

6.7 Overturning – Priority 3

The ratio of the least horizontal dimension of the lateral force resisting system at the base to the building height (length/height) must be greater than 0.6 times the spectral response acceleration. This check is for localized concentrations of forces in foundation elements and soils. If there are well-connected ties between lateral elements, then a larger horizontal dimension can be used and this deficiency is likely mitigated. This deficiency has a high likelihood to be mitigated by either demonstrating that there is a connecting element capable of transferring the required seismic forces between lateral elements or through calculations to check the foundations and soils. This would be done in Tier 2.

6.8 Liquefaction – Priority 3

As noted in section 4.2, the site lies within a zone of potential liquefaction. No soils information is known nor has a recent geotechnical investigation been performed.

6.9 Diaphragm Continuity – Priority 3

The diaphragms are composed of split-level floors and have differences in elevations. Split-level floors and roofs create discontinuities in the diaphragm and can lead to increased lateral deflection and reduced stability if the diaphragm is not supported on at least 3 sides.

6.10 Roof Chord Continuity – Priority 3

Chord elements are not continuous through changes in roof elevation. Diaphragms with discontinuous chords are more flexible and could experience more damage around the perimeter than properly detailed diaphragms.

6.11 Cross Ties – Priority 3

Continuous cross-ties between diaphragm chords are not present due to the offsets in height between roof levels. Cross ties are needed to develop out-of-plane wall forces into the diaphragm and to help keep the walls from separating from the building.

6.12 Other Items Noted

There is evidence of water stains on acoustical tile ceiling which may indicate leaks in the roofing and the potential for damage in structural members due to water. The leaks were not widespread and are likely only in localized areas.

The building's irregular shape and height offsets creates some possible reentrant corners. Some conditions may not be an issue where there are walls on all sides to help reduce lateral deflection and damage, while other conditions with large windows may act more flexible and could experience more damage. This would be studied further in Tier 2.

7 Conclusions

The existing community center does not meet Possible Post Earthquake Performance. A reinforced building meeting Collapse Prevention performance level could see crushing and extensive cracking in the masonry walls. Wood walls could see damage and significant lateral deflection. There could be damage around openings and at corners. Secondary elements such as windows and doors could be shattered and stucco finishes could have extensive cracking. There could be extensive permanent drift and extensive damage to nonstructural elements. MLK Jr. Community Center is nearly 56 years old; seismic demands have increased and detailing demands have become more stringent since the original construction. Retrofits are suggested to meet the Structural Performance Level (see Appendix A) A Tier 2 should be performed. The Tier 1 criteria are conservative. Some of the non-compliant structural items may be shown to be compliant by a Tier 2 evaluation.

Thank you for the opportunity to be of service.
Please call with any questions.
IDA Structural Engineers, Inc.

Ian Dickson

Elliott Goodwin, P.E.

Stephen DeJesse, S.E.
President

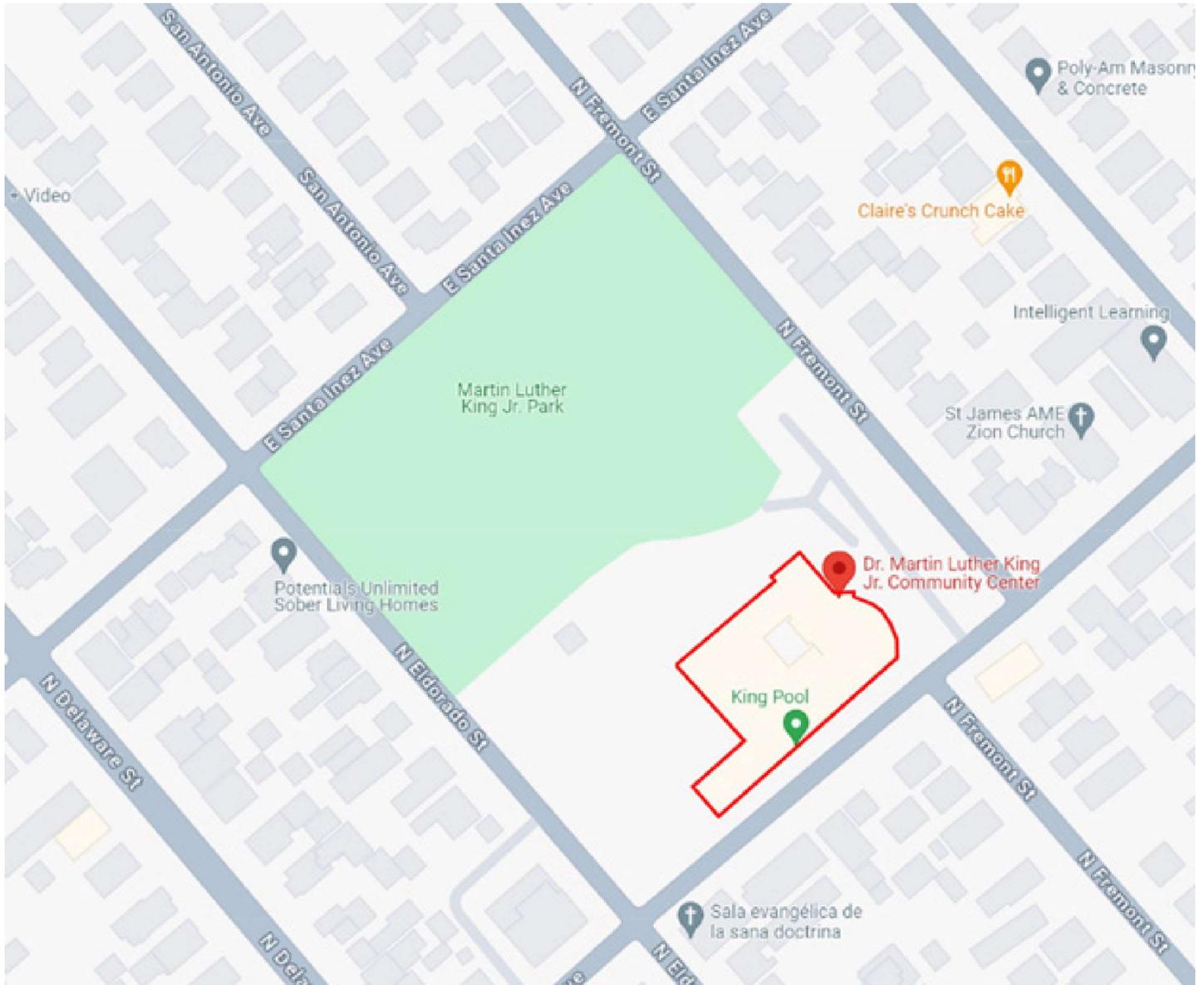
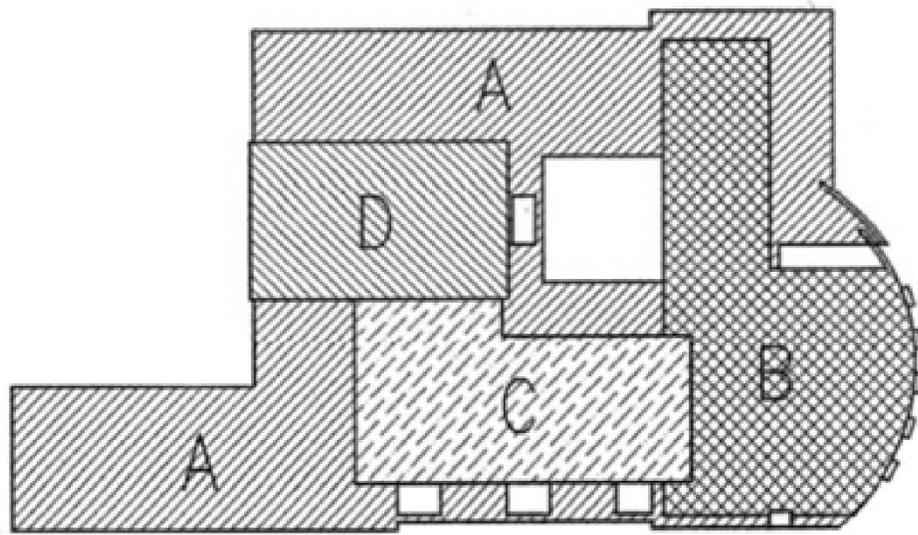
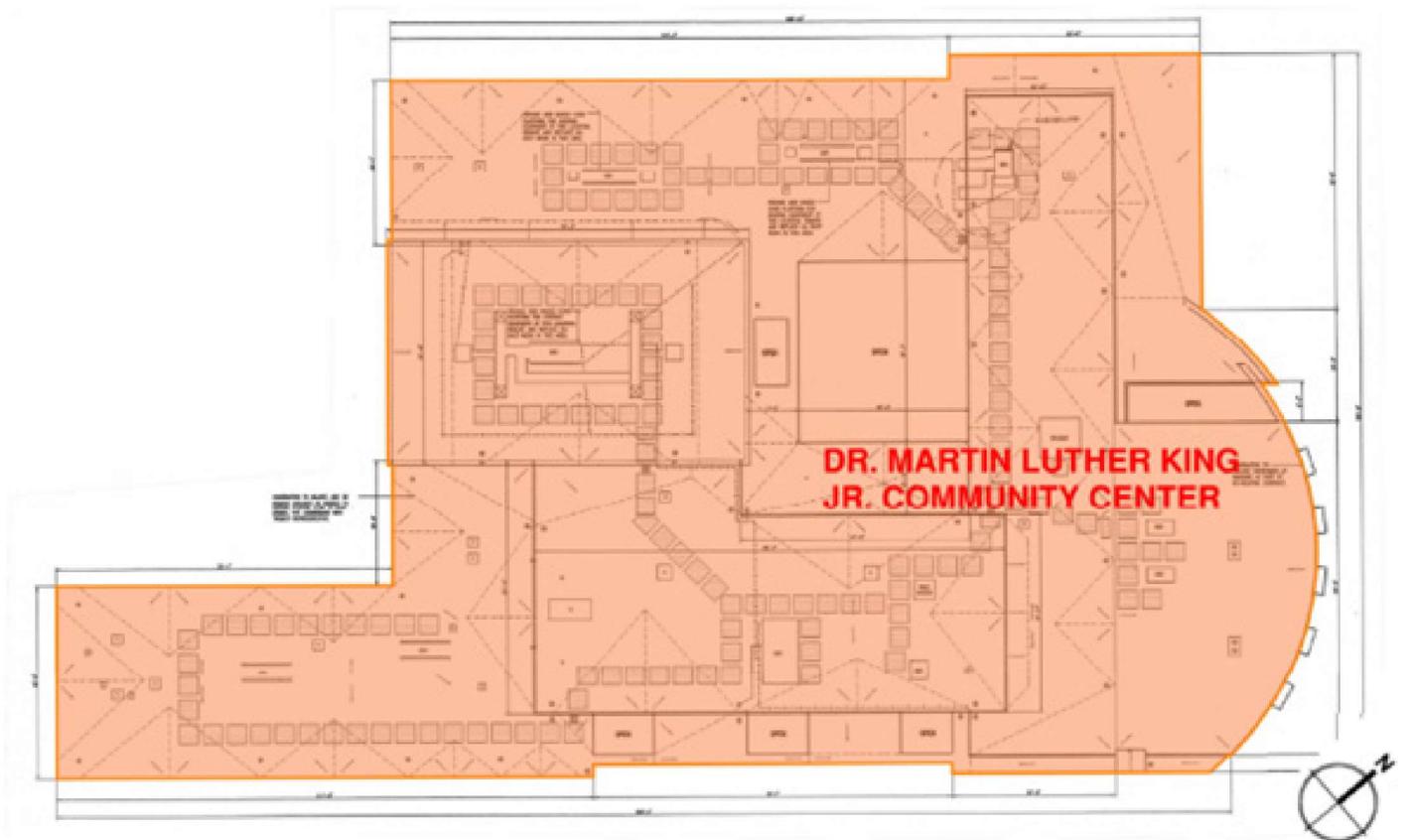


Figure 1. Proximity map of site



A (LOWEST ROOF LEVEL)
 B
 C (ROOF ACCESS LEVEL)
 D (HIGHEST ROOF LEVEL)

KEY MAP

SCALE: N.T.S.

Figure 2. Site Plan

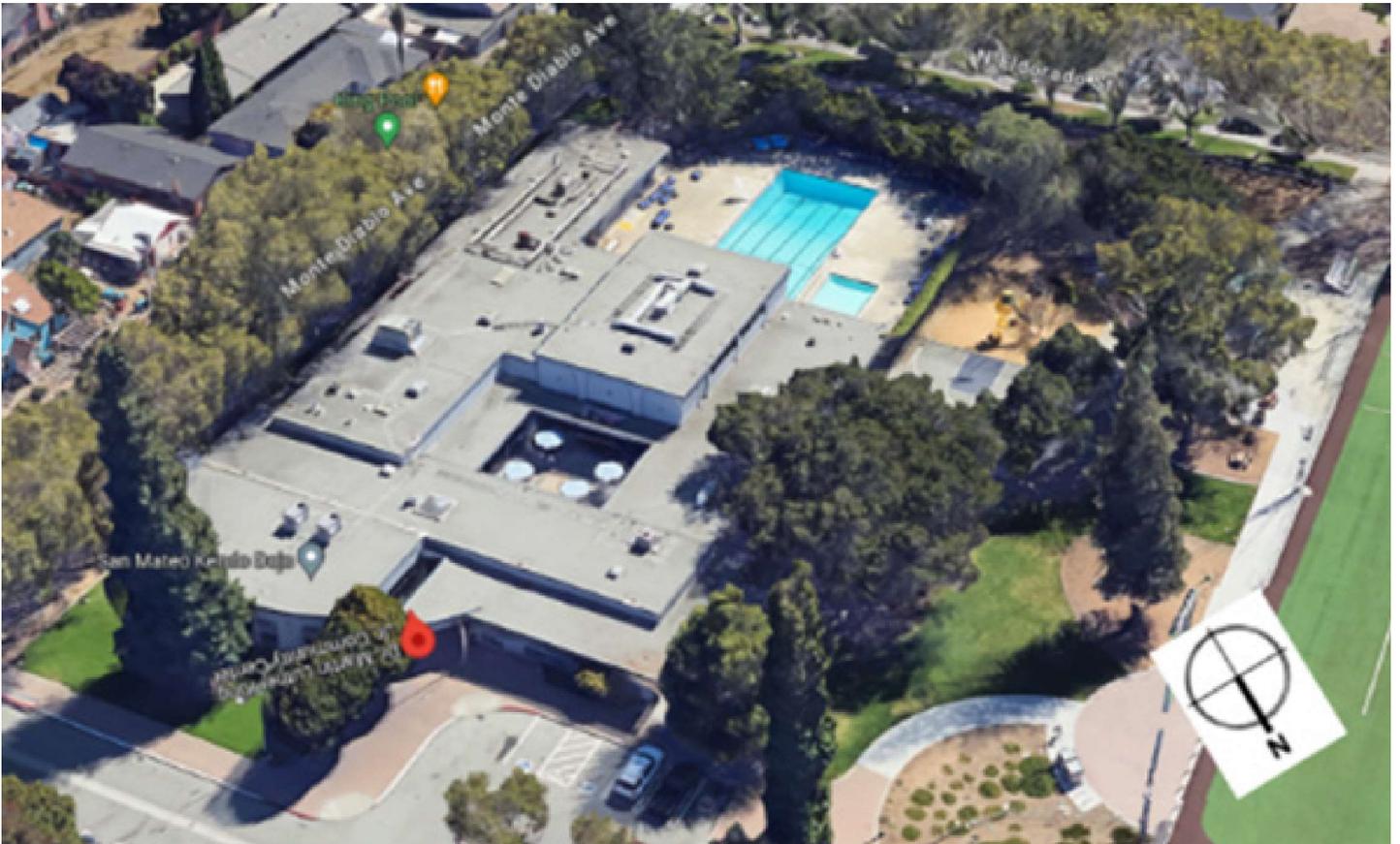
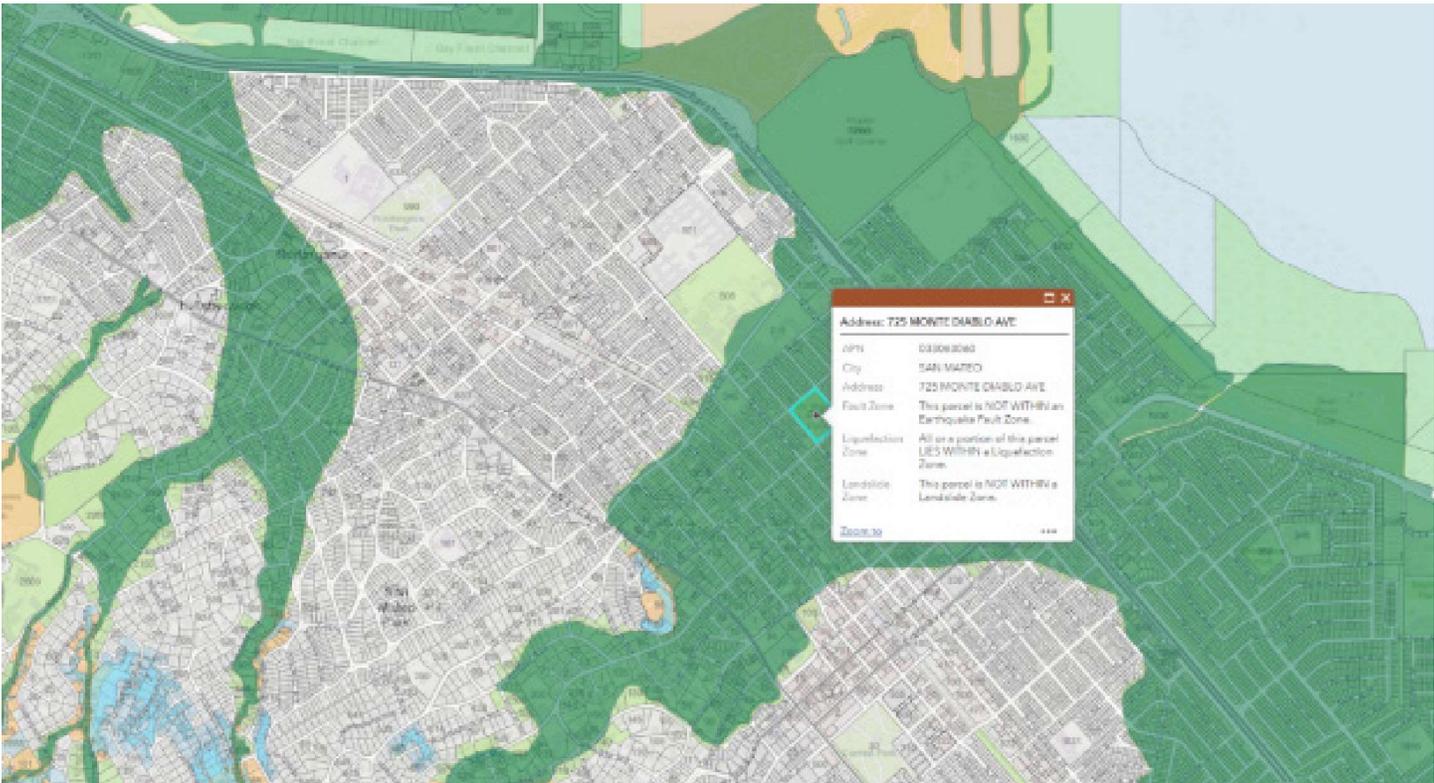


Figure 3. Aerial View



□
✕

Address: 725 MONTE DIABLO AVE

APN	033063060
City	SAN MATEO
Address	725 MONTE DIABLO AVE
Fault Zone	This parcel is NOT WITHIN an Earthquake Fault Zone.
Liquefaction Zone	All or a portion of this parcel LIES WITHIN a Liquefaction Zone.
Landslide Zone	This parcel is NOT WITHIN a Landslide Zone.

