, more than a dozen events in the region that have produced ground shaking strong enough in Piedmont to produce MMI effects greater than V (MMI VI corresponds to the lowest intensity level with which some damage (slight) is associated, although fragile contents may be broken at MMI V).

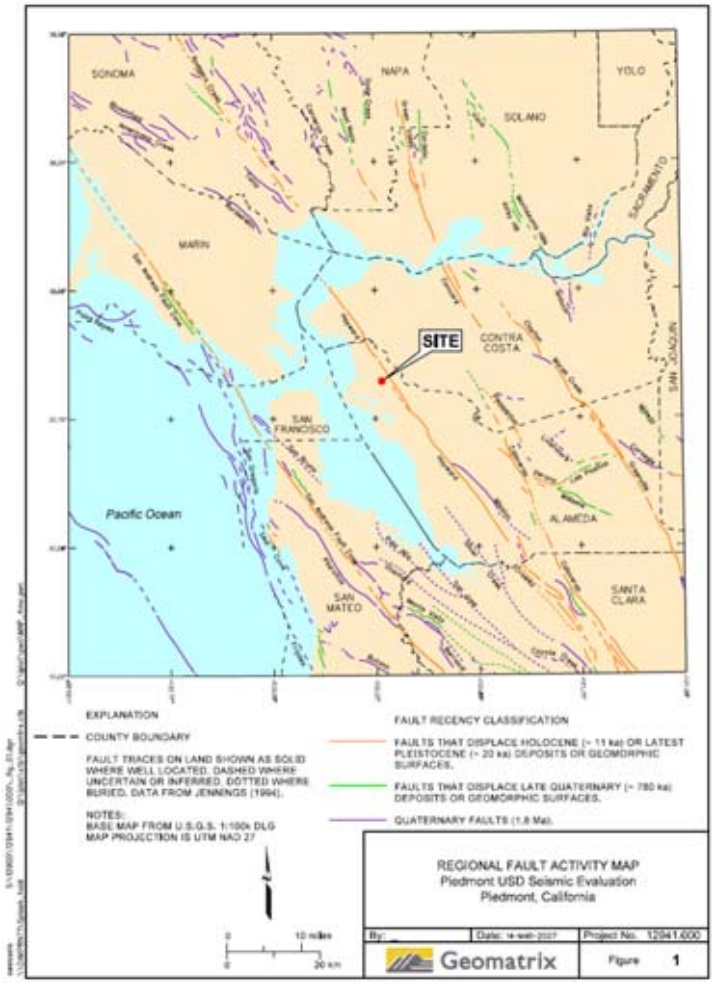
The first significant earthquake reported to have affected the region had a magnitude of approximately 7.5 (estimated from felt intensities), occurring on the Peninsula segment of the San Andreas fault in 1838 (Toppozada and Borchardt, 1998). A series of smaller earthquakes between 1850 and 1865 damaged various sections of the Bay Area, with the 1865 shock centered near the Santa Cruz Mountains being the most damaging (Townley and Allen, 1939).

In 1868, the Hayward fault produced an earthquake having an estimated magnitude of 6.9. Although the effects of this earthquake were poorly documented, surface rupture apparently extended from near Montclair (WGCEP, 2003) southward to the Warm Springs area of Fremont. Significant damage, including liquefaction and settlement in low-lying areas, apparently occurred along the surface rupture between Oakland and Fremont (Lawson, 1908).

During the M_W 7.9[1] 1906 San Francisco earthquake, the San Andreas fault ruptured from Shelter Cove near Cape Mendocino southward to near San Juan Bautista. Maximum lateral displacements of 15 to 20 feet [4.6 to 6.1 m] occurred north of the Golden Gate at Olema in Marin County (Lawson, 1908). Landslides, liquefaction, and ground settlement occurred throughout the Bay Area and in the vicinity of the surface rupture as result of this earthquake.

Earthquakes in the region during the past 50 years include the 1957 Daly City earthquake on the San Andreas fault (M_L 5.3); the two Santa Rosa earthquakes of 1969 on the Healdsburg-Rodgers Creek fault (M_L 5.6 and 5.7); the Coyote Lake and Morgan Hill earthquakes of 1979 and 1984 on the Calaveras fault (M_L 5.9 and 6.1, respectively); the 1980 Livermore earthquake on the Greenville fault (M_L 5.8); the 1989 M_W 6.9 Loma Prieta earthquake in the southern Santa Cruz Mountains; the 1999 M_L 5.0 earthquake near Bolinas; and the 2000 M_L 5.2 Yountville earthquake.

[1] M_W – Moment magnitude; M_L – Local or Richter magnitude.



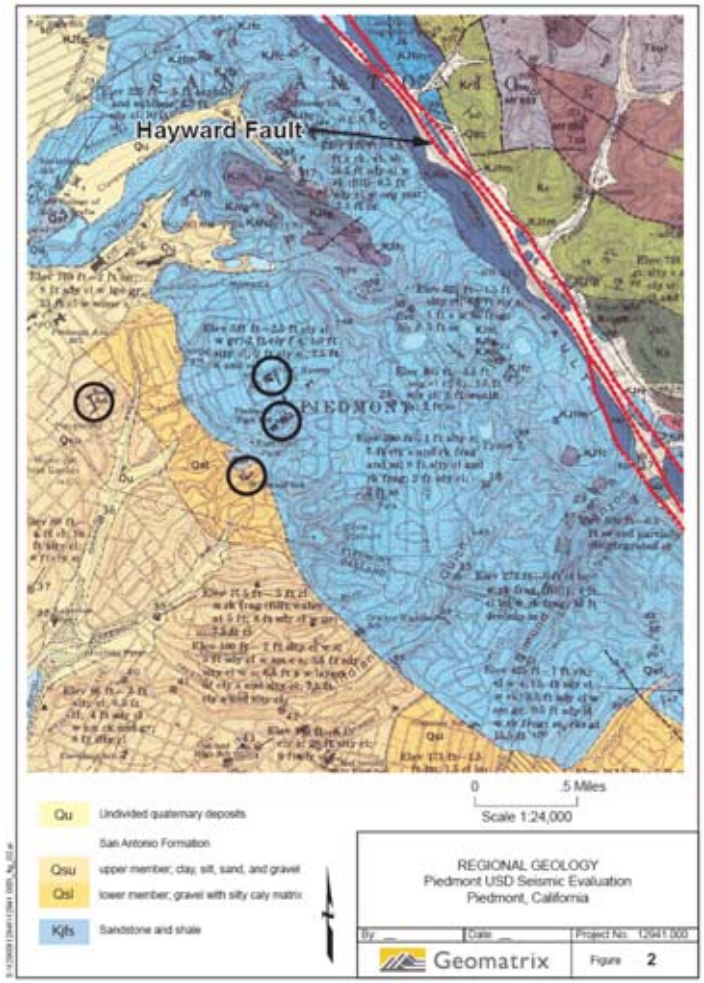
The October 1989 Loma Prieta earthquake, that ruptured on or near the San Andreas fault zone approximately 75 km [47 mi] south of Piedmont, caused significant damage in areas of fill and soft soils, such as in the Marina District of San Francisco and at the Port of Oakland; little damage occurred to structures founded on rock or stiff alluvium in Oakland or San Francisco. We note that ground shaking was recorded at the Piedmont Middle School during the earthquake. That recorded ground shaking was characterized by peak horizontal ground accelerations (PGA) of 0.07g to 0.08g (Shakal and others, 1989). Modified Mercalli Intensity (MMI) effects of VII were reported for Piedmont for this event.

Based on the estimates of MMI reported for the Piedmont vicinity, significantly stronger ground shaking than was experienced in 1989 was quite likely experienced by the school sites during at least the two historic Bay region events mentioned above. The M_W 6.9 Hayward earthquake in October 1868 produced MMI VIII effects in the Piedmont area; to the south, MMI IX+ effects were experienced in near-fault areas of San Leandro (Toppozada and others, 1981; 1982a). The great M_W 7.9 San Francisco earthquake in April 1906 also produced MMI VIII effects in the Piedmont area (Toppozada and Parke, 1982b). Both of these events likely also produced substantially longer ground shaking durations than was experienced during the Loma Prieta earthquake.

