BEAVERTON SCHOOL DISTRICT
FIVE OAKS MIDDLE SCHOOL

1600 NW 173rd Ave, Beaverton, OR 97006

SEISMIC EVALUATION AND CONCEPTUAL SEISMIC STRENGTHENING SCHEME

April 20, 2022

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Project No. 21603.10

1 INTRODUCTION AND PROJECT SUMMARY

Holmes Structures has been engaged by Beaverton School District to perform a seismic evaluation of the Five Oaks Middle School located at 1600 NW 173rd Ave, Beaverton, OR 97006. American Society of Civil Engineers (ASCE) Standard 41-17, *Seismic Evaluation and Retrofit of Existing Buildings* was used to complete the evaluation and strengthening scheme using the Tier 1 seismic evaluation procedure. The purpose of this report is to present the seismic deficiencies of the building only. Any issues related to gravity system not associated with the lateral resisting system will not be addressed in this report.

A strengthening scheme is included in this report, which provides recommendations for rehabilitation of the deficiencies found during the Tier 1 evaluation.

A summary of the project and building parts is found in the table below. A site plan showing the buildings and its different components is shown in Figures 1 and 2.

Table 1: Project Summary Information

Project Summary Information						
Building Part	Building Name	Included in Retrofit	Year Built	Building Type	Nonstructural Retrofits Included in Scope Y/N	Previous Seismic Retrofit Y/N (Year if Yes)
A	Gym	Y	1974	PC1	Y	N
B	Classrooms	Y	1974	RM1	Y	N
C	Classrooms	Y	1974	RM1	Y	N
D	Covered Play Area	Y	1989	S3	Y	N
E	Classroom Additions	N	2019	S2A	N	N
Total Retrofit Cost						$11,010,338
Retrofit Square Feet						152,276
Retrofit Cost Per Square Foot						$70.91
Is the school within a tsunami, FEMA flood zone or other high hazard area?						No *

* The site is partially in a Moderate liquefaction zone and partially in a Moderate landsliding zone, per DOGAMI mapping. However the site-specific geotechnical report for the 2019 classroom included a liquefaction analysis and concluded that there is low risk of liquefaction at this site. The 2019 geotechnical report also concluded that there is low risk of earthquake-induced landsliding at this site.

Table 2: Engineering Report Checklist

Engineering Report Checklist		
☒	Engineering Report Cover Page	
☒	Project Summary Page	Page 1
☒	Building Parts Identification	Page 3
☒	Statement of the Performance Objective	Page 7
	Summary of Deficiencies	Page 10
☒	Structural Seismic Deficiencies	Page 10
☒	Nonstructural Seismic Deficiencies	Page 13
	Summary of Mitigation/Retrofit	Page 15
☒	Structural Mitigation/Retrofit	Page 15
☒	Nonstructural Mitigation/Retrofit	Page 17
	Summary Construction Cost Estimate	Page 19
☒	Direct Cost	Page 19
☒	Indirect Soft Cost	Page 19
☒	Certification Statement by Engineer	Page 19
	ASCE 41-17 Tier 1 Checklists	Page 20
☒	Basic Configuration Checklist	Page 21
☒	Building System Structural Checklists	Page 29
☒	Nonstructural Checklist	Page 38
☒	Retrofit Drawings & Sketches	Page 44
☒	Itemized Construction Cost Estimate	Page 69

2 LIMITATIONS

Findings presented as a part of this project are for the sole use of Beaverton School District in its evaluation of the subject property. The findings are not intended for use by other parties and may not contain sufficient information for the purposes of other parties or other uses. Our professional services are performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field at this time. No other warranty, expressed or implied, is made as to the professional advice presented in this report.

No material sampling or destructive testing has been undertaken. Our conclusions are based on our review of the original building drawings as available, our visual observations and experience with buildings of this type.

3 BUILDING PARTS IDENTIFICATION

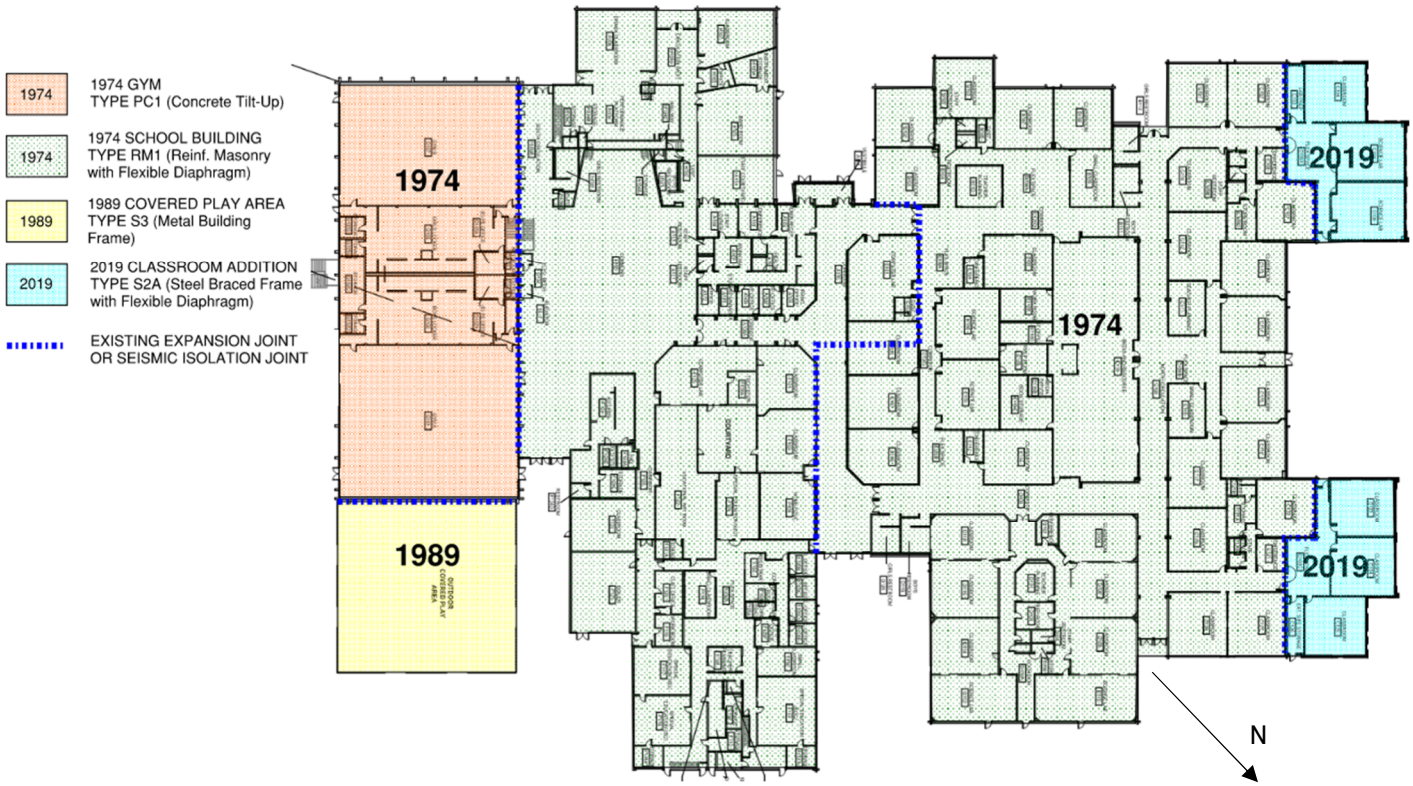


Figure 1: Building Year Plan

Five Oaks Middle School is comprised of three eras of construction. The majority of the building was constructed in 1974 and consists of the gym (Part A) and classroom areas (Parts B and C), which have a 1 inch expansion joint between them. In 1989 a covered play area (Part D) was added outside the northeast end of the gym, and in 2019 two classroom blocks (Part E) were added at the northwest end of the school building with a 4 inch seismic gap.

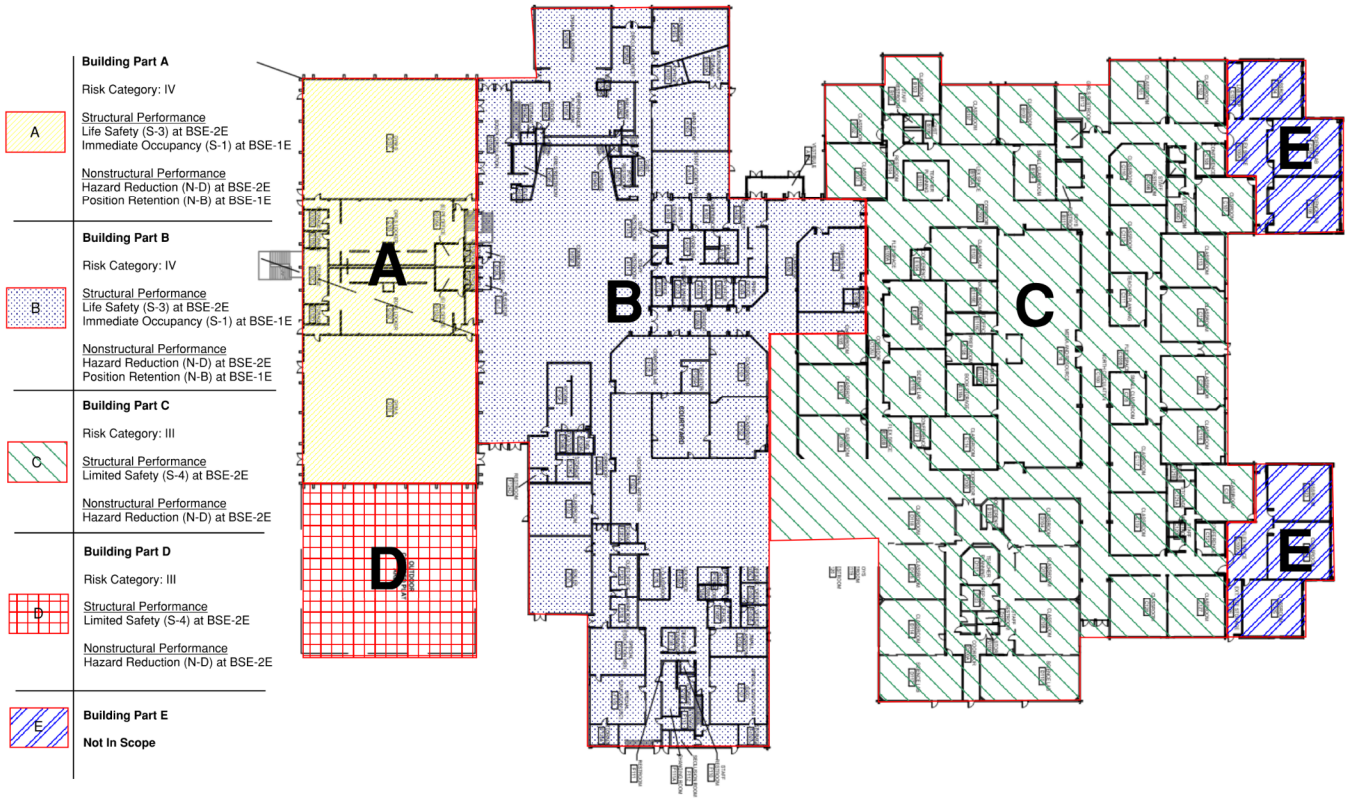


Figure 2: Building Parts

1974 Gym (Part A)

The gym is a tilt-up concrete structure and was constructed as part of the original building circa 1974. It was designed by Hewlett, Jamison & Atkinson Architects and the Engineer who stamped the structural drawings was Robert A Walker.

The Gym building contains a main gym and a secondary gym separated by a locker room block which also has a mezzanine floor above. It is rectangular in plan with approximately 25,000 sf of floor area, including the mezzanine. The perimeter walls are precast concrete tilt-up panels connected by insitu concrete pilasters, which protrude on the exterior of the gym. There are also interior tilt-up walls on both sides of the mezzanine, extending up to the gym roof. The roof is 22 GA. metal deck supported by long-span steel truss joists at 8 ft o.c., spanning between exterior and interior tilt-up walls. Some roof joists bear onto the pilasters, however some bear onto pockets in the tilt-up panels. The mezzanine floor is a 3 ½ inch concrete slab, supported by steel truss joists at 4 ft o.c, spanning between tilt-up walls and an interior steel beam and columns. The foundations at the tilt-up walls are typically 4 ft wide concrete strip footings, however the tilt-up walls are not connected to the footings.

The lateral system at the Gym building consists of the metal deck diaphragm at the roof and the concrete slab diaphragm at the mezzanine, which distribute lateral forces to the perimeter and interior tilt-up walls, which act as shear walls to transfer the lateral forces down to the foundations.

1974 School Building (Parts B and C)

The School Building (Parts B and C) are reinforced masonry shear wall structures constructed along with the gym circa 1974. They were designed by Hewlett, Jamison & Atkinson Architects and the Engineer who stamped the structural drawings was Robert A Walker. Part B is structural separated from Part A by a 1 inch expansion joint. Parts B and C are themselves separated by a 1 inch expansion joint.

Part B contains the kitchen/cafeteria/commons areas, performing arts, computer lab, vocational and special education areas, and the main admin offices. It is irregular in plan with approximately 56,000 sf of floor area. There is a small mezzanine above the performing arts area the connects to the gym, and several elevated mechanical rooms. Part C predominantly contains classrooms, as well as science labs and the media/resource center. It is irregular in plan with approximately 66,000 sf of floor area. There are several elevated mechanical rooms. The typical roof height is approximately 17 ft, with popup roofs at the mechanical rooms. Above the commons and admin areas in Part B, the roof height is approximately 27 ft.

A renovation project was performed at Parts B and C circa 2019. However this renovation did not include any major structural work or seismic retrofit.

The roof structure at Parts B and C is metal deck supported by long-span steel truss joists at 8 ft o.c., spanning typically between exterior 8 inch reinforced masonry walls and interior steel beams supported on steel columns. There are also some interior reinforced masonry walls. Most of the masonry walls are partially grouted with vertical reinforcing at 48 inches o.c. Some walls are solid grouted and in several locations the walls are reinforced concrete rather than masonry. The foundations at the masonry walls are typically 2 ft wide concrete strip footings, with spread footings at the interior steel columns.

The lateral system at Parts B and C consists of the metal deck diaphragm at the roof which distributes lateral forces to the perimeter and interior reinforced masonry walls, which act as shear walls to transfer the lateral forces down to the foundations. The vertical reinforcing bars in the walls are dowelled into the foundations.

Note that the metal deck roof diaphragm is 22 GA typically, however at the high roof areas above the commons and admin offices it is 18 GA.

1989 Covered Play Area (Part D)

The covered play area is a lightweight steel canopy designed by Dull Olson Weeks Architects. Structural drawings were not available for our review.

This open canopy structure is square in plan with 8,100 sf of floor area. The roof height is approximately 20 ft. The roof is metal deck supported on light gauge metal purlins, which span between steel portal frames. The latera system is steel moment frames in both directions. The foundations are indicated as concrete spread footings at the steel portal frame legs.

2019 Classroom Additions (Part E)

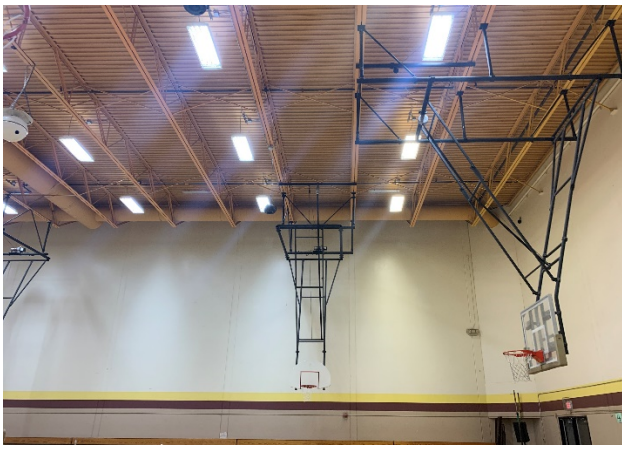
This Building Part is newly constructed and is not in scope.

Picture 1: Building Part A

Picture 2: Building Part B

Picture 3: Building Part C

Picture 4: Building Part D



Picture 7: Gym Beam Framing

Picture 8: Locker Rooms

Picture 7: Typ. Corridor

Picture 8: Interior

4 STATEMENT OF PERFORMANCE OBJECTIVE

Five Oaks Middle School was evaluated in accordance with ASCE 41-17, the national standard for evaluating and retrofitting existing buildings, using its Tier 1 evaluation procedure. A Tier 1 evaluation uses checklists to coarsely but systematically identify or screen areas of potential seismic deficiencies. Structural systems or components which are identified as “non-compliant” (NC) should be further evaluated using a more detailed Tier 2 or Tier 3 evaluation to confirm if an actual deficiency exists and quantify the extent or severity. Tier 2 or Tier 3 evaluations were beyond the scope of this project.

See Figure 3 below for a summary of basic performance objectives for existing buildings according to ASCE 41-17. The target performance objective for existing buildings (BPOE) for Building Parts A and B, which are assumed to be Risk Category IV structures, is to achieve Life Safety (S-3) Structural Performance Level for BSE-2E seismic event and Immediate Occupancy (S-1) Structural Performance Level for a BSE-1E seismic event. The BPOE for Building Parts C and D, which are assumed to be Risk Category III structures, is to achieve Limited Safety (S-4) Structural Performance Level for BSE-2E seismic event. The BSE-1E hazard is not explicitly checked as part of the Tier 1 structural procedure for this Risk Category. The nonstructural target for Building Parts A

and B is Hazard Reduction (HR) and Position Retention (PR) for the BSE-2E and BSE-1E hazard respectively. For Building Parts C and D the nonstructural target is HR at the BSE-2E hazard.

The BSE-1E and BSE-2E hazard for the site is presented in Table 3 below. Site Class D was assumed for the site.

Table 3: ASCE41 Tier 1 Hazard Parameters

	BSE-1E	BSE-2E
S_{XS}	0.380g	0.820g
S_{X1}	0.206g	0.586g

The site is classified as having a High Level of Seismicity per ASCE 41-17 Table 2-4.

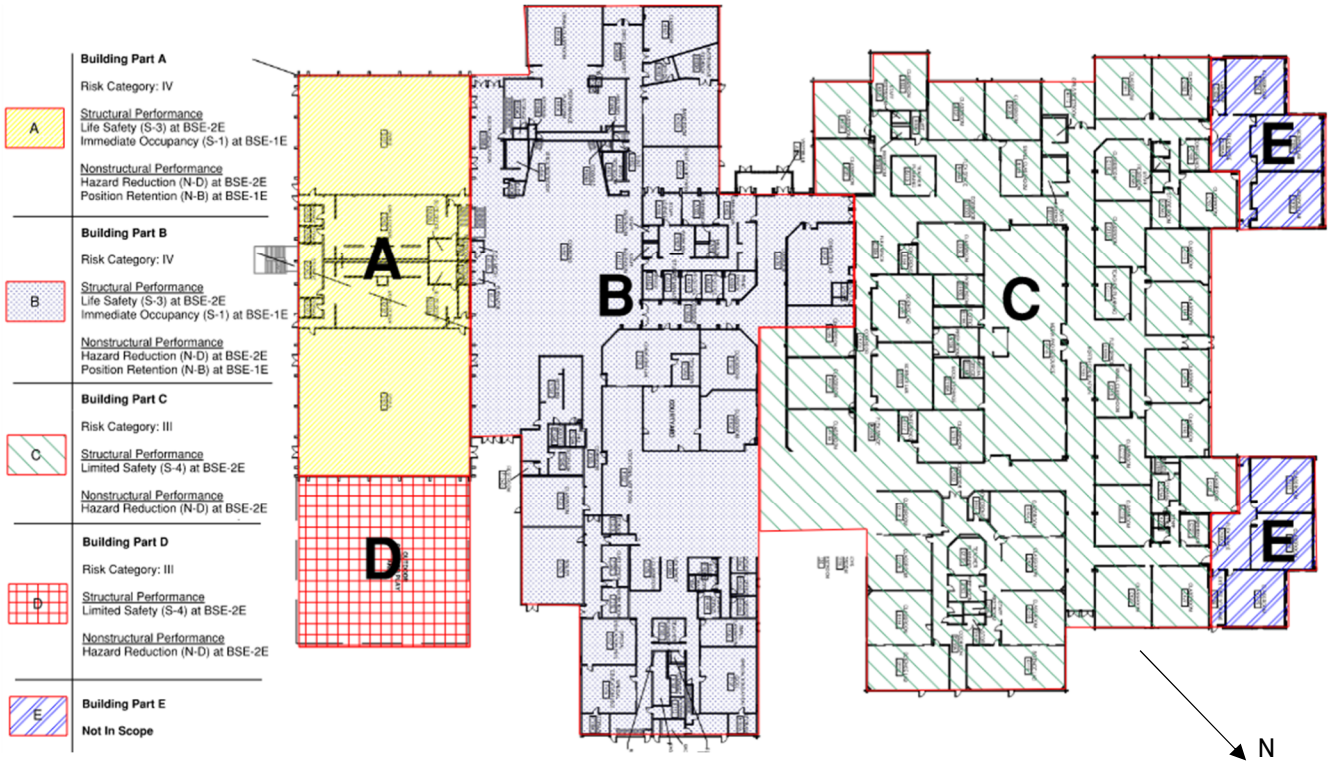


Figure 3: Basic Performance Objective for Existing Buildings (BPOE)

5 OBSERVATIONS

5.1 Site Survey

Holmes and Oh Planning & Design conducted a site survey of the Five Oaks Middle School on 2/11/2022 to verify the general conformance of the existing documents and general building conditions. The existing drawings appear to be generally accurate based on the visual observations of the accessible building areas.

5.2 Documents Reviewed

The following documents were provided and reviewed for this project:

- Architectural drawings for "Beaverton Intermediate School No. 6", prepared by Hewlett Jamison & Atkinson Architects, dated 1974
- Structural drawings for "Beaverton Intermediate School No. 6", stamped by Robert A. Walker, Registered Professional Engineer, dated 1974
- Architectural drawing for "Five Oaks Intermediate School, Covered Play Addition", prepared by Dull Olson Weeks, dated 1989
- Architectural drawings for "Five Oaks Middle School Renovation", prepared by Bassetti Architects, record set dated April 16, 2021.
- Structural drawings for "Five Oaks Middle School Renovation", prepared by Catena Consulting Engineers, record set dated December 4, 2020.

6 SUMMARY OF DEFICIENCIES

The seismic structural and nonstructural deficiencies are listed in tables below for each building part. The deficiency identification tag noted in the tables below corresponds with the seismic retrofit tag in Section 7 and in the seismic strengthening scheme. The tags are also used in the cost estimate for complete tracking of each deficiency, corresponding retrofit and associated cost.

6.1 Building Part A Structural Seismic Deficiencies

TAG	Deficiency/unknown	Description
F1	Inadequate connections between tilt-up wall panels and foundations	The walls are not doweled into the foundations, therefore there is no direct load path for in-plane shear forces in the walls to transfer to foundations.
F5, R9	Inadequate out-of-plane strength at tilt-up wall at northwest of gym	The 1 inch expansion gap between Part A and Part B is inadequate, therefore the roof beam at Part B will impose an out-of-plane load on the tilt-up wall, which the wall does not have adequate strength to resist.
M1, M2, M3, R10	Inadequate seismic separation between Part A and Part B	The 1 inch expansion gap between Part A and Part B is inadequate, therefore the mezzanine at Part B will impose seismic loads on Part A. However the existing load paths and connections to transfer these loads are not adequate.
M4	Inadequate connections between mezzanine floor and tilt-up walls	The mezzanine truss joists are not connected to the walls.
R1	Inadequate out-of-plane connections between gym roof and end walls.	The roof truss joists are not connected to the tilt-up walls at each end of the gym, to provide out-of-plane support to the walls.
R2	Inadequate out-of-plane connections between gym roof and side walls.	The tilt-up walls at the sides of the gym do not have connections to the roof framing, to provide out-of-plane support to the walls.
R3	Inadequate capacity at roof diaphragm	The metal deck at the roof does not have adequate strength to distribute in-plane forces from the roof to the walls.
R8	Inadequate connections between metal deck and steel framing at roof	The metal deck at the roof is not adequately welded to the steel framing.

6.2 Building Part B Structural Seismic Deficiencies

TAG	Deficiency/unknown	Description
F2, F8	Insufficient shear walls	The lengths and locations of the existing masonry shear walls are not adequate in some areas of the building. As a result, some existing walls are overstressed. In other areas the roof structure is not adequate to drag seismic forces long distances to the existing shear walls.
F3	Insufficient footings.	Footings are inadequate at some shear walls
M1, M2, M3	Inadequate seismic separation between Part B and Part A	The 1 inch expansion gap between Part B and Part A is inadequate, therefore the mezzanine at Part B will impose seismic loads on Part A. However the existing load paths and connections to transfer these loads are not adequate.
R5	Inadequate out-of-plane connections between roof and masonry walls	Where the roof trusses run parallel to the masonry walls, no connections exist to tie the tops of the walls to the roof structure for out-of-plane support of the walls.
R6, R7	Inadequate drag ties at roof diaphragm	In some locations, existing drag members and connections are inadequate or are not provided, to collect in-plane forces and transfer these to the shear walls.
R8	Inadequate connections between metal deck and steel framing at roof	The metal deck at the roof is not adequately welded to the steel framing.
R11, R12	Inadequate seismic separation between Part B and Part A	The 1 inch expansion gap between Part B and Part A is inadequate, therefore the roof at Part B will impose seismic loads on Part A. However the existing load paths and connections to transfer these loads are not adequate.
R13	Inadequate out-of-plane connections at exterior wall	At the main entry area on the southwest side of the building, the existing connections between the masonry wall and the roof are assumed to be inadequate.

6.3 Building Part C Structural Seismic Deficiencies

TAG	Deficiency/unknown	Description
F2, F8	Insufficient shear walls	The lengths and locations of the existing masonry shear walls are not adequate in some areas of the building. As a result, some existing walls are overstressed. In other areas the roof structure is not adequate to drag seismic forces long distances to the existing shear walls.
F3	Insufficient footings.	Footings are inadequate at some shear walls
R5	Inadequate out-of-plane connections between roof and masonry walls	Where the roof trusses run parallel to the masonry walls, no connections exist to tie the tops of the walls to the roof structure for out-of-plane support of the walls.
R6, R7	Inadequate drag ties at roof diaphragm	In some locations, existing drag members and connections are inadequate or are not provided, to collect in-plane forces and transfer these to the shear walls.
R8	Inadequate connections between metal deck and steel framing at roof	The metal deck at the roof is not adequately welded to the steel framing.

6.4 Building Part D Structural Seismic Deficiencies

TAG	Deficiency/unknown	Description
F6	Insufficient anchor bolts at portal frame legs	The existing anchor bolts are not adequate.
F7	Insufficient strength at portal frame moment connections	The existing connections are not adequate.

6.5 Building Part A Nonstructural Seismic Deficiencies

TAG	Deficiency/unknown	Description
N2	Masonry walls in locker room	Tops of walls are not adequately braced for o-o-p forces.
N3	Fire Suppression piping	Bracing is inadequate
N4	Lay-in tile ceilings (at mezzanine)	Bracing is inadequate
N5	Other interior walls and partitions	Bracing is inadequate
N6	Tall Narrow Contents	Bracing is inadequate
N7	Fall-prone Contents over 20 lbs	Bracing is inadequate
N8	Fall-prone Equipment over 20 lbs	Bracing is inadequate
N9	Tall Narrow Equipment over 6 ft high	Bracing is inadequate
N10	In-Line Equipment over 75 lb	Bracing is inadequate
N11	Conduit Couplings	Couplings are inadequate
N12	Couplings for Fluid and Gas Pipe	Couplings are inadequate
N13	Gas shut-off valve	Not provided
N14	Fluid and Gas Piping	Bracing is inadequate
N15	Ducts Larger than 6 sf of Cross-Section	Bracing is inadequate

6.6 Building Part B Nonstructural Seismic Deficiencies

TAG	Deficiency/unknown	Description
N3	Fire Suppression piping	Bracing is inadequate
N4	Lay-in tile ceilings	Bracing is inadequate
N5	Other interior walls and partitions	Bracing is inadequate
N6	Tall Narrow Contents	Bracing is inadequate
N7	Fall-prone Contents over 20 lbs	Bracing is inadequate
N8	Fall-prone Equipment over 20 lbs	Bracing is inadequate
N9	Tall Narrow Equipment over 6 ft high	Bracing is inadequate
N10	In-Line Equipment over 75 lb	Bracing is inadequate
N11	Conduit Couplings	Couplings are inadequate
N12	Couplings for Fluid and Gas Pipe	Couplings are inadequate
N13	Gas shut-off valve	Not provided
N14	Fluid and Gas Piping	Bracing is inadequate
N15	Ducts Larger than 6 sf of Cross-Section	Bracing is inadequate

6.7 Building Part C Nonstructural Seismic Deficiencies

TAG	Deficiency/unknown	Description
N1	Brick pilasters at corridors	Bracing is inadequate
N3	Fire Suppression piping	Bracing is inadequate
N5	Other interior walls and partitions	Bracing is inadequate
N6	Tall Narrow Contents	Bracing is inadequate
N7	Fall-prone Contents over 20 lbs	Bracing is inadequate
N8	Fall-prone Equipment over 20 lbs	Bracing is inadequate
N9	Tall Narrow Equipment over 6 ft high	Bracing is inadequate
N10	In-Line Equipment over 75 lb	Bracing is inadequate

6.8 Building Part D Nonstructural Seismic Deficiencies

No deficiencies were noted.

