



MAIN RESIDENCE

PRESCRIPTIVE PROTOTYPE #4 DESIGN FOR TWO STORY MASONRY STRUCTURE

1st FLOOR MODEL WITH WOOD STRUCTURE 2nd FLOOR HOME IN PUERTO RICO

PREFACE:

THIS PRESCRIPTIVE HOME DRAWING SET PRESENTS RECOMMENDATIONS FOR THE CONSTRUCTION OF A TWO 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). 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:

- TWO STORY BUILDING WITH THE MAXIMUM MEAN ROOF HEIGHT AS SHOWN IN THE DRAWING SET.
- ROOF AS SHOWN IN THE DRAWING SET.
- 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 COMPLY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

INFORMATION ABOUT STORM SURGE CAN BE ACCESSED AT [HTTPS://NHC.NOAA.GOV/NATIONALSURGE/](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](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/](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

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A-402	Notes, Windows, Doors, Finishes, Bathrooms & Kitchen Schedules
A-500	Reflected Ceiling Plan
A-510	Wall Sections
A-511	Doors and Windows Details
A-512	Roofing Details
A-512	Module Joint Details
STRUCTURAL	
S-001	Title Sheet
S-002A	General Notes
S-002B	General Notes
S-003	Design Data
S-004	Schedule and Hook Types
S-005	Foundation Plans
S-006	First Floor Plan
S-007	Second Floor Plan
S-008	Roof Framing Plans
S-009	Primary Structure Elevations
S-010	Primary Structure Elevations
S-011	Expansion Module Structure Elevations
S-012	Foundation Sections and Details
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PLUMBING	
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ELECTRICAL	
E-400	Electrical layout
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MAP OF PUERTO RICO (N.T.S.)

GENERAL LEGEND

ROOM KEY:
ROOM NAME
ROOM NUMBER

ELEV
25'-0"

ALIGN KEY

1"
DIMENSION LINE

C.5
COLUMN LINE INDICATORS

DOOR NUMBER

ROOM KEY:
ROOM NAME
ROOM NUMBER

SPOT ELEVATION
KEY

1"
A90
EXTERIOR ELEVATION KEY

1"
A80
INTERIOR ELEVATION KEY

1"
A80
MULTIPLE INTERIOR
ELEVATIONS

1"
REVISION KEY

1"
KEYNOTE INDICATOR

DETAIL KEY:
DETAIL NUMBER
DRAWING NUMBER

1
A90
ENLARGED PLAN KEY

1
A80
EXTERIOR ELEVATION KEY

1
A80
INTERIOR ELEVATION KEY

1
A80
MULTIPLE INTERIOR
ELEVATIONS

1
REVISION KEY

1
KEYNOTE INDICATOR

ABBREVIATIONS

& - And
< - Angle
@ - At
CL - Center Line
Ø - Diameter
- Pound
± - Tolerance Dimension
A/E - Architect / Engineer
ADDL - Additional
ADH - Adhesive
ADJ - Adjustable
ADJG - 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
SCHD - 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
UN - 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
WTRPF - Waterproofing
WWF - Welded Wire Fabric

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD 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

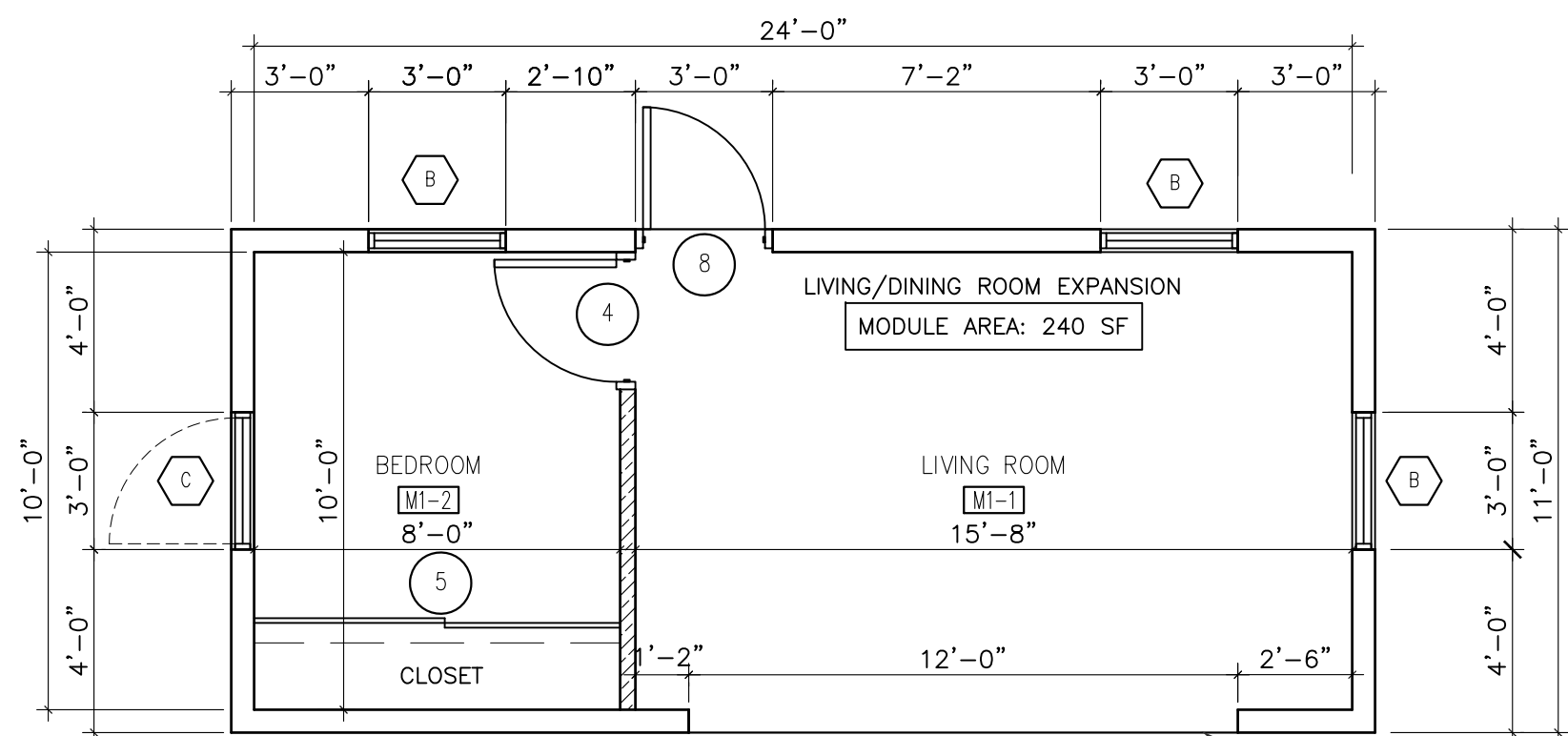
PROFESSIONAL SEALS:

SHEET TITLE:

Title Sheet

SHEET INFORMATION:	
JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number:
Checked By:	A-004
QC Review:	
Phase:	

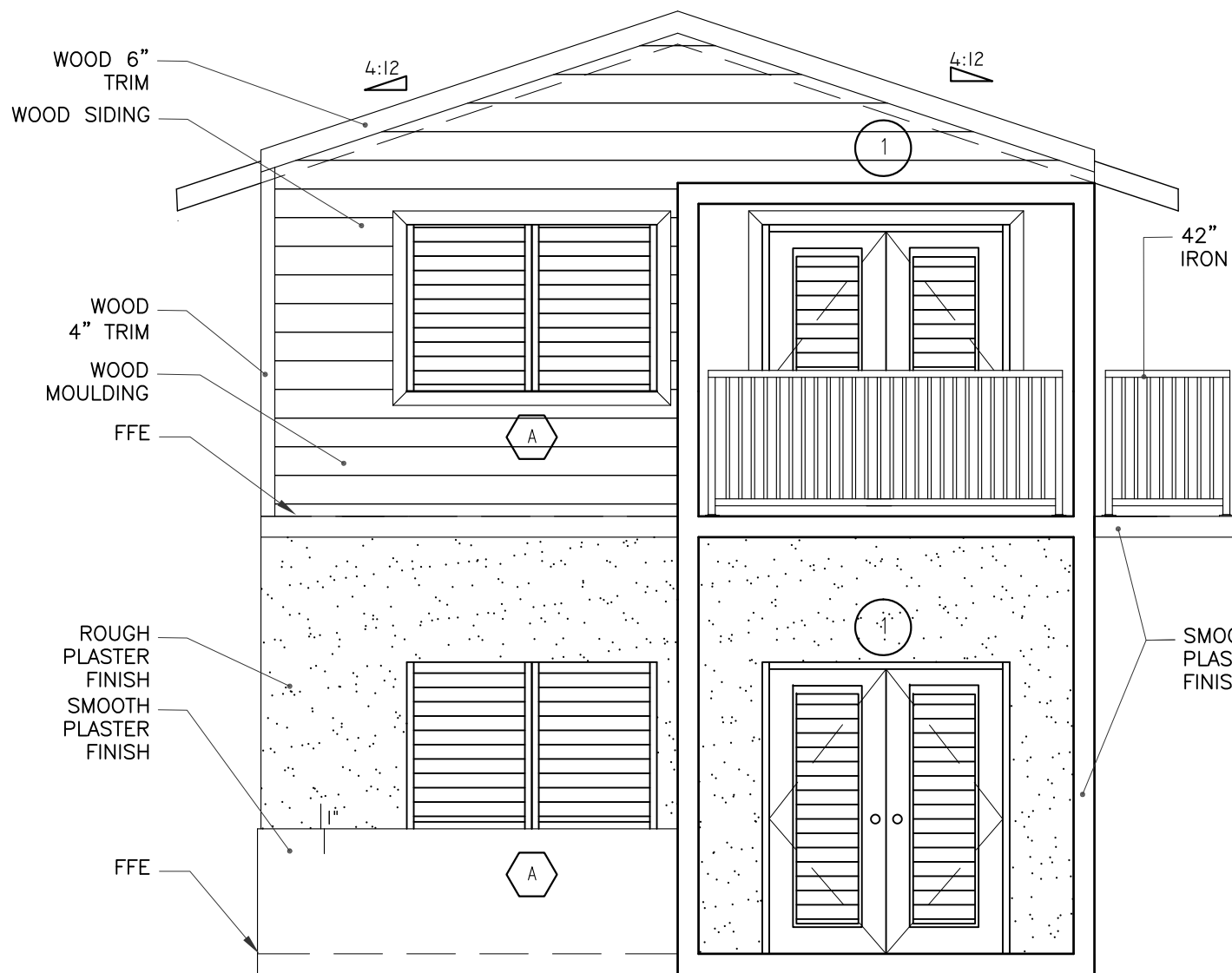
ADDITION OPTION



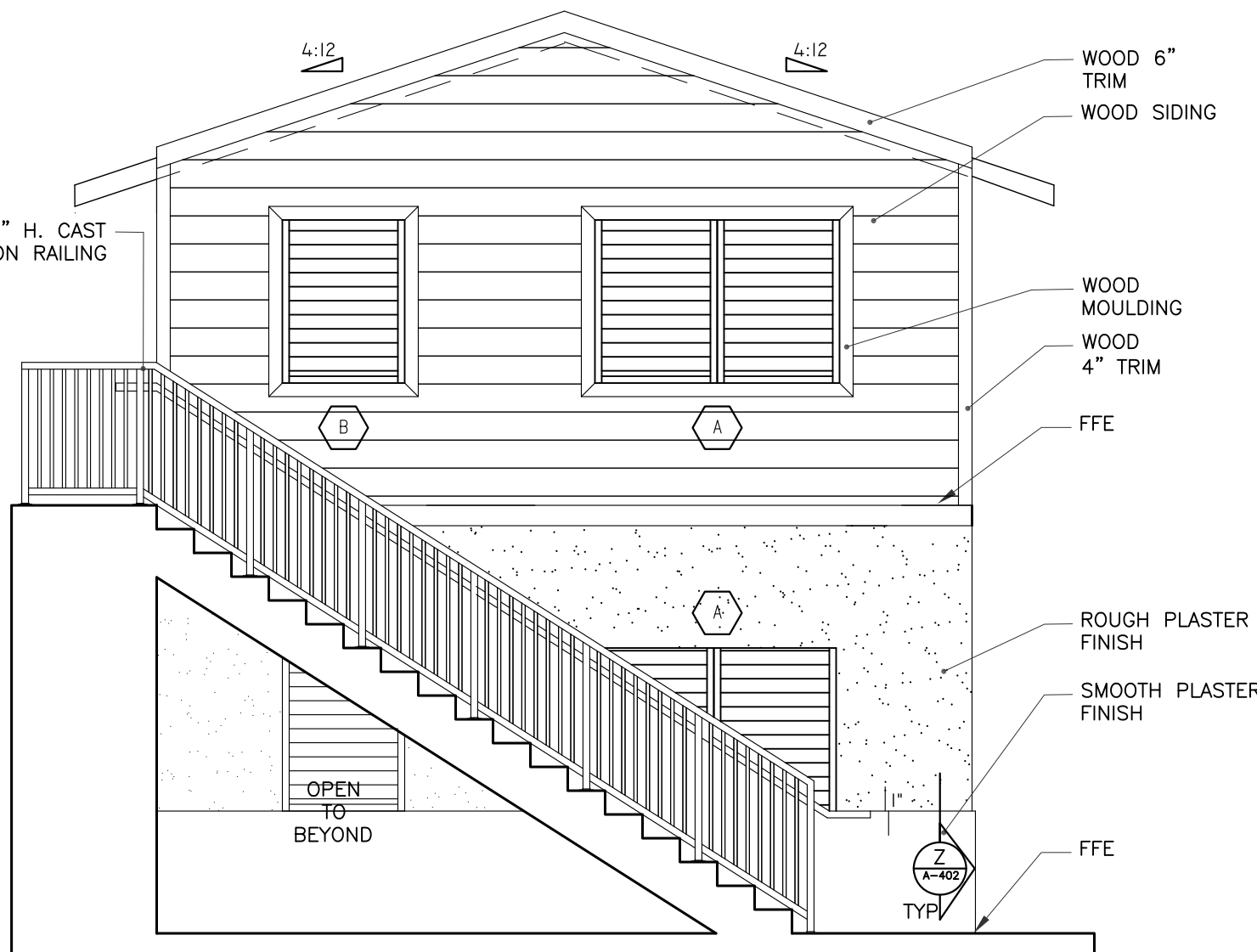
FUTURE EXPANSION MODULE - 1
SCALE: 1/4"=1'-0"

FOR MODULE CONNECTION
TO MAIN HOUSE REFER TO
STRUCTURAL PLANS

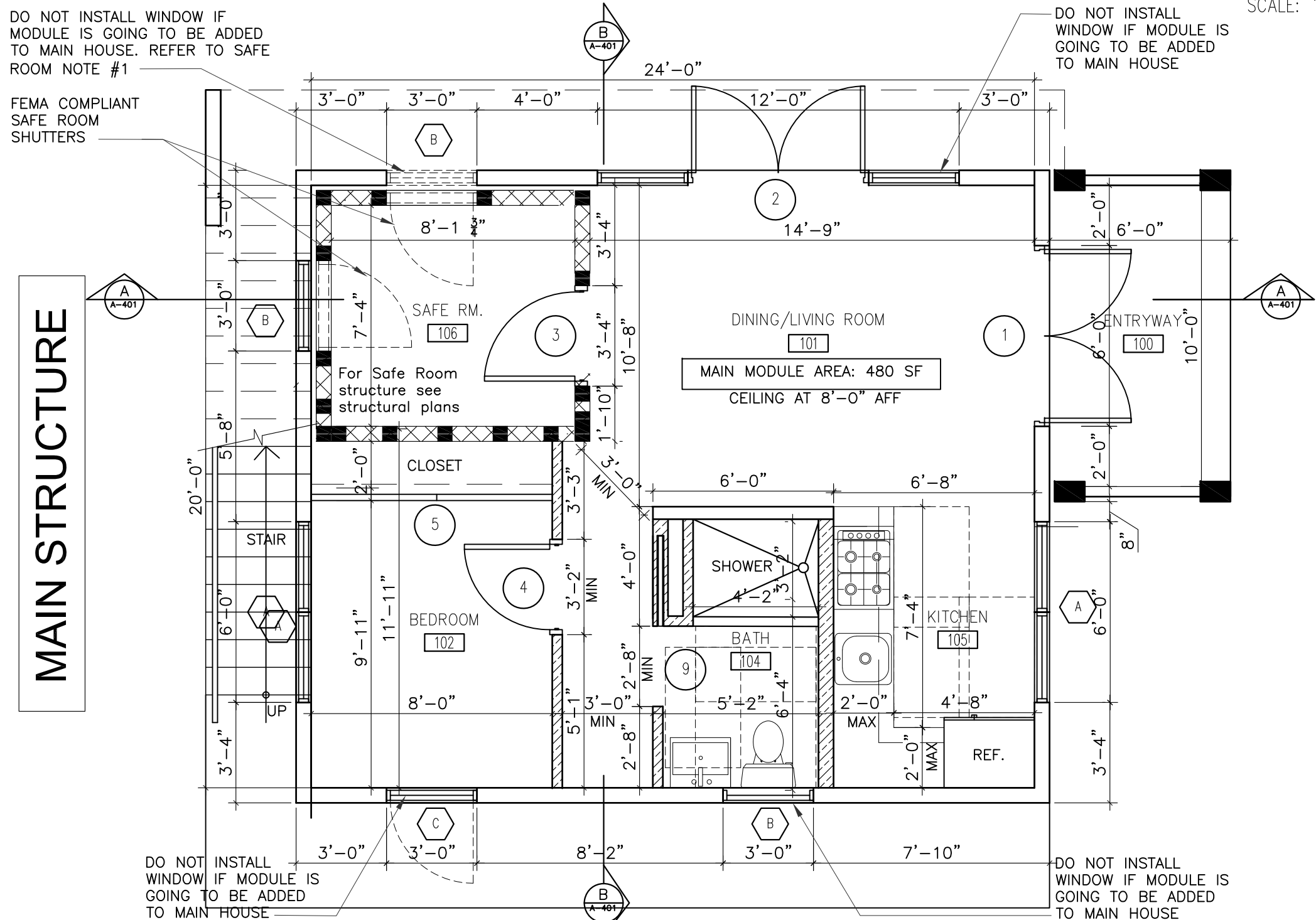
FRONT ELEVATION
SCALE: 1/4"=1'-0"



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



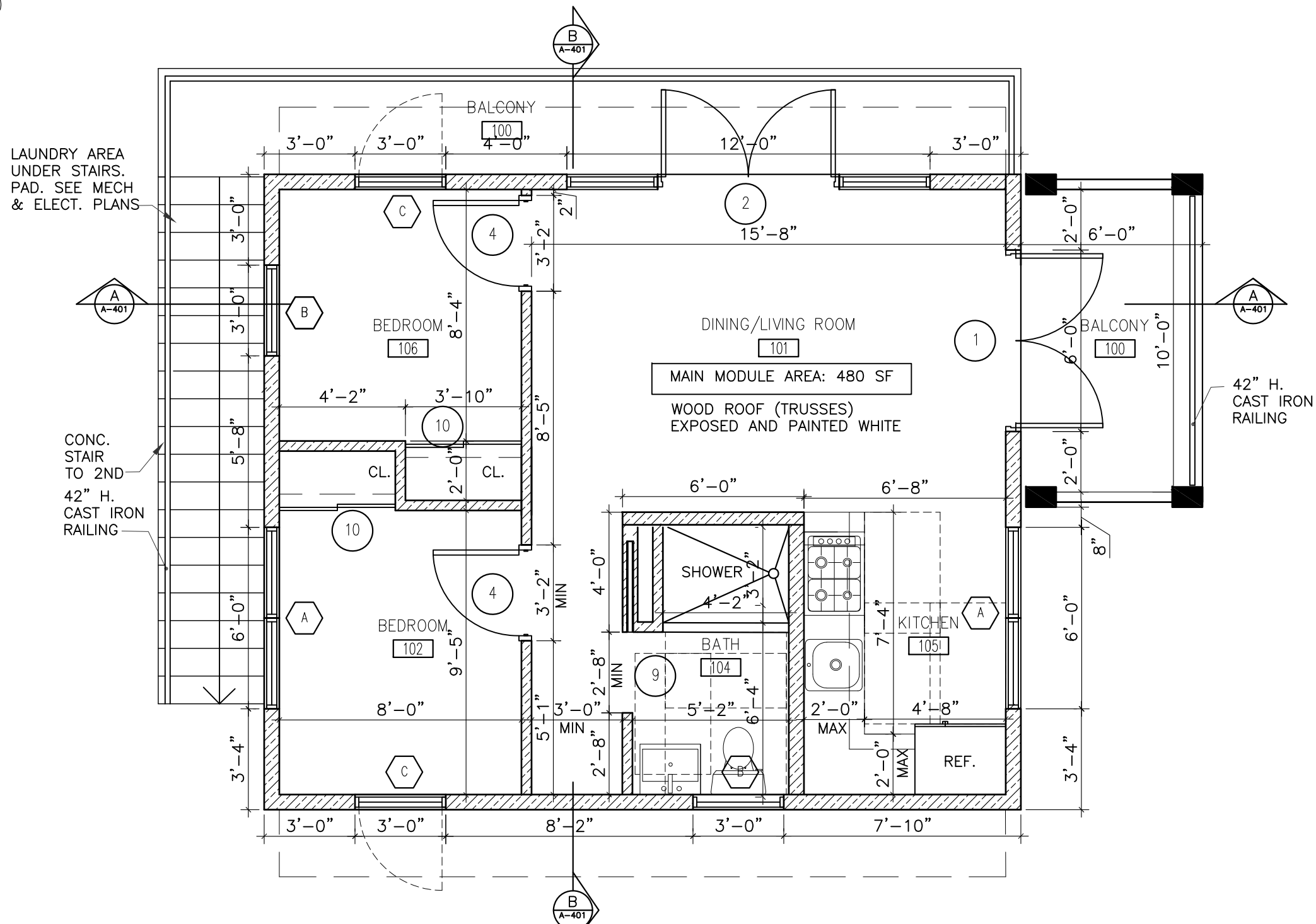
MAIN STRUCTURE



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

FOR MODULE CONNECTION
TO MAIN HOUSE REFER TO
STRUCTURAL PLANS

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

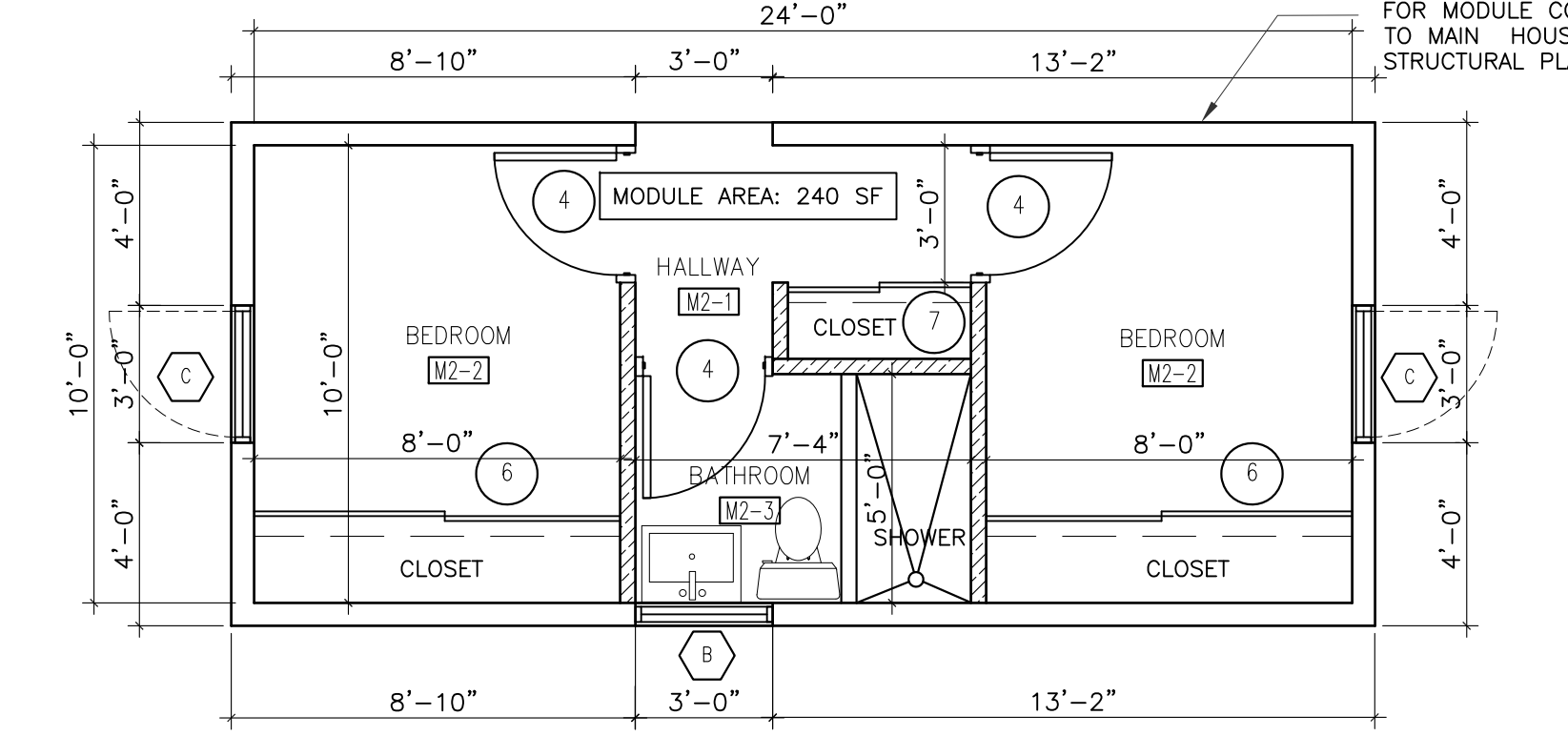


WOOD HOUSE ROOFING OPTIONS:

1. LIQUID APPLIED MEMBRANE
2. STANDING SEAM
3. GALVANIZED CORRUGATED PANELS

OWNER SHALL DECIDE WHAT SYSTEM TO BE
USED IN THE WOOD CEILING. INSTALLATION TO
BE AS PER MANUFACTURERS' INSTRUCTIONS.

ADDITION OPTION

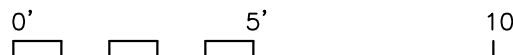


FUTURE EXPANSION MODULE - 2
SCALE: 1/4"=1'-0"

LEGEND:

- CONCRETE
- REINFORCED MASONRY WALLS
- STRUCTURAL WOOD WALL
- SOLID GROUTED MASONRY WALLS

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



CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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SHEET TITLE:

PROTOTYPE 4 - FLOOR PLANS & ELEVATIONS

SHEET INFORMATION:

JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number:
Checked By:	A-400
QC Review:	
Phase:	

GENERAL NOTES

- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL BUILDING CODES AND/OR REGULATIONS.
- ALL WORK SHALL BE DONE IN A MANNER CONSISTENT WITH THE HIGHEST STANDARDS OF THE RESPECTIVE TRADES.
- THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS BEFORE BIDDING.
- THE CONTRACTOR SHALL VERIFY ALL FIELD DIMENSIONS BEFORE PROCEEDING WITH THE WORK AND COMPLIANCE WITH ZONING REGULATIONS.
- THE CONTRACTOR SHALL ABIDE BY ALL REQUIREMENTS OF THE OWNER WITH RESPECT TO CONSTRUCTION SCHEDULING, COORDINATION, TEMPORARY CONSTRUCTION, UTILITIES, ETC.
- 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.
- ALL MATERIALS, PRODUCTS, AND UNITS, SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.
- 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.
- ALL FINISH PAINT SHALL BE APPLIED OVER A COMPATIBLE FACTORY OR FIELD APPLIED PRIMER.
- 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.
- THE CONTRACTOR SHALL YIELD TO THE OWNER AND THEIR VISITORS AT ALL TIMES.
- THE CONTRACTOR SHALL NOT DISRUPT THE BUILDING OR OPERATIONS WITHOUT PRIOR SCHEDULING AND APPROVAL FROM THE OWNER.
- NOT USED
- IF A CONFLICT OCCURS ON THESE CONSTRUCTION DOCUMENTS AND/OR THE SPECIFICATIONS, THE CONTRACTOR SHALL BID THE HIGHER QUALITY AND/OR QUANTITY.
- AIR CONDITIONING NOT INCLUDED. HOUSE OWNER SHALL DECIDE IF REQUIRED AND INSTALLATION WILL BE DONE BY OTHERS AFTER HOUSE IS BUILT.
- ALL WORK THAT IS EITHER IMPLIED OR REASONABLY INFERRED BY THE CONTRACT DOCUMENTS, DRAWINGS, AND SPECIFICATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 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.
- 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.
- 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.
- ROOF WATERPROOFING TO BE LIQUID APPLIED MEMBRANE SYSTEM ON CONCRETE ROOFS, OR STANDING SEAM OR GALVANIZED CORRUGATED PANELS. ALL ROOFING DESIGNS BY OTHERS.
- ONE BEDROOM WINDOW SHOULD BE CASEMENT TYPE JALOUSIE TO SWING IN THE DIRECTION OF EGRESS PER CODE
- NOT USED
- THE CONTRACTOR ASSUMES RESPONSIBILITY FOR CONSTRUCTION MEANS, METHODS, MATERIALS, TECHNIQUES, PROCEDURES, SEQUENCES, OR SCHEDULING IN CONNECTION WITH THIS WORK.
- NOT USED
- 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.
- 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.

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 OCCUPANT. 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).

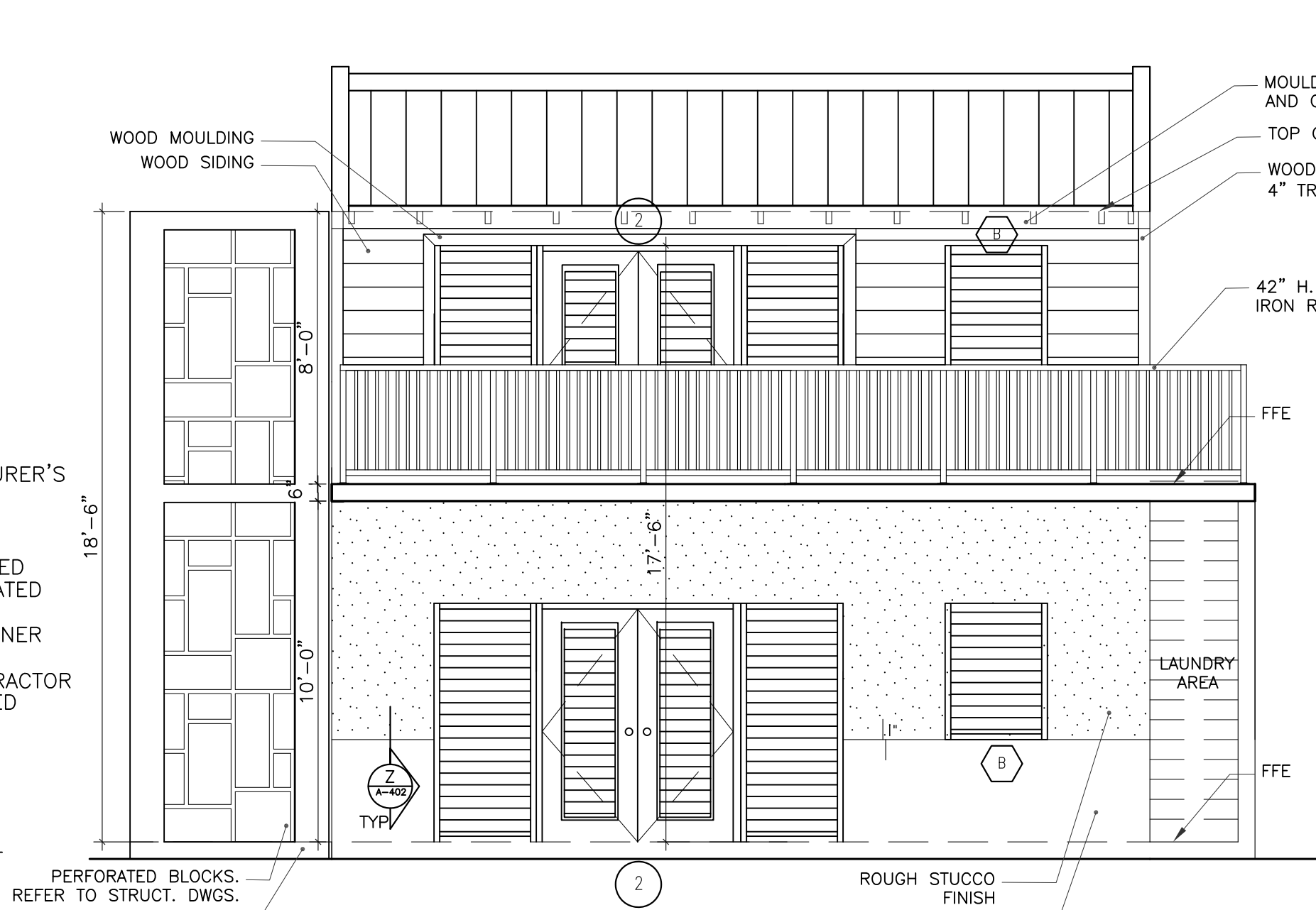
NOT ALL SAFE ROOM OPENINGS ARE SHOWN IN THESE DRAWINGS. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR MECHANICAL, PLUMBING, AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS, AND SUBCONTRACTORS PRIOR TO CONSTRUCTION. OPENINGS MAY REQUIRE ADDITIONAL REINFORCING OR SUPPORTS AS SHOWN ON TYPICAL DETAILS.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

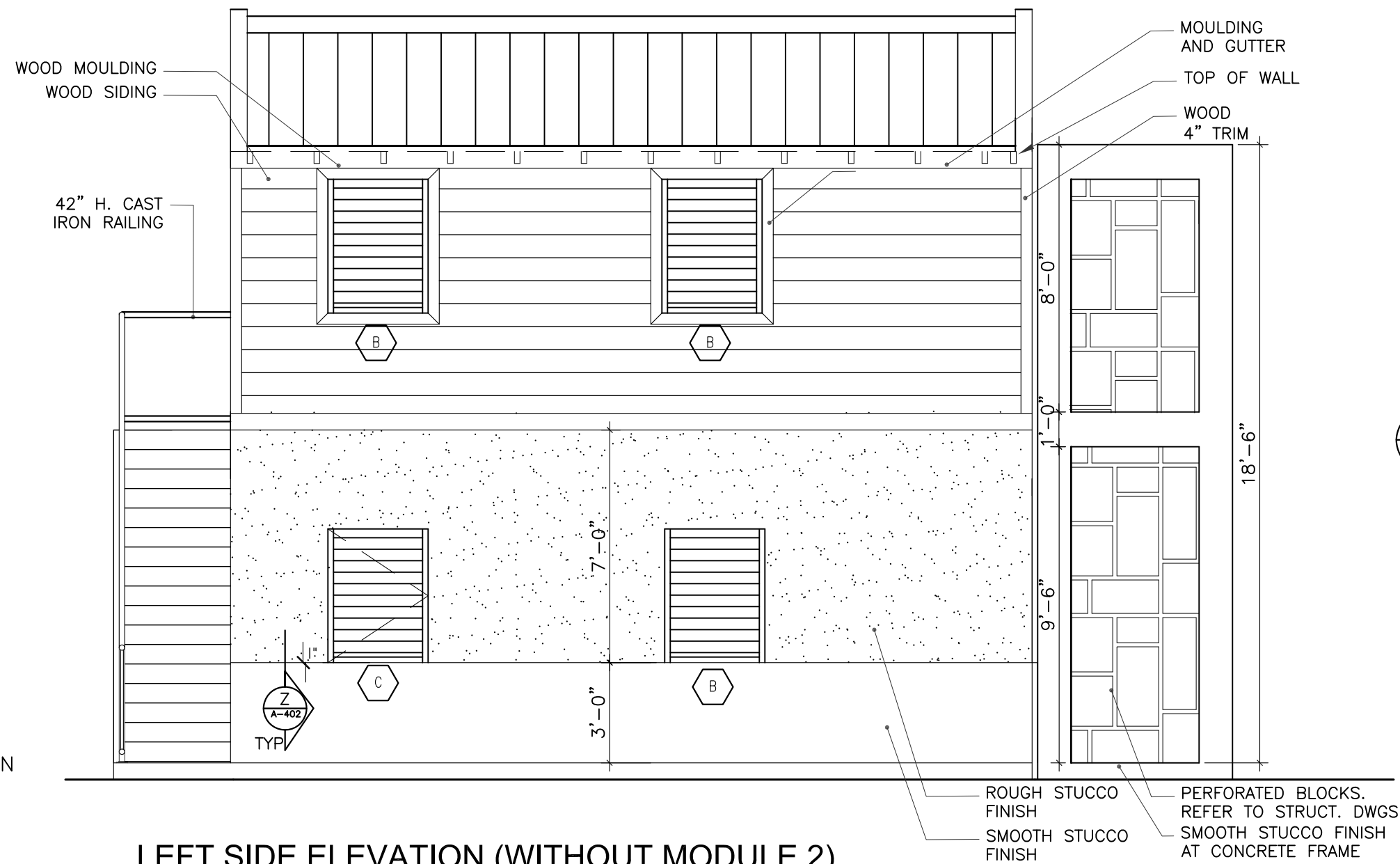
THE SELECTED DOOR AND WINDOW PROTECTION SHALL MEET THE DESIGN CRITERIA OF 2015 FEMA P-361 AND 2014 ICC-500. ALL DOORS AND WINDOW PROTECTIONS SHALL BE A TESTED ASSEMBLY AND INSTALLED PER MANUFACTURES RECOMMENDATIONS.

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



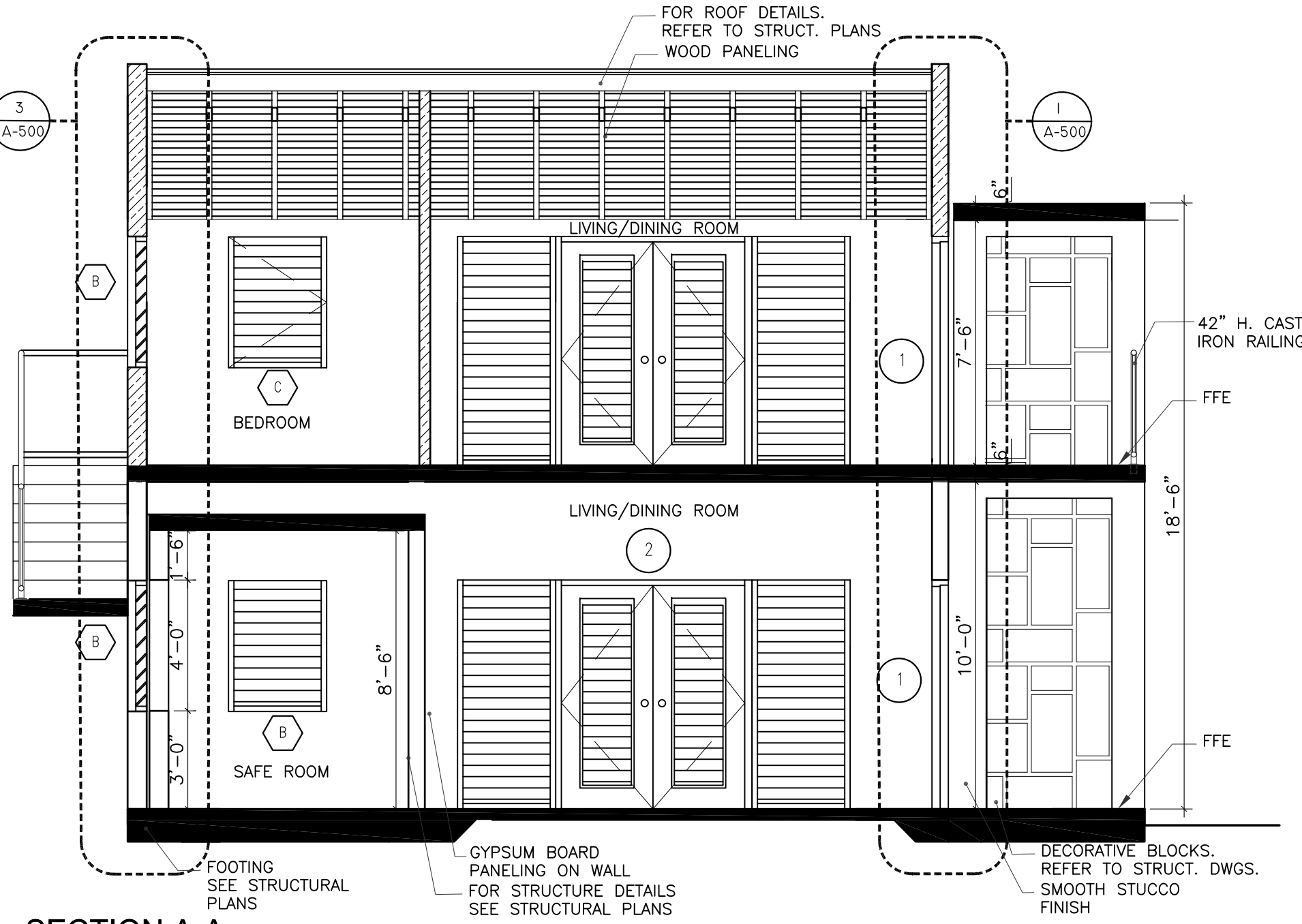
RIGHT SIDE ELEVATION (WITHOUT MODULE 1)

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



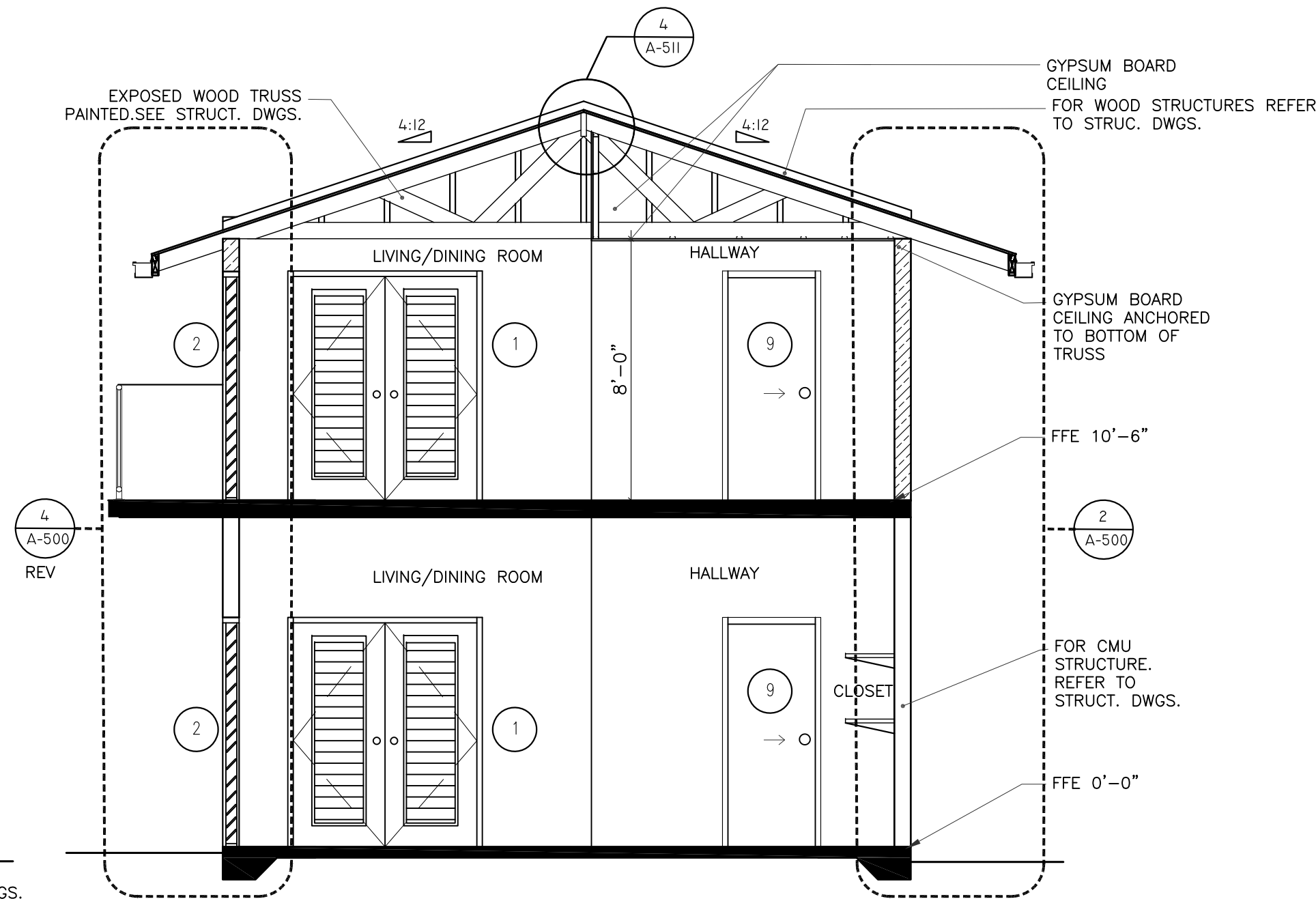
LEFT SIDE ELEVATION (WITHOUT MODULE 2)

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



SECTION A-A

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



SECTION B-B

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

TWO STORY CMU AND 2ND FL. WOOD HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OPM-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:

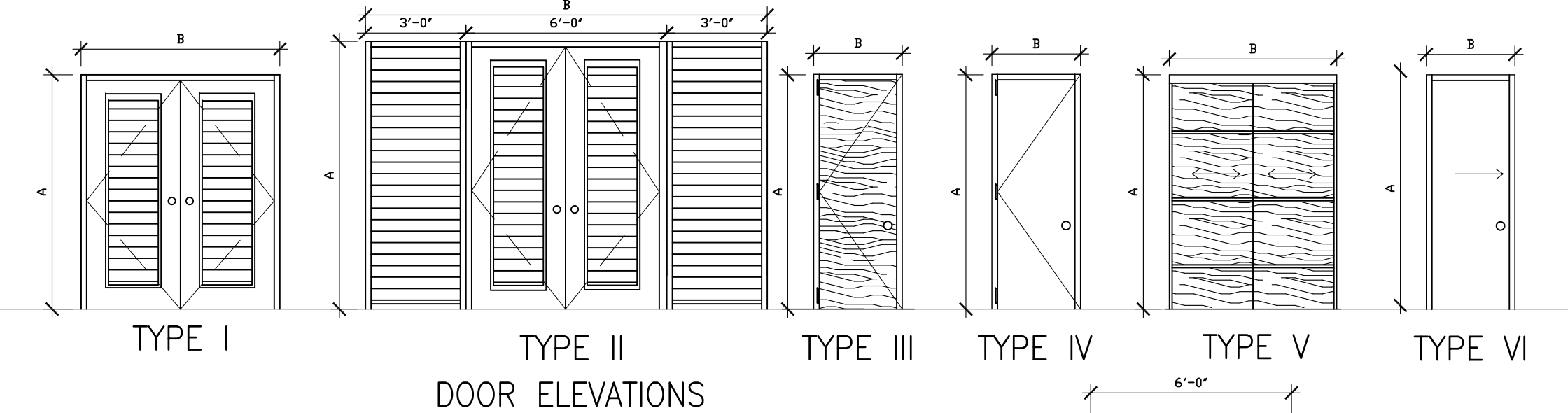
PROTOTYPE 4 - SECTIONS & ELEVATIONS

SHEET INFORMATION:

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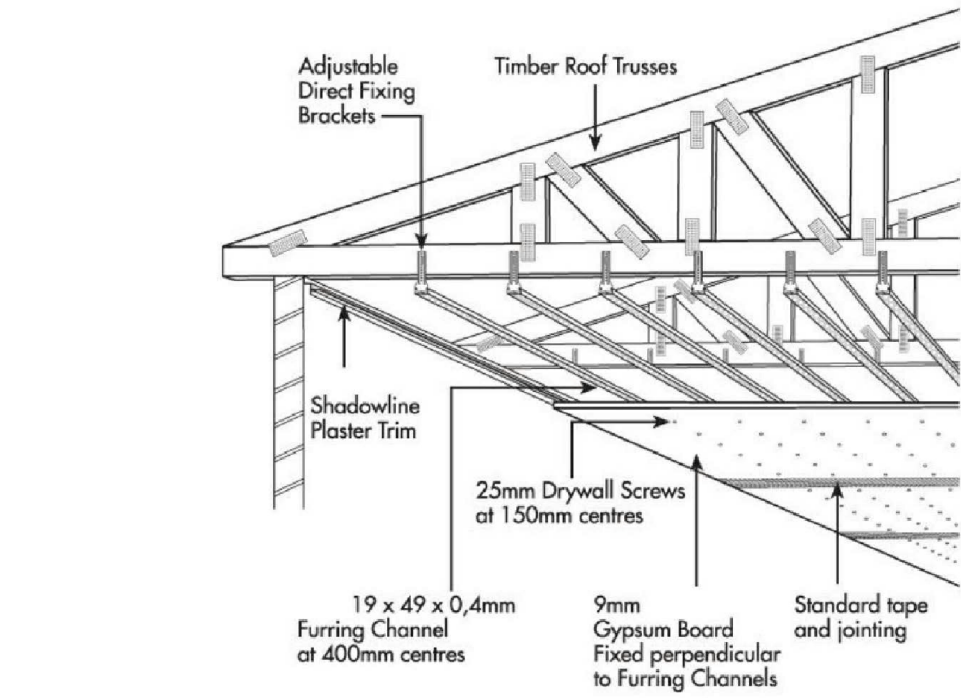
FINISH SCHEDULE MAIN MODULE (1ST FL.)					
NO.	NAME	FLOOR	BASE	CEILING	WALL
100	BALCONY	F1		C1	W1
101	LIVING/DINING ROOM	F1		C1	W1
102	BEDROOM	F1		C1	W1
103	HALL	F1		C1	W1
104	BATHROOM	F1, F2		C1	W1,W2
105	KITCHEN	F1		C1	W1
106	SAFE ROOM	F1		C1	W1

FINISH SCHEDULE MODULES 1&2					
NO.	NAME	FLOOR	BASE	CEILING	WALL
M1-1	LIVING ROOM	F1		C3	W1
M1-2	BEDROOM	F1		C2	W1
M2-1	HALLWAY	F1		C2	W1
M2-2	BEDROOM	F1		C2	W1
M2-3	BATHROOM	F1, F2		C2	W1,W2



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



TYP. INST. DETAIL FOR GWB CEILINGS ON WOOD TRUSSES
SCALE: NTS

FINISH SCHEDULE MAIN MODULE (2ND FL.)					
NO.	NAME	FLOOR	BASE	CEILING	WALL
100	BALCONY	F1	B1	C1	W1
101	LIVING/DINING ROOM	F1	B1	C3	W1
102	BEDROOM	F1	B1	C2	W1
103	HALL	F1	B1	C2	W1
104	BATHROOM	F1, F2	B1	C2	W1,W2
105	KITCHEN	F1	B1	C2	W1
106	SAFE ROOM	F1		C1	W1

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.

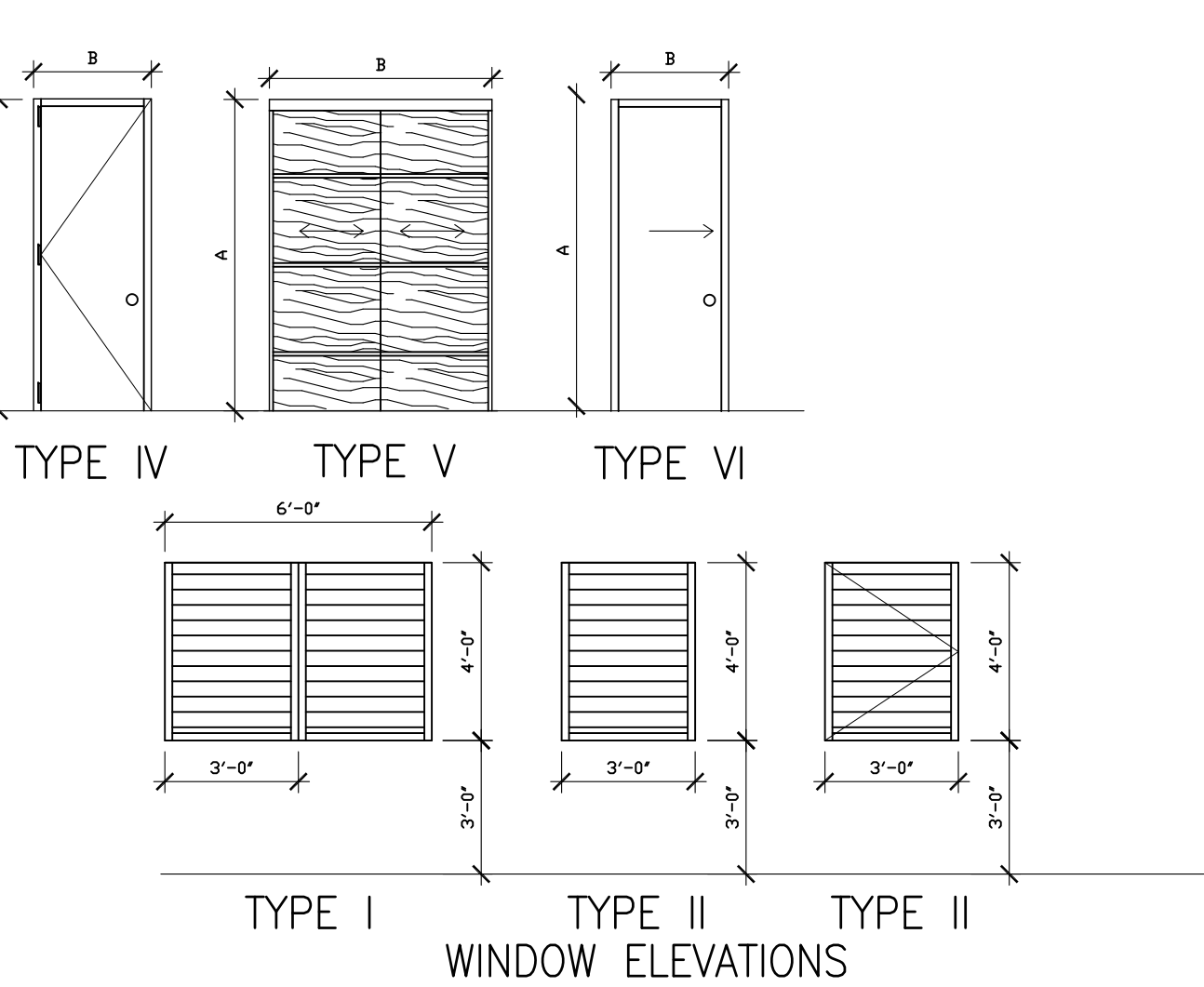
BASE:
B1 - Vinyl Base, color Gray

CEILING:
C1 - Concrete, smooth plaster painted white
C2 - Gypsum board, firecode, ½" OR ¾"
C3 - Exposed wood trusses 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

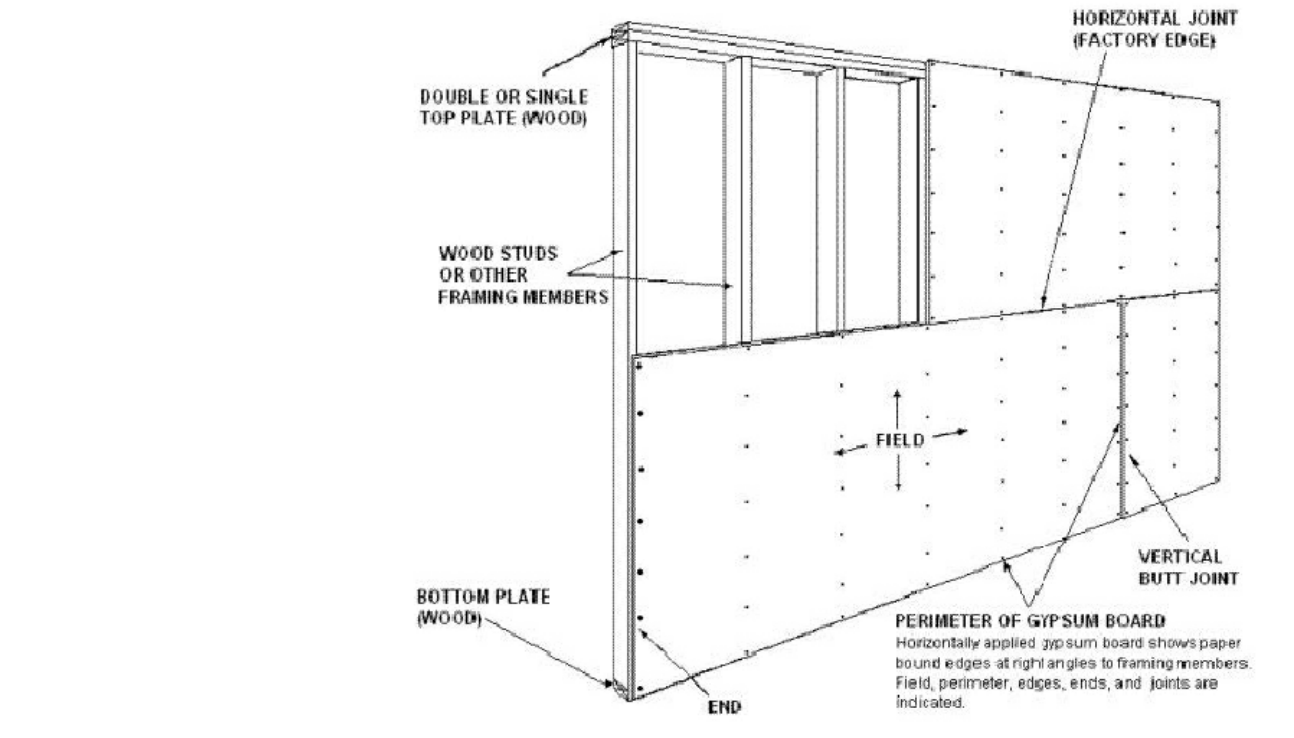
ROUGH STUCCO
SMOOTH STUCCO

WALL DETAIL - Z
N.T.S.



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

- 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.
- For safe room window requirements, see structural drawings.



TYPICAL INSTALLATION DETAIL FOR GWB ON WOOD STUDS
SCALE: NTS

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:**
- Bathroom equipment and accessories to be equal or similar to the specified above. Variations to be submitted to the Architect for approval.
 - Bathroom equipment and accesories supplier: The Home Depot
 - Bathroom walls to be painted white (eggshell finish).
 - For bathroom wainscot and shower tiles see finish schedule.

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. Submit shop drawings to architect for 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

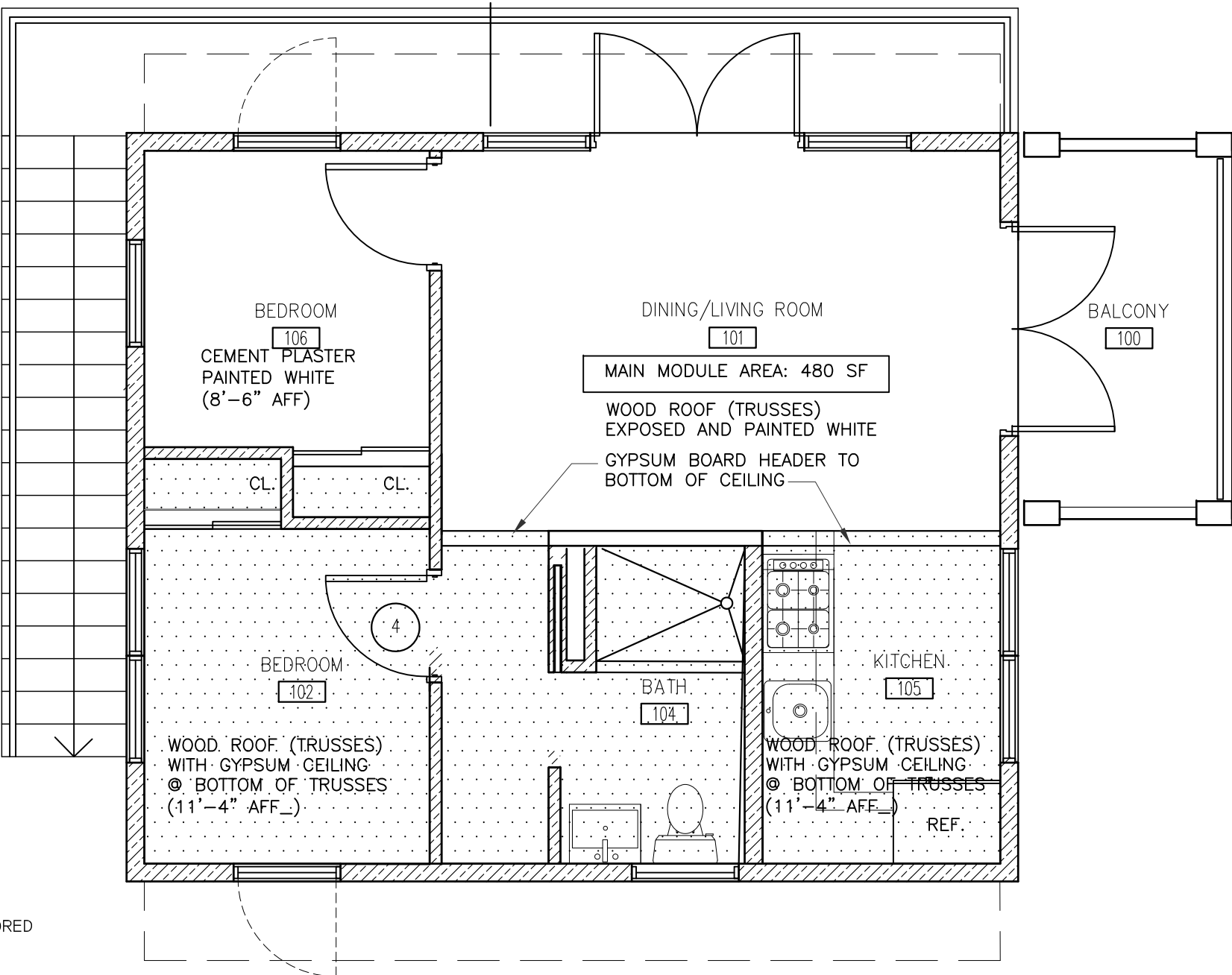
- KITCHEN NOTES:**
- Kitchen equipment and accessories to be equal or similar to the specified above. Variations to be submitted to the Architect for approval.
 - Kitchen equipment and accesories supplier: The Home Depot
 - Kitchen walls to be painted white (eggshell finish).
 - Kitchen backsplash tiles: Ceramic tiles 6x6, color gray. Submit to Architect for approval

FINISHES NOTES

- All floor finishes must be level and smooth
- Contractor must consult with the Architect a/o Owner for any material changes from the specified in the contract documents.
- 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.
- Whenever a color is not selected or indicated in the contract documents, it must be consulted with the Owner for selection.
- 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.
- Ceiling paint to be equal or similar to Behr Premium Plus Ultra Stain Blocking Ceiling Paint in white, unless otherwise indicated by the Owner.
- Exterior point 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.
- Bathrooms wall and floor finishes to be selected and provided by the contractor, unless otherwise indicated by the Owner.
- 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. Architect will not be responsible for any discrepancies in the dimensions not verified by the supplier.
- 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.
- Closets to have one metal shelf and a clothes rod installed on its interior.
- Gypsum board ceilings to be ½" or ¾" Firecode panel by USG. Install on the bottom of the trusses.
- Point wood exterior walls white. Submit exterior wood quality paint type to Architect for approval.

GYPSUM BOARD NOTES:

- Provide Type X gypsum wallboard, 5/8" in thickness ("5/8" type X wallboard"), is manufactured for use as one component of an assembly/system (such as a wall) where a fire resistance rating is required in a residential, structure by the applicable building code.
- 5/8" type X wallboard is required to be manufactured in accordance with established ASTM standards defining type X wallboard as that which provides not less than one-hour fire resistance when tested in specified building assemblies/systems in a laboratory setting under certain controlled conditions and pursuant to certain ASTM procedures



GYPSUM BOARD CEILING
½" FIRECODE RATED ANCHORED TO BOTTOM OF TRUSSES

MAIN MODULE HOUSE (2nd FL) REFLECTED CEILING PLAN
SCALE: 1/4"=1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

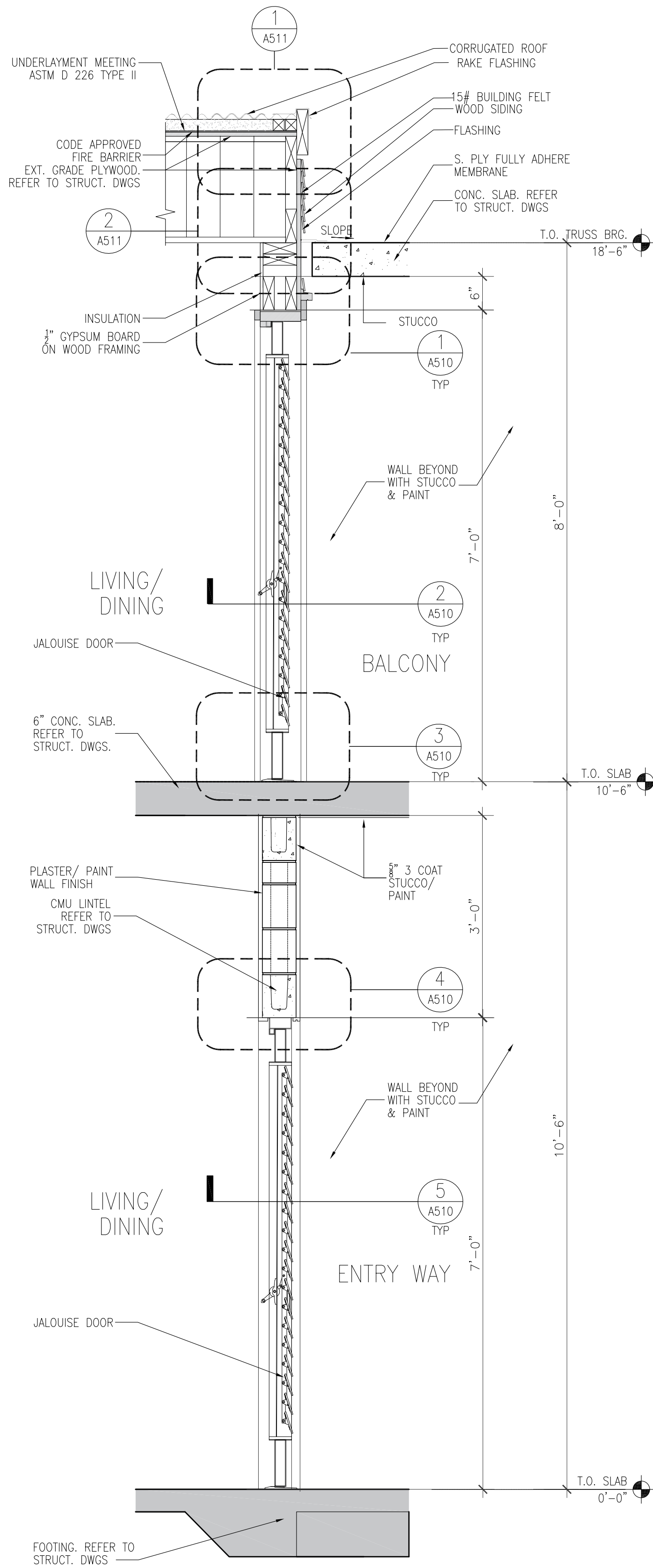
TWO STORY CMY AND 2ND FL WOOD HOME

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.