The Working Group on California Earthquake Probabilities (WGCEP, 2003) concluded that there is a 62 percent probability that a major (M_W 6.7 or larger) earthquake will occur in the greater Bay region during the 30-year time period between 2003 and 2032. The report also concludes that there is an 80 percent probability that a large (M_W 6.0 to 6.7) earthquake will occur during the same period. The implications of this study are that there is a high likelihood that ground motions stronger than those recorded during the 1989 Loma Prieta earthquake will occur at the PUSD school sites during the next 25 to 30 years.

SITE CONDITIONS

Geologic maps (i.e., Radbruch, 1969; Dibblee, 2005), our site reconnaissance, and available logs of borings drilled by others at the school sites (Harza, 1994; 1995a,b,c,d; 1997a,b) indicate that subsurface conditions at the school sites typically consist of a thin veneer of fill or Pleistocene-age soil deposits overlying Franciscan formation sandstone and/or shale rock at relatively shallow depths (see Figure 2). Given these conditions, it is our opinion that ground motion attenuation relationships developed for rock site conditions are appropriate to characterize the potential ground shaking at the school sites. For this study, we have utilized the published empirical attenuation relationships developed by Abrahamson and Silva (1997), Boore and others (1997), Campbell (1997), Sadigh and others (1997), and Idriss (1995). These attenuation relationships describe the variation of peak ground acceleration and response spectral accelerations at specific structural periods of vibration and damping ratios with earthquake magnitude and distance and were developed on the basis of statistical analyses of ground motions recorded during earthquakes at many locations in California, as well as in other parts of the western United States and foreign countries having similar tectonic environments.



EARTHQUAKE GROUND SHAKING

As mentioned previously, we have considered results from both probabilistic ground motion analyses (PSHA) and deterministic ground motion analyses (DSHA) in developing design-level response spectra for this project.

School Sites' Hazard Comparisons. Based on our evaluations and experience with other sites near the Hayward fault and in the general vicinity, as well as elsewhere in the Bay region, we expect that differences in the ground motion hazard amongst the school sites are not significant. We therefore are of the opinion that a single, common set of design-level response spectra (BSE-2 and BSE-1) is appropriate to all of the sites for conducting seismic safety and retrofit evaluations of the school buildings.

PSHA results presented by the California Geological Survey (CGS) (Cao and others, 2003) for each of the schools' site coordinates, corresponding to a 10% probability of exceedance in 50 years (475-year return period) and firm rock site conditions, are summarized in Table 1.

TABLE 1

SUMMARY OF CGS HAZARD RESULTS FOR THE PUSD SCHOOL SITES

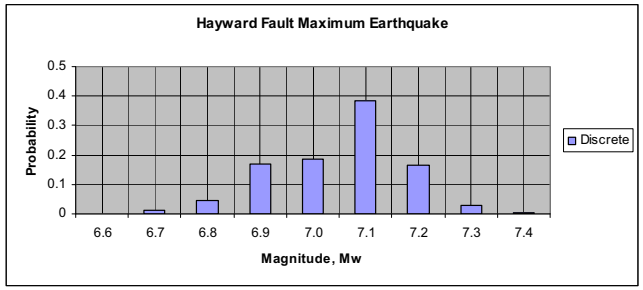
School	Closest Distance to Hayward Fault (km)	Ground Motion Hazard for P_E=10% in 50 Years and Firm Rock Site Conditions (5%-damped)		
		PGA (g)	S_a (g) @ T=0.2s	S_a (g) @ T=1s
Havens	1.7	0.779	1.811	0.686
High School	1.8	0.779	1.809	0.685
Middle School	1.9	0.777	1.807	0.684
Wildwood	2.2	0.774	1.800	0.681
Beach	2.7	0.772	1.794	0.679

We note that these results demonstrate the very small difference in estimated ground shaking hazard (less than 1%) amongst the sites.

Deterministic estimates of possible horizontal peak ground accelerations and response spectral accelerations at the PUSD school sites were developed assuming the occurrence of possible maximum magnitude earthquakes rupturing through the closest point on the Hayward fault zone from the sites. The WGCEP (2003) defines three segments for the Hayward-Rodgers Creek fault zone: the south Hayward, north Hayward, and Rodgers Creek. The boundary between the south and north Hayward segments has been taken by the WGCEP (2003) to lie at Montclair, or approximately the closest point on the Hayward fault from the PUSD school sites; the Rodgers Creek fault segment lies north of San Pablo Bay. The WGCEP (2003) has characterized five possible rupture scenarios ruptures involving either the south Hayward or north Hayward segments, individually or in combination, each associated with a likelihood of that rupture

scenario occurring and probabilistic distributions for characteristic maximum earthquake magnitudes for that scenario. These scenario likelihoods and magnitude distributions were incorporated in conducting the deterministic ground motion analyses to estimate the ground shaking characteristics representative of the possible range of maximum earthquake capability of the Hayward fault near Piedmont; this possible range of maximum earthquake capability is illustrated on Figure 3.

FIGURE 3



The ground motion attenuation relationships mentioned previously were used in these deterministic analyses. The results of deterministic analyses indicate a median response spectrum characterized by median peak horizontal ground accelerations of 0.67g; this ground motion level corresponds to the BSE-1 design-level in the structural design criteria being implemented by the PUSD for this project. To obtain the MCE or BSE-2 design-level ground shaking response spectrum in accordance with these structural design criteria, the median deterministic response spectrum was multiplied by a factor 1.5.

RECOMMENDED DESIGN-LEVEL RESPONSE SPECTRA

Based on the considerations mentioned previously and results from probabilistic and deterministic ground motion analyses for the sites, we recommend the response spectra presented in Table 2 and Figure 4 below to represent the design levels BSE-2 and BSE-1 for use in seismic safety and retrofit evaluations being conducted for the PUSD schools.

Near-Field Effects Considerations. Although the sites are situated in relatively-close proximity to the Hayward fault zone, we understand, based on discussions with the design/evaluation team, that the school buildings are relative short-period structures (i.e., $T \leq 1$ sec.); so, we anticipate that potential near-field rupture directivity and fault normal/parallel effects that can be significant to longer period horizontal-component ground motions will be small or insignificant at the

periods of the buildings. We have not, therefore, included explicit evaluation of these effects in our analyses.

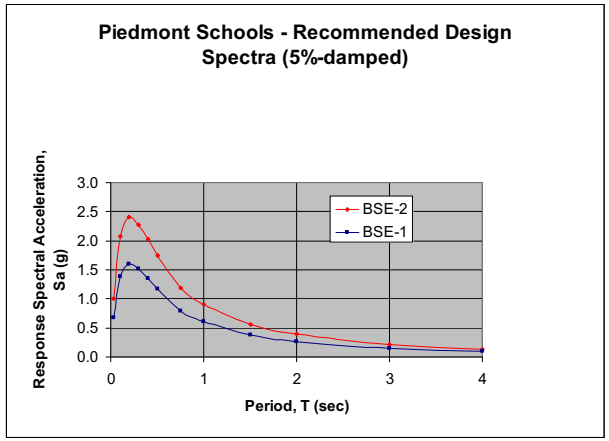
Vertical Response Spectra Considerations. As mentioned previously, the Piedmont school sites are is situated in close proximity to the Hayward fault, which dominates ground motion hazard at the sites. Near-field strong motion recordings obtained from earthquakes that have occurred over the past three decades have exhibited vertical motions equal to or exceeding the horizontal motions (e.g., Egan and others, 1994; Abrahamson and Silva, 1997; Campbell and Bozorgnia, 2003). Of relevance to the Piedmont school sites, examination by these and other authors of available ground motion data from moderate to large ($M_W \geq 6.5$) California earthquakes indicates: (1) within about 15 km of fault ruptures, peak ground accelerations and higher frequency ($T < 0.2$ sec) response spectral ordinates for the vertical component approximately equal or exceed those of the horizontal components; and (2) there appears to be little distance dependence for longer period motions ($T > 0.3$ sec), with average vertical to horizontal ratios for spectral ordinates of about one-half or less for all distance ranges examined.