7 SUMMARY OF MITIGATION/RETROFIT

7.1 Building Part A Structural Seismic Retrofit

#	Deficiency/unknown	Description
F1	Inadequate connections between tilt-up wall panels and foundations	Provide new reinforced concrete band at base of tilt-up walls, with rebars epoxy dowelled into existing walls and foundations.
F5, R9	Inadequate out-of-plane strength at tilt-up wall at northwest of gym	Provide new steel strongback to span vertically and support the wall for out-of-plane forces. Provide struts at top of wall to tie into gym roof structure.
M1, M2, M3, R10	Inadequate seismic separation between Part A and Part B	Provide new connections to tie the mezzanine structure to the gym structure. Provide new strut to tie the Part A roof structure to the gym walls.
M4	Inadequate connections between mezzanine floor and tilt-up walls	Provide new connections to tie the mezzanine floor to the tilt-up walls.
R1	Inadequate out-of-plane connections between gym roof and end walls.	Provide new out-of-plane connections.
R2	Inadequate out-of-plane connections between gym roof and side walls.	Provide new out-of-plane connections and continuity ties across gym roof.
R3	Inadequate capacity at roof diaphragm	Provide new horizontal steel channel X-bracing at the underside of the roof.
R8	Inadequate connections between metal deck and steel framing at roof	Provide additional welding of metal deck to the steel framing (this will require removing and replacing the roofing)

7.2 Building Part B Structural Seismic Retrofit

TAG	Deficiency/unknown	Description
F2, F8	Insufficient shear walls	Provide new reinforced masonry shear walls in selected locations
F3	Insufficient footings.	Provide new or supplemental foundations.
M1, M2, M3	Inadequate seismic separation between Part B and Part A	Provide new connections to tie the P{art B mezzanine structure to the gym structure.
R5	Inadequate out-of-plane connections between roof and masonry walls	Provide new out-of-plane connections and continuity ties to develop adequate sub diaphragms.
R6, R7	Inadequate drag ties at roof diaphragm	Provide new drag members and connections.
R8	Inadequate connections between metal deck and steel framing at roof	Provide additional welding of metal deck to steel framing (this will require removing and replacing the roofing)
R11, R12	Inadequate seismic separation between Part B and Part A	Provide new connections to tie the Part B roof structure to the gym structure.
R13	Inadequate out-of-plane connections at exterior wall	Provide new out-of-plane connections

7.3 Building Part C Structural Seismic Retrofit

TAG	Deficiency/unknown	Description
F2, F8	Insufficient shear walls	Provide new reinforced masonry shear walls in selected locations
F3	Insufficient footings.	Provide new or supplemental foundations.
R5	Inadequate out-of-plane connections between roof and masonry walls	Provide new out-of-plane connections and continuity ties to develop adequate sub diaphragms.
R6, R7	Inadequate drag ties at roof diaphragm	Provide new drag members and connections.
R8	Inadequate connections between metal deck and steel framing at roof	Provide additional welding of metal deck to the steel framing (this will require removing and replacing the roofing)

7.4 Building Part D Structural Seismic Retrofit

TAG	Deficiency/unknown	Description
F6	Insufficient anchor bolts at portal frame legs	Add supplemental bolts.
F7	Insufficient strength at portal frame moment connections	Add supplemental welded plates.

7.5 Building Part A Nonstructural Seismic Retrofit

#	Deficiency/unknown	Description
N2	Masonry walls in locker room	Provide bracing
N3	Fire Suppression piping	Provide bracing
N4	Lay-in tile ceilings (at mezzanine)	Provide bracing and edge clearance detailing
N5	Other interior walls and partitions	Provide bracing
N6	Tall Narrow Contents	Provide bracing
N7	Fall-prone Contents over 20 lbs	Provide restraint
N8	Fall-prone Equipment over 20 lbs	Provide restraint
N9	Tall Narrow Equipment over 6 ft high	Provide bracing
N10	In-Line Equipment over 75 lb	Provide bracing
N11	Conduit Couplings	Provide flexible couplings
N12	Couplings for Fluid and Gas Pipe	Provide flexible couplings
N13	Gas shut-off valve	Provide automatic seismic shutoff valve
N14	Fluid and Gas Piping	Provide bracing
N15	Ducts Larger than 6 sf of Cross-Section	Provide bracing

7.6 Building Part B Nonstructural Seismic Deficiencies

TAG	Deficiency/unknown	Description
N3	Fire Suppression piping	Provide bracing
N4	Lay-in tile ceilings	Provide bracing and edge clearance detailing
N5	Other interior walls and partitions	Provide bracing
N6	Tall Narrow Contents	Provide bracing
N7	Fall-prone Contents over 20 lbs	Provide restraint
N8	Fall-prone Equipment over 20 lbs	Provide restraint
N9	Tall Narrow Equipment over 6 ft high	Provide bracing
N10	In-Line Equipment over 75 lb	Provide bracing
N11	Conduit Couplings	Provide flexible couplings
N12	Couplings for Fluid and Gas Pipe	Provide flexible couplings
N13	Gas shut-off valve	Provide automatic seismic shutoff valve
N14	Fluid and Gas Piping	Provide bracing
N15	Ducts Larger than 6 sf of Cross-Section	Provide bracing

7.7 Building Part C Nonstructural Seismic Deficiencies

TAG	Deficiency/unknown	Description
N1	Brick pilasters at corridors	Provide bracing
N3	Fire Suppression piping	Provide bracing
N5	Other interior walls and partitions	Provide bracing
N6	Tall Narrow Contents	Provide bracing
N7	Fall-prone Contents over 20 lbs	Provide restraint
N8	Fall-prone Equipment over 20 lbs	Provide restraint
N9	Tall Narrow Equipment over 6 ft high	Provide bracing
N10	In-Line Equipment over 75 lb	Provide bracing
N14	Fluid and Gas Piping	Provide bracing
N15	Ducts Larger than 6 sf of Cross-Section	Provide bracing

7.8 Building Part D Nonstructural Seismic Deficiencies

No nonstructural retrofit measures are required.

8 SUMMARY CONSTRUCTION COST ESTIMATE

8.1 Direct Cost and Indirect Soft Cost

Direct Cost		
Construction COW	$	8,460,338
Sub total	**$**	**8,460,338**
Indirect Soft Cost		
Engineering	$	1,100,000
Construction Management	$	100,000
Relocation	$	50,000
Construction Contingency	$	1,300,000
Sub total	**$**	**2,550,000**
Totals and Summary		
Total Cost Estimate	**$**	**11,010,338**
Match Funds	**$**	**8,510,338**
Total Amount Requested from SRGP	**$**	**2,500,000**

*Costs above are for Summer 2023 construction. An additional $425,000 is estimated to be in addition to the construction costs above if delayed to Summer of 2024.

9 RECOMMENDATIONS

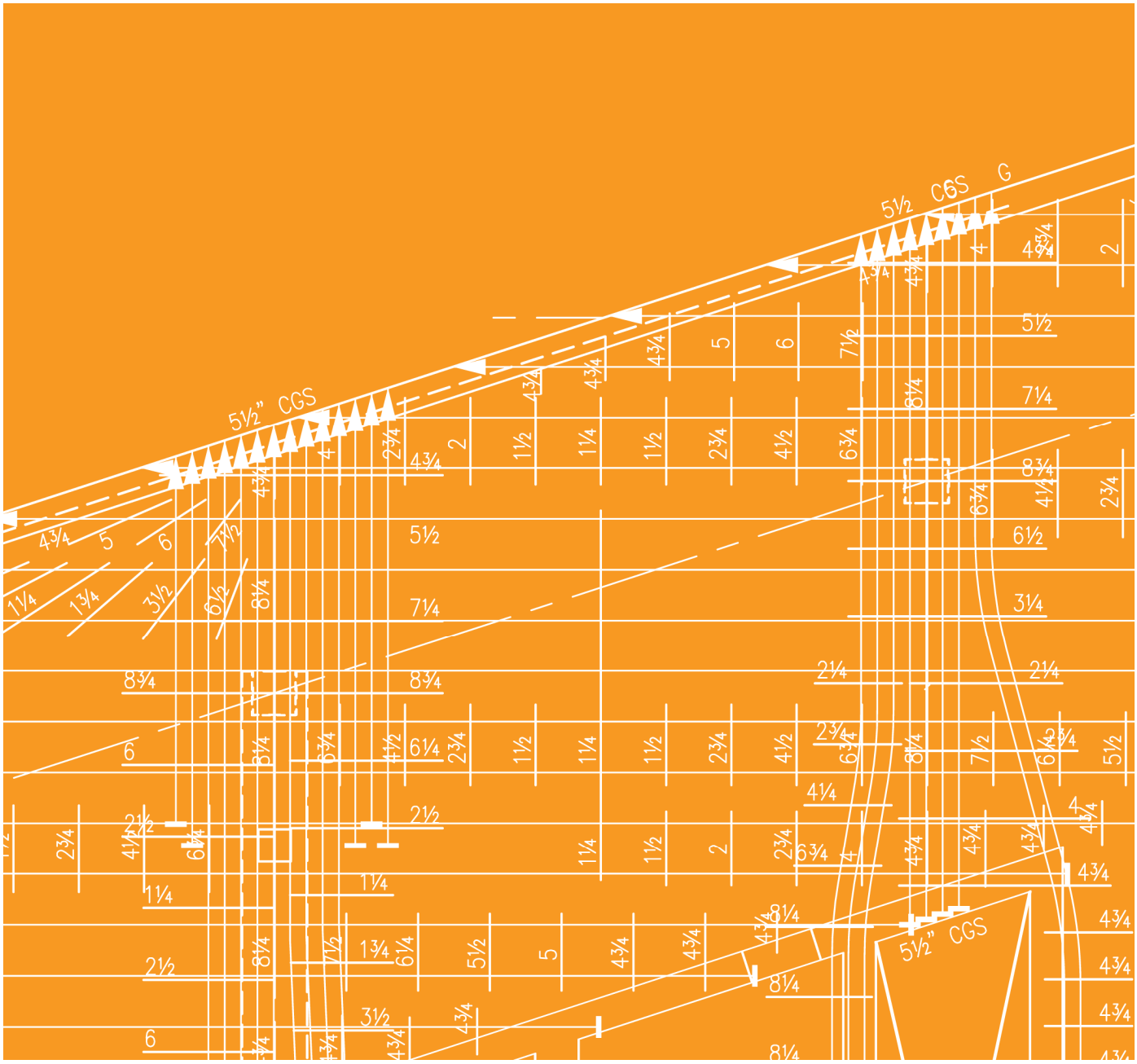
Based on the ASCE 41-17 Tier 1 screening, Five Oaks Middle School does not meet the performance objective and has a potential for partial collapse of the building particularly due to building Parts A, B and C having insufficient out-of-plane roof-to-wall connections, and Parts B and C having insufficient masonry shear walls.

10 CERTIFICATION STATEMENT

Holmes Structures reviewed the engineering cost estimate and certifies that all of the seismic deficiencies are included in the retrofit scope of work and that all of the retrofit's scope of work elements are included in the cost estimate.

_____ April 20, 2022

Jennifer Eggers, S.E.



ASCE41-17 Tier 1 Checklists

Holmes

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part A
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-3: Immediate Occupancy Basic Configuration Checklist

Very Low Seismicity

Building System - General

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	Tilt-up walls are not conneccted to foundations
C	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	1" expansion joint between Parts A and B is inadequate
C	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	

Building System - Building Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	Single story building
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	Single story building
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	Single story building
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	Single story building
C	NC	N/A	U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	Single story building
C	NC	N/A	U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part A
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-3: Immediate Occupancy Basic Configuration Checklist

Low Seismicity

Geologic Site Hazards

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	Site-specific geotechnical report for 2019 additions determined low liquefaction risk at site.
C	NC	N/A	U	SLOPE FAILURE: The building site is located away from potential earthquake- induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	Site-specific geotechnical report for 2019 additions determined low landslide risk at site.
C	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	

Moderate and High Seismicity

Foundation Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force- resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa.	
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	Strip footings at tilt-up walls are continuous

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part B
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-3: Immediate Occupancy Basic Configuration Checklist

Very Low Seismicity

Building System - General

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	
C	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	1" expansion joint between Parts A and B is inadequate
C	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	

Building System - Building Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	Single story building
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	Single story building
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	Single story building
C	NC	N/A	U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	Single story building
C	NC	N/A	U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part B
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-3: Immediate Occupancy Basic Configuration Checklist

Low Seismicity

Geologic Site Hazards

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	Site-specific geotechnical report for 2019 additions determined low liquefaction risk at site.
C	NC	N/A	U	SLOPE FAILURE: The building site is located away from potential earthquake- induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	Site-specific geotechnical report for 2019 additions determined low landslide risk at site.
C	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	

Moderate and High Seismicity

Foundation Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force- resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa.	
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	Strip footings at perimter and interior shear walls are generally continuous

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part C
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-2: Collapse Prevention Basic Configuration Checklist

Low Seismicity

Building System - General

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	
C	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity.	1" expansion joint between Parts A and B is inadequate. However the diaphragms are generally at the same elevation.
C	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	

Building System - Building Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	Single story building
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	Single story building
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	Single story building
C	NC	N/A	U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	Single story building
C	NC	N/A	U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part C
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-2: Collapse Prevention Basic Configuration Checklist

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

Geologic Site Hazards

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	Site-specific geotechnical report for 2019 additions determined low liquefaction risk at site.
C	NC	N/A	U	SLOPE FAILURE: The building site is located away from potential earthquake- induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	Site-specific geotechnical report for 2019 additions determined low landslide risk at site.
C	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	

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

Foundation Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force- resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa.	
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	Strip footings at perimter and interior shear walls are generally continuous

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part D
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-2: Collapse Prevention Basic Configuration Checklist

Low Seismicity

Building System - General

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	
C	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity.	2" separation is provided between Part D and Part A. This does not meet the 1.5% requirement, however the impacts of pounding are expected to be relatively minor, due to the lightweight nature of the Part D structure.
C	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	

Building System - Building Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	Single story building
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	Single story building
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	Single story building
C	NC	N/A	U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	Single story building
C	NC	N/A	U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part D
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-2: Collapse Prevention Basic Configuration Checklist

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

Geologic Site Hazards

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	Site-specific geotechnical report for 2019 additions determined low liquefaction risk at site.
C	NC	N/A	U	SLOPE FAILURE: The building site is located away from potential earthquake- induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	Site-specific geotechnical report for 2019 additions determined low landslide risk at site.
C	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	

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

Foundation Configuration

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force- resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa.	
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	Foundation system is unknown, however foundation ties are not considered an important feature for this building.

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part A
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-29 - Immediate Occupancy Structural Checklist for Building Type PC1 and PC1a

Very Low Seismicity

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	
C	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3., is less than the greater of 100lb/in^2 (0.69 MPa) or 2*sqrt(f'c)	
C	NC	N/A	U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spcaing of the reinforcing steel is equal to or less than 18 in. (457 mm)	

Diaphragms (Stiff or Flexible)

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	In direction perpendicular to roof truss joists, joists are not welded to bearing plates in gym end walls (wall anchorage relies on ledger angle and metal deck, which is inadequate). In direction parallel to roof truss joists, no out-of-plane connections are provided at gym side walls (wall anchorage relies on ledger angle and metal deck, which is inadequate).
C	NC	N/A	U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength or the walls or diaphragms.	Existing connections may not be able to develop the strength of the dipahragm after it is strengthened with new bracing.
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements, and the dowels are able to develop the least of the shear strength of the walls, frames, or slabs.	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	There are no girders, however comments above re Wall Anchorage apply at pilasters also.

Foundation Systems

RATING				EVALUATION STATEMENT	COMMENTS

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part A
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-29 - Immediate Occupancy Structural Checklist for Building Type PC1 and PC1a

C	NC	N/A	U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.	
C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.	

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

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components.	
C	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 50% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1.	
C	NC	N/A	U	PANEL-TO-PANEL CONNECTIONS: Adjacent wall panels are interconnected to transfer overturning forces between panels by nethods other than welded steel inserts.	Horzontall bars in panels are embedded into the insitu pilasters.
C	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	Walls span horizontally up to 16 ft between pilasters (15 ft clear span). 15 ft / 25 = 7.2 inches, whereas panel thickness is 6 inches. However we assume that this will be determined by Tier 2 analysis to be ok.

Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords.	No cross ties are provided in direction perpendicular to roof truss joists.
C	NC	N/A	U	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	
C	NC	N/A	U	PIAGHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	
C	NC	N/A	U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	
C	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	
C	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	
C	NC	N/A	U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part A
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-29 - Immediate Occupancy Structural Checklist for Building Type PC1 and PC1a

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors connecting each precast wall panel to the diaphragm elements.	See Wall Anchorage comments above
C	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation, and the connections are able to develop the strength of the walls.	Wall panels are not connected to the foundations.
C	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles.	
C	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	See Wall Anchorage comments above

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part B
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-35 - Immediate Occupancy Structural Checklist for Building Type RM1

Very Low Seismicity

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	
C	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in^2 (4.83 MPa).	Some walls are non-compliant
C	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls.	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	In direction perpendicular to roof truss joists, joists are welded to bearing plates in walls and these connections comply with the quick check. However in direction parallel to roof truss joists, no out-of-plane connections are provided at walls (wall anchorage relies on metal deck, which is not acceptable).
C	NC	N/A	U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	
C	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part B
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-35 - Immediate Occupancy Structural Checklist for Building Type RM1

Stiff Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	

Foundation Systems

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.	
C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.	

Low, Moderate, and High Seismicity

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides.	
C	NC	N/A	U	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30.	

Diaphragms (Stiff or Flexible)

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft (1.2 m) long.	
C	NC	N/A	U	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	
C	NC	N/A	U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part B
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-35 - Immediate Occupancy Structural Checklist for Building Type RM1

Flexible Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords.	No cross ties are provided in direction perpendicular to roof truss joists.
C	NC	N/A	U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	
C	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	
C	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1	
C	NC	N/A	U	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	Some areas of the metal deck diaphragm have spans greater than 40 ft.
C	NC	N/A	U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors.	See Wall Anchorage comments above

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part C
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-34. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Low and Moderate Seismicity

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	
C	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.2 (0.48 MPa).	Some walls are non-compliant
C	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in. (1220 mm), and all vertical bars extend to the top of the walls.	

Stiff Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	In direction perpendicular to roof truss joists, joists are welded to bearing plates in walls and these connections comply with the quick check. However in direction parallel to roof truss joists, no out-of-plane connections are provided at walls (wall anchorage relies on metal deck, which is not acceptable).
C	NC	N/A	U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	
C	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation.	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part C
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-34. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

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

Stiff Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	

Flexible Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords.	No cross ties are provided in direction perpendicular to roof truss joists.
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings	
C	NC	N/A	U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	
C	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or	
C	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	
C	NC	N/A	U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	See Wall Anchorage comments above

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School - Part D
Project No:	U21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-12. Collapse Prevention Structural Checklist for Building Type S3

Low and Moderate Seismicity

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.4.3.4, is less than 0.50Fy.	Moment Frames in both directions

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel moment frames.	No structural drawings are available, however this is not expected to be a signficant concern.
C	NC	N/A	U	STEEL COLUMNS: The columns in seismic-force-resisting frames are anchored to the building foundation.	Bolts do not appear adequate

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

Seismic-Force-Resisting System

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the elastic moment (FyS) of the adjoining members.	Moment frame connections in portal frames along each side may not be adequate.
C	NC	N/A	U	COMPACT MEMBERS: All frame elements meet compact section requirements in accordance with AISC 360, Table B4.1.	No structural drawings are available, however this is not expected to be a signficant concern.

Diaphragms

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	

Connections

RATING				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	ROOF PANELS: Where considered as diaphragm elements for lateral resistance, metal, plastic, or cementitious roof panels are positively attached to the roof framing to resist seismic forces.	No structural drawings are available, however this is not expected to be a signficant concern.
C	NC	N/A	U	WALL PANELS: Where considered as shear elements for lateral resistance, metal, fiberglass, or cementitious wall panels are positively attached to the framing and foundation to resist seismic forces.	There are no walls.

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

Life Safety Systems

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	
C	NC	N/A	U	HR—not required; LS—-MH; PR—MH. SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	
C	NC	N/A	U	HR-not required; LS-not required; PR-LMH. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	Needs to be verified (Not required at Part C)

Hazardous Materials

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR-LMH; LS-LMH; PR-LMH. HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.
C	NC	N/A	U	HR-LMH; LS-LMH; PR-LMH. HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.
C	NC	N/A	U	HR-MH; LS-MH; PR-MH. HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.
C	NC	N/A	U	HR-MH; LS-MH; PR-MH. SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.
C	NC	N/A	U	HR-LMH; LS-LMH; PR-LMH. FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.
C	NC	N/A	U	HR-MH; LS-MH; PR-MH. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	Needs to be verified. Snap report notes "Presumed Postive" materials in various locations.

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

Partitions

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	Brick pilasters at Part C need bracing. Bracing for masonry walls at other areas need to be verified.
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	Needs to be verified
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	Needs to be verified (Not required at Part C)

Ceilings

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—H; LS—MH; PR—LMH. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft2 (1.1 m2) of area.	
C	NC	N/A	U	HR—not required; LS—MH; PR—LMH. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft2 (1.1 m2) of area.	Needs to be verified
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.	Not required at Part C
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	Not required at Part C
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.	Assume non-compliant at joint between Part B and Part C.
C	NC	N/A	U	HR—not required; LS—not required; PR—H. EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft2 (13.4 m2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	Not required at Part C
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft2 (232.3 m2) and has a ratio of long-to-short dimension no more than 4-to-1.	Not required at Part C

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

Light Fixtures

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	
C	NC	N/A	U	HR—not required; LS—not required; PR—H. PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. LENS COVERS: Lens covers on light fixtures are attached with safety devices.	

Cladding and Glazing

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—MH; LS—MH; PR—MH. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft2 (0.48 kN/m2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	
C	NC	N/A	U	HR—MH; LS—MH; PR—MH. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	
C	NC	N/A	U	HR—MH; LS—MH; PR—MH. PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	
C	NC	N/A	U	HR—MH; LS—MH; PR—MH. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	
C	NC	N/A	U	HR—MH; LS—MH; PR—MH. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft2 (1.5 m2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	Needs to be verified at other areas with panes more than 16 ft2 in area

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

Masonry Veneer

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft2 (0.25 m2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	
C	NC	N/A	U	HR—not required; LS—MH; PR—MH. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	

Parapets, Cornices, Ornamentations, and Appendages

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to- thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	
C	NC	N/A	U	HR—H; LS—MH; PR—LMH. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	
C	NC	N/A	U	HR—MH; LS—MH; PR—LMH. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	

Masonry Chimneys

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	
C	NC	N/A	U	HR—LMH; LS—LMH; PR—LMH. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.	

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

Stairs

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.	
C	NC	N/A	U	HR—not required; LS—LMH; PR—LMH. STAIR DETAILS: The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.	Needs to be verified

Contents and Furnishings

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—LMH; LS—MH; PR—MH. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	
C	NC	N/A	U	HR—not required; LS—H; PR—MH. TALL NARROW CONTENTS: Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	Contents to be inspected and braced.
C	NC	N/A	U	HR—not required; LS—H; PR—H. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	Contents to be inspected and braced.
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	Contents to be inspected and braced. (Not required at Part C)

Mechanical and Electrical Equipment

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—H; PR—H. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	Equipment to be inspected and braced.
C	NC	N/A	U	HR—not required; LS—H; PR—H. IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	Equipment to be inspected and braced.
C	NC	N/A	U	HR—not required; LS—H; PR—MH. TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls.	Equipment to be inspected and braced.
C	NC	N/A	U	HR—not required; LS—not required; PR—MH. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components.	Equipment to be inspected and braced. (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.	Needs to be verified (Not required at Part C)

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Appendix B - ASCE 41-17 **Tier 1 Checklists**

Project:	Five Oaks Middle School
Project No:	21603.10
Completed By:	Mark Ellis
Reviewed By:	Jennifer Eggers

Table 17-38 - Nonstructural Checklist

C	NC	N/A	U	HR—not required; LS—not required; PR—H. CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	Components to be inspected and install couplers as needed. (Not required at Part C)

Piping

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—not required; PR—H. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	Components to be inspected and install couplers as needed. (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	Piping to be inspected and braced. (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	Needs to be verified (Not required at Part C)

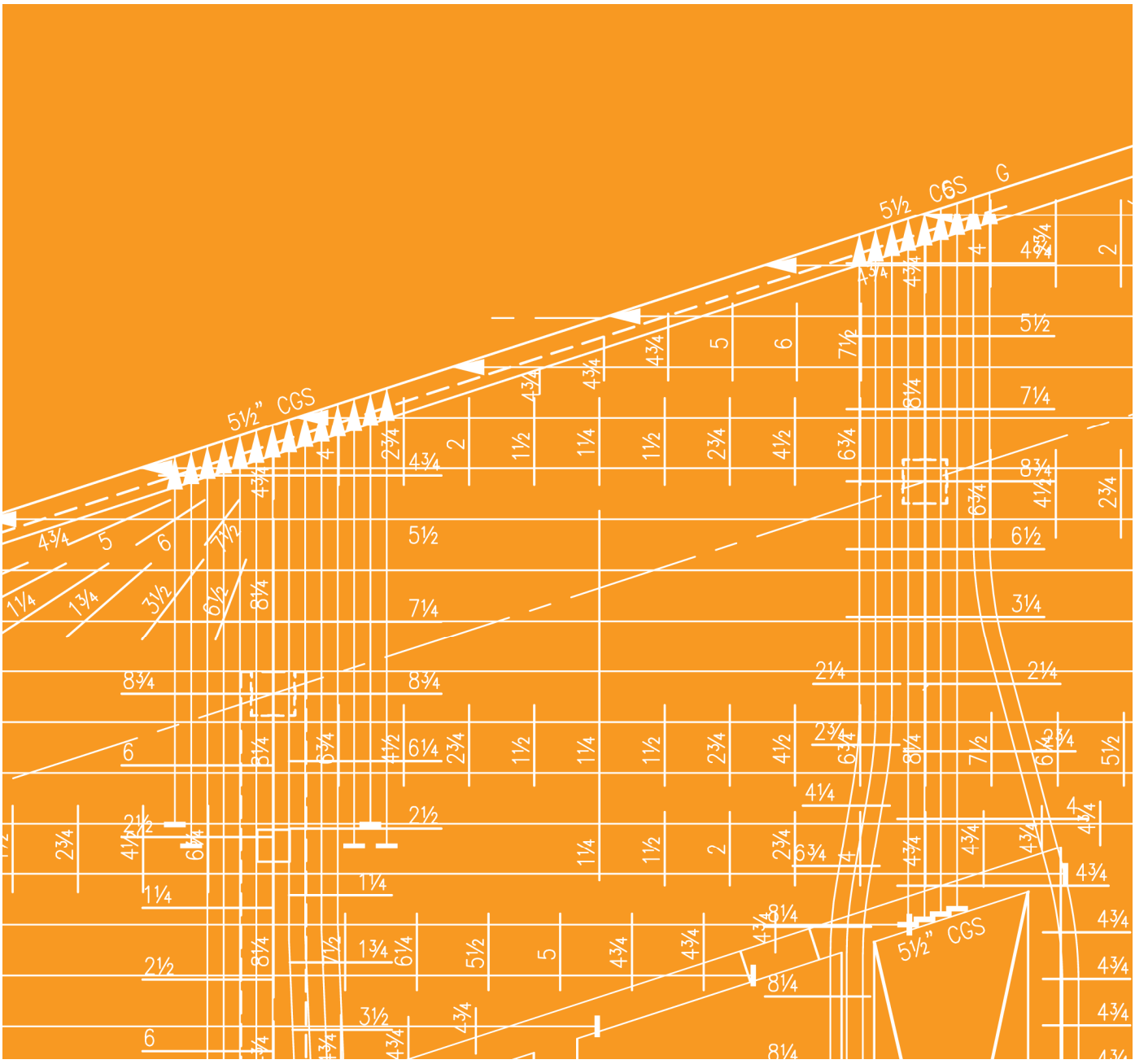
Ducts

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—not required; PR—H. DUCT BRACING: Rectangular ductwork larger than 6 ft2 (0.56 m2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	Equipment to be inspected and braced. (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	Needs to be verified (Not required at Part C)
C	NC	N/A	U	HR—not required; LS—not required; PR—H. DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	Needs to be verified (Not required at Part C)

Elevators

STATUS				EVALUATION STATEMENT	COMMENTS
C	NC	N/A	U	HR—not required; LS—H; PR—H. RETAINER GUARDS: Sheaves and drums have cable retainer guards.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—H; PR—H. RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—not required; PR—H. ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	Needs to be verified
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.	Needs to be verified
C	NC	N/A	U	HR—not required; LS—not required; PR—H. COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—not required; PR—H. BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—not required; PR—H. SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	Elevator is hydraulic
C	NC	N/A	U	HR—not required; LS—not required; PR—H. GO-SLOW ELEVATORS: The building has a go-slow elevator system.	Elevator is hydraulic

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.



