

Engineering Report  
for  
City of Dayton, Oregon

# Seismic Retrofit of Dayton City Hall Annex

*408 Ferry Street, Dayton, Oregon*

*February 23, 2022*

SUBMITTED TO:

Rochelle Roaden  
City Manager  
Dayton, OR

SUBMITTED BY:

MSC Engineers, Inc.  
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AUTHORS:

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## 1.0 - Introduction:

The Dayton City Hall Annex is an independent structure located to the northeast of Dayton City Hall. It was formerly the site of the city fire station before it was relocated several blocks to the southwest.

The structure was originally constructed in 1975 and is a single-story structure approximately 60 feet wide by 96 feet long. The walls are comprised of reinforced concrete masonry units (CMU) with an eave height of approximately 12 feet. The structure has a gabled, wood roof with a single ridge running parallel to the length of the structure.

It currently supports various city functions including offices for a county police officer, public works and the city manager. Given the age and vulnerability of the existing city hall, the Annex is identified as the emergency operation center for the City of Dayton and, pending seismic upgrades, will house the remaining functions of City Hall as well.

It has been identified as a viable candidate for seismic retrofit and has been given a target performance objective of "Immediate Occupancy," appropriate for its emergency services role.

## 2.0 - Project Summary Information:

Project Summary Information						
Building Part	Building Part Name	Included in Retrofit	Year Built	Building Type	Nonstructural Retrofits included in scope?	Previous Seismic Retrofits?
A	City Hall Annex	Y	1975	RM1	Y	N

### 3.0- Engineering Report Checklist:

Engineering Report Checklist		
<input checked="" type="checkbox"/>	Engineering Report Cover	Page 1
<input checked="" type="checkbox"/>	Project Summary Information	Page 2
<input checked="" type="checkbox"/>	Building Parts Identification	Page 4
<input checked="" type="checkbox"/>	Statement of the Performance Objective	Page 9
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<input checked="" type="checkbox"/>	Itemized Construction Cost Estimate	App. C

#### 4.0 - Identification of Building Parts:

The building consists of a single, rectangular structure constructed in 1975. It is independent of all surrounding buildings and has not been added to, expanded, or retrofitted.



*Satellite View – 408 Ferry Street, Dayton, OR*

Photographs:



*Photo 1 – Front (North) Elevation*



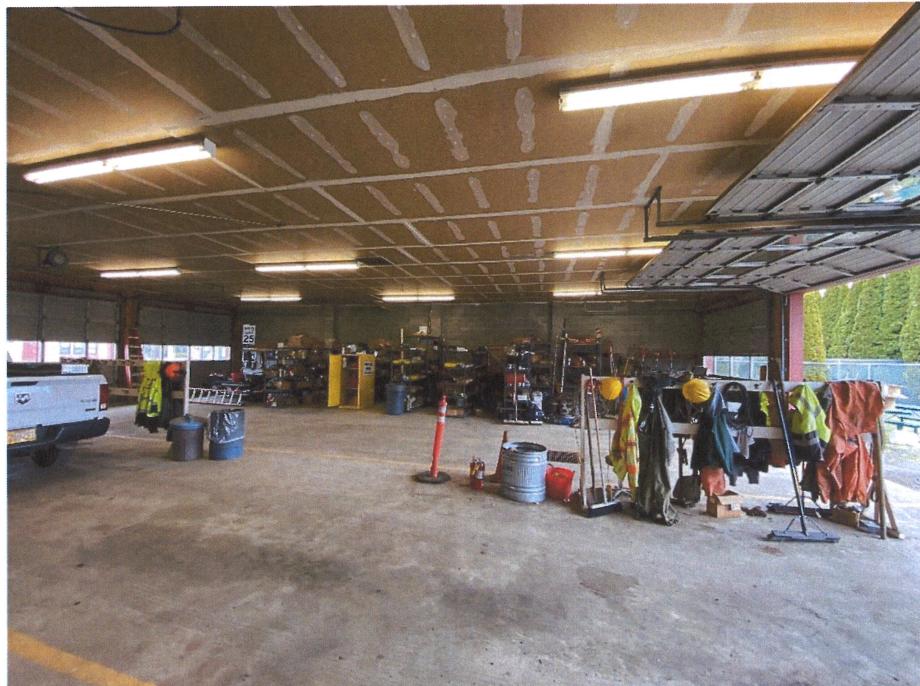
*Photo 2 – Rear (South)Elevation*



*Photo 3 – Side (West) Elevation*



*Photo 4 – East side / Property Boundary*



*Photo 5 – Apparatus Bay*



*Photo 6 – Apparatus Bay*



Photo 7 – Public Meeting Room

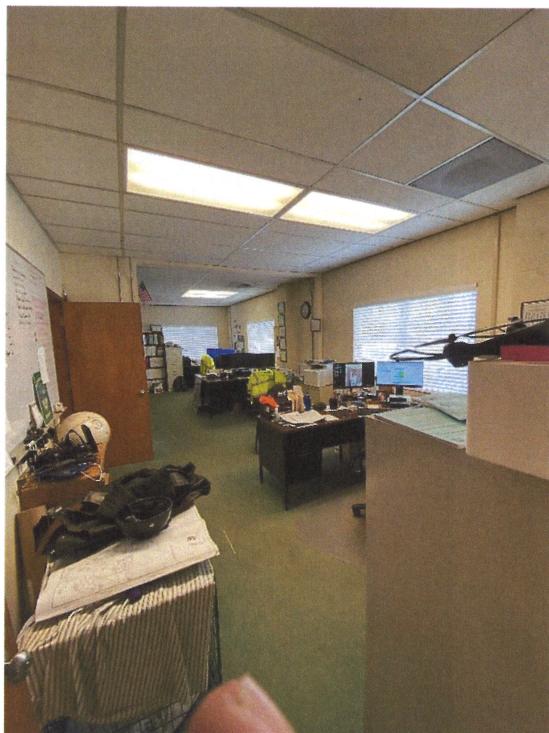


Photo 8 – Office Space



Photo 9 – Front Perspective / Veterans Memorial

## 5.0 - Statement of Performance Objective:

The target evaluation and rehabilitation objective per ASCE 41-17 Basic Performance Objective for Existing Buildings (BPOE) for Risk Category IV buildings is to achieve Life Safety Structural Performance Level and Hazards Reduced Nonstructural Performance Level for the BSE-2E event AND Immediate Occupancy Structural Performance Level and Position Retention Nonstructural Performance Level for the BSE-1E event.

## 6.0 - Summary of Deficiencies:

Summarized below are items that have been identified as either “non-compliant” or “unobserved” in a Tier 1 evaluation of the structure. See “Appendix A: ASCE 41-17 Tier 1 Checklists” for full checklists (Basic, Structural and Nonstructural).