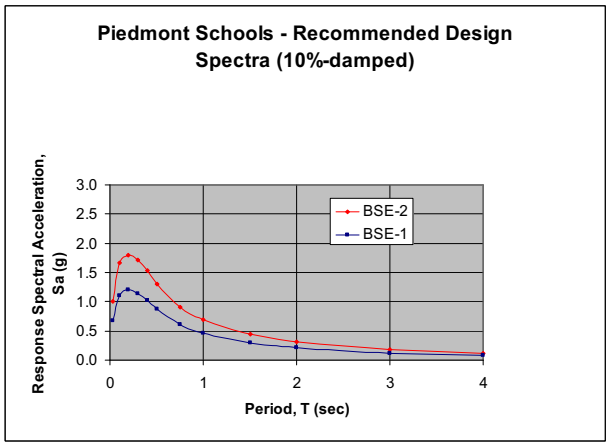
TABLE 2

RECOMMENDED DESIGN-LEVEL BSE-2 AND BSE-1 HORIZONTAL-COMPONENT RESPONSE SPECTRA FOR THE PUSD SCHOOL SITES.

Period, T (sec)	Response Spectral Acceleration, S_a (g) 5%-damped		Response Spectral Acceleration, S_a (g) 10%-damped	
	BSE-2	BSE-1	BSE-2	BSE-1
PGA	1.005	0.670	1.005	0.670
0.03	1.005	0.670	1.005	0.670
0.1	2.071	1.381	1.657	1.105
0.2	2.404	1.603	1.803	1.202
0.3	2.281	1.521	1.711	1.141
0.4	2.035	1.357	1.526	1.017
0.5	1.747	1.165	1.310	0.873
0.75	1.192	0.794	0.905	0.603
1	0.913	0.609	0.699	0.466
1.5	0.565	0.376	0.443	0.296
2	0.390	0.260	0.312	0.208
3	0.218	0.145	0.181	0.121
4	0.139	0.093	0.120	0.080

FIGURE 4





OTHER COMPARATIVE RESPONSE SPECTRA

For comparison purposes, we have also evaluated response spectral ordinates associated with a number of probabilistic hazard levels and several deterministic events of significance to ground shaking at the sites. These include:

- Probabilistic hazard levels of 2%, 10%, and 20% in 50 years.
- Characteristic maximum magnitude earthquakes assigned to the Hayward fault. The 2002 Working Group on California Earthquake Probabilities (United States Geological Survey [USGS], 2003) selected Montclair as the segmentation point between the northern and southern segments of the Hayward fault; Montclair lies essentially at the closest location of the fault to the school sites. Therefore, characteristic maximum magnitude earthquakes assigned by the CGS/USGS to the northern Hayward fault segment (M_W 6.5), to the southern Hayward fault segment (M_W 6.7), and to the Hayward fault as a whole (M_W 6.9) may be considered as rupturing the fault at the closest distance of the fault to the school sites. We note that the October 21, 1868, earthquake that ruptured the southern portions of the Hayward fault is interpreted to have been a M_W 6.9 event; there is some uncertainty as to extent of surface rupture for this event, but trenching evidence suggests it extended at least as far north as Montclair.
- Characteristic maximum magnitude earthquake assigned to the San Andreas fault based on the fault rupture that occurred in 1906 (M_W 7.9).

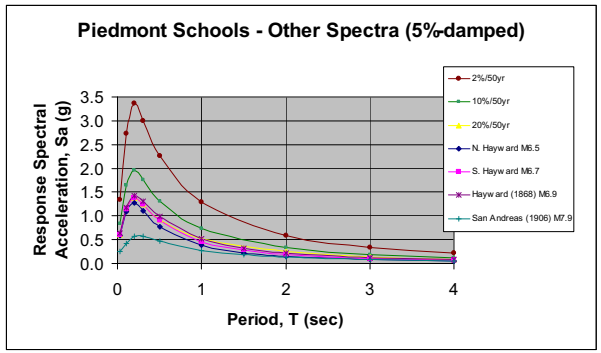
Response spectral ordinates for these various hazard levels and characteristic and/or historic events are summarized in Table 3 and Figure 5 below.

TABLE 3

COMPARATIVE HORIZONTAL-COMPONENT RESPONSE SPECTRA ESTIMATED FOR SELECTED HAZARD LEVELS AND CHARACTERISTIC AND/OR HISTORIC EARTHQUAKES AFFECTING THE PIEDMONT SCHOOL SITES.

Period, T (sec)	Response Spectral Acceleration, S_a (g) 5%-damped						
	Probability of Exceedance (P_E) in 50 years			Hayward Fault			San Andreas Fault
	2%	10%	20%	Northern M_W 6.5	Southern M_W 6.7	Historic (1868) M_W 6.9	Historic (1906) M_W 7.9
PGA	1.34	0.84	0.61	0.58	0.61	0.63	0.25
0.03	1.34	0.84	0.61	0.58	0.61	0.63	0.25
0.1	2.73	1.65	1.15	1.08	1.14	1.17	0.42
0.2	3.36	1.96	1.37	1.27	1.37	1.43	0.58
0.3	2.99	1.76	1.24	1.11	1.23	1.31	0.57
0.5	2.26	1.31	0.93	0.78	0.90	0.98	0.46
1	1.29	0.74	0.52	0.38	0.46	0.51	0.27
1.5	-	-	-	0.22	0.28	0.32	0.18
2	0.58	0.34	0.24	0.15	0.19	0.21	0.13
3	0.33	0.19	0.14	0.08	0.10	0.12	0.08
4	0.21	0.12	0.09	0.05	0.07	0.08	0.05

FIGURE 5



GEOLOGIC HAZARDS

Geologic hazards considered during this study for the PUSD school sites include the potential for surface fault rupture, soil liquefaction, and slope instability.

Surface Fault Rupture. There have been no active or potentially active faults identified in the immediate vicinity of the PUSD school sites according to the California Geological Survey and the site is not located within a State of California Special Fault Studies Zone. The nearest active fault is the Hayward fault, situated no closer than approximately 1¾ km [1 mile] to any of the school sites (see Figure 2). Additionally, reconnaissance observations of the sites and surrounding areas do not indicate the presence of geologic conditions, geomorphic features or lineaments suggestive of active or inactive faulting crossing the sites. Based on this information, we are of the opinion that surface fault rupture hazard to the PUSD school sites is negligible.

Liquefaction. Liquefaction is a soil behavior phenomenon in which a soil loses a substantial amount of strength due to high excess pore-water pressure generated by strong earthquake ground shaking. Recently deposited (geologically) and relatively unconsolidated soils and artificial fills located below the ground water surface are considered susceptible to liquefaction (Youd and Perkins, 1978). Typically, susceptible soils include relatively clean, loose, uniformly graded silt and sand deposits (National Research Council, 1985).

As discussed previously in this report, the geologic and geotechnical data gathered during this study indicate that the surficial soils, if present, are Pleistocene-age deposits. These soils are considered to have very low susceptibility to earthquake-induced liquefaction. We note that no evidence of liquefaction and/or related effects was reported for the PUSD school sites or vicinity for the 1868 Hayward earthquake or the great 1906 San Francisco earthquake (Lawson, 1908; Youd and Hoose, 1978), nor for the 1989 Loma Prieta earthquake (Tinsley and others, 1998). We are of the opinion, therefore, that the hazard due to potential soil liquefaction to the PUSD school sites is negligible.

Site Stability. Lateral spreading, which is the lateral displacement of surficial soils, is usually associated with the liquefaction of underlying soils. With the potential liquefaction hazard at the site judged to be negligible, we expect that the potential for lateral spreading to occur and affect the school buildings to be of similar hazard level. The soil deposits and rock materials underlying the school sites are considered to be quite competent and not susceptible to significant strength changes that would affect site stability. No ground cracking, hummocky topography, displaced flatwork, slope creep affecting tree growth, or other significant evidence of ground deformation or site instability was observed at the school sites or in slopes adjacent to the school sites during our ground reconnaissance. We do note that at Beach Elementary School, the retaining wall along the Linda Avenue (west) side of the playground and the retaining wall along Howard Avenue at the top of the slope on the west side of the school are cracked and some portions of the walls have rotated outward about the base of the wall. It is our opinion that this localized wall

distress represent long-term wall maintenance and repair/replacement issues, rather than being indicative of global site instability. In addition, there are no mapped landslides (Nilsen, 1975) nor reports of ground failure at the sites or in their immediate vicinities during historical earthquakes (Youd and Hoose, 1978), and Miles and Keefer (2001) map the relative seismic landslide hazard for the Havens, Wildwood, Middle School, and High School sites as negligible to low, with the Beach site as moderate. We are of the opinion that hazard to the PUSD schools due to site instability is very low.