Strengthening Scheme

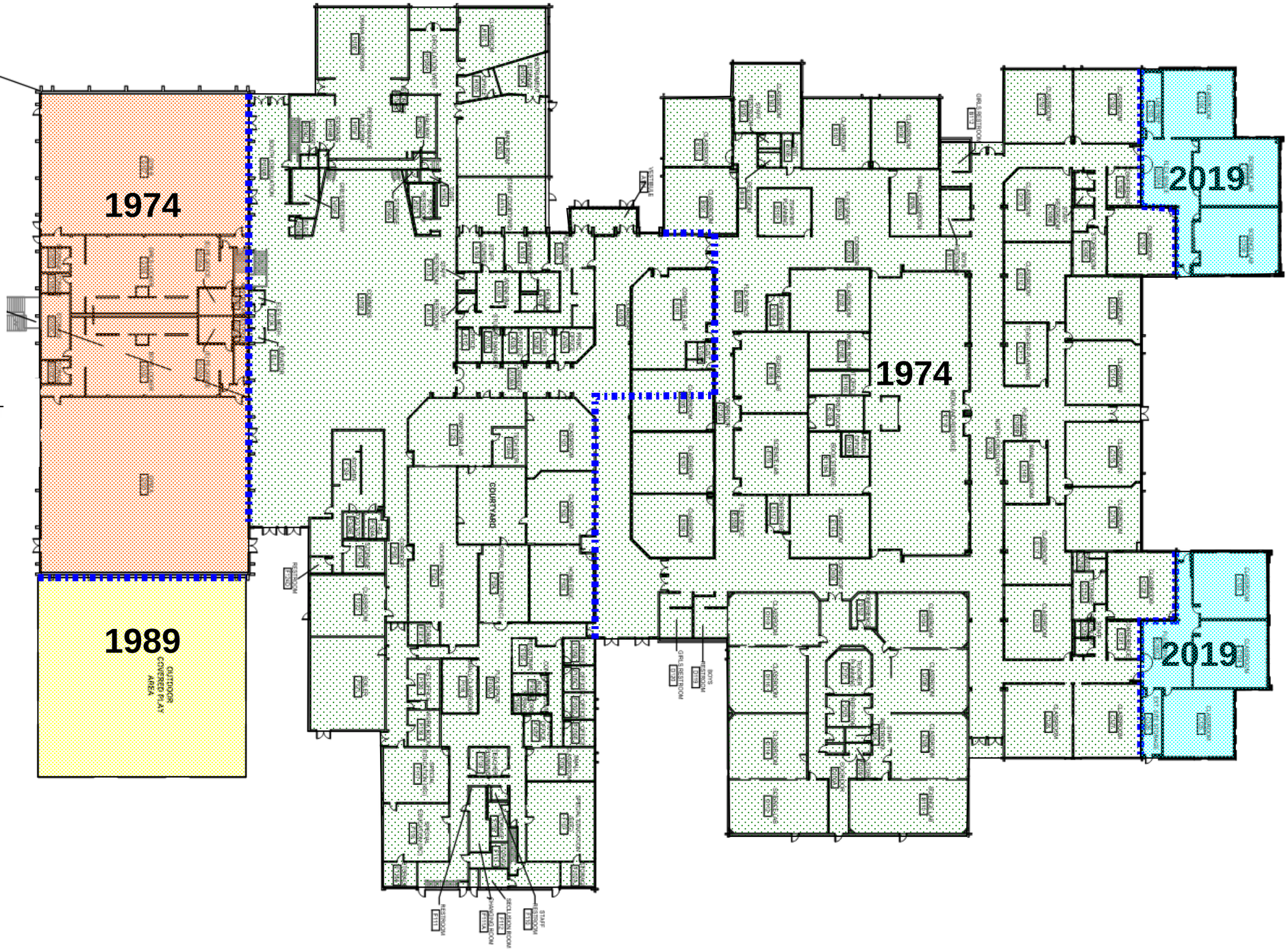
1974 — 1974 GYM
TYPE PC1 (Concrete Tilt-Up)

1974 — 1974 SCHOOL BUILDING
TYPE RM1 (Reinf. Masonry with Flexible Diaphragm)

1989 — 1989 COVERED PLAY AREA
TYPE S3 (Metal Building Frame)

2019 — 2019 CLASSROOM ADDITION
TYPE S2A (Steel Braced Frame with Flexible Diaphragm)

EXISTING EXPANSION JOINT OR SEISMIC ISOLATION JOINT



1 OVERALL PLAN - BUILDING ERAS
N.T.S.

Holmes

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-01 Revision: 00 By: ME

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A

Building Part A

Risk Category: IV

Structural Performance
Life Safety (S-3) at BSE-2E
Immediate Occupancy (S-1) at BSE-1E

Nonstructural Performance
Hazard Reduction (N-D) at BSE-2E
Position Retention (N-B) at BSE-1E

B

Building Part B

Risk Category: IV

Structural Performance
Life Safety (S-3) at BSE-2E
Immediate Occupancy (S-1) at BSE-1E

Nonstructural Performance
Hazard Reduction (N-D) at BSE-2E
Position Retention (N-B) at BSE-1E

C

Building Part C

Risk Category: III

Structural Performance
Limited Safety (S-4) at BSE-2E

Nonstructural Performance
Hazard Reduction (N-D) at BSE-2E

D

Building Part D

Risk Category: III

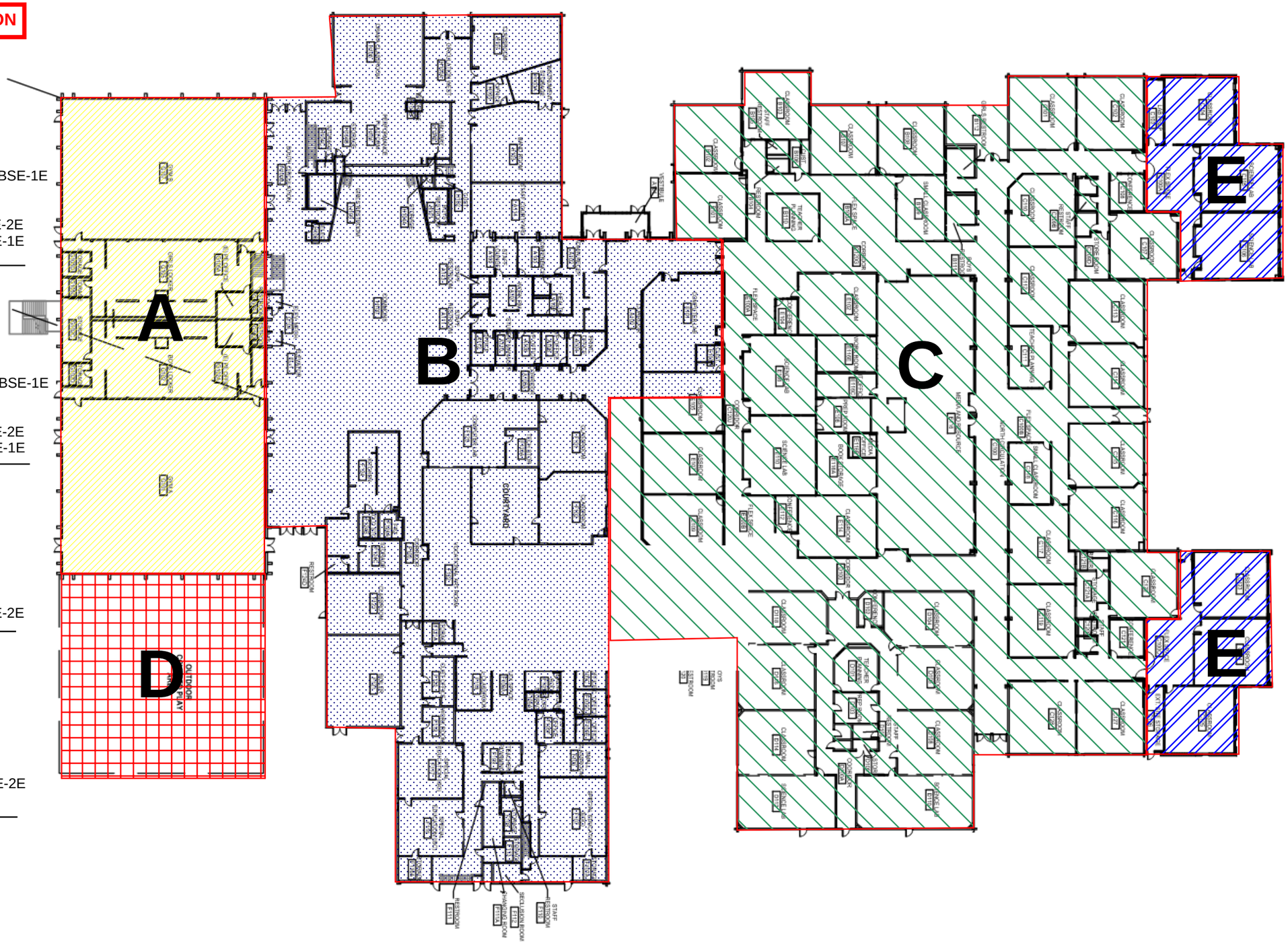
Structural Performance
Limited Safety (S-4) at BSE-2E

Nonstructural Performance
Hazard Reduction (N-D) at BSE-2E

E

Building Part E

Not In Scope



1 OVERALL PLAN - PERFORMANCE OBJECTIVES
N.T.S.

Holmes

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-02 Revision: 00 By: ME

LEGEND

F1	AT BASE OF (E) TILT-UP WALLS AT GYM PROVIDE 2 FT. HIGH X 6 IN. THICK CONC. BAND WITH 2 ROWS #4 @18" DRILL & EPOXY INTO WALL AND #5 @ 12" OC DRILL & EPOXY INTO (E) FOUNDATION
F2	DEMO (E) WALL AND REPLACE WITH (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.)
F3	PROVIDE (N) CONCRETE STRIP FOOTING TO SUPPORT (N) CMU SHEAR WALL. ASSUME MIN 18IN THICKNESS AND 36IN WIDTH UNO. PROVIDE 250 LB/CY REINFORCING. DEMO AND REBUILD (E) SLAB AS REQUIRED FOR INSTALLATION OF WALL AND RECONSTRUCT AFTER INSTALLATION OF WALL.
F4	PROVIDE NEW SUREBOARD SHEATHING (ONE SIDE ONLY) FROM GROUND FLOOR TO UNDERSIDE OF FAN ROOM FLOOR. PROVIDE ADDITONAL CONNECTIONS FROM (E) METAL STUD FRAMING TO SLAB BELOW, FLOOR ABOVE AND STEEL POSTS AT ENDS OF WALLS
F5	PROVIDE NEW 18 IN. STEEL COLUMN ON INSIDE FACE OF GYM WALL (SPANS FLOOR TO ROOF). CONNECT TO FOUNDATION AND TO ROOF. BOLT TO (E) TILT-UP WALL AT 24 IN. O.C.
F6	AT BASE OF (E) COLUMNS AT COVERED PLAY AREA, PROVIDE TWO NEW ANCHOR BOLTS. DRILL & EPOXY INTO (E) FOUNDATION
F7	AT (E) PORTAL FRAMES, PROVIDE NEW STEEL PLATES AND WELDS TO STRENGHTEN PORTAL FRAME MOMENT CONNECTIONS
F8	PROVIDE (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.) ADJACENT TO (E) WALL

R1	NEW OUT-OF-PLANE CONNECTION AT GYM ROOF (2 - 3 X 3 X 1/4 ANGLES AT PILASTERS AND 8 FT MAX SPACING)
R2	NEW OUT-OF PLANE CONNECTION AND CONTINUITY TIE ACROSS GYM ROOF AT PILASTERS AND 8 FT MAX SPACING
R3	NEW C 4 X 7.25 CHANNEL CROSS BRACING ACROSS ENTIRE GYM ROOF
R4	(NOT USED)
R5	NEW OUT-OF-PLANE CONNECTION AND CONTINUITY TIES (3 X 3 X 1/4 ANGLE AT 8 FT MAX SPACING) AT UNDERSIDE OF METAL DECK.
R6	NEW HSS 3 1/2 X 2 1/2 DRAG TIE AT UNDERSIDE OF METAL DECK.
R7	NEW 2 1/2 X 2 1/2 X 1/4 STEEL ANGLE AT UNDERSIDE OF HSS DRAG - TO SUPPORT DRAG (AT 8 FT MAX SPACING). WELD ANGLES TO UNDERSIDE OF TOP CHORD OF (E) TRUSS JOIST
R8	REMOVE ROOFING AND WELD (E) DECK TO NEW STEEL MEMBERS @ 12 IN. O.C.
R9	PROVIDE STRUTS AT TOP OF NEW 18 IN. STEEL COLUMN TO TIE IN TO ROOF FRAMING
R10	NEW HSS STRUT AT MAIN BUILDING ROOF LEVEL. CONNECT EA END
R11	NEW CONNECTIONS BETWEEN MAIN BUILDING ROOF AND GYM WALL
R12	NEW CONNECTION BETWEEN BEAM AT MAIN BUILDING ROOF AND GYM WALL
R13	INCLUDE ALLOWANCE FOR NEW CONNECTIONS

M1	NEW HSS 4 X 4 STRUT AT MEZZANINE LEVEL
M2	NEW HSS TIE BETWEEN (E) CONCRETE SHEAR WALL AND TILT-UP WALL
M3	NEW CONNECTION BETWEEN (E) RB-19 AND TILT-UP WALL AT GYM
M4	NEW CONNECTIONS BETWEEN MEZZANINE FLOOR AND GYM WALL

NON-STRUCTURAL

N1	AT INTERIOR BRICK PILASTER WITHOUT STEEL COLUMN, PROVIDE BRACING ABOVE CEILING
N2	SUPPLEMENT (E) SUPPORT AT TOP OF (E) PLUMBING WALL PER DETAIL 5/CR21
N3	PROVIDE SEISMIC BRACING AT FIRE SUPPRESSION PIPING
N4	AT DROP-IN CEILINGS, PROVIDE CLEARANCE FOR SPRINKLER HEADS, SPLAY WIRE BRACING AND COMPRESSION POSTS, AND INDEPENDENT SUPPORT FOR LIGHT FIXTURES
N5	INCLUDE ALLOWANCE FOR ADDITIONAL BRACING AT INTERIOR MASONRY WALLS AND PARTITIONS
N6 TO N15	- BRACE TALL NARROW CONTENTS - BRACE/ANCHOR FALL-PRONE CONTENTS WEIGHING MORE THAN 20LBS WHOSE CENTER OF MASS IS MORE THAN 4FT ABOVE THE FLOOR - BRACE/ANCHOR FALL-PRONE EQUIPMENT WEIGHING MORE THAN 20LBS WHOSE CENTER OF MASS IS MORE THAN 4FT ABOVE THE FLOOR - BRACE/ANCHOR TALL NARROW EQUIPMENT (MORE THAN 6FT HEIGH) WITH A H:W RATIO GREATER THAN 3:1 - BRACE IN-LINE EQUIPMENT WITH AN OPERATING WEIGHT MORE THAN 75LB. - PROVIDE CONDUIT COUPLINGS FOR CONDUIT GREATER THAN 2.5in. THAT IS ATTACHED TO PANELS, CABINETS OR OTHER EQPT - PROVIDE FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING - PROVIDE GAS SHUT-OFF VALVE - BRACE FLUID AND GAS PIPING - BRACE DUCTS LARGER THAN 6 ft^2 IN CROSS SECTIONAL AREA @30FT O.C. TRANSVERSE AND 60FT O.C. LONGITUDINALLY

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Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-03 Revision: 00 By: ME

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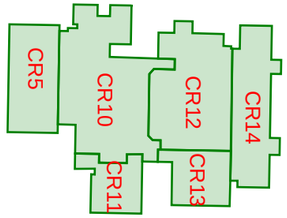
N3-A and N4-A:
Provide throughout building



SHEET NUMBERS FOR STRUCTURAL FLOOR PLANS (90 DEGREE ROTATION)

OVERALL GROUND FLOOR PLAN

NEW HSS 4 X 4 STRUT AT MEZZANINE LEVEL

AT INTERIOR BRICK PILASTERS WITHOUT STEEL COLUMN, PROVIDE BRACING ABOVE CEILING TYP.

NEW 8 IN. CMU WALL (FULL HT TO ROOF) ADJACENT TO (E) WALL, WITH ECCENTRIC FOUNDATION

M4-A

SUPPLEMENT (E) SUPPORT AT TOP OF (E) BLOCK WALL

N2-A

NEW 12 IN. CMU WALL (FULL HT TO ROOF) ADJACENT TO (E) WALL, WITH ECCENTRIC FOUNDATION

F8-A

F8-B

F8-C

NEW 8 IN. CMU WALL (FULL HT TO ROOF) ADJACENT TO (E) WALL, WITH ECCENTRIC FOUNDATION

REPLACE (E) WALL WITH NEW 8 IN. CMU WALL (FULL HT TO ROOF) AND FOUNDATION

F2-B

F8-A

F8-C

REPLACE (E) WALL WITH NEW 8 IN. CMU WALL (FULL HT TO ROOF) AND FOUNDATION

N1-A
Typ.

F2-A

F4-A

F4-A

NEW 18 IN. STEEL COLUMN ON INSIDE FACE OF WALL (SPANS FLOOR TO ROOF)

NEW CONCRETE BAND CONNECTING BASE OF (E) TILT-UP WALL PANEL TO (E) FOUNDATION

OUTDOOR COVERED PLAY AREA

(E) EXPANSION JOINT ABOVE TO REMAIN

AT COVERED PLAY AREA, STRENGTHEN PORTAL FRAMES AND ADD BOLTS AT BASE OF COLUMNS TYP.

NEW SUREBOARD SHEATHING (ONE SIDE ONLY) FROM GROUND FLOOR TO UNDERSIDE OF FAN ROOM FLOOR.

CONCRETE SLAB SEE STRUCT

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-04 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

F1

AT BASE OF (E) TILT-UP WALLS AT GYM PROVIDE 2 FT. HIGH X 6 IN. THICK CONC. BAND WITH 2 ROWS #4 @18" DRILL & EPOXY INTO WALL AND #5 @ 12" OC DRILL & EPOXY INTO (E) FOUNDATION

F1-D

3/CR-6

4/CR-6

3/CR-6

F5-A

F5: NEW 18 IN. STEEL COLUMN ON INSIDE FACE OF WALL (SPANS FLOOR TO ROOF). CONNECT TO FOUNDATION AND TO ROOF. BOLT TO (E) TILT-UP WALL AT 24 IN. O.C.

F6: TYP. 8 LOCATIONS

F6-A

2/CR-6

F7: 2 LOCATIONS

N2-A

1/CR-6

1/CR-6

F1-C

2/CR-6

F1-A

F1-C

F6-A

2/CR-6

2/CR-6

2/CR-6

F1-B

N2: SUPPLEMENT (E) SUPPORT AT TOP OF (E) PLUMBING WALL PER DETAIL 5/CR21

GROUND FLOOR PLAN - GYM AND COVERED PLAY AREA

GENERAL NOTES

GENERAL
1. These notes set minimum standards for construction. The drawings govern over the General Notes to extent shown.
2. Contractor shall verify all dimensions and conditions on drawing and on field. Coordinate locations of openings through floors, roofs and walls with architectural, mechanical and electrical plans. Notify Architect of any discrepancies.
3. Contractor shall provide all necessary temporary support prior to completion of vertical and lateral load systems.
4. Where reference is made to ASTM, AISC, ACI or other standards, the dates shall be as indicated in the specifications unless noted.
5. Design criteria:
   a. 1970 Uniform Building Code
   b. Basic Roof Load (snow) . . . . . 24#/sq.ft.
   c. Floors (classrooms & office) . . . . . 80#/sq.ft.
   d. Wind . . . . . 20#/sq.ft.
   e. Seismic . . . . . Zone II
   f. Attic space in Rm. . Rooms . . . . . 10#/sq.ft.

FOUNDATIONS
1. Soil pressure to be 2000 psf L.L. & D.L. per Dawes & Moore soils report.
2. Footings to rest on firm undisturbed soil.
3. Do not excavate closer than a 1:1 slope below footing.
4. Excavations may be made under continuous footings for piers. Backfill with lean concrete to bottom of footing.

CONCRETE
1. Concrete for foundations, foundation walls, walls, columns and slabs to be 3000 psi.
2. Place and cure all concrete per ACI.
3. Sleeves, pipes, or conduits of aluminum shall not be embedded in structural concrete unless effectively coated.
4. Contractor to provide additional reinforcing steel as required for lifting stresses in tilt-up panels.

REINFORCING
1. All reinforcing steel to be ASTM A615 Grade 60, except ties, stirrups and dowels to masonry to be Grade 40.
2. Provide 6 x 6 - 10/10 welded wire mesh with 2 #4 Edge Bars flap 2'-0" at corners in all 4" slabs on grade unless noted otherwise. Place 1" from top of slab.
3. Fabricate and install reinforcing steel accordance to the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" ACI Standard 315-65.
4. The minimum area of wall reinforcing shall be 1/2% times the gross concrete area, each way.
5. Provide 2'-0" x 2'-0" corner bars to match horizontal reinforcing in walls at all corners and intersections.
6. Splices in wall reinforcing shall be lapped 27 diameters or 2'-0" whichever is greater.
7. Provide 2 extra ties @ 3" o.c. at top of all columns and pilasters.
8. Provide the following reinforcing around wall openings larger than 12" x 12".
   a. 2 #6 over x opening plus 3'-0" each side.
   b. 2 #5 under x opening plus 2'-0" each side.
   c. 2 #5 each side x opening plus 2'-0" each side.
   d. 1 #4 x 4'-0" @ 45 degrees at all corners of openings.
   e. Provide 90 degree hook for bars at openings if required extension past opening cannot be obtained.
9. Provide 2 #5 continuous bars at top and bottom, at discontinuous ends, and at horizontal pour joints of all walls.
10. Place 2 #5 x opening plus 2'-0" each side around all edges of openings in slabs and place 1 #4 x 4'-0" @ 45 degrees to each corner.
11. Lap all bars in intersecting footings 21'-0" or 27 diameters whichever is greater.
12. Alternate welded splices (2) in structural slabs whenever possible.
13. Provide the following concrete cover over reinforcing bars: 3/4" for slabs, joist and walls not exposed to ground or weather; 1½" to the ties for beams, girders and columns; 2" for formed concrete exposed to ground or weather, and 3" for concrete poured against ground (footings).

STRUCTURAL & MISCELLANEOUS STEEL
1. Erection, fabrication and erection shall conform to the Steel Construction Manual of AISC (Seventh Edition).
2. All steel to be A36 except as noted.
3. All welds to be made by Certified Welders to AWS Standards with E70 Electrodes.
4. Nuts to be A307, except as noted otherwise on drawings.
5. All bolts shall be 3/4" ø A325 bolts (2 at each end of beam).
6. DELETED
7. All "cast steel" [illegible] shall be fabricate to AISC Specifications. Submit shop drawings for review.
8. All steel joists shall conform to the latest standards for steel joists, including bridging and camber as called for in each.
9. Steel deck to be ASTM A-525 Type 30 galvanized.
10. Provide welded wire fabric bearing pads where indicated on the side where noted on drawings. Thickness to be 1/4" typical.

BLOCK AND HOLLOW BRICK
1. Assumed f'm 1350 psi for block.
2. Assumed f'm 2600 psi for brick. Make brick tests as specified in Section 2606(c) of the UBC. Tests to be made before commercial brick unit for each 5000 sq.ft. of wall laid.
3. See specification for type of units, mortar and grouts.
4. Grout walls and core beams that indicate reinforcing.
5. All work shall conform to Chapter 24 of the Uniform Building Code 1970 Edition.
6. Reinforcing in CMU beams and walls to be in center of cells filled solid. Provide corner bars at all wall intersections. Provide 2 #5 x opening plus 2'-0" each side around all openings larger than 12" x 12".
7. Compact mortar and grout in CMU walls at all intersections with 1/2" dia. x 18" W.D. or 16 gauge shields at 16" vertical centers.
8. [illegible] between masonry units shall be 1/4" min. and 3/8" max.

STEEL JOIST
1. Steel joist shall be designed, fabricated and erected per AISC standard specifications.
2. Space all joists with standard centers per above standard specifications unless noted otherwise on the drawings.
3. Provide bridging as called for by above specifications. Do not use slotted holes in bolted connection unless approved by Engineer.
4. Provide shop drawing that indicates joist sizes, loading, member sizes, panel point locations, camber, bridging and any other information that may be pertinent to the job.
5. H-Series steel joist [illegible] shall be supplied by the joist manufacturer with special [illegible] high top sections to match LH-Series steel joists instead of the standard 2½" high bearings.

1 S1 FOUNDATION PLAN - SECTOR 'A'

2 S1 PLAN - INTERIOR STAIRS

3 S1 SECTION

4 S1 SECTION

5 S1

6 S1 BEAM TO TURN PILASTER

7 S1

8 S1

9 S1

10 S1

11 S1 WALL ELEVATION DETAIL

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1970 ROBERT A. WALKER

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-05 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

2 FT. HIGH X 6 IN. THICK CONC. BAND WITH 2 ROWS #4 @18" DRILL & EPOXY INTO WALL AND #5 @ 12" OC DRILL & EPOXY INTO FOUNDATION (TYP. AS SHOWN)

1 / S 2

2 / S 2

3 / S 2

4 / S 2

5 / S 2

6 / S 2

7 / S 2

1 / CR-06

8 / S 2

2 / CR-06

9 / S 2

10 / S 2

3 / CR-06

11 / S 2

12 / S 2

13 / S 2

14 / S 2 TYP. C.J. AT DOOR SILL

14a / S 2 BRICK WALL CONN. TO TILT-UP WALL

15 / S 2 SECTION @ EXTERIOR DWRS. SECTION "A"

16 / S 2

17 / S 2

17a / S 2

18 / S 2

19 / S 2

20 / S 2 CHIMNEY FOUNDATION DETAIL "C"

21 / S 2 BRICK NON-BEARING WALL @ CONC. ALTY WALL

22 / S 2 TYP. FLOOR JOINT (C.J.)

23 / S 2

24 / S 2

25 / S 2

4 / CR-06

26 / S 2

27 TYP. WALL SEC. THRU WATER METER VAULT

28 / S 2 PLAN - TYP. STEEL COL. BASE

29 / S 2 TYPICAL STEEL COLUMN FOUNDATION

30 / S 2

31 TOP VIEW - WATER METER VAULT

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1979 ROBERT A. WARGIN SEAL

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-06 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

1 S 3

2 S 3 ELEVATION - COLUMN BASE & BRICK FENCE, COVERED AREA AT SHOP

3 S 3 TOP VIEW OF COLUMN BASE

4 S 3 FOUND. OF TYP. BRICK OR CONC. BLOCK WALLS

5 S 3 SECTION @ URINAL

6 S 3 LONGITUDINAL SECT. @ URINAL

7 S 3

8 S 3

DETAIL DELETED

9 S 3

10 S 3

11 S 3 SECTION THRU STEPS IN BAND ROOM

12 S 3

13 S 3 SECTION THRU STEPS IN CHORAL ROOM

14 S 3

15 S 3

16 S 3

17 S 3

18 S 3

19 S 3

20 S 3

21 S 3

22 S 3

23 S 3

24 S 3

25 S 3

26 S 3

27 S 3

28 S 3

29 S 3

30 S 3

31 S 3

32 S 3

33 S 3

34 S 3

BEAVERTON INTERMEDIATE SCHOOL NO.6

DRAWING TITLE FOUNDATION DETAILS

SHEET S3

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 17, 1990 ROBERT A. WALKER SEAL

HEVELETT, JAMISON & ATKINSON - AIA - ARCHITECTS

COMM. NO. 9910

REVISED:

DRAWN BY: J.J.E.D./S.J.K.Y.

DATE: 8/30/94

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-07 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

M1: NEW HSS 4 X 4 STRUT AT MEZZANINE LEVEL. CONNECT TO (E) WALL/FLOOR AT EA. END

M1-A

M2-A

M2: NEW HSS TIE BETWEEN (E) CONCRETE SHEAR WALL AND TILT-UP WALL AT GYM

M3: NEW CONNECTION BETWEEN (E) RB-19 AND TILT-UP WALL AT GYM

M3-A

M4-A

1/CR-8

M4: NEW CONNECTIONS BETWEEN MEZZANINE FLOOR AND GYM WALL

M4-A

M4: ADD WELD AT CONNECTIONS BETWEEN MEZZANINE FLOOR AND TILT-UP WALL

2/CR-8

2/CR-8

ADD FILLET WELD EA. SIDE OF TRUSS BEARING PLATE TO EMBED PLATE

2 CR-08

1 CR-08

NEW STEEL BRACKETS AT 4 FT O.C. EPOXY BOLT TO (E) TILT-UP WALL AND WELD TO UNDERSIDE OF (E) BEAM

50 S 4 UPPER LEVEL FLOOR FRAMING PLAN – SECTOR 'A' AND 'B'

KEY PLAN

MEZZANINE FLOOR PLAN - GYM

BEAVERTON INTERMEDIATE SCHOOL NO. 8
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON
WASHINGTON COUNTY

hja HEWLETT, JAMISON & ATKINSON · AIA · ARCHITECTS
3223 S. W. HARBOR DRIVE · PORTLAND, OREGON 97201 · 228-9468

COMM. NO. 6910
REVISED
DRAWN BY: J. EDWARDS
DATE: 8/30/94
SCALE: 1/8" 1/4" 1'-0"

DRAWING TITLE
SECTION A & B
UPPER LEVEL FLOOR FRAMING PLAN AND DETAILS

SHEET NO.
S 4

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1970 ROBERT A. WALKER
SEAL

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-08 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

R1 — NEW OUT-OF-PLANE CONNECTION AT GYM ROOF (2 - 3 X 3 X 1/4 ANGLES AT PILASTERS AND 8 FT MAX SPACING)

R2 — NEW OUT-OF PLANE CONNECTION AND CONTINUITY TIE ACROSS GYM ROOF AT PILASTERS AND 8 FT MAX SPACING

R3 — NEW C 4 X 7.25 CHANNEL CROSS BRACING ACROSS ENTIRE GYM ROOF

R8 — REMOVE (E) ROOFING AND PUDDLE WELD (E) DECK TO NEW ANGLES AND ALL PERIMETER AND INTERIOR WALLS.

