MAIN RESIDENCE

PRESCRIPTIVE PROTOTYPE #1 DESIGN FOR ONE STORY MASONRY STRUCTURE MODEL WITH CONCRETE FLAT ROOF HOME IN PUERTO RICO

PREFACE:

THIS PRESCRIPTIVE HOME DRAWING SET PRESENTS RECOMMENDATIONS FOR THE CONSTRUCTION OF A ONE STORY HOME. THIS GUIDANCE DISPLAYS INFORMATION FOR A PARTICULAR SIZED HOME. THE DESIGN INFORMATION PROVIDED HEREIN INCORPORATES SEISMIC AND WIND CRITERIA BASED UPON THE LATEST PUERTO RICO BUILDING CODE WHICH REFERENCES THE 2018 INTERNATIONAL RESIDENTIAL CODE (2018 IRC), 2018 INTERNATIONAL BUILDING CODE (2018 IBC), AND THE AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE/SEI 7-16: MINIMUM DESIGN LOADS AND ASSOCIATED CRITIERIA FOR BUILDINGS AND OTHER STRUCTURES.

ALL RECOMMENDED DESIGN WORK, INCLUDING THOSE PARTS COVERED BY THIS DOCUMENT, SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL SUCH AS A REGISTERED PROFESSIONAL ENGINEER OR A LICENSED ARCHITECT IN PUERTO RICO. WHEN THESE GUIDANCE DRAWINGS ARE USED FOR A PROJECT, THEY SHOULD BE MODIFIED AS NEEDED IN ORDER TO COMPLY WITH ALL OF THE APPLICABLE CODE REQUIREMENTS FOR A GIVEN PROJECT SITE, THEN SIGNED AND SEALED IN ACCORDANCE WITH PUERTO RICO LAWS, BUILDING CODE, AND DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERENCE (DDEC). THIS SET ASSUMES A FLAT PROJECT SITE , IF THE SITE IS NOT FLAT, A REGISTERED PROFESSIONAL ENGINEER OR A LICENSED ARCHITECT WILL NEED TO MODIFY THE FOUNDATION DESIGN. A GEOTECHNICAL ENGINEER MAY ALSO BE REQUIRED TO PERFORM A SLOPE STABILITY ANALYSIS AND PROVIDE SOIL CONDITIONS FOR THE DESIGN OF A REVISED HOUSE FOUNDATION.

THE FOLLOWING BOUNDARY CONDITIONS SHALL BE MET IN ORDER TO USE THIS DRAWING SET. THIS DRAWING SET IS NOT VALID IF THE PROJECT PARAMETERS ARE OUTSIDE OF THESE BOUNDARY CONDITIONS:

1. SINGLE STORY BUILDING WITH THE MAXIMUM MEAN ROOF HEIGHT AS SHOWN IN THE DRAWING SET.

2. GABLE ROOF AS SHOWN IN THE DRAWING SET.

3. BUILDING WIDTH AND LENGTH AS SHOWN IN THE DRAWING SET.

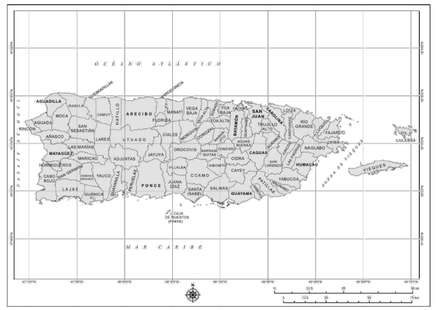
ALL CONSTRUCTION MUST COMPLY WITH THE PUERTO RICO BUILDING CODE.
YOU ARE REQUIRED TO OBTAIN THE NECESSARY BUILDING PERMITS FROM THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC). SIGNED AND SEALED DRAWINGS FOR PERMIT MUST BE SUBMITTED TO THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC).

STRUCTURES LOCATED IN SPECIAL FLOOD HAZARD AREAS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL AND CERTIFIED TO COMPY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

INFORMATION ABOUT STORM SURGE CAN BE ACCESSED AT HTTPS://NHC.NOAA.GOV/NATIONALSURGE/, BY CLICKING ON PUERTO RICO. ADDITIONAL FLOOD DESIGN INFORMATION CAN BE ACCESSED AT THE FEMA FLOOD MAP SERVICE CENTER HTTPS://MSC.FEMA.GOV/PORTAL/ADVANCESEARCH BY SELECTING PUERTO RICO FOR THE STATE AND THEN SELECTING THE APPROPRIATE COUNTY FOR PROJECT LOCATION. REFER TO PLANNING REGULATION 13: SPECIAL FLOOD HAZARD AREAS REGULATION, WHICH PROVIDES ADDITIONAL FLOOD HAZARD REQUIREMENTS AT HTTP://JP.PR.GOV/

FEMA/DDEC DOES NOT SPECIFICALLY ENDORSE THE PRODUCTS OF ANY MANUFACTURER. PRODUCTS THAT EQUAL THE SPECIFICATIONS OF THE NOTED PRODUCTS MAY BE SUBSTITUTED

DRAWING INDEX	
SHEET NUMBER	**SHEET NAME**
	ARCHITECTURAL
A-001	Title Sheet
A-100	Floor Plan, Elevations, Sections and Roof Plans
A-101	Notes, Windows, Doors, Finishes, Bathrooms & Kitchen Schedules
A-500	Wall Sections
A-510	Doors and Windows Details
A-511	Roofing Details
A-512	Module Joint Details
	STRUCTURAL
S-001	Title Sheet
S-002A	General Notes
S-002B	General Notes
S-003	Wind Diagrams-Flat Roof
S-004	Safe Room Wind Diagrams
S-005	Foundation Plans
S-006	Wall Framing Plan
S-007	Roof Framing Plans
S-008	Elevations
S-009	Sections
S-010	Typical Details
S-011	Typical Details
S-012	Slab Typical Details
	PLUMBING
PL-100	Plumbing layout
PL-200	Plumbing notes and details
	ELECTRICAL
E-100	Electrical layout
E-101	Electrical notes and details



MAP OF PUERTO RICO (N.T.S.)

GENERAL LEGEND

ROOM KEY:
ROOM NAME
ROOM NUMBER

DETAIL KEY:
DETAIL NUMBER
DRAWING NUMBER

ELEV 25'-0" — SPOT ELEVATION KEY

ENLARGED PLAN KEY

ALIGN KEY

EXTERIOR ELEVATION KEY

DIMENSION LINE

INTERIOR ELEVATION KEY

C.5 C.5 — COLUMN LINE INDICATORS

MULTIPLE INTERIOR ELEVATIONS

REVISION KEY

DOOR NUMBER

KEYNOTE INDICATOR

ABBREVIATIONS

& - And
< - Angle
@ - At
℄ - Center Line
Ø - Diameter
- Pound
± - Tolerance Dimension
A/E - Architect / Engineer
ADDL - Additional
ADH - Adhesive
ADJ - Adjustable
ADJC - Adjacent
AF - Access Floor
AFF - Above Finished Floor
AL - Aluminum
ALT - Alternate
APPROX - Approximately
ARCH - Architect
BD - Board
BETW - Between
BLDG - Building
BLKG - Blocking
BM - Beam
BO - By Others
BOT - Bottom
CLG - Ceiling
CL- Closet
CLR - Clear
CMU - Concrete Masonry Unit
CNTR - Counter
COL - Column
CONC - Concrete
CONSTR - Construction
CONT - Continuous
CONTR - Contractor
CORR - Corridor
CT - Ceramic Tile
DIA - Diameter
DIM - Dimension
DN - Down
DOP - Door Opening
DR - Door
DTL - Detail
DWG - Drawing
EA - Each
EJ - Expansion Joint
EL - Elevation
ELEC - Electrical
ENCL - Enclosure
ENGR - Engineer
ENTR - Entrance
EQ - Equal
EQUIP - Equipment
EXT - Exterior
F/F - Face to Face
FDN - Foundation
FIN - Finish
FLR - Floor
FT - Foot or Feet
FTG - Footing
FUT - Future
GC - General Contractor
GND - Ground
GR - Grade
GWB - Gypsum Wall Board
HDW - Hardware
HT - Height
HM - Hollow Metal
HMD - Hollow Metal Door
HNDRL - Handrail
HORIZ - Horizontal
HP - High Point
IN - Inch or Inches
INSUL - Insulation
INT - Interior
JT - Joint
KIT - Kitchen
KO - Knockout
L - Length or Left
LAV - Lavatory
LF - Linear Foot or Feet
LNTL - Lintel
LONG - Longitudinal
LP - Low Point
LT - Light
LTG - Lighting
LTWT - Lightweight
MAS - Masonry
MATL - Material
MAX - Maximum
MECH - Mechanical
MED - Medium
MEMB - Membrane
MF - Metal Flashing
MFR - Manufacturer
MIN - Minimum
MIR - Mirror
MISC - Miscellaneous
ML - Metal Lath
MLDG - Molding
MLWK - Millwork
MO - Masonry Opening
MTD - Mounted
MTR - Mortar
MTL - Metal
MVBL - Movable
N - North
NA - Not Applicable
NIC - Not In Contract
NO - Number
NOM - Nominal
NTS - Not To Scale
OA - Overall
OC - On Center
OPNG - Opening
OPP - Opposite
PAR - Parallel
PERF - Perforated
PERIM - Perimeter
PERP - Perpendicular
PL - Plate
PLAS - Plaster
PLBG - Plumbing
PLYWD - Plywood
PNL - Panel
POL - Polished
PR - Pair
PREFIN - Prefinished
PT - Pressure Treated
PTD - Painted
PTN - Partition
QTY - Quantity
QUAL - Quality
RCP - Reflected Ceiling Plan
REC - Recessed
REF - Reference
REFR - Refrigerator
REINF - Reinforced or Reinforcing
REM - Removable
REQD - Required
REQMTS - Requirements
RFG - Roofing
RLG - Railing
RM - Room
RO - Rough Opening
S - South
SCHED - Schedule
SCR - Screw
SECT - Section
SF - Square Foot or Feet
SHR - Shower
SHT - Sheet
SHTG - Sheathing
SIM - Similar
SK - Sink
SM - Sheet Metal
SPEC - Specifications
SQ - Square
SS - Stainless Steel
SSF - Solid Surface
STD - Standard
STL - Steel
STRUCT - Structural
SUSP - Suspended
SYM - Symbol
SYMM - Symmetrical
SYP - Southern Yellow Pine
SYS - System
T - Treads (Stairs)
T&B - Top and Bottom
T&G - Tongue and Groove
TBD - To Be Determined
TBM - Top of Beam
TC - Top of Concrete
TEMP - Temporary
TF - Top of Footing
TFF - Top of Finished Floor
THK - Thickness
THRES - Threshold
THRU - Through
T.O. - Top Of
TOC - Top Of Concrete
TOF - Top of Footing
TOL - Tolerance
TOM - Top Of Masonry
TOP - Top of Pavement
TOS - Top Of Steel
TOSL - Top of Slab
TOW - Top Of Wall
TYP - Typical
UNFIN - Unfinished
UON - Unless Otherwise Noted
VB - Vapor Barrier or Vinyl Base
VER - Verify
VERT - Vertical
VEST - Vestibule
VIF - Contractor to Verify In Field
VR - Vapor Retarder
W - West
W/ - With
W/O - Without
WC - Water Closet
WD - Wood
WLD - Welded
WP - Working Point
WT - Weight
WTH - Width
WTPRF - Waterproofing
WWF - Welded Wire Fabric

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

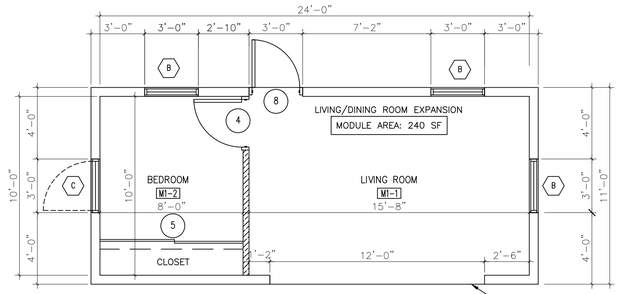
SHEET TITLE:

Title Sheet

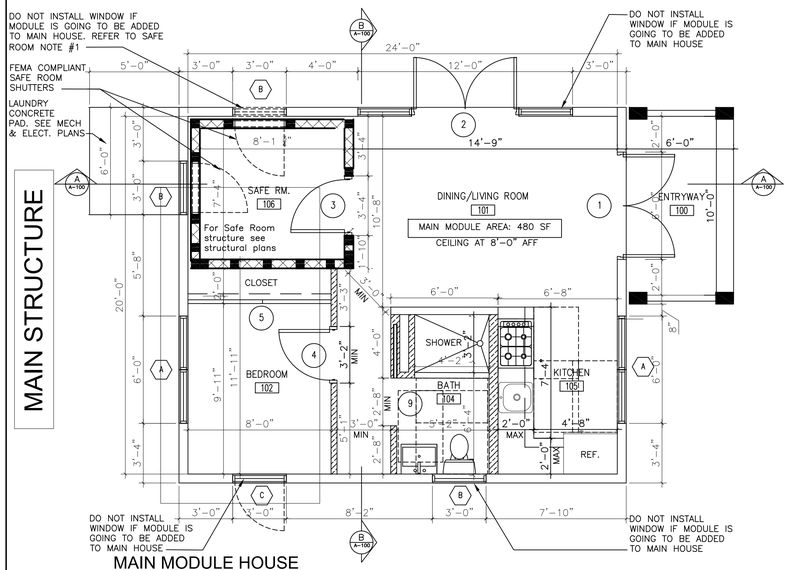
SHEET INFORMATION:

JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: **A-001**
Checked By:	
QC Review:	
Phase:	

ADDITION OPTION

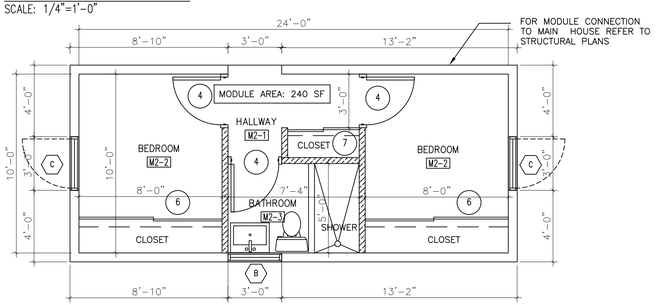


FUTURE EXPANSION MODULE -1
SCALE: 1/4"=1'-0"



MAIN MODULE HOUSE
SCALE: 1/4"=1'-0"

MAIN STRUCTURE

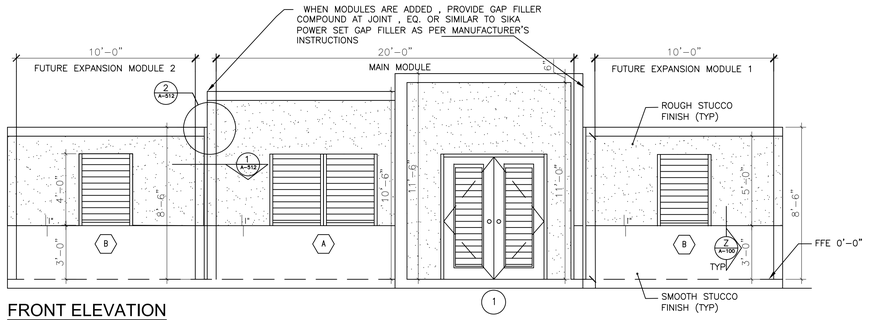


FUTURE EXPANSION MODULE - 2
SCALE: 1/4"=1'-0"

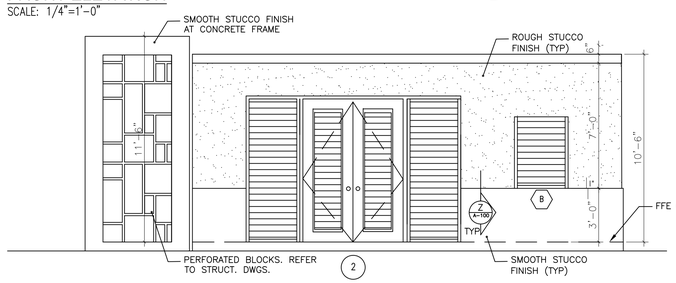
LEGEND:
- CONCRETE
- REINFORCED MASONRY WALLS
- STRUCTURAL WOOD WALL
- SOLID GROUTED MASONRY WALLS (SAFE ROOM. SEE STRUCTURAL PLANS)

0' 5' 10'

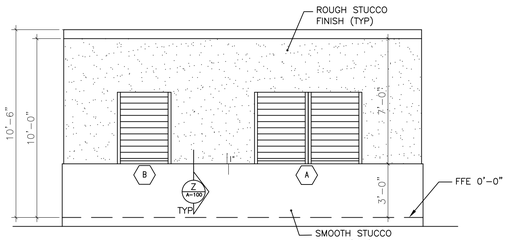
NOTE: FOR STRUCTURE DESIGN, FOOTINGS AND WALLS DESCRIPTION SEE STRUCTURAL PLANS



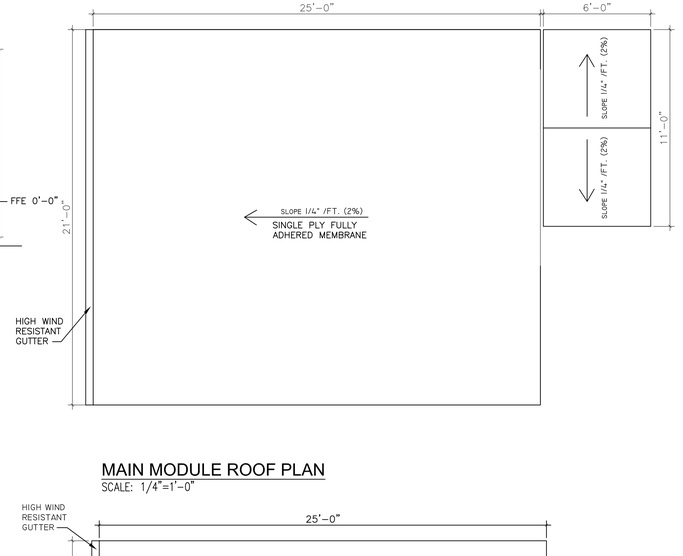
FRONT ELEVATION
SCALE: 1/4"=1'-0"



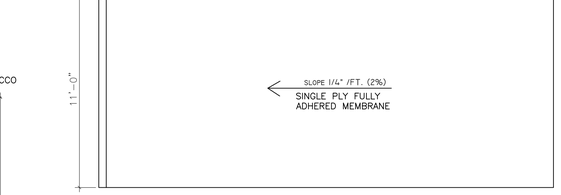
RIGHT SIDE ELEVATION (WITHOUT MODULE 1)
SCALE: 1/4"=1'-0"



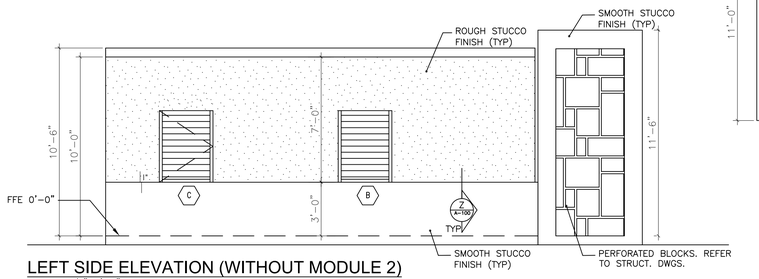
REAR ELEVATION
SCALE: 1/4"=1'-0"



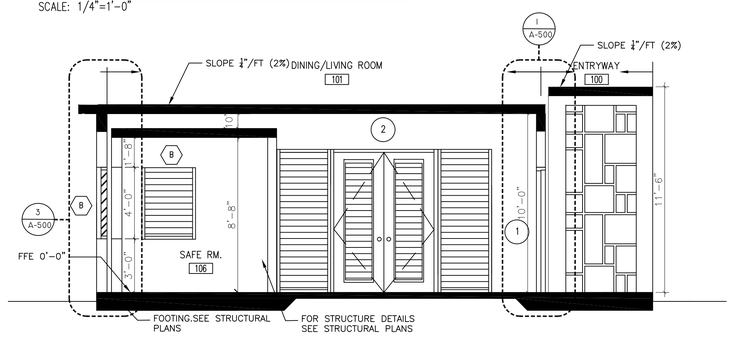
MAIN MODULE ROOF PLAN
SCALE: 1/4"=1'-0"



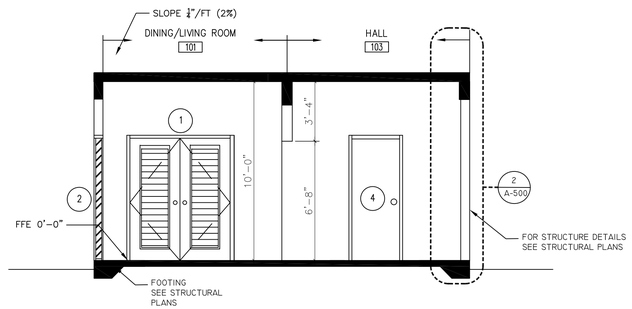
EXPANSION MODULES ROOF PLAN
SCALE: 1/4"=1'-0"



LEFT SIDE ELEVATION (WITHOUT MODULE 2)
SCALE: 1/4"=1'-0"



SECTION A-A
SCALE: 1/4"=1'-0"



SECTION B-B
SCALE: 1/4"=1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

PROTOTYPE 1_FLOOR PLANS & ELEVATIONS

SHEET INFORMATION:

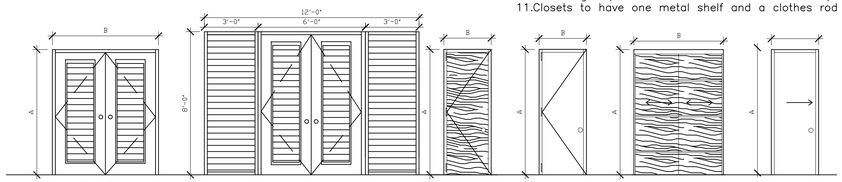
JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-100
Checked By:	
QC Review:	
Phase:	

FINISH SCHEDULE MAIN MODULE

NO.	NAME	FLOOR	BASE	CEILING	WALL
100	BALCONY	F1		C1	W1
101	LIVING/DINING ROOM	F1		C1	W1
102	BEDROOM	F1		C1	W1
103	HALL	F1		C1	W1
104	BATHROOM	F1, F2		C1	W1,W2
105	KITCHEN	F1		C1	W1
106	SAFE ROOM	F1		C1	W1

FINISH SCHEDULE MODULES 1&2

NO.	NAME	FLOOR	BASE	CEILING	WALL
M1-1	LIVING ROOM	F1		C1	W1
M1-2	BEDROOM	F1		C1	W1
M2-1	HALLWAY	F1		C1	W1
M2-2	BEDROOM	F1		C1	W1
M2-3	BATHROOM	F1, F2		C1	W1,W2

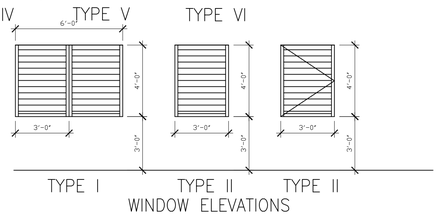


TYPE I TYPE II TYPE III TYPE IV TYPE V TYPE VI

DOOR ELEVATIONS

MAIN BLDG	MOD. 1	MOD. 2	DOOR SCHEDULE PROTOTYPE 1						
QTY.	QTY.	QTY.	NO.	TYPE	DIMENSIONS (D.O.) A	DIMENSIONS (D.O.) B	MATERIAL	DESCRIPTION	REMARKS
1			1	I	7'-0"	6'-0"	ALUMINUM	JALOUSIE WINDOW DOOR	HARDWARE BY MANUFACTURER (ENTRANCE) COLOR: GRAY; FRAME: ALUM.
1			2	II	7'-0"	12'-0"	ALUMINUM	JALOUSIE WINDOW DOOR & JALOUSIE WINDOW	STOREFRONT; DOOR 6' X 8' H. HARDWARE BY MANUFACTURER (ENTRANCE)
1			3	IV	7'-0"	3'-4"	HOLLOW METAL	FIXED	SAFETY ROOM DOOR HARDWARE BY MANUFACTURER (COLOR GRAY)
2	1	3	4	III	7'-0"	3'-0"	WOOD & WOOD FRAME	FLUSH DOOR SEMI-SOLID	HARDWARE: PRIVACY WOOD: CEDAR. PAINT GRAY
1	1		5	V	8'-0"	8'-9 1/4"	WOOD	FLUSH SLIDING BYPASS CL. DOOR	HARDWARE: JOHNSON HARDWARE 200SD COLOR: GRAY PAINT; LOCATION:ROOM M1-2 & ROOM 102
		2	6	V	8'-0"	7'-8 3/8"	WOOD	FLUSH SLIDING BYPASS CL. DOOR	HARDWARE: JOHNSON HARDWARE 200SD COLOR: GRAY PAINT
		1	7	V	8'-0"	5'-2 5/8"	WOOD	FLUSH SLIDING BYPASS CL. DOOR	HARDWARE: JOHNSON HARDWARE 200SD COLOR: GRAY PAINT
		1	8	V	8'-0"	3'-0"	ALUMINUM	FLUSH DOOR	SECURITY ENTRANCE DOOR HARDWARE BY MANUFACTURER (COLOR GRAY)
		1	9	VI	7'-0"	3'-0"	WOOD & WOOD FRAME	POCKET DOOR SEMI-SOLID	HARDWARE: PRIVACY WOOD: CEDAR. PAINT GRAY

1. Install doors as per the FMA/AMMA 200 and 400 guidelines.



TYPE I TYPE II TYPE II

WINDOW ELEVATIONS

MAIN BLDG	MOD. 1	MOD. 2	WINDOW SCHEDULE PROTOTYPE 1						
QTY.	QTY.	QTY.	NO.	TYPE	DIMENSIONS A	DIMENSIONS B	MATERIAL	A.F.F. (C)	REMARKS
2			A	I	6'-0"	6'-0"	ALUMINUM JALOUSIE	3'-0"	COLOR: GRAY JALOUSIE: 4", ADD ALUM. SCREEN
3	3	1	B	II	6'-0"	3'-0"	ALUMINUM JALOUSIE	3'-0"	COLOR: GRAY JALOUSIE: 4", ADD ALUM. SCREEN
1	1	2	C	III	6'-0"	3'-0"	ALUMINUM JALOUSIE	3'-0"	COLOR: GRAY JALOUSIE: 4", ADD ALUM. SCREEN

1. Window waterproofing: Provide 100% Silicone caulking around the interior and exterior perimeter of each window, eq. or similar to Sikaflex 211. Install as per the FMA/AMMA 200 and 400 guidelines.
2. For safe room window requirements, see structural drawings.

FINISHES KEYNOTES

FLOOR FINISHES:
F1 – Polished concrete with satin sealer
F2 – Shower floor and 4" high shower curb to be mosaic ceramic tile, 2x2, color white, grout silver color.

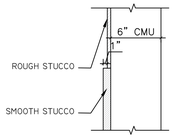
BASE:
No base to be installed

CEILING:
C1 – Concrete, smooth plaster painted white

WALLS:
W1 – Concrete, smooth plaster painted white
W2 – Ceramic tile wainscot, 4"x4", color white with silver grout at shower walls (3), to 72" high

FINISHES NOTES

1. All floor finishes must be level and smooth
2. Contractor must consult with the Owner for any material changes from the specified in the contract documents.
3. When required by Owner, Contractor must submit one sample of the finishes to the Owner for approval. Sample must conform with the specifications in the contract documents and colors selected by the Architect and/or Owner.
4. Whenever a color is not selected or indicated in the contract documents, it must be consulted with the Owner for selection.
5. Interior Walls paints shall be equal or similar to Behr Premium Plus Ultra (paint and primer) in eggshell finish, white, unless otherwise indicated by the Owner. Personal Colors to be selected by the Owner.
6. Ceiling paint to be equal or similar to Behr Premium Plus Ultra Stain Blocking Ceiling Paint in white, unless otherwise indicated by the Owner.
7. Exterior paint to be equal or similar to Behr Premium Plus Ultra Exterior Flat Enamel, color white unless otherwise indicated by the Owner. Personal Colors to be selected by Owner.
8. Bathrooms wall and floor finishes to be selected and provided by the contractor, unless otherwise indicated by the Owner.
9. Kitchen finishes to be selected by the Owner. Kitchen design and construction shop drawings to be provided by Others to the Owner. Contractor must coordinate with Kitchen supplier. Kitchen supplier must verify all the dimensions prior to the start of the kitchen cabinetry construction. Contractor shall be responsible for any discrepancies in the dimensions not verified by the supplier.
10. Contractor must verify on field all the finishes quantities and areas before the material is purchased. Contractor must provide the exact quantities to the Owner so he can get quotes on the material finishes if required.
11. Closets to have one metal shelf and a clothes rod installed on its interior.



WALL DETAIL - Z

N.T.S.

BATHROOM SCHEDULE

BATHROOM EQUIPMENT:
Water Closet: Cadet 3 FloWise Tall Height 2–Piece 1.28 GPF Single Flush High Efficiency Elongated Toilet in White with Slow Close Seat by American Standard
Lavatory sink: Elmbrook 24 in. Pedestal Sink in White with 4 in. Centerset Faucet Holes by Kohler
Lavatory faucet: Elmbrook 4 in. Centerset 2–Handle Bathroom Faucet in Polished Chrome by Kohler
Lavatory mirror: 20 in. x 26 in. Recessed or Surface–Mount Bathroom Medicine Cabinet with Beveled Mirror in Silver by Pegasus
Accessories: Serano 5–Piece Bathroom Accessory Set in Chrome by Kingston Brass
Shower: Centa 47 in. 1 Jet Shower Panel with Hand Shower in Stainless Steel by Mediterraneo
Shower drain: PVC Shower Drain with Chrome Barrel and Square 4–3/16 in. Chrome Strainer by Oatey
Shower curtain rod: Expanse Wall Mount Shower Rod in Brushed Stainless by Kohler

BATHROOM NOTES:
1. Bathroom equipment and accessories to be equal or similar to the specified above. Variations to be approved by Owner.
2. Bathroom equipment and accesories supplier: Equal or similar to The Home Depot
3. Bathroom walls to be painted white (eggshell finish).
4. For bathroom wainscot and shower tiles see finish schedule.
5. For water cistern (potable) and rain water cistern details, see mechanical plans.

KITCHEN SCHEDULE

KITCHEN EQUIPMENT:
Sink: Handcrafted All–in–One Drop–In Stainless Steel 25 in. x 22 in. x 9 in. Single Bowl Kitchen Sink with Tray and Drain by Akdy
Sink Faucet: Fairbury Single–Handle Pull–Down Sprayer Kitchen Faucet in Stainless Steel by American Standard
Cabinets: Wood cabinets, laminated by others. For Owner approval.
Cooking range: N.I.C.
Refrigerator: N.I.C.
Kitchen Hood: RL6200 Series 30 in. Ductless Under Cabinet Range Hood with Light in Stainless Steel by NuTone

KITCHEN NOTES:
1. Kitchen equipment and accessories to be equal or similar to the specified above. Variations to be approved by the Owner.
2. Kitchen equipment and accesories supplier: equal or similar to The Home Depot
3. Kitchen walls to be painted white (eggshell finish).
4. Kitchen backsplash tiles: Ceramic tiles 6x6, color gray unless otherwise indicated by the Owner.

SAFE ROOM NOTES

SAFE ROOM SIZE SHOWN IN THIS PLAN SET IS BASED UPON A 7 PERSON OCCUPANCY. PER FEMA P-320 REQUIREMENTS 7 S.F. OF SPACE IS REQUIRED PER OCCCUPANT. FOR VARYING OCCUPANCY REQUIREMENTS CONFIRM SAFE ROOM SIZE REQUIREMENTS WITH FEMA P-320, FEMA 361, AND ICC 500.

SEE FEMA P-361 AND ICC-500 FOR ADDITIONAL SAFE ROOM REQUIREMENTS SUCH AS FIRST AID KITS, OPERATION, AND MAINTENANCE REQUIREMENTS. ONCE THE SAFE ROOM IS CONSTRUCTED IT SHOULD BE REGISTERED WITH LOCAL FIRST RESPONDERS (E.G., POLICE, FIRE, RESCUE ORGANIZATIONS).

NOT ALL SAFE ROOM OPENINGS ARE SHOWN IN THESE DRAWINGS. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR MECHANICAL, PLUMBING, AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS, AND SUBCONTRACTORS PRIOR TO CONSTRUCTION. OPENINGS MAY REQUIRE ADDITIONAL REINFORCING OR SUPPORTS AS SHOWN ON TYPICAL DETAILS. OPENINGS NEED TO BE PROTECTED PER ICC 500.

COMPLETE SAFE ROOM INSPECTION REQUIREMENTS SHALL BE AS DIRECTED BY THE LOCAL BUILDING DEPARTMENT.

SAFE ROOM VENTILATION IS TO BE PROVIDED. VERIFY SIZE REQUIREMENTS BASED ON SAFE ROOM SIZE, OCCUPANCY, AND ICC 500 SPECIFICATIONS. CONSULT LOCAL BUILDING OFFICIAL AND REFER TO ICC 500-14 FOR VENTILATION OPENING PROTECTION.

THE SELECTED DOOR AND WINDOW PROTECTION SHALL MEET THE DESIGN CRITERIA OF 2015 FEMA P-361 AND 2014 ICC-500. ALL DOORS AND WINDOW PROTECTIONS SHALL BE A TESTED ASSEMBLY AND INSTALLED PER MANUFACTURES RECOMMENDATIONS.

(1) OWNER HAS THE OPTION TO ELIMINATE SAFE ROOM WINDOW IF THIS ROOM WILL NEVER BE USED AS A BEDROOM.

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL BUILDING CODES AND/OR REGULATIONS.
2. ALL WORK SHALL BE DONE IN A MANNER CONSISTENT WITH THE HIGHEST STANDARDS OF THE RESPECTIVE TRADES.
3. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS BEFORE BIDDING.
4. THE CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS BEFORE PROCEEDING WITH THE WORK AND COMPLIANCE WITH ZONING REGULATIONS.
5. THE CONTRACTOR SHALL ABIDE BY ALL REQUIREMENTS OF THE OWNER WITH RESPECT TO CONSTRUCTION SCHEDULING, COORDINATION, TEMPORARY CONSTRUCTION, UTILITIES, ETC.
6. THE CONTRACTOR SHALL NOT SCALE THESE CONSTRUCTION DOCUMENTS. IN THE EVENT THAT THE CONTRACTOR DOES SCALE THESE DOCUMENTS, IT SHALL BE AT THEIR OWN RISK.
7. ALL MATERIALS, PRODUCTS, AND UNITS, SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
8. INSTALLATION OF ALL MATERIALS AND/OR UNITS TO BE SELECTED BY, SUPPLIED BY, AND/OR INSTALLED BY THE OWNER SHALL BE SCHEDULED AND COORDINATED BY THE CONTRACTOR TO MAINTAIN THE CONSTRUCTION SCHEDULE. PRIOR TO THE COMMENCEMENT OF THE WORK, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ALL QUANTITIES OF OWNER SUPPLIED MATERIALS AND/OR UNITS NOT SPECIFICALLY CALLED OUT IN THESE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL NOTIFY THE OWNER OF REQUIRED DELIVERY DATES OF OWNER SUPPLIED MATERIALS AND UNITS.
9. ALL FINISH PAINT SHALL BE APPLIED OVER A COMPATIBLE FACTORY OR FIELD APPLIED PRIMER.
10. THE CONTRACTOR SHALL PROTECT ALL EXISTING AND ADJACENT AREAS AT ALL TIMES DURING CONSTRUCTION. ANY AREA DAMAGED OR AFFECTED BY CONSTRUCTION SHALL BE PATCHED, REPAIRED, OR REPLACED AS REQUIRED TO MATCH EXISTING OR ADJACENT AREAS AT THE CONTRACTOR'S EXPENSE.
11. THE CONTRACTOR SHALL YIELD TO THE OWNER AND THEIR VISITORS AT ALL TIMES.
12. THE CONTRACTOR SHALL NOT DISRUPT THE BUILDING OR OPERATIONS WITHOUT PRIOR SCHEDULING AND APPROVAL FROM THE OWNER.
13. NOT USED
14. IF A CONFLICT OCCURS ON THESE CONSTRUCTION DOCUMENTS AND/OR THE SPECIFICATIONS, THE CONTRACTOR SHALL BID THE HIGHER QUALITY AND/OR QUANTITY.
15. AIR CONDITIONING NOT INCLUDED. HOUSE OWNER SHALL DECIDE IF REQUIRED AND INSTALLATION WILL BE DONE BY OTHERS AFTER HOUSE IS BUILT.
16. ALL WORK THAT IS EITHER IMPLIED OR REASONABLY INFERRED BY THE CONTRACT DOCUMENTS, DRAWINGS, AND SPECIFICATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DRAWINGS ARE DIRECTED TO THE ATTENTION OF THE CONTRACTOR, AND THE INCLUSION OF ANY WORK BY MENTION, NOTE, DETAIL, OR IMPLICATION, HOWEVER BRIEF, MEANS THAT THE CONTRACTOR SHALL PROVIDE AND INSTALL THE SAME.
18. ALL WORK PERFORMED SHALL INCLUDE ALL APPURTENANCES AND APPARATUS NORMALLY DEEMED TO BE PART OF A COMPLETE PACKAGE WITHIN THE DEFINITIONS OF NORMAL INDUSTRY STANDARDS.
19. ALL DIMENSIONS ARE CLEAR (FINISH TO FINISH). ALL FINAL DIMENSIONS AND LAYOUT SHALL BE VERIFIED WITH AND APPROVED BY THE OWNER AS REQUIRED BEFORE PROCEEDING WITH THE WORK.
20. ROOF WATERPROOFING TO BE LIQUID APPLIED MEMBRANE (LAM) SYSTEM ON CONCRETE ROOFS, EQ. OR SIMILAR TO SIKALASTIC PRODUCTS (560, 612 OR 614). APPLICATION TO BE AS PER MANUFACTURER'S INSTRUCTIONS. WARRANTY BY MANUFACTURER.
21. ONE BEDROOM WINDOW SHOULD BE CASEMENT TYPE JALOUSIE TO SWING IN THE DIRECTION OF EGRESS PER CODE
22. NOT USED
23. THE CONTRACTOR ASSUMES RESPONSIBILITY FOR CONSTRUCTION MEANS, METHODS, MATERIALS, TECHNIQUES, PROCEDURES, SEQUENCES, OR SCHEDULING IN CONNECTION WITH THIS WORK.
24. NOT USED
25. THE CONTRACTOR SHALL REMOVE ALL RUBBISH AND WASTE MATERIAL PERIODICALLY AND KEEP THE JOB SITE BROOM CLEAN AT ALL TIMES. ALL WASTE MATERIAL SHALL BE DISPOSED OF PROPERLY.
26. ALL MECHANICAL, ELECTRICAL, PLUMBING FIXTURES AND EQUIPMENT SHOWN IN THE ARCHITECTURAL CONSTRUCTION DOCUMENTS, ARE SHOWN FOR LOCATION PURPOSES ONLY. ALL SPECIFICATIONS, ETC. SHALL BE PROVIDED UNDER SEPARATE COVER.

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

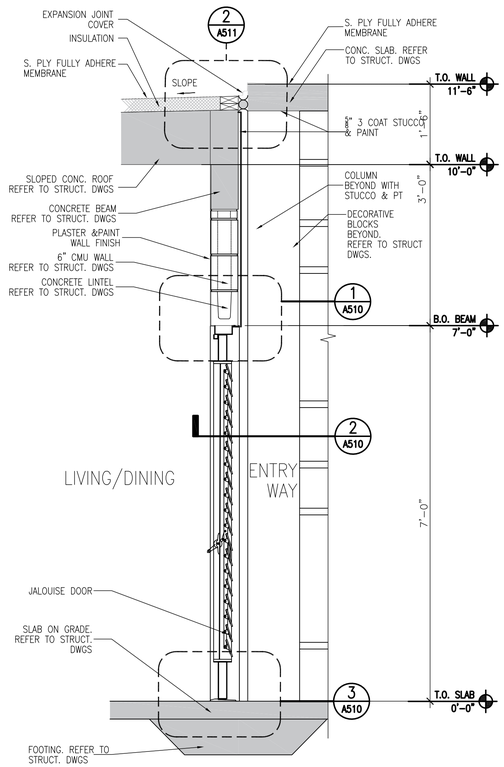
PROFESSIONAL SEALS:

SHEET TITLE:

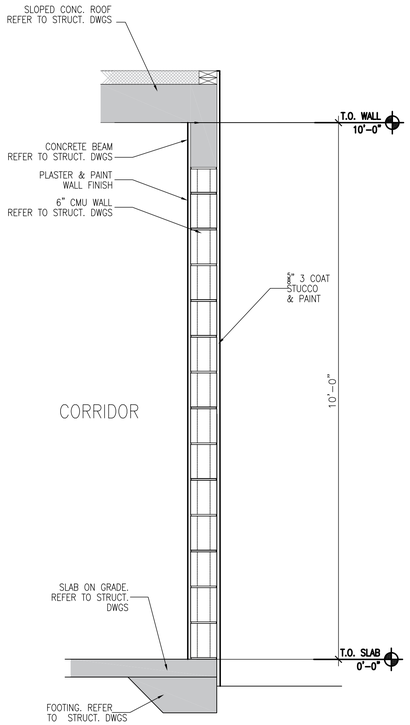
PROTOTYPE 1_DOORS, WINDOWS AND FINISHES

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-101
Checked By:	
QC Review:	
Phase:	



1 WALL SECTION
SCALE: 3/4" = 1'-0"



2 WALL SECTION
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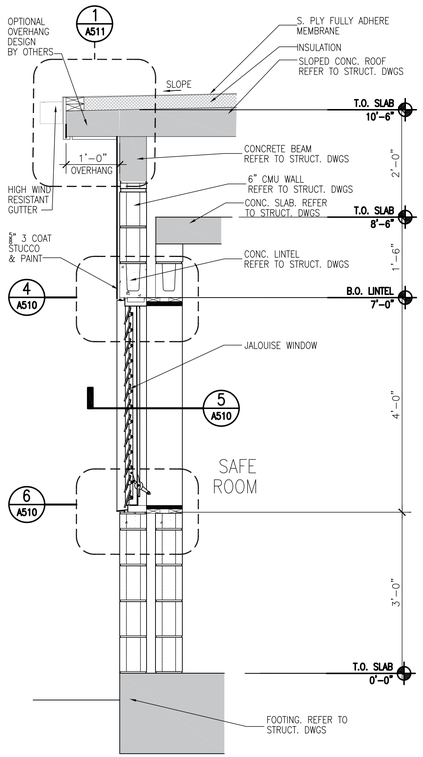

3 WALL SECTION
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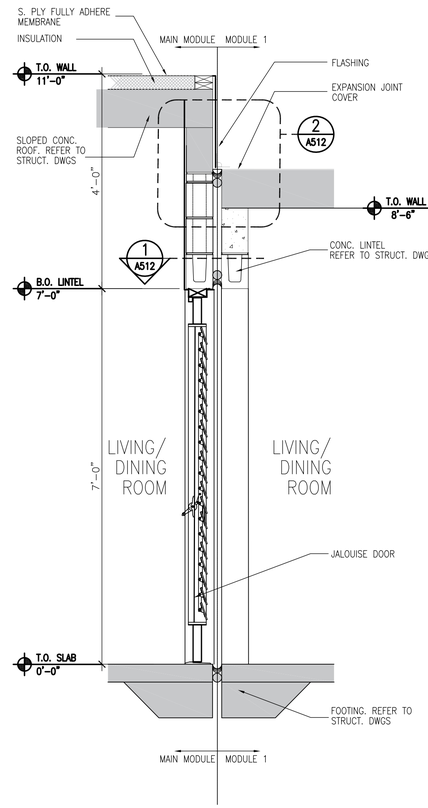

4 WALL SECTION
SCALE: 3/4" = 1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

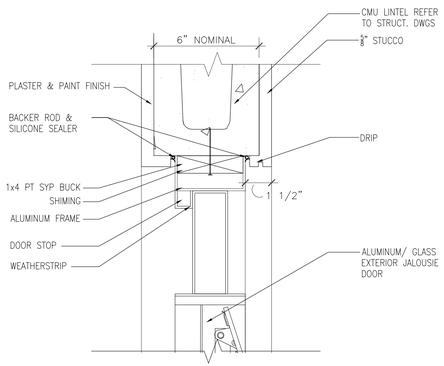
PROFESSIONAL SEALS:

SHEET TITLE:

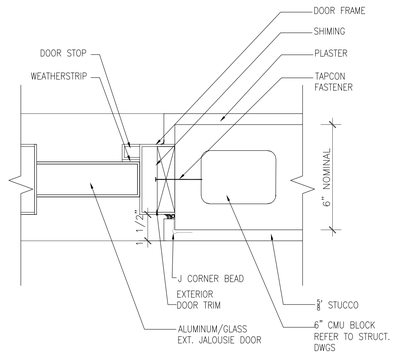
PROTOTYPE#1 WALL SECTIONS

SHEET INFORMATION:

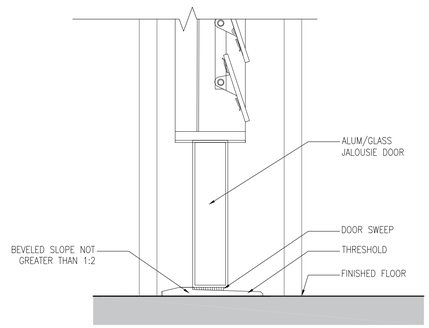
JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-500
Checked By:	
QC Review:	
Phase:	



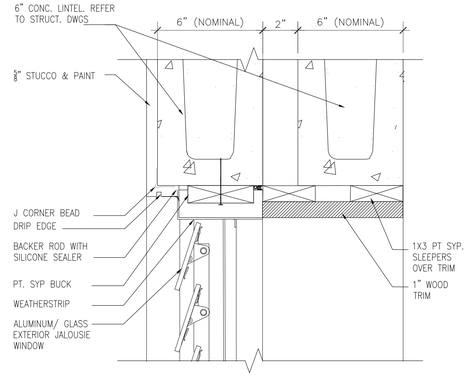
1 SECTION DETAIL–DOOR HEADER– CONC. WALL
SCALE: 3" = 1'–0"



2 SECTION DETAIL–DOOR JAMB– CONC WALL
SCALE: 3" = 1'–0"



3 SECTION DETAIL–DOOR THRESHOLD –CONC. FLOOR
SCALE: 3" = 1'–0"



4 SECTION DETAIL–WINDOW HEADER–CONC. WALL
SCALE: 3" = 1'–0"

5 SECTION DETAIL–WINDOW JAMB–CONC. WALL
SCALE: 3" = 1'–0"

6 SECTION DETAIL–WINDOW SILL CONC. WALL
SCALE: 3" = 1'–0"

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

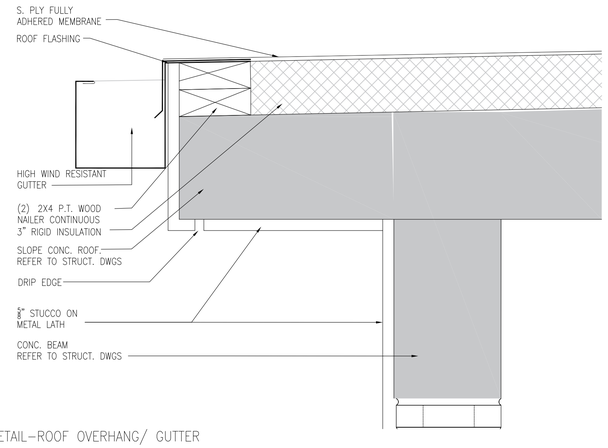
PROFESSIONAL SEALS:

SHEET TITLE:

PROTOTYPE #1-DETAILS DOORS AND WINDOWS

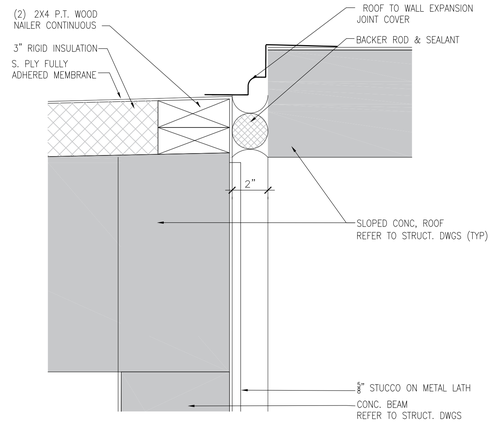
SHEET INFORMATION:

JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-510
Checked By:	
QC Review:	
Phase:	



1 SECTION DETAIL–ROOF OVERHANG/ GUTTER

SCALE: 3" = 1'-0"



2 SECTION DETAIL–MAIN HOUSE AND ENTRY WAY JOINT

SCALE: 3" = 1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

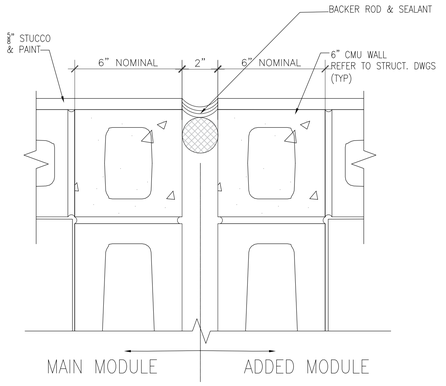
PROFESSIONAL SEALS:

SHEET TITLE:

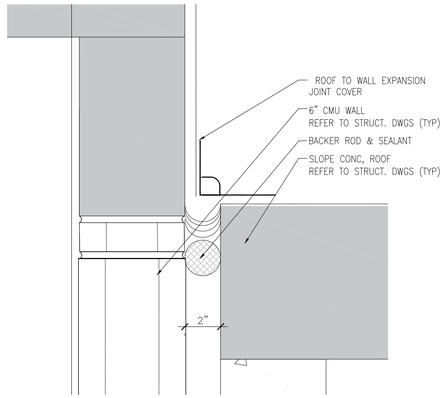
PROTOTYPE #1
ROOFING DETAILS

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-511
Checked By:	
QC Review:	
Phase:	



1 SECTION DETAIL–MAIN AND NEW MODULE JOINT CMU WALLS
SCALE: 3" = 1'–0"



2 SECTION DETAIL–MAIN AND NEW MODULE JOINT CMU WALLS
SCALE: 3" = 1'–0"

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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ISSUE LOG

No.	Date	Description

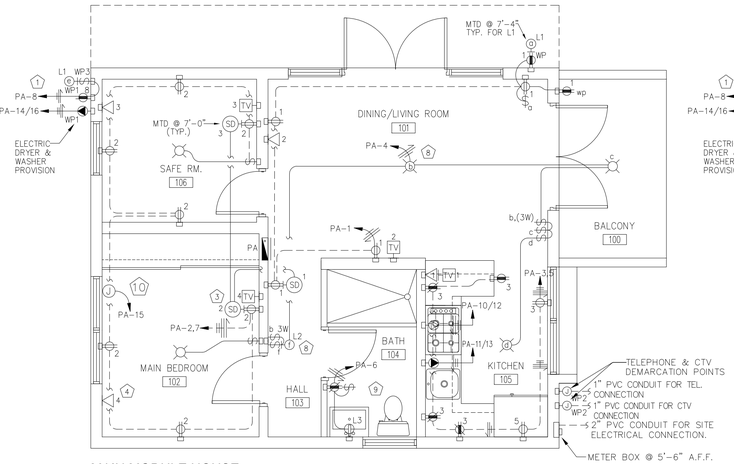
PROFESSIONAL SEALS:

SHEET TITLE:

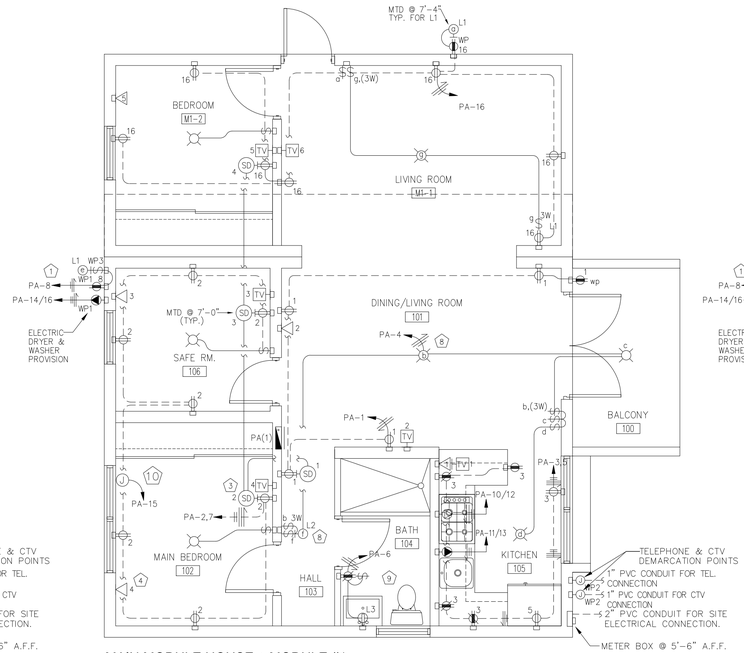
PROTOTYPE #1
MODULES JOINT DETAILS

SHEET INFORMATION:

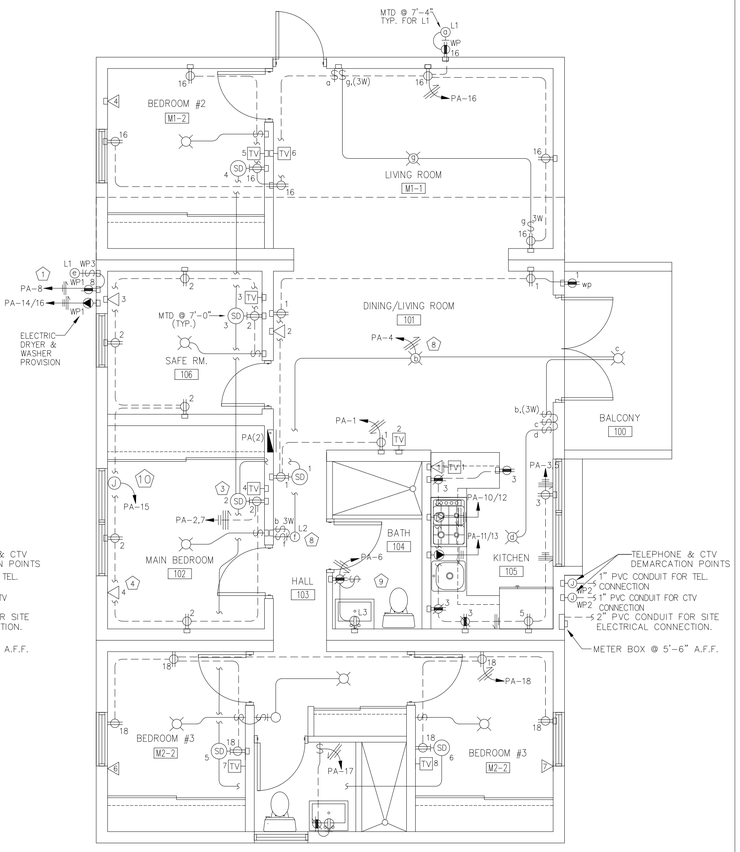
JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number: A-512
Checked By:	
QC Review:	
Phase:	



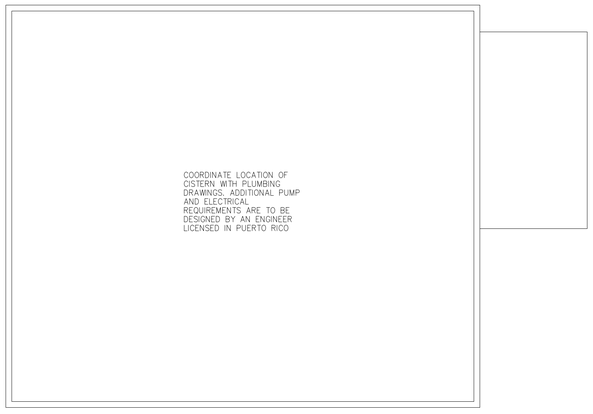
MAIN MODULE HOUSE
SCALE: 1/4"=1'-0"



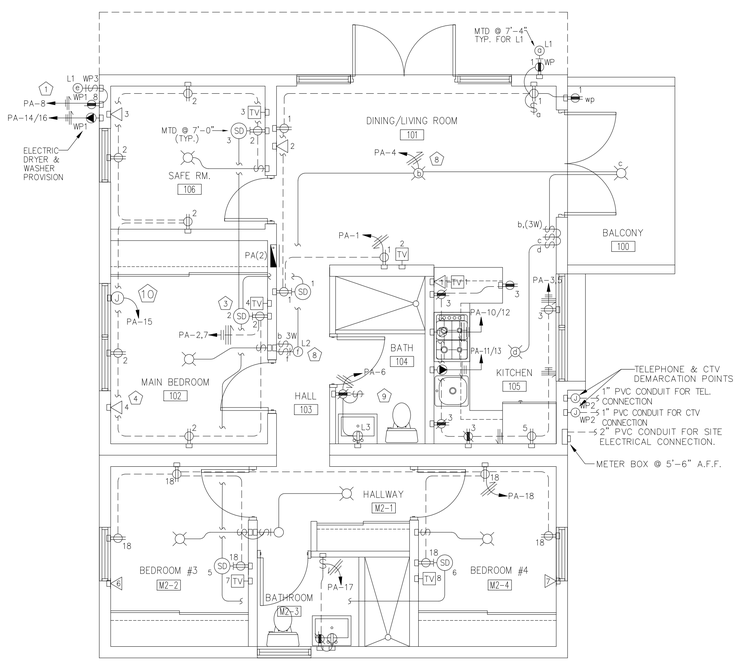
MAIN MODULE HOUSE + MODULE #1
SCALE: 1/4"=1'-0"



MAIN MODULE HOUSE + MODULES #1 & #2
SCALE: 1/4"=1'-0"



MAIN MODULE HOUSE ROOF PLAN
SCALE: 1/4"=1'-0"



MAIN MODULE HOUSE + MODULE #2
SCALE: 1/4"=1'-0"

NOTES:

1. WASHER AND DRYER AREA RECEPTACLES LOCATED @ 48" A.F.F. (COORDINATE FINAL LOCATION WITH FIELD ENGINEER.)
2. NOT USED
3. ALL SMOKE DETECTORS MUST BE CONNECTED BETWEEN EACH OTHER FOR PARALLEL ACTIVATION.
4. COORDINATE WITH ARCHITECT OR FIELD ENGINEER THE FINAL LOCATION FOR ALL TELEPHONE AND CTV OUTLETS (TYPICAL).
5. VANITY LIGHTS OUTLETS. COORDINATE FINAL HEIGHT WITH ARCHITECT.
6. COORDINATE WITH ARCHITECT OR FIELD ENGINEER THE FINAL HEIGHT FOR LIGHTING FIXTURE.
7. NOT USED
8. ALL INDOOR & OUTDOOR LIGHTING FIXTURES ARE TO BE PORCELAIN LAMP HOLDERS WITH 26 WATTS FLUORESCENT BULBS OR LED EQUIVALENTS.
9. INTERLOCK FAN WITH BATHROOM LIGHTING SWITCH. COORDINATED WITH MECHANICAL DWGS. WHEN APPLICABLE.
10. 4"X4" JUNCTION BOX FOR A/C UNIT DEDICATED RECEPTACLE. INSTALL EMPTY CONDUIT UP TO PANEL BOARD PA. RECEPTACLE, WIRING AND BREAKER (N.I.C.).

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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No.	Date	Description

ISSUE LOG

PROFESSIONAL SEALS:

SHEET TITLE:

PROTOTYPE #1 SCHEMATIC - ONE STORY, CONCRETE & FLAT CONCRETE ROOF

SHEET INFORMATION:

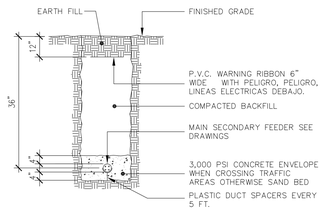
JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: E-100
Checked By:	
QC Review:	
Phase:	

LEGEND :

- CEILING MOUNTED LIGHTING OUTLET, COORDINATE FIXTURE TYPE WITH ARCHITECT/OWNER
- WALL MOUNTED LIGHTING OUTLET COORDINATE FIXTURE TYPE WITH ARCHITECT/OWNER
- 15 AMPS, 125 VOLTS, NEMA 5–15R, 3–WIRE, TAMPER–RESISTANT, DUPLEX RECEPTACLE, STRAIGHT BLADE, SELF GROUNDING, SIDE WIRE, UL CERTIFIED & NEC COMPLIANCE. IMPACT–RESISTANCE THERMOPLASTIC DESIGN, FLUSH & HORIZONTALLY MOUNTED @ 18" A.F.F. UNLESS SPECIFIED. COORDINATE FINAL COLOR AND MATCHING PLATE WITH THE ARCHITECT.
- SAME AS ABOVE BUT MTD. @ 6" ABOVE FINISH COUNTER. DO NOT EXCEED 42" ABOVE FINISH FLOOR LEVEL (A.F.F.).
- 15 AMP. 125 VOLT RECEPTACLE/OUTLET, NEMA 5–15R, 20 AMPS FEED–THROUGH, TAMPER RESISTANT, SELF GROUNDING, SELF TEST GFCI, BACK AND SIDE WIRED, NYLON WALL PLATE/FACE PLATE, SCREWS AND SELF GROUNDING CLIP. FLUSH & HORIZONTALLY MOUNTED @ 18" A.F.F. UNLESS SPECIFIED. COORDINATE FINAL COLOR AND COVER PLATE WITH ARCHITECT. UL CERTIFIED & NEC COMPLIANCE.
- SAME AS ABOVE BUT MTD. @ 6" ABOVE FINISH COUNTER. DO NOT EXCEED 42" ABOVE FINISH FLOOR LEVEL (A.F.F.).
- 50 AMP. NEMA 14–50R, 4W, 125/250 VOLTS, FLUSH MTD., STRAIGHT BLADE, GROUNDING, MOUNTED @ 18" A.F.F. WITH STAINLESS STEEL COVER PLATE. UL LISTED & NEC COMPLIANCE. COORDINATE RECEPTACLE CONFIGURATION WITH EQUIPMENT'S PIGTAIL PRIOR TO INSTALLATION.
- 30 AMP. NEMA 14–30R, 4W, 125/250 VOLTS, FLUSH MTD., STRAIGHT BLADE, GROUNDING, MOUNTED @ 18" A.F.F. WITH STAINLESS STEEL COVER PLATE. UL LISTED & NEC COMPLIANCE. COORDINATE RECEPTACLE CONFIGURATION WITH EQUIPMENT'S PIGTAIL PRIOR TO INSTALLATION.
- $ 15 AMPS, 120 VOLTS, TOGGLE FRAME SINGLE–POLE AC QUIET SWITCH, RESIDENTIAL GRADE, GROUNDING, SIDE WIRED, MOUNTED @ 48" A.F.F. SWITCH MUST BE ABLE TO WORK WITH FLUORESCENT AND LED LIGHTING FIXTURES. UL LISTED & NEC COMPLIANCE. COORDINATE FINAL COLOR AND MATCHING PLATE WITH THE ARCHITECT.
- $3W 15 AMPS, 120 VOLTS, TOGGLE FRAME 3–WAY AC QUIET SWITCH, RESIDENTIAL GRADE, GROUNDING, SIDE WIRED, MOUNTED @ 48" A.F.F. SWITCH MUST BE ABLE TO WORK WITH FLUORESCENT AND LED LIGHTING FIXTURES. UL LISTED & NEC COMPLIANCE. COORDINATE FINAL COLOR AND MATCHING PLATE WITH THE ARCHITECT.
- (J) JUNCTION BOX. MINIMUM SIZE 4"x 4" X 2–1/8", METAL ZINC GALVANIZED. WHEN BOXES ARE WALL MOUNTED AND USED AS JUNCTION BOXES, PROVIDE A 4"X4" SINGLE GANG RAISED COVER WITH PLASTIC BLANC COVER PLATE MATCHING RECEPTACLES AND SWITCHES PLATES. IF MOUNTED OUTSIDE PROVIDE AND OUTDOOR COVER PLATE WITH GASKET. WHEN JUNCTION BOX IS CEILING MOUNTED INSTALL WITH ROUND RAISED COVER AND ROUND COVER PLATE. IF MOUNTED OUTDOOR COVER PLATE MUST HAVE GASKET. FOR CEILING APPLICATIONS OCTAGONAL BOXES 21/8" DEEP ARE PERMITTED. JUNCTION BOXES MUST HAVE GROUND BUMP.
- LOAD CENTER, FLUSH MOUNTED, SINGLE PHASE, 100 AMPS, 3W, 120/240 V. INSULATED BONDABLE NEUTRAL, GROUND BAR, 10 KAIC. REFER TO PANEL SCHEDULE
- 125 AMPS N–3R METER BOX/SOCKET WITH MAIN BREAKER 100A/250V/2P, 10K A.I.C., BOX MUST BE ALUMINUM OR STAINLESS STEEL. COORDINATE PRIOR INSTALLATION IF THE SERVICE WILL BE UNDERGROUND OR OVERHEAD. EQUIPMENT MUST BE APPROVED BY P.R.E.P.A.
- TV TELEVISION OUTLET BOX FLUSH MOUNTED. 4"X4"X2–1/8" ZINC GALVANIZED WITH 1G RAISED COVER. COORDINATE COVER PLATE COLOR WITH ARCHITECT. MOUNTED @ 18" A.F.F.
- TV SAME AS ABOVE BUT MOUNTED. @ 6" ABOVE COUNTER. DO NOT EXCEED 42" A.F.F.
- TELEPHONE OUTLET BOX FLUSH MOUNTED. 4"X4"X2–1/8" ZINC GALVANIZED WITH 1G RAISED COVER. COORDINATE COVER PLATE COLOR WITH ARCHITECT. MOUNTED @ 18" A.F.F.
- TV SAME AS ABOVE BUT MOUNTED. @ 6" ABOVE COUNTER. DO NOT EXCEED 42" A.F.F.
- PVC CONDUIT CONCEALED IN WALLS OR CEILING CONCRETE SLAB
- PVC CONDUIT CONCEALED IN FLOOR CONCRETE SLAB
- NEW HOMERUN TO PANELBOARD. PANEL & CIRCUIT AS INDICATED
- (SD) IONIZATION SMOKE DETECTOR, 120 VOLT. EQUAL MANUFACTURED BY BRK MODEL 4120B WITH BATTERY BACKUP.

IMPORTANT NOTES:

1– ALL SMOKE DETECTORS SHALL BE CONNECTED BETWEEN EACH OTHER FOR PARALLEL ACTIVATION IN CASE OF FIRE TO MEET LATEST HUD & FHA REGULATIONS.
2– ELECTRICAL CONTRACTOR MUST INSTALL ALL METER BASES ACCESSIBLE TO P.R.E.P.A. PERSONNEL.
3– ALL INDOOR & OUTDOOR LIGHTING FIXTURES ARE TO BE PORCELAIN LAMP HOLDERS WITH 26 WATTS FLUORESCENT BULBS OR LED EQUIVALENTS.
4– ELECTRICAL CONTRACTOR MUST VERIFY WITH FIELD ENGINEER ALL FINAL HEIGHTS FOR WIRING DEVICES AND LIGHTING FIXTURES.
5– ALL ELECTRICAL WORK SHALL BE COORDINATED WITH OTHER TRADE.
6– ELECTRICAL CONTRACTOR MUST BALANCE ALL ELECTRICAL LOADS.
7– PROVIDE TYPEWRITTEN IDENTIFICATION CARDS FOR ALL BRANCH CIRCUITS INSIDE THE PANELBOARDS.



SECONDARY FEEDERS TRENCH DETAIL
NOT TO SCALE FOR REFERENCE ONLY

SPECIAL NOTES:

1– IN CASE OF CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL NOT PROCEED WITH THAT PART OF THE WORK UNTIL SUCH DIFFERENCES HAVE BEEN BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
2– IN CASE THE CONTRACTOR BELIEVES HE HAS DISCOVERED DISCREPANCIES, ERRORS, OMISSIONS, ETC. IN THE DRAWINGS AND/OR SPECIFICATIONS, HE SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF THE CONTRACTOR FAILS TO GIVE SUCH NOTICE AND OBTAIN ADEQUATE CLARIFICATION, HE WILL BE HELD RESPONSIBLE FOR THE RESULT OF SUCH ERRORS OR OMISSIONS, AND HE WILL BE HELD RESPONSIBLE FOR THE COST OF RECTIFYING SUCH ERRORS.
3– BEFORE COMMENCING WORK, CONTRACTOR SHALL VERIFY MEASUREMENTS AT SITE AND THE EXISTING STRUCTURES (IF ANY). ANY DIFFERENCES BETWEEN ACTUAL MEASUREMENTS AND THOSE SHOWN ON PLANS, SHALL BE SUBMITTED TO THE ENGINEER FOR CONSIDERATIONS AND DECISIONS BEFORE PROCEEDING WITH THE WORK.
4– THE RIGHT TO CLARIFY THE WORK IS RESERVED BY THE ENGINEER. IF THE ENGINEER CONSIDERS IS NECESSARY, HE WILL PROVIDE ADDITIONAL DETAILS OR INFORMATION.
5– ANY SET OF ELECTRICAL DRAWINGS WHICH IS MISSING AT LEAST ONE OF PAGES OF SET IS AUTOMATICALLY VOID. THIS INFORMATION WAS DEVELOPED TO BE USED OR AND IN CONNECTION WITH THIS PROJECT ONLY. HOWEVER IT REMAINS THE PROPERTY OF THIS OFFICE AND SHALL BE USED ONLY BY AUTHORIZED PERSONS AND CANNOT BE REPRODUCE IN ANY MANNERS UNLESS IT BEARS THE WRITTEN PERMISSION OF THE ARCHITECT.
6– WRITTEN DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS.
7– ALL PROGRAMS, DESIGN, DRAWINGS, SPECIFICATIONS AND PRINTED MATTERS HEREIN ISSUED BY THE ENGINEER ARE THE PROPERTY OF THE ENGINEER AND SHALL NOT BE USED ON ANY OTHER LOCATION OR PURPOSE EXCEPT THE ONE FOR WHICH THEY WERE EXPRESSLY DESIGN, IF THEY, OR ANY PART THEREOF IS REPRODUCED WITHOUT THE WRITTEN CONSENT OF THE ENGINEER, THE PERSON SO DOING WILL BE INDEBTED TO THE ENGINEER FOR HIS FULL COMMISSION.
8– CONTRACTOR SHALL NOT USE FOR THE CONSTRUCTION PURPOSES ANY DOCUMENTS THAT WERE ADVANCED TO HIM PRIOR TO THE START OF THE CONSTRUCTION. ALL PLANS BEING USED BY CONTRACT SHOULD BEAR THE SEAL OF THE ENGINEER WITH P.R.E.P.A.'S ENDORSEMENT AND THE ENGINEER'S SIGNATURE.
9– CONTRACTOR SHALL MAKE PROVISIONS TO ORDER ALL ELECTRICAL EQUIPMENT AND MATERIALS SPECIFIED HEREIN UPON CONTRACT AWARD IN ORDER TO AVOID DELAYS OR CHANGES IN THE SPECIFIED PRODUCTS.
10– CONTRACTOR SHALL SUBMIT IN WRITING (ORIGINAL TO ENGINEER AND DUPLICATE TO THE OWNER) ANY REQUEST TO CHANGE A SPECIFIED ITEM SHALL WAIT FOR THE ENGINEER'S WRITTEN APPROVAL BEFORE PROCEEDING.
11– CONTRACTOR SHALL SUBMIT SAMPLES OF THE SPECIFIED MATERIALS AND MANUFACTURERS LITERATURE OF THE SPECIFIED EQUIPMENT AS WELL AS SHOP DRAWINGS. WHEN SO REQUESTED IN THE DRAWINGS OR SPECIFICATIONS PRIOR TO THE BEGINNING OF CONSTRUCTION.
12– ALL BOLTS, WASHERS, SCREWS AND NUTS EXCEPT IF OTHERWISE SPECIFIED SHALL BE GALVANIZED STEEL.