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6. MATERIALS TESTING & INVESTIGATION REPORT

APPLIED MATERIALS & ENGINEERING, INC.
980 41st Street
Oakland, CA 94608
Tel: (510) 420-8190
FAX: (510) 420-8186
e-mail: info@appmateng.com

May 4, 2007

Mr. John Nelson
MURAKAMI & NELSON
100 Filbert Street
Oakland, CA 94607

Project No. 107126C

Fax Transmittal: 510-893-5244

Subject: Exploratory Field Work
Havens Elementary School
1800 Oakland Avenue, Piedmont, CA

Dear Mr. Nelson:

As requested, Applied Materials & Engineering, Inc. (AME) has furnished manpower and equipment for investigation of roof, ceiling, and wall framing of the Administration and Second Grade buildings at the subject location. Access was provided by us for documentation of existing structural details by the structural engineer.

In addition, two items were investigated at the Driscoll Auditorium; a) nailing of roof sheathing to framed wall, and b) structural details of 2x6 ledger at roof level.

PROCEDURES & RESULTS

a) Nailing of Roof Sheathing To Framed Wall

Roof tiles were removed in order to document nail size and pattern of attachment of roof sheathing to framed wall below. Location of this investigation is shown in Figure 1.

Based on our observations, the framed wall does not extend up to the roof sheathing, therefore, no connection of the sheathing to wall exists.

b) Structural Details of 2x6 Ledger At Roof Level

Documentation of 2x6 ledger splice was performed in the attic of the entry at the Driscoll Auditorium. Location of ledger splice documented is shown in Figure 1.

Based on our examination of the splice in the 2x6 ledger, we have determined the following:

Splice Location: 22' from the south wall
Nail Size: 20d common
Nail Pattern: Two nails each side of splice
Connection Hardware: None, no straps or wood scabs exist.

Please call if you have questions regarding the above.

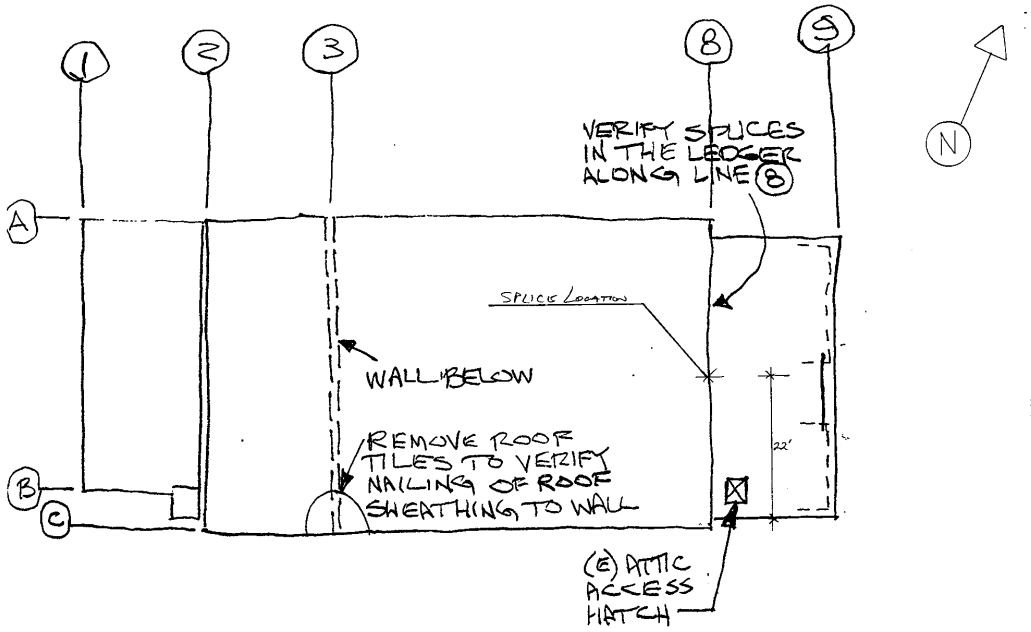
Sincerely,

APPLIED MATERIALS & ENGINEERING, INC.

Dean Wilson
Project Manager

Reviewed by:

Armen Tajirian, Ph.D., P.E.
Principal



ROOF PLAN

ELLEN DRISCOLL AUDITORIUM

FIGURE 1

7. APPENDIX

APPENDIX A:

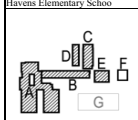
PIEDMONT SEISMIC SAFETY PROGRAM

PIEDMONT UNIFIED SCHOOL DISTRICT

PROJECT STATUS & INFORMATION AVAILABILITY MATRIX

JULY 5, 2007

School / Site	Abbreviation	Building Designation	Building Name	Seismic Tier 1	Letter From Forcell & Elsesser on Seismic Performance	ATI Report (Accessibility, Seismic Performance)	Included in Scope Of Work (for m/N)	Qualitative Seismic Assessment by R.P. Gallagher	Benchmark Building	Seismic Tier 2	Seismic Non-Structural Hazard Report	ADA / Access Evaluation	Life Safety Evaluation	Materials Testing	Destructive Testing	Slope Stability Analysis / Site Specific Spectra	Peer Review a Investigation and Analysis	Peer Review Non-Structural	Peer Review at Concept Design	Peer Review at Schematic Design	Peer Review at Design Development	Peer Review at 100% CDs	Existing Hazardous Materials Reports in m/N possession	Hazardous Materials Report	Topographical Survey	Property Survey / Title Report	Existing Geotechnical Reports	Existing Structural Calculations in m/N possession	Existing Specifications in m/N possession	Measured Drawings - Architectural	Measured Drawings - Structural	DSA Drawings in m/N possession	DSA Drawing Date	DSA Number for Drawings	Drawings	Architect	Concept Plan	Cost Estimate (1)	Refined Concept Plan / Vision	Cost Estimate (2)	Comments
Havens Elementary Schoo	HES																																								
		A	Admin. / Kindergarten Wings	●		●	●	×		●	●	●	●	●	●	●	●	●	○	○	○	●	○	●	●	×	×	×	×		●	5/29/1954	11628	original	Warnecke & Warnecke	●	●	○	○	
																															●	5/25/1970	851..?	Rehabilitation (not built	Richard C. Marshall, Chester Bowles Jr					
																															●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architec					
		B	Second Grade	●		●	●	×		●	●	●	●	●	●	●	●	●	○	○	○	●	○	●	●	×	×	×	×		●	2/27/1936	1444	original	John J. Donovan, Architect	●	●	○	○	
																															●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Eng.					
																															●	5/25/1970	851..?	Rehabilitation (not built	Richard C. Marshall, Chester Bowles Jr					
																															●	9/5/1990	54740	Re-Roofing Project	Keith Eric Johnson Architec					
		C	Ellen Driscoll Playhouse	●		●	●	×		●	●	●	●	●	○	●	●	●	○	○	○	●	○	●	●	×	×	×	×		●	9/23/1940	3415	original	John J. Donovan, Architect	●	●	○	○	
																															●	5/10/1954	11953	Electrical Work	Romains W. Myers-Elect. Engineer					
		D	First Grade	●		●	●				●	●	●	×	×	●	×	●					○	○	●	●	×	×	×	×		●	2/17/1961	20815	original	Clarence W. Mayhew	●	●	○	○	
		E	Multi-Purpose Gym	×		●	●		●		●	●	●	×	×	●	×	●					○	○	●	●	●	×	×	×		●	5/20/1998	67713	original - phase I	Byrens Associates	●	●	○	○	
																															●	9/24/1998	67713	original - phase II	Byrens Associates					
		F	After-School Program (City Owned	×		×	●																		●	●															
		G	Portables	×		×	●																		●	●															



LEGEND

- ○ NEEDED/IN PROGRESS
- ● YES / OK / COMPLETE
- ○ DO NOT HAVE
- ● NON CONCLUSIVE
- × NOT NECESSARY
- ○ Pending Authorizatior
- ● NO

Shaded Area Indicates Tier 2 Seismic Analysis

APPENDIX B: BUILDING CODE ANALYSIS

Legend:

☒ NOT IN COMPLIANCE
✓ ACCEPTABLE

Calculation of Building Area

Building A:	27,597 sf
Building B:	7,541 sf
Building C (auditorium):	5,090 sf
Building D:	2,979 sf
Building E (multi-purpose room):	3,072 sf
Total Area for all buildings:	46,698 sf

Chapter 3: Use or Occupancy

Main Occupancy Group:	E-1	(Sec 305)
Accessory Occupancy Groups:		
Auditorium/Theatre	A-2	Assembly
Administrative	B	Office (less than 25% of Building A)

✓ No occupancy separation required between **E** and **B** Occupancy. (Table 3-B)
CBC 302.1. Exception 2.2: "Administrative and Clerical offices & similar rooms which do not exceed 25 percent of the floor area of the major use."