### Structural Seismic Deficiencies:

#	Deficiency	Description
S1	LOAD PATH	The connection between the roof diaphragm and the gable-end shearwalls is not present in the structure. There is insufficient strength in the gable-end truss to transfer the seismic forces to the masonry wall below.
S2	TORSION	Rear (south) wall has more overhead doors and only one full-height wall segment without openings.
S3	REINFORCING STEEL	Reinforcing spacing (@ 48" OC ea. way) was confirmed with use of thermal imaging. Reinforcing sizes were assumed based on 1973 UBC and are non-compliant per ASCE 41-17. Assumed reinforcing was further found to be insufficient for gravity and seismic loads.
S4	WALL ANCHORAGE	The out-of-plane supports for the masonry walls (seismic loads perpendicular to the face of the wall) are not present.
S5	TRANSFER TO SHEARWALLS	The connection of the roof diaphragm to the north and south shearwalls is insufficient to transfer the lateral load to the shear walls.

#	Deficiency	Description
S6	FOUNDATION DOWELS	Length of wall dowels in unknown but is assumed to be insufficient to develop either the wall strength or uplift capacity of foundation.
S7	GIRDER-COLUMN CONNECTION	The connection of the 4x8 post to the glulam beam at the overhead doors is questionable. ASCE 31-03 prescribes that steel connectors be used. The installed connector is plywood gussets.
S8	REINFORCING AT WALL OPENINGS	The assumed masonry wall reinforcement based on the 1973 Uniform Building Code reference is under-reinforced for the combined lateral and gravity loads at the windows jambs.
S9	CROSS-TIES	Wood trusses may act as cross ties in one direction but no cross ties or sub-diaphragm elements are present perpendicular to the trusses.
S10	UNBLOCKED DIAPHRAGM	The roof diaphragm construction is 3/8" CDX plywood over flat 2x4's @ 24" OC. There is no blocking between the 2x4's and the current spans exceed maximum allowable per ASCE 7-41.

#### Nonstructural Seismic Deficiencies:

#	Deficiency	Description
N1	HEAVY PARTITIONS SUPPORTED BY CEILINGS / DRIFT	Interior masonry walls are not connected to the roof structure or detailed to accommodate drift.
N2	LIGHT PARTITIONS SUPPORTED BY CEILING / TOPS OF PARTITIONS	Interior partition walls are not supported above ceiling.
N3	INTEGRATED CEILINGS / EDGE CLEARANCE / EDGE SUPPORT	Lay-in acoustical tile ceiling is non-compliant. No diagonal tie wires were observed and edge supports are non-compliant.

N4	LIGHT FIXTURES / LIGHT COVERS	Existing light fixtures are non-compliant
N5	TALL NARROW CONTENTS / FALL PRONE CONTENTS	Bookcases, shelves and similar items are not anchored.
N6	INLINE EQUIPMENT / TALL NARROW EQUIPMENT	Electric furnace is not braced.
N7	MECHANICAL DOORS	Overhead doors at apparatus bays are not detailed to operate at specified drift limit
N8	FLEXIBLE COUPLINGS	Water lines are run under the slab but do not have flexible couplings to fixtures.

## 7.0 - Summary of Mitigation and Retrofit:

Summarized below are proposed retrofit measures for each identified deficiency.

### Structural Mitigation / Retrofit:

#	Deficiency	Description	Ref. Details / Cost
S1	LOAD PATH	At east and west walls, add a new wood stud wall to inside face of the structure adjacent to the masonry wall. New wall to be built to underside of existing roof trusses and sheathed with plywood for lateral restraint. Additional sheathing provided at gable-end truss along with shear transfer clips (Simpson A35 and LTP5) provided to complete the load path.	<u>Details:</u> 3/S5 <u>Est. Cost:</u> \$35,059
S2	TORSION	Planned retrofit of existing non-compliant walls to address torsional instability. Infill (2) doors on south wall and (1) door on north wall. See "S3" for additional info.	<u>Plan:</u> S3 <u>Est. Cost:</u> \$7,000
S3	REINFORCING STEEL	Infill existing overhead doors in (3) locations with new 8" CMU, reinforced. Provide epoxy dowels at new-existing interface.	<u>Plan:</u> S3 <u>Est. Cost:</u> \$15,400
S4	WALL ANCHORAGE	The installation of seismic ties to support the wall is required. At the gable ends of the structure this will require diagonal braces from the top of the wall to the roof diaphragm to be installed. At walls supporting trusses, strengthen attachment to truss.	<u>Details:</u> 1-3/S5 <u>Est. Cost:</u> \$28,000
S5	TRANSFER TO SHEARWALLS	Roof diaphragm to be re-nailed to blocking for "S10" mitigation. Add shear transfer clips (Simpson A35) from blocking to wood plate. At long walls supporting trusses, add retrofit plates (Simpson FRFP) or screw anchors (Titen HD) at existing overhead doors.	<u>Details:</u> 1-2/S5 <u>Est. Cost:</u> \$30,445

#	Deficiency	Description	Ref. Details / Cost
S6	FOUNDATION DOWELS	With new load path ("S1" retrofit) and planned infill of CMU walls ("S3" retrofit) importance of foundation dowels developing full capacity is diminished and no further retrofit is required.	N/A
S7	GIRDER-COLUMN CONNECTION	Add additional plywood gusset at top of column and additional retrofit bases at bottom for uplift resistance.	<u>Plan:</u> S3 <u>Est. Cost:</u> \$7,400
S8	REINFORCING AT WALL OPENINGS	Add new stud walls on inside face of existing non-compliant, exterior CMU walls. Stud walls to be designed to support full weight of roof system and out-of-plane loads from CMU.	<u>Details:</u> 1/S5 <u>Est. Cost:</u> \$30,500
S9	CROSS-TIES	Provide strapping at 8'-0" OC to create sub-diaphragm at gabled ends of roof.	<u>Plan:</u> S4 <u>Est. Cost:</u> \$4,980
S10	UNBLOCKED DIAPHRAGM	Preliminary analysis indicates that allowable shear exceeds the capacity for unblocked 3/8" sheathing. Add second layer of 3/8" plywood with increased nailing at perimeter as required.	<u>Plan:</u> S4 <u>Est. Cost:</u> \$234,640

#### Nonstructural Mitigation / Retrofit:

#	Deficiency	Description	Ref. Details / Cost
N1	HEAVY PARTITIONS SUPPORTED BY CEILINGS / DRIFT	Remove existing full height CMU wall and replace with wood stud wall. Provide lateral support at remaining heavy partitions.	<u>Est. Cost:</u> \$14,550