GENERAL NOTES:

1– PVC CONDUIT SHALL BE USED EXCEPT WHERE NOT ALLOWED BY N.E.C. OR UNLESS OTHER WISE INDICATED, 1/2" IPS MINIMUM SIZE AS ALLOWED BY THE NATIONAL ELECTRICAL CODE. IF ELECTRICAL CONTRACTOR USES NON METALIC TUBING (ENT) FLEXIBLE CONDUIT IS USED 3/4" IPS IS THE MINIMUM ALLOWED.
2– THHN WIRE SHALL BE USED UNLESS OTHERWISE INDICATED. #12 AWG. MIN. GAUGE ALLOWED
3– WIRING DEVICES AND PLATES SHALL BE WHITE COLOR UNLESS OTHERWISE SPECIFIED BY ARCHITECT/ OWNER.
4– ALL ELECTRICAL INSTALLATION SHALL BE DONE IN STRICT ACCORDANCE WITH N.E.C. AND P.R.E.P.A. REGULATIONS LATEST EDITION.
5– INSTALLATION DETAILS ARE ILLUSTRATIVE AND SHOULD NOT BE USED WITHOUT VERIFYING JOB SITE CONDITIONS, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING ANY DEVIATION THEY PERFORM.
6– DIMENSIONS OF JUNCTION OR PULL BOXES SHALL BE REVISED BY THE ELECTRICAL CONTRACTOR ACCORDING TO ACTUAL BUILDING CONDITIONS TO SECURE AT LEAST THE MINIMUM CABLE BENDING RADIUS.
7– ALL ELECTRICAL WIRES MUST BE IDENTIFY WITH THEIR RESPECTIVE CIRCUIT NUMBER AT EACH JUNCTION BOX.
8– ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE ITSELF WITH THE PROJECTPRIOR TO THEIR BID.
9– MINIMUN SIZE FOR ALL BOXES IS 4" X 4" X 2–1/8". NO 2"x4" BOXES ARE ALLOWED.
10– ALL CONDUITS SHALL HAVE A MINIMUM OF 2 #12 (HOT & NEUTRAL) & 1 #12 GROUND CONDUCTOR UNLESS OTHERWISE NOTED. FOR EXAMPLE, CONDUITS SHOWN AS FOLLOW ////// 2 #12 (HOT), 1 #12 (NEUTRAL) & 1 #12 (GROUND) WIRE. ////// 3 #12 (HOT), 1 #12 (NEUTRAL) & 1 #12 (GROUND).
11– THE ELECTRICAL SYSTEM SHALL HAVE GROUND CONTINUITY. NO JUMPER WILL BE ALLOWED.

ABBREVIATIONS:

RGC RIGID GALVANIZED CONDUIT
EMT ELECTRICAL METALLIC CONDUIT
UOS UNLESS OTHERWISE SPECIFIED
AFF ABOVE FINISHED FLOOR
ACT ABOVE COUNTER TOP
TEL TELEPHONE
NIC NOT IN CONTRACT OR NOT INCLUDED
GF DENOTES GROUND FAULT RECEPTACLE.
WP DENOTES HORIZONTAL SINGLE GANG GFCI RECEPTACLE WEATHER PROOF COVER PLATE WHEN COVER IS CLOSED, UL LISTED FOR WET LOCATION. EQUAL OR SIMILAR TO THOMAS & BETTS RED DOT CAT.# CCG.
WP1 DENOTES SINGLE GANG WEATHER PROOF COVER PLATE WHILE IN USE, METALLIC, UL LISTED FOR WET LOCATION. MEDIUM HORIZONTAL COVER 31/2" DEEP WITH GASKET, EQUAL OR SIMILAR TO THOMAS & BETTS RED DOT CAT.# CKMU
WP2 DENOTES 2"X4" BLANK COVER PLATE WITH GASKET, ALUMINUM, UL LISTED FOR WET LOCATION. SIMILAR OR EQUAL RED DOT CAT.# 1CCB–AL.
WP3 DENOTES 2"X4" SINGLE GANG LIGHT SWITCH WEATHER PROOF COVER PLATE WITH GASKET, ALUMINUM, UL LISTED FOR WET LOCATION.. SIMILAR OR EQUAL RED DOT CAT.# CCT–1

PANELBOARD SCHEDULE

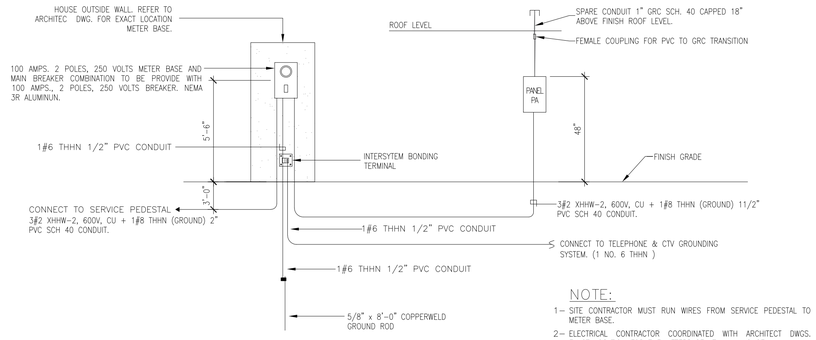
DESIGNATION TYPE	DESCRIPTION	BREAKERS CKT. No.	POLES	TRIP (AMPS)	REMARKS
PANEL "PA"	100 AMPS LOAD CENTER 1ø, 3W, GROUND BUS, FLUSH MOUNTED NEMA 1 ENCLOSURE 120/240 VAC 10,000 AMP. I.C. CAPACITY MIN., 100/2P MAIN BREAKER 24 SINGLE SPACE – 24 POLE SIMILAR TO CUTLER–HAMMER TYPE CH		2	100	MAIN BREAKER
		1	1	20*	LIVING / DINING RM RECEP.
		2	1	20*	BEDROOMS RECEPTACLES
		3	1	20*	KITCHEN RECEPTACLES
		4	1	20*	GENERAL LIGHTING
		5	1	20***	REFRIGERATOR RECEPTACLE
		6	1	20	BATHROOM RECEPTACLES
		7	1	20*	SMOKE DETECTORS
	* COMBINATION ARC–FAULT BREAKER (AFCI)	8	1	20*	LAUNDRY RECEPTACLES
	** GROUND FAULT BREAKER	9	1	20**	CISTERN PUMP
	*** DUAL FUNCTION CIRCUIT BREAKER (CAFI+GFI)	10/12	2	50	RANGE (3#6, 1#10) 1"
		11/13	2	30	WATER HEATER (3#10) 3/4"
		14/16	2	30	DRYER (4#10)3/4"
		15			SPACE
		16–24			SPACE

PANELBOARD SCHEDULE

DESIGNATION TYPE	DESCRIPTION	BREAKERS CKT. No.	POLES	TRIP (AMPS)	REMARKS
PANEL "PA(1)"	100 AMPS LOAD CENTER 1ø, 3W, GROUND BUS, FLUSH MOUNTED NEMA 1 ENCLOSURE 120/240 VAC 10,000 AMP. I.C. CAPACITY MIN., 100/2P MAIN BREAKER 24 SINGLE SPACE – 24 POLE SIMILAR TO CUTLER–HAMMER TYPE CH		2	100	MAIN BREAKER
		1	1	20*	LIVING / DINING RM RECEP.
		2	1	20*	BEDROOMS RECEPTACLES
		3	1	20*	KITCHEN RECEPTACLES
		4	1	20*	GENERAL LIGHTING
		5	1	20***	REFRIGERATOR RECEPTACLE
		6	1	20	BATHROOM RECEPTACLES
		7	1	20*	SMOKE DETECTORS
	* COMBINATION ARC–FAULT BREAKER (AFCI)	8	1	20*	LAUNDRY RECEPTACLES
	** GROUND FAULT BREAKER	9	1	20**	CISTERN PUMP
	*** DUAL FUNCTION CIRCUIT BREAKER (CAFI+GFI)	10/12	2	50	RANGE (3#6, 1#10) 1"
		11/13	2	30	WATER HEATER (3#10) 3/4"
		14/16	2	30	DRYER (4#10)3/4"
		15			SPACE
		16	1	20*	MODULE 1 EXPANSION
		17–24			SPACE

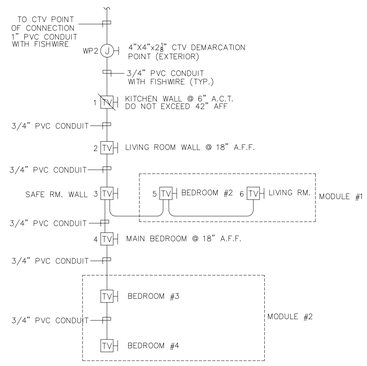
PANELBOARD SCHEDULE

DESIGNATION TYPE	DESCRIPTION	BREAKERS CKT. No.	POLES	TRIP (AMPS)	REMARKS
PANEL "PA(2)"	100 AMPS LOAD CENTER 1ø, 3W, GROUND BUS, FLUSH MOUNTED NEMA 1 ENCLOSURE 120/240 VAC 10,000 AMP. I.C. CAPACITY MIN., 100/2P MAIN BREAKER 24 SINGLE SPACE – 24 POLE SIMILAR TO CUTLER–HAMMER TYPE CH		2	100	MAIN BREAKER
		1	1	20*	LIVING / DINING RM RECEP.
		2	1	20*	BEDROOMS RECEPTACLES
		3	1	20*	KITCHEN RECEPTACLES
		4	1	20*	GENERAL LIGHTING
		5	1	20***	REFRIGERATOR RECEPTACLE
		6	1	20	BATHROOM RECEPTACLES
		7	1	20*	SMOKE DETECTORS
		8	1	20*	LAUNDRY RECEPTACLES
		9	1	20**	CISTERN PUMP
		10/12	2	50	RANGE (3#6, 1#10) 1"
	* COMBINATION ARC–FAULT BREAKER (AFCI)	11/13	2	30	WATER HEATER (3#10) 3/4"
	** GROUND FAULT BREAKER	14/16	2	30	DRYER (4#10)3/4"
	*** DUAL FUNCTION CIRCUIT BREAKER (CAFI+GFI)	15			SPACE
		16	1	20*	MODULE 1 EXPANSION
		17	1	20	(MODULE 2 EXPANSION) BATHROOM
		18	1	20*	(MODULE 2 EXPANSION) BEDROOMS
		19–24			SPACE



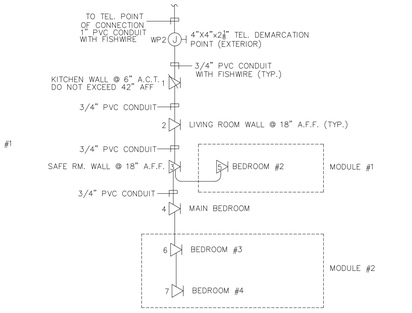
TYP. METER BASE ONE LINE DETAIL
NOT TO SCALE FOR REFERENCE ONLY

NOTE:
1– SITE CONTRACTOR MUST RUN WIRES FROM SERVICE PEDESTAL TO METER BASE.
2– ELECTRICAL CONTRACTOR COORDINATED WITH ARCHITECT DWGS. EXACT LOCATION FOR THE METERBASE AT WALL HOUSE.



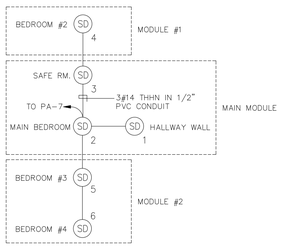
* REFER TO "COMISION DE TELECOMUNICACIONES" FOR INSTALLATION DETAILS.

CTV ONE LINE DIAGRAM
NOT TO SCALE SCHEMATIC ONLY



* REFER TO "COMISION DE TELECOMUNICACIONES" FOR INSTALLATION DETAILS.

TELEPHONE ONE LINE DIAGRAM
NOT TO SCALE SCHEMATIC ONLY



NOTE:
THIS DIAGRAM IS FOR REFERENCE ONLY THE ELECTRICAL CONTRACTOR MAY CHOOSE ANY PATH AS LONG AS ALL DETECTORS ARE CONNECTED BETWEEN EACH OTHER FOR PARALLEL ACTIVATION.

SMOKE DETECTOR ONE LINE DIAGRAM
NOT TO SCALE SCHEMATIC ONLY

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPERATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

No.	Date	Description

ISSUE LOG

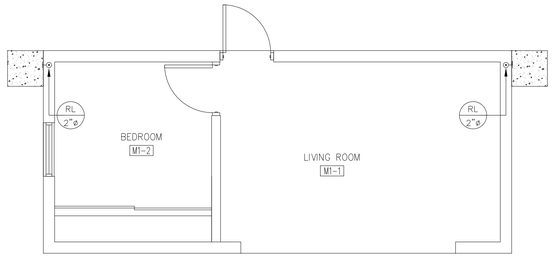
PROFESSIONAL SEALS:

SHEET TITLE:

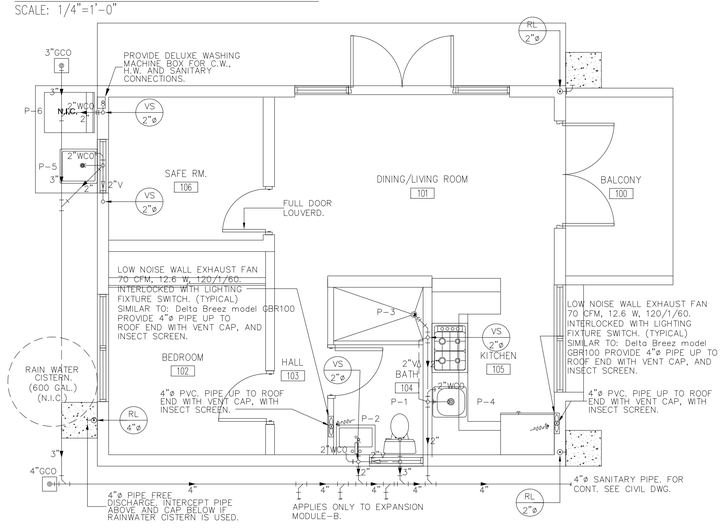
PROTOTYPE #1 SCHEMATIC - ONE STORY, CONCRETE & FLAT CONCRETE ROOF

SHEET INFORMATION:

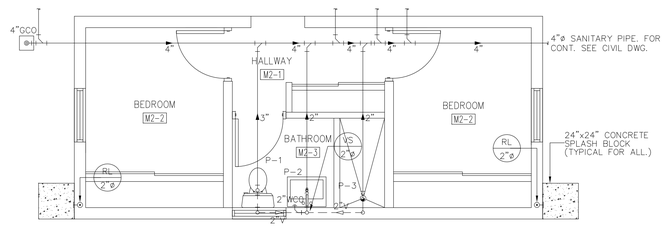
JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: E-101
Checked By:	
QC Review:	
Phase:	



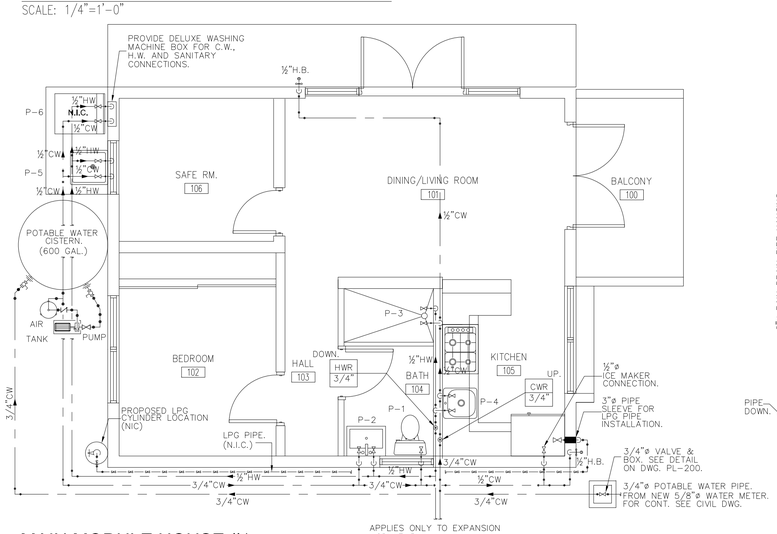
EXPANSION MODULE - A
FLOOR PLAN- SANITARY LAYOUT
SCALE: 1/4"=1'-0"



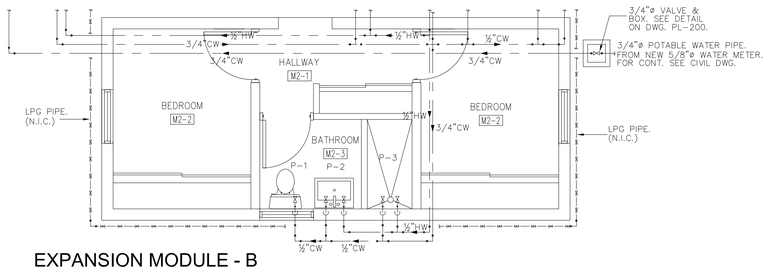
MAIN MODULE HOUSE #1
FLOOR PLAN- SANITARY LAYOUT
SCALE: 1/4"=1'-0"



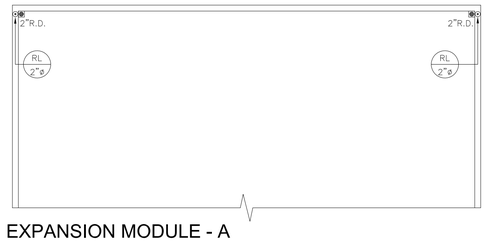
EXPANSION MODULE - B
FLOOR PLAN- SANITARY LAYOUT
SCALE: 1/4"=1'-0"



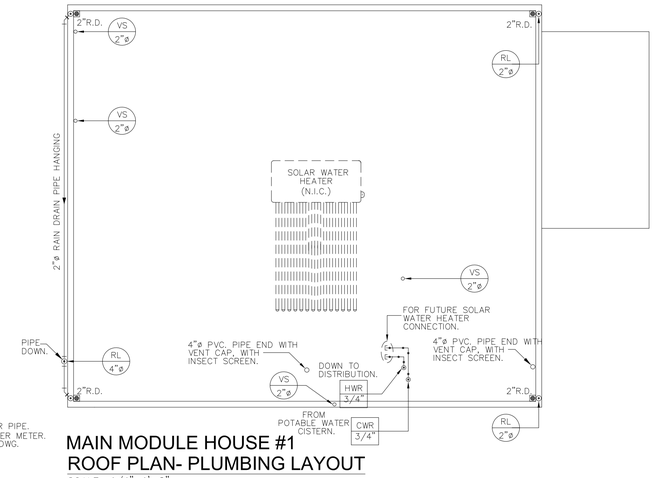
MAIN MODULE HOUSE #1
FLOOR PLAN- POTABLE WATER LAYOUT
SCALE: 1/4"=1'-0"



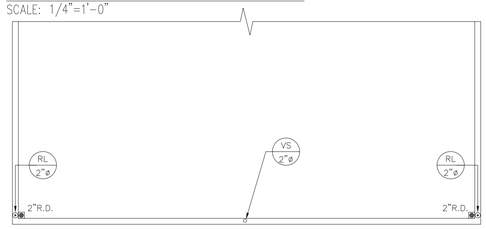
EXPANSION MODULE - B
FLOOR PLAN- POTABLE WATER LAYOUT
SCALE: 1/4"=1'-0"



EXPANSION MODULE - A
ROOF PLAN- PLUMBING LAYOUT
SCALE: 1/4"=1'-0"



MAIN MODULE HOUSE #1
ROOF PLAN- PLUMBING LAYOUT
SCALE: 1/4"=1'-0"



EXPANSION MODULE - B
ROOF PLAN- PLUMBING LAYOUT
SCALE: 1/4"=1'-0"

PLUMBING LEGEND:

——— - ———	COLD POTABLE WATER LINE
——— - - ———	HOT POTABLE WATER LINE
———	SANITARY SEWER LINE
- - - - - - - - - - - -	SANITARY VENTILATION LINE
CWR ½"ø	INDICATES COLD WATER RISER DESIGNATION AND SIZE
HWS ½"ø	INDICATES HOT WATER SUPPLY RISER DESIGNATION AND SIZE
HWR ½"ø	INDICATES HOT WATER RETURN RISER DESIGNATION AND SIZE
SS 3"ø	INDICATES SANITARY STACK DESIGNATION AND SIZE
3"ø WS	INDICATES WASTE STACK DESIGNATION AND SIZE
RL 3"ø	INDICATES RAIN LEADER STACK DESIGNATION AND SIZE
VS ½"ø	INDICATES SANITARY VENTILATION STACK DESIGNATION AND SIZE
P-1	INDICATES PLUMBING FIXTURE DESIGNATION SEE SCHEDULE
	POINT OF CONNECTION

PLUMBING ABBREVIATIONS:

C.W.	COLD WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
(TYP.)	TYPICAL
VS	VENT STACK
WCO	WALL CLEAN OUT
FCO	FLOOR CLEAN OUT
GCO	GROUND CLEAN OUT
W.H.	WATER HEATER
FD	FLOOR DRAIN
V	VENTILATION
H.B.	HOSE BIBB
(E)	EXISTING
CC	CEILING CASSETTE
FCU	FAN COIL UNIT

NOTE:

1) NON-POTABLE WATER SYSTEM IS NOT IN CONTRACT. CISTERN LOCATION DEPICTED ON DRAWINGS SHOULD BE EVALUATED AND MODIFIED ACCORDING TO ACTUAL SITE CONDITIONS.
2) LPG SYSTEM IS NOT IN CONTRACT. INSTALLATION SHALL COMPLY WITH APPLICABLE CODES, REGULATIONS, STANDARDS AND "COMISION DE SERVICIO PUBLICO"
3) SOLAR WATER HEATING SYSTEM IS NOT IN CONTRACT. COLLECTORS SHOULD BE INSTALLED WITH THE APPROPRIATE ANGLE AND FACING SOUTH.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

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No.	Date	Description

ISSUE LOG

PROFESSIONAL SEALS:

SHEET TITLE:

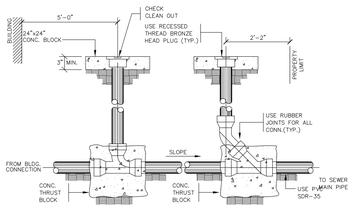
PROTOTYPE #1 FLOOR PLAN- PLUMBING LAYOUT

SHEET INFORMATION:

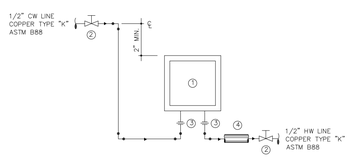
JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number:
Checked By:	PL-100
QC Review:	
Phase:	

PLUMBING FIXTURE SHEDULE

DESIG-NATION	DESCRIPTIONS	LOCATIONS	UNIT WASTE OR SOIL	VENT SIZE	WATER SUPPLY		FIXTURES		REMARKS
					COLD	HOT	COLD	HOT	
P-1	WATER CLOSET (TANK)	TOILETS	3"	2"	¾"	–	¾"	–	SEE ARCHITECTURAL DWG'S.
P-2	LAVATORY	TOILETS	1¾"	1¼"	½"	–	½"	–	SEE ARCHITECTURAL DWG'S.
P-3	SHOWER	TOILETS	2"	1½"	3/4"	–	3/4"	–	SEE ARCHITECTURAL DWG'S.
P-4	KITCHEN SINK	KITCHEN	1¾"	1½"	½"	–	½"	–	SEE ARCHITECTURAL DWG'S.
F.C.O.	FLOOR CLEANOUT	AS SHOWN ON DWGS.	–	–	–	–	–	–	RECESSED HEAD BRONZE CLEANOUT PLUG
W.C.O.	WALL CLEANOUT	AS SHOWN ON DWGS.	–	–	–	–	–	–	RECESSED HEAD BRONZE CLEANOUT PLUG



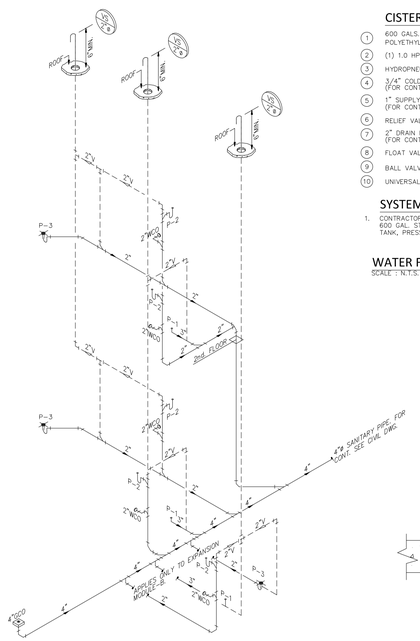
ELEVATION
CLEAN OUT INSTALLATION DETAIL
SCALE : N.T.S.



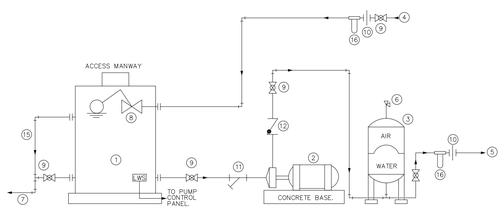
LEGEND:

1. IN-LINE WATER HEATER 7.0 KW, 208/1/60. 30 AMPS. SIMILAR TO MAREY SANTON MODEL HP 724.
2. 1/2" GATE VALVE
3. 1/2" UNIVERSAL CONN.
4. ½" THICK NEOPRENE INSULATION. (APPLIES FOR EXPOSED HOT WATER PIPING).

IN-LINE WATER HEATER INSTALLATION DETAIL
SCALE : N.T.S.



MAIN MODULE HOUSE #4 SANITARY DIAGRAM
SCALE : N.T.S.



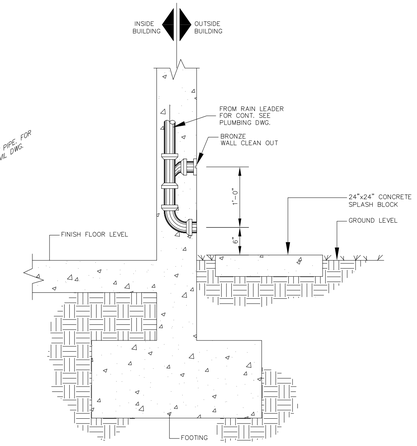
CISTERN LEGEND:

1. 600 GALS. (5,008 lb) 5'-9" x 3'-7". POLYETHYLENE POTABLE WATER CISTERN.
2. (1) 1.0 HP CENTRIFUGAL PUMP
3. HYDROPNEUMATIC TANK.
4. 3/4" COLD WATER CISTERN FEED LINE (COPPER). (FOR CONT. SEE PLUMBING DWG'S).
5. 1" SUPPLY LINE TO SYSTEM (COPPER). (FOR CONT. SEE PLUMBING DWG'S).
6. RELIEF VALVE
7. 2" DRAIN PIPE (PVC). (FOR CONT. SEE PLUMBING DWG'S).
8. FLOAT VALVE
9. BALL VALVE (BRONZE BODY).
10. UNIVERSAL UNION
11. STRAINER
12. SWING CHECK VALVE
13. NOT USED
14. NOT USED
15. 2" OVER FLOW (PVC)
16. IN-LINE FILTER (5 Mc)
- NOT USED
- NOT USED
- NOT USED
- LWS LOW WATER SWITCH

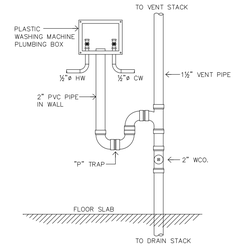
SYSTEM DESCRIPTION:

1. CONTRACTOR SHALL FURNISH AND INSTALL A WATER RESERVOIR/BOOSTER SYSTEM WITH TWO 600 GAL. STORAGE CAPACITY SIZE POLIETILENE TANK, 1 HP BOOSTER PUMP, HYDROPNEUMATIC TANK, PRESSURE SWITCH, IN-LINE FILTER, 24"ø ACCESS MAN WAY.

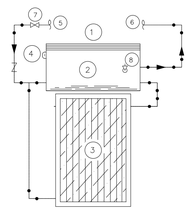
WATER FLOW DIAGRAM
SCALE : N.T.S.



STORM SEWER FREE DISCHARGE DETAIL
SCALE : N.T.S.



CLOTH WASHER PLUMBING BOX INSTALLATION DETAIL
SCALE:N.T.S.



SOLAR WATER HEATER LEGEND:

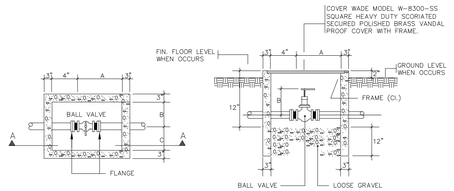
1. SOLAR WATER HEATER, UNIVERSAL SOLAR PRODUCTS MODEL A8224SS.
2. STORAGE TANK.
3. SOLAR HEAT COLLECTORS.
4. AUXILIARY ELECTRICAL HEATER
5. 1" DIA. COLD WATER SUPPLY (COPPER)
6. 1" DIA. HOT WATER OUTLET (COPPER)
7. 1" DIA. BRONZE BODY GATE VALVE.
8. 1" DIA. PRESSURE TEMPERATURE RELIEF VALVE INSTALLED IN THE HOT WATER LINE WITHIN 3" OF THE TOP OF THE WATER TANK. ASME RATED.

HOT WATER FLOW DIAGRAM (N.I.C.)
SCALE : N.T.S.

NOT IN CONTRACT

PLUMBING GENERAL NOTES:

1. ALL PLUMBING WORK SHALL BE IN STRICT ACCORDANCE WITH THE DEPARTMENT OF HEALTH OF P.R., THE LOCAL BUILDING CODE, THE NATIONAL PLUMBING CODE (A.S.A. A 40 8-1955) AND THE SPECIFICATIONS ISSUED FOR THIS PROJECT.
2. CLEANOUTS SHALL BE OF THE SAME NOMINAL SIZE AS THE PIPE DIAMETER UP TO 4".
3. THE CONTRACTOR SHALL FURNISH AND SET IN PLACE BEFORE CONCRETE POURING ALL NECESSARY SLEEVES FOR WASTE OR SOIL, COLD WATER LINES. THESE SLEEVES SHALL BE AS PER THE SPECIFICATIONS.
4. THE PLUMBING CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF THE PIPING TO AVOID ANY INTERFERENCE WITH PIPING AND/OR EQUIPMENT BEING INSTALLED BY OTHER CONTRACTORS.
5. FOR FIXTURES AND/OR EQUIPMENT NOT LISTED IN THE SCHEDULE, SEE THE SPECIFICATIONS.
6. CLEANOUTS SHALL BE PLACED AS SHOWN ON DRAWINGS.
7. THE CONTRACTOR SHALL VERIFY IN FIELD ALL INVERT ELEVATIONS AND SHALL MAKE ANY NECESSARY ADJUSTMENT AS REQUIRED BY FIELD CONDITIONS AND AS REQUIRED, TO OBTAIN THE PROPER SLOPES.
8. IT IS THE INTENTION OF THE DRAWINGS TO CALL FOR FINISHED WORK, COMPLETE, TESTED AND READY FOR OPERATION. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER INSTALLATION AND FOR FUNCTIONING AND OPERATION OF THE SYSTEM SHALL FORM PART OF THE WORK TO BE DONE BY THE CONTRACTOR.
9. BIDDERS SHALL VISIT THE SITE AND ACQUAINT THEMSELVES WITH THE CONDITIONS AS THEY ACTUALLY EXIST AND VERIFY DIMENSIONS, LOCATIONS AND DETAILS REQUIRED TO COMPLETE THE WORK, WHICH WILL BE THE ONLY OPPORTUNITY FOR POTENTIAL CONTRACTORS TO SEE THE SITE. FAILURE TO VISIT THE PROJECT AREA WILL IN NO WAY RELIEVE THE SUCCESSFUL BIDDER OF FURNISHING ALL MATERIAL AND PERFORMING ALL WORK REQUIRED FOR THE COMPLETION OF THE CONTRACT. VISITS TO THE PROJECT AREA SHALL BE ARRANGED THROUGH THE OWNER.
10. PROVIDE ACCESS FOR OPERATION AND MAINTENANCE TO EVERY PLUMBING VALVE. ACCESS SHALL BE AS REQUIRED BY ARCHITECT.
11. THE CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT, AS NEEDED, TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK.
12. CONTRACTOR SHALL LOCATE IN FULLY ACCESSIBLE POSITIONS ALL EQUIPMENT WHICH MUST BE SERVICED, OPERATED, OR MAINTAINED.
13. INSTALL WATER HAMMER ARRESTER AS PER PDI-WH-201.
14. ALL UNDERGROUND COPPER PIPING SHALL BE TYPE "K"ASTM B-88, DIAMETER AS INDICATED.
15. ALL COPPER PIPING ABOVE FINISH FLOOR ELEVATION SHALL BE TYPE "L"ASTM B-88, DIAMETER AS INDICATED.
16. ALL WASTE, SANITARY AND STORM DRAINAGE LINES SHALL BE PVC SCH-40.
17. ALL PIPING SHALL BE CONCEALED IN FLOOR TOPPINGS, WALL OR CHASES UNLESS OTHERWISE NOTED.
18. LONG SWEEP BENDS OR LONG SWEEP FITTINGS SHALL BE PROVIDED AT THE BASE OF ALL STACKS.
19. CLEANOUTS SHALL NOT BE MORE THAN 50 FEET APART
20. THE PLUMBING CONTRACTOR SHALL COORDINATE HIS/HER PORTION OF THE WORK WITH THE GENERAL CONTRACTOR AND SHALL PROVIDE SLEEVES AT SLABS OR BEAMS FOR PIPING LAYOUT AND FIXTURES INSTALLATION.
21. ALL FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER SPECIFICATIONS.
22. SIZES SHOWN IN FIXTURES SCHEDULE ARE MINIMUM AND SHALL BE INCREASED AS NECESSARY TO COMPLY WITH CODE REQUIREMENTS OR AS SHOWN ON DRAWINGS.
23. SINGLE AND DOUBLE TEES AND QUATER BENDS SHALL BE USED IN LINES ONLY WHERE THE DIRECTION OF FLOW IS FROM THE HORIZONTAL TO THE VERTICAL.
24. ALL HORIZONTAL PORTIONS OF SOIL STACKS AND BRANCHES SHALL HAVE MINIMUM SLOPE OF 1/4" PER FOOT FOR PIPES 3" DIAMETER OR LESS. 1/8" PER FOOT FOR PIPES 4" OR LARGER IN DIAMETER.
25. THE PLUMBING CONTRACTOR SHALL COORDINATE HIS/HER WORK IN ORDER TO AVOID ANY INTERFERENCE WITH THE WORK OF OTHER CONTRACTORS AND THE INSTALLATION OF FIXTURES AND OR EQUIPMENT BY OTHERS.
26. WATER HAMMER ARRESTER SHALL BE INSTALLED IN ALL WATER DISTRIBUTION BRANCHES WHENEVER INDICATED ON THE DRAWINGS AS PER MANUFACTURER RECOMMENDATIONS. SAME SHALL BE SERIES 5000, MODELS AS SHOWN ON LEGEND.
27. WATER HAMMER ARRESTERS INSTALLED ON WALLS SHALL BE PROVIDED WITH 12" X 12" FRAME WITH HINGERS LOCKED DOOR, MODEL JAY R. SMITH FIG.4762-SL,WITH ITS BOTTOM AT 18" ABOVE FINISH FLOOR ELEVATION.
28. GATE VALVES LOCATED UNDERGROUND OR BELOW FLOOR SLABS SHALL BE INSTALLED WITHIN A CAST IRON OR CONCRETE BOX WITH 9 X 9 J.R. SMITH ACCESS COVER FIG. 4915-U.
29. PLUMBING CONTRACTOR SHALL PROVIDE ALL NECESSARY SERVICES AND/OR CONNECTIONS REQUIRED FOR THE PLUMBING FIXTURES AND/OR EQUIPMENT SHOWN ON THE FIXTURES PLANS.
30. PLUMBING CONTRACTOR SHALL PROVIDE ALL NECESSARY ROUGHING-IN AND SHALL INSTALL THE PLUMBING FIXTURES INDICATED ON THESE DRAWINGS.
31. WHENEVER REQUIRED OR NEEDED, THE PLUMBING CONTRACTOR SHALL PREPARE AND SUBMIT THE NECESSARY SHOP DRAWINGS FOR THE APPROVAL OF THE ARCHITECT.
32. BEFORE STARTING CONSTRUCTION, THE PLUMBING CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND ELEVATIONS OF EXISTING PIPE LINES TO REMAIN IN USE ANY SIGNIFICANT DISCREPANCY WITH THE INFORMATION SHOWN ON THESE DRAWINGS SHALL BE NOTIFIED TO THE ARCHITECT FOR REVISION AND/OR CLARIFICATION.
33. ALL EXPOSED HOT WATER LINES SHALL BE INSULATED WITH 1-1/2" THICK MATERIAL WITH A THERMAL CONDUCTIVITY NOT TO EXCEED 0.228TU PER SQ. INCH PER HOUR AT MEAN TEMPERATURE OF 75°F
34. FIXTURES, FITTINGS, ACCESSORIES, MATERIAL AND ALL PLUMBING PRODUCTS SHALL BE AS PER SPECIFICATIONS ON THESE DRAWINGS AND CONTRACT SPECIFICATIONS. EQUAL OR SIMILAR SHALL BE ONLY ACCEPTED IF PREVIOUSLY APPROVED BY THE ARCHITECT.

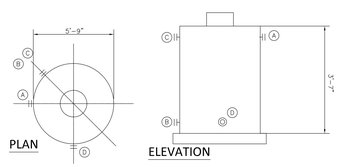


PLAN SECTION A-A

VALVE BOX SCHEDULE								
DIMENSIONS MARKED	VALVE SIZE (IN INCHES)							
	3"	2 1/2"	2"	1 1/2"	1 1/4"	1"	3/4"	1/2"
A	13"	13"	11"	11"	11"	8"	8"	8"
B	6"	6"	5"	5"	5"	4"	4"	4"
C	9"	9"	8"	8"	8"	6"	6"	6"
ACCESS COVER SIZE	AS REQUIRED							

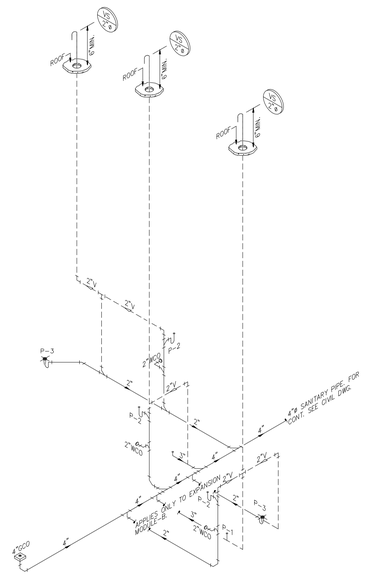
NOTE: VALVES 2 1/2" & SMALLER SHALL BE EQUAL TO NIBCO MODEL 595-Y-66. FOR 3" VALVE USE NIBCO MODEL 590-Y-66 OR APPROVED EQUAL.

VALVE BOX DETAIL
SCALE : N.T.S.

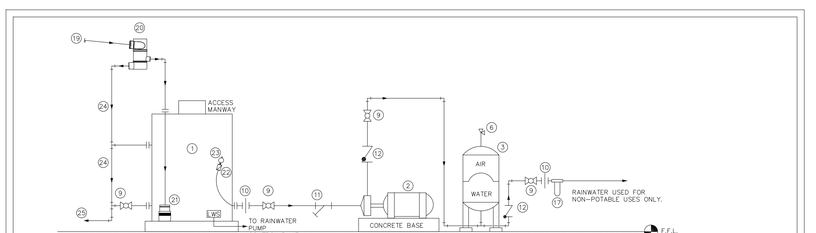


TAG	SIZE	DESCRIPTION	CONNECTION TYPE
A	3/4"ø	WATER INLET	FLANGE
B	2"ø	DRAIN	FLANGE
C	2"ø	OVERFLOW	FLANGE
D	3/4"ø	SUPPLY	FLANGE
E	24"ø	ACCESS MAN-WAY	N/A

TANK DETAIL
SCALE : N.T.S.



MAIN MODULE HOUSE #1, 2 & 3 SANITARY DIAGRAM
SCALE : N.T.S.



1. 600 GALS. STORM SEWER CISTERN. (5,010 lb WET WEIGHT)
2. 1 HP CENTRIFUGAL PUMP 208-1-60.
3. HYDROPNEUMATIC TANK.
4. 3/4" COLD WATER LINE FROM WATER METER (COPPER TYPE "K" ASTMB-88. FOR CONT. SEE PLUMBING DWG'S).
5. 3/4" SUPPLY LINE TO SYSTEM (COPPER TYPE "K" ASTMB-88. FOR CONT. SEE PLUMBING DWG'S).
6. RELIEF VALVE
7. 2" DRAIN PIPE (PVC SCH. 40 ASTMD-2665 FOR CONT. SEE PLUMBING DWG'S).
8. FLOAT VALVE
9. BALL VALVE (BRONZE BODY).
10. UNIVERSAL UNION
11. STRAINER
12. CHECK VALVE
13. NOT USED
14. PRESSURE REGULATING NON-SLAM CHECK VALVE.
15. 2" OVER FLOW (PVC SCH. 40 ASTMD-2665)
16. IN-LINE FILTER (5 Mc)
17. IN-LINE FILTER (50 Mc)
18. CONTROL VALVE
19. 4" RAIN COLLECTION PIPE (PVC SCH. 40 ASTMD-2665 FOR CONT. SEE PLUMBING DWG'S).
20. VORTEX RAINWATER FILTER SMITH FIG. RH952O-06. W/ STAINLESS STEEL WALL BRACKET.
21. SMOOTHING INLET SMITH FIG. RH953OSI.
22. FLOATING FILTERS AND HOSES
23. MULTI-FUNCTIONAL OVERFLOW DEVICE
24. 4" OVER FLOW (PVC SCH. 40 ASTMD-2665 FOR CONT. SEE PLUMBING DWG'S).
25. 4" DRAIN PIPE (PVC SCH. 40 ASTMD-2665 FOR CONT. SEE PLUMBING DWG'S).
26. NOT USED
- PG NOT USED
- P5 NOT USED
- P1 NOT USED
- F5 NOT USED
- LWS LOW WATER SWITCH
- (NO) NORMALLY OPEN
- (NC) NORMALLY CLOSED

SYSTEM DESCRIPTION:

1. CONTRACTOR SHALL FURNISH AND INSTALL A WATER RESERVOIR/BOOSTER SYSTEM WITH 600 GAL. STORAGE CAPACITY SIZE FIBERGLASS TANK, 1 HP BOOSTER PUMP, HYDROPNEUMATIC TANK, PRESSURE SWITCH, IN-LINE FILTER, BY PASS AND LOW WATER CUT-OFF SWITCH AND 24"ø ACCESS MAN WAY.

NON-POTABLE WATER SYSTEM FLOW DIAGRAM (N.I.C.)
SCALE : N.T.S.

NOT IN CONTRACT

PLUMBING LEGEND:

- COLD POTABLE WATER LINE
- HOT POTABLE WATER LINE
- SANITARY SEWER LINE
- SANITARY VENTILATION LINE
- CWR ½"ø — INDICATES COLD WATER RISER DESIGNATION AND SIZE
- HWS ½"ø — INDICATES HOT WATER SUPPLY RISER DESIGNATION AND SIZE
- HWR ½"ø — INDICATES HOT WATER RETURN RISER DESIGNATION AND SIZE
- SS 3"ø — INDICATES SANITARY STACK DESIGNATION AND SIZE
- 3"ø WS — INDICATES WASTE STACK DESIGNATION AND SIZE
- RL 3"ø — INDICATES RAIN LEADER STACK DESIGNATION AND SIZE
- VS 1½"ø — INDICATES SANITARY VENTILATION STACK DESIGNATION AND SIZE
- P-1 — INDICATES PLUMBING FIXTURE DESIGNATION SEE SCHEDULE
- POINT OF CONNECTION

PLUMBING ABBREVIATIONS:

C.W.	COLD WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
(TYP.)	TYPICAL
VS	VENT STACK
WCO	WALL CLEAN OUT
FCO	FLOOR CLEAN OUT
GCO	GROUND CLEAN OUT
W.H.	WATER HEATER
FD	FLOOR DRAIN
V	VENTILATION
H.B.	HOSE BIBB
(E)	EXISTING
CC	CEILING CASSETTE
FCU	FAN COIL UNIT

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPERATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

No.	Date	Description

ISSUE LOG

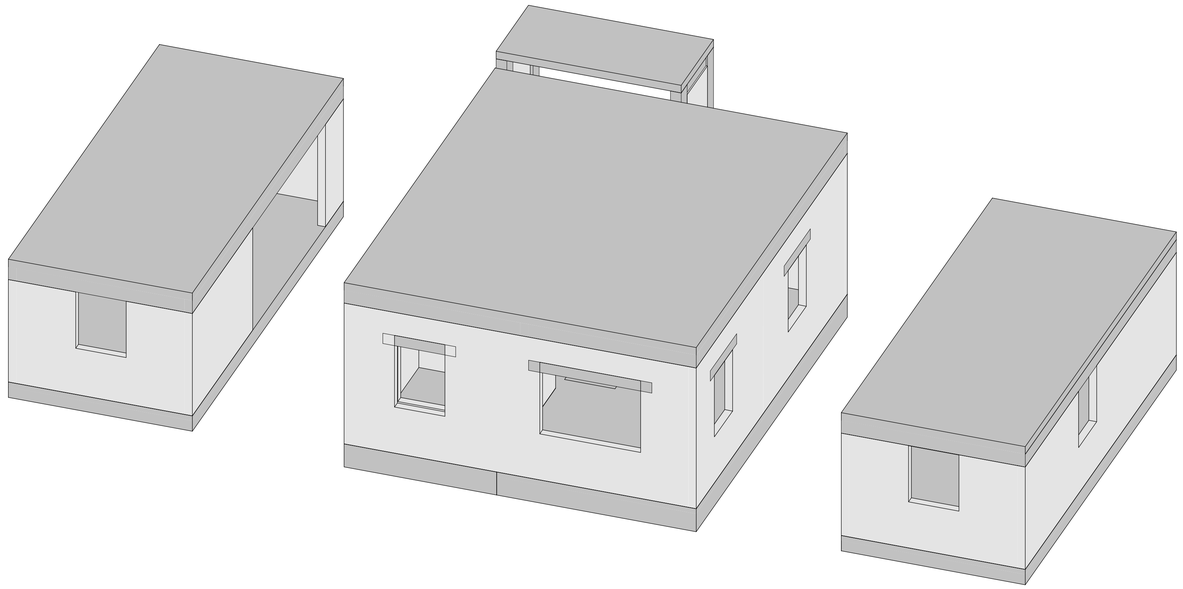
PROFESSIONAL SEALS:

SHEET TITLE:

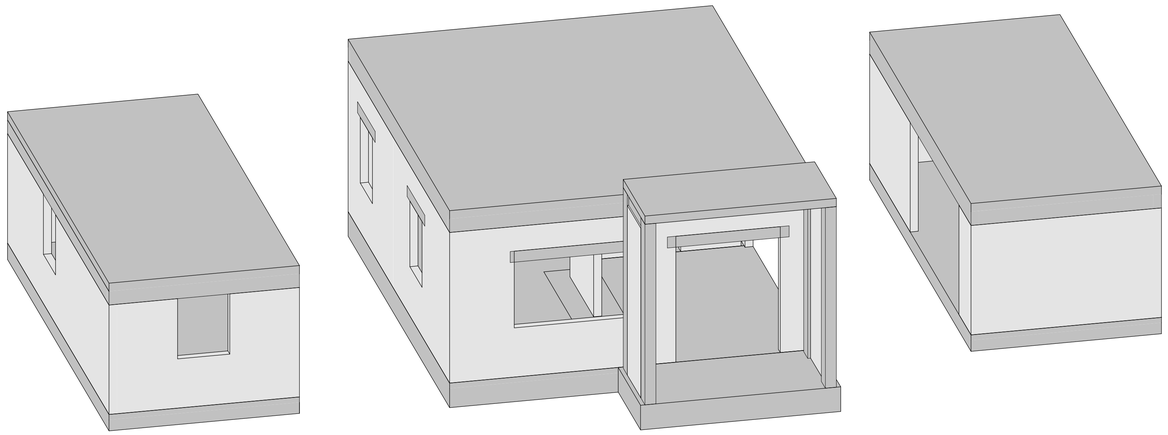
PLUMBING DETAILS, SCHEDULES & NOTES

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number:
Checked By:	PL-200
QC Review:	
Phase:	



1 **PRIMARY STRUCTURE WITH MODULE EXPANSIONS**



2 **PRIMARY STRUCTURE WITH MODULE EXPANSIONS OPPOSITE VIEW**

DRAWING INDEX	
SHEET NUMBER	SHEET NAME
S-001	TITLE SHEET
S-002A	GENERAL NOTES
S-002B	GENERAL NOTES
S-003	WIND DIAGRAMS FLAT ROOF
S-004	SAFE ROOM WIND DIAGRAMS
S-005	FOUNDATION PLAN
S-006	WALL FRAMING PLAN
S-007	FLAT ROOF FRAMING PLAN
S-008	ELEVATIONS
S-009	SECTIONS
S-010	TYPICAL DETAILS
S-011	TYPICAL DETAILS
S-012	SLAB TYP. DETAILS

PREFACE:

THIS PRESCRIPTIVE HOME DRAWING SET PRESENTS RECOMMENDATIONS FOR THE CONSTRUCTION OF A ONE STORY HOME. THIS GUIDANCE DISPLAYS INFORMATION FOR A PARTICULAR SIZED HOME. THE DESIGN INFORMATION PROVIDED HEREIN INCORPORATES SEISMIC AND WIND CRITERIA BASED UPON THE LATEST PUERTO RICO BUILDING CODE WHICH REFERENCES THE 2018 INTERNATIONAL RESIDENTIAL CODE (2018 IRC), 2018 INTERNATIONAL BUILDING CODE (2018 IBC), AND THE AMERICAN SOCIETY OF CIVIL ENGINEERS ASCE/SEI 7-16: MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES.

ALL RECOMMENDED DESIGN WORK, INCLUDING THOSE PARTS COVERED BY THIS DOCUMENT, SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL SUCH AS A REGISTERED PROFESSIONAL ENGINEER OR A LICENSED ARCHITECT IN PUERTO RICO. WHEN THESE GUIDANCE DRAWINGS ARE USED FOR A PROJECT, THEY SHOULD BE MODIFIED AS NEEDED IN ORDER TO COMPLY WITH ALL OF THE APPLICABLE CODE REQUIREMENTS FOR A GIVEN PROJECT SITE, THEN SIGNED AND SEALED IN ACCORDANCE WITH PUERTO RICO LAWS, BUILDING CODE, AND DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC).

THE FOLLOWING BOUNDARY CONDITIONS SHALL BE MET IN ORDER TO USE THIS DRAWING SET. THIS DRAWING SET IS NOT VALID IF THE PROJECT PARAMETERS ARE OUTSIDE OF THESE BOUNDARY CONDITIONS.

1. SINGLE STORY BUILDINGS WITH THE MAXIMUM MEAN ROOF HEIGHT AS SHOWN IN THE DRAWING SET.

2. GABLE ROOF AS SHOWN IN THE DRAWING SET

3. BUILDING WIDTH AND LENGTH AS SHOWN IN THE DRAWING SET.

4. DETERMINE SITE SPECIFIC EXPOSURE CATEGORY FIRST AND THEN DETERMINE THE SITE SPECIFIC WIND SPEED AS SHOWN IN THE ATC ONLINE HAZARDS TOOL FOR THE PUERTO RICO BUILDING CODE 2018. CONFIRM THAT THE EXPOSURE AND DESIGN WIND SPEED DO NOT EXCEED THAT SHOWN IN THE DESIGN DATA WITHIN THE DRAWING SET.

ALL CONSTRUCTION MUST COMPLY WITH THE PUERTO RICO BUILDING CODE. YOU ARE REQUIRED TO OBTAIN THE NECESSARY BUILDING PERMITS FROM THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC). SIGNED AND SEALED DRAWINGS FOR PERMIT MUST BE SUBMITTED TO THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OFPe-DDEC).

STRUCTURES LOCATED IN SPECIAL FLOOD HAZARD AREAS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL AND CERTIFIED TO COMPLY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

TITLE SHEET

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: **S-001**
Checked By:	
QC Review:	
Phase:	

GENERAL STRUCTURAL NOTES

1.0 GENERAL

1.01 DRAWINGS SHOW TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. FOR DETAILS NOT SPECIFICALLY SHOWN, PROVIDE DETAILS SIMILAR TO THOSE SHOWN.

1.02 VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS BEFORE STARTING WORK. NOTIFY ENGINEER OF RECORD OF ANY DISCREPANCY.

1.03 STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE ONCE IN SERVICE. NO CONSIDERATION FOR STABILITY AND SHORING IS ASSUMED BY THE ENGINEER DURING THE BUILDING PROCESS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THE STABILITY AND SAFETY OF THE STRUCTURE AND ITS COMPONENTS BY DETERMINING AND IMPLEMENTING ERECTION PROCEDURES AND SEQUENCE OF CONSTRUCTION. THIS INCLUDES TEMPORARY BRACING AND SHORING AS WELL AS SOIL STABILIZATION AND PROTECTIVE MEASURES FOR ADJACENT EXISTING CONSTRUCTION.

1.04 COORDINATE STRUCTURAL CONTRACT DOCUMENTS WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL. NOTIFY ENGINEER OF RECORD OF ANY CONFLICT AND/OR OMISSION. CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER OF RECORD. FOR ADDITIONAL OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE ARCHITECTURAL, MECHANICAL AND PLUMBING DRAWINGS.

1.05 FOR DIMENSIONS NOT SHOWN, SEE ARCHITECTURAL DRAWINGS.

1.06 REVIEW OF SUBMITTALS AND/OR SHOP DRAWINGS BY THE ENGINEER OF RECORD DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO REVIEW AND CHECK SHOP DRAWINGS BEFORE SUBMITTAL TO THE ENGINEER OF RECORD. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS AND DIMENSIONS SPECIFIED IN THE CONTRACT DOCUMENTS. CONTRACTOR IS ALSO RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION AND JOBSITE SAFETY.

1.07 ANY BRAND SPECIFIC MATERIALS MAY BE SUBSTITUTED W/ AN EQUIVALENT PRODUCT BY AN ALTERNATE MANUF. IF APPROVED BY THE ENGINEER OF RECORD, U.N.O. IF AN OPTION IS USED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES AND SHALL COORDINATE DETAILS.

1.08 NO STRUCTURAL MEMBER OR COMPONENT SHALL BE CUT, NOTCHED OR OTHERWISE ALTERED UNLESS APPROVED IN WRITING BY THE ENGINEER OF RECORD OR DETAILED IN THIS PLAN SET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS INCURRED BY THE ENGINEER OF RECORD FOR REVIEW OF SUCH DEVIATIONS AND IMPLEMENTATION OF APPROPRIATE SOLUTIONS.

1.09 PRIOR TO COMMENCING WORK, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND COORDINATING WITH THE SUB-CONTRATORS WORK INDICATED ON STRUCTURAL DRAWINGS WITH ARCHITECTURE, SITE WORK, DELEGATED COMPONENTS, AND THE WORK OF OTHER ENGINEERING DISCIPLINES.

1.10 THE ENGINEER OF RECORD SHALL NOT BE CONSTRUED AS HAVING CONTROL, CHARGE, AND RESPONSIBILITY FOR THE ACTS AND OMISSIONS AND FOR FAILURE OF THE CONTRACTOR, SUB-CONTRACTOR, AND OTHER PERSONS PERFORMING THE WORK TO CARRY OUT SUCH WORK IN ACCORDANCE WITH THE STRUCTURAL DRAWINGS AND COLLECTIVE CONTRACT DOCUMENTS.

1.11 PERIODIC SITE OBSERVATION BY THE ENGINEER OF RECORD AND HIS / HER REPRESENTATIVES IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN GENERAL ACCORDANCE WITH THE STRUCTURAL DRAWINGS AND SPECIFICATIONS. THIS LIMITED SITE OBSERVATION SHALL NOT BE CONSTRUED AS AN INSPECTION, EXHAUSTIVE, OR CONTINUOUS OBSERVATION TO VERIFY THE QUALITY AND QUANTITY OF THE WORK.

1.12 COMPLETE INSPECTION REQUIREMENTS SHALL BE AS DIRECTED BY THE LOCAL BUILDING DEPARTMENT.

1.13 THE USE OF REPRODUCTIONS OF THESE STRUCTURAL DRAWINGS AND SPECIFICATIONS BY ANY CONTRACTOR, SUBCONTRACTOR, ERECTOR, FABRICATOR OR MATERIAL SUPPLIER IN LIEU OF THE PREPARATION OF SHOP DRAWINGS IS PROHIBITED UNLESS PRIOR WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER OF RECORD.

1.14 IN THE EVENT THERE IS CONFLICTING INFORMATION BETWEEN THE DRAWINGS, SPECIFICATIONS AND LOCAL CODE APPLICATIONS OR ANY OTHER CONTROLLING AUTHORITY, THE MOST STRINGENT CONDITION SHALL APPLY.

2.0 SOIL PREPARATION AND FOUNDATION

2.01 THE DESIGN OF FOUNDATIONS IS BASED ON AN ALLOWABLE SOIL BEARING PRESSURE OF 1,500 PSF.

2.02 A QUALIFIED GEOTECHNICAL ENGINEER SHALL VERIFY CONDITION AND/OR ADEQUACY OF ALL SUBGRADES, FILLS AND BACKFILLS BEFORE PLACEMENT OF FOUNDATIONS, FOOTINGS, SLABS, WALLS, FILLS, BACKFILLS, ETC. AND SHALL ANTICIPATE SOIL EROSION WHEN DETERMINING EXCAVATION DEPTH.

2.03 SOIL, DEWATERING, AND SITE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

2.04 SOIL SUPPORTED FOUNDATIONS:
A. REINFORCING SHALL BE SUPPORTED FROM ABOVE OR WITH 3" SLAB BOSTER WITH PLATE (SBP) AT 4'-0" O.C. MAXIMUM FOR ALL FOUNDATION REINFORCING.

2.05 REMOVE FREE WATER FROM EXCAVATIONS BEFORE PLACING CONCRETE.

2.06 REMOVE EXISTING TOP SOIL, FILL, PAVEMENT OR FOUNDATIONS FROM THE BUILDING AREA.

2.07 BACKFILL BELOW STRUCTURAL ELEMENTS TO BE A GRANULAR MATERIAL HAVING MAXIMUM SIZE OF 3" AND LESS THAN 12% PASSING THE #200 SIEVE SIZE. FILL TO BE PLACED IN LIFTS OF ONE-FOOT OR LESS COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MODIFIED PROCTOR (ASTM:D1557).

2.08 DO NOT BACKFILL FOUNDATION WALLS UNTIL THE RESTRAINING SLABS OR ADEQUATE BRACING ARE IN PLACE. ALL BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATION.

2.09 EXTERIOR SLABS SHALL SLOPE AWAY FROM THE STRUCTURE A MINIMUM OF 1/4" PER FOOT UNLESS NOTED OTHERWISE.

2.10 SLABS ON FILL TO BE PLACED OVER A 10-MIL POLYETHYLENE FILM VAPOR BARRIER INSTALLED ON COMPACTED SOIL. CONCRETE POURS TO BE PLACED IN A CHECKERBOARD PATTERN, LIMITED TO 400 SQ. FT. OR 20 FEET IN ANY DIRECTION. AS AN ALTERNATIVE, SLABS MAY BE POURED CONTINUOUSLY, HOWEVER, THEY MUST BE SAWN AS SOON AS THE SLAB WILL SUPPORT THE WEIGHT OF THE SAW AND OPERATOR AND THE SAW BLADE WILL PRODUCE CLEAN CUTS WITHOUT DISLODGING AGGREGATE (7 HOURS MAX). SAW CUT TO BE A MINIMUM OF 1/4 OF THE SLAB DEPTH AND 1/8 INCH WIDTH.

2.11 PROVIDE SOIL POISONING UNDER BUILDINGS FOR TERMITE PROTECTION.

2.12 HOUSES BUILT ON THE SIDES OF STEEP SLOPES REQUIRE SPECIAL DESIGN GUIDANCE. THESE HOMES ARE OFTEN SET ON EXPOSED POSTS OR COLUMNS. WALLS, POSTS, AND COLUMNS SHALL BE PROPERLY BRACED TO PREVENT COLLAPSE DURING AN EARTHQUAKE. FOUNDATIONS SHALL BE PROPERLY EMBEDDED IN CONSIDERATION OF ALL DESIGN FORCES AND POTENTIAL IMPACTS OF EROSION. CONSULT A PUERTO RICO LICENSED PROFESSIONAL ARCHITECT OR ENGINEER FOR DESIGN GUIDANCE IN SUPPORTING A HOME ON A STEEP SLOPE. IT IS RECOMMENDED TO PROVIDE ADDITIONAL ANCHORAGE FOR EACH FLOOR SYSTEM TO THE UPHILL FOUNDATION AND SUPPLEMENTAL ANCHORAGE, STRAPPING, AND BRACING OF CRIPPLE WALLS.

2.13 A REGISTERED GEOTECHNICAL ENGINEER SHALL PERFORM A SLOPE STABILITY ANALYSIS ON STEEP SLOPES AND ADDITIONAL STABILIZING DESIGN OF KNEEWALLS OR WIDER GRADE BEAMS MAY BE REQUIRED IN THE DESIGN.

3.0 REINFORCED CONCRETE

3.01 PRIOR TO CASTING FOUNDATIONS, PREPARE THE SITE IN ACCORDANCE WITH PLANS, SPECIFICATIONS AND REQUIRED COMPACTION.

3.02 ALL CONCRETE WORK SHALL CONFORM TO ACI 301-10, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS. DESIGN IS BASED ON ACI 318-14, BUILDING CODE REQUIREMENTS FOR REINF. CONCRETE.

3.03 UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE THE FOLLOWING MINIMUM 28-DAY COMPRESSIVE STRENGTHS:

	f'c
FOUNDATIONS	3,000 PSI
SLABS-ON-GRADE	3,000 PSI
WALLS	3,000 PSI

3.04 USE OF CALCIUM CHLORIDE, CHLORIDE IONS OR OTHER SALTS IN CONCRETE IS NOT PERMITTED.

3.05 CHAMFER OR ROUND ALL EXPOSED CORNERS MINIMUM 3/4".

3.06 DETAIL CONCRETE REINFORCEMENT AND ACCESSORIES IN ACCORDANCE WITH ACI 315-18, DETAILING MANUAL.

3.07 REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.

3.08 WELDED WIRE FABRIC (MESH) SHALL CONFORM TO ASTM A185 AND SHALL BE PROVIDED IN FLAT SHEETS. LAP EDGES 3 CROSS WIRES MINIMUM.

3.09 PROVIDE CONTINUOUS REINFORCEMENT WHEREVER POSSIBLE; SPLICE ONLY AS SHOWN OR APPROVED; STAGGER SPLICES WHERE POSSIBLE; USE FULL TENSION SPLICE (CLASS "B") FOR CONTINUOUS REINF. AND MATCHING DOWELS U.N.O. LAP SPLICES SHALL BE 57 BAR DIAMETERS FOR BARS SMALLER THAN #7 AND 72 BAR DIAMETERS FOR #7 & LARGER.

3.10 REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER UNLESS NOTED OTHERWISE:
A. CONCRETE CAST AGAINST EARTH (NOT FORMED) . . . 3"
B. FORMED CONCRETE EXPOSED TO THE EARTH OR WEATHER
#6 THROUGH #18 BARS . . . . . 2"
#5 BARS AND SMALLER . . . . . 1½"
C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER
SUSPENDED SLABS AND WALLS
#14 THROUGH #18 BARS. . . . . 1½"
#11 BARS AND SMALLER. . . . . 1"
BEAMS (STIRRUPS) AND COLUMNS (TIES) . . . . . 1½"

3.11 DO NOT PLACE PIPES OR DUCTS EXCEEDING ONE-THIRD THE SLAB OR WALL THICKNESS WITHIN THE SLAB OR WALL UNLESS SPECIFICALLY SHOWN AND DETAILED ON STRUCTURAL DRAWINGS. ANY PIPES SHALL BE BETWEEN THE OUTER HORIZONTAL AND VERTICAL LAYERS OF REINF.

3.12 DO NOT WELD OR TACK WELD REINFORCING STEEL UNLESS APPROVED OR DIRECTED BY THE ENGINEER OF RECORD.

3.13 REINFORCE SLAB-ON-GRADE AT ALL PENETRATIONS AND AT RE-ENTRANT CORNERS. PLACE THREE #3x3'-0 AROUND FLOOR DRAINS. PLACE #4x4'-0" (MIN.) AT RE-ENTRANT CORNERS. HOLD REINFORCING 1" CLEAR FROM TOP OF CONCRETE.

3.14 WALLS AND OTHER INTERSECTING ELEMENTS SHALL HAVE CORNER BARS TO PROVIDE CONTINUITY. USE CONCRETE STEEL REINFORCING INSTITUTE (CRSI) STANDARDS OR AS SHOWN ON THE DRAWINGS.

3.15 FINISH INTERIOR SLAB ON GRADES WITH A TROWEL FINISH.

4.0 SAWN LUMBER

4.01 DESIGN STANDARDS:

AMERICAN WOOD COUNCIL, "NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION" (ANSI/AWC NDS-2018) WITH "NDS SUPPLEMENT", 2018 EDITION.

AMERICAN SOFTWOOD LUMBER STANDARD VOLUNTARY PRODUCT STANDARD PS20-15.

APA E30– THE ENGINEERED WOOD ASSOCIATION, "ENGINEERED WOOD CONSTRUCTION GUIDE", AND D510 "PANEL DESIGN SPECIFICATION", LATEST EDITIONS.

4.02 ALL WOOD FRAMING MEMBERS INCLUDING BUT NOT LIMITED TO WALL STUDS AND JOISTS, ARE INTENDED TO ACT AS A SYSTEM AS DETAILED IN THE STRUCTURAL DRAWINGS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE SAFETY AND STABILITY OF THE WOOD FRAMING SYSTEMS (I.E. TEMPORARY BRACING IF REQUIRED) DURING CONSTRUCTION.

4.03 ALL SAWN LUMBER SHALL CONFORM TO THE AMERICAN SOFTWOOD LUMBER STANDARD, PS20-15. LUMBER SIZES SHOWN ARE NOMINAL UNLESS NOTED OTHERWISE. LUMBER SHALL BE OF THE SPECIES AND GRADE SHOWN BELOW, UNLESS NOTED OTHERWISE:

MEMBER	GRADE	SPACING
WALL STUDS	SOUTHERN YELLOW PINE No.2	REF. PLANS
RAFTERS/JOISTS	SOUTHERN YELLOW PINE No.2	REF. PLANS
POST/COLUMNS	SOUTHERN YELLOW PINE No.2	REF. PLANS
SILL PLATE	SOUTHERN YELLOW PINE No.2	
DOUBLE TOP PLATE	SOUTHERN YELLOW PINE No.2	

4.04 ALL ATTACHMENTS OF WOOD FRAMING SHALL NOT BE LESS THAN THAT DESCRIBED IN TABLE "FASTENING SCHEDULE" ON SHEET S-004.

4.05 STORAGE OF ALL LUMBER AND TIMBER ON SITE SHALL BE KEPT OFF OF THE GROUND, UNDER COVER, AND PROTECTED FROM DAMAGE.

4.06 ALL LUMBER IN CONTACT WITH THE GROUND OR CONCRETE SHALL BE PRESSURE TREATED.

4.07 ALL FASTENERS FOR PRESERVATIVE-TREATED AND FIRE-RETARDENT-TREATED WOODS AND ALL OTHER WOODS SHALL BE OF HOT-DIPPED ZINC COATED GALVANIZED STEEL OR STAINLESS STEEL. ALL FASTENERS SHALL FOLLOW CURRENT MANUFACTURER'S GUIDELINES BASED ON WEATHER EXPOSURE. STAINLESS STEEL OR HOT-DIPPED GALVANIZED FASTENERS SHALL BE USED TO MATCH THE CONNECTOR TYPE. AT A MINIMUM ALL FASTENERS SHALL BE HOT-DIPPED GALVANIZED MEETING ASTM A153. WHEN FASTENERS ARE USED AT PERMANENTLY EXPOSED EXTERIOR AREAS, FASTENERS SHALL BE STAINLESS STEEL. FOR HOMES LOCATED WITHIN 1 MILE OF THE OCEAN, FASTENERS SHALL BE HOT-TIPPED GALVANIZED G185 OR BE IN ACCORDANCE WITH FEMA TECHNICAL BULLETIN 8.

4.08 ALL METAL HARDWARE AND FRAMING ACCESSORIES SHALL BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, MITEK USP, OR APPROVED EQUAL. ALL ITEMS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION REQUIREMENTS. ALL CONNECTORS SHALL BE MINIMUM HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A653, ASTM A123, OR HIGHER STANDARDS. STAINLESS STEEL CONNECTORS MAY ALSO BE USED IN LIEU OF HOT-DIP GALVANIZED CONNECTORS. ALL NAIL/BOLT HOLES SHALL BE FILLED WITH THE RECOMMENDED FASTENER UNLESS NOTED OTHERWISE.

4.09 ALL WALLS SHALL HAVE DOUBLE TOP PLATES AND SHALL BE SPLICED PER THE TYPICAL TOP PLATE SPLICE DETAIL ON S-014, UNLESS NOTED OTHERWISE. TOP PLATES AT WALL INTERSECTIONS SHALL BE LAPPED AND NAILED WITH (3) 16d NAILS.

4.10 WHERE ROOF MEMBERS OR ROOF TRUSSES ARE CONNECTED TO EXTERIOR WALLS OR WALLS W/ PLYWOOD SHEATHING, THE SPECIFIED HURRICANE CLIP SHALL BE PLACED ON THE SIDE OF THE WALL WITH SHEATHING.

4.11 HOLES FOR BOLTS SHALL BE DRILLED WITH A BIT OF THE SAME NOMINAL DIAMETER AS THE BOLT + 1/16". LEAD HOLES FOR LAG SCREWS SHALL BE DRILLED PER NDS.

4.12 ALL BOLTS, CARRIAGE BOLTS, LAG SCREWS, EXPANSION BOLTS, AND EPOXY BOLTS SHALL BE INSTALLED WITH STANDARD CUT WASHERS AND NUTS THAT BEAR DIRECTLY ON THE WOOD. ALL NUTS SHALL BE TIGHTENED AT THE TIME OF INSTALLATION AND RE-TIGHTENED IF NECESSARY, DUE TO WOOD SHRINKAGE, PRIOR TO CLOSE-IN OR AT THE COMPLETION OF THE PROJECT. BOLTS AND LAG SCREWS SHALL CONFORM TO ANSI/ASME STANDARD B18.2.1. WOOD SCREWS SHALL CONFORM TO B18.6.1. ALL BOLTS SHALL CONFORM TO ASTM A307 GRADE A UNLESS NOTED OTHERWISE. ALL SHALL BE GALVANIZED.