Chapter 5: Building Limitations

Building A

Allowable Floor Area

	Allowance	Running Total
-Construction Type V-N: (Table 5-B)	9,100 sf	9,100 sf
-Side yard separation increase: (505.1.2) three sides (60' - 20') x .025 =	100%	18,200 sf
Total allowable floor area:		18,200 sf
☒ Total actual floor area:		27,597 sf

Allowable Height

✓ 40 feet, 1 stories (Type V -N) (Table 5-B)

Wall and Opening Protection (Table 5-A)

☒ Walls: Two-hour less than 5 ft. (considered separate from Building A).
☒ Walls: One-hour less than 10 ft.
✓ Walls: NR elsewhere
☒ Openings: Protected less than 10 ft., not permitted less than 5 ft.

Building B

Allowable Floor Area

	Allowance	Running Total
-Construction Type V-N: (Table 5-B)	9,100 sf	9,100 sf
Total allowable floor area:		9,100 sf
✓ Total actual floor area:		7,554 sf

Allowable Height

✓ 40 feet, 1 stories (Type V -N) (Table 5-B)

Wall and Opening Protection (Table 5-A)

☒ Walls: Two-hour less than 5 ft. (considered separate from Building A).
☒ Walls: One-hour less than 10 ft.
✓ Walls: NR elsewhere
☒ Openings: Protected less than 10 ft., not permitted less than 5 ft.

Building C

☒ TYPE V-N not permitted for Auditorium/Theatre, one-hour construction required throughout. (Table 5-A).

Allowable Floor Area

	Allowance	Running Total
-Construction Type V-N: (Table 5-B)	9,100 sf	9,100 sf
Total allowable floor area:		9,100 sf
✓ Total actual floor area:		5,788 sf

Allowable Height

✓ 40 feet, 1 stories (Type V -N) (Table 5-B)

Wall and Opening Protection (Table 5-A)

✓ Walls: Two-hour less than 5 ft.
☒ Walls: One-hour less than 10 ft. (verify width at exit court)
✓ Walls: NR elsewhere
☒ Openings: Protected less than 10 ft., not permitted less than 5 ft.

Chapter 9: Fire Protection Systems

☒ Sprinklers are required for Group E Occupancy (Section 904.2.4.1).
Note: buildings are close to complying with the following exception no.1: "…sprinklers are not required when ground floor exits are provided at each classroom and assembly space…"

✓ Sprinklers not required for Group A2 Occupancy.

Chapter 10: Means of Egress

Exits Required: See plans for room exiting requirements. Cumulative occupant load exiting requirements will be calculated during future concept design phase.

✓ Maximum travel distance to exit in non-sprinklered hallway is 150' (section 1007.3.3).
✓ Hallway width shall be two feet wider than required by Sec. 1003, but not less than 6'. Except when less than 100 occupants 44" min. (Section 1007.3.5).

✓ Stair width shall not be less than 5'. (Section 1007.3.6).

✓ Panic hardware required where occupant load is over 50.

☒ Exit Court at Building B: One- hour rated walls to 10' ht with ¾ hour rated openings. (Section 1006.3.5.3)

THEODORE C. ZSUTTY PH.D.
STRUCTURAL ENGINEER
1579 PEREGRINO WAY
SAN JOSE, CALIFORNIA 95125
TELEPHONE (408) 265-8518

March 29, 2007

Constance Hubbard
Superintendent
Piedmont City Unified School District
760 Magnolia Avenue
Piedmont, CA 94611

Subject: Peer Review of Havens Elementary School Seismic Evaluation

Dear Ms. Hubbard:

I have completed my peer review of the seismic evaluation of the three buildings at the Havens Elementary School site. This review consisted of: coordination with the Structural Engineer, a site visit, and review of the Draft Report of January 8, 2007 and related calculations as prepared by R.P. Gallagher Associates.
I approve the use of the ASCE 31 Tier 2 Seismic Evaluation criteria and procedures for the purpose of evaluating these buildings and identifying the elements that require retrofit in order to provide the life safety performance level. I concur with the results of the evaluation and related conclusions.
The report is thorough and the findings can serve as a basis for the preparation of upgrade studies for these buildings. I am presently coordinating with RPG for the selection of criteria to be used for these studies.

Sincerely,

Theodore C. Zsutty

Copies:
R.P. Gallagher
Mike Wasserman, CPM
John Nelson, Murakami/Nelson ✓

THEODORE C. ZSUTTY PH.D.
STRUCTURAL ENGINEER
1579 PEREGRINO WAY
SAN JOSE, CALIFORNIA 95125
TELEPHONE (408) 265-8518

June 22, 2007

Constance Hubbard
Superintendent
Piedmont City Unified School District
760 Magnolia Avenue
Piedmont, CA 94611

Re: Peer Review of Canopy Evaluation at Ellen Driscoll Auditorium at Havens Elementary School

Dear Ms Hubbard:

I have completed my peer review of the "ASCE 31 Tier 2 Seismic Evaluation of Canopies at Ellen Driscoll Auditorium" as prepared by R.P. Gallagher Associates,Inc.
I approve the use of the ASCE 31 Tier 2 Evaluation with the Linear Static Procedure. The response spectrum value of S_a = 1.28g is appropriate for the structures, along with the use of the Life Safety Performance Level parameters of m = 2.5 and J =2.5. The evaluation is consistent with that used for the ASCE 31 evaluation of the other structures at the Havens Elementary School.

I concur with the conclusion that these canopies do not meet the required life safety criteria. The behavior of these non-ductile concrete structures under strong ground shaking is highly variable. Damage could include large distortion due to footing rotation, local column failure due to flexure at the slab base, and severe spauling or tear-out failure at the top slab connection. The damaged condition could empede safe exiting of the auditorium and could also be a falling hazard in the event of strong aftershocks.

I approve the representation of this canopy evaluation as given in the "Seismic Evaluation of Three Buildings at Havens Elementary School" dated June 11, 2007.

Sincerely,

Theodore C. Zsutty, SE

Copies:
John Nelson ✓
R.P. Gallagher

REGISTERED PROFESSIONAL ENGINEER
THEODORE C. ZSUTTY
S 1946
EXP. 3/31/08
STRUCTURAL
STATE OF CALIFORNIA

November 7, 2007

Mr. John Nelson, A.I.A.
President
Murakami/Nelson
100 Filbert Street
Oakland, CA 94607

Subject: Peer Review of Tier 1 Evaluation of Havens First Grade Building

Dear John:

I have completed my peer review of the Tier 1 Evaluation of the First Grade Building at Havens Elementary School, dated December 2, 2002. Except for the item discussed below, the evaluation complies with the procedures and load criteria as prescribed by ASCE 31.

Reference to the Degenkolb Tier 1 Evaluation Lateral Force Resisting System check list item 4.4.2.1.1 REDUNDANCY: There is only one line (not two lines as stated) of shear wall in the EW direction. The single EW shear wall is on the South side and the North side window wall cannot be used as a shear wall. There are four orthogonal NS walls to resist torsion. I have checked with Janielle and there was a wall stress check for the open front condition. With the available plans, I have performed a rough check: the single EW wall and the two exterior NS walls have shear stresss of about 500 plf to 600 plf are below the 1000 plf limit for wood panel walls.
I recommend that a Tier 2 evaluation be performed to evaluate wall and diaphragm stresses, tie details, and particularly to estimate displacement in the North side window wall. The concern is the possibility of glass breakage and jamming of the North wall exit doors for the three classrooms due to plan torsion displacement of the "open front" configuration.