[Zoom to](#) ● ● ●

Figure 4. CGS Zoning Map of Seismic Hazards



Figure 5. View of Building from Pools Looking Towards High Roof



Figure 6. Image of Auditorium

5b. Appendix A



Structural Cost Estimate Narrative and Conceptual Retrofits

Structural Improvements Narrative

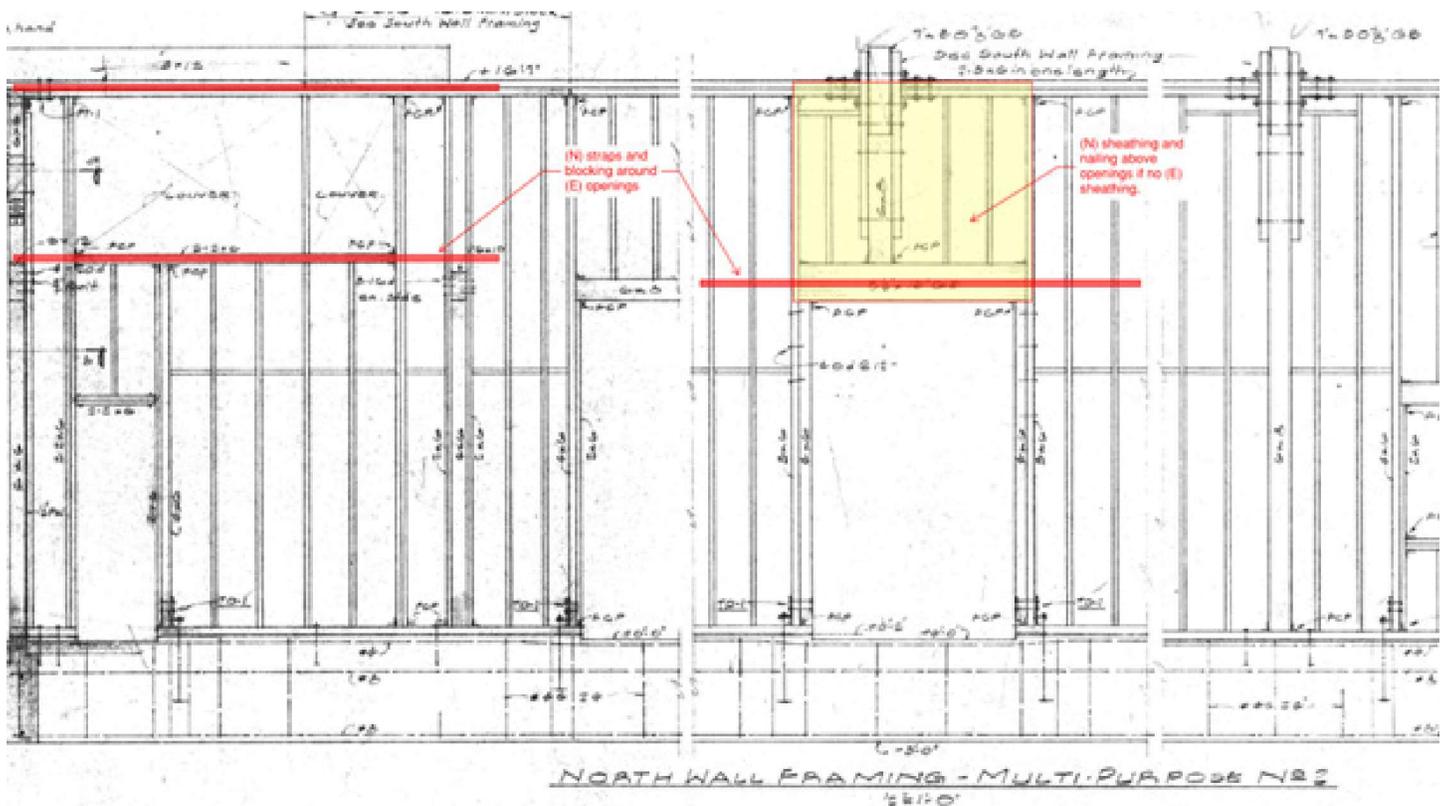
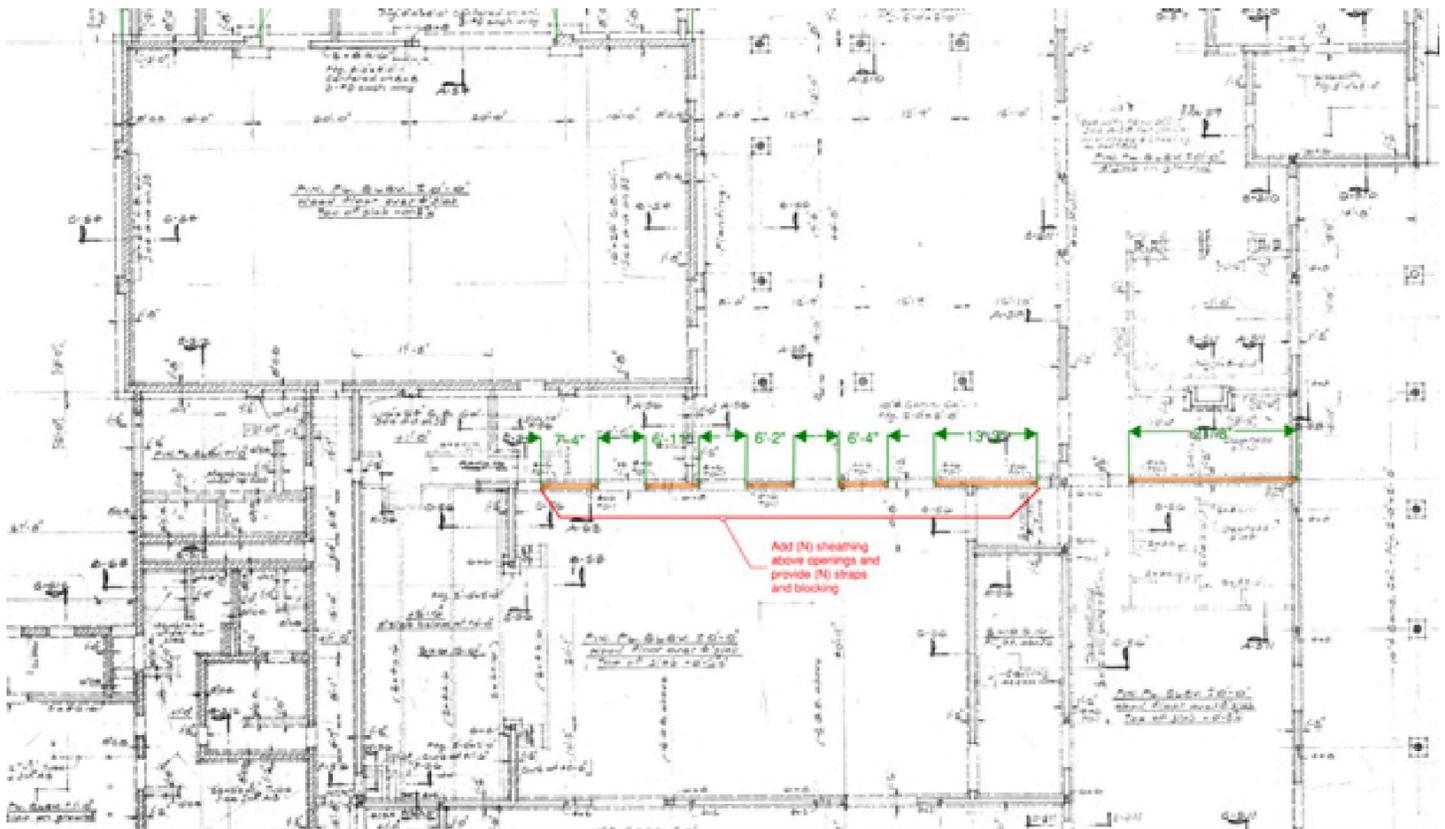
This document provides a preliminary narrative for structural improvements to the Martin Luther King Jr. Community Center. The intent with these descriptions is to inform a preliminary cost estimate.

Basis of these improvements is:

- an ASCE 41-17 Tier 1 analysis. This analysis is ongoing. The improvements are sorted in to buckets based on structural priority. The Basic Performance Objective for Existing Buildings was used as the basis for the analysis. More information will be provided in a Tier 1 report to be issued in March 2024.
- observations made in the field based on the existing condition of the structure that are outside the scope of an ASCE 41 analysis.

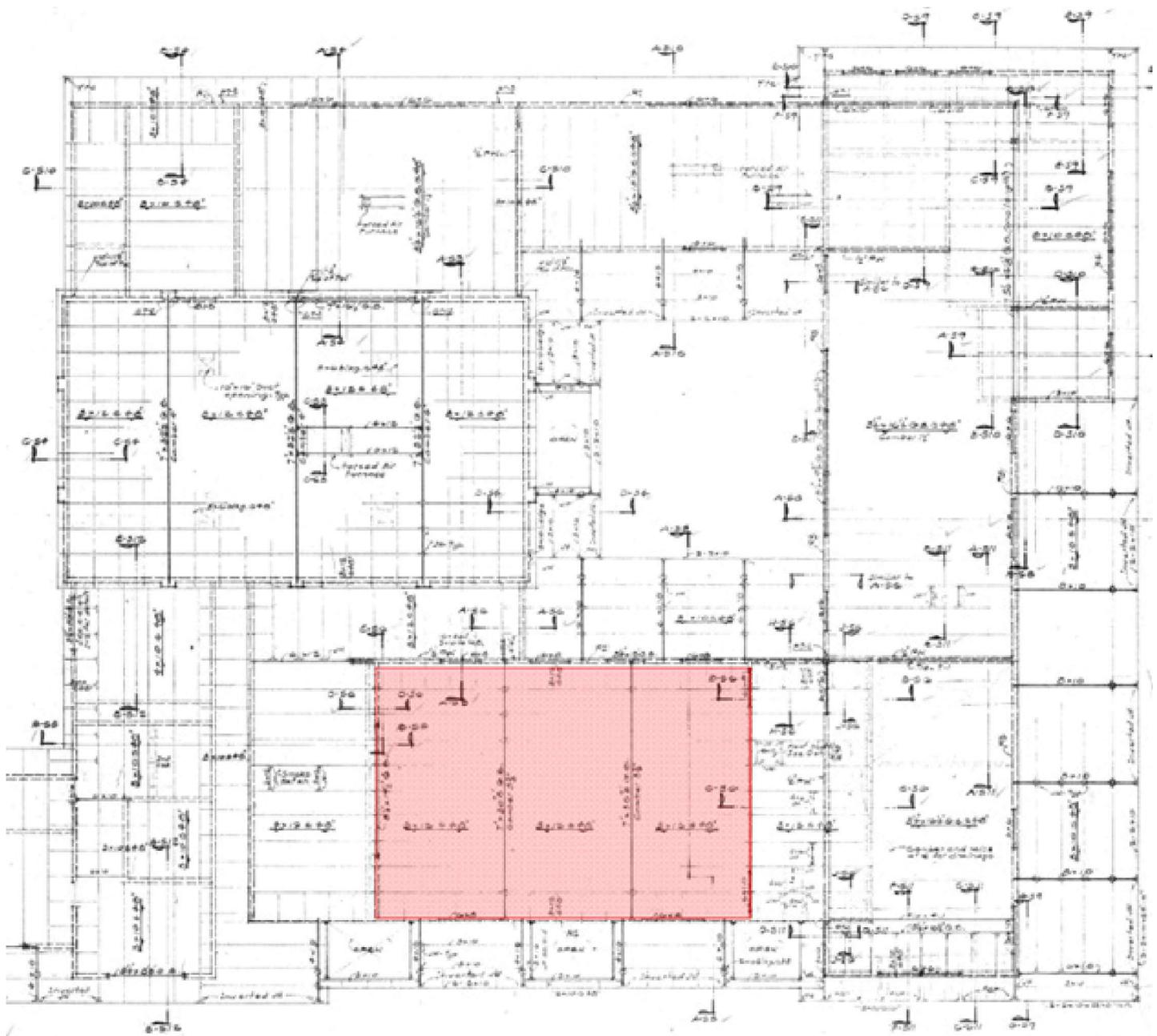
Item 2 – Add sheathing around openings and straps at shear walls (Priority 2)

Provide new sheathing and/or nailing around existing openings unless already sheathed. Add straps above and below openings in and adjacent to existing narrow shear walls.



Item 3 – Re-sheath Multipurpose room roof (Priority 2)

Add new 5/8" sheathing over existing sheathing in the shaded area shown.

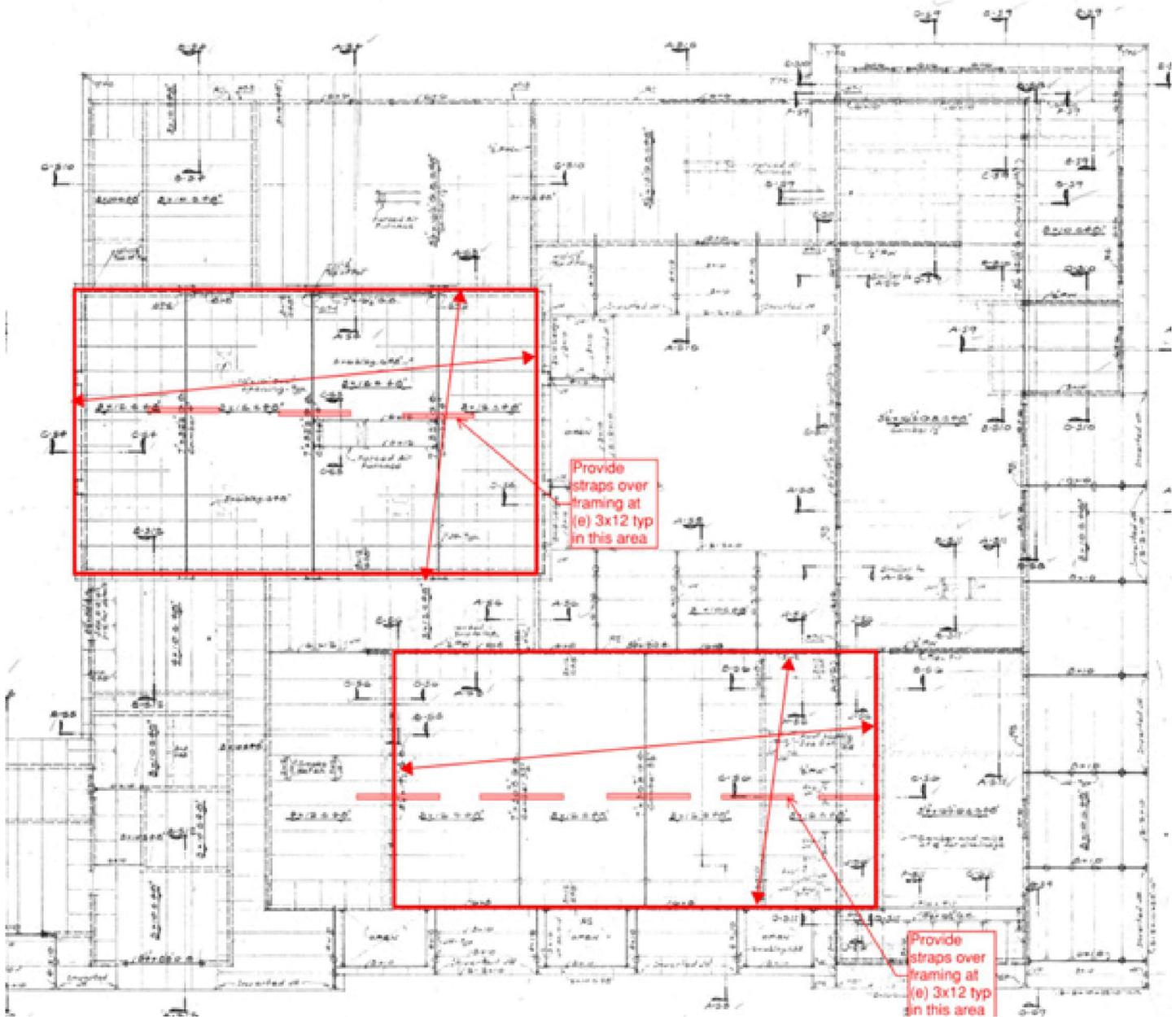


Item 4 – Add nailing and new tie-downs at wood shear walls (Priority 2)

Add new nailing at existing plywood sheathed and wood framed walls. At plywood sheathed walls without tiedowns, add a new tiedown at each end of wall and attach to either new or existing 4x6 posts continuous from sill plate to top plate. New tiedowns shall be drilled and epoxied into existing foundations.

Item 5 – Provide new straps over multipurpose room roofs (Priority 2)

Install new straps across (E) 3x12 framing over multipurpose room roofs.



5C. Appendix B



Building Checklists and Quick Check Calculations



Date: 02/27/2024
By: ITD
Project: MLK Jr. Community Center

Page:
Job #: 23076

MLK Jr. Community Center ASCE 41-17 Tier 1

Evaluate the BPOE with the BSE-2E at S-5 Structural Performance Level (Collapse Prevention) and N-D Non structural performance Level (Hazards Reduced)

Compliance with BSE-2E implies compliance with BSE-1E 3-C Performance Objective (Life Safety Structural Non structural)

Seismic Parameters for Performance Objectives:
Per Seismic Design Maps and ASCE 41-17:

$$S_s := 1.706$$

$$S_l := 0.686$$

$$S_{XS} := 2.047$$

$$S_{XI} := 1.165$$

Building type

W1 / RM1

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout error*.
 USGS web services are now operational so this tool should work as expected.



MLK Jr. Community Center

725 Monte Diablo Ave, San Mateo, CA 94401, USA

Latitude, Longitude: 37.5736226, -122.3246579



Date	2/21/2024, 4:29:42 PM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Default (See Section 11.4.3)

Type	Description	Value
Hazard Level		BSE-2N
S _S	spectral response (0.2 s)	1.842
S ₁	spectral response (1.0 s)	0.754
S _{XS}	site-modified spectral response (0.2 s)	2.21
S _{X1}	site-modified spectral response (1.0 s)	1.282
F _a	site amplification factor (0.2 s)	1.2
F _v	site amplification factor (1.0 s)	1.7
ssuh	max direction uniform hazard (0.2 s)	2.461
crs	coefficient of risk (0.2 s)	0.897
ssrt	risk-targeted hazard (0.2 s)	2.206
ssd	deterministic hazard (0.2 s)	1.842
s1uh	max direction uniform hazard (1.0 s)	1.029
cr1	coefficient of risk (1.0 s)	0.886
s1rt	risk-targeted hazard (1.0 s)	0.911
s1d	deterministic hazard (1.0 s)	0.754

Type	Description	Value
Hazard Level		BSE-1N
S _{XS}	site-modified spectral response (0.2 s)	1.474
S _{X1}	site-modified spectral response (1.0 s)	0.855

Type	Description	Value
Hazard Level		BSE-2E
S _S	spectral response (0.2 s)	1.706
S ₁	spectral response (1.0 s)	0.686
S _{XS}	site-modified spectral response (0.2 s)	2.047
S _{X1}	site-modified spectral response (1.0 s)	1.165
f _a	site amplification factor (0.2 s)	1.2
f _v	site amplification factor (1.0 s)	1.7

Type	Description	Value
Hazard Level		BSE-1E
S _S	spectral response (0.2 s)	0.793
S ₁	spectral response (1.0 s)	0.291
S _{XS}	site-modified spectral response (0.2 s)	0.951
S _{X1}	site-modified spectral response (1.0 s)	0.587
F _a	site amplification factor (0.2 s)	1.2
F _v	site amplification factor (1.0 s)	2.018

Type	Description	Value
Hazard Level		TL Data
T-Sub-L	Long-period transition period in seconds	12

DISCLAIMER

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Determine T

Coefficient to determine building period $C_t := 0.020$

Height in feet above the base to the roof level $h_n := 15 \text{ ft}$

$$\beta := 0.75$$

Fundamental period of vibration of the building, calculated in accordance with Section 4.5.2.4 $T := C_t \cdot \left(\frac{h_n}{1 \text{ ft}} \right)^\beta = 0.152$

Per 7.2.3.6, beta (damping) is the default 5% $\beta := 0.05$

Per 2.4.1.7.1, horizontal response spectrum $B_I := \frac{4}{(5.6 - \ln(100 \cdot \beta))} = 1.002$

For periods between T_0 and long period (i.e along the flat line), Spectral Response Acceleration uses this eqn:

$$S_a := \left(\frac{S_{XS}}{B_I} \right) = 2.04$$

$$T_S := \frac{S_{Xl}}{S_{XS}} = 0.57$$

$$T_0 := 0.2 \cdot \frac{S_{Xl}}{S_{XS}} = 0.11$$

$$T_L := 8$$

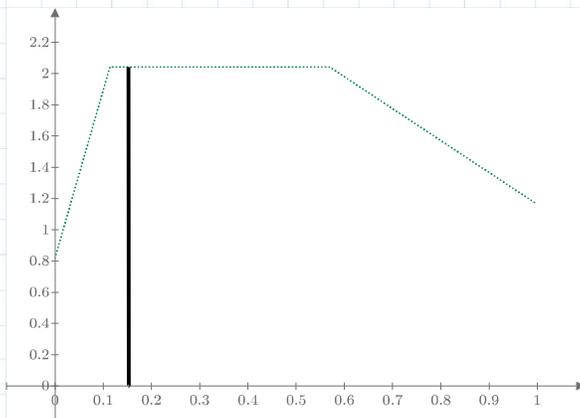
Periods shorter than T_0 not allowed to be used, unless dynamic analysis



$$ResponseSpectra_{BSE2N} := \begin{bmatrix} 0 & 0.4 \cdot S_{XS} \\ T_0 & \frac{S_{XS}}{B_I} \\ T_S & \frac{S_{XS}}{B_I} \\ 1 & \frac{S_{XI}}{B_I} \end{bmatrix} = \begin{bmatrix} 0 & 0.82 \\ 0.11 & 2.04 \\ 0.57 & 2.04 \\ 1 & 1.16 \end{bmatrix}$$

Leave off tail to T_L

$$Period := \begin{bmatrix} T & 0 \\ T & \max(ResponseSpectra_{BSE2N}^{(2)}) \end{bmatrix} = \begin{bmatrix} 0.15 & 0 \\ 0.15 & 2.04 \end{bmatrix}$$



$ResponseSpectra_{BSE2N}^{(2)}$

$Period^{(2)}$

$ResponseSpectra_{BSE2N}^{(1)}$

$Period^{(1)}$



Torsion:

Estimated distance btwn story center of mass and story center of rigidity not less than 20% of the building width in either direction

Due to the irregular shape and layout of the building, the distance between center of mass and center of rigidity is expected as greater than 20% of the building width by inspection.
Therefore Torsion Deficiency Exists.