#	Deficiency	Description	Ref. Details / Cost
N2	LIGHT PARTITIONS SUPPORTED BY CEILING / TOPS OF PARTITIONS	Provide diagonal bracing at top of walls.	<u>Est. Cost:</u> \$9,250
N3	INTEGRATED CEILINGS / EDGE CLEARANCE / EDGE SUPPORT	Replace existing ceiling grid with new.	<u>Est. Cost:</u> \$33,000
N4	LIGHT FIXTURES / LIGHT COVERS	Replace existing lighting with new.	<u>Est. Cost:</u> \$22,000
N5	TALL NARROW CONTENTS / FALL PRONE CONTENTS	Add anchors to existing shelving	<u>Est. Cost:</u> \$2,500
N6	INLINE EQUIPMENT / TALL NARROW EQUIPMENT	Provide straps and anchors at existing furnace.	<u>Est. Cost:</u> \$2,000
N7	MECHANICAL DOORS	Infill of existing openings will drastically increase wall stiffness and negate need for special detailing at overhead doors.	<u>N/A</u>
N8	FLEXIBLE COUPLINGS	Add flexible coupling at plumbing fixtures.	<u>Est. Cost:</u> \$6,000

## 8.0 - Summary of Construction Cost Estimate:

Refer to "Appendix C: Construction Cost Estimate" for a more detailed breakdown of construction costs. This cost estimate has been developed by MSC Engineers Inc. and is based more comprehensive cost analyses performed for similar projects. The cost estimate is also based on our company's extensive experience performing seismic rehabilitation. Lastly, the cost estimate only represents probable costs and is intended for budgetary purpose only. A final estimate will be performed by the owner once full construction documents are available and the start of construction is near enough to offset any potential volatility in the market.

### Summary of Direct Costs:

<b>TOTAL DIRECT CONSTRUCTION COSTS:</b>	<b>\$ 482,724</b>
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### Summary of Indirect Costs:

Soft Costs (taxes, overhead, profit, etc):	\$ 176,194
Project fees and management	\$ 112,016
Contingency & Relocation Allowance:	\$ 184,187
<b>TOTAL INDIRECT COSTS:</b>	<b>\$ 472,397</b>

### Total Project Cost / Funding Requirement:

<b>ESTIMATED TOTAL PROJECT COST (Direct + Indirect):</b>	<b>\$ 955,121</b>
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## 9.0 - Certification Statement:

The authors of this report certify that all seismic deficiencies identified during the evaluation process, are addressed in the above list. The evaluation was conducted according to the standards listed above and to the best of our abilities.

## Appendices

*Appendix A: ASCE 41-17 Evaluation & RVS*

*Basic Configuration Checklist*

*Building System Structural Checklist*

*Nonstructural Checklist*

*Appendix B: Retrofit Drawings and Sketches*

*Appendix C: Construction Cost Estimate*

## **Appendix A: ASCE 41-17 Evaluation & RVS**

Rapid Visual Screening of Buildings for Potential Seismic Hazards  
FEMA P-154 Data Collection Form

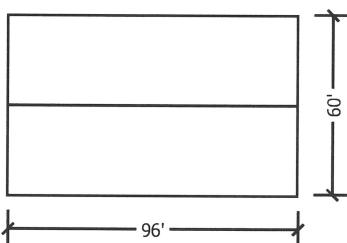
Level 1  
VERY HIGH Seismicity



ELEV



PLAN



SKETCH

<p><b>Address:</b> 408 Ferry St.  <b>Zip:</b> 97114</p> <p><b>Other Identifiers:</b> Old Dayton Fire Station</p> <p><b>Building Name:</b> Dayton City Hall Annex</p> <p><b>Use:</b> Emergency Operations Center</p> <p><b>Latitude:</b> 45.219713      <b>Longitude:</b> -123.076982</p> <p><b>Ss:</b> 0.874      <b>Sf:</b> 0.431</p> <p><b>Screener(s):</b> JAC      <b>Date/Time:</b> 2/7/22</p>														
<p><b>No. Stories:</b> Above Grade: 1    Below Grade: 0    <b>Year Built:</b> 1975 <input type="checkbox"/> EST</p> <p><b>Total Floor Area (sq. ft.):</b> 5760    <b>Code Year:</b> 1973 UBC</p> <p><b>Additions:</b> <input checked="" type="checkbox"/> None    <input type="checkbox"/> Yes, Year(s) Built: _____</p>														
<p><b>Occupancy:</b> Assembly    Commercial    <b>Emer. Services</b> <input type="checkbox"/> Historic    <input type="checkbox"/> Shelter            Industrial    Office    School <input checked="" type="checkbox"/> Government            Utility    Warehouse    Residential, # Units: _____</p>														
<p><b>Soil Type:</b> <input type="checkbox"/> A Hard Rock    <input type="checkbox"/> B Avg Rock    <input type="checkbox"/> C Dense Soil    <input checked="" type="checkbox"/> D Stiff Soil    <input type="checkbox"/> E Soft Soil    <input type="checkbox"/> F Poor Soil    <b>DNK</b> <input type="checkbox"/>  <small>If DNK, assume Type D.</small></p>														
<p><b>Geologic Hazards:</b> Liquefaction: Yes <input type="checkbox"/> No    DNK Landslide: Yes <input type="checkbox"/> No    DNK Surf. Rupt.: Yes <input type="checkbox"/> No</p>														
<p><b>Adjacency:</b> <input type="checkbox"/> Pounding    <input type="checkbox"/> Falling Hazards from Taller Adjacent Building</p>														
<p><b>Irregularities:</b> <input type="checkbox"/> Vertical (type/severity) _____  <input checked="" type="checkbox"/> Plan (type) Torsion _____</p>														
<p><b>Exterior Falling Hazards:</b> <input type="checkbox"/> Unbraced Chimneys    <input type="checkbox"/> Heavy Cladding or Heavy Veneer  <input type="checkbox"/> Parapets    <input type="checkbox"/> Appendages  <input type="checkbox"/> Other: _____</p>														
<p><b>COMMENTS:</b> _____</p>														
<p><input type="checkbox"/> Additional sketches or comments on separate page</p>														

**BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE,  $S_{L1}$**

FEMA BUILDING TYPE	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
<b>Basic Score</b>		<b>2.1</b>	<b>1.9</b>	<b>1.8</b>	<b>1.5</b>	<b>1.4</b>	<b>1.6</b>	<b>1.4</b>	<b>1.2</b>	<b>1.0</b>	<b>1.2</b>	<b>0.9</b>	<b>1.1</b>	<b>1.0</b>	<b>1.1</b>	<b>1.1</b>	<b>0.9</b>	<b>1.1</b>
Severe Vertical Irregularity, $V_{L1}$		-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, $V_{L1}$		-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, $P_{L1}$		-0.7	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code		-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark		1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B		0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)		0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)		-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, $S_{MIN}$		0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.2	1.0