Consider this as a draft report for information and discussion at our meeting on November 14th.

Sincerely,

Ted Zsutty

R. P. Gallagher Associates, Inc.
Structural and Earthquake Engineering

519 Seventeenth Street
Suite 220
Oakland, CA 94612
(510) 893-2400
FAX (510) 893-2452

March 20, 2008

Mr. John Nelson, AIA
Murakami/Nelson Architects
100 Filbert Street
Oakland, CA 94607

Subject: Tier 1 Evaluation of Havens ES First Grade Building

Dear John:

The Tier 1 seismic evaluation of the Havens First Grade building (Building D) was peer reviewed by Ted Zsutty. In his 11/15/07 letter to the District, he found that the building met ASCE 31 requirements with one exception.

ASCE 31 requires at least two lines of resistance in both directions. Because the north facing wall is an open window wall, the building did not meet this requirement. Ted recommended that a Tier 2 evaluation be performed to evaluate wall and diaphragm stresses, tie details, and displacements.

We have performed the supplementary calculations he requested. Results show that the building's shear walls, roof diaphragm and connection details meet the ASCE 31 Tier 2 criteria. Consequently, we believe the building meets the ASCE 31 Tier 1 life safety structural requirements. Some nonstructural elements, such as the pendant light fixtures, do not meet ASCE 31.

Our calculations indicate that the transient deflection of the top of the north window wall would be in the 2 to 3 inch range. Evaluation of this deflection is not required as part of the ASCE 31 Tier 1 requirements. The amount of deflection indicates the advisability of reviewing the glass elements of the wall for breakage during a seismic event. This had previously been identified as a concern in our Havens nonstructural study.

Mr. John Nelson, AIA
March 20, 2008
Page Two

A copy of this letter and the supplemental calculations are being sent to Ted Zsutty for his review.

Very truly yours,

Ronald Gallagher, SE
President

cc: Ted Zsutty (w/calcs)

THEODORE C. ZSUTTY PH.D.
STRUCTURAL ENGINEER
1579 PEREGRINO WAY
SAN JOSE, CALIFORNIA 95125
TELEPHONE (408) 265-8518

March 31, 2008

Constance Hubbard
Superintendent
Piedmont City Unified School District
760 Magnolia Avenue
Piedmont, CA 94611

Subject: Peer Review of Supplementary Evaluation of Havens ES First Grade Building D

Dear Ms. Hubbard:

I have completed my peer review of the Supplementary Evaluation of the Havens ES First Grade Building D (March 20, 2008) as prepared by R.P. Gallagher Associates (RPGA). This supplementary evaluation was performed in response to my recommendation (Tier 1 Peer Review, November 15, 2007) concerning the investigation of torsional effects of the single East-West shear wall configuration of the building plan.

My review included the Supplementary Calculations by RPGA (March, 2008) and related letter report by RPGA to John Nelson (March 20, 2998). I agree with the conclusion that the building essentially meets the ASCE Tier 1 life safety structural requirements.
I also agree that the front window wall needs a review for possible glass breakage during a seismic event, along with a mitigation of the breakage effects.

Sincerely,

Theodore C. Zsutty
Peer Review Engineer

Copies:
John Nelson ✓
Ron Gallagher

Fidelity National Title Company

PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein, ***Fidelity National Title Company*** *hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a policy or policies of title insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.*

The printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said policy or policies are set forth in Attachment One. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Attachment One. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Fidelity National Title Insurance Company, a California corporation.

Please read the exceptions shown or referred to herein and the exceptions and exclusions set forth in Attachment One of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.

Countersigned

Fidelity National Title Company

SEAL

BY President

ATTEST Secretary

Fidelity National Title Company

50 California Street, Suite 3550 • San Francisco, CA 94111
415 392-1061 • FAX 415 438-7876

PRELIMINARY REPORT

Title Officer: Rob Delgado
Escrow Officer: Margo Maggiani
Escrow No.: 07-**144322**-MM

Title No.: 07-**1145989**-RD
Locate No.: CAFNT0901-0938-0014-0001145989

TO: Sandis Civil Engineers
605 Castro Street
Mountain View, CA 94041

ATTN: Nidhi Chanani

SHORT TERM RATE: No

PROPERTY ADDRESS: APN#s 050-4624-003-04 and 050-4624-013-02, Piedmont, California

EFFECTIVE DATE: March 2, 2007, 07:30 A.M.

The form of policy or policies of title insurance contemplated by this report is:

1. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

   A Fee

2. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

   Piedmont Unified School District of Alameda County, State of California, a public corporation

3. THE LAND REFERRED TO IN THIS REPORT IS DESCRIBED AS FOLLOWS:

   SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

RB\BS 03/27/2007

LEGAL DESCRIPTION

EXHIBIT "A"

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF PIEDMONT, COUNTY OF ALAMEDA, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

Lots 4, 5 , 8 and 9 and portions of Lots 1, 2, 3, 6, 7 and 10, Block 4, revised Map of Piedmont Park filed April 25, 1883, in Book 6 of Maps at Page 24, Alameda County Records described as follows:

Beginning at the southwestern corner of Lot 1, Block 4 said point also being the intersection of the eastern line of Bonita Avenue and the northern line of Vista Avenue as said Lot, Block and Avenues are shown on the aforementioned Map; thence north 23° 45' west along said eastern line of Bonita Avenue and along the western line of said Lots 1, 4, 5, 8 and 9 in Block 4 500.00 feet to the northern line of said Lot 9 said line also being the southern line of Oakland Avenue; thence along said northern line of Lot 9 and of Lof 10 north 66° 15' east 274.00 feet to the western line of the parcel of land described in the Deed to David B. Oppenheimer and Marcy D. Kates recorded October 2, 1989, Series No. 89-268707, Alameda County Records; thence along said line and the western line of the parcel of land described in the Deed to Geraldean A. James recorded October 6 1977, Series No. 77-199216, Alameda County Records south 23° 45' east 100.00 feet to the northern line of the Parcel of land described in the Deed to Stephen A. and Brooke S. Guiney recorded September 5, 1991, Series No. 91-240310, Alameda County Records; thence along said line south 66° 15' west 42.00 feet to the western line of said Guiney Parcel; thence along said line south 23° 45' east 50.00 feet to the southern line of said Guiney Parcel; thence along said line north 66° 15' east 2.00 feet to the western line of the parcel of land described in the Henry Cebers Trust Deed recorded May 16, 1990, Series No. 90-135634, Alameda County Records; thence along said line south 23° 45' east 45.00 feet to the southern line of said Cebers Trust Deed; thence along said line north 66° 15' east 130.00 feet to the eastern line of the aforementioned Lot 7, Block 4 said line also being the western line of Highland Avenue; thence along said line south 23° 45' east 155.00 feet to the northern line of the parcel of land described in the Lempres Trust Deed recorded November 13, 1989, Series No. 89-305926, Alameda County Records; thence along said line south 66° 15' west 132.00 feet to the western line of said parcel; thence along said line south 23° 45' east 103.00 feet; thence south 66° 15' west 51.50 feet; thence south 23° 45' east 25.60 feet; thence north 66° 15' east 0.70 feet; thence south 23° 45' east 21.40 feet to the aforementioned southern line of Lot 1, Block 4 and the northern line of Vista Avenue; thence along said line south 66° 15' west 181.20 feet to the point of beginning.

APN: 050-4624-003-04, 050-4624-013-02

AT THE DATE HEREOF, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN SAID POLICY FORM WOULD BE AS FOLLOWS:

1. **Property taxes**, which are a lien not yet due and payable, including any assessments collected with taxes to be levied for the fiscal year 2007-2008.

2. **The property** taxes for 2006-2007, APN# 050-4264-003-04 are assessed to the Piedmont Unified School District. No Taxes Due.

3. **The property** taxes for 2006-2007, APN# 050-4264-013-02 are assessed to the Piedmont Unified School District. No Taxes Due.