Overturning:

Minimum horizontal dimension of CMU shear walls

$$length := 17.5 \text{ ft}$$

Lots of length of masonry shear walls. Choose shorter shear walls at gym at very tall walls

$$h_n := 21 \text{ ft}$$

$$Overturning := \text{if} \left(\frac{length}{h_n} > 0.6 \cdot S_d, \text{"Compliant"}, \text{"Non Compliant"} \right)$$

$$Overturning = \text{"Non Compliant"}$$

Therefore overturning deficiency exists.



Reinforcing Steel:

$$VertRatio := \frac{0.2 \text{ in}^2}{16 \text{ in} \cdot 8 \text{ in}} = 0.0016 \quad \#4 @ 16" \text{ OC vert wall bars}$$

$$HorizRatio := \frac{0.2 \text{ in}^2}{16 \text{ in} \cdot 8 \text{ in}} = 0.0016 \quad \#4 @ 16" \text{ OC horiz wall bars}$$

$$TotalReinfRatio := \text{if}(VertRatio + HorizRatio > 0.002, \text{"Compliant"}, \text{"Non Compliant"})$$

$$TotalReinfRatio = \text{"Compliant"}$$

Minimum of 0.0007 in either direction is met. Spacing of reinf less than 48".
Therefore, compliant



Narrow Wood Shear Walls

$length := 6 \text{ ft}$

taken as the shortest wood shear wall

$height := 17 \text{ ft}$

height at auditorium at narrow wood shear walls

$$AspectRatio := \frac{height}{length} = 2.83$$

$status := \text{if}(AspectRatio > 2.0, \text{"Non Compliant"}, \text{"Compliant"})$

$status = \text{"Non Compliant"}$

Therefore narrow wood shear wall deficiency exists.

Shear Stress Check of Shear Walls:

Determine V , the pseudo lateral force from Equation 4-1. V is a function of

- C , modification factor to relate expected maximum inelastic displacements to displacements calculated for linear elastic response; shall be taken from table 4-7
- S_a , the response spectral acceleration at the fundamental period of the building in the direction under consideration. S_a shall be calculated in accordance with Section 4.4.2.3
- W , the total dead load

From Weigh-Up:

$$w_{roof} := 21 \text{ psf}$$

$$w_{walls_CMU} := 84 \text{ psf}$$

$$w_{walls_wood} := 16 \text{ psf}$$

1) Shear stress check of tall masonry walls at gym roof:

$$A_{roof_trib} := 3593 \text{ ft}^2$$

$$L_{walls_gym} := 44 \text{ ft} + 17.5 \text{ ft} + 17.5 \text{ ft} + 28.5 \text{ ft} + 19 \text{ ft} + 22 \text{ ft} + 24 \text{ ft} = 172.5 \text{ ft}$$

$$h_{walls_gym} := 21 \text{ ft}$$

$$W_{roof} := w_{roof} \cdot A_{roof_trib} = 75.45 \text{ kip} \quad W_{walls_trib_roof} := \frac{h_{walls_gym}}{2} \cdot w_{walls_CMU} \cdot L_{walls_gym} = 152.15 \text{ kip}$$

$$Floors := 1 \quad w := W_{roof} + W_{walls_trib_roof} = 227.6 \text{ kip} \quad w := [w]$$

$$\text{Total seismic weight of structure} \quad W := \sum_{i=1}^{Floors} w_i = 227.6 \text{ kip}$$



Dr. Martin Luther King Jr Community Center - Tier 1 Analysis

DESIGN LOADS

Roof

	<u>Decking</u>	<u>Joists</u>	<u>Beams</u>	<u>Seismic</u>
Composition Roofing	4.0	4.0	4.0	4.0
3/4" Plywood	2.5	2.5	2.5	2.5
4x12 @ 48" OC	0.0	2.4	2.4	2.4
Beams and Columns	0.0	0.0	1.0	1.0
Acoustical Tile Ceilings	0.0	0.0	4.0	4.0
Partitions	0.0	0.0	0.0	5.0
Mech/Elec/Miscellaneous	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>	<u>2.5</u>
Dead Load	9	11	16	21
Live Load	<u>20</u>	<u>20</u>	<u>20</u>	<u>0</u>
Total Load	29	31	36	21

CMU Walls

8" CMU Wall, fully grouted	84.0
Dead Load	84.0



Modification Factor for RM1

$$C := 1.0$$

Table 4-7. Modification Factor, C

Building Type ^a	Number of Stories			
	1	2	3	≥4
Wood and cold-formed steel shear wall (W1, W1a, W2, CFS1) Moment frame (S1, S3, C1, PC2a)	1.3	1.1	1.0	1.0
Shear wall (S4, S5, C2, C3, PC1a, PC2, RM2, URMa) Braced frame (S2) Cold-formed steel strap-brace wall (CFS2)	1.4	1.2	1.1	1.0
Unreinforced masonry (URM) Flexible diaphragms (S1a, S2a, S5a, C2a, C3a, PC1, RM1)	1.0	1.0	1.0	1.0

^a Defined in Table 3-1.

Seismic force

Pseudo seismic force per 4.4.2.1 Eq. 4-1 $V := C \cdot S_a \cdot W = 464.79 \text{ kip}$

factor per 4.4.2.2 $k := \text{if}(T > 2.5, 2, \text{if}(T \leq 0.5, 1, 0.5 \cdot T + 0.75)) = 1$

Story force $F_x := V = 464.79 \text{ kip}$



Shear Stress Check:

System modification factor; shall be taken from Table 4-8

$$M_s := 4.5$$

Table 4-8. M_s Factors for Shear Walls

Wall Type	Level of Performance		
	CP ^a	LS ^a	IO ^a
Reinforced concrete, precast concrete, wood, reinforced masonry, and cold-formed steel	4.5	3.0	1.5
Unreinforced masonry	1.75	1.25	1.0

^a CP = Collapse Prevention, LS = Life Safety, IO = Immediate Occupancy.

Determine summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing. For masonry walls, the net area shall be used.

Total area of masonry shear walls in north south direction

$$A_{wNS} := 8 \text{ in} \cdot (44 \text{ ft} + 28.5 \text{ ft}) = 48.33 \text{ ft}^2$$

Total area of masonry shear walls in east west direction

$$A_{wEW} := 8 \text{ in} \cdot (17.5 \text{ ft} + 17.5 \text{ ft} + 19 \text{ ft} + 22 \text{ ft} + 24 \text{ ft}) = 66.67 \text{ ft}^2$$

Shear stress in shear walls in north south direction

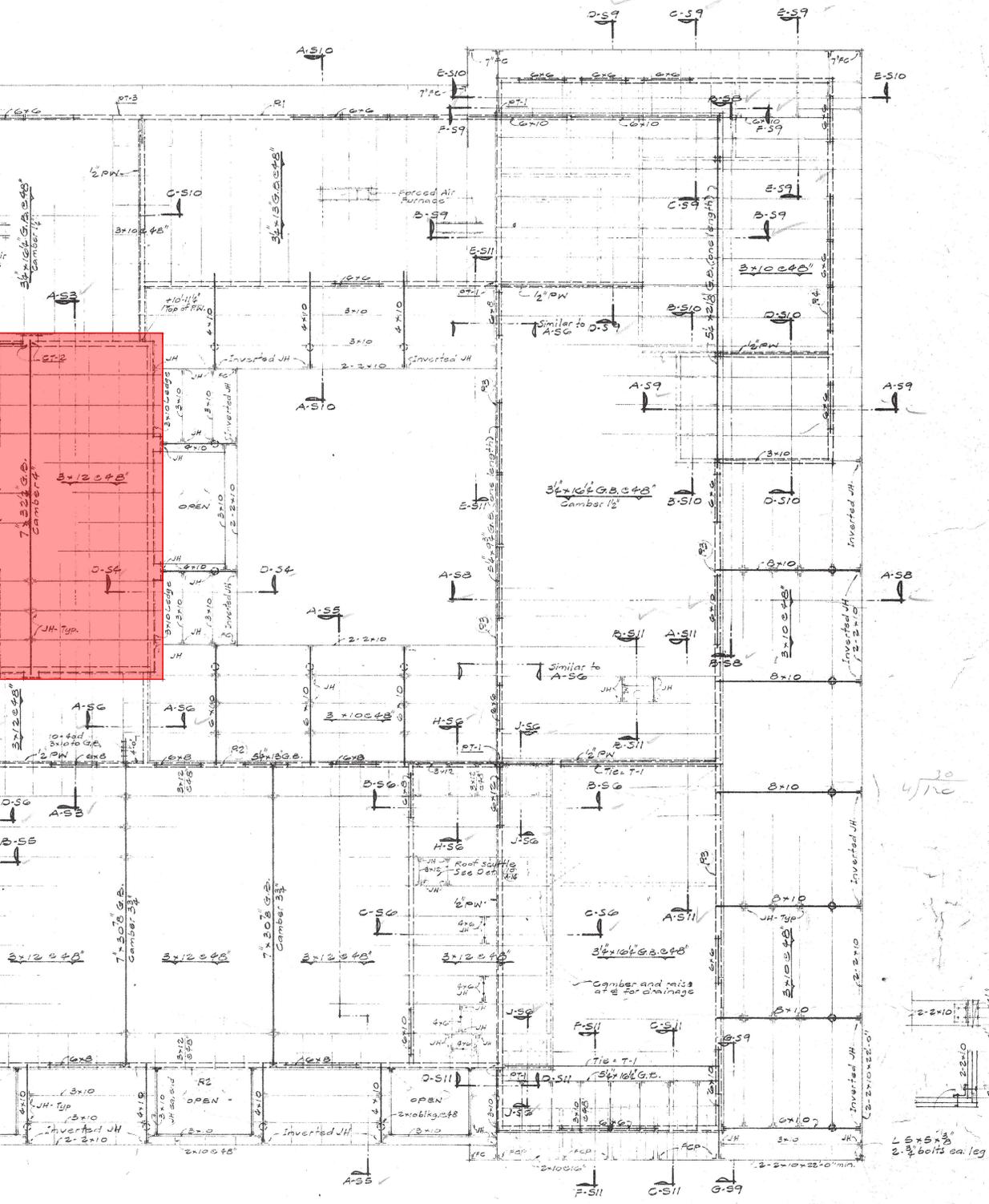
$$v_{NS} := \frac{1}{M_s} \cdot \frac{V}{A_{wNS}} = 14.84 \text{ psi}$$

Shear stress in shear walls in east west direction

$$v_{EW} := \frac{1}{M_s} \cdot \frac{V}{A_{wEW}} = 10.76 \text{ psi}$$

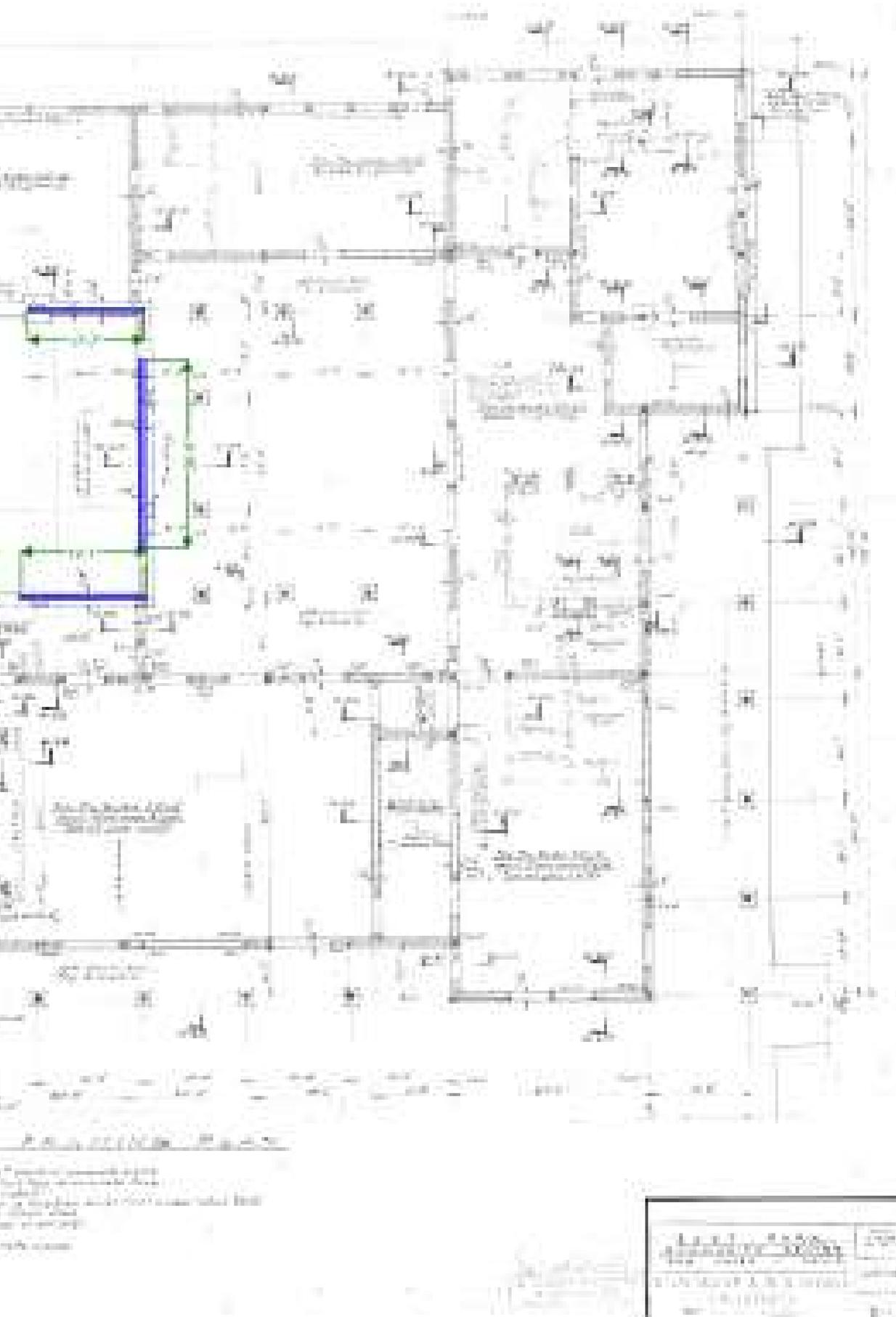
$$\text{ShearStressCheck} := \text{if} (\max (v_{NS}, v_{EW}) > 70 \text{ psi}, \text{“Non Compliant”}, \text{“Compliant”}) = \text{“Compliant”}$$

Therefore, masonry shear stress OK at gym



FRAMING PLAN
 = 1" = 0"

EAST PARK COMMUNITY CENTER SAN MATEO CALIF.		JOB No. Q707
<i>J. Albert Paquette</i> J. ALBERT PAQUETTE & ASSOCIATES STRUCTURAL ENGINEERS 417 MARKET STREET		DATE 2/20/08
E. JAY MILLER & R. D. STEINER ARCHITECTS 220 3RD AVE. SAN MATEO		BY S-2





2) Shear stress check of masonry walls at main roof level:

$$A_{\text{roof_trib}} := 20727 \text{ ft}^2 + 3593 \text{ ft}^2 + 4130 \text{ ft}^2 = 28450 \text{ ft}^2$$

$$L_{\text{walls_cmu}} := 500 \text{ ft}$$

$$h_{\text{walls}} := 15 \text{ ft}$$

$$W_{\text{roof}} := w_{\text{roof}} \cdot A_{\text{roof_trib}} = 597.45 \text{ kip} \quad W_{\text{walls_trib_roof}} := \frac{h_{\text{walls}}}{2} \cdot w_{\text{walls_CMU}} \cdot L_{\text{walls_cmu}} = 315 \text{ kip}$$

$$\text{Floors} := 1 \quad w := W_{\text{roof}} + W_{\text{walls_trib_roof}} = 912.45 \text{ kip} \quad w := [w]$$

$$\text{Total seismic weight of structure} \quad W := \sum_{i=1}^{\text{Floors}} w_i = 912.45 \text{ kip}$$

$$\text{Modification Factor for RM1} \quad C := 1.0$$

Seismic force

$$\text{Psuedo seismic force per 4.4.2.1 Eq. 4-1} \quad V := C \cdot S_a \cdot W = 1863.38 \text{ kip}$$

$$\text{factor per 4.4.2.2} \quad k := \text{if}(T > 2.5, 2, \text{if}(T \leq 0.5, 1, 0.5 \cdot T + 0.75)) = 1$$

$$\text{Story force} \quad F_x := V = 1863.38 \text{ kip}$$



Shear Stress Check:

System modification factor; shall be taken from Table 4-8

$$M_s := 4.5$$

Determine summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing. For masonry walls, the net area shall be used.