THE MINIMUM STRENGTHS FOR LAG SCREWS AND WOOD SCREWS SHALL BE AS FOLLOWS:

WOOD SCREW DIAMETER-INCHES	MIN. BENDING YIELD STRENGTH (PSI)
0.138 (#6)	100,000
0.151 (#7)	90,000
0.164 (#8)	90,000
0.177 (#9)	90,000
0.190 (#10)	80,000
0.216 (#12)	80,000
0.246 (#14)	70,000

WOOD SCREW DIAMETER-INCHES	MIN. BENDING YIELD STRENGTH (PSI)
1/4"	70,000
5/16"	60,000
3/8" AND GREATER	45,000

4.13 WOOD STUDS IN EXTERIOR WALLS AND BEARING PARTITIONS MAY BE CUT OR NOTCHED TO A DEPTH NOT EXCEEDING ¼ OF ITS WIDTH, PROVIDED NOT MORE THAN TWO SUCCESSIVE STUDS ARE NOTCHED OR CUT. BUNDLED STUDS UNDER POINTS OF CONCENTRATED LOADS SHALL NOT BE CUT OR NOTCHED. CUTTING AND NOTCHING OF STUDS TO A DEPTH NOT GREATER THAN 40% OF THE WIDTH OF THE STUD IS PERMITTED IN NON-BEARING PARTITIONS SUPPORTING NO LOADS OTHER THAN THE WEIGHT OF THE PARTITION.

4.14 A HOLE MAY BE BORED IN A WOOD STUD UP TO A DIAMETER OF 33% OF THE STUD WIDTH. BORED HOLES NOT GREATER THAN 60% OF THE WIDTH OF THE STUD ARE PERMITTED IN NON-BEARING PARTITIONS OR IN ANY WALL WHERE EACH BORED STUD IS DOUBLED, PROVIDED NOT MORE THAN TWO SUCCESSIVE DOUBLE STUDS ARE BORED. IN NO CASE, SHALL THE EDGE OF THE BORED HOLE BE NEARER THAN 5/8" TO THE EDGE OF THE STUD, BORED HOLES SHALL NOT BE LOCATED AT THE SAME SECTION OF THE STUD AS A CUT OR NOTCH.

4.15 END NOTCHES NOT EXCEEDING ¼ THE DEPTH ARE PERMITTED FOR 2X FLOOR JOISTS OR RAFTERS. TAPER CUT FROM THE REDUCED DEPTH OF THE MEMBER TO THE FULL DEPTH AT A MINIMUM SLOPE OF (1) HORIZ./(1) VERT. DO NOT SQUARE CUT AN END NOTCH.

4.16 INTERIOR NOTCHES NOT EXCEEDING 1/6 THE DEPTH OF A 2X FLOOR JOIST OR RAFTER SHALL BE PERMITTED ONLY IN THE OUTER THIRD OF ANY SPAN. NOTCHES ARE NOT PERMITTED IN THE MIDDLE THIRD OF ANY SPAN NOR IN ANY LINTEL MEMBERS.

4.17 THE LENGTH OF NOTCHES IN FLOOR JOISTS SHALL NOT EXCEED 1/3 THE JOIST DEPTH.

4.18 HOLES BORED IN FLOOR JOISTS OR RAFTERS SHALL NOT BE WITHIN 2 INCHES OF THE TOP OR BOTTOM AND THE DIAMETER OF ANY SUCH HOLE SHALL NOT EXCEED 1/3 THE DEPTH OF THE MEMBER. HOLES SHALL NOT OCCUR WITHIN 12" OF THE EDGE OF ANY BEARING SUPPORT OR CONNECTION.

4.19 WHEN NAILS ARE USED AT PERMANENTLY EXPOSED EXTERIOR AREAS, NAILS SHALL BE STAINLESS STEEL (TYPE 316). NAILS THAT ARE NOT EXPOSED TO THE ELEMENTS BUT IN CONTACT WITH PRESERVATIVE TREATMENT LUMBER SHALL BE MINIMUM HOT-DIP GALVANIZED MEETING ASTM A153. ALL NAILS FOR STRUCTURAL WORK SHALL BE COMMON WIRE NAILS UNLESS NOTED OR DETAILED OTHERWISE MEETING ASTM F1667. HOLES SHALL BE PRE-DRILLED WHERE NECESSARY TO PREVENT SPLITTING. NAILS SHALL HAVE THE MINIMUM PROPERTIES SPECIFIED IN THE TABLE BELOW:

NAIL TYPE	SHANK DIAMETER-INCHES	MIN. PENETRATION-INCHES	MIN. BENDING YIELD STRENGTH (PSI)
6d	0.113	1.25	100,000
8d box	0.113	1.38	100,000
8d	0.131	1.38	100,000
10d box	0.128	1.50	100,000
10d	0.148	1.50	90,000
12d box	0.128	1.48	100,000
12d	0.148	1.48	90,000
16d box	0.135	1.63	100,000
16d	0.162	1.63	90,000
20d	0.192	1.92	80,000

5.0 WOOD STRUCTURAL PANELS

5.01 STRUCTURAL WOOD PANELS SHALL CONFORM TO THE REQUIREMENTS OF ONE OF THE FOLLOWING STANDARDS AND PUBLICATIONS:

A. U.S. PRODUCT STANDARD PS1-95 FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD.
B. U.S. PRODUCT STANDARD PS2-92 PERFORMANCE STANDARD FOR WOOD BASED STRUCTURAL USE PANELS.
C. APA PRP-108 PERFORMANCE STANDARDS.

5.02 ROOF AND WALL PANELS SHALL BE APA RATED, EXPOSURE 1, OSB WITH A MIN. 48/24 SPAN RATING UNLESS NOTED OTHERWISE ON THE DRAWINGS. SHEATHING SHALL BE EXTERIOR GRADE WHERE EITHER SIDE OF SHEATHING IS PERMANENTLY EXPOSED TO WEATHER. SHEATHING SHALL RUN CONTINUOUS OVER AT LEAST THREE SPANS.

5.03 ALL ROOF SHEATHING SHALL BE INSTALLED WITH THE FACE GRAIN PERPENDICULAR TO THE SUPPORTS. ROOF SHEATHING SHALL BE NAILED AND GLUED TO WOOD FRAMING IN ACCORDANCE WITH THE PUERTO RICO CODE AND AMERICAN PLYWOOD ASSOCIATION (APA) SPECIFICATION AFG-01, ADHESIVES FOR FIELD GLUING PLYWOOD TO WOOD FRAMING.

5.04 ALL SHEATHING PANELS SHALL BE INSTALLED WITH END JOINTS STAGGERED UNLESS NOTED OTHERWISE.

5.05 STAINLESS STEEL (TYPE 316) NAILS SHALL BE USED AT PERMANENTLY EXPOSED EXTERIOR AREAS. ALL NAILS THAT ARE NOT EXPOSED TO THE ELEMENTS BUT IN CONTACT WITH PRESERVATIVE TREATMENT LUMBER SHALL BE MINMUM HOT-DIPPED GALVANIZED MEETING ASTM A153.

5.06 3x BLOCKING SHALL BE PROVIDED AT PLYWOOD SHEATHED INTERIOR AND EXTERIOR WALLS. BLOCKING SHALL BE INSTALLED AT ALL WALL AND ROOF PANEL EDGES PERPENDICULAR TO FRAMING MEMBERS AND AS SHOWN ON PLAN.

6.0 PRE-FABRICATED WOOD TRUSSES

6.01 DESIGN STANDARDS:

TRUSS PLATE INSTITUTE. "NATIONAL DESIGN STANDARD FOR METAL-PLATE CONNECTED WOOD TRUSS CONSTRUCTION" (ANSI/TPI 1-2014)

6.02 MINIMUM DESIGN LOADS:
ROOF TRUSSES

TOP CHORD	LIVE LOAD:	20 PSF
	SUPERIMPOSED DEAD LOAD:	5 PSF
BOTTOM CHORD	LIVE LOAD:	20 PSF
	SUPERIMPOSED DEAD LOAD:	5 PSF
DEFLECTION:	LIVE LOAD:	L/240 MAX.
	TOTAL LOAD:	L/180 MAX.

WOOD TRUSSES SHALL BE DESIGNED TO RESIST DOWNWARD AND UPLIFT WIND PRESSURE NORMAL TO THE TOP CHORD. SEE DESIGN DATA DRAWING FOR WIND LOAD CRITERIA. ROOF TRUSS AT GABLE END TO BE DESIGNED FOR LATERAL WIND PRESSURE. SEE PLANS FOR GABLE END BRACING DETAILS.

6.03 FABRICATION AND PLACEMENT REQUIREMENTS:
ALL CONNECTIONS BETWEEN TRUSSES AND/OR TRUSSES AND CONVENTIONAL FRAMING SHALL BE DESIGNED AND DETAILED BY THE TRUSS FABRICATOR. TRUSSES SHALL BE ASSEMBLED, HANDLED, STORED, AND ERECTED IN ACCORDANCE WITH STANDARDS OF THE TRUSS PLATE INSTITUTE. BOTTOM CHORD BRACING AND BRIDGING SHALL BE LOCATED AND DESIGNED BY THE TRUSS FABRICATOR AND INSTALLED BY THE TRUSS ERECTOR IN CONFORMANCE WITH THE "BUILDING COMPONENT SAFETY INFORMATION, BCSI 2013 GUIDELINE" PUBLISHED BY THE TRUSS PLATE INSTITUTE.

6.04 SHOP DRAWINGS:
SHOP DRAWINGS SEALED BY AN ENGINEER REGISTERED IN PUERTO RICO SHALL BE SUBMITTED FOR REVIEW, DESCRIBING ALL DIMENSIONS, SIZES AND GRADE OF LUMBER, DESIGN LOADS, FORCES, REACTIONS, AND CONNECTIONS FOR ALL MEMBERS OF EACH TRUSS AND TRUSS CONNECTIONS.

6.05 THE TRUSS MANUFACTURER SHALL DESIGN THE TRUSSES AND GIRDER TRUSSES FOR THE LOADS INDICATED ON THE STRUCTURAL DRAWINGS. SPECIAL LOAD CONSIDERATIONS, SUCH AS OVERFRAMING, ETC. SHALL BE ACCOUNTED FOR IN THE DESIGN.

6.06 THE TRUSS MANUFACTURER SHALL ACCEPT FULL RESPONSIBILITY FOR THE DESIGN. THE TRUSS ENGINEER SHALL PREPARE DESIGN CALCULATIONS AND DRAWINGS, WHICH SHALL BE SEALED, SIGNED, AND DATED BY THE RESPONSIBLE PROFESSIONAL ENGINEER REGISTERED IN PUERTO RICO.

6.07 THE DESIGN SHALL INCLUDE INTERNAL CONNECTIONS AND CONNECTIONS BETWEEN TRUSSES. CONNECTIONS TO OTHER STRUCTURAL MEMBERS AND ARCHITECTURAL SYSTEMS SHALL BE INCLUDED. TYPICAL DETAILS OF CONNECTIONS SHALL BE SHOWN.

6.08 THE MEMBER SIZE AND PROPERTIES FOR EACH MEMBER USED SHALL BE SHOWN, CLEARLY INDICATING WHERE EACH MEMBER IS BEING USED.

6.09 PARTICULAR ATTENTION SHALL BE GIVEN TO HEEL HEIGHTS AND TOP CHORD SLOPES TO ENSURE THAT THE FASCIA DETAILS ARE CONSISTENT, ALIGNED, AND IN ACCORDANCE WITH THE ARCHITECTURAL DRAWINGS.

6.10 THE MAXIMUM SPACING OF THE TRUSSES SHALL BE 24 INCHES FOR ROOF TRUSSES. THE SELECTED SPACING MUST BE COORDINATED WITH THE TRUSS ENGINEER, THE MECHANICAL ENGINEER, THE FABRICATOR, THE DECKING, HVAC AND ELECTRICAL SUBCONTRACTORS, ERECTORS, DRYWALLER, AND ANY OTHER RELATED SUBCONTRACTORS. THE SPACING SHALL BE DENOTED IN SHOP DRAWINGS FOR EACH TRADE.

6.11 A SAMPLE SUBMITTAL OF THE TYPICAL TRUSS AND TRUSS GIRDER TYPES SHALL BE SUBMITTED FOR PRELIMINARY REVIEW PRIOR TO COMPLETION OF DESIGN CALCULATIONS AND DRAWINGS.

6.12 COMPLETE ERECTION PLANS AND DETAILS SHALL BE SUBMITTED TO EACH TRADE FOR REVIEW.

6.13 THE TRUSS ENGINEER SHALL BE RESPONSIBLE FOR ANY FIELD COORDINATION ISSUES WHICH MAY ARISE REGARDING THE TRUSSES, OPENINGS IN TRUSSES, AND CONNECTIONS OF TRUSSES.

6.14 TRUSS ENGINEER SHALL VERIFY THAT DETAILS OF CONNECTIONS SHOWN ARE APPROPRIATE FOR THE TRUSS DESIGN. IF NOT, THE PROPOSED REVISIONS TO DETAILS SHALL BE SUBMITTED.

6.15 SHIM PLATES SHALL BE INSTALLED AS REQUIRED TO PROVIDE A POSITIVE BEARING SURFACE BETWEEN THE TRUSSES AND WALLS. EACH TRUSS SHALL BEAR ON EACH WALL WITH WHICH IT INTERSECTS AS SHOWN ON THE PLAN AND IN THE LOADING DIAGRAMS. UNLESS SPECIFICALLY NOTED, THERE SHALL NOT BE ANY SPACE BETWEEN THE TRUSSES AND THE STRUCTURAL WALLS.

6.16 LOADS SHOWN ABOVE ARE SUPERIMPOSED LOADS AND DO NOT INCLUDE THE TRUSS SELF-WEIGHT. TRUSS MANUFACTURER SHALL CONSIDER THE TRUSS SELF-WEIGHT IN THE TRUSS DESIGN.

6.17 TRUSS TOP CHORD SHALL BE A MINIMUM 3x MEMBER.

ALL CONSTRUCTION MUST COMPLY WITH THE PUERTO RICO BUILDING CODE. YOU ARE REQUIRED TO OBTAIN THE NECESSARY BUILDING PERMITS FROM THE DEPARTMENT OF PLANNING AND RESOURCES. SIGNED AND SEALED DRAWINGS FOR PERMIT MUST BE SUBMITTED TO THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE.

STRUCTURES LOCATED IN SPECIAL FLOOD HAZARD AREAS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL AND CERTIFIED TO COMPY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

GENERAL NOTES

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: **S-002A**
Checked By:	
QC Review:	
Phase:	

7.0 MASONRY

7.01 CONCRETE MASONRY DESIGN AND CONSTRUCTION SHALL CONFORM TO TMS 402/602-16 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

7.02 PROVIDE NORMAL WEIGHT, HOLLOW, LOAD-BEARING CONCRETE MASONRY UNITS (CMU) CONFORMING TO ASTM C90, GRADE N, TYPE II.

7.03 PROVIDE MASONRY CONSTRUCTION WITH MINIMUM COMPRESSIVE STRENGTH, f'm = 1,900 PSI.

7.04 PROVIDE TYPE "S" MORTAR IN ACCORDANCE WITH ASTM C270.

7.05 VERTICAL REINFORCING SHALL BE HELD IN POSITION WITH BAR POSITIONERS AT TOP OF THE GROUT POUR AT SPACINGS AS SHOWN ON THE PLANS.

7.06 PROVIDE HORIZONTAL JOINT REINFORCEMENT COMPLYING WITH ASTM A82, NO. 9 GAUGE OR HEAVIER, LADDER TYPE, ZINC COATED, PLACED 16" ON CENTER, UNLESS NOTED OTHERWISE. LADDER RUNGS SHALL BE POSITIONED TO COMPLETELY CLEAR CELL OPENINGS. LAP JOINT REINF. 1 FULL CROSS WIRE SPACING PLUS 2" (18" MIN FOR CROSS WIRE SPACING OF 16" ON CENTER), BUT NOT LESS THAN 12".

7.07 PROVIDE RUNNING BONDS WITH VERTICAL JOINTS LOCATED AT CENTER OF MASONRY UNITS IN THE ALTERNATE COURSE BELOW.

7.08 PROVIDE FOUNDATION DOWELS WITH HOOKS SIZED AND SPACED TO MATCH CMU VERTICAL REINFORCING. DOWELS SHALL LAP WALL VERTICALS SEE FASTENING SCHEDULES FOR MASONRY LAP SPLICE REQUIREMENTS.

7.09 REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, UNLESS NOTED OTHERWISE.

7.10 PROVIDE FINE GROUT FOR REINFORCED MASONRY IN ACCORDANCE WITH ASTM C476 WITH MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2,000 PSI. GROUT SHALL BE OF FLUID CONSISTENCY, WHICH MEANS AS FLUID AS POSSIBLE FOR POURING WITHOUT SEGREGATION OF THE CONSTITUENT PARTS. GROUT SLUMP SHALL BE 8 TO 10 INCHES. WATER CEMENT RATIO SHALL BE REDUCED AND WATER REDUCERS USED AS REQUIRED TO MAINTAIN SLUMP WHEN PLACED IN LOW ABSORPTION CMU. FILL ALL CELLS BELOW GRADE WITH GROUT. ALL GROUT SHALL BE CONSOLIDATED AT THE TIME OF POURING BY VIBRATING AND THEN RECONSOLIDATED AGAIN BY PUDDLING LATER, BEFORE PLASTICITY IS LOST. TYPICALLY WITHIN 10 TO 15 MINUTES. WHEN GROUTING S STOPPED FOR ONE HOUR OR LONGER, CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE POUR OF GROUT 1 1/2" BELOW THE TOP OF THE UPPERMOST UNIT.

7.11 ALL VERTICAL REINFORCING SHALL HAVE A STANDARD HOOK WHEN TERMINATING INTO A BOND BEAM.

7.12 ALL VERTICAL REINFORCING SHALL BE LOCATED IN GROUTED CELLS.

8.0 MISCELLANEOUS

8.01 SUBSTITUTION OF EXPANSION ANCHORS FOR ADHESIVE ANCHORS OR EMBEDDED ANCHORS SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER OF RECORD IN ADVANCE.

8.02 THE CONTRACTOR SHALL PROVIDE THE FOLLOWING SERVICES AS PART OF THE CONSTRUCTION SCOPE OF WORK:
- A. VERIFICATION OF ALL DIMENSIONS, ELEVATIONS, OPENING SIZES, MECHANICAL EQUIPMENT WEIGHTS PRIOR TO STARTING WORK.
- B. REMOVE ALL ABANDONED FOUNDATIONS, UTILITIES, PIPELINES, ETC. THAT INTERFERE WITH NEW CONSTRUCTION.
- C. REVIEW AND APPROVE ALL SHOP DRAWINGS PRIOR TO SUBMITTAL, NOTING CHANGES MADE WHICH DO NOT COMPLY WITH DESIGN DRAWINGS.
- D. PROVIDE TEMPORARY BRACING AND SHORING TO PREVENT EXCESSIVE DEFLECTIONS AND DAMAGE DURING CONSTRUCTION. DESIGN OF TEMPORARY BRACING AND SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- E. SUPPORT OF CEILING SYSTEMS, FOLDING PARTITIONS, TOILET PARTITIONS, COUNTERS, MISCELLANEOUS EQUIPMENT, AND WINDOW SYSTEMS AS DEFINED IN THE ARCHITECTURAL PLANS.

9.0 SPECIAL INSPECTIONS

9.01 PER THE REQUIREMENTS OF CHAPTER 17, SECTION 1704.1 OF THE REFERENCED BUILDING CODE, SPECIAL INSPECTION IS REQUIRED FOR THE PROPOSED BUILDING CONSTRUCTION. SPECIAL INSPECTION INVOLVES THE VERIFICATION OF COMPLIANCE OF MATERIALS, INSTALLATION, FABRICATION, ERECTION AND OR PLACEMENT OF COMPONENTS WITH THE OFFICIAL SET OF CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. SPECIAL INSPECTION IS PART OF THE PERMIT APPLICATION PROCESS FUNDED BY THE OWNER OR OWNER'S AGENT.

9.02 A STATEMENT OF SPECIAL INSPECTION LISTING THE REQUIREMENTS ALONG WITH A SCHEDULE OF TESTING, SUBMITTAL REVIEWS, AND FIELD OBSERVATION REQUIREMENTS HAS BEEN PREPARED AND DISPLAYED ON THIS DRAWING SET. THIS STATEMENT INCLUDES A COMPLETE LIST OF MATERIAL AND ACTIVITY REQUIRING INSPECITON. IT IS THE RESPONSIBILITY OF ALL PARTIES TO BECOME FAMILIAR WITH THIS REQUIREMENT AND UNDERSTAND THE GUIDELINES AND REQUIREMENTS OF EACH PARTY INVOLVED WITH THE CONSTRUCTION. THE SPECIAL INSPECTOR COORDINATOR SHALL COORDINATE WITH THE OWNER, CONTRACTOR, AND THE DESIGN PROFESSIONALS AND SCHEDULE THE INSPECTIONS ACCORDINGLY.

10.0 SAFE ROOM

10.01 SAFE ROOM WALLS TO BE FULLY CONSTRUCTED AND INSPECTED PRIOR TO COMMENCING CONSTRUCTION ON EXTERIOR WALLS.

10.02 EXTERIOR AND INTERIOR SIDES OF SAFE ROOM WALLS MUST HAVE TOOLED JOINTS.

10.03 MECHANICAL AND ELECTRICAL PENETRATIONS SHOULD BE KEPT TO A MINIMUM. ANY OPENINGS LARGER THAN 3 1/2" SQUARE OR 2" IN DIAMETER SHALL BE PROTECTED BY BAFFLES, COWLINGS, OR OTHER MEANS. THESE COVERINGS SHOULD MEET PRESSURE TESTING AND IMPACT CRITERIA AS SPECIFICED IN THESE PLANS.

10.04 THE SELECTED SAFE ROOM DOOR SHALL MEET THE DESIGN CRITERIA OF 2015 FEMA P-361 AND 2014 ICC-500. DOOR SHALL BE A TESTED ASSEMBLY AND IN INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

10.05 IF AN IMPACT RESISTANT GLAZING IS SELECTED FOR THE SAFE ROOM WINDOW(S) THE SELECTED WINDOW(S) SHALL MEET THE DESIGN CRITERIA OF 2015 FEMA P-361 AND 2014 ICC-500. WINDOW SHALL BE A TESTED ASSEMBLY AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

10.06 IF A WINDOW PROTECTION ASSEMBLY IS SELECTED FOR THE SAFE ROOM, IT SHALL MEET THE DESIGN CRITERIA OF 2015 FEMA P-361 AND 2014 ICC-500. WINDOW PROTECTION ASSEMBLY SHALL BE A TESTED ASSEMBLY AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

COMMON ABBREVIATIONS

ARCH.	ARCHITECT	IN.	INCHES
B/	BOTTOM OF	INFO.	INFORMATION
BRG.	BEARING	INT.	INTERIOR
BOTT.	BOTTOM	JNT.	JOINT
C/C	CENTER-TO-CENTER	K	KIPS
CIP.	CAST IN PLACE	KSI	KIPS PER SQUARE INCH
C.J.	CONTROL JOINT	LAT.	LATERAL
CLR.	CLEAR	LBS.	POUNDS
COL.	COLUMN	LLH	LONG LEG HORIZONTAL
CONC.	CONCRETE	LLV	LONG LEG VERTICAL
CONN.	CONNECTION	L.W.	LONG WAYS
CONT.	CONTINUOUS	MANUF.	MANUFACTURER
COORD.	COORDINATE	MAX.	MAXIMUM
CMU	CONCRETE MASONRY UNIT	MECH.	MECHANICAL
DIM.	DIMENSION	MIN.	MINIMUM
DTL.	DETAIL	N.T.S.	NOT TO SCALE
DIA.	DIAMETER	NO.	NUMBER (BAR)
DIST.	DISTANCE	O.C.	ON CENTER
DWGS.	DRAWINGS	OPNG.	OPENING
EA.	EACH	PL.	PLATE
EL.	ELEVATION	PREFAB.	PREFABRICATED
E.F.	EACH FACE	PROJ.	PROJECTION
EMBED.	EMBEDMENT	PSF	POUNDS PER SQUARE FOOT
ENG.	ENGINEER	PSI	POUNDS PER SQUARE INCH
E.O.R.	ENGINEER OF RECORD	P.T.	PRESSURE TREATED
EQ.	EQUAL	QTY	QUANTITY
E.S.	EACH SIDE	REF.	REFERENCE
E.W.	EACH WAY	REINF.	REINFORCED OR REINFORCING
EXP.	EXPANSION	SCH.	SCHEDULE
EXT.	EXTERIOR	S.F.	STEPPED FOOTING
FABR.	FABRICATOR	SPA.	SPACING
F.F.	FINISHED FLOOR	SIM.	SIMILAR
FFE	FINISHED FLOOR ELEVATION	SQU.	SQUARE
FT.	FEET	SQ. FT.	SQUARE FEET
FDN.	FOUNDATION	STL.	STEEL
GA.	GAUGE	STRUC.	STRUCTURAL
GALV.	GALVANIZED	S.W.	SHORT WAYS
HGT.	HEIGHT	SYP	SOUTHERN YELLOW PINE
HKD.	HOOKED	T/	TOP OF
HORIZ.	HORIZONTAL	TDD.	TRUSS DESIGN DRAWINGS
HR.	HOUR	TYP.	TYPICAL
H.S.	HEADED STUD	U.N.O.	UNLESS NOTED OTHERWISE
		VERT.	VERTICAL
		VCJ	VERTICAL CONTROL JOINT
		VMCJ	VERTICAL MASONRY CONTROL JOINT
		W/	WITH
		W/0	WITHOUT
		WWF	WELDED WIRE FABRIC

DESIGN CRITERIA FOR PRIMARY STRUCTURE AND MODULES

DESIGN CRITERIA – CODES AND SPECIFICATIONS

1. 2018 PUERTO RICO BUILDING CODE.
2. ACI 318-14-BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
3. ACI 301-10–SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
4. ASCE/SEI 7-16–MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
6. TMS 402/602-16 BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES.
7. NDS 2018-NATIONAL DESIGN ASSOCIATION SPECIFICATION FOR WOOD CONSTRUCTION.
8. ANSI/TP1 1-2014-NATIONAL DESIGN STANDARD FOR METAL-PLATE CONNECTED WOOD TRUSS CONSTRUCTION.

DESIGN LOADS

DEAD LOAD

THE WEIGHT OF ALL PERMANENT CONSTRUCTION INCLUDING BUT NOT LIMITED TO: WALLS, FLOORS, CEILINGS, ROOF CLADDING.

ROOF. . . . . SELF WEIGHT

LIVE LOAD

ROOF. . . . . 20 PSF
FIRST FLOOR . . . . . 40 PSF

WIND LOAD

BASIC WIND SPEED (ULTIMATE). . . . . 190 MPH IF EXPOSURE D
BASIC WIND SPEED (NOMINAL). . . . . 147 MPH IF EXPSOURE D
BASIC WIND SPEED (ULTIMATE) . . . . . 210 MPH IF EXPOSURE C
BASIC WIND SPEED (NOMINAL). . . . . 163 MPH IF EXPSOURE C
BASIC WIND SPEED (ULTIMATE). . . . . 255 MPH IF EXPOSURE B
BASIC WIND SPEED (NOMINAL). . . . . 194 MPH IF EXPSOURE B
ULTIMATE BASIC DESIGN WIND SPEEDS CORRESPOND TO PUERTO RICO SPECIAL WIND HAZARD MAP ADOPTED IN THE 2018 PUERTO RICO BUILDING CODE

RISK CATEGORY. II

ENCLOSURE CLASSIFICATION. . . . . PARTIALLY OPEN
INTERNAL PRESSURE COEFFICIENTS. . . . . +/- 0.18

SEISMIC LOAD

SEISMIC IMPORTANCE FACTOR. 1.0
Ss 1.35
S1. . . . . 0.53
SITE CLASS. . . . . D (STIFF SOIL)
Sds 0.90
Sd1. . . . . 0.36
SEISMIC DESIGN CATEGORY. . . . . D

SEISMIC FORCE RESISTING SYSTEM

BEARING WALL SYSTEM (PRIMARY STRUCTURE 1ST STORY):
LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
ANALYSIS METHOD . . . . . EQUIVALENT LATERAL FORCE
R 6.5
Cs 0.14
DESIGN BASE SHEAR . . . . . 4.72 KIPS
OVERSTRENGTH FACTOR 3

BEARING WALL SYSTEM (MODULE STRUCTURES):
LIGHT-FRAME (WOOD) WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
ANALYSIS METHOD . . . . . EQUIVALENT LATERAL FORCE
R 6.5
Cs 0.14
DESIGN BASE SHEAR . . . . . 2.3 KIPS
OVERSTRENGTH FACTOR 3

DESIGN CRITERIA FOR SAFE ROOM

DESIGN CRITERIA – SAFE ROOM

1. 2018 INTERNATIONAL RESIDENTIAL CODE
2. 2018 INTERNATIONAL BUILDING CODE
3. FEMA P-361 THIRD EDITION
4. ICC 500-2014

DESIGN LOADS

DEAD LOAD

THE WEIGHT OF ALL PERMANENT CONSTRUCTION INCLUDING BUT NOT LIMITED TO: WALLS, FLOORS, CEILINGS, ROOF CLADDING.

ROOF. . . . . SELF WEIGHT
COLLATERAL LOAD. . . . . 5 PSF

LIVE LOAD

ROOF. . . . . 150 PSF

WIND LOAD

BASIC WIND SPEED (ULTIMATE). . . . . 250 MPH
BASIC WIND SPEED (NOMINAL). . . . . 194 MPH
RISK CATEGORY. II
EXPOSURE CATEGORY. . . . . D
ENCLOSURE CLASSIFICATION. . . . . PARTIALLY ENCLOSED
INTERNAL PRESSURE COEFFICIENTS. . . . . +/- 0.55

SEISMIC LOAD

SEISMIC IMPORTANCE FACTOR. 1.0
Ss 1.35
S1. . . . . 0.53
SITE CLASS. . . . . D (STIFF SOIL)
Sds 0.9
Sd1. . . . . 0.36
SEISMIC DESIGN CATEGORY. . . . . D

SEISMIC FORCE RESISTING SYSTEM

BEARING WALL SYSTEM:
SPECIAL REINFORCED MASONRY SHEAR WALL
R 5
Cs 0.181
DESIGN BASE SHEAR . . . . . 9.48 KIPS
OVERSTRENGTH FACTOR 2 1/2

FLOOD CRITERIA

A. THE SAFE ROOM SHALL BE LOCATED OUTSIDE OF THE FOLLOWING HIGH-RISK FLOOD HAZARD AREAS:

1. FLOOD HAZARD AREAS SUBJECT TO HIGH VELOCITY WAVE ACTION (V ZONES) AND COASTAL A ZONES.
2. FLOODWAYS
3. ANY AREAS SUBJECT TO STORM SURGE INUNDATION ASSOCIATED WITH ANY MODELED HURRICANE CATEGORY, INCLUDING COASTAL WAVE EFFECTS.

B. THE LOWEST FLOOD USED FOR THE OCCUPIED RESIDENTIAL SAFE ROOM SHALL BE ELEVATED TO THE HIGHER OF THE ELEVATIONS DETERMINED BY:

1. THE FLOOD ELEVATION, INCLUDING COASTAL WAVE EFFECTS, HAVING A 0.2 PERCENT ANNUAL CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR; OR
2. THE FLOOD ELEVATION CORRESPONDING TO THE HIGHEST RECORDED FLOOD ELEVATION IF A FLOOD HAZARD STUDY HAS NOT BEEN CONDUCTED FOR THE AREA; OR
3. THE MINIMUM ELEVATION OF THE LOWEST FLOOR REQUIRED BY THE AUTHORITY HAVING JURISDICTION FOR THE LOCATION WHERE THE SAFE ROOM IS INSTALLED.
4. THE FLOOD ELEVATION HAVING A 1 PERCENT ANNUAL CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR.

SAFE ROOM DOOR, WINDOW AND/OR AND WINDOW PROTECTION ASSEMBLY

A. MISSILE IMPACT CRITERIA

1. VERTICAL SURFACES . . . . . 15 POUND 2 x 4 AT 100 MPH
2. HORIZONTAL SURFACES . . . . . 15 POUND 2 x 4 AT 67 MPH

DESIGN CRITERIA – CODES AND SPECIFICATIONS

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7. NDS 2018-NATIONAL DESIGN ASSOCIATION SPECIFICATION FOR WOOD CONSTRUCTION.
8. ANSI/TP1 1-2014-NATIONAL DESIGN STANDARD FOR METAL-PLATE CONNECTED WOOD TRUSS CONSTRUCTION.

STATEMENT OF SPECIAL INSPECTIONS

	SPECIAL INSPECTION TYPE	CONTINUOUS	PERIODIC
1.	*CONCRETE VERIFICATION/INSPECTION*		
a.	Inspect reinforcement and verify placement		X
b.	Inspect anchors cast in concrete		X
c.	Inspect anchors post installed in concrete	X	
d.	Verify use of required design mix		X
e.	Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	X	
f.	Inspect concrete for proper application techniques	X	
g.	Verify in-situ concrete strength prior to removal of forms		X
h.	Inspect formwork for shape, location, and dimensions of the concrete member being formed		X
2.	*SOILS VERIFICATION/INSPECTION*		
a.	Verify materals below shallow foundations are adequate to achieve the design-bearing cpacity.		X
b.	Verify excavations are extended to proper depth and have reached proper material		X
c.	Perform classification and testing of compacted fill materials.		X
d.	Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	
e.	Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.		X
3.	*STRUCTURAL WOOD*		
a.	Verify nailing, bolting, anchoring, and other fastening elements		X
4.	*MASONRY*		
a.	Prior to construction verify proportions of site prepared mortar		X
b.	Prior to construction verify grade, type, and size of reinforcement, anchor bolts, and connectors		X
c.	Prior to grouting verify grout spacing, and locations of anchors, reinforcement, and connectors		X
d.	During construction verify compliance with the approved submittals		X
e.	During construction verify location of structural members including: anchors, reinfrocement, and other connectors		X
f.	Verify preperation of masonry during code or hot weather		X
g.	Observe preperation of grout specimens, mortar specimen, and/or prisms		X

ALL CONSTRUCTION MUST COMPLY WITH THE PUERTO RICO BUILDING CODE. YOU ARE REQUIRED TO OBTAIN THE NECESSARY BUILDING PERMITS FROM THE DEPARTMENT OF PLANNING AND RESOURCES. SIGNED AND SEALED DRAWINGS FOR PERMIT MUST BE SUBMITTED TO THE DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE.

STRUCTURES LOCATED IN SPECIAL FLOOD HAZARD AREAS SHALL BE DESIGNED BY A REGISTERED DESIGN PROFESSIONAL AND CERTIFIED TO COMPY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

GENERAL NOTES

SHEET INFORMATION:

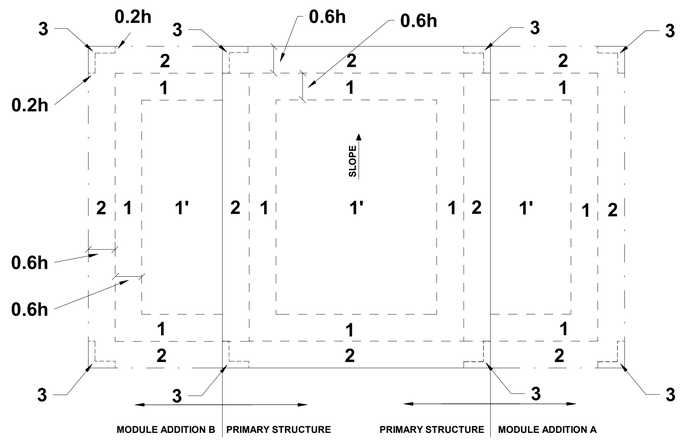
JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number:
Checked By:	**S-002B**
QC Review:	
Phase:	

COMPONENTS AND CLADDING
ULTIMATE DESIGN PRESSURE SCHEDULE

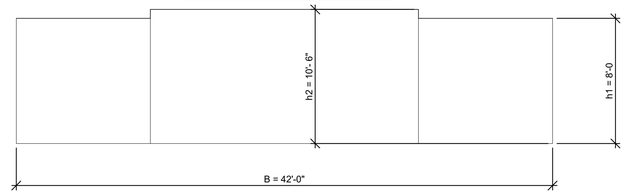
GABLE ROOF, θ ≤ 7° WALLS h ≤ 60 '			EXPOSURE CATEGORY, TOPOGRAPHIC FACTOR EXP. D, Kzt = 1.0	
COMPONENT	ZONE	EFFECTIVE WIND AREA (SF)	SURFACE PRESSURE (PSF) POSITIVE	SURFACE PRESSURE (PSF) NEGATIVE
ROOF ELEMENTS	1	10	38.8	-152.1
		50	33.2	-127.8
		100	30.8	-119.7
	1'	10	38.8	-87.4
		50	33.2	-87.4
		100	30.8	-87.4
	2	10	38.8	-200.7
		50	33.2	-168.3
		100	30.8	-168.3
	3	10	38.8	-273.5
		50	33.2	-247.6
		100	30.8	-213.6
EXTERIOR WALL ELEMENTS	4	10	95.5	-103.6
		50	87.4	-95.5
		100	79.3	-87.4
	5	10	95.5	-127.8
		50	87.4	-110.0
		100	79.3	-103.6

NOTES:

1. DESIGN WIND PRESSURES SHALL BE USED IN THE DESIGN OF ALL COMPONENTS AND CLADDING ELEMENTS COMPRISING THE BUILDING ENVELOPE.
2. REFER TO THE WIND PRESSURE DIAGRAM FOR ZONE LOCATIONS AND EXTENTS.
3. POSITIVE PRESSURES ACT TOWARD COMPONENT SURFACES AND NEGATIVE PRESSURES ACT AWAY FROM COMPONENT SURFACES.
4. LINEAR INTERPOLATION BETWEEN EFFECTIVE WIND AREAS MAY BE USED TO OBTAIN THE REQUIRED COMPONENT AND CLADDING DESIGN PRESSURE.
5. OVERHANG SOFFIT PRESSURE EQUALS ADJACENT WALL PRESSURE.



ROOF PLAN - ONE STORY OPTION



ELEVATION

1 ROOF DIAGRAM-C & C PRESSURES - ONE STORY OPTION

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

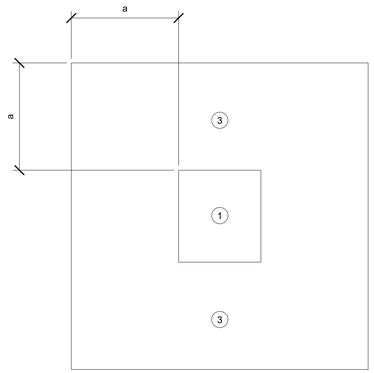
PROFESSIONAL SEALS:

SHEET TITLE:

WIND DIAGRAMS FLAT ROOF

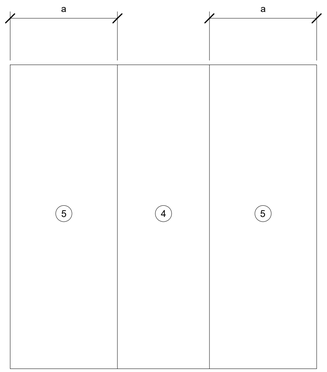
SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-003
Checked By:	
QC Review:	
Phase:	



1 SAFE ROOM C&C DIAGRAM ROOF PLAN

SCALE: 1/2" = 1'-0"



2 SAFE ROOM C&C ELEVATION

SCALE: 1/2" = 1'-0"

ULTIMATE C&C WIND PRESSURE (ASCE 7-16)										
BUILDING	a (FT)	Vult (MPH)	Vasd (MPH)	GCpi	Area (SF)	ZONE 1 (PSF)	ZONE 2 (PSF)	ZONE 3 (PSF)	ZONE 4 (PSF)	ZONE 5 (PSF)
SAFE ROOM	3.0	250	193.6	+/- 0.55	<10	+119.1 -315.3	+119.1 -399.3	+119.1 -525.4	+203.2 -203.2	+203.2 -329.3
					20	+114.9 -297.9	+114.9 -377	+114.9 -480.7	+196.5 -209.1	+196.5 -240.2
					50	+109.3 -274.9	+109.3 -347.4	+109.3 -421.7	+187.6 -200.2	+187.6 -222.5
					100	+105.1 -257.5	+105.1 -325.1	+105.1 -377	+180.9 -193.5	+180.9 -209.1
					500+	+105.1 -217.2	+105.1 -273.2	+105.1 -273.2	+165.3 -177.9	+165.3 -177.9

ULTIMATE C&C WIND PRESSURE PLAN NOTES:

1. PRESSURES INDICATED ARE ULTIMATE COMPONENTS AND CLADDING PRESSURES, CONVERTED FROM NOMINAL PRESSURES USING A 0.6 MULTIPLIER FACTOR.
2. a - INDICATES END ZONE WIDTH IN FT.
3. THIS BUILDING PROTOTYPE IS ASSUMED TO HAVE A Kzt FACTOR OF 1.
4. Vult AND Vasd INDICATE ULTIMATE AND NOMINAL DESIGN WIND SPEED IN MPH RESPECTIVELY.
5. GROSS PRESSURES SHALL BE LINEARLY INTERPOLATED FOR (A) NOT SHOWN IN TABLE.
6. GROSS PRESSURES ARE FOR JOISTS, WINDOWS, DOORS, VENEER, LIGHT GAGE METAL FRAMING, METAL DECK ATTACHMENTS, ROOFING, ROOFING ACCESSORIES AND OTHER BUILDING COMPONENTS AND CLADDING.
7. POSITIVE PRESSURES INDICATE PRESSURES ACTING TOWARD A PROJECTED SURFACE. NEGATIVE PRESSURES INDICATE PRESSURES ACTING AWAY FROM A PROJECTED SURFACE.
8. ROOF ZONES INCLUDING END CONDITIONS ARE DENOTED AS (1) THRU (3)
9. WALL ZONES INCLUDING END CONDITIONS ARE DENOTED AS (4) AND (5)
10. OVERHANG ZONES (2H) AND (3H) APPLY ONLY TO ROOF OVERHANGS WHERE THE COMPONENT OR CLADDING RECEIVES PRESSURE SIMULTANEOUSLY ON BOTH SIDES (UPWARD SUCTION ON TOP AND UPWARD PRESSURE ON BOTTOM, SUCH AS AT OPEN SOFFITS), AND IS CONTINUOUS WITH FIELD OF ROOF.
11. NET DESIGN ROOF PRESSURES SHALL BE CALCULATED USING THE SELFWEIGHT (DEAD LOAD) OF THE MATERIALS. THE MAXIMUM REDUCTION OF GROSS WIND UPLIFT PRESSURES SHALL BE LIMITED TO THE SELF WEIGHT OF THE ROOF SYSTEM PLUS 5 PSF MAXIMUM FOR SUPERIMPOSED DEAD LOADS.

WINDOWS/DOORS PERFORMANCE REQUIREMENTS:

PROVIDE WINDOW, DOOR AND FRAME SYSTEMS AS SHOWN ON THE ARCHITECTURAL DRAWINGS WHICH COMPLY WITH THE DESIGN PRESSURES LISTED HEREIN.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

SAFE ROOM WIND DIAGRAMS

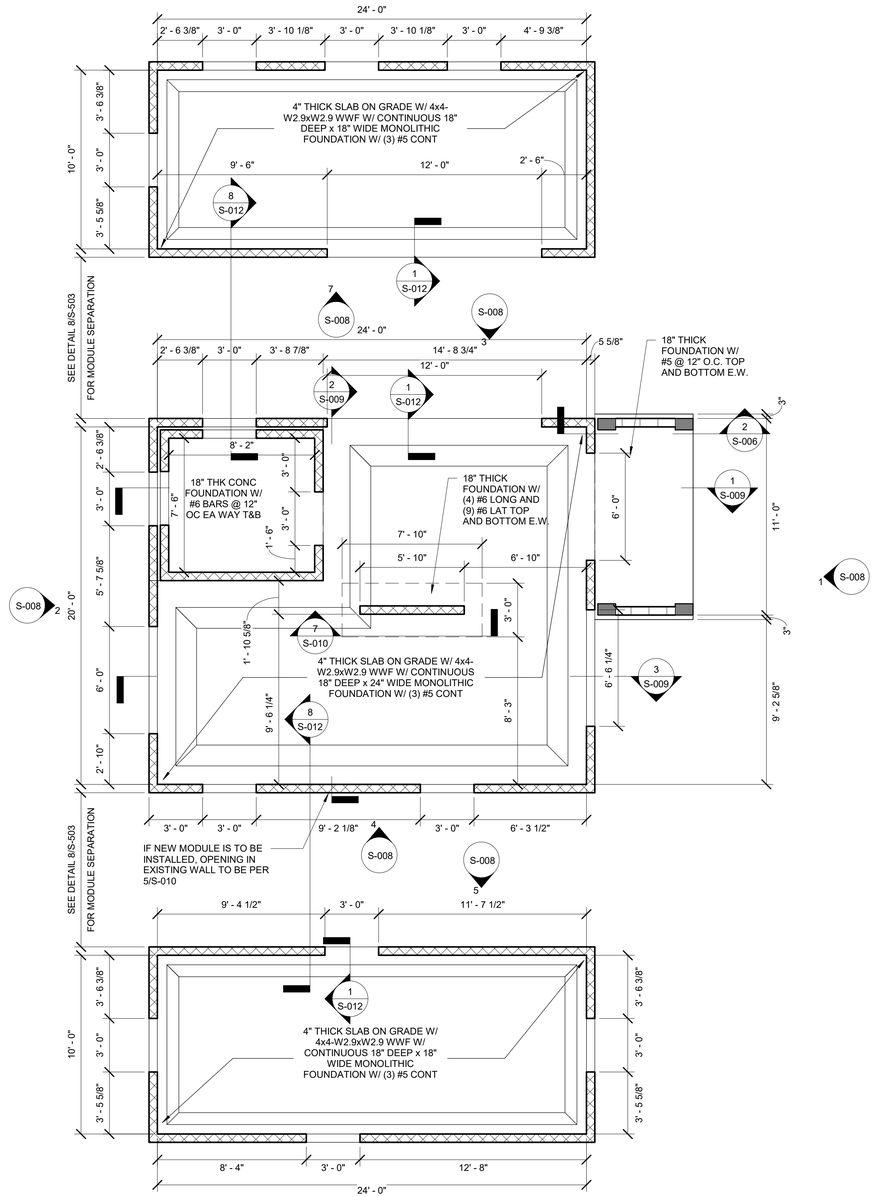
SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-004
Checked By:	
QC Review:	
Phase:	

FUTURE MODULE

MAIN STRUCTURE

FUTURE MODULE



1 FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

FOUNDATION PLAN NOTES

1. REFER TO GENERAL STRUCTURAL NOTES AND PROJECT SPECIFICATIONS FOR DEFINITION OF SYMBOLS, ABBREVIATIONS, AND OTHER INFORMATION AND CRITERIA NOT SHOWN ON PLAN.
2. FOUNDATION SIZES INDICATED ARE BASED ON THE SUBSURFACE RECOMMENDATIONS PROVIDED BY THE GEOTECHNICAL ENGINEER FOR THE PROJECT. REFER TO STRUCTURAL GENERAL NOTES FOR ADDITIONAL INFORMATION.
3. VERIFY DIMENSIONS, ELEVATIONS, DEPRESSIONS, DRAIN LOCATIONS, FINISHES AND LIMITS THEREOF, AND INFORMATION NOT EXPLICITLY INDICATED ON STRUCTURAL DRAWINGS WITH THE DRAWINGS OF OTHER DISCIPLINES PRIOR TO CONSTRUCTION.
4. COLUMN CENTERLINES SHALL COINCIDE WITH FOUNDATION CENTERLINES UNLESS NOTED OTHERWISE ON PLAN, SECTIONS, AND DETAILS.
5. ALL REINFORCING IN FOUNDATION AND SLAB CORNERS, INTERSECTIONS, TEES, AND CHANGES IN DIRECTION SHALL BE CONTINUOUS AND CORNER REINFORCING SHALL BE PROVIDED AND LAPPED.
6. CONCRETE SLAB ON GRADE CONTROL JOINTS SHALL NOT EXCEED A MAXIMUM SPACING OF 10'-0" O.C. EACH WAY. SEE TYPICAL DETAIL FOR ADDITIONAL INFORMATION.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

FOUNDATION PLAN

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
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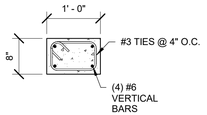
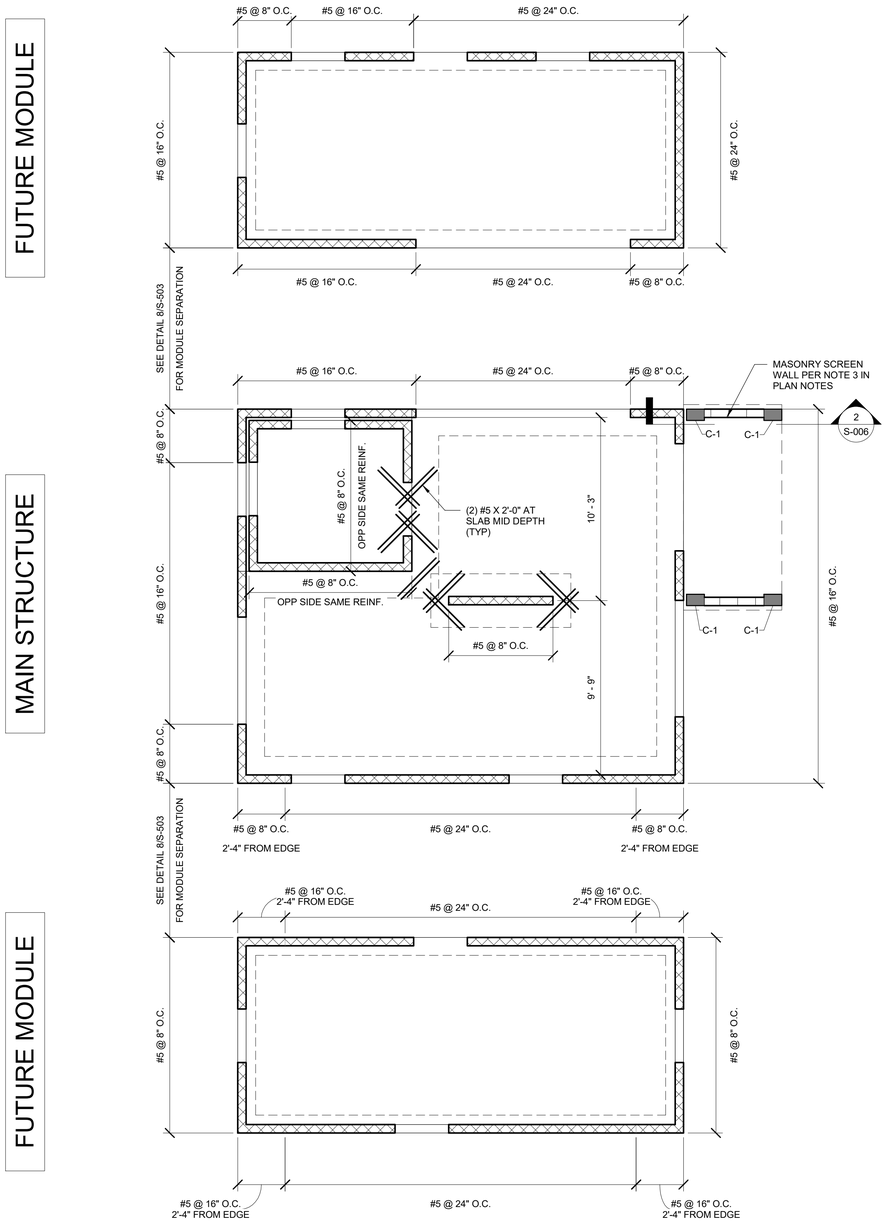
QC Review:	
Phase:	



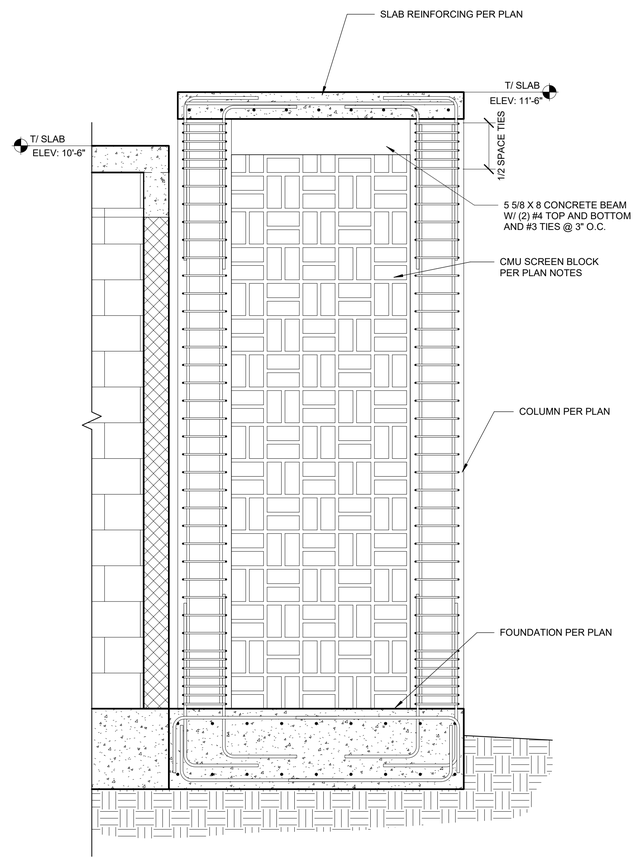
COLUMN C-1

SLAB PLAN NOTES	
1.	ALL MASONRY WALLS TO BE NOMINAL 6" WIDE BLOCK U.N.O.
2.	FOR ADDITIONAL FOUNDATION INFORMATION SEE FOUNDATION PLAN SHEET
3.	SCREEN BLOCK TO HAVE MINIMUM 30% OPEN AREA AND A MINIMUM OF 2000 PSI NET AREA COMPRESSIVE STRENGTH. PROVIDE 9 GA TRUSS TYPE JOINT REINFORCEMENT AT EVERY COURSE AND EXTEND INTO COLUMNS 4" MINIMUM.
4.	ALL MASONRY TO BE FULLY GROUTED



1 SLAB PLAN

SCALE: 1/4" = 1'-0"



2 ENTRY FRAMING

SCALE: 3/4" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

WALL FRAMING PLAN

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-006
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QC Review:	
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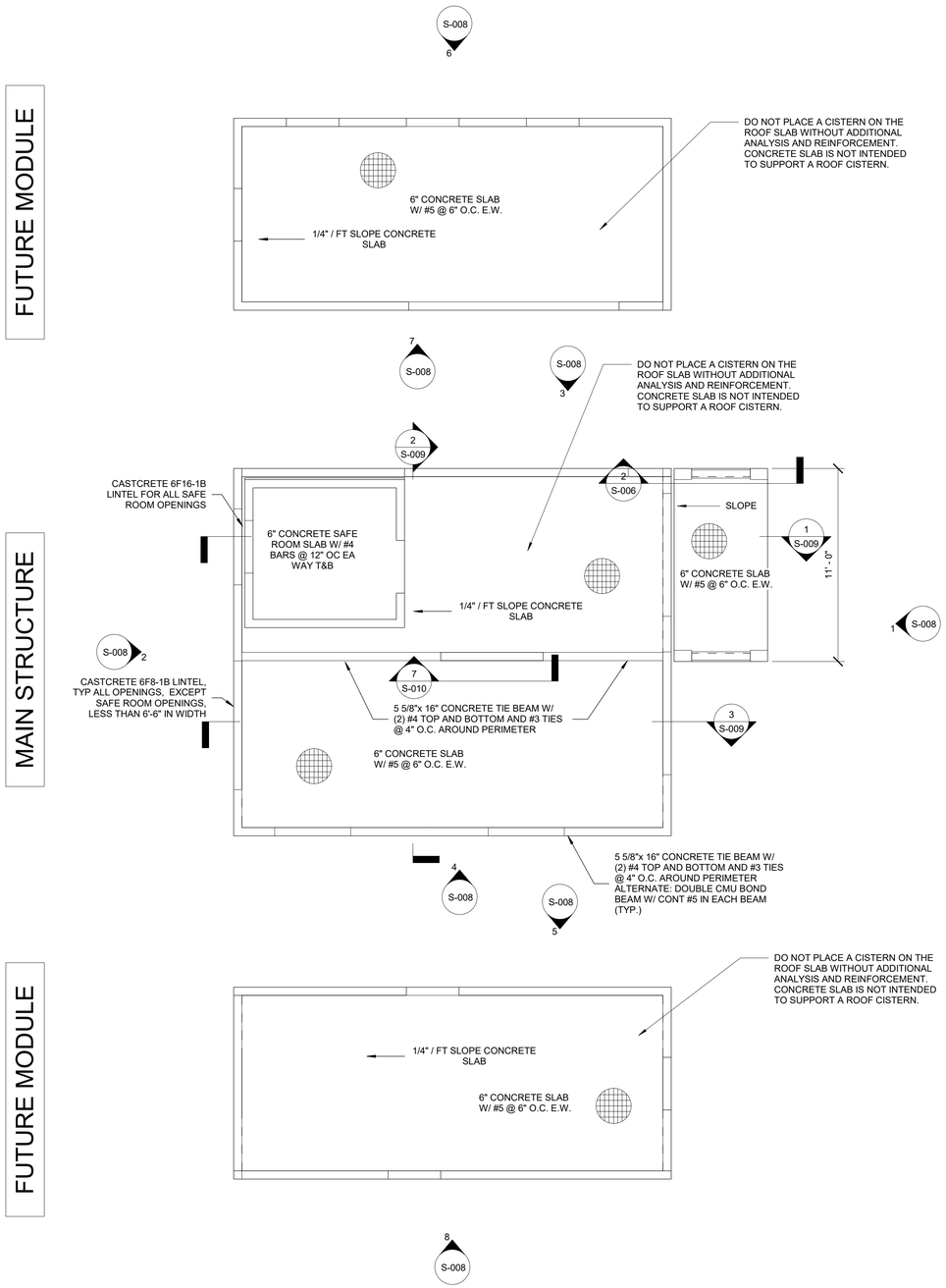

1 CONCRETE ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

ROOF FRAMING PLAN NOTES

1. ROOF CONSTRUCTION "ROOFING" COORDINATE WITH ARCHITECTURAL DRAWINGS.
2. VERIFY ROOF SLOPE WITH ARCHITECTURAL DRAWINGS PRIOR TO FABRICATION AND CONSTRUCTION.
3. ROOF FASTENER DECKING PATTERN, SEE DETAIL.
4. SEE GENERAL NOTES FOR ADDITIONAL BOND BEAMS AT 4'-0".
5. STAGGER MODULE ROOF TRUSSES TO AVOID CONFLICT WITH PRIMARY ROOF TRUSSES

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

FLAT ROOF FRAMING PLAN

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
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Checked By:	**S-007**
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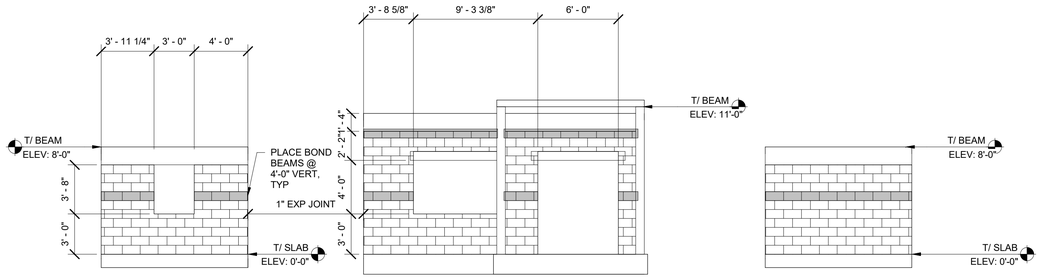
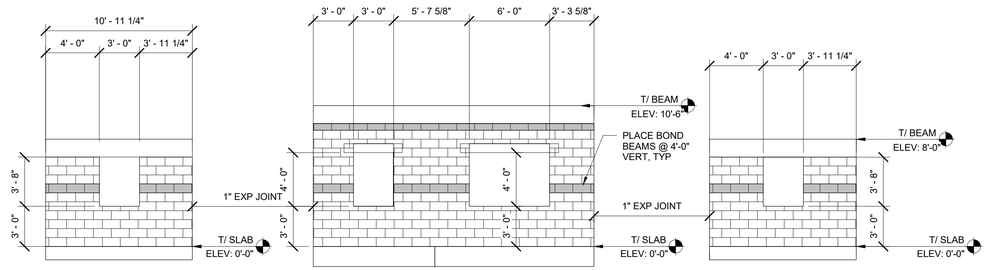


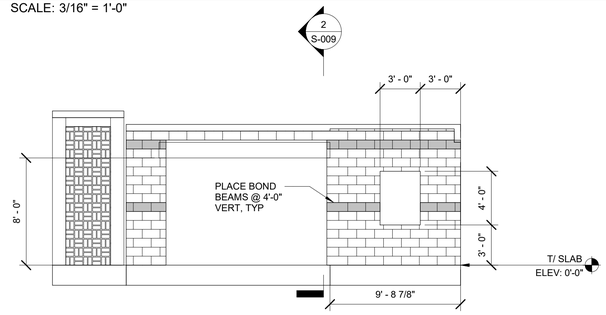
1 FRONT ELEVATION OF STRUCTURE AND FUTURE MODULE 1 & 2

SCALE: 3/16" = 1'-0"



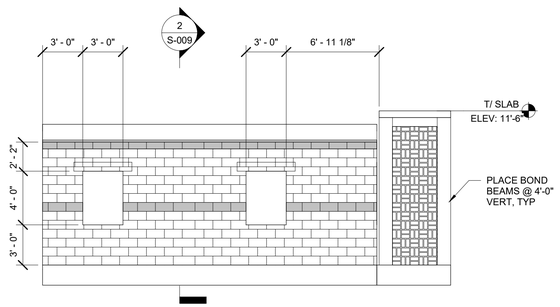
2 REAR STRUCTURE AND FUTURE MODULE 1 & 2 ELEVATIONS

SCALE: 3/16" = 1'-0"



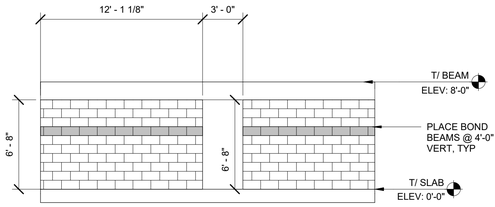
3 RIGHT STRUCTURE ELEVATION

SCALE: 3/16" = 1'-0"



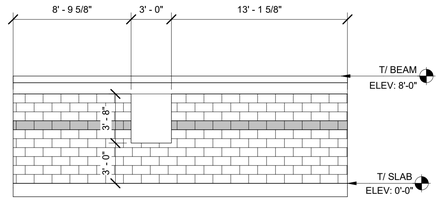
4 LEFT STRUCTURE ELEVATION

SCALE: 3/16" = 1'-0"



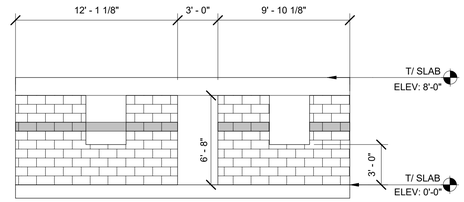
5 FUTURE MODULE 1 RIGHT ELEVATION

SCALE: 3/16" = 1'-0"



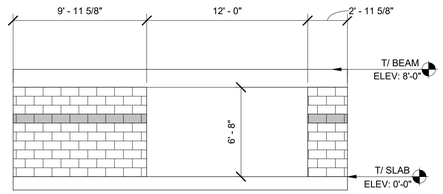
8 FUTURE MODULE 1 LEFT ELEVATION

SCALE: 3/16" = 1'-0"



6 FUTURE MODULE 2 RIGHT ELEVATION

SCALE: 3/16" = 1'-0"



7 FUTURE MODULE 2 LEFT ELEVATION

SCALE: 3/16" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

ELEVATIONS

SHEET INFORMATION:

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Drawn By:	Sheet Number: **S-008**
Checked By:	
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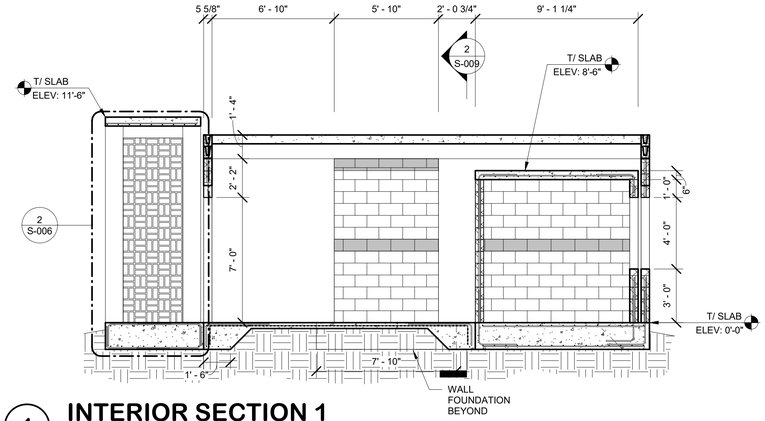
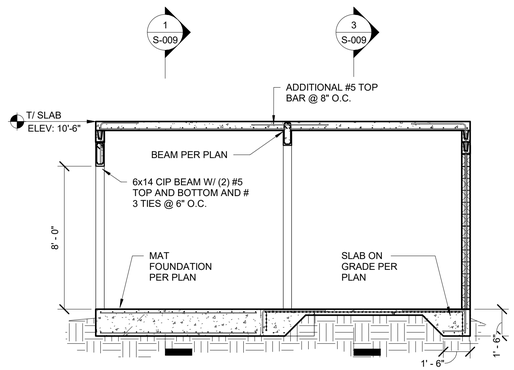


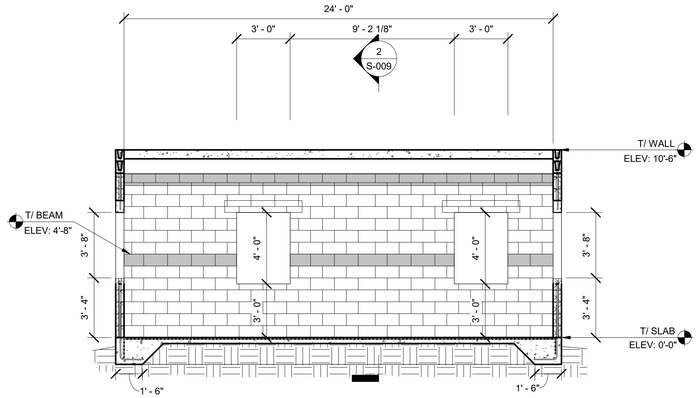
1 INTERIOR SECTION 1

SCALE: 1/4" = 1'-0"



2 INTERIOR SECTION 2

SCALE: 1/4" = 1'-0"



3 INTERIOR SECTION 3

SCALE: 1/4" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

SECTIONS

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-009
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QC Review:	
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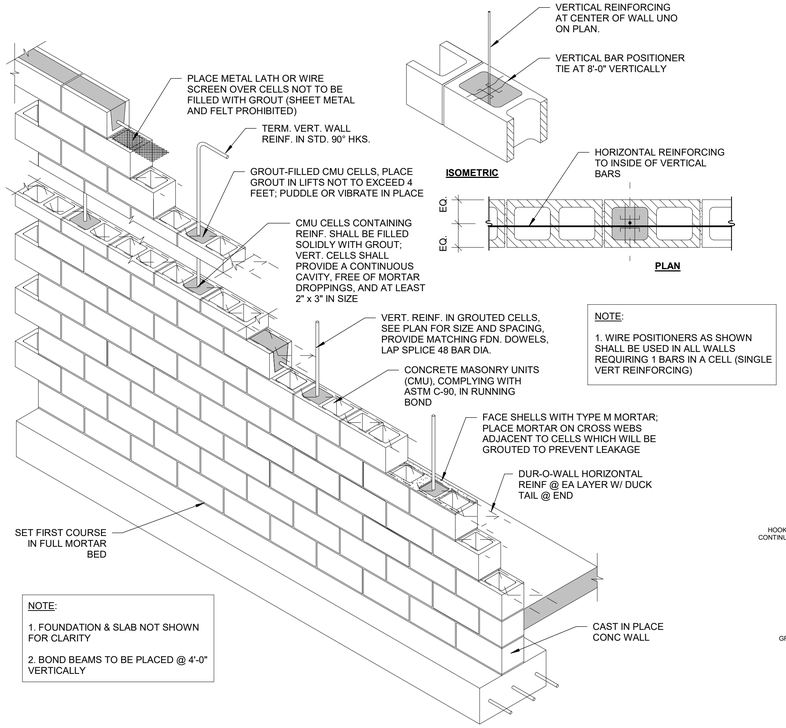


NOTE:

1. FOUNDATION & SLAB NOT SHOWN FOR CLARITY

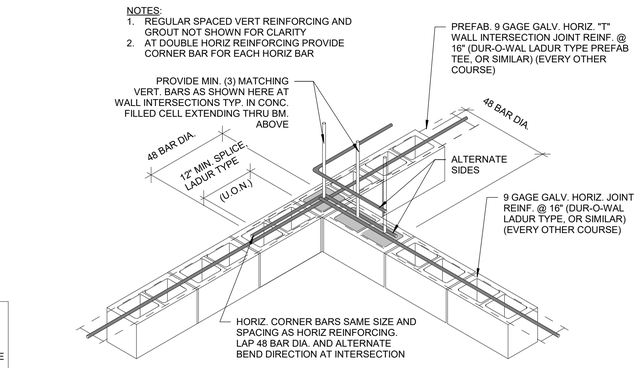
2. BOND BEAMS TO BE PLACED @ 4'-0" VERTICALLY

NOTE:

1. WIRE POSITIONERS AS SHOWN SHALL BE USED IN ALL WALLS REQUIRING 1 BARS IN A CELL (SINGLE VERT REINFORCING)

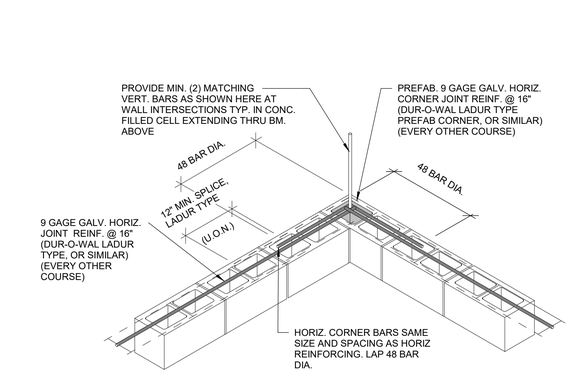
1 TYP.REINF MASONRY WALL CONSTRUCTION

3/4" = 1'-0"



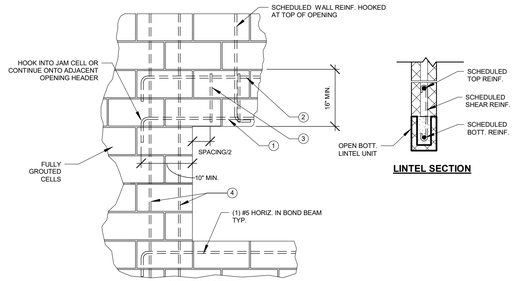
2 TEE WALL INTERSECTION

3/4" = 1'-0"



3 TYP. REINF. CORNER DETAIL

3/4" = 1'-0"



CMU PILASTER

LINTEL SECTION

CMU LINTEL/JAMB SCHEDULE

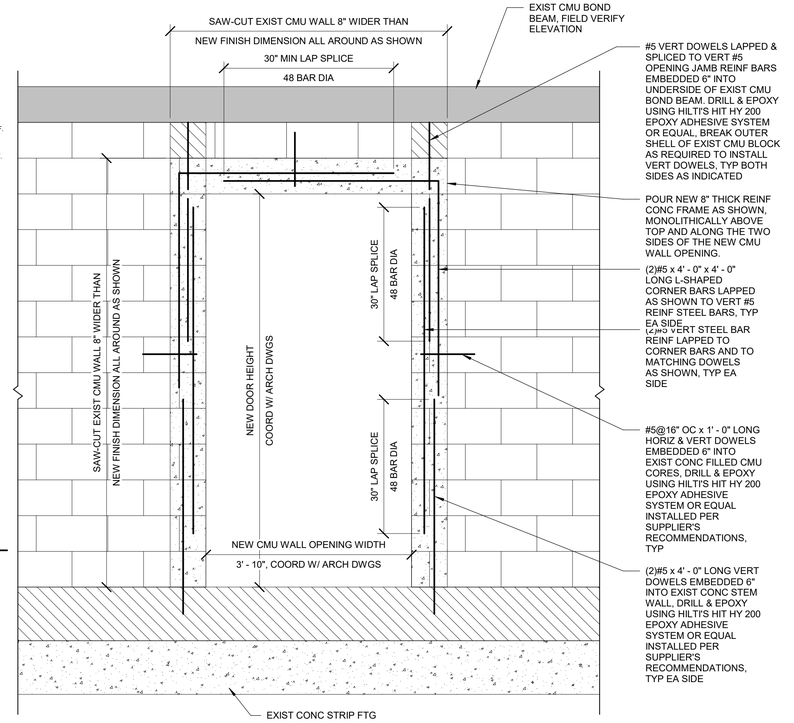
MAX OPENING SPAN	CMU WIDTH	① HORIZONTAL BOTT. REINF.	② HORIZONTAL TOP REINF.	③ SHEAR REINF.	④ MIN. ADJACENT REINF. JAMB CELLS (1 VERT.) PER CELL
OPNG. ≤ 4'-0"	6"	(1) #5 BOTT.	N/A	N/A	8" (1) #5
4'-0" < OPNG. ≤ 6'-0"	6"	(1) #5 BOTT.	N/A	N/A	16" (2) #5
6'-0" < OPNG. ≤ 8'-0"	6"	(1) #6 BOTT.	(1) #5 TOP	SINGLE LEG #3 AT 7" C/C	16" (2) #6

NOTES:

1. #6 VERT. SHALL START ABOVE FOOTING WITH A MINIMUM LAP LENGTH OF 50".
2. ALL CMU LINTEL BEAMS ABOVE BOTTOM COURSE SHALL BE CONSTRUCTED OF OPEN BOTTOM LINTEL UNITS, OR STRETCHER COURSES WITH 1/2 WEB CUT OUT.
3. COORDINATE W/ SECTIONS, DETAILS, & GENERAL NOTES.
4. PROVIDE THE SAME REINFORCMENT AND PLACEMENT FOR CONCRETE WALL OPENINGS.