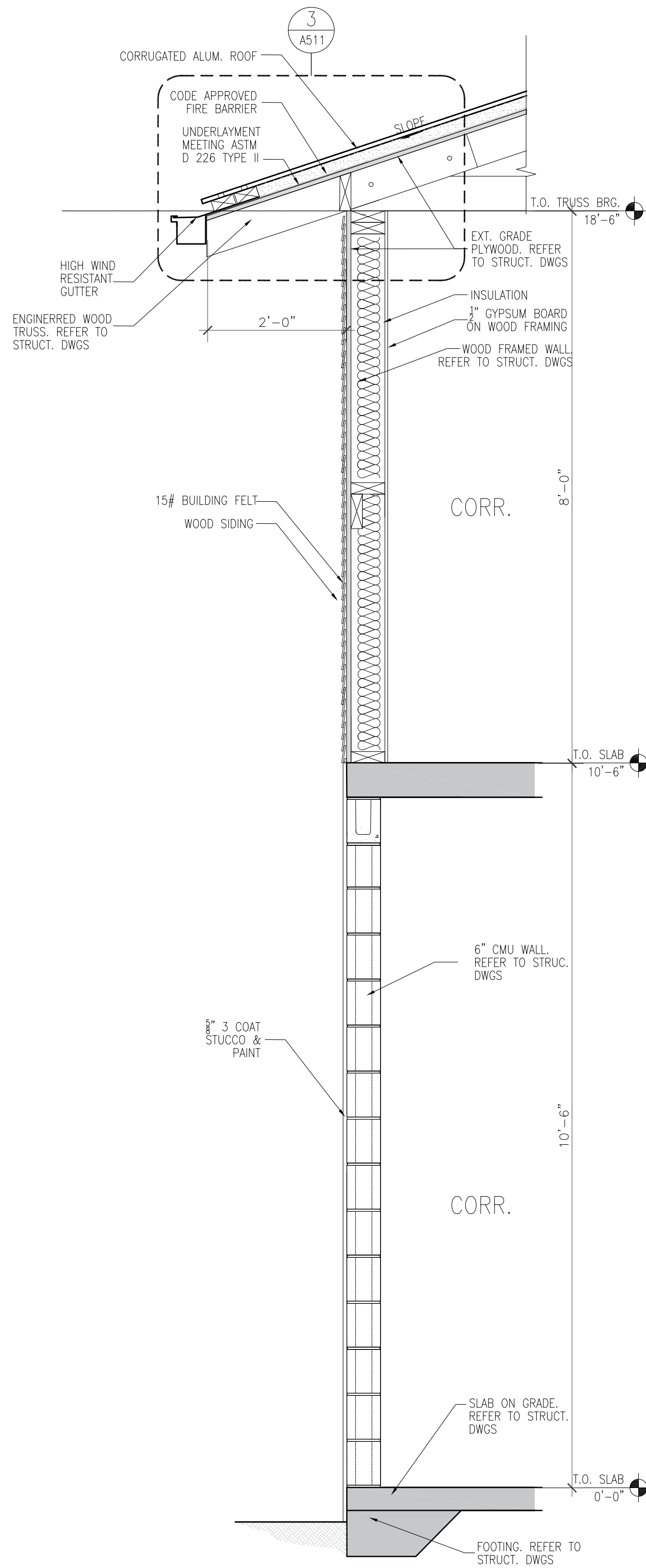
ISSUE LOG		
No.	Date	Description

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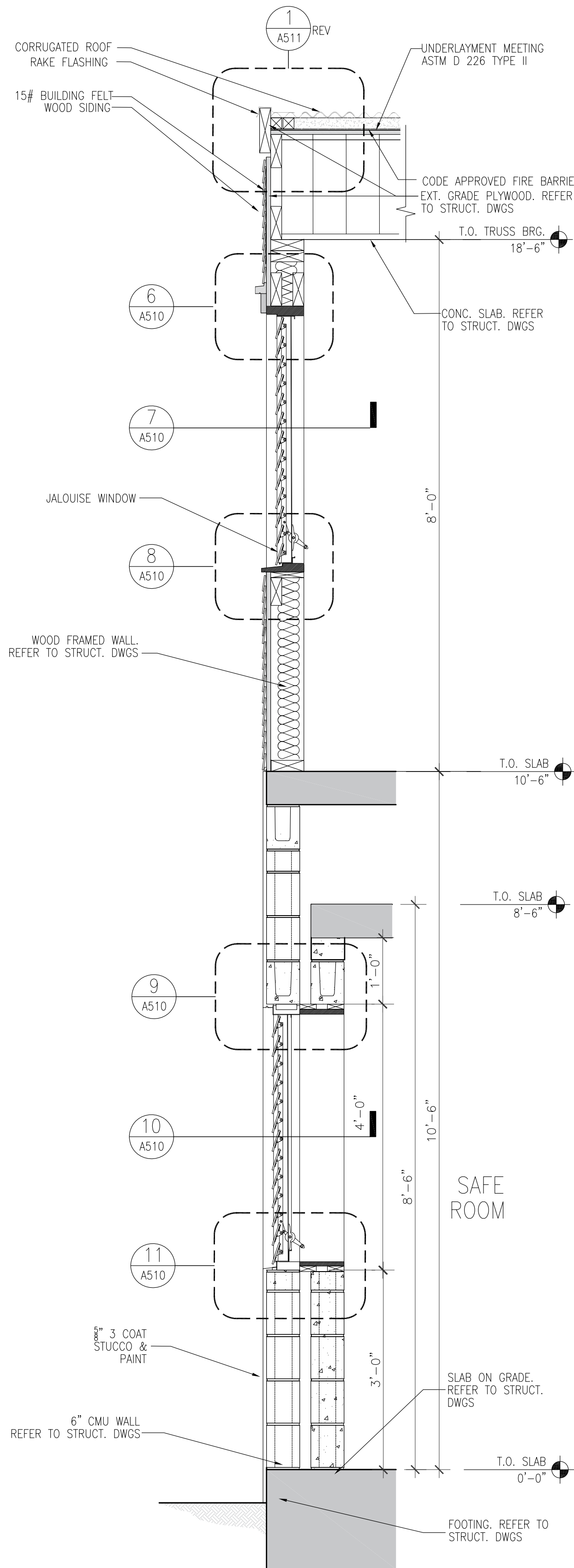
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PROTOTYPE 4 - DOOR, WINDOWS, FINISHES, REF. CLG. PLAN	
SHEET INFORMATION:	
JOB No.	Date Issued: 05/08/20
Drawn By:	Sheet Number:
Checked By:	A-402
QC Review:	
Phase:	



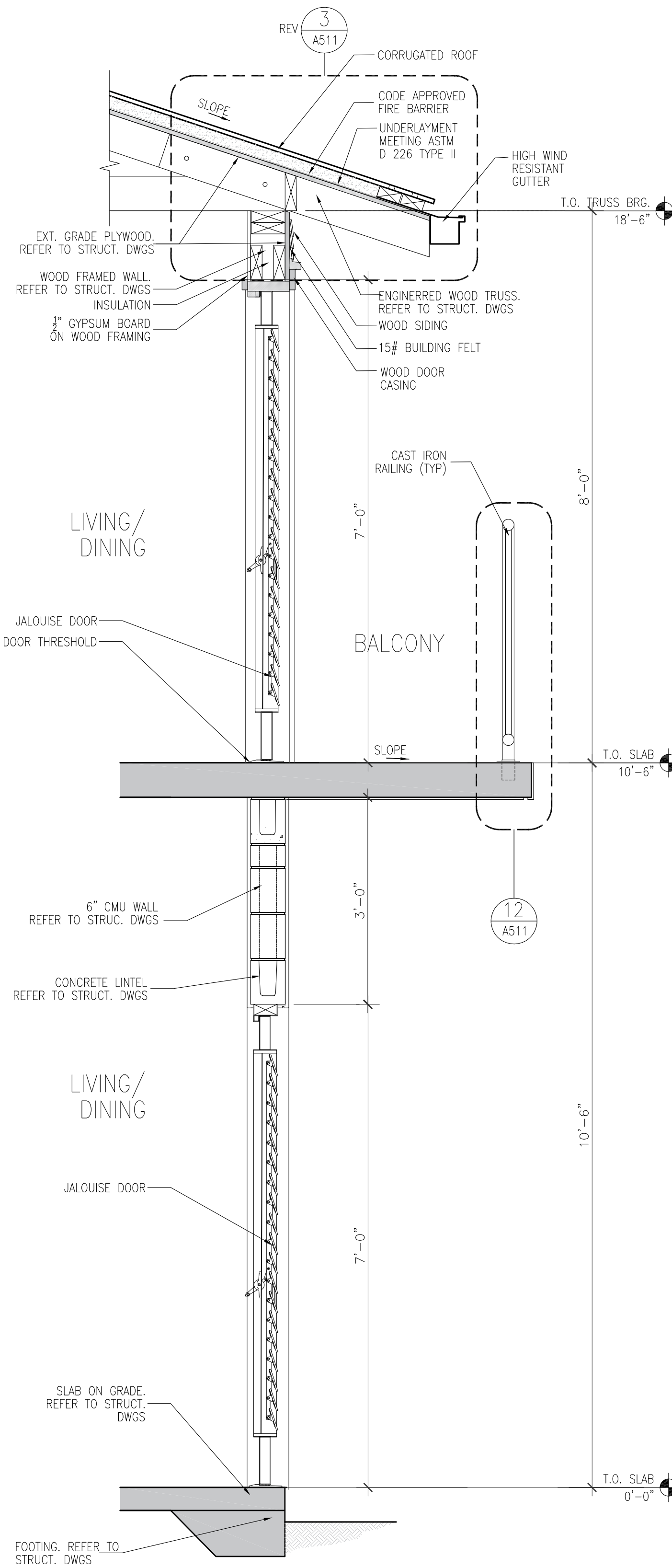
1 WALL SECTION
SCALE: 3/4" = 1'-0"



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



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



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

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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ISSUE LOG

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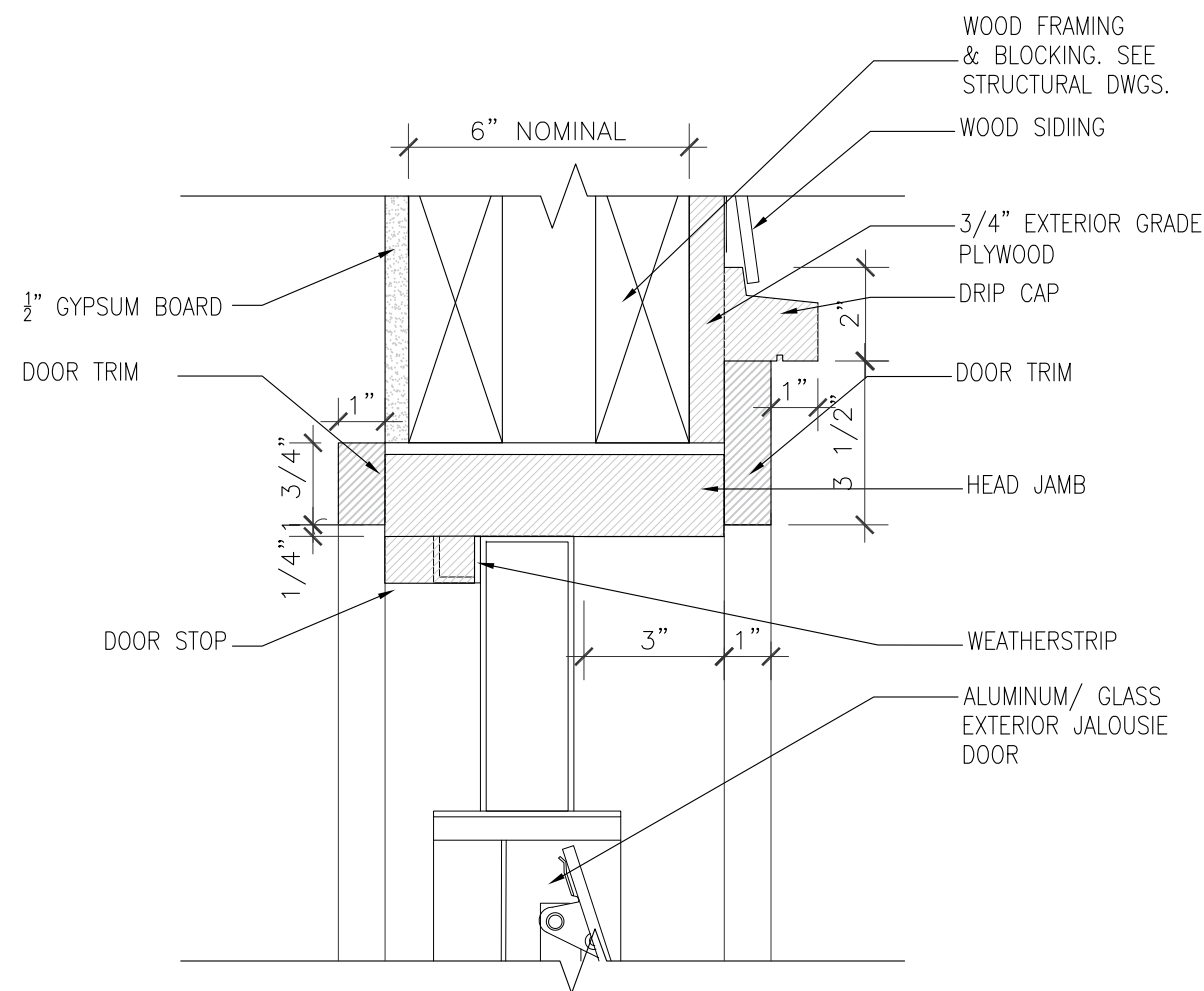
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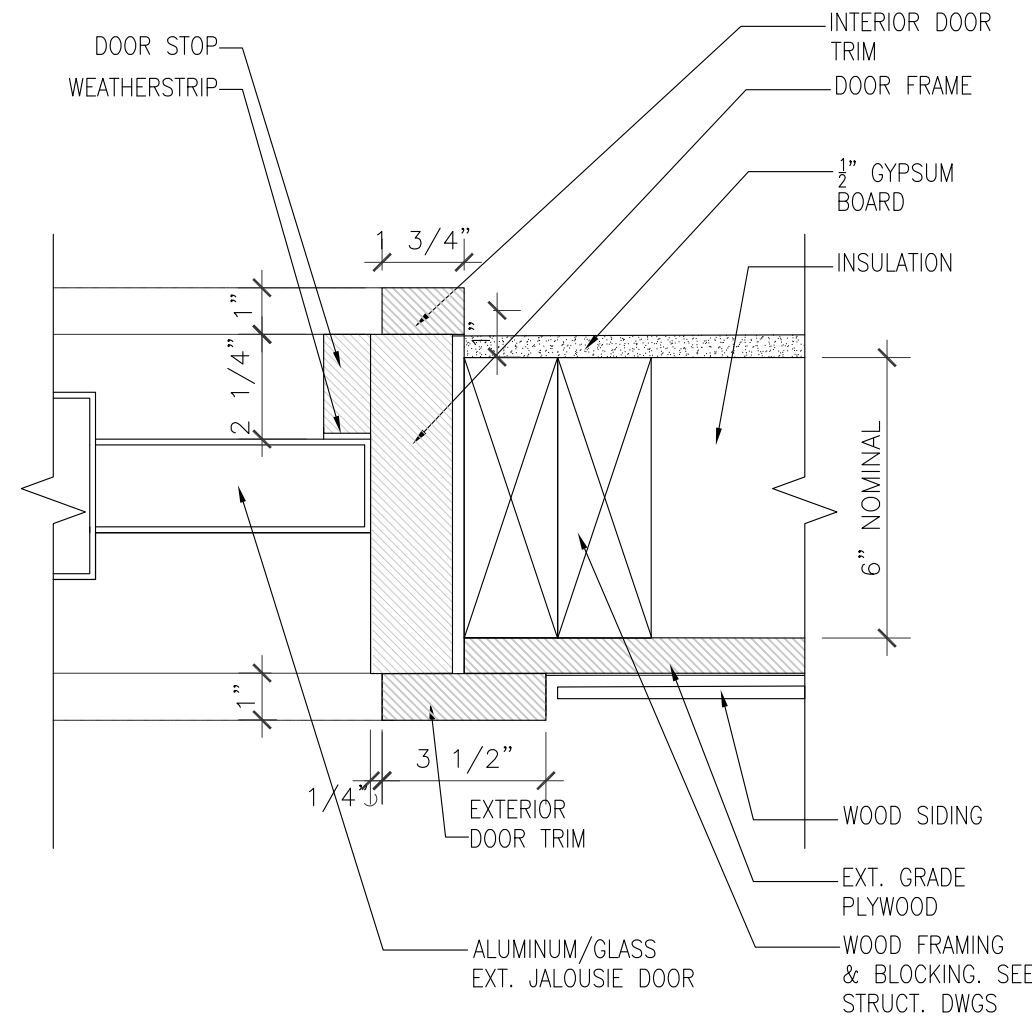
**PROTOTYPE #4
WALL SECTIONS**

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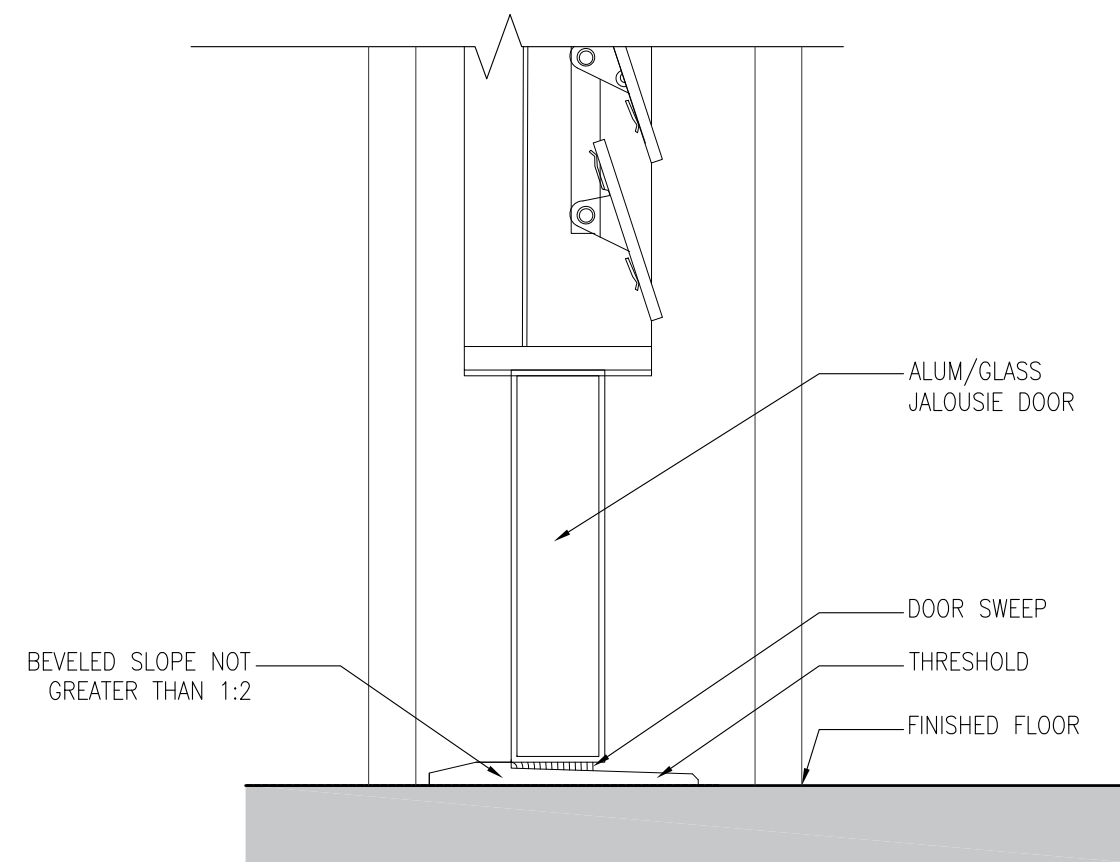
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Checked By:	A-500
QC Review:	
Phase:	



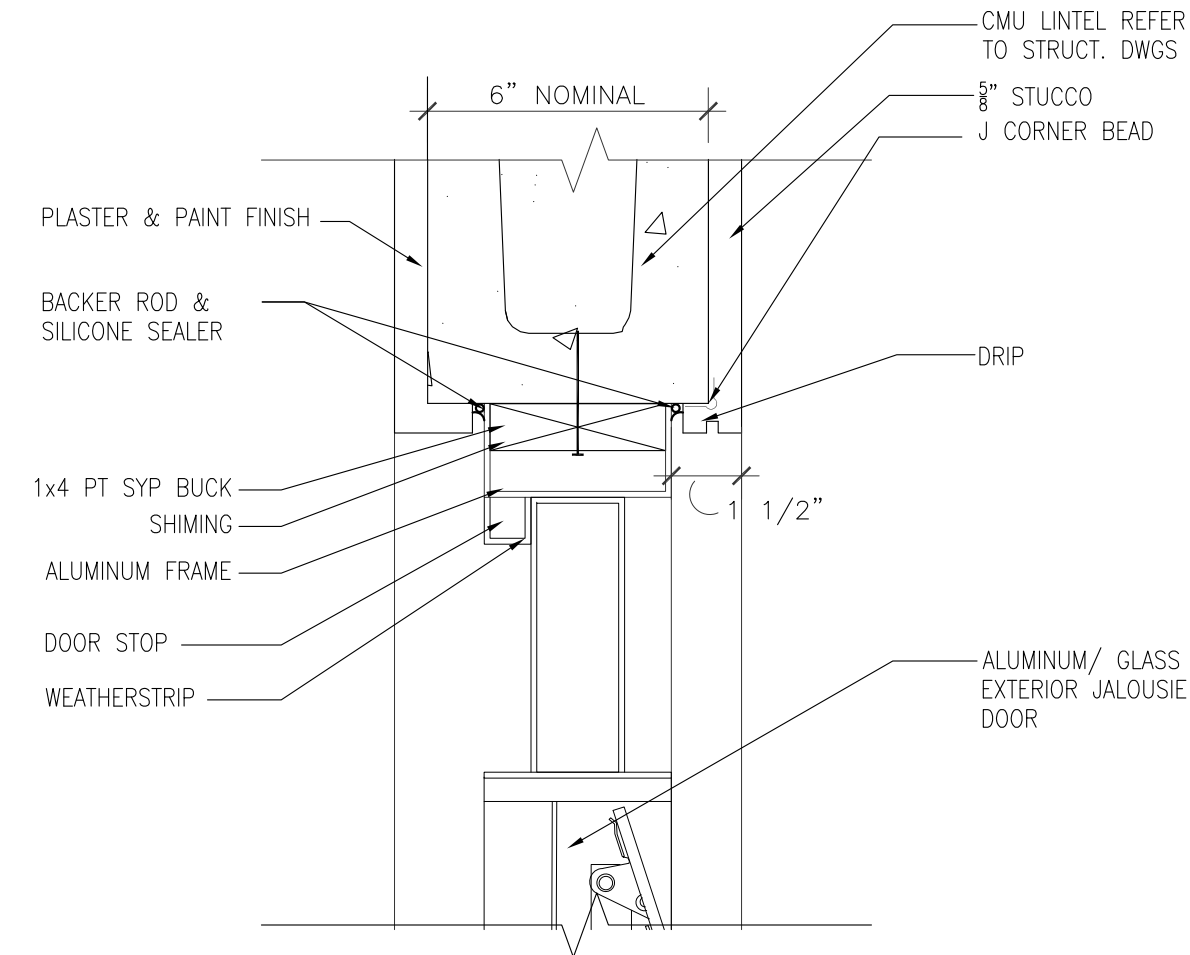
1 SECTION DETAIL-DOOR HEADER-WOOD WALL FRAME
SCALE: 3" = 1'-0"



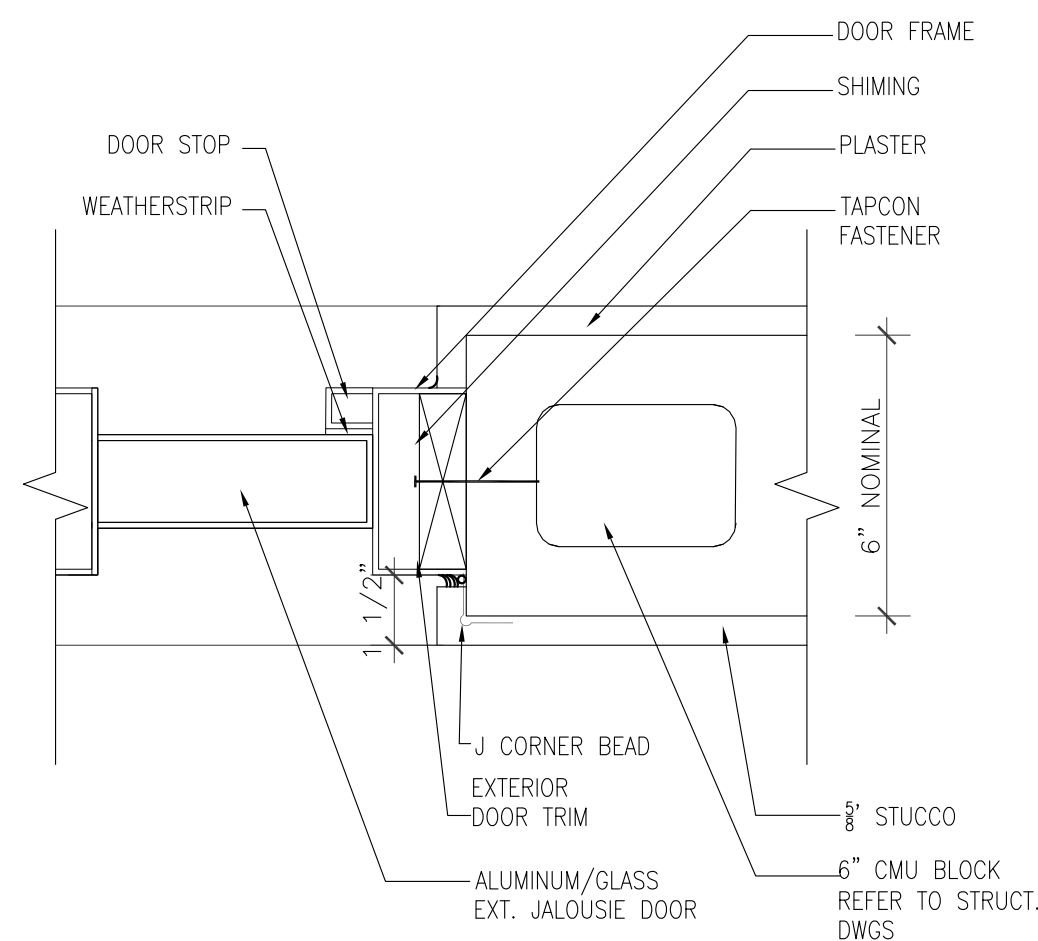
2 SECTION DETAIL-DOOR JAMB- WOOD WALL FRAME
SCALE: 3" = 1'-0"



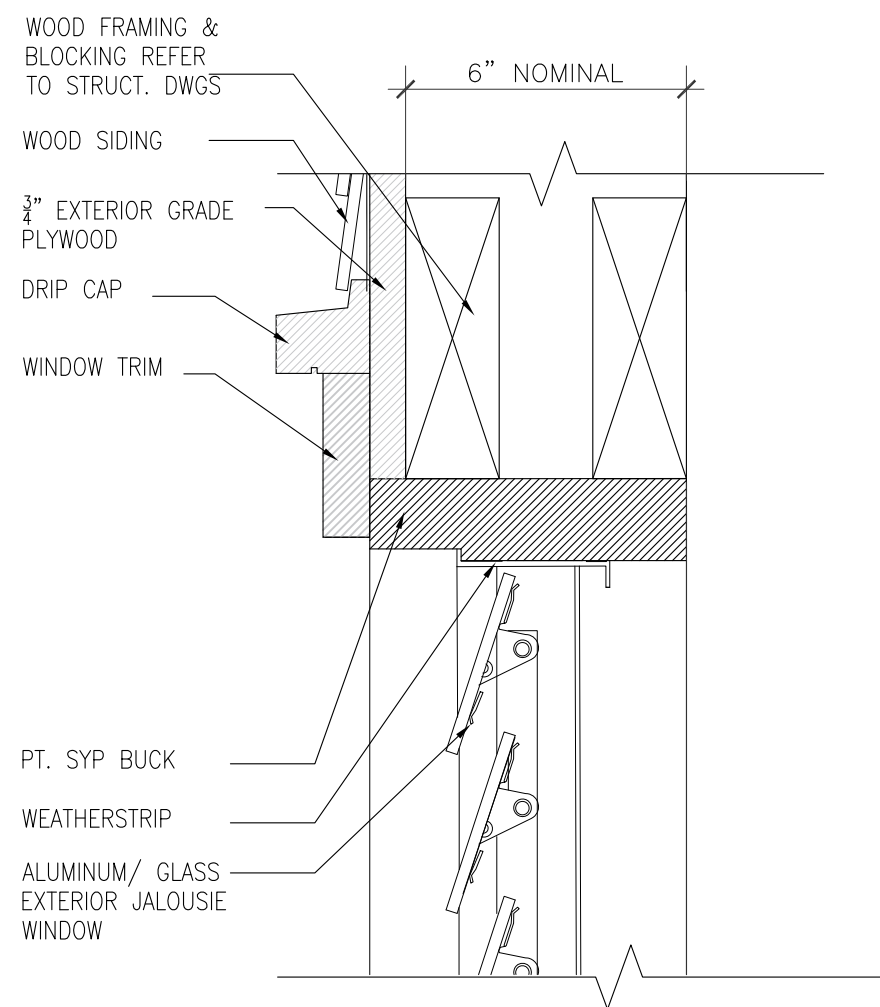
3 SECTION DETAIL-DOOR THRESHOLD -CONC. FLOOR
SCALE: 3" = 1'-0"



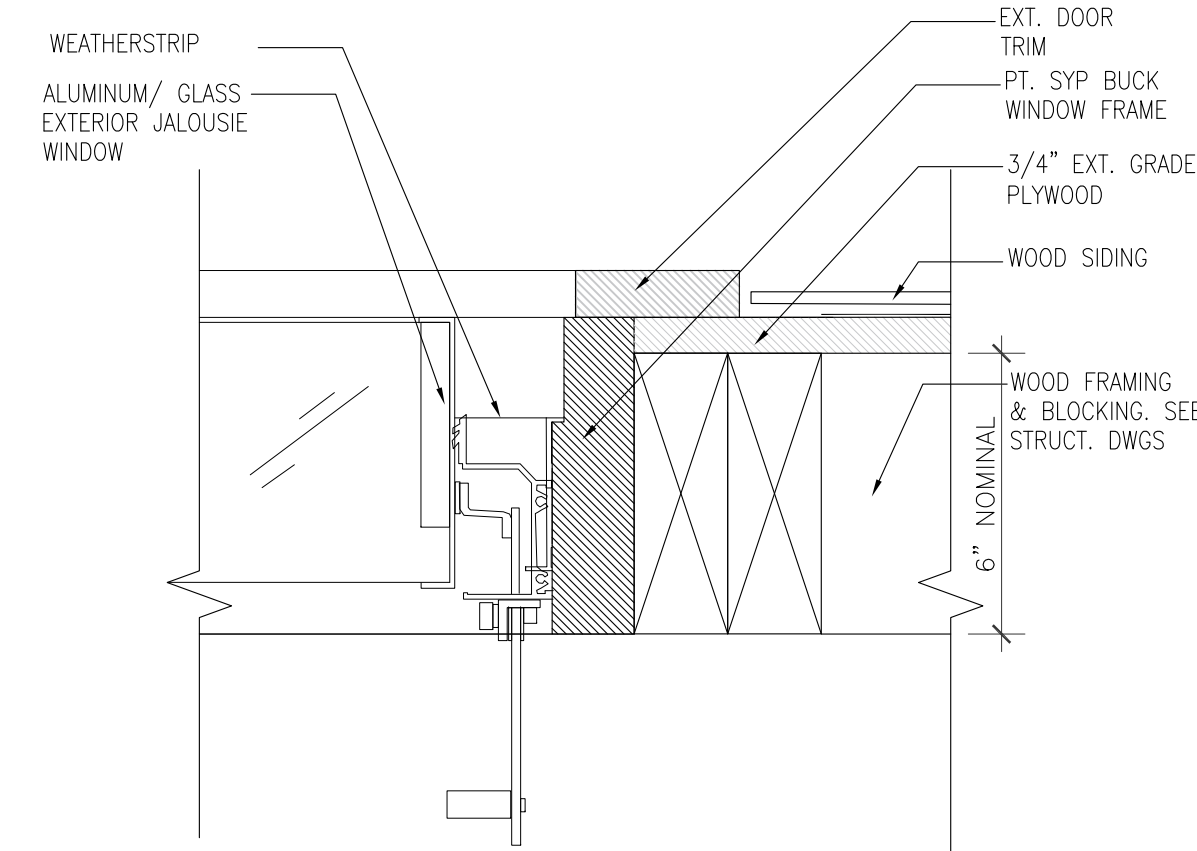
4 SECTION DETAIL-DOOR HEADER- CMU WALL
SCALE: 3" = 1'-0"



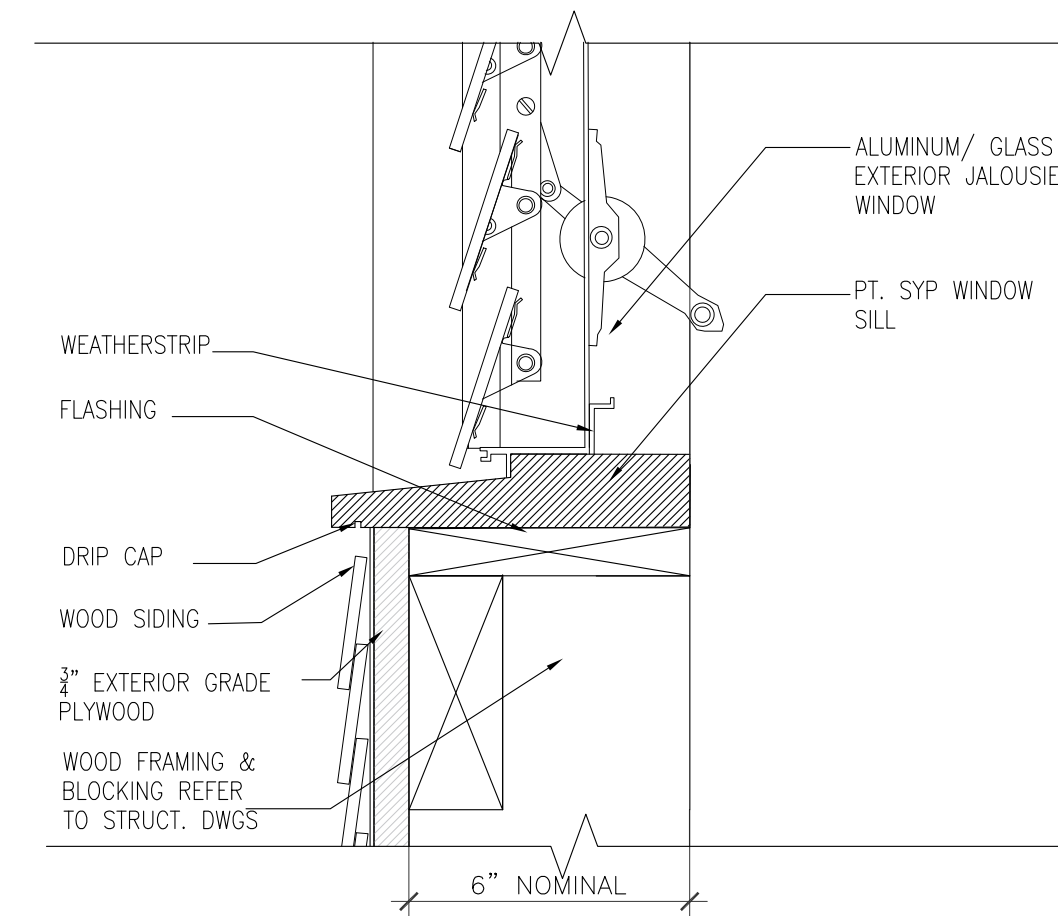
5 SECTION DETAIL-DOOR JAMB- CONC WALL
SCALE: 3" = 1'-0"



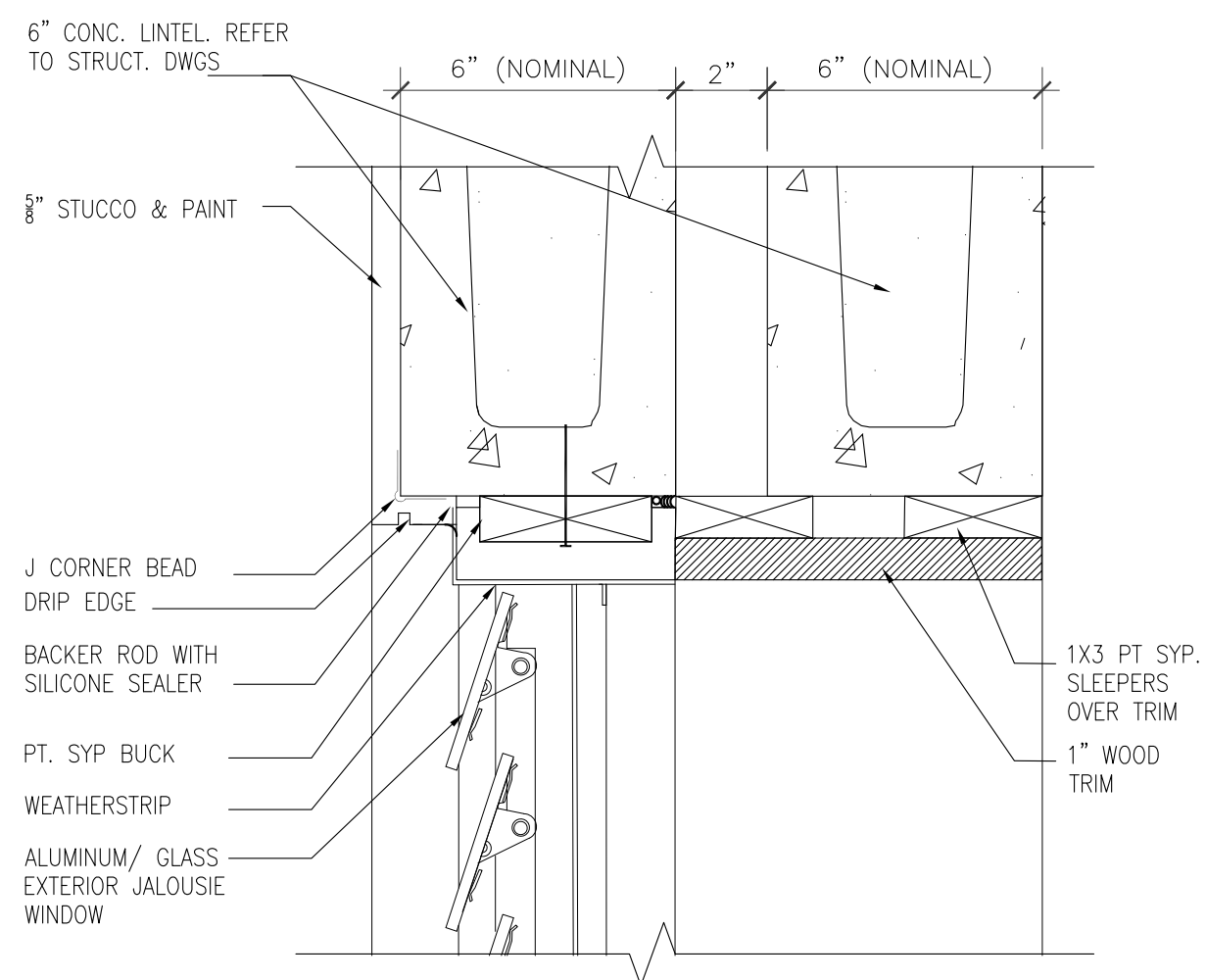
6 SECTION DETAIL-WINDOW HEADER-WOOD WALL FRAME
SCALE: 3" = 1'-0"



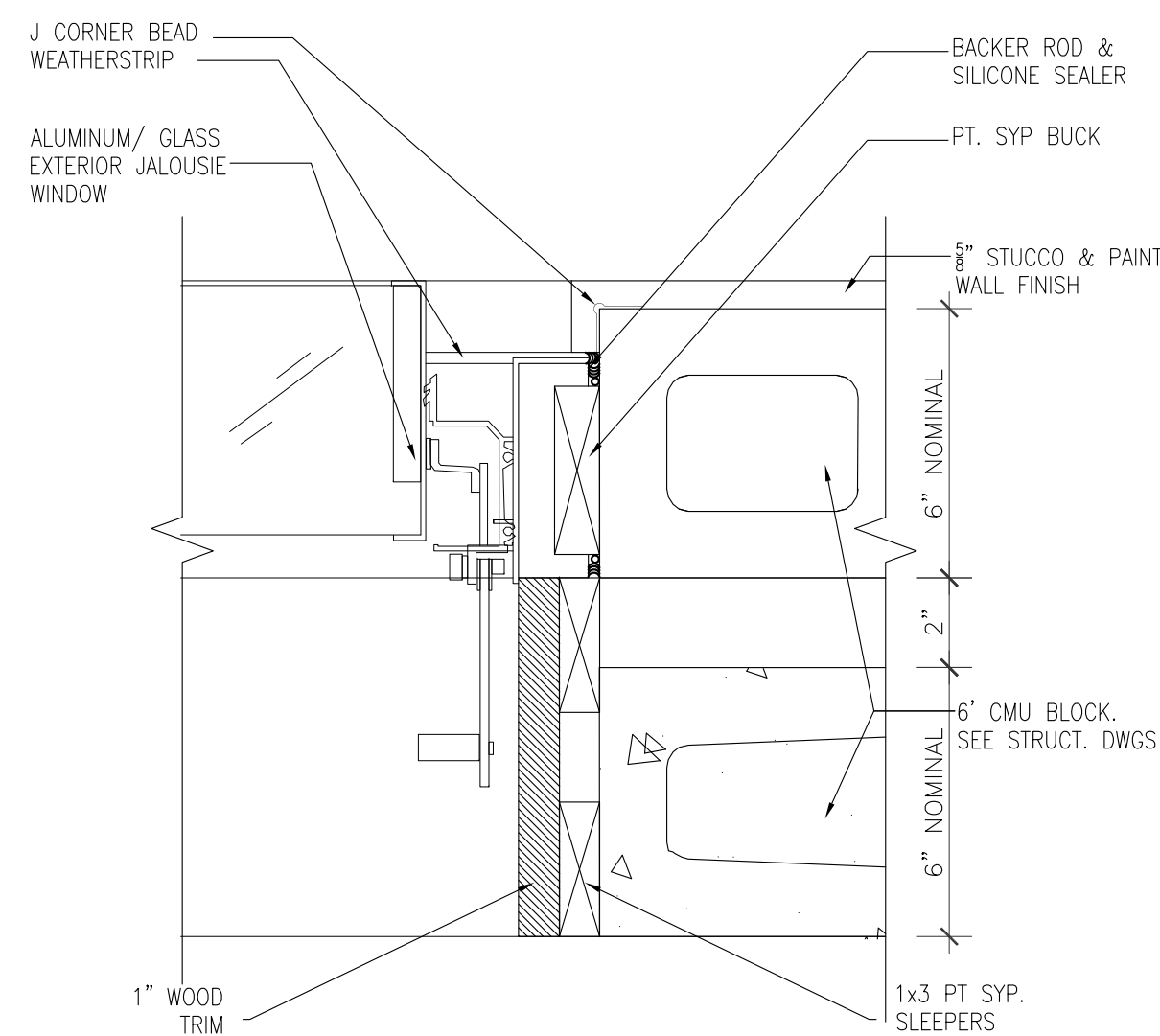
7 SECTION DETAIL-WINDOW JAMB-WOOD WALL FRAME
SCALE: 3" = 1'-0"



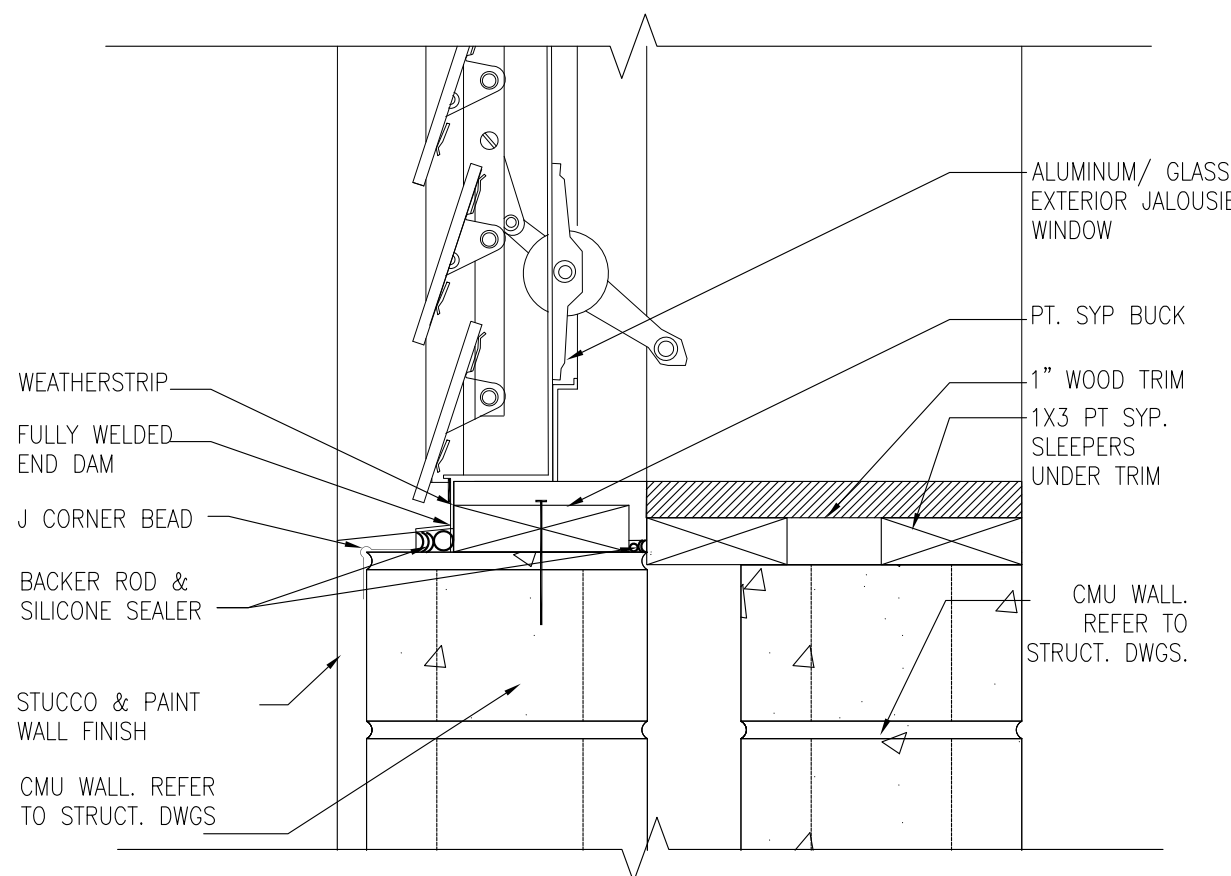
8 SECTION DETAIL-WINDOW SILL-WOOD WALL FRAME
SCALE: 3" = 1'-0"



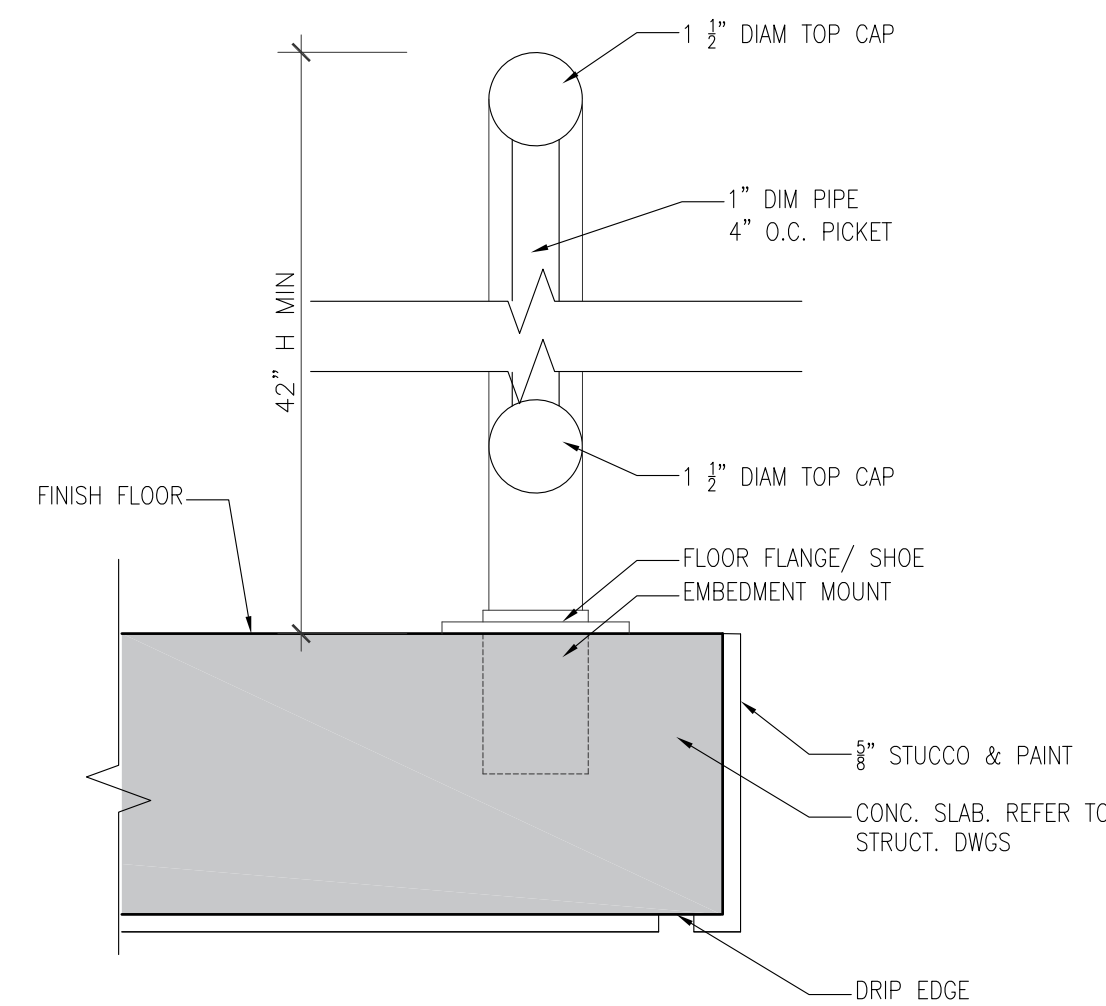
9 SECTION DETAIL-WINDOW HEADER-CONC. WALL
SCALE: 3" = 1'-0"



10 SECTION DETAIL-WINDOW JAMB-CONC. WALL
SCALE: 3" = 1'-0"



11 SECTION DETAIL-WINDOW SILL CONC. WALL
SCALE: 3" = 1'-0"



12 SECTION DETAIL-CAST IRON RAILING
SCALE: 3" = 1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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ISSUE LOG

No.	Date	Description

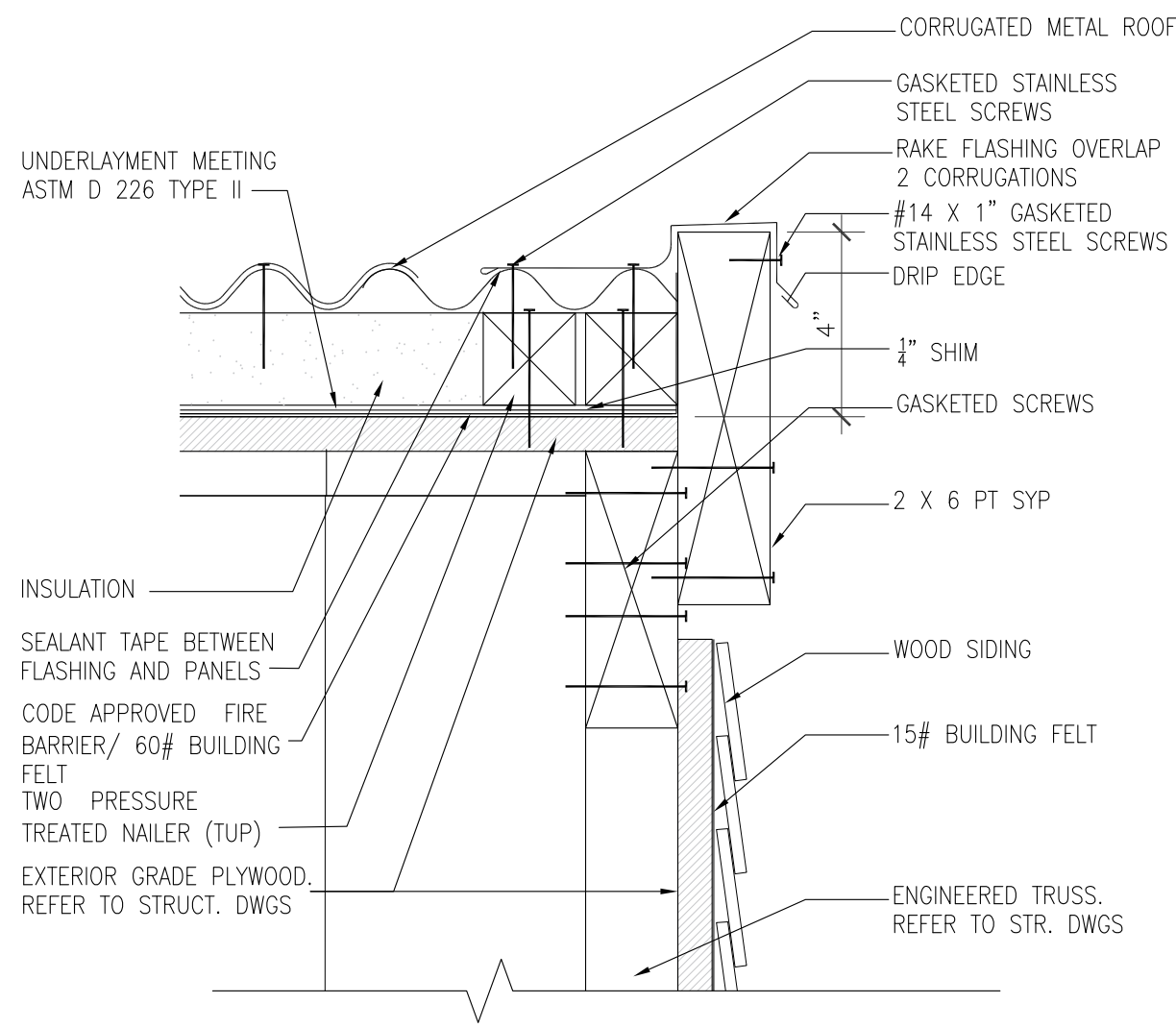
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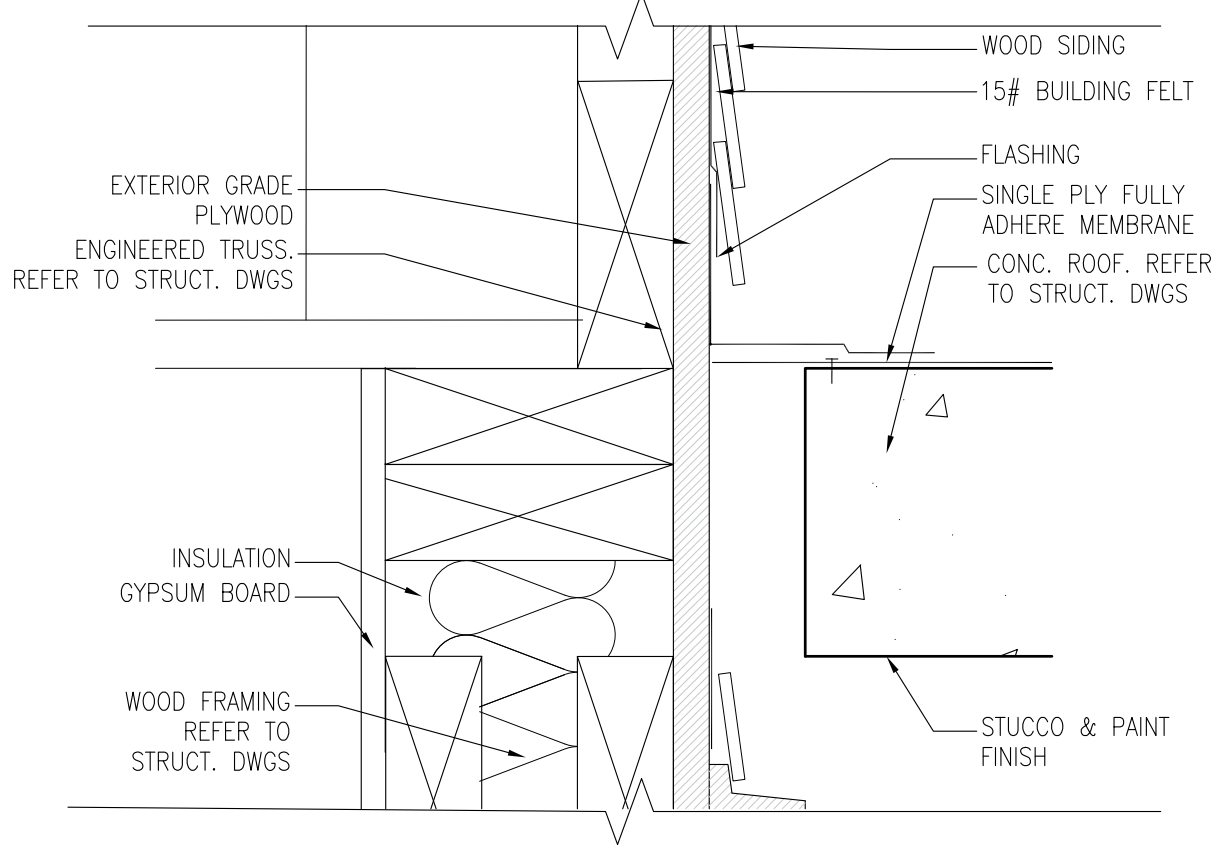
**PROTOTYPE #4-DETAILS
DOORS AND WINDOWS**

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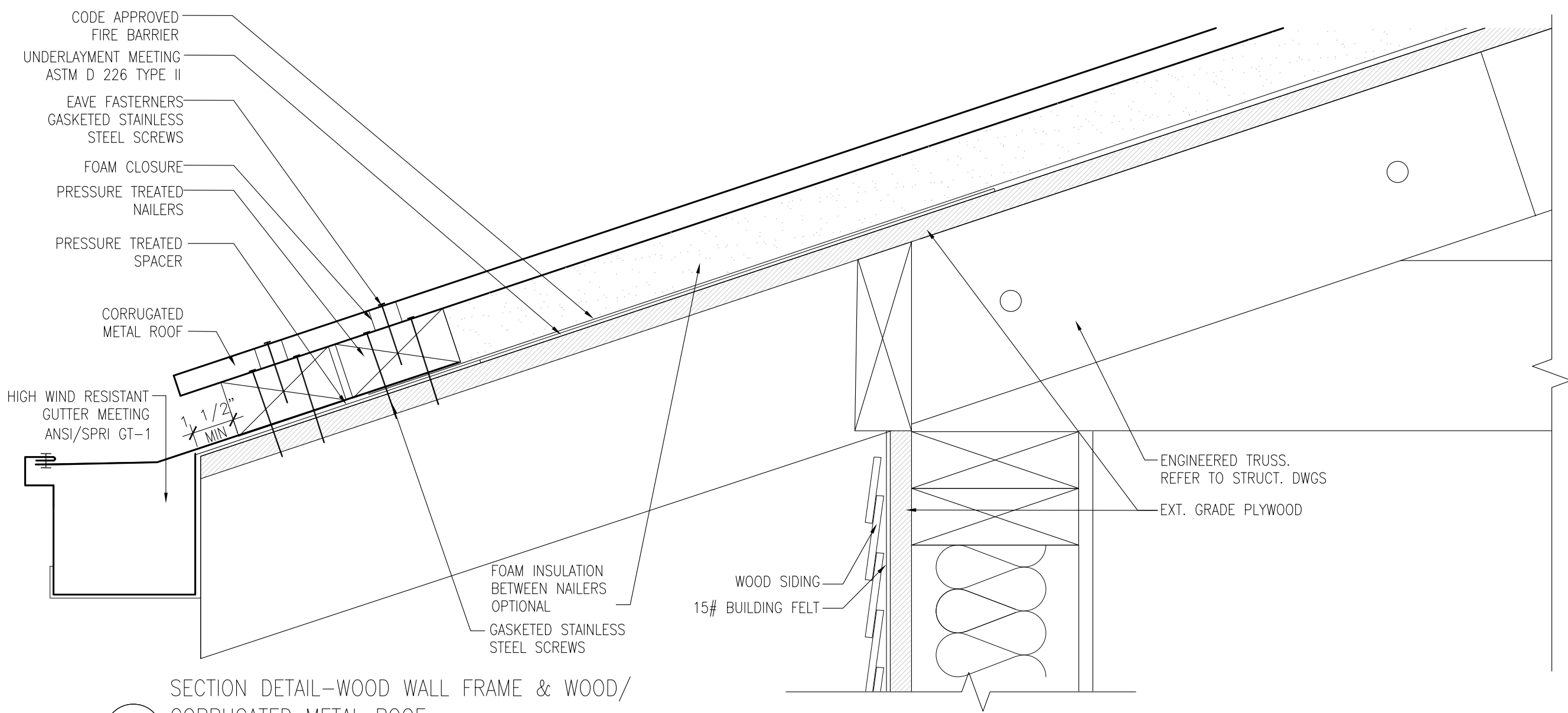
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Checked By:	A-510
QC Review:	
Phase:	



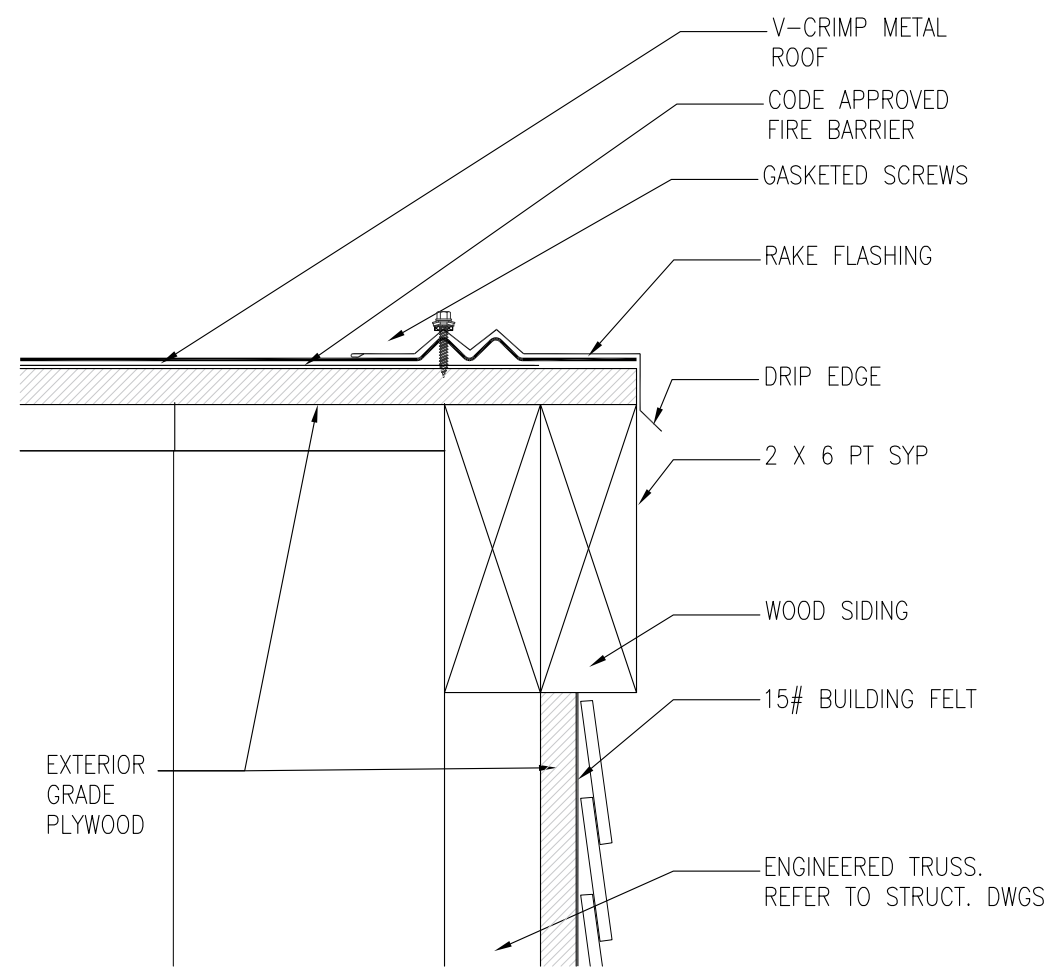
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SCALE: 3" = 1'-0"



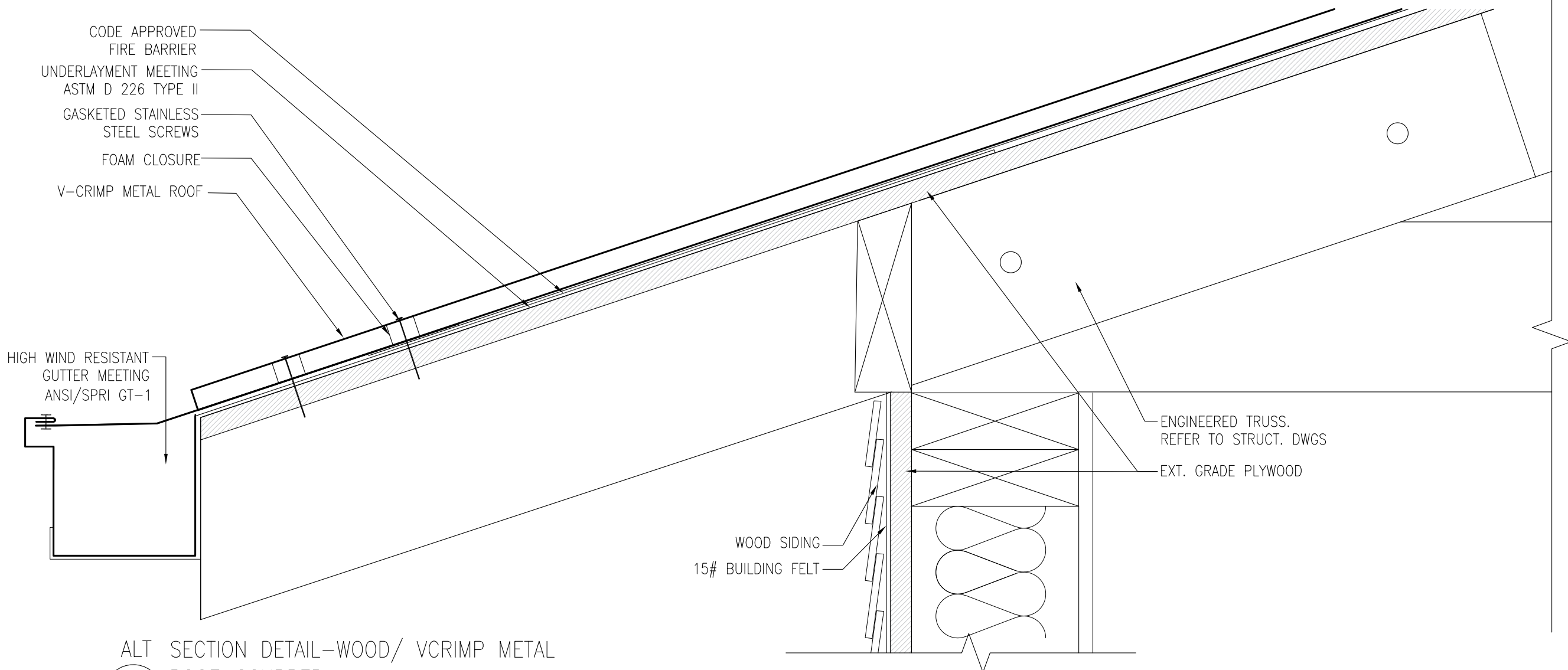
2 SECTION DETAIL—WOOD WALL / CONC. ROOF JOINT
SCALE: 3" = 1'-0"