Total area of masonry shear walls in north south direction

$$A_{wNS} := 8 \text{ in} \cdot (15 \text{ ft} + 30 \text{ ft} + 10 \text{ ft} + 10 \text{ ft} + 11 \text{ ft} + 19 \text{ ft} + 16 \text{ ft} + 20 \text{ ft} + 9 \text{ ft}) = 93.33 \text{ ft}^2$$

Total area of masonry shear walls in east west direction

$$A_{wEW} := 8 \text{ in} \cdot (15 \text{ ft} + 11.5 \text{ ft} + 7.5 \text{ ft} + 7.5 \text{ ft} + 14 \text{ ft} + 14.5 \text{ ft} + 13.5 \text{ ft} + 2 \cdot 20 \text{ ft}) = 82.33 \text{ ft}^2$$

Shear stress in shear walls
in north south direction

$$v_{NS} := \frac{1}{M_s} \cdot \frac{V}{A_{wNS}} = 30.81 \text{ psi}$$

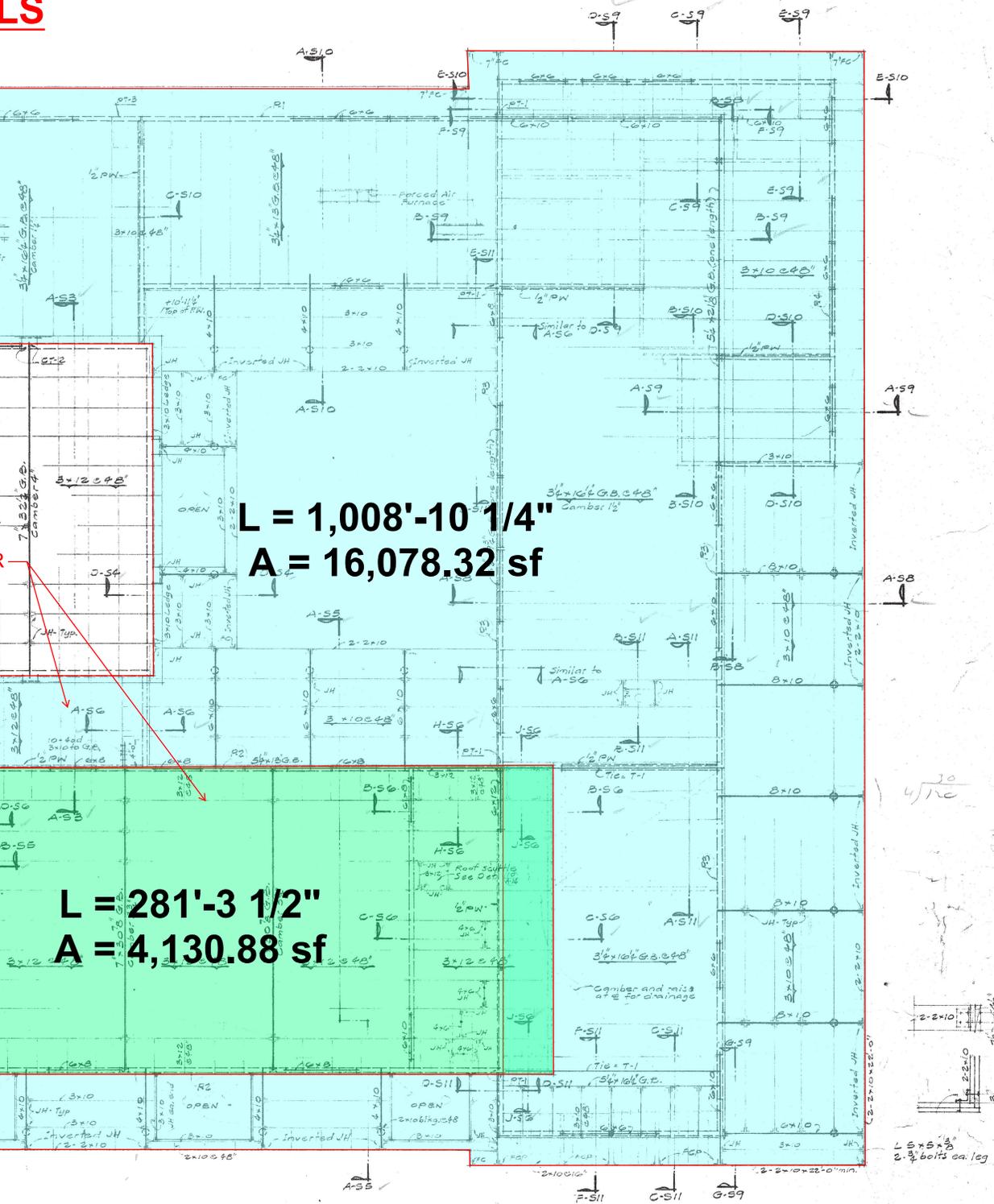
Shear stress in shear walls
in east west direction

$$v_{EW} := \frac{1}{M_s} \cdot \frac{V}{A_{wEW}} = 34.93 \text{ psi}$$

$$\text{ShearStressCheck} := \text{if}(\max(v_{NS}, v_{EW}) > 70 \text{ psi}, \text{"Non Compliant"}, \text{"Compliant"}) = \text{"Compliant"}$$

Therefore, masonry shear stress OK

MOD SHEAR WALLS AND SLABS



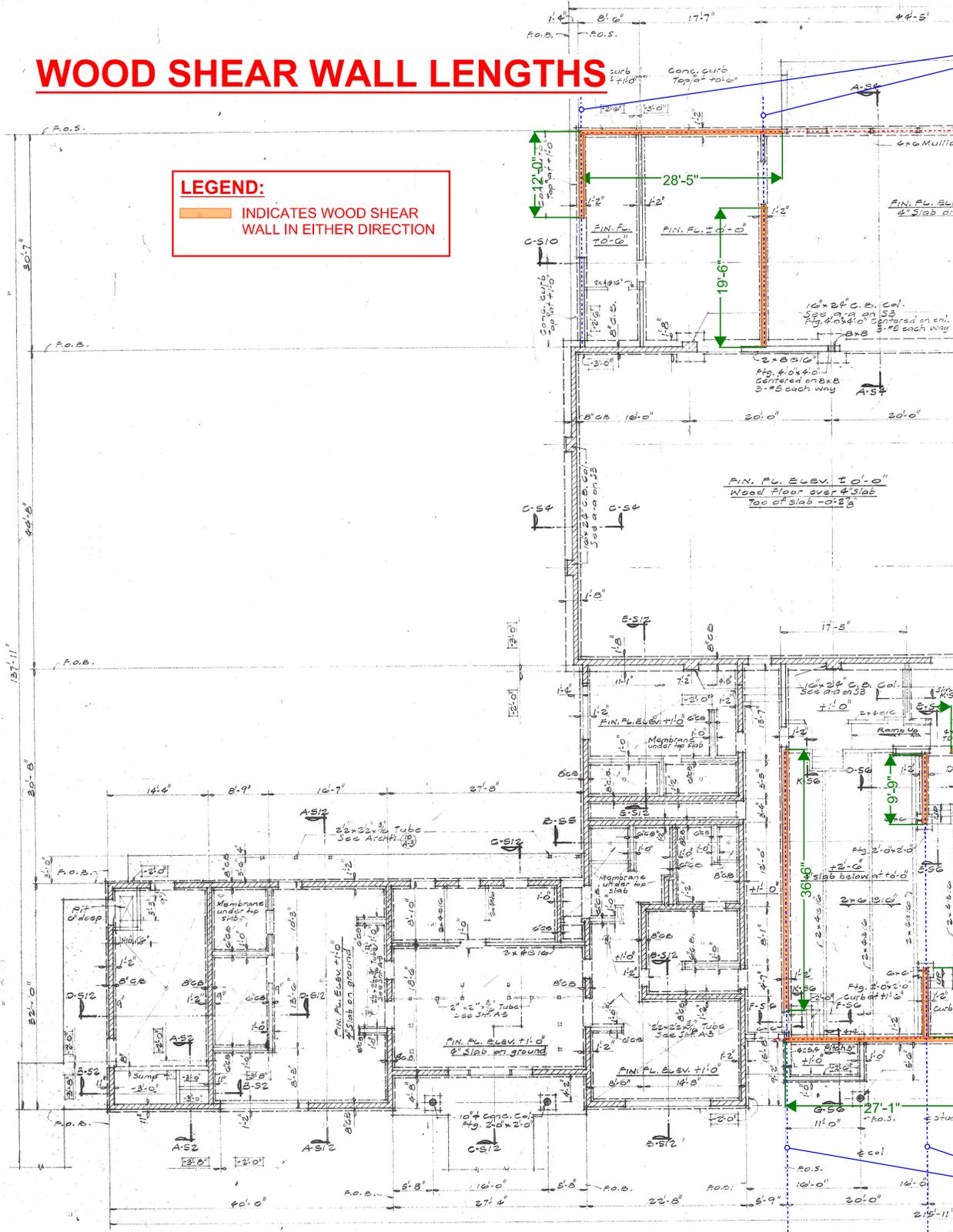
FRAMING PLAN
= 1" = 0"

Albert Paquette
J. ALBERT PAQUETTE
& ASSOCIATES
STRUCTURAL ENGINEERS
417 MARKET STREET
SAN MATEO, CALIFORNIA

EAST PARK COMMUNITY CENTER SAN MATEO, CALIF.		JOB No. 6707
E. JAY MILLER & R. D. STEINER ARCHITECTS 220 3RD AVE. SAN MATEO CALIF. 94401		DATE 2/20/08
		SCALE S-2

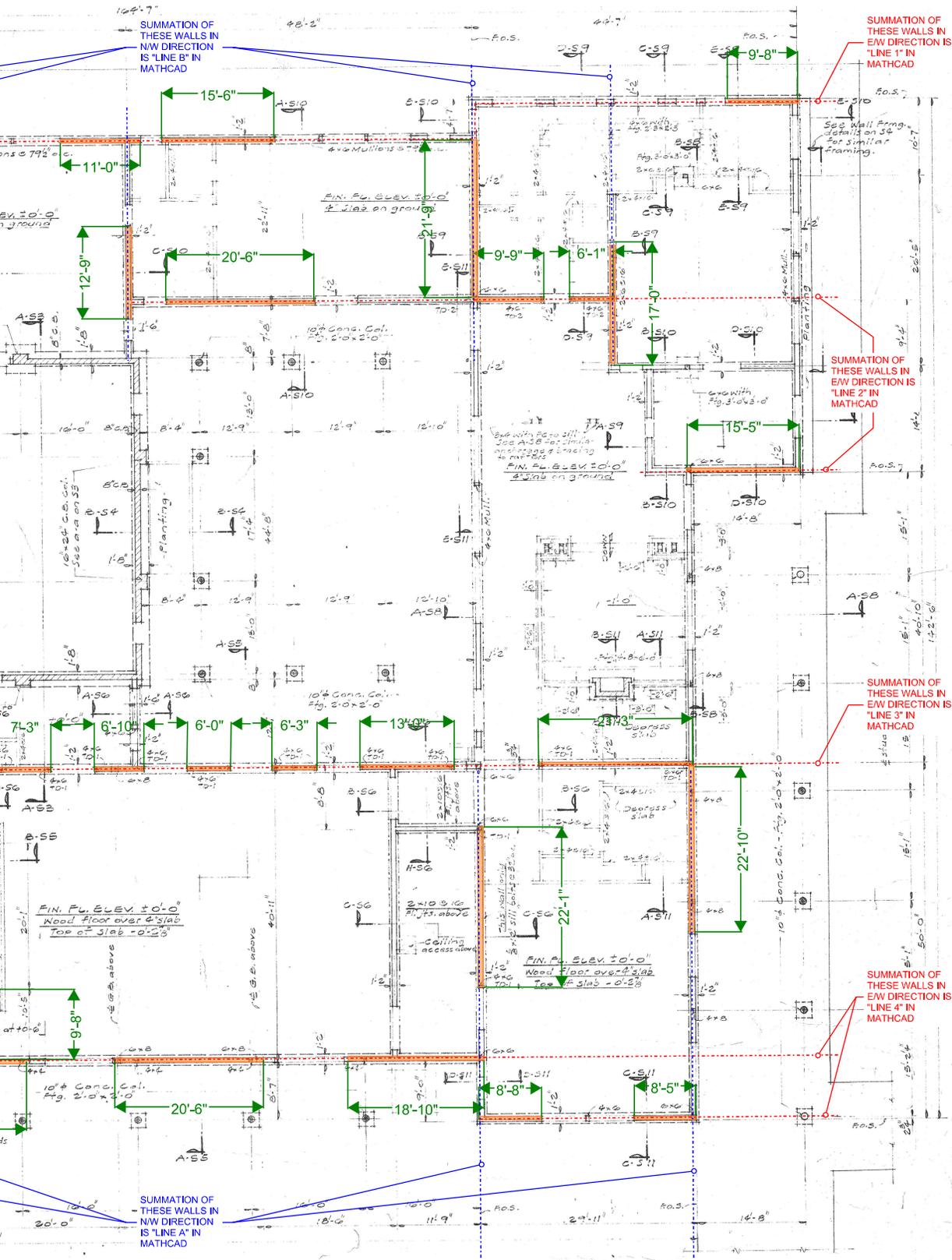
WOOD SHEAR WALL LENGTHS

LEGEND:
 INDICATES WOOD SHEAR WALL IN EITHER DIRECTION



FOOTING & FLOOR

All dimensions are to face or \pm of J.
 See sections for relation of studs.
 All studs are 2" x 6" unless noted.
 Elevation of bottom of footings is CE indicates concrete blocks. JD indicates Ties-Down (See detail).
 F.O.S. indicates face of studs.
 F.O.B. indicates face of concrete.



FRAMING PLAN

stud of concrete blocks.
 face to concrete face.
 1/2"
 3'-3 1/2" from finish floor unless noted [30]
 shown thus
 on 3/4" SIB)
 blocks.

EAST PARK COMMUNITY CENTER SAN MATEO, CALIF.		JOB No. G707
J. ALBERT PAQUETTE STRUCTURAL ENGINEER		DATE 4/20/15
E. JAY MILLER & R. D. STEINER ARCHITECTS 220 3RD AVE. SAN MATEO		SHEET S-1



3) Shear stress check of wood shear walls:

$$A_{roof_trib} := 16078 \text{ ft}^2 + 4130 \text{ ft}^2 = 20208 \text{ ft}^2$$

$$L_{walls_wood} := 1008 \text{ ft} + 282 \text{ ft} = 1290 \text{ ft}$$

$$h_{walls} := 15 \text{ ft}$$

$$W_{roof} := w_{roof} \cdot A_{roof_trib} = 424.37 \text{ kip} \quad W_{walls_trib_roof} := \frac{h_{walls}}{2} \cdot w_{walls_wood} \cdot L_{walls_wood} = 154.8 \text{ kip}$$

$$Floors := 1 \quad w := W_{roof} + W_{walls_trib_roof} = 579.17 \text{ kip} \quad w := [w]$$

$$\text{Total seismic weight of structure} \quad W := \sum_{i=1}^{Floors} w_i = 579.17 \text{ kip}$$

$$\text{Modification Factor for W1} \quad C := 1.3$$

Seismic force

$$\text{Psuedo seismic force per 4.4.2.1 Eq. 4-1} \quad V := C \cdot S_a \cdot W = 1537.59 \text{ kip}$$

$$\text{factor per 4.4.2.2} \quad k := \text{if}(T > 2.5, 2, \text{if}(T \leq 0.5, 1, 0.5 \cdot T + 0.75)) = 1$$

$$\text{Story force} \quad F_x := V = 1537.59 \text{ kip}$$



Shear Stress Check:

System modification factor; shall be taken from Table 4-8

$$M_s := 4.5$$

Determine summation of the horizontal cross-sectional area of all shear walls in the direction of loading. Openings shall be taken into consideration where computing. For masonry walls, the net area shall be used.

Total area of wood shear walls in north south direction

$$A_{wNS_A} := 36.5 \text{ ft} + 2 \cdot 9.75 \text{ ft} + 22 \text{ ft} + 22 \text{ ft} = 100 \text{ ft}$$

$$A_{wNS_B} := 12 \text{ ft} + 19 \text{ ft} + 12.5 \text{ ft} + 21 \text{ ft} + 17 \text{ ft} = 81.5 \text{ ft}$$

$$A_{wNS} := A_{wNS_A} + A_{wNS_B} = 181.5 \text{ ft}$$

Total area of wood shear walls in east west direction

$$A_{wEW_1} := 28 \text{ ft} + 11 \text{ ft} + 15.5 \text{ ft} + 9.5 \text{ ft} = 64 \text{ ft}$$

$$A_{wEW_2} := 20.5 \text{ ft} + 9.5 \text{ ft} + 6 \text{ ft} = 36 \text{ ft}$$

$$A_{wEW_3} := 7.25 \text{ ft} + 6.75 \text{ ft} + 6 \text{ ft} + 6 \text{ ft} + 13 \text{ ft} + 21 \text{ ft} + 15.5 \text{ ft} = 75.5 \text{ ft}$$

$$A_{wEW_4} := 27 \text{ ft} + 20.5 \text{ ft} + 18.75 \text{ ft} + 8.5 \text{ ft} + 8.5 \text{ ft} = 83.25 \text{ ft}$$

$$A_{wEW} := A_{wEW_1} + A_{wEW_2} + A_{wEW_3} + A_{wEW_4} = 258.75 \text{ ft}$$

Shear stress in shear walls in north south direction

$$v_{NS} := \frac{1}{M_s} \cdot \frac{V}{A_{wNS}} = 1882.57 \text{ plf}$$

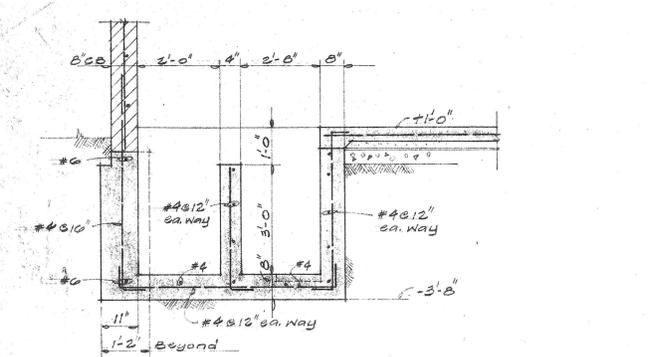
Shear stress in shear walls in east west direction

$$v_{EW} := \frac{1}{M_s} \cdot \frac{V}{A_{wEW}} = 1320.53 \text{ plf}$$

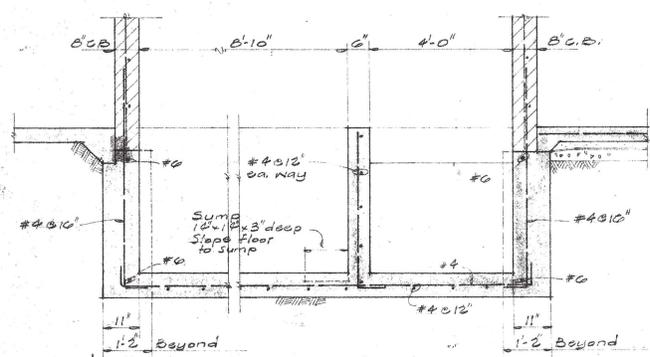
$$\text{ShearStressCheck} := \text{if}(\max(v_{NS}, v_{EW}) > 1000 \text{ plf}, \text{"Non Compliant"}, \text{"Compliant"}) = \text{"Non Compliant"}$$

Therefore, wood shear stress deficiency is present

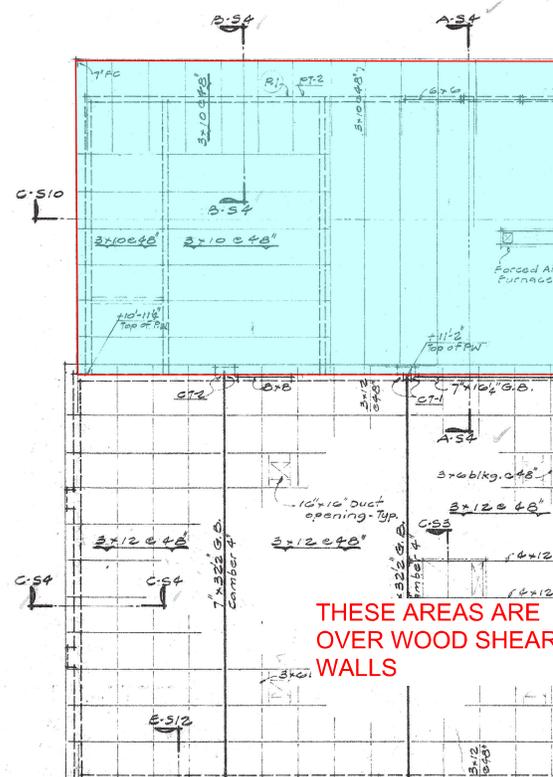
ROOF AREAS FOR WOOD MASONRY SHEAR WALL



SECTION A-S2
1/2" = 1'-0"
See note on B-S2

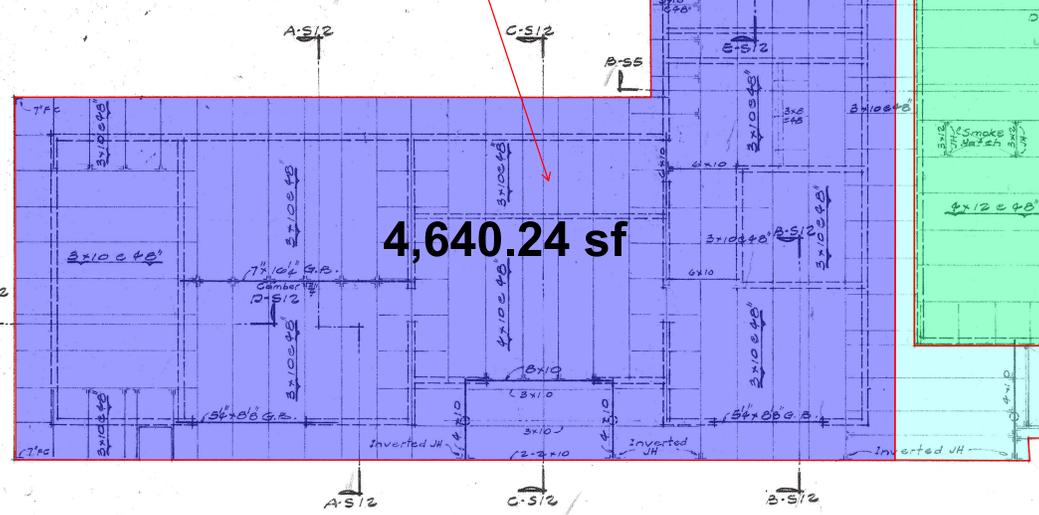


SECTION B-S2
1/2" = 1'-0"
Note: Pits and Footings to be in one pour. (No construction joints)