**FINAL LEVEL 1 SCORE,  $S_{L1} \geq S_{MIN}$ :** 0.5

<b>EXTENT OF REVIEW</b> Exterior: <input type="checkbox"/> Partial <input checked="" type="checkbox"/> All Sides <input type="checkbox"/> Aerial Interior: <input type="checkbox"/> None <input checked="" type="checkbox"/> Visible <input type="checkbox"/> Entered Drawings Reviewed: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Soil Type Source: N/A Geologic Hazards Source: N/A Contact Person: N/A		<b>OTHER HAZARDS</b> Are There Hazards That Trigger A Detailed Structural Evaluation? <input type="checkbox"/> Pounding potential (unless $S_{L2} >$ cut-off, if known) <input type="checkbox"/> Falling hazards from taller adjacent building <input type="checkbox"/> Geologic hazards or Soil Type F <input type="checkbox"/> Significant damage/deterioration to the structural system		<b>ACTION REQUIRED</b> Detailed Structural Evaluation Required? <input type="checkbox"/> Yes, unknown FEMA building type or other building <input checked="" type="checkbox"/> Yes, score less than cut-off <input type="checkbox"/> Yes, other hazards present <input type="checkbox"/> No  Detailed Nonstructural Evaluation Recommended? (check one) <input checked="" type="checkbox"/> Yes, nonstructural hazards identified that should be evaluated <input type="checkbox"/> No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary <input type="checkbox"/> No, no nonstructural hazards identified <input type="checkbox"/> DNK	
<b>LEVEL 2 SCREENING PERFORMED?</b> <input type="checkbox"/> Yes, Final Level 2 Score, $S_{L2}$ _____ <input checked="" type="checkbox"/> No Nonstructural hazards? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data    OR    DNK = Do Not Know

Legend:

MRF = Moment-resisting frame  
BR = Braced frame

RC = Reinforced concrete  
SW = Shear wall

URM INF = Unreinforced masonry infill  
TU = Tilt up

MH = Manufactured Housing  
LM = Light metal

FD = Flexible diaphragm  
RD = Rigid diaphragm

# ASCE 41-17 EVALUATION

## SUMMARY DATA SHEET

### BUILDING DATA

Building Name:	Dayton City Hall Annex		Date:	2/23/22	
Building Address:	408 Ferry Street, Dayton, OR				
Latitude:	45.219713	Longitude:	-123.076982	By:	MSC Eng.
Year Built:	1975	Year(s) Remodeled:	N/A	Original Design Code:	1973 UBC
Area (sf):	5760	Length (ft):	96'-0"	Width (ft):	60'-0"
No. of Stories:	1	Story Height:	12'-4"	Total Height:	23'-2"
USE	<input type="checkbox"/> Industrial <input type="checkbox"/> Office <input type="checkbox"/> Warehouse <input type="checkbox"/> Hospital <input type="checkbox"/> Residential <input type="checkbox"/> Educational				<input checked="" type="checkbox"/> Other: Gov't

### CONSTRUCTION DATA

Gravity Load Structural System:	Site-built, wood trusses @ 4' OC spanning full width of structure to ext. bearing walls			
Exterior Transverse Walls:	8" CMU, partially grouted @ 48" OC ea. way		Openings?	Yes, windows
Exterior Longitudinal Walls:	8" CMU, partially grouted @ 48" OC ea. way		Openings?	Yes, primarily open
Roof Materials/Framing:	Comp. roof on 3/8" Plywood on Flat 2x4 @ 24" OC			
Intermediate Floors/Framing:	N/A			
Ground Floor:	Slab on Grade			
Columns:	Wood 4x6		Foundation:	Cont. concrete ftgs.
General Condition of Structure:	Good			
Levels Below Grade?	None			
Special Features and Comments:	None			

### LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	RM1	RM1
Vertical Elements:	8" CMU	8" CMU
Diaphragms:	Wood sheathing (unblocked)	Wood Sheathing (unblocked)
Connections:	Inadequate	Inadequate

### EVALUATION DATA

BSE-1N Spectral Response Accelerations:	$S_{Ds} = 0.699$	$S_{D1} = 0.537$	
Soil Factors:	Class = D (assumed)	$F_a = 1.303$	$F_v = 2.004$
BSE-1E Spectral Response Accelerations:	$S_{xs} = 0.348$	$S_{x1} = 0.193$	
Level of Seismicity:	High	Performance Level:	I.O.
Building Period:	$T = 0.02(17.75)^{0.75} = 0.17$		
Spectral Acceleration:	$S_a = 0.699$		
Modification Factor:	$C_m C_1 C_2 = 1.0$	Building Weight:	W = 259.5 kips
Pseudo Lateral Force:	$V = C_m C_1 C_2 S_a W = 181.65 \text{ k}$		

### BUILDING CLASSIFICATION: RM1

REQUIRED TIER 1 CHECKLISTS	Yes	No
Basic Configuration Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Building Type RM1 Structural Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Nonstructural Component Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>

FURTHER EVALUATION REQUIREMENT: none

## ASCE 41-17 Tier 1 Checklists

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FIRM:	MSC Engineers Inc
PROJECT NAME:	Dayton City Hall Annex Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	211219
COMPLETED BY:	JAC
DATE COMPLETED:	02/07/22
REVIEWED BY:	CBS
REVIEW DATE:	02/14/22

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## 17.1.2IO Basic Configuration Checklist

**Table 17-3. Immediate Occupancy Basic Configuration Checklist**

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
<b>Very Low Seismicity</b>							
<b>Building System—General</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.1.1	A.2.1.1	seismic ties between the roof diaphragm and CMU walls are not present; chord forces on the roof diaphragm are undetermined.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.1.2	A.2.1.2	distance between structures exceeds the 3% limit.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3	no mezzanines
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>Building System—Building Configuration</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.2.1	A.2.2.2	single-story building
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.2.2	A.2.2.3	single-story building
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4	walls are continuous to foundation
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.2.4	A.2.2.5	single-story, rectangular building
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	5.4.2.5	A.2.2.6	single-story building
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.2.6	A.2.2.7	one side of the building has greater percent of opening than the other

<b>Status</b>	<b>Evaluation Statement</b>				<b>Tier 2 Reference</b>	<b>Commentary Reference</b>	<b>Comments</b>			
	<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>						
<b>Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)</b>										
<b>Geologic Site Hazards</b>										
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.4.3.1	A.6.1.1	Earthquake liquefaction hazard is moderate per DOGAMI hazard maps.			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.	5.4.3.1	A.6.1.2	Site is flat			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3	No known local faults at this location			

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Status	Evaluation Statement				Tier 2 Reference	Commentary Reference	Comments			
	C	NC	N/A	U						
<b>Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)</b>										
<b>Foundation Configuration</b>										
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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 $0.6S_a$ .	5.4.3.3	A.6.2.1				
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.	5.4.3.4	A.6.2.2				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## ASCE 41-17 Tier 1 Checklists