R3: C 4 X 7.25 CHANNEL CROSS-BRACING ACROSS ENTIRE ROOF (REMAINDER NOT SHOWN). SEE DETAILS 4/CR9 TO 7/CR9 FOR TYPICAL WELDING.

R3-A

R12: SEE SHEET CR18

R8-A Typ.

3/CR-9

R9: PROVIDE STRUTS AT TOP OF NEW 18 IN. STEEL COLUMN TO TIE IN TO ROOF FRAMING

R10: NEW HSS STRUT AT MAIN BUILDING ROOF LEVEL. CONNECT EA END.

1/CR-9 AT PILASTER

1/CR-9 SIM. AT WALL

NEW PUDDLE WELD (E) DECK TO (E) ANGLE @ 12 IN. O.C.

12 X 6 X 3/8 IN. PL FIELD WELDED TO TOP CHORD (DBL ANGLE) OF (E) TRUSS JOIST

REMOVE (E) ROOFING AND PUDDLE WELD (E) DECK TO NEW ANGLE @ 12 IN. O.C.

3 x 3 x 1/4 ANGLE CONTINUITY TIE ACROSS ROOF. FIELD WELD TO PLATES EA. END

4 x 4 x 5/16 ANGLE AT EA. PILASTER AND AT 8 FT MAX. IN BETWEEN PILASTERS. WELD ANGLE TO PLATE/SHIM AT EA. END

2/CR-09 SIM. (ONLY ONE ANGLE)

(E) PILASTER AND TILT-UP WALL

(E) TRUSS JOIST

3 x 3 x 1/4 ANGLE EA. SIDE AT EA TRUSS JOIST. WELD ANGLE TO PLATE/SHIM AT EACH END

USE ANGLE EA. SIDE TO SHIM OUT. WELD SHIM ANGLE TO TOP CHORD

ADD FILLET WELD EA. SIDE OF TRUSS BEARING PLATE TO EMBED PLATE

(E) PILASTER AND TILT-UP WALL

2/CR-09

(E) TRUSS JOIST

C 8 x 18.75 x 24" LONG WITH 3/8 IN. TAB PLATES AS SHOWN. BOLT CHANNEL TO PILASTER AND TO TILT-UP WALLS WITH 3/4 IN. THRU BOLTS AND PLATES (4 BOLTS TOTAL)

1 S5 ROOF FRAMING PLAN — SECTOR A

2 S5 TYP. S/W. COL. TYPE

3 S5

4 CR-09

5 CR-09

6 CR-09

7 CR-09

1 CR-09

2 CR-09

3 CR-09

KEY PLAN

ROOF FRAMING PLAN - GYM

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BEAVERTON INTERMEDIATE SCHOOL NO.6
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON

DRAWN BY: JE/DO/CLY | COMM. NO. G910
DATE: 6/30/14 | REVISED
SCALE: 1/8"

DRAWING TITLE: SECTOR A ROOF FRAMING PLAN AND DETAILS

SHEET NO. S5

SEAL: ROBERT A. WALKER

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-09 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

F2 — DEMO (E) WALL AND REPLACE WITH (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.)

F3 — PROVIDE (N) CONCRETE STRIP FOOTING TO SUPPORT (N) CMU SHEAR WALL. ASSUME MIN 18IN THICKNESS AND 36IN WIDTH UNO. PROVIDE 250 LB/CY REINFORCING. DEMO AND REBUILD (E) SLAB AS REQUIRED FOR INSTALLATION OF WALL AND RECONSTRUCT AFTER INSTALLATION OF WALL.

F8 — PROVIDE (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.) ADJACENT TO (E) WALL

(E) EXPANSION JOINT ABOVE TO REMAIN

NEW 8 IN CMU WALL SEE SHEET CR13

NEW 12 IN CMU SHEAR WALL WITH 5 FT WIDE X 2 FT DEEP ECCENTRIC FOUNDATION

NOTE THAT DIAGONAL MASONRY WALLS HAVE ALREADY BEEN DEMO'D AS PART OF 2019 RENOVATIONS

NOTE: (S1) INDICATES COLUMN NUMBER, LETTER DENOTES THE SECTOR IN WHICH THE COLUMN OCCURS

1 / S6 FOUNDATION PLAN - SECTOR 'B'

KEY PLAN

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1970 ROBERT A. WALKER

SEAL

HEWLETT, JAMISON & ATKINSON - AIA - ARCHITECTS
3233 S. W. HARBOR DRIVE · PORTLAND, OREGON 97201 · 238-9468

COMM. NO. 9910 | REVISED
DRAWN BY: J. REDDICK | DATE: 5/30/14

BEAVERTON INTERMEDIATE SCHOOL NO. 6
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON
WASHINGTON COUNTY

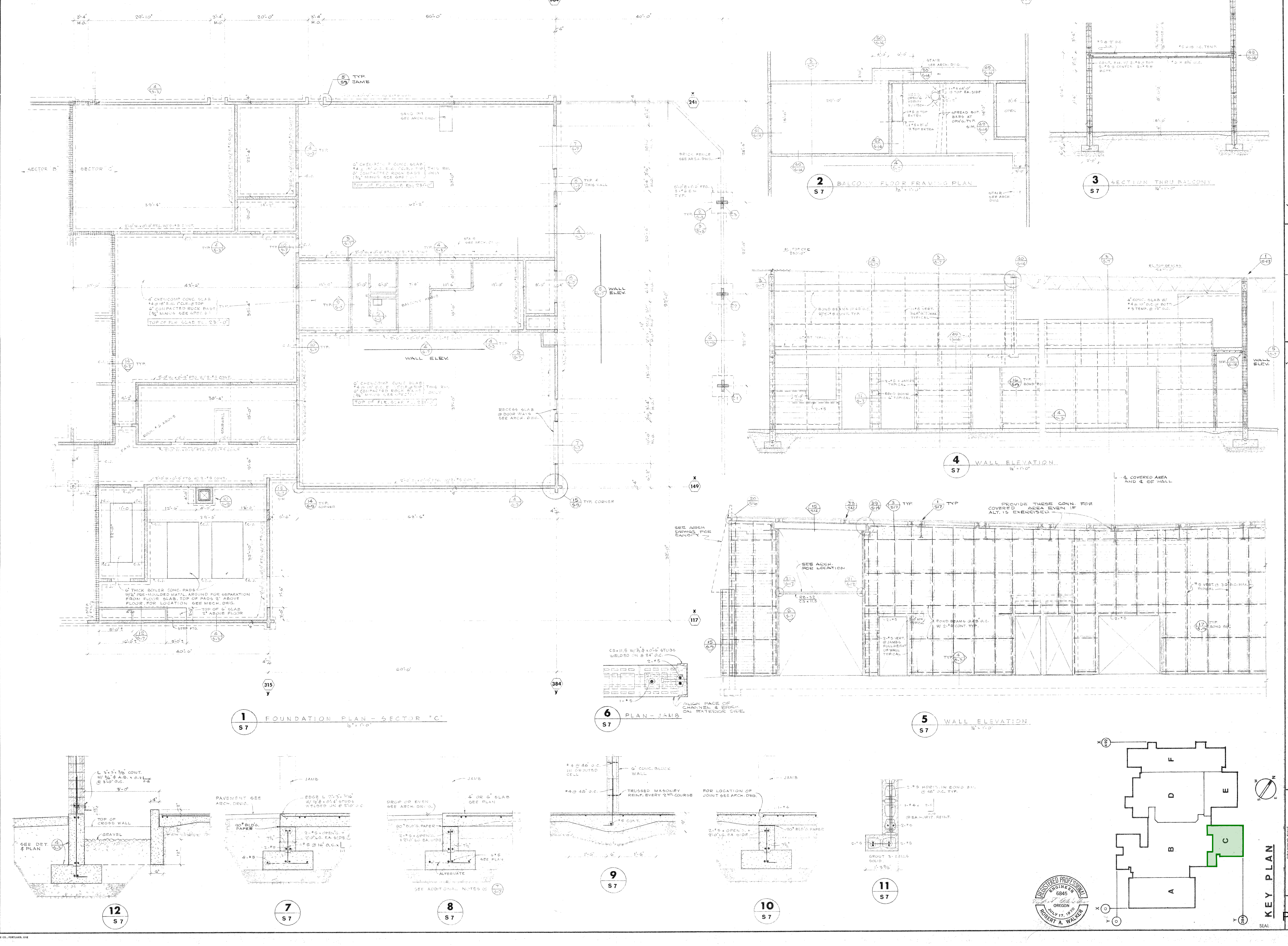
DRAWING TITLE: SECTOR 'B' FOUNDATION PLAN
SHEET NO.

PARTIAL GROUND FLOOR AND FOUNDATION PLAN

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-10 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION



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3223 S. W. HARBOR DRIVE · PORTLAND, OREGON 97201 · 228-9468

DRAWN BY: J. JEDOVSKY
DATE 5/30/74
SCALE 1/8"
COMM. NO. 6910
REVISED

BEAVERTON INTERMEDIATE SCHOOL NO.6
SCHOOL DISTRICT NO. 48 WASHINGTON COUNTY
BEAVERTON, OREGON

DRAWING TITLE
SECTOR "C"
FOUNDATION PLAN, BALCONY
FLOOR FRAMING PLAN & DETAILS

SHEET NO.
S7

SEAL
ROBERT A. WALKER
6845
JULY 17, 1970

PARTIAL GROUND FLOOR AND FOUNDATION PLAN

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-11 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

F2 — DEMO (E) WALL AND REPLACE WITH (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.)

F3 — PROVIDE (N) CONCRETE STRIP FOOTING TO SUPPORT (N) CMU SHEAR WALL. ASSUME MIN 18IN THICKNESS AND 36IN WIDTH UNO. PROVIDE 250 LB/CY REINFORCING. DEMO AND REBUILD (E) SLAB AS REQUIRED FOR INSTALLATION OF WALL AND RECONSTRUCT AFTER INSTALLATION OF WALL.

F8 — PROVIDE (N) CMU SHEAR WALL (8 IN. CMU TYP UNO.) ADJACENT TO (E) WALL

AT (E) STEEL COLUMN, WELD HORIZ BARS TO TIE TO NEW CMU WALL TYP.

AT (E) STEEL COLUMN, WELD HORIZ BARS TO TIE TO NEW CMU WALL TYP.

(E) EXPANSION JOINT ABOVE TO REMAIN

AT (E) STEEL COLUMN, WELD HORIZ BARS TO TIE TO NEW CMU WALL TYP.

NOTE: (01) INDICATES COLUMN NUMBER LETTER DENOTES THE SECTOR IN WHICH THE COLUMN OCCURS

1 / S8 FOUNDATION PLAN - SECTOR "D"

KEY PLAN

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1970 ROBERT A. WALKER

SEAL

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DRAWN BY: JESSICA | COMM. NO. 6910
DATE: 5/30/19 | REVISED

BEAVERTON INTERMEDIATE SCHOOL NO. 48
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON
WASHINGTON COUNTY

DRAWING TITLE: SECTOR D FOUNDATION PLAN
SHEET NO.

PARTIAL GROUND FLOOR AND FOUNDATION PLAN

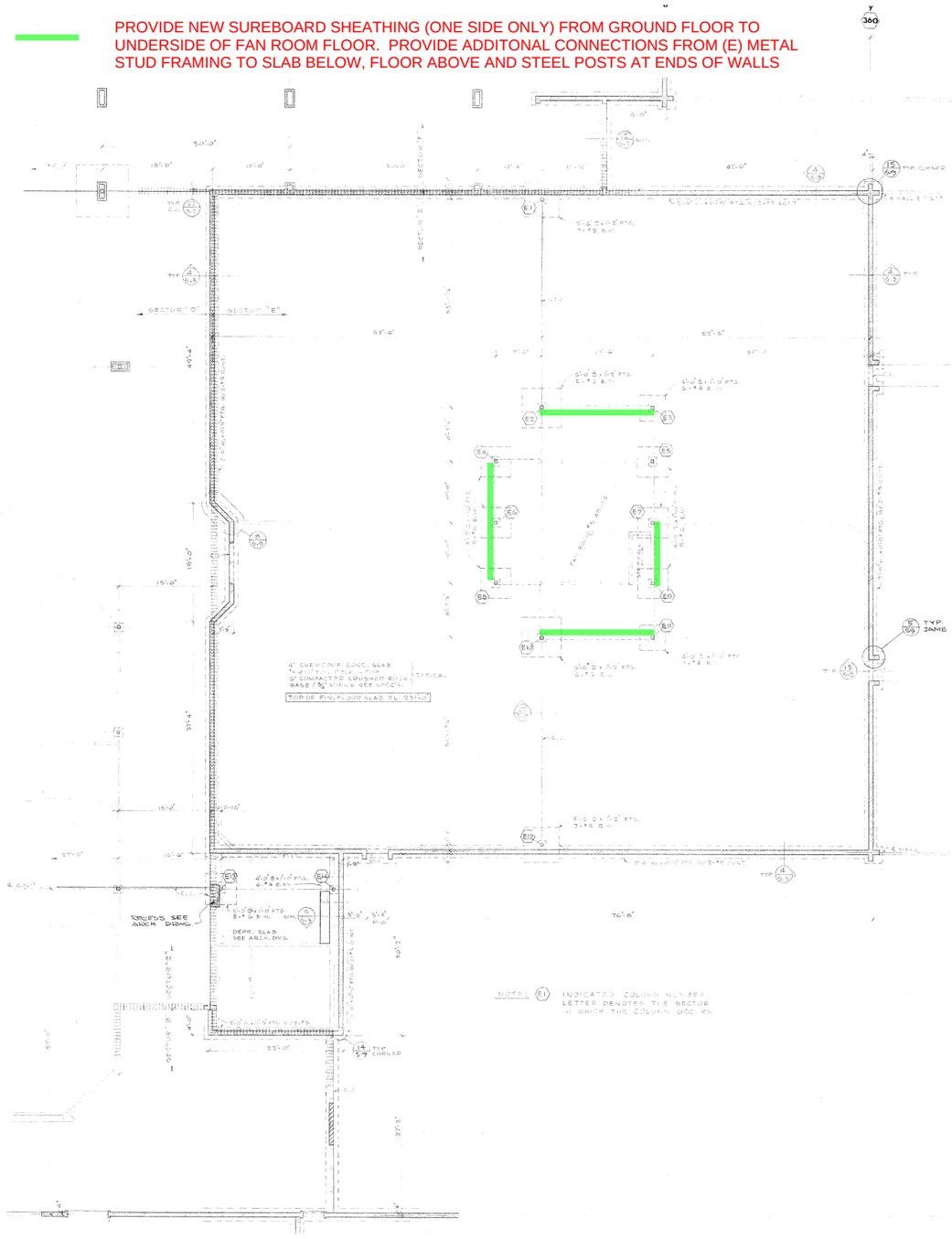
Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-12 Revision: 00 By: ME

Holmes

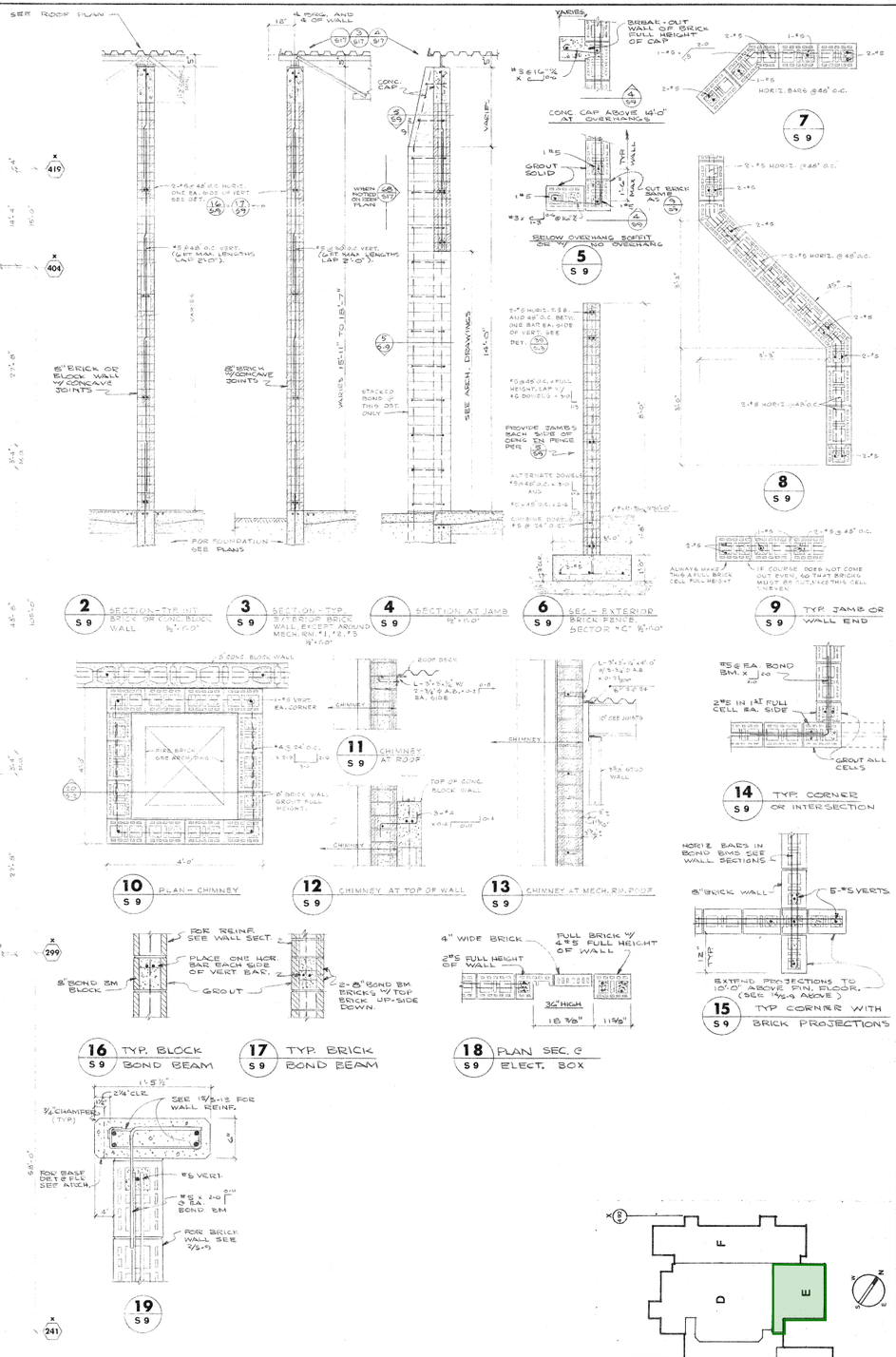
DRAFT - NOT FOR CONSTRUCTION

F4

PROVIDE NEW SUREBOARD SHEATHING (ONE SIDE ONLY) FROM GROUND FLOOR TO UNDERSIDE OF FAN ROOM FLOOR. PROVIDE ADDITONAL CONNECTIONS FROM (E) METAL STUD FRAMING TO SLAB BELOW, FLOOR ABOVE AND STEEL POSTS AT ENDS OF WALLS



1 S9 FOUNDATION PLAN – SECTOR "E" 1/8"=1'-0"



2 S9 SECTION – TYP. INT. BRICK OR CONC. BLOCK WALL 3/4"=1'-0"

3 S9 SECTION – TYP. EXTERIOR BRICK WALL EXCEPT AROUND MECH. RM. 1/2, 3/4"=1'-0"

4 S9 SECTION AT JAMB 3/4"=1'-0"

6 S9 SEC – EXTERIDE BRICK FENCE SECTOR "C" 3/4"=1'-0"

9 S9 TYP. JAMB OR WALL END

10 S9 PLAN – CHIMNEY

11 S9 CHIMNEY AT ROOF

12 S9 CHIMNEY AT TOP OF WALL

13 S9 CHIMNEY AT MECH. RM. FLOOR

14 S9 TYP. CORNER OR INTERSECTION

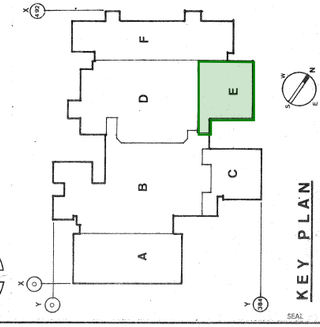
15 S9 TYP CORNER WITH BRICK PROJECTIONS

16 S9 TYP. BLOCK BOND BEAM

17 S9 TYP. BRICK BOND BEAM

18 S9 PLAN SEC. @ ELECT. BOX

19 S9



KEY PLAN

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1970 ROBERT A. WALKER

SEAL

BEAVERTON SCHOOL DISTRICT NO. 48

SCHOOL NO.6 INTERMEDIATE

WASHINGTON COUNTY

HEWLETT, JAMISON & ATKINSON · AIA · ARCHITECTS

COMM. NO. 6010

DRAWN BY: J. JENNINGS | DATE: 5/30/74 | REVISED

DRAWING TITLE: FOUNDATION PLAN – SECTOR "E" TYPICAL WALL SECTIONS AND

SHEET NO. S1

PARTIAL GROUND FLOOR AND FOUNDATION PLAN

Project: Five Oaks MS - SRGP 2022 Application

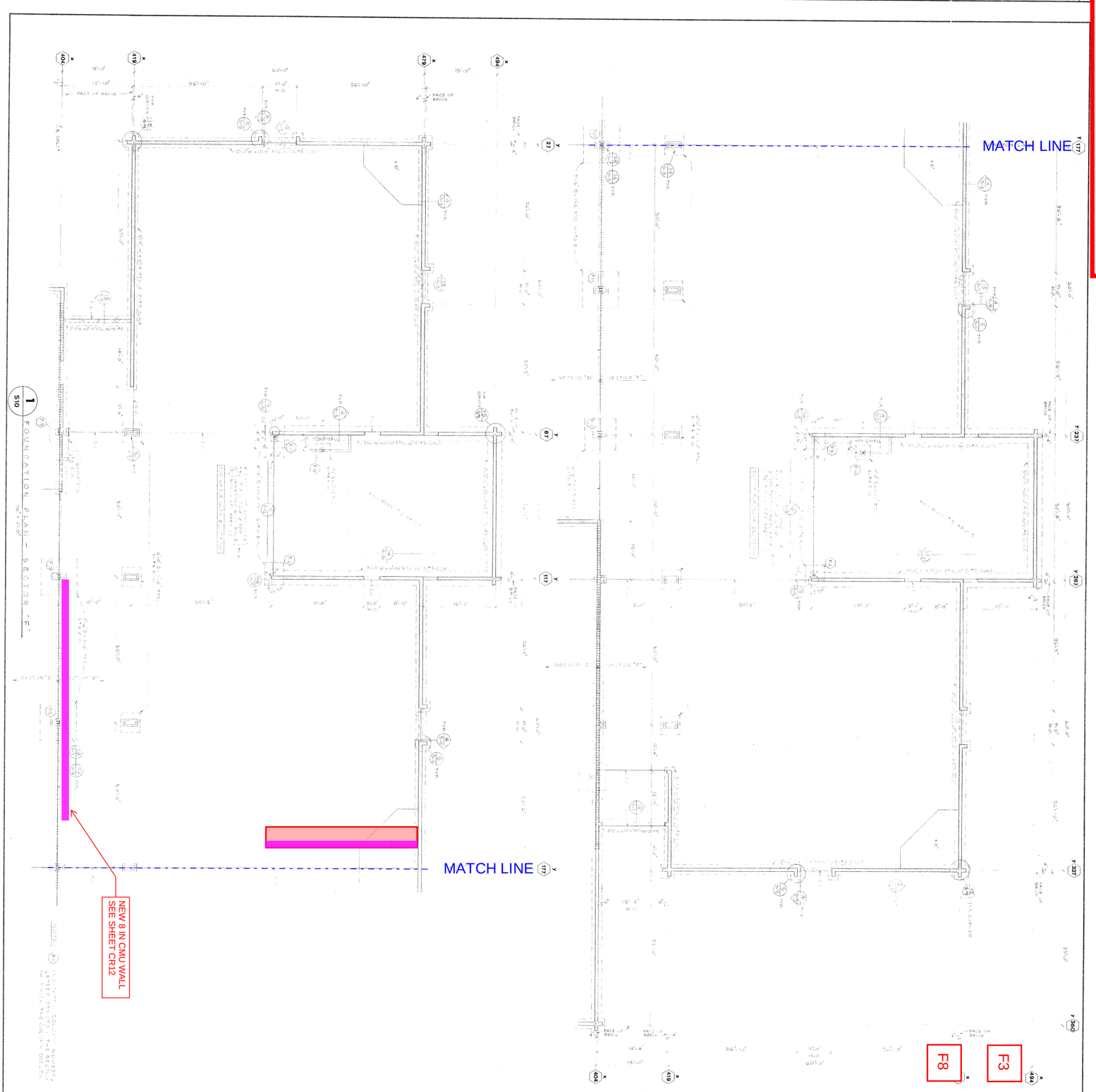
Project No: 21603.10 Date: 03/04/2022

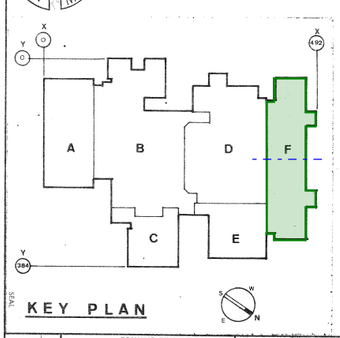
Sketch Title: Conceptual Retrofit

Sketch No: CR-13 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION





S10

DRAWING TITLE: SECTION "F" FOUNDATION PLAN AND DETAILS

BEAVERTON INTERMEDIATE SCHOOL NO.6
SCHOOL DISTRICT NO. 48
WASHINGTON COUNTY
BEAVERTON, OREGON

DRAWN BY: J. JEDDVESEK | COMM. NO. 6910
DATE 8/30/74 | REVISED
SCALE 1/8"

HEWLETT, JAMISON & ATKINSON · AIA · ARCHITECTS
3223 S. W. HARBOR DRIVE · PORTLAND, OREGON 97201 · 228-9468

Holmes

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-14 Revision: 00 By: ME

PARTIAL GROUND FLOOR AND FOUNDATION PLAN

DRAFT - NOT FOR CONSTRUCTION

R6: HSS TIE BETWEEN (E) BEAMS RB-9 AND RB-16. SHIM AND WELD TO (E) BEAMS. CONNECT TO CONC WALL AR 24 IN O.C. WITH STEEL TABS AND 3/4 IN. EPOXY ANCHORS

ADD ANGLE BRACING AT 8 FT O.C.

AT DETAIL 1A, NEW WALL IS OFFSET FROM (E) STEEL BEAM. PROVIDE WIDER CONCRETE CAP TO TIE WALL IN.

CONCRETE CAP WITH 3/4 IN. DIA. STUDS WELDED TO UNDERSIDE OF (E) STEEL BEAM

NEW 8 IN. CMU SHEAR WALL

R6: SEE ROOF PLAN SHEET CR18

1 S12 WALL ELEVATION - SECTOR "B"

2 S12

3 S12

4 S12

5 S12

6 S12 WALL ELEVATION - SECTOR "B"

7 S12 WALL ELEVATION - SECTOR "A"

8 S12 WALL ELEVATION - SECTOR "B"

9 S12 CONT. WALL ELEVATION - SECTOR "B"

10 S12

11 S12

12 S12

13 S12

14 S12

16 S12

17 S12

18 S12

19 S12

20 S12

21 S12

22 S12

23 S12

24 S12

25 S12

26 S12

27 S12

28 S12

29 S12

30 S12

31 S12 DELETED

32 S12

33 S12

34 S12

35 S12

36 S12

37 S12

38 S12

39 S12

2 CR-15

1 CR-15

1A CR-15

WALL ELEVATIONS AND DETAILS

HEWLETT, JAMISON & ATKINSON - AIA - ARCHITECTS
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COMM. NO. 2021.0
REVISED

DRAWN
DATE
SCALE

BEAVERTON INTERMEDIATE SCHOOL NO. 48
SCHOOL DISTRICT NO. 48 WASHINGTON COUNTY

DRAWING TITLE

SHEET NO.