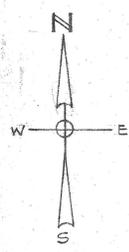


THESE AREAS ARE OVER WOOD SHEAR WALLS

THESE IS AREA OVER MASONRY SHEAR WALLS

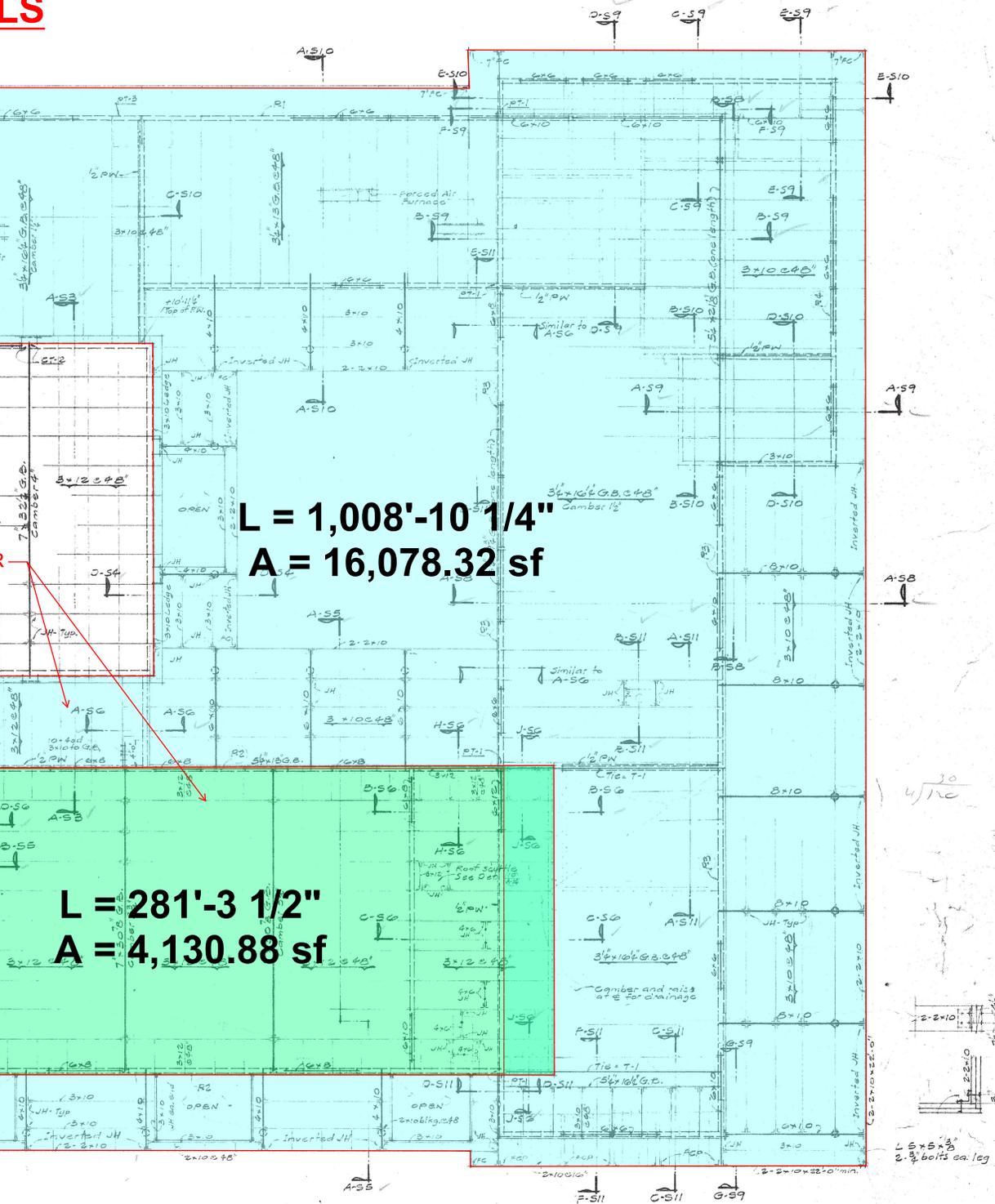


4,640.24 sf



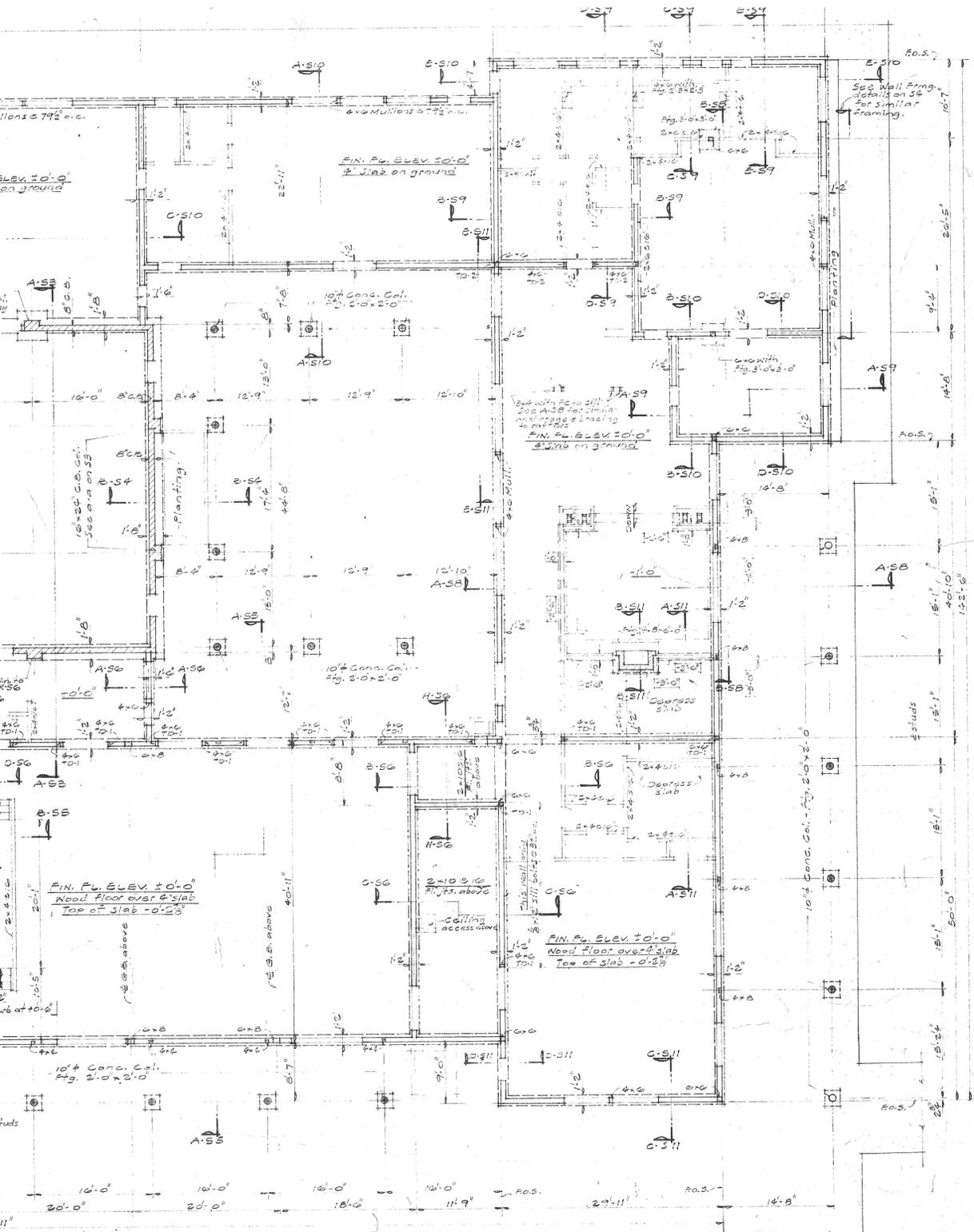
ROOF FR

OD SHEAR WALLS AND LS



AMING PLAN
= 1" = 0'

EAST PARK COMMUNITY CENTER SAN MATEO, CALIF.		JOB No. 6707
J. ALBERT PAQUETTE & ASSOCIATES STRUCTURAL ENGINEERS 417 MARKET STREET SAN MATEO, CALIF. 94401		DATE 2/20/08
E. JAY MILLER & R. D. STEINER ARCHITECTS 220 3RD AVE. SAN MATEO SAN MATEO, CALIF. 94401		S. 2



FRAMING PLAN

Joists or concrete blocks.
 and face to concrete face.
 offset.
 15'-3" from finish floor unless noted.
 shown thus
 (1 on sheet 513)
 concrete blocks.

EAST PARK COMMUNITY CENTER SAN MATEO • CALIF.		JOB NO. G70
J. ALBERT PAQUETTE & ASSOCIATES STRUCTURAL ENGINEERS		DATE 4/20/
E. JAY MILLER & R. D. STEINER ARCHITECTS 220 110 AVE. SAN MATEO		SCALE 1" = 1'

6. Mechanical Assessment

Introduction

The existing building consists of a lobby with support spaces, locker and dressing rooms, multipurpose and assembly spaces, as well as a commercial kitchen.

Existing Conditions

It appears that, other than the 1987 addition related rooftop package units, the rest of the HVAC equipment is original to the building. All of the equipment is beyond it's useful life and should be replaced with an electric version of the existing equipment type. The roof mounted ductwork and associated equipment located outside appear to have considerable weather damage and algae growth.

The multi-purpose rooms, meeting room, lobby, and daycare are all heated and ventilated using horizontal gas-fired furnaces hung above the ceilings. The ductwork shall be inspected for reuse.

The gym and Meeting Room B are ventilated and conditioned from rooftop gas packaged units. The ductwork shall be inspected for reuse.

Existing Equipment

<i>Space</i>	<i>Existing Equipment and Notes</i>
<i>Multi-Purpose 1</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. All interior equipment.</i>
<i>Gym</i>	<i>Existing rooftop packaged unit with roof mounted duct work</i>
<i>Daycare</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. All interior equipment.</i>
<i>Meeting Rm A, Misc. Support Spaces</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. All interior equipment.</i>
<i>Lobby</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. All interior equipment.</i>
<i>Multi-Purpose 2 and Stage</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. All interior equipment.</i>
<i>Multi-Purpose 3</i>	<i>Existing duct mounted, gas-fired horizontal furnace with supply and return air ducting, connected to central supply fan in mechanical room. AND a dedicated gas-fired rooftop package unit.</i>
<i>Meeting Room B, Misc. Support Spaces</i>	<i>Existing dedicated gas-fired rooftop package unit.</i>
<i>Kitchen</i>	<i>Supply air from adjacent multi-purpose space system, grease exhaust fan</i>



Roof mounted ductwork



Boiler Room Exhaust



Locker Room Exhaust Ductwork



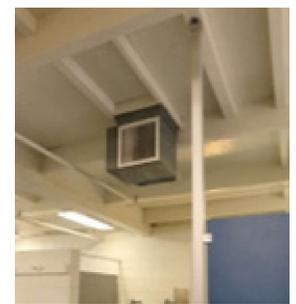
Family Changing Room Unit Heater



Pool Equipment Room Exhaust Fan



Stage Supply Air Grilles



Family Changing Room Unit Heater



Multi-Purpose ceiling diffusers

Assuming the interior program and spaces remain, the existing equipment shall be replaced in kind with an electric version if there is a gas connection existing. However, load and airflow calculations shall be completed prior to selecting equipment. The sizes listed here are based on the existing equipment heating capacities. When moving to all-electric, heat pump equipment is the most likely replacement for gas equipment. Heat pumps provide both heating and cooling. If cooling is not desired, it can be locked out at the unit controller. All heat pumps shall utilize R-32 or better refrigerant.

The existing horizontal furnaces shall be replaced with high static ducted fan coils. Ductwork shall be cleaned and reused if it is in good condition. All air outlets and inlets shall be replaced with new. Balancing dampers shall be added where needed to correctly balance the systems. The fan coils shall have refrigerant piping from the unit to the heat pump outside. Each zone shall have a dedicated heat pump. The central supply fan used for ventilation shall be replaced with new and all ductwork associated shall be replaced. The ventilation ductwork shall have a filter box in-line, downstream of the fan, and it shall be easily accessible for filter changes. The filter box shall be capable of housing a MERV 13 filter and a carbon filter. The carbon filter would only be installed in a wildfire or smoke event.

The spaces with rooftop units shall have new heat pump rooftop units installed. The roof penetrations shall be reused where possible. Interior ductwork that is in good condition and is sized for the new system shall be cleaned and reused.

If the kitchen is remodeled, a new rooftop mounted grease exhaust fan shall be installed as well as a make-up air unit. The kitchen space is currently conditioned from the adjacent multi-purpose space and can remain that way. If the kitchen is not remodeled and will be used as is, the kitchen hood, exhaust fan, and make-up air systems that are existing shall be serviced and rebalanced to ensure proper space ventilation.

The women's locker room has exposed exhaust ductwork that has condensation dripping from the exhaust air plenum. We recommend placing all the ductwork within the building envelope and it should be insulated to prevent condensation. The men's locker room exhaust should be replaced with a similarly ducted system as the women's to help move air around the space. The exhaust system shall be designed to provide ventilation but also prevent stagnant, moist air from settling in the space.

All exterior equipment shall be provided with the manufacturer's corrosion resistant coating for salty air, to be applied at the factory. The pool equipment and chemical rooms shall be exhausted per the latest codes and standards. All utility and equipment type spaces shall be exhausted.



Outdoor Heat Pump



Indoor Ducted Fan Coil

Preliminary Equipment List

<i>Space</i>	<i>Recommendations</i>
<i>Multi-Purpose 1</i>	<i>Split system with indoor, horizontal fan coil with new supply air and return air ducting, mixing box with outside air connection through roof, outdoor heat pump unit on roof; Daikin 6 ton split heat pump</i>
<i>Gym</i>	<i>Rooftop packaged heat pump unit, Daikin Rebel 15 ton; new ductwork on the roof.</i>
<i>Daycare</i>	<i>Split system with indoor, horizontal fan coil with new supply air and return air ducting, mixing box with outside air connection through roof, outdoor heat pump unit on roof; Daikin 5 ton split heat pump</i>
<i>Meeting Rm A, Misc. Support Spaces</i>	<i>Split system with indoor, horizontal fan coil with new supply air and return air ducting, mixing box with outside air connection through roof, outdoor heat pump unit on roof; Daikin 6 ton split heat pump</i>
<i>Lobby</i>	<i>Split system with indoor, horizontal fan coil with new supply air and return air ducting, mixing box with outside air connection through roof, outdoor heat pump unit on roof; Daikin 6 ton split heat pump</i>
<i>Multi-Purpose 2 and Stage</i>	<i>Split system with indoor, horizontal fan coil with new supply air and return air ducting, mixing box with outside air connection through roof, outdoor heat pump unit on roof; Daikin 18 ton split heat pump</i>
<i>Multi-Purpose 3</i>	<i>Rooftop packaged heat pump unit, Daikin Rebel 12.5 ton; new ductwork on the roof.</i>
<i>Meeting Room B, Misc. Support Spaces</i>	<i>Rooftop packaged heat pump unit, Daikin 3 ton; new ductwork on the roof.</i>
<i>Kitchen</i>	<i>Roof mounted upblast exhaust fan, <u>CaptiveAire DU85HFA</u>; Roof mounted make-up air unit, <u>CaptiveAire CASRTU1-E.152-13-7.5T-DOAS</u>.</i>

Miscellaneous Exhaust

- (6) Inline exhaust fans and associated duct work, all routed to the roof
- (1) Supply fan to replace the central ventilation supply fan in the mechanical room

Controls and Instruments

- Stand-alone manufacturer's controls (no central controls)

7. Plumbing Assessment

Existing Conditions

Most of the plumbing appears to be original copper and cast iron from 1968. Record drawings (1987) indicate water closets and lavatories were replaced. 1.6 GPF water closets with manual flushometers noted on site walk and the lavatories include sensor faucets (flowrate unknown)

Pool Equipment Room and Locker Room Plumbing Fixtures

The gas-fired tank-type water heater that serves the locker rooms is located within the pool equipment room and includes a circ pump to reduce wait time for hot water. Both the water heater and the circ pump appear to have been replaced within the past 10 years. The hot from the tank is routed to a tempering valve to set a single hot water temperature distributed up high along the back wall out to all locker room fixtures. Mostly parallel with cold water distribution piping.

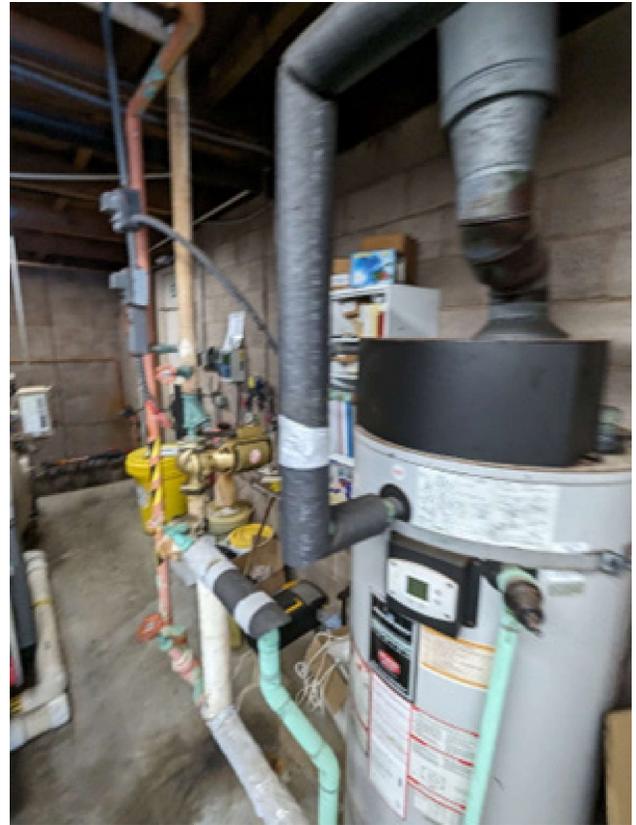
Copper piping in mechanical room is green in places (due to the pool chemicals in the air) but appears to be in good condition. No history of below grade leaks was reported. Below grade sanitary piping has no history of severe blockages besides the occasional hair ball from the showers (based on site discussions with the maintenance staff).

All shower fixtures are original and are operated by a single hot water valve and a single cold water valve for each head (no compliant pressure balance valve).

Community Center and Kitchen

The lavatory fixtures have under counter electric tankless water heaters for handwashing.