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FIRM:	MSC Engineers Inc
PROJECT NAME:	Dayton City Hall Annex Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	211219
COMPLETED BY:	JAC
DATE COMPLETED:	02/07/22
REVIEWED BY:	CBS
REVIEW DATE:	02/14/22

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## 17.17IO Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Table 17-35. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2	Commentary	Comments		
		Reference	Reference			
<b>Very Low Seismicity</b>						
<i>Seismic-Force-Resisting System</i>						
<input checked="" type="checkbox"/> C	<input type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.		
<input checked="" type="checkbox"/> C	<input type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> 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. <sup>2</sup> (4.83 MPa).		
<input type="checkbox"/> C	<input type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> 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.		
<i>Connections</i>						
<input type="checkbox"/> C	<input checked="" type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> 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.		
<input type="checkbox"/> C	<input type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.		
<input type="checkbox"/> C	<input checked="" type="checkbox"/> NC	<input type="checkbox"/> N/A	<input type="checkbox"/> 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.		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.7.3.4	A.5.3.5	unable to confirm the sufficiency of foundation dowels without further testing, assumed to be non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

#### ***Stiff Diaphragms***

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.7.2	A.5.2.3	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

#### ***Foundation System***

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.	A.6.2.3		
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.	A.6.2.4		
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

Status	Evaluation Statement	Tier 2		Commentary			
		Reference	Reference	Comments			
<b>Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)</b>							
<b><i>Seismic-Force-Resisting System</i></b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides.	5.5.3.1.5	A.3.2.4.3	unable to confirm without further testing, assumed to be non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30.	5.5.3.1.2	A.3.2.4.4	$h/t = 12' / (7.625"/12) = 18.9 < 30$
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b><i>Diaphragms (Stiff or Flexible)</i></b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	5.6.1.3	A.4.1.4	no openings of diaphragm adjacent to shear walls
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.6.1.3	A.4.1.6	no openings of diaphragm adjacent to shear walls
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7	no re-entrant corners or other plan irregularities
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	5.6.1.5	A.4.1.8	no openings of diaphragm
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>Flexible Diaphragms</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2	no cross ties are present perpendicular to the trusses
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2	wood structural panels present
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.6.2	A.4.2.3	diaphragm is unblocked and exceeds span limits; ratio (1.6:1) is compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.6.3	A.4.3.1	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1	wood sheathing diaphragm
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
<b>Connections</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	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.	5.7.1.2	A.5.1.4	no anchors observed in the structure
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## ASCE 41-17 Tier 1 Checklists

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FIRM:	MSC Engineers Inc
PROJECT NAME:	Dayton City Hall Annex Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	211219
COMPLETED BY:	JAC
DATE COMPLETED:	02/07/22
REVIEWED BY:	CBS
REVIEW DATE:	02/14/22

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## 17.19 Nonstructural Checklist

Table 17-38. Nonstructural Checklist

Status	Evaluation Statement <sup>a,b</sup>				Tier 2 Reference	Commentary Reference	Comments	
<b>Life Safety Systems</b>								
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.4	A.7.13.1	no fire sprinklers
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.4	A.7.13.2	no fire sprinklers
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.7	A.7.12.1	no fire sprinklers
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.6	A.7.14.1	no fire sprinklers
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.4	A.7.13.3	no fire sprinklers
C NC N/A U	HR—not required; LS—not required; PR—LMH. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.9	A.7.3.1	no emergency lighting or lit egress signs
<b>Hazardous Materials</b>								
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.1	A.7.12.2	No toxic or hazardous material
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.8.3	A.7.15.1	No toxic or hazardous material
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.3 13.7.5	A.7.13.4	No toxic or hazardous material
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.3 13.7.5	A.7.13.3	No toxic or hazardous material
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.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.7.3 13.7.5	A.7.15.4	No toxic or hazardous material

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. PIPING OR DUCTS</b>	13.7.3	A.7.13.6	No toxic or hazardous material
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.7.5		
<hr/>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. UNREINFORCED MASONRY</b>	13.6.2	A.7.1.1	Interior masonry wall is not braced
<hr/>							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. HEAVY PARTITIONS SUPPORTED BY CEILINGS</b>	13.6.2	A.7.2.1	Interior masonry wall is not braced at top
<hr/>							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. DRIFT</b>	13.6.2	A.7.1.2	Interior masonry wall is not designed for drift
<hr/>							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.2	A.7.2.1	Interior partitions not continuous to structure or braced above ceiling.
<hr/>							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.2	A.7.1.3	No structural separations
<hr/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.2	A.7.1.4	Interior partitions not continuous to structure or braced above ceiling.
<hr/>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—H; LS—MH; PR—LMH. SUSPENDED LATH AND PLASTER</b>	13.6.4	A.7.2.3	No lath and plaster ceilings.
<hr/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft <sup>2</sup> (1.1 m <sup>2</sup> ) of area.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—LMH. SUSPENDED GYPSUM BOARD</b>	13.6.4	A.7.2.3	Gypsum ceilings are small (less than 12' wide) and supported by partitions.
<hr/>							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft <sup>2</sup> (1.1 m <sup>2</sup> ) of area.			

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.2	Suspended ceiling is non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) 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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.4	Suspended ceiling is non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) 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).			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.4	A.7.2.5	No seismic joints
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. EDGE SUPPORT</b>	13.6.4	A.7.2.6	Suspended ceiling is non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft <sup>2</sup> (13.4 m <sup>2</sup> ) are supported by closure angles or channels not less than 2 in. (51 mm) wide.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.6.4	A.7.2.7	No ceiling areas greater than 2500 sq.ft.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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 ft <sup>2</sup> (232.3 m <sup>2</sup> ) and has a ratio of long-to-short dimension no more than 4-to-1.			
<b>Light Fixtures</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH.</b>	13.6.4	A.7.3.2	Light fixtures non-compliant
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.	13.7.9		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.9	A.7.3.3	No pendant lighting
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. LENS</b>	13.7.9	A.7.3.4	Light fixtures non-compliant
<b>COVERS: Lens covers on light fixtures are attached with safety devices.</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. CLADDING ANCHORS:</b>	13.6.1	A.7.4.1	no cladding on exterior, exposed CMU
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cladding components weighing more than 10 lb/ft <sup>2</sup> (0.48 kN/m <sup>2</sup> ) 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)			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. CLADDING</b>	13.6.1	A.7.4.3	no cladding on exterior, exposed CMU
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. MULTI-STORY PANELS:</b>	13.6.1	A.7.4.4	no cladding on exterior, exposed CMU
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. THREADED RODS:</b> 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.	13.6.1	A.7.4.9	no cladding on exterior, exposed CMU
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.6.1.4	A.7.4.5	no cladding on exterior, exposed CMU
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. BEARING CONNECTIONS:</b> Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6	no cladding on exterior, exposed CMU
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—MH. INSERTS:</b> Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7	no cladding on exterior, exposed CMU
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. OVERHEAD GLAZING:</b> Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft <sup>2</sup> (1.5 m <sup>2</sup> ) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8	No overhead glazing
<b>Masonry Veneer</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. TIES:</b> Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft <sup>2</sup> (0.25 m <sup>2</sup> ), 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).	13.6.1.2	A.7.5.1	No masonry veneer present
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Angles: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	13.6.1.2	A.7.5.2	No masonry veneer present
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. WEAKENED PLANES:</b> Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	13.6.1.2	A.7.5.3	No masonry veneer present