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1990 ROBERT A. WALKER

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-15 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

F2: CONNECT NEW CMU SHEAR WALL TO SIDE OF EXISTING FLOOR STRUCTURE (NEW WALL CONTINUES UP TO ROOF)

F4: CONNECT NEW SUREBOARD SHEAR WALL TO (E)FAN ROOM FLOOR STRUCTURE

R6: SEE DETAILS 1/CR17 AND 2/CR17

1 S13 FLOOR FRAMING PLAN – FAN ROOM #1 & #2 & SECTOR "D" & "F"

2 S13 FLOOR FRAMING PLAN – FAN ROOM #4 & SECTOR "D"

3 S13 FLOOR FRAMING PLAN – FAN ROOM #5 & SECTOR "E"

4 S13 FLOOR FRAMING PLAN – FAN ROOM #6 & SECTOR "C"

5 S13 | 6 S13 | 7 S13 | 8 S13 | 9 S13 | 10 S13 | 11 S13 | 12 S13 | 13 S13

14 S13 WALL ELEVATION – SECTOR "D" & "F" FAN ROOM #1, #2 & #3

15 S13 WALL ELEVATION – SECTOR "D" FAN ROOM #4

16 S13 WALL ELEVATION – SECTOR "D" & "F"

17 S13 WALL ELEVATION DETAIL – SECTOR "E" FAN ROOM #5

18 S13 WALL ELEVATION – SECTOR "E" FAN ROOM #5

19 S13 WALL ELEVATION – SECTOR "C" FAN ROOM #6

20 S13 WALL ELEVATION – SECTOR "C" FAN ROOM #6

21 S13 | 22 S13 | 23 S13 MECHANICAL HANGER DETAILS | 24 S13 | 25 S13 BRACING CONNECTION | 26 S13 BRACE CONN. TO COL. | 27 S13 HEADER OVER MECH. OPENINGS.

MEZZANINE FLOOR PLANS, WALL ELEVATIONS

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3233 S. W. HARBOR DRIVE · PORTLAND, OREGON 97201 · 238-9468

COMM. NO. 9610
REVISED
DRAWN BY: JJ/BD/WS/EK
DATE 5/30/14
SCALE 1/8"

BEAVERTON INTERMEDIATE SCHOOL NO6
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON
WASHINGTON COUNTY

DRAWING TITLE: MECH. ROOM FLOOR FRAMING, FLOOR AND DETAILS, SECTOR

SHEET NO. S13

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 19, 1960 ROBERT A. WALLER

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-16 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

HSS 3 1/2 X 2 1/2 DRAG. REMOVE ROOFING AND WELD METAL DECK TO HSS

1/2 IN PLATE WELDED TO HSS. BOLT PLATE TO WALL WITH 2 ROWS 3/4 IN. EPOXY ANCHORS (12 ANCHORS TOTAL EACH ROW). GROUT CELLS AT ANCHORS PRIOR TO DRILLING AND EPOXYING.

2/CR-17

DETAILS DELETED

CHANNEL CONN. TO TOP OF JOIST

BEAVERTON INTERMEDIATE SCHOOL NO6
SCHOOL DISTRICT NO 48J
WASHINGTON COUNTY, OREGON

HEWLETT, JAMISON & ATKINSON - AIA - ARCHITECTS

COMM. NO. 6310
REVISED
DRAWN BY: J. BOOSKY
DATE: 5/30/74

DRAWING TITLE
DETAILS AT FAN ROOMS AND BALCONY (FLOOR, WALL & ROOF)

SHEET NO. 11

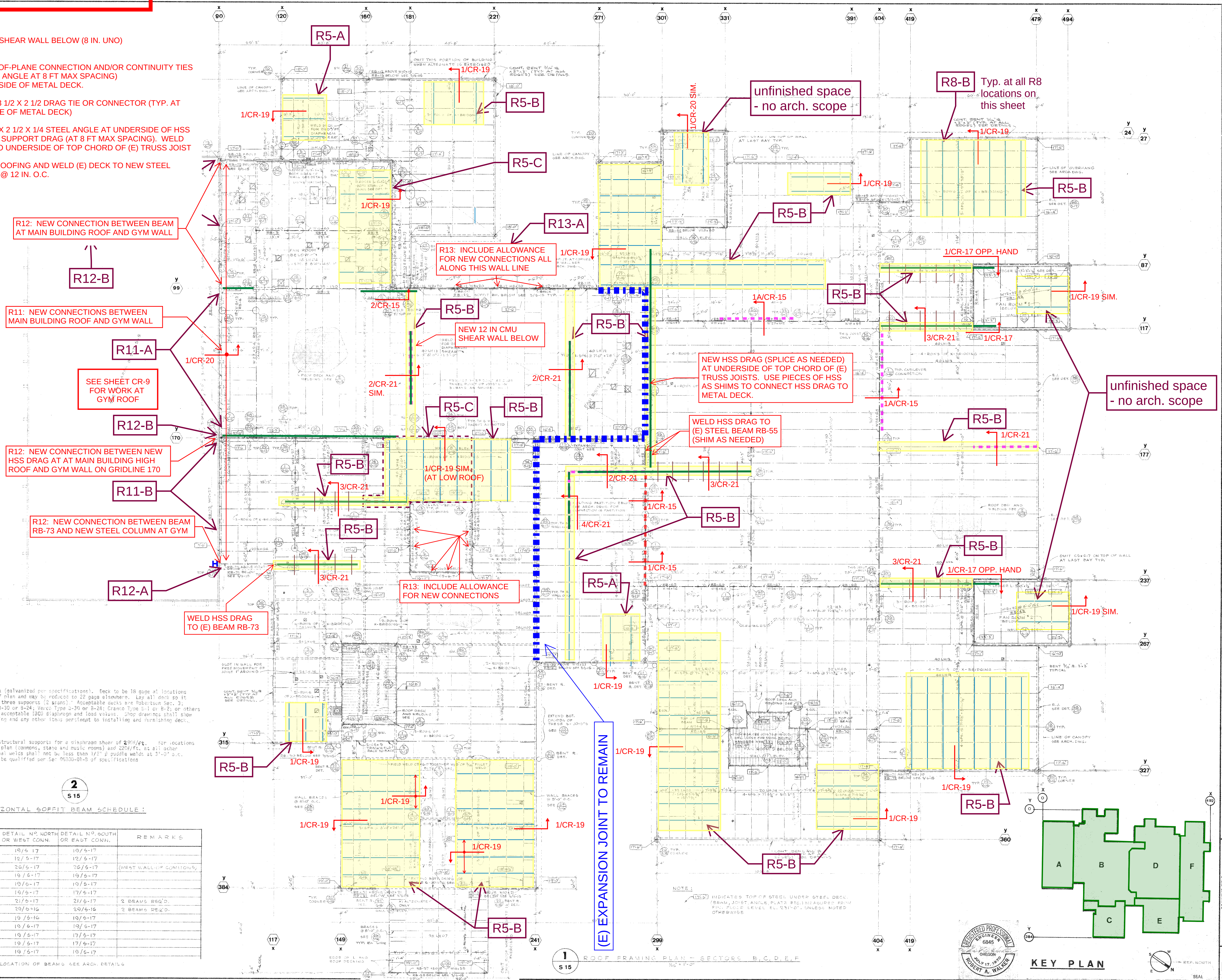
ROOF DETAILS

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-17 Revision: 00 By: ME

Holmes

DRAFT - NOT FOR CONSTRUCTION

- - - -	NEW CMU SHEAR WALL BELOW (8 IN. UNO)
R5	NEW OUT-OF-PLANE CONNECTION AND/OR CONTINUITY TIES (3 X 3 X 1/4 ANGLE AT 8 FT MAX SPACING) AT UNDERSIDE OF METAL DECK.
R6	NEW HSS 3 1/2 X 2 1/2 DRAG TIE OR CONNECTOR (TYP. AT UNDERSIDE OF METAL DECK)
R7	NEW 2 1/2 X 2 1/2 X 1/4 STEEL ANGLE AT UNDERSIDE OF HSS DRAG - TO SUPPORT DRAG (AT 8 FT MAX SPACING). WELD ANGLES TO UNDERSIDE OF TOP CHORD OF (E) TRUSS JOIST
R8	REMOVE ROOFING AND WELD (E) DECK TO NEW STEEL MEMBERS @ 12 IN. O.C.



Roof Deck:

1½" deep roof deck (galvanized per specifications). Deck to be 18 gage at locations **shaded** on the roof plan and may be reduced to 22 gage elsewhere. Lay all deck so it bears on at least three supports (2 spans). Acceptable decks are Robertson Sec. 3; ASC Pacific Type B-30 or B-24; Verco Type B-30 or B-24; Cranco Type B-1 or B-2; or others upon submittal of acceptable IBCO diaphragm and load values. Shop drawings shall show deck layout, welding and any other items pertinent to installing and furnishing deck.

Welding:

Weld deck to all structural supports for a diaphragm shear of 290#/ft. for locations noted on the roof plan (commons, stage and music rooms) and 220#/ft. at all other locations. Marginal welds shall not be less than 1/2" ∅ puddle welds at 3'-0" o.c. All welders shall be qualified per Sec 05300-01-B of specifications

2
S 15

3
S 15

HORIZONTAL SOFFIT BEAM SCHEDULE:

BEAM Nº.	BEAM SIZE	DETAIL Nº. NORTH OR WEST CONN.	DETAIL Nº. SOUTH OR EAST CONN.	REMARKS
RB-13	C8 x 11.5	19/5 17	19/5-17	
RB-15	C6 x 8.2	12/5-17	12/5-17	
RB-29	C8 x 11.5	26/5-17	26/5-17	(WEST WALL OF COMMONS)
RB-46	C6 x 8.2	19/5-17	19/5-17	
RB-72	C6 x 8.2	19/5-17	19/5-17	
RB-40	C10 x 20	19/5-17	17/5-17	
RB-32	C8 x 11.5	21/5-17	21/5-17	2 BEAMS REQ'D.
RB-38	C8 x 11.5	29/5-16	29/5-16	2 BEAMS REQ'D.
RB-30	C6 x 8.2	19/5-16	19/5-17	
RB-28	C10 x 15.3	19/5-17	19/5-17	
RB-74	C10 x 20	19/5-17	17/5-17	
RB-79	C8 x 11.5	19/5-17	17/5-17	
RB-81	C6 x 8.2	19/5-17	19/5-17	

NOTE: FOR LOCATION OF BEAMS SEE ARCH. DETAILS

HEWLETT, JAMISON & ATKINSON · AIA · ARCHITECTS
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COMM. NO. 6910
REVISED
DRAWN BY: J. JEDOVSZKY
DATE 5/30/74

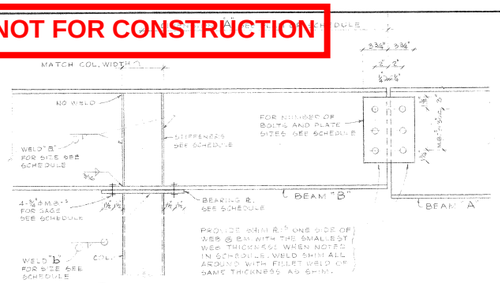
BEAVERTON INTERMEDIATE SCHOOL NO. 6
SCHOOL DISTRICT NO. 48 WASHINGTON COUNTY

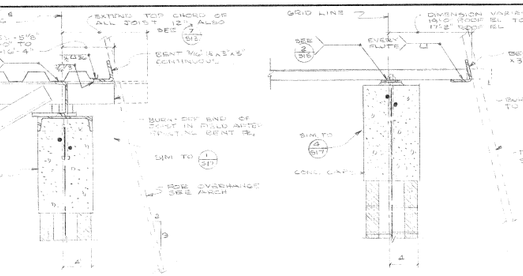
DRAWING TITLE
SECTORS B, C, D, E, F
ROOF FRAMING PLAN
SHEET NO

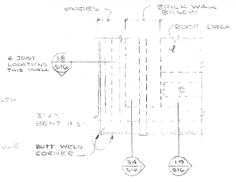
ROOF FRAMING PLAN

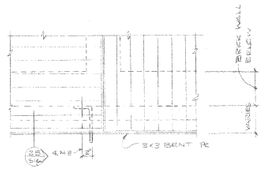
Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-18 Revision: 00 By: ME

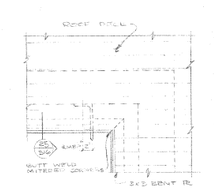
Holmes

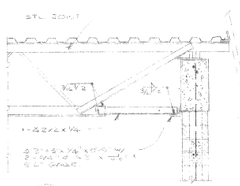


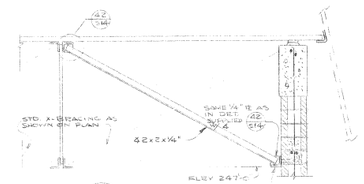


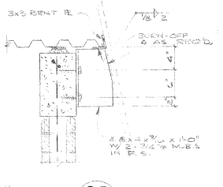


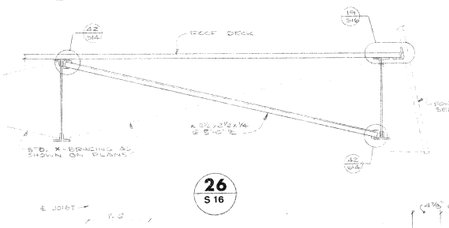


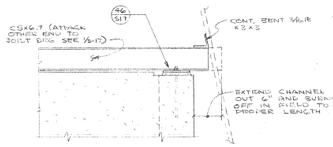


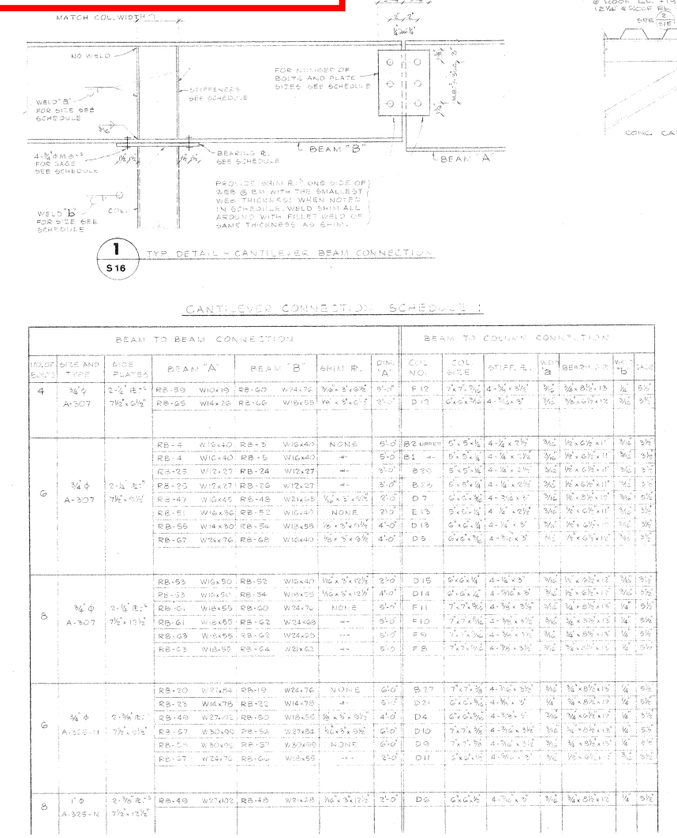


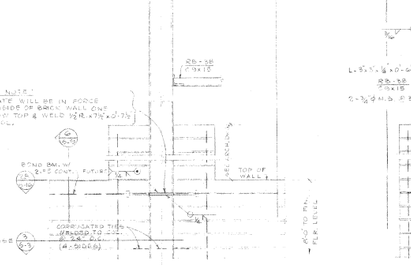


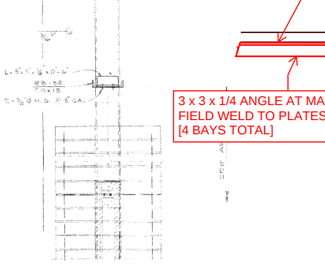


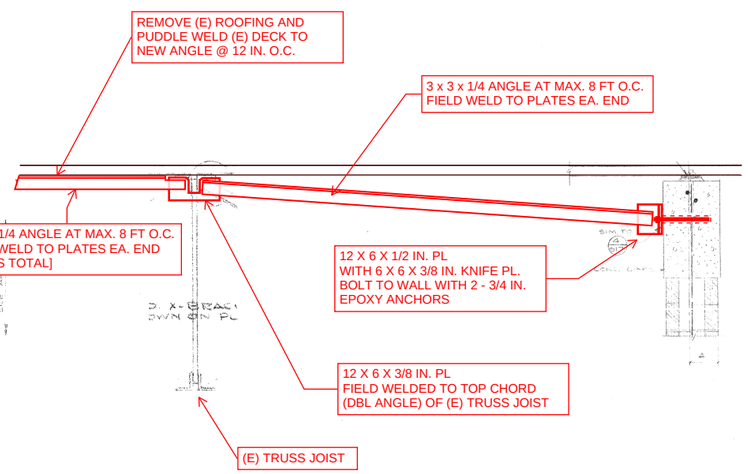












DRAFT - NOT FOR CONSTRUCTION

CANTILEVER CONNECTION SCHEDULE :

BEAM TO BEAM CONNECTION									BEAM TO COLUMN CONNECTION						
NO. OF BOLTS	SIZE AND TYPE	SIDE PLATES	BEAM "A"		BEAM "B"		SHIM PL.	DIM. "A"	COL. NO.	COL. SIZE	STIFF. PL.	WELD "a"	BEARING PL.	WELD "b"	GAGE
4	3/4" ϕ A-307	2-1/4" PL.'S 7 1/2" x 6 1/2"	RB-59	W10x19	RB-60	W24x76	3/16" x 3" x 6 1/2"	5'-0"	F 12	7" x 7" x 5/16"	4 - 3/8" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-65	W14x26	RB-66	W18x55	1/8" x 3" x 6 1/2"	2'-0"	D 12	6" x 6" x 3/16"	4 - 3/16" x 3"	3/16"	3/8" x 6 1/2" x 12"	3/16"	3 1/2"
6	3/4" ϕ A-307	2-1/4" PL.'S 7 1/2" x 9 1/2"	RB-4	W16x40	RB-3	W16x40	NONE	5'-0"	B2 UPPER	5" x 5" x 1/4"	4 - 1/4" x 2 1/2"	3/16"	1/2" x 6 1/2" x 11"	3/16"	3 1/2"
			RB-4	W16x40	RB-5	W16x40	-"-	5'-0"	B1 -"-	5" x 5" x 1/4"	4 - 1/4" x 2 1/2"	3/16"	1/2" x 6 1/2" x 11"	3/16"	3 1/2"
			RB-25	W12x27	RB-24	W12x27	-"-	3'-0"	B 29	5" x 5" x 1/4"	4 - 1/4" x 2 1/2"	3/16"	1/2" x 6 1/2" x 11"	3/16"	3 1/2"
			RB-25	W12x27	RB-26	W12x27	-"-	3'-0"	B 28	5" x 5" x 1/4"	4 - 1/4" x 2 1/2"	3/16"	1/2" x 6 1/2" x 11"	3/16"	3 1/2"
			RB-47	W16x45	RB-48	W21x68	1/16" x 3" x 9 1/2"	2'-0"	D 7	6" x 6" x 3/16"	4 - 3/16" x 3"	3/16"	1/2" x 8 1/2" x 12"	3/16"	5 1/2"
			RB-51	W16x36	RB-52	W16x40	NONE	2'-0"	E 13	5" x 5" x 1/4"	4 - 1/4" x 2 1/2"	3/16"	1/2" x 6 1/2" x 11"	3/16"	3 1/2"
			RB-55	W14x30	RB-54	W18x55	1/8" x 3" x 9 1/2"	4'-0"	D 13	6" x 6" x 1/4"	4 - 1/4" x 3"	3/16"	1/2" x 6 1/2" x 12"	3/16"	3 1/2"
			RB-67	W24x76	RB-68	W16x40	1/8" x 3" x 9 1/2"	4'-0"	D 5	6" x 6" x 3/16"	4 - 3/16" x 3"	3/16"	1/2" x 6 1/2" x 12"	3/16"	3 1/2"
8	3/4" ϕ A-307	2-1/4" PL.'S 7 1/2" x 12 1/2"	RB-53	W16x50	RB-52	W16x40	1/16" x 3" x 12 1/2"	2'-0"	D 15	6" x 6" x 1/4"	4 - 1/4" x 3"	3/16"	1/2" x 6 1/2" x 12"	3/16"	3 1/2"
			RB-53	W16x50	RB-54	W18x55	1/16" x 3" x 12 1/2"	4'-0"	D 14	6" x 6" x 1/4"	4 - 5/16" x 3"	3/16"	1/2" x 6 1/2" x 12"	3/16"	3 1/2"
			RB-61	W18x55	RB-60	W24x76	NONE	5'-0"	F 11	7" x 7" x 5/16"	4 - 3/8" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-61	W18x55	RB-62	W24x68	-"-	5'-0"	F 10	7" x 7" x 5/16"	4 - 3/8" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-63	W18x55	RB-62	W24x68	-"-	5'-0"	F 9	7" x 7" x 5/16"	4 - 3/8" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-63	W18x55	RB-64	W21x62	-"-	5'-0"	F 8	7" x 7" x 5/16"	4 - 3/8" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
6	3/4" ϕ A-325-N	2-3/8" PL.'S 7 1/2" x 9 1/2"	RB-20	W27x84	RB-19	W24x76	NONE	6'-0"	B 27	7" x 7" x 3/8"	4 - 7/16" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-23	W14x78	RB-22	W14x78	-"-	5'-0"	D 21	6" x 6" x 5/16"	4 - 3/8" x 3"	1/4"	3/4" x 8 1/2" x 12"	1/4"	5 1/2"
			RB-49	W27x102	RB-50	W18x55	1/8" x 3" x 9 1/2"	4'-0"	D 4	6" x 6" x 5/16"	4 - 3/8" x 3"	3/16"	3/4" x 6 1/2" x 12"	1/4"	3 1/2"
			RB-57	W30x99	RB-56	W27x84	1/16" x 3" x 9 1/2"	6'-0"	D 10	7" x 7" x 3/8"	4 - 7/16" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-58	W30x99	RB-57	W30x99	NONE	6'-0"	D 9	7" x 7" x 3/8"	4 - 7/16" x 3 1/2"	3/16"	3/4" x 8 1/2" x 13"	1/4"	5 1/2"
			RB-67	W24x76	RB-66	W18x55	-"-	2'-0"	D 11	6" x 6" x 1/2"	4 - 5/16" x 3"	3/16"	1/2" x 6 1/2" x 12"	3/16"	3 1/2"
8	1" ϕ A-325-N	2-3/8" PL.'S 7 1/2" x 12 1/2"	RB-49	W27x102	RB-48	W21x68	1/16" x 3" x 12 1/2"	2'-0"	D 6	6" x 6" x 1/2"	4 - 7/16" x 3"	3/16"	3/4" x 8 1/2" x 12"	1/4"	5 1/2"

REMOVE (E) ROOFING AND PUDDLE WELD (E) DECK TO NEW ANGLE @ 12 IN. O.C.

3 x 3 x 1/4 ANGLE AT MAX. 8 FT O.C. FIELD WELD TO PLATES EA. END

3 x 3 x 1/4 ANGLE AT MAX. 8 FT O.C. FIELD WELD TO PLATES EA. END [4 BAYS TOTAL]

12 X 6 X 1/2 IN. PL WITH 6 X 6 X 3/8 IN. KNIFE PL. BOLT TO WALL WITH 2 - 3/4 IN. EPOXY ANCHORS

12 X 6 X 3/8 IN. PL FIELD WELDED TO TOP CHORD (DBL ANGLE) OF (E) TRUSS JOIST

(E) TRUSS JOIST

1
CR-19

HEWLETT, JAMISON & ATKINSON · AIA · ARCHITECTS

DRAWN BY: J. JEDOVNZKY
DATE 5/30/74
COMM. NO. 6910
REVISED

BEAVERTON INTERMEDIATE SCHOOL NO. 6

DRAWING TITLE
ROOF DETAILS, BM. CONNECTION
SHEET

ROBERT A. WALKER
6845
OREGON
JULY 17, 1970

ROOF DETAILS

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-19 Revision: 00 By: ME

Holmes

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NEW STEEL BRACKETS AT 4 FT O.C. EPOXY BOLT TO (E) TILT-UP WALL AND WELD TO UNDERSIDE OF (E) BEAM

1 CR-20

NOTE:
DETAILS 23,24,25,31,33,35,36,41,42,44,47 & 54 ARE DELETED.

DETAILS - STEEL FRAME FOR MECH. UNIT HANGERS. (VERIFY LOCATIONS W/MECH.)

ROOF DETAILS

BEAVERTON INTERMEDIATE SCHOOL NO6
SCHOOL DISTRICT NO. 48 BEAVERTON, OREGON

HEWLETT, JAMISON & ATKINSON - AIA - ARCHITECTS
3223 S. W. HARBOR DRIVE • PORTLAND, OREGON 97201 • 226-2468

COMM. NO. 9310
REVISED
DRAWN BY: J.JEDYNAK
DATE: 5/26/76
SCALE: 3/4"=1'-0"

DRAWING TITLE: ROOF WALL & MISC. DETAILS
SHEET NO.

REGISTERED PROFESSIONAL ENGINEER 6845 OREGON JULY 17, 1979 ROBERT A. WALKER

Project: Five Oaks MS - SRGP 2022 Application
Project No: 21603.10 Date: 03/04/2022
Sketch Title: Conceptual Retrofit
Sketch No: CR-20 Revision: 00 By: ME

Holmes

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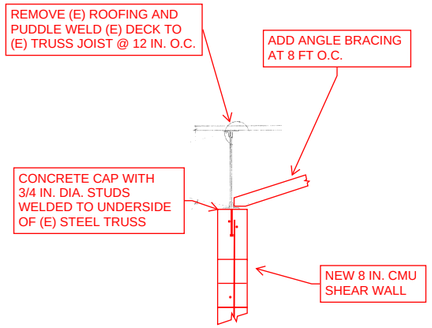
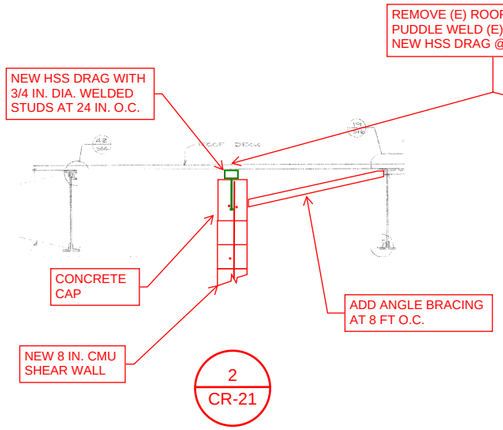


1
CR-21



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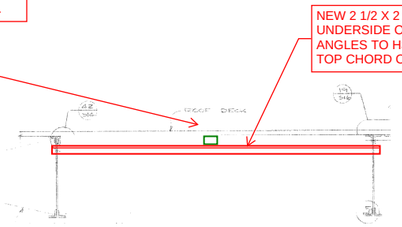

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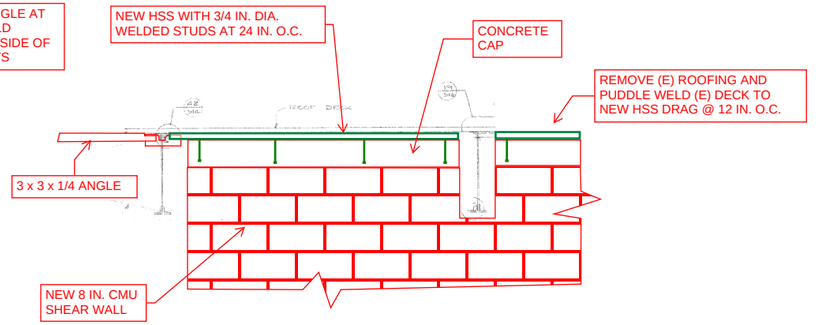
CR-21



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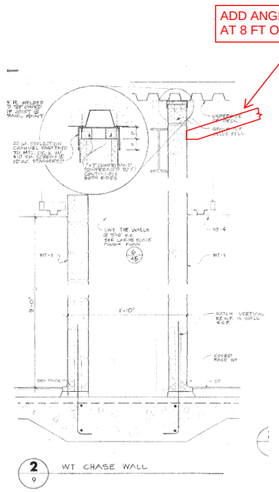
CR-21



5
CR-21

DETAILS

Holmes

Project: Five Oaks MS - SRGP 2022 Application

Project No: 21603.10 Date: 03/04/2022

Sketch Title: Conceptual Retrofit

Sketch No: CR-21 Revision: 00 By: ME

Architectural Scope Notes

F1

F1-A:
- Excavate for new concrete band.
- Install concrete band per structural.
- Paint exposed concrete.
- Install sheet metal flashing over top of concrete band.

F1-B:
- Sawcut and remove concrete paving.
- Excavate for new concrete band.
- Install concrete band per structural.
- Paint exposed concrete.
- Install sheet metal flashing over top of concrete band.
- Patch concrete paving.

F1-C:
- Remove and salvage bleacher system
- Remove maple flooring along wall
- Install concrete band per structural.
- Construct metal-framed spacer with painted gypsum board finish above concrete band. Match thickness of concrete band and height of bleacher system for purpose of supporting bleacher system.
- Paint exposed concrete.
- Patch maple flooring.
- Reinstall bleacher system.