The kitchen area is believed to be fed by an electric tank typer water heater. Maintenance staff were unable to identify the location of the existing water heater. Maintenance staff identified a portion of the sanitary line serving the kitchen sink that was recently replaced because it had clogged and failed due to a buildup of grease. The kitchen was flagged as an area to be renovated to be modernized and possibly all electric.



Gas Fired Water Heater and Tank



Central Thermostatic Mixing Valve beside the tank

Recommendations

P1: Install Grease Interceptor to serve a grease producing fixtures.

- This could be an undercounter grease trap solution if it is determined that the sink is the only grease producing fixture within the space. Typically, floor sinks or floor drains are included which would also have to route through the grease interceptor which would require a below-grade installation in the courtyard.

P2: Replace Fixtures to be improved and compliant.

- This would improve user experience (sensor flush at urinals and water closets)
- Shower valves replaced with modern compliant pressure balance valves. (This may trigger required modifications of floor drains)
- Refer to attached floor plans for fixture counts.

P3: Replace existing gas fired tank type water heater for heat pump

- Replace the existing water heater with a 119 gallon tank paired with multiple SANCO2 air source heat pumps making use of all the existing connections but using electricity instead of gas.
- The feasibility of this first will require City input on how much showering they anticipate.
- Replace thermostatic mixing valve. It is not likely that the existing mixing valve was listed to the same safety standard as a modern thermostatic mixing valve so to provide an improved level of temperature control and scald protection.

P4: Camera the sanitary lines

- While not an immediate pain point, the existing sanitary lines are over 50 years old and likely include sags or cracks or root intrusion that can be managed if it can be identified and remedied.



Undercounter Electric Tankless Water Heaters

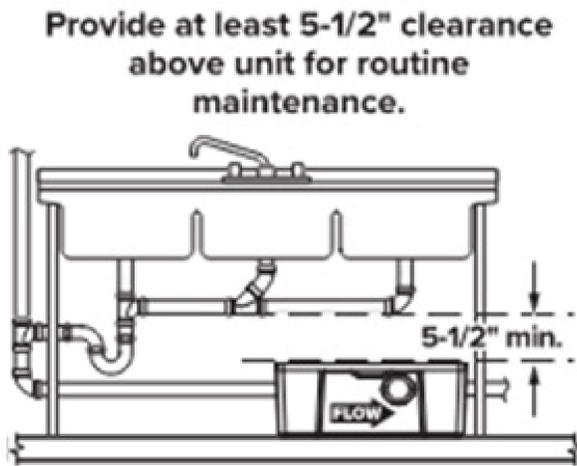


Manual Flushvalve for Floor mounted water closets

Preliminary Equipment List

Undercounter Grease Interceptor at Kitchen – Schier GB-1

- An undercounter is appropriate if only the 3-comp sink generates grease.
- With more source fixtures a slightly larger unit would be required and installed below grade.
- Owner maintenance protocol is also important aspect of the final design



Central Thermostatic Mixing Valve beside the tank



Schier Hydromechanical Grease Interceptor

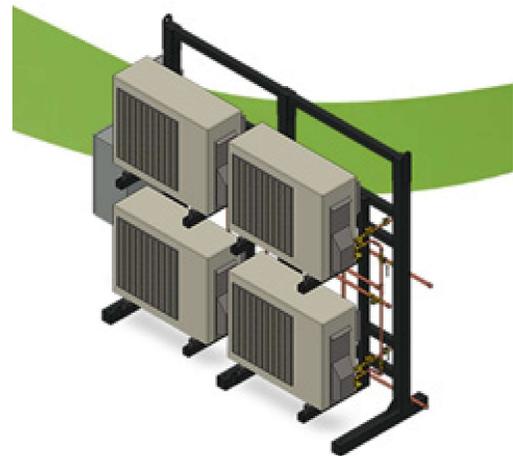
Electrifying Water Heater for Building

- (6) SANCO2 Water Heaters (This represents about 25% of the capacity of the existing gas water heater.)
- Install somewhere outside (luckily these blow cold air during the summer and they are relatively quiet at 40dB)
- WaterDrop provides pre-plumbed and wired heat pumps on a rack for ease of installation.

Digital Mixing Valve: Leonard Proton – 3/4" Hot Water Outlet

- Expansion Tank

WaterDrop Droplets



Heat Pump Package on Rack (SANCO2 units)



Digital Mixing Valve

8. Electrical Assessment

Electrical Report

1 Executive Summary

This report describes recommended electrical improvements, based on building modernization, improvements, and electrification to the pool process equipment and mechanical systems. This report also assumes part of the community center will serve as disaster relief center for the local community. As such, the report describes a standby power system that can support this functionality. Due to cost efficiencies, the standby power system is not intended to support the entire community center.

1.1 Project Goals

Key electrical objectives for the proposed project are to:

- Maximize and balance energy and cost efficiencies to design for sustainability in state-of-the-art buildings.
- Design systems to allow for seamless operations and maintenance schedule.
- Design electrical distribution system to include a standby power system that supports essential function of a disaster relief / resiliency center.
- Electrification of Mechanical and Pool process equipment

1.2 Codes & Standards

California Codes

- California Building Code (CBC), Volumes #1 and #2 (Part 2, Title 24, CCR).
- California Building Code (Part 3, Title 24, CCR).
- California Fire Code (CFC) (Part 9, Title 24, CCR).
- California Green Code (Part 11, Title 24, CCR).
- California Referenced STANDARDS CODE (Part 12, Title 24, CCR).
- NFPA 72 National Fire Alarm Code.
- ADA Standards for Accessible Design.
- City Electrical Department Standards.

2 Electrical System

2.1 Utility Service

Upgrade the existing electrical service from 600Amp to 1000Amp (estimated), 208/120V, 3phase. Includes upgrading the existing pad mount transformer and main switchboard. Assume main switchboard will be indoor rated.

2.2 Electrical Distribution System

The main switchboard described in the section above shall include a distribution section with the following feeder breakers.

- 250Amp 3phase panel for Pool Equipment
- 250Amp 3phase panel for HVAC
- 150Amp 3phase panel for domestic hot water systems
- 150Amp 3phase panel for Stage/Auditorium
- (4) additional 150Amp 3phase panels for general power and lighting

2.3 Standby Power System

The standby power system described here will provide 200Amps, 208V single phase standby power for approximately 3-days of cloudy conditions. The system also includes provisions for a temporary / plug-in generator to provide additional standby power capacity.

We assume standby power will be provided for the following:

- HVAC for a portion of the community center
- General power & lighting of the community center
- Power for preparing food, limited to warming equipment, not full food service.

System Equipment shall include the following:

- (64) LG Solar 375W LG375N1C-A6 PV Modules
- String Wiring with Cable and Wire Management Supports
- (4) 6.0 KW SE-6000H-US 240 V 1 PH Energy Hub PV & Battery SolarEdge Inverter
- (64) P401 SolarEdge DC Optimizers
- (1) BI-EUSGNA-01 SolarEdge Backup Interface with

- 200 Amp Integral Breaker and Generator Input
- (4) SolarEdge BAT-10KP 9.7 kWh Batteries
- PV & Battery Sub Panel(s), (1) 200A Main, 225A Bus, 240V/120V 1 PH, 3 Wire, 35kAIC with (4) 35A/2P branch circuit breakers
- PV & Battery Disconnect, (1) 200A, fused at 125A, 240 1 PH
- PV Roof Mount Racking Equipment
- PV Monitoring System

2.4 Emergency Power System

Code required emergency loads must be served from a separate standby source than the system described in the section above. Code required emergency load for this project are the following:

- Emergency and Egress Lighting
- Exit Signs
- Fire Alarm

Secondary source of power for the emergency loads will be via central lighting inverters for emergency lighting and local batteries for the other loads described above.

2.5 Branch Distribution

- Branch circuit design will not exceed a maximum of 1,080 volt amperes per 20 ampere, 120 volt circuit for general areas.
- Branch circuit design for computer rooms, offices, and administration will not exceed a maximum of 720 volt amperes per 20 ampere, 120 volt circuit.
- Motors of 1/2 horsepower and larger will be served at 208 volt service, 3 phase, 3 wire + ground.
- Motors less than 1/2 horsepower will be served at 120 volt service, 1 phase, 2 wire + ground.
- All multi-wire branch circuits will be installed with dedicated neutrals. Highly loaded, 20-amp, continuous electrical loads, such as circulation lighting and servers, will have increased wire sizes (i.e.: from #12 to #10) in order to reduce power loss in the wiring.
- Separate wires in conduit will be provided for each of the following loads:

- Mechanical and Pool Systems
 - 208V, 3 phase, 3 wire + ground, 60 hertz.
 - 208V, 1 phase, 2 wire + ground, 60 hertz.
 - 120V, 1 phase, 2 wire + ground, 60 hertz.
- Lighting
 - 120V, 1 phase, 2 wire + ground, 60 hertz.
- General Purpose Receptacles
 - 120V, 1 phase, 2 wire + ground, 60 hertz.
- Head-ends for Signal Systems (i.e.: BMS, Security, Fire Alarm, Lighting Controls, etc.)
 - 120V, 1 phase, 2 wire + ground, 60 hertz.

2.6 Grounding

- Grounding will be accomplished by utilizing a UFER grounding system, rods, and connections to active cold water pipe and building steel.
- A single point grounding system will be established via main ground bus located in the main electrical room. The main ground bus will function as a connection point for the grounding and bonding systems within the room.
- A minimum of two ground rods will be located in opposite corners of the room and will be outside the main switchgear. The ground rods will be exothermically connected to the electrical room ground loop.
- Separately derived systems will be grounded per CEC requirements. Grounding of emergency generators will conform to CEC 250.30 – Grounding Separately Derived Alternating Current Systems.
- A telecommunications ground bus will be installed in all telecommunication rooms. The ground bus will include stainless steel mounting brackets, an insulator, and a pre-drilled copper bus bar. Isolated ground buses will be provided in distribution equipment serving telecommunication rooms.

2.7 Power Monitoring

A main building meter will be provided at the main switchboard. Additionally, we recommend submetering of end use loads. A multipoint metering system shall be used at the main switchboard to monitor all feeder breakers. Sub-meters will be web-enabled and communicate to the building energy management system.

2.8 Lighting Controls

- An addressable lighting control system will have the ability for granular control and monitoring of each luminaire and associated lighting control device, load monitoring, and automatic demand response (ADR) capability. Addressable lighting controls will be Wattstopper DLM.
- Time schedules shall be defined in the BMS and shared with the lighting control system.
- The primary method of controlling interior luminaires while conserving energy in the building will be achieved through the use of occupancy sensors and manual override switches. Lighting control devices will be integrated into an addressable system.
- Occupancy sensors will be set to “manual on/ auto off” in offices and conference rooms; “auto on/auto off” for restrooms and support areas.
- Emergency lighting will be controlled with other lights. Occupancy sensors that control stairs and emergency egress lighting will be bypassed to provide 100% illumination in the event of normal power failure.
- Photosensors will dim luminaires based on available daylighting.
- Astronomical time clock controls, occupancy sensors, and/or photosensors will be provided for exterior, site, and landscape lighting applications via the lighting control system. Lighting will automatically turn on or off as appropriate throughout the course of the day. Photosensors will allow dimming based on scheduled times, occupancy sensor control overrides at night, and adjustment based on available daylight levels.
- Daylight harvesting will be designed and specified to reduce energy where natural daylight occurs in abundant and sufficient levels. Spaces, receiving sufficient, natural sunlight from glazing, will be equipped with a dimmable lighting system to

automatically adjust the amount of electric light against available and constantly fluctuating daylight. This continuously dimming system consists of photocells, daylight dimming control modules, and dimmable 0-10VDC drivers for each space.

3 ELECTRICAL EQUIPMENT

3.1 Switchboard

Switchboards will be completely assembled, free standing, with copper bus bars, full neutral bus, and separate copper ground bus. All bus work will be braced to withstand 65KAIC amperes RMS symmetrical. Short circuit values shall be revisited in future design phase to determine actual ratings for all equipment. Protective devices will be provided with approved barrier between sections and extended load terminals. Protective devices will consist of circuit breakers. Circuit breaker selection will utilize molded case type; be rated for application in their intended enclosure; include solid state tripping with adjustable long time, instantaneous, short time, and ground fault. Additional spare branch feeder breakers will be provided for future and spare capacity. Switchboard will be Eaton Cutler Hammer, Square D, GE, Siemens, or approved equal

3.2 Panelboards

Panelboards shall have door-in-door construction with 42-poles, and copper bussing, unless otherwise noted in single line diagram. Transient Voltage Surge Suppressors shall be used on all panelboards feeding all IT rooms (IDF, MDF, Site Cores, etc). For pricing purposes, 208/120V panelboard bus work will be braced to withstand 22kAIC amperes RMS symmetrical.

Proposed: Square D, Eaton Cutler Hammer, or approved

3.3 Conduit and Wiring

Conductors will be copper, THHN or THWN-2, with PVC insulation; galvanized rigid steel (GRS) conduit in exterior or exposed interior work up to eight feet above finished floor, and for work embedded in concrete; rigid nonmetallic conduit (HDPE) for all underground exterior work; concrete encased for all site underground, electrical metallic tubing (EMT) for interior concealed work or above eight feet exposed; flexible metal conduit (Greenfield) for interior work in short lengths or liquid tight flexible metal conduit (Sealtight) wherever moisture may be present for the connection of recessed luminaires, motors, separate building structures and any vibrating equipment. To avoid the potential environmental impacts of PVC coated power cables, we recommend the use of a cable similar to General Cable XHHW-2 VW-1, which uses XLPE insulation in lieu of PVC.

Electrical Improvement List

List of recommended improvements based on the electrification of Pool equipment and mechanical systems

Service Upgrade

- Upgrade the existing electrical service from 600Amp to 1000Amp (estimated), 208/120V, 3phase. Includes upgrading the existing pad mount transformer and main switchboard. Assume main switchboard will be indoor rated. Switchboards will be completely assembled, free standing, with copper bus bars, full neutral bus, and separate copper ground bus. All bus work will be braced to withstand 36KAIC amperes RMS symmetrical. Protective devices will consist of circuit breakers. Circuit breaker selection will utilize molded case type; be rated for application in their intended enclosure; include solid-state tripping with adjustable long time, instantaneous, short time, and ground fault. Additional spare branch feeder breakers will be provided for future and spare capacity. Switchboard will be Eaton Cutler Hammer, Square D, GE, Siemens, or approved equal
- Include feeder branch breakers per Item 2 below.

Electrical Distribution Equipment Replacement

- 250Amp 3phase panel for Pool Equipment
- 250Amp 3phase panel for HVAC
- 150Amp 3phase panel for domestic hot water systems
- 150Amp 3phase panel for Stage/Auditorium
- 4) additional 150Amp 3phase panels for general power and lighting
- Panelboards shall have door-in-door construction with 42-poles, and copper bussing, unless otherwise noted in single line diagram. Transient Voltage Surge Suppressors shall be used on all panelboards feeding all IT rooms. For pricing purposes, 208/120V panelboard bus work will be braced to withstand 22kAIC amperes RMS symmetrical. Proposed: Square D, Eaton Cutler Hammer, or approved

Standby Power System (provides 200Amps at 208V single phase standby power)

- Solaredge Backup Interface
- 400Amp standby power panel with 200Amp main breaker
- (2) 100Amp/1ph panels
- 24kW Grid-tied PV system with 38.8kWh Lithium Ion Battery system.

New lighting and lighting control system

- New interior and exterior lighting through out.
- All lighting will be LED with 0-10v dimming with energy compliant lighting controls
- Assume \$25/sqft lighting cost and \$7/sqft lighting control cost (Wattstopper DLM)

New receptacles throughout based on proposed program

9. Conceptual Design Cost Plan

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(E) Swimming Pool Remodel..... 149 - 154

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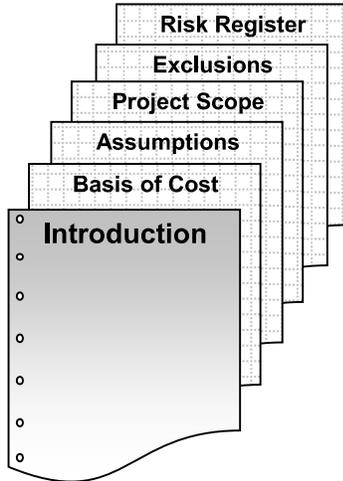
Conceptual Design Cost Plan

Commentary
Martin Luther King Community Center

Introduction
Basis of Cost
Assumptions
Exclusions

March 8, 2024

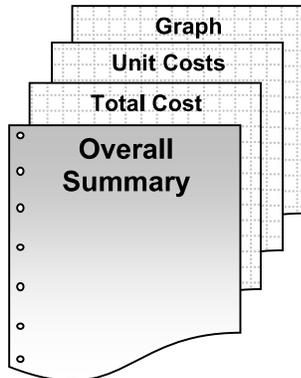
introduction



mack5 was requested to carry out a Conceptual Design Cost Plan for the proposed renovation of existing Martin Luther King Community Center, located at 725 Monte Diablo Ave., San Mateo, CA 94403.

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

The Overall Summary section contains a Summary of Gross Floor Areas, an Overall Project Summary, and Component and Trade Cost Summaries with Graphs.