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. UNREINFORCED MASONRY BACKUP:</b> There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2	No masonry veneer present
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.6.1.1 13.6.1.2	A.7.6.1	No masonry veneer present
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—MH; PR—MH. ANCHORAGE:</b> 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.	13.6.1.1 13.6.1.2	A.7.7.1	No masonry veneer present
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6	No masonry veneer present
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b> OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2	No masonry veneer present
<b>Parapets, Cornices, Ornamentation, and Appendages</b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. URM PARAPETS OR CORNICES:</b> 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.	13.6.5	A.7.8.1	No URM parapets or cornices
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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).	13.6.6	A.7.8.2	Fabric canopy at entry attached less than 6' oc
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—H; LS—MH; PR—LMH. CONCRETE PARAPETS:</b> Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3	No concrete parapets or cornices
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—MH; LS—MH; PR—LMH. APPENDAGES:</b> 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.	13.6.6	A.7.8.4	No heavy appendages

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**Masonry Chimneys**

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. URM CHIMNEYS:</b>	13.6.7	A.7.9.1	no masonry chimney
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—LMH; PR—LMH. ANCHORAGE:</b>	13.6.7	A.7.9.2	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.			

**Stairs**

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. STAIR ENCLOSURES:</b> 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.	13.6.2	A.7.10.1	no stairs
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		13.6.8		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—LMH; PR—LMH. STAIR DETAILS:</b> 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.	13.6.8	A.7.10.2	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			

**Contents and Furnishings**

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—LMH; LS—MH; PR—MH. INDUSTRIAL STORAGE RACKS:</b> 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.	13.8.1	A.7.11.1	no industrial racks
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—MH. TALL NARROW CONTENTS:</b> 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.	13.8.2	A.7.11.2	bookcases and similar items are not anchored
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—H. FALL-PRONE CONTENTS:</b> 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.	13.8.2	A.7.11.3	not all items weighing more than 20 lbs are secured
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.			

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.10	A.7.11.4	no access floors
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.7.7	A.7.11.5	no access floors
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.6.10		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.8.2	A.7.11.6	no suspended contents
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.			
<b><i>Mechanical and Electrical Equipment</i></b>							
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—H. FALL-PRONE</b>	13.7.1	A.7.12.4	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.7.7		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—H. IN-LINE</b>	13.7.1	A.7.12.5	Electric furnace is unbraced
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—MH. TALL NARROW</b>	13.7.1	A.7.12.6	Electric furnace is unbraced
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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.	13.7.7		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—MH.</b>	13.6.9	A.7.12.7	Overhead doors are not designed for drift
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.1	A.7.12.8	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.7.7		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.1	A.7.12.9	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.			
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.1	A.7.12.10	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	13.7.7		

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<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.7	A.7.12.11
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.8	A.7.12.12
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.		
<b>Piping</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.3	A.7.13.2
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.5	Water pipes do not have flexible couplings.
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. FLUID</b>	13.7.3	A.7.13.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.5	No natural gas lines. Water pipes underslab
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. C-</b>	13.7.3	A.7.13.5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.5	
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.3	A.7.13.6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.	13.7.5	no seismic joint
<b>Ducts</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. DUCT</b>	13.7.6	A.7.14.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BRACING: Rectangular ductwork larger than 6 ft <sup>2</sup> (0.56 m <sup>2</sup> ) 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).		Rectangular and circular ducts are smaller than limits
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. DUCT</b>	13.7.6	A.7.14.3
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SUPPORT: Ducts are not supported by piping or electrical conduit.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.6	A.7.14.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.		no seismic joint
<b>Elevators</b>						
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—H. RETAINER</b>	13.7.11	A.7.16.1
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	GUARDS: Sheaves and drums have cable retainer guards.		no elevator
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—H; PR—H. RETAINER PLATE:</b>	13.7.11	A.7.16.2
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	A retainer plate is present at the top and bottom of both car and counterweight.		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.3
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.4
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	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.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.5
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.7
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H.</b>	13.7.11	A.7.16.8
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.		
<b>C</b>	<b>NC</b>	<b>N/A</b>	<b>U</b>	<b>HR—not required; LS—not required; PR—H. GO-SLOW ELEVATORS: The building has a go-slow elevator system.</b>	13.7.11	A.7.16.9

<sup>a</sup> Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.

<sup>b</sup> Level of Seismicity: L = Low, M = Moderate, and H = High.