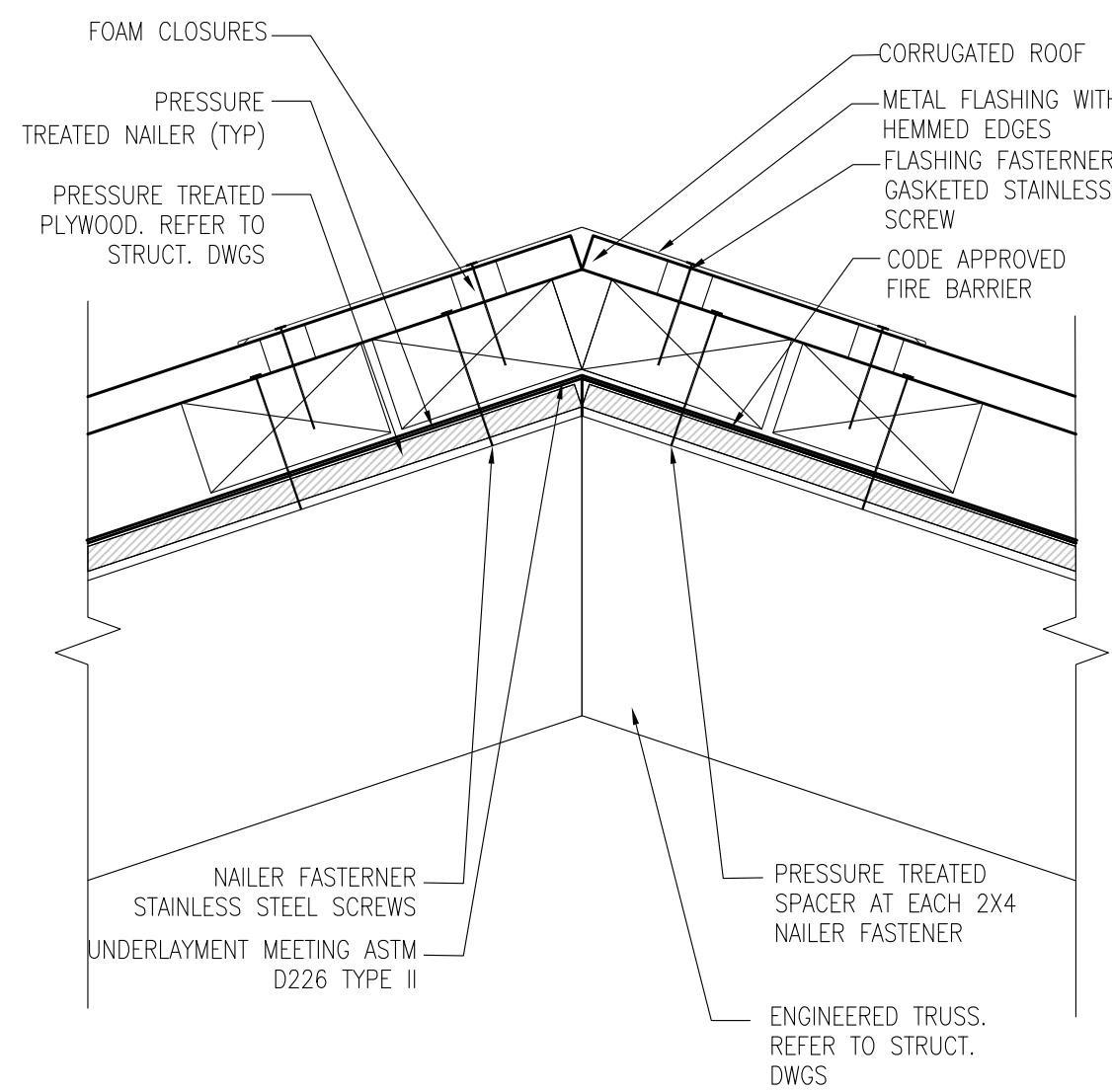
3 SECTION DETAIL—WOOD WALL FRAME & WOOD/ CORRUGATED METAL ROOF
SCALE: 3" = 1'-0"



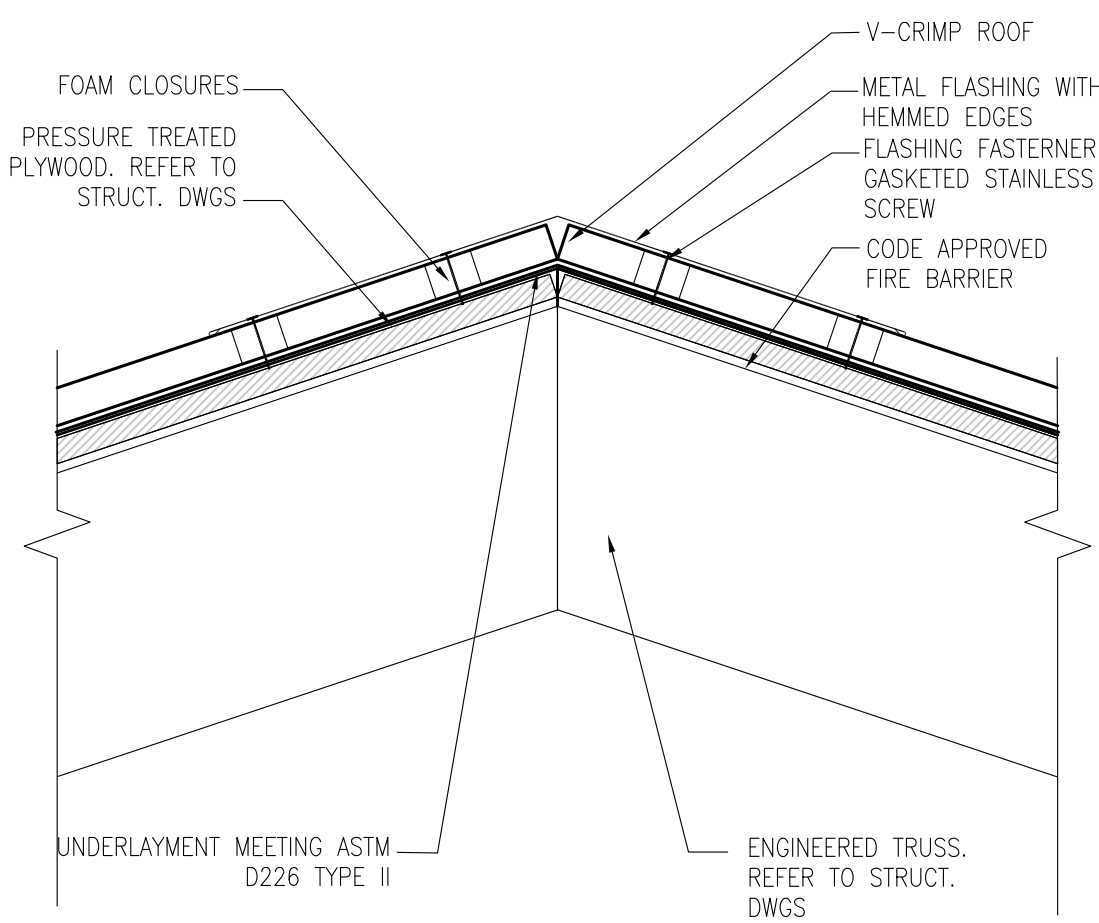
ALT 1 SECTION DETAIL—RAKE—WOOD/ V-CRIMP METAL ROOF
SCALE: 3" = 1'-0"



ALT 3 SECTION DETAIL—WOOD/ VCRIMP METAL ROOF—SCUPPER
SCALE: 3" = 1'-0"



4 SECTION DETAIL AT ROOF RIDGE—CORRUGATED METAL ROOF
SCALE: 3" = 1'-0"



ALT 4 SECTION DETAIL AT ROOF RIDGE—V-CRIMP METAL ROOF
SCALE: 3" = 1'-0"

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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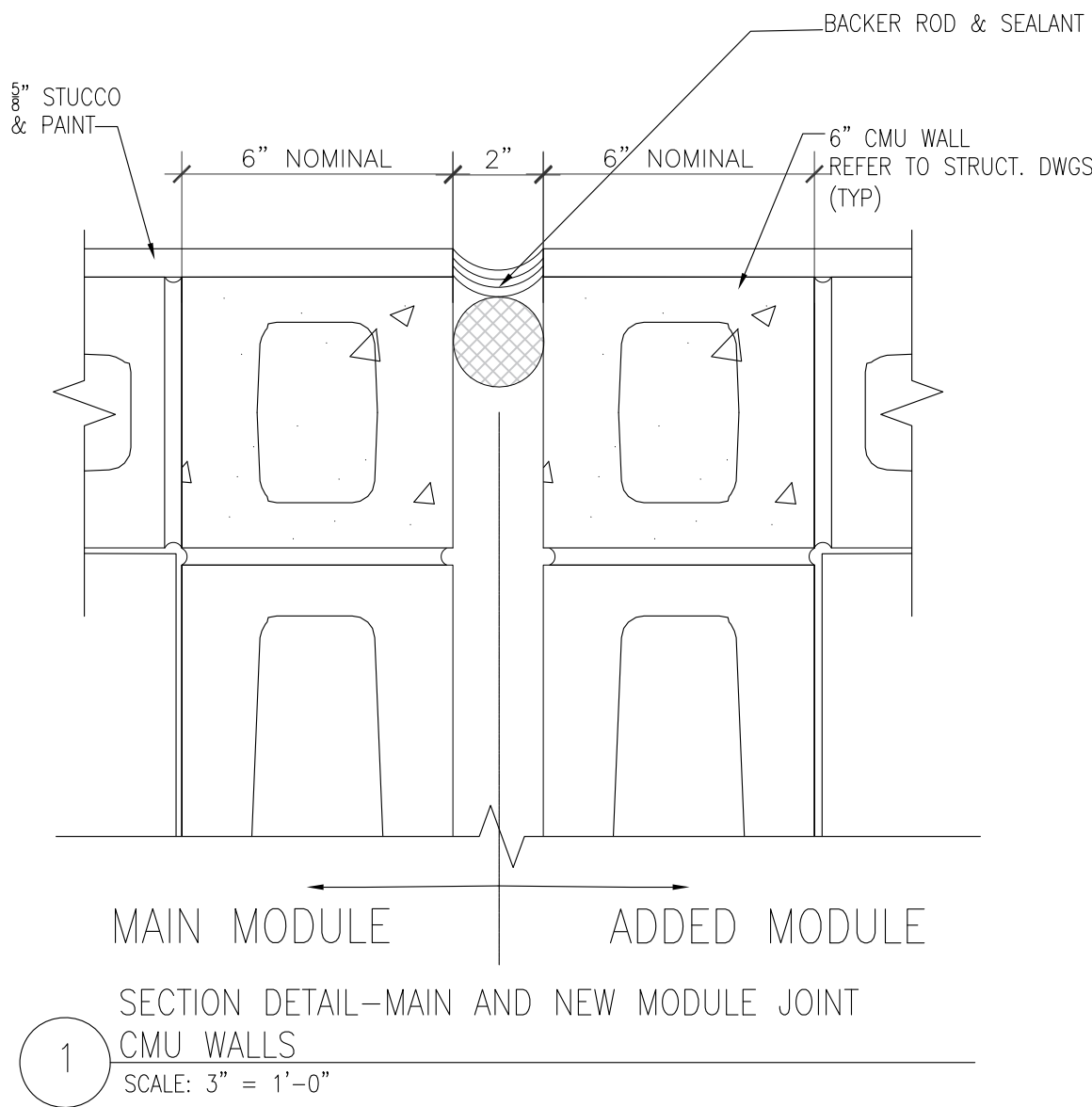
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PROTOTYPE #4 ROOF DETAILS

SHEET INFORMATION:

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



CONSULTANT:

CLIENT:

PROJECT NAME:

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No.	Date	Description

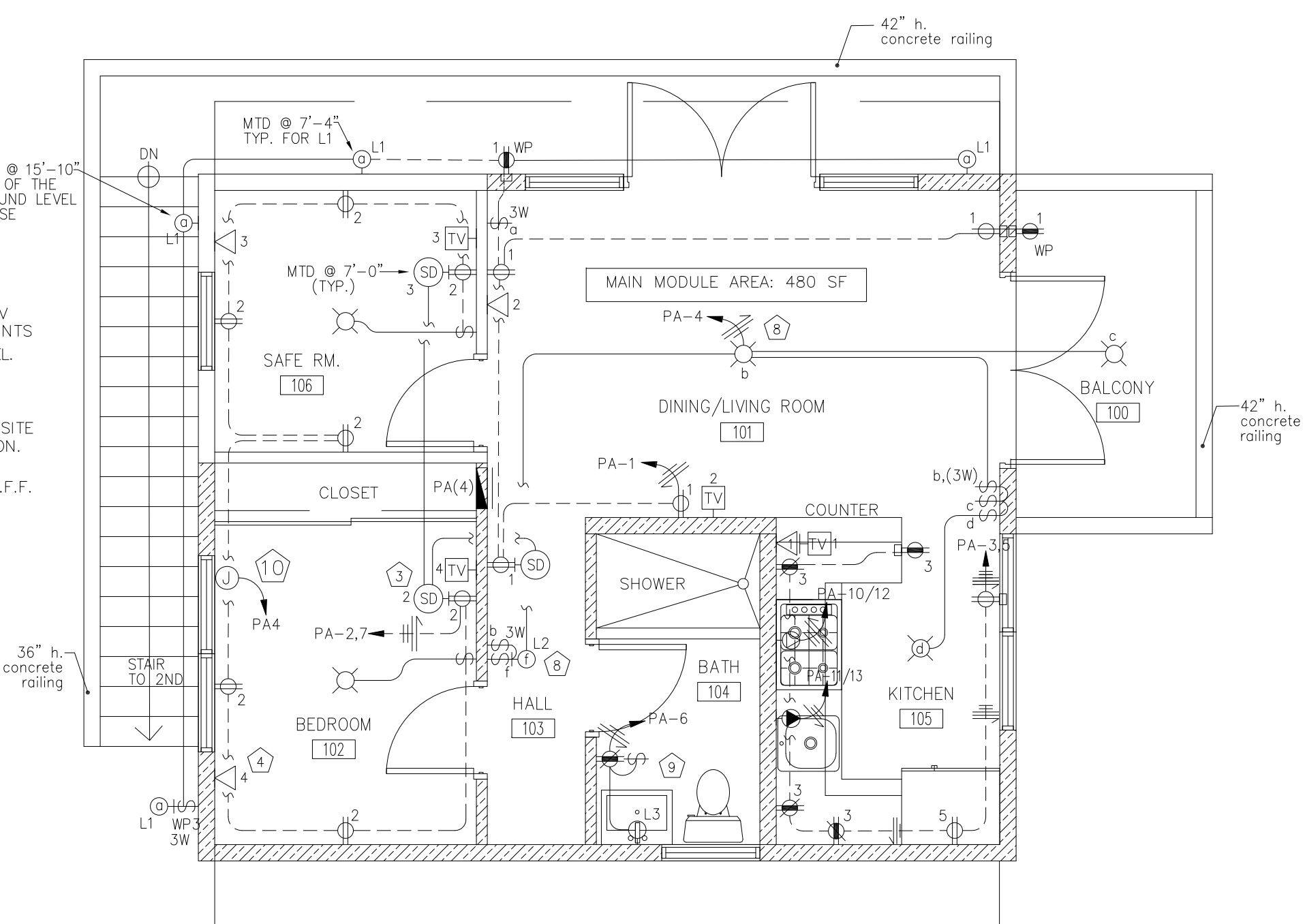
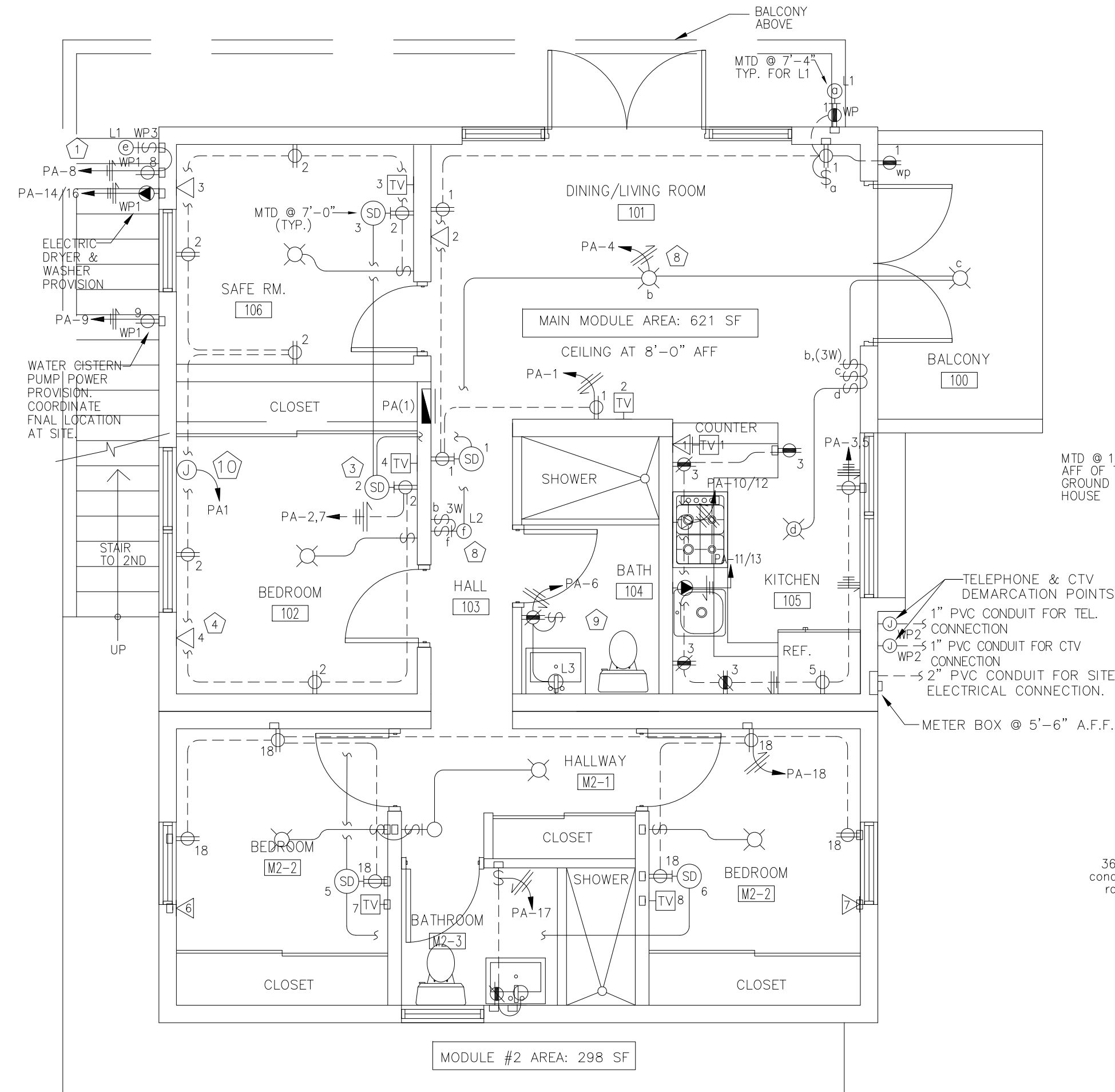
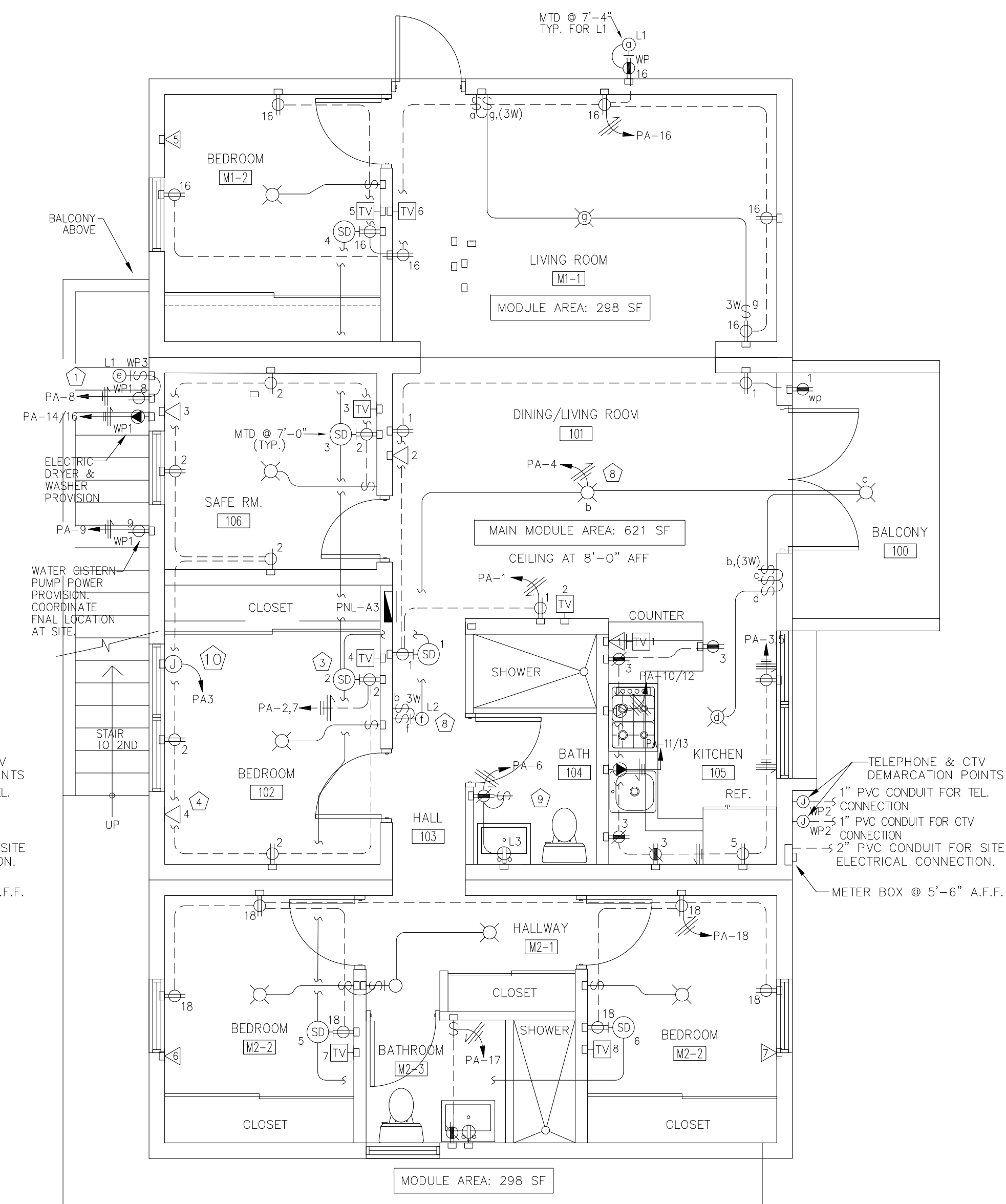
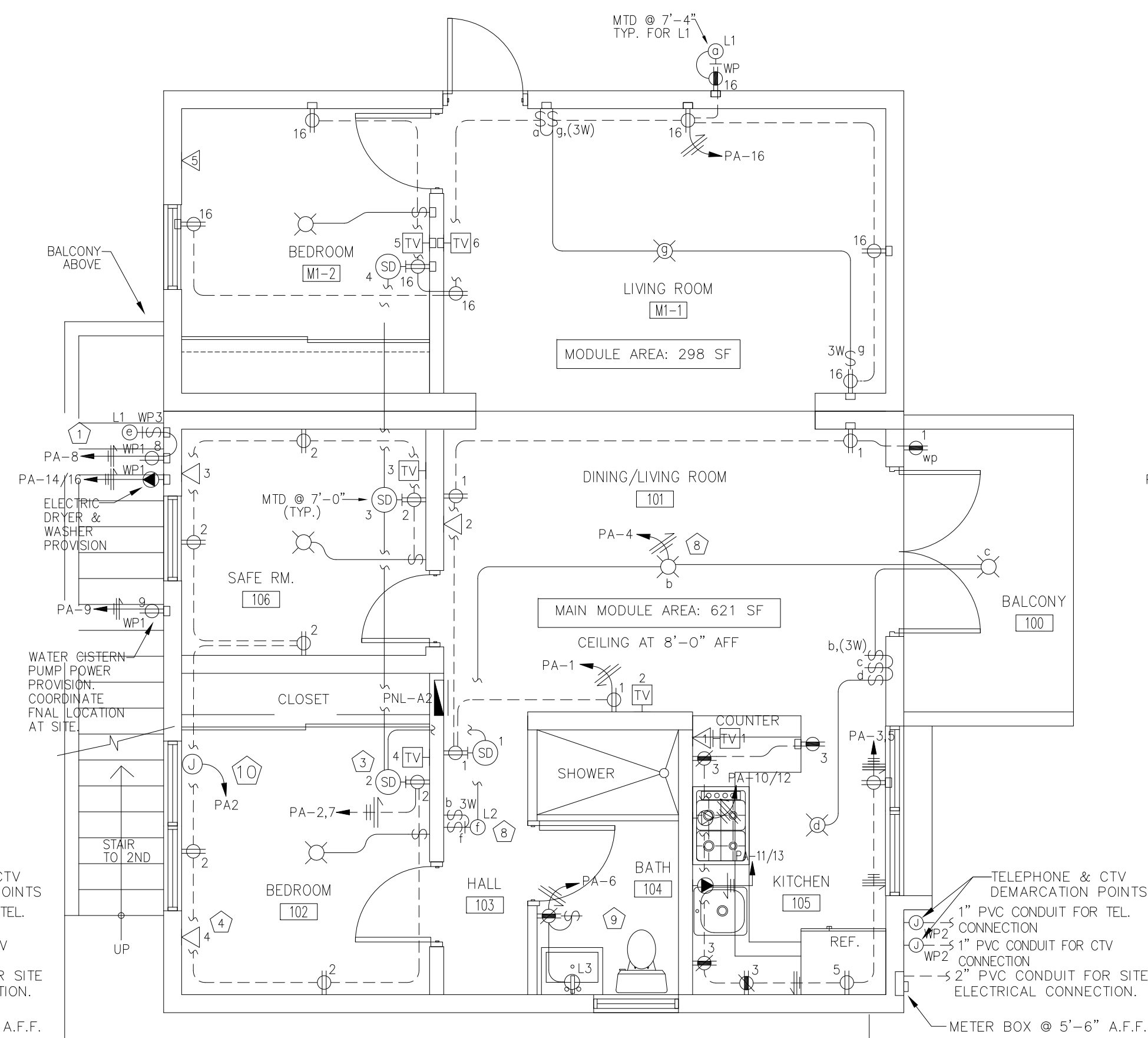
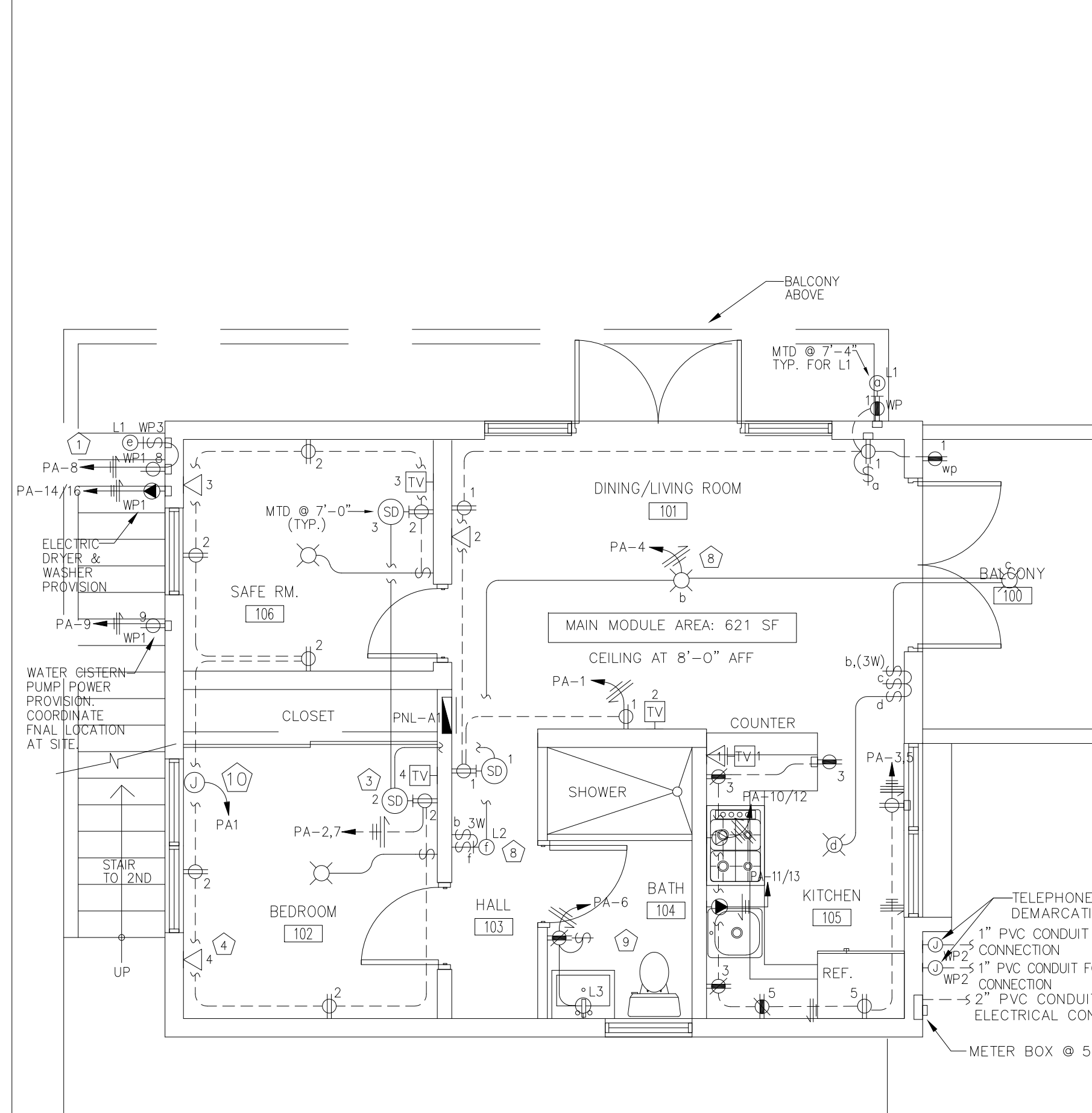
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

PROTOTYPE #4 MODULES JOINT DETAILS

SHEET INFORMATION:

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



LEGEND:

- CONCRETE
 STRUCTURAL WALLS (CMU)
 STRUCTURAL WOOD WALL

NOTE: FOR STRUCTURE DESIGN SEE
STRUCTURAL PLANS

NOTES:

- ① WASHER AND DRYER AREA RECEPTACLES LOCATED @ 48" A.F.F. (COORDINATE FINAL LOCATION WITH FIELD ENGINEER.)
- ② NOT USED
- ③ ALL DETECTORS MUST BE CONNECTED BETWEEN EACH OTHER FOR PARALLEL ACTIVATION.
- ④ COORDINATE WITH ARCHITECT OR FIELD ENGINEER THE FINAL LOCATION FOR ALL TELEPHONE AND CCTV 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 HOLDS WITH 26 WATTS FLUORESCENT BULBS OR LED EQUIVALENTS.
- ⑨ INTERLOCK FAN WITH BATHROOM LIGHTING SWITCH. COORDINATED WITH MECHANICAL DWS.
- ⑩ 4"x4" JUNCTION BOX FOR A/C UNIT DECEALED RECEPTACLE. INSTALL EMPTY CONDUIT UP TO PANEL BOARD P.A. RECEPTACLE, WIRING AND BREAKER (N.I.C.).

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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[illegible]

ISSUE LOG

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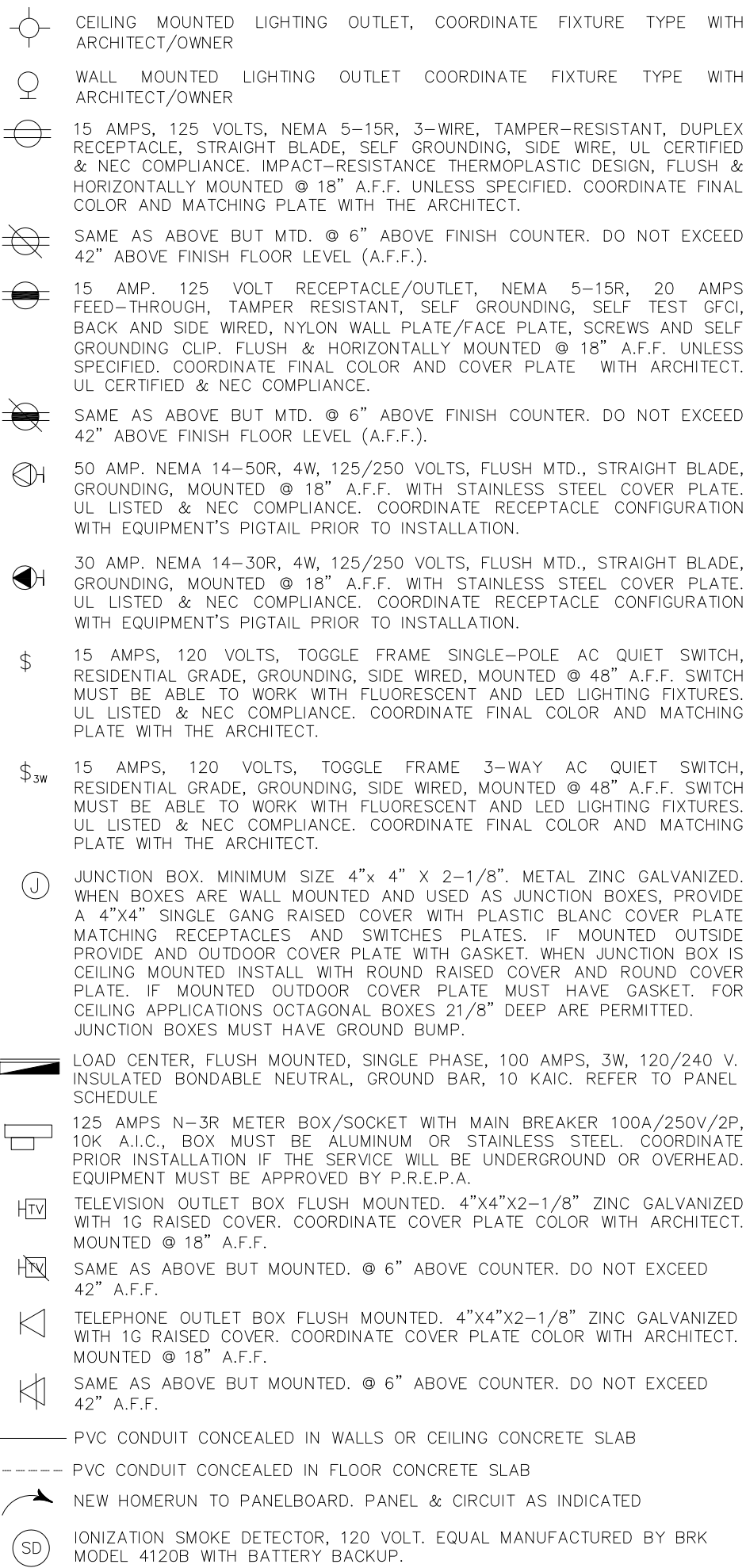
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**PROTOTYPE #4 SCHEMATIC - TWO
STORY, CONC. & WOOD STRUCTURE &
WOOD GABLE ROOF**

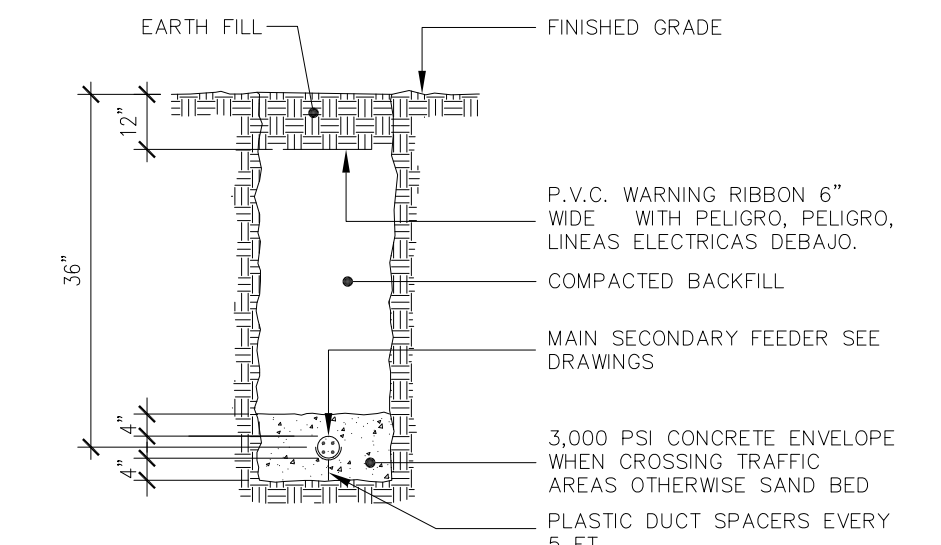
SHEET INFORMATION:

JOB No.	Date Issued: 05/08/2020
Drawn By:	Sheet Number: <div style="font-size: 2em; font-weight: bold; text-align: center;">E-400</div>
Checked By:	
QC Review:	
Phase:	

NOT FOR CONSTRUCTION



- 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 MATERIALS TO BE MATCHED WITH OTHER TRADE.
- 6- ELECTRICAL CONTRACTOR MUST BALANCE ALL ELECTRICAL LOADS.
- 7- PROVIDE TYPEWRITTEN IDENTIFICATION CARDS FOR ALL BRANCH CIRCUITS INSIDE THE PANELBOARDS.



NOT TO SCALE

- 1- IN THE CASE OF CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL NOT PROCEED WITH THAT PART OF THE WORK UNTIL THE DISCREPANCY HAS BEEN BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
- 2- IN THE 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 DO SO, HE WILL BE RESPONSIBLE FOR ANY SUCH CLARIFICATION. HE WILL BE HELD RESPONSIBLE FOR THE RESULT OF SUCH ERRORS OR OMISSIONS, AND HE WILL BE HELD RESPONSIBLE FOR THE CONSEQUENCES OF ANY SUCH CLARIFICATIONS.
- 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 BROUGHT TO THE ATTENTION OF 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 IT NECESSARY, HE WILL PROVIDE ADDITIONAL DETAILS.
- 5- ANY SET OF ELECTRICAL DRAWINGS WHICH IS MISSING AT LEAST ONE OF THE PAGES OF SET IS AUTOMATICALLY VOID. THIS INFORMATION WAS DEVELOPED TO BE USED OR IN CONNECTION WITH THIS PROJECT ONLY. HOWEVER, CONTRACTOR PROTECTS ITSELF BY NOT REPRODUCING OR REPRODUCING ANY AUTHORIZED PERSONS AND CANNOT BE REPRODUCED IN ANY MANNER. 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. CONTRACTOR SHALL NOT REPRODUCE OR REPRODUCE ANY OF THE MATTER OR THE ONE FOR WHICH THEY WERE EXPRESSLY DESIGN. IF THEY, OR ANY PART THEREOF IS REPRODUCED WITHOUT THE WRITTEN CONSENT OF THE ENGINEER, CONTRACTOR SHALL BE HELD RESPONSIBLE FOR 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 DOCUMENTS MUST BE RETURNED TO THE ENGINEER WITH SEAL OF THE ENGINEER WITH P.R.E.P.'S ENDORSEMENT AND THE ENGINEER'S SIGNATURE.
- 9- CONTRACTOR SHALL MAKE PROVISIONS TO ORDER ALL ELECTRICAL MATERIALS AND EQUIPMENT SPECIFIC HEREON. 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 EQUIPMENT TO THE ENGINEER FOR APPROVAL. THE SPECIFIC MATERIALS AND SHOP DRAWINGS WHEN SO REQUESTED IN THE DRAWINGS OR SPECIFICATIONS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- 12- BOLT HEADS, SCREWS AND NUTS EXCEPT IF OTHERWISE SPECIFIED SHALL BE GALVANIZED STEEL.

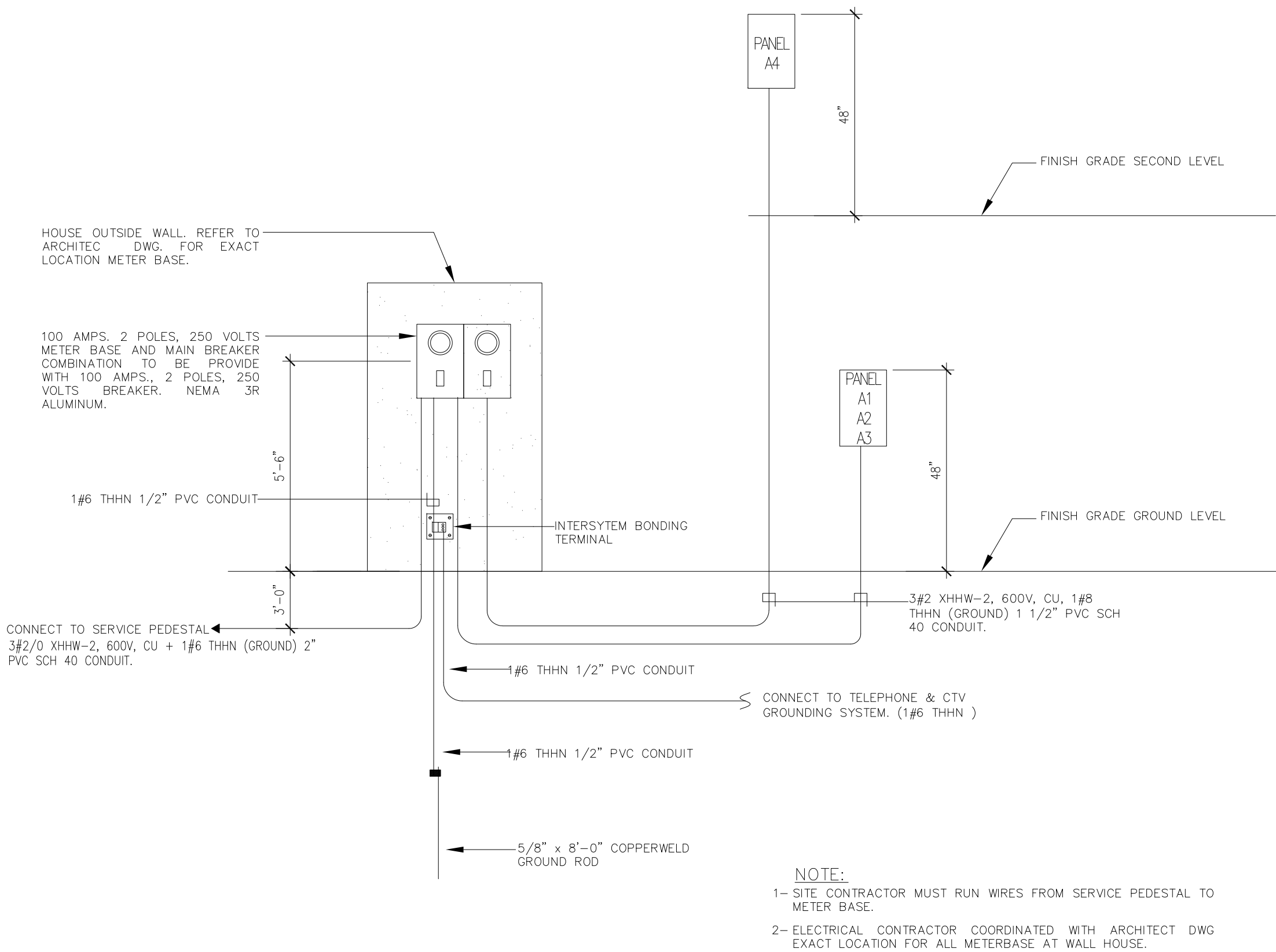
- 1- PVC CONDUIT SHALL BE USED EXCEPT WHERE NOT ALLOWED BY N.E.C. OR
UNLESS OTHERWISE SPECIFIED. 1/2" IPS MINIMUM SIZE AS ALLOWED BY
THE NATIONAL ELECTRICAL CODE. IF ELECTRICAL CONDUIT USING NON
MILITARY WINDING (ENT) FLEXIBLE CONDUIT IS USED 3/4" IPS IS THE
MINIMUM ALLOWED.
- 2- THIN WIRE SHALL BE USED UNLESS OTHERWISE INDICATED. #12 AWG. MIN.
GAUGE ALLOWED
- 3- WRING 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.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 REVISIONS BY THE
ELECTRICIAN TO ACCORDANCE TO ACTUAL BENDING 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 PROJECT/PRIOR TO THEIR BID.
- 9- MINIMUM SIZE FOR ALL BOXES IS 4" x 4" x 2-3/8". NO 2"x4" BOXES ARE
ALLOWED.
- 10- ALL CONDUITS SHALL HAVE A MINIMUM OF 2" HOT (#2 HOT & NEUTRAL) & #12
GROUND CONDUIT UNLESS OTHERWISE NOTED. FOR EXAMPLE,
CONDUITS SHOWN AS FOLLOW: #12 (HOT), #12 (NEUTRAL) & #12 (GND)
OR #12 (HOT), #12 (GND), #12 (NEUTRAL) & #12 (GROUND)
- 11- THE ELECTRICAL SYSTEM SHALL HAVE GROUND CONTINUITY. NO JUMPER
WILL BE ALLOWED.

- RCM RIGID GALVANIZED CONDUIT
EXT ELECTRICAL METALLIC CONDUIT
VOS UNLESS OTHERWISE SPECIFIED
AFF ABOVE FINISHED FLOOR
ACT ABOVE COUNTER TOP
TEL TELEPHONE
N/C NOT IN CONTRACT OR NOT INCLUDED
GF DENOTES GROUND FAULT RECEPTACLE.
WP DENOTES HORIZONTAL SINGLE GANG GFI
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 WITH UL LISTED, 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
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

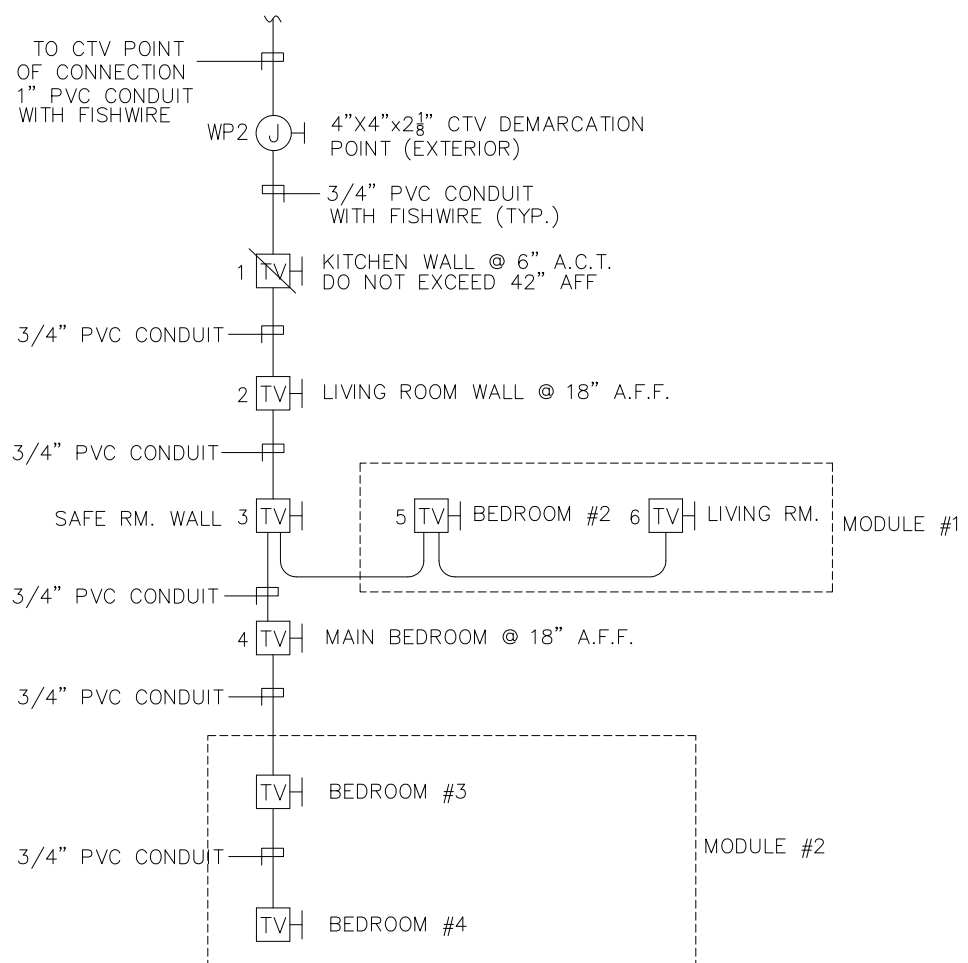
P A N E L B O A R D S C H E D U L E					
DESIGNATION TYPE	DESCRIPTION	BREAKERS			REMARKS
		CKT. No.	POLES	TRIP (AMPS)	
PANEL "PA1" PANEL "PA4"	100 AMPS LOAD CENTER 1Ø, 3W, GROUND BUS, FLUSH MOUNTED NEMA 1 ENCLOSURE 120/240 VAC 10,000 AMP I.C. CAPACITY MIN., 100/2P MAIN BREAKER 24 SINGLE SPACE ~ 2/4 POLE SIMILAR TO OUTLET-HAMMER TYPE GH		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
* - COMBINATION ARC-FAULT BREAKER (AFO)		10/12	2	50	RANGE (3#6, 1#10) 1"
		11/13	2	30	WATER HEATER (4#10) 3/4"
		14/16	2	30	DRYER (4#10) 3/4"
		15			SPACE
		16-24			SPACE
*** DUAL FUNCTION CIRCUIT BREAKER (CAF+GFI)					

P A N E L B O A R D S C H E D U L E					
DESIGNATION TYPE	D E S C R I P T I O N	B R E A K E R S			R E M A R K S
		CKT. No.	POLES	TRIP (AMPS)	
PANEL "PAZ"	100 AMPS LOAD CENTER 1# 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"
		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		

PANEL BOARD SCHEDULE					
DESIGNATION TYPE	DESCRIPTION	BREAKERS			REMARKS
		CKT. No.	POLES	TRIP (AMPS)	
PANEL "PA3"	100 AMPS LOAD CENTER 1ø, 3ø, 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 (3ø#6, 1ø#10) 1"
		11/13	2	30	WATER HEATER (3ø#10) 3/4"
		14/16	2	30	DRYER (4ø#10) 3/4"
		15			SPACE
		16	1	20*	MODULE 1 EXPANSION
		17	1	20	MODULE 2 BATHROOM
		18	1	20*	MODULE 2 BEDROOMS
		19-24			SPACE
			*. COMBINATION ARC-FAULT BREAKER (AFO)		
	** GROUND FAULT BREAKER				
	*** DUAL FUNCTION CIRCUIT BREAKER (CAFI+GFI)				

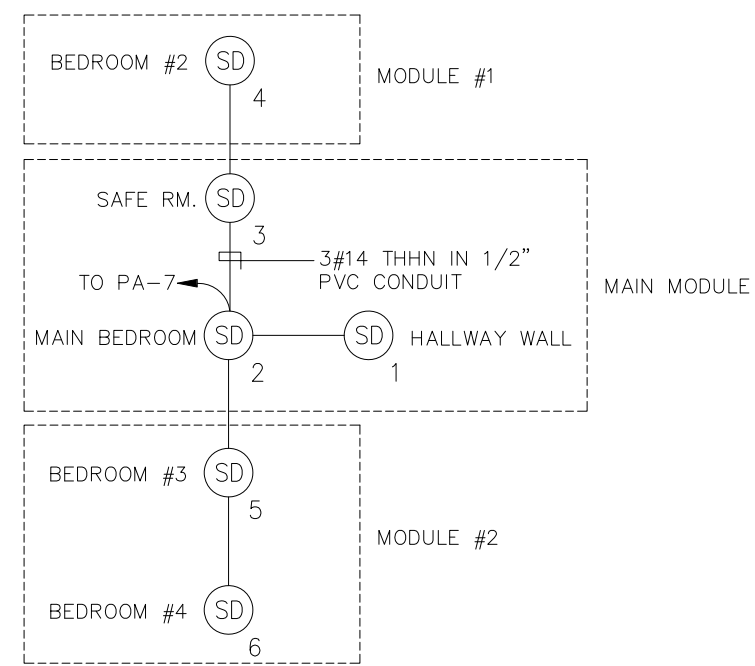


TYP. METER BASE ONE LINE DETAIL
NOT TO SCALE FOR REFERENCE ONLY



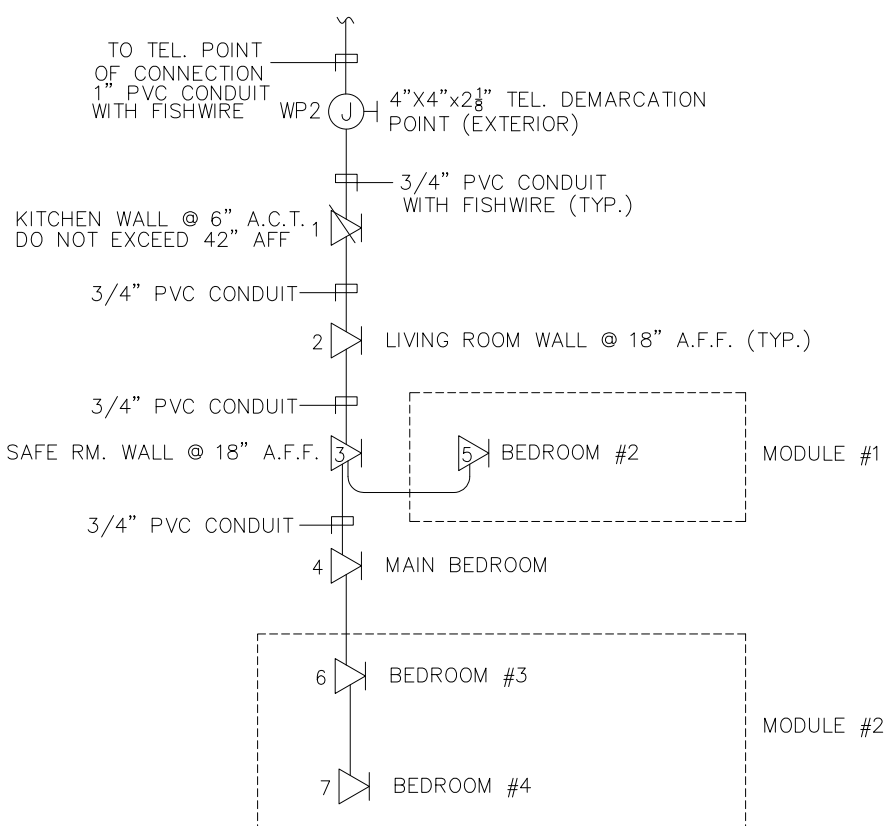
* REFER TO "COMISION DE TELECOMUNICACIONES" FOR INSTALLATION DETAILS.

NOT TO SCALE SCHEMATIC ONLY



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.

NOT TO SCALE



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

NOT TO SCALE

**TWO STORY
CMU AND 2ND FL.
WOOD HOME**

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DEC), PERMITS MANAGEMENT OFFICE (OGP-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.

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ISSUE LOG

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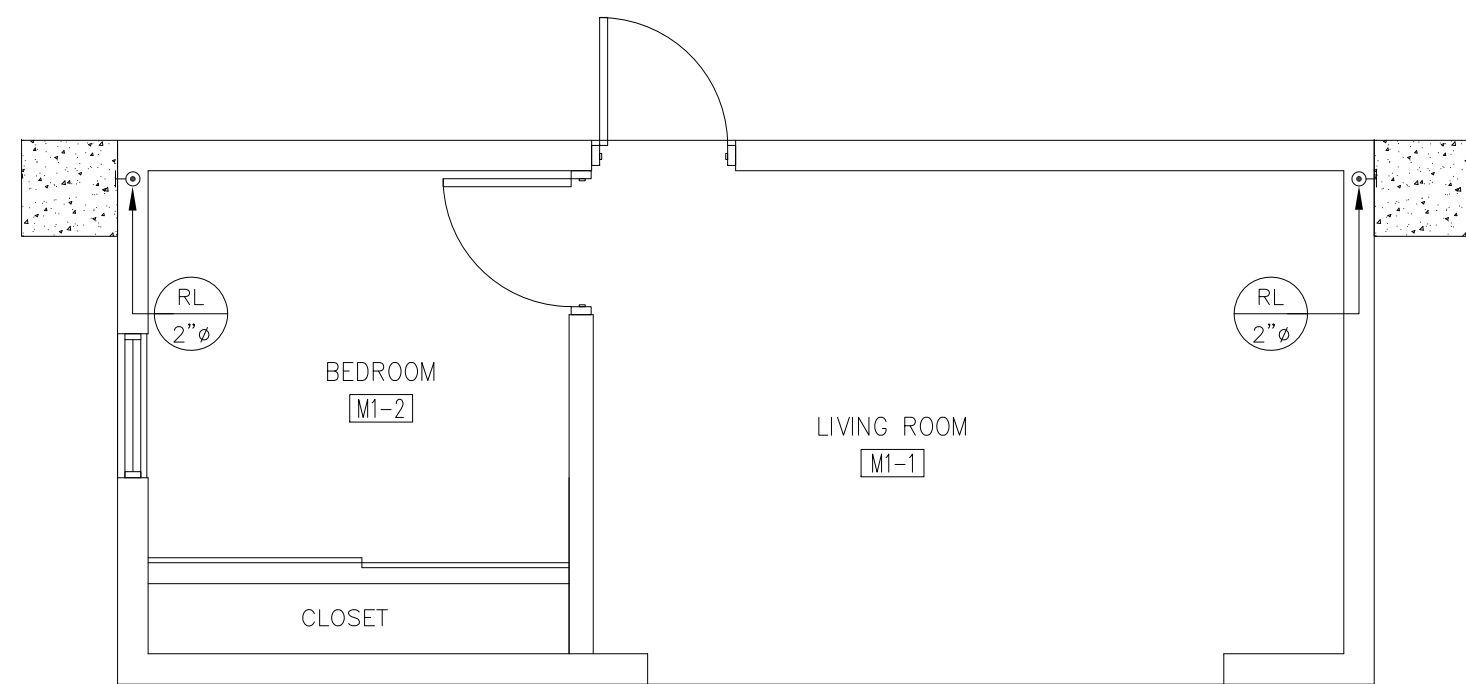
SHEET TITLE:

**PROTOTYPE #4 SCHEMATIC - TWO
STORY, CONC. & WOOD STRUCTURE &
WOOD GABLE ROOF**

SHEET INFORMATION

JOB No.	Date Issued: 05/08/2020
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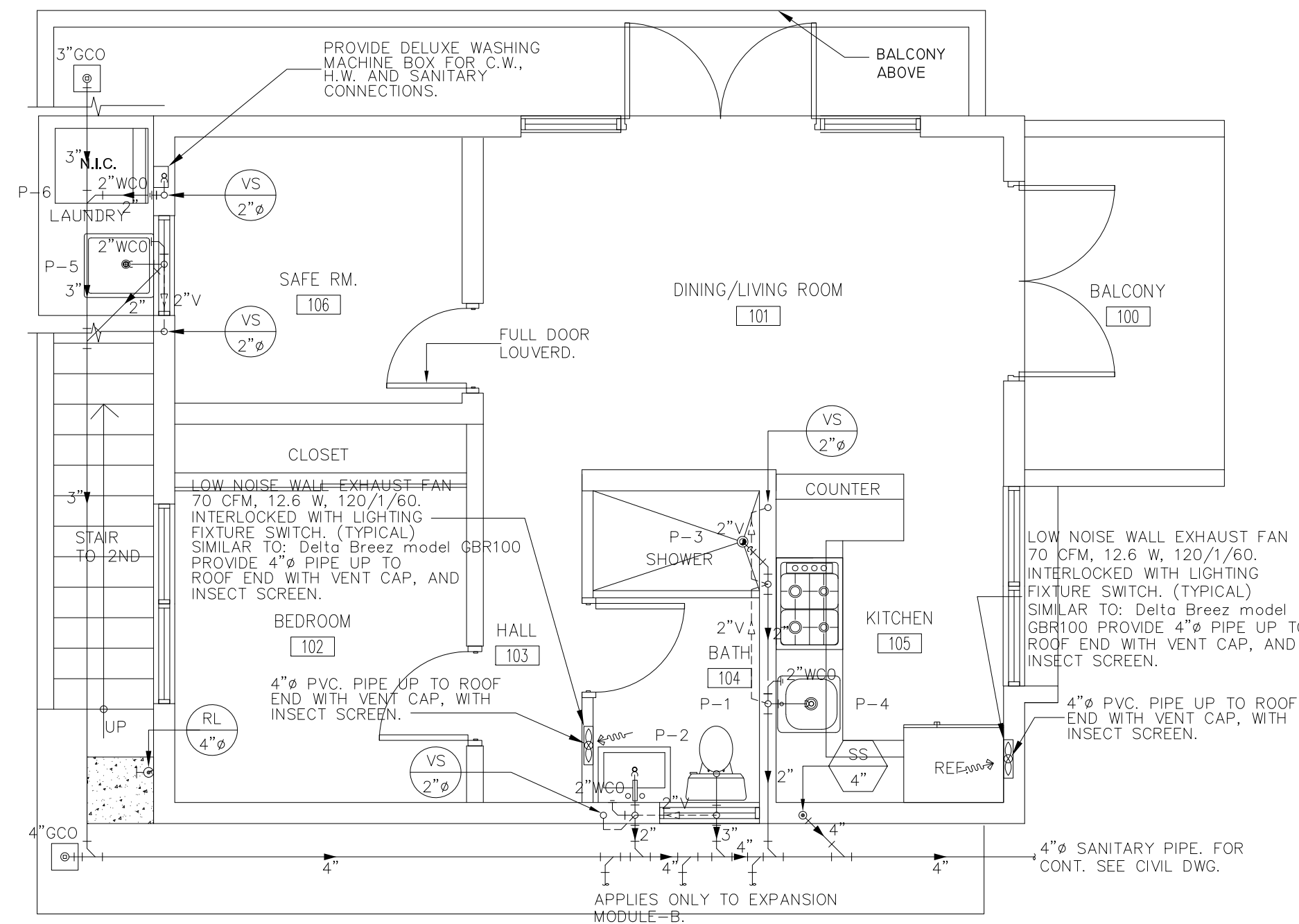
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EXPANSION MODULE - A

FLOOR PLAN- SANITARY LAYOUT

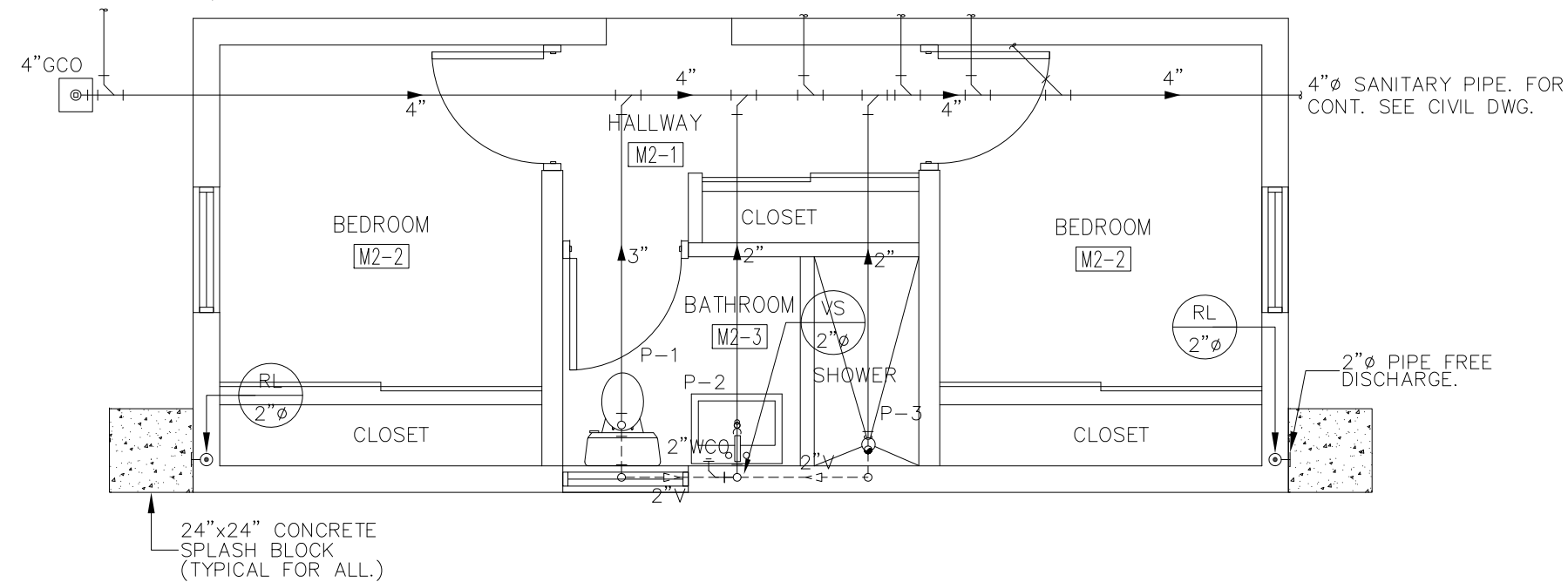
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MAIN MODULE HOUSE #4