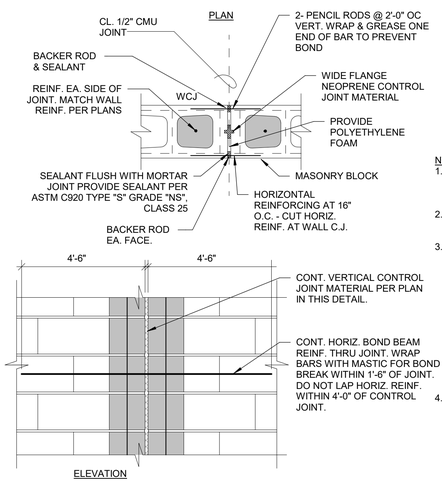
4 CMU LINTEL/JAMB SCHEDULE

SCALE: 3/4" = 1'-0"



5 TYP. OPENING IN EXISTING WALL DETAIL

SCALE: 3/4" = 1'-0"

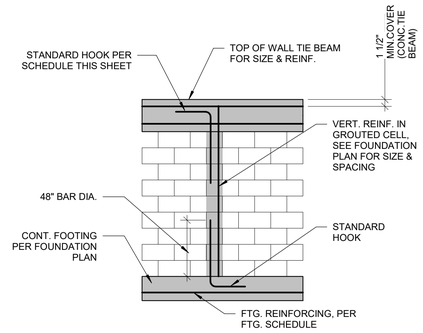


NOTES:

1. MASONRY CONTROL JOINTS TO BE COORDINATED WITH ARCH ELEVATIONS, PLANS AND SPECIFICATIONS.
2. WALL CONTROL JOINTS SHOULD MATCH LOCATION OF SLAB CONTROL JOINTS. ONLY AS NOTED IN PLAN.
3. CONTROL JOINTS @ MASONRY WALLS SHOULD BE PLACED @ SPACINGS NOT EXCEEDING 25'-4" OR 3 TIMES THE WALL HEIGHT WHICHEVER IS LESS. MORE SPECIFICALLY WHEN SELECTING A LOCATION IT SHOULD INCLUDE
   A. CHANGES IN WALL HT. OR THICKNESS.
   B. OVER OPENINGS @ ONE SIDE PAST THE LINTEL
   C. AT INTERSECTING WALL.
   D. AT CONSTRUCTION JOINTS IN SLAB.
   E. NOT LESS THAN 2'-0" FROM A BEARING PLATE.
4. G. C. TO PROVIDE SHOP DWG. W/ LOCATIONS OF CONTROL JOINTS & ALL VERTICAL REINF. FOR REVIEW BY A/E.

6 MASONRY CONTROL JOINT (MCJ)

3/4" = 1'-0"



7 TYP. ONE STORY MASONRY WALL

3/4" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

TYPICAL DETAILS

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: **S-010**
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BAR SIZE	BEND DIAMETER, d_b (IN)	MINIMUM INSIDE DIAMETER OF BEND (IN)	180 DEGREE HOOK $4d_b$ EXTENSION (IN)	STIRRUPS & TIES, $6d_b$ EXTENSION (IN)	90 DEGREE HOOK, 12db EXTENSION (IN)	EQUIVALENT EMBEDMENT LENGTH, l_e, $13d_b$ (IN)
# 3	12	-	12	-	12	-
# 4	20	-	15	-	15	-
# 5	32	-	23	-	23	-
# 6	54	29	43	27	43	27
# 7	NP	-	60	32	60	32
# 8	NP	-	72	50	72	50
# 9	NP	-	NP	-	NP	-

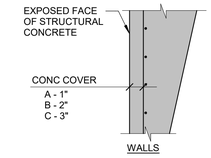
TABLE A - REINFORCEMENT TENSION LAPS, EMBEDMENT AND HOOK LENGTHS

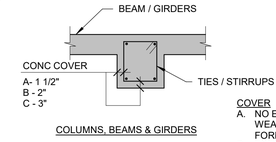
fw = 60000psi f'c = 4000psi

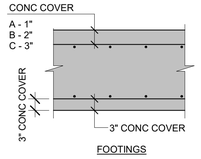
BAR SIZE	CLASS "A" LAP		CLASS "B" LAP		HOOKS
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	
#3	19	15	24	19	6
#4	25	19	32	25	8
#5	31	24	40	31	10
#6	37	29	48	37	12
#7	54	42	70	54	14

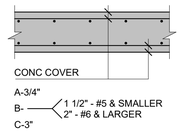
NOTES FOR USE WITH TABLE A

1. LENGTH SHOWN CONFORM TO NON-SEISMIC PROVISIONS OF ACI 318 FOR UNCOATED BARS ENCLOSED BY PROPERLY SPACED TIES OR STIRRUPS.
2. CLASS "A" LAPS APPLY WHEN BAR LAPS ARE STAGGERED TO LAP HALF THE BARS AT ONE LOCATION OR WHEN BARS ARE LAPPED AT THE LOCATION OF MINIMUM STRESS IN THE BARS.
3. CLASS "B" LAPS APPLY WHEN ALL BARS ARE LAPPED AT A LOCATION OF MAXIMUM STRESS IN THE BARS.
4. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BARS IN ANY SINGLE POUR.
5. LAP AND EMBEDMENT LENGTHS HAVE THE SAME VALUE.
6. CLEAR SPACING OF REINFORCING SHALL NOT BE LESS THAT 1" OR 1 BAR DIAMETER. IF THE CLEAR SPACING IS LESS THAN SPECIFIED, MULTIPLY THE ABOVE LENGTHS BY 1.5.
7. CLEAR COVER FOR REINFORCING SHALL NOT BE LESS THAN 1 BAR DIAMETER OR AS SPECIFIED IN SECTION 7.7 OF ACI 318. IF THE CLEAR COVER IS LESS THAN SPECIFIED, MULTIPLY THE ABOVE LENGTHS BY 1.5.
8. MULTIPLY THE ABOVE LENGTHS BY 1.3 FOR CONCRETE WITH LIGHTWEIGHT AGGREGATE.
9. MULTIPLY THE ABOVE LENGTHS BY 1.5 FOR EPOXY COATED REINFORCING.
10. FOR CONCRETE STRENGTHS OTHER THAN 4000 PSI, MULTIPLY ABOVE LENGTHS BY $4000 / f'c$.
11. UNLESS NOTED OTHERWISE ALL FOOTING REINFCING BARS SHALL LAP AROUND CORNERS.









COVER

A. NO EXPOSURE TO GROUND, WEATHER, OR WATER AFTER FORM REMOVAL.*
B. EXPOSURE TO GROUND, WEATHER OR WATER AFTER FORM REMOVAL.
C. CONCRETE PLACED AGAINST SOIL. *

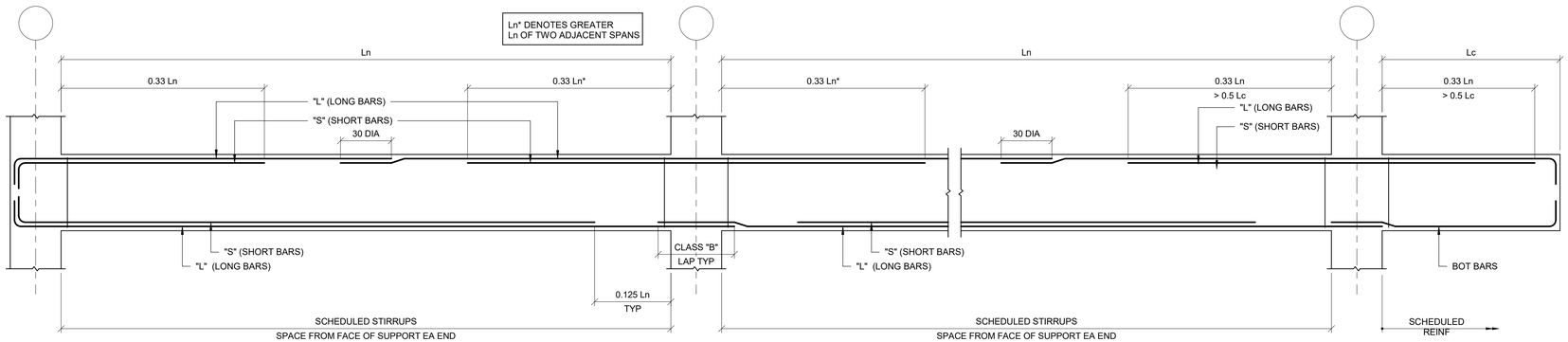
1. LENGTH SHOWN CONFORM TO NON-SEISMIC PROVISIONS OF ACI 318 FOR UNCOATED BARS ENCLOSED BY PROPERLY SPACED TIES OR STIRRUPS
2. CLASS "A" LAPS APPLY WHEN BAR LAPS ARE STAGGERED TO LAP HALF THE BARS AT ONE LOCATION OR WHEN BARS.

1 STANDARD HOOK DIMENSIONS AND EQUIVALENT EMBEDMENT LENGTHS

SCALE: 3/4" = 1'-0"

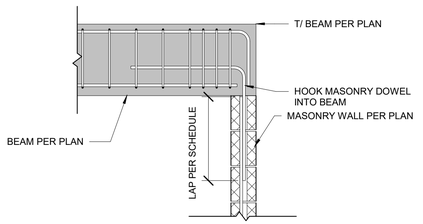
2 LAP SPLICE SCHEDULE

SCALE: 3/4" = 1'-0"



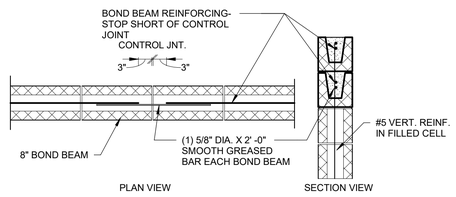
3 TYPICAL BEAM DIAGRAM

SCALE: 3/8" = 1'-0"



4 BEAM BEARING IN MASONRY

SCALE: 3/4" = 1'-0"



5 CONROL JOINT AT BOND BEAM

SCALE: 3/4" = 1'-0"

LONGITUDINAL BAR SIZE	MINIMUM LAP SPLICE LENGTH, IN, FOR 1,900 PSI STRENGTH MASONRY WITH CENTER REINFORCEMENT:
	6 IN CMU
	UNCONFINED
# 3	24
# 4	33
# 5	40
# 6	48
# 7	NP
# 8	NP
# 9	NP

6 MASONRY LAP SPLICE SCHEDULE

SCALE: 3/4" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPEMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGPe-DDEC) FOR BUILDING REQUIREMENTS IN PUERTO RICO. THIS INFORMATION HAS BEEN DEVELOPED FOR THE USE OF PUERTO RICO RESIDENTS AND IS BELIEVED TO MEET THE PUERTO RICO BUILDING CODE. ALL DRAWINGS MUST BE SEPARATELY APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

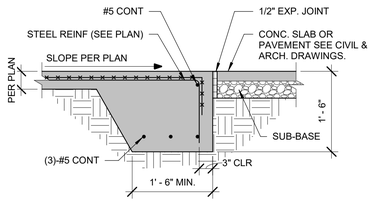
PROFESSIONAL SEALS:

SHEET TITLE:

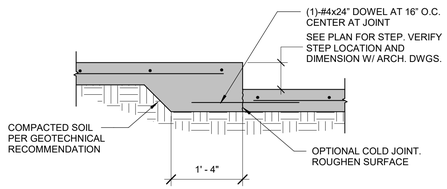
TYPICAL DETAILS

SHEET INFORMATION:

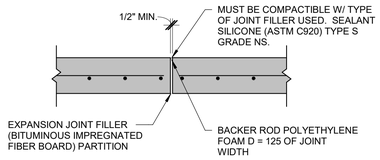
JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-011
Checked By:	
QC Review:	
Phase:	



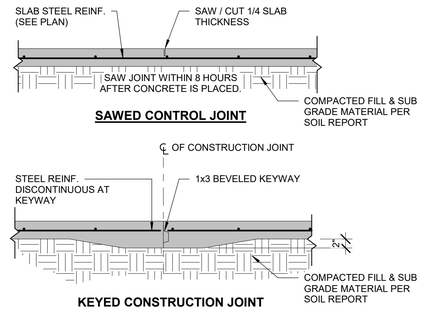
1 SLAB EDGE DETAIL
3/4" = 1'-0"



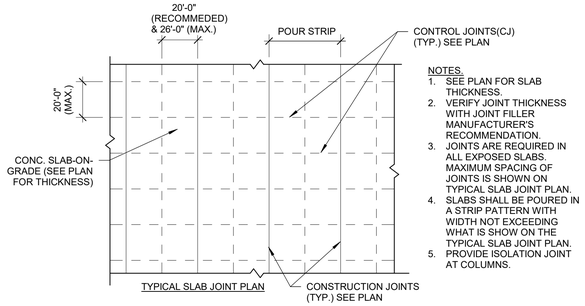
2 TYP. SMALL STEP IN SLAB (IF REQ'D)
3/4" = 1'-0"



3 TYP. ISOLATION JOINT DETAIL
3/4" = 1'-0"

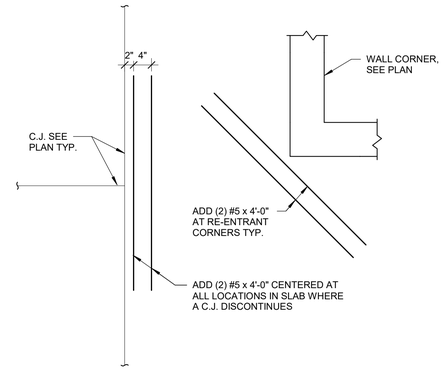


4 SLAB CONTROL AND CONSTRUCTION JOINT DETAILS
3/4" = 1'-0"

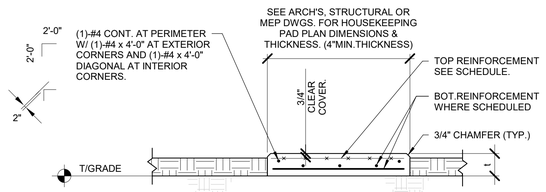


NOTES.
1. SEE PLAN FOR SLAB THICKNESS.
2. VERIFY JOINT THICKNESS WITH JOINT FILLER MANUFACTURER'S RECOMMENDATION.
3. JOINTS ARE REQUIRED IN ALL EXPOSED SLABS. MAXIMUM SPACING OF JOINTS IS SHOWN ON TYPICAL SLAB JOINT PLAN.
4. SLABS SHALL BE POURED IN A STRIP PATTERN WITH WIDTH NOT EXCEEDING WHAT IS SHOW ON THE TYPICAL SLAB JOINT PLAN.
5. PROVIDE ISOLATION JOINT AT COLUMNS.

5 SLAB ON GRADE JOINT NOTES
3/4" = 1'-0"



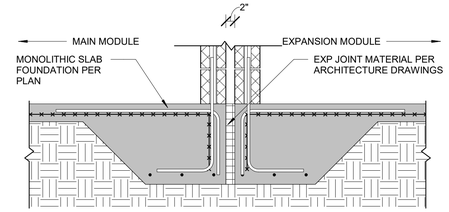
6 TYP. S.O.G. CRACK CONTROL
3/4" = 1'-0"



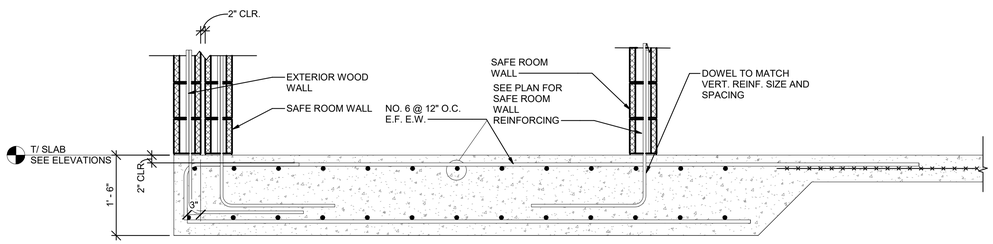
HOUSEKEEPING PAD REINFORCING SCHEDULE		
PAD THICKNESS	TOP REINF.	BOTTOM REINF.
t ≤ 4"	6"x 6",W2.9 x W2.9	NONE
4" < t ≤ 6"	4"x 4",W4.0 x W4.0	NONE
6" < t ≤ 8"	4"x 4",W5.5 x W5.5	NONE
8" < t ≤ 12"	#4@12"EW	#3@18"EW
12" < t ≤ 16"	#4@12"EW	#4@12"EW

NOTE: GENERAL CONTRACTOR TO COORDINATE WITH MECHANICAL DRAWINGS AND SPECS. TO DETERMINE REQUIREMENTS FOR HOUSEKEEPING PADS OVER STRUCTURAL SLAB AND PROVIDE WHERE REQUIRED WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT. COORDINATE DIMENSIONS AND OTHER SPECIAL REQUIREMENTS WITH EQUIPMENT MANUFACTURERS AS REQUIRED.

7 TYP. HOUSEKEEPING PAD - EXTERIOR
3/4" = 1'-0"



8 EXP JOINT AT MODULES
SCALE: 3/4" = 1'-0"



9 SECTION AT SAFE ROOM FOUNDATION
SCALE: 3/4" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

ONE STORY CMU HOME CONCRETE ROOF

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

SLAB TYP. DETAILS

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: S-012
Checked By:	
QC Review:	
Phase:	

FEMA - PUERTO RICO PRESCRIPTIVE DESIGN HOUSE WIND DESIGN CRITERIA

Atkins Global
S Keller Rd
Orlando, FL
954-233-4399

JOB TITLE	PR CMU Prescriptive Design		
JOB NO.		**SHEET NO.**	
CALCULATED BY	EEB	**DATE**	8/29/19
CHECKED BY	MJR	**DATE**	

Code Search

Code: ASCE 7 - 16

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category =	II
Wind factor =	1.00
Snow factor =	1.00
Seismic factor =	1.00

Type of Construction:

Fire Rating:

Roof =	0.0 hr
Floor =	0.0 hr

Building Geometry:

Roof angle (θ)	4.00 / 12	18.4 deg
Building length (L)	32.2 ft	
Least width (B)	11.0 ft	
Mean Roof Ht (h)	22.4 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

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JOB TITLE PR CMU Prescriptive Design

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Wind Loads : ASCE 7- 16

Ultimate Wind Speed	190 mph
Nominal Wind Speed	147.2 mph
Risk Category	II
Exposure Category	D
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	1.105
Kh case 2	1.105
Type of roof	Gable

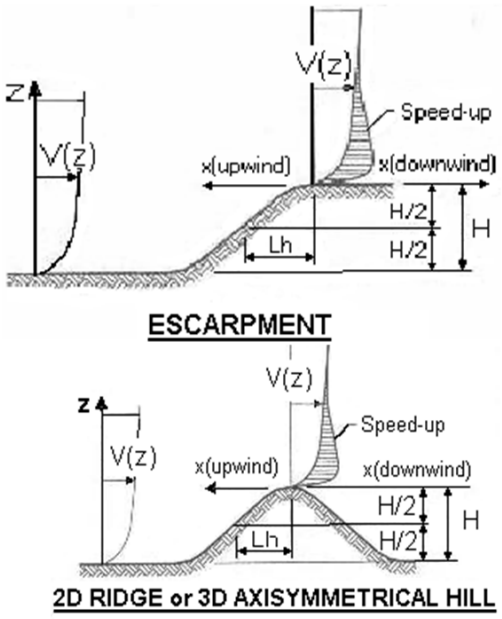
Topographic Factor (Kzt)

Topography		2D Ridge
Hill Height	(H)	15.0 ft
Half Hill Length (Lh)		15.0 ft
Actual H/Lh	=	0.00
Use H/Lh	=	0.00
Modified Lh	=	15.0 ft
From top of crest: x =		0.0 ft
Bldg up/down wind?		downwind

H/Lh<0.2
∴ Kzt=1.0

H/Lh= 0.00 K_1 = 0.000
x/Lh = 0.00 K_2 = 1.000
z/Lh = 1.49 K_3 = 0.011

At Mean Roof Ht:
Kzt = $(1+K_1K_2K_3)^2$ = 1.00



Gust Effect Factor

h = 22.4 ft
B = 11.0 ft
/z (0.6h) = 13.4 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B>4 then may be flexible and should be investigated.
h/B = 2.04

G = 0.85 Using rigid structure formula

Rigid Structure

ē =	0.13
ℓ =	650 ft
z_{min} =	7 ft
c =	0.13
g_Q, g_v =	3.4
L_z =	581.0 ft
Q =	0.95
I_z =	0.15
G =	0.90 use G = 0.85

Flexible or Dynamically Sensitive Structure

34 ncy (η_1) =	0.0 Hz			
Damping ratio (β) =	0			
/b =	0.80			
/α =	0.11			
Vz =	201.8			
N_1 =	0.00			
R_n =	0.000			
R_h =	28.282	η =	0.000	h = 22.4 ft
R_B =	28.282	η =	0.000	
R_L =	28.282	η =	0.000	
g_R =	0.000			
R =	0.000			
Gf =	0.000			

Enclosure Classification

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CHECKED BY	MJR	**DATE**	

Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) =	1.10	h =	22.4 ft	GCpi =	+/-0.18
Base pressure (q_h) =	**86.8 psf**	ridge ht =	23.3 ft	G =	0.85
Roof Angle (θ) =	18.4 deg	L =	32.2 ft	qi = qh	
Roof tributary area - (h/2)*L:	360 sf	B =	11.0 ft		
(h/2)*B:	123 sf				

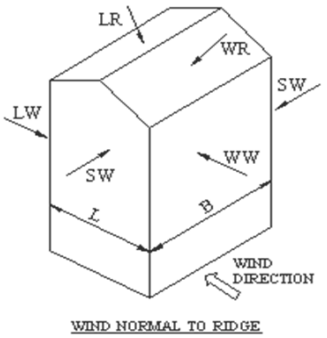
Ultimate Wind Surface Pressures (psf)

	Wind Normal to Ridge				Wind Parallel to Ridge				
	B/L = 0.34		h/L = 2.04			L/B = 2.93		h/L = 0.70	
Surface	Cp	q_hGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Dist.*	Cp	q_hGC_p	w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	59.0	see table below			0.80	59.0	see table below	
Leeward Wall (LW)	-0.50	-36.9	-52.5	-21.3		-0.25	-18.7	-34.3	-3.1
Side Wall (SW)	-0.70	-51.6	-67.2	-36.0		-0.70	-51.6	-67.2	-36.0
Leeward Roof (LR)	-0.60	-44.3	-59.9	-28.6		Included in windward roof			
Neg Windward Roof pressure	-0.79	-58.6	-74.2	-42.9	0 to h/2*	-1.05	-77.1	-92.7	-61.5
Pos/min Windward Roof press.	-0.18	-13.3	-28.9	2.3	h/2 to h*	-0.82	-60.6	-76.2	-45.0
					h to 2h*	-0.58	-42.7	-58.3	-27.0
					Min press.	-0.18	-13.3	-28.9	2.3

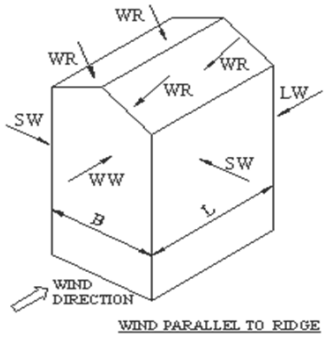
*Horizontal distance from windward edge

Windward Wall Pressures at "z" (psf)

	z	Kz	Kzt	Windward Wall q_zGC_p	Windward Wall w/+q_iGC_{pi}	Windward Wall w/-q_hGC_{pi}	Combined WW + LW Normal to Ridge	Combined WW + LW Parallel to Ridge
	0 to 15'	1.03	1.00	55.0	39.4	70.7	91.9	73.7
	20.0 ft	1.08	1.00	57.9	42.2	73.5	94.7	76.6
h=	22.4 ft	1.10	1.00	59.0	43.4	74.6	95.9	77.7
ridge =	23.3 ft	1.11	1.00	59.4	43.8	75.0	96.3	78.1



WIND NORMAL TO RIDGE



WIND PARALLEL TO RIDGE

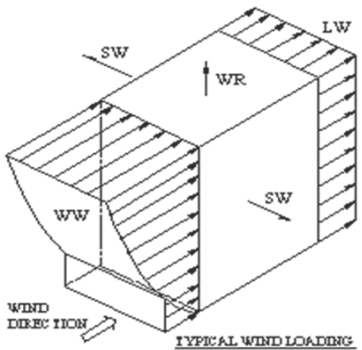
NOTE:
See figure in ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.

Parapet

z	Kz	Kzt	qp (psf)
0.0 ft	1.03	1.00	0.0

Windward parapet: 0.0 psf (GCpn = +1.5)
Leeward parapet: 0.0 psf (GCpn = -1.0)

Windward roof overhangs (add to windward roof pressure) : 59.0 psf (upward)



TYPICAL WIND LOADING

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JOB TITLE PR CMU Prescriptive Design

JOB NO. | **SHEET NO.**
CALCULATED BY EEB | **DATE** 8/29/19
CHECKED BY MJR | **DATE**

Ultimate Wind Pressures

Wind Loads - Components & Cladding : h ≤ 60'

Kh (case 1) =	1.10	h =	22.4 ft
Base pressure (qh) =	**86.8 psf**	a =	3.0 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	18.4 deg	qi = qh =	86.8 psf
Type of roof =	Gable		

Roof

	Surface Pressure (psf)								User input	
Area	2 sf	10 sf	20 sf	50 sf	75 sf	100 sf	200 sf	250 sf	75 sf	500 sf
Negative Zone 1 & 2e	-189.2	-189.2	-189.2	-115.1	-82.3	-59.0	-59.0	-59.0	-82.3	-59.0
Negative Zone 2n, 2r &3e	-275.9	-275.9	-238.6	-189.2	-167.3	-151.8	-114.4	-102.4	-167.3	-102.4
Negative Zone 3r	-328	-328	-281	-218.8	-191.3	-171.8	-171.8	-171.8	-191.3	-171.8
Positive All Zones	45.1	30.8	24.7	16.6	16.0	16.0	16.0	16.0	16.0	16.0
Overhang Zone 1 & 2e	-201.3	-201.3	-201.3	-151.9	-130.1	-114.5	-114.5	-114.5	-130.1	-114.5
Overhang Zone 2n & 2r	-303.7	-288.1	-260.1	-223	-206.6	-195.0	-167.0	-157.9	-206.6	-157.9
Overhang Zone 3e	-355.8	-355.8	-307.2	-243	-214.5	-194.4	-145.8	-130.2	-214.5	-130.2
Overhang Zone 3r	-407.8	-407.8	-345.1	-262.3	-225.6	-199.6	-199.6	-199.6	-225.6	-199.6

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0
Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 15.6 psf)

Parapet

qp = 0.0 psf

		Surface Pressure (psf)						User input
Solid Parapet Pressure		10 sf	20 sf	50 sf	100 sf	250 sf	500 sf	40 sf
CASE A:	Zone 2e :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 2n, 2r & 3e :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3r :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi				Surface Pressure at h				User input	
Area	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf	20 sf	50 sf
Negative Zone 4	-1.28	-1.10	-1.05	-0.98	-93.7	-95.7	-91.1	-85.0	-106.5	-100.4
Negative Zone 5	-1.58	-1.23	-1.12	-0.98	-171.8	-106.5	-97.2	-85.0	-127.9	-115.7
Positive Zone 4 & 5	1.18	1.00	0.95	0.88	93.7	87.1	82.5	76.4	97.8	91.7

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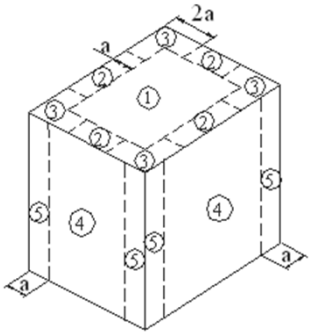
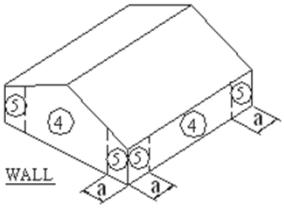
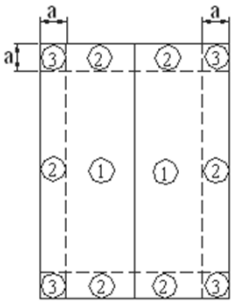
Location of C&C Wind Pressure Zones - ASCE 7-10 & earlier



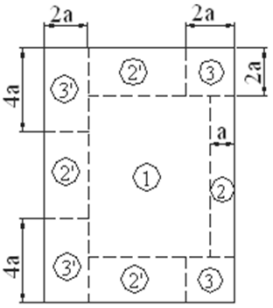
Roofs w/ θ ≤ 10°
and all walls
h > 60'



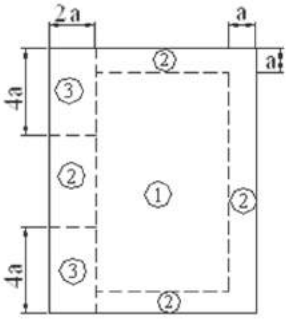
Walls h ≤ 60'
& alt design h<90'



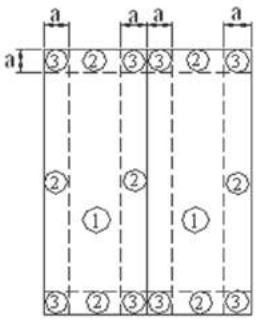
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



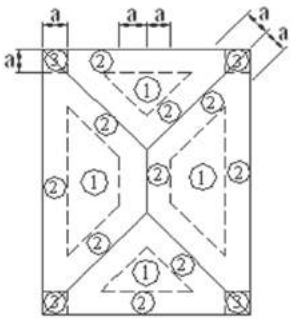
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



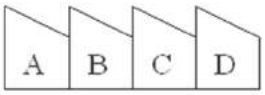
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'

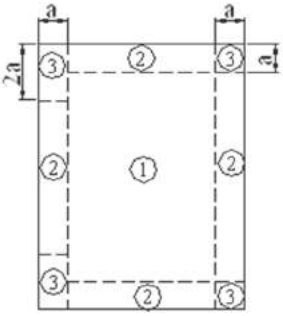


Multispan Gable &
Gable 7° < θ ≤ 45°

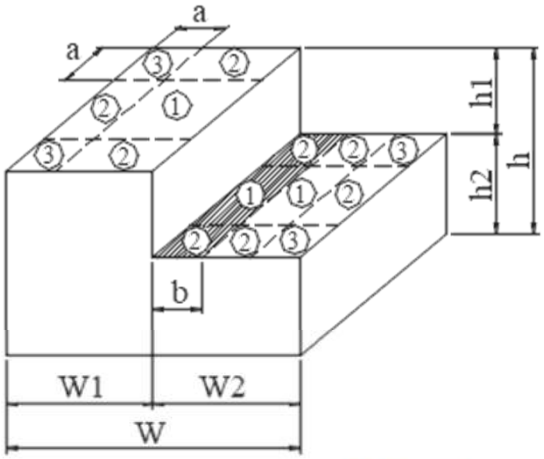


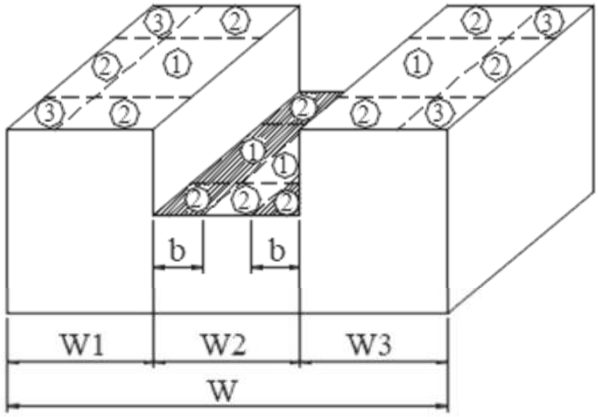
Hip 7° < θ ≤ 27°





Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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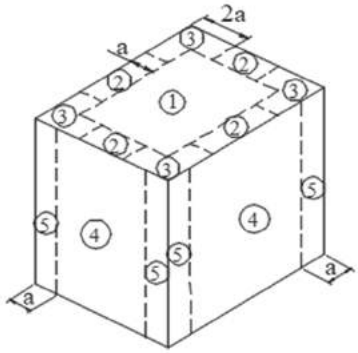
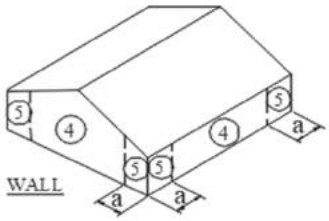
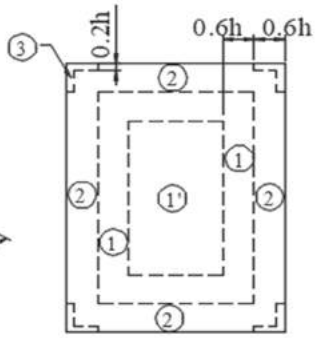
Location of C&C Wind Pressure Zones - ASCE 7-16



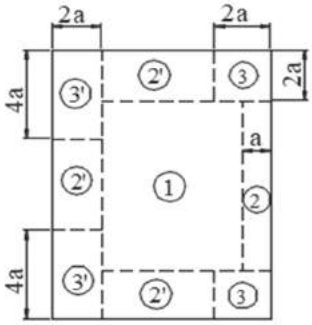
Roofs w/ θ ≤ 10°
and all walls
h > 60'



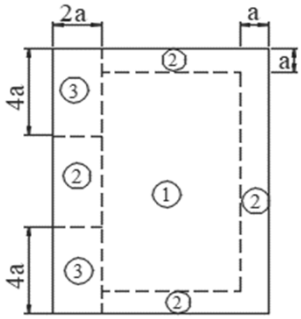
Walls h ≤ 60'
& alt design h<90'



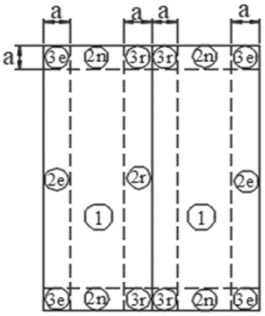
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



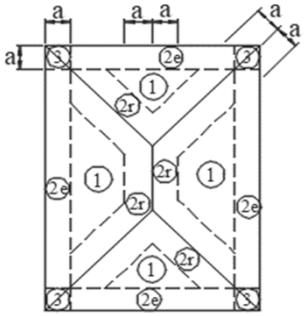
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



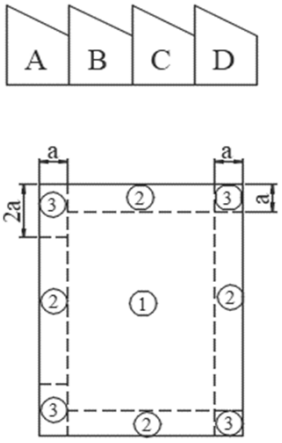
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'



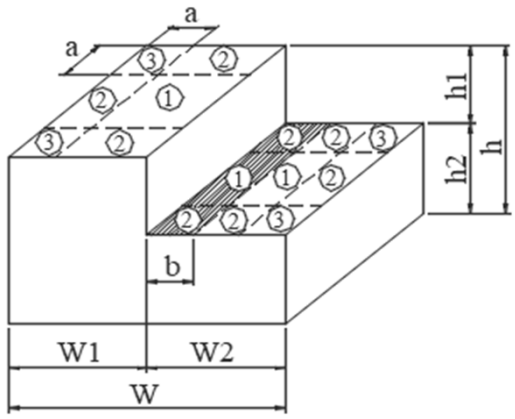
Multispan Gable &
Gable 7° < θ ≤ 45°

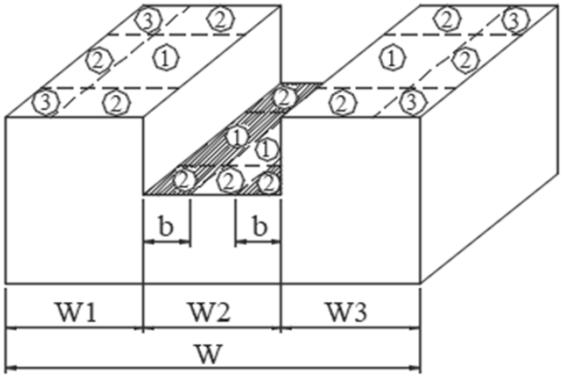


Hip 7° < θ ≤ 27°



Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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Code Search

Code: ASCE 7 - 16

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category =	II
Wind factor =	1.00
Snow factor =	1.00
Seismic factor =	1.00

Type of Construction:

Fire Rating:

Roof =	0.0 hr
Floor =	0.0 hr

Building Geometry:

Roof angle (θ)	0.00 / 12	0.0 deg
Building length (L)	32.2 ft	
Least width (B)	11.0 ft	
Mean Roof Ht (h)	22.4 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

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Wind Loads : ASCE 7- 16

Ultimate Wind Speed	190 mph
Nominal Wind Speed	147.2 mph
Risk Category	II
Exposure Category	D
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	1.105
Kh case 2	1.105
Type of roof	Monoslope

Topographic Factor (Kzt)

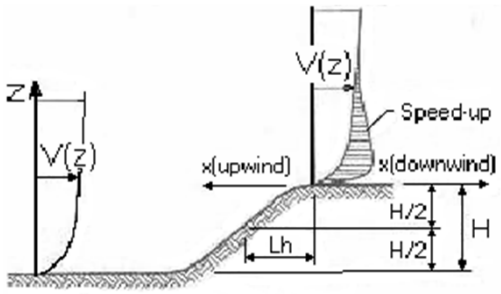
Topography		2D Ridge
Hill Height	(H)	10.0 ft
Half Hill Length (Lh)		10.0 ft
Actual H/Lh	=	0.00
Use H/Lh	=	0.00
Modified Lh	=	10.0 ft
From top of crest: x =		0.0 ft
Bldg up/down wind?		downwind

H/Lh= 0.00 K_1 = 0.000
x/Lh = 0.00 K_2 = 1.000
z/Lh = 2.24 K_3 = 0.001

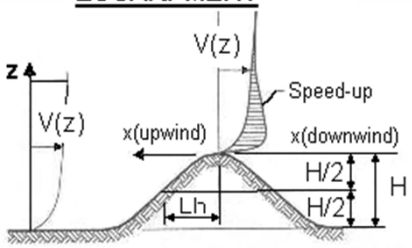
At Mean Roof Ht:

Kzt = $(1+K_1K_2K_3)^2$ = 1.00

H< 15ft;exp D
∴ Kzt=1.0



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

h = 22.4 ft
B = 11.0 ft
/z (0.6h) = 13.4 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B>4 then may be flexible and should be investigated.
h/B = 2.04

G = 0.85 Using rigid structure formula

Rigid Structure

ē =	0.13	
ℓ =	650 ft	
z_{min} =	7 ft	
c =	0.13	
g_Q, g_v =	3.4	
L_z =	581.0 ft	
Q =	0.95	
I_z =	0.15	
G =	0.90	use G = 0.85

Flexible or Dynamically Sensitive Structure

34 ncy (η_1) =	0.0 Hz			
Damping ratio (β) =	0			
/b =	0.80			
/α =	0.11			
Vz =	201.8			
N_1 =	0.00			
R_n =	0.000			
R_h =	28.282	η =	0.000	h = 22.4 ft
R_B =	28.282	η =	0.000	
R_L =	28.282	η =	0.000	
g_R =	0.000			
R =	0.000			
Gf =	0.000			

Enclosure Classification

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Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) =	1.10	h =	22.4 ft	GCpi =	+/-0.18
Base pressure (q_h) =	**86.8 psf**	ridge ht =	22.4 ft	G =	0.85
Roof Angle (θ) =	0.0 deg	L =	32.2 ft	qi = qh	
Roof tributary area - (h/2)*L:	360 sf	B =	11.0 ft		
(h/2)*B:	123 sf				

Ultimate Wind Surface Pressures (psf)

Surface	Wind Normal to Ridge B/L = 0.34 Cp	q_hGC_p	h/L = 2.04 w/+q_iGC_{pi}	w/-q_hGC_{pi}	Wind Parallel to Ridge L/B = 2.93 Dist.*	Cp	q_hGC_p	h/L = 0.70 w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	59.0	see table below			0.80	59.0	see table below	
Leeward Wall (LW)	-0.50	-36.9	-52.5	-21.3		-0.25	-18.7	-34.3	-3.1
Side Wall (SW)	-0.70	-51.6	-67.2	-36.0		-0.70	-51.6	-67.2	-36.0
Leeward Roof (LR)		**				Included in windward roof			
Neg Windward Roof: 0 to h/2*	-1.14	-84.4	-100.0	-68.8	0 to h/2*	-1.05	-77.1	-92.7	-61.5
> h/2*	-0.70	-51.6	-67.2	-36.0	h/2 to h*	-0.82	-60.6	-76.2	-45.0
					h to 2h*	-0.58	-42.7	-58.3	-27.0
Pos/min windward roof press.	-0.18	-13.3	-28.9	2.3	Min press.	-0.18	-13.3	-28.9	2.3

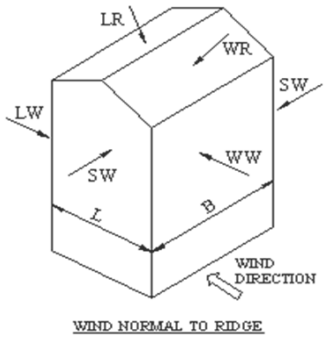
**Roof angle < 10 degrees. Therefore, leeward roof is included in windward roof pressure zones.

*Horizontal distance from windward edge

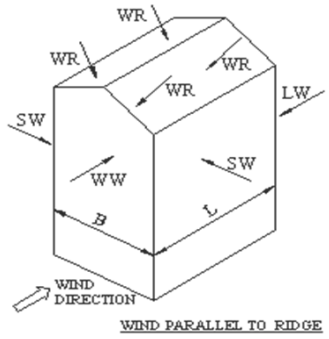
For monoslope roofs, entire roof surface is either windward or leeward surface.

Windward Wall Pressures at "z" (psf)

	z	Kz	Kzt	Windward Wall q_zGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Combined WW + LW Normal to Ridge	Parallel to Ridge
	0 to 15'	1.03	1.00	55.0	39.4	70.7	91.9	73.7
	20.0 ft	1.08	1.00	57.9	42.2	73.5	94.7	76.6
h=	22.4 ft	1.10	1.00	59.0	43.4	74.6	95.9	77.7



WIND NORMAL TO RIDGE



WIND PARALLEL TO RIDGE

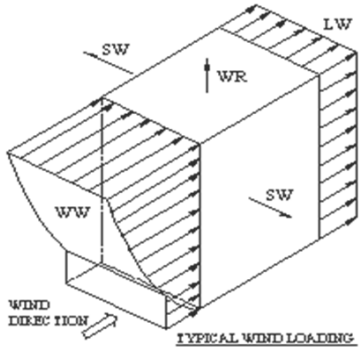
NOTE:
See figure in ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.

Parapet

z	Kz	Kzt	qp (psf)
0.0 ft	1.03	1.00	0.0

Windward parapet: 0.0 psf (GCpn = +1.5)
Leeward parapet: 0.0 psf (GCpn = -1.0)

Windward roof overhangs (add to windward roof pressure) : 59.0 psf (upward)



TYPICAL WIND LOADING

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Ultimate Wind Pressures

Wind Loads - Components & Cladding : h ≤ 60'

Kh (case 1) =	1.10	h =	22.4 ft
Base pressure (qh) =	**86.8 psf**	0.6h =	13.4 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	0.0 deg	qi = qh =	86.8 psf
Type of roof =	Monoslope		

Roof

	Surface Pressure (psf)								User input	
Area	10 sf	20 sf	50 sf	100 sf	200 sf	350 sf	500 sf	1000 sf	75 sf	500 sf
Negative Zone 1	-163.1	-152.4	-138.1	-127.4	-116.6	-107.9	-102.4	-102.4	-131.9	-102.4
Negative Zone 1'	-93.7	-93.7	-93.7	-93.7	-80.7	-70.1	-63.4	-50.3	-93.7	-63.4
Negative Zone 2	-215.2	-201.4	-183.1	-169.2	-155.4	-144.2	-137.1	-137.1	-175.0	-137.1
Negative Zone 3	-293.3	-265.6	-229	-201.4	-173.7	-151.3	-137.1	-137.1	-212.8	-137.1
Positive All Zones	41.7	39	35.6	33	33.0	33.0	33.0	33.0	34.1	33.0
Overhang Zone 1&1'	-147.5	-144.9	-141.5	-138.8	-116.4	-98.3	-86.8	-86.8	-139.9	-86.8
Overhang Zone 2	-199.6	-181.1	-156.7	-138.3	-119.8	-104.9	-95.5	-95.5	-145.9	-95.5
Overhang Zone 3	-277.7	-245.4	-202.7	-170.4	-138.1	-112.1	-95.5	-95.5	-183.8	-95.5

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0
Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 15.6 psf)

Parapet

qp = 0.0 psf

		Surface Pressure (psf)						User input
Solid Parapet Pressure		10 sf	20 sf	50 sf	100 sf	200 sf	500 sf	40 sf
CASE A:	Zone 2 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi				Surface Pressure at h				User input	
Area	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf	20 sf	50 sf
Negative Zone 4	-1.17	-1.01	-0.96	-0.90	-93.7	-87.7	-83.6	-78.1	-97.4	-91.9
Negative Zone 5	-1.44	-1.12	-1.03	-0.90	-171.8	-97.4	-89.1	-78.1	-116.7	-105.7
Positive Zone 4 & 5	1.08	0.92	0.87	0.81	93.7	79.9	75.8	70.3	89.6	84.1

Note: GCp reduced by 10% due to roof angle <= 10 deg.

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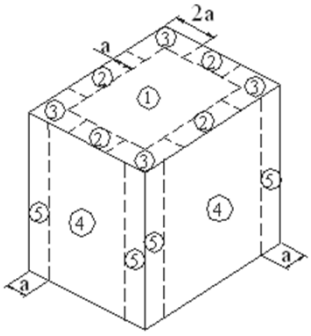
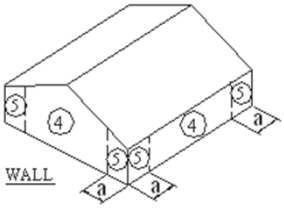
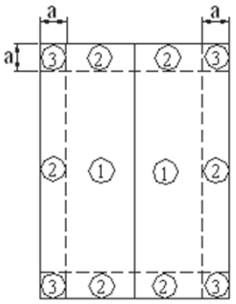
Location of C&C Wind Pressure Zones - ASCE 7-10 & earlier



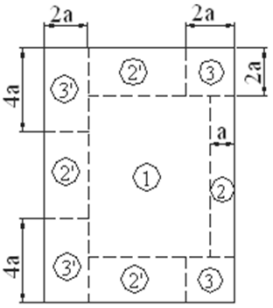
Roofs w/ θ ≤ 10°
and all walls
h > 60'



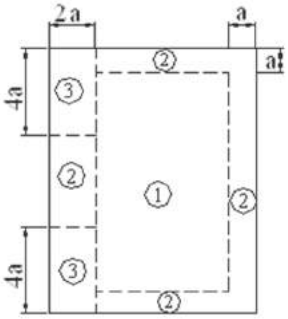
Walls h ≤ 60'
& alt design h<90'



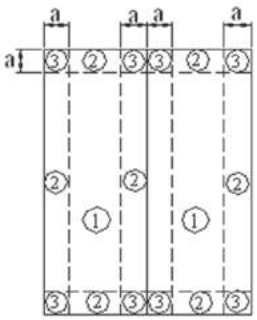
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



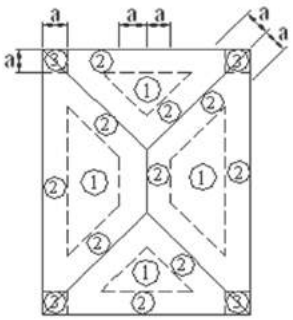
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



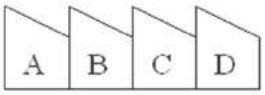
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'

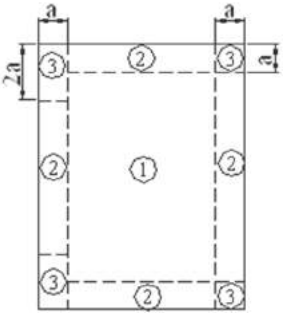


Multispan Gable &
Gable 7° < θ ≤ 45°

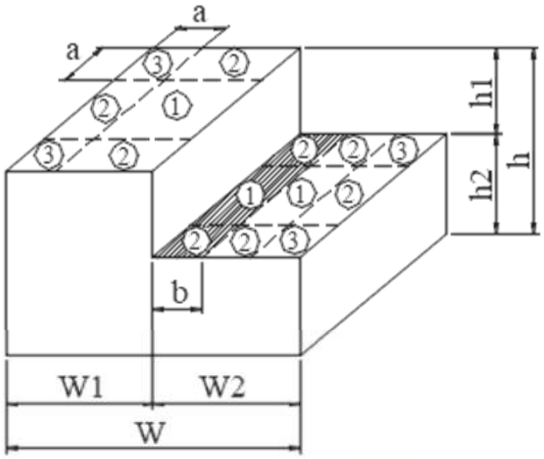


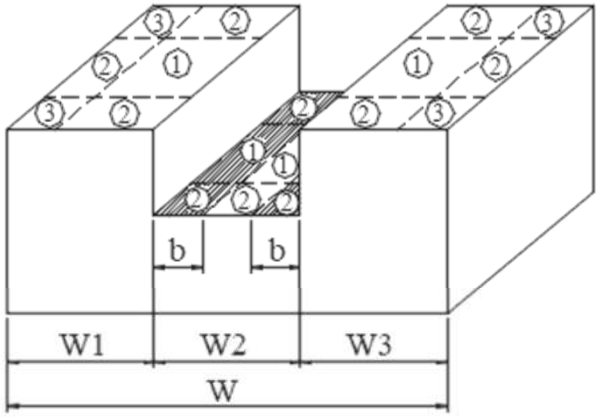
Hip 7° < θ ≤ 27°





Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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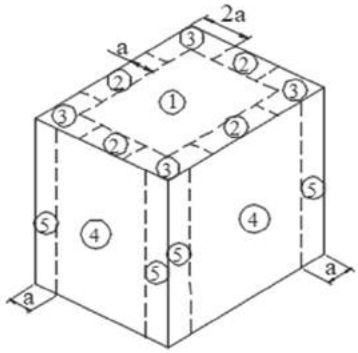
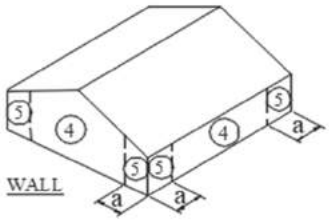
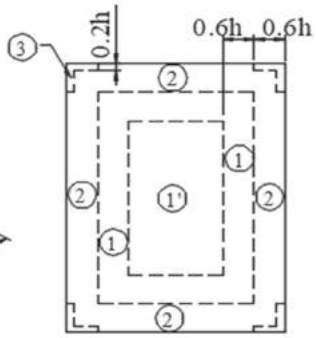
Location of C&C Wind Pressure Zones - ASCE 7-16



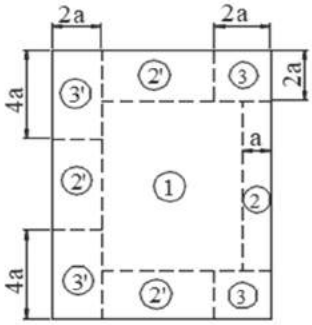
Roofs w/ θ ≤ 10°
and all walls
h > 60'



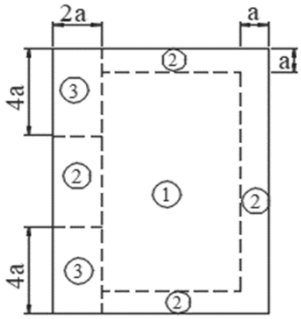
Walls h ≤ 60'
& alt design h<90'



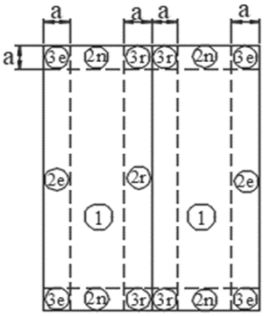
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



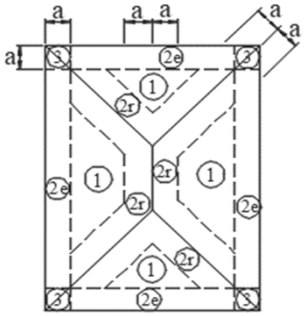
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



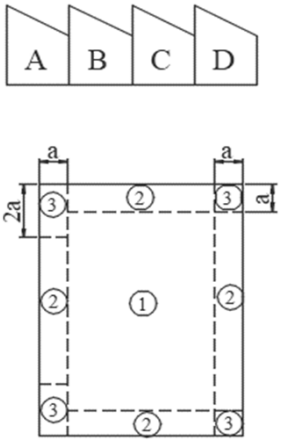
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'



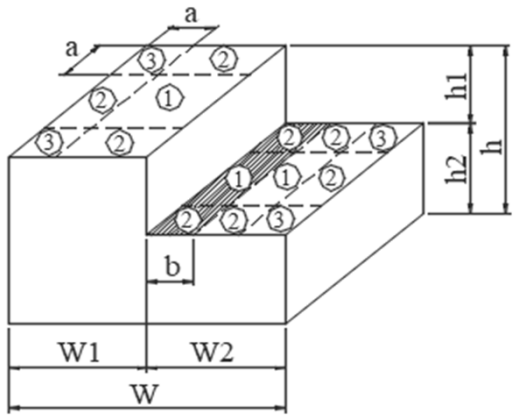
Multispan Gable &
Gable 7° < θ ≤ 45°

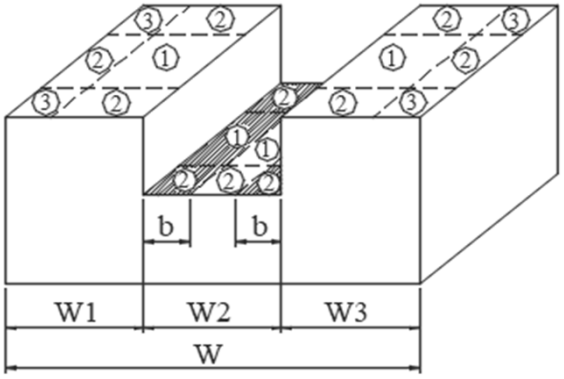


Hip 7° < θ ≤ 27°



Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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Code Search

Code: ASCE 7 - 16

Occupancy:

Occupancy Group = R Residential

Risk Category & Importance Factors:

Risk Category =	II
Wind factor =	1.00
Snow factor =	1.00
Seismic factor =	1.00

Type of Construction:

Fire Rating:

Roof =	0.0 hr
Floor =	0.0 hr

Building Geometry:

Roof angle (θ)	0.00 / 12	0.0 deg
Building length (L)	8.0 ft	
Least width (B)	8.0 ft	
Mean Roof Ht (h)	10.5 ft	
Parapet ht above grd	0.0 ft	
Minimum parapet ht	0.0 ft	

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Wind Loads : ASCE 7- 16

Ultimate Wind Speed	250 mph
Nominal Wind Speed	193.6 mph
Risk Category	II
Exposure Category	D
Enclosure Classif.	Partially Enclosed
Internal pressure	+/-0.55
Directionality (Kd)	0.85
Kh case 1	1.030
Kh case 2	1.030
Type of roof	Monoslope

Topographic Factor (Kzt)

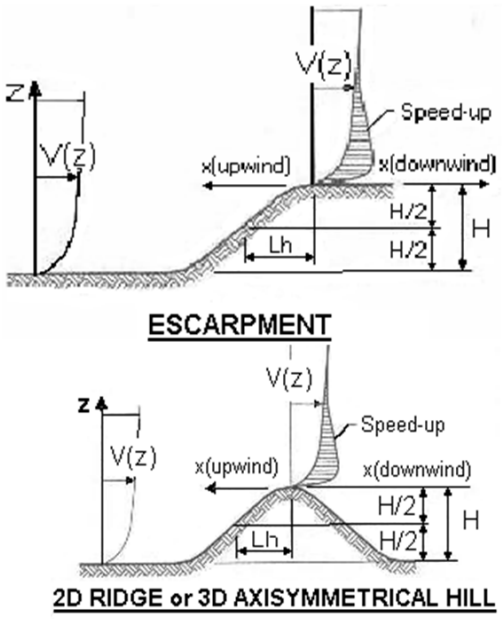
Topography		Flat
Hill Height	(H)	0.0 ft
Half Hill Length (Lh)		0.0 ft
Actual H/Lh	=	0.00
Use H/Lh	=	0.00
Modified Lh	=	0.0 ft
From top of crest: x =		0.0 ft
Bldg up/down wind?		downwind

H/Lh= 0.00 K_1 = 0.000
x/Lh = 0.00 K_2 = 0.000
z/Lh = 0.00 K_3 = 1.000

At Mean Roof Ht:

Kzt = $(1+K_1K_2K_3)^2$ = 1.00

H< 15ft;exp D
∴ Kzt=1.0



Gust Effect Factor

h = 10.5 ft
B = 8.0 ft
/z (0.6h) = 7.0 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B>4 then may be flexible and should be investigated.
h/B = 1.31

G = 0.85 Using rigid structure formula

Rigid Structure

ē =	0.13	
ℓ =	650 ft	
z_{min} =	7 ft	
c =	0.13	
g_Q, g_v =	3.4	
L_z =	535.5 ft	
Q =	0.96	
I_z =	0.16	
G =	0.91	use G = 0.85

Flexible or Dynamically Sensitive Structure

34 ncy (η_1) =	0.0 Hz			
Damping ratio (β) =	0			
/b =	0.80			
/α =	0.11			
Vz =	246.9			
N_1 =	0.00			
R_n =	0.000			
R_h =	28.282	η =	0.000	h = 10.5 ft
R_B =	28.282	η =	0.000	
R_L =	28.282	η =	0.000	
g_R =	0.000			
R =	0.000			
Gf =	0.000			

Enclosure Classification

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Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) =	1.03	h =	10.5 ft	GCpi =	+/-0.55
Base pressure (q_h) =	**140.1 psf**	ridge ht =	10.5 ft	G =	0.85
Roof Angle (θ) =	0.0 deg	L =	8.0 ft	z for qi :	10.5 ft
Roof tributary area - (h/2)*L:	42 sf	B =	8.0 ft	qi =	140.1 psf for positive internal pressures
(h/2)*B:	42 sf				

Ultimate Wind Surface Pressures (psf)

	Wind Normal to Ridge				Wind Parallel to Ridge				
	B/L = 1.00		h/L = 1.31			L/B = 1.00		h/L = 1.31	
Surface	Cp	q_hGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Dist.*	Cp	q_hGC_p	w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	95.3	see table below			0.80	95.3	see table below	
Leeward Wall (LW)	-0.50	-59.5	-136.6	17.5		-0.50	-59.5	-136.6	17.5
Side Wall (SW)	-0.70	-83.4	-160.4	-6.3		-0.70	-83.4	-160.4	-6.3
Leeward Roof (LR)		**				Included in windward roof			
Neg Windward Roof: 0 to h/2*	-1.30	-154.8	-231.9	-77.8	0 to h/2*	-1.30	-154.8	-231.9	-77.8
> h/2*	-0.70	-83.4	-160.4	-6.3	> h/2*	-0.70	-83.4	-160.4	-6.3
Pos/min windward roof press.	-0.18	-21.4	-98.5	55.6	Min press.	-0.18	-21.4	-98.5	55.6

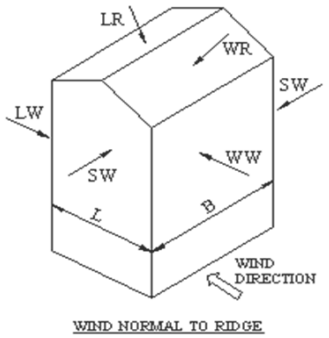
**Roof angle < 10 degrees. Therefore, leeward roof is included in windward roof pressure zones.

*Horizontal distance from windward edge

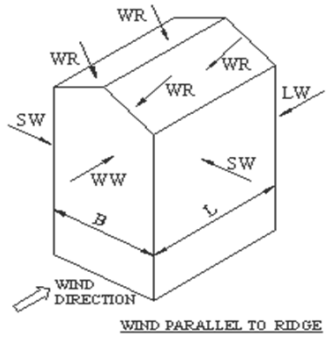
For monoslope roofs, entire roof surface is either windward or leeward surface.

Windward Wall Pressures at "z" (psf)

	z	Kz	Kzt	Windward Wall q_zGC_p	Windward Wall w/+q_iGC_{pi}	Windward Wall w/-q_hGC_{pi}	Combined WW + LW Normal to Ridge	Combined WW + LW Parallel to Ridge
h=	0 to 15'	1.03	1.00	95.3	18.2	172.3	154.8	154.8



WIND NORMAL TO RIDGE



WIND PARALLEL TO RIDGE

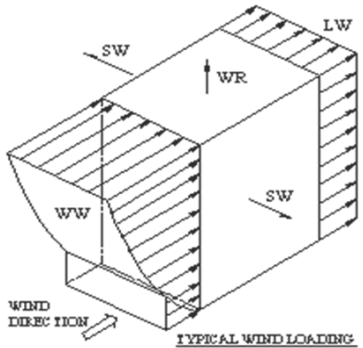
NOTE:
See figure in ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.

Parapet

z	Kz	Kzt	qp (psf)
0.0 ft	1.03	1.00	0.0

Windward parapet: 0.0 psf (GCpn = +1.5)
Leeward parapet: 0.0 psf (GCpn = -1.0)

Windward roof overhangs (add to windward roof pressure) : 95.3 psf (upward)



TYPICAL WIND LOADING

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Ultimate Wind Pressures

Wind Loads - Components & Cladding : h ≤ 60'

Kh (case 1) =	1.03	h =	10.5 ft
Base pressure (qh) =	**140.1 psf**	0.6h =	6.3 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.55
Roof Angle (θ) =	0.0 deg	qi =	140.1 psf for
Type of roof =	Monoslope		positive internal pressures

Roof

	Surface Pressure (psf)								User input	
Area	10 sf	20 sf	50 sf	100 sf	200 sf	350 sf	500 sf	1000 sf	75 sf	500 sf
Negative Zone 1	-315.3	-297.9	-274.9	-257.5	-240.1	-226.1	-217.2	-217.2	-264.7	-217.2
Negative Zone 1'	-203.2	-203.2	-203.2	-203.2	-182.1	-165.0	-154.2	-133.1	-203.2	-154.2
Negative Zone 2	-399.3	-377	-347.4	-325.1	-302.8	-284.7	-273.2	-273.2	-334.4	-273.2
Negative Zone 3	-525.4	-480.7	-421.7	-377	-332.3	-296.2	-273.2	-273.2	-395.5	-273.2
Positive All Zones	119.1	114.9	109.3	105.1	105.1	105.1	105.1	105.1	106.8	105.1
Overhang Zone 1&1'	-238.2	-234	-228.4	-224.2	-188.0	-158.7	-140.1	-140.1	-225.9	-140.1
Overhang Zone 2	-322.3	-292.5	-253.1	-223.3	-193.5	-169.5	-154.1	-154.1	-235.7	-154.1
Overhang Zone 3	-448.4	-396.2	-327.3	-275.2	-223.0	-181.0	-154.1	-154.1	-296.8	-154.1

Overhang pressures in the table above assume an internal pressure coefficient (Gcpi) of 0.0
Overhang soffit pressure equals adj wall pressure (which includes internal pressure of 77.1 psf)

Parapet

qp = 0.0 psf

		Surface Pressure (psf)						User input
Solid Parapet Pressure		10 sf	20 sf	50 sf	100 sf	200 sf	500 sf	40 sf
CASE A:	Zone 2 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi				Surface Pressure at h				User input	
Area	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf	50 sf	20 sf
Negative Zone 4	-1.54	-1.38	-1.33	-1.27	-203.2	-193.5	-186.8	-177.9	-200.2	-209.1
Negative Zone 5	-1.81	-1.49	-1.40	-1.27	-329.3	-209.1	-195.7	-177.9	-222.5	-240.2
Positive Zone 4 & 5	1.45	1.29	1.24	1.18	203.2	180.9	174.2	165.3	187.6	196.5

Note: GCp reduced by 10% due to roof angle <= 10 deg.

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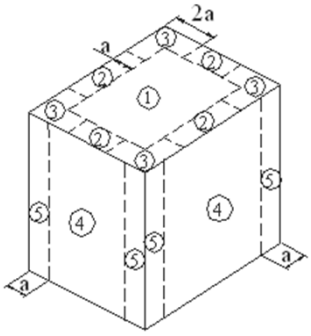
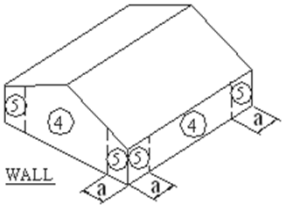
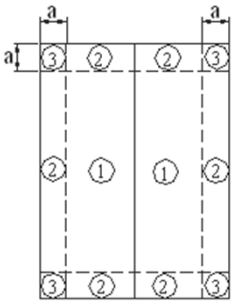
Location of C&C Wind Pressure Zones - ASCE 7-10 & earlier



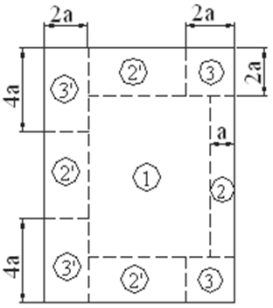
Roofs w/ θ ≤ 10°
and all walls
h > 60'



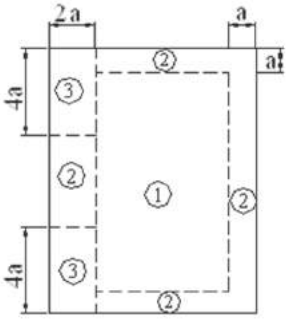
Walls h ≤ 60'
& alt design h<90'



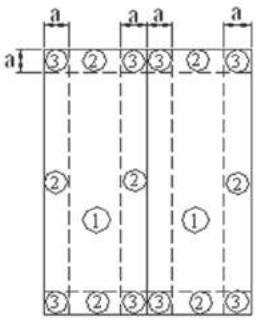
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



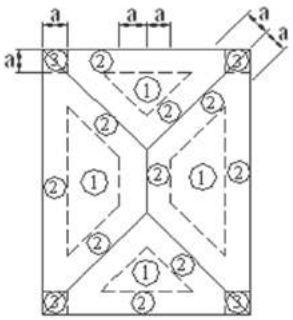
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



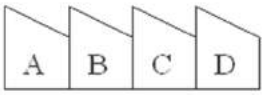
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'

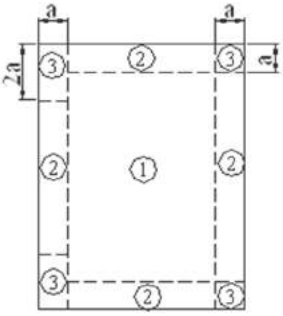


Multispan Gable &
Gable 7° < θ ≤ 45°

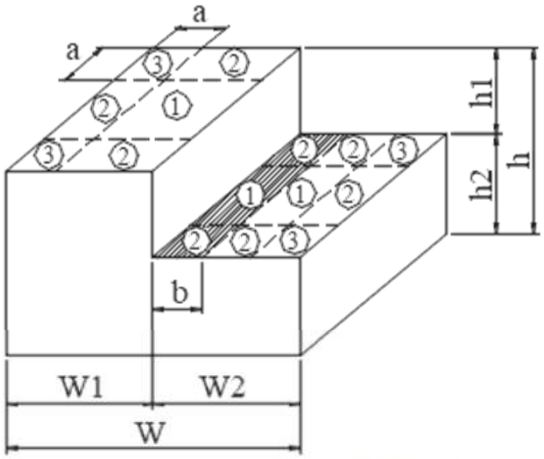


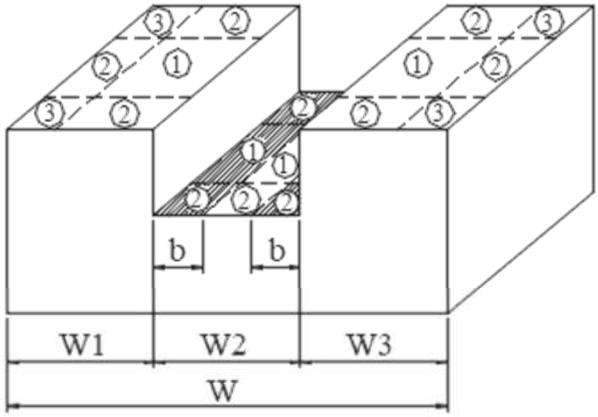
Hip 7° < θ ≤ 27°





Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

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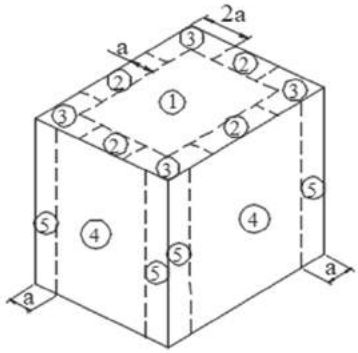
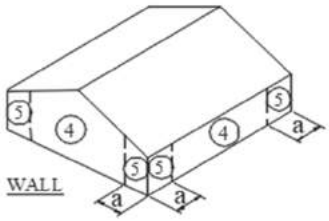
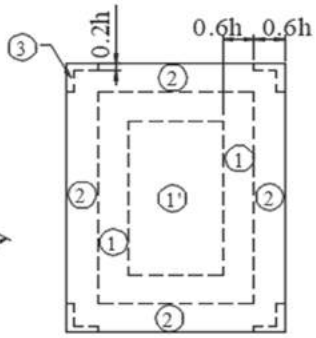
Location of C&C Wind Pressure Zones - ASCE 7-16



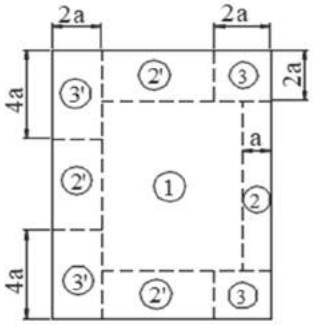
Roofs w/ θ ≤ 10°
and all walls
h > 60'



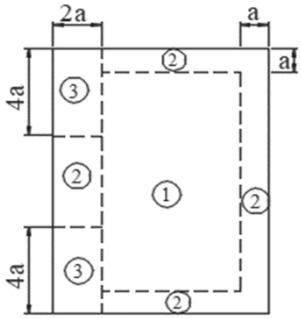
Walls h ≤ 60'
& alt design h<90'



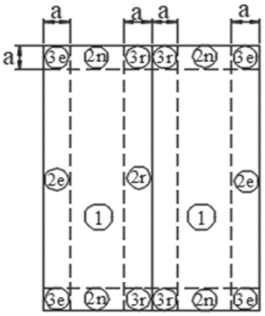
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



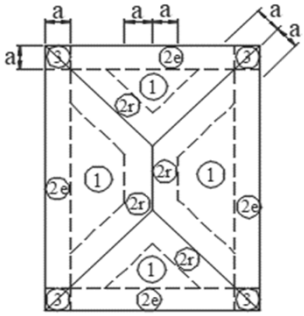
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



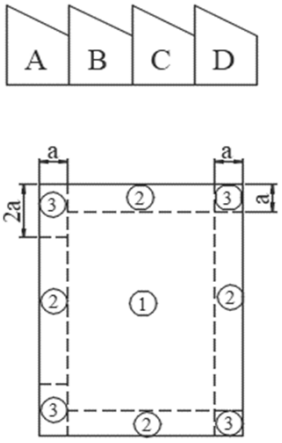
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'



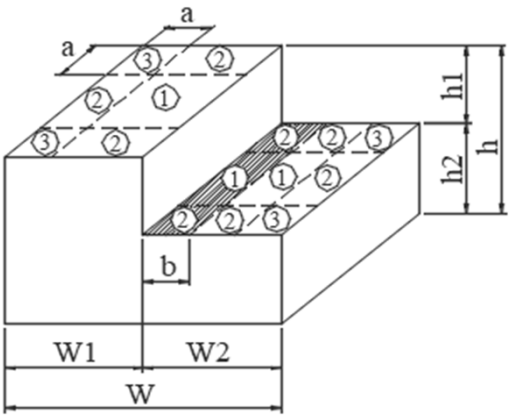
Multispan Gable &
Gable 7° < θ ≤ 45°

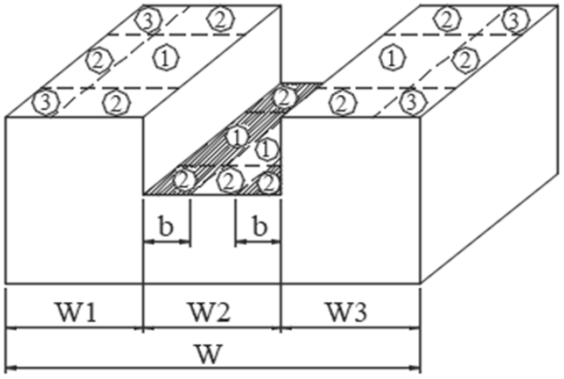


Hip 7° < θ ≤ 27°



Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





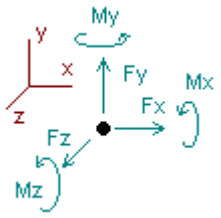
Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'

FEMA - PUERTO RICO PRESCRIPTIVE DESIGN HOUSE ELEMENTS MODEL REACTIONS FOR CONCEPT FOUNDATION MODEL ANALYSIS

Current Date: 1/10/2020 10:52 AM
Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\190 Exp D CMU Design 2 Story_with Conc Frame_6 in.etz\

Analysis result

Reactions



Direction of positive forces and moments

Vseismic = (0.2*159.4)/4 = 7.89
Therefore, Wind Controls, see reactions on pages 2-4.