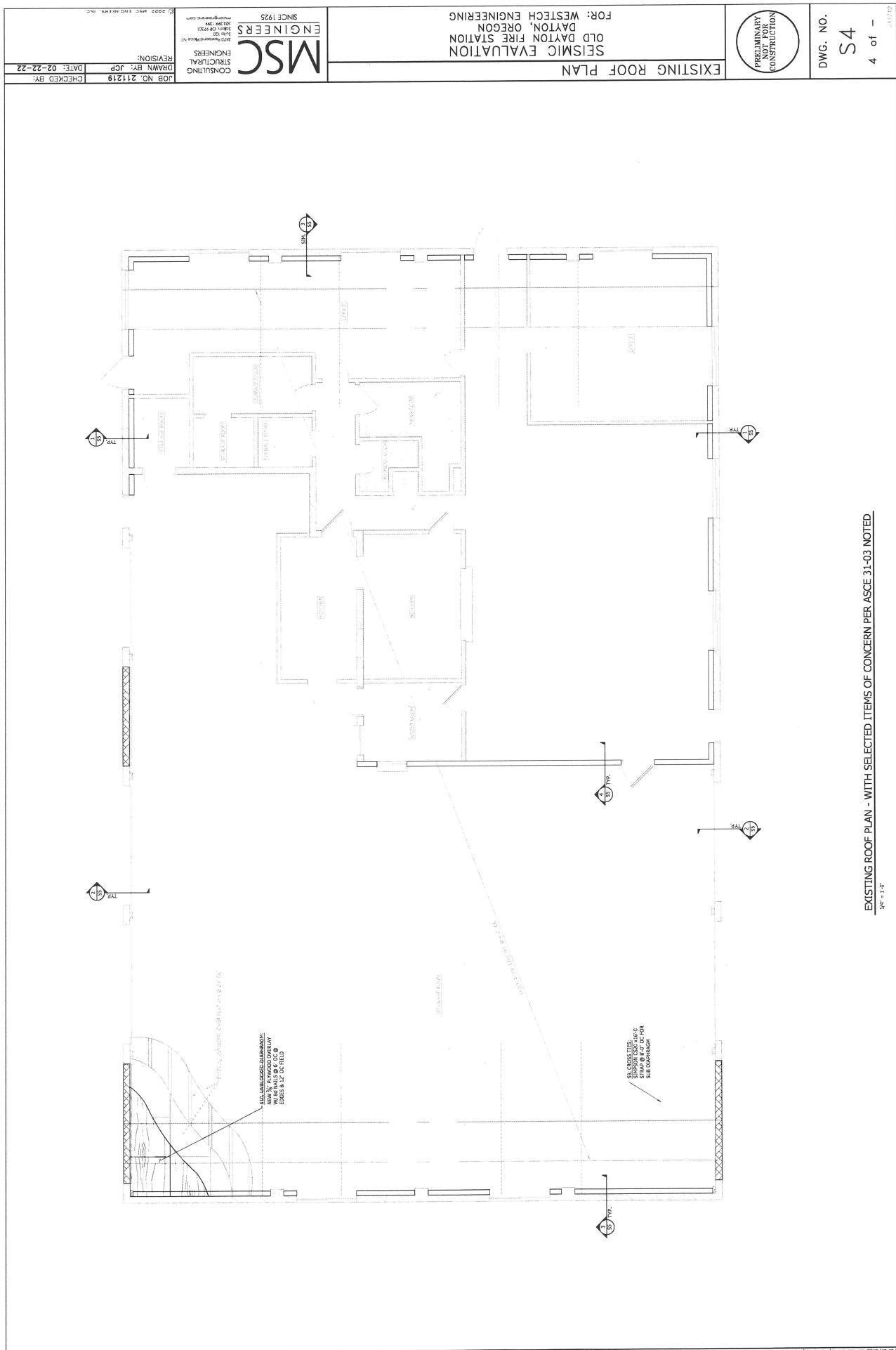
Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

## **Appendix B: Retrofit Drawings and Sketches**





EXISTING FLOOR PLAN - WITH RECOMMENDED SEISMIC UPGRADES



## EXISTING ROOF PLAN

SEISMIC EVALUATION  
OLD DAYTON FIRE STATION  
DAYTON, OREGON  
FOR: WESTECH ENGINEERING

S5

MSCE ENGINEERS CONSULTING STRUCTURAL ENGINEERS  
REV 1.0  
JOB NO. 21219 DRAWN BY: JCP DATE: 02-22-22  
CHECKED BY: DATE: 02-22-22  
SINGAPORE 1925  
MSCE ENGINEERS PTE LTD  
2023 MSC ENGINEERS PTE LTD

## **TYPICAL EXTERIOR WALL RETROFIT**

**RETROFIT @ OVERHEAD DOORS**

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## GABLE END WALL RETROFIT

## INTERIOR SHEARWALL

45

2  
55

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FB3 23, 2022-09-23 AM G:\DOCS-2021211219 DWTON ANNEX BUILDING211219.DWG, JPUFFPAFF

## **Appendix C: Construction Cost Estimate**

MSC Engineers, Inc.

Job #: 211219

Project: Dayton Annex SRGP

Date: 2/23/2022

Designer: JAC

Client: Westech

**ENGINEERING COST ESTIMATE**  
**DAYTON CITY HALL ANNEX**

Row	Description	Quantity	Unit Price	Estimated Cost
10	<b>DEFICIENCY (1) - LOAD PATH</b>			
11	New 2x6 stud wall (~ 12' tall) each end	117 lf	\$60.00 / lf	\$ 7,040
12	Plywood sheathing gable-end	660 sf	\$10.00 / sf	\$ 6,600
13	Shear transfer clips	117 lf	\$50.00 / lf	\$ 5,867
14	Gypsum Board	1,447 sf	\$4.00 / sf	\$ 5,787
15	Paint (primer plus 2 coats, roller)	1,447 sf	\$2.00 / sf	\$ 2,893
16	Rubber base	117 lf	\$3.00 / lf	\$ 352
17	Electrical (remove and reinstall)	117 lf	\$30.00 / lf	\$ 3,520
18	Mobilization	1	\$3,000.00	\$ 3,000
19	<b>SUBTOTAL</b>			
20	<b>DEFICIENCY (S2) - TORSION</b>			
21	Demo and Cleaning	100 sf	\$5.00 / sf	\$ 500
22	Epoxy dowels at opening perimeter	40 lf	\$50.00 / lf	\$ 2,000
23	Infill existing 10x10 O.H.D. w/ 8" CMU	100 sf	\$20.00 / sf	\$ 2,000
24	Disposal	1	\$500.00 ea.	\$ 500
25	Mobilization	1	\$2,000.00 ea.	\$ 2,000
26	<b>SUBTOTAL</b>			
27	<b>DEFICIENCY (S3) - REINFORCING</b>			
28	Demo and Cleaning	240 sf	\$5.00 / sf	\$ 1,200
29	Epoxy dowels at opening perimeter	88 lf	\$50.00 / lf	\$ 4,400
30	Infill (2) existing 10x12 O.H.D. w/ 8" CMU	240 sf	\$20.00 / sf	\$ 4,800
31	Disposal	1	\$1,000.00 ea.	\$ 1,000
32	Mobilization	1	\$4,000.00 ea.	\$ 4,000
33	<b>SUBTOTAL</b>			
34	<b>DEFICIENCY (S4) - WALL ANCHORAGE</b>			
35	Add 4x4 Kickers at gable-end walls	18	\$750.00 ea.	\$ 13,500
36	Add simpson clips at ea. truss	46	\$250.00 ea.	\$ 11,500
37	Mobilization	1	\$3,000.00 ea.	\$ 3,000
38	<b>SUBTOTAL</b>			
39	<b>DEFICIENCY (S5) - SHEAR TRANSFER</b>			
40	Add Simpson FRFP Clips @ 48" OC	25	\$250.00 ea.	\$ 6,250
41	Add Titen HD A.B. @ 32" OC (at O.H.D.)	46	\$45.00 ea.	\$ 2,070
42	Add Titen HD A.B. @ 32" OC (short walls)	45	\$45.00 ea.	\$ 2,025
43	Add LTP5 Clips at perimeter	312 lf	\$50.00 / lf	\$ 15,600
44	Straps between wood beams at O.H.D.	8	\$250.00 ea.	\$ 2,000
45	Mobilization	1	\$2,500.00 ea.	\$ 2,500
46	<b>SUBTOTAL</b>			
47	<b>DEFICIENCY (S7) - GIRDER COLUMN TIES</b>			
48	Add plywood gusset at post/beam connection	8	\$300.00 ea.	\$ 2,400
49	Add (6) HGAM clips ea. post/pilaster	48	\$50.00 ea.	\$ 2,400
50	Add (2) RPZ bases ea. post	16	\$100.00 ea.	\$ 1,600
51	Mobilization	1	\$1,000.00 ea.	\$ 1,000
52	<b>SUBTOTAL</b>			

MSC Engineers, Inc.