FLOOR PLAN- SANITARY LAYOUT

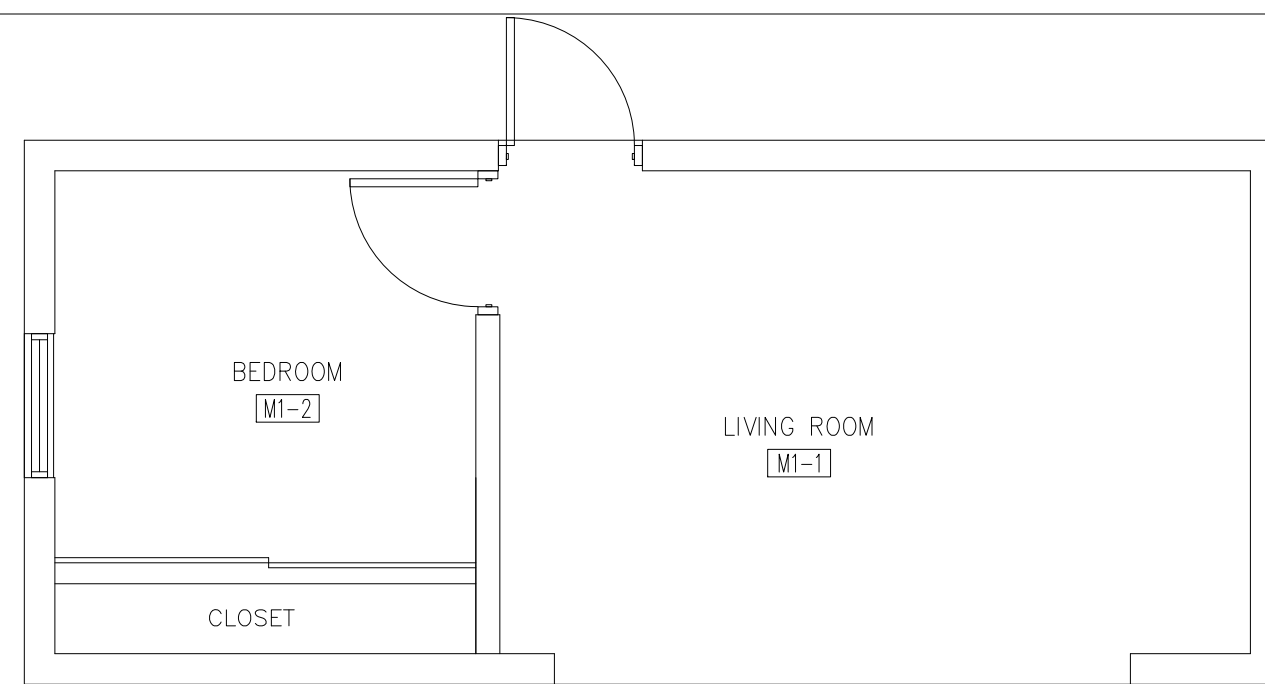
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EXPANSION MODULE - B

FLOOR PLAN- SANITARY LAYOUT

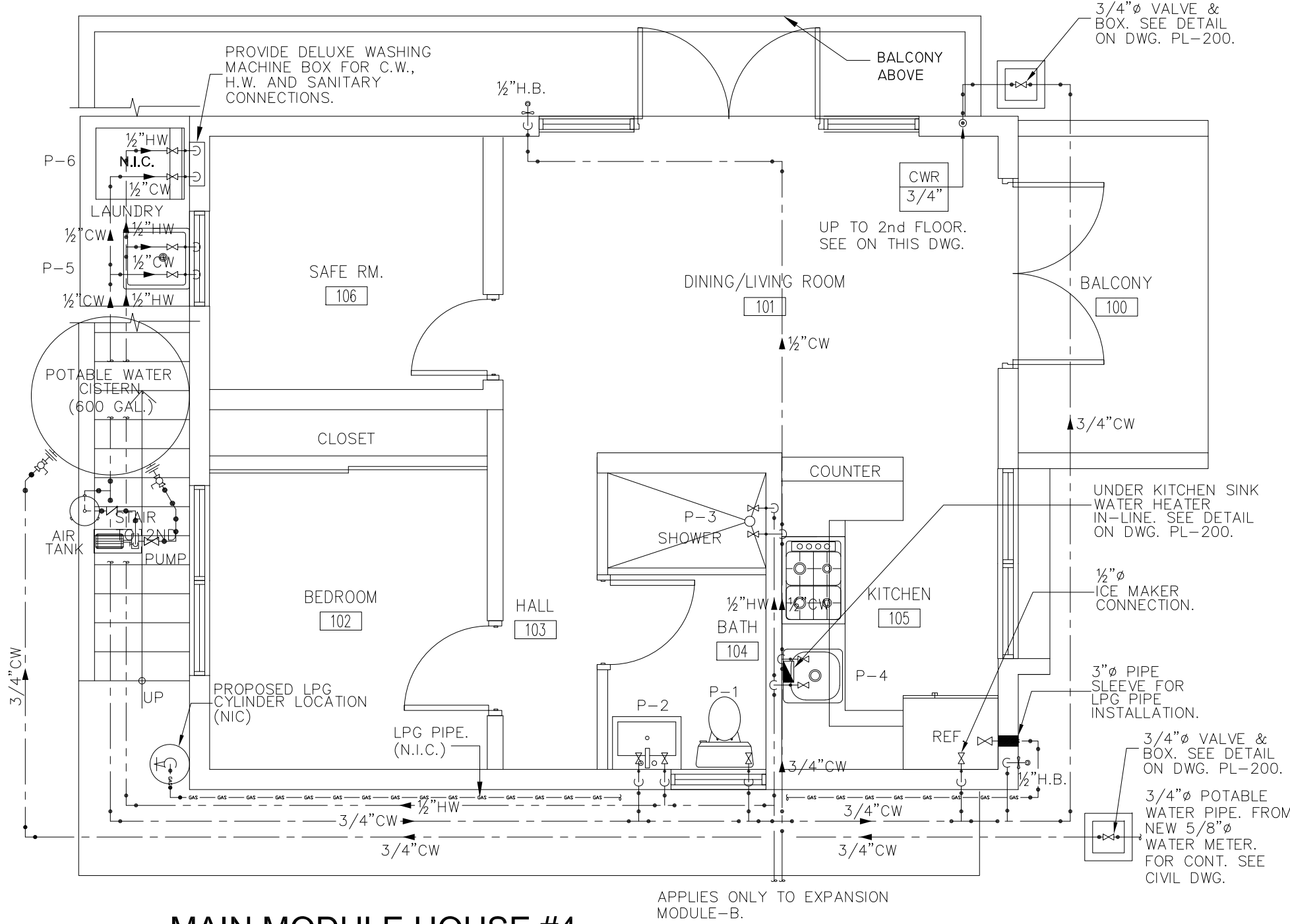
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EXPANSION MODULE - A

FLOOR PLAN- POTABLE WATER LAYOUT

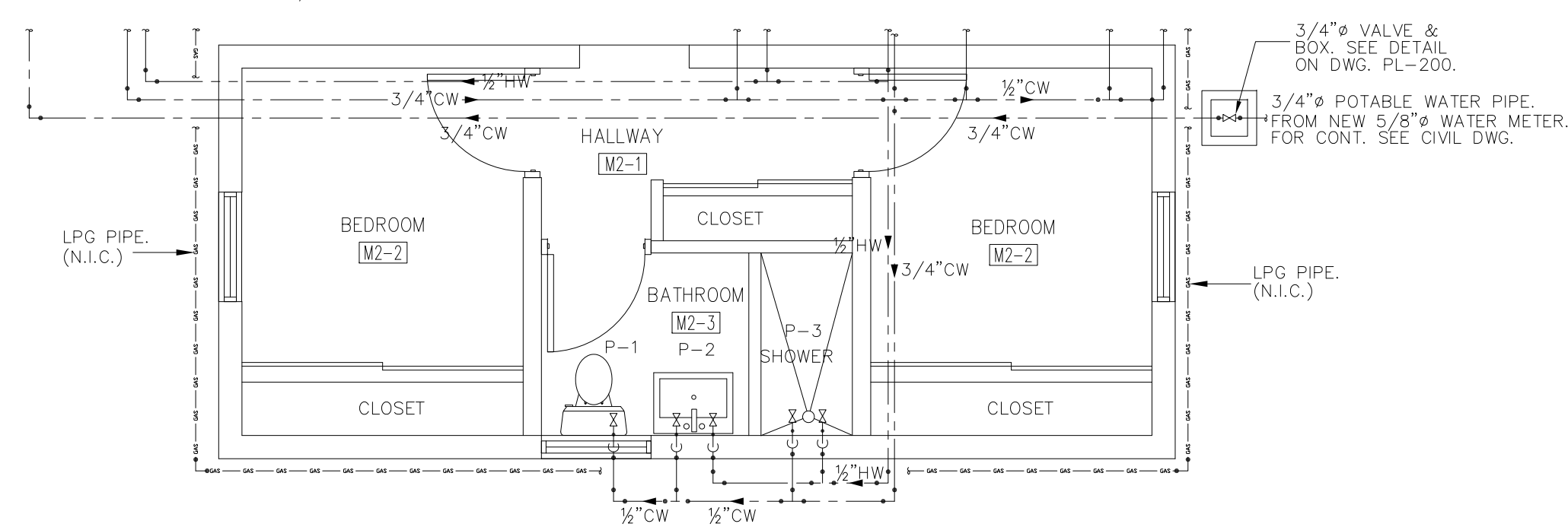
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MAIN MODULE HOUSE #4

FLOOR PLAN- POTABLE WATER LAYOUT

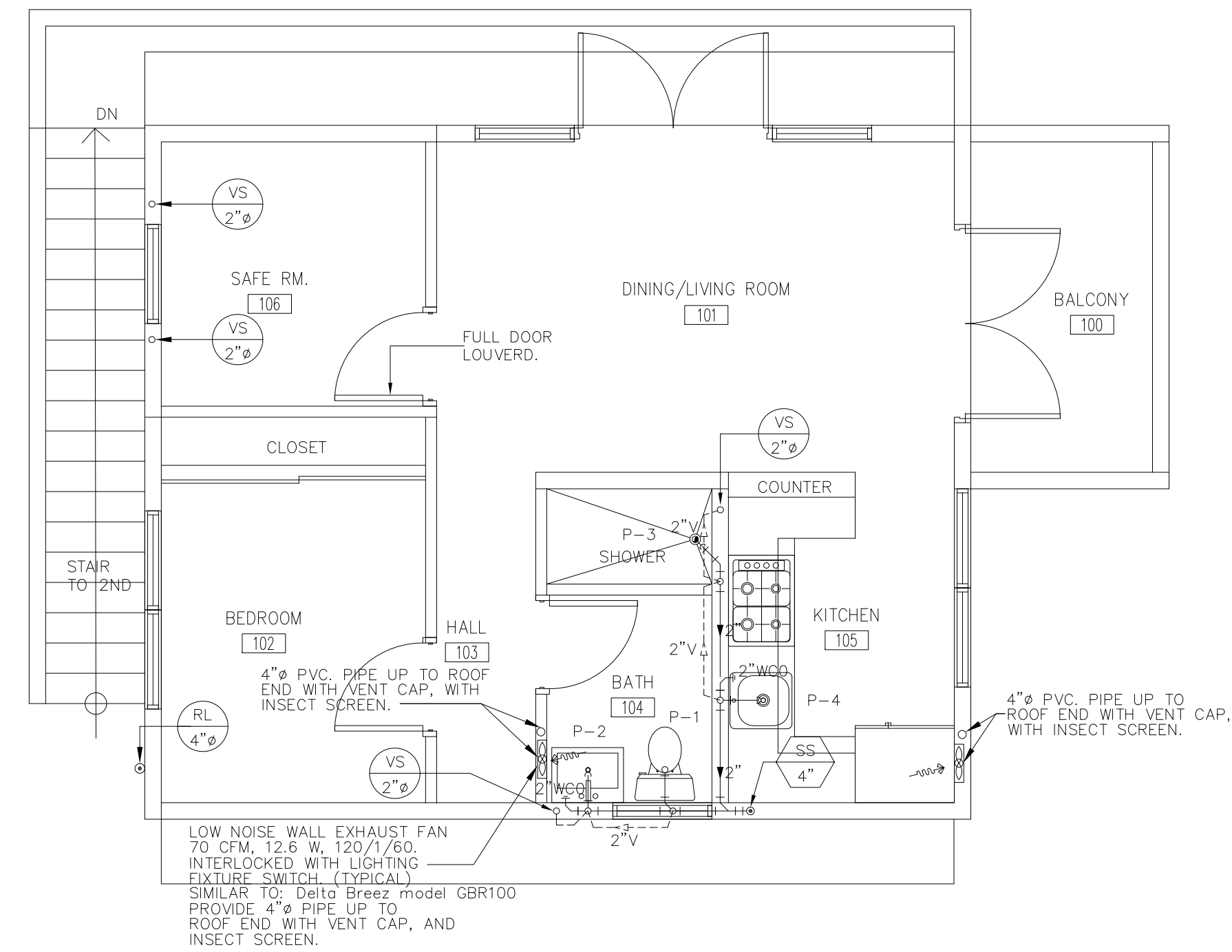
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EXPANSION MODULE - B

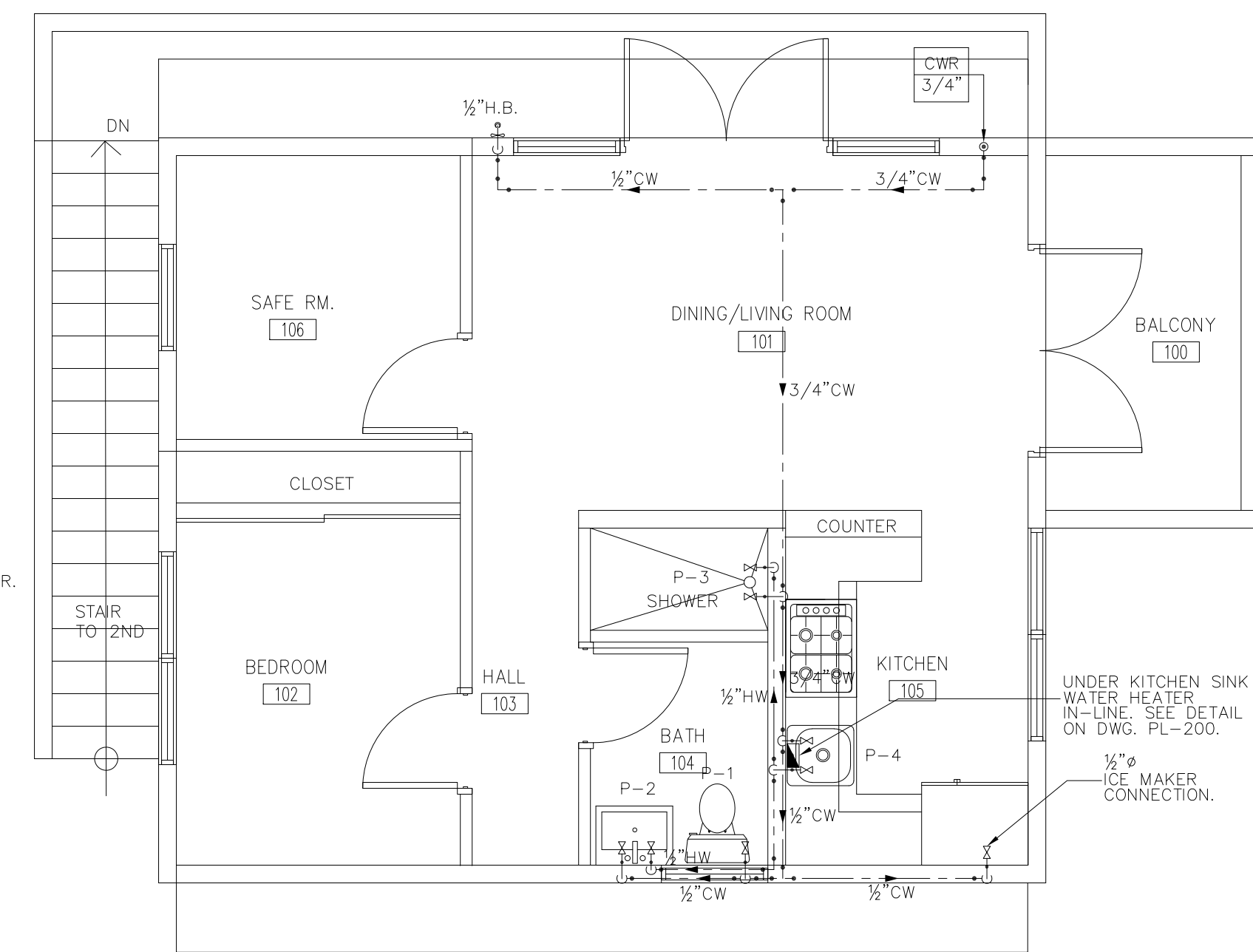
FLOOR PLAN- POTABLE WATER LAYOUT

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



MAIN MODULE HOUSE #4
2nd FLOOR PLAN- SANITARY LAYOUT

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



MAIN MODULE HOUSE #4
2nd FLOOR PLAN- POTABLE WATER LAYOUT

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

PLUMBING LEGEND:

----	COLD POTABLE WATER LINE		INDICATES WASTE STACK DESIGNATION AND SIZE
----	HOT POTABLE WATER LINE		
----	SANITARY SEWER LINE		INDICATES RAIN LEADER STACK DESIGNATION AND SIZE
----	SANITARY VENTILATION LINE		
	INDICATES COLD WATER RISER DESIGNATION AND SIZE		INDICATES SANITARY VENTILATION STACK DESIGNATION AND SIZE
	INDICATES HOT WATER SUPPLY RISER DESIGNATION AND SIZE	P-1	INDICATES PLUMBING FIXTURE DESIGNATION SEE SCHEDULE
	INDICATES HOT WATER RETURN RISER DESIGNATION AND SIZE		POINT OF CONNECTION
	INDICATES SANITARY STACK DESIGNATION AND SIZE		

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 SHOULD BE EVALUATED 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"

CONSULTANT:

CLIENT:

PROJECT NAME:

**TWO STORY
CMU AND 2ND FL.
WOOD HOME**

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ISSUE LOG

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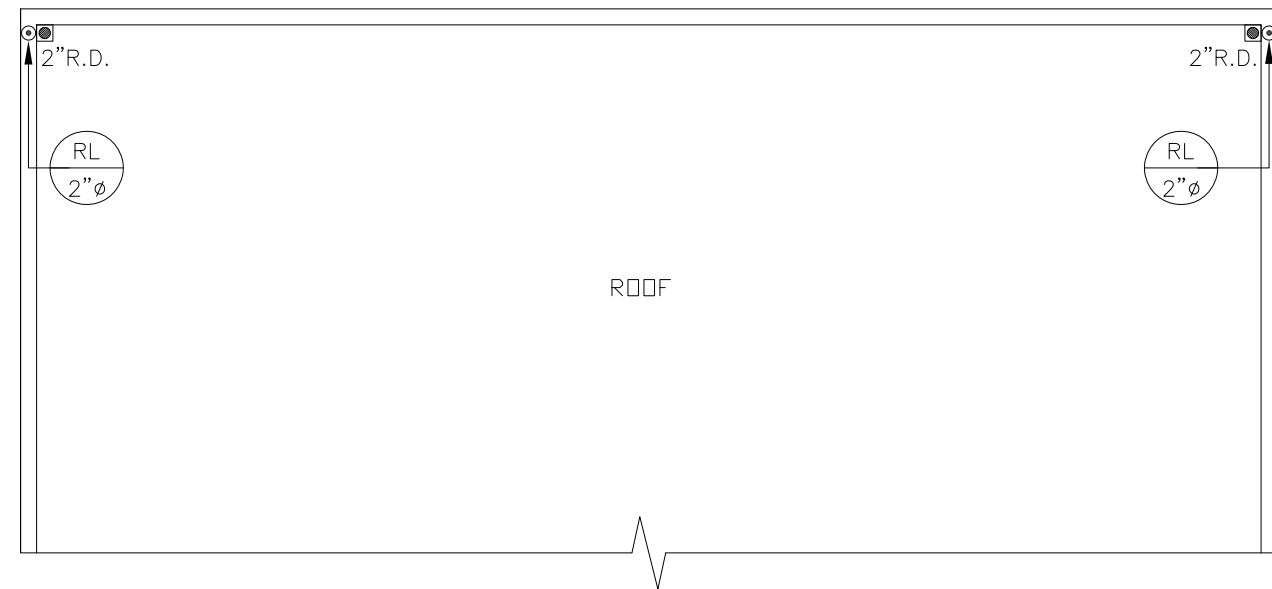
SHEET TITLE:

PROTOTYPE #4 FLOOR PLAN- PLUMBING LAYOUT

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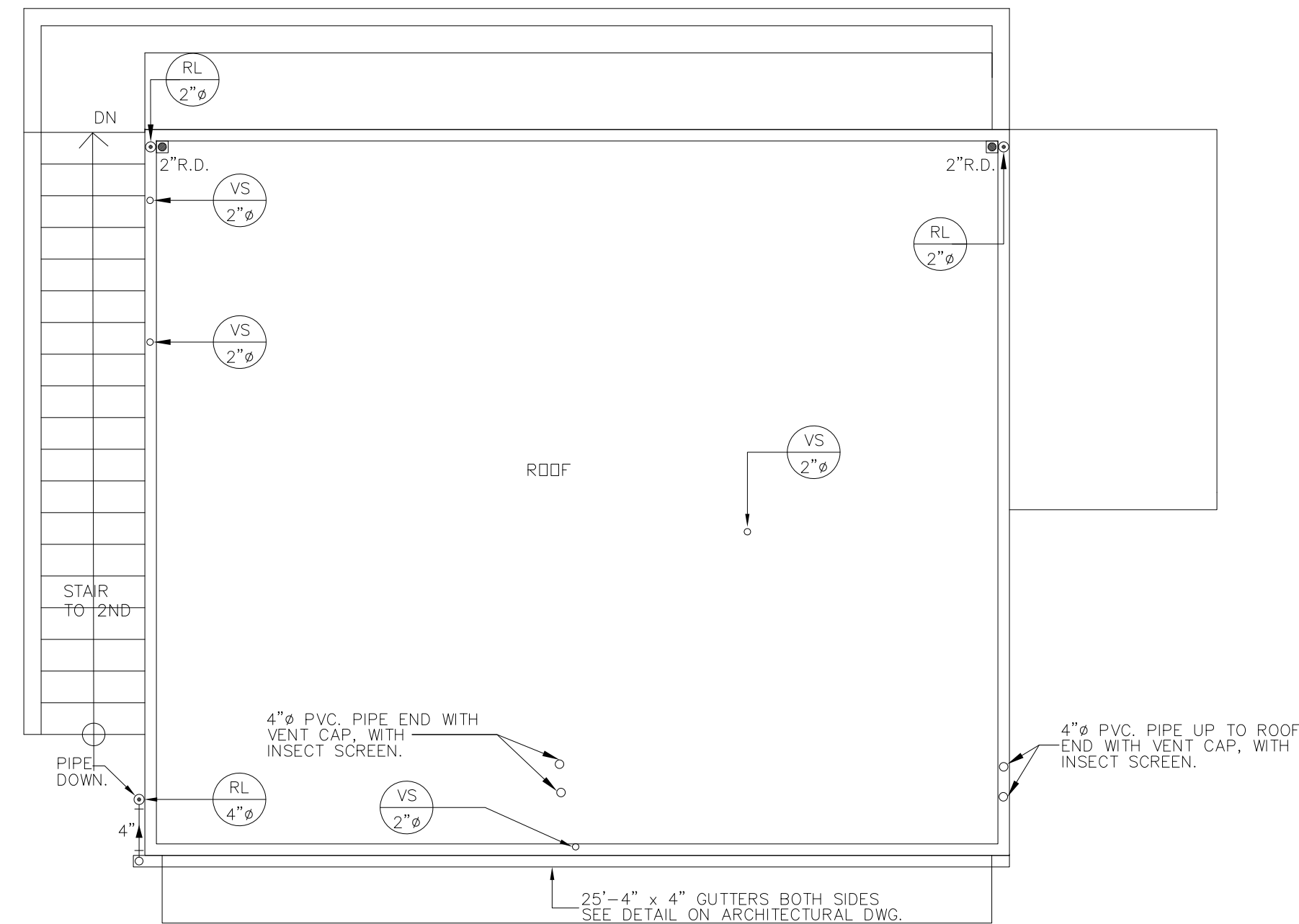
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EXPANSION MODULE - A

ROOF PLAN- PLUMBING LAYOUT

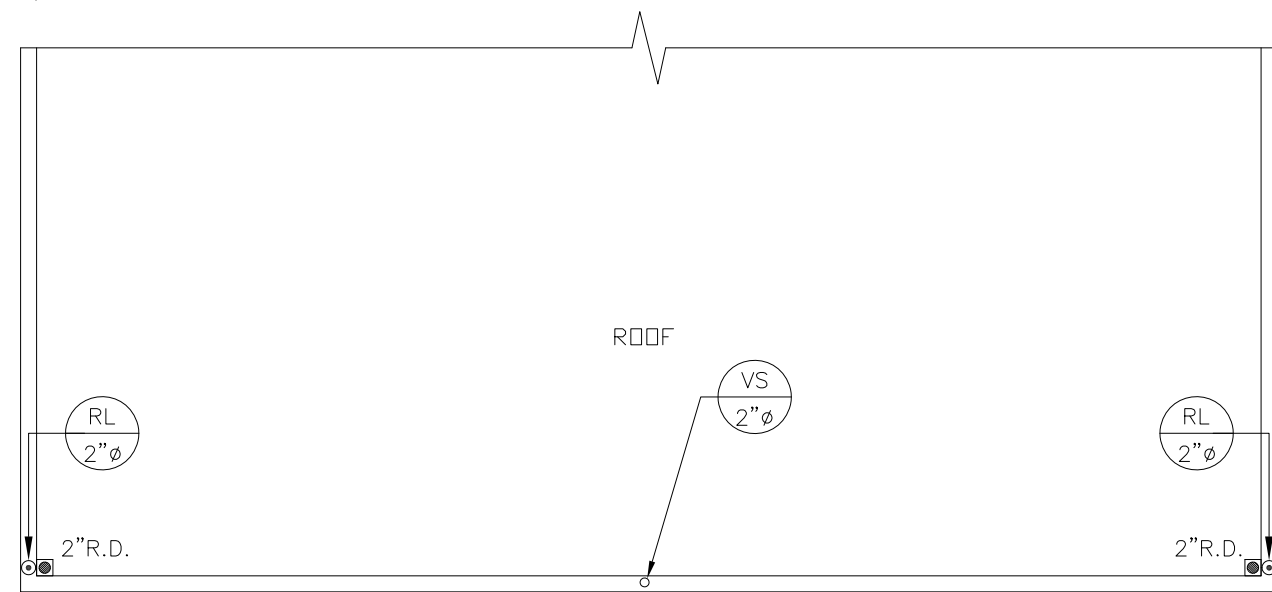
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MAIN MODULE HOUSE #4

ROOF PLAN- PLUMBING LAYOUT









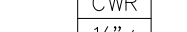

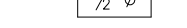



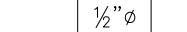


SCALE: 1/4"=1'-0"



EXPANSION MODULE - B
ROOF PLAN- PLUMBING LAYOUT

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

PLUMBING LEGEND:

	COLD POTABLE WATER LINE		INDICATES WASTE STACK DESIGNATION AND SIZE
	HOT POTABLE WATER LINE		INDICATES WASTE STACK DESIGNATION AND SIZE
	SANITARY SEWER LINE		INDICATES RAIN LEADER STACK DESIGNATION AND SIZE
	SANITARY VENTILATION LINE		INDICATES RAIN LEADER STACK DESIGNATION AND SIZE
	INDICATES COLD WATER RISER DESIGNATION AND SIZE		INDICATES SANITARY VENTILATION STACK DESIGNATION AND SIZE
	INDICATES HOT WATER SUPPLY RISER DESIGNATION AND SIZE		INDICATES SANITARY VENTILATION STACK DESIGNATION AND SIZE
	INDICATES HOT WATER RETURN RISER DESIGNATION AND SIZE		INDICATES PLUMBING FIXTURE DESIGNATION SEE SCHEDULE
	INDICATES HOT WATER RETURN RISER DESIGNATION AND SIZE		POINT OF CONNECTION
	INDICATES SANITARY STACK DESIGNATION AND SIZE		

PLUMBING ABBREVIATIONS:

C.W.	COLD WATER
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
(TYP.)	TYPICAL
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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:

**TWO STORY
CMU AND 2ND FL.
WOOD HOME**

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ISSUE LOG

PROFESSIONAL SEALS:

SHEET TITLE:

PROTOTYPE #4

ROOF PLAN- PLUMBING LAYOUT

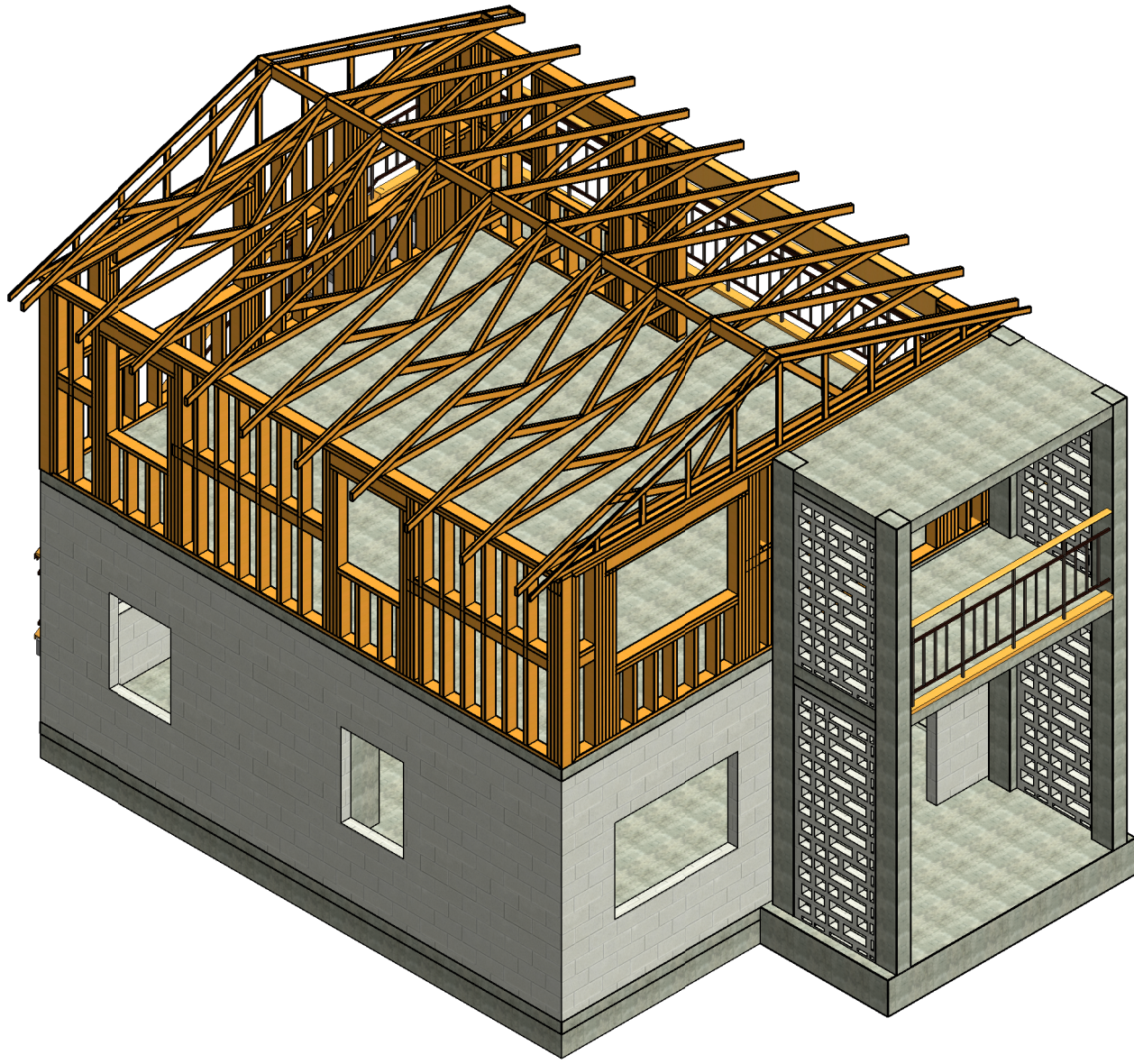
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Phase:	

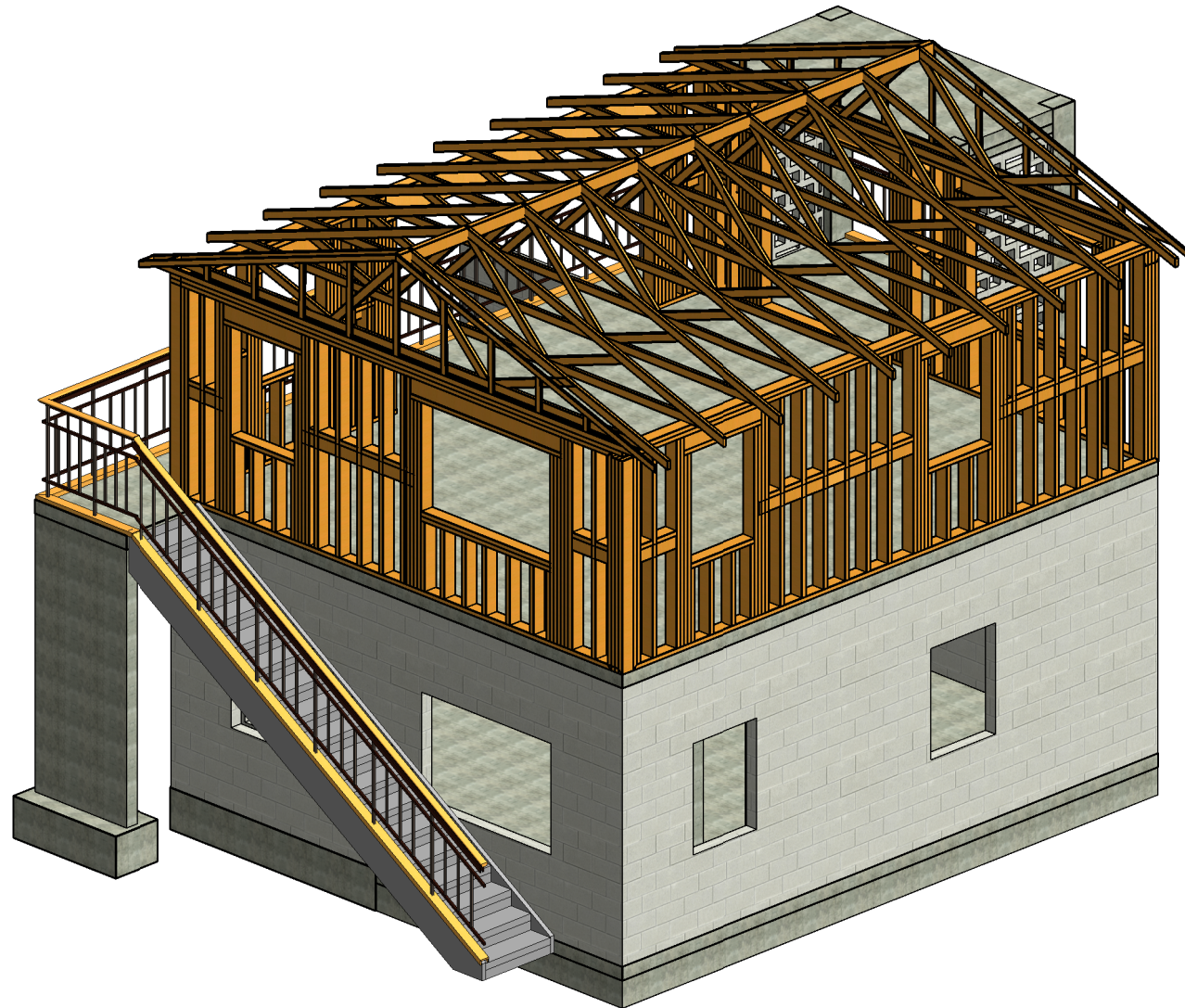
DESIGNATION	DESCRIPTIONS	LOCATIONS	UNIT WASTE OR SOL.	VENT SIZE	WATER SUPPLY		FIXTURES		REMARKS
					COLD	HOT	COLD	HOT	
P-1	WATER CLOSET (TANK)	TOILETS	3"	2"	½"	–	½"	–	SEE ARCHITECTURAL DWG'S.
P-2	LAVATORY	TOILETS	1½"	1½"	½"	–	½"	–	SEE ARCHITECTURAL DWG'S.
P-3	SHOWER	TOILETS	2"	1½"	3/4"	–	3/4"	–	SEE ARCHITECTURAL DWG'S.
P-4	KITCHEN SINK	KITCHEN	1½"	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

NOT FOR CONSTRUCTION

PREScriptive DESIGN FOR TWO STORY CMU/WOOD RESIDENTIAL HOME IN
PUERTO RICO



ISOMETRIC VIEW OF
PRIMARY STRUCTURE



ISOMETRIC VIEW OF PRIMARY
STRUCTURE

PREFACE:

THIS PRESCRIPTIVE HOME DRAWING SET PRESENTS RECOMMENDATIONS FOR THE CONSTRUCTION OF A TWO STORY HOME (PRIMARY STRUCTURE) WITH FUTURE ADDITIONS (MODULES).

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:

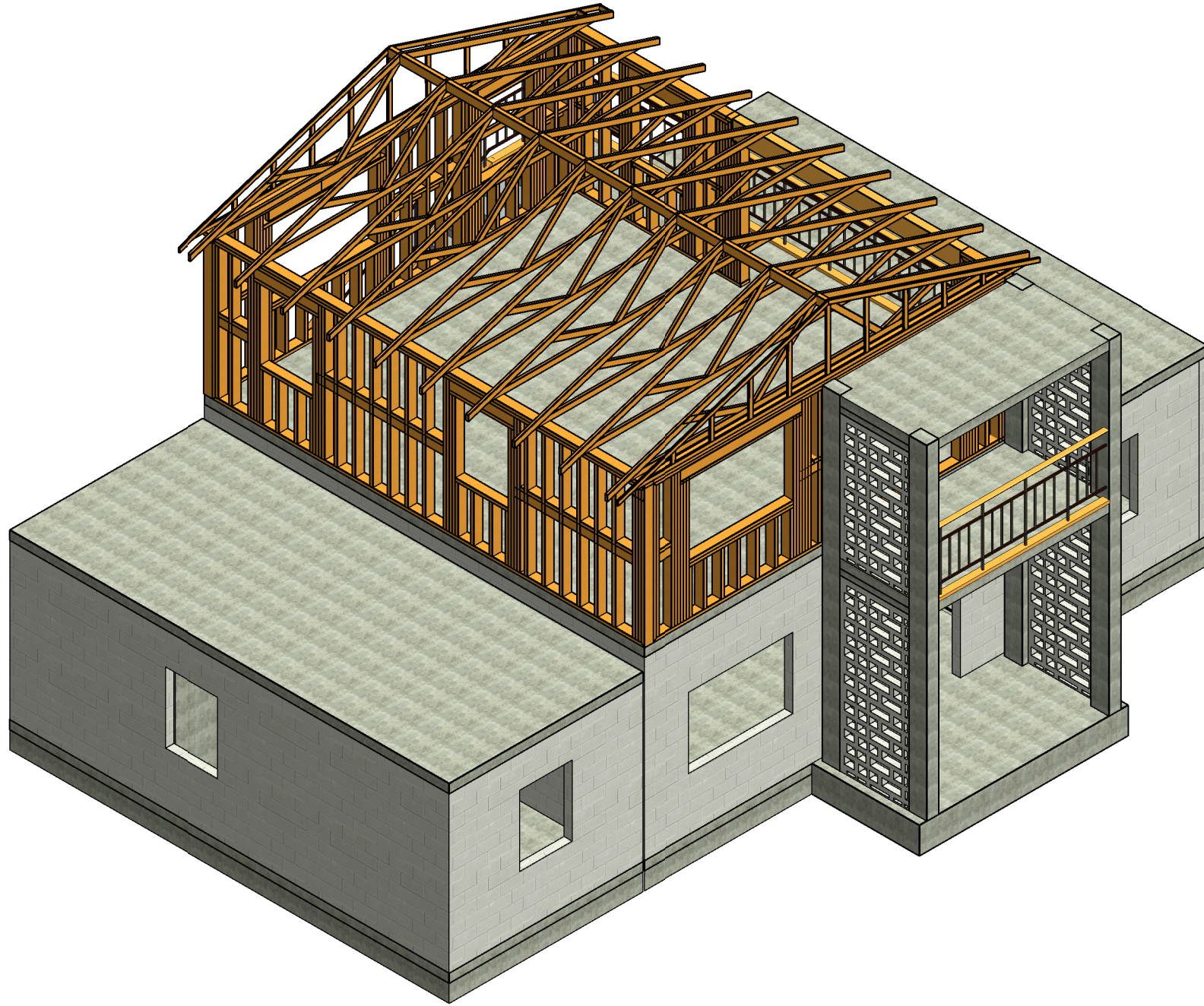
- TWO STORY BUILDING WITH THE MAXIMUM MEAN ROOF HEIGHT AS SHOWN IN THE DRAWING SET.
- ROOF AS SHOWN IN THE DRAWING SET.
- BUILDING WIDTH AND LENGTH AS SHOWN IN THE DRAWING SET.

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.

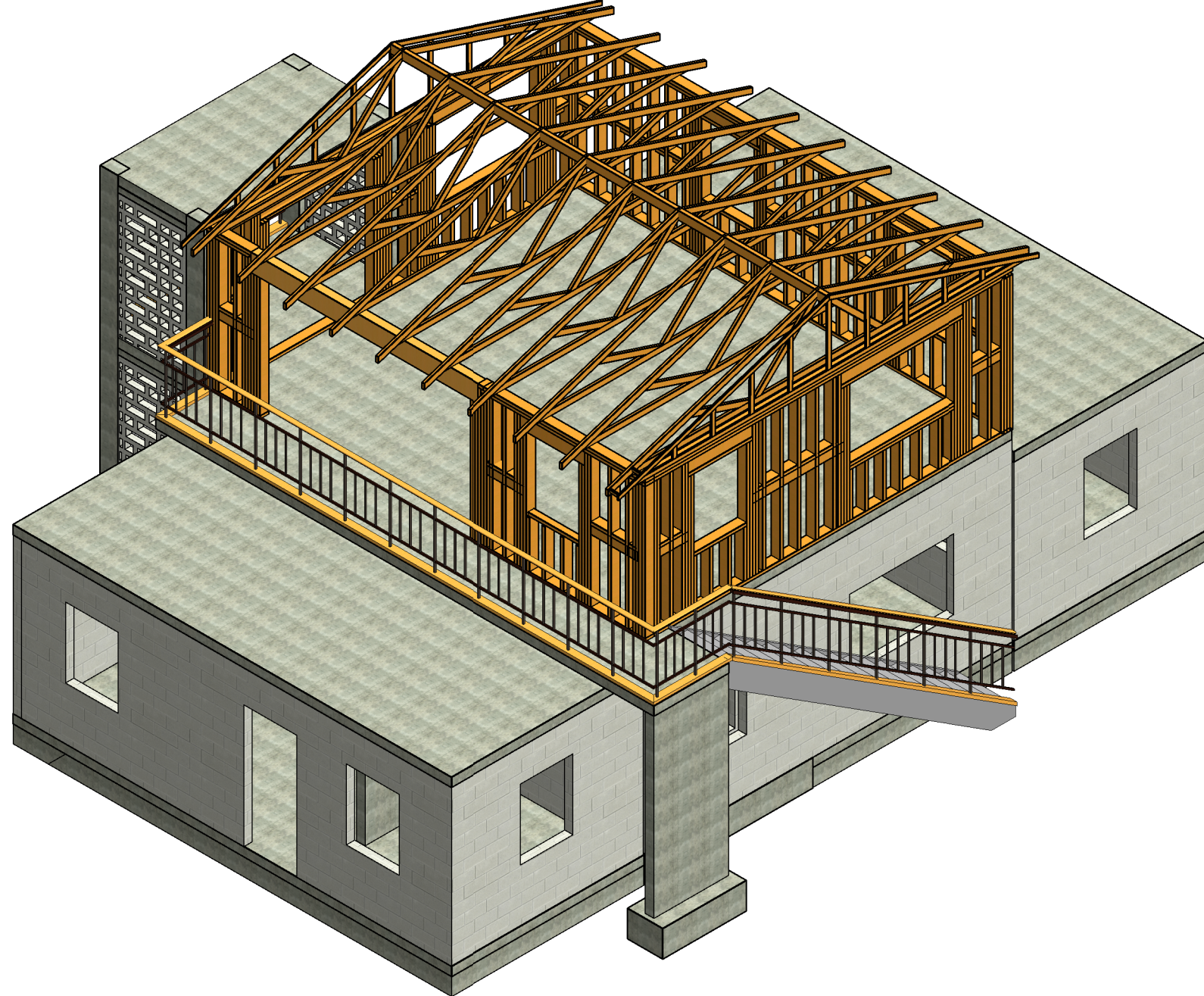
SITE SPECIFIC WIND AND SEISMIC INFORMATION FOR PUERTO RICO CAN BE FOUND BY USING THE ONLINE HAZARDS TOOL DEVELOPED BY ATC AND FOUND AT THE WEBSITE: [HTTPS://HAZARDS.ATCOUNCIL.ORG/](https://hazards.atcouncil.org/)

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 (OPPe-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.



ISOMETRIC VIEW OF
PRIMARY STRUCTURE WITH
MODULES ATTACHED



ISOMETRIC VIEW OF PRIMARY STRUCTURE
WITH MODULES ATTACHED

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY
CMU AND 2ND
FL. WOOD
HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OPPe-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: 5/15/2020
Drawn By:	Sheet Number: S-001
Checked By:	
QC Review:	
Phase:	

NOT FOR CONSTRUCTION

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-CONTRACTORS 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 DISLOGGING 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:
FOUNDATIONS 4,000 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"
#6 BARS AND SMALLER 1 1/2"
C. CONCRETE NOT EXPOSED TO EARTH OR WEATHER
SUSPENDED SLABS AND WALLS
#14 THROUGH #18 BARS 1 1/2"
#11 BARS AND SMALLER 1"
BEAMS (STIRRUPS) AND COLUMNS (TIES) 1 1/2"
- 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 C185 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/AISC 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 1/4 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 1/4 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 1/8 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 MINIMUM 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:
SUPERIMPOSED DEAD LOAD: | 20 PSF
5 PSF |
| BOTTOM CHORD | LIVE LOAD:
SUPERIMPOSED DEAD LOAD: | 20 PSF
5 PSF |
| DEFLECTION: | LIVE LOAD:
TOTAL LOAD: | L/240 MAX.
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. TRUSS TO STOP AT WALL TOP PLATES. SEE 4/S-015 FOR SISTERED PRESSURE TREATED EAVE OVERHANG MEMBER TO BE DESIGNED BY TRUSS MANUFACTURER.

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 COMPLY WITH ASCE 24-14 FLOOD RESISTANT DESIGN AND CONSTRUCTION.

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY
CMU AND 2ND
FL. WOOD
HOME

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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 IS 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 INSPECTION. 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 BAYETS, COWLINGS, OR OTHER MEANS. THESE COVERINGS SHOULD MEET PRESSURE TESTING AND IMPACT CRITERIA AS SPECIFIED 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 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	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.	LONGWAYS
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	SPL.	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.	SHORTWAYS
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/O	WITHOUT
		WWF	WELDED WIRE FABRIC

NOTE: ABBREVIATIONS MAY BE SHOWN WITH OR WITHOUT PERIODS (IE, TYP OR TYP. FOR TYPICAL)

DESIGN CRITERIA FOR PRIMARY STRUCTURE AND MODULES

DESIGN CRITERIA – CODES AND SPECIFICATIONS

- 2018 PUERTO RICO BUILDING CODE.
- ACI 318-14-BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE.
- ACI 301-10-SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
- ASCE/SEI 7-16-MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
- TMS 402/602-16 BUILDING CODE REQUIREMENTS AND SPECIFICATIONS FOR MASONRY STRUCTURES.
- NDS 2018-NATIONAL DESIGN ASSOCIATION SPECIFICATION FOR WOOD CONSTRUCTION.
- ANSI/TPI 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
BALCONY..... 40 PSF
SECOND FLOOR..... 40 PSF
FIRST FLOOR..... 40 PSF
GUARDRAILS AND HANDRAILS..... 200 LBS. IN ANY DIRECTION AT ANY POINT ALONG THE TOP RAIL
GUARDRAIL IN FILL COMPONENTS..... 50 PSF
STAIRS..... 40 PSF OR 500 POUND CONCENTRATED LOAD ON 4 SQ. INCHES OF TREAD

WIND LOAD

BASIC WIND SPEED (ULTIMATE)..... 190 MPH IF EXPOSURE D
BASIC WIND SPEED (NOMINAL)..... 147 MPH IF EXPOSURE D
BASIC WIND SPEED (ULTIMATE)..... 210 MPH IF EXPOSURE C
BASIC WIND SPEED (NOMINAL)..... 163 MPH IF EXPOSURE C
BASIC WIND SPEED (ULTIMATE)..... 255 MPH IF EXPOSURE B
BASIC WIND SPEED (NOMINAL)..... 194 MPH IF EXPOSURE 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):
SPECIAL REINFORCED MASONRY SHEAR WALLS
ANALYSIS METHOD..... EQUIVALENT LATERAL FORCE
R..... 5
Cs..... 0.181
DESIGN BASE SHEAR..... 16.1 KIPS
OVERSTRENGTH FACTOR..... 2.5

BEARING WALL SYSTEM (PRIMARY STRUCTURE 2ND STORY):
LIGHT-FRAMED WOOD WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE
ANALYSIS METHOD..... EQUIVALENT LATERAL FORCE
R..... 6 1/2
Cs..... 0.139
DESIGN BASE SHEAR..... 3.83 KIPS
OVERSTRENGTH FACTOR..... 3

BEARING WALL SYSTEM (MODULE STRUCTURES):
SPECIAL REINFORCED MASONRY SHEAR WALLS
ANALYSIS METHOD..... EQUIVALENT LATERAL FORCE
R..... 5
Cs..... 0.181
DESIGN BASE SHEAR..... 9.16 KIPS
OVERSTRENGTH FACTOR..... 2.5

DESIGN CRITERIA FOR SAFE ROOM

DESIGN CRITERIA – SAFE ROOM

- 2018 INTERNATIONAL RESIDENTIAL CODE
- 2018 INTERNATIONAL BUILDING CODE
- FEMA P-361 THIRD EDITION
- 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..... D
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:

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

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

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

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

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 materials below shallow foundations are adequate to achieve the design-bearing capacity		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, reinforcement, and other connectors		X
f. Verify preparation of masonry during cold or hot weather		X
g. Observe preparation of grout specimens, mortar specimen, and/or prisms		X

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TWO STORY
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Drawn By:	Sheet Number:
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QC Review:	
Phase:	

COMPONENTS AND CLADDING ULTIMATE DESIGN PRESSURE SCHEDULE				
GABLE ROOF, $\theta \leq 7^\circ$ WALLS $h \leq 60'$			EXPOSURE CATEGORY, TOPOGRAPHIC FACTOR	
COMPONENT	ZONE	EFFECTIVE WIND AREA (SF)	EXP. D, Kzt = 1.0	
			SURFACE PRESSURE (PSF)	
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
<u>NOTES:</u>				
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 & WALL DIAGRAM-C & C
PRESSURES - ONE STORY OPTION

1
S-003
1/16" = 1'-0"

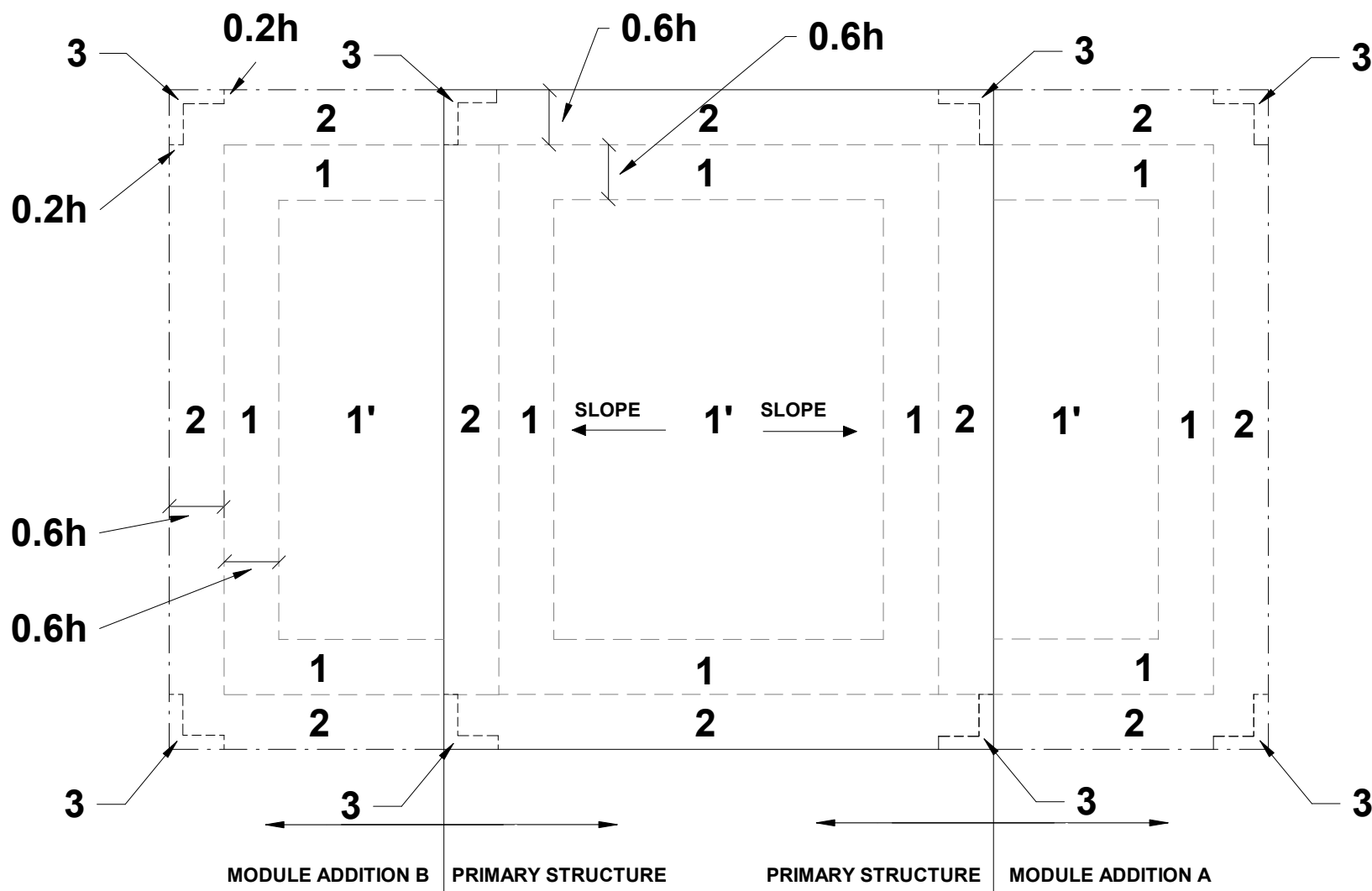
COMPONENTS AND CLADDING ULTIMATE DESIGN PRESSURE SCHEDULE				
GABLE ROOF 7° < θ ≤ 20° WALLS h ≤ 60'			EXPOSURE CATEGORY, TOPOGRAPHIC FACTOR	
COMPONENT	ZONE	EFFECTIVE WIND AREA (SF)	EXP. D, Kzt = 1.0	
			SURFACE PRESSURE (PSF)	
			POSITIVE	NEGATIVE
ROOF ELEMENTS	1 & 2e	10	58.2	-186.7
		50	48.8	-109.6
		100	41.1	-58.2
	2n, 2r, & 3e	10	58.2	-272.3
		50	48.8	-186.7
		100	41.1	-152.4
	3r	10	58.2	-323.7
		50	48.8	-220.9
		100	41.1	-169.5
	Ovh. 1 & 2e	10	N/A	-229.5
		50	N/A	-202.9
		100	N/A	-178.1
	Ovh. 2n	10	N/A	-315.1
		50	N/A	-229.5
		100	N/A	-186.7
	Ovh. 3e	10	N/A	-366.5
		50	N/A	-255.2
		100	N/A	-212.3
	Ovh. 3r	10	N/A	-417.8
		50	N/A	-272.3
		100	N/A	-212.3
EXTERIOR WALL ELEMENTS	4	10	101.0	-109.6
		50	92.5	-101.0
		100	83.9	-92.5
	5	10	101.0	-135.3
		50	92.5	-116.5
100	83.9	-109.6		

NOTES:

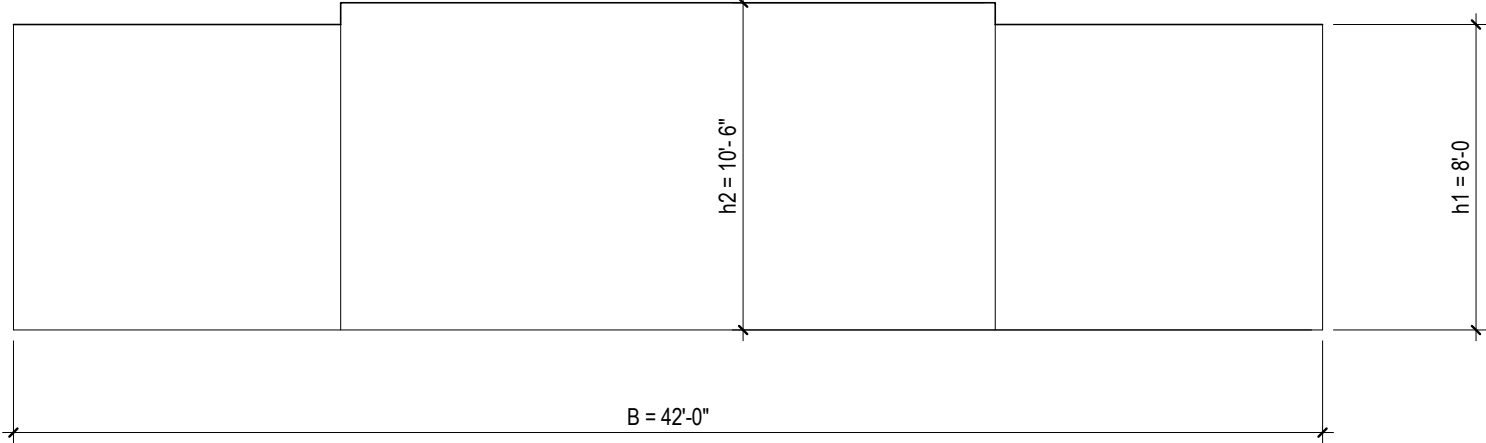
- DESIGN WIND PRESSURES SHALL BE USED IN THE DESIGN OF ALL COMPONENTS AND CLADDING ELEMENTS COMPRISING THE BUILDING ENVELOPE.
- REFER TO THE WIND PRESSURE DIAGRAM FOR ZONE LOCATIONS AND EXTENTS.
- POSITIVE PRESSURES ACT TOWARD COMPONENT SURFACES AND NEGATIVE PRESSURES ACT AWAY FROM COMPONENT SURFACES.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

ROOF & WALL DIAGRAM-C & C
PRESSURES - TWO STORY OPTION

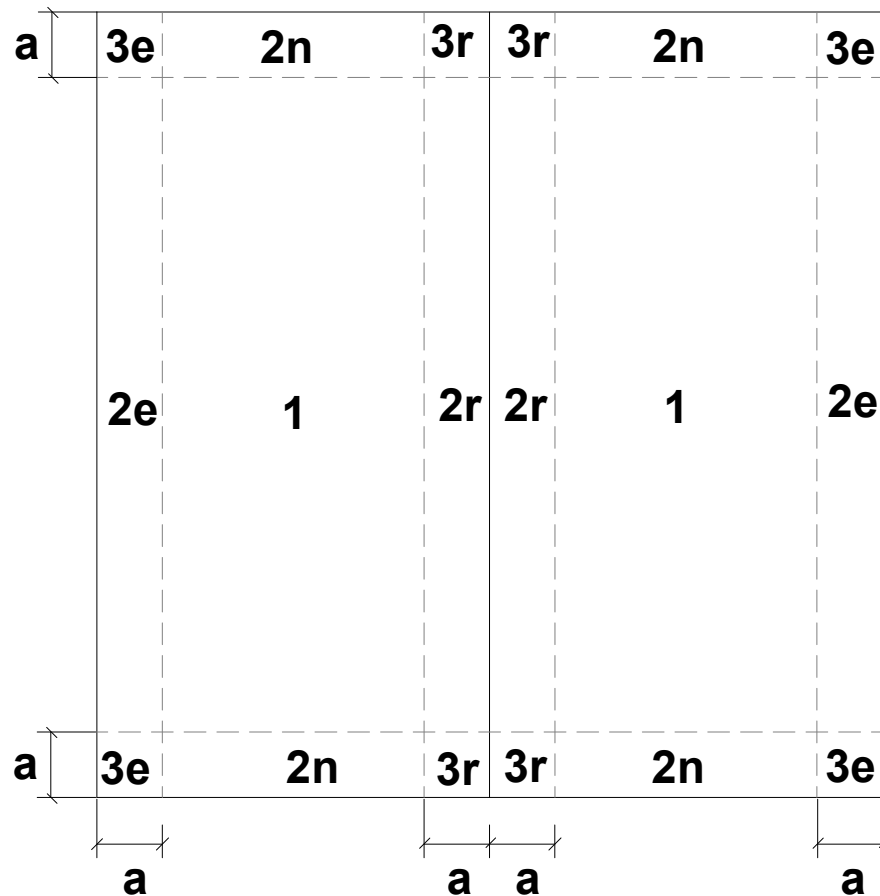
2
S-003
1/16" = 1'-0"



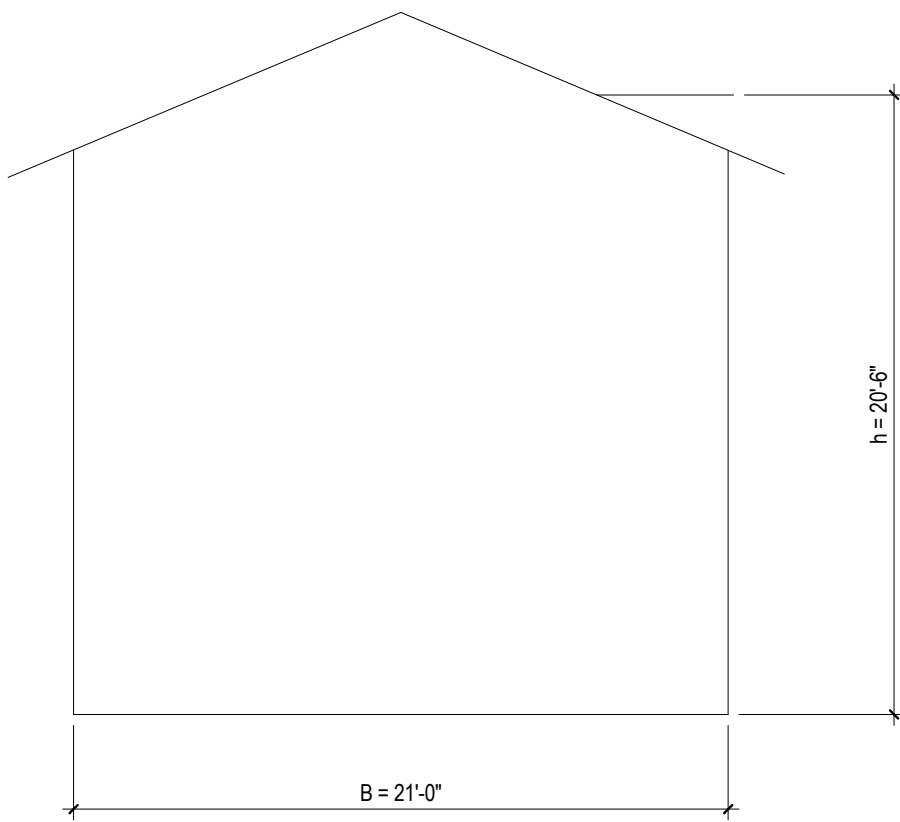
ROOF PLAN - ONE STORY OPTION



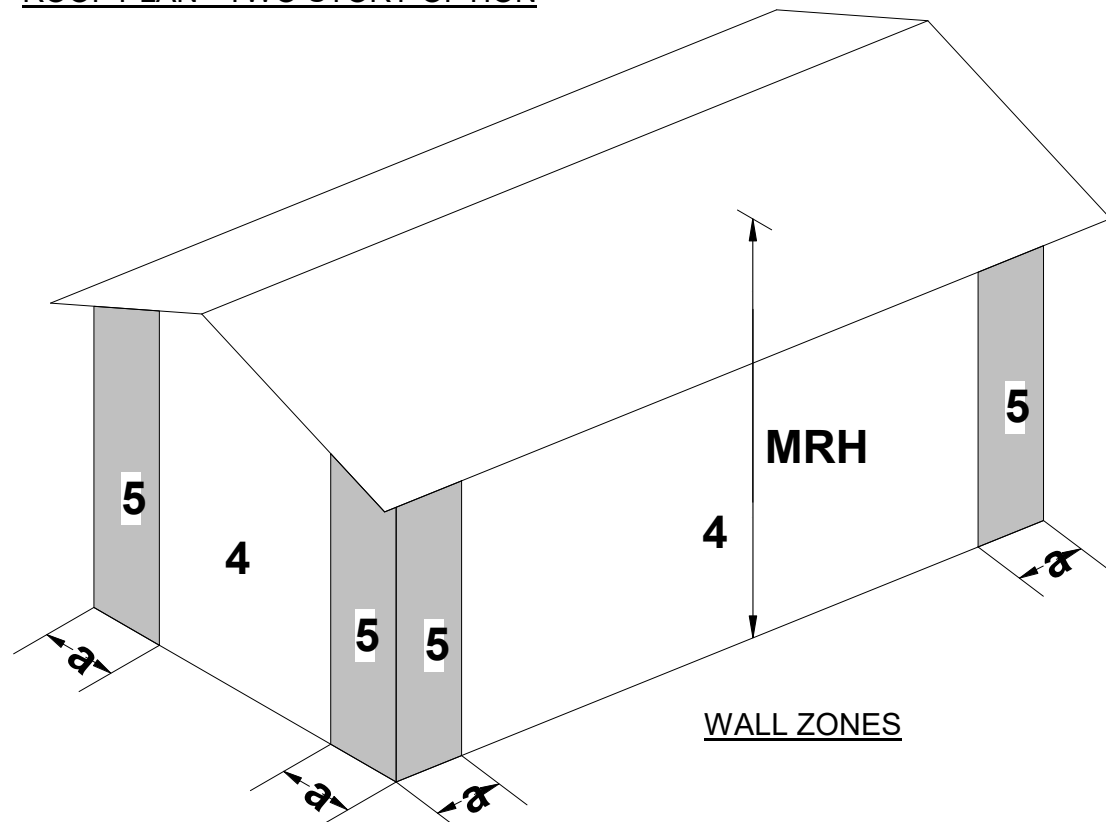
ELEVATION



ROOF PLAN - TWO STORY OPTION



ELEVATION



WIND PRESSURE DIAGRAMS

REFER TO "COMPONENTS AND CLADDING"
TABLE FOR ULTIMATE DESIGN PRESSURES

a = 10% of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3ft (0.9m). If an overhang exists, the edge distance shall be measured from the outside edge of the overhang. The horizontal dimensions used to compute the edge distance shall not include any overhang distances.