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **DL=Dead Load**						
3	0.59272	10.99016	0.01747	0.00000	0.00000	0.00000
4	0.60530	6.76885	0.55404	0.00000	0.00000	0.00000
5	-0.11966	8.38738	0.11857	0.00000	0.00000	0.00000
6	1.37289	14.22302	-0.60624	0.00000	0.00000	0.00000
7	-1.43727	13.95079	-0.53806	0.00000	0.00000	0.00000
8	0.48990	15.98248	-0.76043	0.00000	0.00000	0.00000
9	-1.57726	13.35661	-0.18165	0.00000	0.00000	0.00000
26	0.34544	8.35221	0.30165	0.00000	0.00000	0.00000
80	0.49211	2.76294	-0.03738	0.00000	0.00000	0.00000
82	-0.51991	2.29466	-0.03337	0.00000	0.00000	0.00000
FEM: 115	0.52804	3.55711	-0.00486	0.00000	0.00000	0.00000
FEM: 126	-1.16321	11.52911	0.01247	0.00000	0.00000	0.00000
FEM: 138	1.79876	7.38591	0.03398	0.00000	0.00000	0.00000
FEM: 139	1.08902	8.70216	-0.16806	0.00000	0.00000	0.00000
FEM: 140	-0.30003	8.00909	-0.17125	0.00000	0.00000	0.00000
FEM: 141	-0.59781	6.42171	-0.15723	0.00000	0.00000	0.00000
FEM: 142	-1.23217	6.91681	-0.02091	0.00000	0.00000	0.00000
FEM: 180	0.03132	2.15651	-0.43795	0.00000	0.00000	0.00000
FEM: 181	0.01120	0.93070	-0.63738	0.00000	0.00000	0.00000
FEM: 182	0.01886	1.93361	-1.07404	0.00000	0.00000	0.00000
FEM: 206	-0.00521	1.18256	0.03530	0.00000	0.00000	0.00000
FEM: 97	-0.02838	0.78695	0.50263	0.00000	0.00000	0.00000
FEM: 96	-0.02262	0.18554	-0.01032	0.00000	0.00000	0.00000
FEM: 207	-0.00508	0.78699	0.40897	0.00000	0.00000	0.00000
FEM: 230	0.00009	3.69734	0.34092	0.00000	0.00000	0.00000
FEM: 247	0.07060	2.74326	-0.75073	0.00000	0.00000	0.00000
FEM: 248	0.02519	1.01480	-0.67498	0.00000	0.00000	0.00000
FEM: 249	-0.04304	2.19392	-0.33421	0.00000	0.00000	0.00000
FEM: 274	0.17621	0.31470	0.00731	0.00000	0.00000	0.00000
FEM: 329	0.25666	2.57940	-0.01992	0.00000	0.00000	0.00000
FEM: 330	-0.17447	2.37603	-0.00902	0.00000	0.00000	0.00000
FEM: 331	-0.48693	1.72236	0.01264	0.00000	0.00000	0.00000
SUM	0.19126	174.19567	-4.28202	0.00000	0.00000	0.00000

	Fx	Fy	Fz			
Condition **WLX=Wind Load X**						
3	-1.31961	-8.78349	-0.63455	0.00000	0.00000	0.00000
4	-0.39102	-2.23311	0.16843	0.00000	0.00000	0.00000
5	0.00631	-1.19063	0.72218	0.00000	0.00000	0.00000
6	-1.89598	-12.13287	0.22589	0.00000	0.00000	0.00000
7	-0.33855	-4.18068	0.37804	0.00000	0.00000	0.00000
8	-1.06336	-11.89495	0.30867	0.00000	0.00000	0.00000
9	-0.21575	0.24553	-0.77607	0.00000	0.00000	0.00000
26	-0.48307	-11.26926	-0.68961	0.00000	0.00000	0.00000
80	-0.21981	-1.45457	0.73670	0.00000	0.00000	0.00000
82	0.12716	-0.59310	1.27424	0.00000	0.00000	0.00000
FEM: 115	-0.32109	-0.90660	0.38973	0.00000	0.00000	0.00000
FEM: 126	-0.86731	-4.14990	-0.56831	0.00000	0.00000	0.00000
FEM: 138	-3.44926	-5.01774	-0.98345	0.00000	0.00000	0.00000
FEM: 139	-2.66472	-5.11156	-1.60712	0.00000	0.00000	0.00000
FEM: 140	-1.72839	-4.00557	-1.12692	0.00000	0.00000	0.00000
FEM: 141	-2.09388	-4.26240	-1.24288	0.00000	0.00000	0.00000
FEM: 142	-1.25168	-4.66269	-0.87158	0.00000	0.00000	0.00000
FEM: 180	0.01442	-1.73802	-0.51719	0.00000	0.00000	0.00000
FEM: 181	-0.15527	-0.73938	-0.60384	0.00000	0.00000	0.00000
FEM: 182	-0.07498	-0.88375	-0.29131	0.00000	0.00000	0.00000
FEM: 206	-0.03948	-1.43569	-0.19612	0.00000	0.00000	0.00000
FEM: 97	-0.13473	-1.28462	-0.44019	0.00000	0.00000	0.00000
FEM: 96	-0.11517	-0.84198	0.47395	0.00000	0.00000	0.00000
FEM: 207	0.00511	-0.41247	0.60634	0.00000	0.00000	0.00000
FEM: 230	-0.55664	-3.78997	-1.04429	0.00000	0.00000	0.00000
FEM: 247	-0.22664	-1.27486	-0.19088	0.00000	0.00000	0.00000
FEM: 248	-0.42021	-1.05213	-0.98207	0.00000	0.00000	0.00000
FEM: 249	-0.59739	-3.55325	-1.14588	0.00000	0.00000	0.00000
FEM: 274	-0.12288	-0.10390	-0.28754	0.00000	0.00000	0.00000
FEM: 329	-0.42691	-2.45071	0.63101	0.00000	0.00000	0.00000
FEM: 330	-0.07094	-1.63202	0.66257	0.00000	0.00000	0.00000
FEM: 331	-0.03854	-0.91840	0.65150	0.00000	0.00000	0.00000
SUM	-21.13026	-103.71474	-6.97055	0.00000	0.00000	0.00000
Condition **WLZ=Wind Load Z**						
3	1.11964	-2.46496	-3.71761	0.00000	0.00000	0.00000
4	-0.09028	-10.06238	-2.30776	0.00000	0.00000	0.00000
5	0.08272	-0.42898	-0.86147	0.00000	0.00000	0.00000
6	0.13545	12.17977	-1.24812	0.00000	0.00000	0.00000
7	0.98828	10.74682	-1.31699	0.00000	0.00000	0.00000
8	-0.16195	-1.24925	-2.26792	0.00000	0.00000	0.00000
9	0.22306	-2.41588	-0.29670	0.00000	0.00000	0.00000
26	0.02468	-14.39751	-2.76074	0.00000	0.00000	0.00000
80	-0.45496	-2.40802	-1.15776	0.00000	0.00000	0.00000
82	0.26116	-0.49433	-1.38118	0.00000	0.00000	0.00000
FEM: 115	0.14430	-1.20652	-0.46177	0.00000	0.00000	0.00000
FEM: 126	-0.12128	-1.12179	-0.08904	0.00000	0.00000	0.00000
FEM: 138	0.40120	1.15283	-0.16221	0.00000	0.00000	0.00000
FEM: 139	0.64964	-1.10945	-0.51394	0.00000	0.00000	0.00000
FEM: 140	1.03975	-1.82778	-0.37292	0.00000	0.00000	0.00000
FEM: 141	1.49065	-0.50978	-0.40465	0.00000	0.00000	0.00000
FEM: 142	1.55186	1.18376	-0.22695	0.00000	0.00000	0.00000
FEM: 180	-0.14983	-4.43424	-3.77313	0.00000	0.00000	0.00000
FEM: 181	-0.22822	-3.22838	-5.75676	0.00000	0.00000	0.00000
FEM: 182	-0.07933	1.37169	-5.56743	0.00000	0.00000	0.00000
FEM: 206	-0.07440	-4.11391	0.85686	0.00000	0.00000	0.00000
FEM: 97	-0.08957	-3.22394	0.08973	0.00000	0.00000	0.00000
FEM: 96	0.03881	5.64325	-2.03807	0.00000	0.00000	0.00000

	Fx	Fy	Fz			
FEM: 207	-0.09132	4.65481	-2.28769	0.00000	0.00000	0.00000
FEM: 230	0.51413	-1.41558	-7.48293	0.00000	0.00000	0.00000
FEM: 247	0.19556	3.29096	-3.32623	0.00000	0.00000	0.00000
FEM: 248	0.29343	-0.46941	-4.98000	0.00000	0.00000	0.00000
FEM: 249	0.17076	-3.90665	-3.02236	0.00000	0.00000	0.00000
FEM: 274	-0.26739	-0.38583	0.62736	0.00000	0.00000	0.00000
FEM: 329	0.69835	-2.97656	-0.65830	0.00000	0.00000	0.00000
FEM: 330	0.55239	-1.54864	-0.72316	0.00000	0.00000	0.00000
FEM: 331	0.36339	-0.72505	-0.71957	0.00000	0.00000	0.00000
SUM	9.13067	-25.90094	-58.30941	0.00000	0.00000	0.00000

Condition **RLL=Roof Live Load**

3	0.00168	0.07888	-0.01319	0.00000	0.00000	0.00000
4	0.01396	0.14387	0.00363	0.00000	0.00000	0.00000
5	-0.00596	0.18437	-0.00018	0.00000	0.00000	0.00000
6	0.14736	0.80433	-0.00140	0.00000	0.00000	0.00000
7	-0.15891	0.85054	-0.00388	0.00000	0.00000	0.00000
8	0.01810	0.23304	-0.00663	0.00000	0.00000	0.00000
9	-0.01433	0.21970	0.00047	0.00000	0.00000	0.00000
26	0.03802	0.51728	-0.00926	0.00000	0.00000	0.00000
80	0.01206	0.06748	-0.00016	0.00000	0.00000	0.00000
82	-0.04088	0.13491	0.00017	0.00000	0.00000	0.00000
FEM: 115	0.00901	0.07680	-0.00003	0.00000	0.00000	0.00000
FEM: 126	0.00433	0.17596	0.00032	0.00000	0.00000	0.00000
FEM: 138	0.20401	0.56465	0.00009	0.00000	0.00000	0.00000
FEM: 139	0.12084	0.75020	0.00033	0.00000	0.00000	0.00000
FEM: 140	-0.03542	0.71225	0.00031	0.00000	0.00000	0.00000
FEM: 141	-0.07986	0.53274	0.00033	0.00000	0.00000	0.00000
FEM: 142	-0.16078	0.53821	0.00003	0.00000	0.00000	0.00000
FEM: 180	-0.00041	0.14164	0.02629	0.00000	0.00000	0.00000
FEM: 181	-0.00020	0.05827	0.02277	0.00000	0.00000	0.00000
FEM: 182	0.00027	0.03060	0.00159	0.00000	0.00000	0.00000
FEM: 206	0.00014	0.01950	0.00285	0.00000	0.00000	0.00000
FEM: 97	0.00011	0.01570	0.00672	0.00000	0.00000	0.00000
FEM: 96	0.00014	0.02113	-0.00585	0.00000	0.00000	0.00000
FEM: 207	0.00003	0.03330	0.00044	0.00000	0.00000	0.00000
FEM: 230	0.00010	0.11457	-0.04936	0.00000	0.00000	0.00000
FEM: 247	0.00001	0.02863	-0.00697	0.00000	0.00000	0.00000
FEM: 248	0.00014	0.04527	0.01395	0.00000	0.00000	0.00000
FEM: 249	0.00040	0.14116	0.03275	0.00000	0.00000	0.00000
FEM: 274	0.00341	0.00558	0.00050	0.00000	0.00000	0.00000
FEM: 329	0.03286	0.17094	-0.00005	0.00000	0.00000	0.00000
FEM: 330	-0.00866	0.15992	-0.00005	0.00000	0.00000	0.00000
FEM: 331	-0.03777	0.10660	-0.00007	0.00000	0.00000	0.00000
SUM	0.06379	7.67802	0.01647	0.00000	0.00000	0.00000

Condition **EQX=Earthquake X**

4	-7.98000	0.00000	0.00000	0.00000	0.00000	0.00000
6	-7.98000	0.00000	0.00000	0.00000	0.00000	0.00000
7	-7.98000	0.00000	0.00000	0.00000	0.00000	0.00000
26	-7.98000	0.00000	0.00000	0.00000	0.00000	0.00000
SUM	-31.92000	0.00000	0.00000	0.00000	0.00000	0.00000

	Fx	Fy	Fz			
Condition	**EQZ=Earthquake Z**					
4	0.00000	0.00000	-7.98000	0.00000	0.00000	0.00000
6	0.00000	0.00000	-7.98000	0.00000	0.00000	0.00000
7	0.00000	0.00000	-7.98000	0.00000	0.00000	0.00000
26	0.00000	0.00000	-7.98000	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	-31.92000	0.00000	0.00000	0.00000

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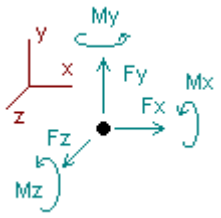
Analysis result

Reactions



Direction of positive forces and moments

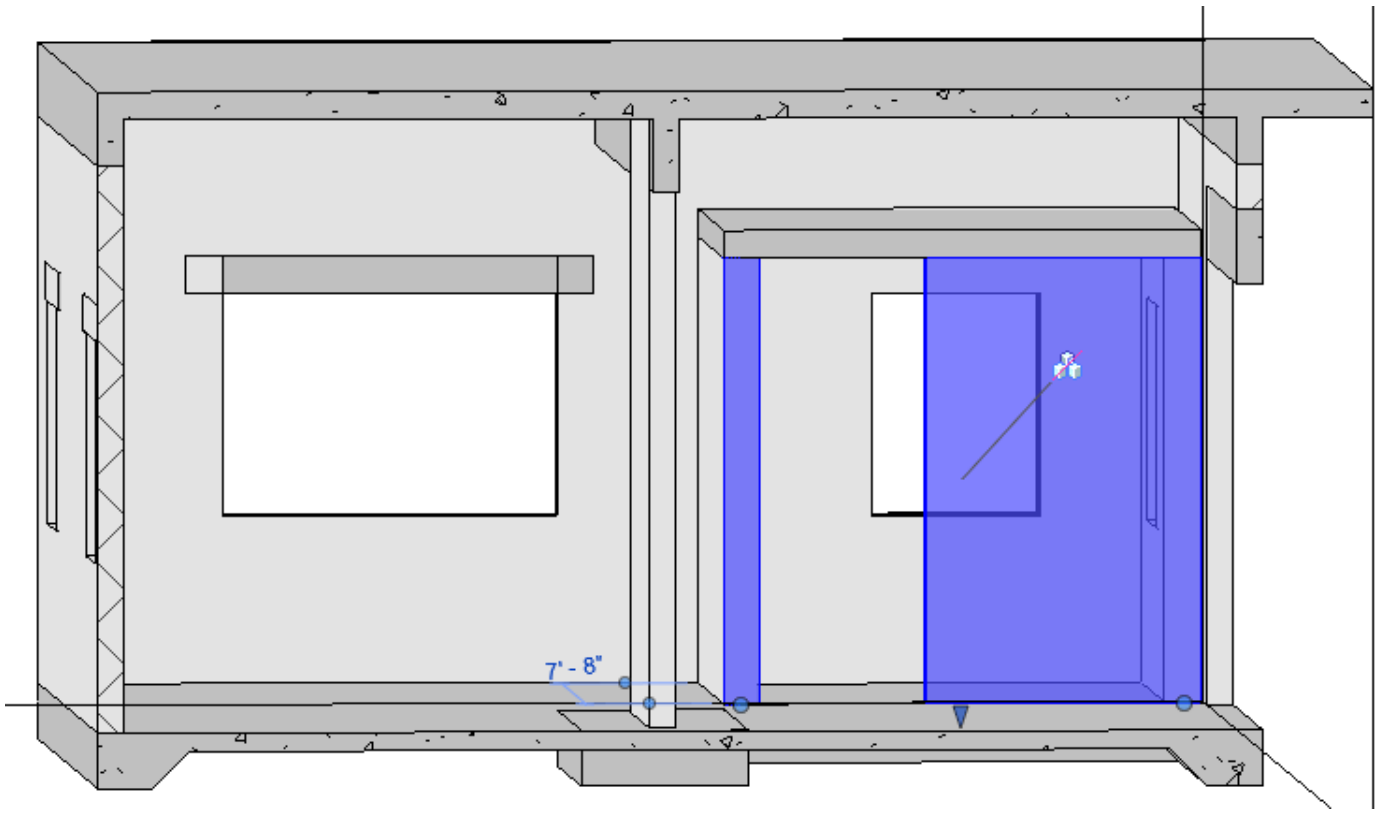
	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **DL=Dead Load**						
1	0.18734	4.02866	0.27239	0.00000	0.00000	0.00000
2	-0.01341	3.20992	0.41279	0.00000	0.00000	0.00000
3	0.12909	4.85453	-0.45545	0.00000	0.00000	0.00000
4	-0.12947	4.86026	-0.30572	0.00000	0.00000	0.00000
FEM: 37	-0.23416	1.70485	0.00145	0.00000	0.00000	0.00000
FEM: 49	0.06496	2.24651	0.00144	0.00000	0.00000	0.00000
FEM: 66	-0.00150	3.31514	-0.11342	0.00000	0.00000	0.00000
FEM: 78	0.00263	3.26716	0.18714	0.00000	0.00000	0.00000
FEM: 87	-0.00548	2.28515	-0.00061	0.00000	0.00000	0.00000
SUM	0.00000	29.77219	0.00000	0.00000	0.00000	0.00000
Condition **LLR=Roof Live Load**						
1	0.00082	0.49748	0.03805	0.00000	0.00000	0.00000
2	-0.00894	0.48629	0.12230	0.00000	0.00000	0.00000
3	0.00483	0.82709	-0.12027	0.00000	0.00000	0.00000
4	-0.00309	0.82849	-0.06666	0.00000	0.00000	0.00000
FEM: 37	-0.01920	0.45542	0.00121	0.00000	0.00000	0.00000
FEM: 49	0.03278	0.42183	0.00028	0.00000	0.00000	0.00000
FEM: 66	-0.00045	0.56592	-0.06232	0.00000	0.00000	0.00000
FEM: 78	0.00110	0.51180	0.08726	0.00000	0.00000	0.00000
FEM: 87	-0.00782	0.20542	0.00016	0.00000	0.00000	0.00000
SUM	0.00000	4.79974	0.00000	0.00000	0.00000	0.00000
Condition **WL_X=Wind Load X Direction**						
1	-0.78348	-3.79331	-0.06676	0.00000	0.00000	0.00000
2	-1.44013	-2.47821	-0.59015	0.00000	0.00000	0.00000
3	-0.65580	-5.13656	-0.42561	0.00000	0.00000	0.00000
4	-0.98921	1.44207	-0.79909	0.00000	0.00000	0.00000
FEM: 37	-0.21276	1.63041	1.17371	0.00000	0.00000	0.00000
FEM: 49	-1.16868	-0.90809	0.89351	0.00000	0.00000	0.00000
FEM: 66	-1.10344	-1.45118	-0.95556	0.00000	0.00000	0.00000
FEM: 78	-0.53389	-2.83896	0.80355	0.00000	0.00000	0.00000
FEM: 87	-2.55238	-1.31337	-1.47719	0.00000	0.00000	0.00000
SUM	-9.43976	-14.84720	-1.44360	0.00000	0.00000	0.00000

	Fx	Fy	Fz			
Condition	**WL_Z=Wind Load Z Direction**					
1	-0.20559	-3.46858	-1.02095	0.00000	0.00000	0.00000
2	-0.04643	-2.31591	-0.52930	0.00000	0.00000	0.00000
3	-0.02989	2.30118	-1.02889	0.00000	0.00000	0.00000
4	0.06904	0.65647	-0.60250	0.00000	0.00000	0.00000
FEM: 37	0.06367	-0.35633	-1.29766	0.00000	0.00000	0.00000
FEM: 49	-0.06756	-1.05013	-0.95843	0.00000	0.00000	0.00000
FEM: 66	-0.10441	-0.37238	-0.97496	0.00000	0.00000	0.00000
FEM: 78	0.32282	-0.55970	-2.58594	0.00000	0.00000	0.00000
FEM: 87	-0.00164	0.17364	-0.11237	0.00000	0.00000	0.00000
SUM	0.00000	-4.99173	-9.11100	0.00000	0.00000	0.00000
Condition	**EQ_X=Earthquake Load X Direction**					
1	-1.40000	0.00000	0.00000	0.00000	0.00000	0.00000
2	-1.40000	0.00000	0.00000	0.00000	0.00000	0.00000
3	-1.40000	0.00000	0.00000	0.00000	0.00000	0.00000
4	-1.40000	0.00000	0.00000	0.00000	0.00000	0.00000
SUM	-5.60000	0.00000	0.00000	0.00000	0.00000	0.00000
Condition	**EQ_Z=Earthquake Load Z Direction**					
1	0.00000	0.00000	-1.40000	0.00000	0.00000	0.00000
2	0.00000	0.00000	-1.40000	0.00000	0.00000	0.00000
3	0.00000	0.00000	-1.40000	0.00000	0.00000	0.00000
4	0.00000	0.00000	-1.40000	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	-5.60000	0.00000	0.00000	0.00000

FEMA - PUERTO RICO PRESCRIPTIVE DESIGN HOUSE
8" SAFE ROOM CMU AND 6" CMU EXTERIOR WALL DESIGN

PR FEMA SAFE ROOM WALL DESIGN

PR FEMA HOUSE SAFE ROOM
DOOR WALL DESIGN



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Design Results

Masonry wall

GENERAL INFORMATION:

Global status : Warnings in design

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	8.50 [ft]
Total length	:	8.00 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Full grouting
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	8.50	7.63	0.14

Openings:

Reference	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
Lower left	0.00	0.00	3.00	7.00

Flanges:

Distance [ft]	Thickness [in]	Width [ft]	Position X	Position Z
0.00	7.63	2.81	Centered	Back
8.00	7.63	2.81	Centered	Back

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WLx	No	WIND	Wind Load in X
WLz	No	WIND	Wind Load in Z
EQx	No	EARTH	Earthquake in X
EQz	No	EARTH	Earthquake in Z
SM1	Yes		DL
DM1	Yes		DL
D1	Yes		1.4DL
D2	Yes		1.2DL+1.6LL
D3	Yes		1.2DL+0.5LLR
D4	Yes		1.2DL+1.6LL+0.5LLR
D5	Yes		1.2DL+1.6LL+0.5LLR+1.6EQx+1.6EQz
D6	Yes		1.2DL+1.6LL+0.5LLR+0.9EQx+0.9EQz
D7	Yes		1.2DL+1.6LLR
D8	Yes		1.2DL+0.5WLx
D9	Yes		1.2DL+0.5WLz
D10	Yes		1.2DL+1.6LLR+LL
D11	Yes		1.2DL+1.6LLR+0.5WLx
D12	Yes		1.2DL+1.6LLR+0.5WLz
D13	Yes		1.2DL+WLx
D14	Yes		1.2DL+WLz
D15	Yes		1.2DL+WLx+0.5LLR
D16	Yes		1.2DL+WLz+0.5LLR
D17	Yes		1.2DL+WLx+LL
D18	Yes		1.2DL+WLz+LL
D19	Yes		1.2DL+WLx+LL+0.5LLR
D20	Yes		1.2DL+WLz+LL+0.5LLR
D21	Yes		0.9DL+WLx
D22	Yes		0.9DL+WLz
D23	Yes		0.9DL+WLx+1.6EQx+1.6EQz
D24	Yes		0.9DL+WLz+1.6EQx+1.6EQz
D25	Yes		0.9DL+WLx+0.9EQx+0.9EQz
D26	Yes		0.9DL+WLz+0.9EQx+0.9EQz
D27	Yes		DL
D28	Yes		DL+LL
D29	Yes		DL+LL+EQx+EQz
D30	Yes		DL+LL+0.6EQx+0.6EQz
D31	Yes		DL+LLR
D32	Yes		DL+0.75LL
D33	Yes		DL+0.75LLR
D34	Yes		DL+0.75LL+0.75LLR
D35	Yes		DL+0.6WLx
D36	Yes		DL+0.6WLz
D37	Yes		DL+0.75LL+0.45WLx+0.75LLR
D38	Yes		DL+0.75LL+0.45WLz+0.75LLR
D39	Yes		DL+0.75LL+0.45WLx
D40	Yes		DL+0.75LL+0.45WLz
D41	Yes		DL+0.45WLx+0.75LLR
D42	Yes		DL+0.45WLz+0.75LLR
D43	Yes		0.6DL+0.6WLx
D44	Yes		0.6DL+0.6WLz

D45	Yes	0.6DL+0.6WLx+EQx+EQz
D46	Yes	0.6DL+0.6WLz+EQx+EQz
D47	Yes	0.6DL+0.6WLx+0.6EQx+0.6EQz
D48	Yes	0.6DL+0.6WLz+0.6EQx+0.6EQz
S1	Yes	DL
S2	Yes	DL+LL
S3	Yes	DL+LL+EQx+EQz
S4	Yes	DL+LL+0.6EQx+0.6EQz
S5	Yes	DL+LLR
S6	Yes	DL+0.75LL
S7	Yes	DL+0.75LLR
S8	Yes	DL+0.75LL+0.75LLR
S9	Yes	DL+0.6WLx
S10	Yes	DL+0.6WLz
S11	Yes	DL+0.75LL+0.45WLx+0.75LLR
S12	Yes	DL+0.75LL+0.45WLz+0.75LLR
S13	Yes	0.6DL+0.6WLx
S14	Yes	0.6DL+0.6WLz
S15	Yes	0.6DL+0.6WLx+EQx+EQz
S16	Yes	0.6DL+0.6WLz+EQx+EQz
S17	Yes	0.6DL+0.6WLx+0.6EQx+0.6EQz
S18	Yes	0.6DL+0.6WLz+0.6EQx+0.6EQz

Distributed loads:

Consider self weight : No

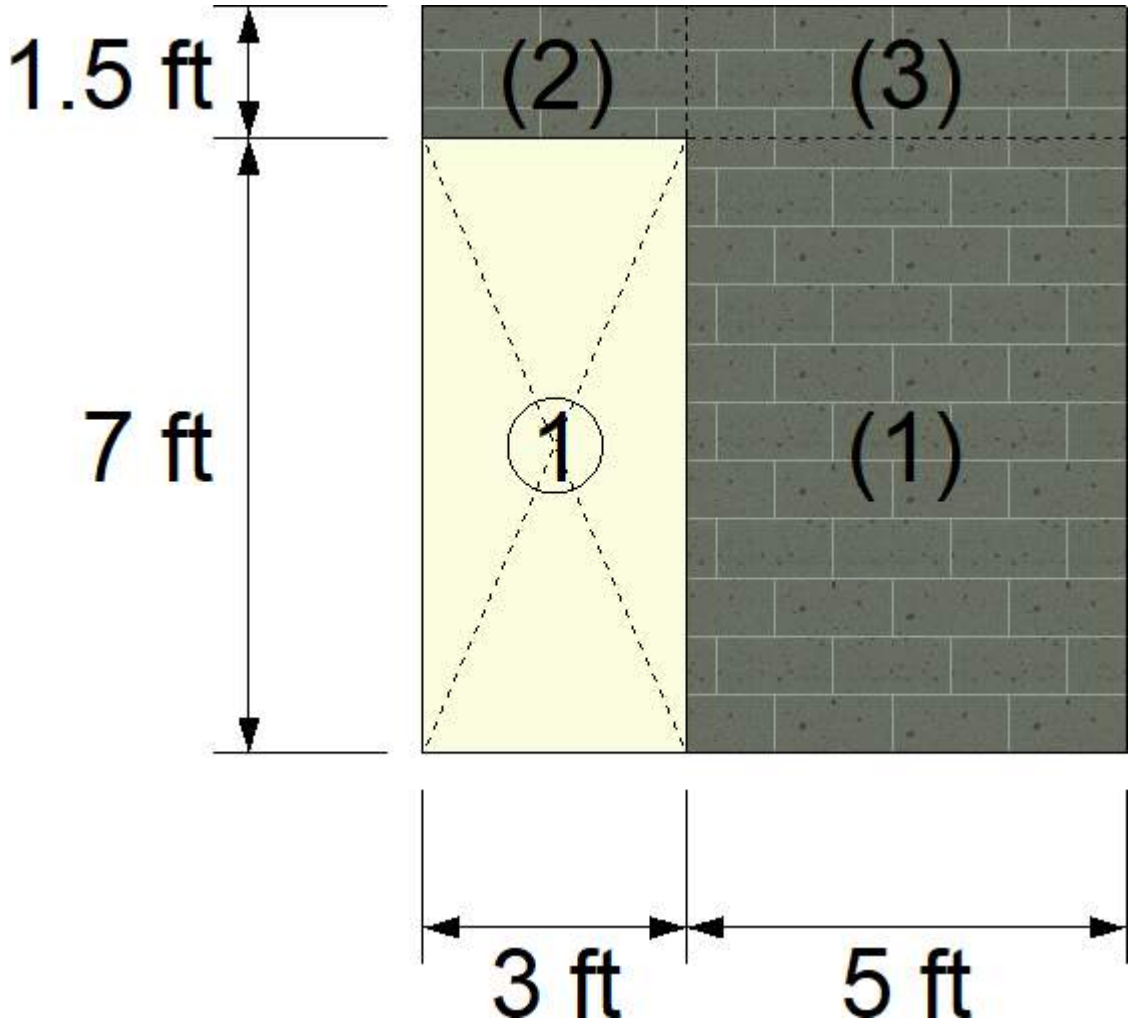
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.30	0.00
1	LLR	Vertical	0.30	0.00
1	WLx	Vertical	-0.93	0.00
1	WLz	Vertical	-0.31	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WLx	0.16
1	WLz	-0.17
Parapet	WLx	0.16
Parapet	WLz	-0.17

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	3.00	0.00	5.00	7.00
2	0.00	7.00	3.00	1.50
3	3.00	7.00	5.00	1.50

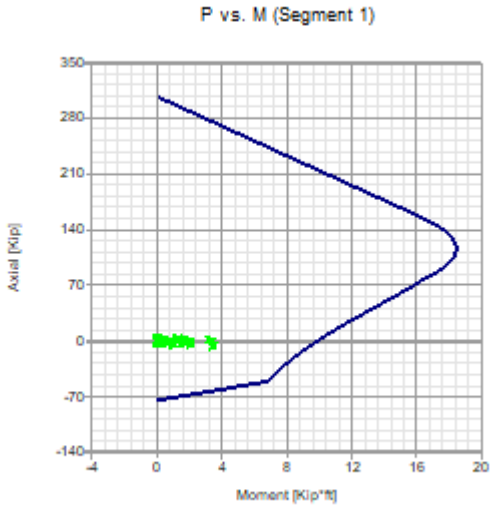
Vertical reinforcement:

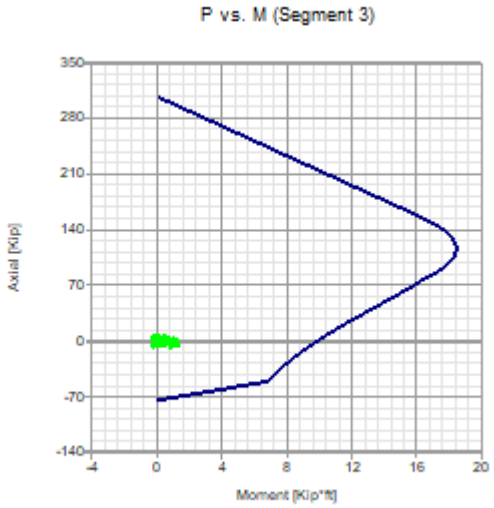
Segment	Bars	Spacing [in]	Ld [in]
1	8-#5	8.00	39.33
2	4-#5	8.00	39.33
3	8-#5	8.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D15(Max)	-5.28	-3.53	9.49	0.37
2	D11(Max)	1.50	-0.29	6.03	0.05
3	D15(Max)	-2.75	-1.22	9.67	0.13

Interaction diagrams, P vs. M:





Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D10(Top)	4.11	152.11	0.03
2	D7(Max)	2.29	91.27	0.03
3	D10(Max)	4.22	152.11	0.03

Results: Axial tension

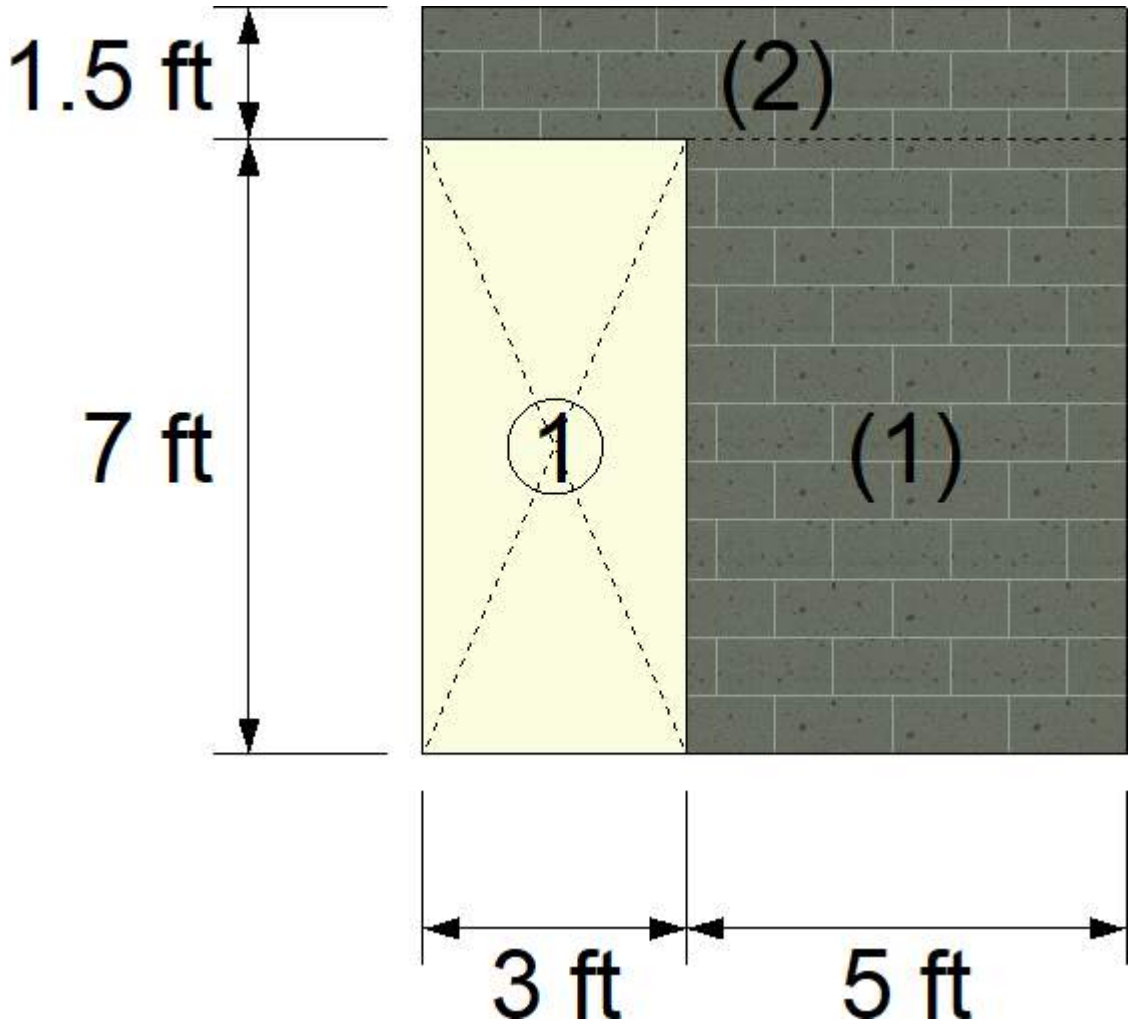
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D25(Max)	2671.73	32000.00	0.08
2	D25(Top)	1691.98	32000.00	0.05
3	D25(Bottom)	2071.16	32000.00	0.06

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D15(Bottom)	14.565	68.086	0.21
2	D20(Max)	5.938	47.460	0.13
3	D15(Max)	6.117	43.571	0.14

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	3.00	0.00	5.00	7.00
2	0.00	7.00	8.00	1.50

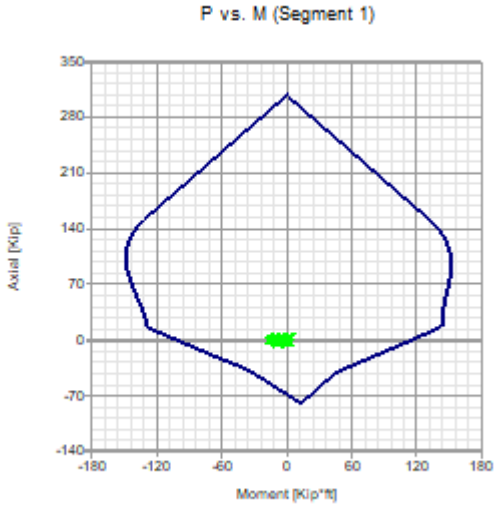
Reinforcement:

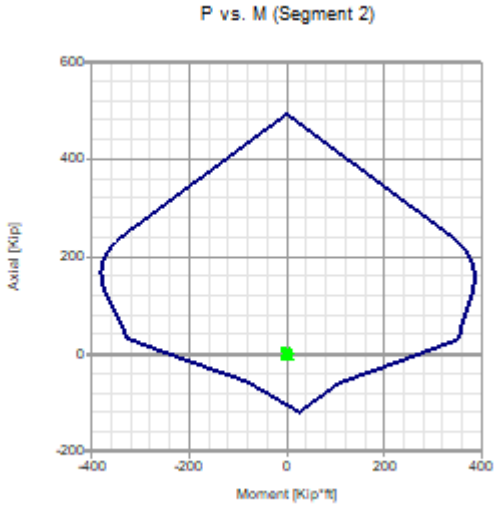
	Vertical reinforcement			Horizontal reinforcement		
Segment	**Bars**	**Spacing [in]**	**Ld [in]**	**Bars**	**Spacing [in]**	**Ld [in]**
1	8-#5	8.00	0.00	11-W2.8	8.00	9.02
2	4-#5	8.00	0.00	2-W2.8	8.00	9.02
	8-#5	8.00	0.00	2-W2.8	8.00	9.02

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D19(Bottom)	-0.93	-16.38	100.02	0.16
2	D15(Bottom)	-3.88	5.85	261.52	0.02

Interaction diagrams, P vs. M:





Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D10(Top)	4.19	152.06	0.03
2	D7(Max)	6.31	243.38	0.03

Results: Axial tension

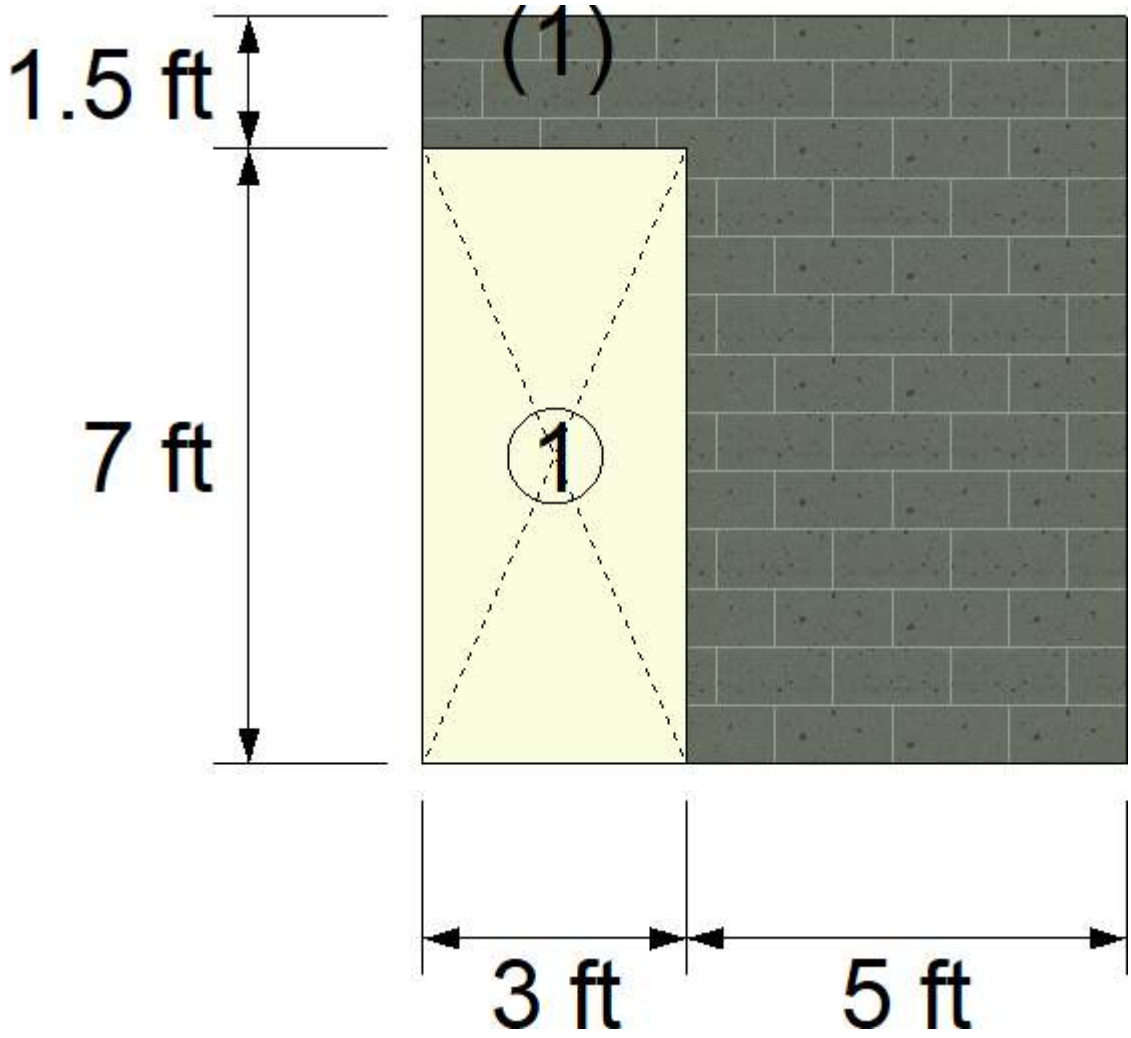
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D25(Top)	1951.97	32000.00	0.06
2	D25(Top)	1674.83	32000.00	0.05

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D11(Bottom)	20.242	40.669	0.50
2	D12(Max)	2.894	51.395	0.06

LINTEL DESIGN:

Status : Warnings in design
- Insufficient development length, TMS 402-11 ASD, 8.1.6 (Lintel 1)



Geometry:

Lintel	X Coordinate [ft]	Y Coordinate [ft]	Length [ft]	Depth [in]
1	0.00	0.00	3.00	16.00

Reinforcement:

Lintel	Top long. reinforcement Bars	Top long. reinforcement Extent [in]	Bottom long. reinforcement Bars	Bottom long. reinforcement Extent [in]	Transverse reinforcement Bars	Transverse reinforcement Spacing [in]	Ld [in]
1	1-#5	0.00	1-#5	0.00	--	0.00	0.00

Results: Bending

Lintel	Condition	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D25(Bottom)	-0.68	10.19	0.07

Results: Shear

Lintel	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D15(Top)	38.499	43.571	0.88

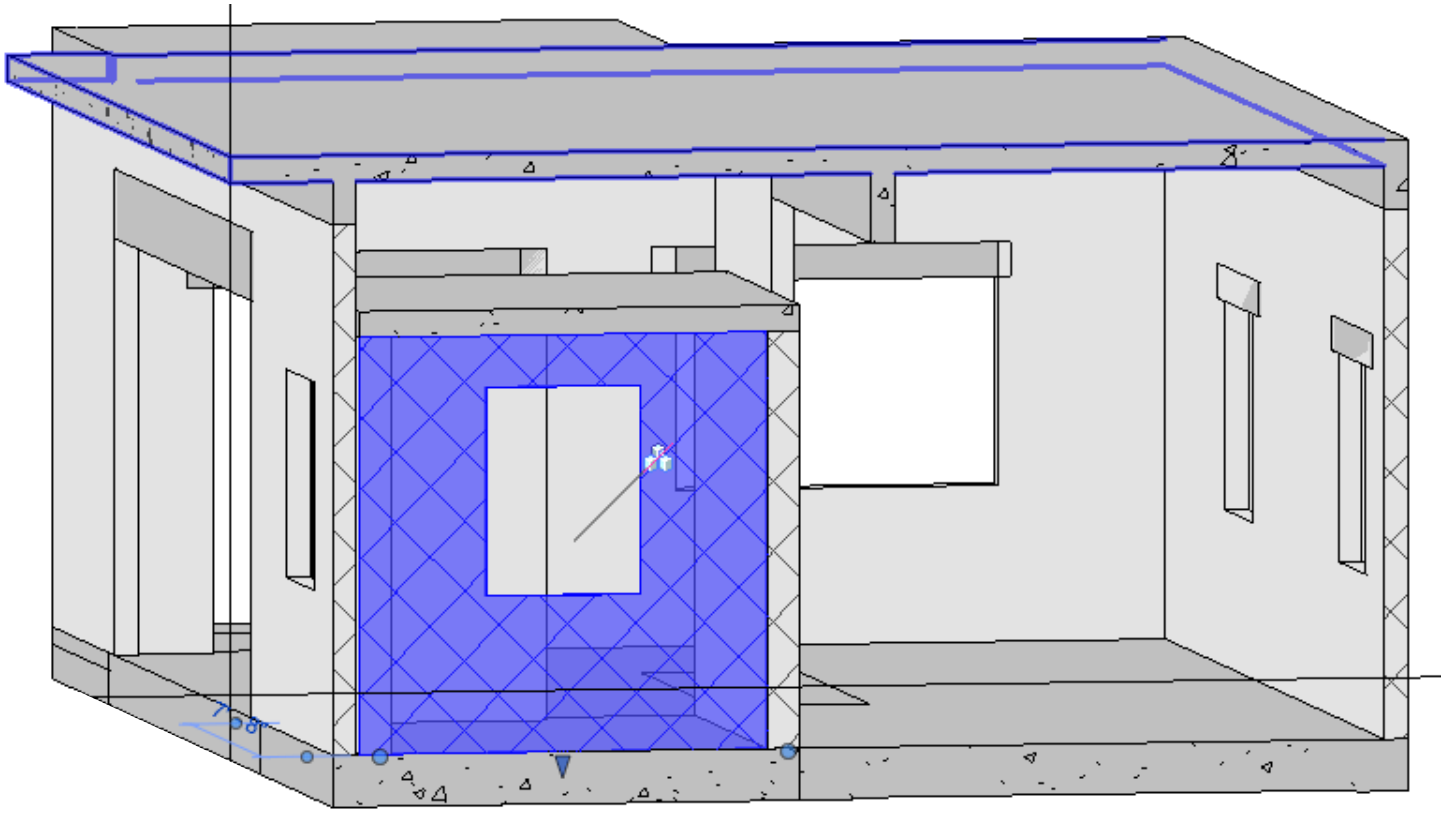
Results: Deflection

Lintel	Condition	δs [in]	δmax [in]	Ratio
1		0.00	0.00	0.00

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE SAFE ROOM
WINDOW WALL DESIGN



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Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	8.50 [ft]
Total length	:	8.00 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Full grouting
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	8.50	7.63	0.14

Openings:

Reference	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
Lower left	2.50	3.00	3.00	4.00

Flanges:

Distance [ft]	Thickness [in]	Width [ft]	Position X	Position Z
0.00	7.63	2.81	Centered	Front
8.00	7.63	2.81	Centered	Front

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
RLL	No	LLR	Roof Live Load
WLx	No	WIND	Wind Load in X
WLz	No	WIND	Wind Load in Z
EQx	No	EQ	Earthquake in X
EQz	No	EQ	Earthquake in Z
SM1	Yes		DL
DM1	Yes		DL
D1	Yes		1.4DL
D2	Yes		1.2DL+1.6LL
D3	Yes		1.2DL+0.5RLL
D4	Yes		1.2DL+1.6LL+0.5RLL
D5	Yes		1.2DL+1.6RLL
D6	Yes		1.2DL+0.5WLx
D7	Yes		1.2DL+0.5WLz
D8	Yes		1.2DL+1.6RLL+LL
D9	Yes		1.2DL+1.6RLL+0.5WLx
D10	Yes		1.2DL+1.6RLL+0.5WLz
D11	Yes		1.2DL+WLx
D12	Yes		1.2DL+WLz
D13	Yes		1.2DL+WLx+0.5RLL
D14	Yes		1.2DL+WLz+0.5RLL
D15	Yes		1.2DL+WLx+LL
D16	Yes		1.2DL+WLz+LL
D17	Yes		1.2DL+WLx+LL+0.5RLL
D18	Yes		1.2DL+WLz+LL+0.5RLL
D19	Yes		1.2DL+EQx
D20	Yes		1.2DL+EQz
D21	Yes		1.2DL+EQx+LL
D22	Yes		1.2DL+EQz+LL
D23	Yes		0.9DL+WLx
D24	Yes		0.9DL+WLz
D25	Yes		0.9DL+EQx
D26	Yes		0.9DL+EQz
D27	Yes		DL
D28	Yes		DL+LL
D29	Yes		DL+RLL
D30	Yes		DL+0.75LL
D31	Yes		DL+0.75RLL
D32	Yes		DL+0.75LL+0.75RLL
D33	Yes		DL+0.6WLx
D34	Yes		DL+0.6WLz
D35	Yes		DL+0.7EQx
D36	Yes		DL+0.7EQz
D37	Yes		DL+0.75LL+0.45WLx+0.75RLL
D38	Yes		DL+0.75LL+0.45WLz+0.75RLL
D39	Yes		DL+0.75LL+0.45WLx
D40	Yes		DL+0.75LL+0.45WLz
D41	Yes		DL+0.45WLx+0.75RLL
D42	Yes		DL+0.45WLz+0.75RLL
D43	Yes		DL+0.75LL+0.525EQx
D44	Yes		DL+0.75LL+0.525EQz

D45	Yes	DL+0.525EQx
D46	Yes	DL+0.525EQz
D47	Yes	0.6DL+0.6WLx
D48	Yes	0.6DL+0.6WLz
D49	Yes	0.6DL+0.7EQx
D50	Yes	0.6DL+0.7EQz
S1	Yes	DL
S2	Yes	DL+LL
S3	Yes	DL+RLL
S4	Yes	DL+0.75LL
S5	Yes	DL+0.75RLL
S6	Yes	DL+0.75LL+0.75RLL
S7	Yes	DL+0.6WLx
S8	Yes	DL+0.6WLz
S9	Yes	DL+0.7EQx
S10	Yes	DL+0.7EQz
S11	Yes	DL+0.75LL+0.45WLx+0.75RLL
S12	Yes	DL+0.75LL+0.45WLz+0.75RLL
S13	Yes	DL+0.525EQx
S14	Yes	DL+0.525EQz
S15	Yes	0.6DL+0.6WLx
S16	Yes	0.6DL+0.6WLz
S17	Yes	0.6DL+0.7EQx
S18	Yes	0.6DL+0.7EQz

Distributed loads:

Consider self weight : No

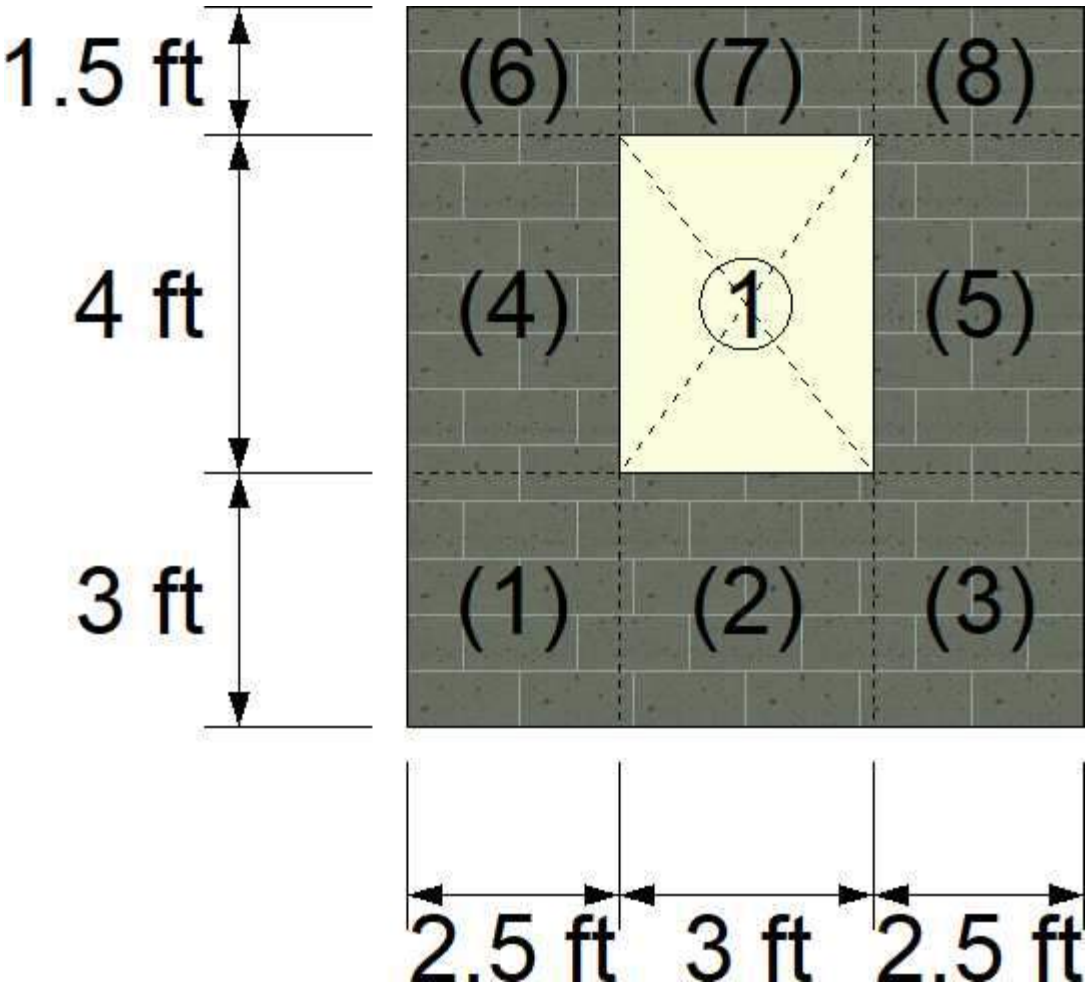
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.30	0.00
1	RLL	Vertical	0.30	0.00
1	WLx	Vertical	-0.93	0.00
1	WLz	Vertical	-0.31	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WLx	0.16
1	WLz	-0.17
Parapet	WLx	0.16
Parapet	WLz	-0.17

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	2.50	3.00
2	2.50	0.00	3.00	3.00
3	5.50	0.00	2.50	3.00
4	0.00	3.00	2.50	4.00
5	5.50	3.00	2.50	4.00
6	0.00	7.00	2.50	1.50
7	2.50	7.00	3.00	1.50
8	5.50	7.00	2.50	1.50

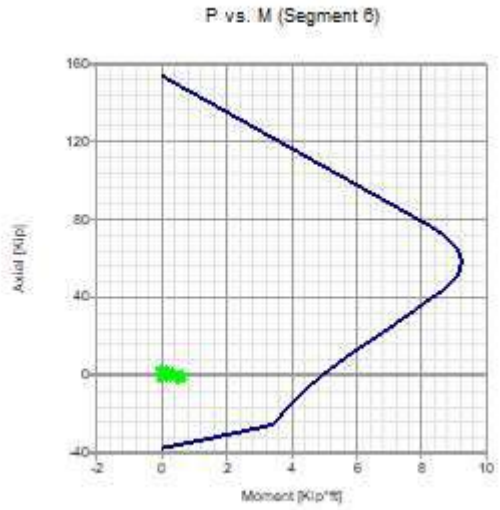
Vertical reinforcement:

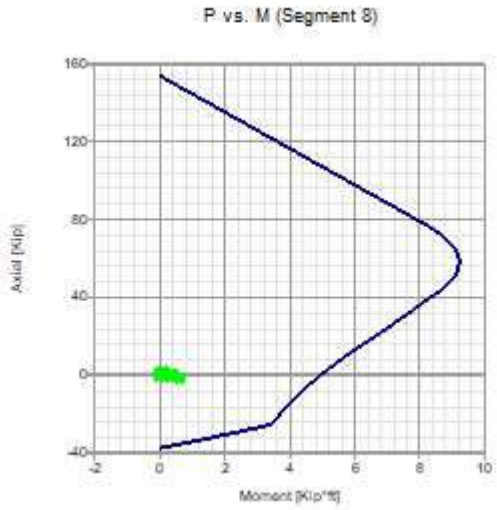
Segment	Bars	Spacing [in]	Ld [in]
1	4-#5	8.00	39.33
2	2-#5	16.00	39.33
3	4-#5	8.00	39.33
4	4-#5	8.00	39.33
5	4-#5	8.00	39.33
6	4-#5	8.00	39.33
7	2-#5	16.00	39.33
8	4-#5	8.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D15(Top)	-0.26	-0.44	4.91	0.09
2	D15(Max)	0.25	-0.61	4.81	0.13
3	D17(Top)	0.23	-0.51	4.95	0.10
4	D15(Top)	-1.05	-0.62	4.86	0.13
5	D17(Max)	-0.11	-0.66	4.92	0.13
6	D15(Max)	-1.69	-0.66	4.81	0.14
7	D15(Max)	-1.28	-0.31	4.68	0.07
8	D15(Max)	-1.75	-0.66	4.81	0.14

Interaction diagrams, P vs. M:

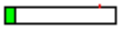
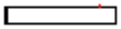
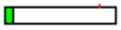
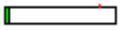
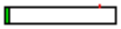
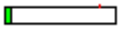
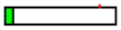
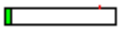




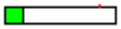
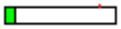
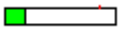
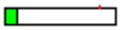
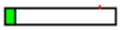
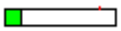
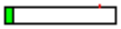
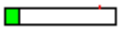
Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D8(Top)	2.79	76.06	0.04
2	D8(Bottom)	0.74	91.50	0.01
3	D10(Bottom)	2.76	76.06	0.04
4	D8(Max)	3.35	76.06	0.04
5	D8(Top)	2.95	76.06	0.04
6	D8(Bottom)	2.89	76.06	0.04
7	D5(Top)	2.52	91.50	0.03
8	D8(Bottom)	2.95	76.06	0.04

Results: Axial tension

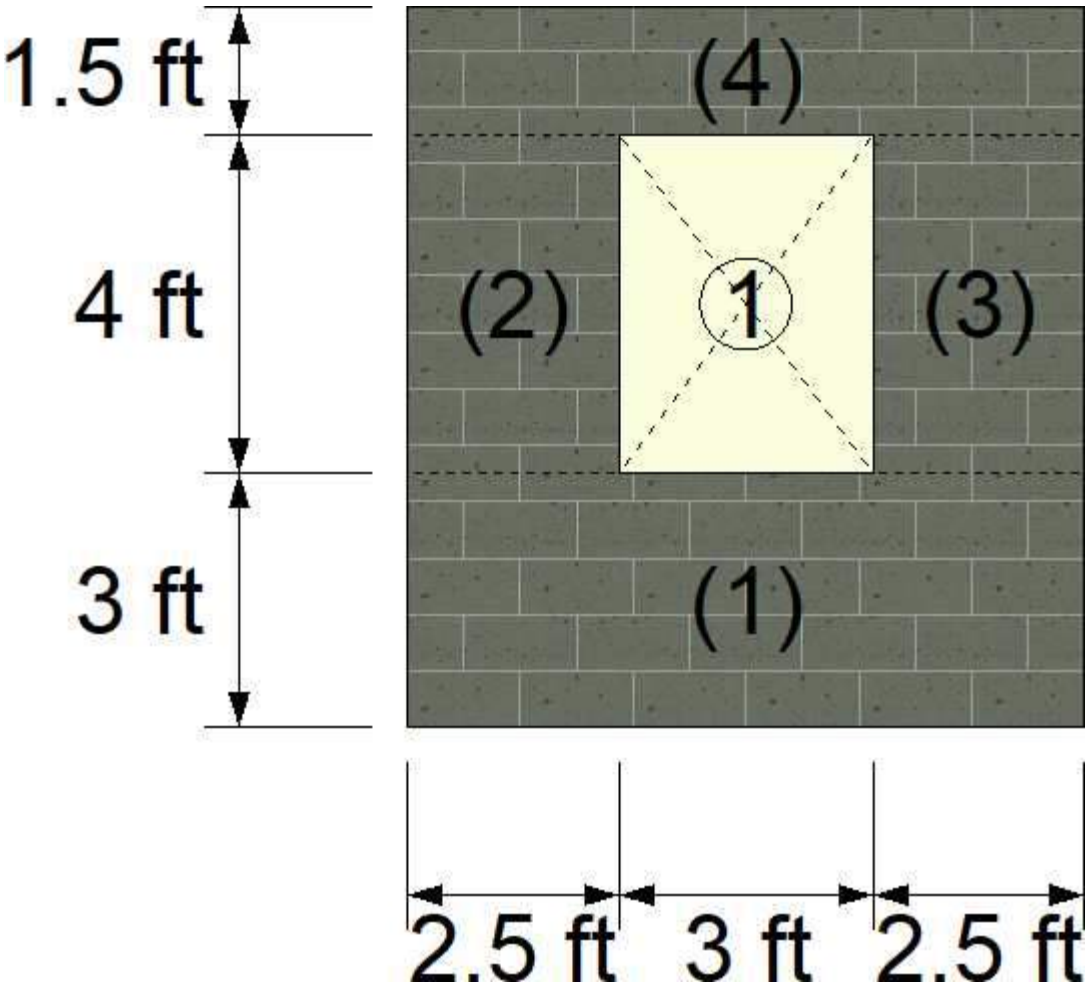
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio	
1	D15(Bottom)	3544.89	32000.00	0.11	
2	D24(Bottom)	681.33	32000.00	0.02	
3	D15(Bottom)	2906.08	32000.00	0.09	
4	D23(Top)	1255.82	32000.00	0.04	
5	D23(Top)	1238.40	32000.00	0.04	
6	D23(Max)	1750.81	32000.00	0.05	
7	D23(Top)	2885.37	32000.00	0.09	
8	D23(Max)	1796.63	32000.00	0.06	

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio	
1	D17(Bottom)	11.753	58.864	0.20	
2	D15(Max)	5.185	44.027	0.12	
3	D17(Max)	9.451	43.571	0.22	
4	D17(Top)	5.545	43.571	0.13	
5	D15(Top)	4.629	43.571	0.11	
6	D15(Top)	11.862	73.600	0.16	
7	D15(Max)	4.089	43.571	0.09	
8	D15(Top)	11.984	77.133	0.16	

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	8.00	3.00
2	0.00	3.00	2.50	4.00
3	5.50	3.00	2.50	4.00
4	0.00	7.00	8.00	1.50

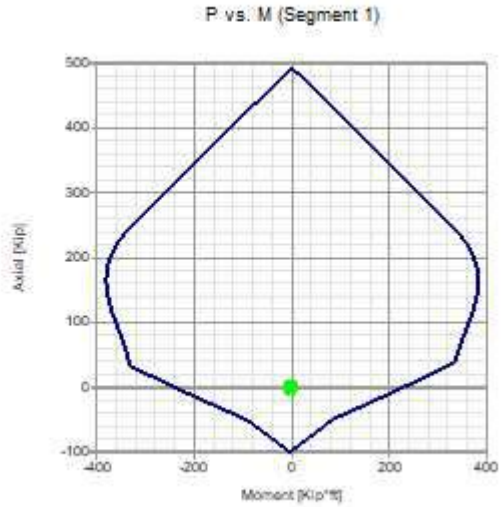
Reinforcement:

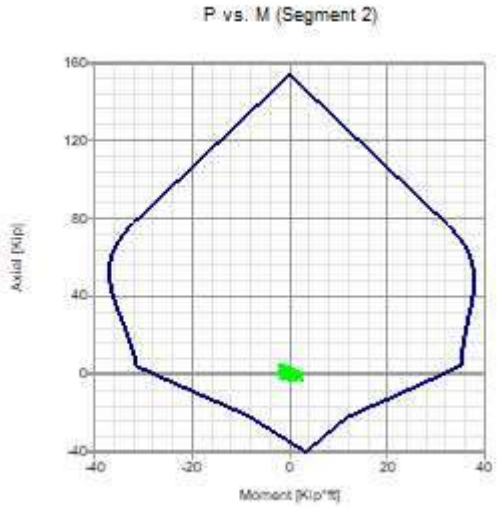
	Vertical reinforcement			Horizontal reinforcement		
Segment	**Bars**	**Spacing** [in]	**Ld** [in]	**Bars**	**Spacing** [in]	**Ld** [in]
1	4-#5	8.00	0.00	4-W2.8	8.00	9.02
	2-#5	16.00	0.00	4-W2.8	8.00	9.02
	4-#5	8.00	0.00	4-W2.8	8.00	9.02
2	4-#5	8.00	0.00	6-W2.8	8.00	9.02
3	4-#5	8.00	0.00	6-W2.8	8.00	9.02
4	4-#5	8.00	0.00	2-W2.8	8.00	9.02
	2-#5	16.00	0.00	2-W2.8	8.00	9.02
	4-#5	8.00	0.00	2-W2.8	8.00	9.02

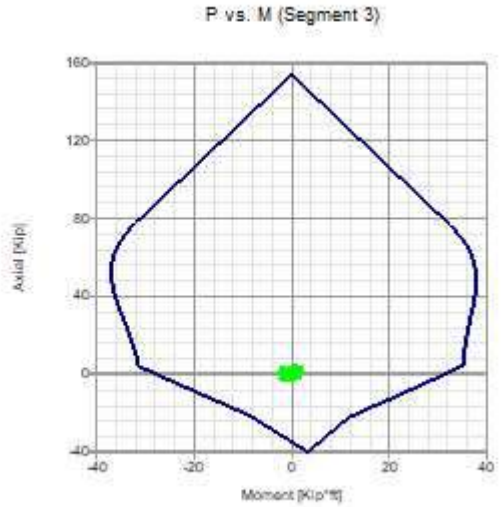
Results: Combined axial flexure

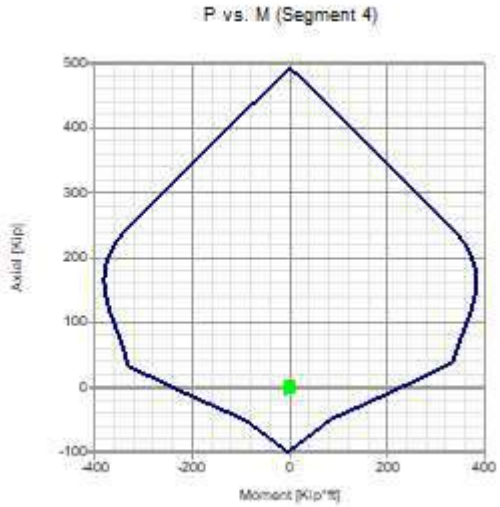
Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D9(Bottom)	-0.97	-6.05	236.03	0.03
2	D15(Max)	-0.61	1.96	30.63	0.06
3	D15(Max)	-0.25	-1.88	27.39	0.07
4	D9(Max)	2.95	0.71	235.97	0.00