F1-D:
- Salvage and reinstall (2) recessed drinking fountains.
- Install concrete band per structural.
- Construct metal-framed partition with painted gypsum board in front of concrete band. Partition to extend to 7 feet above floor.

F2
F3

F2-A (classroom/corridor, full wall replacement):
- Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm outlets.
- Salvage and reinstall clock and chalkboard in classroom.
- Salvage plastic laminate wainscot panels and demolish aluminum trim on corridor side of wall.
- Remove 2x4 ceiling panels and grid back 3 feet each side of wall.
- Sawcut and remove concrete floor slab along length of each side of wall.
- Excavate for new footing.
- Demolish existing wall and replace with CMU wall per structural.
- Install metal furring with painted gypsum board finish each side of wall.
- Reinstall 2x4 ceiling system.
- Patch and polish concrete floor in corridor.
- Patch carpeting in classroom.
- Reinstall plastic laminate wainscot panels and install new aluminum trim on corridor side of wall.
- Salvage and reinstall doors and frames where occurring (Corridor C120J).
- Salvage and reinstall tackboards where occurring (Corridor C120J).
- Recreate mural where occurring (Corridor C120J).

F2-B (classroom/classroom, full wall replacement):
- Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices, wall speaker.
- Salvage and reinstall tackboards.
- Salvage and reinstall acoustical wall panels.
- Demolish VCT flooring along each side of wall.
- Sawcut and remove concrete floor slab along length of each side of wall.
- Excavate for new footing.
- Demolish existing wall and replace with CMU wall per structural.
- Install metal furring with painted gypsum board finish each side of wall.
- Patch VCT flooring.
- Salvage and reinstall door and frame.

F4

F4-A:
- Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.
- Salvage and reinstall clock (Teacher Planning D101)
- Demolish existing gypsum board finish on one side of wall.
- Remove 2x4 ceiling panels and grid back 3 feet.
- Install SureBoard on wall framing per structural
- Reinstall 2x4 ceiling system.

F5

F5-A:
- Selectively demolish existing gypsum board and framing at mechanical loft/soffit.
- Modify mechanical equipment and ductwork as necessary to install column.
- Remove maple flooring at column base.
- Sawcut and remove concrete slab for column connection to foundation.
- Install steel column per structural
- Patch and repair gypsum board and framing at mechanical loft/soffit.
- Patch concrete slab.
- Patch maple flooring.
- Paint column where exposed to view.

F6

F6-A:
- Paint bolts where exposed to view.

F7

F7-A:
- Remove paint from existing steel structure where new steel plates are to be installed.
- Paint new steel plates.

F8

F8-A (corridor, one side of wall):
- Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.
- Remove 2x4 ceiling panels and grid back 3 feet.
- Sawcut and remove concrete floor slab along length of wall. Excavate for new footing.
- Salvage plastic laminate wainscot panels and demolish aluminum trim.
- Demolish existing gypsum board finish on one side of wall and construct adjacent CMU wall per structural.
- Install metal furring with painted gypsum board finish.
- Reinstall 2x4 ceiling system.
- Patch and polish concrete floor.
- Reinstall plastic laminate wainscot panels and install new aluminum trim.

F8-B (corridor, one side of wall):
- Demolish decorative brick pier
- Install new decorative brick pier after completion of new shear wall

F8-C (classroom, one side of wall)
- Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.
- Remove 2x4 ceiling panels and grid back 3 feet.
- Sawcut and remove concrete floor slab along length of wall. Excavate for new footing.
- Demolish existing gypsum board finish on one side of wall and construct adjacent CMU wall per structural.
- Install metal furring with painted gypsum board finish.
- Reinstall 2x4 ceiling system.
- Patch carpeting.

M1

M1-A:
- Paint steel struts.

M2

M2-A:
- Demolish 2x4 ceiling system and lighting.
- Install HSS tie per structural.
- Install new 2x4 ceiling system and lighting.

M3

M3-A:
- Architectural scope included under R11-B.

M4

M4-A:
- Demolish hard lid ceiling back from wall 2 feet.
- Install weld connections per structural.
- Patch and repair hard lid ceiling.

R1
R2
R3
R9
R10

R3-A (open ceilings):
- Remove and salvage lighting, speakers, and basketball hoops.
- Install steel members at underside of gym roof per structural.
- Paint all exposed steel members.
- Reinstall lighting, speakers, and basketball hoops.
- Include allowance for selectively relocating light fixtures.

R3-B (dropped ceilings at mezzanine)
- Remove and salvage 2x4 ceiling panels. Disassemble ceiling grid and salvage lighting as necessary for structural work.
- Install steel members at underside of roof deck per structural.
- Reinstall 2x4 ceiling system and lighting.

R5
R6
R7

R5-A:
- Demolish hard lid ceiling and 1x1 acoustical tiles (where occurring). Remove and salvage lighting for access to underside of roof deck.
- Install steel members at underside of roof deck per structural.
- Patch ceiling, install new 1x1 acoustical tiles (where occurring), and reinstall lighting.

R5-B:
- Remove and salvage 2x4 ceiling panels. Dissassemble ceiling grid and salvage lighting as necessary for structural work.
- Install steel members at underside of roof deck per structural.
- Reinstall 2x4 ceiling system and lighting.

R5-C:
- Install steel members at underside of roof deck per structural.
- Paint steel members.

R8

R8-A:
- Salvage and reinstall rooftop mechanical equipment and roof drains.
- Demolish roofing to steel deck and weld deck to steel members per structural.
- Install new deck sheathing, vapor retarder, R-30 insulation, cover board, single-ply roof membrane, and flashing.

R8-B:
- Salvage and reinstall rooftop mechanical equipment and roof drains.
- Demolish roofing to steel deck and weld deck to steel members per structural.
- Patch roof with new deck sheathing, vapor retarder, insulation (match existing R-18 thickness), cover board, and 2-ply SBS roofing.

Architectural Scope Notes

R11

R11-A:
- Demolish hard lid ceiling and 1x1 acoustical tiles back 3 feet for access.
- Install new connections per structural.
- Patch ceiling and install new 1x1 acoustical tiles.

R11-B:
- Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access.
- Install new connections per structural.
- Reinstall 2x4 ceiling system.

R12

R12-A:
- Remove and salvage exterior soffit panels for access for structural work.
- Make new beam-column connection per structural.
- Reinstall salvaged exterior soffit panels.

R12-B:
- Architectural scope included under R11-A and R11-B.

R13

R13-A:
- Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access.
- Install new connections per structural.
- Reinstall 2x4 ceiling system.

N1

N1-A:
- Remove and salvage 2x4 ceiling panels for access above ceiling.
- Install bracing at brick pilaster per structural.
- Reinstall 2x4 ceiling panels.

N2

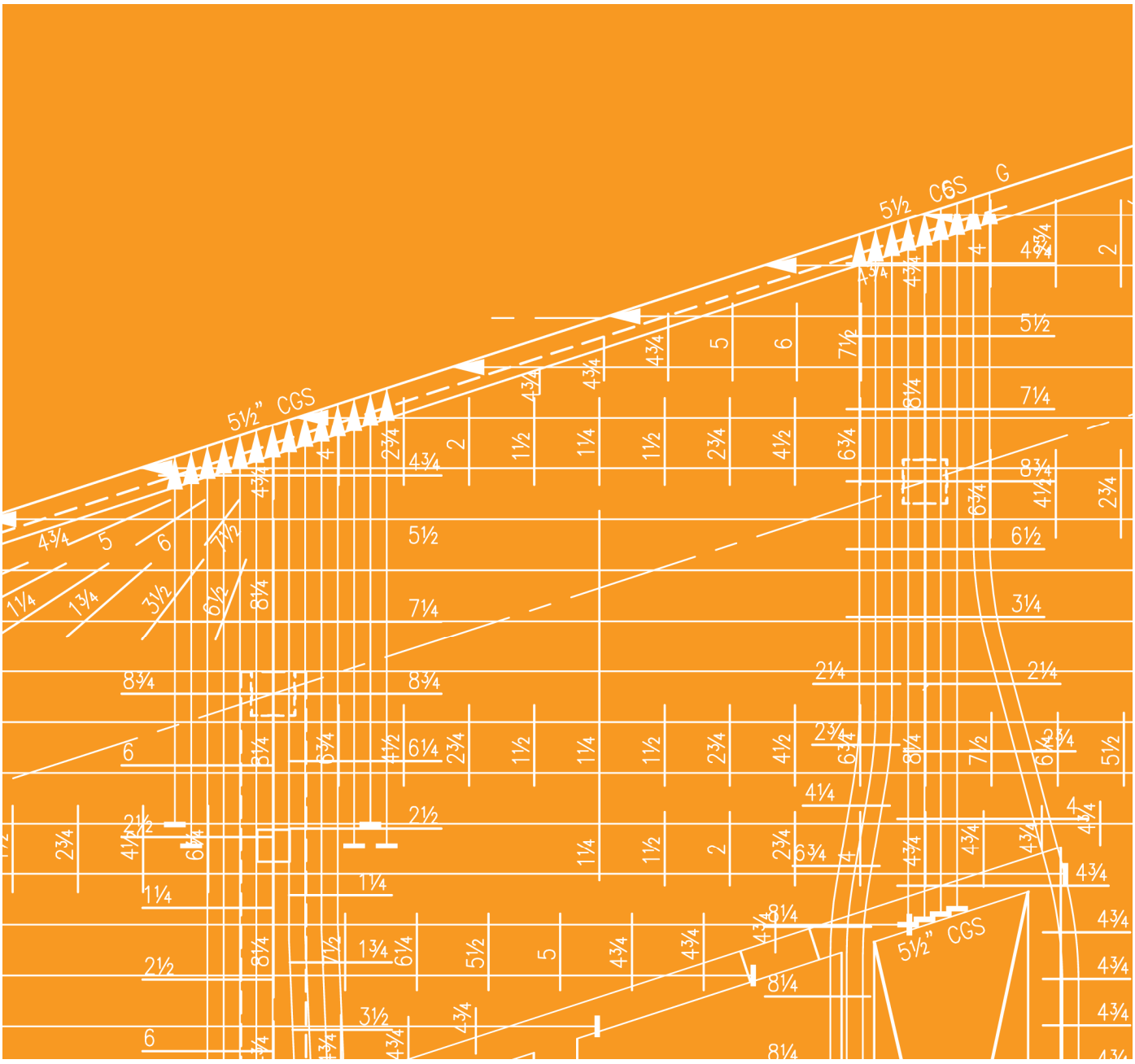
N2-A:
- Demolish hard lid ceiling back from wall 2 feet.
- Install supplemental wall support per structural.
- Patch and repair hard lid ceiling.

N3

N3-A:
- Remove and salvage 2x4 ceiling panels for access above ceiling. At hard lid ceilings, cut holes in ceiling for access to sprinkler piping.
- Install sprinkler system bracing per structural.
- Reinstall 2x4 ceiling panels. At hard lid ceilings, patch access holes to match existing finishes.
- At 2x4 grid ceilings, install oversized escutcheons at sprinkler head penetrations.

N4

N4-A: At nonstructural "position retention" zones noted on sheet CR-02 (zones A and B), provide the following:
- Remove and salvage 2x4 ceiling panels for access above ceiling.
- Install ceiling system bracing per structural.
- Modify edge details of grid system and install wide edge angle to allow movement per code.
- Reinstall 2x4 ceiling panels
- Install oversized escutcheons at sprinkler head penetrations.



Itemized Construction Cost Estimate

BPS SRGP 2022 - Five Oaks Middle School

Conceptual

March 18, 2022 ***Revised April 7, 2022***

22-00165.02

FIVE OAKS
MIDDLE SCHOOL

Prepared for Holmes Structures

CUMMING
Building Value Through Expertise

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.1 Introduction

This estimate has been prepared, pursuant to an agreement between Holmes Structures and Cumming, for the purpose of establishing a probable cost of construction at the conceptual stage.

The project scope encompasses a comprehensive seismic retrofit of structural, architectural, mechanical, plumbing, and electrical systems.

1.2 Project Schedule

	Start	Finish	Duration
Construction	Jun-23	Sep-23	4 months

1.3 Market Volatility

The ongoing novel Coronavirus (COVID-19) pandemic together with the current crisis in Ukraine are having an impact on global financial markets and the material supply chain.

Market activity is being impacted in many sectors and circumstances remain very fluid and variable in different jurisdictions. Accordingly, as of this date, we are concerned with the market related impacts on the deliverables we are furnishing to you as part of our Services including cost estimates and budgets ("Deliverable(s)"). Indeed, the current response to these issues means that we are faced with an unprecedented set of circumstances on which to base a judgement of the effects on the availability of labor, materials, and other impacts, although we are monitoring those on a continuing basis.

Given the unknown future impact that the current situations might have on the construction and real estate markets, we recommend that you keep the Deliverables of this project under frequent review. For your information, we have not added or considered additional contingency within this "Deliverable"

1.4 Key Assumptions & Exclusions

This document should be read in association with *Approach & Methodology* which outline assumptions, project understanding, approach, and cost management methodology. Key assumptions built into the above cost breakdown include

Key Assumptions

- Design / Bid / Build
- Single Phase Construction

Key Exclusions

- Project Soft Costs
- Department Relocation
- Sttuctural Modifications to Building Part E
- Allowance for COVID-19 impacts
- Allowance for Russia/Ukraine conflict impacts

APPROACH & METHODOLOGY

Basis of Estimate

- Documents used:
  - Drawings
    - Five Oaks MS - Conceptual Seismic Retrofit 3-4-2022-Struct+Arch+Parts, dated 03/04/22
  - Other
    - Various photos, 219 total - IMG_1823 to IMG_2042

Estimate Format

A component cost classification format has been used for the preparation of this estimate. It classifies costs by trade.

Cost Mark Ups

The following % mark ups have been included in each design option:

- General Conditions (10.00% on direct costs)
- General Requirements (4.00% compound)
- Bonds & Insurance (2.00% compound)
- Contractor's Fee (5.00% compound)
- Design Contingency (20.00% compound)
- Escalation to MOC, 08/15/23 (8.99% compound)

Escalation

All subcontract prices herein are reflective of current bid prices. Escalation has been included on the summary level to the stated mid point of construction.

Design Contingency

An allowance of 20% for undeveloped design details has been **included** in this estimate. As the design of each system is further developed, details which historically increase cost become apparent and must be incorporated into the estimate while decreasing the % burden.

Construction Contingency

It is prudent for all program budgets to include an allowance for change orders which occur during the construction phase. These change orders normally increase the cost of the project. It is recommended that a 10% to 15% construction contingency is carried in this respect. This cost is *not* included within the estimate.

Construction Schedule

Costs included herein have been based upon a construction period of 3 months. Any costs for excessive overtime to meet accelerated schedule milestone dates are not included in this estimate.

Method of Procurement

The estimate is based on a Design/Bid/Build procurement stategy.

Bid Conditions

This estimate has been based upon competitive bid situations (minimum of 3 bidders) for all items of subcontracted work.

Basis For Quantities

Wherever possible, this estimate has been based upon the actual measurement of different items of work. For the remaining items, parametric measurements were used in conjunction with other projects of a similar nature.

Basis for Unit Costs

Unit costs as contained herein are based on current bid prices in the Beaverton / Portland, OR area. Sub overheads and profit are included in each line item unit cost. Their overhead and profit covers each sub's cost for labor burden, materials, and equipment, field overhead, home office overhead, and profit. The general contractor's overhead is shown separately on the master summary.

APPROACH & METHODOLOGY

Sources for Pricing

This estimate was prepared by a team of qualified cost consultants experienced in estimating construction costs at all stages of design. These consultants have used pricing data from Cumming's construction database, updated to reflect current conditions in Beaverton, OR.

Key Exclusions

The following items have been excluded from our estimate:
- Project Soft Costs
- Department Relocation
- Allowance for COVID-19 impacts
- Allowance for Russia/Ukraine conflict impacts

Items Affecting Cost Estimate

Items which may change the estimated construction cost include, but are not limited to:
- Modifications to the scope of work included in this estimate.
- Unforeseen sub-surface conditions.
- Restrictive technical specifications or excessive contract conditions.
- Any specified item of material or product that cannot be obtained from 3 sources.
- Any other non-competitive bid situations.
- Bids delayed beyond the projected schedule.

Statement of Probable Cost

Cumming has no control over the cost of labor and materials, the general contractor's or any subcontractor's method of determining prices, or competitive bidding and market conditions. This estimate is made on the basis of the experience, qualifications, and best judgement of a professional consultant familiar with the construction industry. Cumming, however, cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from this or subsequent cost estimates.

Cumming's staff of professional cost consultants has prepared this estimate in accordance with generally accepted principles and practices. This staff is available to discuss its contents with any interested party.

Pricing reflects probable construction costs obtainable in the project locality on the target dates specified and is a determination of fair market value for the construction of this project. The estimate is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all sub and general contractors with a range of 3 - 4 bidders for all items of work. Experience and research indicates that a fewer number of bidders may result in higher bids. Conversely, an increased number of bidders may result in more competitive bid day responses.

Recommendations

Cumming recommends that the Owner and the Architect carefully review this entire document to ensure it reflects their design intent. Requests for modifications of any apparent errors or omissions to this document must be made to Cumming within ten days of receipt of this estimate. Otherwise, it will be assumed that its contents have been reviewed and accepted. If the project is over budget or there are unresolved budget issues, alternate systems / schemes should be evaluated before proceeding into further design phases.

It is recommended that there are preparations of further cost estimates throughout design by Cumming to determine overall cost changes since the preparation of this preliminary estimate. These future estimates will have detailed breakdowns indicating materials by type, kind, and size, priced by their respective units of measure.

SUMMARY

Element	Area	Cost / SF	Total
Building Part A	25,324	$122.94	$3,113,407
Building Part B	55,783	$41.00	$2,287,177
Building Part C	66,068	$46.19	$3,051,877
Building Part D	8,100	$0.97	$7,877
Total Estimated Construction Cost	**155,276**	**$54.49**	**$8,460,338**

Add Alternates			**Total**
Alternate Schedule - Work Delayed to Summer 2024	155,276	$2.72	$423,017

SUMMARY MATRIX

	Building Part A 25,324 SF		Building Part B 55,783 SF	
Element	Total	Cost/SF	Total	Cost/SF
1 F1 - Connect Tilt-up Walls to Foundations	$197,087	$7.78		
2 F2 - Demo + CMU Shear Wall			$29,160	$0.52
3 F3 - Shear Wall Footing			$14,676	$0.26
4 F4 - Sheath Wall				
5 F5 - 18" Steel Column	$23,612	$0.93		
6 F6 - Anchor Columns				
7 F7 - Strengthen Portal Frames				
8 F8 - CMU Shear Wall			$119,751	$2.15
9 M1 - Mezzanine HSS Strut	$2,334	$0.09	$2,073	$0.04
10 M2 - HSS Tie	$732	$0.03	$2,392	$0.04
11 M3 - Tilt-up Wall Connection	$573	$0.02	$1,955	$0.04
12 M4 - Gym Wall / Mezzanine Floor Connections	$9,570	$0.38		
13 R1 - Out-of-Plane Connection at Gym Roof	$23,650	$0.93		
14 R2 - Out-of-Plane Connection at Gym Roof Pilasters	$43,066	$1.70		
15 R3 - Channel Cross Bracing across Gym Roof	$388,148	$15.33		
16 R5 - Out-of-Plane Connection under Metal Deck			$188,609	$3.38
17 R6 - HSS Drag Tie			$53,152	$0.95
18 R7 - Angle under HSS Drag			$1,360	$0.02
19 R8 - R&R Roofing to Weld Metal Deck to Steel Members	$919,542	$36.31	$362,555	$6.50
20 R9 - Struts at Top of Column	$573	$0.02		
21 R10 - HSS Strut at Main Building	$409	$0.02		
22 R11 - Connect Main Building Roof and Gym Wall			$28,513	$0.51
23 R12 - Connect between Main Building Beam and Gym Wall			$4,260	$0.08
24 R13 - Allowance for New Connections			$12,440	$0.22
25 N1 - Bracing above Ceiling at Interior Brick Pilaster				
26 N2 - Supplement Support at top of Plumbing Wall	$2,801	$0.11		
27 N3 - Fire Suppression Piping Seismic Bracing	$79,011	$3.12	$201,934	$3.62
28 N4 - Drop-in Ceiling Seismic	$54,043	$2.13	$167,349	$3.00
29 N5 - Bracing at Interior Masonry Walls and Partitions	$25,324	$1.00	$27,892	$0.50
30 N6 - Brace Tall Narrow Contents	$12,662	$0.50	$13,946	$0.25
31 N7 - Brace/Anchor Fall-Prone Contents over 20 lbs	$6,331	$0.25	$5,578	$0.10
32 N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs	$6,331	$0.25	$8,367	$0.15
33 N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High	$8,863	$0.35	$8,367	$0.15
34 N10 - Brace in-Line Equipment over 75 lb	$12,662	$0.50	$11,157	$0.20
35 N11 - Conduit Couplings for Conduit over 1.5 in	$15,000	$0.59		
36 N12 - Flexible Couplings for Fluid and Gas Pipe	$6,000	$0.24		
37 N13 - Gas Shut-off Valve	$1,200	$0.05		
38 N14 - Brace Fluid and Gas Piping	$22,792	$0.90	$11,157	$0.20
39 N15 - Brace Ducts Larger Than 6 sf Cross-Section	$17,220	$0.68	$11,157	$0.20
40 Hazmat Abatement Allowance	$63,310	$2.50	$139,458	$2.50

BPS SRGP 2022 - Five Oaks Middle School
Beaverton, Oregon
Conceptual

SUMMARY MATRIX

		Building Part A 25,324 SF		Building Part B 55,783 SF	
Element		**Total**	**Cost/SF**	**Total**	**Cost/SF**
Subtotal Cost		$1,942,846	$76.72	$1,427,257	$25.59
General Conditions	10.0%	$194,285	$7.67	$142,726	$2.56
General Requirements	4.0%	$85,485	$3.38	$62,799	$1.13
Bonds & Insurance	2.0%	$44,452	$1.76	$32,656	$0.59
Contractor's Fee	5.0%	$113,353	$4.48	$83,272	$1.49
Design Contingency	20.0%	$476,084	$18.80	$349,742	$6.27
Escalation to MOC, 08/15/23	9.0%	$256,901	$10.14	$188,725	$3.38
Total Estimated Construction Cost		**$3,113,407**	**$122.94**	**$2,287,177**	**$41.00**

SUMMARY MATRIX

	Building Part C 66,068 SF		Building Part D 8,100 SF	
Element	**Total**	**Cost/SF**	**Total**	**Cost/SF**
1 F1 - Connect Tilt-up Walls to Foundations			$300	$0.04
2 F2 - Demo + CMU Shear Wall	$104,953	$1.59		
3 F3 - Shear Wall Footing	$57,307	$0.87		
4 F4 - Sheath Wall	$12,540	$0.19		
5 F5 - 18" Steel Column				
6 F6 - Anchor Columns			$720	$0.09
7 F7 - Strengthen Portal Frames			$3,896	$0.48
8 F8 - CMU Shear Wall	$206,350	$3.12		
9 M1 - Mezzanine HSS Strut				
10 M2 - HSS Tie				
11 M3 - Tilt-up Wall Connection				
12 M4 - Gym Wall / Mezzanine Floor Connections				
13 R1 - Out-of-Plane Connection at Gym Roof				
14 R2 - Out-of-Plane Connection at Gym Roof Pilasters				
15 R3 - Channel Cross Bracing across Gym Roof				
16 R5 - Out-of-Plane Connection under Metal Deck	$320,042	$4.84		
17 R6 - HSS Drag Tie	$42,103	$0.64		
18 R7 - Angle under HSS Drag	$3,885	$0.06		
19 R8 - R&R Roofing to Weld Metal Deck to Steel Members	$666,253	$10.08		
20 R9 - Struts at Top of Column				
21 R10 - HSS Strut at Main Building				
22 R11 - Connect Main Building Roof and Gym Wall				
23 R12 - Connect between Main Building Beam and Gym Wall				
24 R13 - Allowance for New Connections				
25 N1 - Bracing above Ceiling at Interior Brick Pilaster	$4,096	$0.06		
26 N2 - Supplement Support at top of Plumbing Wall				
27 N3 - Fire Suppression Piping Seismic Bracing	$206,132	$3.12		
28 N4 - Drop-in Ceiling Seismic				
29 N5 - Bracing at Interior Masonry Walls and Partitions	$33,034	$0.50		
30 N6 - Brace Tall Narrow Contents	$16,517	$0.25		
31 N7 - Brace/Anchor Fall-Prone Contents over 20 lbs	$6,607	$0.10		
32 N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs	$9,910	$0.15		
33 N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High	$9,910	$0.15		
34 N10 - Brace in-Line Equipment over 75 lb	$13,214	$0.20		
35 N11 - Conduit Couplings for Conduit over 1.5 in				
36 N12 - Flexible Couplings for Fluid and Gas Pipe				
37 N13 - Gas Shut-off Valve				
38 N14 - Brace Fluid and Gas Piping	$13,214	$0.20		
39 N15 - Brace Ducts Larger Than 6 sf Cross-Section	$13,214	$0.20		
40 Hazmat Abatement Allowance	$165,170	$2.50		

BPS SRGP 2022 - Five Oaks Middle School
Beaverton, Oregon
Conceptual

SUMMARY MATRIX

		Building Part C 66,068 SF		Building Part D 8,100 SF	
Element		**Total**	**Cost/SF**	**Total**	**Cost/SF**
Subtotal Cost		$1,904,450	$28.83	$4,916	$0.61
General Conditions	10.0%	$190,445	$2.88	$492	$0.06
General Requirements	4.0%	$83,796	$1.27	$216	$0.03
Bonds & Insurance	2.0%	$43,574	$0.66	$112	$0.01
Contractor's Fee	5.0%	$111,113	$1.68	$287	$0.04
Design Contingency	20.0%	$466,676	$7.06	$1,205	$0.15
Escalation to MOC, 08/15/23	9.0%	$251,824	$3.81	$650	$0.08
Total Estimated Construction Cost		**$3,051,877**	**$46.19**	**$7,877**	**$0.97**

SUMMARY MATRIX

	Element	Overall Totals Total	Cost/SF
1	F1 - Connect Tilt-up Walls to Foundations	$197,387	$1.27
2	F2 - Demo + CMU Shear Wall	$134,113	$0.86
3	F3 - Shear Wall Footing	$71,982	$0.46
4	F4 - Sheath Wall	$12,540	$0.08
5	F5 - 18" Steel Column	$23,612	$0.15
6	F6 - Anchor Columns	$720	$0.00
7	F7 - Strengthen Portal Frames	$3,896	$0.03
8	F8 - CMU Shear Wall	$326,102	$2.10
9	M1 - Mezzanine HSS Strut	$4,407	$0.03
10	M2 - HSS Tie	$3,124	$0.02
11	M3 - Tilt-up Wall Connection	$2,528	$0.02
12	M4 - Gym Wall / Mezzanine Floor Connections	$9,570	$0.06
13	R1 - Out-of-Plane Connection at Gym Roof	$23,650	$0.15
14	R2 - Out-of-Plane Connection at Gym Roof Pilasters	$43,066	$0.28
15	R3 - Channel Cross Bracing across Gym Roof	$388,148	$2.50
16	R5 - Out-of-Plane Connection under Metal Deck	$508,650	$3.28
17	R6 - HSS Drag Tie	$95,255	$0.61
18	R7 - Angle under HSS Drag	$5,245	$0.03
19	R8 - R&R Roofing to Weld Metal Deck to Steel Members	$1,948,350	$12.55
20	R9 - Struts at Top of Column	$573	$0.00
21	R10 - HSS Strut at Main Building	$409	$0.00
22	R11 - Connect Main Building Roof and Gym Wall	$28,513	$0.18
23	R12 - Connect between Main Building Beam and Gym Wall	$4,260	$0.03
24	R13 - Allowance for New Connections	$12,440	$0.08
25	N1 - Bracing above Ceiling at Interior Brick Pilaster	$4,096	$0.03
26	N2 - Supplement Support at top of Plumbing Wall	$2,801	$0.02
27	N3 - Fire Suppression Piping Seismic Bracing	$487,078	$3.14
28	N4 - Drop-in Ceiling Seismic	$221,392	$1.43
29	N5 - Bracing at Interior Masonry Walls and Partitions	$86,250	$0.56
30	N6 - Brace Tall Narrow Contents	$43,125	$0.28
31	N7 - Brace/Anchor Fall-Prone Contents over 20 lbs	$18,516	$0.12
32	N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs	$24,609	$0.16
33	N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High	$27,141	$0.17
34	N10 - Brace in-Line Equipment over 75 lb	$37,032	$0.24
35	N11 - Conduit Couplings for Conduit over 1.5 in	$15,000	$0.10
36	N12 - Flexible Couplings for Fluid and Gas Pipe	$6,000	$0.04
37	N13 - Gas Shut-off Valve	$1,200	$0.01
38	N14 - Brace Fluid and Gas Piping	$47,162	$0.30
39	N15 - Brace Ducts Larger Than 6 sf Cross-Section	$41,591	$0.27
40	Hazmat Abatement Allowance	$367,938	$2.37

SUMMARY MATRIX

		Overall Totals	
Element		**Total**	**Cost/SF**
Subtotal Cost		$5,279,468	$34
General Conditions	10.0%	$527,947	$3.40
General Requirements	4.0%	$232,297	$1.50
Bonds & Insurance	2.0%	$120,794	$0.78
Contractor's Fee	5.0%	$308,025	$1.98
Design Contingency	20.0%	$1,293,706	$8.33
Escalation to MOC, 08/15/23	9.0%	$698,100	$4.50
Total Estimated Construction Cost		**$8,460,338**	**$54.49**