Each section contains Control Quantities, a Cost Summary and Graph, and a Detailed Breakdown of Costs.

project introduction

The City of San Mateo wishes to renovate their existing Martin Luther King Community Center. The project consists of an assessment of the current physical conditions of the pool and existing buildings, including structural analysis, facility assessments of the pool decks, buildings shells/finishes, equipment & pipings, and code & accessibility requirement.

items used for cost estimate

pricing documents Preliminary estimate package prepared by ELS, dated 02/29/2024
IDA Structural Engineers Memorandum, dated 2/7/2024
Mechanical/Plumbing narrative, dated 2/7/2024
Electrical narrative prepared by RIJA Consulting, dated 2/23/2024
Existing building documents

assumptions

- (a) Construction will start in March, 2026
- (b) A construction period of 8 months
- (c) The general contract will be competitively bid by a minimum of five (5) qualified contractors
- (d) The general contractor will have full access to the site during normal business hours
- (e) There are no phasing requirements
- (f) The contractor will be required to pay prevailing wages

exclusions

- (a) Cost escalation beyond a midpoint of July, 2026
- (b) Loose furniture and equipment except as specifically identified
- (c) Compression of schedule, premium or shift work, and restrictions on the contractor's working hours
- (d) Soft Cost such as testing and inspection fees, architectural design and construction management fees, assessments, taxes, finance, legal and development charges
- (e) Scope change and post contract contingencies
- (f) Environmental impact mitigation
- (g) Temporary housing for displaced management and staff
- (h) Moving and relocation cost

Conceptual Design Cost Plan

Overall Summary
Martin Luther King Community Center

Gross Floor Areas
Overall Summary
Component Summary
Trade Summary

March 8, 2024

PRIORITY 1:	Area	%	\$/SF	\$,000
(N) Building Addition for Pool Equipment - Allowance	525 SF	4%	\$900.00	\$473
(E) Building Remodel & Upgrade	23,789 SF	65%	\$316.66	\$7,533
(E) Swimming Pool Remodel	11,490 SF	30%	\$303.22	\$3,484
Site Improvement	1,360 SF	1%	\$109.56	\$149
TOTAL BUILDING CONSTRUCTION & SITEWORK (PRIORITY 1)				\$11,639

PRIORITY 2:	\$,000
Remodel (E) Kitchen To Be All-Electirc	\$493
Replace (E) Paving And Improve Courtyard Drainage	\$263
(N) All-Electric Pool Equipment & Electrical Service Upgrade	TBD

Figure 4: View of building and high roof at gym



Conceptual Design Cost Plan

**(E) Building Remodel & Upgrade
Martin Luther King Community Center**

Control Quantities
(E) Building Remodel & Upgrade Summary
Detailed Cost Breakdown

March 8, 2024

(E) Building Remodel & Upgrade Control Quantities	Job #24842
	March 8, 2024

Enclosed Areas

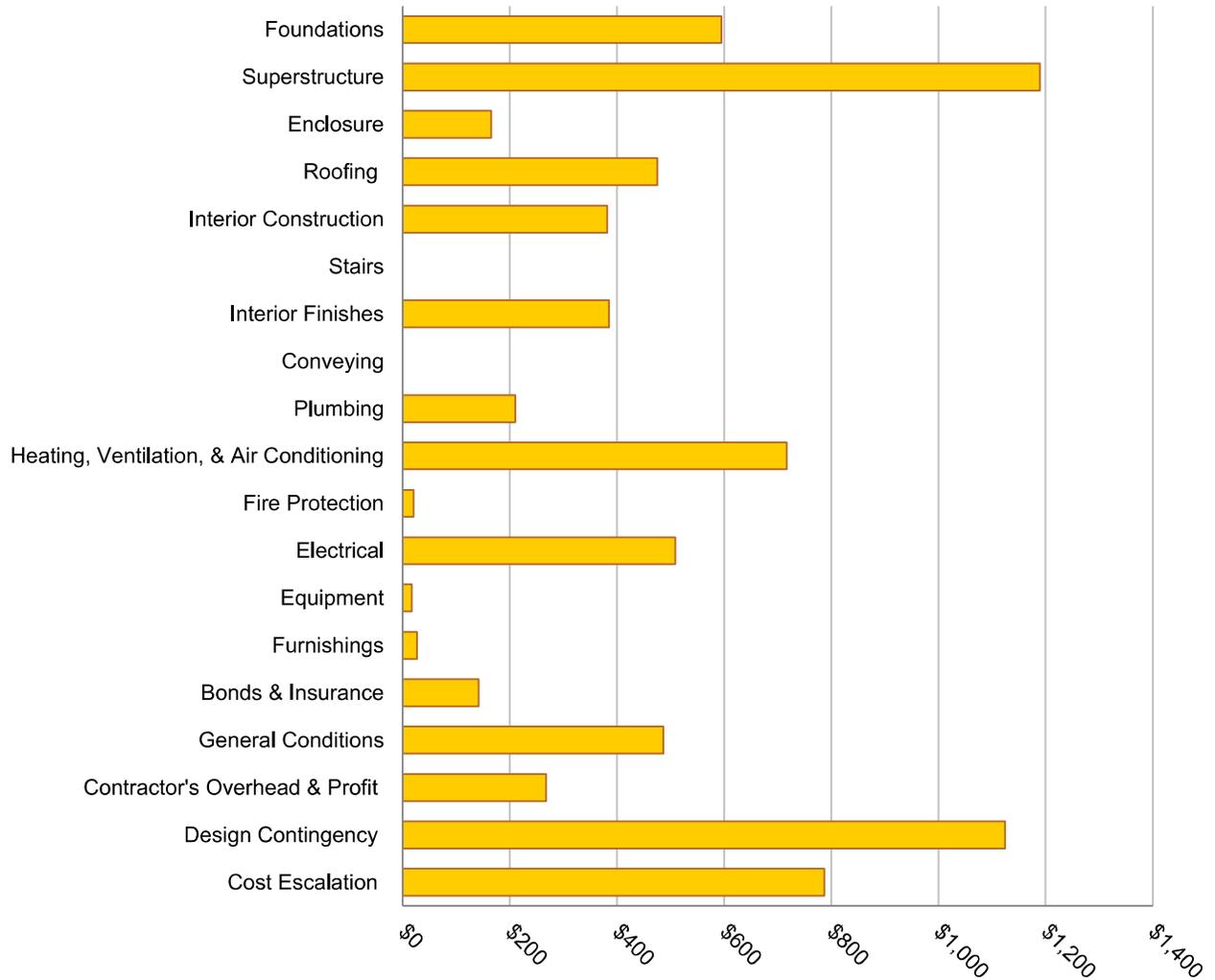
(N) Building Addition, 525SF	<i>see Overall Summary</i>
(E) Building Remodel (New Toilets, Showers, Lockers & Changing Areas)	1,728
(E) Building Remodel (Storage/office/lobby)	1,516
(E) Building Upgrade (Excluding Architectural)	20,545

Subtotal of Enclosed Area	23,789
---------------------------	--------

CSI UniFormat Summary	23,789 SF	%	\$/SF	,\$000
SUBSTRUCTURE				
Foundations		8%	\$25.00	\$595
SHELL				
Superstructure		16%	\$50.00	\$1,189
Enclosure		2%	\$6.94	\$165
Roofing		6%	\$20.00	\$476
INTERIORS				
Interior Construction		5%	\$16.04	\$382
Stairs		-	-	-
Interior Finishes		5%	\$16.20	\$385
SERVICES				
Conveying		-	-	-
Plumbing		3%	\$8.83	\$210
Heating, Ventilation, & Air Conditioning		10%	\$30.13	\$717
Fire Protection		0%	\$0.87	\$21
Electrical		7%	\$21.40	\$509
EQUIPMENT & FURNISHINGS				
Equipment		0%	\$0.74	\$18
Furnishings		0%	\$1.13	\$27
Selective Building Demolition		0%	\$1.36	\$32
Subtotal - Building Construction		63%	\$198.66	\$4,726
Bonds & Insurance	3.00%	2%	\$5.96	\$142
General Conditions	10.00%	6%	\$20.46	\$487
Contractor's Overhead & Profit	5.00%	4%	\$11.25	\$268
Subtotal		75%	\$236.33	\$5,622
Design Contingency	20.00%	15%	\$47.27	\$1,124
Cost Escalation	11.67%	10%	\$33.09	\$787
TOTAL CONSTRUCTION BUDGET		100%	\$316.66	\$7,533

NOTE: Inclusions and Exclusions listed in the Commentary Section.

CSI UniFormat Summary



FOUNDATIONS	Quantity	Unit	Rate	Total (\$)
Standard Foundations Allowance for seismic retrofit	23,789	GSF	\$25.00	\$594,725
Subtotal For Foundations:				\$594,725

SUPERSTRUCTURE	Quantity	Unit	Rate	Total (\$)
Structural Framing Allowance for seismic retrofit	23,789	GSF	\$50.00	\$1,189,450
Subtotal For Superstructure:				\$1,189,450

ENCLOSURE	Quantity	Unit	Rate	Total (\$)
Wall Framing, Furring & Insulation + Exterior Finishes Allowance for Locker Room remodel only	3,244	SF	\$50.00	\$162,200
Exterior Doors, Frames And Door Hardware (N) Automatic door operators at exits from locker rooms to pool deck	2	EA	\$1,500.00	\$3,000
Subtotal For Enclosure:				\$165,200

ROOFING	Quantity	Unit	Rate	Total (\$)
Roof Coverings - Entire Roof Allowance for roof repairs - Owners report for ongoing issues with roof leaking and water accumulation within the layers of the roof assembly	23,789	SF	\$20.00	\$475,780
Subtotal For Roofing:				\$475,780

INTERIOR CONSTRUCTION

Quantity

Unit

Rate

Total (\$)

Note: Only At Locker Room Remodel Area

Interior Partitions (Locker Room Remodel Only)

Non-rated partition; including metal stud framing, insulation and gypsum board on both sides

310 LF \$432.00 \$133,920

Backing and blocking, provide 16 gauge or heavier metal blocking and backing at all wall or ceiling mounted items including but not limited to light fixtures, handrails, grab bars, cabinetry, bulletin boards, equipment, shelving, signage, etc.

3,244 SF \$2.00 \$6,488

Interior Doors & Door Hardware

(N) Connection from community center to locker rooms and pool deck

2 EA \$6,000.00 \$12,000

(N) Single leaf door

9 EA \$4,000.00 \$36,000

Fittings

Protective guards, barriers and bumpers

3,244 SF \$0.50 \$1,622

Toilet fittings and accessories

Standard toilet partition, phenolic

2 EA \$1,800.00 \$3,600

ADA toilet partition, phenolic

2 EA \$2,000.00 \$4,000

Shower enclosure, phenolic

4 EA \$3,000.00 \$12,000

Urinal screen, phenolic

2 EA \$500.00 \$1,000

Toilet accessories; including toilet tissue dispenser, napkin disposal, seat cover dispenser, soap dispenser, waste receptacle, grab bar, paper towel dispenser, wall mirror, etc.

4 STALL \$5,000.00 \$20,000

Shelving and millwork

Janitor's mop and broom holder

1 EA \$500.00 \$500

Quartz solid surface vanity countertop & backsplash (12.1)

12 LF \$350.00 \$4,200

Custom wood reception desk with lower & upper soiled surface countertop and low swing doors

1 LS \$10,000.00 \$10,000

Custom casework at breakroom, 1st aid, office & lobby

Allowance

1,516 SF \$10.00 \$15,160

INTERIOR CONSTRUCTION

Quantity	Unit	Rate	Total (\$)
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Note: Only At Locker Room Remodel Area

Chalkboards, insignia and graphics

Door signage	11	EA	\$200.00	\$2,200
Directional/wayfinding & code signage	3,244	SF	\$3.00	\$9,732

Miscellaneous

Rough carpentry	3,244	SF	\$2.00	\$6,488
Cut/patch and repair areas affected by the structural/mechanical/electrical upgrade	20,545	GSF	\$5.00	\$102,725

Subtotal For Interior Construction:				\$381,635
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STAIRS

Quantity	Unit	Rate	Total (\$)
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No Work Anticipated In This Section

Subtotal For Stairs:				
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INTERIOR FINISHES

Quantity	Unit	Rate	Total (\$)
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Note: Only At Locker Room Remodel Area

Floor Finishes

Vinyl sheet at offices/lobby	816	SF	\$16.00	\$13,056
Ceramic floor tile at changing & restrooms	1,728	SF	\$35.00	\$60,480
Sealed concrete at storage	700	SF	\$4.00	\$2,800

Bases

Rubber base (B1)	902	LF	\$5.00	\$4,510
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Wall Finishes

Ceramic wall tile	3,390	SF	\$35.00	\$118,650
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Ceiling Finishes

Gypsum board, waster resistant at wet locations, painted (C1)	1,728	SF	\$35.00	\$60,480
Ceiling at office/lobby	1,516	SF	\$15.00	\$22,740

Miscellaneous - Allowance

Cut/patch and repair areas affected by the structural/mechanical/electrical upgrade	20,545	GSF	\$5.00	\$102,725
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Subtotal For Interior Finishes:				\$385,441
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CONVEYING

Quantity	Unit	Rate	Total (\$)
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No Work Anticipated In This Section

Subtotal For Conveying:

PLUMBING

Quantity	Unit	Rate	Total (\$)
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Fixtures & Associated piping; (N) water-efficient plumbing fixture at remodelled locker room

Remodel and reconfigure locker rooms with new showers; New water-efficient plumbing fixtures, including minimum 2 toilets and 2 urinals for men, 2 toilets for women, 2 lavatories for each and 2 showers each for men and women, 6 Floor drains

20	EA	\$6,500.00	\$130,000
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Equipment

Sanco2 heat pump

6	EA	\$5,500.00	\$33,000
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Tank, 119 gal

1	EA	\$12,000.00	\$12,000
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Grease interceptor at sink, plus drains

1	EA	\$10,000.00	\$10,000
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Plumbing related items & Demo

1	LS	\$25,000.00	\$25,000
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Subtotal For Plumbing: \$210,000

HEATING, VENTILATION, & AIR-CONDITIONING

Quantity	Unit	Rate	Total (\$)
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Equipment

Multipurpose / Meeting Room / Lobby;

Packaged Heat pump, 6 ton

3	EA	\$50,000.00	\$150,000
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Indoor Fan Coil

3	EA	\$4,500.00	\$13,500
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Refrigerant line sets

420	LF	\$48.00	\$20,160
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Gym;

Rooftop packaged heat pump, 15 ton

1	EA	\$140,000.00	\$140,000
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Daycare

Packaged Heat pump, 5 ton

1	EA	\$45,000.00	\$45,000
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Indoor Fan Coil

1	EA	\$4,000.00	\$4,000
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Refrigerant line sets

200	LF	\$48.00	\$9,600
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Multipurpose 2 / Stage;

Packaged Heat pump, 18 ton

1	EA	\$196,000.00	\$196,000
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Indoor Fan Coil

1	EA	\$7,000.00	\$7,000
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Refrigerant line sets

200	LF	\$48.00	\$9,600
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HEATING, VENTILATION, & AIR-CONDITIONING	Quantity	Unit	Rate	Total (\$)
Equipment				
Multipurpose 3; Rooftop packaged heat pump, 12.5 ton Meeting rm B	1	EA	\$60,000.00	\$60,000
Rooftop packaged heat pump, 3 ton Kitchen;	1	EA	\$12,000.00	\$12,000
MAU & Exhaust				NIC, See Priority 2
General exhaust				NIC, See Priority 2
Distribution & Control included above				
Energy recovery ventilator				NIC, Not in design
HVAC Related items & Demo	1	LS	\$50,000.00	\$50,000
Subtotal For Heating, Ventilation, & Air-Conditioning:				\$716,860

FIRE PROTECTION	Quantity	Unit	Rate	Total (\$)
Fire Sprinkler System Allowance at remodelled locker room	1,728	SF	\$12.00	\$20,736
Subtotal For Fire Protection:				\$20,736

ELECTRICAL	Quantity	Unit	Rate	Total (\$)
Electrical Service Upgrade				NIC, See Priority 2
Standby Power System:				
Solaredge Backup Interface	1	EA	\$7,000.00	\$7,000
400A standby power panel with 200AMCB 208/120V 1Ph	1	EA	\$8,700.00	\$8,700
Panel 100A 208/120V 1Ph	2	EA	\$3,500.00	\$7,000
24kW Grid-tied PV system with 38.8kW Li Ion battery system	1	EA	\$114,000.00	\$114,000
Structural steel support - allowance	1	LS	\$18,000.00	\$18,000
AC Feeder allowance	1	LS	\$25,000.00	\$25,000
PV conduit infrastructure allowance	1	LS	\$15,000.00	\$15,000

ELECTRICAL	Quantity	Unit	Rate	Total (\$)
Machine and Equipment Connections				
Replace Mechanical and water heater connections:				
Multi-purpose 1 - split system with indoor fan coil/outdoor heat pump on roof - 6 ton split heat pump	1	EA	\$5,250.00	\$5,250
Gym - Rooftop pckaged heat pump unit - 15 ton	1	EA	\$8,235.00	\$8,235
Daycare - split system with indoor fan coil//outdoor heat pump on roof - 5 ton split heat pump	1	EA	\$5,250.00	\$5,250
Meeting room A/Misc Support Areas - split system with indoor fan coil/outdoor heat pump on roof - 6 ton split heat pump	1	EA	\$5,250.00	\$5,250
Lobby - split system with indoor fan coil/outdoor heat pump on roof - 6 ton split heat pump	1	EA	\$5,250.00	\$5,250
Multi-purpose 2 and Stage - split system with indoor fan coil/outdoor heat pump on roof - 18 ton split heat pump	1	EA	\$9,250.00	\$9,250
Multi-purpose 3 - split system with indoor fan coil/outdoor heat pump on roof - 12.5 ton split heat pump	1	EA	\$7,750.00	\$7,750
Meeting room B/Misc Support Areas - Rooftop packaged heat pump unit - 3 ton	1	EA	\$4,275.00	\$4,275
Kitchen - roof mounted upblast exhaust fan/roof mounted mak-up air unit	1	EA	\$5,250.00	\$5,250
Misc exhaust - inline exhaust fans mounted on roof	6	EA	\$2,865.00	\$17,190
<i>Resiliency Items:</i>				
Replace existing water heater with 119 gal tank paired with multiple SANCO2 air source heat pumps using electricity onstead of gas	6	EA	\$4,285.00	\$25,710
New ADO at exits from lockers rooms to pool deck - ADO power connections	2	EA	\$3,500.00	\$7,000
Addition of 525 sf to house new equipment - electrical works - lighting, power, fire alarm	<i>Included In Overall Summary - (N) Bldg Addition</i>			

ELECTRICAL	Quantity	Unit	Rate	Total (\$)
Power Receptacles and Misc Power				
New power receptacles throughout based on proposed program	3,244	SF	\$10.00	\$32,440
Lighting & Branch Wiring				
New interior and exterior LED lighting throughout	3,244	SF	\$25.00	\$81,100
Lighting Control and Branch Wiring				
New energy compliant lighting controls	3,244	SF	\$7.00	\$22,708
Communications, AV, PA, FA & Security				
Telecom				<i>Excluded</i>
AV Conduit rough-ins only				<i>Excluded</i>
Paging System				<i>Excluded</i>
Fully addressable fire alarm system				<i>Excluded</i>
Access Control System/Intrusion Burglar Alarm System				
New exits from pool deck, panic hardware - allow site card reader	3	EA	\$5,500.00	\$16,500
CCTV Surveillance Camera System				<i>Excluded</i>
Miscellaneous Electrical Work				
Permits/Fees	1	LS	\$5,000.00	\$5,000
Selective Trade demolition - electrical	1	LS	\$20,000.00	\$20,000
Temporary Power	1	LS	\$12,500.00	\$12,500
Seismic Bracing/Firesealing/Grounding allowance	1	LS	\$8,500.00	\$8,500
Testing & commissioning/Coordination	1	LS	\$10,000.00	\$10,000
Subtotal For Electrical:				\$509,108

(E) Building Remodel & Upgrade Detail	Job #24842
	March 8, 2024

EQUIPMENT	Quantity	Unit	Rate	Total (\$)
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Note: Only At Locker Room Remodel Area

Miscellaneous Equipment - Allowance

Breakroom and 1st Aid Room equipment; including refrigerator, ice machine, microwave, etc.

Swimsuit spinner

Flat screen TV, wall mounted

1	LS	\$10,000.00	\$10,000
1	EA	\$2,500.00	\$2,500
1	EA	\$5,000.00	\$5,000

Subtotal For Equipment: \$17,500

FURNISHINGS	Quantity	Unit	Rate	Total (\$)
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Note: Only At Locker Room Remodel Area

Amenities & convenience items

Phenolic lockers & pedestal bench

Portable Fire extinguisher - allowance

1,728	SF	\$15.00	\$25,920
2	EA	\$500.00	\$1,000

Moveable Furnishings

FF&E Allowance

Conference/meeting tables and chairs

Office tables and chairs

NIC, OFOI
NIC, OFOI
NIC, OFOI

Subtotal For Furnishings: \$26,920

SELECTIVE BUILDING DEMOLITION	Quantity	Unit	Rate	Total (\$)
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Interior Building Demolition

Interior demolition; including walls/doors and floor/wall/ceiling finishes - remodelled area

3,244	SF	\$10.00	\$32,440
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Hazardous Materials Abatement

NIC, Excluded

Subtotal For Selective Building Demolition: \$32,440



Conceptual Design Cost Plan

(E) Swimming Pool Remodel Martin Luther King Community Center

Control Quantities
(E) Swimming Pool Remodel Summary
Detailed Cost Breakdown

March 8, 2024

mack⁵

(E) Swimming Pool Remodel Control Quantities	Job #24842
	March 8, 2024

Swimming Pool Areas

Swimming Pool	2,585
Pool deck	8,905

Subtotal	11,490
----------	--------

CSI UniFormat Summary	11,490 SF	%	\$/SF	,\$000
Site Preparation		0%	\$0.00	\$0
Site Improvement		0%	\$0.00	\$0
Site Mechanical Utilities		0%	\$0.00	\$0
Site Electrical Utilities		0%	\$0.00	\$0
Swimming Pool Budget (Excluding Pool Deck)		63%	\$190.14	\$2,185
Subtotal - Sitework		63%	\$190.14	\$2,185
Bonds & Insurance	3.00%	2%	\$5.70	\$66
General Conditions	10.00%	6%	\$19.58	\$225
Contractor's Overhead & Profit	5.00%	4%	\$10.77	\$124
Subtotal		75%	\$226.28	\$2,600
Design Contingency	20.00%	15%	\$45.26	\$520
Cost Escalation	11.67%	10%	\$31.68	\$364
TOTAL CONSTRUCTION BUDGET		100%	\$303.22	\$3,484

NOTE: Inclusions and Exclusions listed in the Commentary Section.