Interaction diagrams, P vs. M:









Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D8(Top)	5.05	243.59	0.02
2	D8(Max)	3.35	76.03	0.04
3	D8(Max)	3.16	76.03	0.04
4	D8(Bottom)	6.66	243.59	0.03

Results: Axial tension

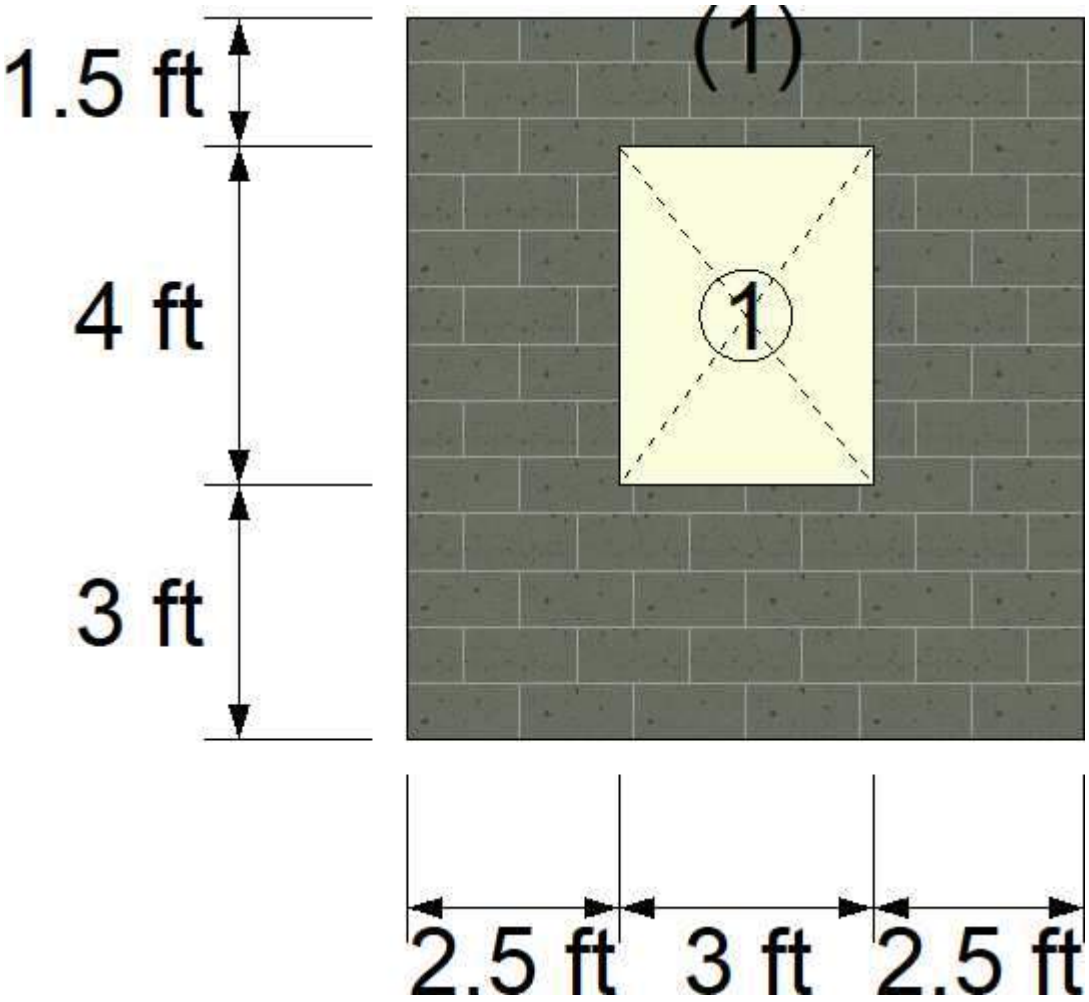
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D15(Bottom)	2362.80	32000.00	0.07
2	D23(Top)	1251.73	32000.00	0.04
3	D23(Top)	1228.77	32000.00	0.04
4	D23(Max)	1562.39	32000.00	0.05

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D9(Bottom)	11.926	49.993	0.24
2	D17(Max)	15.024	42.068	0.36
3	D10(Bottom)	20.451	51.409	0.40
4	D9(Bottom)	2.884	54.216	0.05

LINTEL DESIGN:

Status : OK



Geometry:

Lintel	X Coordinate [ft]	Y Coordinate [ft]	Length [ft]	Depth [in]
1	2.50	3.00	3.00	16.00

Reinforcement:

Lintel	Top long. reinforcement Bars	Top long. reinforcement Extent [in]	Bottom long. reinforcement Bars	Bottom long. reinforcement Extent [in]	Transverse reinforcement Bars	Transverse reinforcement Spacing [in]	Ld [in]
1	1-#5	1.00	1-#5	0.00	--	0.00	0.00

Results: Bending

Lintel	Condition	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D23(Bottom)	-0.90	10.19	0.09

Results: Shear

Lintel	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D8(Top)	14.503	43.571	0.33

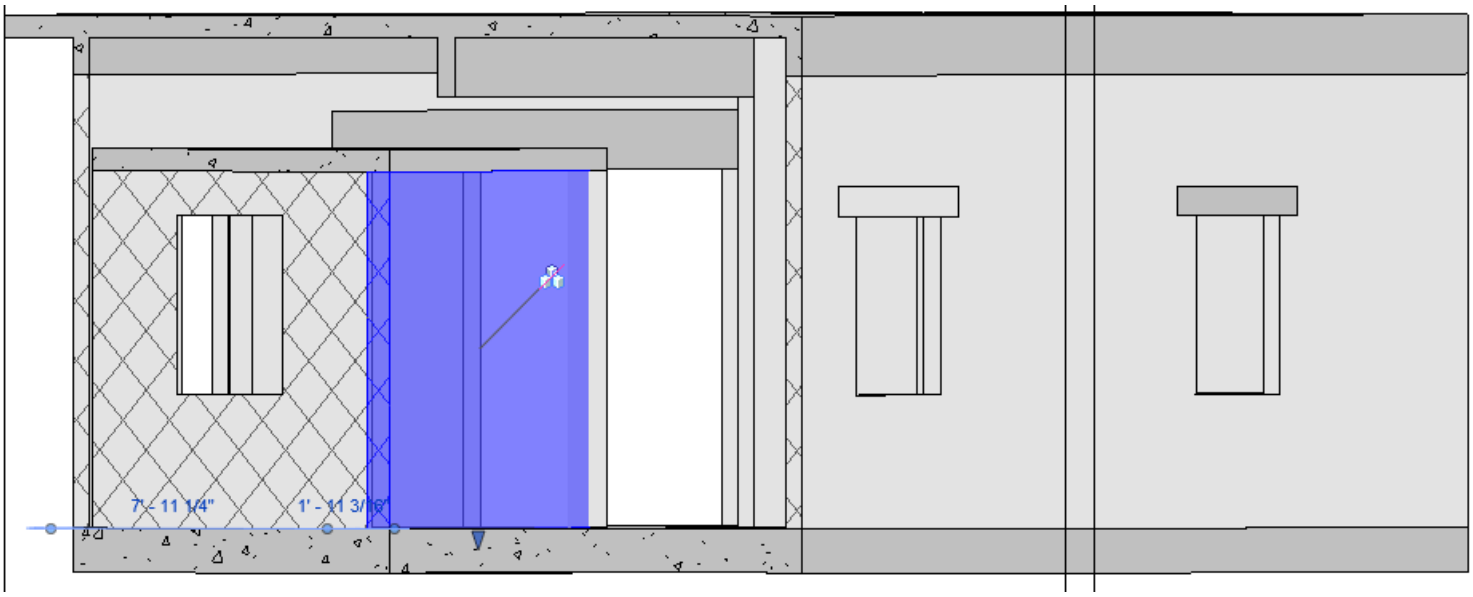
Results: Deflection

Lintel	Condition	δs [in]	δmax [in]	Ratio
1		0.00	0.00	0.00

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE SAFE ROOM
WALL DESIGN



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Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Elements Wall Designs\Safe Room\PR House Safe RM Wall.bak\

Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	8.50 [ft]
Total length	:	8.00 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Full grouting
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	8.50	7.63	0.14

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
RLL	No	LLR	Roof Live Load
WLx	No	WIND	Wind Load in X
WLz	No	WIND	Wind Load in Z
EQx	No	EQ	Earthquake in X
EQz	No	EQ	Earthquake in Z
SM1	Yes		DL
DM1	Yes		DL

S1	Yes	DL
S2	Yes	DL+LL
S3	Yes	DL+RLL
S4	Yes	DL+0.75LL
S5	Yes	DL+0.75RLL
S6	Yes	DL+0.75LL+0.75RLL
S7	Yes	DL+0.6WLx
S8	Yes	DL+0.6WLz
S9	Yes	DL+0.7EQx
S10	Yes	DL+0.7EQz
S11	Yes	DL+0.75LL+0.75RLL+0.45WLx
S12	Yes	DL+0.75LL+0.75RLL+0.45WLz
S13	Yes	DL+0.525EQx
S14	Yes	DL+0.525EQz
S15	Yes	0.6DL+0.6WLx
S16	Yes	0.6DL+0.6WLz
S17	Yes	0.6DL+0.7EQx
S18	Yes	0.6DL+0.7EQz
D1	Yes	DL
D2	Yes	DL+LL
D3	Yes	DL+RLL
D4	Yes	DL+0.75LL
D5	Yes	DL+0.75RLL
D6	Yes	DL+0.75LL+0.75RLL
D7	Yes	DL+0.6WLx
D8	Yes	DL+0.6WLz
D9	Yes	DL+0.7EQx
D10	Yes	DL+0.7EQz
D11	Yes	DL+0.75LL+0.75RLL+0.45WLx
D12	Yes	DL+0.75LL+0.75RLL+0.45WLz
D13	Yes	DL+0.75LL+0.45WLx
D14	Yes	DL+0.75LL+0.45WLz
D15	Yes	DL+0.75RLL+0.45WLx
D16	Yes	DL+0.75RLL+0.45WLz
D17	Yes	DL+0.75LL+0.525EQx
D18	Yes	DL+0.75LL+0.525EQz
D19	Yes	DL+0.525EQx
D20	Yes	DL+0.525EQz
D21	Yes	0.6DL+0.6WLx
D22	Yes	0.6DL+0.6WLz
D23	Yes	0.6DL+0.7EQx
D24	Yes	0.6DL+0.7EQz
D25	Yes	1.4DL
D26	Yes	1.2DL+1.6LL
D27	Yes	1.2DL+0.5RLL
D28	Yes	1.2DL+1.6LL+0.5RLL
D29	Yes	1.2DL+1.6RLL
D30	Yes	1.2DL+0.5WLx
D31	Yes	1.2DL+0.5WLz
D32	Yes	1.2DL+LL+1.6RLL
D33	Yes	1.2DL+1.6RLL+0.5WLx
D34	Yes	1.2DL+1.6RLL+0.5WLz
D35	Yes	1.2DL+WLx
D36	Yes	1.2DL+WLz
D37	Yes	1.2DL+0.5RLL+WLx
D38	Yes	1.2DL+0.5RLL+WLz
D39	Yes	1.2DL+LL+WLx
D40	Yes	1.2DL+LL+WLz
D41	Yes	1.2DL+LL+0.5RLL+WLx
D42	Yes	1.2DL+LL+0.5RLL+WLz
D43	Yes	1.2DL+EQx
D44	Yes	1.2DL+EQz
D45	Yes	1.2DL+LL+EQx
D46	Yes	1.2DL+LL+EQz

D47	Yes	0.9DL+WLx
D48	Yes	0.9DL+WLz
D49	Yes	0.9DL+EQx
D50	Yes	0.9DL+EQz

Distributed loads:

Consider self weight : No

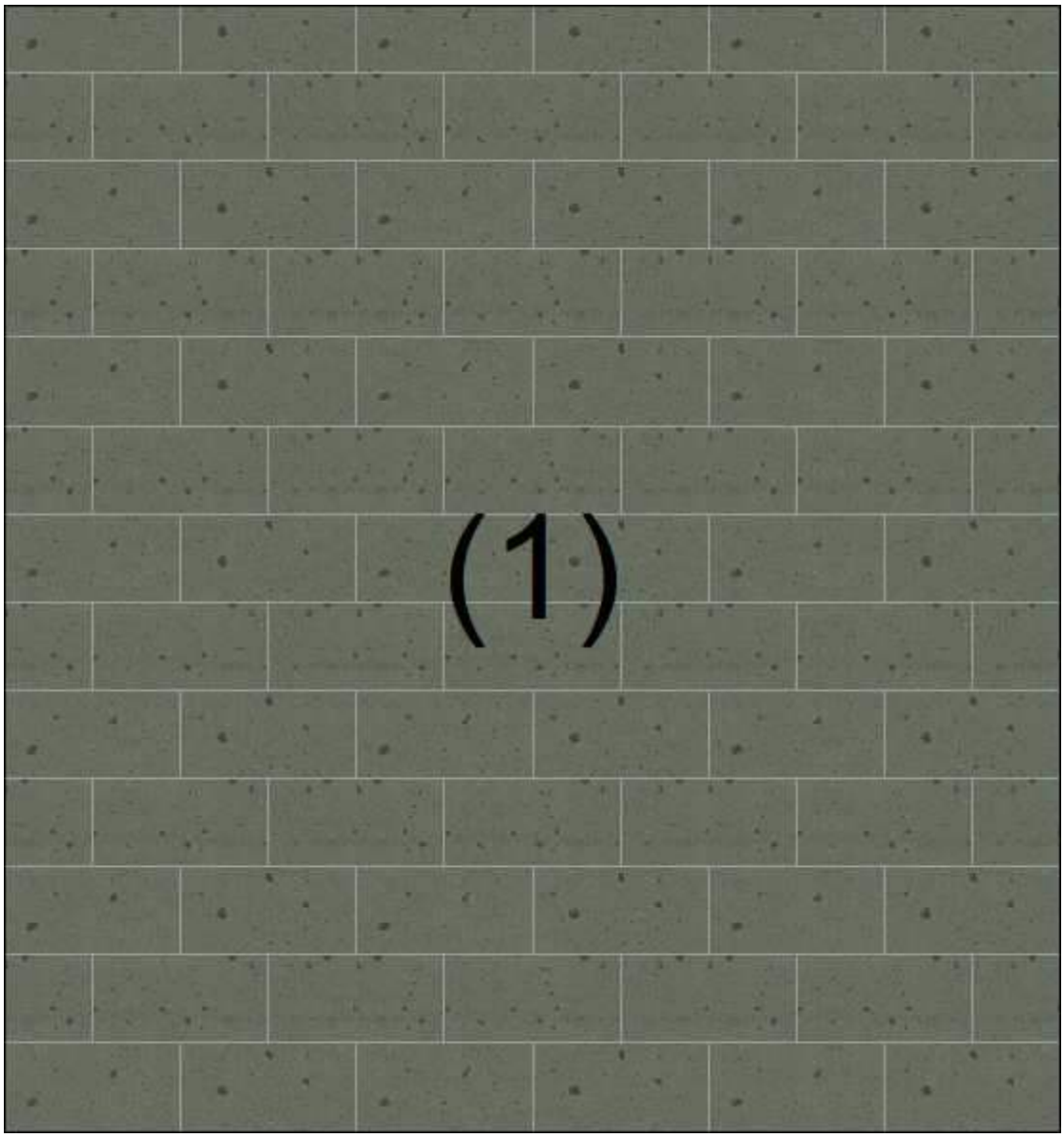
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.30	0.00
1	RLL	Vertical	0.30	0.00
1	WLx	Vertical	-0.93	0.00
1	WLz	Vertical	-0.31	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WLx	0.16
1	WLz	-0.17
Parapet	WLx	0.16
Parapet	WLz	-0.17

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	8.00	8.50

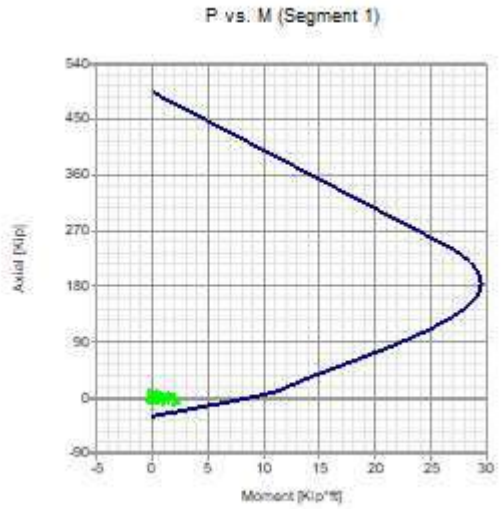
Vertical reinforcement:

Segment	Bars	Spacing [in]	Ld [in]
1	3-#5	32.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D37(Max)	-5.47	-2.26	7.06	0.32

Interaction diagrams, P vs. M:



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D29(Top)	6.22	244.32	0.03

Results: Axial tension

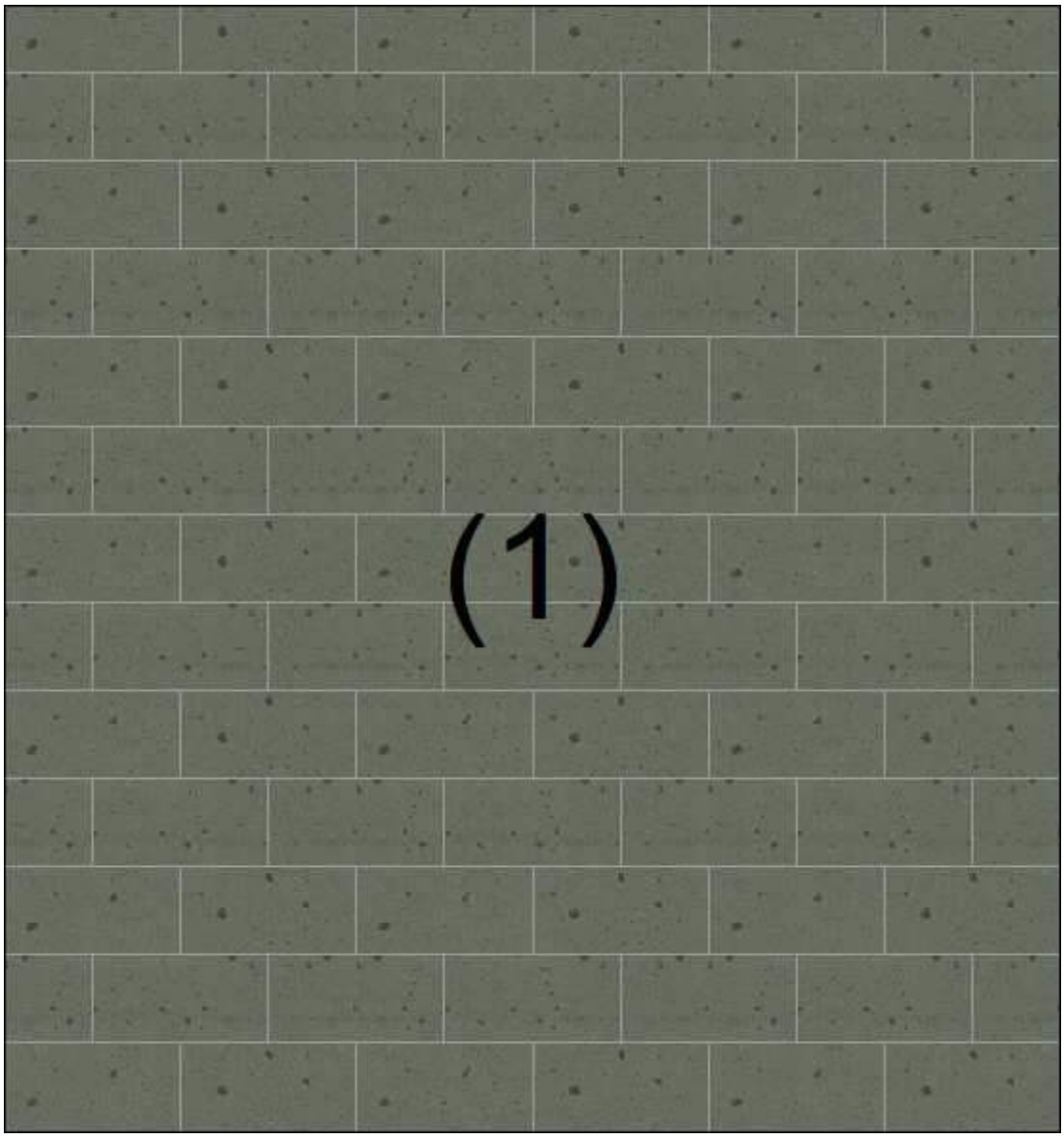
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D47(Max)	7306.12	32000.00	0.23

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D37(Bottom)	10.494	66.549	0.16

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	8.00	8.50

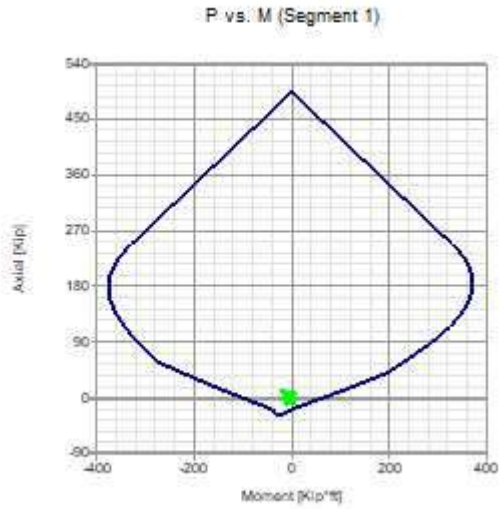
Reinforcement:

	Vertical reinforcement			Horizontal reinforcement		
Segment	Bars	Spacing [in]	Ld [in]	Bars	Spacing [in]	Ld [in]
1	3-#5	32.00	0.00	13-W2.8	8.00	9.02

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D34(Bottom)	3.38	-11.14	112.24	0.10

Interaction diagrams, P vs. M:



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D32(Top)	6.22	244.32	0.03

Results: Axial tension

Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D47(Top)	6291.08	32000.00	0.20

Results: Shear

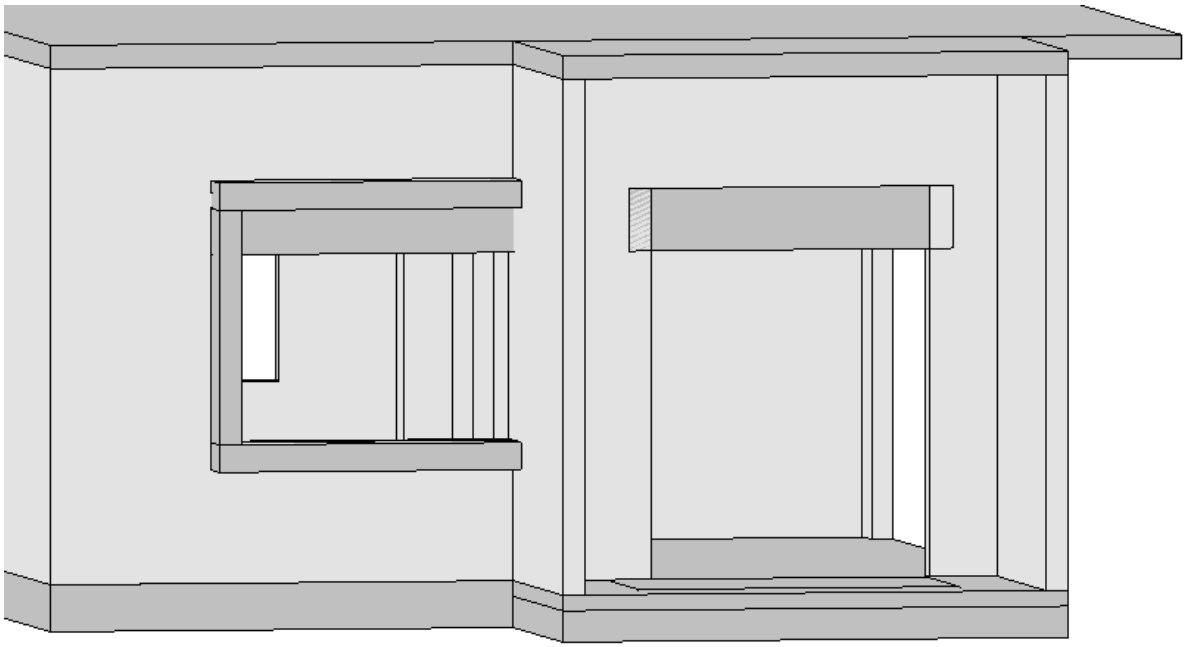
Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D34(Bottom)	13.606	49.144	0.28

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE MAIN STRUCTURE DESIGN

PR FEMA HOUSE ENTRY DOOR
WALL DESIGN



Current Date: 1/9/2020 5:19 PM
Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Elements Wall Designs\190 mph Exp D\PR House Entry Door Wall Design_6 in 190 Exp D.msw\

Design Results

Masonry wall

GENERAL INFORMATION:

Global status : Warnings in design

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	11.50 [ft]
Total length	:	10.50 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Full grouting
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	11.50	5.63	0.14

Openings:

Reference	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
Lower left	2.00	0.00	6.00	7.00

Flanges:

Distance [ft]	Thickness [in]	Width [ft]	Position X	Position Z
0.00	5.63	2.81	Centered	Front
10.50	5.63	2.79	Centered	Centered

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WL_X	No	WIND	Wind Load X-Direction
WL_Z	No	WIND	Wind Load Z-Direction
EQ_X	No	EQ	Earthquake X-Direction
EQ_Z	No	EQ	Earthquake Z-Direction
SM1	Yes		DL
DM1	Yes		DL
D1	Yes		DL
D2	Yes		DL+LL
D3	Yes		DL+LLR
D4	Yes		DL+0.75LL
D5	Yes		DL+0.75LLR
D6	Yes		DL+0.75LL+0.75LLR
D7	Yes		DL+0.6WL_X
D8	Yes		DL+0.6WL_Z
D9	Yes		1.126DL+0.91EQ_X
D10	Yes		1.126DL+0.91EQ_Z
D11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
D12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
D13	Yes		DL+0.75LL+0.45WL_X
D14	Yes		DL+0.75LL+0.45WL_Z
D15	Yes		DL+0.75LLR+0.45WL_X
D16	Yes		DL+0.75LLR+0.45WL_Z
D17	Yes		1.09DL+0.75LL+0.683EQ_X
D18	Yes		1.09DL+0.75LL+0.683EQ_Z
D19	Yes		1.09DL+0.683EQ_X
D20	Yes		1.09DL+0.683EQ_Z
D21	Yes		0.6DL+0.6WL_X
D22	Yes		0.6DL+0.6WL_Z
D23	Yes		0.474DL+0.91EQ_X
D24	Yes		0.474DL+0.91EQ_Z
S1	Yes		DL
S2	Yes		DL+LL
S3	Yes		DL+LLR
S4	Yes		DL+0.75LL
S5	Yes		DL+0.75LLR
S6	Yes		DL+0.75LL+0.75LLR
S7	Yes		DL+0.6WL_X
S8	Yes		DL+0.6WL_Z
S9	Yes		1.126DL+0.91EQ_X
S10	Yes		1.126DL+0.91EQ_Z
S11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
S12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
S13	Yes		1.09DL+0.683EQ_X
S14	Yes		1.09DL+0.683EQ_Z
S15	Yes		0.6DL+0.6WL_X
S16	Yes		0.6DL+0.6WL_Z
S17	Yes		0.474DL+0.91EQ_X
S18	Yes		0.474DL+0.91EQ_Z

Distributed loads:

Consider self weight : No

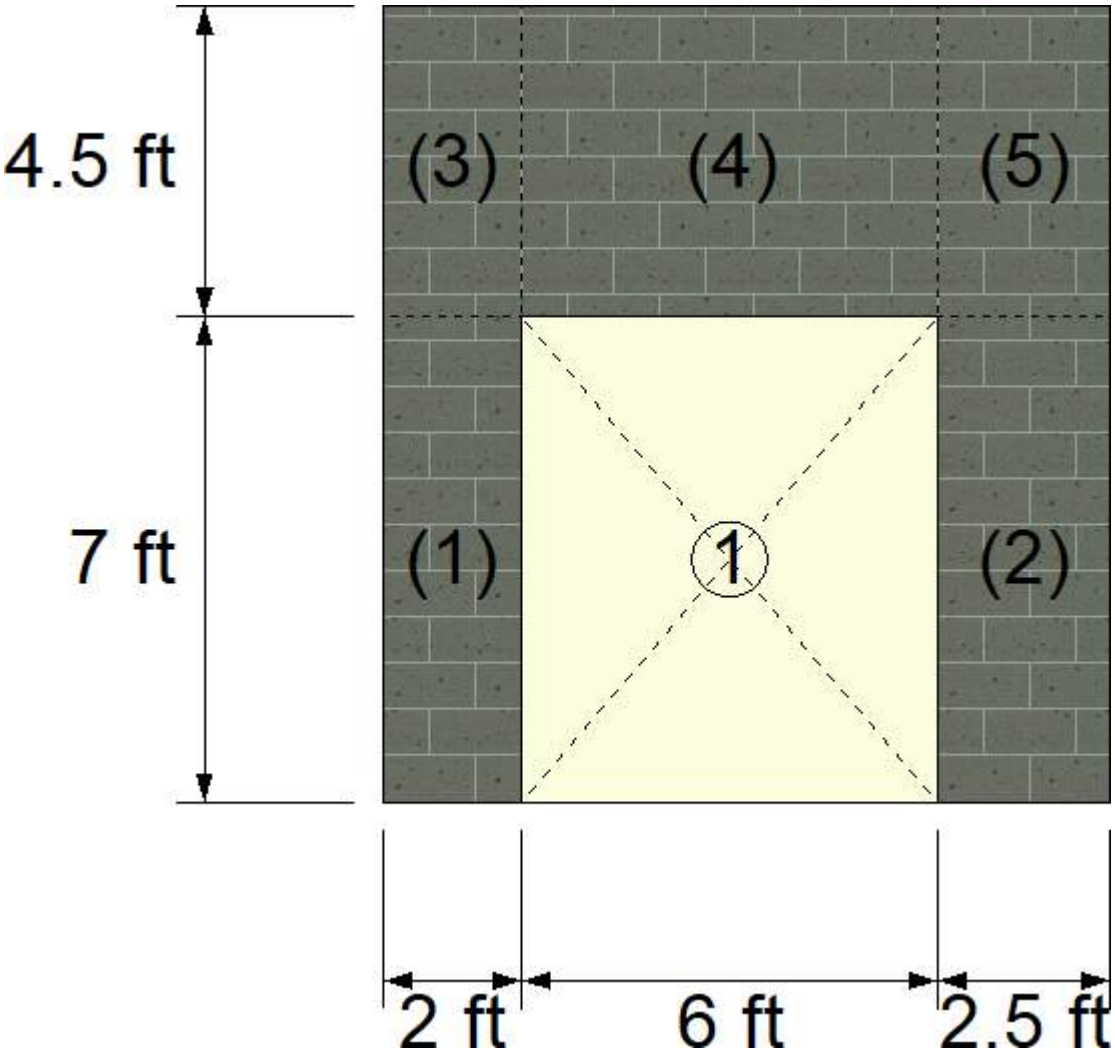
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.23	0.00
1	LL	Vertical	0.06	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WL_X	0.03
1	WL_Z	0.04
Parapet	WL_X	0.03
Parapet	WL_Z	0.04

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	2.00	7.00
2	8.00	0.00	2.50	7.00
3	0.00	7.00	2.00	4.50
4	2.00	7.00	6.00	4.50
5	8.00	7.00	2.50	4.50

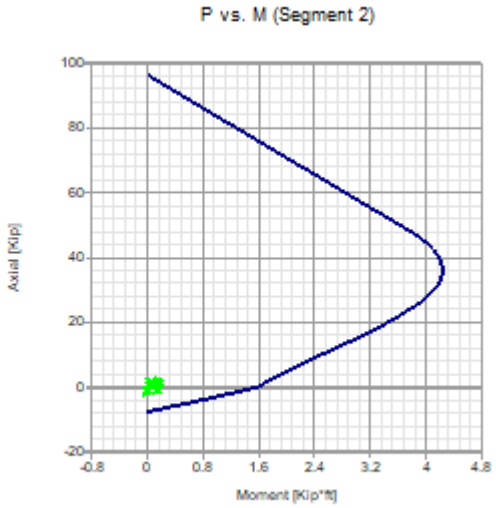
Vertical reinforcement:

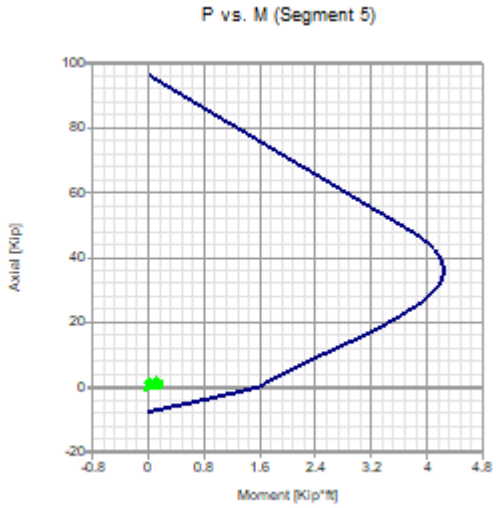
Segment	Bars	Spacing [in]	Ld [in]
1	1-#5	40.00	39.33
2	1-#5	40.00	39.33
3	1-#5	40.00	39.33
4	2-#5	40.00	39.33
5	1-#5	40.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D8(Top)	0.96	-0.13	1.34	0.10
2	D8(Max)	-0.93	-0.16	1.38	0.11
3	D8(Bottom)	0.96	-0.13	1.34	0.09
4	D8(Max)	1.01	-0.40	3.86	0.10
5	D8(Bottom)	1.55	-0.18	1.70	0.10

Interaction diagrams, P vs. M:





Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D12(Max)	1.08	31.98	0.03
2	D18(Top)	1.82	39.97	0.05
3	D12(Bottom)	1.02	31.98	0.03
4	D18(Top)	1.74	95.94	0.02
5	D17(Bottom)	1.82	39.97	0.05

Results: Axial tension

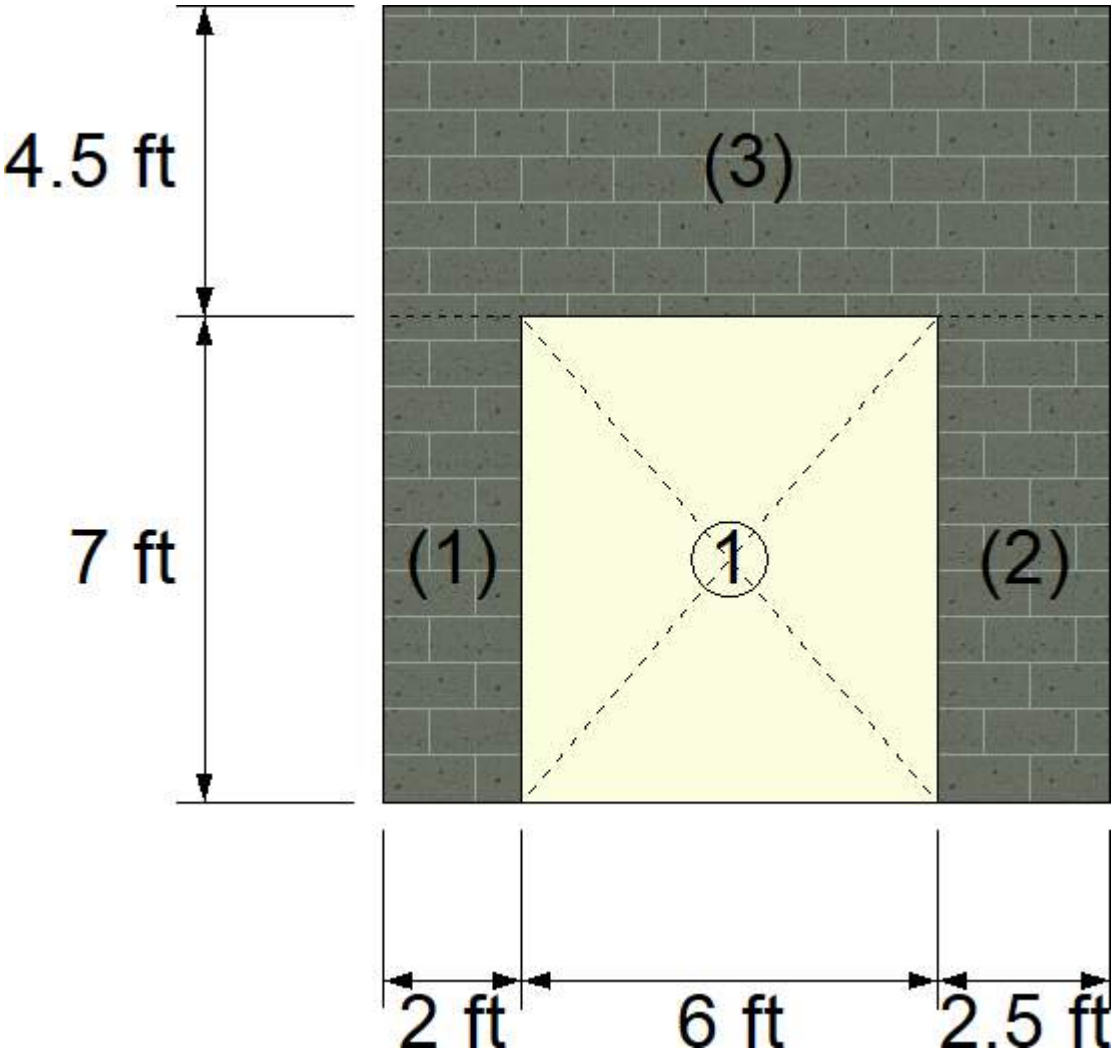
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D22(Bottom)	2174.85	32000.00	0.07
2	D8(Bottom)	5548.80	32000.00	0.17
3	DM1(Top)	0.00	32000.00	0.00
4	DM1(Top)	0.00	32000.00	0.00
5	DM1(Top)	0.00	32000.00	0.00

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D8(Bottom)	2.965	43.571	0.07
2	D8(Bottom)	3.252	72.352	0.04
3	D22(Top)	2.325	72.245	0.03
4	D8(Top)	2.026	79.072	0.03
5	D8(Top)	2.841	76.352	0.04

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	2.00	7.00
2	8.00	0.00	2.50	7.00
3	0.00	7.00	10.50	4.50

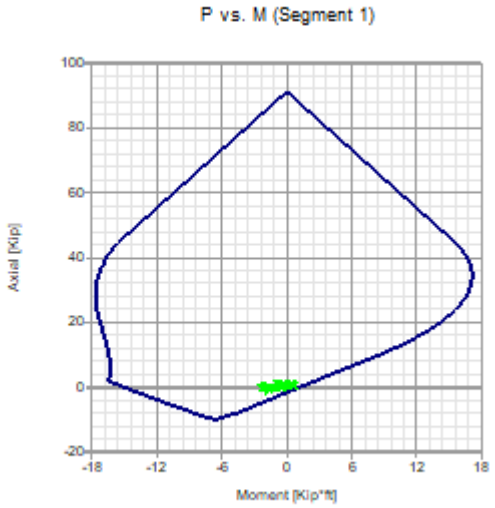
Reinforcement:

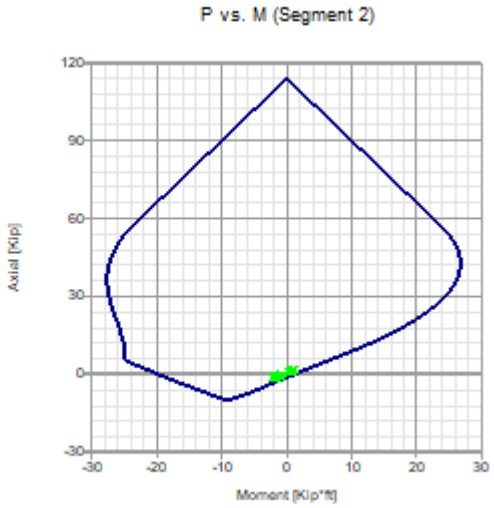
	Vertical reinforcement			Horizontal reinforcement		
Segment	**Bars**	**Spacing [in]**	**Ld [in]**	**Bars**	**Spacing [in]**	**Ld [in]**
1	1-#5	40.00	0.00	11-W2.8	8.00	9.02
2	1-#5	40.00	0.00	11-W2.8	8.00	9.02
3	1-#5	40.00	0.00	7-W2.8	8.00	9.02
	2-#5	40.00	0.00	7-W2.8	8.00	9.02
	1-#5	40.00	0.00	7-W2.8	8.00	9.02

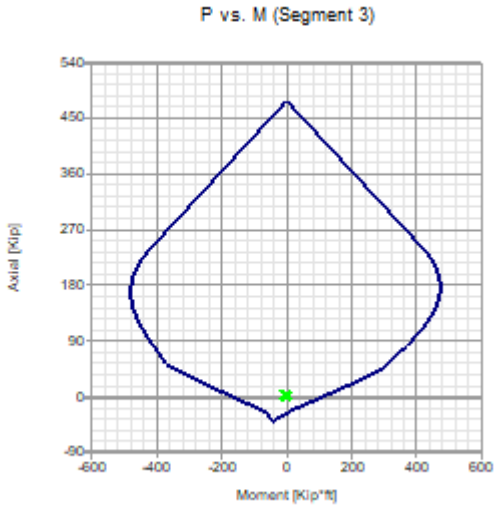
Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D10(Top)	0.67	0.59	1.60	0.37
2	D9(Top)	1.83	1.05	2.92	0.36
3	D10(Bottom)	2.87	-4.33	178.60	0.02

Interaction diagrams, P vs. M:







Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D14(Max)	1.06	31.96	0.03
2	D18(Top)	1.93	39.97	0.05
3	D12(Max)	3.26	167.87	0.02

Results: Axial tension

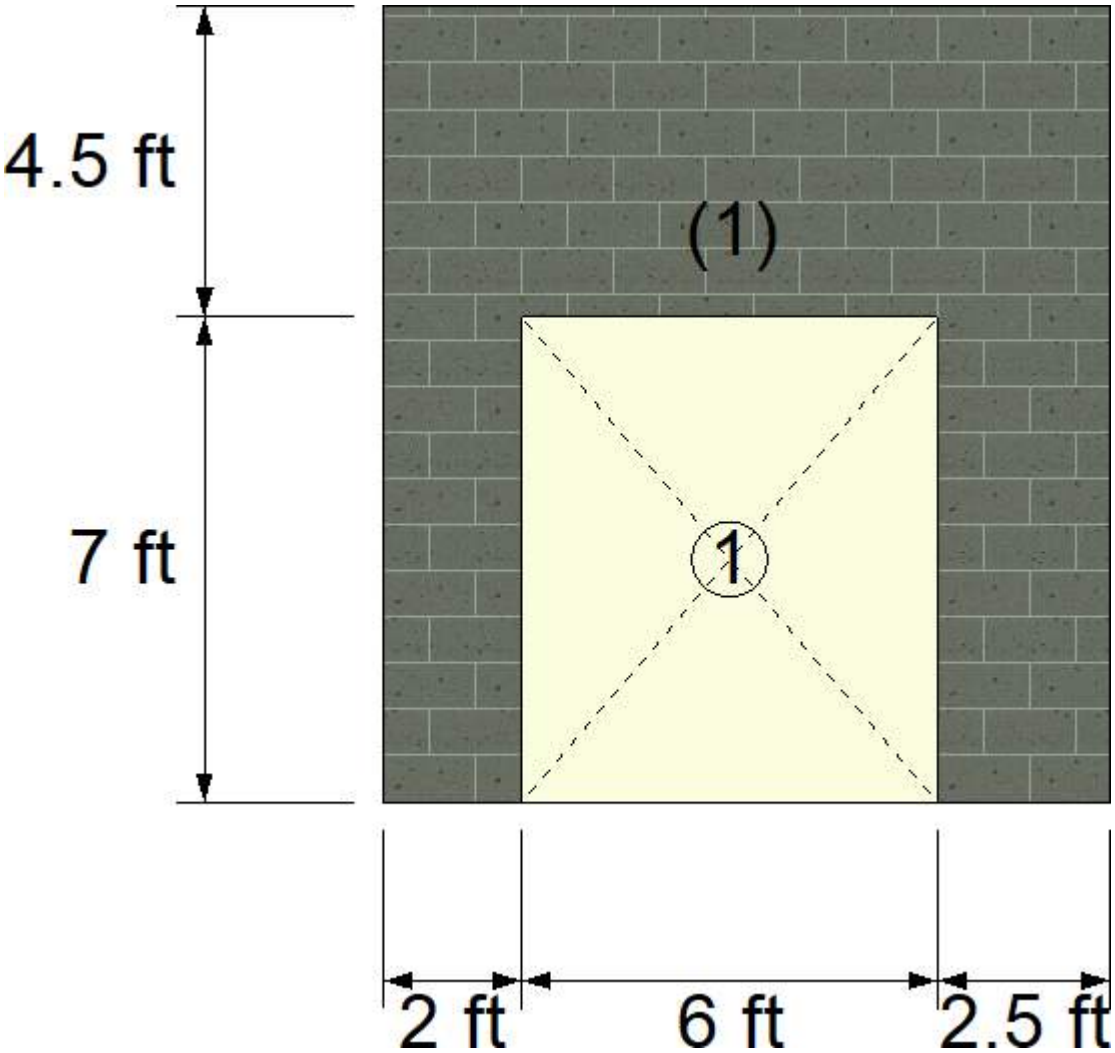
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D22(Bottom)	1328.83	32000.00	0.04
2	D8(Bottom)	4166.33	32000.00	0.13
3	DM1(Top)	0.00	32000.00	0.00

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D10(Max)	9.703	44.976	0.22
2	D10(Top)	14.266	52.746	0.27
3	D9(Bottom)	3.255	52.917	0.06

LINTEL DESIGN:

Status : Warnings in design
- Insufficient development length, TMS 402-11 ASD, 8.1.6 (Lintel 1)



Geometry:

Lintel	X Coordinate [ft]	Y Coordinate [ft]	Length [ft]	Depth [in]
1	2.00	0.00	6.00	24.00

Reinforcement:

	Top long. reinforcement		Bottom long. reinforcement		Transverse reinforcement		
Lintel	Bars	Extent [in]	Bars	Extent [in]	Bars	Spacing [in]	Ld [in]
1	1-#5	2.00	1-#5	0.00	--	0.00	0.00

Results: Bending

Lintel	Condition	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D8(Bottom)	-0.85	16.25	0.05

Results: Shear

Lintel	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D18(Bottom)	8.746	43.571	0.20

Results: Deflection

Lintel	Condition	δs [in]	δmax [in]	Ratio
1		0.00	0.00	0.00

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

Current Date: 1/9/2020 5:33 PM
Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Elements Wall Designs\190 mph Exp D\PR House Front Window Wall Design_6 in 190 Exp D.msw\

Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	11.50 [ft]
Total length	:	10.00 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	None

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Partial grouting
Mortar bed type	:	Full bed
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	11.50	5.63	0.08

Openings:

Reference	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
Lower left	3.67	3.00	6.00	4.00

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WL_X	No	WIND	Wind Load X-Direction
WL_Z	No	WIND	Wind Load Z-Direction
EQ_X	No	EQ	Earthquake X-Direction
EQ_Z	No	EQ	Earthquake Z-Direction
SM1	Yes		DL
DM1	Yes		DL
D1	Yes		DL
D2	Yes		DL+LL
D3	Yes		DL+LLR
D4	Yes		DL+0.75LL
D5	Yes		DL+0.75LLR
D6	Yes		DL+0.75LL+0.75LLR
D7	Yes		DL+0.6WL_X
D8	Yes		DL+0.6WL_Z
D9	Yes		1.126DL+0.91EQ_X
D10	Yes		1.126DL+0.91EQ_Z
D11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
D12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
D13	Yes		DL+0.75LL+0.45WL_X
D14	Yes		DL+0.75LL+0.45WL_Z
D15	Yes		DL+0.75LLR+0.45WL_X
D16	Yes		DL+0.75LLR+0.45WL_Z
D17	Yes		1.09DL+0.75LL+0.683EQ_X
D18	Yes		1.09DL+0.75LL+0.683EQ_Z
D19	Yes		1.09DL+0.683EQ_X
D20	Yes		1.09DL+0.683EQ_Z
D21	Yes		0.6DL+0.6WL_X
D22	Yes		0.6DL+0.6WL_Z
D23	Yes		0.474DL+0.91EQ_X
D24	Yes		0.474DL+0.91EQ_Z
S1	Yes		DL
S2	Yes		DL+LL
S3	Yes		DL+LLR
S4	Yes		DL+0.75LL
S5	Yes		DL+0.75LLR
S6	Yes		DL+0.75LL+0.75LLR
S7	Yes		DL+0.6WL_X
S8	Yes		DL+0.6WL_Z
S9	Yes		1.126DL+0.91EQ_X
S10	Yes		1.126DL+0.91EQ_Z
S11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
S12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
S13	Yes		1.09DL+0.683EQ_X
S14	Yes		1.09DL+0.683EQ_Z
S15	Yes		0.6DL+0.6WL_X
S16	Yes		0.6DL+0.6WL_Z
S17	Yes		0.474DL+0.91EQ_X
S18	Yes		0.474DL+0.91EQ_Z

Distributed loads:

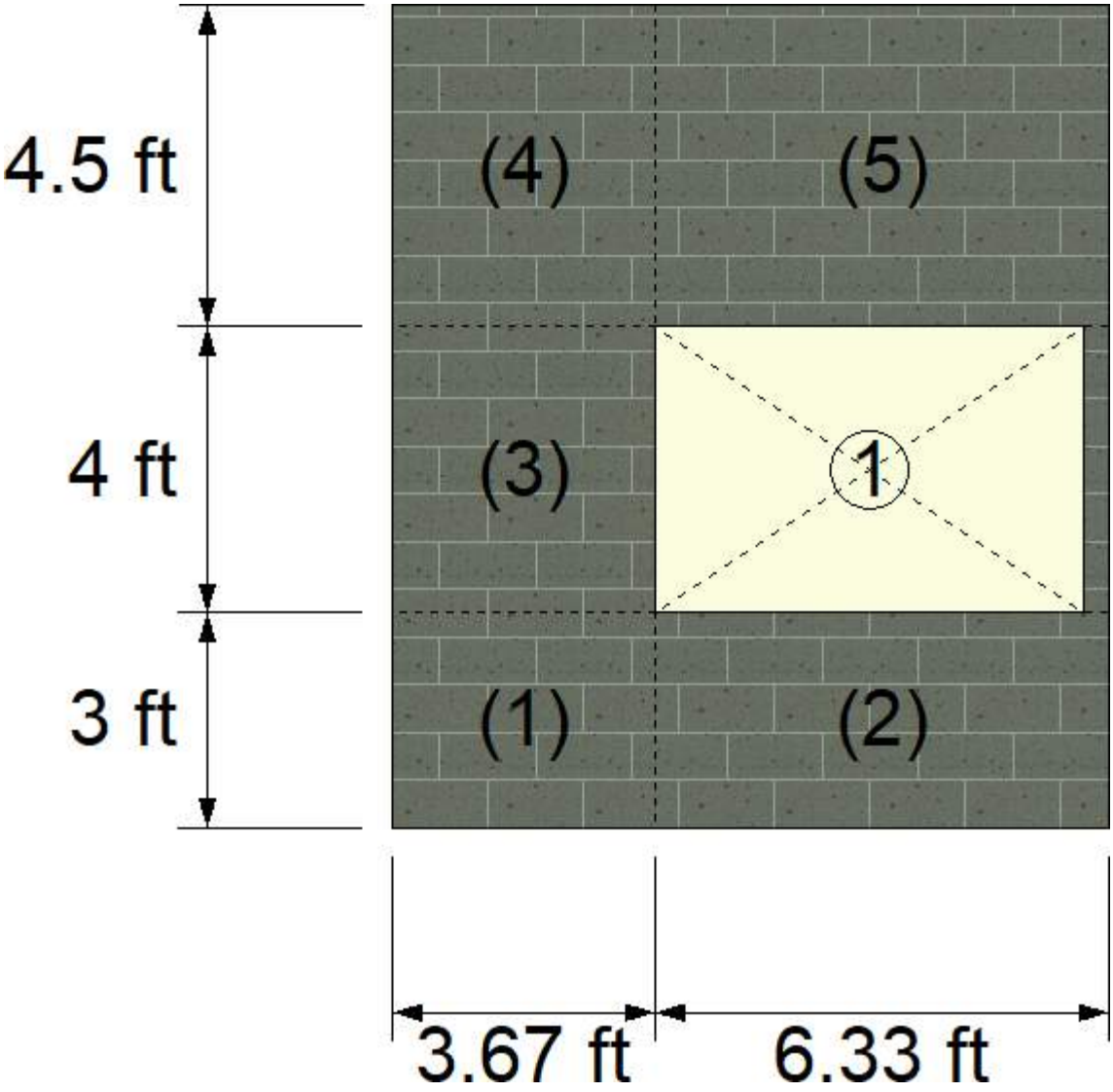
Consider self weight : No

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WL_X	-0.03
1	WL_Z	-0.04
Parapet	WL_X	-0.03
Parapet	WL_Z	-0.04

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	3.67	3.00
2	3.67	0.00	6.33	3.00
3	0.00	3.00	3.67	4.00
4	0.00	7.00	3.67	4.50
5	3.67	7.00	6.33	4.50

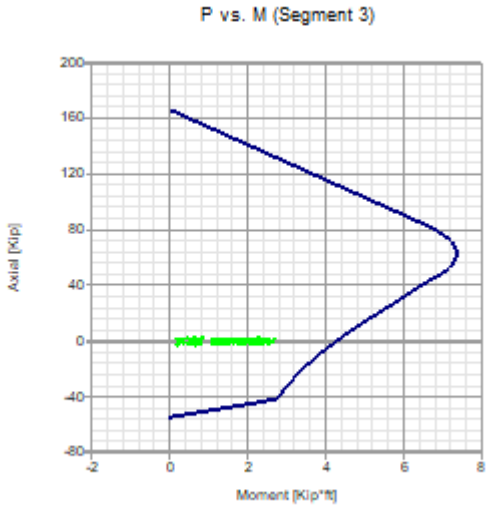
Vertical reinforcement:

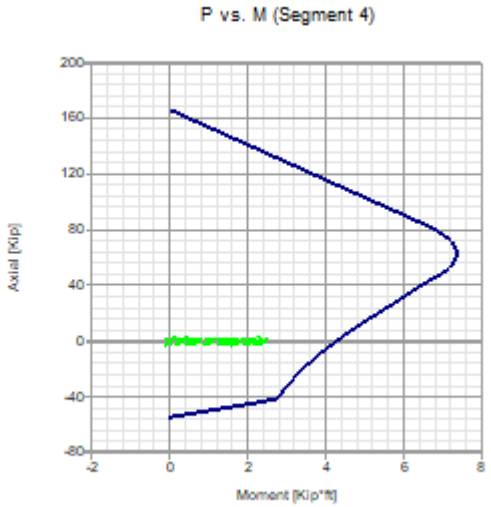
Segment	Bars	Spacing [in]	Ld [in]
1	6-#5	8.00	39.33
2	9-#5	8.00	39.33
3	6-#5	8.00	39.33
4	6-#5	8.00	39.33
5	9-#5	8.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D22(Top)	-0.15	2.02	4.26	0.47
2	D22(Max)	0.23	0.55	7.38	0.07
3	D22(Max)	-0.09	2.63	4.27	0.62
4	D22(Bottom)	-0.03	2.39	4.27	0.56
5	D22(Max)	0.00	0.94	7.37	0.13

Interaction diagrams, P vs. M:





Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	DM1(Top)	-0.26	58.34	0.00
2	D10(Bottom)	0.64	100.71	0.01
3	DM1(Top)	-0.06	58.34	0.00
4	D10(Top)	0.00	58.34	0.00
5	D9(Bottom)	0.02	100.71	0.00

Results: Axial tension

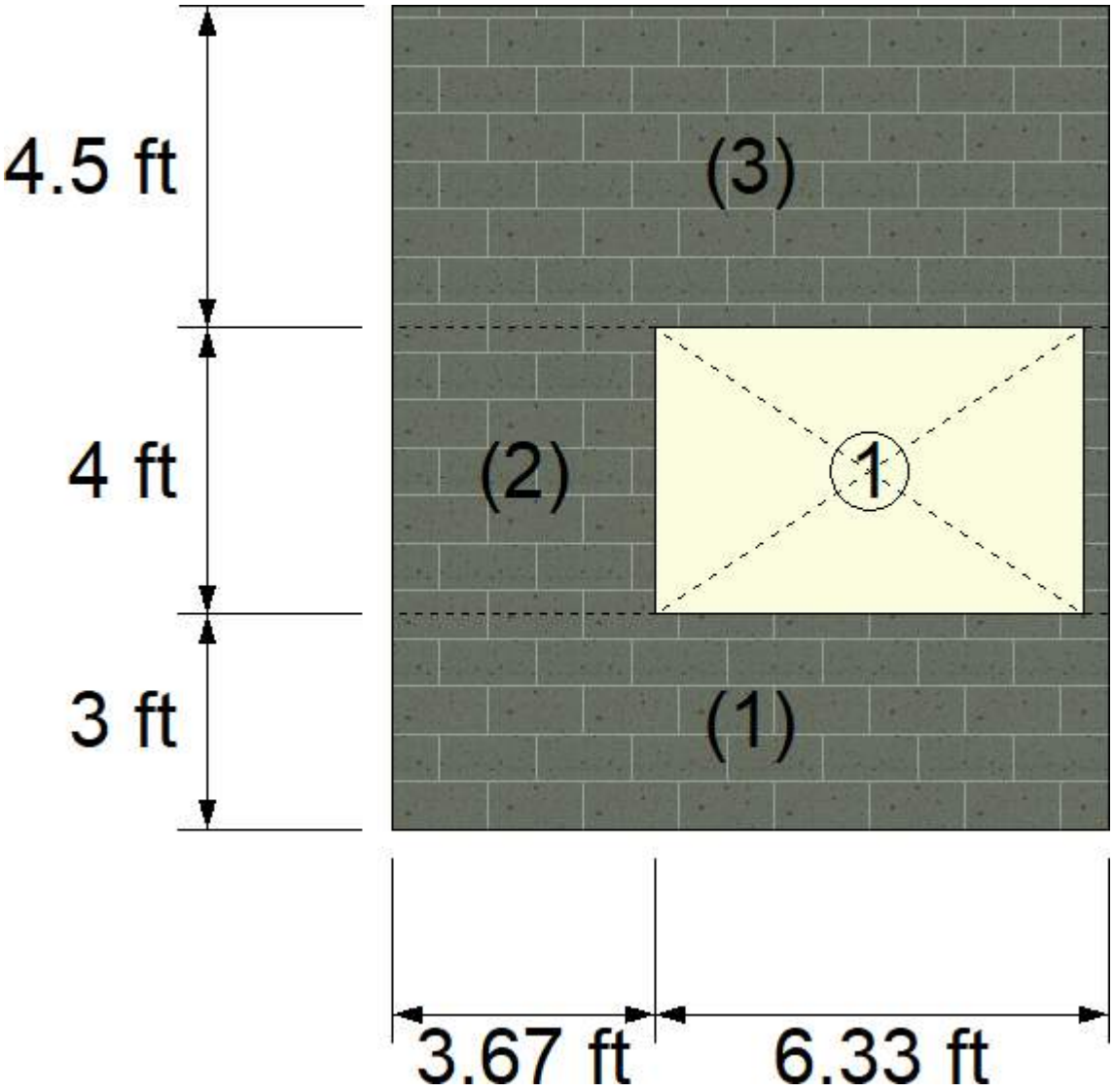
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D9(Bottom)	371.72	32000.00	0.01
2	DM1(Top)	0.00	32000.00	0.00
3	D9(Bottom)	169.61	32000.00	0.01
4	D10(Bottom)	38.37	32000.00	0.00
5	D10(Max)	2.76	32000.00	0.00

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D22(Top)	5.690	43.571	0.13
2	D22(Top)	3.245	43.770	0.07
3	D22(Top)	5.869	43.571	0.13
4	D22(Bottom)	5.913	43.571	0.14
5	D22(Bottom)	2.658	43.583	0.06

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	10.00	3.00
2	0.00	3.00	3.67	4.00
3	0.00	7.00	10.00	4.50

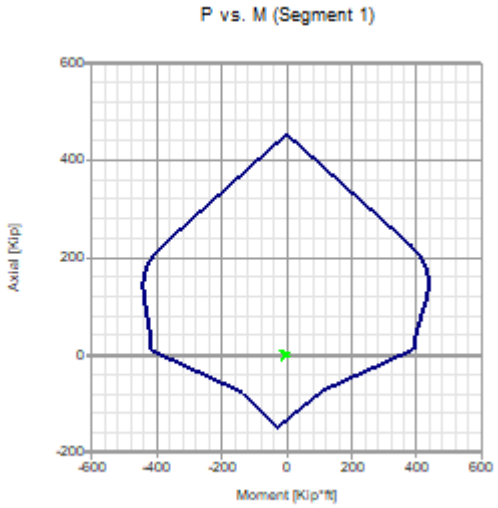
Reinforcement:

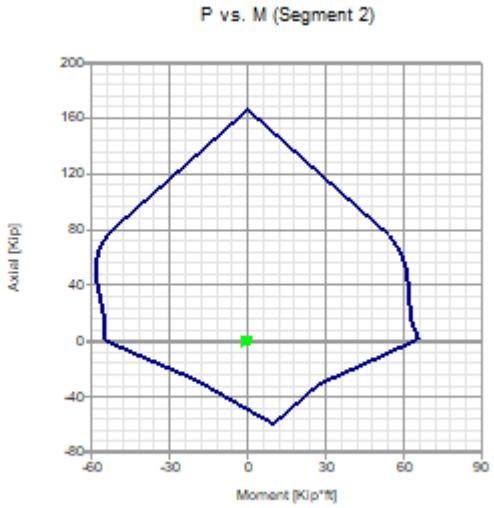
	Vertical reinforcement			Horizontal reinforcement		
Segment	**Bars**	**Spacing** [in]	**Ld** [in]	**Bars**	**Spacing** [in]	**Ld** [in]
1	6-#5	8.00	0.00	4-W2.8	8.00	9.02
	9-#5	8.00	0.00	4-W2.8	8.00	9.02
2	6-#5	8.00	0.00	6-W2.8	8.00	9.02
3	6-#5	8.00	0.00	7-W2.8	8.00	9.02
	9-#5	8.00	0.00	7-W2.8	8.00	9.02

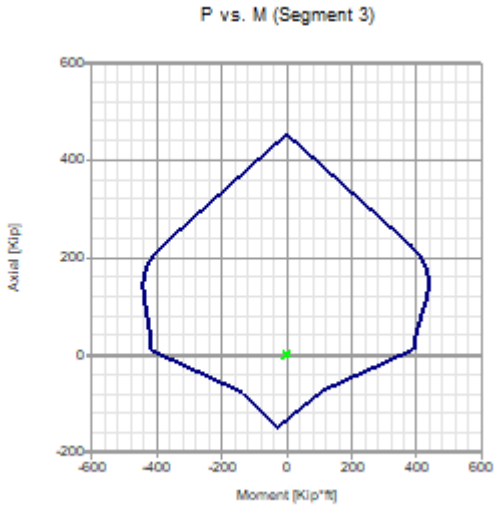
Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D10(Bottom)	0.01	-4.20	384.29	0.01
2	D10(Bottom)	-0.25	-1.00	53.93	0.02
3	D10(Bottom)	-0.04	-0.67	384.12	0.00

Interaction diagrams, P vs. M:







Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D9(Top)	0.03	159.05	0.00
2	DM1(Top)	-0.06	58.30	0.00
3	D10(Top)	0.01	159.05	0.00

Results: Axial tension

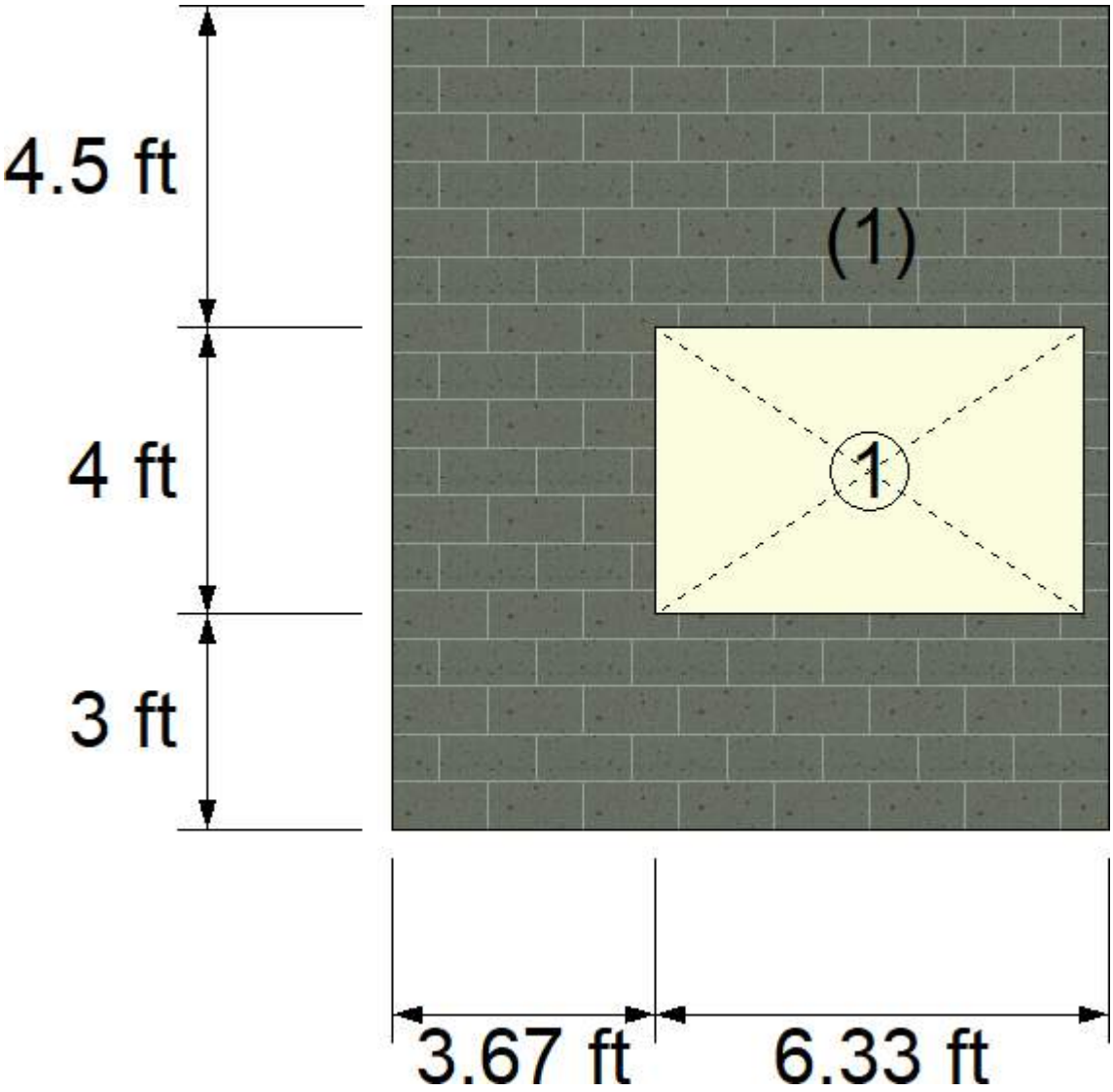
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D10(Max)	4.46	32000.00	0.00
2	D10(Bottom)	136.91	32000.00	0.00
3	D9(Bottom)	9.61	32000.00	0.00

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D9(Bottom)	2.267	36.107	0.06
2	D9(Bottom)	4.630	35.391	0.13
3	D9(Bottom)	1.136	41.467	0.03

LINTEL DESIGN:

Status : OK



Geometry:

Lintel	X Coordinate [ft]	Y Coordinate [ft]	Length [ft]	Depth [in]
1	3.67	3.00	6.00	24.00

Reinforcement:

	Top long. reinforcement		Bottom long. reinforcement		Transverse reinforcement		
Lintel	Bars	Extent [in]	Bars	Extent [in]	Bars	Spacing [in]	Ld [in]
1	--	0.00	1-#5	0.50	--	0.00	0.00

Results: Bending

Lintel	Condition	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D10(Top)	0.34	16.25	0.02

Results: Shear

Lintel	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio	
1	D9(Top)	1.167	43.571	0.03	

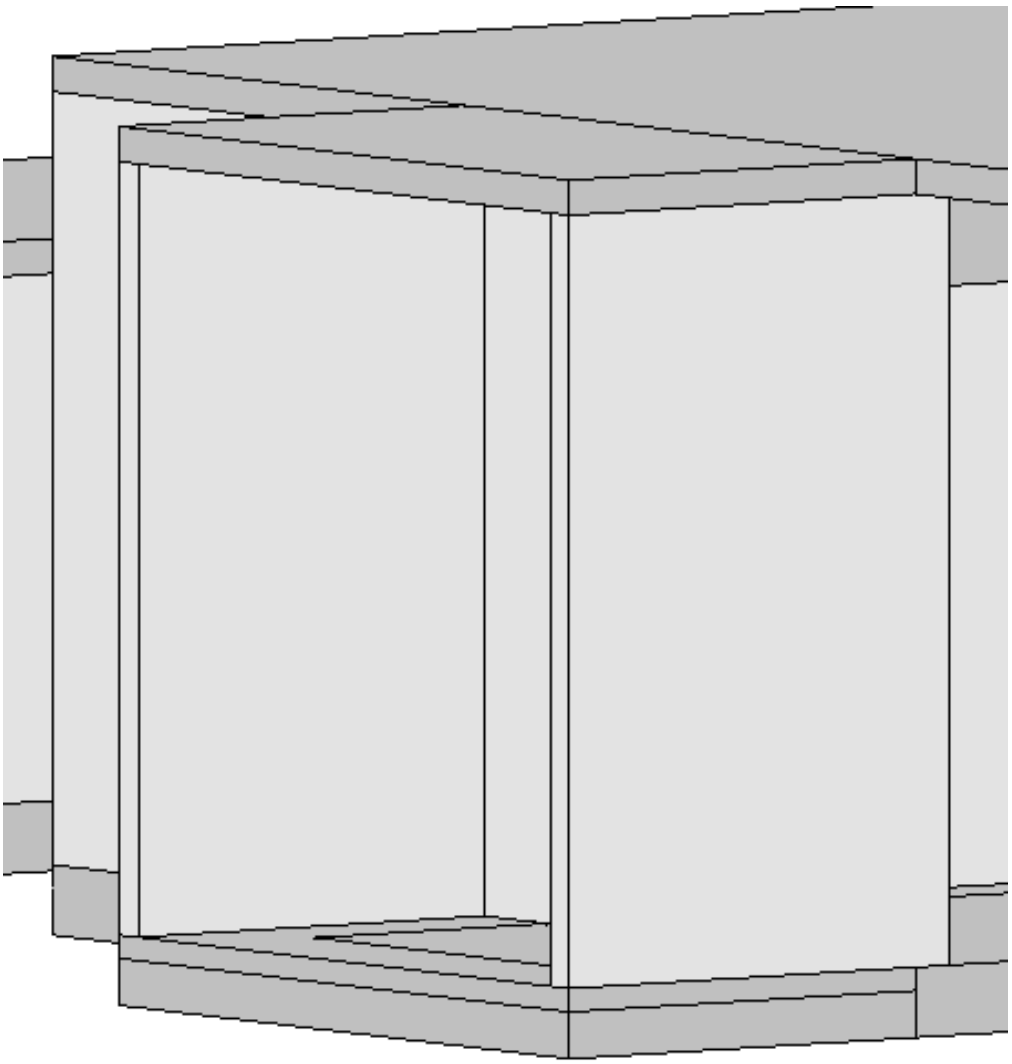
Results: Deflection

Lintel	Condition	δs [in]	δmax [in]	Ratio	
1		0.00	0.00	0.00	

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE ENTRY WALL DESIGN



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Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Elements Wall Designs\190 mph Exp D\PR House Entry Wall Design_6 in 190 Exp D.msw\

Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	11.50 [ft]
Total length	:	6.32 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Partial grouting
Mortar bed type	:	Full bed
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	11.50	5.63	0.08

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WL_X	No	WIND	Wind Load X-Direction
WL_Z	No	WIND	Wind Load Z-Direction
EQ_X	No	EQ	Earthquake X-Direction
EQ_Z	No	EQ	Earthquake Z-Direction
SM1	Yes		DL

DM1	Yes	DL
D1	Yes	DL
D2	Yes	DL+LL
D3	Yes	DL+LLR
D4	Yes	DL+0.75LL
D5	Yes	DL+0.75LLR
D6	Yes	DL+0.75LL+0.75LLR
D7	Yes	DL+0.6WL_X
D8	Yes	DL+0.6WL_Z
D9	Yes	1.126DL+0.91EQ_X
D10	Yes	1.126DL+0.91EQ_Z
D11	Yes	DL+0.75LL+0.75LLR+0.45WL_X
D12	Yes	DL+0.75LL+0.75LLR+0.45WL_Z
D13	Yes	DL+0.75LL+0.45WL_X
D14	Yes	DL+0.75LL+0.45WL_Z
D15	Yes	DL+0.75LLR+0.45WL_X
D16	Yes	DL+0.75LLR+0.45WL_Z
D17	Yes	1.09DL+0.75LL+0.683EQ_X
D18	Yes	1.09DL+0.75LL+0.683EQ_Z
D19	Yes	1.09DL+0.683EQ_X
D20	Yes	1.09DL+0.683EQ_Z
D21	Yes	0.6DL+0.6WL_X
D22	Yes	0.6DL+0.6WL_Z
D23	Yes	0.474DL+0.91EQ_X
D24	Yes	0.474DL+0.91EQ_Z
S1	Yes	DL
S2	Yes	DL+LL
S3	Yes	DL+LLR
S4	Yes	DL+0.75LL
S5	Yes	DL+0.75LLR
S6	Yes	DL+0.75LL+0.75LLR
S7	Yes	DL+0.6WL_X
S8	Yes	DL+0.6WL_Z
S9	Yes	1.126DL+0.91EQ_X
S10	Yes	1.126DL+0.91EQ_Z
S11	Yes	DL+0.75LL+0.75LLR+0.45WL_X
S12	Yes	DL+0.75LL+0.75LLR+0.45WL_Z
S13	Yes	1.09DL+0.683EQ_X
S14	Yes	1.09DL+0.683EQ_Z
S15	Yes	0.6DL+0.6WL_X
S16	Yes	0.6DL+0.6WL_Z
S17	Yes	0.474DL+0.91EQ_X
S18	Yes	0.474DL+0.91EQ_Z

Distributed loads:

Consider self weight : No

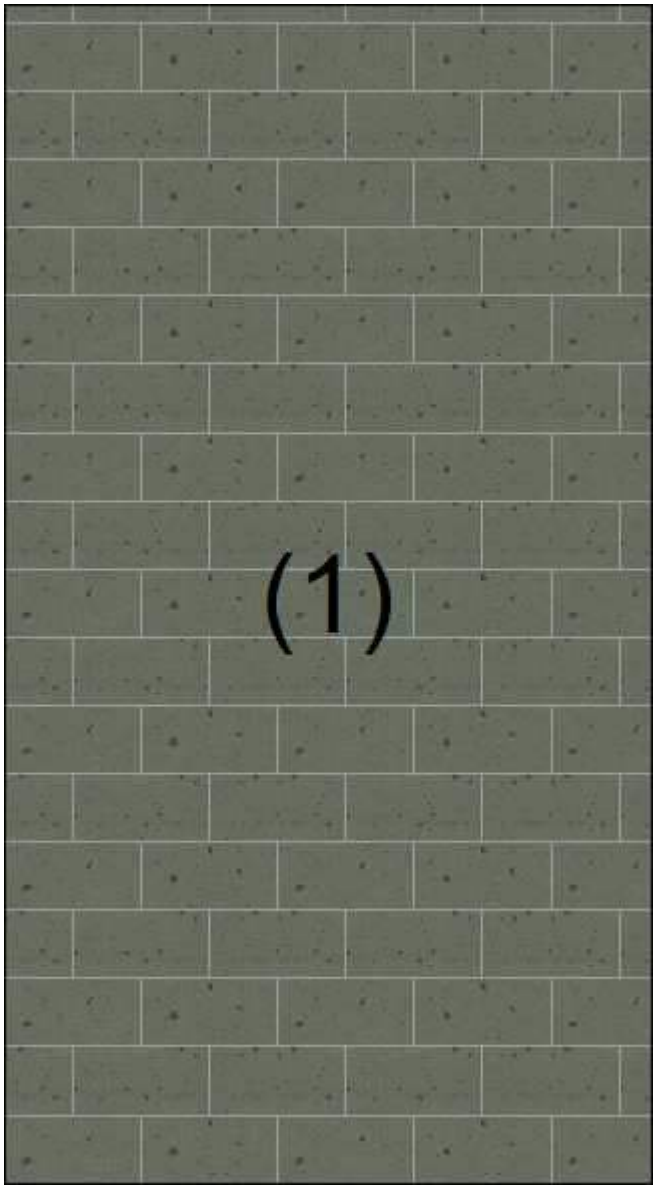
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	1.45	0.00
1	LL	Vertical	0.11	0.00
1	LLR	Vertical	0.11	0.00
1	WL_X	Vertical	-1.30	0.00
1	WL_Z	Vertical	-0.40	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WL_X	0.07
1	WL_Z	-0.08
Parapet	WL_X	0.07
Parapet	WL_Z	-0.08

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	6.32	11.50

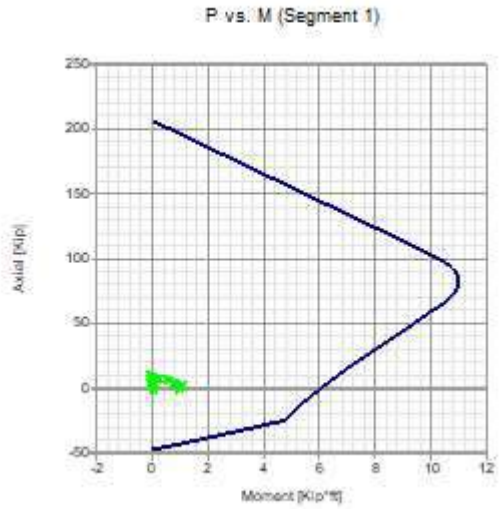
Vertical reinforcement:

Segment	Bars	Spacing [in]	Ld [in]
1	5-#5	16.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D7(Max)	3.08	-1.07	6.22	0.17

Interaction diagrams, P vs. M:



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D17(Top)	10.05	80.21	0.13

Results: Axial tension

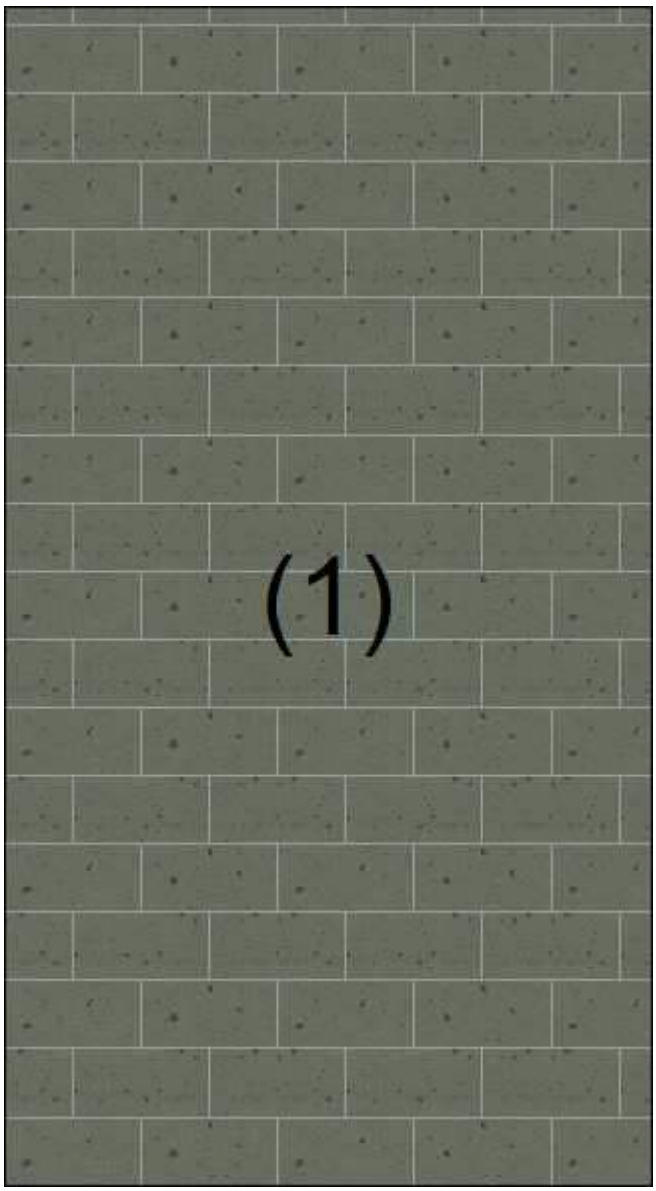
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Bottom)	253.91	32000.00	0.01

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D7(Bottom)	3.954	73.336	0.05

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	6.32	11.50

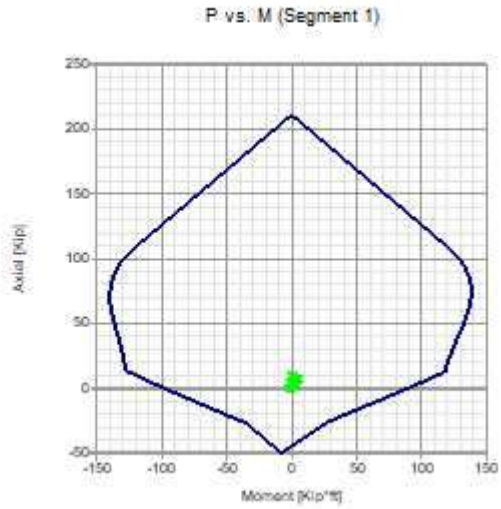
Reinforcement:

Segment	Vertical reinforcement Bars	Spacing [in]	Ld [in]	Horizontal reinforcement Bars	Spacing [in]	Ld [in]
1	5-#5	16.00	0.00	9-W2.8	16.00	9.02

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D18(Max)	8.14	5.43	107.27	0.05

Interaction diagrams, P vs. M:



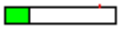
Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D17(Top)	10.05	81.43	0.12

Results: Axial tension

Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Bottom)	240.99	32000.00	0.01

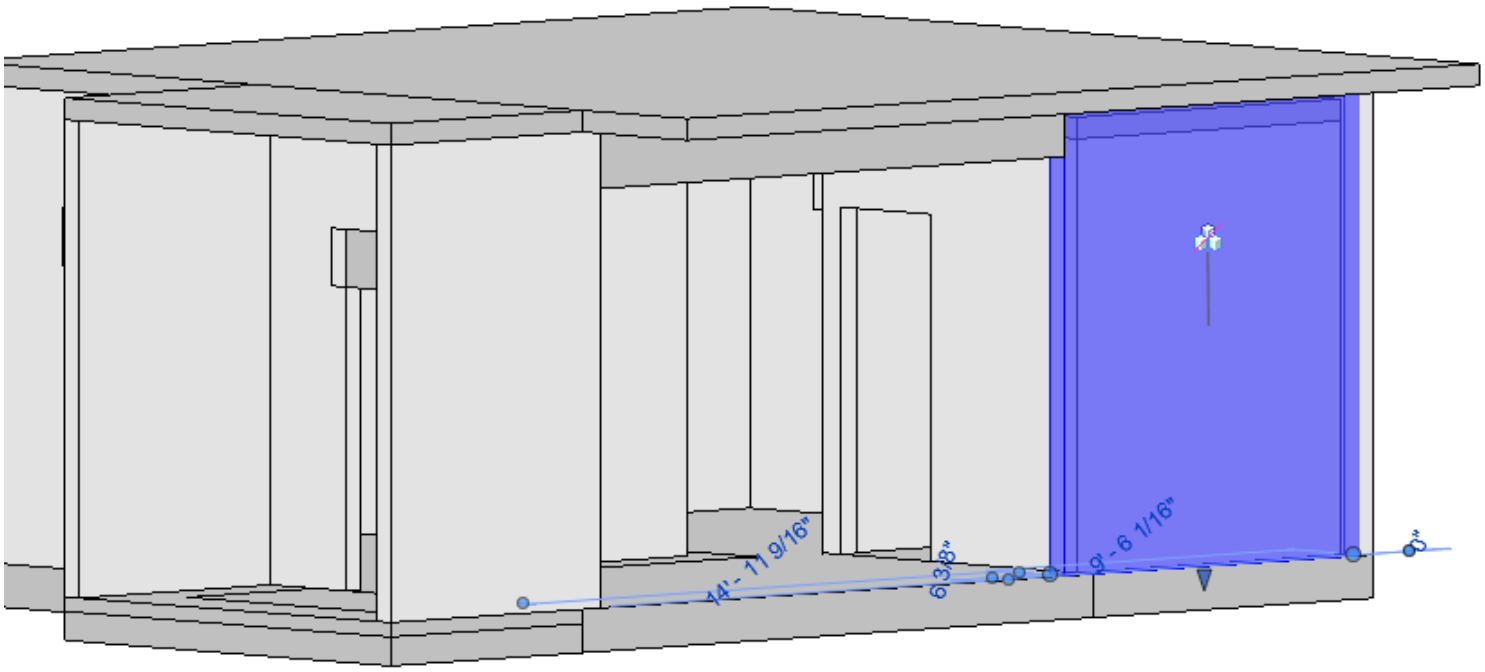
Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio	
1	D10(Bottom)	10.216	38.960	0.26	

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE LONG SIDE
WALL DESIGN



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Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	11.50 [ft]
Total length	:	10.23 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	Flanges

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Partial grouting
Mortar bed type	:	Full bed
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	11.50	5.63	0.08

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WL_X	No	WIND	Wind Load X-Direction
WL_Z	No	WIND	Wind Load Z-Direction
EQ_X	No	EQ	Earthquake X-Direction
EQ_Z	No	EQ	Earthquake Z-Direction
SM1	Yes		DL

DM1	Yes	DL
D1	Yes	DL
D2	Yes	DL+LL
D3	Yes	DL+LLR
D4	Yes	DL+0.75LL
D5	Yes	DL+0.75LLR
D6	Yes	DL+0.75LL+0.75LLR
D7	Yes	DL+0.6WL_X
D8	Yes	DL+0.6WL_Z
D9	Yes	1.126DL+0.91EQ_X
D10	Yes	1.126DL+0.91EQ_Z
D11	Yes	DL+0.75LL+0.75LLR+0.45WL_X
D12	Yes	DL+0.75LL+0.75LLR+0.45WL_Z
D13	Yes	DL+0.75LL+0.45WL_X
D14	Yes	DL+0.75LL+0.45WL_Z
D15	Yes	DL+0.75LLR+0.45WL_X
D16	Yes	DL+0.75LLR+0.45WL_Z
D17	Yes	1.09DL+0.75LL+0.683EQ_X
D18	Yes	1.09DL+0.75LL+0.683EQ_Z
D19	Yes	1.09DL+0.683EQ_X
D20	Yes	1.09DL+0.683EQ_Z
D21	Yes	0.6DL+0.6WL_X
D22	Yes	0.6DL+0.6WL_Z
D23	Yes	0.474DL+0.91EQ_X
D24	Yes	0.474DL+0.91EQ_Z
S1	Yes	DL
S2	Yes	DL+LL
S3	Yes	DL+LLR
S4	Yes	DL+0.75LL
S5	Yes	DL+0.75LLR
S6	Yes	DL+0.75LL+0.75LLR
S7	Yes	DL+0.6WL_X
S8	Yes	DL+0.6WL_Z
S9	Yes	1.126DL+0.91EQ_X
S10	Yes	1.126DL+0.91EQ_Z
S11	Yes	DL+0.75LL+0.75LLR+0.45WL_X
S12	Yes	DL+0.75LL+0.75LLR+0.45WL_Z
S13	Yes	1.09DL+0.683EQ_X
S14	Yes	1.09DL+0.683EQ_Z
S15	Yes	0.6DL+0.6WL_X
S16	Yes	0.6DL+0.6WL_Z
S17	Yes	0.474DL+0.91EQ_X
S18	Yes	0.474DL+0.91EQ_Z

Distributed loads:

Consider self weight : No

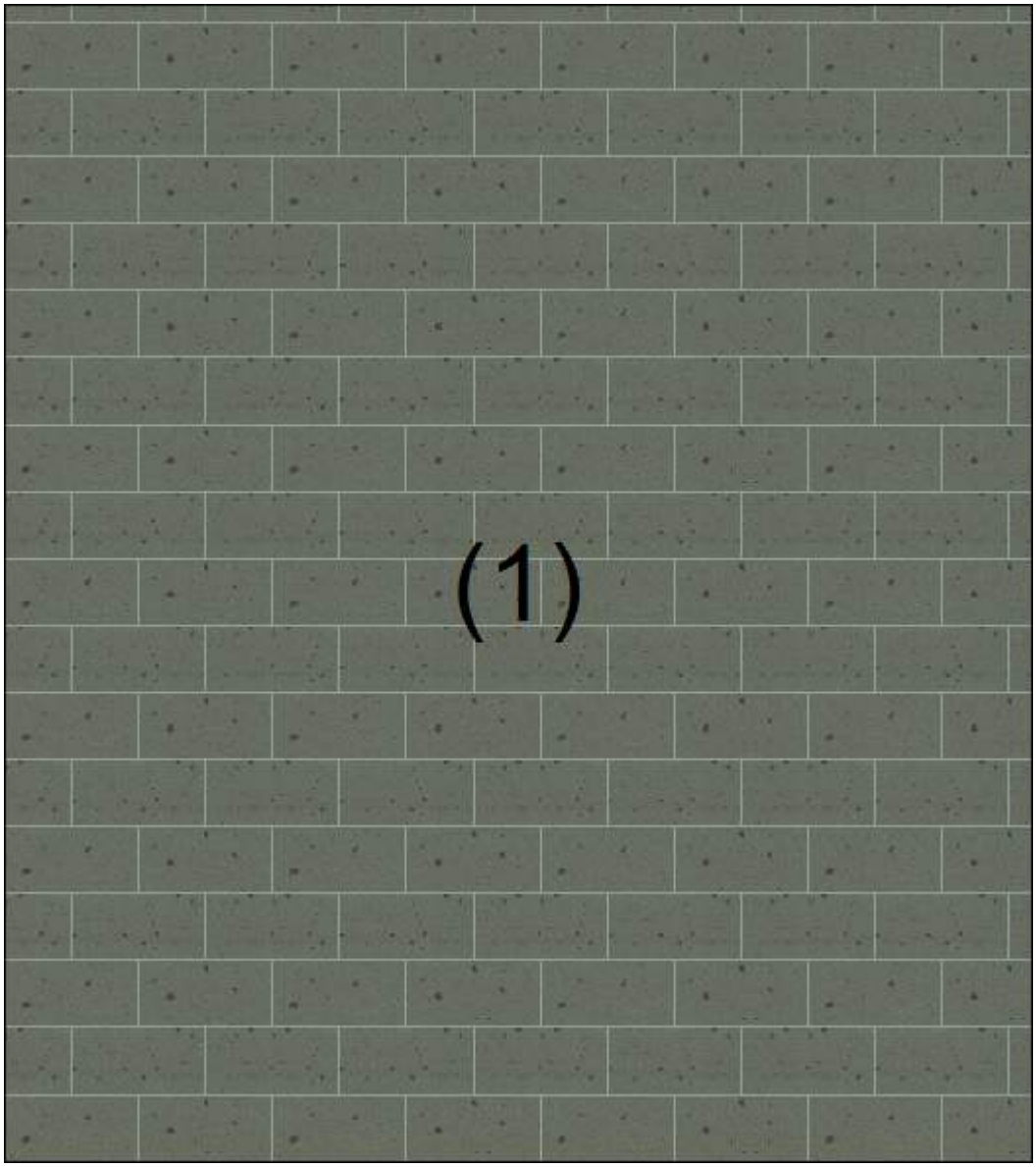
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.82	0.00
1	LL	Vertical	1.03	0.00
1	LLR	Vertical	0.21	0.00
1	WL_X	Vertical	-1.30	0.00
1	WL_Z	Vertical	-0.40	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WL_X	0.07
1	WL_Z	-0.08
Parapet	WL_X	0.07
Parapet	WL_Z	-0.08

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	10.23	11.50

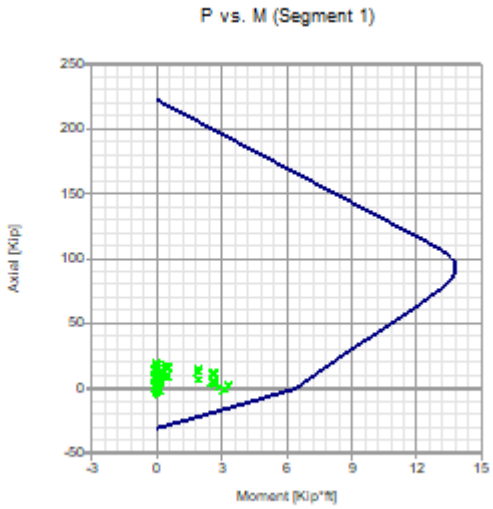
Vertical reinforcement:

Segment	Bars	Spacing [in]	Ld [in]
1	3-#5	40.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D21(Max)	-1.39	-3.12	6.12	0.51

Interaction diagrams, P vs. M:



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D2(Top)	18.64	109.00	0.17

Results: Axial tension

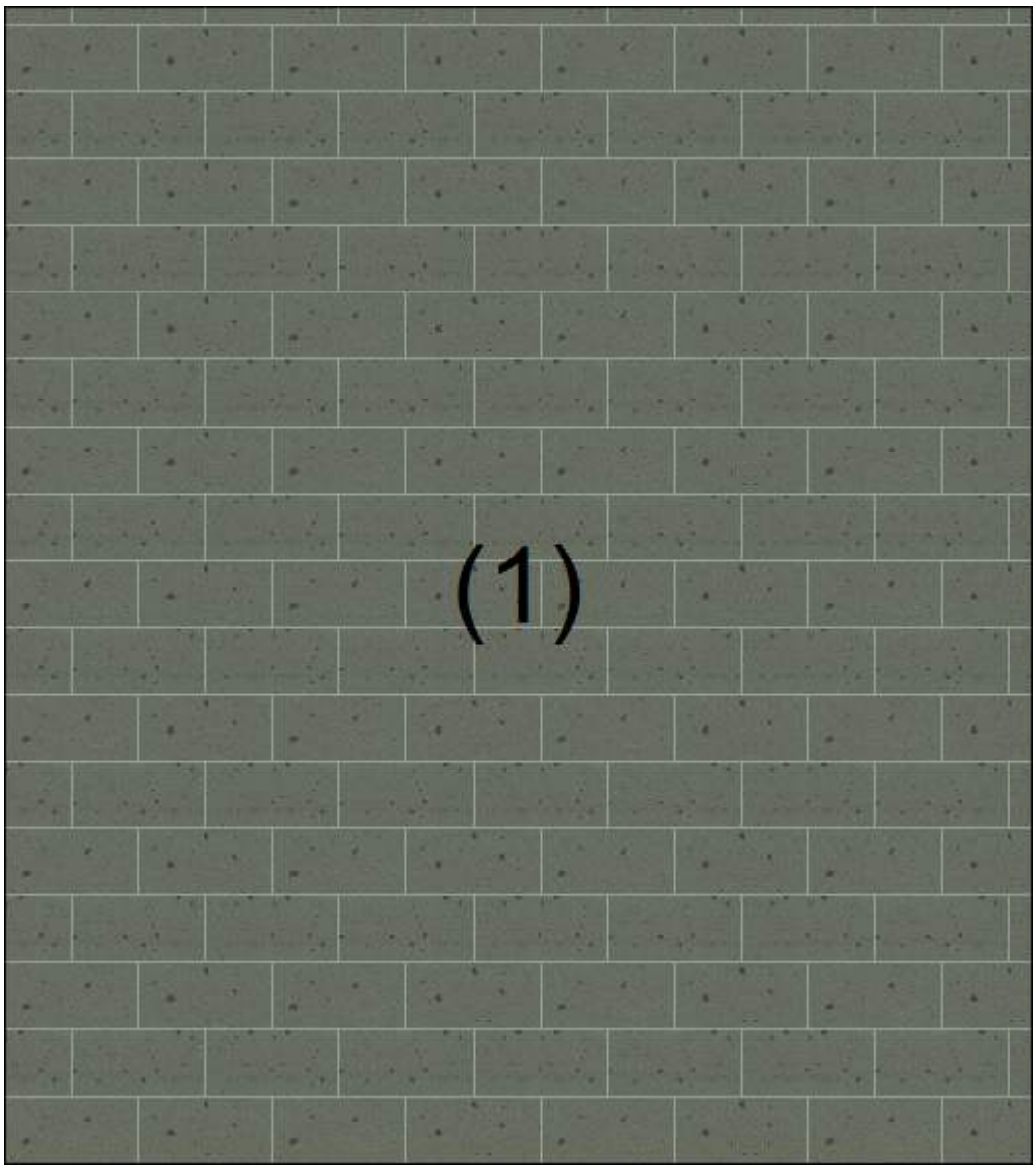
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Bottom)	4350.20	32000.00	0.14

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D7(Bottom)	4.593	69.514	0.07

SHEAR WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	10.23	11.50

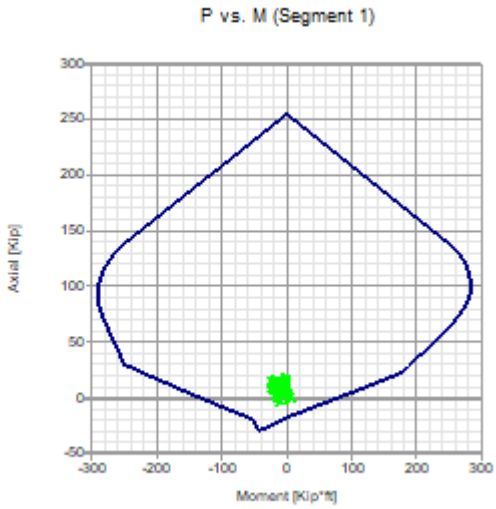
Reinforcement:

Segment	Vertical reinforcement Bars	Spacing [in]	Ld [in]	Horizontal reinforcement Bars	Spacing [in]	Ld [in]
1	3-#5	40.00	0.00	9-W2.8	16.00	9.02

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D11(Bottom)	8.64	-23.73	167.35	0.14

Interaction diagrams, P vs. M:



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D2(Top)	18.64	106.36	0.18

Results: Axial tension

Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Bottom)	4471.74	32000.00	0.14

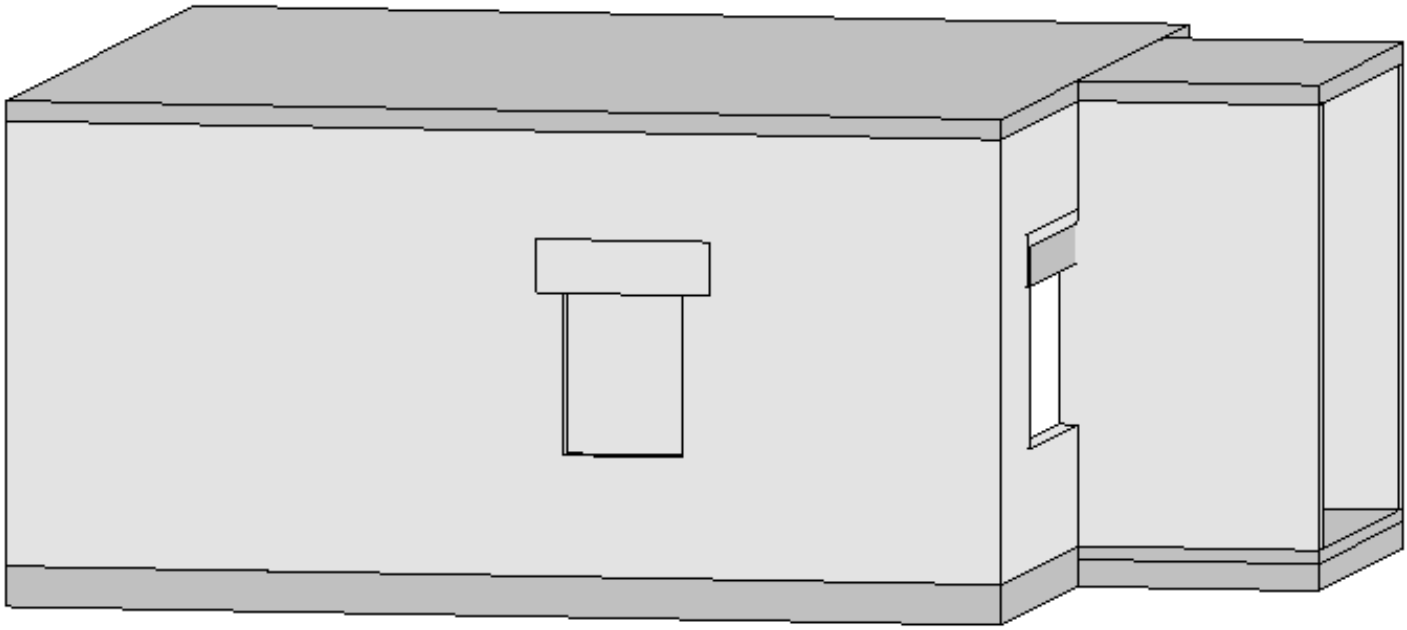
Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D7(Bottom)	10.299	31.037	0.33

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

PR FEMA HOUSE LONG
OPPOSITE SIDE WALL DESIGN



Current Date: 1/9/2020 5:37 PM
Units system: English
File name: \\FUSOLA1000\ah$\STRUCTURAL\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Elements Wall Designs\190 mph Exp D\PR House Long Side Wall Design_6 in 190 Exp D.msw\

Design Results

Masonry wall

GENERAL INFORMATION:

Global status : OK

Design code	:	TMS 402-13 ASD

Geometry:

Total height	:	11.50 [ft]
Total length	:	24.65 [ft]
Base support type	:	Continuous
Wall bottom restraint	:	Pinned
Column bottom restraint	:	Fixed
Rigidity elements	:	None

Materials:

Material	:	CMU 1.5-60
Mortar type	:	Port/Mort - M/S
Grouting type	:	Partial grouting
Mortar bed type	:	Full bed
Masonry compression strength (F`m)	:	1500 [Lb/in2]
Steel tension strength (fy)	:	60000 [Lb/in2]
Steel allowable tension strength (Fs)	:	32000 [Lb/in2]
Joint reinforcement allowable tension strength (Fs)	:	30000 [Lb/in2]
Steel elasticity modulus (Es)	:	2.9E07 [Lb/in2]
Masonry elasticity modulus (Em)	:	1.35E06 [Lb/in2]
Masonry unit weight	:	0.135 [Kip/ft3]

Seismic data:

Seismic design category	:	SDC D
Response modification factor	:	1.00
Shear wall type	:	Special

Number of stories: 1

Story	Story height [ft]	Wall thickness [in]	Effective unit weight [Kip/ft3]
1	11.50	5.63	0.08

Openings:

Reference	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
Lower left	13.63	3.25	3.00	4.00

Load conditions:

ID	Comb.	Category	Description
DL	No	DL	Dead Load
LL	No	LL	Live Load
LLR	No	LLR	Roof Live Load
WL_X	No	WIND	Wind Load X-Direction
WL_Z	No	WIND	Wind Load Z-Direction
EQ_X	No	EQ	Earthquake X-Direction
EQ_Z	No	EQ	Earthquake Z-Direction
SM1	Yes		DL
DM1	Yes		DL
D1	Yes		DL
D2	Yes		DL+LL
D3	Yes		DL+LLR
D4	Yes		DL+0.75LL
D5	Yes		DL+0.75LLR
D6	Yes		DL+0.75LL+0.75LLR
D7	Yes		DL+0.6WL_X
D8	Yes		DL+0.6WL_Z
D9	Yes		1.126DL+0.91EQ_X
D10	Yes		1.126DL+0.91EQ_Z
D11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
D12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
D13	Yes		DL+0.75LL+0.45WL_X
D14	Yes		DL+0.75LL+0.45WL_Z
D15	Yes		DL+0.75LLR+0.45WL_X
D16	Yes		DL+0.75LLR+0.45WL_Z
D17	Yes		1.09DL+0.75LL+0.683EQ_X
D18	Yes		1.09DL+0.75LL+0.683EQ_Z
D19	Yes		1.09DL+0.683EQ_X
D20	Yes		1.09DL+0.683EQ_Z
D21	Yes		0.6DL+0.6WL_X
D22	Yes		0.6DL+0.6WL_Z
D23	Yes		0.474DL+0.91EQ_X
D24	Yes		0.474DL+0.91EQ_Z
S1	Yes		DL
S2	Yes		DL+LL
S3	Yes		DL+LLR
S4	Yes		DL+0.75LL
S5	Yes		DL+0.75LLR
S6	Yes		DL+0.75LL+0.75LLR
S7	Yes		DL+0.6WL_X
S8	Yes		DL+0.6WL_Z
S9	Yes		1.126DL+0.91EQ_X
S10	Yes		1.126DL+0.91EQ_Z
S11	Yes		DL+0.75LL+0.75LLR+0.45WL_X
S12	Yes		DL+0.75LL+0.75LLR+0.45WL_Z
S13	Yes		1.09DL+0.683EQ_X
S14	Yes		1.09DL+0.683EQ_Z
S15	Yes		0.6DL+0.6WL_X
S16	Yes		0.6DL+0.6WL_Z
S17	Yes		0.474DL+0.91EQ_X
S18	Yes		0.474DL+0.91EQ_Z

Distributed loads:

Consider self weight : No

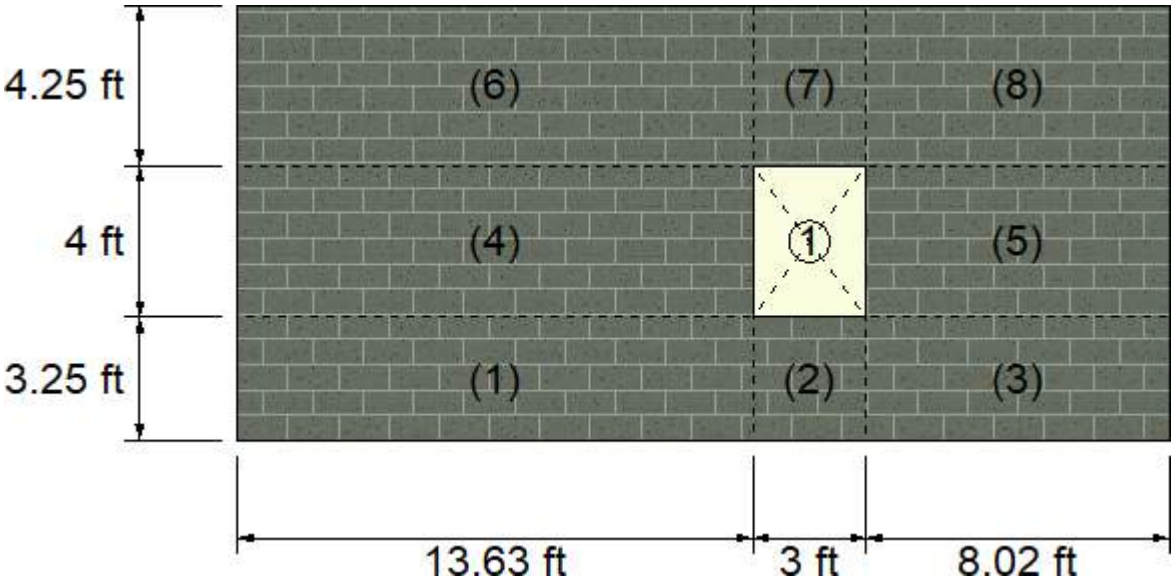
Story	Condition	Direction	Magnitude [Kip/ft]	Eccentricity [ft]
1	DL	Vertical	0.82	0.00
1	LL	Vertical	1.03	0.00
1	LLR	Vertical	0.21	0.00
1	WL_X	Vertical	-1.30	0.00
1	WL_Z	Vertical	-0.40	0.00

Out-of-plane loads:

Story	Condition	Magnitude [Kip/ft2]
1	WL_X	0.07
1	WL_Z	0.02
Parapet	WL_X	0.07
Parapet	WL_Z	0.02

BEARING WALL DESIGN:

Status : OK



Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	13.63	3.25
2	13.63	0.00	3.00	3.25
3	16.63	0.00	8.02	3.25
4	0.00	3.25	13.63	4.00
5	16.63	3.25	8.02	4.00
6	0.00	7.25	13.63	4.25
7	13.63	7.25	3.00	4.25
8	16.63	7.25	8.02	4.25

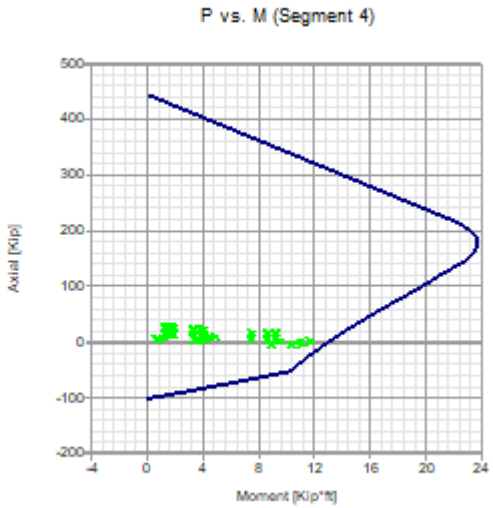
Vertical reinforcement:

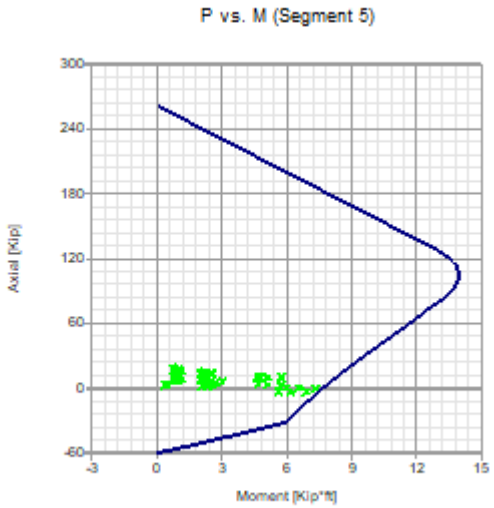
Segment	Bars	Spacing [in]	Ld [in]
1	10-#5	16.00	39.33
2	1-#5	40.00	39.33
3	6-#5	16.00	39.33
4	10-#5	16.00	39.33
5	6-#5	16.00	39.33
6	10-#5	16.00	39.33
7	1-#5	40.00	39.33
8	6-#5	16.00	39.33

Results: Combined axial flexure

Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D7(Top)	0.37	-9.54	13.03	0.73
2	D7(Max)	0.09	-0.83	1.89	0.44
3	D7(Top)	0.63	-5.98	7.69	0.78
4	D7(Max)	0.46	-11.76	13.03	0.90
5	D7(Max)	0.56	-7.34	7.68	0.96
6	D7(Bottom)	0.50	-10.98	13.03	0.84
7	D21(Max)	-0.57	-1.16	1.76	0.66
8	D7(Bottom)	0.47	-6.54	7.68	0.85

Interaction diagrams, P vs. M:





Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D2(Top)	27.43	172.88	0.16
2	D2(Bottom)	3.23	24.39	0.13
3	D2(Top)	17.65	101.72	0.17
4	D2(Max)	27.89	172.88	0.16
5	D2(Max)	17.94	101.72	0.18
6	D2(Bottom)	27.47	172.88	0.16

7	D2(Top)	5.50	24.39	0.23
8	D2(Bottom)	16.82	101.72	0.17

Results: Axial tension

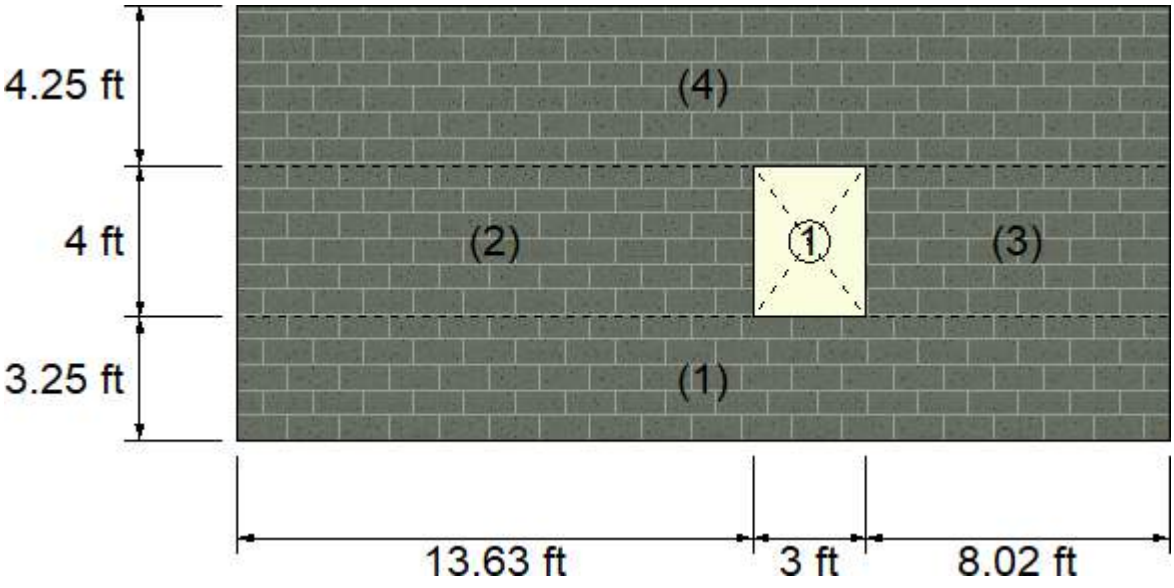
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Top)	1401.20	32000.00	0.04
2	D21(Bottom)	1765.77	32000.00	0.06
3	D21(Top)	1371.64	32000.00	0.04
4	D21(Max)	1404.82	32000.00	0.04
5	D21(Max)	1427.79	32000.00	0.04
6	D21(Bottom)	1371.59	32000.00	0.04
7	D21(Top)	3066.76	32000.00	0.10
8	D21(Bottom)	1358.81	32000.00	0.04

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D7(Max)	7.326	43.727	0.17
2	D7(Max)	5.662	43.784	0.13
3	D7(Max)	7.576	44.176	0.17
4	D7(Bottom)	3.465	43.774	0.08
5	D7(Top)	3.537	44.009	0.08
6	D7(Max)	5.927	43.847	0.14
7	D7(Max)	4.844	43.785	0.11
8	D7(Max)	5.623	43.996	0.13

SHEAR WALL DESIGN:

Status : OK



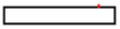
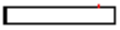
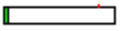
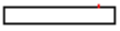
Geometry:

Segment	X Coordinate [ft]	Y Coordinate [ft]	Width [ft]	Height [ft]
1	0.00	0.00	24.65	3.25
2	0.00	3.25	13.63	4.00
3	16.63	3.25	8.02	4.00
4	0.00	7.25	24.65	4.25

Reinforcement:

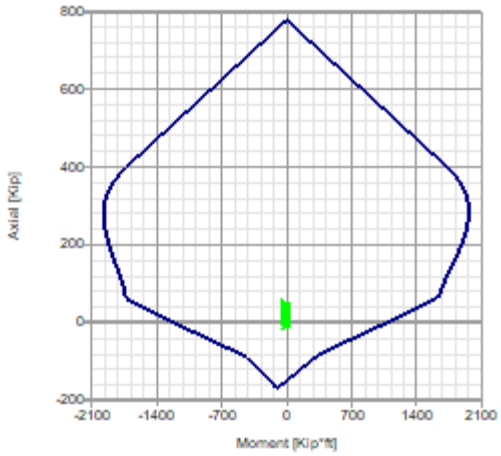
	Vertical reinforcement			Horizontal reinforcement		
Segment	**Bars**	**Spacing** [in]	**Ld** [in]	**Bars**	**Spacing** [in]	**Ld** [in]
1	10-#5	16.00	0.00	3-W2.8	16.00	9.02
	1-#5	40.00	0.00	3-W2.8	16.00	9.02
	6-#5	16.00	0.00	3-W2.8	16.00	9.02
2	10-#5	16.00	0.00	3-W2.8	16.00	9.02
3	6-#5	16.00	0.00	3-W2.8	16.00	9.02
4	10-#5	16.00	0.00	3-W2.8	16.00	9.02
	1-#5	40.00	0.00	3-W2.8	16.00	9.02
	6-#5	16.00	0.00	3-W2.8	16.00	9.02

Results: Combined axial flexure

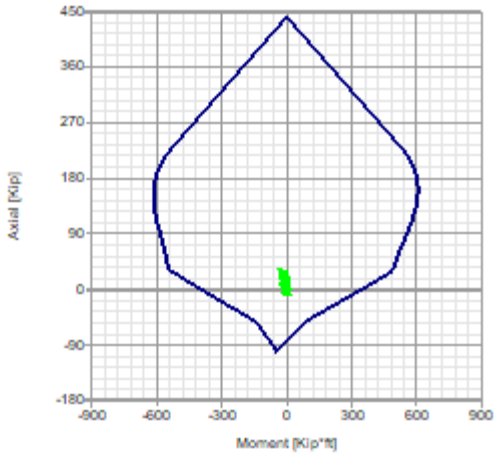
Segment	Condition	P [Kip]	M [Kip*ft]	Ma [Kip*ft]	Ratio	
1	D7(Bottom)	0.99	-10.06	1216.02	0.01	
2	D2(Max)	28.00	-15.17	525.16	0.03	
3	D2(Max)	17.94	7.92	175.27	0.05	
4	D9(Bottom)	22.91	-2.02	1402.09	0.00	

Interaction diagrams, P vs. M:

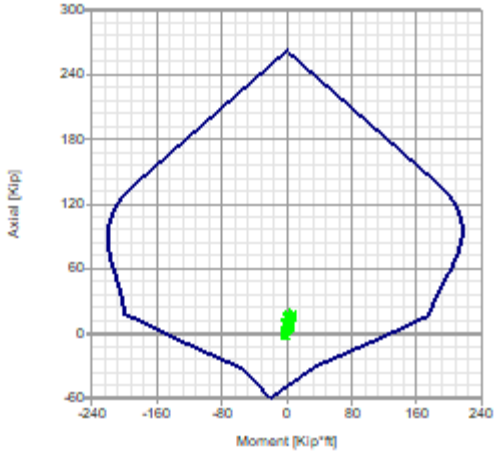
P vs. M (Segment 1)



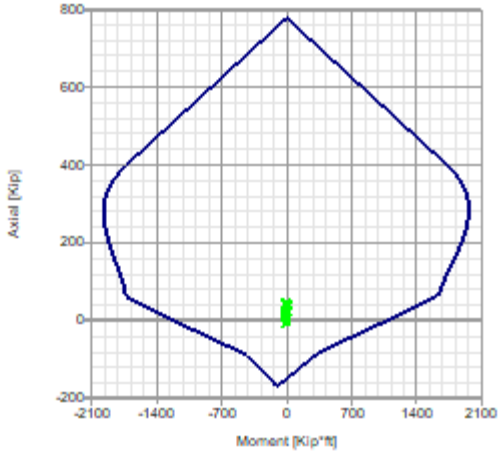
P vs. M (Segment 2)



P vs. M (Segment 3)



P vs. M (Segment 4)



Results: Axial compression

Segment	Condition	P [Kip]	Pa [Kip]	Ratio
1	D2(Top)	46.40	305.44	0.15
2	D2(Max)	28.00	171.88	0.16
3	D2(Max)	17.94	101.78	0.18
4	D2(Bottom)	45.86	305.44	0.15

Results: Axial tension

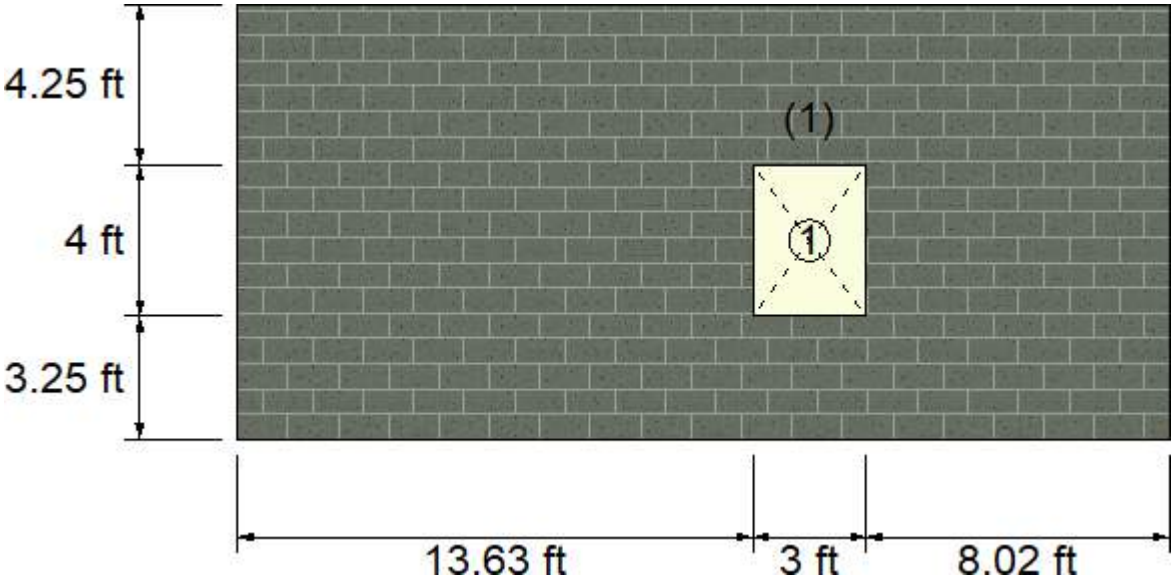
Segment	Condition	ft [Lb/in2]	Fs [Lb/in2]	Ratio
1	D21(Top)	1367.82	32000.00	0.04
2	D21(Max)	1435.87	32000.00	0.04
3	D21(Max)	1424.00	32000.00	0.04
4	D21(Bottom)	1350.55	32000.00	0.04

Results: Shear

Segment	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D10(Max)	3.672	40.571	0.09
2	D7(Bottom)	2.568	36.437	0.07
3	D2(Max)	8.173	39.238	0.21
4	D9(Bottom)	1.318	42.013	0.03

LINTEL DESIGN:

Status : OK



Geometry:

Lintel	X Coordinate [ft]	Y Coordinate [ft]	Length [ft]	Depth [in]
1	13.63	3.25	3.00	16.00

Reinforcement:

Lintel	Top long. reinforcement Bars	Top long. reinforcement Extent [in]	Bottom long. reinforcement Bars	Bottom long. reinforcement Extent [in]	Transverse reinforcement Bars	Transverse reinforcement Spacing [in]	Ld [in]
1	1-#5	0.50	1-#5	0.50	--	0.00	0.00

Results: Bending

Lintel	Condition	M [Kip*ft]	Ma [Kip*ft]	Ratio
1	D2(Top)	0.26	8.90	0.03

Results: Shear

Lintel	Condition	fv [Lb/in2]	Fv [Lb/in2]	Ratio
1	D2(Top)	13.327	43.571	0.31

Results: Deflection

Lintel	Condition	δs [in]	δmax [in]	Ratio
1		0.00	0.00	0.00

Notes:

* P = Axial load
* Pa = Allowable compressive force due to axial load.
* M = Moment at the section under consideration.
* Ma = Wall allowable moment due to axial force or lintel pure flexure allowable moment
* fa = Calculated compressive stress due to axial load only
* fb = Calculated compressive stress due to axial flexure only
* ft = Calculated axial tension
* Fa = Allowable compressive stress due to axial load only
* Fb = Allowable compressive stress due to axial flexure only
* fv = Calculated shear stress
* Fs = Allowable tensile or compressive stress
* Fv = Allowable shear stress
* ld = Embedment length
* As = Effective cross sectional area of reinforcement
* δs = Calculated deflection
* δmax = Maximum allowable deflection

$L1 := 9.667 \cdot 12 = 116.004$

$L2 := 10.833 \cdot 12 = 129.996$

$L3 := 15.25 \cdot 12 = 183$

$T := 5.667$

$$I1 := \frac{\left(L1^3 \cdot T\right)}{12} = 7.372 \times 10^5$$

$$I2 := \frac{\left(L2^3 \cdot T\right)}{12} = 1.037 \times 10^6$$

$$I3 := \frac{\left(L3^3 \cdot T\right)}{12} = 2.894 \times 10^6$$

$IT := I1 + I2 + I3 = 4.669 \times 10^6$

Wall 1 Rigidity

$$R1 := \frac{I1}{IT} = 0.158$$

Wall 2 Rigidity

$$R2 := \frac{I2}{IT} = 0.222$$

Wall 3 Rigidity

$$R3 := \frac{I3}{IT} = 0.62$$

FEMA - PUERTO RICO PRESCRIPTIVE DESIGN HOUSE
LINTEL DESIGN

Subject: PR House Lintel Design

ATKINS

Comp by: EEB
Check by: NJR
Date: 11/27/19
Job Number: 100060693
Sheet Number: 1

Lintel for 3'-0" Opening: (6½" Bearing)

Load: (0.33)(135 pcf)(6"/12")(4'+1"/12") = 90.96 plf

Lateral Load: (76.1 psf)(16"/12") = (101.5 plf)(0.6) = 60.9 plf

Per the Cast Crete Catalogue: CF16-1B: 3850 plf Gravity + 953 plf Lateral
OR CF8: 1887 plf Gravity + 609 plf Lateral

Lintel for 6'-0" Opening: (6½" Bearing)

Load: (0.33)(135 pcf)(8.5')(7'+½") = 157.8 plf

Lateral Load: (76.1 psf)(16"/12") = (101.5 plf)(0.6) = 94.7 plf

Per the Cast Crete Catalogue: CF16-1B will work.
(2853 plf Gravity, 653 plf Lateral)
OR CF8: 883 plf Gravity + 367 plf Lateral

PER ELEMENTS WALL DESIGN, THE SAFE ROOM REQUIRES A 16" DEEP LINTEL.

CAST-CRETE	GRAVITY							
TYPE OF LINTEL / OVERALL LINTEL LENGTH	6U8	6F8-1B	6F12-1B	6F16-1B	6F20-1B	6F24-1B	6F28-1B	6F32-1B
2'-8" TO 3'-6" PRECAST	2332	2676	3892	5050	6148	7227	8297	9357
3'-7" TO 4'-0" PRECAST	2025	2313	3892	5050	6148	7227	8297	9357
4'-1" TO 4'-6" PRECAST	1654	1887	3633	5050	6148	7227	8297	9357
4'-7" TO 5'-10" PRECAST	1067	1260	2198	3557	5734	7227	8297 (31)	8225 (19)
5'-11" TO 6'-6" PRECAST	949	1078	1831	2850	4328	6737	8297	9357
6'-7" TO 7'-6" PRECAST	779	883	1459	2188	3151	4524	6654	9357 (11)
7'-7" TO 9'-4" PRECAST	584	660	1056	1523	2084	2795	3731	5017
9'-5" TO 10'-6" PRECAST	503	566	895	1270	1706	2236	2898	3747
10'-7" TO 11'-4" PRECAST	457	513	805	1133	1507	1952	2492	3163
11'-5" TO 12'-0" PRECAST	425	477	744	1042	1377	1769	2238	2808
12'-1" TO 13'-4" PRECAST	373	417	646	895	1170	1485	1852	2285
13'-5" TO 14'-0" PRECAST	351	392	605	835	1087	1373	1703	2087
14'-1" TO 17'-4" PRECAST	NR	299	455	620	794	985	1198	1437

CAST-CRETE	UPLIFT							LATERAL		
TYPE OF LINTEL / OVERALL LINTEL LENGTH	6F8-1T	6F12-1T	6F16-1T	6F20-1T	6F24-1T	6F28-1T	6F32-1T	6U8	6F8	RCMU
2'-8" TO 3'-6" PRECAST	1412	2074	2715	3356	3997	4638	5279	587	1055	596
3'-7" TO 4'-0" PRECAST	1225	1800	2357	2913	3470	4027	4583	487	787	445
4'-1" TO 4'-6" PRECAST	1083	1592	2084	2577	3069	3562	4055	416	609	344
4'-7" TO 5'-10" PRECAST	831	1222	1600	1979	2357	2736	3114	300	350	198
5'-11" TO 6'-6" PRECAST	723	1097 (9)	1437 (1)	1777	2117	2457	2797	263	496	157
6'-7" TO 7'-6" PRECAST	648 (16)	863 (13)	1249 (14)	1544 (9)	1840 (6)	2135 (4)	2431 (2)	222	367	116
7'-7" TO 9'-4" PRECAST	575	571 (12)	980 (27)	1252 (26)	1492 (24)	1732 (22)	1972 (20)	173	352	74
9'-5" TO 10'-6" PRECAST	514	462 (12)	787 (27)	1121 (33)	1336 (31)	1551 (29)	1766 (28)	151	276	58
10'-7" TO 11'-4" PRECAST	474	404 (11)	685 (26)	985 (33)	1213 (33)	1442 (33)	1645 (32)	139	311	49
11'-5" TO 12'-0" PRECAST	454 (7)	367 (11)	619 (26)	888 (33)	1093 (33)	1299 (33)	1506 (33)	131	277	44
12'-1" TO 13'-4" PRECAST	402 (13)	308 (11)	516 (25)	736 (32)	906 (32)	1076 (32)	1247 (32)	117	223	35
13'-5" TO 14'-0" PRECAST	368 (13)	285 (10)	475 (24)	677 (31)	832 (32)	989 (32)	1145 (32)	111	202	32
14'-1" TO 17'-4" PRECAST	253 (12)	208 (9)	338 (22)	476 (29)	585 (29)	693 (29)	803 (29)	NR	130	21

FEMA - PUERTO RICO PRESCRIPTIVE DESIGN HOUSE
TYPICAL MONOLITHIC FOUNDATION

BEAM ON ELASTIC FOUNDATION ANALYSIS

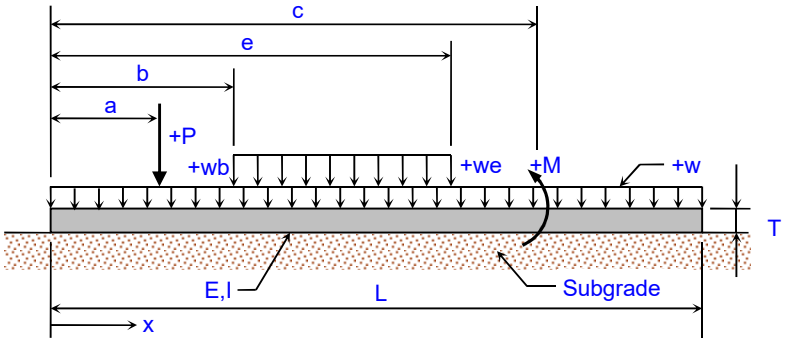
For Soil Supported Beam, Combined Footing, Slab Strip or Mat Strip of Assumed Finite Length with Both Ends Free

Job Name:	CMU PRESCRIPTIVE DESIGN	Subject:	TURNDOWN FOUNDATION		
Job Number:		Originator:		Checker:	

Input Data:

Beam Data:

Length, L =	24.0000	ft.
Width, W =	1.5000	ft.
Thickness, T =	1.5000	ft.
Modulus, E =	3605	ksi
Subgrade, K =	250	pci
Inertia, I =	0.422	ft.^4



Beam Loadings:

Full Uniform:

w = 2.2500 kips/ft.

Distributed:	Start b (ft.)	Start Wb (kips/ft.)	End e (ft.)	End We (kips/ft.)
#1:				
#2:				
#3:				
#4:				
#5:				
#6:				

Point Loads:	a (ft.)	P (kips)
#1:		
#2:		
#3:		
#4:		
#5:		
#6:		
#7:		
#8:		
#9:		
#10:		
#11:		
#12:		

Moments:	c (ft.)	M (ft-kips)
#1:		
#2:		
#3:		
#4:		

Nomenclature

Results:

Beam Flexiblity Criteria:

for β*L <= π/4	beam is rigid
for π/4 < β*L < π	beam is semi-rigid
for β*L >= π	beam is flexible
for β*L >= 6	beam is semi-infinite long

β = 0.165 β = ((K*W)/(4*E*144*I))^(1/4)

β*L = 3.96 β*L = Flexibility Factor

Beam is flexible

Max. Shears and Locations:

+V(max) = 0.00 k @ x = 0.00 ft.

-V(max) = 0.00 k @ x = 0.00 ft.

Max. Moments and Locations:

+M(max) = 0.00 ft-k @ x = 0.00 ft.

-M(max) = 0.00 ft-k @ x = 0.00 ft.

Max. Deflection and Location:

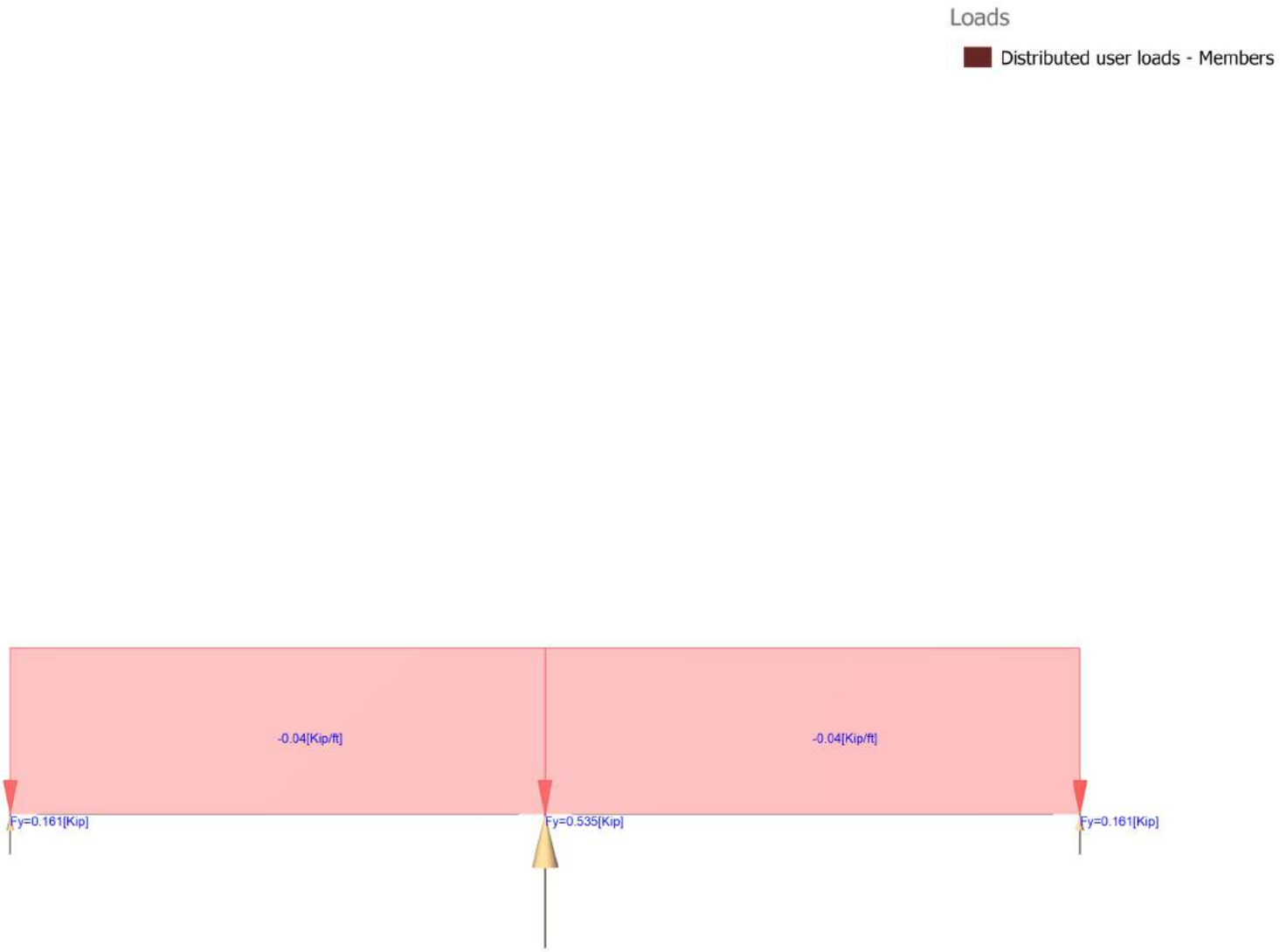
Δ(max) = -0.042 in. @ x = 0.00 ft.

Max. Soil Pressure and Location:

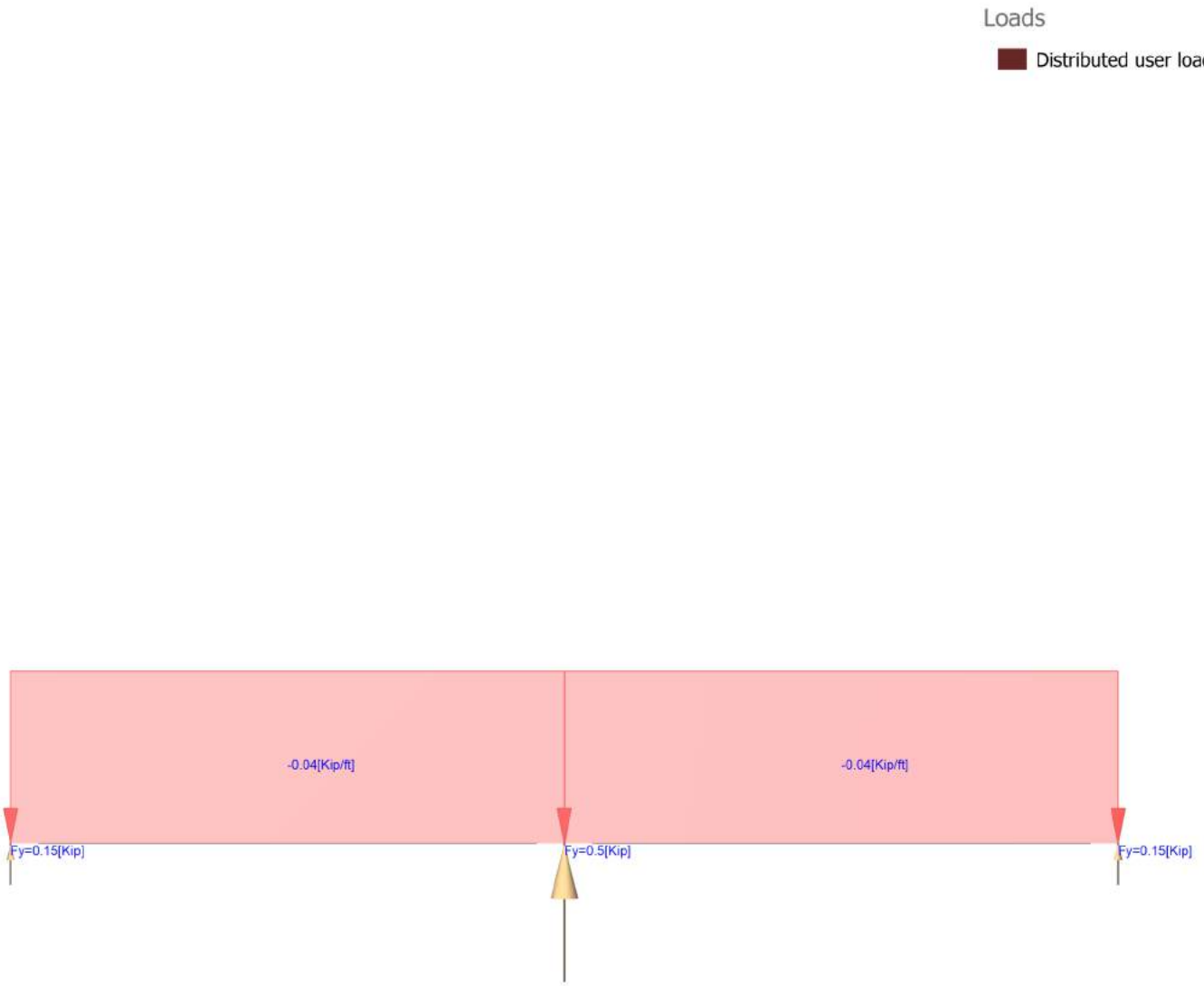
Q(max) = 1.500 ksf @ x = 0.00 ft.