SCHEDULE OF AREAS AND CONTROL QUANTITIES

Schedule of Areas	Building Part A	Building Part B	Building Part C	Building Part D	SF
1. Enclosed Areas					
Level 1	25,324	55,783	66,068	8,100	155,275
Total Enclosed	25,324	55,783	66,068	8,100	155,275
Total Gross Floor Area	25,324	55,783	66,068	8,100	155,275

Building Part A

SUMMARY - BUILDING PART A

	Element		Total	Cost / SF
01	F1 - Connect Tilt-up Walls to Foundations		$197,087	$7.78
05	F5 - 18" Steel Column		$23,612	$0.93
09	M1 - Mezzanine HSS Strut		$2,334	$0.09
10	M2 - HSS Tie		$732	$0.03
11	M3 - Tilt-up Wall Connection		$573	$0.02
12	M4 - Gym Wall / Mezzanine Floor Connections		$9,570	$0.38
13	R1 - Out-of-Plane Connection at Gym Roof		$23,650	$0.93
14	R2 - Out-of-Plane Connection at Gym Roof Pilasters		$43,066	$1.70
15	R3 - Channel Cross Bracing across Gym Roof		$388,148	$15.33
19	R8 - R&R Roofing to Weld Metal Deck to Steel Members		$919,542	$36.31
20	R9 - Struts at Top of Column		$573	$0.02
21	R10 - HSS Strut at Main Building		$409	$0.02
26	N2 - Supplement Support at top of Plumbing Wall		$2,801	$0.11
27	N3 - Fire Suppression Piping Seismic Bracing		$79,011	$3.12
28	N4 - Drop-in Ceiling Seismic		$54,043	$2.13
29	N5 - Bracing at Interior Masonry Walls and Partitions		$25,324	$1.00
30	N6 - Brace Tall Narrow Contents		$12,662	$0.50
31	N7 - Brace/Anchor Fall-Prone Contents over 20 lbs		$6,331	$0.25
32	N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs		$6,331	$0.25
33	N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High		$8,863	$0.35
34	N10 - Brace in-Line Equipment over 75 lb		$12,662	$0.50
35	N11 - Conduit Couplings for Conduit over 1.5 in		$15,000	$0.59
36	N12 - Flexible Couplings for Fluid and Gas Pipe		$6,000	$0.24
37	N13 - Gas Shut-off Valve		$1,200	$0.05
38	N14 - Brace Fluid and Gas Piping		$22,792	$0.90
39	N15 - Brace Ducts Larger Than 6 sf Cross-Section		$17,220	$0.68
40	Hazmat Abatement Allowance		$63,310	$2.50
	Subtotal		$1,942,846	$76.72
	General Conditions	10.00%	$194,285	$7.67
	Subtotal		$2,137,131	$84.39
	General Requirements	4.00%	$85,485	$3.38
	Subtotal		$2,222,616	$87.77
	Bonds & Insurance	2.00%	$44,452	$1.76
	Subtotal		$2,267,068	$89.52
	Contractor's Fee	5.00%	$113,353	$4.48
	Subtotal		$2,380,421	$94.00
	Design Contingency	20.00%	$476,084	$18.80
	Subtotal		$2,856,506	$112.80
	Escalation to MOC, 08/15/23	8.99%	$256,901	$10.14
	TOTAL ESTIMATED CONSTRUCTION COST		**$3,113,407**	**$122.94**

Total Area: 25,324 SF

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
F1 - Connect Tilt-up Walls to Foundations				
F1-A				
At base of (E) tilt-up walls at gym provide 2 ft. high x 6 in. thick conc. band with 2 rows #4 @18" drill & epoxy into wall and #5 @ 12" oc drill & epoxy into (E) foundation				
F1-A				
Excavate & backfill for new concrete band.	13	cy	$46.14	$608
Install concrete band per structural (see below)				
Paint exposed concrete.	163	sf	$1.25	$204
Install sheet metal flashing over top of concrete band	89	lf	$26.80	$2,385
2/CR-6				
6"x24" concrete band	4	cy	$597.79	$2,168
(2) continuous #4	137	lb	$1.62	$222
(4) lf #4 @ 18" OC, drill & epoxy (2) into wall	183	lb	$1.62	$296
(4) drill and epoxy (2) into wall	119	ea	$44.84	$5,321
(3) lf #5 @12" OC, drill & epoxy (1) into foundation	319	lb	$1.62	$517
(3) drill and epoxy (1) into wall	89	ea	$44.84	$3,991
F1-B				
At base of (E) tilt-up walls at gym provide 2 ft. high x 6 in. thick conc. band with 2 rows #4 @18" drill & epoxy into wall and #5 @ 12" oc drill & epoxy into (E) foundation				
F1-B				
Sawcut and remove concrete paving.	900	sf	$5.69	$5,121
Excavate & backfill for new concrete band.	44	cy	$46.14	$2,051
Install concrete band per structural (see below)				
Paint exposed concrete.	550	sf	$1.25	$687
Install sheet metal flashing over top of concrete band.	300	lf	$26.80	$8,040
Patch concrete paving	900	sf	$17.73	$15,957
2/CR-6				
6"x24" concrete band	12	cy	$597.79	$7,306
(2) continuous #4	462	lb	$1.62	$749
(4) lf #4 @ 18" OC, drill & epoxy (2) into wall	616	lb	$1.62	$999
(4) drill and epoxy (2) into wall	400	ea	$44.84	$17,936
(3) lf #5 @12" OC, drill & epoxy (1) into foundation	936	lb	$1.62	$1,516
(3) drill and epoxy (1) into wall	300	ea	$44.84	$13,452
F1-C 1/CR-6				
At base of (E) tilt-up walls at gym provide 2 ft. high x 6 in. thick conc. band with 2 rows #4 @18" drill & epoxy into wall and #5 @ 12" oc drill & epoxy into (E) foundation				
F1-C				
Remove and salvage bleacher system	177	lf	$30.00	$5,310
Remove maple flooring along wall	531	sf	$2.01	$1,067
Install concrete band per structural (see below)				
Construct metal-framed spacer with painted gypsum board finish above concrete band. Match thickness of concrete and height of bleacher system for purpose of supporting bleacher system.	177	lf	$101.23	$17,918
Paint exposed concrete.	443	sf	$1.25	$553

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
Patch maple flooring.	531	sf	$28.08	$14,910
Reinstall bleacher system	177	lf	$35.00	$6,195
1/CR-6				
6"x24" concrete band	7	cy	$597.79	$4,311
(2) continuous #4	273	lb	$1.62	$442
(4) lf #4 @ 18" OC, drill & epoxy (2) into wall	364	lb	$1.62	$589
(4) drill and epoxy (2) into wall	236	ea	$44.84	$10,582
(3) lf #5 @12" OC, drill & epoxy (1) into foundation	552	lb	$1.62	$895
(3) drill and epoxy (1) into wall	177	ea	$44.84	$7,937
F1-D				
At base of (E) tilt-up walls at gym provide 2 ft. high x 6 in. thick conc. band with 2 rows #4 @18" drill & epoxy into wall and #5 @ 12" oc drill & epoxy into (E) foundation				
F1-D				
Salvage and reinstall (2) recessed drinking fountains.	2	ea	$370.26	$741
Install concrete band per structural (see below)				
Construct metal-framed partition with painted gypsum board in front of concrete band. Partition to extend to 7 feet above floor	15	lf	$137.14	$2,057
4/CR-6				
6"x24" concrete band	1	cy	$597.79	$365
(2) continuous #4	23	lb	$1.62	$37
(4) lf #4 @ 18" OC, drill & epoxy (2) into wall	31	lb	$1.62	$50
(4) drill and epoxy (2) into wall	20	ea	$44.84	$897
(3) lf #5 @12" OC, drill & epoxy (1) into foundation	47	lb	$1.62	$76
(3) drill and epoxy (1) into wall	15	ea	$44.84	$673
F1-C 3/CR-6				
At base of (E) tilt-up walls at gym provide 2 ft. high x 6 in. thick conc. band with 2 rows #4 @18" drill & epoxy into wall and #5 @ 12" oc drill & epoxy into (E) foundation				
F1-C				
Remove maple flooring along wall	411	sf	$2.01	$826
Install concrete band per structural (see below)				
Paint exposed concrete.	343	sf	$1.25	$428
Patch maple flooring.	411	sf	$28.08	$11,541
3/CR-06				
6"x24" concrete band	6	cy	$597.79	$3,337
(2) continuous #4	211	lb	$1.62	$342
(4) lf #4 @ 18" OC, drill & epoxy (2) into wall	281	lb	$1.62	$456
(4) drill and epoxy (2) into wall	183	ea	$44.84	$8,191
(3) lf #5 @12" OC, drill & epoxy (1) into foundation	427	lb	$1.62	$692
(3) drill and epoxy (1) into wall	137	ea	$44.84	$6,143
Total - F1 - Connect Tilt-up Walls to Foundations				**$197,087**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
F5 - 18" Steel Column				
F5				
New 18 in. steel column on inside face of wall (spans floor to roof). Connect to foundation and to roof. Bolt to (E) tilt-up wall at 24 in. O.C.	4,370	lb	$4.12	$18,003
F5-A				
Selectively demolish existing gypsum board and framing at mechanical loft/soffit	108	sf	$12.00	$1,296
Modify mechanical equipment and ductwork as necessary to install column	1	ls	$750.00	$750
Remove maple flooring at column base	9	sf	$2.01	$18
Sawcut and remove concrete slab for column connection to foundation	9	sf	$5.69	$51
Install steel column per structural (see above)				
Patch and repair gypsum board and framing at mechanical loft/soffit	108	sf	$26.70	$2,884
Patch concrete slab	9	sf	$17.73	$160
Patch maple flooring	9	sf	$28.08	$253
Paint column where exposed to view	132	sf	$1.50	$198
Total - F5 - 18" Steel Column				**$23,612**
M1 - Mezzanine HSS Strut				
M1				
New HSS 4 x 4 strut at mezzanine level	477	lb	$4.12	$1,964
M1-A				
Paint steel struts	24	lf	$5.00	$120
Miscellaneous demolition and patching of adjacent finishes	25	sf	$10.00	$250
Total - M1 - Mezzanine HSS Strut				**$2,334**
M2 - HSS Tie				
M2				
New HSS tie between (E) concrete shear wall and tilt-up wall	139	lb	$4.12	$573
M2-A				
Demolish 2x4 ceiling system and lighting.	14	sf	$2.23	$31
Install HSS tie per structural (see above)				
Install new 2x4 ceiling system and lighting	14	sf	$9.15	$128
Total - M2 - HSS Tie				**$732**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
M3 - Tilt-up Wall Connection				
M3				
New connection between (E) RB-19 and tilt-up wall at gym	139	lb	$4.12	$573
M3-A				
Architectural scope included under R11-B				
Total - M3 - Tilt-up Wall Connection				**$573**
M4 - Gym Wall / Mezzanine Floor Connections				
M4				
New connections between mezzanine floor and gym wall				
1/CR-8				
New steel brackets @ 4' OC, approximately 1'x1'-6"	259	lb	$4.12	$1,066
Epoxy bolt to tilt-up wall	30	ea	$29.98	$899
Weld to US of beam	15	ea	$24.58	$369
R11-B				
Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access.	57	sf	$1.11	$63
Install new connections per structural (see above)				
Reinstall 2x4 ceiling system	57	sf	$5.15	$294
M4-A, 2/CR-8				
New connection between mezzanine floor and gym wall				
M4-A				
Demolish hard lid ceiling back from wall 2 feet	362	sf	$3.34	$1,209
Install weld connections per structural (see below)				
Patch and repair hard lid ceiling	362	sf	$12.54	$4,539
2/CR-8				
Add fillet weld ea. Side of truss bearing plate to embed plate @4' OC	46	ea	$24.58	$1,131
Total - M4 - Gym Wall / Mezzanine Floor Connections				**$9,570**
R1 - Out-of-Plane Connection at Gym Roof				
R1				
New out-of-plane connection at gym roof (2 3 x 3 x 1/4 angles at pilasters and 8 ft max spacing)				
1/CR-09				
Per R1 location				
(2) L3x3x1/4 x 8' long angles, welded each end	1,984	lb	$4.12	$8,172
(2) L3x3x1/4 x 18" long angles, welded to truss top chord	372	lb	$4.12	$1,532
(2) PL3/8" x 4"x8" tab plates welded to C-channel	112	lb	$4.12	$463
(1) C8x18.75 x 24" long, with (4) 7/8" holes drilled	949	lb	$4.12	$3,909
(4) 3/4" x 15" average thru-bolts, nuts, & washers	88	ea	$20.48	$1,802
(4) 7/8" holes drilled 12" avg through pilaster or tilt-up wall	88	ea	$45.16	$3,974

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
Add fillet weld at existing truss bearing plate to embed plate	22	ea	$24.58	$541

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
R3-A				
Remove and salvage lighting, speakers, and basketball hoops.	352	sf	$2.00	$704
Install steel members at underside of gym roof per structural (see above)				
Paint all exposed steel members.	22	ea	$20.00	$440
Reinstall lighting, speakers, and basketball hoops.	352	sf	$3.00	$1,056
Include allowance for selectively relocating light fixtures	352	sf	$3.00	$1,056
Total - R1 - Out-of-Plane Connection at Gym Roof				**$23,650**
R2 - Out-of-Plane Connection at Gym Roof Pilasters				
R2				
New out-of-plane connection and continuity tie across gym roof at pilasters and 8 ft max spacing				
L3x3x1/4	8,362	lb	$5.15	$43,066
Total - R2 - Out-of-Plane Connection at Gym Roof Pilasters				**$43,066**
R3 - Channel Cross Bracing across Gym Roof				
R3				
New C 4 x 7.25 channel cross bracing across entire gym roof	29,123	lb	$5.15	$149,983
R3-A				
Remove and salvage lighting, speakers, and basketball hoops.	12,544	sf	$2.00	$25,088
Install steel members at underside of gym roof per structural (see above)				
Paint all exposed steel members.	5,495	lf	$5.00	$27,475
Reinstall lighting, speakers, and basketball hoops.	12,544	sf	$3.00	$37,632
Include allowance for selectively relocating light fixtures	12,544	sf	$3.00	$37,632
Ductwork modification allowance	1	ls	$20,000.00	$20,000
R3-B				
Remove and salvage 2x4 ceiling panels. Disassemble ceiling grid and salvage lighting as necessary for structural work.	6,358	sf	$2.23	$14,178
Install steel members at underside of roof deck per structural (see above)				
Reinstall 2x4 ceiling system and lighting	6,358	sf	$9.15	$58,176
R&R grilles, registers, and diffusers; clean and paint	6,368	sf	$1.34	$8,533
R&R Electrical incidental allowance in ceiling R3-A	12,544	sf	$0.50	$6,272
R&R Electrical incidental allowance in ceiling R3-B	6,358	sf	$0.50	$3,179
Total - R3 - Channel Cross Bracing across Gym Roof				**$388,148**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
R8 - R&R Roofing to Weld Metal Deck to Steel Members				
R8				
Remove roofing and weld (E) deck to new steel members @ 12 in. o.c.	25,324	sf	$5.68	$143,840
3/CR-9				
At 8' OC				
(1) L4x4x5/16 x 8' long angles, welded each end	9,752	lb	$4.12	$40,178
(1) PL3/8 x 12"x6" welded to truss top chord	467	lb	$4.12	$1,922
(2) PL3/8" x 4"x8" tab plates welded to C-channel	156	lb	$4.12	$641
(1) C8x18.75 x 24" long, with (4) 7/8" holes drilled	2,286	lb	$4.12	$9,417
(4) 3/4" x 15" average thru-bolts, nuts, & washers	212	ea	$20.48	$4,342
(4) 7/8" holes drilled 12" avg through pilaster or tilt-up wall	212	ea	$45.16	$9,574
(1484) total lf L3x3x1/4 angle welded across roof (R2)	8,362	lb	$4.12	$34,453
R8-A				
Salvage and reinstall rooftop mechanical equipment and roof drains.				
R&R AC units for new roofing	25,324	sf	$0.80	$20,259
R&R roof drains and flashing at pipe penetrations	25,324	sf	$0.55	$13,928
Demolish roofing to steel deck and weld deck to steel members per structural (see above)				
Install new deck sheathing, vapor retarder, R-30 insulation, cover board, single-ply roof membrane, and flashing	25,324	sf	$19.32	$489,260
R&R Electrical on roof R8-A and B	18,966	sf	$8.00	$151,728
Total - R8 - R&R Roofing to Weld Metal Deck to Steel Members				**$919,542**
R9 - Struts at Top of Column				
R9				
Provide struts at top of new 18 in. steel column to tie in to roof framing	139	lb	$4.12	$573
Total - R9 - Struts at Top of Column				**$573**
R10 - HSS Strut at Main Building				
R10				
New HSS strut at main building roof level. Connect ea end	99	lb	$4.12	$409
Total - R10 - HSS Strut at Main Building				**$409**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
N2 - Supplement Support at top of Plumbing Wall				
N2				
Supplement (E) support at top of (E) plumbing wall per detail 5/CR-21				
5/CR-21				
L3x3x1/4 x 8' long (assumed) @ 8' OC, welded each end	316	lb	$3.34	$1,054
N2-A				
Demolish hard lid ceiling back from wall 2 feet	110	sf	$3.34	$367
Install supplemental wall support per structural (see above)				
Patch and repair hard lid ceiling	110	sf	$12.54	$1,379
Total - N2 - Supplement Support at top of Plumbing Wall				**$2,801**
N3 - Fire Suppression Piping Seismic Bracing				
N3-A				
Remove and salvage 2x4 ceiling panels for access above ceiling. At hard lid ceilings, cut holes in ceiling for access to sprinkler piping	25,324	sf	$0.15	$3,799
Install sprinkler system bracing per structural	25,324	sf	$1.37	$34,694
Reinstall 2x4 ceiling panels. At hard lid ceilings, patch access holes to match existing finishes	25,324	sf	$0.62	$15,701
At 2x4 grid ceilings, install oversized escutcheons at sprinkler head penetrations	25,324	sf	$0.98	$24,818
Total - N3 - Fire Suppression Piping Seismic Bracing				**$79,011**
N4 - Drop-in Ceiling Seismic				
N4-A: At nonstructural "position retention" zones noted on sheet CR-02 (zones A and B), provide the following				
Remove and salvage 2x4 ceiling panels for access above ceiling.	6,358	sf	$0.15	$954
Install ceiling system bracing per structural.	6,358	sf	$0.50	$3,179
Modify edge details of grid system and install wide edge angle to allow movement per code.	6,358	sf	$0.25	$1,590
Reinstall 2x4 ceiling panels	6,358	sf	$0.62	$3,942
Install oversized escutcheons at sprinkler head penetrations	6,358	sf	$0.98	$6,231
R&R Elect in ceilings covers work n3 n4	6,358	sf	$6.00	$38,148
Total - N4 - Drop-in Ceiling Seismic				**$54,043**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
N5 - Bracing at Interior Masonry Walls and Partitions				
Bracing at interior masonry walls and partitions - allowance	25,324	sf	$1.00	$25,324
Total - N5 - Bracing at Interior Masonry Walls and Partitions				**$25,324**
N6 - Brace Tall Narrow Contents				
Brace tall narrow contents - allowance	25,324	sf	$0.50	$12,662
Total - N6 - Brace Tall Narrow Contents				**$12,662**
N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				
Brace/anchor fall-prone contents over 20 lbs - allowance	25,324	sf	$0.25	$6,331
Total - N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				**$6,331**
N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				
Brace/anchor fall-prone equipment over 20 lbs - allowance	25,324	sf	$0.25	$6,331
Total - N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				**$6,331**
N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				
Brace/anchor tall narrow equipment over 6 ft high - allowance	25,324	sf	$0.35	$8,863
Total - N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				**$8,863**
N10 - Brace in-Line Equipment over 75 lb				
Brace in-line equipment over 75 lb - allowance	25,324	sf	$0.50	$12,662
Total - N10 - Brace in-Line Equipment over 75 lb				**$12,662**

DETAIL ELEMENTS - BUILDING PART A

Element	Quantity	Unit	Unit Cost	Total
N11 - Conduit Couplings for Conduit over 1.5 in				
Electrical allowance expansion joints	1	ls	$15,000.00	$15,000
Total - N11 - Conduit Couplings for Conduit over 1.5 in				**$15,000**
N12 - Flexible Couplings for Fluid and Gas Pipe				
Flex connections	1	ls	$6,000.00	$6,000
Total - N12 - Flexible Couplings for Fluid and Gas Pipe				**$6,000**
N13 - Gas Shut-off Valve				
Shut off valve	1	ea	$1,200.00	$1,200
Total - N13 - Gas Shut-off Valve				**$1,200**
N14 - Brace Fluid and Gas Piping				
Pipe bracing	25,324	sf	$0.90	$22,792
Total - N14 - Brace Fluid and Gas Piping				**$22,792**
N15 - Brace Ducts Larger Than 6 sf Cross-Section				
Duct bracing	25,324	sf	$0.68	$17,220
Total - N15 - Brace Ducts Larger Than 6 sf Cross-Section				**$17,220**
Hazmat Abatement Allowance				
Hazmat abatement allowance	25,324	sf	$2.50	$63,310
Total - Hazmat Abatement Allowance				**$63,310**

Building Part B

SUMMARY - BUILDING PART B

	Element		Total	Cost / SF
02	F2 - Demo + CMU Shear Wall		$29,160	$0.52
03	F3 - Shear Wall Footing		$14,676	$0.26
08	F8 - CMU Shear Wall		$119,751	$2.15
09	M1 - Mezzanine HSS Strut		$2,073	$0.04
10	M2 - HSS Tie		$2,392	$0.04
11	M3 - Tilt-up Wall Connection		$1,955	$0.04
16	R5 - Out-of-Plane Connection under Metal Deck		$188,609	$3.38
17	R6 - HSS Drag Tie		$53,152	$0.95
18	R7 - Angle under HSS Drag		$1,360	$0.02
19	R8 - R&R Roofing to Weld Metal Deck to Steel Members		$362,555	$6.50
22	R11 - Connect Main Building Roof and Gym Wall		$28,513	$0.51
23	R12 - Connect between Main Building Beam and Gym Wall		$4,260	$0.08
24	R13 - Allowance for New Connections		$12,440	$0.22
27	N3 - Fire Suppression Piping Seismic Bracing		$201,934	$3.62
28	N4 - Drop-in Ceiling Seismic		$167,349	$3.00
29	N5 - Bracing at Interior Masonry Walls and Partitions		$27,892	$0.50
30	N6 - Brace Tall Narrow Contents		$13,946	$0.25
31	N7 - Brace/Anchor Fall-Prone Contents over 20 lbs		$5,578	$0.10
32	N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs		$8,367	$0.15
33	N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High		$8,367	$0.15
34	N10 - Brace in-Line Equipment over 75 lb		$11,157	$0.20
38	N14 - Brace Fluid and Gas Piping		$11,157	$0.20
39	N15 - Brace Ducts Larger Than 6 sf Cross-Section		$11,157	$0.20
40	Hazmat Abatement Allowance		$139,458	$2.50
	Subtotal		$1,427,257	$25.59
	General Conditions	10.00%	$142,726	$2.56
	Subtotal		$1,569,983	$28.14
	General Requirements	4.00%	$62,799	$1.13
	Subtotal		$1,632,782	$29.27
	Bonds & Insurance	2.00%	$32,656	$0.59
	Subtotal		$1,665,438	$29.86
	Contractor's Fee	5.00%	$83,272	$1.49
	Subtotal		$1,748,710	$31.35
	Design Contingency	20.00%	$349,742	$6.27
	Subtotal		$2,098,452	$37.62
	Escalation to MOC, 08/15/23	8.99%	$188,725	$3.38
	TOTAL ESTIMATED CONSTRUCTION COST		**$2,287,177**	**$41.00**

Total Area: 55,783 SF

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
F2 - Demo + CMU Shear Wall				
F2 17' high				
Demo (E) wall and replace with (N) CMU shear wall (8 in. CMU typ uno.)				
Demolish existing wall and replace with CMU wall per structural.	357	sf	$53.44	$19,078
At (E) steel column, weld horiz bars to tie to new CMU wall, typ. 17' high	417	lb	$4.12	$1,718
F2-B				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices, wall speaker.	21	lf	$75.00	$1,575
Salvage and reinstall tackboards.	357	sf	$0.25	$89
Salvage and reinstall acoustical wall panels.	357	sf	$1.00	$357
Demolish VCT flooring along each side of wall.	63	sf	$0.83	$52
Sawcut and remove concrete floor slab along length of each side of wall.	63	sf	$5.69	$358
Excavate for new footing.	9	cy	$46.14	$431
Install metal furring with painted gypsum board finish each side of wall.	357	sf	$13.15	$4,695
Patch VCT flooring.	63	sf	$5.33	$336
Salvage and reinstall door and frame	1	ea	$470.51	$471
Total - F2 - Demo + CMU Shear Wall				**$29,160**
F3 - Shear Wall Footing				
F3				
Provide (N) concrete strip footing to support (N) CMU shear wall. assume min 18in thickness and 36in width uno. provide 250 lb/cy reinforcing. demo and rebuild (E) slab as required for installation of wall and reconstruct after installation of wall.				
In addition to F2 scope, above:				
Reinforcing	2,979	lb	$1.62	$4,826
Form and place concrete footing	12	cy	$420.03	$5,005
Backfill footing	14	cy	$17.02	$234
Infill concrete floor slab	260	sf	$17.73	$4,610
Total - F3 - Shear Wall Footing				**$14,676**
F8 - CMU Shear Wall				
F8, 8" wall, 27' high				
Provide (N) CMU shear wall (8 in. CMU typ uno.) adjacent to (E) wall	945	sf	$34.25	$32,366
At (E) steel column, weld horiz bars to tie to new CMU wall, typ.	695	lb	$4.12	$2,864

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
F8-A				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.	35	lf	$50.00	$1,750
Remove 2x4 ceiling panels and grid back 3 feet.	140	sf	$1.11	$155
Sawcut and remove concrete floor slab along length of wall. Excavate for new footing.				
Sawcut and remove concrete floor slab along length of wall	140	sf	$5.69	$797
Excavate for new footing	16	cy	$29.12	$453
Form and place concrete footing	6	cy	$420.03	$2,695
Backfill footing	7	cy	$17.02	$126
Salvage plastic laminate wainscot panels and demolish aluminum trim.	140	sf	$5.00	$700
Demolish existing gypsum board finish on one side of wall (*see structural scope above for construction of new CMU wall*).	945	sf	$0.60	$567
Install metal furring with painted gypsum board finish.	945	sf	$13.15	$12,427
Reinstall 2x4 ceiling system	140	sf	$5.15	$721
Patch and polish concrete floor	140	sf	$22.44	$3,142
Reinstall plastic laminate wainscot panels and install new aluminum trim	140	sf	$5.00	$700
F8, 12" wall, 27' high				
Provide (N) CMU shear wall (12 in. CMU) adjacent to (E) wall	891	sf	$40.28	$35,889
At (E) steel column, weld horiz bars to tie to new CMU wall, typ.	655	lb	$4.12	$2,700
F8-A				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets,	33	lf	$50.00	$1,650
Remove 2x4 ceiling panels and grid back 3 feet.	132	sf	$1.11	$147
Sawcut and remove concrete floor slab along length of wall. Excavate for				
Sawcut and remove concrete floor slab along length of wall	132	sf	$5.69	$751
Excavate for new footing	15	cy	$29.12	$427
Form and place concrete footing	6	cy	$420.03	$2,541
Backfill footing	6	cy	$17.02	$105
Salvage plastic laminate wainscot panels and demolish aluminum trim.	132	sf	$0.35	$46
Demolish existing gypsum board finish on one side of wall (*see structural scope above for construction of new CMU wall*).	891	sf	$0.60	$535
Install metal furring with painted gypsum board finish.	891	sf	$13.15	$11,717
Reinstall 2x4 ceiling system.	132	sf	$5.15	$680
Patch and polish concrete floor.	132	sf	$22.44	$2,962
Reinstall plastic laminate wainscot panels and install new aluminum trim	132	sf	$1.05	$139
Total - F8 - CMU Shear Wall				**$119,751**
M1 - Mezzanine HSS Strut				
M1				
New HSS 4 x 4 strut at mezzanine level	417	lb	$4.12	$1,718
M1-A				
Paint steel struts	21	lf	$5.00	$105
Miscellaneous demolition and patching of adjacent finishes	25	sf	$10.00	$250
Total - M1 - Mezzanine HSS Strut				**$2,073**