MRH=MEAN ROOF HEIGHT

h = Mean roof height, in ft (m), except that eave height shall be used for $\theta \geq 10^\circ$

B = Horizontal dimension of the building measured normal to wind direction, in ft(m)

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY
CMU AND 2ND
FL. WOOD
HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGP+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:

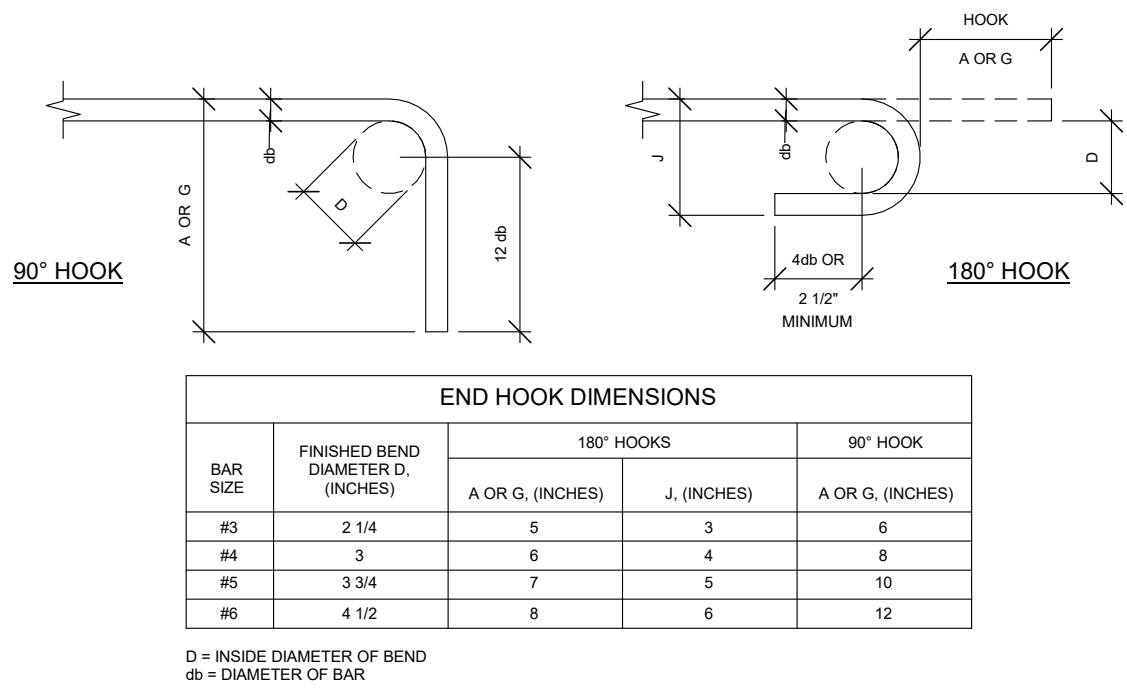
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SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-003
Checked By:	
QC Review:	
Phase:	

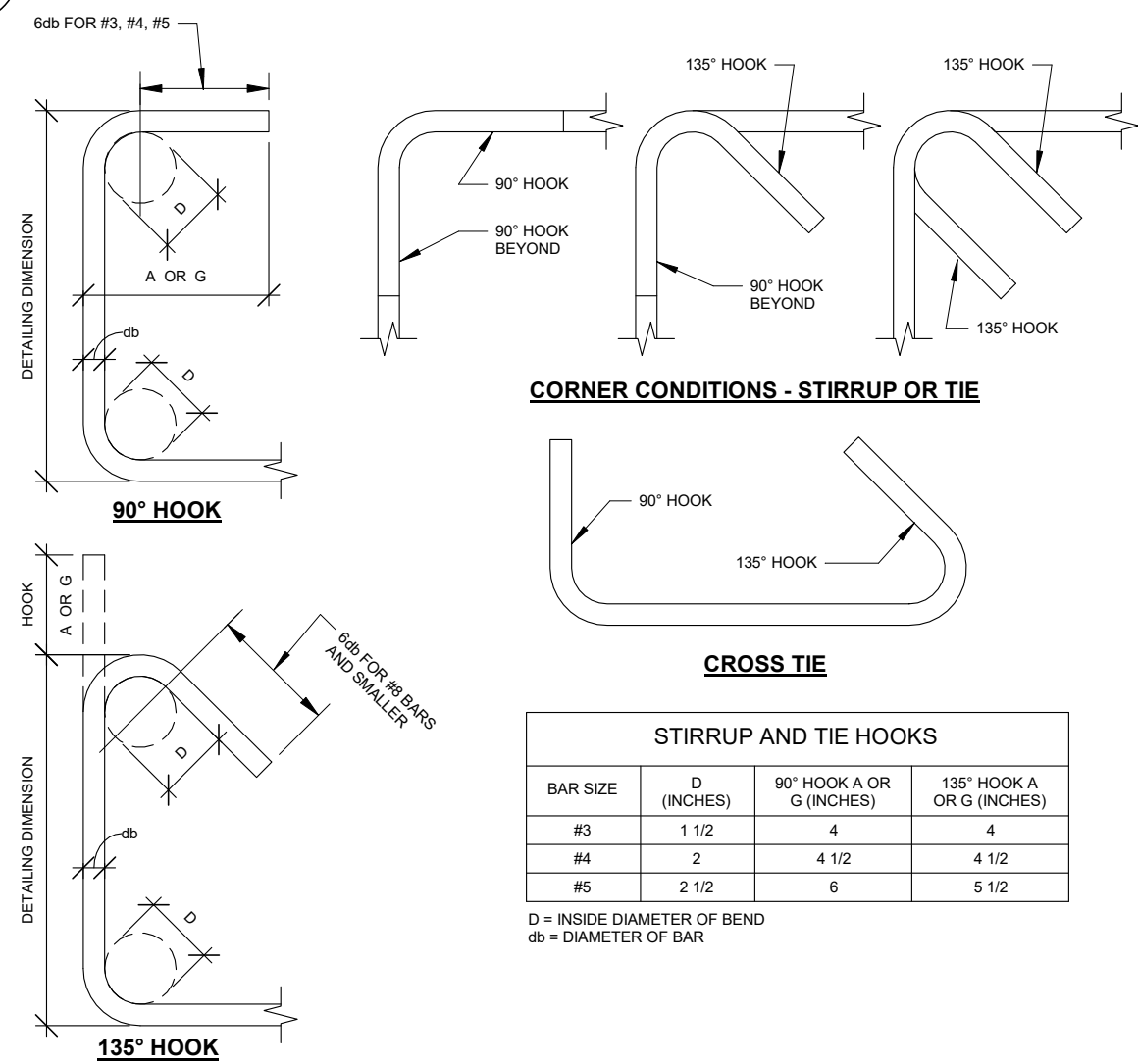
WOOD FASTENING SCHEDULE			
ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
Roof			
1	Rafter or roof truss to top plate	Use Connector See Plans	See Plans
2	Blocking to top plate	A34 Connector with 8 #9 x 1 1/2" SD Screws	6" o.c.
Wall			
3	Built-up header ((3) 2x header with (2) 1/2" spacers)	16d common (3 1/2" x 0.162")	16" o.c each edge, face nail, both sides
		16d box (3 1/2" x 0.135")	12" o.c each edge, face nail, both sides
4	Top plate to top plate	10d box (3" x 0.128")	6" o.c face nail
5	Double top plate splice	See Plans	See Plans
6	Top plate or bottom plate to stud	Use Connector See Plans	See Plans
7	Top plate, laps at corners	3-10d box (3" x 0.128") or 2-16d common (3 1/2" x 0.162")	Face nail
8	King Stud to King Stud at Openings	See Plans	See Plans
9	Blocking to Stud	6-10d box (3" x 0.128")	Toe Nail (3) Ea. End
10	Sill Plate to Sill Plate	10d box (3" x 0.128")	6" o.c. face nail

NOTE: THIS FASTENING SCHEDULE SHALL APPLY TO ALL MEMBERS UNLESS SPECIFIED IN PLANS. WHERE PLANS CALL OUT MORE STRINGENT REQUIREMENTS FOLLOW PLANS.

1 WOOD FASTENING SCHEDULE



2 TYPICAL END HOOK TYPES



3 TYPICAL STIRRUP AND TIE HOOK TYPES

HEADERED WALL OPENING SCHEDULE					
OPENING WIDTH	BEAM SIZE	KING & JACK STUD (EA. SIDE)	SILL PLATE	LOCATION	HEADER STRAPS (EA. SIDE)
3'-0"	(3) 2"x8"	2 & 2	(1) 2"x6"	2ND. FLOOR	MSTA 30
6'-0"	(3) 2"x8"	3 & 3	(2) 2"x6"	2ND. FLOOR	MSTA 30

NOTES:

- PROVIDE TSP STUD PLATE TIES AT EACH KING/JACK, REF. TYP. WALL OPENING DETAILS.
- PROVIDE MSTA 30 STRAPS EACH SIDE OF BEARING HEADERED OPENINGS, REF. TYPICAL WALL OPENING DETAILS.

4 HEADERED WALL OPENING SCHEDULE

LAP SPLICE SCHEDULE CONCRETE		
BAR SIZE	f'c = 3000 psi	
	TENSION	COMPRESSION
3	21	8
4	28	11
5	36	14
6	43	16
7	62	19
8	71	22
9	80	25

NOTES:

- LAP LENGTHS ARE IN INCHES AND ARE BASED ON GRADE 60 REINFORCING STEEL AND NORMAL WEIGHT CONCRETE.

5 LAP SPLICE SCHEDULE CONCRETE

LAP SPLICE SCHEDULE MASONRY		
BAR SIZE	f'm = 1900 psi	
	TENSION	COMPRESSION
3	27	27
4	36	36
5	45	45
6	54	54
7	63	63
8	72	72
9	82	82

NOTES:

- LAP LENGTHS ARE IN INCHES AND ARE BASED ON GRADE 60 REINFORCING STEEL AND NORMAL WEIGHT MASONRY UNITS.

6 LAP SPLICE SCHEDULE MASONRY

STRUCTURAL SHEATHING SCHEDULE					
ELEMENT	SHEATHING	FASTENER	SPAN RATING	PANEL FASTENING EDGE INTERIOR	
EXTERIOR WALL	23/32" STRUCT. 1 PANELS	#12 SCREW W/ 3" LENGTH	48/24	3" C/C	6" C/C
ROOF	23/32" STRUCT. 1 PANELS	#12 SCREW W/ 3" LENGTH	48/24	3" C/C	6" C/C

NOTES:

- FOR ALL WALL SHEATHING PROVIDE CONTINUOUS BLOCKING AT ALL PANEL EDGES PERPENDICULAR TO THE FRAMING MEMBERS. APPLY SHEATHING PERPENDICULAR TO FRAMING MEMBERS. PROVIDE DOUBLE WALL STUDS TO SUPPORT EXTERIOR SHEATHING AT SHEATHING JOINTS.
- WHERE FASTENER ATTACHES TO BLOCKING PROVIDE 3/4" EDGE DISTANCE FROM PANEL EDGE TO CENTER LINE OF FASTENER.

7 STRUCTURAL SHEATHING SCHEDULE

WALL STUD SCHEDULE				
EXTERIOR LOAD BEARING				
STUD SIZE	SPECIES/GRADE	UNBRACED HGT.	LOCATION	SPACING
2"x6"	S-Y-P No.2	8'-0"	2nd FLOOR	12" C/C
INTERIOR NON-LOAD BEARING				
2"x4"	S-Y-P No.2	8'-0"	2nd FLOOR	16" C/C

NOTES:

- SEE TYPICAL DETAILS FOR REQUIRED CONNECTORS
- PROVIDE ATTACHMENT OF INTERIOR NON LOAD BEARING WALLS TO CONC. SLAB AND WOODEN ROOF TRUSSES UTILIZING VERTICALLY SLOTTED CONNECTION.

8 WALL STUD SCHEDULE

TWO STORY CMU AND 2ND FL. WOOD HOME

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ISSUE LOG

No.	Date	Description

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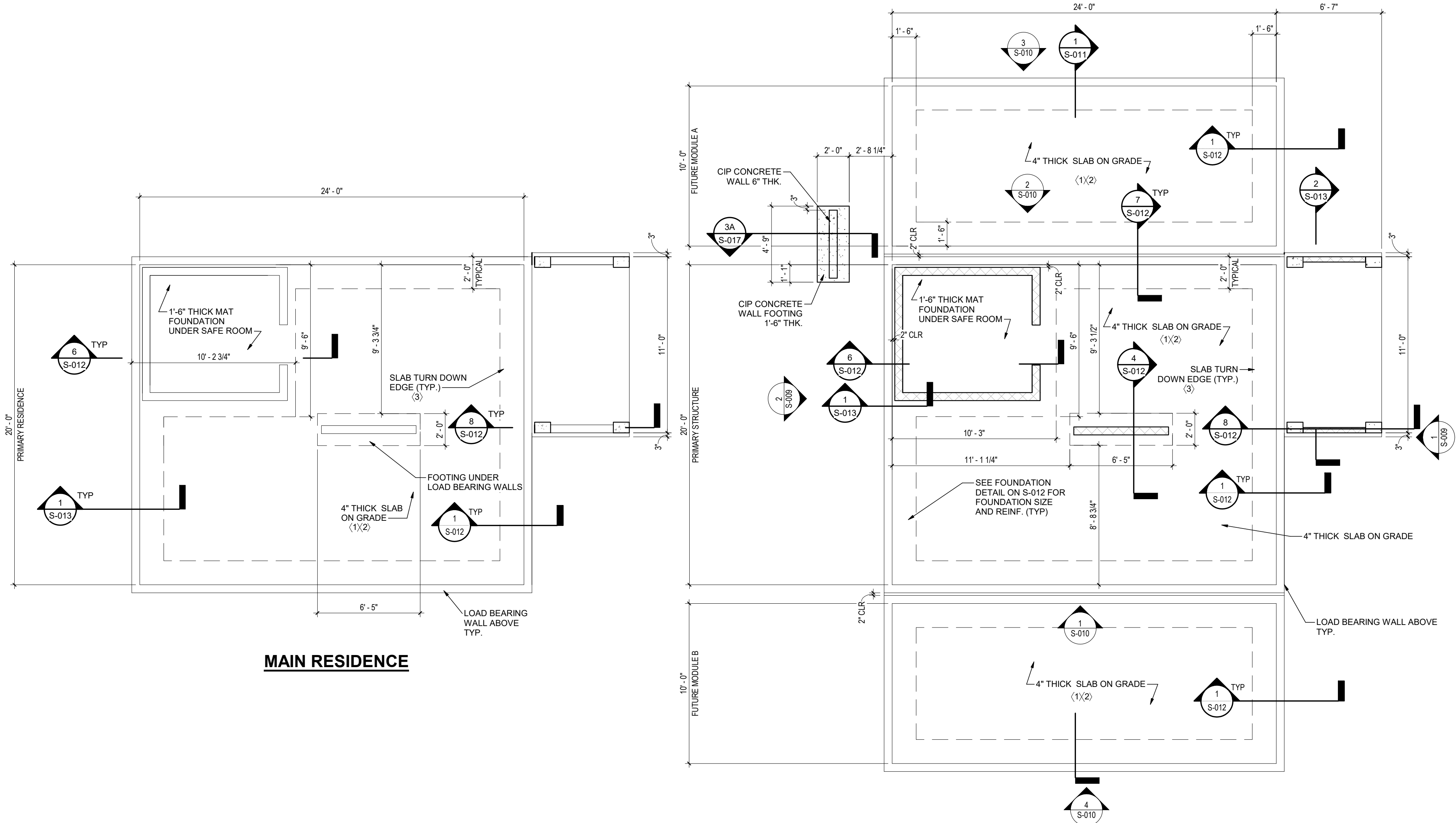
SHEET TITLE:

Schedules and Hook Types

SHEET INFORMATION:

JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-004
QC Review:	
Phase:	

NOT FOR CONSTRUCTION



STRUCTURAL NOTES:

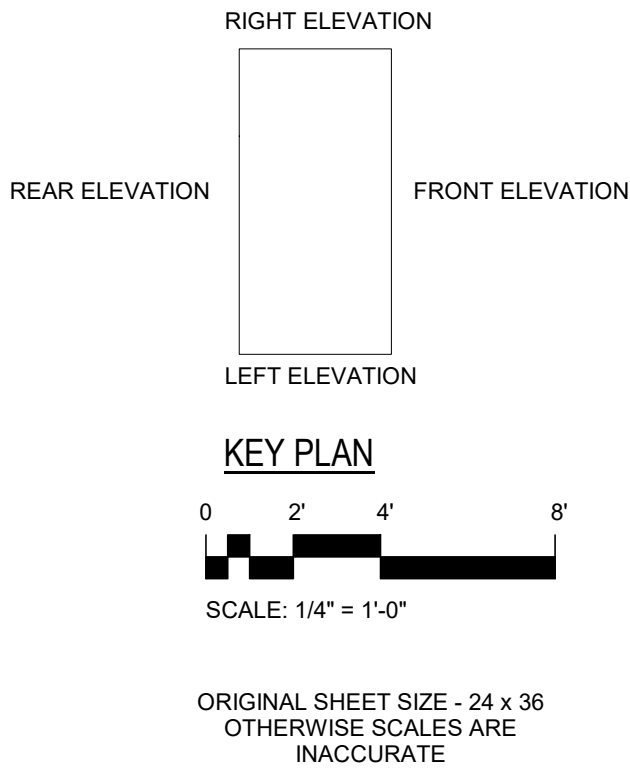
1. MAIN RESIDENCE (PRIMARY STRUCTURE) TO BE BUILT PRIOR OR SIMULTANEOUSLY WITH BUILDING MODULES. MODULES SHALL NOT BE CONSTRUCTED WITHOUT CONSTRUCTING THE PRIMARY STRUCTURE.
2. SEE SECTIONS FOR CONCRETE STEEL REINFORCING.
3. COORDINATE DOOR/WINDOW OPENINGS WITH ARCH. DWGS.
4. COORDINATE WITH OTHER DISCIPLINES AND TRADES FOR LOCATIONS AND DIMENSIONS OF OPENINGS, RECESSES, SLEEVES, AND PIPING.
5. DIMENSIONS INDICATED ARE FROM FACE OF UNFINISHED WALL, UNLESS NOTED OTHERWISE.

DRAWING KEY NOTES:

- ① SLAB ON GRADE SHALL BE A MINIMUM 4" THICK CONCRETE WITH 4" x 4" W8 x W8 WWF
- ② TOP OF SLAB ELEVATION IS AT 0'-0" (DATUM ELEVATION). ALL OTHER ELEVATIONS ARE REFERENCED AS + OR - FROM DATUM.
- ③ BOTTOM OF FDN = 1'-6" BELOW FINISHED FLOOR ASSUMING A FLAT SITE WITH LEVEL GROUND ON ALL SIDES OF STRUCTURE.

1
S-005
1/4" = 1'-0"

FOUNDATION PLANS



NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

**TWO STORY
CMU AND 2ND
FL. WOOD
HOME**

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGP+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.

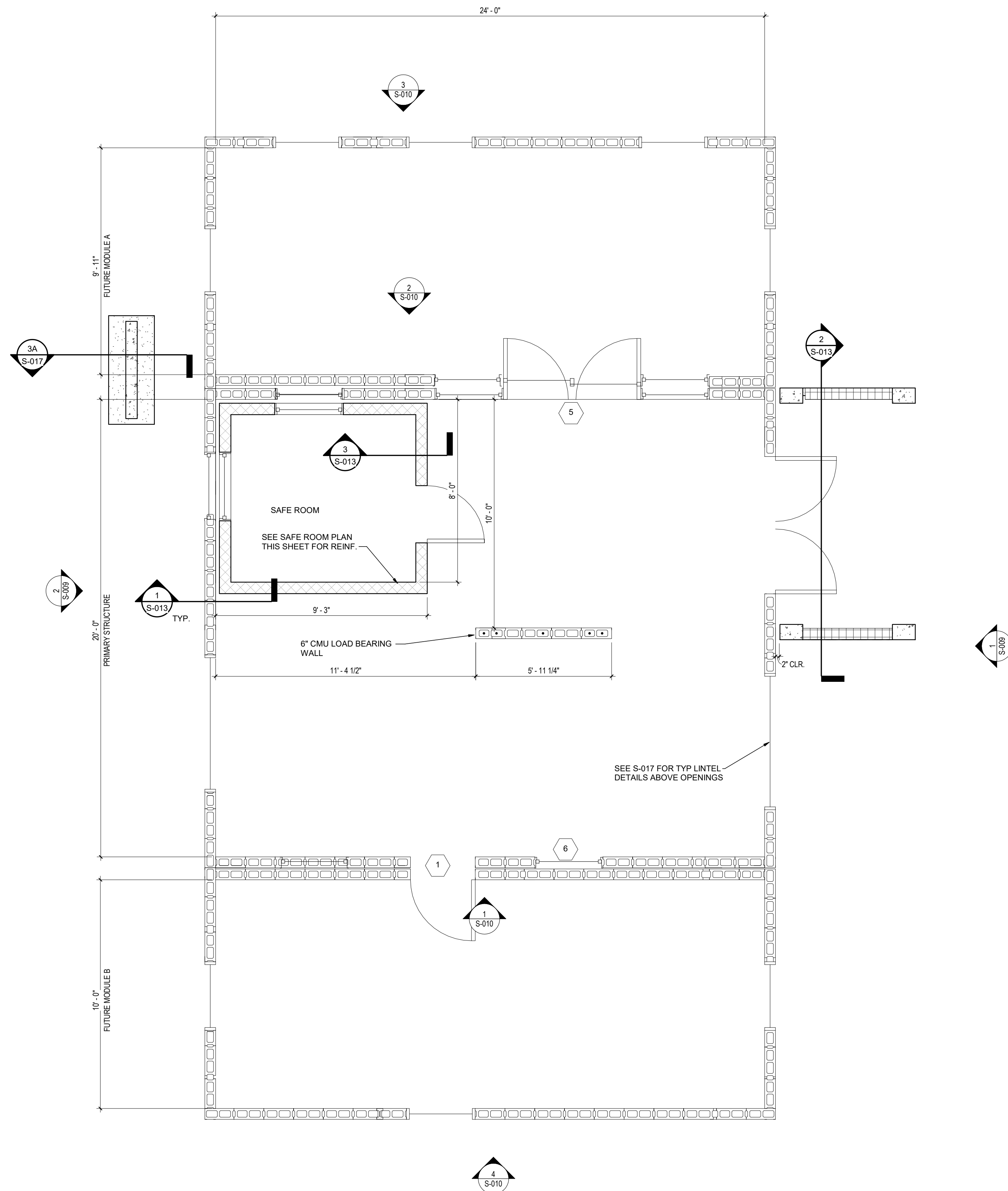
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

Foundation Plans

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-005
Checked By:	
QC Review:	
Phase:	



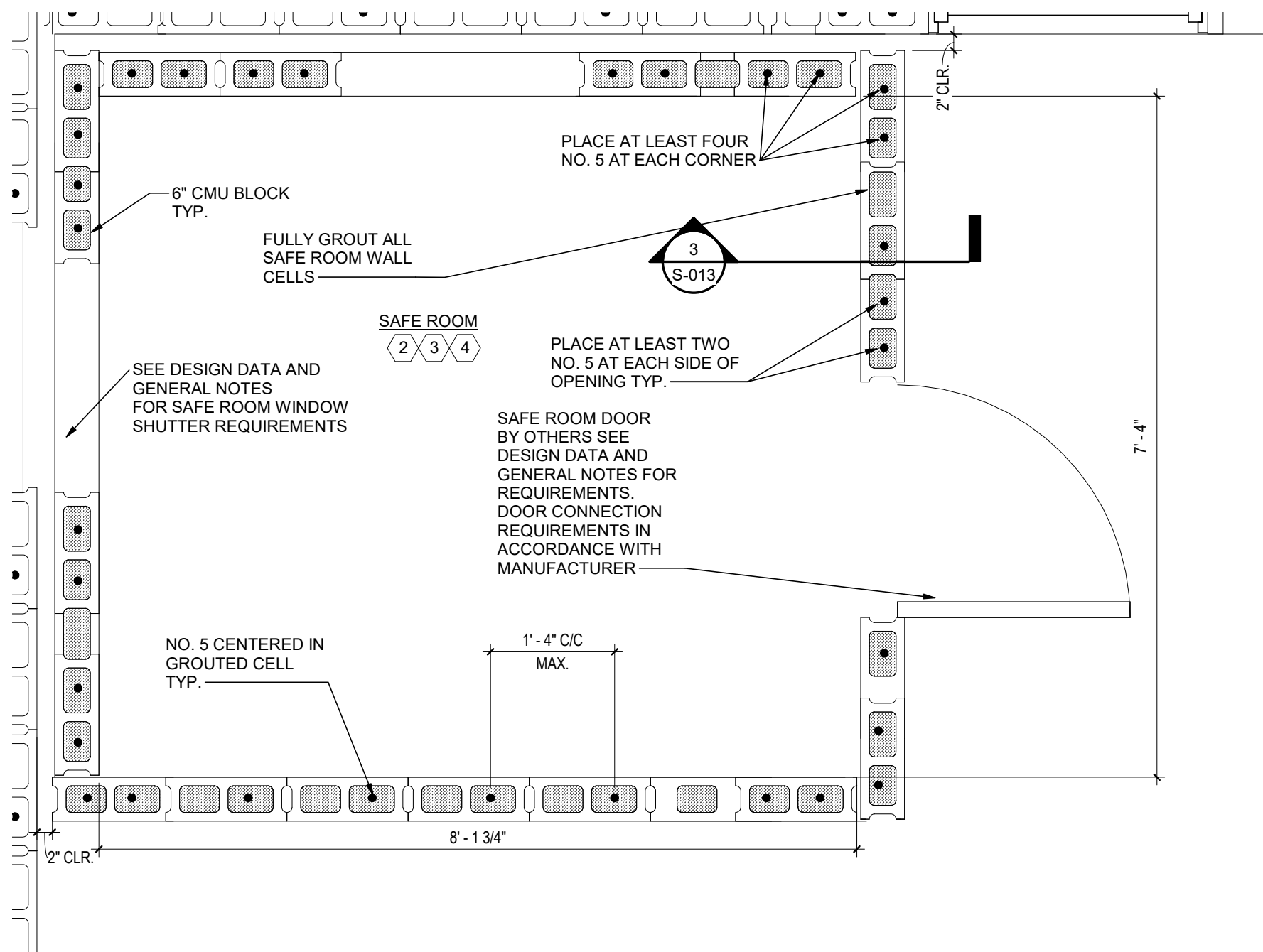
1
S-006
FIRST FLOOR PLAN
3/8" = 1'-0"

STRUCTURAL NOTES

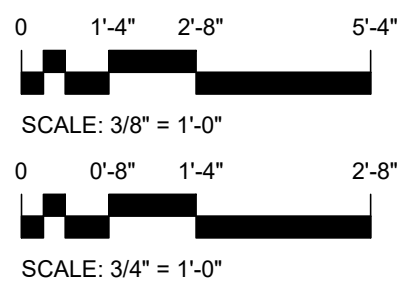
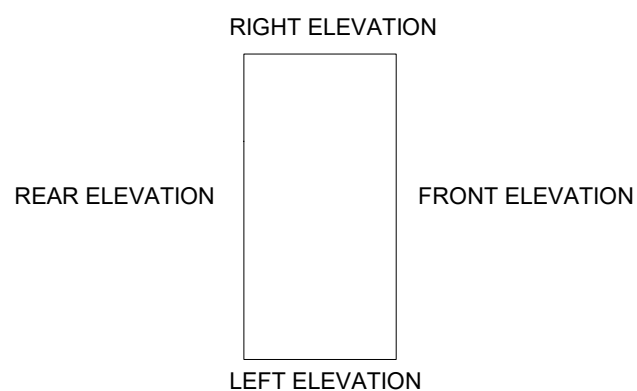
1. MAIN RESIDENCE FOUNDATION AND STRUCTURE TO BE BUILT PRIOR OR SIMULTANEOUSLY TO BUILDING MODULES.
2. SEE SECTIONS FOR MASONRY AND CONCRETE STEEL REINFORCING.
3. MODULES ARE NOT ATTACHED TO PRIMARY STRUCTURE. SEE S-009 FOR FLOOR JOINT DETAIL.
4. COORDINATE DOOR AND WINDOW OPENING LOCATIONS WITH ARCH. DWGS.
5. ALL MASONRY CELLS WITH REBAR SHALL BE FULLY GROUTED. SEE S-013 FOR TYPICAL PRIMARY STRUCTURE AND MODULE WALL REINFORCING. SEE ELEVATIONS FOR ADDITIONAL SHEAR WALL REINFORCING.

DRAWING KEY NOTES

- ① PROVIDE DOOR AT THIS LOCATION ONLY WHEN BUILDING MODULE. SEE TYPICAL FLOOR JOINT DETAIL ON S-012.
- ② PROVIDE 2" CLR BETWEEN SAFE ROOM WALLS AND ANY ADJACENT WALLS.
- ③ PROVIDE DOOR AND WINDOW SHUTTERS MEETING SAFE ROOM REQUIREMENTS. SEE STRUCTURAL GENERAL NOTES.
- ④ SEE "TYPICAL LINTEL DETAIL" ON S-017 FOR LINTEL ABOVE DOORS AND WINDOWS.
- ⑤ SEE TYPICAL FLOOR JOINT DETAIL ON S-012.
- ⑥ WINDOW NOT REQUIRED IF MODULE IS CONSTRUCTED AT THE SAME TIME AS PRIMARY RESIDENCE.



3
S-006
SAFE ROOM PLAN
3/4" = 1'-0"



ORIGINAL SHEET SIZE - 24 x 36
OTHERWISE SCALES ARE
INACCURATE

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

**TWO STORY
CMU AND 2ND
FL. WOOD
HOME**

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGP+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.

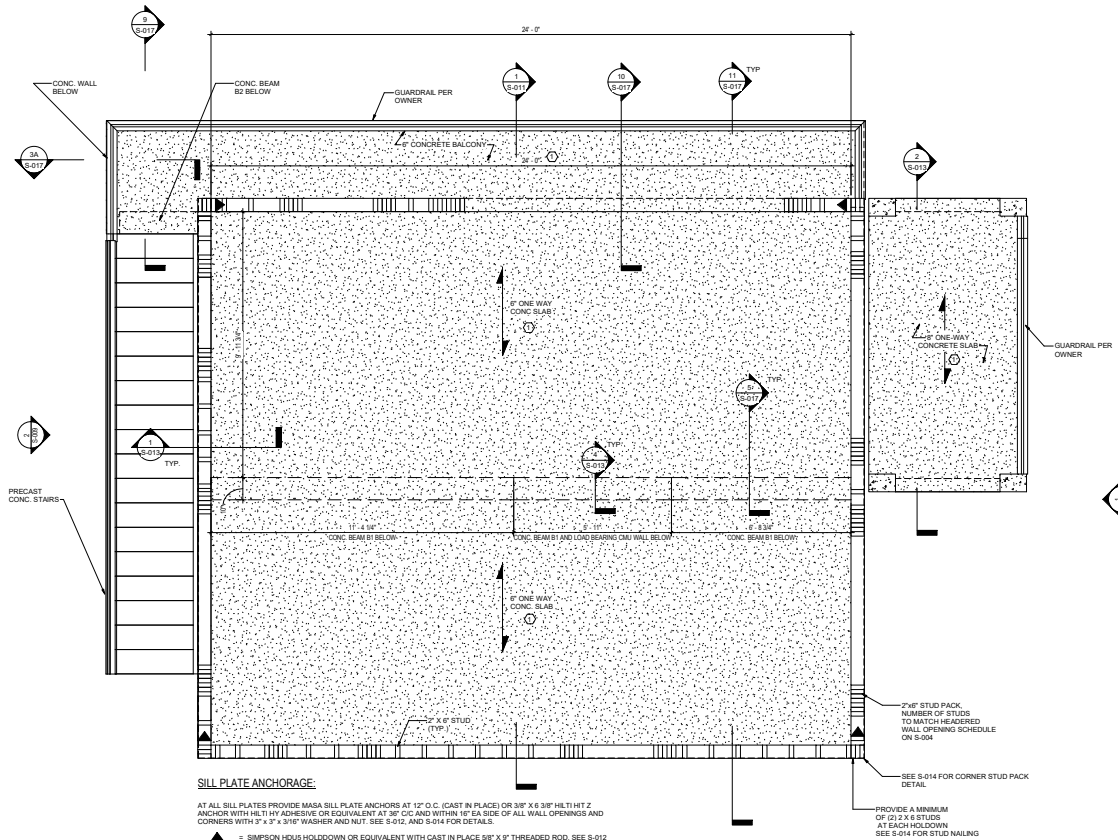
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

First Floor Plan

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-006
QC Review:	
Phase:	



1 SECOND FLOOR FRAMING PLAN
1/2" = 1'-0"

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (ODEC), PERMITS MANAGEMENT OFFICE (OPM-DOEC) 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 ODEC, PERMITS MANAGEMENT OFFICE UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS

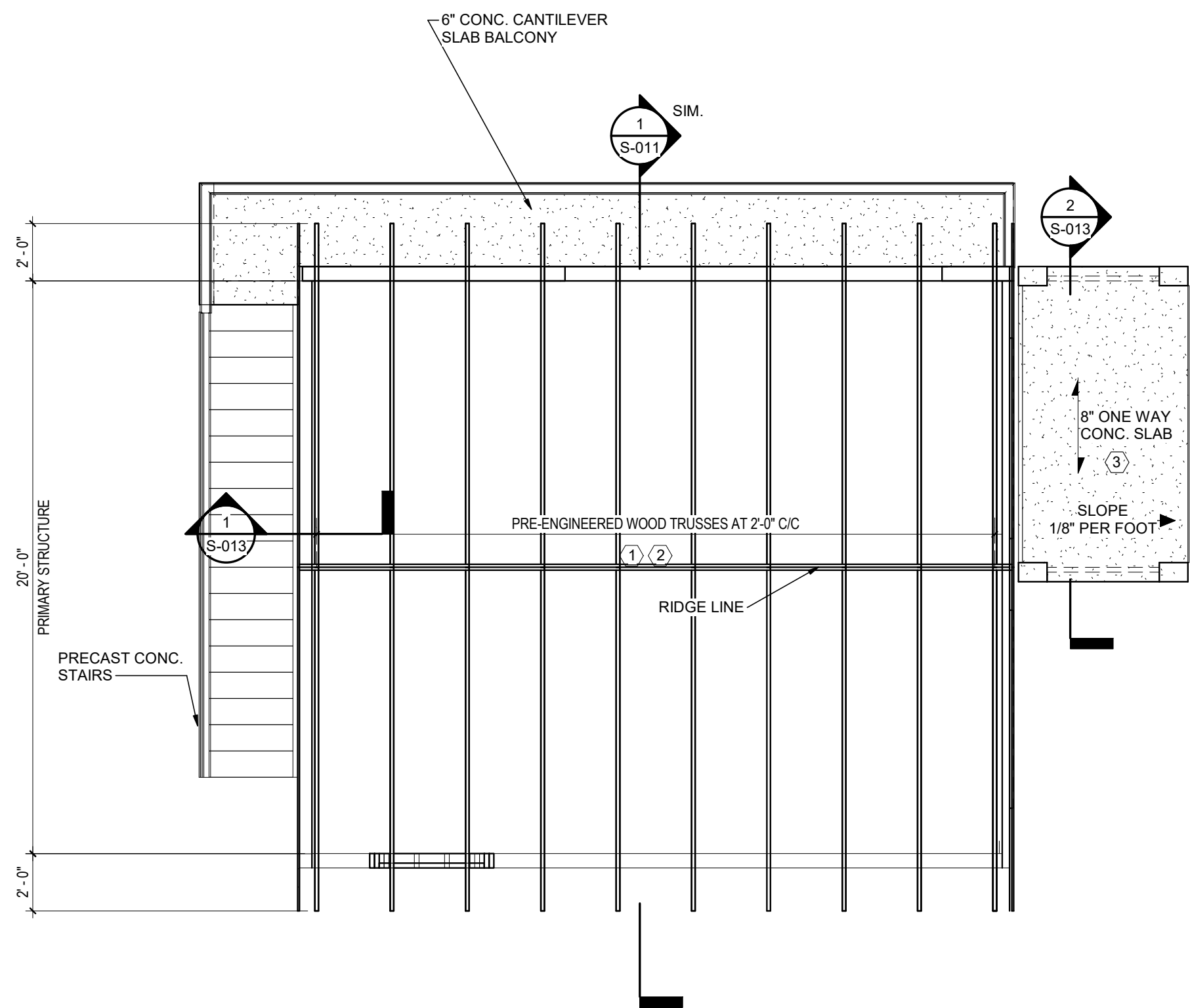
SHEET TITLE:

Second Floor Framing Plan

SHEET INFORMATION:

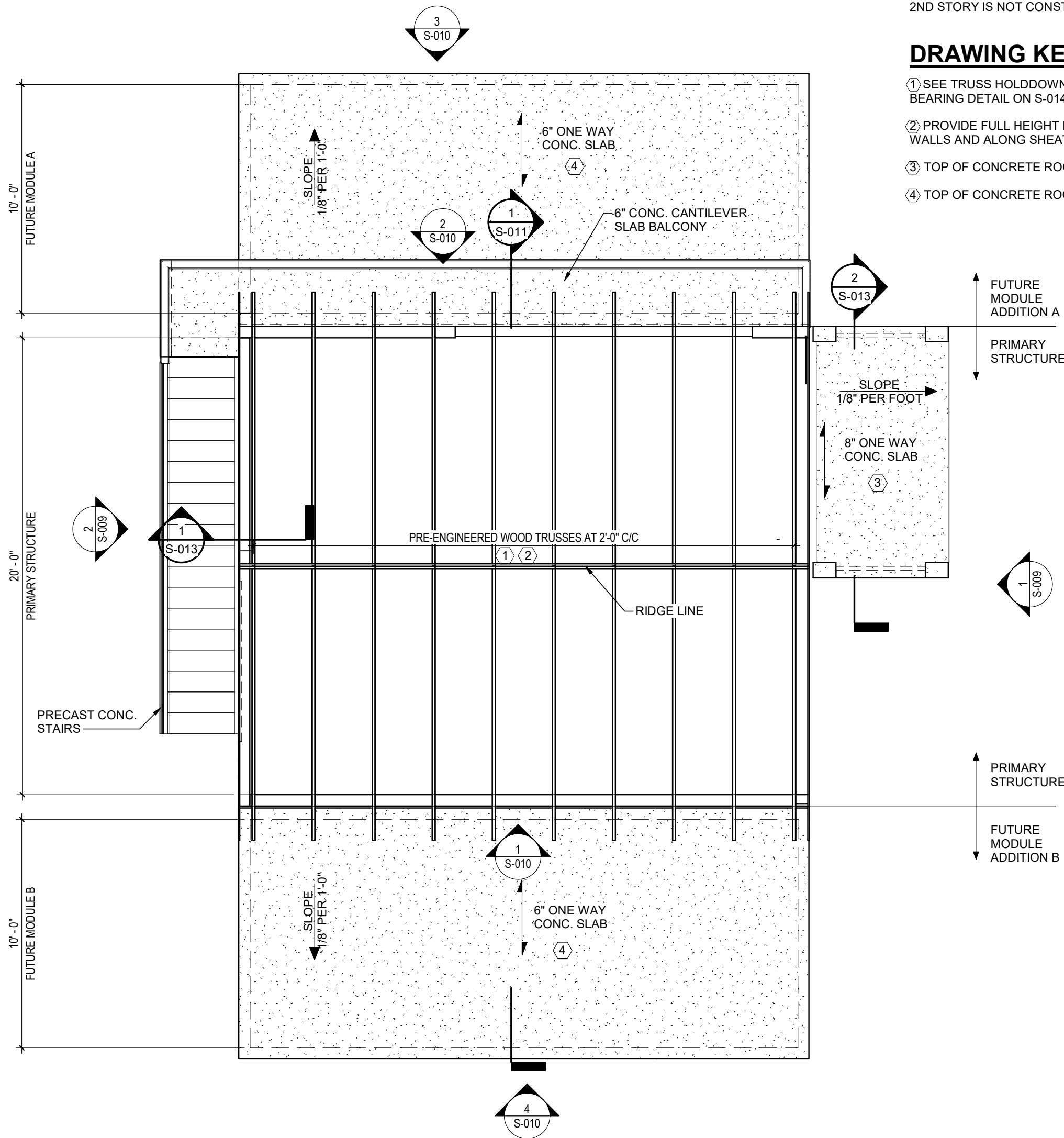
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	
OC Review:	
Phase:	

S-007



MAIN RESIDENCE

1 ROOF FRAMING PLANS
S-008 1/4" = 1'-0"



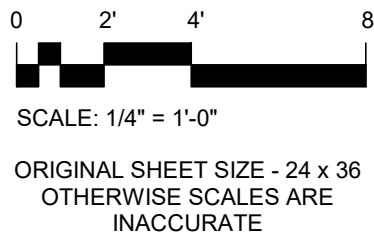
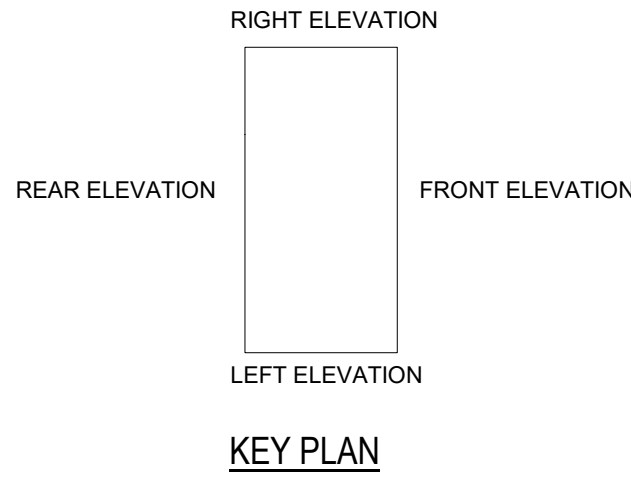
MAIN RESIDENCE WITH FUTURE MODULES

STRUCTURAL NOTES:

1. SECOND STORY CAN BE BUILT IMMEDIATELY FOLLOWING CONSTRUCTION OF THE 1ST STORY (CAST IN PLACE) OR AT A LATER TIME (POST INSTALLED).
2. SEE S-015 FOR TYPICAL GABLE END BRACING DETAIL AND FOR CONTINUOUS LATERAL RESTRAINT FOR TRUSSES.
3. DO NOT PLACE A CISTERN ON THE ROOF/2ND FLOOR SLAB WITHOUT ADDITIONAL REINFORCEMENT. CONCRETE SLAB IS NOT INTENDED TO SUPPORT A ROOF CISTERN WHEN 2ND STORY IS NOT CONSTRUCTED.

DRAWING KEY NOTES:

- ① SEE TRUSS HOLDDOWN DETAIL AND TRUSS BEARING DETAIL ON S-014.
- ② PROVIDE FULL HEIGHT BLOCKING ABOVE BEARING WALLS AND ALONG SHEATHING EDGES.
- ③ TOP OF CONCRETE ROOF ELEVATION = 18' - 6"
- ④ TOP OF CONCRETE ROOF ELEVATION = 9' - 2"



NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY
CMU AND 2ND
FL. WOOD
HOME

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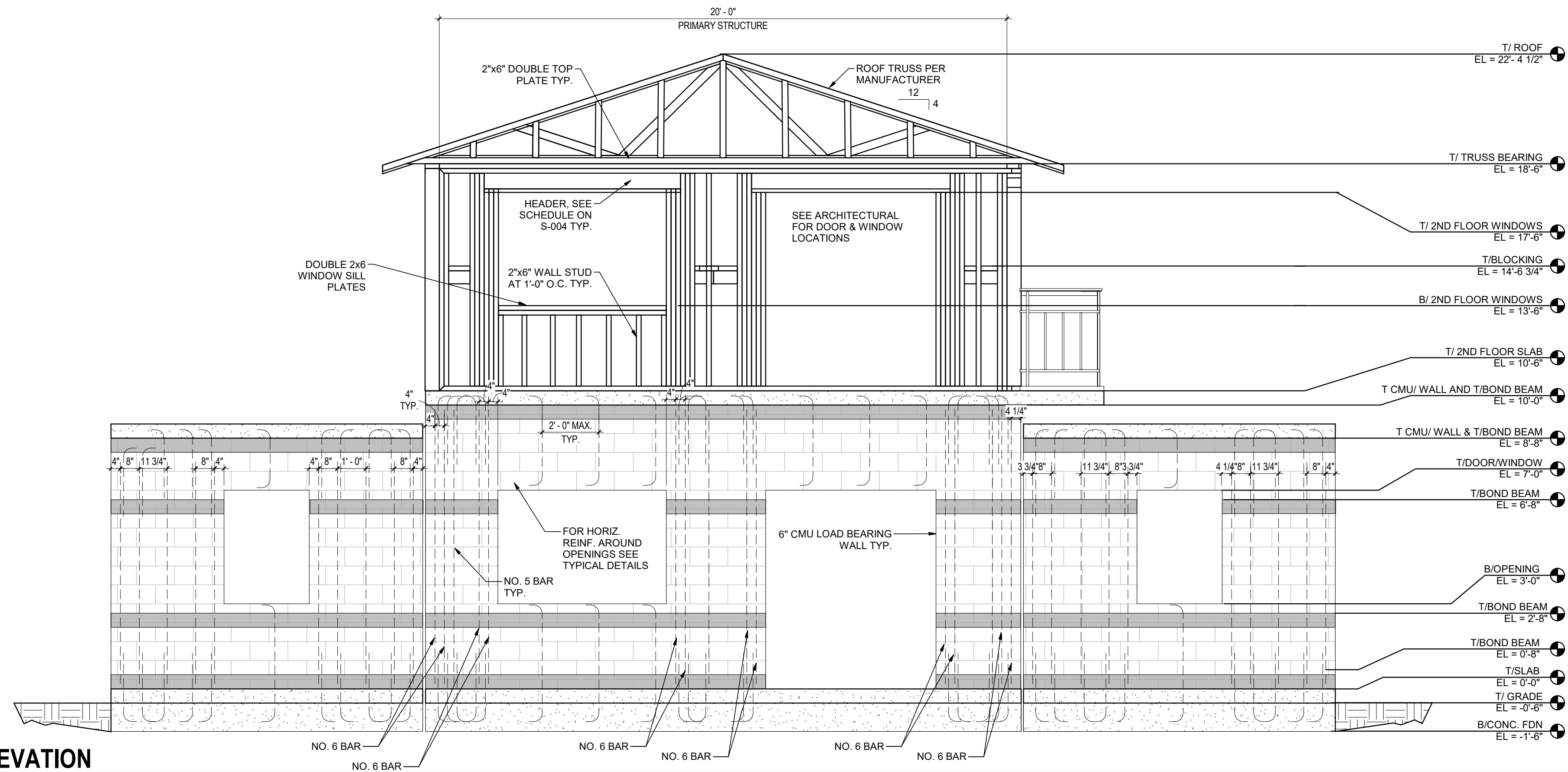
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No.	Date	Description

PROFESSIONAL SEALS:

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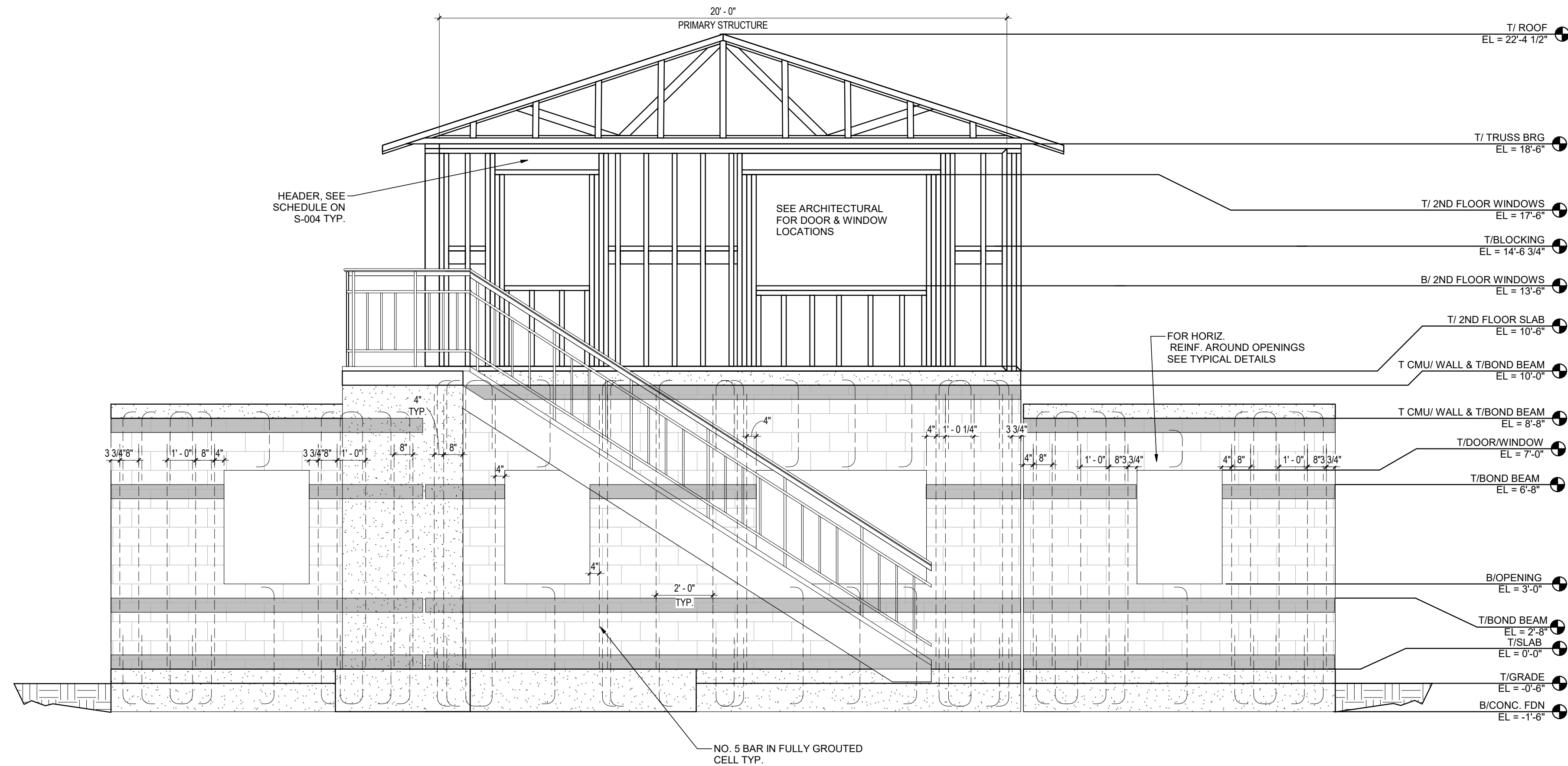
Roof Framing Plans

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-008
Checked By:	
QC Review:	
Phase:	



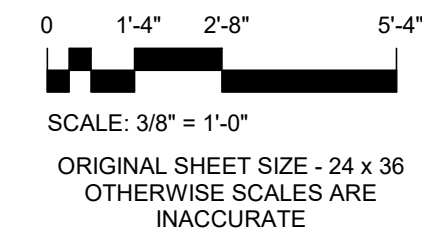
1 FRONT ELEVATION

3/8" = 1'-0"



2 REAR ELEVATION

3/8" = 1'-0"



NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD 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:

Primary Structure Elevations

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-009
QC Review:	
Phase:	

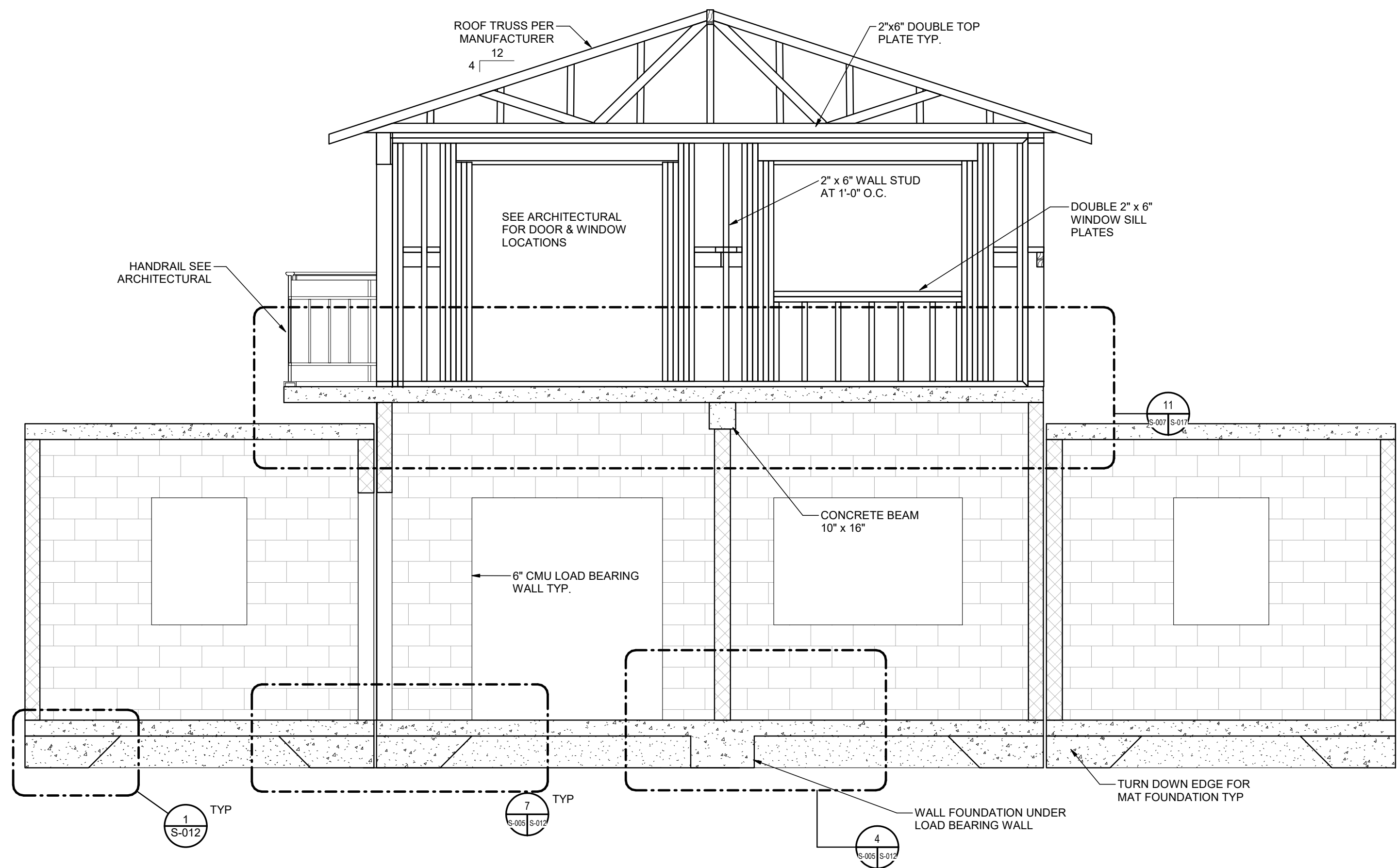
2 RIGHT ELEVATION PRIMARY RESIDENCE
S-010 3/8" = 1'-0"

4 EXPANSION MODULE B LEFT ELEVATION

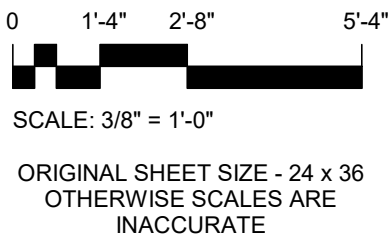
EXPANSION MODULE A RIGHT ELEVATION

JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: <div style="font-size: 2em; font-weight: bold;">S-010</div>
Checked By:	
QC Review:	
Phase:	

NOT FOR CONSTRUCTION



SECTION 1
3/8" = 1'-0"



NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

**TWO STORY
CMU AND 2ND
FL. WOOD
HOME**

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGP+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.

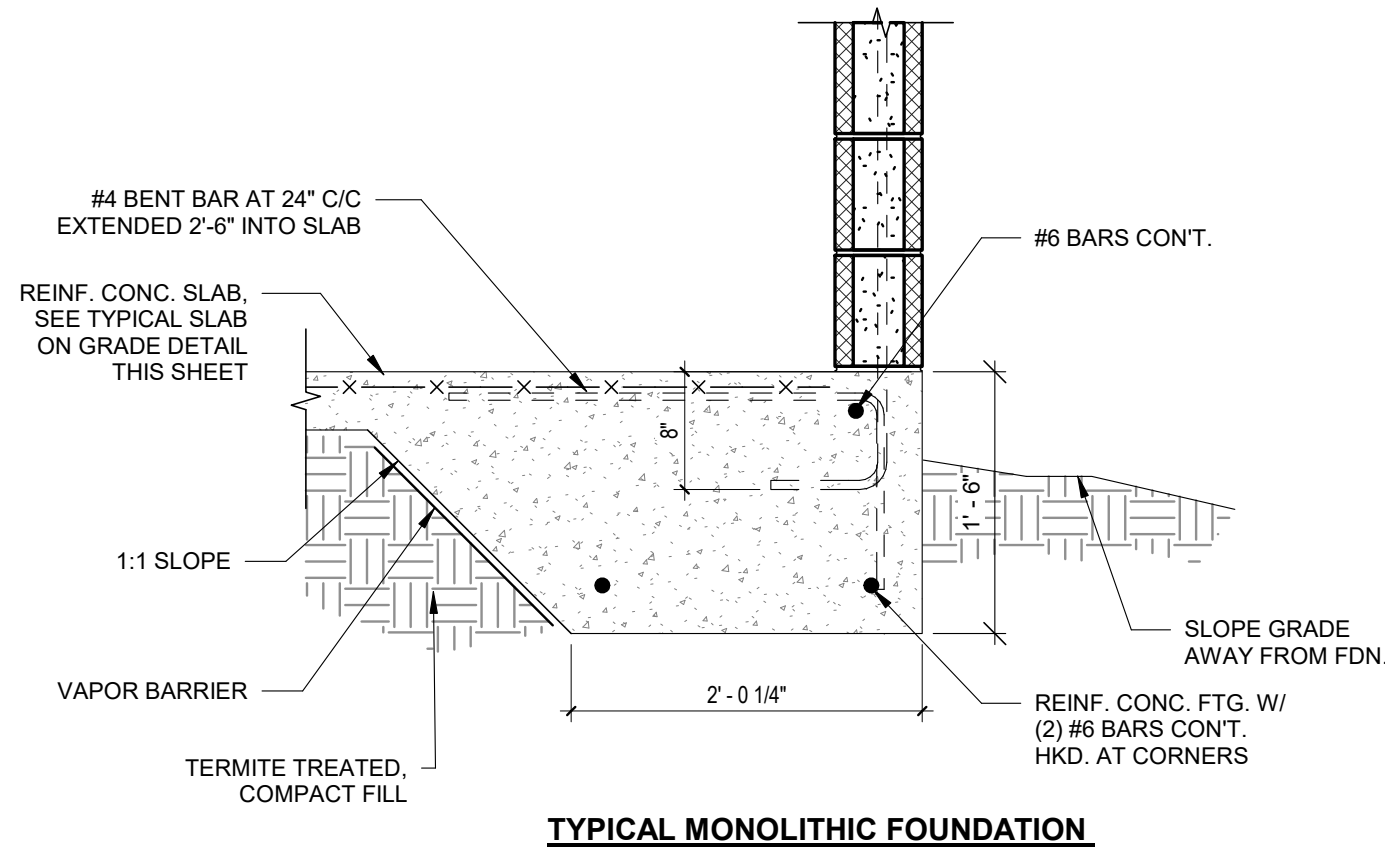
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

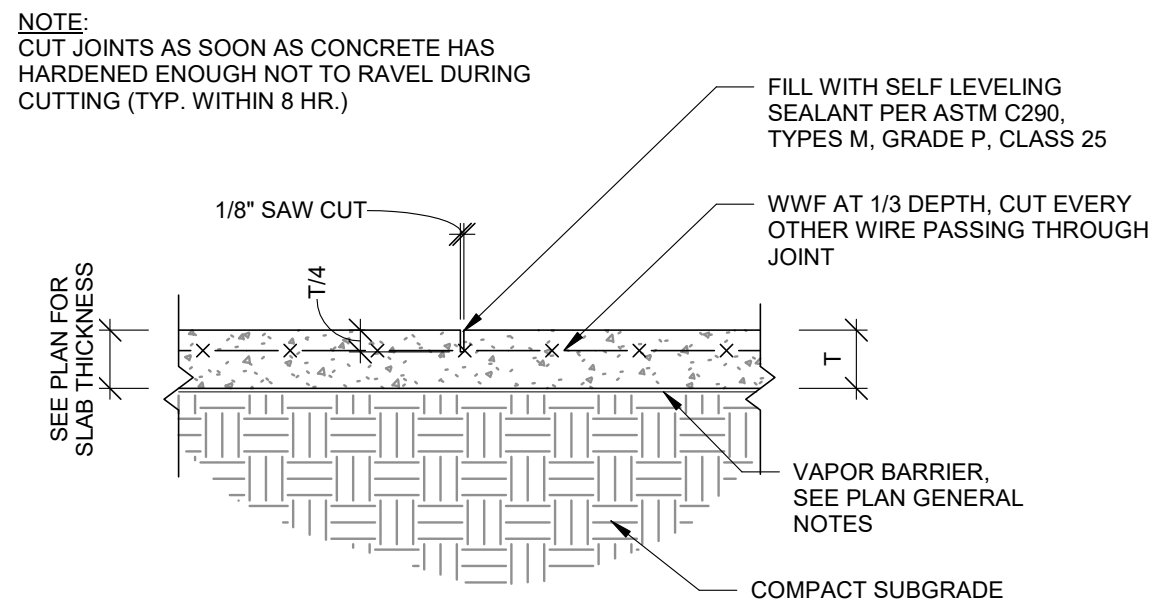
Sections

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-011
Checked By:	
QC Review:	
Phase:	

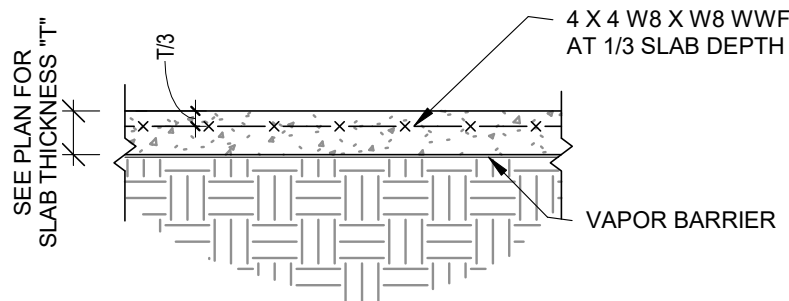


TYPICAL MONOLITHIC FOUNDATION

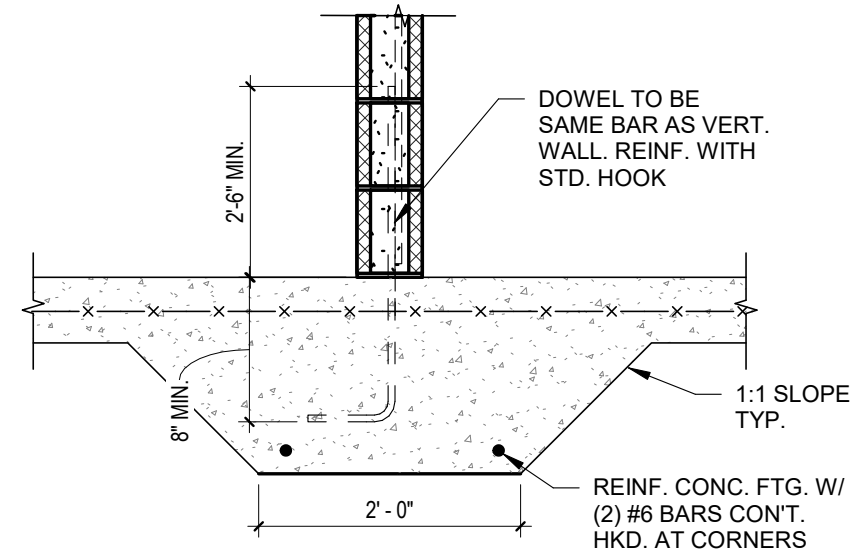
1 FOUNDATION DETAIL
S-012 1" = 1'-0"



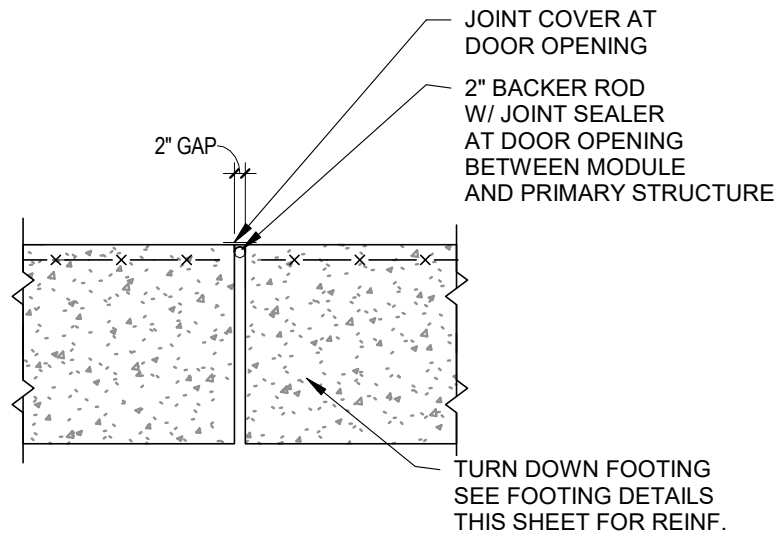
2 CONTROL JOINT DETAIL
S-012 1" = 1'-0"



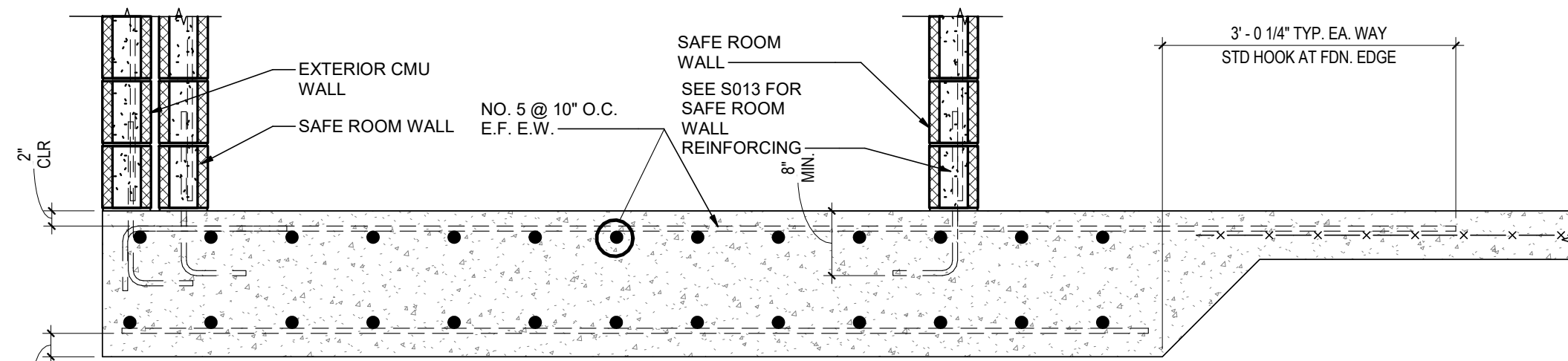
3 TYPICAL SLAB ON GRADE DETAIL
S-012 3/4" = 1'-0"