4. **The lien of supplemental taxes**, if any, assessed pursuant to the provisions of Chapter 3.5 (Commencing with Section 75) of the Revenue and Taxation code of the State of California.

5. **Terms** and conditions as contained in the Deed to the Piedmont Unified School District, recorded December 16, 1994, Instrument No. 94-386448, Official Records.

6. **Matters** which may be disclosed by an inspection and/or by a correct ALTA/ACSM Land Title Survey of said land that is satisfactory to this Company, and/or by inquiry of the parties in possession thereof.

7. **The transaction contemplated** in connection with this Report is subject to the review and approval of the Company's Corporate Underwriting Department. The Company reserves the right to add additional items or make further requirements after such review.

8. **The application** for title insurance was placed by reference to only a street address or tax identification number.

   Based on our records, we believe that the description in this report covers the parcel requested, however, if the legal description is incorrect a new report must be prepared.

   If the legal description is incorrect, in order to prevent delays, the seller/buyer/borrower must provide the Company and/or the settlement agent with the correct legal description intended to be the subject of this transaction.

   RB/bs
   03/27/07

END OF ITEMS

Note 1. No open Deeds of Trust: CONFIRM BEFORE CLOSING

Note 2. There are NO deeds affecting said land, recorded within twenty-four (24) months of the date of this report.

Note 3. NOTE: The policy of title insurance will include an arbitration provision. The Company or the insured may demand arbitration. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the insured arising out of or relating to this policy, any service of the Company in connection with its issuance or the breach of a policy provision or other obligation. Please ask your escrow or title officer for a sample copy of the policy to be issued if you wish to review the arbitration provisions and any other provisions pertaining to your Title Insurance coverage.

Note 4. **Any documents** being executed in conjunction with this transaction must be signed in the presence of an authorized Company employee, an authorized employee of an agent, an authorized employee of the insured lender, or by using Bancserv or other approved third-party service. If the above requirements cannot be met, please call the company at the number provided in this report.

Note 5. If a county recorder, title insurance company, escrow company, real estate broker, real estate agent or association provides a copy of a declaration, governing document or deed to any person, California law requires that the document provided shall include a statement regarding any unlawful restrictions. Said statement is to be in at least 14-point bold face type and may be stamped on the first page of any document provided or included as a cover page attached to the requested document. Should a party to this transaction request a copy of any document reported herein that fits this category, the statement is to be included in the manner described.

Note 6. Wiring instructions for Fidelity National Title Company, San Francisco, CA, are as follows:

Receiving Bank:	Wells Fargo 707 Wilshire Blvd., 13th Floor Los Angeles, CA 90017
ABA Routing No.:	121000248
Credit Account Name:	Fidelity National Title Company - San Francisco Commerical 50 California Street, Suite 3550, San Francisco, CA 94111
Credit Account No.:	4375682432
Escrow No.:	07-**144322**-MM

These wiring instructions are for this specific transaction involving the Title Department of the Concord office of Fidelity National Title Company. These instructions therefore should not be used in other transactions without first verifying the information with our accounting department. It is imperative that the wire text be exactly as indicated. Any extraneous information may cause unnecessary delays in confirming the receipt of funds.

END OF NOTES

ATTACHMENT ONE

AMERICAN LAND TITLE ASSOCIATION
RESIDENTIAL TITLE INSURANCE POLICY (6-1-87) EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes building and zoning ordinances and also laws and regulations concerning:
   - land use
   - improvements on the land
   - land division
   - environmental protection

   This exclusion does not apply to violations or the enforcement of these matters which appear in the public records at policy date.
   This exclusion does not limit the zoning coverage described in Items 12 and 13 of Covered Title Risks.
2. The right to take the land by condemning it, unless:
   - a notice of exercising the right appears in the public records on the Policy Date
   - the taking happened prior to the Policy Date and is binding on you if you bought the land without knowledge of the taking
3. Title Risks:
   - that are created, allowed, or agreed to by you
   - that are known to you, but not to us, on the Policy Date-unless they appeared in the public records
   - that result in no loss to you
   - that first affect your title after the Policy Date – this does not limit the labor and material lien coverage in Item 8 of Covered Title Risks
4. Failure to pay value for your title.
5. Lack of a right:
   - to any land outside the area specifically described and referred to in Item 3 of Schedule A
     or
   - in streets, alleys, or waterways that touch your land

   This exclusion does not limit the access coverage in Item 5 of Covered Title Risks.

In addition to the Exclusions, you are not insured against loss, costs, attorneys' fees, and the expenses resulting from:

1. Any rights, interests, or claims of parties in possession of the land not shown by the public records.
2. Any easements or liens not shown by the public records. This does not limit the lien coverage in Item 8 of Covered Title Risks.
3. Any facts about the land which a correct survey would disclose and which are not shown by the public records. This does not limit the forced removal coverage in Item 12 of Covered Title Risks.
4. Any water rights or claims or title to water in or under the land, whether or not shown by the public records.

ATTACHMENT ONE
(CONTINUED)

CALIFORNIA LAND TITLE ASSOCIATION STANDARD COVERAGE POLICY – 1990
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
   (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy; or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

SCHEDULE B, PART I
EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

PART I

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the public records.

ATTACHMENT ONE
(CONTINUED)

AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (10-17-92)
WITH A.L.T.A. ENDORSEMENT-FORM 1 COVERAGE
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
   (a) created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy (except to the extent that this policy insures the priority of the lien of the insured mortgage over any statutory lien for services, labor or material or to the extent insurance is afforded herein as to assessments for street improvements under construction or completed at Date of Policy); or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the land is situated.
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any statutory lien for services, labor or materials (or the claim of priority of any statutory lien for services, labor or materials over the lien of the insured mortgage) arising from an improvement or work related to the land which is contracted for and commenced subsequent to Date of Policy and is not financed in whole or in part by proceeds of the indebtedness secured by the insured mortgage which at Date of Policy the insured has advanced or is obligated to advance.
7. Any claim, which arises out of the transaction creating the interest of the mortgagee insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
   (i) the transaction creating the interest of the insured mortgagee being deemed a fraudulent conveyance or fraudulent transfer; or
   (ii) the subordination of the interest of the insured mortgagee as a result of the application of the doctrine of equitable subordination; or
   (iii) the transaction creating the interest of the insured mortgagee being deemed a preferential transfer except where the preferential transfer results from the failure:
      (a) to timely record the instrument of transfer; or
      (b) of such recordation to impart notice to a purchaser for value or a judgement or lien creditor.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage.
In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

ATTACHMENT ONE
(CONTINUED)

2006 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
   (a) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage.
In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) that arise by reason of:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.

ATTACHMENT ONE
(CONTINUED)

AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (10-17-92)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims, or other matters:
   (a) created, suffered, assumed or agreed to by the insured claimant;
   (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
   (c) resulting in no loss or damage to the insured claimant;
   (d) attaching or created subsequent to Date of Policy, or
   (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy.
4. Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
   (i) the transaction creating the estate or interest insured by this policy being deemed a fraudulent conveyance or fraudulent transfer; or
   (ii) the transaction creating the estate or interest insured by this policy being deemed a preferential transfer except where the preferential transfer results from the failure:
   (a) to timely record the instrument of transfer; or
   (b) of such recordation to impart notice to a purchaser for value or a judgement or lien creditor.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage.
In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.
2. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.

ATTACHMENT ONE
(CONTINUED)

2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (06-17-06)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage.
In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) that arise by reason of:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown in the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and that are not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.

ATTACHMENT ONE
(CONTINUED)

CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE (10-22-03)
ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (10-22-03)
EXCLUSIONS

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes ordinances, laws and regulations concerning:
   a. building
   b. zoning
   c. Land use
   d. improvements on Land
   e. Land division
   f. environmental protection
   This Exclusion does not apply to violations or the enforcement of these matters if notice of the violation or enforcement appears in the Public Records at the Policy Date.
   This Exclusion does not limit the coverage described in Covered Risk 14, 15, 16, 17 or 24.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at the Policy Date.
3. The right to take the Land by condemning it, unless:
   a. notice of exercising the right appears in the Public Records at the Policy Date; or
   b. the taking happened before the Policy Date and is binding on You if You bought the Land without Knowing of the taking.
4. Risks:
   a. that are created, allowed, or agreed to by You, whether or not they appear in the Public Records;
   b. that are Known to You at the Policy Date, but not to Us, unless they appear in the Public Records at the Policy Date;
   c. that result in no loss to You; or
   d. that first occur after the Policy Date – this does not limit the coverage described in Covered Risk 7, 8.d, 22, 23, 24 or 25.
5. Failure to pay value for Your Title.
6. Lack of a right:
   a. to any Land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   b. in streets, alleys, or waterways that touch the Land.
   This Exclusion does not limit the coverage described in Covered Risk 11 or 18.