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
M2 - HSS Tie				
M2				
New HSS tie between (E) concrete shear wall and tilt-up wall	437	lb	$4.12	$1,800
M2-A				
Demolish 2x4 ceiling system and lighting.	52	sf	$2.23	$116
Install HSS tie per structural (see above)				
Install new 2x4 ceiling system and lighting	52	sf	$9.15	$476
Total - M2 - HSS Tie				**$2,392**
M3 - Tilt-up Wall Connection				
M3-A				
Structural allowance components	1	ls	$1,000.00	$1,000
Architectural scope included under R11-B				
R11-B				
Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access.	48	sf	$1.11	$53
Install new connections per structural.	159	lb	$4.12	$655
Reinstall 2x4 ceiling system	48	sf	$5.15	$247
Total - M3 - Tilt-up Wall Connection				**$1,955**
R5 - Out-of-Plane Connection under Metal Deck				
R5				
New out-of-plane connection and continuity ties (3 x 3 x 1/4 angle at 8 ft max spacing) At underside of metal deck.	6,001	lb	$4.12	$24,725
1/CR-19				
(1) at each R5 location				
(1) L3x3x1/4 x 8' long angles, welded each end	1,668	lb	$4.12	$6,872
(1) PL3/8 x 12"x6" welded to truss top chord	326	lb	$4.12	$1,342
(1) PL1/2 x 12"x6"	434	lb	$4.12	$1,790
(1) PL3/8 x 6"x6" knife plate w/ (2) 7/8" drilled holes, welded to 12x6 plate	163	lb	$4.12	$671
(2) 3/4" epoxy anchors	74	ea	$29.98	$2,219
R5-A				
Demolish hard lid ceiling and 1x1 acoustical tiles (where occurring). Remove and salvage lighting for access to underside of roof deck.	458	sf	$4.45	$2,038
Install steel members at underside of roof deck per structural (see above)				
Patch ceiling, install new 1x1 acoustical tiles (where occurring), and reinstall lighting.	458	sf	$22.10	$10,122

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
R5-B				
Remove and salvage 2x4 ceiling panels. Disassemble ceiling grid and salvage lighting as necessary for structural work.	7,394	sf	$2.23	$16,489
Install steel members at underside of roof deck per structural (see above) Reinstall 2x4 ceiling system and lighting	7,394	sf	$9.15	$67,655
R5-C				
Install steel members at underside of roof deck per structural (see above) Paint steel members	2,713	sf	$2.50	$6,783
Remove and replace grilles, registers, and diffusers outlets with new including flex duct	458	sf	$1.85	$847
R&R grilles, registers, and diffusers outlets	7,062	sf	$0.95	$6,709
R&R Electrical allowance in ceiling R5-A	458	sf	$11.00	$5,038
R&R Electrical allowance in ceiling R5-B	7,062	sf	$5.00	$35,310
Total - R5 - Out-of-Plane Connection under Metal Deck				**$188,609**
R6 - HSS Drag Tie				
R6				
New HSS 3 1/2 x 2 1/2 x 3/8 (assumed) drag tie at underside of metal deck.	4,199	lb	$4.12	$17,298
2/CR-21				
Continuous 8"Wx8"H concrete cap on new CMU wall	5	cy	$597.79	$3,247
(2) 3/4" dia stud embeds welded to US of new R6 HSS drag beam @ 2' OC	300	ea	$3.87	$1,161
L4x4x5/16 x 8' diagonal bracing welded each end @ 8' OC	6,992	lb	$4.12	$28,807
R6 - 2/CR-15				
New HSS 3 1/2 x 2 1/2 x 3/8 (assumed) drag tie at underside of metal deck.	364	lb	$4.12	$1,499
2/CR-15				
PL1/2 x 3"x6" (assumed) steel tabs, w/ 7/8" holes welded to HSS 2' OC	38	lb	$4.12	$157
3/4" epoxy anchors to concrete walls, 2' OC	13	ea	$29.98	$390
M2-A				
Demolish 2x4 ceiling system and lighting.	52	sf	$2.23	$116
Install HSS tie per structural (see above) Install new 2x4 ceiling system and lighting	52	sf	$9.15	$476
Total - R6 - HSS Drag Tie				**$53,152**

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
R7 - Angle under HSS Drag				
R7				
New 2 1/2 x 2 1/2 x 1/4 steel angle at underside of HSS drag to support drag (at 8 ft max spacing). Weld angles to underside of top chord of (E) truss joist				
3/CR-21				
At each R7 location				
(10) lf L2 1/2x2 1/2x/14, welded to HSS and to US of truss top chord each end	330	lb	$4.12	$1,360
Total - R7 - Angle under HSS Drag				**$1,360**
R8 - R&R Roofing to Weld Metal Deck to Steel Members				
R8				
Remove roofing and weld (E) deck to new steel members @ 12 in. o.c.	10,233	sf	$5.68	$58,123
R8-B				
Salvage and reinstall rooftop mechanical equipment and roof drains.				
R&R AC units for new roofing	10,233	sf	$0.80	$8,186
R&R roof drains and flashing at pipe penetrations	10,233	sf	$0.55	$5,628
Patch roof with new deck sheathing, vapor retarder, insulation (match existing R-18 thickness), cover board, and 2-ply SBS roofing	10,233	sf	$22.40	$229,219
R&R Electrical on roof	10,233	sf	$6.00	$61,398
Total - R8 - R&R Roofing to Weld Metal Deck to Steel Members				**$362,555**
R11 - Connect Main Building Roof and Gym Wall				
R11				
New connections between main building roof and gym wall				
1/CR-20				
New steel brackets @ 4' OC, approximately 1'x1'-6"	828	lb	$4.12	$3,411
Epoxy bolt to tilt-up wall	96	ea	$29.98	$2,878
Weld to US of beam	48	ea	$24.58	$1,180
R11-A				
Demolish hard lid ceiling and 1x1 acoustical tiles back 3 feet for access.	204	sf	$3.34	$681
Install new connections per structural (see above)				
Patch ceiling and install new 1x1 acoustical tiles	204	sf	$17.07	$3,482
R11-B				
Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access.	296	sf	$2.23	$660
Install new connections per structural (see above)				
Reinstall 2x4 ceiling system	296	sf	$4.12	$1,220

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
Electrical allowance expansion joints	1	ls	$15,000.00	$15,000
Total - R11 - Connect Main Building Roof and Gym Wall				**$28,513**
R12 - Connect between Main Building Beam and Gym Wall				
R12				
New connection between new HSS drag beam at main building high roof and gym wall	556	lb	$4.12	$2,291
R12-A				
Remove and salvage exterior soffit panels for access for structural work. Make new beam-column connection per structural (see above)	64	sf	$7.50	$480
Reinstall salvaged exterior soffit panels	64	sf	$23.27	$1,489
Total - R12 - Connect between Main Building Beam and Gym Wall				**$4,260**
R13 - Allowance for New Connections				
R13				
Include allowance for new connections	2,913	lb	$4.12	$12,000
R13-A				
Remove and salvage 2x4 ceiling panels. Disassemble and salvage grid as necessary for access. Install new connections per structural (see above)	572	sf	$0.15	$86
Reinstall 2x4 ceiling system	572	sf	$0.62	$355
Total - R13 - Allowance for New Connections				**$12,440**
N3 - Fire Suppression Piping Seismic Bracing				
N3-A				
Remove and salvage 2x4 ceiling panels for access above ceiling. At hard lid ceilings, cut holes in ceiling for access to sprinkler piping	55,783	sf	$0.15	$8,367
Install sprinkler system bracing per structural	55,783	sf	$1.37	$76,423
Reinstall 2x4 ceiling panels. At hard lid ceilings, patch access holes to match existing finishes	55,783	sf	$0.62	$34,585
At 2x4 grid ceilings, install oversized escutcheons at sprinkler head penetrations	55,783	sf	$0.98	$54,667
R&R Elect in ceilings	55,783	sf	$0.50	$27,892
Total - N3 - Fire Suppression Piping Seismic Bracing				**$201,934**

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
N4 - Drop-in Ceiling Seismic				
N4-A: At nonstructural "position retention" zones noted on sheet CR-02 (zones A and B), provide the following				
Remove and salvage 2x4 ceiling panels for access above ceiling.	55,783	sf	$0.15	$8,367
Install ceiling system bracing per structural.	55,783	sf	$0.50	$27,892
Modify edge details of grid system and install wide edge angle to allow movement per code.	55,783	sf	$0.25	$13,946
Reinstall 2x4 ceiling panels	55,783	sf	$0.62	$34,585
Install oversized escutcheons at sprinkler head penetrations	55,783	sf	$0.98	$54,667
R&R Elect in ceilings	55,783	sf	$0.50	$27,892
Total - N4 - Drop-in Ceiling Seismic				**$167,349**
N5 - Bracing at Interior Masonry Walls and Partitions				
Bracing at interior masonry walls and partitions - allowance	55,783	sf	$0.50	$27,892
Total - N5 - Bracing at Interior Masonry Walls and Partitions				**$27,892**
N6 - Brace Tall Narrow Contents				
Brace tall narrow contents - allowance	55,783	sf	$0.25	$13,946
Total - N6 - Brace Tall Narrow Contents				**$13,946**
N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				
Brace/anchor fall-prone contents over 20 lbs - allowance	55,783	sf	$0.10	$5,578
Total - N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				**$5,578**
N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				
Brace/anchor fall-prone equipment over 20 lbs - allowance	55,783	sf	$0.15	$8,367
Total - N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				**$8,367**

DETAIL ELEMENTS - BUILDING PART B

Element	Quantity	Unit	Unit Cost	Total
N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				
Brace/anchor tall narrow equipment over 6 ft high - allowance	55,783	sf	$0.15	$8,367
Total - N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				**$8,367**
N10 - Brace in-Line Equipment over 75 lb				
Brace in-line equipment over 75 lb - allowance	55,783	sf	$0.20	$11,157
Total - N10 - Brace in-Line Equipment over 75 lb				**$11,157**
N14 - Brace Fluid and Gas Piping				
Pipe bracing	55,783	sf	$0.20	$11,157
Total - N14 - Brace Fluid and Gas Piping				**$11,157**
N15 - Brace Ducts Larger Than 6 sf Cross-Section				
Duct bracing	55,783	sf	$0.20	$11,157
Total - N15 - Brace Ducts Larger Than 6 sf Cross-Section				**$11,157**
Hazmat Abatement Allowance				
Hazmat abatement allowance	55,783	sf	$2.50	$139,458
Total - Hazmat Abatement Allowance				**$139,458**

Building Part C

SUMMARY - BUILDING PART C

	Element		Total	Cost / SF
02	F2 - Demo + CMU Shear Wall		$104,953	$1.59
03	F3 - Shear Wall Footing		$57,307	$0.87
04	F4 - Sheath Wall		$12,540	$0.19
08	F8 - CMU Shear Wall		$206,350	$3.12
16	R5 - Out-of-Plane Connection under Metal Deck		$320,042	$4.84
17	R6 - HSS Drag Tie		$42,103	$0.64
18	R7 - Angle under HSS Drag		$3,885	$0.06
19	R8 - R&R Roofing to Weld Metal Deck to Steel Members		$666,253	$10.08
25	N1 - Bracing above Ceiling at Interior Brick Pilaster		$4,096	$0.06
27	N3 - Fire Suppression Piping Seismic Bracing		$206,132	$3.12
29	N5 - Bracing at Interior Masonry Walls and Partitions		$33,034	$0.50
30	N6 - Brace Tall Narrow Contents		$16,517	$0.25
31	N7 - Brace/Anchor Fall-Prone Contents over 20 lbs		$6,607	$0.10
32	N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs		$9,910	$0.15
33	N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High		$9,910	$0.15
34	N10 - Brace in-Line Equipment over 75 lb		$13,214	$0.20
38	N14 - Brace Fluid and Gas Piping		$13,214	$0.20
39	N15 - Brace Ducts Larger Than 6 sf Cross-Section		$13,214	$0.20
40	Hazmat Abatement Allowance		$165,170	$2.50
	Subtotal		$1,904,450	$28.83
	General Conditions	10.00%	$190,445	$2.88
	Subtotal		$2,094,895	$31.71
	General Requirements	4.00%	$83,796	$1.27
	Subtotal		$2,178,691	$32.98
	Bonds & Insurance	2.00%	$43,574	$0.66
	Subtotal		$2,222,264	$33.64
	Contractor's Fee	5.00%	$111,113	$1.68
	Subtotal		$2,333,378	$35.32
	Design Contingency	20.00%	$466,676	$7.06
	Subtotal		$2,800,053	$42.38
	Escalation to MOC, 08/15/23	8.99%	$251,824	$3.81
	TOTAL ESTIMATED CONSTRUCTION COST		**$3,051,877**	**$46.19**

Total Area: 66,068 SF

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
F2 - Demo + CMU Shear Wall				
F2 - 1/CR-15				
1/CR-15				
At 8' OC				
Continuous 8"Wx12"H concrete cap on new CMU wall	2	cy	$597.79	$934
(2) 3/4" dia stud embeds welded to US of (E) steel beam	14	ea	$3.87	$54
L4x4x5/16 x 8' diagonal bracing welded each end	1,288	lb	$4.12	$5,307
F2, 17' high				
Demo (E) wall and replace with (N) CMU shear wall (8 in. CMU typ uno.)				
Demolish existing wall and replace with CMU wall per structural.	935	sf	$53.44	$49,966
At (E) steel column, weld horiz bars to tie to new CMU wall, typ. 17' high	1,092	lb	$4.12	$4,500
F2-A				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm outlets.	55	sf	$75.00	$4,125
Salvage and reinstall clock and chalkboard in classroom.	1	ls	$150.00	$150
Salvage plastic laminate wainscot panels and demolish aluminum trim on corridor side of wall.	220	sf	$5.00	$1,100
Remove 2x4 ceiling panels and grid back 3 feet each side of wall.	440	sf	$1.11	$488
Install metal furring with painted gypsum board finish each side of wall.	1,870	sf	$13.15	$24,591
Reinstall 2x4 ceiling system.	330	sf	$5.15	$1,700
Patch and polish concrete floor in corridor.	165	sf	$22.44	$3,703
Patch carpeting in classroom.	165	sf	$5.55	$916
Reinstall plastic laminate wainscot panels and install new aluminum trim on corridor side of wall.	220	sf	$5.00	$1,100
Salvage and reinstall doors and frames where occurring (Corridor C120J).	3	ea	$470.51	$1,412
Salvage and reinstall tackboards where occurring (Corridor C120J).	935	sf	$0.25	$234
Recreate mural where occurring (Corridor C120J).	935	sf	$5.00	$4,675
Total - F2 - Demo + CMU Shear Wall				**$104,953**
F3 - Shear Wall Footing				
F3				
Provide (N) concrete strip footing to support (N) CMU shear wall. assume min 18in thickness and 36in width uno. provide 250 lb/cy reinforcing. demo and rebuild (E) slab as required for installation of wall and reconstruct after installation of wall.				
Sawcut and remove concrete floor slab	852	sf	$5.69	$4,848
Excavate for new footing.	95	cy	$46.14	$4,368
Reinforcing	9,763	lb	$1.62	$15,815
Form and place concrete footing	39	cy	$420.03	$16,402
Backfill footing	45	cy	$17.02	$768
Infill concrete floor slab	852	sf	$17.73	$15,106
Total - F3 - Shear Wall Footing				**$57,307**

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
F4 - Sheath Wall				
F4				
Provide new sureboard sheathing (one side only) from ground floor to underside of fan room floor. provide additional connections from (E) metal stud framing to slab below, floor above and steel posts at ends of walls				
F4-A				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.	1,105	sf	$5.00	$5,525
Salvage and reinstall clock (Teacher Planning D101)	1	ea	$50.00	$50
Demolish existing gypsum board finish on one side of wall.	1,105	sf	$0.60	$663
Remove 2x4 ceiling panels and grid back 3 feet.	260	sf	$1.11	$289
Install SureBoard on wall framing per structural	1,105	sf	$4.23	$4,674
Reinstall 2x4 ceiling system	260	sf	$5.15	$1,339
Total - F4 - Sheath Wall				**$12,540**
F8 - CMU Shear Wall				
F8 - 1A/CR-15				
Provide (N) CMU shear wall (8 in. CMU typ uno.) adjacent to (E) wall				
1A/CR-15				
At 8' OC				
Continuous 12"Wx12"H concrete cap on new CMU wall	4	cy	$597.79	$2,139
(2) 3/4" dia stud embeds welded to US of (E) steel beam	22	ea	$3.87	$85
L4x4x5/16 x 8' diagonal bracing welded each end	2,024	lb	$4.12	$8,339
F8, 8" wall, 17' high				
Provide (N) CMU shear wall (8 in. CMU typ uno.) adjacent to (E) wall	2,992	sf	$34.25	$102,476
At (E) steel column, weld horiz bars to tie to new CMU wall, typ.	176	lf	$4.12	$725
F8-A				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.	149	lf	$50.00	$7,450
Remove 2x4 ceiling panels and grid back 3 feet.	596	sf	$1.11	$662
Sawcut and remove concrete floor slab along length of wall. Excavate for new footing.	596	sf	$5.69	$3,391
Salvage plastic laminate wainscot panels and demolish aluminum trim.	2,533	sf	$0.35	$887
Demolish existing gypsum board finish on one side of wall and construct adjacent CMU wall per structural.	2,533	sf	$0.60	$1,520
Install metal furring with painted gypsum board finish.	2,533	sf	$13.15	$33,309
Reinstall 2x4 ceiling system.	596	sf	$5.15	$3,069
Patch and polish concrete floor.	596	sf	$22.44	$13,374
Reinstall plastic laminate wainscot panels and install new aluminum trim	2,533	sf	$1.05	$2,660
F8-B				
Demolish decorative brick pier	1	ea	$510.00	$510
Install new decorative brick pier after completion of new shear wall	1	ea	$1,700.00	$1,700

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
F8-C				
Salvage and reinstall miscellaneous electrical outlets, switches, data outlets, fire alarm devices.	68	lf	$50.00	$3,400
Remove 2x4 ceiling panels and grid back 3 feet.	272	sf	$1.11	$302
Sawcut and remove concrete floor slab along length of wall. Excavate for new footing.	272	sf	$5.69	$1,548
Demolish existing gypsum board finish on one side of wall and construct adjacent CMU wall per structural.	1,156	sf	$0.60	$694
Install metal furring with painted gypsum board finish.	1,156	sf	$13.15	$15,201
Reinstall 2x4 ceiling system.	272	sf	$5.15	$1,401
Patch carpeting	272	sf	$5.55	$1,510
Total - F8 - CMU Shear Wall				**$206,350**
R5 - Out-of-Plane Connection under Metal Deck				
R5				
New out-of-plane connection and continuity ties (3 x 3 x 1/4 angle at 8 ft max spacing) At underside of metal deck.	10,825	lb	$4.12	$44,598
1/CR-19				
(1) at each R5 location				
(1) L3x3x1/4 x 8' long angles, welded each end	2,344	lb	$4.12	$9,658
(1) PL3/8 x 12"x6" welded to truss top chord	458	lb	$4.12	$1,886
(1) PL1/2 x 12"x6"	611	lb	$4.12	$2,515
(1) PL3/8 x 6"x6" knife plate w/ (2) 7/8" drilled holes, welded to 12x6 plate	229	lb	$4.12	$943
(2) 3/4" epoxy anchors	104	ea	$29.98	$3,118
R5 - 1/CR-17				
1/CR-17				
Per location				
PL1/2 x 12"x48" (assumed) welded to HSS, w/ (24) 7/8" holes	282	lb	$4.12	$1,161
Pack grout into cells in wall	3	ls	$150.00	$450
(24) 3/4" epoxy anchors into grout	72	ea	$29.98	$2,159
R5 - 1/CR-21				
1/CR-21				
(1) location total				
Continuous 8"Wx12"H concrete cap on new CMU wall	1	cy	$597.79	$526
(2) 3/4" dia stud embeds welded to US of (E) steel beam	8	ea	$3.87	$31
L4x4x5/16 x 8' diagonal bracing welded each end	736	lb	$4.12	$3,032
R5-A				
Demolish hard lid ceiling and 1x1 acoustical tiles (where occurring). Remove and salvage lighting for access to underside of roof deck.	394	sf	$4.45	$1,753
Install steel members at underside of roof deck per structural (see above)				
Patch ceiling, install new 1x1 acoustical tiles (where occurring), and reinstall lighting.	394	sf	$22.10	$8,707

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
R5-B				
Remove and salvage 2x4 ceiling panels. Disassemble ceiling grid and salvage lighting as necessary for structural work.	13,528	sf	$2.23	$30,167
Install steel members at underside of roof deck per structural (see above)				
Reinstall 2x4 ceiling system and lighting	13,528	sf	$9.15	$123,781
Remove and replace grilles, registers, and diffusers outlets with new including flex duct	394	sf	$1.85	$729
R&R grilles, registers, and diffusers outlets	13,528	sf	$0.95	$12,852
R&R Electrical allowance in ceiling R5-A	394	sf	$11.00	$4,334
R&R Electrical allowance in ceiling R5-B	13,528	sf	$5.00	$67,640
Total - R5 - Out-of-Plane Connection under Metal Deck				**$320,042**
R6 - HSS Drag Tie				
R6				
New HSS 3 1/2 x 2 1/2 x 3/8 (assumed) drag tie at underside of metal deck.	3,079	lb	$4.12	$12,686
2/CR-21				
Continuous 8"Wx8"H concrete cap on new CMU wall	4	cy	$597.79	$2,381
(2) 3/4" dia stud embeds welded to US of new R6 HSS drag beam @ 2' OC	220	ea	$3.87	$851
L4x4x5/16 x 8' diagonal bracing welded each end @ 8' OC	5,152	lb	$4.12	$21,226
R6 - 2/CR-15				
New HSS 3 1/2 x 2 1/2 x 3/8 (assumed) drag tie at underside of metal deck.	518	lb	$4.12	$2,133
2/CR-15				
PL1/2 x 3"x6" (assumed) steel tabs, w/ 7/8" holes welded to HSS 2' OC	56	lb	$4.12	$230
3/4" epoxy anchors to concrete walls, 2' OC	19	ea	$29.98	$570
R6				
New HSS 3 1/2 x 2 1/2 x 3/8 (assumed) drag tie at underside of metal deck.	392	lb	$4.12	$1,615
4/CR-21				
At (1) R6 location				
Continuous 8"Wx8"H concrete cap on new CMU wall	1	cy	$597.79	$303
(2) 3/4" dia stud embeds welded to US of new R6 HSS drag beam @ 2' OC	28	ea	$3.87	$108
Total - R6 - HSS Drag Tie				**$42,103**

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
R7 - Angle under HSS Drag				
R7				
New 2 1/2 x 2 1/2 x 1/4 steel angle at underside of HSS drag to support drag (at 8 ft max spacing). Weld angles to underside of top chord of (E) truss joist				
3/CR-21				
At each R7 location				
(10) lf L2 1/2x2 1/2x/14, welded to HSS and to US of truss top chord each end	943	lb	$4.12	$3,885
Total - R7 - Angle under HSS Drag				**$3,885**
R8 - R&R Roofing to Weld Metal Deck to Steel Members				
R8				
Remove roofing and weld (E) deck to new steel members @ 12 in. o.c.	14,365	sf	$5.68	$81,593
R8 1/CR-19				
1/CR-19				
(1) L3x3x1/4 x 8' long angles, welded each end	349	lb	$4.12	$1,439
(1) PL3/8 x 12"x6" welded to truss top chord	35	lb	$4.12	$145
(1) PL1/2 x 12"x6"	47	lb	$4.12	$193
(1) PL3/8 x 6"x6" knife plate w/ (2) 7/8" drilled holes, welded to 12x6 plate	18	lb	$4.12	$73
(2) 3/4" epoxy anchors	8	ea	$29.98	$240
R8 1/CR-20				
1/CR-20				
(2) locations total				
New steel brackets @ 4' OC, approximately 1'x1'-6"	86	lb	$4.12	$355
Epoxy bolt to tilt-up wall	34	ea	$29.98	$1,019
Weld to US of beam	17	ea	$24.58	$418
R8-B				
Salvage and reinstall rooftop mechanical equipment and roof drains.	14,365	sf	$5.00	$71,825
Demolish roofing to steel deck and weld deck to steel members per structural.	14,365	sf	$5.68	$81,593
Patch roof with new deck sheathing, vapor retarder, insulation (match existing R-18 thickness), cover board, and 2-ply SBS roofing	14,365	sf	$22.40	$321,776
R&R AC units for new roofing	14,365	sf	$0.80	$11,492
R&R roof drains and flashing at pipe penetrations	14,365	sf	$0.55	$7,901
R&R Electrical on roof	14,365	sf	$6.00	$86,190
Total - R8 - R&R Roofing to Weld Metal Deck to Steel Members				**$666,253**

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
N1 - Bracing above Ceiling at Interior Brick Pilaster				
N1				
At interior brick pilaster without steel column, provide bracing above ceiling	973	lb	$4.12	$4,009
N1-A				
Remove and salvage 2x4 ceiling panels for access above ceiling.	112	sf	$0.15	$17
Install bracing at brick pilaster per structural (see above)				
Reinstall 2x4 ceiling panels	112	sf	$0.62	$69
Total - N1 - Bracing above Ceiling at Interior Brick Pilaster				**$4,096**
N3 - Fire Suppression Piping Seismic Bracing				
N3-A				
Remove and salvage 2x4 ceiling panels for access above ceiling. At hard lid ceilings, cut holes in ceiling for access to sprinkler piping	66,068	sf	$0.15	$9,910
Install sprinkler system bracing per structural	66,068	sf	$1.37	$90,513
Reinstall 2x4 ceiling panels. At hard lid ceilings, patch access holes to match existing finishes	66,068	sf	$0.62	$40,962
At 2x4 grid ceilings, install oversized escutcheons at sprinkler head penetrations	66,068	sf	$0.98	$64,747
Total - N3 - Fire Suppression Piping Seismic Bracing				**$206,132**
N5 - Bracing at Interior Masonry Walls and Partitions				
Bracing at interior masonry walls and partitions - allowance	66,068	sf	$0.50	$33,034
Total - N5 - Bracing at Interior Masonry Walls and Partitions				**$33,034**
N6 - Brace Tall Narrow Contents				
Brace tall narrow contents - allowance	66,068	sf	$0.25	$16,517
Total - N6 - Brace Tall Narrow Contents				**$16,517**
N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				
Brace/anchor fall-prone contents over 20 lbs - allowance	66,068	sf	$0.10	$6,607
Total - N7 - Brace/Anchor Fall-Prone Contents over 20 lbs				**$6,607**

DETAIL ELEMENTS - BUILDING PART C

Element	Quantity	Unit	Unit Cost	Total
N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				
Brace/anchor fall-prone equipment over 20 lbs - allowance	66,068	sf	$0.15	$9,910
Total - N8 - Brace/Anchor Fall-Prone Equipment over 20 lbs				**$9,910**
N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				
Brace/anchor tall narrow equipment over 6 ft high - allowance	66,068	sf	$0.15	$9,910
Total - N9 - Brace/Anchor Tall Narrow Equipment over 6 ft High				**$9,910**
N10 - Brace in-Line Equipment over 75 lb				
Brace in-line equipment over 75 lb - allowance	66,068	sf	$0.20	$13,214
Total - N10 - Brace in-Line Equipment over 75 lb				**$13,214**
N14 - Brace Fluid and Gas Piping				
Pipe bracing	66,068	sf	$0.20	$13,214
Total - N14 - Brace Fluid and Gas Piping				**$13,214**
N15 - Brace Ducts Larger Than 6 sf Cross-Section				
Duct bracing	66,068	sf	$0.20	$13,214
Total - N15 - Brace Ducts Larger Than 6 sf Cross-Section				**$13,214**
Hazmat Abatement Allowance				
Hazmat abatement allowance	66,068	sf	$2.50	$165,170
Total - Hazmat Abatement Allowance				**$165,170**

Building Part D

SUMMARY - BUILDING PART D

Element		Total	Cost / SF
01 F1 - Connect Tilt-up Walls to Foundations		$300	$0.04
06 F6 - Anchor Columns		$720	$0.09
07 F7 - Strengthen Portal Frames		$3,896	$0.48
Subtotal		$4,916	$0.61
General Conditions	10.00%	$492	$0.06
Subtotal		$5,407	$0.67
General Requirements	4.00%	$216	$0.03
Subtotal		$5,623	$0.69
Bonds & Insurance	2.00%	$112	$0.01
Subtotal		$5,736	$0.71
Contractor's Fee	5.00%	$287	$0.04
Subtotal		$6,023	$0.74
Design Contingency	20.00%	$1,205	$0.15
Subtotal		$7,227	$0.89
Escalation to MOC, 08/15/23	8.99%	$650	$0.08
TOTAL ESTIMATED CONSTRUCTION COST		**$7,877**	**$0.97**

Total Area: 8,100 SF

DETAIL ELEMENTS - BUILDING PART D

Element	Quantity	Unit	Unit Cost	Total
F1 - Connect Tilt-up Walls to Foundations				
F1 Remove and reinstall bench	2	ea	$150.00	$300
Total - F1 - Connect Tilt-up Walls to Foundations				**$300**
F6 - Anchor Columns				
F6				
At base of (E) columns at covered play area, provide two new anchor bolts. drill & epoxy into (E) foundation	16	ea	$37.47	$600
F6-A				
Paint bolts where exposed to view	16	ea	$7.50	$120
Total - F6 - Anchor Columns				**$720**
F7 - Strengthen Portal Frames				
F7				
At (E) portal frames, provide new steel plates and welds to strengthen portal frame moment connections	800	lb	$4.12	$3,296
F7-A				
Remove paint from existing steel structure where new steel plates are to be installed.	40	lf	$10.00	$400
Paint new steel plates	40	lf	$5.00	$200
Total - F7 - Strengthen Portal Frames				**$3,896**