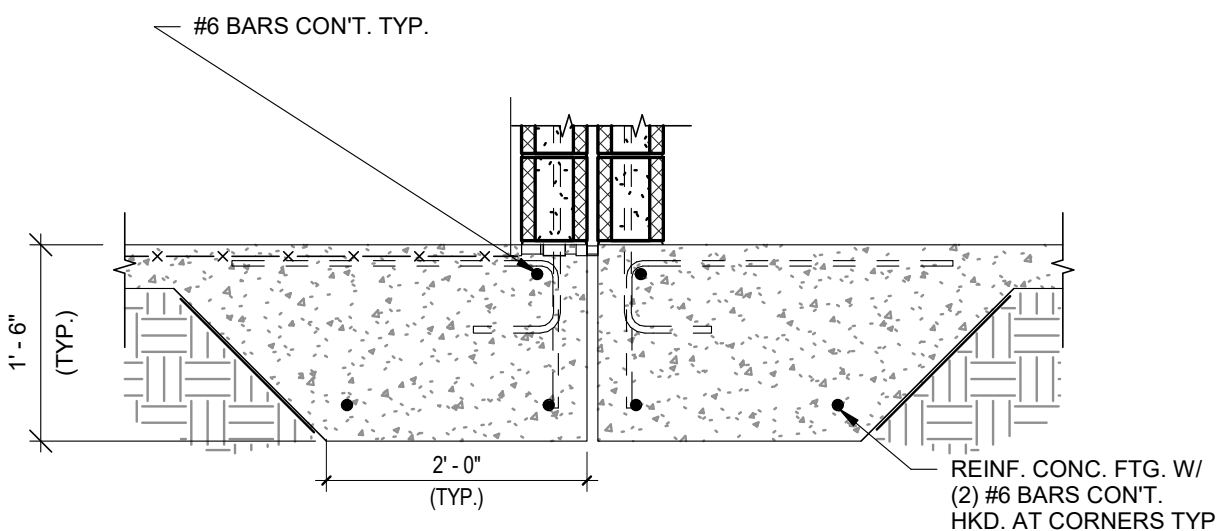
4 TYPICAL INTERIOR FOUNDATION DETAIL
S-012 3/4" = 1'-0"



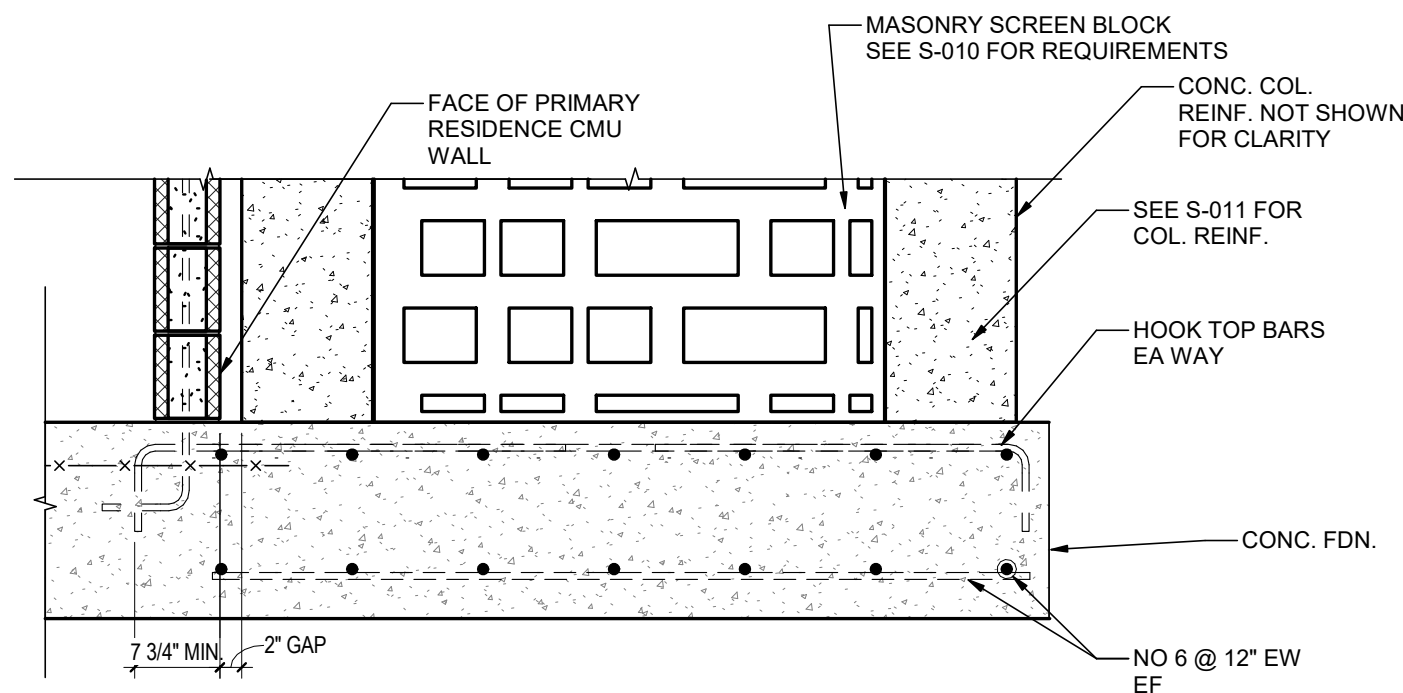
5 TYPICAL FLOOR JOINT DETAIL
S-012 3/4" = 1'-0"



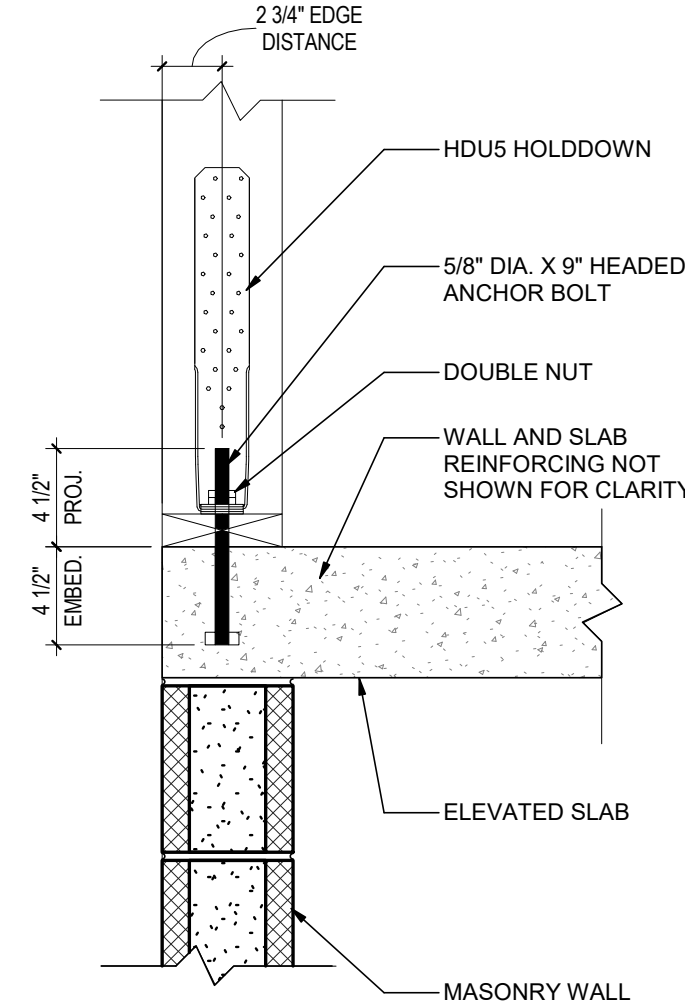
6 TYPICAL SAFE ROOM FOUNDATION SECTION
S-012 3/4" = 1'-0"



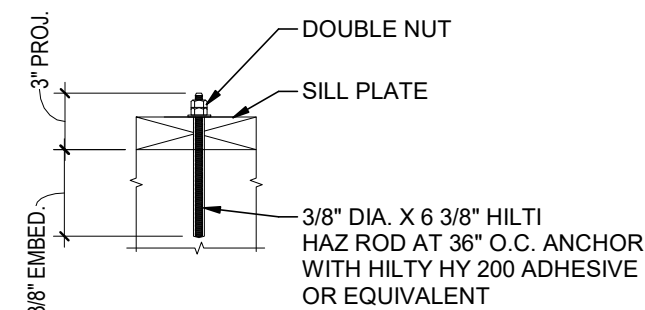
7 TYPICAL FOUNDATION DETAIL AT PRIMARY STRUCTURE AND MODULE INTERFACE
S-012 3/4" = 1'-0"



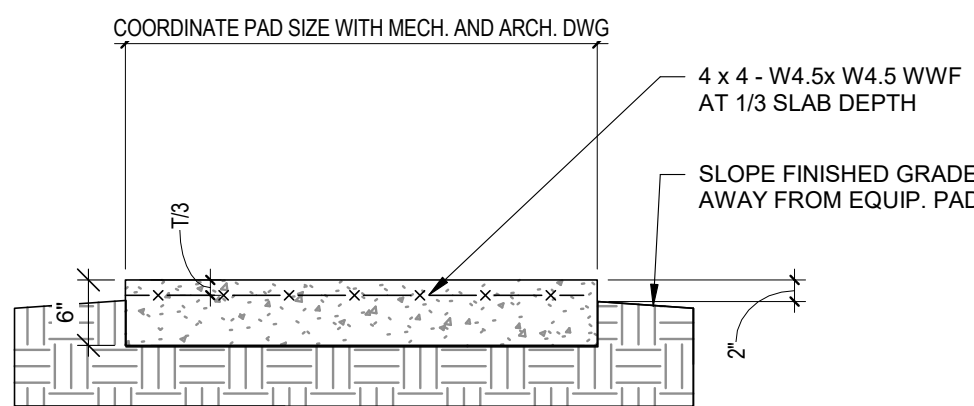
8 OPTIONAL CONCRETE ENTRYWAY FOUNDATION
S-012 3/4" = 1'-0"



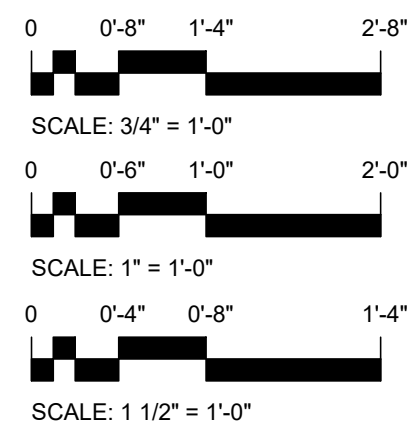
9 HOLDDOWN DETAIL
S-012 1 1/2" = 1'-0"



10 POST INSTALLED SILL ANCHOR DETAIL
S-012 1 1/2" = 1'-0"



11 TYPICAL EXT. MECH. EQUIP. PAD
S-012 3/4" = 1'-0"



ORIGINAL SHEET SIZE - 24 x 36
OTHERWISE SCALES ARE INACCURATE

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

NOTE: PRIOR TO CONSTRUCTION CONTACT PUERTO RICO DEPARTMENT OF ECONOMIC DEVELOPMENT AND COMMERCE (DDEC), PERMITS MANAGEMENT OFFICE (OGP+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.

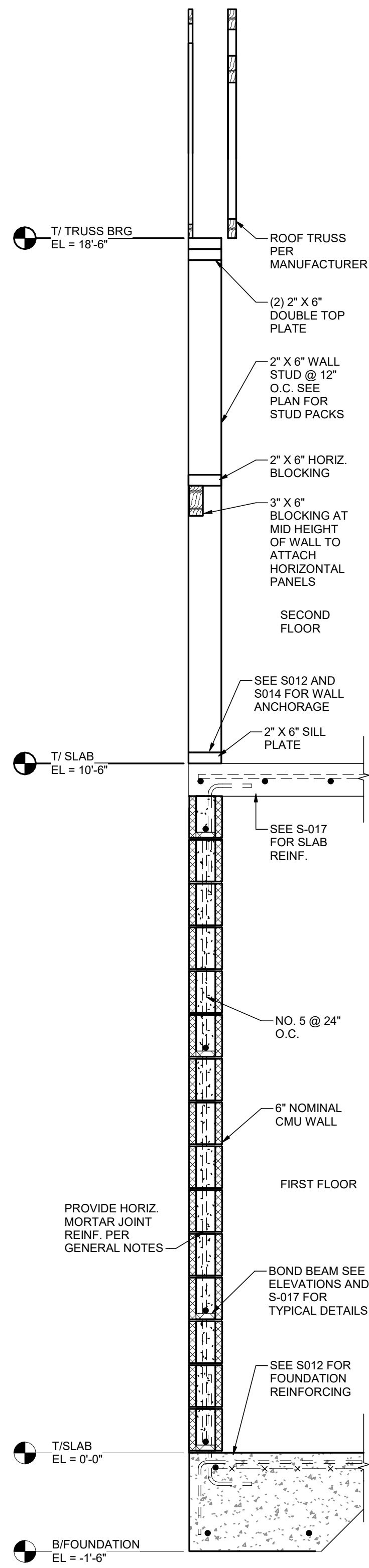
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

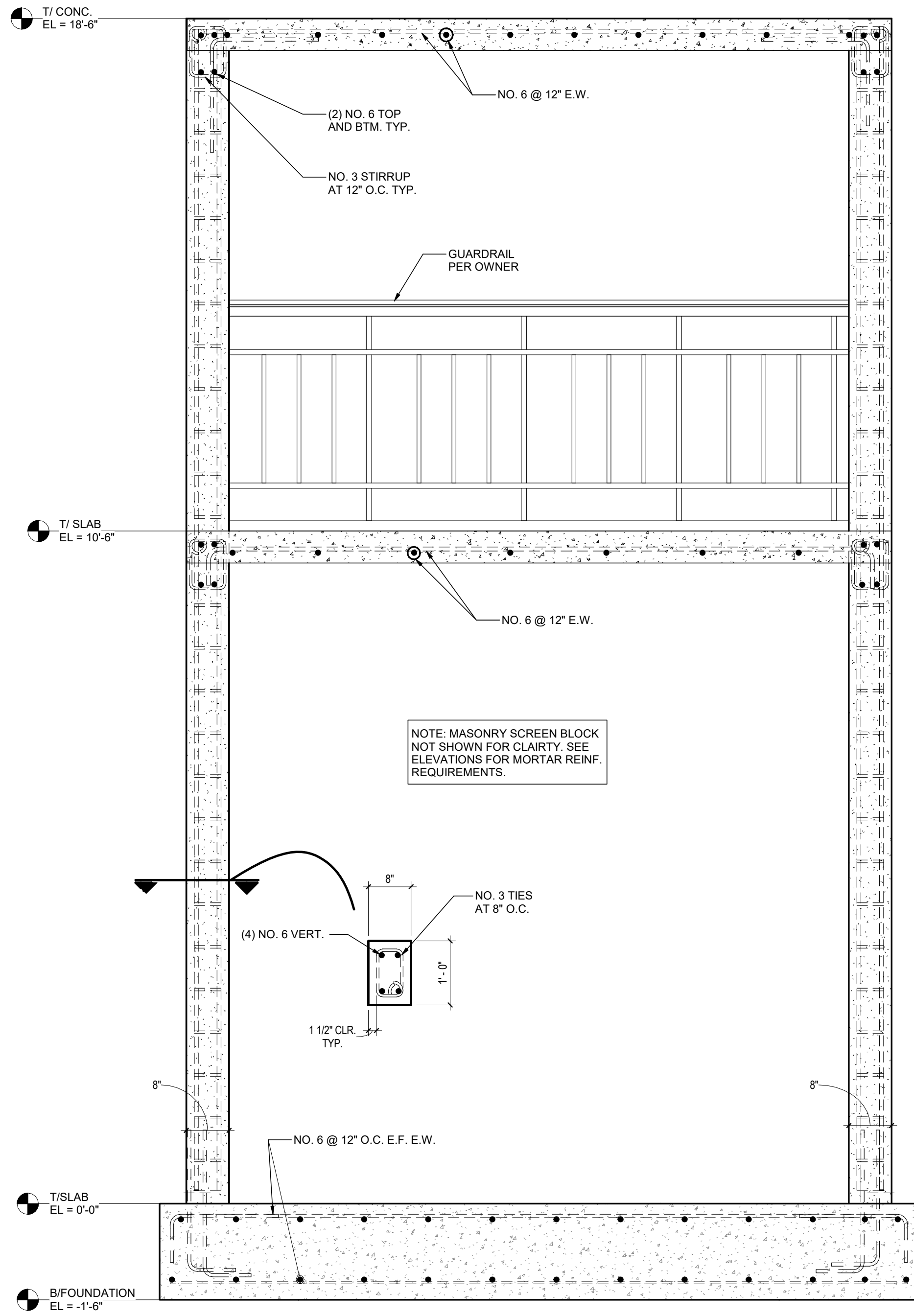
SHEET TITLE:

Foundation Sections and Details

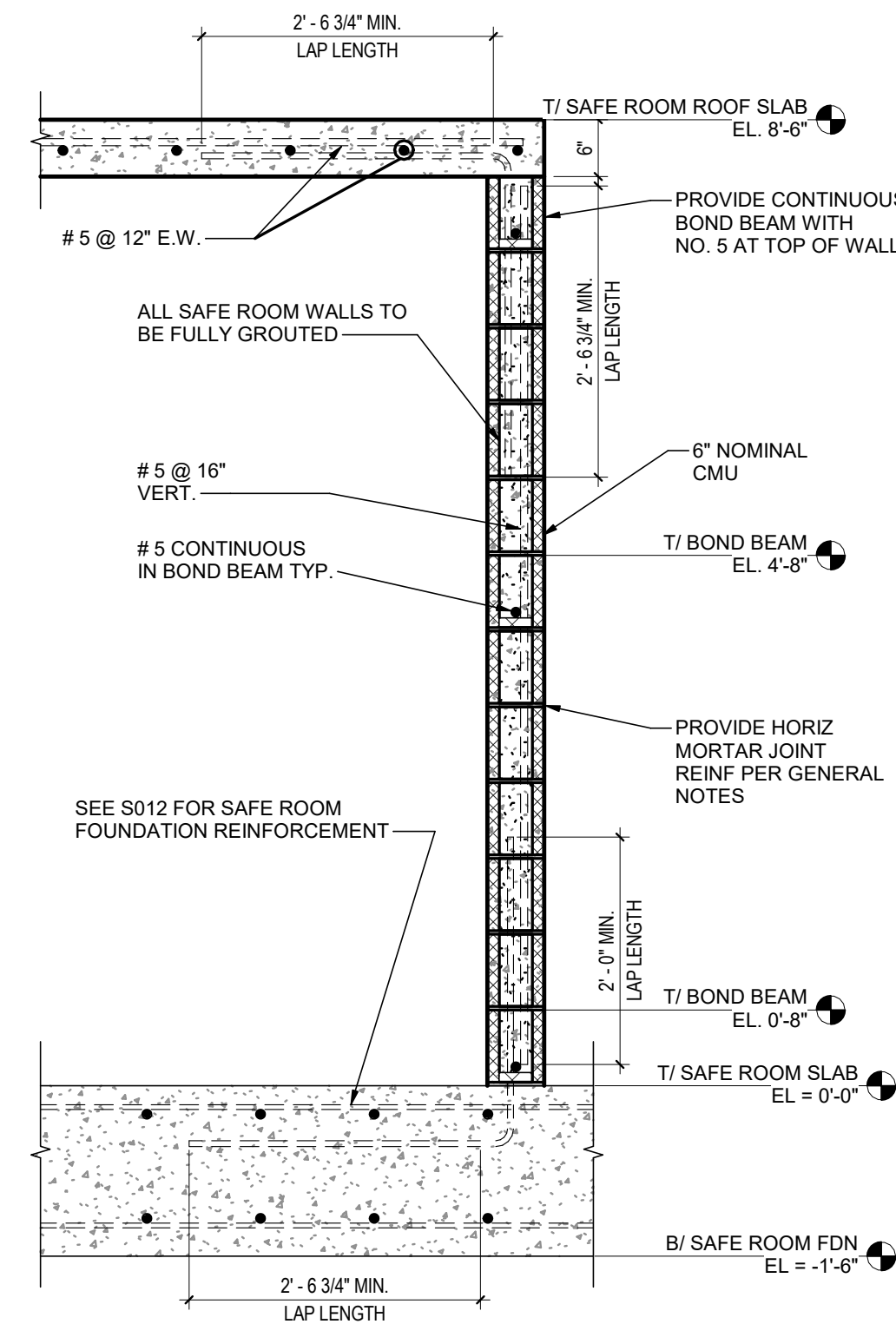
SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-012
QC Review:	
Phase:	



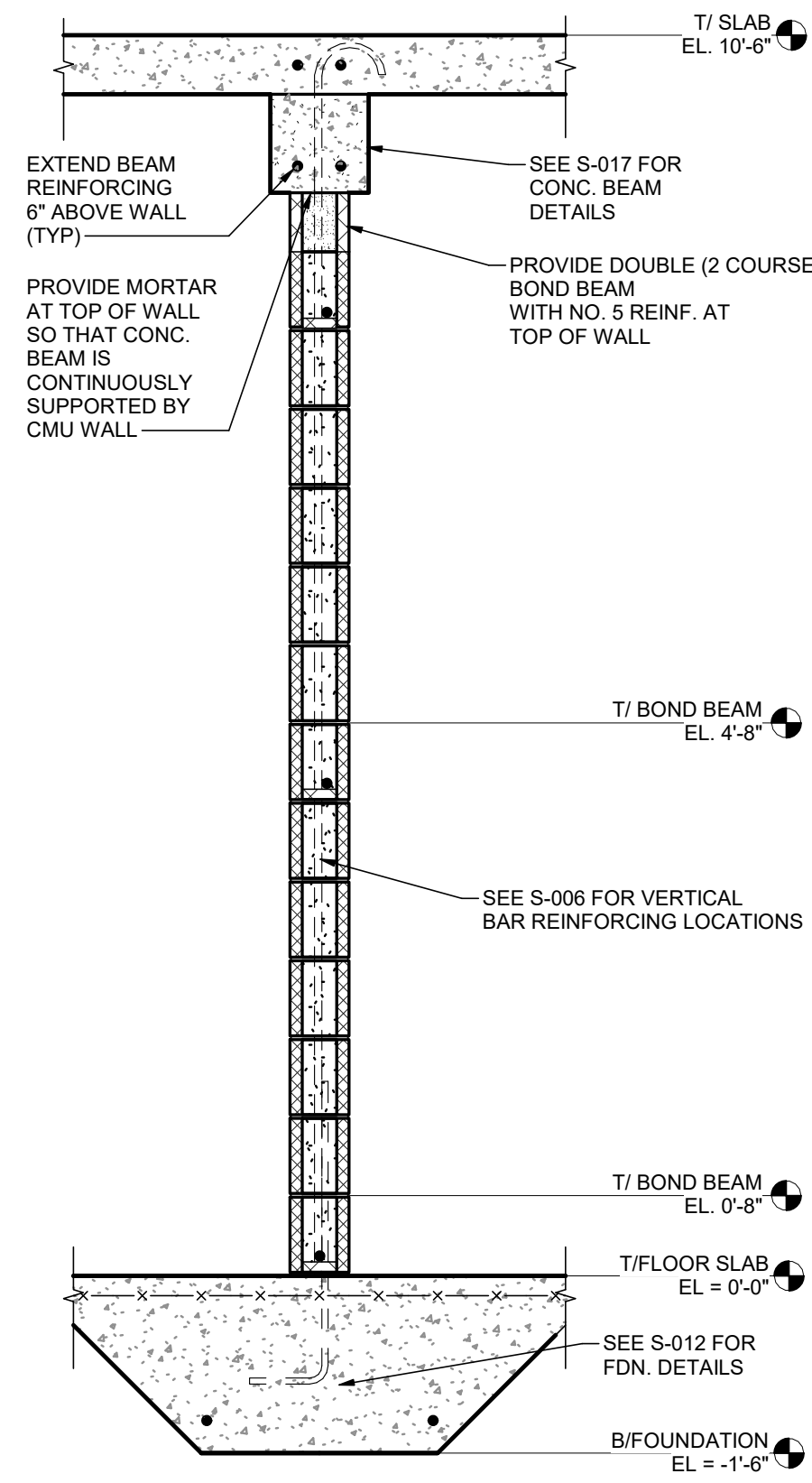
1
S-013
3/4" = 1'-0"



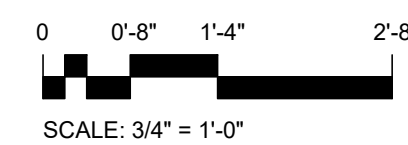
2
S-013
3/4" = 1'-0"



3
S-013
3/4" = 1'-0"



4
S-013
3/4" = 1'-0"



ORIGINAL SHEET SIZE - 24 x 36
OTHERWISE SCALES ARE
INACCURATE

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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APPROVED BY DDEC, PERMITS MANAGEMENT OFFICE
UPON SUBMISSION OF A BUILDING PERMIT APPLICATION.

ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

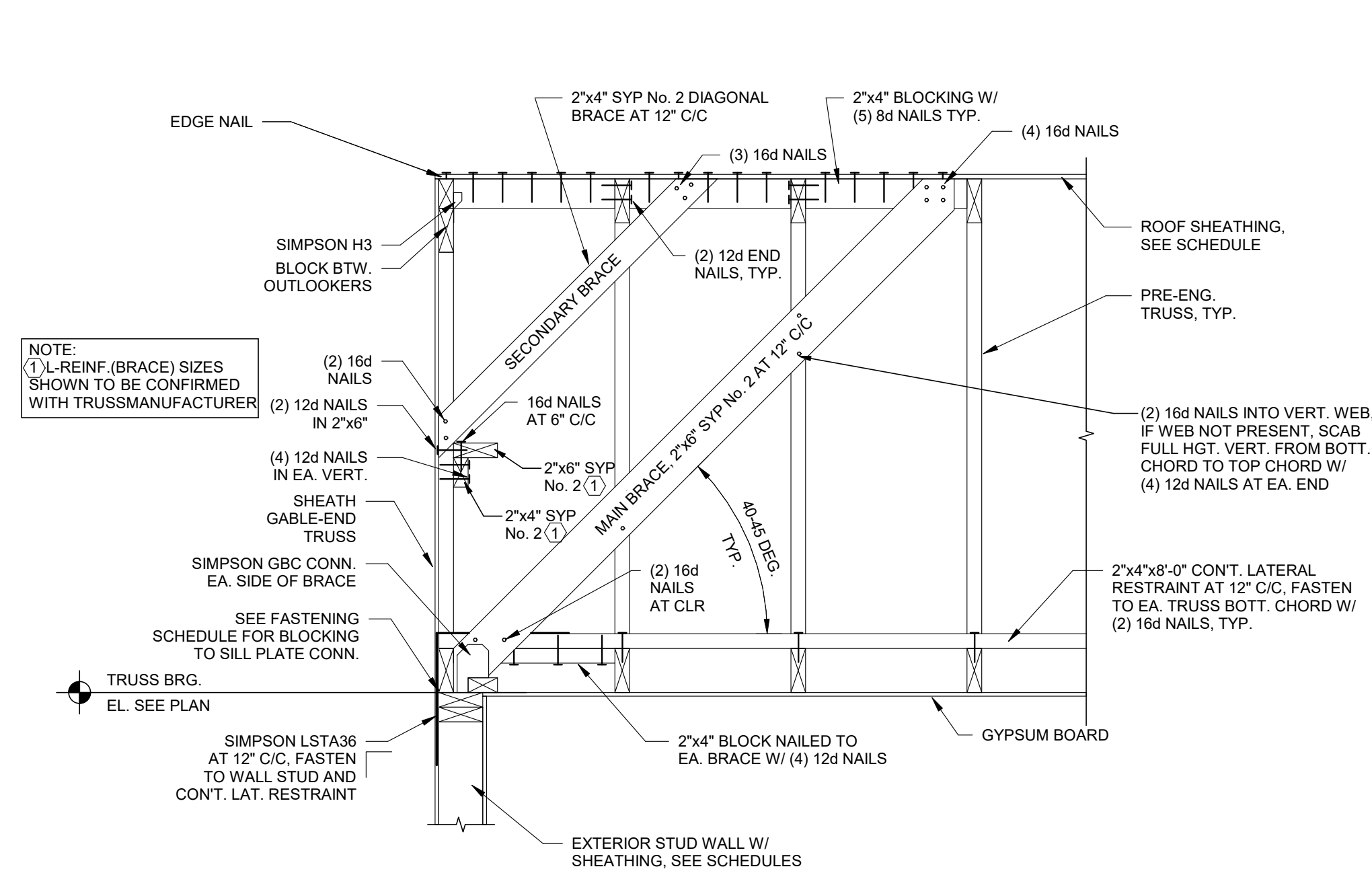
Wall Sections and Details

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-013
QC Review:	
Phase:	

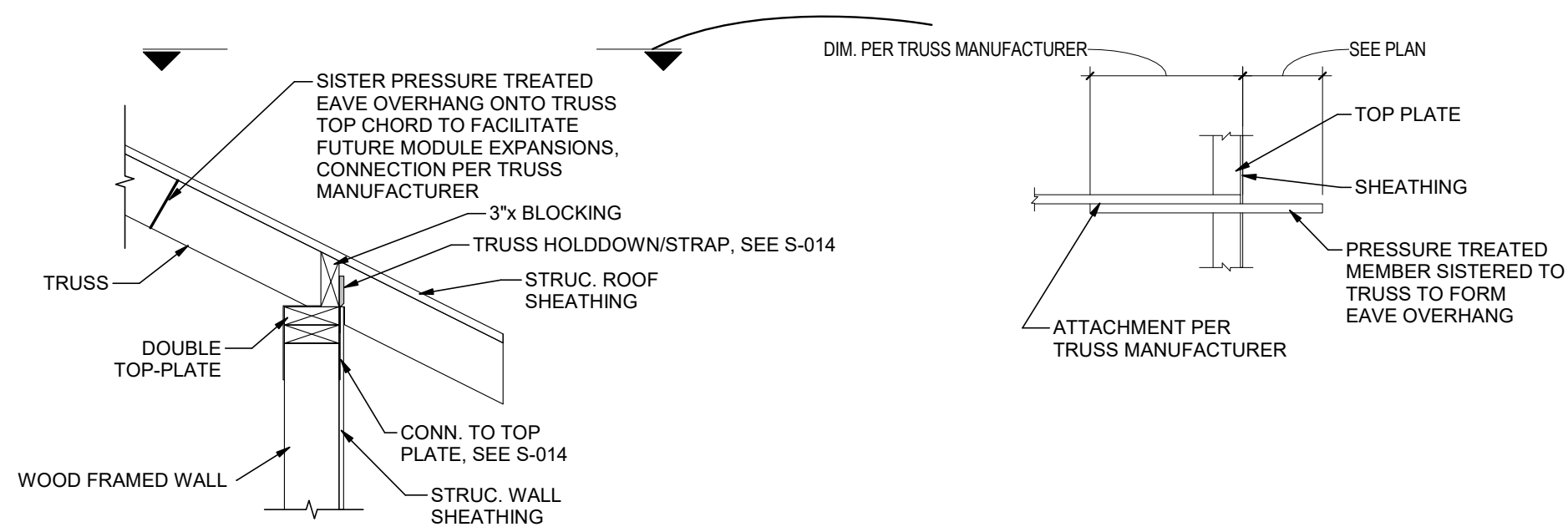


S-014

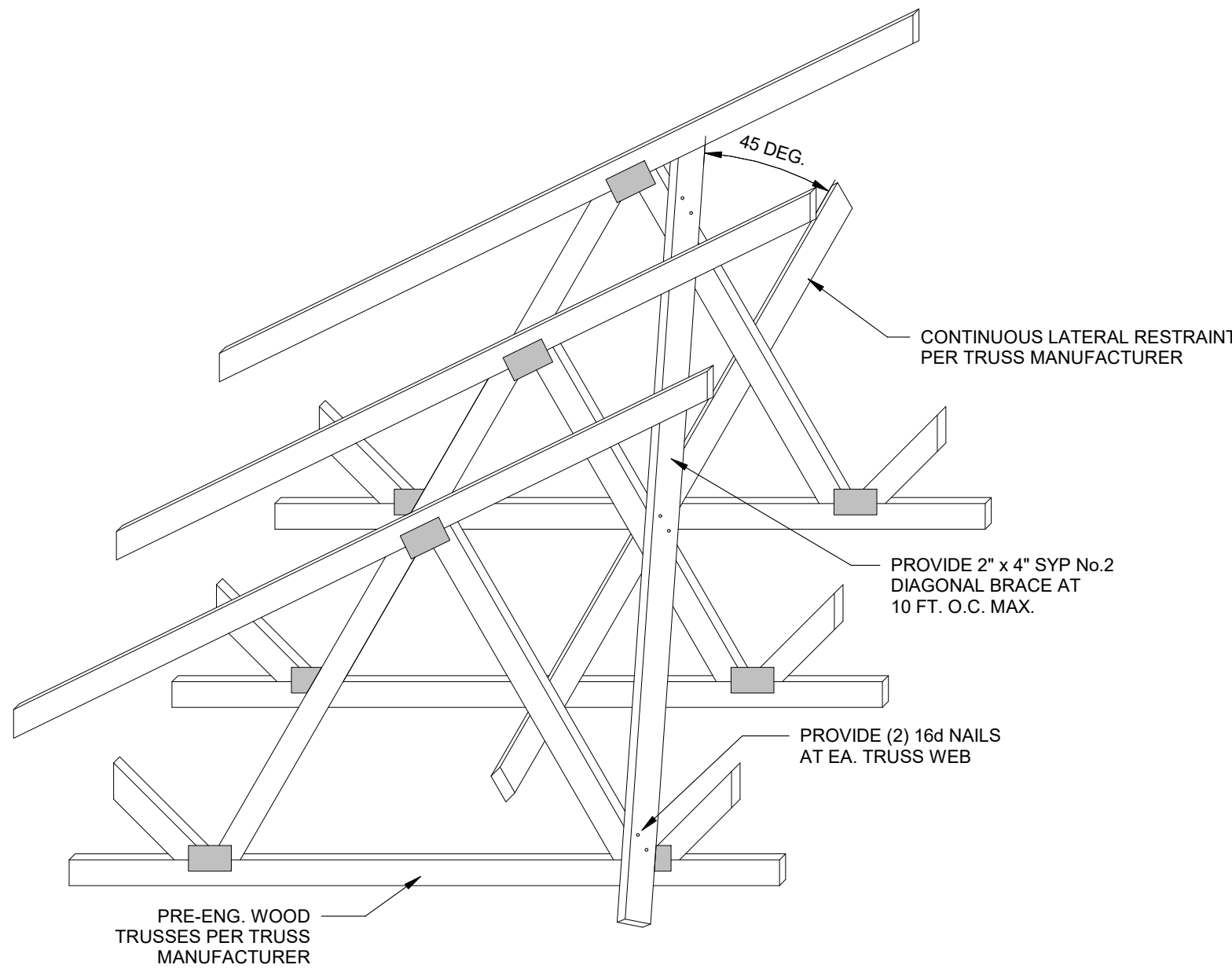
NOT FOR CONSTRUCTION



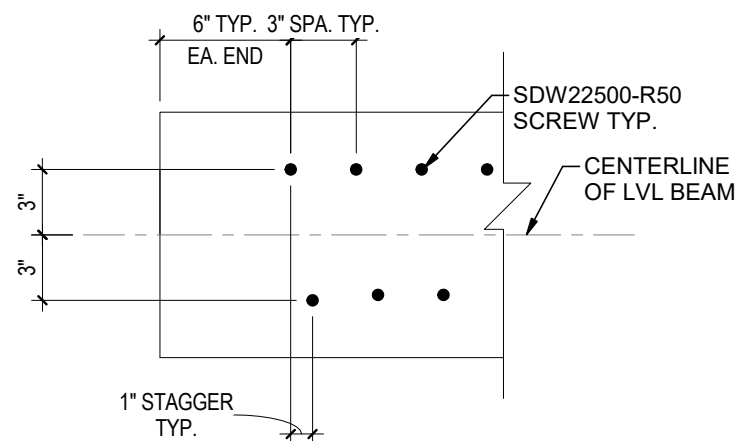
1 TYPICAL GABLE END BRACING DETAILS
3/4" = 1'-0"



3 TYPICAL ROOF TRUSS BEARING
3/4" = 1'-0"



2 BRACING AT CONTINUOUS LATERAL RESTRAINT (CLR)
3/8" = 1'-0"



4 TYPICAL LVL BEAM PLY CONNECTION
1 1/2" = 1'-0"

- NOTES:
- CHECK THE TRUSS DESIGN DRAWINGS (TDD) TO DETERMINE WHICH WEB MEMBERS (IF ANY) REQUIRE RESTRAINT.
 - RESTRAIN AND BRACE WITH:
 - INDIVIDUAL WEB MEMBER REINFORCEMENT (PER THE TRUSS MANUFACTURER) OR,
 - CONTINUOUS LATERAL RESTRAINT (PER THE TRUSS MANUFACTURER) & DIAGONAL BRACING
1. ATTACH EACH ROW OF CLR AT THE LOCATIONS SHOWN ON THE TDD.
2. INSTALL THE DIAGONAL BRACING SHOWN IN THE DETAIL AT AN ANGLE OF LESS THAN OR EQUAL TO 45 DEGREES TO THE CLR AND POSITION SO THAT IT CROSSES THE WEB IN CLOSE PROXIMITY TO THE CLR. ATTACH THE DIAGONAL BRACE AS CLOSE TO THE TOP AND BOTTOM CHORDS AS POSSIBLE AND TO EACH WEB IT CROSSES. REPEAT EVERY 10 FT. OR LESS.

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TWO STORY CMU AND 2ND FL. WOOD HOME

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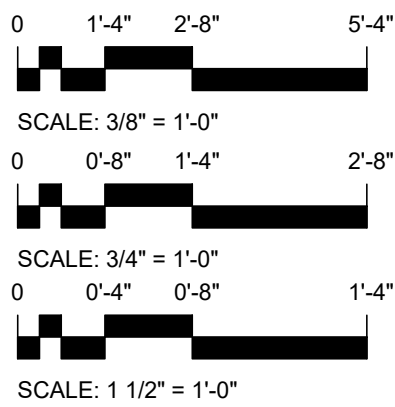
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

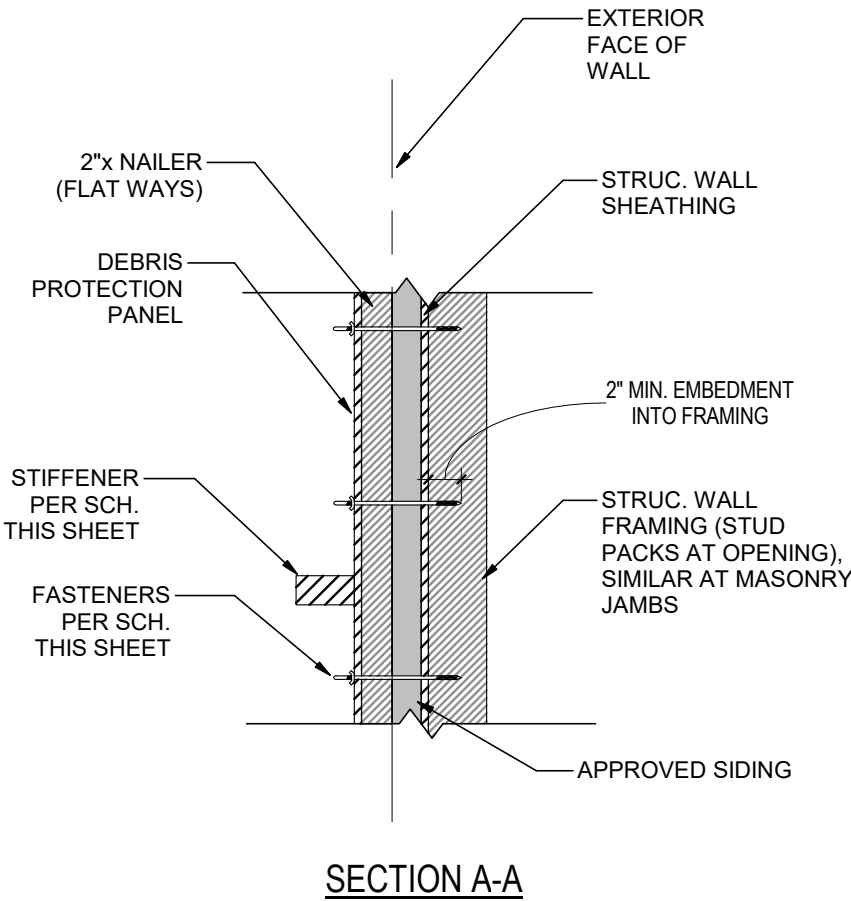
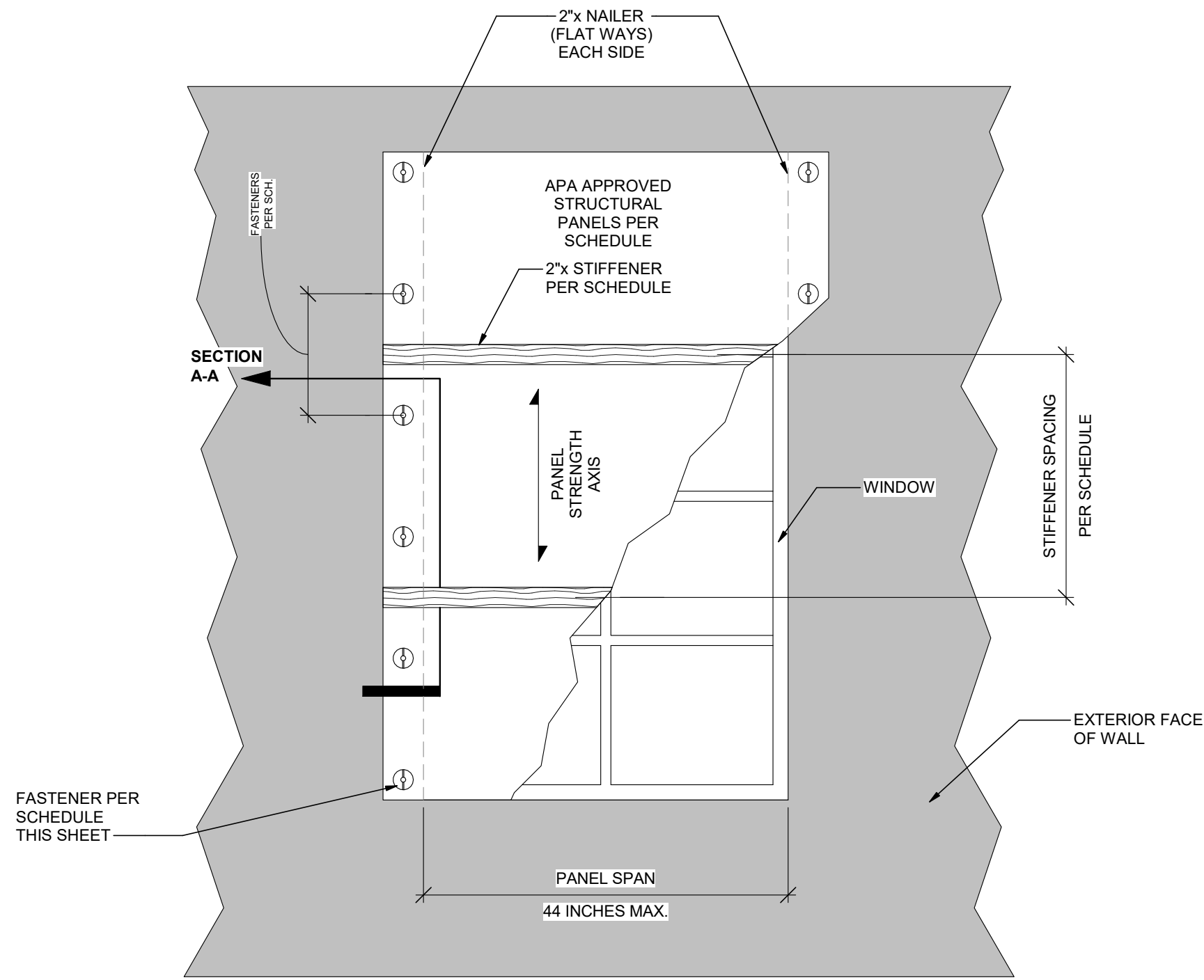
Wood Framing Details

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-015
Checked By:	
QC Review:	
Phase:	



ORIGINAL SHEET SIZE - 24 x 36
OTHERWISE SCALES ARE
INACCURATE

NOT FOR CONSTRUCTION



WIND-BORNE DEBRIS PROTECTION FOR GLAZED AND JALOUSIE WINDOW OPENINGS (NOT SUITABLE FOR SAFE ROOM)

NOTES:

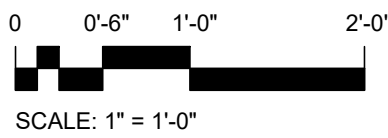
1. THE DETAIL'S INTENDED USE IS TO PROVIDE PROTECTION FROM WIND-BORNE DEBRIS. THE PREFERRED METHOD OF PROTECTION IS APPROVED IMPACT RESISTANT GLAZING OR APPROVED IMPACT RESISTANT COVERINGS (i.e. SHUTTER SYSTEM).
2. THE WOOD PANEL OPTION ONLY APPLIES TO OPENINGS WHICH DO NOT EXCEED 44 INCHES IN WIDTH. OPENINGS GREATER THAN 44 INCHES WIDE SHALL BE PROTECTED BY ONE OF THE PREFERRED METHODS MENTIONED IN THE ABOVE NOTE (NOTE #1).
3. DETAILS ARE ONLY APPLICABLE FOR ONE & TWO STORY BUILDINGS WITH A MEAN ROOF HEIGHT OF 30 FEET OR LESS.
4. ALL FASTENERS AND HARDWARE SHALL BE PERMANENTLY INSTALLED AND SHALL BE STAINLESS STEEL.
5. MIN. 3/4" DIAM. WASHER REQUIRED AT EXTERIOR PANEL ATTACHMENT.
6. MIN. 2" EMBEDMENT OF SCREW THREADS INTO WOOD WALL FRAMING.
7. STRUCTURAL PANELS SHALL BE APA RATED CDX PLYWOOD.
8. PANELS SHALL BE PRE-CUT AND PRE-DRILLED FOR INSTALLATION EFFICIENCY.
9. THE HOMEOWNER SHALL BE RESPONSIBLE FOR ROUTINE INSPECTION AND MAINTENANCE OF THE SYSTEM TO ENSURE FUNCTIONALITY FOR THE INTENDED PURPOSE DURING A STORM EVENT.
10. PANELS ATTACHED TO MASONRY SHALL BE ATTACHED USING VIBRATION-RESISTANT ANCHORS HAVING AN ULTIMATE WITHDRAWAL CAPACITY OF NOT LESS THAN 1,500 POUNDS.
11. MASONRY ANCHORS SHALL BE A MINIMUM OF 2.5 INCHES AWAY FROM WINDOW AND DOOR EDGES.
12. FASTENERS SHALL BE LOCATED NOT LESS THAN 1 INCH FROM THE EDGE OF THE PANEL.

DEBRIS PROTECTION-STRUCTURAL PANEL SCHEDULE REQUIREMENTS		
STRUCTURAL COMPONENT		PANEL SPAN
		MAX. STRUCTURAL PANEL SPAN = 44 INCHES
WOOD FRAMED	PANEL	5/8" APA RATED PRESSURE TREATED PLYWOOD
	FASTENER	1/4" DIAMETER LAG SCREWS AT 12" O.C.
	STIFFENER	2"x4" SYP No.2 PRESSURE TREATED AT 16" O.C.
MASONRY	PANEL	5/8" APA RATED PRESSURE TREATED PLYWOOD
	FASTENER	1/4" DIAMETER MASONRY SCREWS AT 12" O.C.
	STIFFENER	2"x4" SYP No.2 PRESSURE TREATED AT 16" O.C.

NOTES:

1. PANEL REQUIREMENTS SHOWN IN TABLE ABOVE ALSO CAN BE APPLIED AT DOOR OPENINGS WHICH DO NOT EXCEED 44 INCHES IN WIDTH.
2. FOR VENTED OPENINGS NOT EXCEEDING 2'-0" x 2'-0", PROVIDE PANEL WITH FASTENERS AS INDICATED IN TABLE ABOVE. STIFFENERS ARE NOT REQUIRED.

1 PLYWOOD WINDOW PROTECTION DETAIL
S-016 NOT TO SCALE



ORIGINAL SHEET SIZE - 24 x 36
OTHERWISE SCALES ARE
INACCURATE

NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY
CMU AND 2ND
FL. WOOD
HOME

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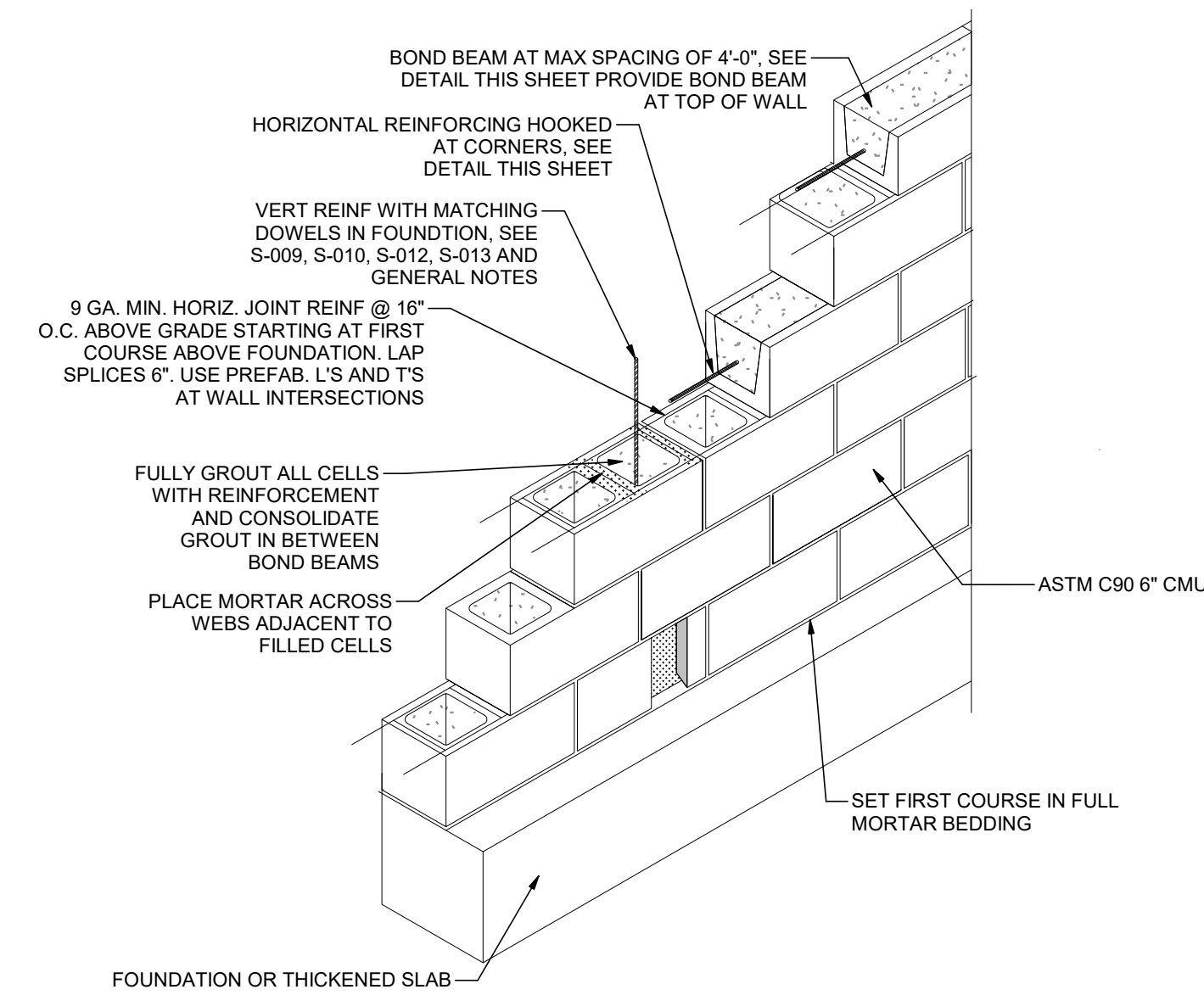
ISSUE LOG		
No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

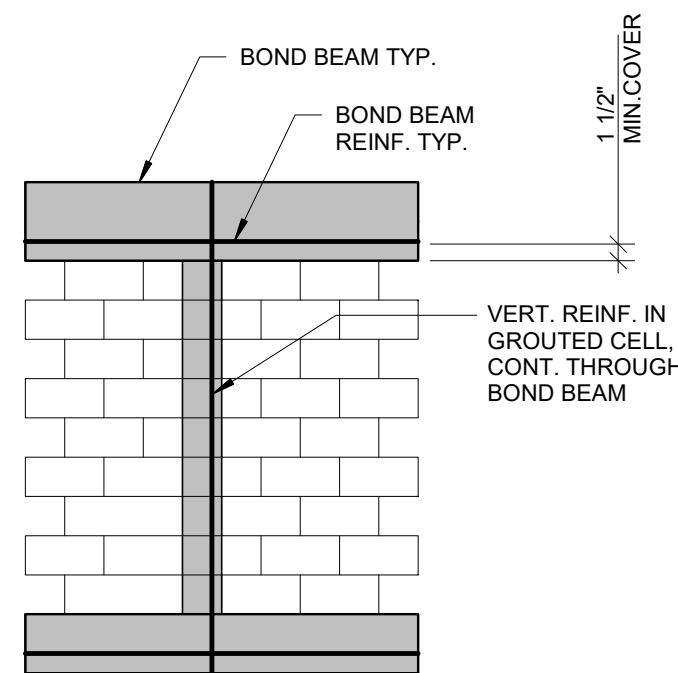
Window Protection Details

SHEET INFORMATION:	
JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number: S-016
Checked By:	
QC Review:	
Phase:	



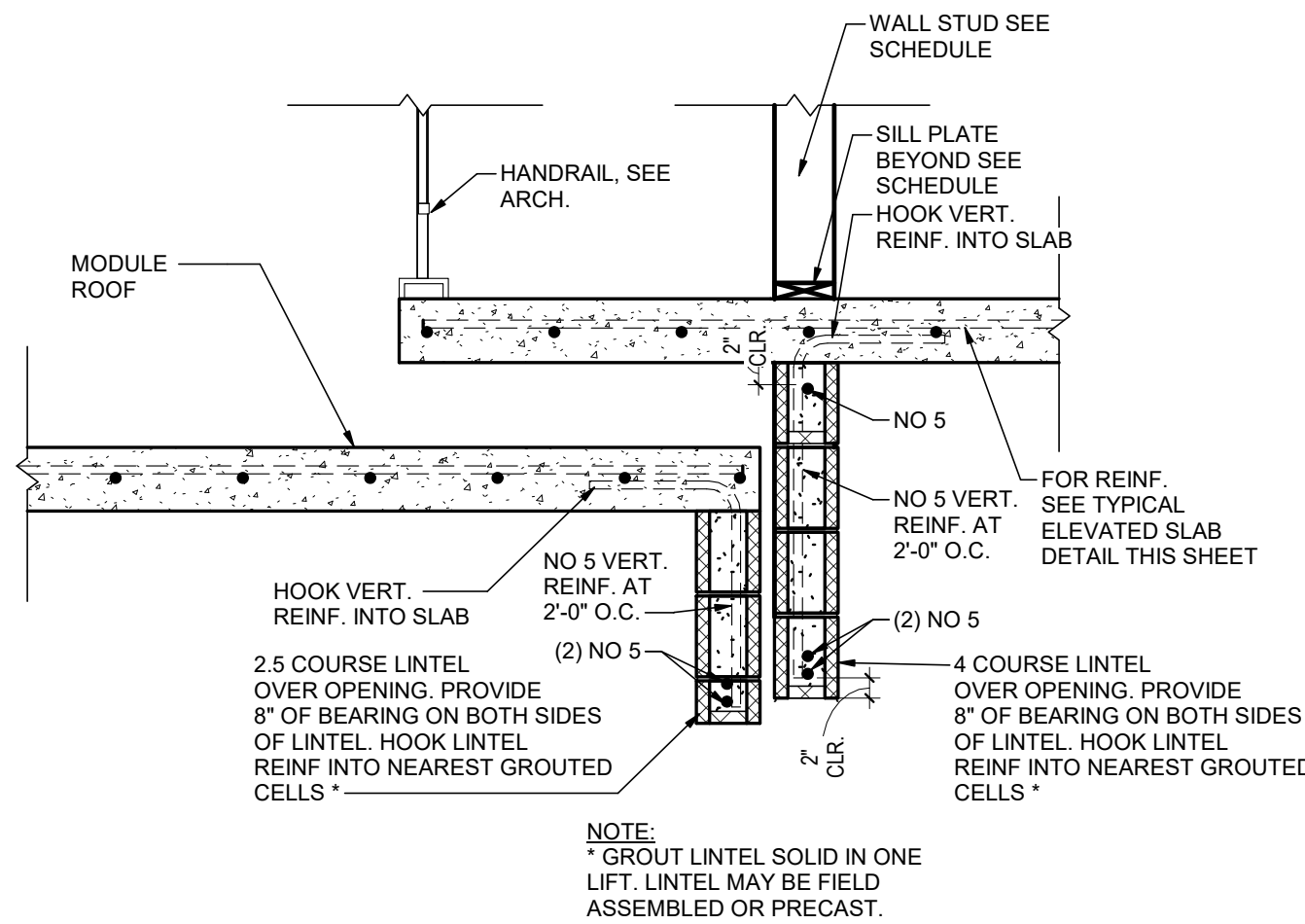
1
S-017
NOT TO SCALE

TYPICAL MASONRY WALL CONSTRUCTION



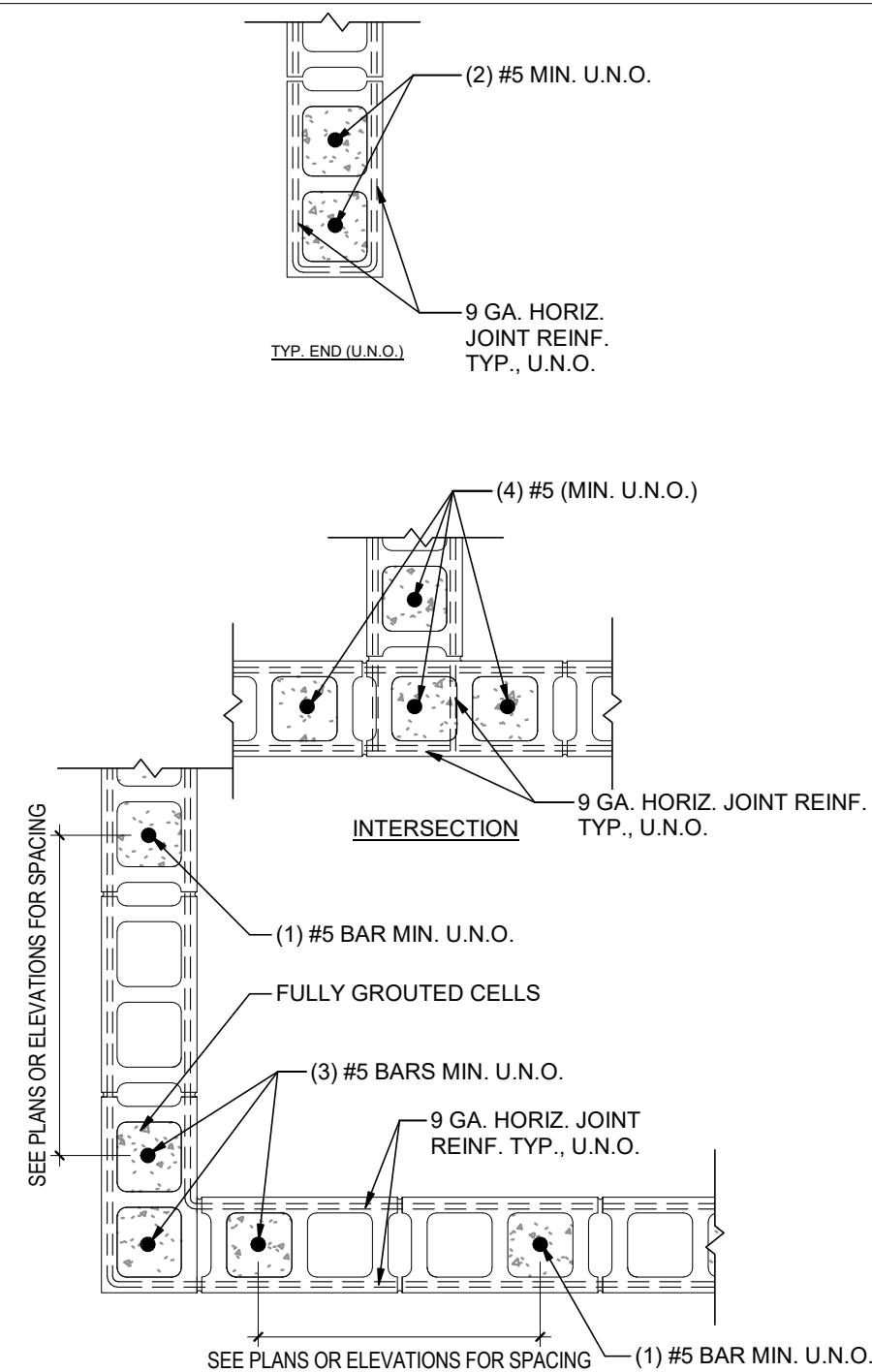
6
S-017
3/4" = 1'-0"

TYPICAL VERTICAL REINFORCING AT BOND BEAM



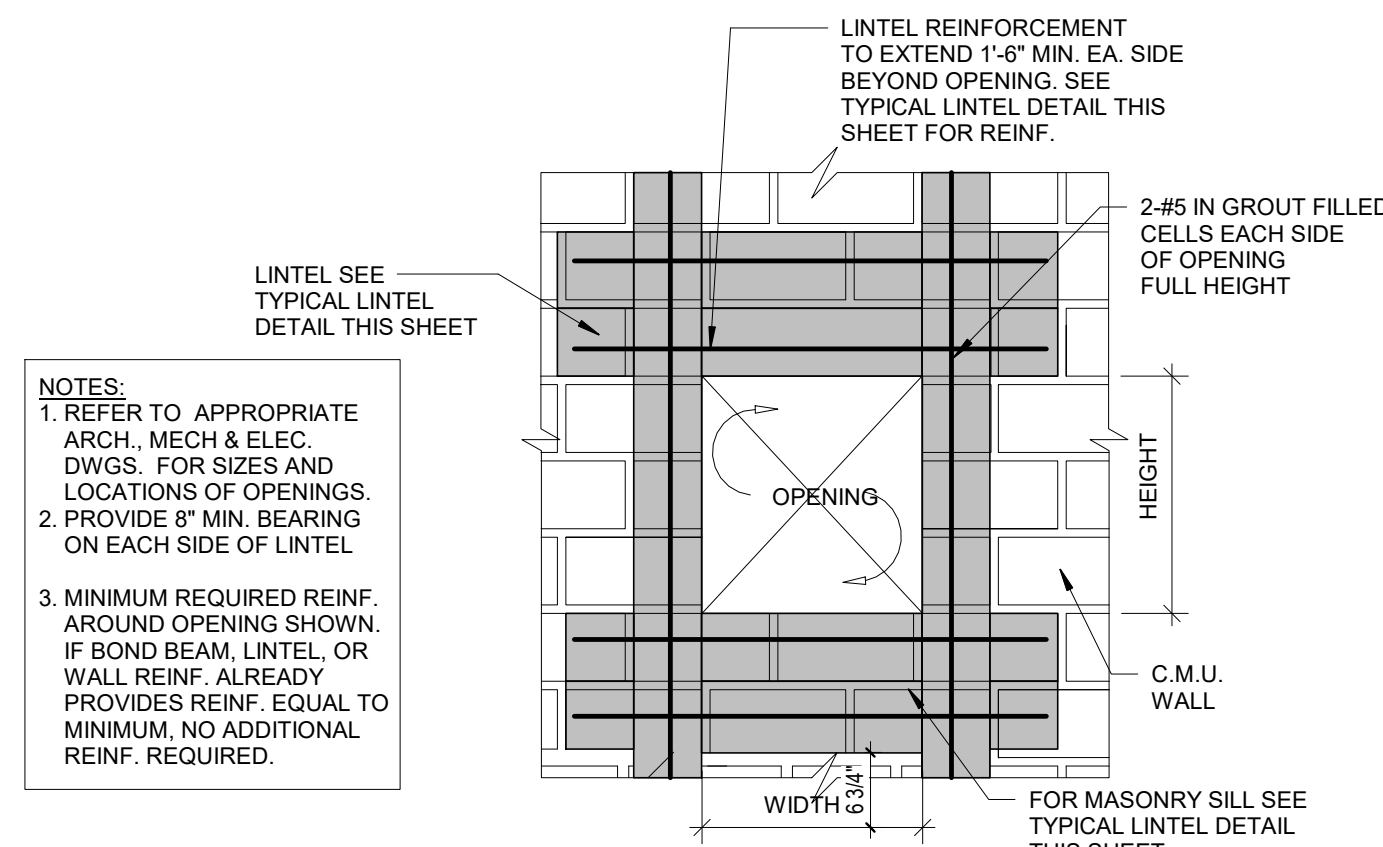
10
S-017
3/4" = 1'-0"

WALL SECTION



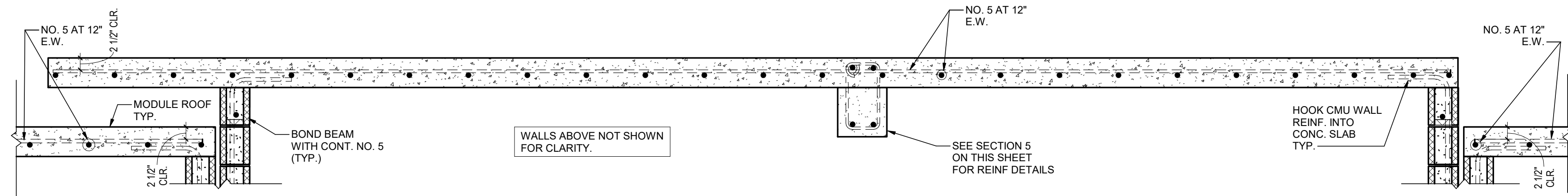
2
S-017
1" = 1'-0"