(E) Swimming Pool Remodel Detail	Job #24842
	March 8, 2024



SITE PREPARATION	Quantity	Unit	Rate	Total (\$)
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Site Protective Construction
 Erosion control; including storm drain inlet protection, fiber rolls, stabilized construction entrance/exit, and curb inlet sediment dam (Outdoor swimming pool area only) *Included Under Site Improvement*

Subtotal For Site Preparation:

SITE IMPROVEMENT	Quantity	Unit	Rate	Total (\$)
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Pool Deck
 Concrete pool deck *included in swimming pole Budget*

Subtotal For Site Improvement:

SITE MECHANICAL UTILITIES	Quantity	Unit	Rate	Total (\$)
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Pool Water Heating
 Pool Heat pump, pool heat exchanger, valves, piping and associated connections *included in swimming pole Budget*

Subtotal For Site Mechanical Utilities:

SITE ELECTRICAL UTILITIES	Quantity	Unit	Rate	Total (\$)
----------------------------------	----------	------	------	------------

Service and Distribution - Pool *Included In Swimming Pool Budget*
 Machine and Equipment Connection *Included In Swimming Pool Budget*
 Power Receptacles and Misc Power Connections *Included In Swimming Pool Budget*
 Lighting and Power Specialties Wiring *Included In Swimming Pool Budget*
 Communications, AV, PA, FA & Security

Subtotal For Site Electrical Utilities:

SWIMMING POOL BUDGET

Quantity

Unit

Rate

Total (\$)

Swimming Pool Budget (provided by Aquatic Design Group thru els)

1.0 Code Concerns

(N) Mechanical and chemical equipment to rectify code violation

1 LS \$650,000.00 \$650,000

(N) Deck and deck drainage

1 LS \$505,000.00 \$505,000

(N) Depth markers/Safety signage

1 LS \$4,000.00 \$5,000

(N) ADA Access for pools; including ADA compliant chair lifts and stairs with dual ADA compliant handrail

1 LS \$65,000.00 \$65,000

Convert pools to skimmer pools

1 LS \$260,000.00 \$260,000

Containment for Chlorine

1 LS \$2,000.00 \$2,000

Gauges for circulation pump

1 LS \$400.00 \$400

2.0 Maintenance & Operations

(N) Pool finishes

1 LS \$215,000.00 \$215,000

(N) Under pool piping

1 LS \$325,000.00 \$325,000

Eliminate surge tank

1 LS \$30,000.00 \$30,000

(N) Chemical storage room door hardware

1 LS \$2,350.00 \$2,350

(N) Acid room door hardware and NFPA

1 LS \$5,000.00 \$5,000

(N) Acid room finishes

1 LS \$15,000.00 \$15,000

(N) Mechanical/chemical building space to accommodate additional equipment

see Overall Summary

(N) Underwater LED pool lights

1 LS \$45,000.00 \$45,000

Eliminate small pool

1 LS \$60,000.00 \$60,000

Subtotal For Swimming Pool Budget:

\$2,184,750

Conceptual Design Cost Plan

Site Improvement
Martin Luther King Community Center

Site Improvement Summary
Detailed Cost Breakdown

March 8, 2024

Site Area

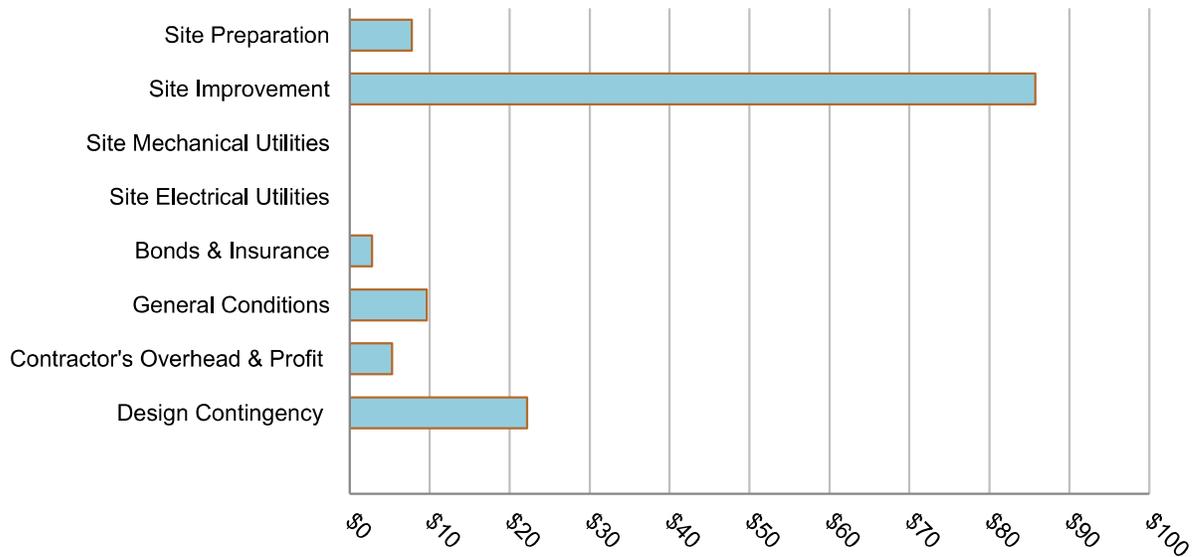
(N) Transition Zone For Access To Pool Deck	1,046
(N) Exit Pathway	314

Subtotal of Enclosed Area	1,360
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CSI UniFormat Summary	1,360 SF	%	\$/SF	,\$000
Site Preparation		5%	\$5.71	\$8
Site Improvement		58%	\$63.03	\$86
Site Mechanical Utilities		0%	\$0.00	\$0
Site Electrical Utilities		0%	\$0.00	\$0
Subtotal - Sitework		63%	\$68.74	\$93
Bonds & Insurance	3.00%	2%	\$2.06	\$3
General Conditions	10.00%	6%	\$7.08	\$10
Contractor's Overhead & Profit	5.00%	4%	\$3.89	\$5
Subtotal		74%	\$81.62	\$111
Design Contingency	20.00%	15%	\$16.32	\$22
Cost Escalation	11.67%	0%	\$11.43	\$16
TOTAL CONSTRUCTION BUDGET		100%	\$109.56	\$149

NOTE: Inclusions and Exclusions listed in the Commentary Section.

CSI UniFormat Summary



SITE PREPARATION	Quantity	Unit	Rate	Total (\$)
Site Demolition				
Demo and remove (E) area for transition zone for access to pool deck	1,046	SF	\$3.00	\$3,138
Demo and remove (E) landscape area, for new exit walkway	314	SF	\$2.00	\$628
Demo and remove (E) chainlink fence due to building expansion	1	LS	\$3,000.00	\$3,000
Site Protective Construction				
SWPP/Erosion control; including storm drain inlet protection, fiber rolls, stabilized construction entrance/exit, and curb inlet	1	LS	\$1,000.00	\$1,000
Subtotal For Site Preparation:				\$7,766

SITE IMPROVEMENT	Quantity	Unit	Rate	Total (\$)
Pedestrian Paving				
(N) Apron/accessible transition at pool deck	1,046	SF	\$50.00	\$52,300
(N) Exit pathway	314	SF	\$30.00	\$9,420
Connect to (E) path in the park	40	LF	\$100.00	\$4,000
(N) Courtyard, Priority 2				
Courtyard paving			<i>NIC, See Priority 2</i>	
Drainage			<i>NIC, See Priority 2</i>	
Landscaping				
Modify (E) planting area as required for new exits and exit pathway - allowance	1	LS	\$5,000.00	\$5,000
Fencing & Miscellaneous Accessories				
(N) Exit gates with panic hardware, single leaf 4'-0"wide	3	EA	\$5,000.00	\$15,000
Subtotal For Site Improvement:				\$85,720

Conceptual Design Cost Plan

Priority 2
Martin Luther King Community Center

Alternates Cost Breakdown

March 8, 2024





Alternates	Job #24842
	March 8, 2024

Remodel (E) Kitchen To Be All-Electirc	Quantity	Unit	Rate	Total (\$)
ADD:				
Structural Upgrades - allowance	400	SF	\$50.00	\$20,000
Finishes				
Floor Finishes	400	SF	\$35.00	\$14,000
Wall Finishes	1,040	SF	\$35.00	\$36,400
Ceiling finishes	400	SF	\$20.00	\$8,000
Equipments				
(N) All-electric kitchen equipments, meeting health department requirements for commercial kitchen including grease trap, 3-compartment sink, handwash sink, dry storage	400	SF	\$450.00	\$180,000
Kitchen HVAC				
MAU & Exhaust	1	LS	\$10,000.00	\$10,000
General exhaust	6	EA	\$2,500.00	\$15,000
Electrical				
Provide new all-electrical kitchen meeting health department requirements for commercial kitchen - provide power connections	400	SF	\$65.00	\$26,000
Mark-up's per Overall Summary	59.41%			\$183,824
Subtotal for Remodel (E) Kitchen To Be All-Electirc:				\$493,224

Replace (E) Paving And Improve Courtyard	Quantity	Unit	Rate	Total (\$)
ADD:				
Demolition				
Demo and remove (E) courtyard	3,298	SF	\$5.00	\$16,490
(N) Courtyard, Priority 2				
Courtyard paving	3,298	SF	\$35.00	\$115,430
Drainage	3,298	SF	\$10.00	\$32,980
Mark-up's per Overall Summary	59.41%			\$97,972
Subtotal for Replace (E) Paving And Improve Courtyard Drainage:				\$262,872

Alternates	Job #24842
	March 8, 2024

(N) All-Electric Pool Equipment & Electrical Service Upgrade	Quantity	Unit	Rate	Total (\$)
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ADD:

Swimming Pool Equipment - Cost premium for All-electric equipment (ref. Aquatic Design)

Service and Distribution

Upgrade existing service from 600A to 1000A 208/120V. Upgrade existing transformer pad and main indoor switchboard, 36kAIC and feeder breakers. Upgrade associated feeders

1 EA \$101,400.00 \$101,400

Replace equipment below:

Panel 250A 208/120V 3Ph 22kAIC for Pool

1 EA \$7,500.00 \$7,500

Panel 250A 208/120V 3Ph 22kAIC for HVAC

1 EA \$7,500.00 \$7,500

Panel 150A 208/120V 3Ph 22kAIC for hot water systems

1 EA \$5,100.00 \$5,100

Panel 150A 208/120V 3Ph 22kAIC for Auditorium

1 EA \$5,100.00 \$5,100

Panel 150A 208/120V 3Ph 22kAIC for Provide TVSS for each panelboard

4 EA \$5,100.00 \$20,400
8 EA \$4,100.00 \$32,800

Mark-up's per Overall Summary

59.41% \$106,825

Subtotal for (N) All-Electric Pool Equipment & Electrical Service Upgrade: \$286,625

10. Appendix: Site Visit Notes and Code Analysis

Building and Pool Assessment

- Accessible Plumbing Fixtures are not present in men's and women's locker rooms, including toilets, showers, and lavs. One new accessible toilet and shower is provided in a family changing room opening onto pool deck.
- Plumbing fixture count for lavatories at pool area may be below code requirements (2 required in men's, one provided)
- Privacy concerns in locker rooms with partial height partitions.
- Pool deck exiting does not meet current code requirements.
- Roof leaks: status and extent of roof leaks unknown. Stains are evident on ceiling tiles in some areas and staff had said it is an ongoing issue.
- Kitchen: may need upgrades to comply with health code requirements. (Three bowl sink, hand washing, etc.)
- Curb at pool deck presents a tripping hazard and an impediment to accessibility.
- Roof drainage: Roof downspouts drain onto the pool deck and into the courtyard with indirect connections to area drains in both areas. It would be preferable for roof drains not to flow across paving.

Resiliency Assessment:

Preliminary questions for City and user groups: what are the requirements for the following elements of a resilient building (answers from discussion in Teams meeting with City staff on February 15, 2024, indicated in *italics*):

- Planning: How many people for what duration? How many meals served? At 50 square feet per person for sleeping cots, the gym could accommodate about 62 cots, and MRP 3 could accommodate another 42. *40 people on cots in the gym is sufficient.*
- Power: Duration and extent of backup power needed. One strategy: Provide backup power in areas of building intended to be used during emergencies. *Goal for backup power is 3 days. Power could be provided through generators or PV, depending on cost and funding.*
- Water supply: Does there need to be a water storage tank to supply water? For what duration? *No on-site water or wastewater storage required. Portable toilets will be provided if needed.*
- Storage for sanitary sewer waste in the event sewers are not working? *Not required.*
- Access to showers and bathing facilities during an emergency? *Desirable to have access to locker room facilities from the main building.*
- Level of structural upgrade. *This will not be considered an essential facility.*

Pool and Pool Deck:

- Pools:
 - According to original building drawings, pool is 75'-1" long by 35' wide (2,628 sf).
 - Lap pool ranges from 3'-6" to 9'-0" deep. (diving board shown on original drawings has been removed.)
 - raining pool is 16'-6" x 20'-0" (330 sf). There are steps into the training pool across the east end.
- Pool Deck:
 - The concrete pool deck shows evidence of cracking and crack repairs over time, with some water ponding from recent rains.
 - There is one on-deck shower (with surface-mounted piping).
 - There is a high-low drinking fountain with bottle filler

- At least one building downspout drains directly onto the pool deck, without a nearby drain.
- There is a 6" curb along the side of the pool deck adjacent to the equipment room and the office entrances, and adjacent to the storage room. Curb ramps have been added to provide wheelchair access, but this change in elevation could present a tripping hazard.
- One gate with panic hardware provides for egress from the pool deck.

Family Restroom/Changing Room:

- A spacious family changing room has been recently added within the existing building, opening onto the pool deck. It includes an accessible toilet (unenclosed), accessible shower, bench, and baby changing station. A wheelchair ramp has been provided to access this room from the pool deck. (The room is about 1' above the level of the pool deck).

Pool Entrance and Locker Rooms:

- The pool entrance and locker rooms are connected to the community center structure, but they do not have public access from the interior of the Community Center portion of the building. It was pointed out that if showers are required as a part of the resilience study, the showers within the pool locker room will not be generally accessible from the Community Center.
- Pool support functions include offices and a small lobby, accessible from the street, with a pay window.
- Construction of locker rooms and offices consists of CMU walls with exposed wood beam ceilings, painted. Some partitions within the locker rooms are made of wood studs and plywood panels, open at the top. Fire sprinklers are exposed.
- Men's locker room:
 - includes two toilets, two urinals and one lavatory. No accessible fixtures (with the exception, possibly of the lavatory).
 - Includes a changing area with wood benches attached to the wall, but no lockers.
 - The shower is a gang shower with five shower heads and a center drain. Controls for two of the shower heads are located on an adjacent wall, at least three to five feet away.
 - A portion of the men's locker room has been

partitioned off to create a family/all gender changing room with an accessible bench (no plumbing fixtures)

- Women's locker room:
 - Similar to Men's locker room.
 - Includes 8 metal lockers (in two tiers)—worn and rusted in spots.
 - A dressing room within the women's locker room is now used for storage.
 - Plumbing drawings from a remodel include 4 toilets and two showers, one large and one small. This fixture count was not verified. Apparently in a later remodel, a wall dividing two toilet rooms was removed to make one larger room.
 - Photos show a gang shower with 4 heads (not in floor plans). Two of the heads have controls on an adjacent wall.
 - A back-of-house passageway known by the staff as the "creepy hallway" runs between the locker rooms and the remainder of the community center.
 - The original building drawings show a second men's dressing room opening off of this hallway, but at least a portion of that area has been converted into the family restroom/ changing room noted above.
- Note: There appear to be no accessible restroom fixtures for pool users except the one toilet, shower and lavatory located in the recently added Family Restroom/Changing Room.

Pool Equipment Room and Storage Room:

- A pool equipment room opens off the pool deck
- Storage room opens off the pool deck.

Community Building Interior:

Multi-Purpose Room (with platform):

- Large room with raised stage, about 30" above main floor. Includes a wheelchair lift for access to the platform. Wood floor.
- Adjacent kitchen included gas stove with fire suppression system, residential refrigerator, double-bowl sink, Commercial dishwasher, storage cabinets. We were told that additional dry storage area is provided in other areas of the building. A window with a roll down counter door opens onto the multi-purpose room.

Other Building Areas:

- A courtyard in the center of the building includes roof drains that discharge to the pavement. One drain near the center of the courtyard appears to be the only drainage in this area. (Possible overflow/flooding issue if this drain becomes clogged.) Settlement over time appears to have occurred so that roof drains don't have a clear sloped path across the paving to the courtyard drain.
- The front, curved area of the building was a later addition, and it is currently being remodeled. It is our understanding that a small warming kitchen is being added in this area.
- Office areas include open office work stations and some enclosed offices.
- There is evidence of leaks in the ceiling tiles in some locations. We were told that there have been roof leaks, and efforts to address them are ongoing. Apparently water becomes trapped in the roof assembly.
- A children's playroom includes a kid's toilet area that is currently being used for storage. Original windows in this room appear to be single pane. In the lower, operable panes, the glass has been painted.
- A gym with full basketball court was in use at the time of the walk-through. Gym size appears to accommodate one basketball court with a small (three to five foot) perimeter. Gym has CMU walls and exposed wood ceiling structure with large glulam beams.

Code Review

Plumbing Fixture Count (for Locker Rooms) per CBC 3116B:

Water Area:

Lap Pool	2,628 sf
Tot Pool	330 sf
Total Area	2,958 sf
Total Users (@1 user/15 sf water area)	198
Users, Male and Female:	99 each

Plumbing Fixtures Required in Locker Rooms(CBC 3116B):

	Men	Women
Toilets	2	2
Urinals	2	
Lavatories	2	2
Showers (one per 50 pool users)	2	2
Drinking Fountains	2	

Pool Deck Exiting:

CBC Table 1004.5 includes the following allowances

	Area	Occupant Load
Skating rinks, swimming pools		
Rink and pool	50 gross	
Pool Water	2,958 sf	60
Pool Deck (gross area)	8,259 sf	551
Total	11,217	611

Minimum 3 exits required per CBC Table 1006.3.3 (4 exits required if occupant load exceeds 1000.)

Exit width required (using an occupant load factor of 0.2 (per CBC 1005.3.2)): 122.2" or 10'-1". One existing 4' wide gate with panic hardware exits from the pool area out towards the street.

In future, a discussion with the building official could be helpful to review how the occupant load is calculated, whether exiting can go back through the building, and whether some areas can be designated as "Safe Dispersal Areas" within the fence line per CBC 1028.5.

CBC Chapter 31B, Public Pools

Pool configuration, CBC 3111B- 3115B: By ADG

3114B.3 Deck slope. The pool's deck surface shall have a slope of no less than 1 percent ($1/8$ inch per foot) but no more than 2 percent ($1/4$ inch per foot) away from the pool to a deck drainage system and shall be constructed and finished to prevent standing water.

CBC 3116B Dressing, Shower and Toilet Facilities

3116B.2 Number of sanitary facilities. For the purpose of this subsection, one pool user shall be considered for every 15 square feet ($1.39 m^2$) of pool water surface area and/or spray ground splash zone area.

3116B.2.1 Showers. One shower shall be provided for every 50 pool users.

3116B.2.2 Toilets. Separate toilet facilities shall be provided for each sex. One toilet shall be provided for every 60 women or less and one toilet plus one urinal for every 75 men or less.

3116B.2.3 Lavatories. One lavatory shall be provided for every 80 pool users.

CBC 3116B.3 Construction

3116B.3 Construction.

3116B.3.1 Floors. Floors shall have a hard, nonabsorbent surface, such as portland cement concrete, ceramic tile or other approved material, which extends upwards onto the wall at least 5 inches (127 mm) with a coved base. Floors which may be walked on by a wet pool user shall be slip resistant. Floors shall be sloped not less than $1/4$ inch (6.4 mm) per foot to floor drains or other approved surface water disposal areas. Carpeting and other similar artificial floor covering shall not be permitted on shower and toilet room floors.

3116B.3.2 Interior surfaces. The materials used in the walls, except for structural elements, shall be of a type which is not adversely affected by moisture.

SECTION 3117B DRINKING FOUNTAINS

One guarded jet drinking fountain shall be provided for the first 250 pool users and an additional fountain shall be provided for each additional 200 pool users or fraction thereof. The number of pool users shall be determined according to Section 3116B.2.