LIMITATIONS ON COVERED RISKS

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

- For Covered Risk 14, 15, 16 and 18, Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 14:	1.00% of Policy Amount or $ 2,500.00 (whichever is less)	$ 10,000.00
Covered Risk 15:	1.00% of Policy Amount or $ 5,000.00 (whichever is less)	$ 25,000.00
Covered Risk 16:	1.00% of Policy Amount or $ 5,000.00 (whichever is less)	$ 25,000.00
Covered Risk 18:	1.00% of Policy Amount or $ 2,500.00 (whichever is less)	$ 5,000.00

ATTACHMENT ONE
(CONTINUED)

ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01)
EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the Land; (ii) the character, dimensions or location of any improvements now or hereafter erected on the Land; (iii) a separation in ownership or a change in the dimensions or areas of the Land or any parcel of which the Land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14, and 16 of this policy.
   (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14, and 16 of this policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the Public Records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without Knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
   (a) created, suffered, assumed or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (this paragraph does limit the coverage provided under Covered Risks 8, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26); or
   (e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of the Insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the Land is situated.
5. Invalidity or unenforceability of the lien of the Insured Mortgage, or claim thereof, which arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, except as provided in Covered Risk 27, or any consumer credit protection or truth in lending law.
6. Real property taxes or assessments of any governmental authority which become a lien on the Land subsequent to Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 7, 8(e) and 26.
7. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This exclusion does not limit the coverage provided in Covered Risk 8.
8. Lack of priority of the lien of the Insured Mortgage as to each and every advance made after Date of Policy, and all interest charged thereon, over liens, encumbrances and other matters affecting the title, the existence of which are Known to the Insured at:
   (a) The time of the advance; or
   (b) The time a modification is made to the terms of the Insured Mortgage which changes the rate of interest charged, if the rate of interest is greater as a result of the modification than it would have been before the modification. This exclusion does not limit the coverage provided in Covered Risk 8.
9. The failure of the residential structure, or any portion thereof to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at Date of Policy.

Fidelity National Title Group of Companies' Privacy Statement

July 1, 2001

We recognize and respect the privacy expectations of today's consumers and the requirements of applicable federal and state privacy laws. We believe that making you aware of how we use your non-public personal information ("Personal Information"), and to whom it is disclosed, will form the basis for a relationship of trust between us and the public that we serve. This Privacy Statement provides that explanation. We reserve the right to change this Privacy Statement from time to time consistent with applicable privacy laws.

In the course of our business, we may collect Personal Information about you from the following sources:

- From applications or other forms we receive from you or your authorized representative;
- From your transactions with, or from the services being performed by, us, our affiliates, or others;
- From our internet web sites;
- From the public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others; and
- From consumer or other reporting agencies.

Our Policies Regarding the Protection of the Confidentiality and Security of Your Personal Information

We maintain physical, electronic and procedural safeguards to protect your Personal Information from unauthorized access or intrusion. We limit access to the Personal Information only to those employees who need such access in connection with providing products or services to you or for other legitimate business purposes.

Our Policies and Practices Regarding the Sharing of Your Personal Information

We may share your Personal Information with our affiliates, such as insurance companies, agents, and other real estate settlement service providers. We also may disclose your Personal Information:

- to agents, brokers or representatives to provide you with services you have requested;
- to third-party contractors or service providers who provide services or perform marketing or other functions on our behalf; and
- to others with whom we enter into joint marketing agreements for products or services that we believe you may find of interest.

In addition, we will disclose your Personal Information when you direct or give us permission, when we are required by law to do so, or when we suspect fraudulent or criminal activities. We also may disclose your Personal Information when otherwise permitted by applicable privacy laws such as, for example, when disclosure is needed to enforce our rights arising out of any agreement, transaction or relationship with you.

One of the important responsibilities of some of our affiliated companies is to record documents in the public domain. Such documents may contain your Personal Information.

Right to Access Your Personal Information and Ability to Correct Errors or Request Changes or Deletion

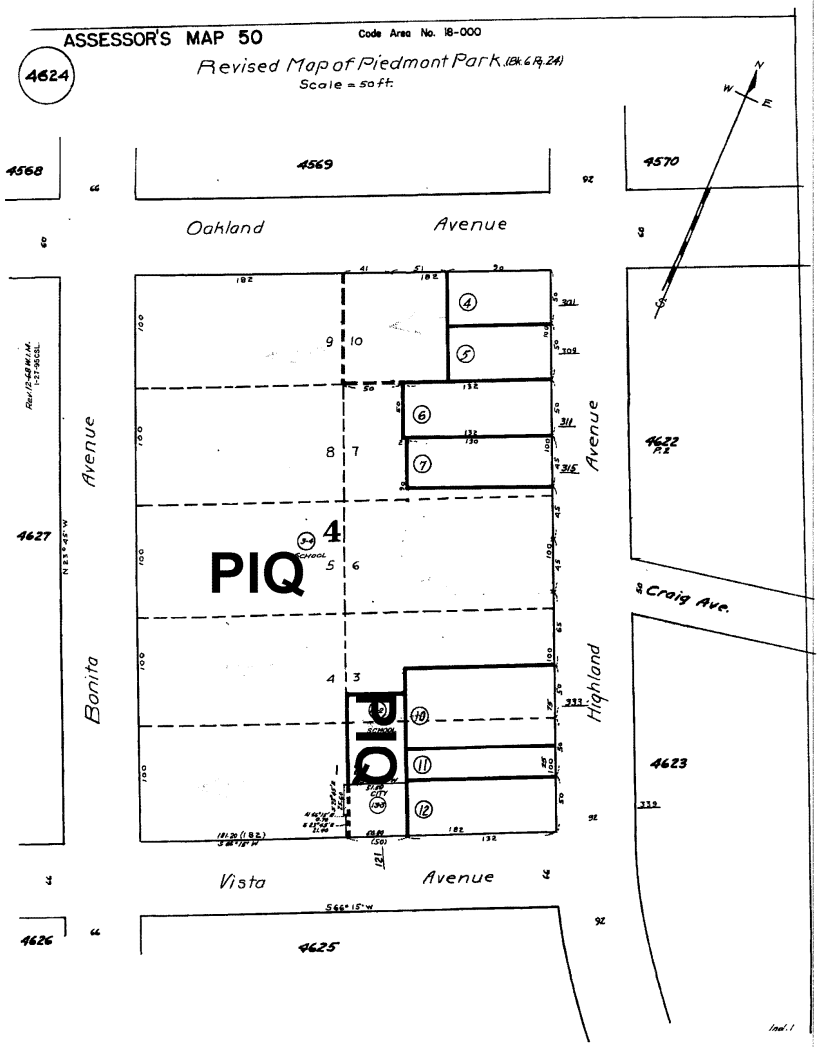
Certain states afford you the right to access your Personal Information and, under certain circumstances, to find out to whom your Personal Information has been disclosed. Also, certain states afford you the right to request correction, amendment or deletion of your Personal Information. We reserve the right, where permitted by law, to charge a reasonable fee to cover the costs incurred in responding to such requests.

All requests must be made in writing to the following address:

Fidelity National Title Group, Inc.
Privacy Compliance Officer
601 Riverside Avenue
Jacksonville, FL 32204

Multiple Products or Services

If we provide you with more than one financial product or service, you may receive more than one privacy notice from us. We apologize for any inconvenience this may cause you.


ASSESSOR'S MAP 50
Code Area No. 18-000
4624
Revised Map of Piedmont Park (Bk. 6 Pg. 24)
Scale = 50 ft.
4568
4569
4570
Oakland
Avenue
Bonita
Avenue
Highland
Avenue
Craig Ave.
4622
4627
4623
PIQ
4
Vista
Avenue
4626
4625