TYPICAL CMU CORNER DETAIL



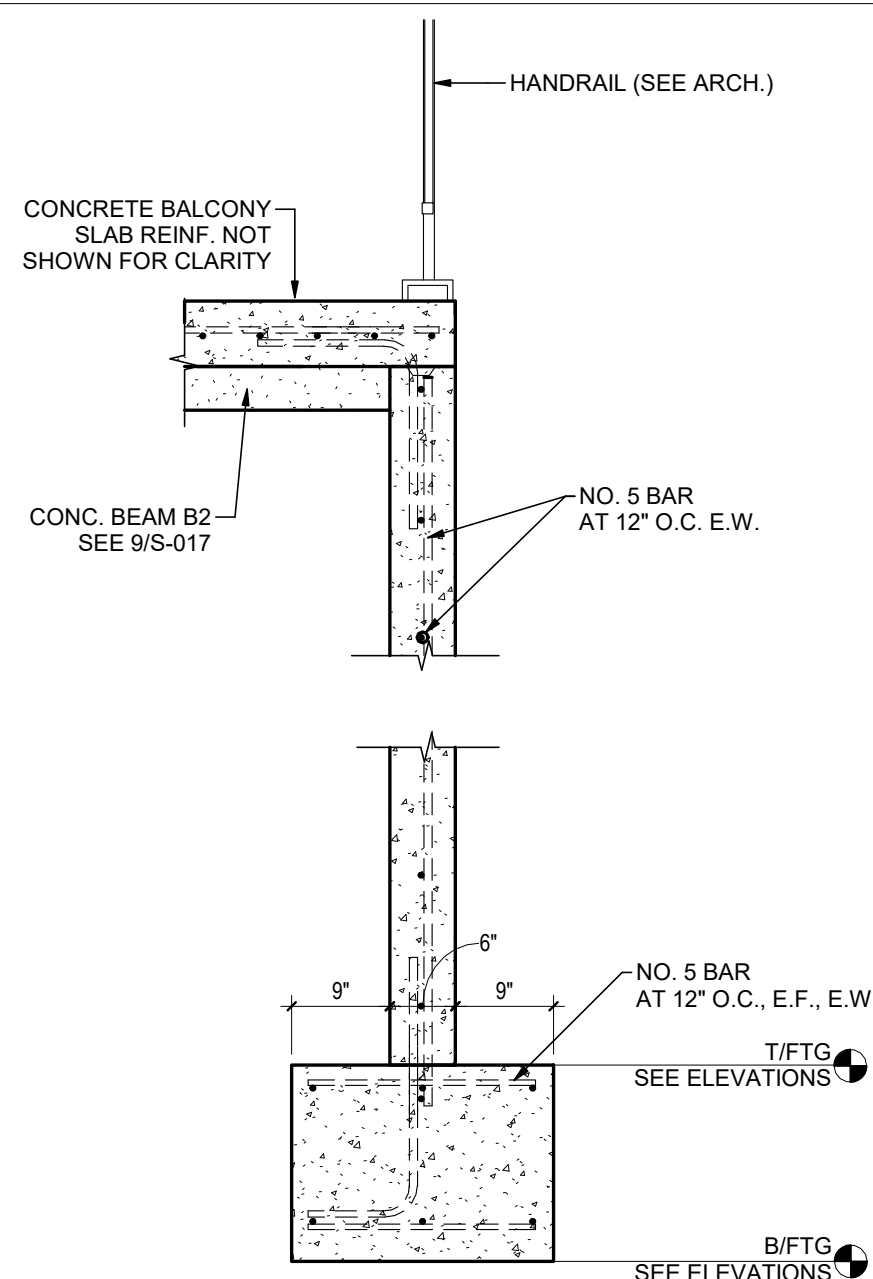
7
S-017
NOT TO SCALE

TYPICAL REINFORCING AROUND OPENINGS



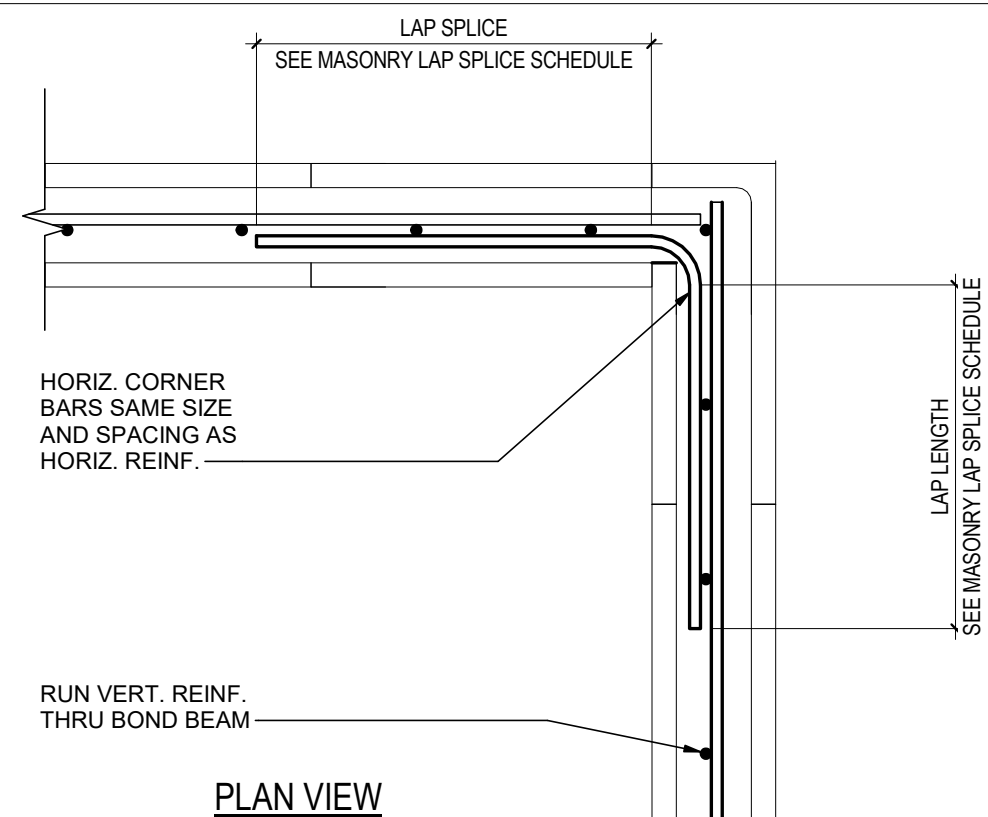
11
S-017
3/4" = 1'-0"

ELEV. SLAB DETAIL FOR PRIMARY STRUCTURE



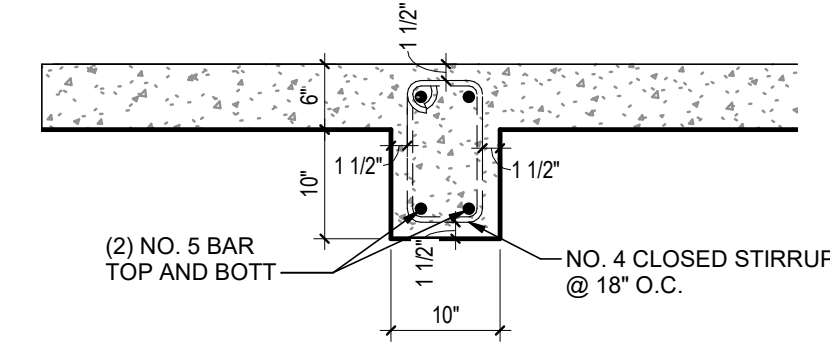
3A
S-017
3/4" = 1'-0"

WALL SECTION AT WALL SUPPORTING EXTERIOR STAIR



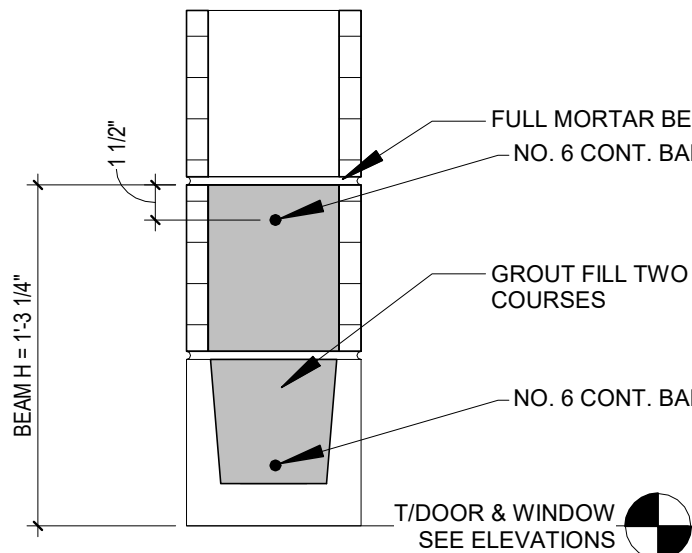
4
S-017
1 1/2" = 1'-0"

TYPICAL CORNER DETAIL AT BOND BEAM



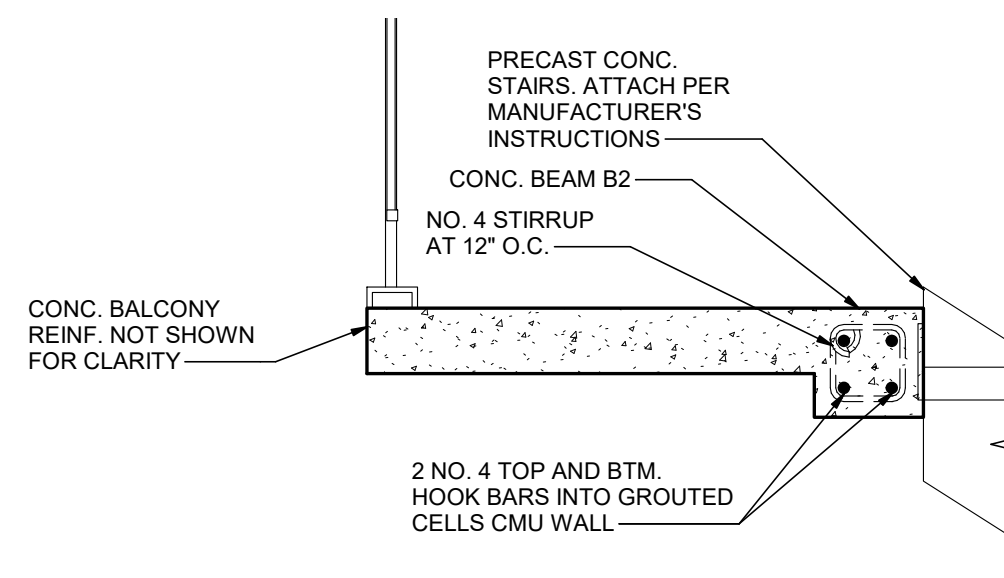
5
S-017
3/4" = 1'-0"

CONCRETE BEAM B1 SECTION



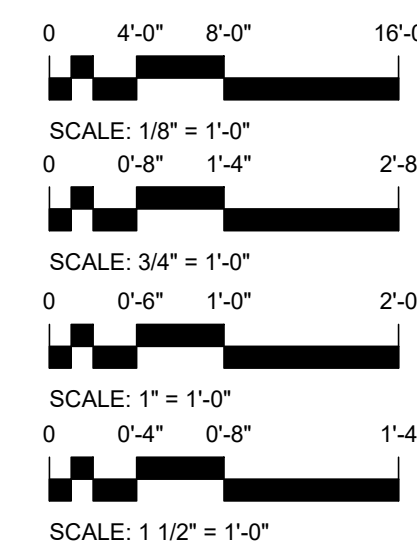
8
S-017
NOT TO SCALE

TYPICAL LINTEL DETAIL



9
S-017
3/4" = 1'-0"

CONCRETE BEAM B2 SECTION



NOT FOR CONSTRUCTION

CONSULTANT:

CLIENT:

PROJECT NAME:

TWO STORY CMU AND 2ND FL. WOOD HOME

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ISSUE LOG

No.	Date	Description

PROFESSIONAL SEALS:

SHEET TITLE:

Masonry and Concrete Details

SHEET INFORMATION:

JOB No.	Date Issued: 5/15/2020
Drawn By:	Sheet Number:
Checked By:	S-017
QC Review:	
Phase:	

STARR II

PR Prescriptive Homes Calculations

Two story
Wood/CMU
JOB TITLE House

JOB NO.		SHEET NO.	
CALCULATED BY	SW	DATE	2/6/20
CHECKED BY	MH	DATE	2/6/20

CS2018 Ver 2018.03.17

www.struware.com

STRUCTURAL CALCULATIONS

FOR

PR Homes: Two story Wood/CMU House

PUERTO RICO

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) 24.0 ft

Least width (B) 20.0 ft

Mean Roof Ht (h) 20.5 ft

Parapet ht above grd

Minimum parapet ht

Live Loads:

Roof 0 to 200 sf: 20 psf
200 to 600 sf: 24 - 0.02Area, but not less than 12 psf
over 600 sf: 12 psf

Floor:

Typical Floor 40 psf

Partitions 15 psf

Lobbies & first floor corridors 100 psf

Corridors above first floor 80 psf

Balconies (1.5 times live load) 60 psf

STARR II

PR Prescriptive Homes Calculations

JOB TITLE PR Homes: Two story Wood/CMU House

JOB NO.		SHEET NO.	
CALCULATED BY	SW	DATE	2/6/20
CHECKED BY	MH	DATE	2/6/20

Wind Loads :

ASCE 7- 16

Ultimate Wind Speed	190 mph
Nominal Wind Speed	147.2 mph
Risk Category	II
Exposure Category	D
Enclosure Classif.	Partially Open Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	1.088
Kh case 2	1.088
Type of roof	Gable

Topographic Factor (Kzt)

Topography

Hill Height (H)

Half Hill Length (Lh)

Actual H/Lh = 0.00

Use H/Lh = 0.00

Modified Lh = 0.0 ft

From top of crest: x =

Bldg up/down wind?

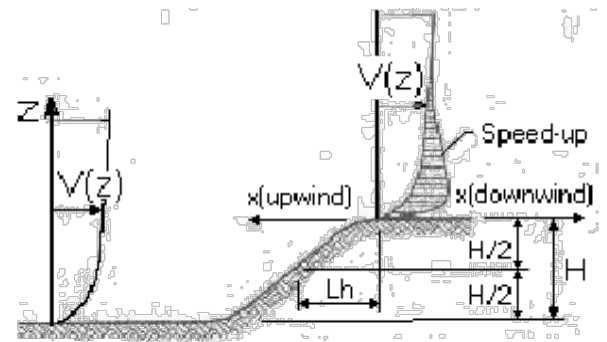
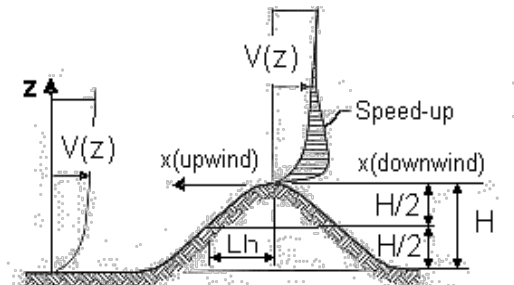
H/Lh = 0.00 $K_1 = 0.000$ x/Lh = 0.00 $K_2 = 0.000$ z/Lh = 0.00 $K_3 = 1.000$

At Mean Roof Ht:

 $K_{zt} = (1 + K_1 K_2 K_3)^2 = 1.00$

use 1.00

$H < 15\text{ft}; \text{exp D}$
 $\therefore K_{zt} = 1.0$

**ESCARPMENT****2D RIDGE or 3D AXISYMMETRICAL HILL****Gust Effect Factor**

h =	20.5 ft
B =	20.0 ft
z (0.6h) =	12.3 ft

Flexible structure if natural frequency < 1 Hz (T > 1 second).

If building $h/B > 4$ then may be flexible and should be investigated. $h/B = 1.03$ **G = 0.85** Using rigid structure default**Rigid Structure**

\bar{e} =	0.13
l =	650 ft
z_{min} =	7 ft
c =	0.13
g_Q, g_v =	3.4
L_z =	574.7 ft
Q =	0.95
I_z =	0.15
G =	0.90 use $G = 0.85$

Flexible or Dynamically Sensitive Structure

34 rcy (η_1) =	0.0 Hz		
Damping ratio (β) =	0		
$/b$ =	0.80		
$/\alpha$ =	0.11		
V_z =	199.8		
N_1 =	0.00		
R_n =	0.000		
R_h =	28.282	$\eta =$	0.000
R_B =	28.282	$\eta =$	0.000
R_L =	28.282	$\eta =$	0.000
g_R =	0.000		
R =	0.000		
G_f =	0.000		

h = 20.5 ft

Enclosure Classification

Test for Enclosed Building: $A_o < 0.01A_g$ or 4 sf, whichever is smaller

Test for Open Building: All walls are at least 80% open.
 $A_o \geq 0.8A_g$

Test for Partially Enclosed Building: Predominately open on one side only

Input		Test	
Ao	500.0 sf	$A_o \geq 1.1A_{oi}$	NO
Ag	600.0 sf	$A_o > 4'$ or $0.01A_g$	YES
Aoi	1000.0 sf	$A_{oi} / A_{gi} \leq 0.20$	YES
Agi	10000.0 sf		

Building is NOT Partially Enclosed

Conditions to qualify as Partially Enclosed Building. Must satisfy all of the following:

$$A_o \geq 1.1A_{oi}$$

$$A_o > \text{smaller of } 4' \text{ or } 0.01 A_g$$

$$A_{oi} / A_{gi} \leq 0.20$$

Where:

A_o = the total area of openings in a wall that receives positive external pressure.

A_g = the gross area of that wall in which A_o is identified.

A_{oi} = the sum of the areas of openings in the building envelope (walls and roof) not including A_o .

A_{gi} = the sum of the gross surface areas of the building envelope (walls and roof) not including A_g .

Test for Partially Open Building: A building that does not qualify as open, enclosed or partially enclosed.
(This type building will have same wind pressures as an enclosed building.)

Reduction Factor for large volume partially enclosed buildings (R_i) :

If the partially enclosed building contains a single room that is unpartitioned , the internal pressure coefficient may be multiplied by the reduction factor R_i .

Total area of all wall & roof openings (A_{og}): 0 sf
Unpartitioned internal volume (V_i) : 0 cf
 $R_i = 1.00$

Ground Elevation Factor (K_e)

Grd level above sea level = 0.0 ft
Constant = 0.00256
Adj Constant = 0.00256
 $K_e = 1.0000$

STARR II

PR Prescriptive Homes Calculations

JOB TITLE PR Homes: Two story Wood/CMU House

JOB NO. _____ SHEET NO. _____
 CALCULATED BY SW DATE 2/6/20
 CHECKED BY MH DATE 2/6/20

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

Kh (case 2) = 1.09 h = 20.5 ft GCpi = +/-0.18
 Base pressure (qh) = **85.5 psf** ridge ht = 22.4 ft G = 0.85
 Roof Angle (θ) = 18.4 deg L = 24.0 ft qi = qh
 Roof tributary area - (h/2)*L: 247 sf B = 20.0 ft
 (h/2)*B: 205 sf

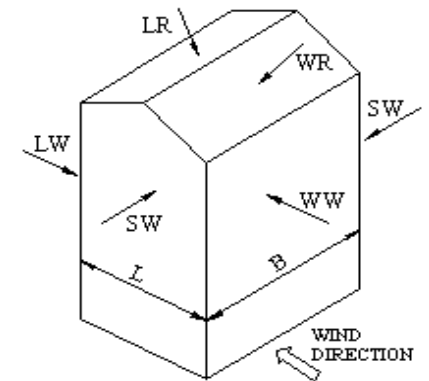
Ultimate Wind Surface Pressures (psf)

Surface	Wind Normal to Ridge				Wind Parallel to Ridge			
	B/L = 0.83		h/L = 1.03		L/B = 1.20		h/L = 0.86	
	Cp	qhGCp	w/+qiGCpi	w/-qhGCpi	Dist.*	Cp	qhGCp	w/+qiGCpi w/-qhGCpi
Windward Wall (WW)	0.80	58.1	see table below			0.80	58.1	see table below
Leeward Wall (LW)	-0.50	-36.3	-51.7	-20.9		-0.46	-33.4	-48.8 -18.0
Side Wall (SW)	-0.70	-50.9	-66.2	-35.5		-0.70	-50.9	-66.2 -35.5
Leeward Roof (LR)	-0.60	-43.6	-59.0	-28.2		Included in windward roof		
Neg Windward Roof pressure	-0.79	-57.7	-73.1	-42.3	0 to h/2*	-1.09	-79.3	-94.7 -63.9
Pos/min Windward Roof press.	-0.18	-13.1	-28.5	2.3	h/2 to h*	-0.76	-55.0	-70.4 -39.7
					h to 2h*	-0.64	-46.7	-62.1 -31.3
					Min press.	-0.18	-13.1	-28.5 2.3

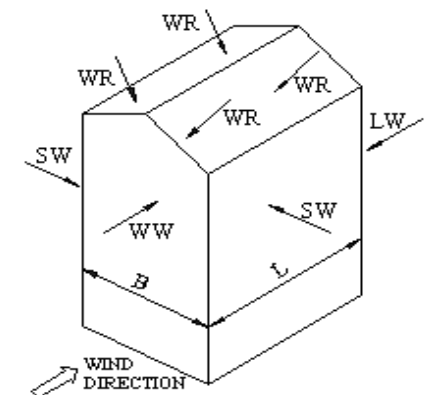
*Horizontal distance from windward edge

Windward Wall Pressures at "z" (psf)

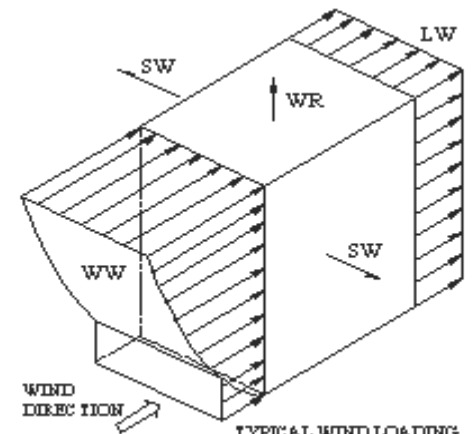
z	Kz	Kzt	Windward Wall			Combined WW + LW	
			qzGCp	w/+qiGCpi	w/-qhGCpi	Normal to Ridge	Parallel to Ridge
0 to 15'	1.03	1.00	55.0	39.6	70.4	91.4	88.5
20.0 ft	1.08	1.00	57.9	42.5	73.2	94.2	91.3
h= 20.5 ft	1.09	1.00	58.1	42.7	73.5	94.5	91.5
ridge = 22.4 ft	1.10	1.00	59.0	43.6	74.4	95.3	92.4



WIND NORMAL TO RIDGE



WIND PARALLEL TO RIDGE



TYPICAL WIND LOADING

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) : 58.1 psf (upward)

ASCE 7-16 Wind Component and Cladding Two story home modules only

(ASCE 7-16 Part 1 Pg 591)

MRH= 8.67
 Kzt = 1
 Kz = 1 ASCE 7-16 Table 26.10
 Kd = 0.85 ASCE 7-16 Table 26.6-1
 V = 250
 qz = 136 psf
 Gcpi = 0.18 ASCE 7-16 Figure 26.10-1

GCp Values ASCE 7-16 Fig 30.4-2B

	10sf	50sf	100sf
ZONE 1	-1.7	-1.4	-1.3
ZONE 1'	-0.9	-0.9	-0.9
ZONE 2	-2.3	-1.9	-1.9
POS ALL	0.3	0.23	0.2
ZONE 3	-3.2	-2.88	-2.46

Note Pressures for one story no modules
 and one story wood with modules are the
 same b/c MRH <15'

Roof C&C Pressures

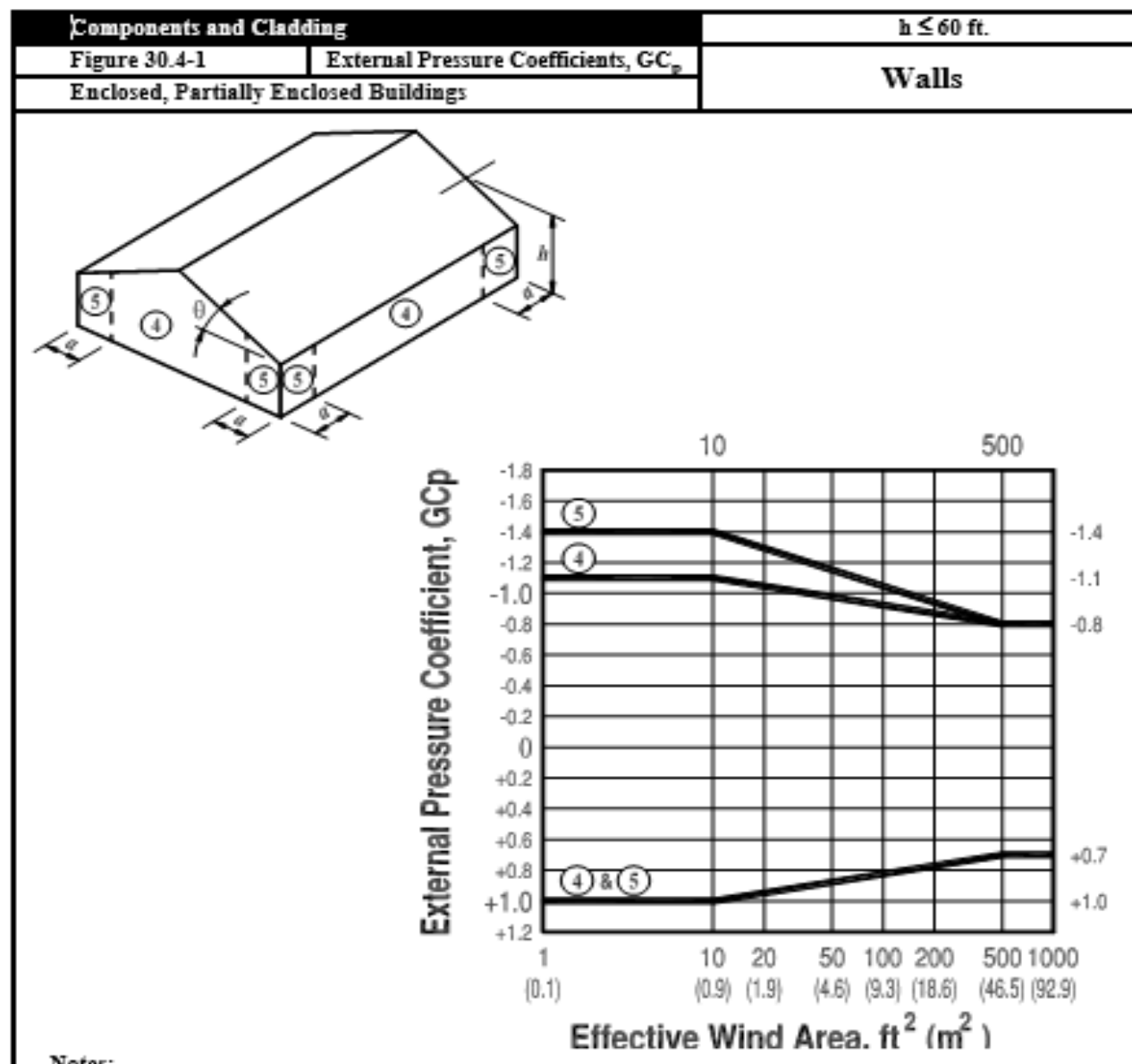
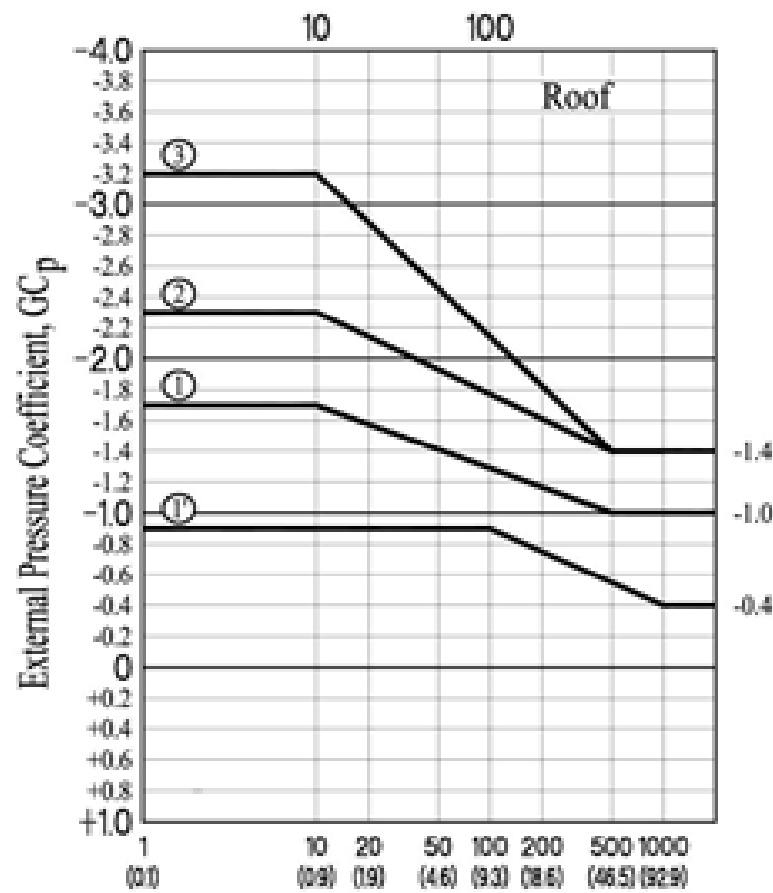
	10sf	50sf	100sf
ZONE 1	-255.7	-214.9	-201.3
ZONE 1'	-146.9	-146.9	-146.9
ZONE 2	-337.3	-282.9	-282.9
POS ALL	65.3	55.8	51.7
ZONE 3	-459.7	-416.2	-359.0

Wall GCp Values ASCE 7-16 Fig 30.4-1

	10sf	50sf	100sf
NEG 4	-1.1	-1	-0.9
NEG 5	-1.4	-1.18	-1.1
POS 4 & 5	1	0.9	0.8

Wall C & C Pressures

	10sf	50sf	100sf
NEG 4	-174.08	-160.48	-146.88
NEG 5	-214.88	-184.96	-174.08
POS 4 & 5	160.48	146.88	133.28



ASCE 7-16 Wind Component and Cladding Two story home no modules

(ASCE 7-16 Part 1 Pg 591)

MRH= 20.45
 Kzt = 1
 Kz = 1.09 ASCE 7-16 Table 26.10
 Kd = 0.85 ASCE 7-16 Table 26.6-1
 V = 190
 qz = 85.623424 psf
 Gcpi = 0.18 ASCE 7-16 Figure 26.10-1

GCp Values ASCE 7-16 Fig 30.4-2B

	10sf	50sf	100sf
NEG 1 & 2E	-2	-1.1	-0.5
NEG 2N, 2R, & 3E	-3	-2	-1.6
NEG 3R	-3.6	-2.4	-1.8
POS ALL	0.5	0.39	0.3
OVERHANG 1 & 2E	-2.5	-2.19	-1.9
OVERHANG 2N&2R	-3.5	-2.5	-2
OVERHANG 3E	-4.1	-2.8	-2.3
OVERHANG 3R	-4.7	-3	-2.3

Note Pressures for one story no modules
 and one story wood with modules are the
 same b/c MRH <15'

Roof C&C Pressures

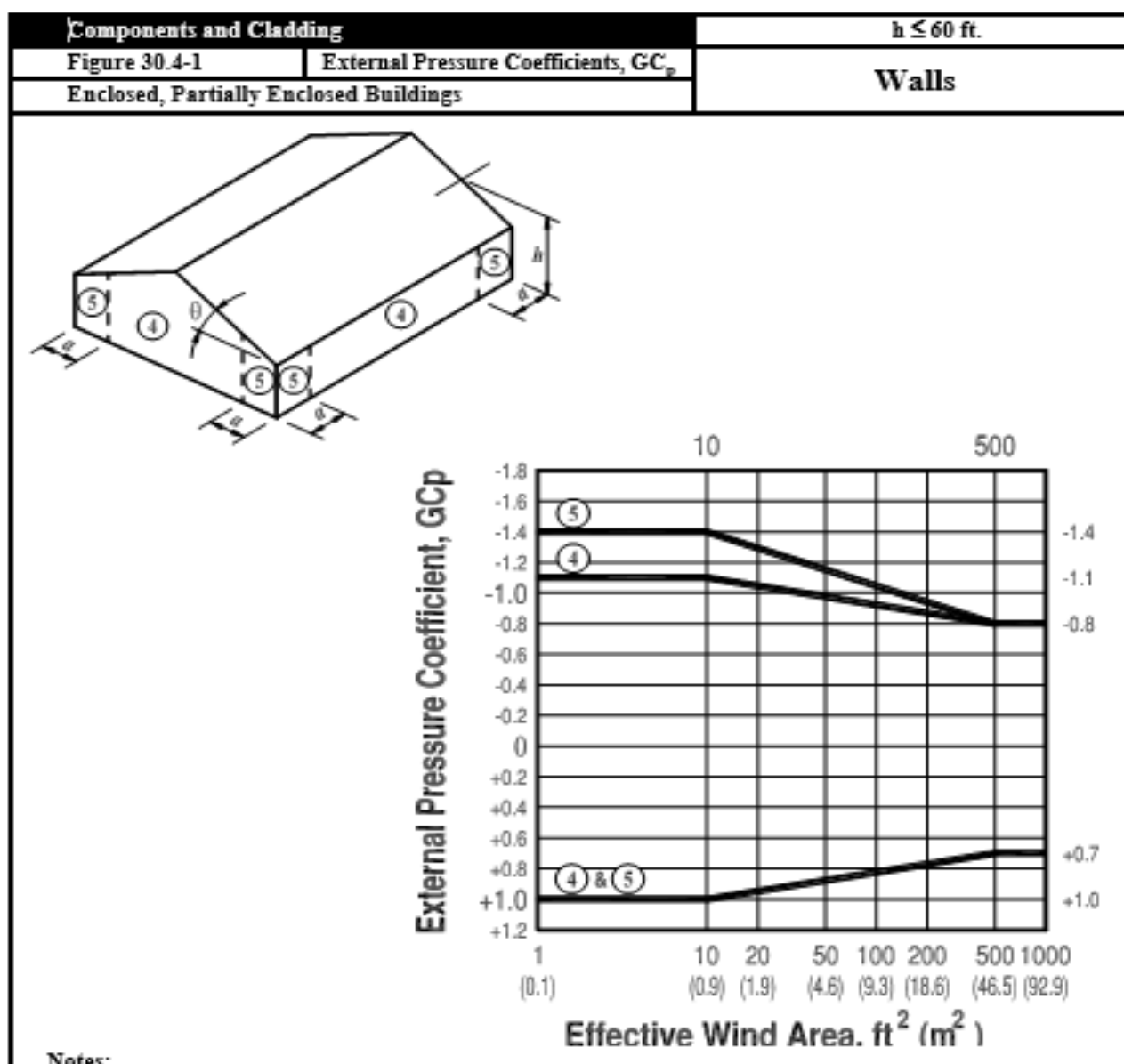
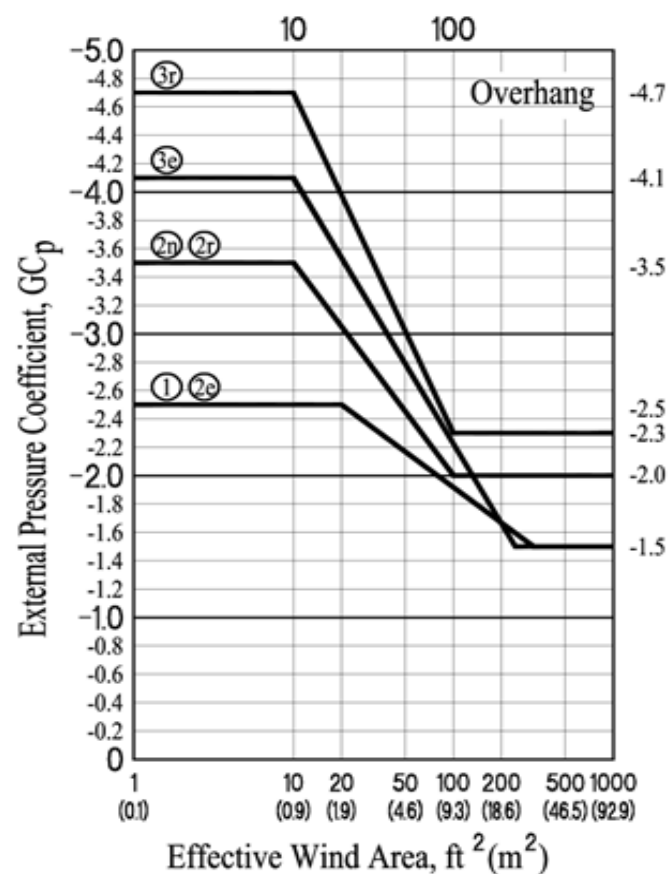
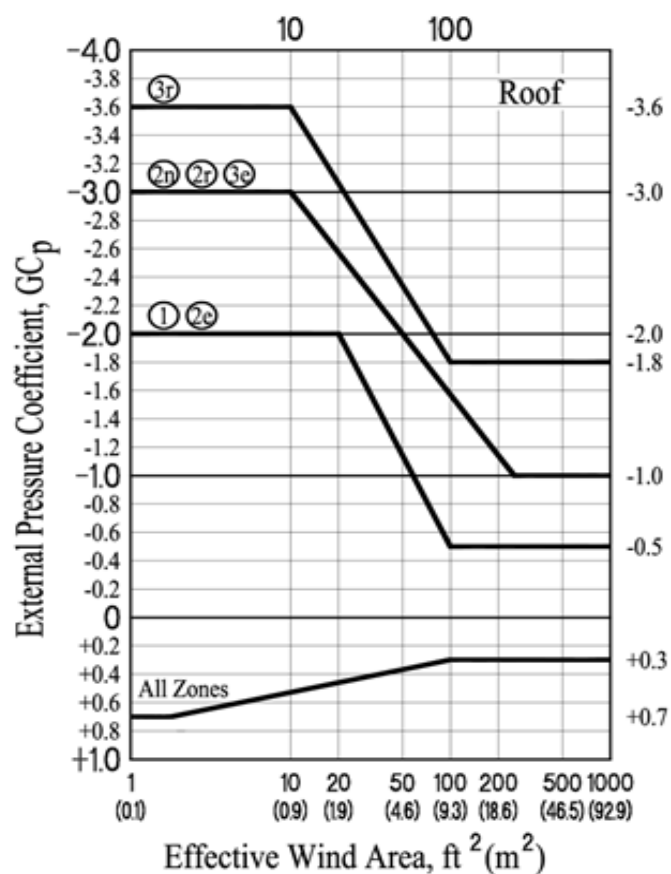
	10sf	50sf	100sf
NEG 1 & 2E	-186.7	-109.6	-58.2
NEG 2N, 2R, & 3E	-272.3	-186.7	-152.4
NEG 3R	-323.7	-220.9	-169.5
POS ALL	58.2	48.8	41.1
OVERHANG 1 & 2E	-229.5	-202.9	-178.1
OVERHANG 2N&2R	-315.1	-229.5	-186.7
OVERHANG 3E	-366.5	-255.2	-212.3
OVERHANG 3R	-417.8	-272.3	-212.3

Wall GCp Values ASCE 7-16 Fig 30.4-1

	10sf	50sf	100sf
NEG 4	-1.1	-1	-0.9
NEG 5	-1.4	-1.18	-1.1
POS 4 & 5	1	0.9	0.8

Wall C & C Pressures

	10sf	50sf	100sf
NEG 4	-109.598	-101.036	-92.4733
NEG 5	-135.285	-116.448	-109.598
POS 4 & 5	101.0356	92.4733	83.91096



Notes:

ASCE 7-16 Wind Component and Cladding Two story home One Story Option

(ASCE 7-16 Part 1 Pg 591)

MRH= 11.42
 Kzt = 1
 Kz = 1.03 ASCE 7-16 Table 26.10
 Kd = 0.85 ASCE 7-16 Table 26.6-1
 V = 190
 qz = 80.910208 psf
 Gcpi = 0.18 ASCE 7-16 Figure 26.10-1

GCp Values ASCE 7-16 Fig 30.4-2B

	10sf	50sf	100sf
ZONE 1	-1.7	-1.4	-1.3
ZONE 1'	-0.9	-0.9	-0.9
ZONE 2	-2.3	-1.9	-1.9
POS ALL	0.3	0.23	0.2
ZONE 3	-3.2	-2.88	-2.46

Note Pressures for one story no modules
 and one story wood with modules are the
 same b/c MRH <15'

Roof C&C Pressures

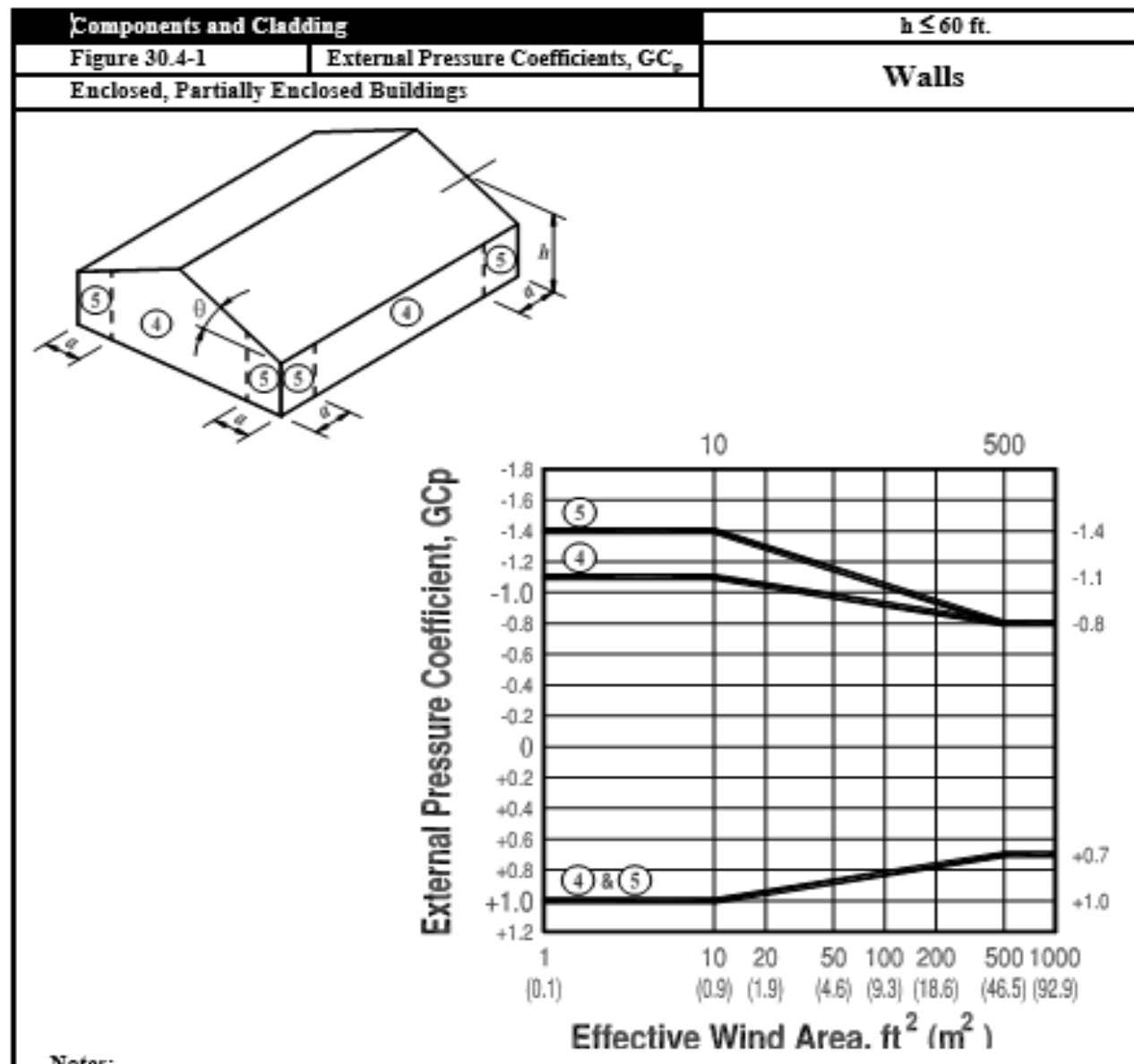
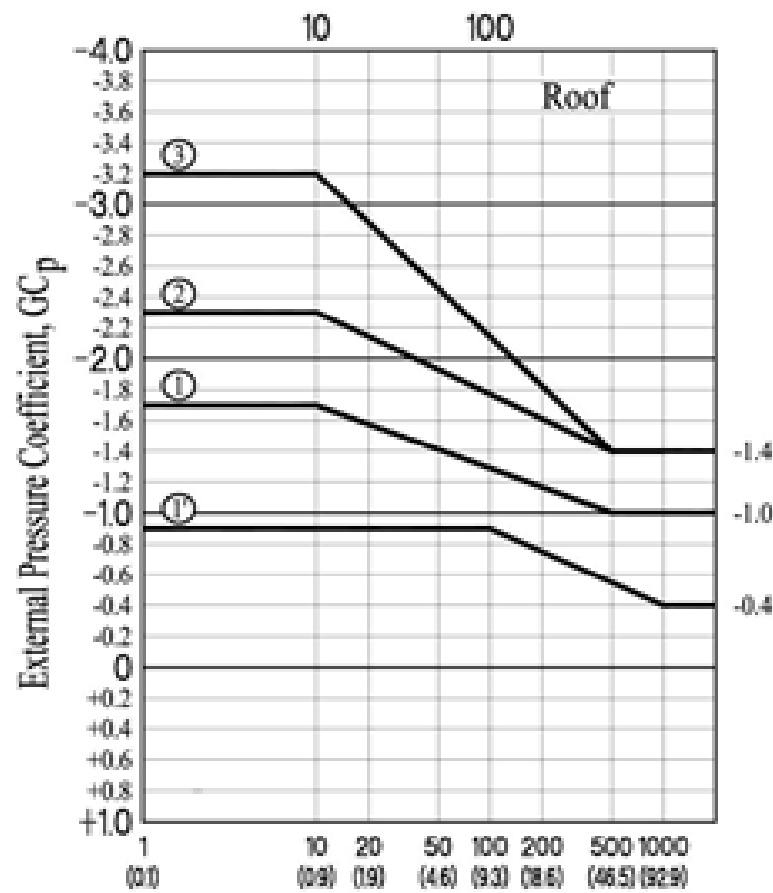
	10sf	50sf	100sf
ZONE 1	-152.1	-127.8	-119.7
ZONE 1'	-87.4	-87.4	-87.4
ZONE 2	-200.7	-168.3	-168.3
POS ALL	38.8	33.2	30.7
ZONE 3	-273.5	-247.6	-213.6

Wall GCp Values ASCE 7-16 Fig 30.4-1

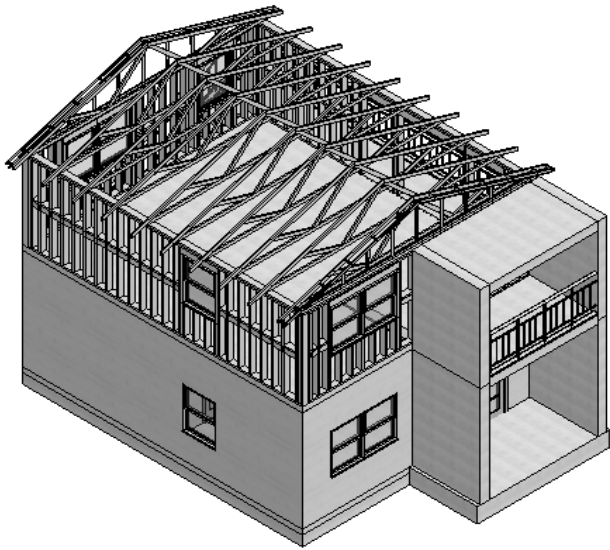
	10sf	50sf	100sf
NEG 4	-1.1	-1	-0.9
NEG 5	-1.4	-1.18	-1.1
POS 4 & 5	1	0.9	0.8

Wall C & C Pressures

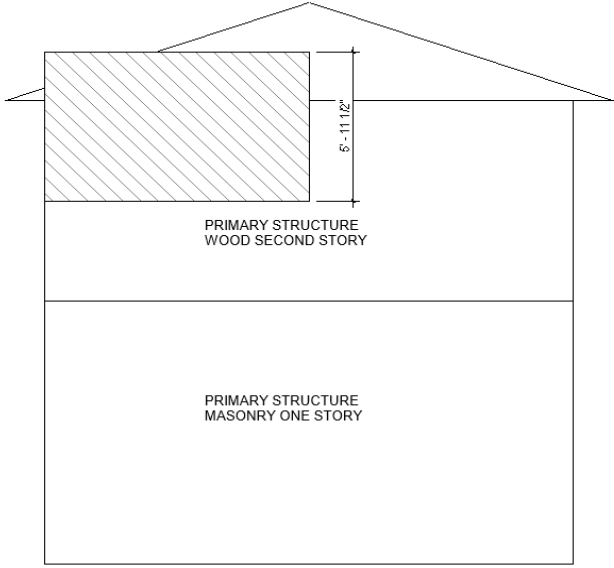
	10sf	50sf	100sf
NEG 4	-103.565	-95.474	-87.383
NEG 5	-127.838	-110.038	-103.565
POS 4 & 5	95.47405	87.38302	79.292



ASD WIND PRESSURES								
	Windward Wall Pressures at "z" (psf)						Combined WW + LW	
				Windward Wall			Normal	Parallel
	z	Kz	Kzt	qzGCp	w/+qiGCpi	w/-qhGCpi	to Ridge	to Ridge
	0 to 15'	1.0	1.0	55.0	23.8	42.3	54.8	53.1
h=	20	1.0	1.0	57.9	25.5	43.9	56.5	54.8
ridge =	22.4	1.1	1.0	59.0	26.2	44.6	57.2	55.5



Note: Modules not included because they are acting independent of the primary structure and are not hard attached.



Roof Diaphragm Load Primary Structure Wind Parallel to Ridge:

B =	24	ft
Wall Ht. Wood =	8.00	ft
Roof Ht. Above 2nd story=	11.90	ft
Roof Ht. Avg =	9.95	ft
Diaphragm Trib Area/ft =	5.95	Ft^2/ft
Diaphragm Load/ft Main =	330	lb/ft
Diaphragm Shear/Ft =	137	lb/ft
Wall Shear 24' Wall Primary	3300	lb
Diaphragm Moment =	23758	lb*ft
Diaphragm Chord T/C =	1188	lbs
Diaphragm Chord T/C per ft =	49	lbs/ft

o/o

Note: Diaphragm transfers load to two adjacent shear walls

Doesn't control

Roof Diaphragm Load Primary Structure Wind Perpendicular to Ridge:

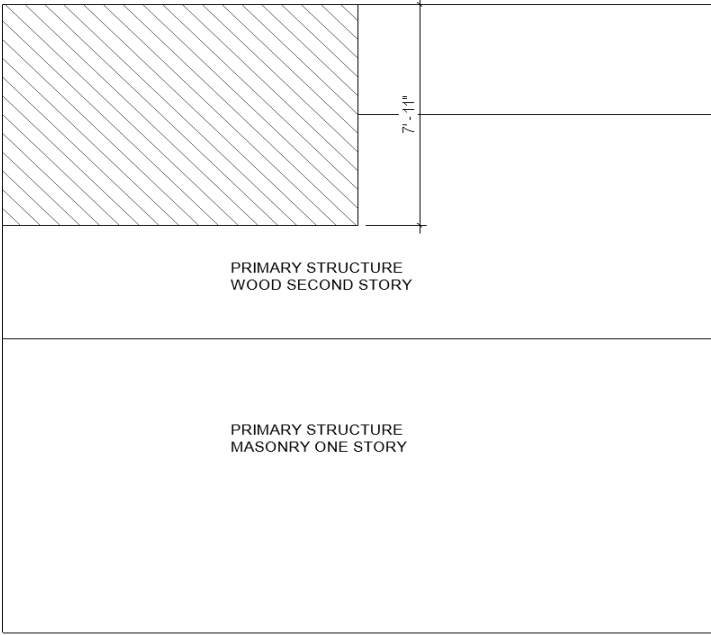
B =	20	ft
Wall Ht. =	8.00	ft
Roof Ht. Above 2nd Story =	11.90	ft
Roof Ht. Avg =	11.90	ft
Diaphragm Trib Area/ft =	7.90	Ft^2/ft
Diaphragm Load/ft =	452	lb/ft
Diaphragm Total Shear/ft =	226	lb/ft
Wall Shear 20' Wall =	4519	lbs
Diaphragm Moment =	22594	lb*ft
Diaphragm Chord T/C =	941	lbs
Diaphragm Chord T/C per ft =	47	lbs/ft

o/o

ASD

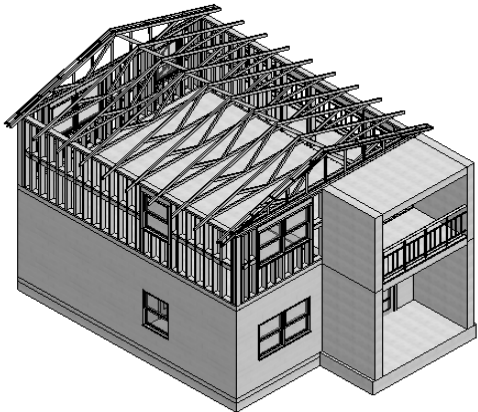
Doesn't control

TRIBUTARY FOR SHEAR WALL WIND PARALLEL TO RIDGE



TRIBUTARY FOR SHEAR WALL WIND PERPENDICULAR TO RIDGE

Seismic Forces			
Ss =	1.35		
S1 =	0.53		
Sms =	1.35		
Sm1 =	0.795		
Sds =	0.9045		
Sd1 =	0.3551		
CMU R =	5		
Wood R =	6.5		
Cs second story wood =	0.1392		
Cs first story CMU =	0.1809		
Wall Weight CMU =	60	psf	
Wall Weight CMU total primary =	53	kips	
Wall Weight CMU total module =	33	kips	
Wall Weight Wood =	20	psf	
Wall Weight Wood total =	14.08	kips	
Slab Weight primary =	36	kips	
Slab Weight module =	18	kips	
Roof Weight wood =	13.44	kips	
Wal Avg Height =	10	ft	
Wall Seismic Pressure Wood =	2.78	psf	Doesn't Control
Wall Seismic Pressure CMU =	10.854	psf	Doesn't Control
Fpx Diaphragm Min = 0.2*Sds*Ie*w =	0.18		
By Inspection Doesn't Control			
Wall Anchorage Min = 0.4Sds*ka*Ie*Wp =	0.515		
Wall Anchorage Design Pressure =	10.3	psf	Doesn't Control
CMU Base Shear primary =	16.06	kips	
Wood Base Shear 2nd story =	3.83	kips	
CMU Base Shear Module =	9.16	kips	
ASD CMU Base Shear Primary/ Shear Wall =	4.82	kips	Doesn't Control See CMU Wind Base Shears
ASD Wood Base Shear Primary/Shear Wall =	1.15	kips	Doesn't Control See Wind Base Shears Wood



Roof Uplift Fastener Design C&C

ASD Wind Uplift Load =	-252	psf
Spacing =	3	in
Trib =	1	sq ft
Uplift on fastener (ASD)=	-252	lbs
Shear on fastener (ASD) per foot =	226	lbs
Shear on fastener (ASD) =	56.48580294	lbs

BY INSPECTION NAILS WILL NOT WORK (UPLIFT VALUES AROUND 30lbs/in PENETRATION)
TRY # 12 SCREW

From Table 12.2 B		
W =	186	lbs/in pen
Cd =	1.6	
W' =	297.6	lbs/in pen
From Table 12L		
Z =	66	lbs (10*0.216" pen = 2.16" pen (3" screw)
Z' =	105.6	lbs
penetration into main member p =	2.28	in
Angle between wood surface and applied load =	77.37	deg
Angle between wood surface and applied load radians=	1.35	
ASD Allowable Combined Lateral and Withdrawl Loading (Z _a)		
12.4.2 =	538.9	lbs

OK >

258 lbs

12.4.1 Lag Screws and Wood Screws

Where a lag screw or wood screw is subjected to combined lateral and withdrawal loading, as when the fastener is inserted perpendicular to the fiber and the load acts at an angle, α , to the wood surface (see Figure 12F), the adjusted design value, Z_{α}' , shall be determined as follows (see Appendix J):

$$Z_{\alpha}' = \frac{(W'p)Z'}{(W'p)\cos^2 \alpha + Z' \sin^2 \alpha} \quad (12.4-1)$$

where:

α = angle between the wood surface and the direction of applied load, degrees
p = length of thread penetration into the main member, in.

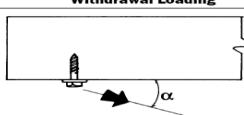
12.4.2 Nails and Spikes

Where a nail or spike is subjected to combined lateral and withdrawal loading, as when the nail or spike is inserted perpendicular to the fiber and the load acts at an angle, α , to the wood surface, the adjusted design value, Z_{α}' , shall be determined as follows:

$$Z_{\alpha}' = \frac{(W'p)Z'}{(W'p)\cos \alpha + Z' \sin \alpha} \quad (12.4-2)$$

where:
 α = angle between the wood surface and the direction of applied load, degrees
p = length of fastener penetration into the main member, in.

Figure 12F Combined Lateral and Withdrawal Loading



WOOD SCREWS LOADED AT AN ANGLE II

WITHDRAWAL AND SHEAR VALUES FOR SCREWS IN WOOD SHEATHING

Table 12.2B Cut Thread or Rolled Thread Wood Screw Reference Withdrawal Design Values, W'

Tabulated withdrawal design values, W, are in pounds per inch of thread penetration into side grain of wood member (see 12.2.2.1).

Specific Gravity, G ²	Wood Screw Number										
	6	7	8	9	10	12	14	16	18	20	24
0.73	209	229	249	268	288	327	367	406	446	485	564
0.71	198	216	235	254	272	310	347	384	421	459	533
0.68	181	199	216	233	250	284	318	352	387	421	489
0.67	176	193	209	226	243	276	309	342	375	409	475
0.58	132	144	157	169	182	207	232	256	281	306	356
0.55	119	130	141	152	163	186	208	231	253	275	320
0.51	102	112	121	131	141	160	179	198	217	237	275
0.50	98	107	117	126	135	154	172	191	209	228	264
0.49	94	103	112	121	130	147	165	183	201	219	254
0.47	87	95	103	111	119	136	152	168	185	201	234
0.46	83	91	99	107	114	130	146	161	177	193	224
0.44	76	83	90	97	105	119	133	148	162	176	205
0.43	73	79	86	93	100	114	127	141	155	168	196
0.42	69	76	82	89	95	108	121	134	147	161	187
0.41	66	72	78	85	91	103	116	128	141	153	178
0.40	63	69	75	81	86	98	110	122	134	146	169
0.39	60	65	71	77	82	93	105	116	127	138	161
0.38	57	62	67	73	78	89	99	110	121	131	153
0.37	54	59	64	69	74	84	94	104	114	125	145
0.36	51	56	60	65	70	80	89	99	108	118	137
0.35	48	53	57	62	66	75	84	93	102	111	130
0.31	38	41	45	48	52	59	66	73	80	87	102

Table 12L WOOD SCREWS: Reference Lateral Design Values, Z, for Single Shear

(two member) Connections^{1,2,3}
For sawn lumber or SGL with both members of identical specific gravity (tabulated lateral design values are calculated based on an assumed length of wood screw penetration, p, into the main member equal to 10D)

Side Member Thickness t _s	Wood Screw Diameter D	Wood Screw Number										
		6	7	8	9	10	12	14	16	18	20	24
1/2	6	88	67	59	57	55	49	47	41	40	38	
	7	96	74	65	63	59	54	52	45	44	42	
	8	107	82	73	71	66	61	59	51	50	48	
	9	121	94	83	81	75	70	68	59	58	56	
	10	130	101	90	87	82	75	73	64	63	60	
	12	166	123	110	107	100	93	91	79	78	75	
	14	168	133	120	117	110	102	99	87	86	83	
	16	174	139	126	123	115	107	104	91	90	87	
	18	181	146	133	130	122	114	111	97	96	93	
	20	188	153	140	137	129	121	118	104	103	100	
	24	198	164	151	148	140	132	129	114	113	110	
	28	209	176	163	160	152	144	141	125	124	121	
5/8	6	107	82	73	71	66	61	59	51	50	48	
	7	121	94	83	81	75	70	68	59	58	56	
	8	130	101	90	87	82	75	73	64	63	60	
	9	144	111	100	97	92	85	83	71	70	68	
	10	153	120	109	106	100	93	91	79	78	75	
	12	189	144	131	128	121	114	111	97	96	93	
	14	191	146	133	130	122	114	111	97	96	93	
	16	198	153	140	137	129	121	118	104	103	100	
	18	205	160	147	144	136	128	125	110	109	106	
	20	212	167	154	151	143	135	132	116	115	112	
	24	229	184	171	168	160	152	149	131	130	127	
	28	249	204	191	188	180	172	169	148	147	144	
3/4	6	121	94	83	81	75	70	68	59	58	56	
	7	135	106	95	93	87	82	80	69	68	66	
	8	144	111	100	97	92	85	83	71	70	68	
	9	153	120	109	106	100	93	91	79	78	75	
	10	162	129	118	115	108	101	99	86	85	82	
	12	198	154	141	138	131	124	121	106	105	102	
	14	200	156	143	140	132	124	121	107	106	103	
	16	207	163	150	147	139	131	128	112	111	108	
	18	214	170	157	154	146	138	135	119	118	115	
	20	221	177	164	161	153	145	142	125	124	121	
	24	239	195	182	179	171	163	160	141	140	137	
	28	259	215	202	199	191	183	180	159	158	155	
7/8	6	135	106	95	93	87	82	80	69	68	66	
	7	149	120	109	106	100	93	91	79	78	75	
	8	158	129	118	115	108	101	99	86	85	82	
	9	167	138	127	124	117	110	107	93	92	89	
	10	176	147	136	133	126	119	116	102	101	98	
	12	212	184	171	168	160	152	149	131	130	127	
	14	214	186	173	170	162	154	151	132	131	128	
	16	221	193	180	177	169	161	158	138	137	134	
	18	228	200	187	184	176	168	165	144	143	140	
	20	235	207	194	191	183	175	172	151	150	147	
	24	253	225	212	209	201	193	190	169	168	165	
	28	273	245	232	229	221	213	210	188	187	184	
1	6	149	120	109	106	100	93	91	79	78	75	
	7	163	131	120	117	111	104	101	89	88	86	
	8	172	140	129	126	119	112	109	95	94	92	
	9	181	149	138	135	128	121	118	104	103	100	
	10	190	158	147	144	137	130	127	112	111	108	
	12	226	194	181	178	170	162	159	140	139	136	
	14	228	196	183	180	172	164	161	141	140	137	
	16	235	203	190	187	179	171	168	147	146	143	
	18	242	210	197	194	186	178	175	154	153	150	
	20	249	217	204	201	193	185	182	161	160	157	
	24	267	235	222	219	211	203	200	179	178	175	
	28	287	255	242	239	231	223	220	198	197	194	
1 1/8	6	163	131	120	117	111	104	101	89	88	86	
	7	177	143	132	129	123	116	113	101	100	98	
	8	186	152	141	138	131	124	121	109	108	106	
	9	195	161	150	147	140	133	130	117	116	114	
	10	204	170	159	156	149	142	139	125	124	122	
	12	240	206	193	190	182	174	171	151	150	147	
	14	242	208	195	192	184	176	173	153	152	149	
	16	249	215	202	199	191	183	180	159	158	155	
	18	256	222	209	206	198	190	187	166	165	162	
	20	263	229	216	213	205	197	194	173	172	169	
	24	281	247	234	231	223	215	212	191	190	187	
	28	301	267	254	251	243	235	232	211	210	207	
1 1/4	6	177	143	132	129	123	116	113	101	100	98	
	7	191	157	146	143	137	130	127	115	114	112	
	8	200	166	155	152	145	138	135	123	122	120	
	9	209	175	164	161	154	147	144	131	130	128	
	10	218	184	173	170	163	156	153	140	139	137	
	12	254	210	197	194	186	178	175	155	154	151	
	14	256	212	199	196	188	180	177	157	156	153	
	16	263	219	206	203	195	187	184	163	162	159	
	18	270	226	213	210	202	194	191	171	170	167	
	20	277	233	220	217	209	201	198	177	176	173	
	24	295	251	238	235	227	219	216	195	194	191	
	28	315	271	258	255	247	239	236	215	214	211	
1 3/8	6	191	157	146	143	137	130	127	115	114	112	
	7	205	171	160	157	151	144	141	129	128	126	
	8	214	180	169	166	159	152	149	137	136	134	
	9	223	189	178	175	169	162	159	147	146	144	
	10	232	198	187	184	177	170	167	155	154	152	
	12	268	224	211	208	200	192	189	169	168	165	
	14	270	226	213	210	202	194	191	171	170	167	
	16	277	233	220	217	209	201	198	177	176	173	
	18	284	240	227	224	216	208	205	185	184	181	
	20	291	247	234	231	223	215	212	191	190	187	
	24	309	265	252	249	241	233	230	209	208	205	
	28	329	285	272	269	261	253	250	229	228	225	
1 1/2	6	205	171	160	157	151	144	141	129	128	126	
	7	219	187	176	173	167	160	157	145	144	142	
	8	228	196	185	182	175	168	165	153	152	150	
	9	237	205	194	191	185	178	175	163	162	160	
	10	246	214	203	200	193	186	183	171	170	168	
	12	282	250	237	234	226	218	215	195	194	191	
	14	284	252	239	236	228	220	217	197	196	193	
	16	291	259	246	243	235	227	224	203	202	199	
	18	298	266	253	250	242	234	231	211	210	207	
	20	305	273	260	257	249	241	238	217	216	213	
	24	323	291	278	275	267	259	256	235	234	231	
	28	343	311	298	295	287	279	276	255	254	251	

RATED PANELS DESIGN CAPACITIES								
Span Rating	Stress Parallel to Strength Axis				Stress Perpendicular to Strength Axis			
	Plywood			OSB	Plywood			OSB
	3-ply	4-ply	5-ply		3-ply	4-ply	5-ply	
PANEL BENDING STIFFNESS, EI (lb-in. ² /ft of panel width)								
24/0	66,000	66,000	66,000	60,000	3,600	7,900	11,000	11,000
24/16	86,000	86,000	86,000	78,000	5,200	11,500	16,000	16,000
32/16	125,000	125,000	125,000	115,000	8,100	18,000	25,000	25,000
40/20	250,000	250,000	250,000	225,000	18,000	39,500	56,000	56,000
48/24	NA	440,000	440,000	400,000	NA	65,000	91,500	91,500
16 oc	165,000	165,000	165,000	150,000	11,000	24,000	34,000	34,000
20 oc	230,000	230,000	230,000	210,000	13,000	28,500	40,500	40,500
24 oc	NA	330,000	330,000	300,000	NA	57,000	80,500	80,500
32 oc	NA	NA	715,000	650,000	NA	NA	235,000	235,000
48 oc	NA	NA	1,265,000	1,150,000	NA	NA	495,000	495,000
Structural I Multiplier								
	1.0	1.0	1.0	1.0	1.5	1.5	1.6	1.6
PANEL BENDING STRENGTH, F _b S (lb-in./ft of panel width)								
24/0	250	275	300	300	54	65	97	97
24/16	320	350	385	385	64	77	115	115
32/16	370	405	445	445	92	110	165	165
40/20	625	690	750	750	150	180	270	270
48/24	NA	930	1,000	1,000	NA	270	405	405
16 oc	415	455	500	500	100	120	180	180
20 oc	480	530	575	575	140	170	250	250
24 oc	NA	705	770	770	NA	260	385	385
32 oc	NA	NA	1,050	1,050	NA	NA	685	685
48 oc	NA	NA	1,900	1,900	NA	NA	1,200	1,200

APA PANEL BENDING CAPACITY

Table A Wood Structural Panel Design Capacities Based on Span Ratings ^(a)																
Span Rating	Strength							Planar Shear			Stiffness and Rigidity					
	Bending F _b S (lb-in/ft of width)		Axial Tension F _t A (lb/ft of width)		Axial Compression F _c A (lb/ft of width)		Shear through the thickness F _v t _v (lb/in of shear-resisting panel length)	Planar Shear F _v (lb/Q) (lb/ft of width)			Bending EI (lb-in ² /ft of width)		Axial EA (lb/ft of width x 10 ³)		Rigidity through the thickness G _v t _v (lb/in of panel depth)	
	Capacities relative to strength axis ^(a)															
	0°	90°	0°	90°	0°	90°	0° / 90°	0°	90°	0°	90°	0°	90°	0° / 90°		
Sheathing Span®	24/0	3-ply	250	54	2,300	600	2,850	2,500	53	156	273	66,000	3,600	3.35	2.90	25,000
	32/16	3-ply	370	92	2,800	1,250	3,550	3,100	62	198	347	126,500	8,100	4.15	3.60	27,000
		4-ply	407	110	2,800	1,250	5,325	4,650	81	198	479	126,500	17,820	4.15	3.60	35,100
		5-ply	444	166	3,640	1,625	5,325	4,650	93	215	165	126,500	25,110	4.15	3.60	40,500
	40/20	3-ply	625	150	2,900	1,600	4,200	4,000	68	246	431	247,500	18,000	5.00	4.50	28,500
	4-ply	688	180	2,900	1,600	6,300	6,000	88	246	595	247,500	39,600	5.00	4.50	37,050	
	5-ply	750	270	3,770	2,080	6,300	6,000	102	267	205	247,500	55,800	5.00	4.50	42,750	
48/24	4-ply	930	270	4,000	1,950	7,500	7,200	98	300	725	440,000	64,900	5.85	5.00	40,300	
	5-ply	1,014	405	5,200	2,535	7,500	7,200	113	325	250	440,000	91,450	5.85	5.00	46,500	

APA WOOD PANEL SHEAR CAPACITIES

Model No.	Strap Length (in.)	Total Quantity of Fasteners		DF/SP Allowable Uplift Loads (160)		SPF/HF Allowable Uplift Loads (160)		Code Ref.	
		0.148" x 3" Nails	0.148" x 1 ½" Nails	0.148" x 3" Nails	0.148" x 1 ½" Nails	0.148" x 3" Nails	0.148" x 1 ½" Nails		
LTS12	12	12	12	660	600	570	515	IBC, FL, LA	
LTS16	16								
LTS20	20								
MTS12	12	14	14	990	990	850	850		
MTS16	16								
MTS20	20								
MTS30	30								
MTS24C	24							FL	
MTS30C	30								
HTS16	16	16	16	1,310	1,310	1,125	1,125	IBC, FL, LA	
HTS20	20	20	24	1,310	1,310	1,125	1,125		
HTS24	24								
HTS30	30								
HTS30C	30								

MTS STRAP CAPACITY

Table 4.2A Nominal Unit Shear Capacities for Wood-Frame Diaphragms

Blocked Wood Structural Panel Diaphragms^{1,2,3,4,5}

					A												B			
					SEISMIC												WIND			
					Nail Spacing (in.) at diaphragm boundaries (all cases), at continuous panel edges parallel to load (Cases 3 & 4), and at all panel edges (Cases 5 & 6)												Nail Spacing (in.) at diaphragm boundaries (all cases), at continuous panel edges parallel to load (Cases 3 & 4), and at all panel edges (Cases 5 & 6)			
					6			4			2-1/2			2			6	4	2-1/2	2
					Nail Spacing (in.) at other panel edges (Cases 1, 2, 3, & 4)												Nail Spacing (in.) at other panel edges (Cases 1, 2, 3, & 4)			
Sheathing Grade	Common Nail Size	Minimum Fastener Penetration in Framing Member or Blocking (in.)	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Nailed Face at Adjoining Panel Edges and Boundaries (in.)	6		6		4		3		6	6	4	3				
					v _c (plf)	G _a (kips/in.)	v _c (plf)	G _a (kips/in.)	v _c (plf)	G _a (kips/in.)	v _c (plf)	G _a (kips/in.)	v _w (plf)	v _w (plf)	v _w (plf)	v _w (plf)				
					OSB	PLY	OSB	PLY	OSB	PLY	OSB	PLY	OSB	PLY						
Structural I	6d	1-1/4	5/16	2	370	15	12	500	8.5	7.5	750	12	10	840	20	15	520	700	1050	1175
				3	420	12	9.5	560	7.0	6.0	840	9.5	8.5	950	17	13	590	785	1175	1330
	8d	1-3/8	3/8	2	540	14	11	720	9.0	7.5	1080	13	10	1200	21	15	755	1010	1485	1680
			3	600	12	10	800	7.5	6.5	1200	10	9.0	1350	18	13	840	1120	1680	1890	
	10d	1-1/2	15/32	2	640	24	17	850	15	12	1280	20	15	1480	31	21	895	1190	1790	2045
			3	720	20	15	980	12	9.5	1440	16	13	1640	26	18	1010	1345	2015	2295	
Sheathing and Single-Floor	6d	1-1/4	5/16	2	340	15	10	450	9.0	7.0	670	13	9.5	780	21	13	475	630	940	1065
				3	380	12	9.0	500	7.0	6.0	760	10	8.0	860	17	12	530	700	1065	1205
			3/8	2	370	13	9.5	500	7.0	6.0	750	10	8.0	840	18	12	520	700	1050	1175
			3	420	10	8.0	580	5.5	5.0	840	8.5	7.0	950	14	10	590	785	1175	1330	
		3/8	2	480	15	11	640	9.5	7.5	980	13	9.5	1090	21	13	670	895	1345	1525	
			3	540	12	9.5	720	7.5	6.0	1080	11	8.5	1220	18	12	755	1010	1510	1710	
	8d	1-3/8	7/16	2	510	14	10	680	8.5	7.0	1010	12	9.5	1150	20	13	715	950	1415	1610
				3	570	11	9.0	760	7.0	6.0	1140	10	8.0	1290	17	12	800	1065	1595	1805
			15/32	2	540	13	9.5	720	7.5	6.5	1080	11	8.5	1200	19	13	755	1010	1485	1680
			3	600	10	8.5	800	6.0	5.5	1200	9.0	7.5	1350	15	11	840	1120	1680	1890	
		1-1/2	2	580	25	15	770	15	11	1150	21	14	1310	33	18	810	1080	1610	1835	
			3	650	21	14	860	12	9.5	1300	17	12	1470	28	16	910	1205	1820	2060	
	10d	1-1/2	19/32	2	640	21	14	850	13	9.5	1280	18	12	1480	28	17	895	1190	1790	2045
				3	720	17	12	980	10	8.0	1440	14	11	1640	24	15	1010	1345	2015	2295

TABLE 4.2A SHEATHING SHEAR CAPACITIES

Top Plate Chord Design

Max Chord Tension/Compression =	1188	lbs
Ft =	350	psi
Fc =	1000	psi
Cd =	1.6	
As pro (2) 2 x 6 =	16.5	in^2
F't =	560	psi
F't allowable tension =	9240	lbs

Controls because fully braced
By inspection Ok for wall shear force

OK >

Top Plate Splice Design

Assuming splice is at a position that has to tranfer full tension/compression or full shear		
Max Chord Tension/Compression =	1188	lbs
Wall Shear =	4519	lbs
Try MST72 Strap		
Allowable Tension	6730	lbs

Controls

OK>

1188 lbs				
MST72	18	(4b) 0.162 x 2½	6,235	5,405
	30	(48) 0.162 x 2½	6,505	5,640
	24	(54) 0.162 x 2½	6,730	6,345
	18	(62) 0.162 x 2½	6,730	6,475

See footnotes below.