WOOD DESIGN CALCULATIONS FOR SINGLE STORY CMU STRUCTURE

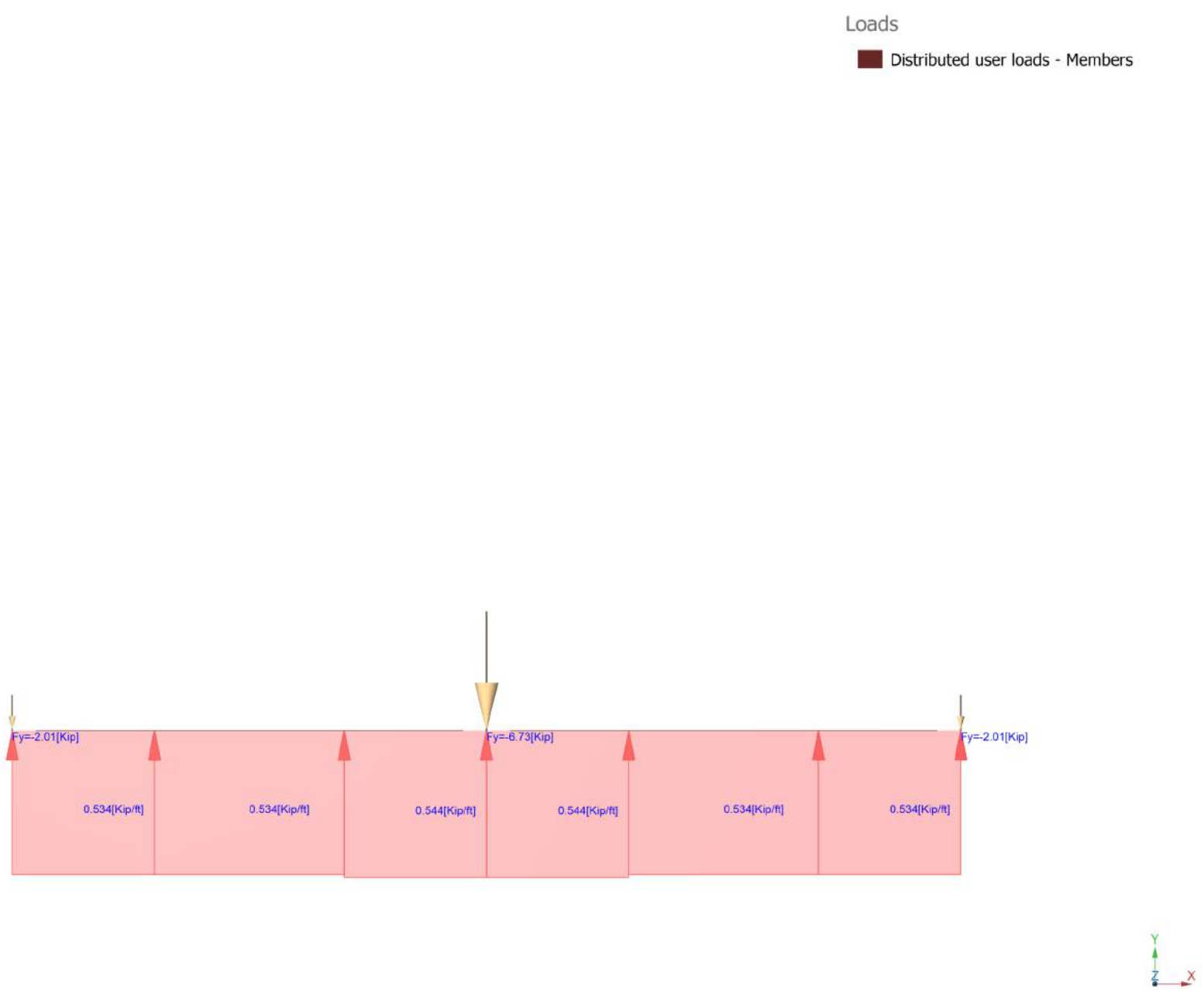
Current Date: 1/7/2020 2:31 PM
Units system: English
File name: A:\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Truss uplift corner.etz\
Load condition: DL=Dead Load



Current Date: 1/7/2020 2:31 PM
Units system: English
File name: A:\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Truss uplift corner.etz\
Load condition: LLr=Live Load Roof



Current Date: 1/7/2020 2:32 PM
Units system: English
File name: A:\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Truss uplift corner.etz\
Load condition: WLU=Wind Load Uplift



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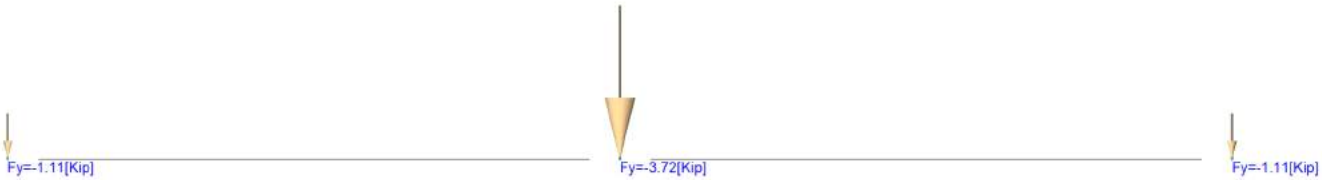
Load condition: S5=0.6DL+0.6WLU



Current Date: 1/7/2020 2:47 PM
Units system: English
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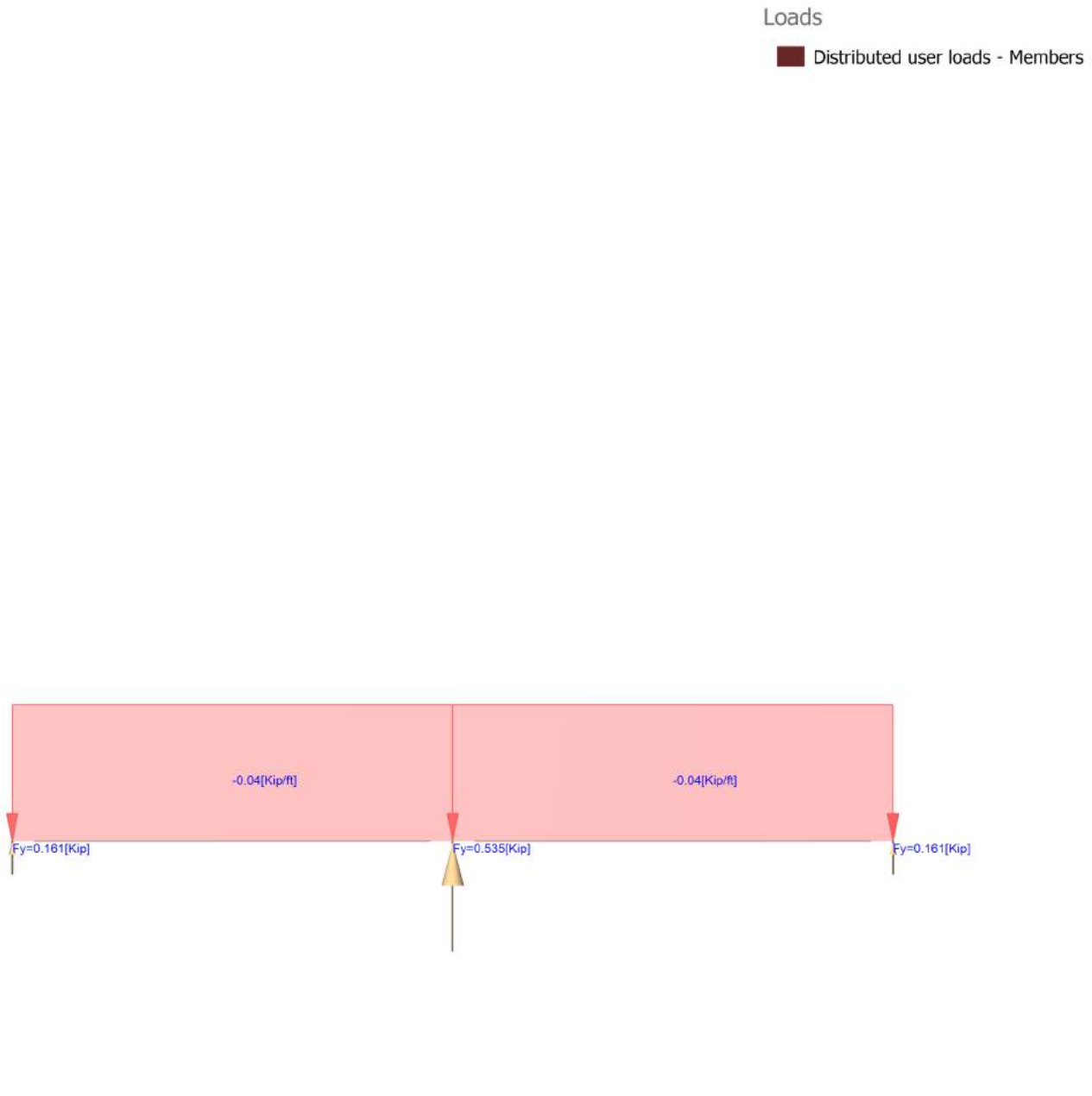
Load condition: DL=Dead Load



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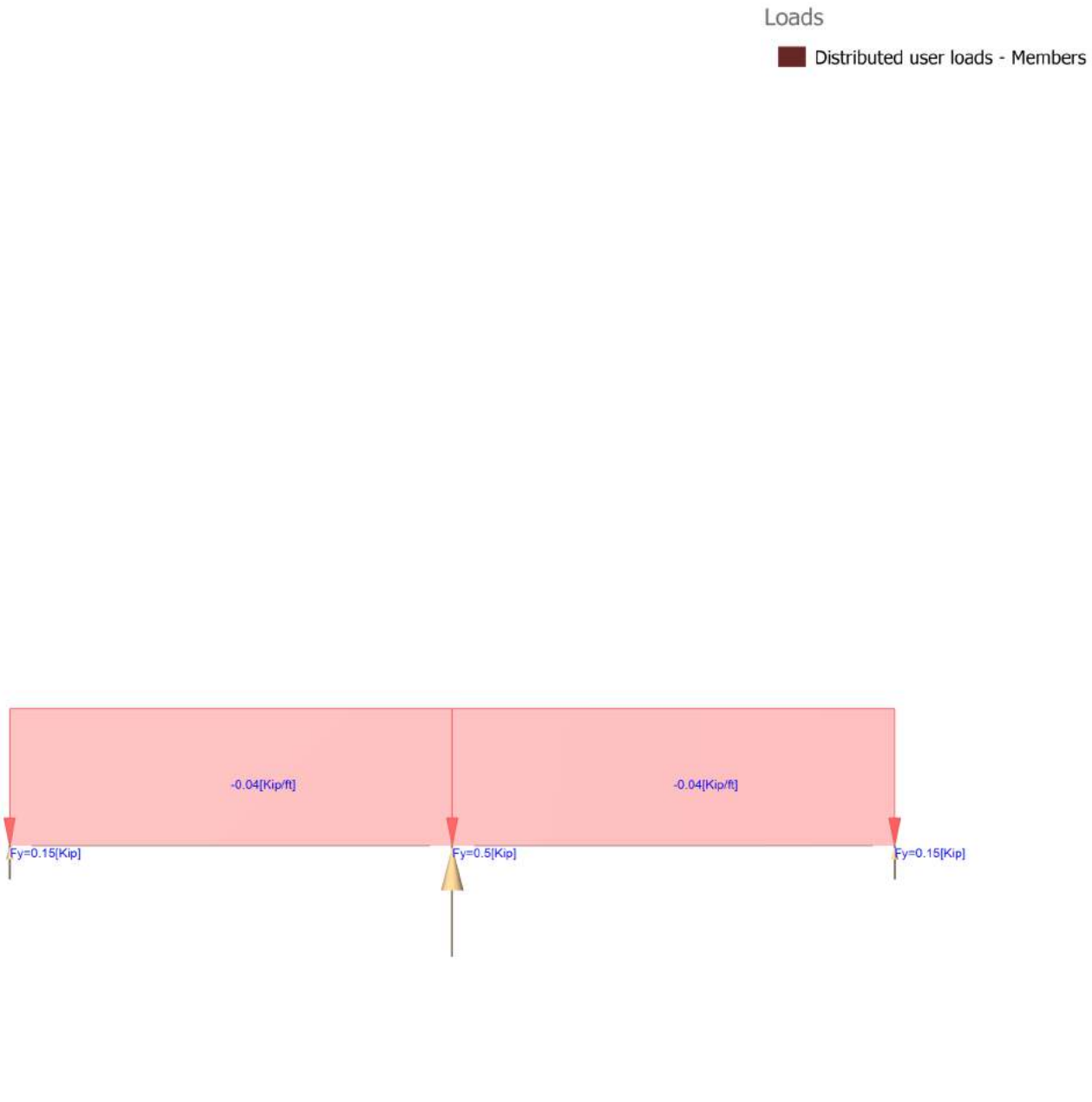
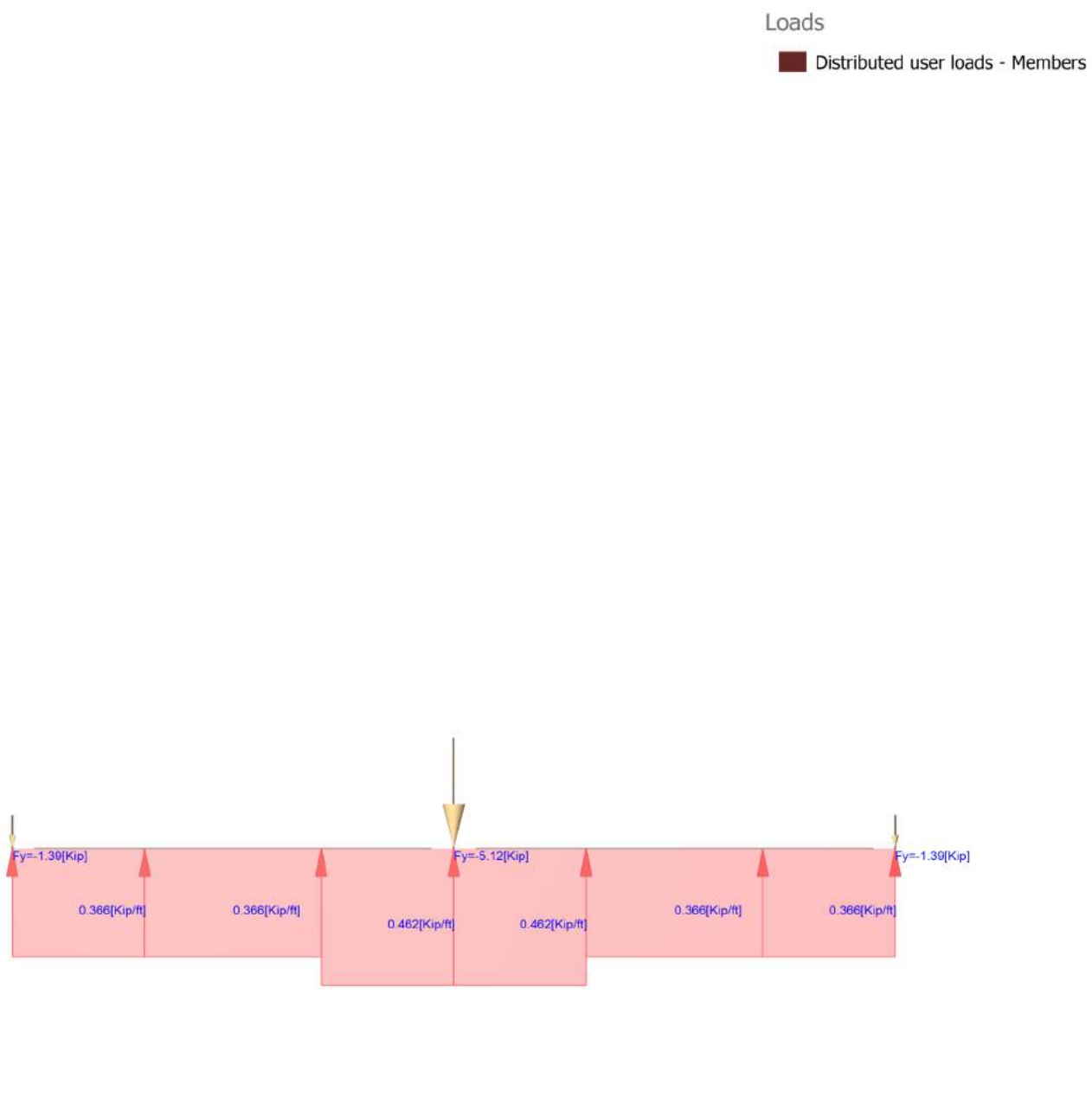
Load condition: LLr=Live Load Roof



Current Date: 1/7/2020 2:49 PM
Units system: English
File name: A:\PROJECTS\100060693 PR FEMA\Prescriptive Designs\Calculations\Truss uplift MIDDLE.etz\
Load condition: WLU=Wind Load Uplift



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Units system: English
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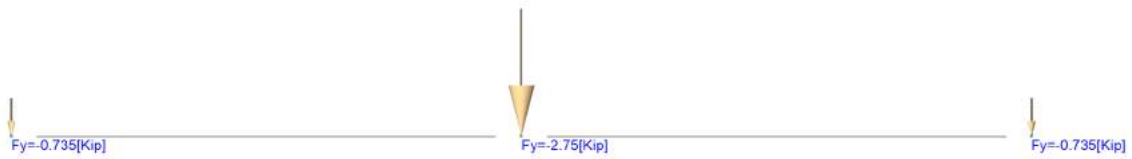
Load condition: S5=0.6DL+0.6WLU



Embedded Truss Anchors and Truss Seat Snap-In (cont.)

These products are available with additional corrosion protection. For more information, see p. 15.

SS For stainless-steel fasteners, see p. 21.

Model No.	H (in.)	1-Ply Southern Pine (SP) Rafter/Truss				2- or 3-Ply Southern Pine (SP) Rafter/Truss					Code Ref.
		Fasteners (in.)	Uplift (160) GFCMU/ Concrete	F_1 (160)	F_2 (160)	Fasteners (in.)	Uplift (160) GFCMU	Uplift (160) Concrete	F_1 (160)	F_2 (160)	
Single Anchor											
META12	8	(7) 0.148 x 1½	1,420	340	770	(6) 0.162 x 3½	1,450	1,450	340	770	FL
META16	12	(8) 0.148 x 1½	1,450	340	770	(6) 0.162 x 3½	1,450	1,450	340	770	
META18	14										
META20	16										
META24	20										
META40	36										
HETA12	8	(7) 0.148 x 1½	1,455	340	770	(7) 0.162 x 3½	1,730	1,730	340	770	
HETA16	12	(9) 0.148 x 1½	1,810	340	770	(8) 0.162 x 3½	1,810	1,810	340	770	
HETA20	16										
HETA24	20										
HETA40	36										
HHETA16	12	(10) 0.148 x 1½	2,120	340	770	(9) 0.162 x 3½	2,120	2,120	340	770	
HHETA20	16										
HHETA24	20										
HHETA40	36										
HETAL12	7	(10) 0.148 x 1½	1,040	390	1,040	(10) 0.162 x 3½	1,235	1,235	390	1,040	
HETAL16	11	(14) 0.148 x 1½	1,810	390	1,040	(13) 0.162 x 3½	1,810	1,810	390	1,040	
HETAL20	15										
Double Anchor											
META12	8	(10) 0.148 x 1½	1,875	680	770	(14) 0.162 x 3½	1,795	2,435	1,285	1,080	FL
META16	12	(10) 0.148 x 1½	1,875	680	770	(14) 0.162 x 3½	1,795	2,435	1,285	1,080	
META18	14										
META20	16										
META24	20										
META40	36										
HETA12	8	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	2,560	1,350	1,430	
HETA16	12	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	2,560	1,350	1,430	
HETA20	16										
HETA24	20										
HETA40	36										
HHETA16	12	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	3,180	1,350	1,430	
HHETA20	16										
HHETA24	20										
HHETA40	36										
DETAL20	15¾	(18) 0.148 x 1½	2,480	2,000	1,370	—	—	—	—	—	

1. Loads have been increased for wind or earthquake loading, with no further increase allowed. Reduce where other loads govern.
2. Concrete shall have a minimum compressive strength of f'_c = 2,500 psi.
3. Grout-filled CMU (GFCMU) shall have a minimum compressive strength of f'_m = 1,500 psi.
4. For simultaneous loads in more than one direction, the connector must be evaluated using the Unity Equation, as described in General Instructions for the Designer.
5. F_1 lateral load toward face of HETAL is 1,870 lb.
6. The HHETA allowable F_1 load can be increased to 435 lb. if the strap is wrapped over the truss and a minimum of 12 nails are installed.
7. The DETAL20 requires (6) 0.148" x 1½" nails in the truss seat and (6) 0.148" x 1½" nails in each strap. For double META/HETA/HHETA installations, install half of the required fasteners in each strap.
8. F_1 lateral loads listed for double META/HETA/HHETA on 2- or 3-ply rafter/truss may cause an additional 1/16" deflection beyond the standard ⅛" limit where the straps are installed not wrapped over the heel as shown.
9. Minimum edge distance for META/HETA/HHETA is 1½" for concrete and 2" for masonry. Where edge distance is less than 2" for masonry, the maximum uplift load is 1,005 lb.
10. It is acceptable to use a reduced number of fasteners provided that there is a reduction in uplift allowable load. Calculate the connector allowable load for a reduced number of nails as follows: Allowable Load = (No. of Nails Used) / (No. of Nails in Table) x Table Load. Lateral loads require the lowest 6 nail holes filled for META and lowest 7 nail holes filled for HETA/HHETA.
11. **Fasteners:** Nail dimensions in the table are listed diameter by length. See pp. 21–22 for fastener information.

Embedded Truss Anchors and Truss Seat Snap-In (cont.)

These products are available with additional corrosion protection. For more information, see p. 15.

SS For stainless-steel fasteners, see p. 21.

Model No.	H (in.)	1-Ply Southern Pine (SP) Rafter/Truss				2- or 3-Ply Southern Pine (SP) Rafter/Truss					Code Ref.
		Fasteners (in.)	Uplift (160) GFCMU/ Concrete	F_1 (160)	F_2 (160)	Fasteners (in.)	Uplift (160) GFCMU	Uplift (160) Concrete	F_1 (160)	F_2 (160)	
Single Anchor											
META12	8	(7) 0.148 x 1½	1,420	340	770	(6) 0.162 x 3½	1,450	1,450	340	770	
META16	12	(8) 0.148 x 1½	1,450	340	770	(6) 0.162 x 3½	1,450	1,450	340	770	
META18	14										
META20	16										
META24	20										
META40	36										
HETA12	8	(7) 0.148 x 1½	1,455	340	770	(7) 0.162 x 3½	1,730	1,730	340	770	
HETA16	12	(9) 0.148 x 1½	1,810	340	770	(8) 0.162 x 3½	1,810	1,810	340	770	FL
HETA20	16										
HETA24	20										
HETA40	36										
HHETA16	12	(10) 0.148 x 1½	2,120	340	770	(9) 0.162 x 3½	2,120	2,120	340	770	
HHETA20	16										
HHETA24	20										
HHETA40	36										
HETAL12	7	(10) 0.148 x 1½	1,040	390	1,040	(10) 0.162 x 3½	1,235	1,235	390	1,040	
HETAL16	11	(14) 0.148 x 1½	1,810	390	1,040	(13) 0.162 x 3½	1,810	1,810	390	1,040	
HETAL20	15										
Double Anchor											
META12	8	(10) 0.148 x 1½	1,875	680	770	(14) 0.162 x 3½	1,795	2,435	1,285	1,080	
META16	12	(10) 0.148 x 1½	1,875	680	770	(14) 0.162 x 3½	1,795	2,435	1,285	1,080	
META18	14										
META20	16										
META24	20										
META40	36										
HETA12	8	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	2,560	1,350	1,430	
HETA16	12	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	2,560	1,350	1,430	FL
HETA20	16										
HETA24	20										
HETA40	36										
HHETA16	12	(10) 0.148 x 1½	1,920	680	770	(12) 0.162 x 3½	2,365	3,180	1,350	1,430	
HHETA20	16										
HHETA24	20										
HHETA40	36										
DETAL20	15¾	(18) 0.148 x 1½	2,480	2,000	1,370	—	—	—	—	—	

1. Loads have been increased for wind or earthquake loading, with no further increase allowed. Reduce where other loads govern.
2. Concrete shall have a minimum compressive strength of f'_c = 2,500 psi.
3. Grout-filled CMU (GFCMU) shall have a minimum compressive strength of f'_m = 1,500 psi.
4. For simultaneous loads in more than one direction, the connector must be evaluated using the Unity Equation, as described in General Instructions for the Designer.
5. F_1 lateral load toward face of HETAL is 1,870 lb.
6. The HHETA allowable F_1 load can be increased to 435 lb. if the strap is wrapped over the truss and a minimum of 12 nails are installed.
7. The DETAL20 requires (6) 0.148" x 1½" nails in the truss seat and (6) 0.148" x 1½" nails in each strap. For double META/HETA/HHETA installations, install half of the required fasteners in each strap.
8. F_1 lateral loads listed for double META/HETA/HHETA on 2- or 3-ply rafter/truss may cause an additional 1/16" deflection beyond the standard ⅛" limit where the straps are installed not wrapped over the heel as shown.
9. Minimum edge distance for META/HETA/HHETA is 1½" for concrete and 2" for masonry. Where edge distance is less than 2" for masonry, the maximum uplift load is 1,005 lb.
10. It is acceptable to use a reduced number of fasteners provided that there is a reduction in uplift allowable load. Calculate the connector allowable load for a reduced number of nails as follows: Allowable Load = (No. of Nails Used) / (No. of Nails in Table) x Table Load. Lateral loads require the lowest 6 nail holes filled for META and lowest 7 nail holes filled for HETA/HHETA.
11. **Fasteners:** Nail dimensions in the table are listed diameter by length. See pp. 21–22 for fastener information.

PLYWOOD SHEATHING CALCULATIONS

Table 3.2.2 Nominal Uniform Load Capacities (psf) for Roof Sheathing Resisting Out-of-Plane Wind Loads[1,2,6]

Sheathing Type[5]	Span Rating or Grade	Minimum Thickness (in.)	Strength Axis[7] Applied Perpendicular to Supports						Strength Axis[7] Applied Parallel to Supports		
			Rafter/Truss Spacing (in.)						Rafter/Truss Spacing (in.)		
			12	16	19.2	24	32	48	12	16	24
			Nominal Uniform Loads (psf)						Nominal Uniform Loads (psf)		
Wood Structural Panels (Sheathing Grades, C-C, C-D, C-C Plugged, OSB)	24/0	3/8	425	240	165	105	-	-	90	50	30[3]
	24/16	7/16	540	305	210	135	-	-	110	60	35[3]
	32/16	15/32	625	355	245	155	90	-	155	90	45[3]
	40/20	19/32	955	595	415	265	150	-	255	145	75[3]
	48/24	23/32	1160[3]	840[3]	615[3]	395[3]	220[3]	100[3]	455[3]	255[3]	115[3]
Wood Structural Panels (Single Floor Grades, Underlayment, C-C Plugged)	16 o.c.	19/32	705	395	275	175	100	-	170	95	50[3]
	20 o.c.	19/32	815	455	320	205	115	-	235	135	70[3]
	24 o.c.	23/32	1160[3]	670[3]	465[3]	300[3]	170[3]	-	440[3]	250[3]	110[3]
	32 o.c.	7/8	1395[4]	1000[4]	695[4]	445[4]	250[4]	110[4]	1160[4]	655[4]	290[4]
	48 o.c.	1-1/8	1790[4]	1295[4]	1060[4]	805[4]	455[4]	200[4]	1790[4]	1145[4]	510[4]

1. Nominal capacities shall be adjusted in accordance with Section 3.2.3 to determine ASD uniform load capacity and LRFD uniform resistances.
2. Unless otherwise noted, tabulated values are based on the lesser of nominal values for either OSB or plywood with 3 or more plies.
3. Tabulated values are based on the lesser of nominal values for either OSB or plywood with 4 or more plies.
4. Tabulated values are based on the lesser of nominal values for either OSB or plywood with 5 or more plies.
5. Wood structural panels shall conform to the requirements for its type in DOC PS 1 or PS 2.
6. Tabulated values are for maximum bending loads from wind. Loads are limited by bending or shear stress assuming a 2-span continuous condition. Where panels are continuous over 3 or more spans, the tabulated values shall be permitted to be increased in accordance with the *ASD/LRFD Manual for Engineered Wood Construction*.
7. Strength axis is defined as the axis parallel to the face and back orientation of the flakes or the grain (veneer), which is generally the long panel direction, unless otherwise marked.

3.3 Connections

Connections resisting induced wind and seismic forces shall be designed in accordance with the methods referenced in 2.1.2.1 for allowable stress design (ASD) and 2.1.2.2 for strength design (LRFD).

Check Withdrawal Values of 10d Ring Shank Nails for plywood sheathing attachment.

Zone 3r Wind Uplift $Z3r := 317.7$ PSF (Ultimate)

$Z3ra := 317.3 \cdot 0.6 = 190.38$ PSF (Allowable)

Fastener tributary Area $FTA := 0.25 \cdot 2 = 0.5$ SQFT (based on truss spacing of 24" O.C.)

Pullout acting on one Fastener: $FPO := Z3ra \cdot FTA = 95.19$ LB

10d Ring Shank Nail Pullout Capacity: $FPOa := 81$ LB/IN (PER NDS)

Table 12.2E Roof Sheathing Ring Shank Nail and Post-Frame Ring Shank Nail Reference Withdrawal Design Values, W[1,2]

Tabulated withdrawal design values, W, are in pounds per inch of ring shank penetration into side grain of wood main member (see Appendix Table L5 and Table L6).

Specific Gravity[3], G	Roof Sheathing Ring Shank Nail Diameter, D (in.)			Post-Frame Ring Shank Nail Diameter, D (in.)				
	0.113	0.120	0.131	0.135	0.148	0.177	0.200	0.207
0.73	108	115	126	129	142	170	192	199
0.71	103	109	119	122	134	161	181	188
0.68	94	100	109	112	123	147	166	172
0.67	91	97	106	109	120	143	162	167
0.58	68	73	79	82	90	107	121	125
0.55	62	65	71	74	81	96	109	113
0.51	53	56	61	63	69	83	94	97
0.50	51	54	59	61	67	80	90	93
0.49	49	52	57	58	64	76	86	89
0.47	45	48	52	54	59	70	80	82

10d Ring Shank Nail Length: $FL := 3$ IN

10d Ring Shank Nail Pullout Capacity: $FPOau := FPOa \cdot \left[FL - \left(\frac{19}{32} \right) \right] = 194.906$ LB

Allowable Fastener Pullout Capacity: $FPOallow := \frac{FPOau}{2} = 97.453$

$FPOallow = 97.453$ LB > $FPO = 95.19$ LB (OK to use 10d Ring shank nails at 3" O.C.)

Table 12S **POST FRAME RING SHANK NAILS: Reference Lateral Design Values, Z, fo**
Single Shear (two member) Connections[1,2,3]

for sawn lumber or SCL with both members of identical specific gravity (tabulated lateral design values are calculated based on an assumed length of nail penetration, p, into the main member equal to 10D)

Side Member Thickness	Nail Diameter	Nail Length	G=0.67 Red Oak	G=0.55 Mixed Maple Southern Pine	G=0.5 Douglas Fir-Larch	G=0.49 Douglas Fir-Larch (N)	G=0.46 Douglas Fir(S) Hem-Fir(N)	G=0.43 Hem-Fir	G=0.42 Spruce-Pine-Fir	G=0.37 Redwood
t_s	D	L								
in.	in.	in.	lb	lb	lb	lb	lb	lb	lb	lb
1/2	0.135	3, 3.5	115	89	79	77	72	66	65	56
	0.148	3 - 4.5	129	101	90	87	82	75	73	64
	0.177	3 - 8	167	133	119	116	109	102	99	87
	0.200	3.5 - 8	179	143	129	126	119	110	108	95
	0.207	4 - 8	185	148	134	131	123	115	112	99
3/4	0.135	3, 3.5	135	108	94	91	84	76	74	63
	0.148	3 - 4.5	154	121	105	102	94	85	83	70
	0.177	3 - 8	200	153	134	130	121	111	107	92
	0.200	3.5 - 8	212	162	143	139	129	118	115	100
	0.207	4 - 8	216	166	147	143	133	122	119	103
1	0.135	3, 3.5	135	113	103	101	96	89	86	71
	0.148	3 - 4.5	154	128	118	115	109	99	96	80
	0.177	3 - 8	213	178	155	150	138	125	121	102
	0.200	3.5 - 8	233	188	164	158	146	132	128	108
	0.207	4 - 8	243	192	167	162	149	135	131	111
1 1/4	0.135	3, 3.5	135	113	103	101	96	89	88	78
	0.148	3 - 4.5	154	128	118	115	109	102	100	89
	0.177	3 - 8	213	178	163	159	151	141	136	113
	0.200	3.5 - 8	233	195	178	174	165	149	144	120
	0.207	4 - 8	243	203	186	182	169	152	147	123
1 1/2	0.135	3, 3.5	135	113	103	101	96	89	88	78
	0.148	3 - 4.5	154	128	118	115	109	102	100	89
	0.177	3 - 8	213	178	163	159	151	141	138	123
	0.200	3.5 - 8	233	195	178	174	165	155	151	133
	0.207	4 - 8	243	203	186	182	172	161	158	135
1 3/4	0.135	3, 3.5	135	113	103	101	96	89	88	78

BLOCKING BETWEEN TRUSSES

$PSF \equiv \frac{lb}{ft^2}$ $K \equiv 1000lb$

Check Lateral force transmission from deck to blocking and blocking to tie beam:

MWFRS Pressure X Direction: $WLX := 78PSF \cdot 0.6$

MWFRS Pressure Z Direction: $WLZ := 96PSF \cdot 0.6$

X Direction Wall Area: $XA := 20ft \cdot 11.5ft = 230 \cdot ft^2$

Z Direction Wall Area: $ZA := 24ft \cdot 11.5ft = 276 \cdot ft^2$

X Direction Diaphragm Reaction: $RX := XA \cdot \left(\frac{WLX}{4} \right) = 2.691 \cdot K$

Z Direction Diaphragm Reaction: $RZ := ZA \cdot \left(\frac{WLZ}{4} \right) = 3.974 \cdot K$

X Direction Load Distribution: $XW := \frac{RX}{24ft} = 112.125 \frac{lb}{ft}$

Load Per Simpson RBC Clip: $PX := XW \cdot 2 = 224.25 \frac{lb}{ft}$

Per Simpson Manual, RBC Clip has capacity of 350 LB, therefore OK for one at each end.

Per NDS 10d Ring Shank Nail shear capacity is 121 lb, therefore nails at 3" O.C. O.K.

Z Direction Load Distribution: $ZW := \frac{RZ}{20ft} = 198.72 \frac{lb}{ft}$

Load Per Titen HD Anchor: $PZ := ZW \cdot 0.667ft = 132.546lb$

1/2" Titen HD anchor w/ 4" embedment Per Simpson Manual:

$THDv := \frac{(7455lb \cdot 0.6)}{4} = 1.118K > PZ = 132.546lb$ Therefore O.K.

RBC

Roof Boundary Clip

The RBC roof boundary clip is designed to aid installation and transfer shear loads between the roof diaphragm and wall. The locator tabs make proper location of the clip easy. The RBC can be used on wood or masonry walls and will handle roof pitches from 0/12 to 12/12. The RBC is available with prongs into one side (RBCP) for pre-attachment of the part to a block at the truss plant.

Material: 20 gauge

Finish: Galvanized

Installation:

- Use all specified fasteners; see General Notes
- Field bend to desired angle — one time only
- See flier F-C-RBC at **strongtie.com** for more information on installation and code requirements

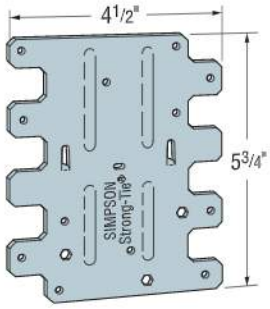
Codes: See p. 12 for Code Reference Key Chart

The RBC installed to blocking resists rotation and lateral displacement of rafter or truss.
Code references:

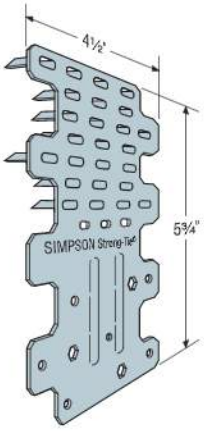
- IRC 2012/2015/2018, R802.8 Lateral Support
- IBC 2012, 2308.10.6; 2015/2018, 2308.7.8 Blocking

Blocking allows proper edge nailing of sheathing.
Code references:

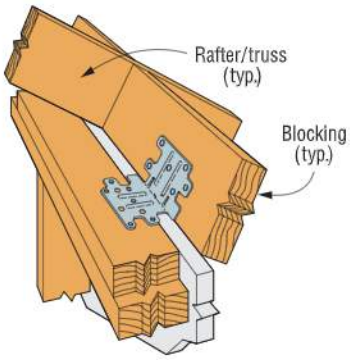
- IRC 2012, Table R602.3(1), footnote i, 2015/2018 Table R602.3(1), footnote h
- IBC 2012/2015/2018, 2305.1 Shear Panel Connections



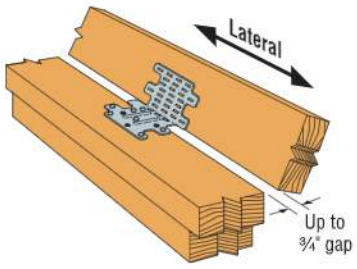
RBC
U.S. Patent 7,293,390



RBCP – Flat
U.S. Patent 7,293,390



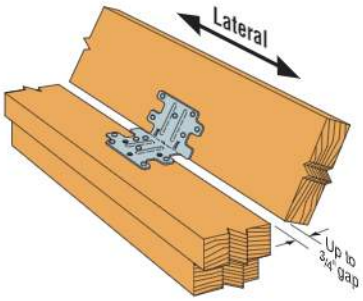
Typical RBC Installation Over 1" Foamboard[5]



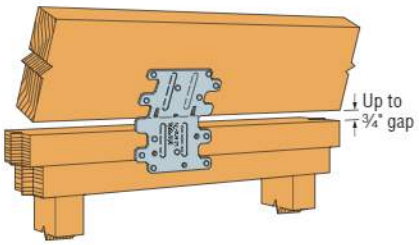
Typical RBCP Installation
U.S. Patent 7,549,262

Model No.	Type of Connection	Bending Angle	Fasteners (in.)		DF/SP Allowable Loads	SPF/HF Allowable Loads	Code Ref.
			To Wall	To Blocking	Lateral (160)	Lateral (160)	
RBC RBCP	1	45° to 90°	(6) 0.148 x 1½	(6) 0.148 x 1½	445	380	IBC, FL, LA
	2	< 30°	(6) 0.148 x 1½	(6) 0.148 x 1½	435	375	
		30° to 45°	(6) 0.148 x 1½	(6) 0.148 x 1½	465	400	
	3	0° to 45°	(3) ¼ x 2¼ Titen® 2[4]	(6) 0.148 x 1½	350	350	

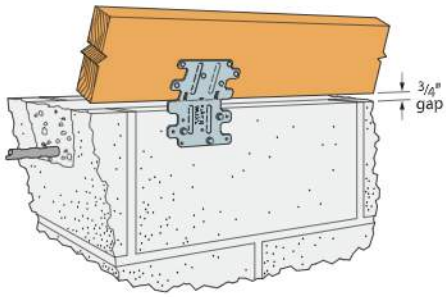
1. See pp. 260–261 for Straps and Ties General Notes.
2. Allowable loads are for one anchor attached to blocking a minimum of 1½" thick.
3. RBC/RBCP can be installed with up to a ¾" gap and achieve 100% of the listed load.
4. When attaching to concrete, use (3) ¼" x 1¾" TTN2-25134H Titen screws.
5. RBC/RBCP installed over 1" foam board has a load of 395 lb. (160) in a parallel-to-wall (F_1) load direction for Douglas fir. For SPF, the load is 340 lb.
6. RBC/RBCP may be installed over ½" structural sheathing using 0.148" x 1½" nails with no load reduction.
7. **Fasteners:** Nail dimensions in the table are diameter by length. Titen® 2 screws are Simpson Strong-Tie® masonry screws. See pp. 21–22 for fastener information.



1 Typical RBC Installation
(RBCP similar)



2 Typical RBC Installation
(RBCP similar)



3 Typical RBC Installation to CMU Block
(RBCP similar)

Titen HD® Heavy-Duty Screw Anchor

Titen HD Anchor Product Data — Zinc Plated

Size (in.)	Model No.	Drill Bit Dia. (in.)	Wrench Size (in.)	Quantity	
				Box	Carton
¼ x 1⅞	THDB25178H	¼	⅜	100	500
¼ x 2¾	THDB25234H	¼	⅜	50	250
¼ x 3	THDB25300H	¼	⅜	50	250
¼ x 3½	THDB25312H	¼	⅜	50	250
¼ x 4	THDB25400H	¼	⅜	50	250
⅜ x 1¾	THD37134H†	⅜	9⁄16	50	250
⅜ x 2½	THD37212H†	⅜	9⁄16	50	200
⅜ x 3	THD37300H	⅜	9⁄16	50	200
⅜ x 4	THD37400H	⅜	9⁄16	50	200
⅜ x 5	THD37500H	⅜	9⁄16	50	100
⅜ x 6	THD37600H	⅜	9⁄16	50	100
½ x 3	THD50300H	½	¾	25	100
½ x 4	THD50400H	½	¾	20	80
½ x 5	THD50500H	½	¾	20	80
½ x 6	THD50600H	½	¾	20	80
½ x 6½	THD50612H	½	¾	20	40
½ x 8	THD50800H	½	¾	20	40
½ x 12	THD501200H	½	¾	5	25
½ x 13	THD501300H	½	¾	5	25
½ x 14	THD501400H	½	¾	5	25
½ x 15	THD501500H	½	¾	5	25
⅝ x 4	THDB62400H	⅝	15⁄16	10	40
⅝ x 5	THDB62500H	⅝	15⁄16	10	40
⅝ x 6	THDB62600H	⅝	15⁄16	10	40
⅝ x 6½	THDB62612H	⅝	15⁄16	10	40
⅝ x 8	THDB62800H	⅝	15⁄16	10	20
⅝ x 10	THDB62100H	⅝	15⁄16	10	20
¾ x 4	THD75400H	¾	1⅛	10	40
¾ x 5	THD75500H	¾	1⅛	5	20
¾ x 6	THDT75600H	¾	1⅛	5	20
¾ x 7	THD75700H	¾	1⅛	5	10
¾ x 8½	THD75812H	¾	1⅛	5	10
¾ x 10	THD75100H	¾	1⅛	5	10

Titen HD Anchor Product Data — Mechanically Galvanized

Size (in.)	Model No.	Drill Bit Dia. (in.)	Wrench Size (in.)	Quantity	
				Box	Carton
⅜ x 3	THD37300HMG	⅜	9⁄16	50	200
⅜ x 4	THD37400HMG			50	200
⅜ x 5	THD37500HMG			50	100
⅜ x 6	THD37600HMG			50	100
½ x 4	THD50400HMG	½	¾	20	80
½ x 5	THD50500HMG			20	80
½ x 6	THD50600HMG			20	80
½ x 6½	THD50612HMG			20	40
½ x 8	THD50800HMG			20	40
⅝ x 5	THDB62500HMG	⅝	15⁄16	10	40
⅝ x 6	THDB62600HMG			10	40
⅝ x 6½	THDB62612HMG			10	40
⅝ x 8	THDB62800HMG			10	20
¾ x 6	THDT75600HMG	¾	1⅛	5	20
¾ x 8½	THD75812HMG			5	10
¾ x 10	THD75100HMG			5	10

Mechanical galvanizing meets ASTM B695, Class 65, Type 1. Intended for some pressure-treated wood sill plate applications. Not for use in other corrosive or outdoor environments. See p. 248 or visit **strongtie.com/info** for more corrosion information.

† These models do not meet minimum embedment depth requirements for strength design and require maximum installation torque of 25 ft. – lb. using a torque wrench, driver drill or cordless ¼" impact driver with a maximum permitted torque rating of 100 ft. – lb.

Titen HD Installation Information and Additional Data[1]

IBC

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)									
			¼		⅜		½		⅝		¾	
Installation Information												
Drill Bit Diameter	d_{bit}	in.	¼		⅜		½		⅝		¾	
Baseplate Clearance Hole Diameter	d_c	in.	⅜		½		⅝		¾		⅞	
Maximum Installation Torque	$T_{inst,max}$	ft.-lbf	24[2]		50[2]		65[2]		100[2]		150[2]	
Maximum Impact Wrench Torque Rating	$T_{impact,max}$	ft.-lbf	125[3]		150[3]		340[3]		340[3]		385[3]	
Minimum Hole Depth	h_{hole}	in.	1¾	2⅝	2¾	3½	3¾	4½	4½	6	6	6¾
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	5½	6¼
Critical Edge Distance	c_{ac}	in.	3	6	2 11⁄16	3⅝	3 9⁄16	4½	4½	6⅜	6⅜	7 5⁄16
Minimum Edge Distance	c_{min}	in.	1½		1¾							
Minimum Spacing	s_{min}	in.	3									
Minimum Concrete Thickness	h_{min}	in.	3¼	3½	4	5	5	6¼	6	8½	8¾	10
Additional Data												
Anchor Category	Category	—	1									
Yield Strength	f_{ya}	psi	100,000		97,000							
Tensile Strength	f_{uta}	psi	125,000		110,000							
Minimum Tensile and Shear Stress Area	A_{se}	in²	0.042		0.099		0.183		0.276		0.414	
Axial Stiffness in Service Load Range – Uncracked Concrete	β_{uncr}	lb./in.	202,000		715,000							
Axial Stiffness in Service Load Range – Cracked Concrete	β_{cr}	lb./in.	173,000		345,000							

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318 Appendix D.
2. $T_{inst,max}$ is the maximum permitted installation torque for the embedment depth range covered by this table using a torque wrench.
3. $T_{impact,max}$ is the maximum permitted torque rating for impact wrenches for the embedment depth range covered by this table.

* See p. 13 for an explanation of the load table icons.

Titen HD® Design Information — Concrete

Titen HD Tension Strength Design Data[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)									
			¼		⅜		½		⅝		¾	
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	5½	6¼
Steel Strength in Tension												
Tension Resistance of Steel	N_{sa}	lb.	5,195		10,890		20,130		30,360		45,540	
Strength Reduction Factor — Steel Failure	ϕ_{sa}	—	0.65[2]									
Concrete Breakout Strength in Tension[6,8]												
Effective Embedment Depth	h_{ef}	in.	1.19	1.94	1.77	2.40	2.35	2.99	2.97	4.24	4.22	4.86
Critical Edge Distance[6]	c_{ac}	in.	3	6	2 11/16	3⅜	3 9/16	4½	4½	6 ⅜	6⅜	7 5/16
Effectiveness Factor — Uncracked Concrete	k_{uncr}	—	30				24					
Effectiveness Factor — Cracked Concrete	k_{cr}	—	17									
Modification Factor	$\Psi_{c,N}$	—	1.0									
Strength Reduction Factor — Concrete Breakout Failure	ϕ_{cb}	—	0.65[7]									
Pullout Strength in Tension[8]												
Pullout Resistance, Uncracked Concrete (f'_c = 2,500 psi)	$N_{p,uncr}$	lb.	—[3]	—[3]	2,700[4]	—[3]	—[3]	—[3]	—[3]	9,810[4]	—[3]	—[3]
Pullout Resistance, Cracked Concrete (f'_c = 2,500 psi)	$N_{p,cr}$	lb.	—[3]	1,905[4]	1,235[4]	2,700[4]	—[3]	—[3]	3,040[4]	5,570[4]	6,070[4]	7,195[4]
Strength Reduction Factor — Concrete Pullout Failure	ϕ_p	—	0.65[5]									
Breakout or Pullout Strength in Tension for Seismic Applications[8]												
Nominal Pullout Strength for Seismic Loads (f'_c = 2,500 psi)	$N_{p,eq}$	lb.	—[3]	1,905[4]	1,235[4]	2,700[4]	—[3]	—[3]	3,040[4]	5,570[4]	6,070[4]	7,195[4]
Strength Reduction Factor — Breakout or Pullout Failure	ϕ_{eq}	—	0.65[5]									

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{sa} must be determined in accordance with ACI 318-11 D.4.4. Anchors are considered brittle steel elements.
3. Pullout strength is not reported since concrete breakout controls.
4. Adjust the characteristic pullout resistance for other concrete compressive strengths by multiplying the tabular value by $(f'_{c,specified} / 2{,}500)^{0.5}$.
5. The tabulated value of ϕ_p or ϕ_{eq} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3.(c) or ACI 318-11 D.4.3(c) for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, appropriate value of ϕ must be determined in accordance with ACI 318-11 Section D.4.4(c).
6. The modification factor $\Psi_{cp,N}$ = 1.0 for cracked concrete. Otherwise, the modification factor for uncracked concrete without supplementary reinforcement to control splitting is either:
   (1) $\Psi_{cp,N} = 1.0$ if $c_{a,min} \geq c_{ac}$ or (2) $\Psi_{cp,N} = \frac{c_{a,min}}{c_{ac}} \geq \frac{1.5h_{ef}}{c_{ac}}$ if $c_{a,min} < c_{ac}$
   The modification factor, $\Psi_{cp,N}$ is applied to the nominal concrete breakout strength, N_{cb} or N_{cbg}.
7. The tabulated value of ϕ_{cb} applies when both the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided. For installations where complying supplementary reinforcement can be verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition A are allowed. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{cb} must be determined in accordance with ACI 318-11 D.4.4(c).

* See p. 13 for an explanation of the load table icons.

Titen HD® Design Information — Concrete

Titen HD Shear Strength Design Data[1]

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)									
			¼[5]		⅜		½		⅝[5]		¾	
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	2½	3¼	3¼	4	4	5½	5½	6¼
Steel Strength in Shear												
Shear Resistance of Steel	V_{sa}	lb.	2,020		4,460		7,455		10,000		16,840	
Strength Reduction Factor — Steel Failure	ϕ_{sa}	—					0.60[2]					
Concrete Breakout Strength in Shear[6]												
Outside Diameter	d_a	in.	0.25		0.375		0.500		0.625		0.750	
Load Bearing Length of Anchor in Shear	ℓ_e	in.	1.19	1.94	1.77	2.40	2.35	2.99	2.97	4.24	4.22	4.86
Strength Reduction Factor — Concrete Breakout Failure	ϕ_{cb}	—					0.70[4]					
Concrete Pryout Strength in Shear												
Coefficient for Pryout Strength	k_{cp}	lb.	1.0					2.0				
Strength Reduction Factor — Concrete Pryout Failure	ϕ_{cp}	—					0.70[4]					
Steel Strength in Shear for Seismic Applications												
Shear Resistance for Seismic Loads	V_{eq}	lb.	1,695		2,855		4,790		8,000		9,350	
Strength Reduction Factor — Steel Failure	ϕ_{eq}	—					0.60[2]					

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. The tabulated value of ϕ_{sa} applies when the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{sa} must be determined in accordance with ACI 318 D.4.4.
3. The tabulated value of ϕ_{cb} applies when both the load combinations of Section 1605.2.1 of the IBC, ACI 318-14 Section 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. Condition B applies where supplementary reinforcement is not provided. For installations where complying supplementary reinforcement can be verified, the ϕ_{cb} factors described in ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition A are allowed. If the load combinations of ACI 318-11 Appendix C are used, the appropriate value of ϕ_{cb} must be determined in accordance with ACI 318-11 D.4.4(c).
4. The tabulated value of ϕ_{cp} applies when both the load combinations of IBC Section 1605.2, ACI 318-14 5.3 or ACI 318-11 Section 9.2 are used and the requirements of ACI 318-14 17.3.3(c) or ACI 318-11 D.4.3(c) for Condition B are met. If the load combinations of ACI 318-11 Appendix C are used, appropriate value of ϕ_{cp} must be determined in accordance with ACI 318-11 Section D.4.4(c).

Titen HD Tension and Shear Strength Design Data for the Soffit of Normal-Weight or Sand-Lightweight Concrete over Metal Deck[1,6,8]

Characteristic	Symbol	Units	Nominal Anchor Diameter, d_a (in.)									
			Lower Flute						Upper Flute			
			Figure 2		Figure 1				Figure 2		Figure 1	
			¼[8]		⅜		½		¼[8]		⅜	½
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½	1⅞	2½	2	3½	1⅝	2½	1⅞	2
Effective Embedment Depth	h_{ef}	in.	1.19	1.94	1.23	1.77	1.29	2.56	1.19	1.94	1.23	1.29
Pullout Resistance, concrete on metal deck (cracked)[2,3,4]	$N_{p,deck,cr}$	lb.	420	535	375	870	905	2,040	655	1,195	500	1,700
Pullout Resistance, concrete on metal deck (uncracked)[2,3,4]	$N_{p,deck,uncr}$	lb.	995	1,275	825	1,905	1,295	2,910	1,555	2,850	1,095	2,430
Steel Strength in Shear, concrete on metal deck[5]	$V_{sa,\ deck}$	lb.	1,335	1,745	2,240	2,395	2,435	4,430	2,010	2,420	4,180	7,145
Steel Strength in Shear, Seismic	$V_{sa,\ deck,eq}$	lb.	870	1,135	1,434	1,533	1,565	2,846	1,305	1,575	2,676	4,591

1. The information presented in this table is to be used in conjunction with the design criteria of ACI 318-14 Chapter 17 and ACI 318-11 Appendix D, except as modified below.
2. Concrete compressive strength shall be 3,000 psi minimum. The characteristic pullout resistance for greater compressive strengths shall be increased by multiplying the tabular value by $(f'_{c,specified}/3{,}000)^{0.5}$.
3. For anchors installed in the soffit of sand-lightweight or normal-weight concrete over metal deck floor and roof assemblies, as shown in Figure 1 and Figure 2, calculation of the concrete breakout strength may be omitted.
4. In accordance with ACI 318-14 Section 17.4.3.2 or ACI 318-11 Section D.5.3.2, the nominal pullout strength in cracked concrete for anchors installed in the soffit of sand-lightweight or normal-weight concrete over metal deck floor and roof assemblies $N_{p,deck,cr}$ shall be substituted for $N_{p,cr}$. Where analysis indicates no cracking at service loads, the normal pullout strength in uncracked concrete $N_{p,deck,uncr}$ shall be substituted for $N_{p,uncr}$.
5. In accordance with ACI 318-14 Section 17.5.1.2(C) or ACI 318-11 Section D.6.1.2(c), the shear strength for anchors installed in the soffit of sand-lightweight or normal-weight concrete over metal deck floor and roof assemblies $V_{sa,deck}$ and $V_{sa,deck,eq}$ shall be substituted for V_{sa}.
6. Minimum edge distance to edge of panel is $2h_{ef}$.
7. The minimum anchor spacing along the flute must be the greater of $3h_{ef}$ or 1.5 times the flute width.

* See p. 13 for an explanation of the load table icons.

Titen HD® Design Information — Concrete

Titen HD Anchor Tension and Shear Strength Design Data in the Topside of Normal-Weight Concrete or Sand-Lightweight Concrete over Metal Deck

IBC *

Design Information	Symbol	Units	Nominal Anchor Diameter, d_a (in.)	
			Figure 3	Figure 3
			¼	⅜
Nominal Embedment Depth	h_{nom}	in.	1⅝	2½
Effective Embedment Depth	h_{ef}	in.	1.19	1.77
Minimum Concrete Thickness	$h_{min,deck}$	in.	2½	3¼
Critical Edge Distance	$c_{ac,deck,top}$	in.	3¾	7¼
Minimum Edge Distance	$c_{min,deck,top}$	in.	3½	3
Minimum Spacing	$s_{min,deck,top}$	in.	3½	3

1. For anchors installed in the topside of concrete-filled deck assemblies, as shown in Figures 2 and 3, the nominal concrete breakout strength of a single anchor or group of anchors in shear, V_{cb} or V_{cbg}, respectively, must be calculated in accordance with ACI 318-14 Section 17.5.2 or ACI 318-11 Section D.6.2, using the actual member thickness, $h_{min,deck}$, in the determination of A_{vc}.
2. Design capacity shall be based on calculations according to values in the tables featured on pp. 116–118.
3. Minimum flute depth (distance from top of flute to bottom of flute) is 1½" (see Figures 2 and 3).
4. Steel deck thickness shall be minimum 20 gauge.
5. Minimum concrete thickness ($h_{min,deck}$) refers to concrete thickness above upper flute (see Figures 2 and 3).

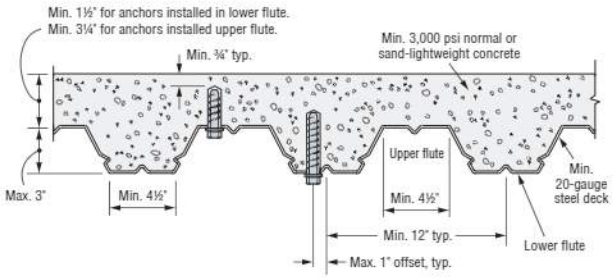


Figure 1. Installation of ⅜"- and ½"-Diameter Anchors in the Soffit of Concrete over Metal Deck

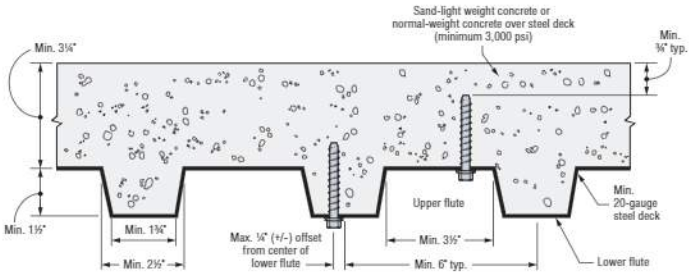


Figure 2. Installation of ¼"-Diameter Anchors in the Soffit of Concrete over Metal Deck

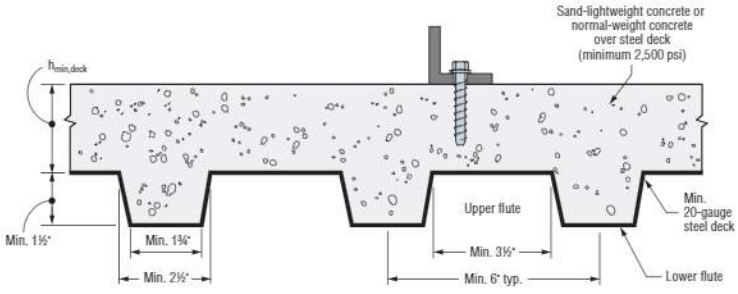


Figure 3. Installation of ¼"- and ⅜"-Diameter Anchors in the Topside of Concrete over Metal Deck

* See p. 13 for an explanation of the load table icons.

Titen HD Allowable Tension and Shear Loads in 8" Lightweight, Medium-Weight and Normal-Weight Grout-Filled CMU

IBC *

Size in. (mm)	Drill Bit Dia. in.	Min. Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical End Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Values for 8" Lightweight, Medium-Weight or Normal-Weight Grout-Filled CMU			
						Tension Load		Shear Load	
						Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)
Anchor Installed in the Face of the CMU Wall (See Figure 4)									
⅜ (9.5)	⅜	2¾ (70)	12 (305)	12 (305)	6 (152)	2,390 (10.6)	480 (2.1)	4,340 (19.3)	870 (3.9)
½ (12.7)	½	3½ (89)	12 (305)	12 (305)	8 (203)	3,440 (15.3)	690 (3.1)	6,920 (30.8)	1,385 (6.2)
⅝ (15.9)	⅝	4½ (114)	12 (305)	12 (305)	10 (254)	5,300 (23.6)	1,060 (4.7)	10,420 (46.4)	2,085 (9.3)
¾ (19.1)	¾	5½ (140)	12 (305)	12 (305)	12 (305)	7,990 (35.5)	1,600 (7.1)	15,000 (66.7)	3,000 (13.3)

1. The tabulated allowable loads are based on a safety factor of 5.0 for installations under the IBC and IRC.
2. Values for 8"-wide, lightweight, medium-weight and normal-weight concrete masonry units.
3. The masonry units must be fully grouted.
4. The minimum specified compressive strength of masonry, f'_m, at 28 days is 1,500 psi.
5. Embedment depth is measured from the outside face of the concrete masonry unit.
6. Allowable loads may be increased 33⅓% for short-term loading due to wind or seismic forces where permitted by code.
7. Grout-filled CMU wall design must satisfy applicable design standards and be capable of withstanding applied loads.
8. Refer to allowable load-adjustment factors for spacing and edge distance on p. 123.

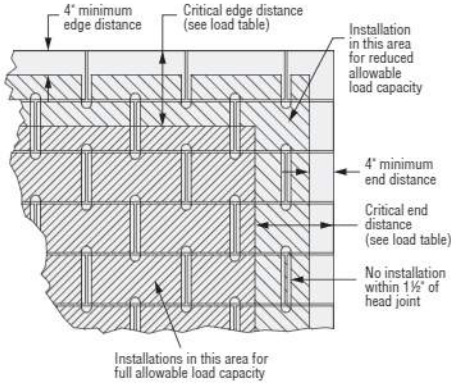


Figure 4. Shaded Area = Placement for Full **and Reduce**d Allowable Load Capacity in Grout-Filled CMU

Titen HD Allowable Tension and Shear Loads in 8" Lightweight, Medium-Weight and Normal-Weight Hollow CMU

IBC *

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth[4] in. (mm)	Min. Edge Dist. in. (mm)	Min. End Dist. in. (mm)	8" Hollow CMU Loads Based on CMU Strength			
					Tension Load		Shear Load	
					Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)
Anchor Installed in Face Shell (See Figure 5)								
⅜ (9.5)	⅜	1¾ (45)	4 (102)	4⅝ (117)	720 (3.2)	145 (0.6)	1,240 (5.5)	250 (1.1)
½ (12.7)	½	1¾ (45)	4 (102)	4⅝ (117)	760 (3.4)	150 (0.7)	1,240 (5.5)	250 (1.1)
⅝ (15.9)	⅝	1¾ (45)	4 (102)	4⅝ (117)	800 (3.6)	160 (0.7)	1,240 (5.5)	250 (1.1)
¾ (19.1)	¾	1¾ (45)	4 (102)	4⅝ (117)	880 (3.9)	175 (0.8)	1,240 (5.5)	250 (1.1)

1. The tabulated allowable loads are based on a safety factor of 5.0 for installations under the IBC and IRC.
2. Values for 8"-wide, lightweight, medium-weight and normal-weight concrete masonry units.
3. The minimum specified compressive strength of masonry, f'_m, at 28 days is 1,500 psi.
4. Embedment depth is measured from the outside face of the concrete masonry unit and is based on the anchor being embedded an additional ½"- through 1¼"-thick face shell.
5. Allowable loads may not be increased for short-term loading due to wind or seismic forces. CMU wall design must satisfy applicable design standards and be capable of withstanding applied loads.
6. Do not use impact wrenches to install in hollow CMU.
7. Set drill to rotation-only mode when drilling into hollow CMU.

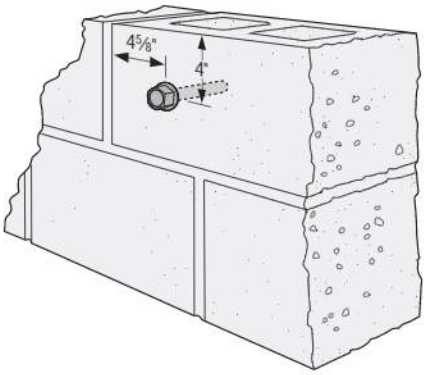


Figure 5

Titen HD® Allowable Tension and Shear Loads in 8" Lightweight, Medium-Weight and Normal-Weight Grout-Filled CMU Stemwall

IBC *

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Min. Edge Dist. in. (mm)	Min. End Dist. in. (mm)	Critical Spacing Dist. in. (mm)	8" Grout-Filled CMU Allowable Loads Based on CMU Strength					
						Tension		Shear Perp. to Edge		Shear Parallel to Edge	
						Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)	Ultimate lb. (kN)	Allowable lb. (kN)
Anchor Installed in Cell Opening or Web (Top of Wall) (See Figure 6)											
½ (12.7)	½	4½ (114)	1¾ (45)	8 (203)	8 (203)	2,860 (12.7)	570 (2.5)	800 (3.6)	160 (0.7)	2,920 (13.0)	585 (2.6)
⅝ (15.9)	⅝	4½ (114)	1¾ (45)	10 (254)	10 (254)	2,860 (12.7)	570 (2.5)	800 (3.6)	160 (0.7)	3,380 (15.0)	675 (3.0)

1. The tabulated allowable loads are based on a safety factor of 5.0 for installations under the IBC and IRC.
2. Values are for 8"-wide, lightweight, medium-weight and normal-weight concrete masonry units.
3. The masonry units must be fully grouted.
4. The minimum specified compressive strength of masonry, f'_m, at 28 days is 1,500 psi.
5. Allowable loads may be increased 33⅓% for short-term loading due to wind or seismic forces where permitted by code.
6. Grout-filled CMU wall design must satisfy applicable design standards and be capable of withstanding applied design loads.
7. Loads are based on anchor installed in either the web or grout-filled cell opening in the top of wall.

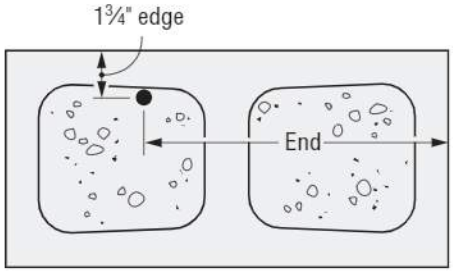


Figure 6. Anchor Installed in Top of Wall

* See p. 13 for an explanation of the load table icons.

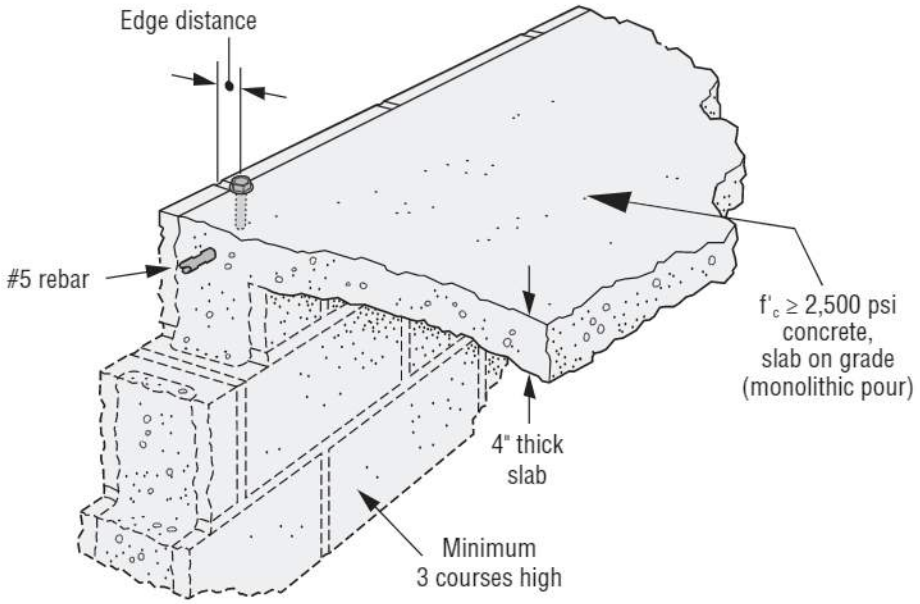
Titen HD® Design Information — Masonry

Titen HD Allowable Tension Loads for 8" Lightweight, Medium-Weight and Normal-Weight CMU Chair Blocks Filled with Normal-Weight Concrete

IBC *

Size in. (mm)	Drill Bit Dia. (in.)	Min. Embed. Depth in. (mm)	Min. Edge Dist. in. (mm)	Critical Spacing in. (mm)	8" Concrete-Filled CMU Chair Block Allowable Tension Loads Based on CMU Strength	
					Ultimate lb. (kN)	Allowable lb. (kN)
⅜ (9.5)	⅜	2⅜ (60)	1¾ (44)	9½ (241)	3,175 (14.1)	635 (2.8)
		3⅜ (86)	1¾ (44)	13½ (343)	5,175 (23.0)	1,035 (4.6)
		5 (127)	2¼ (57)	20 (508)	10,584 (47.1)	2,115 (9.4)
½ (12.7)	½	8 (203)	2¼ (57)	32 (813)	13,722 (61.0)	2,754 (12.2)
		10 (254)	2¼ (57)	40 (1016)	16,630 (74.0)	3,325 (14.8)
⅝ (15.9)	⅝	5½ (140)	1¾ (44)	22 (559)	9,025 (40.1)	1,805 (8.1)

1. The tabulated allowable loads are based on a safety factor of 5.0.
2. Values are for 8"-wide concrete masonry units (CMU) filled with concrete, with minimum compressive strength of 2,500 psi and poured monolithically with the floor slab.
3. Center #5 rebar in CMU cell and concrete slab as shown in the illustration below.



* See p. 13 for an explanation of the load table icons.

Titen HD® Design Information — Masonry

Load-Adjustment Factors for Titen HD Anchors in Face-of-Wall Installation in 8" Grout-Filled CMU: Edge Distance and Spacing, Tension and Shear Loads

How to use these charts:

1. The following tables are for reduced edge distance and spacing.
2. Locate the anchor size to be used for either a tension and/or shear load application.
3. Locate the embedment (E) at which the anchor is to be installed.
4. Locate the edge distance (c_{act}) or spacing (s_{act}) at which the anchor is to be installed.
5. The load adjustment factor (f_c or f_s) is the intersection of the row and column.
6. Multiply the allowable load by the applicable load adjustment factor.
7. Reduction factors for multiple edges or spacings are multiplied together.

Edge or End Distance Tension (f_c)

c_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	c_{cr}	12	12	12	12
	c_{min}	4	4	4	4
	f_{cmin}	1.00	1.00	0.83	0.66
4		1.00	1.00	0.83	0.66
6		1.00	1.00	0.87	0.75
8		1.00	1.00	0.92	0.83
10		1.00	1.00	0.96	0.92
12		1.00	1.00	1.00	1.00

See notes below.

Edge or End Distance Shear (f_c) Shear Load Parallel to Edge or End

c_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	c_{cr}	12	12	12	12
	c_{min}	4	4	4	4
	f_{cmin}	0.77	0.48	0.46	0.44
4		0.77	0.48	0.46	0.44
6		0.83	0.61	0.60	0.58
8		0.89	0.74	0.73	0.72
10		0.94	0.87	0.87	0.86
12		1.00	1.00	1.00	1.00

See notes below.

Edge or End Distance Shear (f_c) Shear Load Perpendicular to Edge or End (Directed Towards Edge or End)

c_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	c_{cr}	12	12	12	12
	c_{min}	4	4	4	4
	f_{cmin}	0.58	0.38	0.30	0.21
4		0.58	0.38	0.30	0.21
6		0.69	0.54	0.48	0.41
8		0.79	0.69	0.65	0.61
10		0.90	0.85	0.83	0.80
12		1.00	1.00	1.00	1.00

1. E = Embedment depth (inches).
2. c_{act} = actual end or edge distance at which anchor is installed (inches).
3. c_{cr} = critical end or edge distance for 100% load (inches).
4. c_{min} = minimum end or edge distance for reduced load (inches).
5. f_c = adjustment factor for allowable load at actual end or edge distance.
6. f_{ccr} = adjustment factor for allowable load at critical end or edge distance. f_{ccr} is always = 1.00.
7. f_{cmin} = adjustment factor for allowable load at minimum end or edge distance.
8. $f_c = f_{cmin} + [(1 - f_{cmin}) (c_{act} - c_{min}) / (c_{cr} - c_{min})]$.

Edge or End Distance Shear (f_c) Shear Load Perpendicular to Edge or End (Directed Away From Edge or End)

c_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	c_{cr}	12	12	12	12
	c_{min}	4	4	4	4
	f_{cmin}	0.89	0.79	0.58	0.38
4		0.89	0.79	0.58	0.38
6		0.92	0.84	0.69	0.54
8		0.95	0.90	0.79	0.69
10		0.97	0.95	0.90	0.85
12		1.00	1.00	1.00	1.00

Spacing Tension (f_s)

s_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	s_{cr}	6	8	10	12
	s_{min}	3	4	5	6
	f_{smin}	0.87	0.69	0.59	0.50
3		0.87			
4		0.91	0.69		
5		0.96	0.77	0.59	
6		1.00	0.85	0.67	0.50
8			1.00	0.84	0.67
10				1.00	0.83
12					1.00

1. E = Embedment depth (inches).
2. s_{act} = actual spacing distance at which anchors are installed (inches).
3. s_{cr} = critical spacing distance for 100% load (inches).
4. s_{min} = minimum spacing distance for reduced load (inches).
5. f_s = adjustment factor for allowable load at actual spacing distance.
6. f_{scr} = adjustment factor for allowable load at critical spacing distance. f_{scr} is always = 1.00.
7. f_{smin} = adjustment factor for allowable load at minimum spacing distance.
8. $f_s = f_{smin} + [(1 - f_{smin}) (s_{act} - s_{min}) / (s_{cr} - s_{min})]$.

Spacing Shear (f_s)

s_{act} (in.)	Dia.	⅜	½	⅝	¾
	E	2¾	3½	4½	5½
	s_{cr}	6	8	10	12
	s_{min}	3	4	5	6
	f_{smin}	0.62	0.62	0.62	0.62
3		0.62			
4		0.75	0.62		
5		0.87	0.72	0.62	
6		1.00	0.81	0.70	0.62
8			1.00	0.85	0.75
10				1.00	0.87
12					1.00

* See p. 13 for an explanation of the load table icons.