Job #: 211219

Project: Dayton Annex SRGP

Date: 2/23/2022

Designer: JAC

Client: Westech

<b>DEFICIENCY (S8) - REINFORCING AT OPENINGS</b>			
54 New 2x6 Stud Wall (~ 12' tall)	100 lf	\$60.00 / lf	\$ 6,000
55 Clips to existing CMU wall (@ 48" OC ea. way)	1,200 sf	\$10.00 / sf	\$ 12,000
56 Gypsum Board	1,200 sf	\$4.00 / sf	\$ 4,800
57 Paint (primer plus 2 coats, roller)	1,200 sf	\$2.00 / sf	\$ 2,400
58 Rubber base	100 lf	\$3.00 / lf	\$ 300
59 Electrical (remove and reinstall)	100 lf	\$30.00 / lf	\$ 3,000
60 Mobilization	1	\$2,000.00 ea.	\$ 2,000
<b>SUBTOTAL</b>			<b>\$ 30,500</b>
<b>DEFICIENCY (S9) - CROSS-TIES</b>			
62 Add straps to existing 2x4 framing (16' long x 8' OC)	224 lf	\$20.00 / lf	\$ 4,480
64 Mobilization	1	\$500.00 ea.	\$ 500
<b>SUBTOTAL</b>			<b>\$ 4,980</b>
<b>DEFICIENCY (S10) - UNBLOCKED DIAPHRAGM</b>			
67 Demo existing roofing	5,760 sf	\$6.00 / sf	\$ 34,560
68 Add 3/8" plywood overlay	5,760 sf	\$3.00 / sf	\$ 17,280
69 New roofing	5,760 sf	\$30.00 / sf	\$ 172,800
70 Disposal	1	\$5,000.00 ea.	\$ 5,000
71 Mobilization	1	\$5,000.00 ea.	\$ 5,000
<b>SUBTOTAL</b>			<b>\$ 234,640</b>
<b>DEFICIENCY (N1) - HEAVY PARTITIONS</b>			
74 Demo existing 12' tall x 34' long wall	408 sf	\$5.00 / sf	\$ 2,040
75 Add diagonal bracing above ceiling at remainder	52 lf	\$75.00 / lf	\$ 3,900
76 New 2x6 Stud Wall (~ 12' tall)	34 lf	\$60.00 / lf	\$ 2,040
77 Gypsum Board	408 sf	\$4.00 / sf	\$ 1,632
78 Paint (primer plus 2 coats, roller)	408 sf	\$2.00 / sf	\$ 816
79 Rubber base	34 lf	\$3.00 / lf	\$ 102
80 Electrical (remove and reinstall)	34 lf	\$30.00 / lf	\$ 1,020
81 Disposal	1	\$1,000.00 ea.	\$ 1,000
82 Mobilization			\$ 2,000
<b>SUBTOTAL</b>			<b>\$ 14,550</b>
<b>DEFICIENCY (N2) - LIGHT PARTITIONS</b>			
84 Add diagonal bracing above ceiling	110 lf	\$75.00 / lf	\$ 8,250
86 Mobilization			\$ 1,000
<b>SUBTOTAL</b>			<b>\$ 9,250</b>
<b>DEFICIENCY (N3) - CEILINGS</b>			
88 Replace existing ceiling grid with new	2,000 sf	\$15.00 / sf	\$ 30,000
89 Mobilization			\$ 3,000
<b>SUBTOTAL</b>			<b>\$ 33,000</b>
<b>DEFICIENCY (N4) - LIGHT FIXTURES</b>			
93 Replace existing fluorescent lighting with new	2,000 sf	\$10.00 / sf	\$ 20,000
94 Mobilization			\$ 2,000
<b>SUBTOTAL</b>			<b>\$ 22,000</b>
<b>DEFICIENCY (N5) - TALL NARROW CONTENTS</b>			
97 Add anchors to existing shelving		allowance	\$ 2,000
98 Mobilization			\$ 500
<b>SUBTOTAL</b>			<b>\$ 2,500</b>
<b>DEFICIENCY (N6) - INLINE / TALL EQUIPMENT</b>			
101 Anchors and bracing to existing units		allowance	\$ 1,500
102 Mobilization			\$ 500
<b>SUBTOTAL</b>			<b>\$ 2,000</b>

**MSC Engineers, Inc.**

Job #: 211219

Date: 2/23/2022

Project: Dayton Annex SRGP

Designer: JAC

Client: Westech

<b>DEFICIENCY (N8) - FLEXIBLE COUPLINGS</b>			
Flexible couplers at plumbing fixtures		allowance	\$ 5,000
Mobilization			\$ 1,000
<b>SUBTOTAL</b>			\$ 6,000
<b>TOTAL (DIRECT COSTS)</b>			\$ 482,724

<b>INDIRECT COSTS</b>			
	<b>Description</b>	<b>Estimate</b>	<b>Total Cost</b>
113			
114	General Conditions	10.0%	\$ 48,272
115	Prevailing Wage	15.0%	\$ 72,409
116	Overhead	6.0%	\$ 28,963
117	Profit	3.0%	\$ 14,482
118	Insurance	2.5%	\$ 12,068
119	<b>SUBTOTAL</b>		\$ 176,194
120	<b>TOTAL CONSTRUCTION COSTS</b>		\$ 658,918
121			
122	Professional Fees	10.0%	\$ 65,892
123	Testing Services	2.0%	\$ 13,178
124	Permit Fees	2.5%	\$ 16,473
125	Project Management	2.5%	\$ 16,473
126	<b>SUBTOTAL</b>		\$ 112,016
127	<b>TOTAL WITH DESIGN FEES</b>		\$ 770,934
128			
129	Contingency	20.0%	\$ 154,187
130	Relocation (Allowance)		\$ 30,000
131	<b>SUBTOTAL</b>		\$ 184,187
132	<b>TOTAL PROJECT COST</b>		\$ 955,121
133			
134			
135	<b>TOTAL PROJECT FUNDING REQUIREMENT</b>		\$ 955,121