4519 MST72 ALLOWABLE TENSION

Wall Out of Plane Stud Design

ASD Wall Design Pressure =	102.0	psf
2" x 6" Stud Spacing =	1.0	ft
ASD Load/stud =	102.00	lb/ft
Controlling Stud Ht. =	8	ft
ASD Wind Moment =	816.00	ft*lb
2 x 6 Section Modulus =	7.56	in^3
Applied Stress =	1295.24	psi
Cd =	1.6	
Fb southern yellow pine =	1100	psi
F'b =	1760	psi
I stud =	20.8	in^4
E stud =	1100000	psi
Deflection =	0.410853147	in
Allowable deflection L/180 =	0.533333333	in

OK > 1295.238

OK

Wall Out of Plane Fastener Withdrawl (side walls negative pressure)

Try 3" spacing s =	3	
Ae =	0.5	sf
C&C Wind Pressure =	-169.2	psf
Applied Withdrawl =	-84.6	lbs
Max ASD Fastener Shear =	137	lbs
Max ASD Fastener Shear Per Fastener =	34.37181273	lbs
Max combined ASD Fastener load =	161.4434694	lbs
Use 2" #12 screw at 3" on center interior and edges capacity =	538.9292165	lbs

OK

Wall In Plane Design Using Segmented Shear Wall Method

Max Wall Shear 20' wall =	4519	lb/ft
Max Wall Shear 24' wall =	3300	lbs

SHEAR WALL 20' WITH DOOR AND 6' WINDOW

See "20' Shear Wall Design" Tab

SHEAR WALL 20' WITH 6' AND 3' WINDOW

See "20' Shear Wall Design" Tab

SHEAR WALL 24' WITH 12' OPENING AND 3' WINDOW

See "24' Shear Wall Design" Tab

NOTE SEE ROOF DESIGN FOR WALL SHEATHING OUT OF PLANE CAPACITY
B/C ROOF SPAN AND PRESSURES ARE GREATER WALL SHEATHING OUT OF PLANE DOESN'T CONTROL

Stud Connection to Top Plate/Sill Plate

Uplift =	-56.82061907	psf
Stud Spacing =	1	ft
Uplift per stud =	-375.0160858	
Roof Weight x 0.6 =	153.84	lb/ft
Wall Weight x 0.6 =	49.5	lb/ft
Total Uplift =	-171.6760858	lb

USE TSP ANCHOR BOTTOM OF STUDS TSP ANCHOR TOP OF STUDS ALLOWABLE UPLIFT = 755 LBS

Sill Plate Attachment to Foundation

See Shear Wall Design Tabs

Stud Connection to Top Plate/Sill Plate at Opening and Header Straps

Largest Opening =	6	ft
Uplift at window jack/king studs =	-1125.048258	lb
Six foot opening uplift =	-562.5241288	lb
Dead load =	540	
Required uplift capacity at six foot opening =	-22.52412876	lbs
Required uplift capacity at twelve foot opening =	-45.04825752	lbs
USE MSTA 30 strap around 6 foot openings CAPACITY =	2050	lbs
Use CS16 strap	1325	lbs

OK

OK

Holddown Requirements

See Shear Wall Design Tabs

											Code Ref.
Model No.	Dimensions (in.)		Stud	Plate Width	Fasteners (in.)		Allowable Uplift Loads				
	W	L			Stud*	Plate	DF/SP		SPF/HF		
							Side 8 (160)	Center 9 (160)	Side 8 (160)	Center 9 (160)	
SP1	3½	5½	2x	—	(6) 0.148 x 3	(4) 0.148 x 3	555	555	535	535	IBC, FL, LA
SP2	3½	6½	2x	—	(6) 0.148 x 3	(6) 0.148 x 3	1,010	1,010	605	605	
SP4	3½	7¼	2x	4x	(6) 0.148 x 1½	—	415	825	355	710	
SP6	5½	7¼	2x	6x	(6) 0.148 x 1½	—	415	825	355	710	
SP8	7½	8½	2x	8x	(6) 0.148 x 1½	—	415	825	355	710	
SPH4	3½	8¼	2x	4x	(10) 0.148 x 1½	—	520	1,040	450	895	
					(12) 0.148 x 1½	—	640	1,280	550	1,100	
SPH6	5½	9¼	2x	6x	(10) 0.148 x 1½	—	520	1,040	450	895	
					(12) 0.148 x 1½	—	640	1,280	550	1,100	
SPH8	7½	8½	2x	8x	(10) 0.148 x 1½	—	520	1,040	450	895	
					(12) 0.148 x 1½	—	640	1,280	550	1,100	
RSP4 (1)	2½	4½	2x	—	(4) 0.131 x 1½	(4) 0.131 x 1½	245	245	285	285	
RSP4 (2)	2½	4½	2x	—	(4) 0.131 x 1½	(4) 0.131 x 1½	390	390	370	370	
CS20	1¼	24	2x	—	(6) 0.148 x 1½	—	—	550	—	475	
				—	(10) 0.148 x 1½	—	—	915	—	790	
				—	(12) 0.148 x 1½	—	—	1,135	—	980	
CS16	1¼	26	2x	—	(14) 0.148 x 1½	—	—	1,325	—	1,140	

1. See pp. 260-261 for Straps and Ties General Notes.

CS16 STUD PLATE TIES

Headers

Per WFCM three 2" x 8" headers can span	6.82	ft
Dist from top plate to header max =	4.095	ft
Dist from sill plate to bottom of window =	3	ft
x =	4.095	
wall height h =	11.42	ft
x/h =	0.358581436	
Number of full head studs required for 6 foot	3	
Number of full head studs required for 3 foot	2	

Blocking to Stud

Withdrawl C & C pressure =	-169.2	psf
Trib =	4	sf
Withdrawl Pressure =	-676.9933361	
Try 3 connectors each end		
Connector Applied Shear =	-112.8322227	
10d box Z =	93	lbs
Cd =	1.6	
Ctn =	0.83	
Z' =	123.504	lbs

OK

Sill Plate Out of Plane Bending/Shear Design

Sill plate trib =	21	psf
C & C Pressure	75.2	psf
Trib =	3.5	sf
Wapp =	263.13	lb/ft
Mapp (6' window) =	1184.085	lb*ft
S (2) 2 x 6=	15.125	in^3
App Stress =	939.4393388	psi
Cd =	1.6	
Fb =	775	psi
F'b =	1240	psi
Vapp =	789.39	lbs
fv =	47.84181818	psi
F'v =	216	psi
Q =	12.375	in^3
I =	415.9375	in^4
Shear Flow =	281.8318017	lb/ft
Z 10d box =	93	lbs
Z' 10d box =	148.8	lbs
Req Spacing =	6.335693806	in

Say 6"

Sill Plate Out of Plane Bending/Shear Design

Sill plate trib =	10.5	psf
C & C Pressure	101.5	psf
Trib =	3.5	sf
Wapp =	355.32	lb/ft
Mapp (6' window) =	399.735	lb*ft
S 2 x 6=	7.5625	in^3
App Stress =	634.2902	psi
Cd =	1.6	
Fb =	775	psi
F'b =	1240	psi
Vapp =	532.98	lbs
fv =	32.30182	psi
F'v =	216	psi

OK

Ok

OK

Stud Plate Ties (cont.)

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

Model No.	Dimensions (in.)		Fasteners (in.)			Allowable Uplift Loads (160)			Code Ref.
	W	L	Studs	Double Top Plate	Single Sill Plate	Double Top Plate	Single Sill Plate		
						DF/SP/SPF	DF/SP	SPF/HF	
SSP	1½	6¾	(4) 0.148 x 1½	(3) 0.148 x 1½	—	330	—	—	IBC, FL, LA
			—	—	(1) 0.148 x 1½	—	395	310	
			(4) 0.148 x 3	(3) 0.148 x 3	—	410	—	—	
DSP	2¾	6¾	—	—	(1) 0.148 x 3	—	430	400	
			(6) 0.148 x 1½	(6) 0.148 x 1½	—	730	—	—	
			—	—	(2) 0.148 x 1½	—	620	515	
			(6) 0.148 x 3	(6) 0.148 x 3	—	780	—	—	
TSP	1½	7¾	—	—	(2) 0.148 x 3	—	780	565	
			(6) 0.148 x 1½	(3) 0.148 x 1½	—	465 ^a	400		
			(9) 0.148 x 1½	(6) 0.148 x 1½	—	755 ^a	—	—	
			(6) 0.148 x 3	—	—	1,015 ^a	—	—	FL

1. See pp. 260-261 for Straps and Ties General Notes.
2. When cross-grain bending or cross-grain tension cannot be avoided in the members, mechanical reinforcement to resist such forces shall be considered by the Designer.
3. Allowable loads for DSP installed to a rim board are 620 lb. (DF/SP) and 515 lb. (SPF/HF).
4. Noted values apply only to DF/SP members. For SPF values, multiply by 0.86.

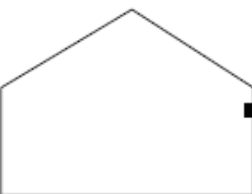
TSP STUD PLATE TIES

SS	MSTA24	16	1 ¼	24	(18) 0.148 x 2 ½	1,640	1,460	FL, LA
	MSTA30		1 ¼	30	(22) 0.148 x 2 ½	2,050	1,825	
	MSTA36		1 ¼	36	(26) 0.148 x 2 ½	2,050	2,050	
SS	MSTA49		1 ¼	49	(26) 0.148 x 2 ½	2,020	2,020	
	ST9		1 ¼	9	(8) 0.162 x 2 ½	885	765	IBC, FL, LA
	ST12		1 ¼	11 ½	(10) 0.162 x 2 ½	1,105	955	
	ST18		1 ¼	17 ¾	(14) 0.162 x 2 ½	1,420	1,335	
	ST22		1 ¼	21 ½	(18) 0.162 x 2 ½	1,420	1,420	

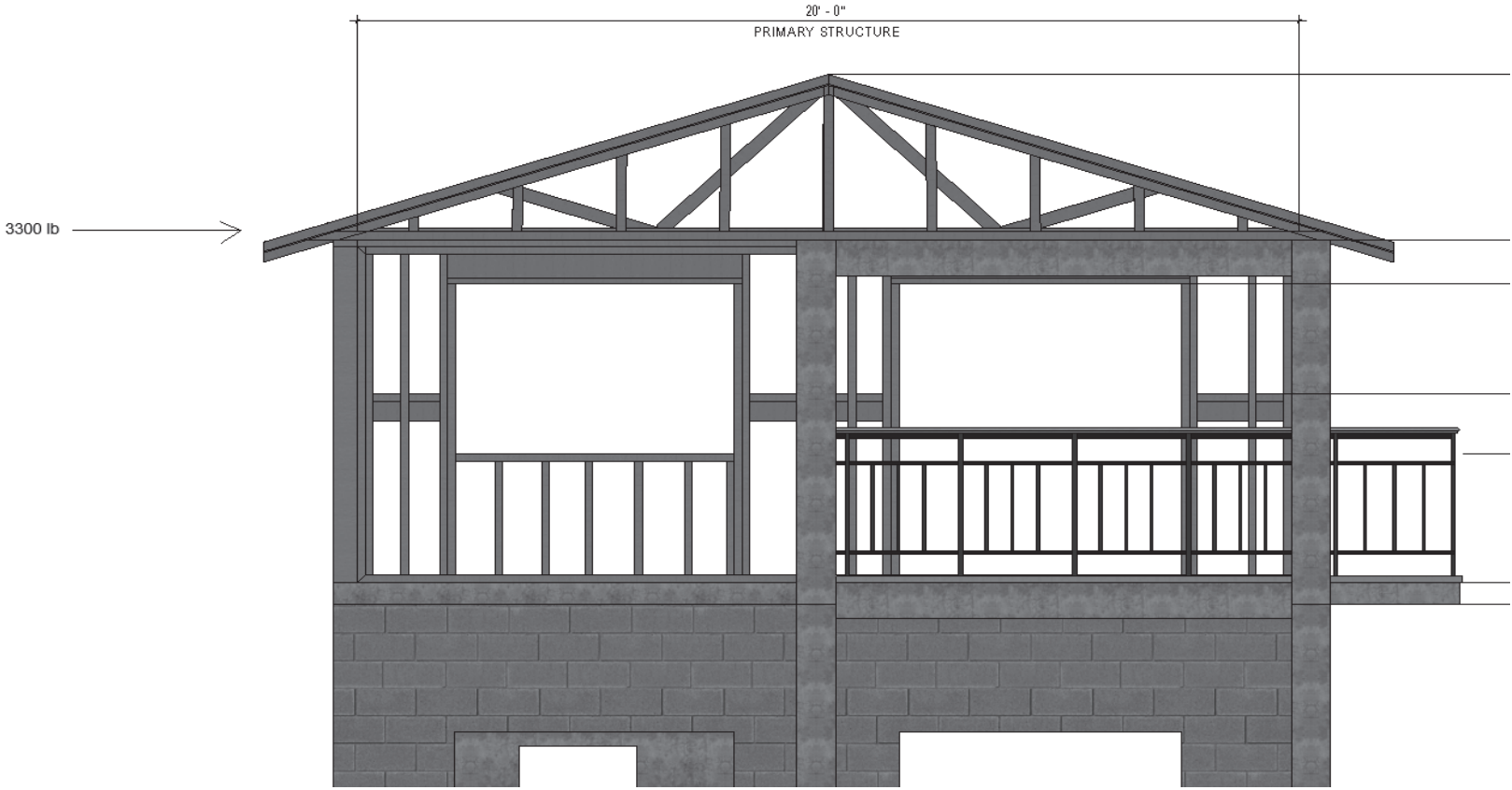
MSTA 30 STRAP CAPACITY

Table 3.22A1
 (Supporting a Roof and Ceiling)
 Dead Load Assumptions: Roof/Ceiling Assembly = 20 psf, L/Δ_{LL}=240

Laterally Unsupported (Dropped) Header Spans for Exterior Loadbearing Walls
Dropped Exterior

		Roof Live Load			Ground Snow Load								
		20 psf			30 psf			50 psf			70 psf		
		Building Width (ft)											
		12	24	36	12	24	36	12	24	36	12	24	36
Headers Supporting	Size	Maximum Header/Girder Spans (ft-in.) for Common Lumber Species ^{1,3,4}											
	1-2x6	4 - 4	3 - 4	2 - 9	3 - 11	3 - 0	2 - 7	3 - 4	2 - 7	2 - 2	3 - 0	2 - 4	2 - 0
	1-2x8	5 - 3	4 - 1	3 - 6	4 - 10	3 - 9	3 - 3	4 - 2	3 - 3	2 - 9	3 - 9	2 - 11	2 - 6
	1-2x10	6 - 0	4 - 9	4 - 0	5 - 7	4 - 5	3 - 9	4 - 10	3 - 10	3 - 3	4 - 4	3 - 5	2 - 11
	1-2x12	6 - 6	5 - 3	4 - 7	6 - 2	5 - 0	4 - 4	5 - 5	4 - 5	3 - 9	4 - 11	4 - 0	3 - 4
	2-2x4	4 - 4	3 - 3	2 - 9	3 - 11	3 - 0	2 - 7	3 - 4	2 - 7	2 - 2	3 - 0	2 - 4	1 - 11
	2-2x6	6 - 2	4 - 10	4 - 1	5 - 8	4 - 5	3 - 9	4 - 11	3 - 10	3 - 3	4 - 5	3 - 5	2 - 11
	2-2x8	7 - 2	5 - 9	4 - 11	6 - 9	5 - 5	4 - 8	5 - 11	4 - 8	4 - 0	5 - 4	4 - 3	3 - 7
	2-2x10	7 - 10	6 - 4	5 - 6	7 - 6	6 - 1	5 - 3	6 - 7	5 - 4	4 - 8	6 - 0	4 - 10	4 - 2
	2-2x12	8 - 5	6 - 10	6 - 0	8 - 1	6 - 7	5 - 10	7 - 2	5 - 11	5 - 2	6 - 6	5 - 5	4 - 9
	3-2x8	8 - 5	6 - 10	5 - 11	8 - 0	6 - 6	5 - 7	7 - 1	5 - 8	4 - 11	6 - 5	5 - 2	4 - 5
	3-2x10	9 - 2	7 - 5	6 - 6	8 - 9	7 - 2	6 - 3	7 - 9	6 - 4	5 - 6	7 - 1	5 - 9	5 - 0
	3-2x12	9 - 9	8 - 0	7 - 0	9 - 4	7 - 8	6 - 9	8 - 4	6 - 10	6 - 1	7 - 8	6 - 3	5 - 7
	4-2x8	9 - 4	7 - 7	6 - 8	8 - 11	7 - 3	6 - 4	7 - 11	6 - 5	5 - 7	7 - 2	5 - 10	5 - 0
	4-2x10	10 - 2	8 - 3	7 - 3	9 - 8	8 - 0	7 - 0	8 - 8	7 - 1	6 - 3	7 - 11	6 - 6	5 - 8
	4-2x12	10 - 10	8 - 10	7 - 9	10 - 4	8 - 7	7 - 6	9 - 3	7 - 8	6 - 9	8 - 6	7 - 0	6 - 2

MAXIMUM HEADER SPANS



USE segmented method

DESIGN WITH ONE OPENING EXCLUDE PANEL ADJACENT TO DOOR

Shear Wall Design 20' Wall with door

Shear Wall Shear =	3300	lb	
Using preforated method			
L1 =	2.58		
L2 =	3.50		
L3 =	2.75		
worst case h/L ratio =	3.10	<3.5	OK
Ltot =	21.00		
% Full Ht. =	0.29		
Co =	0.41		
V/Co =	8048.034		
panel shear =	911.0982		
nominal panel shear =	1822.196		
10d nails at 3" with 3" blocking 15/32" struct 1 OSB =	1860	plf	OK*
T/Co =	3065.918		
T/Co LRFD =	5109.863		
USE HDU5 holddown capacity =	5646	lb	
5/8" DIA. CAP. LRFD 4.5" embed=	5110	lb	OK
NEED 2 STUDS AT EACH HOLDDOWN (NEED DETAIL)			
Required Shear Wall Sill Plate Anchorage Force =	911.0982	lb/ft	
MASA Anchor at 1'-0" on center =	1475	lb	OK

Table 4.3.3.5 Shear Capacity Adjustment Factor, C.

Wall Height, h	Maximum Opening Height ¹				
	h/3	h/2	2h/3	5h/6	h
8' Wall	2'-8"	4'-0"	5'-4"	6'-8"	8'-0"
10' Wall	3'-4"	5'-0"	6'-8"	8'-4"	10'-0"
Percent Full-Height Sheathing ²	Effective Shear Capacity Ratio				
10%	1.00	0.69	0.53	0.43	0.36
20%	1.00	0.71	0.56	0.45	0.38
30%	1.00	0.74	0.59	0.49	0.42
40%	1.00	0.77	0.63	0.53	0.45
50%	1.00	0.80	0.67	0.57	0.50
60%	1.00	0.83	0.71	0.63	0.56
70%	1.00	0.87	0.77	0.69	0.63
80%	1.00	0.91	0.83	0.77	0.71
90%	1.00	0.95	0.91	0.87	0.83
100%	1.00	1.00	1.00	1.00	1.00

SHEAR CAPACITY ADJUSTMENT FACTOR

* Provided sheathing thickness is greater than maximum thickness provided by NDS table therefore actual capacity will be greater than what is shown



20' ShearWallWithTwoWindows

Shear Wall Design 20' Wall with door

Shear Wall Shear =	3300	lb	
Using preforated method			
L1 =	2.75		
L2 =	5.82		
L3 =	3.33		
worst case h/L ratio =	2.91	<3.5	OK
Ltot =	21.00		
% Full Ht. =	0.41		
Co =	0.77		
V/Co =	4285.317		
panel shear =	360.1107		
nominal panel shear =	720.2213		
10d nails at 3" with 3" blocking 15/32" struct 1 OSB =	1860	plf	OK*
Applied Tension T/Co =	1632.502	lb	
Applied Tension T/Co LRFD =	2720.836	lb	
USE HDU5 holddown capacity =	5646	lb	OK
5/8" DIA. CAP. LRFD 4.5" embed=	5110	lb	OK
NEED 2 STUDS AT EACH HOLDDOWN			
Required Shear Wall Sill Plate Anchorage Force =	360.1107	lb/ft	
MASA Anchor at 1'-0" on center =	1475	lb	OK

* Provided sheathing thickness is greater than maximum thickness provided by NDS table therefore actual capacity will be greater than what is shown

Table 4.3.3.5 Shear Capacity Adjustment Factor, C _s					
Wall Height, h	Maximum Opening Height ¹				
	h/3	h/2	2h/3	5h/6	h
8' Wall	2'-8"	4'-0"	5'-4"	6'-8"	8'-0"
10' Wall	3'-4"	5'-0"	6'-8"	8'-4"	10'-0"
Percent Full-Height Sheathing ²	Effective Shear Capacity Ratio				
10%	1.00	0.69	0.53	0.43	0.36
20%	1.00	0.71	0.56	0.45	0.38
30%	1.00	0.74	0.59	0.49	0.42
40%	1.00	0.77	0.63	0.53	0.45
50%	1.00	0.80	0.67	0.57	0.50
60%	1.00	0.83	0.71	0.63	0.56
70%	1.00	0.87	0.77	0.69	0.63
80%	1.00	0.91	0.83	0.77	0.71
90%	1.00	0.95	0.91	0.87	0.83
100%	1.00	1.00	1.00	1.00	1.00

SHEAR CAPACITY ADJUSTMENT FACTOR

Table 4.3A Nominal Unit Shear Capacities for Wood-Frame Shear Walls^{1,3,6,7}

Wood-based Panels ⁴																			
Sheathing Material	Minimum Nominal Panel Thickness (in.)	Minimum Fastener Penetration in Framing Member or Blocking (in.)	Fastener Type & Size	A SEISMIC										B WIND					
				Panel Edge Fastener Spacing (in.)										Panel Edge Fastener Spacing (in.)					
				6			4			3			2			6	4	3	2
				V _s (plf)	G _s (kips/in.)		V _s (plf)	G _s (kips/in.)		V _s (plf)	G _s (kips/in.)		V _s (plf)	G _s (kips/in.)		V _w (plf)	V _w (plf)	V _w (plf)	V _w (plf)
Wood Structural Panels - Structural ^{1,4,5}			Nail (common or galvanized box)	OSB		PLY	OSB		PLY	OSB		PLY	OSB		PLY				
	5/16	1-1/4	6d	400	13	10	600	18	13	780	23	16	1020	35	22	560	840	1090	1430
	3/8 ²			460	19	14	720	24	17	920	30	20	1220	43	24	645	1010	1290	1710
	7/16 ²	1-3/8	8d	510	16	13	790	21	16	1010	27	19	1340	40	24	715	1105	1415	1875
	15/32			560	14	11	860	18	14	1100	24	17	1460	37	23	785	1205	1540	2045
	15/32	1-1/2	10d	680	22	16	1020	29	20	1330	36	22	1740	51	28	950	1430	1860	2435
	5/16			360	13	9.5	540	18	12	700	24	14	900	37	18	505	755	980	1260
NOMINAL SHEAR WALL CAPACITIES																			

NOMINAL SHEAR WALL CAPACITIES

Model No.	Ga.	Dimensions (in.)					Fasteners (in.)		Minimum Wood Member Size (in.)	Allowable Tension Loads (160)		
		W	H	B	CL	SO	Anchor Bolt Dia. (in.)	Wood Fasteners		DF/SP	SPF/HF	Deflection at Allowable Load (in.)
DTT1Z	14	1 ½	7 ⅞	1 ⅞	¾	¾	¾	(6) SD #9 x 1 ½	1 ½ x 5 ½	840	840	0.17
								(6) 0.148 x 1 ½		910	640	0.167
								(8) 0.148 x 1 ½		910	850	0.167
DTT2Z	14	3 ¼	6 15⁄16	1 5⁄8	1 3⁄16	¾	½	(8) ¼ x 1 ½ SDS	1 ½ x 3 ½	1,825	1,800	0.105
(8) ¼ x 1 ½ SDS								3 x 3 ½	2,145	1,835	0.128	
DTT2Z-SDS2.5								(8) ¼ x 2 ½ SDS	3 x 3 ½	2,145	2,105	0.128
HDU2-SDS2.5	14	3	8 1⁄16	3 ¼	1 5⁄16	1 3⁄8	5⁄8	(6) ¼ x 2 ½ SDS	3 x 3 ½	3,075	2,215	0.088
HDU4-SDS2.5	14	3	10 15⁄16	3 ¼	1 5⁄16	1 3⁄8	5⁄8	(10) ¼ x 2 ½ SDS	3 x 3 ½	4,565	3,285	0.114
HDU5-SDS2.5	14	3	13 3⁄16	3 ¼	1 5⁄16	1 3⁄8	5⁄8	(14) ¼ x 2 ½ SDS	3 x 3 ½	5,645	4,340	0.115

HDU5 HOLDDOWN ALLOWABLE CAPACITIES

Simpson Strong-Tie® Wood Construction Connectors

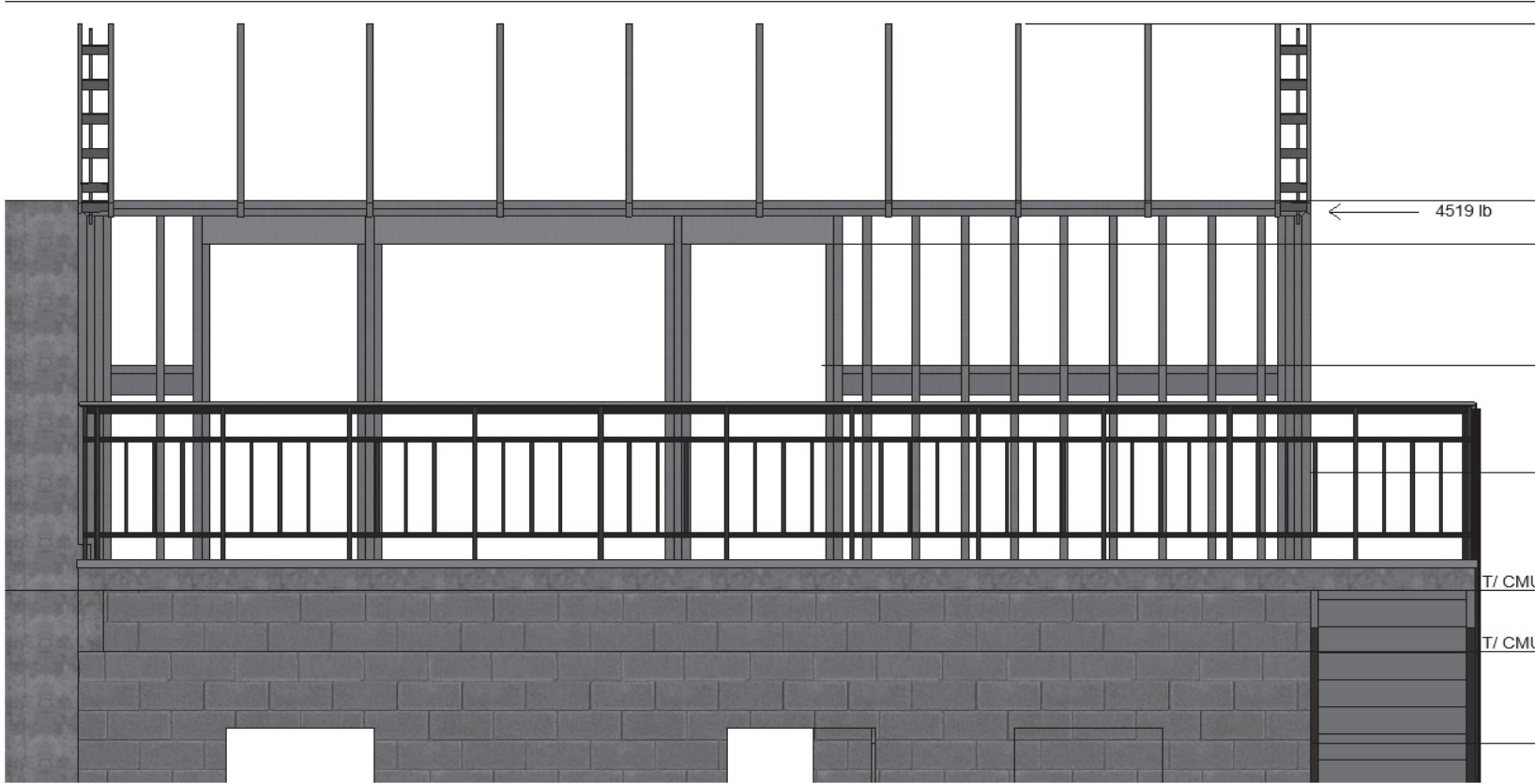
MASA/MASAP

Mudsill Anchors (cont.)

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

Model No.	Sill Size	Fasteners (in.)		Allowable Loads												Code Ref.	
		Sides	Top	Uncracked						Cracked							
				Wind and SDC A&B ^{5,6}			SDC C–F ⁶			Wind and SDC A&B ^{5,6}			SDC C–F ⁶				
				Uplift	F ₁	F ₂	Uplift	F ₁	F ₂	Uplift	F ₁	F ₂	Uplift	F ₁	F ₂		
Standard Installation – Attached to DF/SP Sill Plate																	
MASA or MASAP	2x4, x6, x8, x10	(3) 0.148 x 1 ½	(6) 0.148 x 1 ½	920	1,475	1,095	745	1,235	1,045	750	1,475	875	660	1,235	765	IBC, FL, LA	
	3x4, 3x6	(5) 0.148 x 1 ½	(4) 0.148 x 1 ½	630	1,165	725	550	1,020	725	475	1,165	725	415	1,020	640		
One-Leg-Up Installation – Attached to DF/SP Sill Plate																	

MASA MUDSILL ANCHOR CAPACITIES

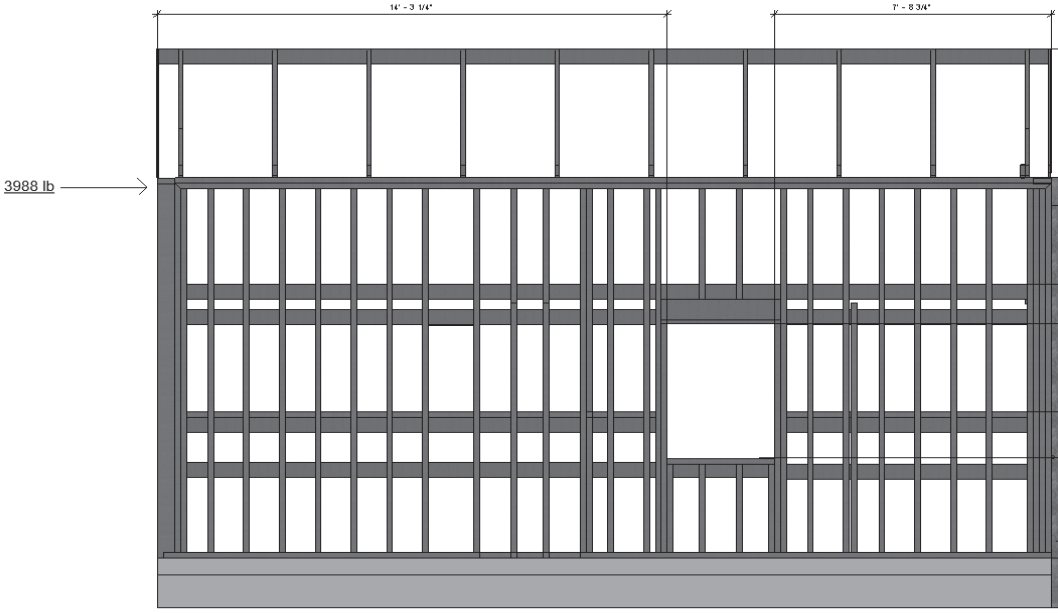


DESIGN WITH ONE OPENING EXCLUDE PANEL ADJACENT TO DOOR
THIS DESIGN WILL WORK FOR MODULE WALL WITH 12' OPNG WITH SHORTER PANELS AND LESS LOAD

Shear Wall Design 24' Wall with large opening and window	
Shear Wall total shear =	4519 lb
Using preforated method	
L1 =	3.82
L2 =	3.00
L3 =	2.75
worst case h/L ratio =	2.91 <3.5 OK
Ltot =	24.00
% Full Ht. =	0.28
Co =	0.73
V/Co =	6190.225
panel shear =	646.8365
nominal panel shear =	1293.673
10d nails at 3" with 3" blocking 15/32" struct 1 OSB =	1860 plf OK*
T/Co =	2063.408
T/Co LRFD =	3439.014
USE HDU5 holddown capacity =	5646 lb
5/8" DIA. CAP. LRFD 4.5" embed=	5110 lb
NEED 2 STUDS AT EACH HOLDDOWN	
Required Shear Wall Sill Plate Anchorage Force =	646.8365 lb/ft
MASA Anchor at 1'-0" on center =	1475 lb OK

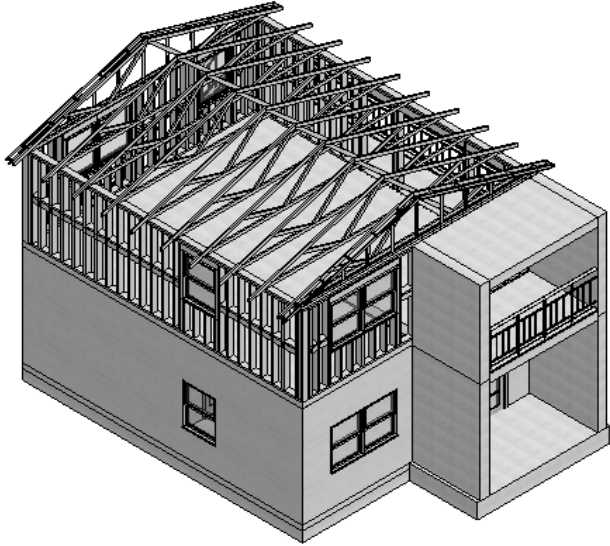
Table 4.3.3.5 Shear Capacity Adjustment Factor, C _s					
Wall Height, h	Maximum Opening Height ¹				
	h/3	h/2	2h/3	5h/6	h
8' Wall	2'-8"	4'-0"	5'-4"	6'-8"	8'-0"
10' Wall	3'-4"	5'-0"	6'-8"	8'-4"	10'-0"
Percent Full-Height Sheathing ²	Effective Shear Capacity Ratio				
10%	1.00	0.69	0.53	0.43	0.36
20%	1.00	0.71	0.56	0.45	0.38
30%	1.00	0.74	0.59	0.49	0.42
40%	1.00	0.77	0.63	0.53	0.45
50%	1.00	0.80	0.67	0.57	0.50
60%	1.00	0.83	0.71	0.63	0.56
70%	1.00	0.87	0.77	0.69	0.63
80%	1.00	0.91	0.83	0.77	0.71
90%	1.00	0.95	0.91	0.87	0.83
100%	1.00	1.00	1.00	1.00	1.00

* Provided sheathing thickness is greater than maximum thickness provided by NDS table
therefore actual capacity will be greater than what is shown

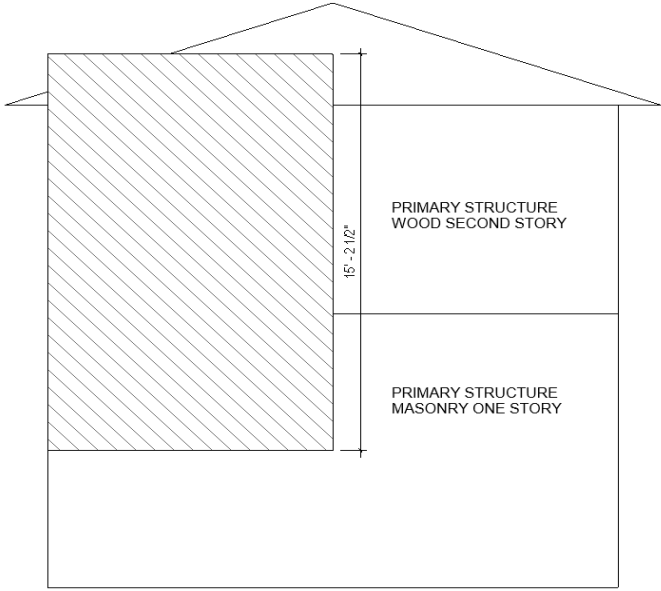


BY INSPECTION ABOVE DESIGN WILL WORK FOR THIS WALL

ASD WIND PRESSURES								
Windward Wall Pressures at "z" (psf)							Combined WW + LW	
				Windward Wall			Normal	Parallel
	z	Kz	Kzt	qzGCp	w/+qiGCpi	w/-qhGCpi	to Ridge	to Ridge
	0 to 15'	1.0	1.0	55.0	23.8	42.3	54.8	53.1
h=	20	1.0	1.0	57.9	25.5	43.9	56.5	54.8
ridge =	22.4	1.1	1.0	59.0	26.2	44.6	57.2	55.5



Note: Modules not included because they are acting independent of the primary structure and are not hard attached.



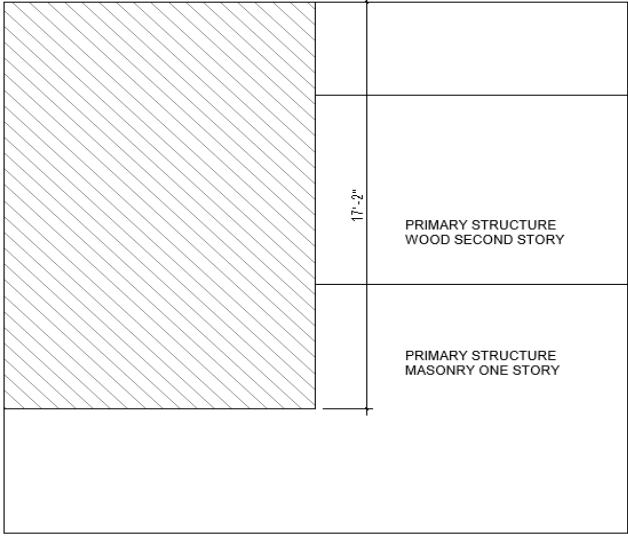
Roof Diaphragm Load Primary Structure Wind Parallel to Ridge:

B =	24	ft
Wall Ht. CMU =	18.50	ft
Roof Ht. Above 1st story=	11.90	ft
Roof Ht. Avg =	15.20	ft
Diaphragm Trib Area/ft =	15.20	Ft^2/ft
Diaphragm Load/ft Main =	843	lb/ft
Diaphragm Shear/Ft =	351	lb/ft
Wall Shear 24' Wall Primary	8429	lb
Diaphragm Moment =	60692	lb*ft
Diaphragm Chord T/C =	3035	lbs
Diaphragm Chord T/C per ft =	126	lbs/ft

o/o

Note: Diaphragm transfers load to two adjacent shear walls

TRIBUTARY FOR SHEAR WALL WIND PARALLEL TO RIDGE



Roof Diaphragm Load Primary Structure Wind Perpendicular to Ridge:

B =	20	ft
Wall Ht. CMU =	10.50	ft
Roof Ht. Above 1nd Story =	11.90	ft
Roof Ht. Avg =	11.90	ft
Diaphragm Trib Area/ft =	17.15	Ft^2/ft
Diaphragm Load/ft =	981	lb/ft
Diaphragm Total Shear/ft =	490	lb/ft
Wall Shear 20' Wall =	9810	lbs
Diaphragm Moment =	49050	lb*ft
Diaphragm Chord T/C =	2044	lbs
Diaphragm Chord T/C per ft =	102	lbs/ft

o/o

ASD

Doesn't control

Roof Diaphragm Load Primary Module for 10' Shear Wall:

B =	20	ft
Wall Ht. CMU =	10.50	ft
Roof Ht. Above 1nd Story =	10.50	ft
Roof Ht. Avg =	10.50	ft
Diaphragm Trib Area/ft =	5.25	Ft^2/ft
Diaphragm Load/ft =	300	lb/ft
Diaphragm Total Shear/ft =	300	lb/ft
Wall Shear 10' Wall =	3003	lbs
Diaphragm Moment =	15015	lb*ft
Diaphragm Chord T/C =	1502	lbs
Diaphragm Chord T/C per ft =	150	lbs/ft

o/o

ASD

Doesn't control

TRIBUTARY FOR SHEAR WALL WIND PERPENDICULAR TO RIDGE

Roof Diaphragm Load Primary Module for 20' Shear Wall:

B =	10	ft
Wall Ht. CMU =	10.50	ft
Roof Ht. Above 1nd Story =	10.50	ft
Roof Ht. Avg =	10.50	ft
Diaphragm Trib Area/ft =	5.25	Ft^2/ft
Diaphragm Load/ft =	300	lb/ft
Diaphragm Total Shear/ft =	75	lb/ft
Wall Shear 20' Wall =	1502	lbs
Diaphragm Moment =	3754	lb*ft
Diaphragm Chord T/C =	375	lbs
Diaphragm Chord T/C per ft =	38	lbs/ft

o/o

ASD

Doesn't control

Wall Design C and C Zone 4

Assume No. 5 at 24" O.C.			
Effective Wind Area =	36.75		
Wind Load =	60.6	lb/ft	ASD
Vert Load =	1150	lb	D+L
Self Wt Mid wall =	195	lb	Self
As pro =	0.15	sq in	
d =	2.8125	in	
Rho =	0.004444		
n =	21.5		
Rho x n =	0.095556		
k =	0.351928		
j =	0.882691	in	
M =	909	lb*ft	
fs =	29292.26	psi	< 32,000 psi OK
fb =	739.8538	psi	< 1900*0.45 = 855 psi OK
Equivalent Wall Thickness =			4 in
fa =	28.02083		28.02083 psi
fa+fb =	767.8747	psi	< 855 psi OK

Development Length

Wall is considered pinned/pinned
but is also a special shear wall

As min special shear wall = 0.2in^2/24"=0.1in^2 per foot
As provided = 0.225 in^2 per foot OK

W1.7 bed joint reinforcement not spaced at more than 16" on center (horiz)

ASCE 7
Anchor bolts embedded in grout have to resist 2 x seismic load (might not control)

Wall Design C and C Zone 5

Assume No. 5 at 16" O.C. at 3' out from edge			
Wind Load =	75.6	lb/ft	
Vert Load =	1150	lb	
Self Wt Mid wall =	195	lb	
As pro =	0.225	sq in	
d =	2.8125	in	
Rho =	0.006667		
n =	21.5		
Rho x n =	0.143333		
k =	0.410933		
j =	0.863022	in	
M =	1134	lb*ft	
fs =	24917.08	psi	
fb =	808.472	psi	
Equivalent Wall Thickness =			
fa =	28.02083		
fa+fb =	836.4928	psi	
NOTE: Many walls will have			
equivalent of Required steel			
due to shear wall panel req.			

ACI 530 7.4.3.1

WALL LOADS

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	8429	lbs
Wind out of plane =	45	psf

Fully Grouted
At 32" O.C.
windward
leeward

Wall Segment 1

l =	3	ft
P =	2.586	kips
Wind Segment =	2.494163	kips
M =	314.2645	kip*in
l =	36	in
t =	5.625	in
fa =	0.01277	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try no 7 at end of wall		
d =	28	in
b =	5.625	in
As =	0.6	in^2
p =	0.00381	
n =	21.5	
pn =	0.081905	
k =	0.331033	
j =	0.889656	
fb =	483.9417	psi
Fb =	855	psi
fs =	21026.36	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	16.41905	psi
Fv =	21.79	psi
Fv =	77.46	psi

Fully Grouted

2 no 5

> 483.9417 psi OK

> 21026.36 psi OK

> 16.41905 psi OK

Doesn't Control

Wall Segment 2

l =	4	ft
P =	3.336	kips
Wind Segment =	5.108366	kips
M =	643.6541	kip*in
l =	48	in
t =	5.625	in
fa =	0.012356	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try no 7 at end of wall		
d =	40	in
b =	5.625	in
As =	0.6	in^2
p =	0.002667	
n =	21.5	
pn =	0.057333	
k =	0.286111	
j =	0.90463	
fb =	552.6308	psi
Fb =	855	psi
fs =	29646.29	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	14.82667	psi
Fv =	21.79	psi
Fv =	77.46	psi

Fully Grouted

2 no 5

> 552.6308 psi OK

> 29646.29 psi OK

> 14.82667 psi OK

Doesn't Control

Relative Rigidities of Piers

Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentage of Lateral Force	V
1	10.5	3	3.5	0.187	0.295886076	2494.163
2	10.5	4	2.625	0.383	0.606012658	5108.366
3	10.5	2	5.25	0.062	0.098101266	826.9417
				0.632		

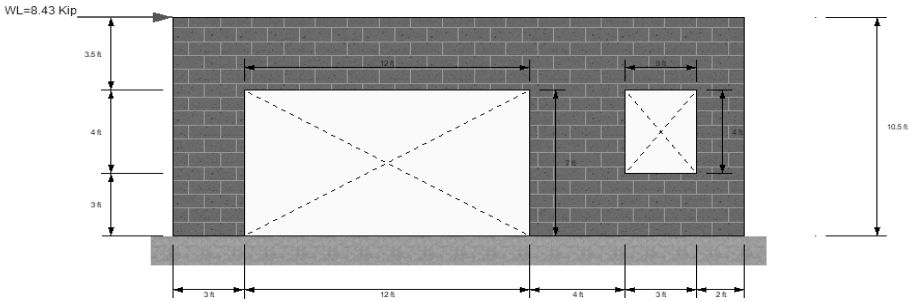


TABLE 11.2 Relative Rigidities of Piers – West Wall

Pier No.	Height h (ft)	Length l (ft)	h/l Ratio (all piers fixed)	Relative Rigidity Table ASD-89 Fixed Piers ²	Percentage Lateral Force to Each Pier	Force V to each Pier (pounds)	Unit Shear f _v in each pier = $\frac{V}{tl}$ (psi)
1	10	3	3.33	0.213	1.5	353	1.1
2	5	2	2.50	0.75	5.0	1,172	5.5
3	5	18	0.28	11.602	81.2	19,050	9.9
4	4	3	1.33	1.577	11.0	2,580	8.0
5	7	2	3.50	0.187	1.3	306	1.4
				$\Sigma = 14.329$	100%	$\Sigma = 23,460$ pounds ¹	

1. It would be conservative and quite usual to use the base shear, V = 26,700 lbs as the force on the wall and distribute this amount to all piers. The approach here is a little more detailed.

Wall Segment 3

l =	2	ft	
P =	1.836	kips	
Wind Segment =	0.826942	kips	
M =	104.1947	kip*in	
l =	24	in	
t =	5.625	in	
fa =	0.0136	ksi	
r =	1.62	in	Fully Grouted
h/r =	77.77778		
Fa =	0.259259	psi	
Try no 7 at end of wall			
d =	16	in	
b =	5.625	in	
As =	0.6	in^2	2 no 5
p =	0.006667		
n =	21.5		
pn =	0.143333		
k =	0.410933		
j =	0.863022		
fb =	408.0562	psi	
Fb =	855	psi	> 408.0562 psi OK
fs =	12576.28	psi	
Fs =	32000	psi	> 12576.28 psi OK
M/Vd =	3.50		
fv =	20.4	psi	
Fv =	21.79	psi	> 20.4 psi OK
Fv =	77.46	psi	Doesn't Control

Maximum bar size for 6" block
1/8" member thickness = 0.703125 in
one quarter of cell = 1 in
No. 9 bar

PROVIDE 2 NO 5 AT ENDS OF EACH SEGMENT

WALL LOADS

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	8429	lbs
Wind out of plane =	45	psf

Relative Rigidities of Piers

Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentage of Lateral Force	V
1	10.5	7	1.5	1.27	0.4127397	3479.177
2	10.5	8	1.3125	1.62	0.5264868	4438.005
3	10.5	3	3.5	0.187	0.0607735	512.2883
				3.077		

Wall Segment 1

l =	7	ft
P =	2.45475	kips
Wind Segment =	3.479177	kips
M =	438.3763	kip*in
l =	84	in
t =	5.625	in
fa =	0.005195	ksi
r =	1.91	in
h/r =	65.96859	
Fa =	0.291737	psi
Try no 5 at end of wall		
d =	80	in
b =	5.625	in
As =	0.3	in^2
p =	0.000667	
n =	21.5	
pn =	0.014333	
k =	0.155585	
j =	0.948138	
fb =	165.0958	psi
Fb =	855	psi
fs =	19264.78	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	5.455	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partially Grouted

OK > fa

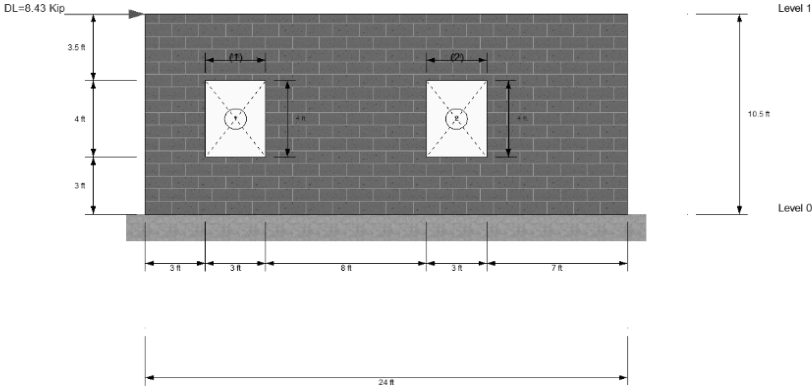
1 NO 5

> 165.0958 psi OK

> 19264.78 psi OK

> 5.455 psi OK

Doesn't Control



Wall Segment 2

l =	8	ft
P =	6.336	kips
Wind Segment =	4.438005	kips
M =	559.1887	kip*in
l =	96	in
t =	5.625	in
fa =	0.011733	ksi
r =	1.91	in
h/r =	65.96859	
Fa =	0.291737	psi
Try no 5 at end of wall		
d =	92	in
b =	5.625	in
As =	0.3	in^2
p =	0.00058	
n =	21.5	
pn =	0.012464	
k =	0.145912	
j =	0.951363	
fb =	169.2205	psi
Fb =	855	psi
fs =	21296.25	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	12.24348	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partially Grouted

OK>fa

> 169.2205 psi OK

> 21296.25 psi OK

> 12.24348 psi OK

Doesn't Control

Wall Segment 2		
l =	3	ft
P =	2.586	kips
Wind Segment =	0.512288	kips
M =	64.54832	kip*in
l =	36	in
t =	5.625	in
fa =	0.01277	ksi
r =	1.91	in
h/r =	65.96859	
Fa =	0.291737	psi
Try no 5 at end of wall		
d =	32	in
b =	5.625	in
As =	0.3	in^2
p =	0.001667	
n =	21.5	
pn =	0.035833	
k =	0.234261	
j =	0.921913	
fb =	103.7775	psi
Fb =	855	psi
fs =	7293.294	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	14.36667	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partially Grouted

OK>fa

> 103.7775 psi OK

> 7293.294 psi OK

> 14.36667 psi OK

Doesn't Control

Maximum bar size for 6" block

1/8" member thickness = 0.703125 in No. 6 bar

one quarter of cell = 1 in

JOB TITLE PR Homes: Two story Wood/CMU House

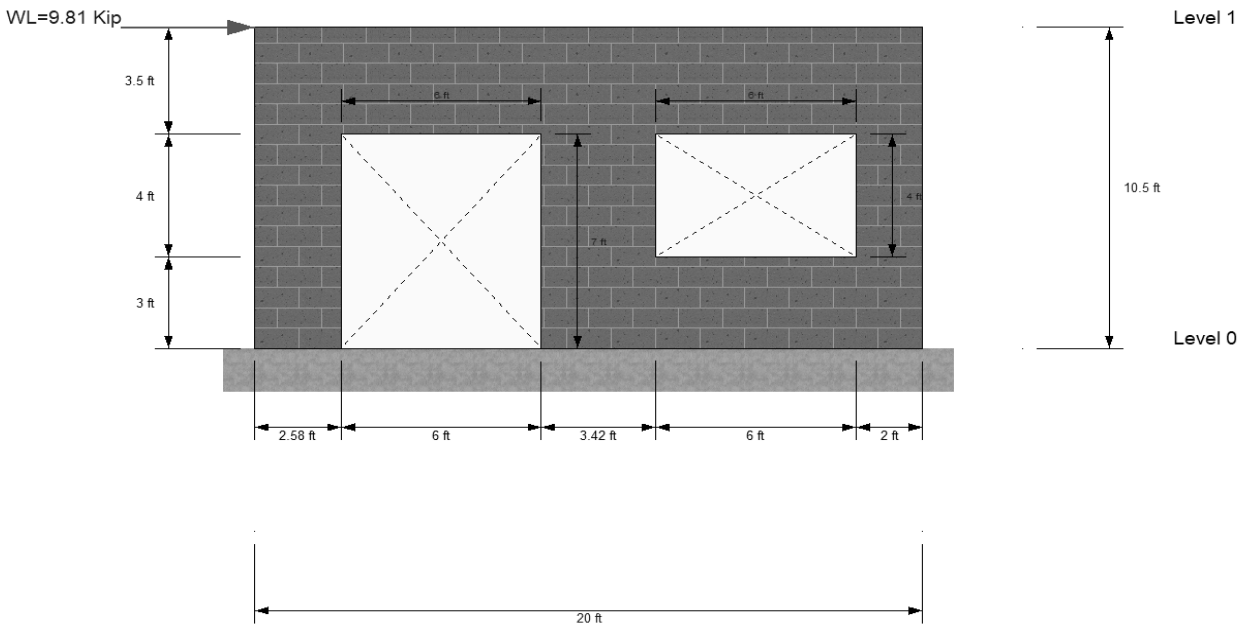
JOB NO. _____	SHEET NO. _____
CALCULATED BY <u>SW</u>	DATE <u>2/6/20</u>
CHECKED BY <u>MH</u>	DATE <u>2/6/20</u>

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
	39	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	9810	lbs
Wind out of plane =	45	psf

Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentage of Lateral Force	V
1	10.5	2.58	4.069767	0.125	0.323834	3176.794
2	10.5	3.42	3.070175	0.199	0.515544	5057.456
3	10.5	2	5.25	<u>0.062</u>	0.160622	1575.69
				0.386		

l =	2.58	ft
P =	2.271	kips
Wind Segment =	3.176794	kips
M =	400.276	kip*
l =	30.96	in
t =	5.625	in
fa =	0.01304	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try 2 no 6 at end of wall		
d =	23	in
b =	5.625	in
As =	0.88	in^2
p =	0.006802	
n =	21.5	
pn =	0.146242	
k =	0.413999	
j =	0.862	
fb =	753.8839	psi
Fb =	855	psi
fs =	22942.55	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	17.55362	psi
Fv =	21.79	psi
Fv =	77.46	psi

```
> 753.8839 psi OK
> 22942.55 psi OK
> 17.55362 psi OK
Doesn't Control
```



l =	3.42	ft
P =	2.901	kip
Wind Segment =	5.057456	kip
M =	637.2394	kip*
l =	48	in
t =	5.625	in
fa =	0.010744	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try 2 no 6 at end of wall		
d =	33.04	in
b =	5.625	in
As =	0.88	in^2
p =	0.004735	
n =	21.5	
pn =	0.101803	
k =	0.360765	
j =	0.879745	
fb =	653.9563	psi
Fb =	855	psi
fs =	24912.83	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	15.60936	psi
Fv =	21.79	psi
Fv =	77.46	psi

> 653.9563 psi OK
> 24912.83 psi OK
> 15.60936 psi OK
Doesn't Control

Wall Segment 3

l =	2	ft		
P =	1.836	kips		
Wind Segment =	1.57569	kips		
M =	198.5369	kip*in		
l =	24	in		
t =	5.625	in		
fa =	0.0136	ksi		
r =	1.62	in	Fully Grouted	
h/r =	77.77778			
Fa =	0.259259	psi		
Try no 2 NO 5 at end of wall				
d =	16	in		
b =	5.625	in		
As =	0.6	in^2		
p =	0.006667			
n =	21.5			
pn =	0.143333			
k =	0.410933			
j =	0.863022			
fb =	777.5275	psi		
Fb =	855	psi	>	777.5275
fs =	23963.37	psi		
Fs =	32000	psi	>	23963.37 psi OK
M/Vd =	3.50			
fv =	20.4	psi		
Fv =	21.79	psi	>	20.4 psi OK
Fv =	77.46	psi		Doesn't Control

Maximum bar size for 6" block
1/8" member thickness = 0.703125 in No. 6 bar = 0.75 in
one quarter of cell = 1 in
No. 9 bar

PROVIDE 2 NO. 5/6 AT ENDS OF WALL SEGMENTS

WALL LOADS

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
	39	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	9810	lbs
Wind out of plane =	45	psf

Relative Rigidities of Piers

Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentag e of Lateral Force	V
1	10.5	2.5	4.2	0.115	0.094031	922.4391
2	10.5	6.25	1.68	1.022	0.83565	8197.676
3	10.5	2.25	4.666667	0.086	0.070319	689.824
				1.223		

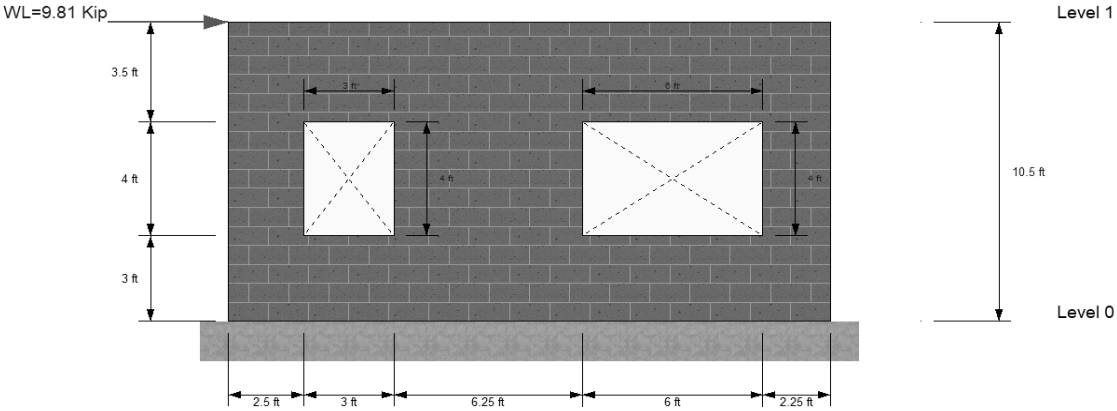
Fully Grouted
At 32" O.C.
windward
leeward

Wall Segment 1

l =	2.5	ft
P =	2.07975	kips
Wind Segment =	0.922439	kips
M =	116.2273	kip*in
l =	30.96	in
t =	5.625	in
fa =	0.011942	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try no 5 at end of wall		
d =	26	in
b =	5.625	in
As =	0.3	in^2
p =	0.002051	
n =	21.5	
pn =	0.044103	
k =	0.256148	
j =	0.914617	
fb =	260.9391	psi
Fb =	855	psi
fs =	16291.99	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	14.22051	psi
Fv =	21.79	psi
Fv =	77.46	psi

Fully Grouted

> 260.9391 psi OK
> 16291.99 psi OK
> 14.22051 psi OK
Doesn't Control



Wall Segment 2

l =	6.25	ft
P =	5.0235	kips
Wind Segment =	8.197676	kips
M =	1032.907	kip*in
l =	75	in
t =	5.625	in
fa =	0.011908	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try no 7 at end of wall		
d =	71	in
b =	5.625	in
As =	0.6	in^2
p =	0.001502	
n =	21.5	
pn =	0.0323	
k =	0.223911	
j =	0.925363	
fb =	351.6128	psi
Fb =	855	psi
fs =	26202.31	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	12.5784	psi
Fv =	21.79	psi
Fv =	77.46	psi

Fully Grouted

> 351.6128 psi OK
> 26202.31 psi OK
> 12.5784 psi OK
Doesn't Control

Wall Segment 3

l =	2.25	ft
P =	2.0235	kips
Wind Segment =	0.689824	kips
M =	86.91783	kip*in
l =	27	in
t =	5.625	in
fa =	0.013323	ksi
r =	1.62	in
h/r =	77.77778	
Fa =	0.259259	psi
Try no 7 at end of wall		
d =	23	in
b =	5.625	in
As =	0.6	in^2
p =	0.004638	
n =	21.5	
pn =	0.09971	
k =	0.357851	
j =	0.880716	
fb =	185.3626	psi
Fb =	855	psi
fs =	7151.444	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	15.64058	psi
Fv =	21.79	psi
Fv =	77.46	psi

Fully Grouted

> 185.3626
> 7151.444 psi OK
> 15.64058 psi OK
Doesn't Control

Maximum bar size for 6" block
1/8" member thickness = 0.703125 in
one quarter of cell = 1 in
No. 9 bar

WALL LOADS

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
	39	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	3003	lbs
Wind out of plane =	45	psf

Relative Rigidities of Piers

Fully Grouted
At 32" O.C.
windward
leeward

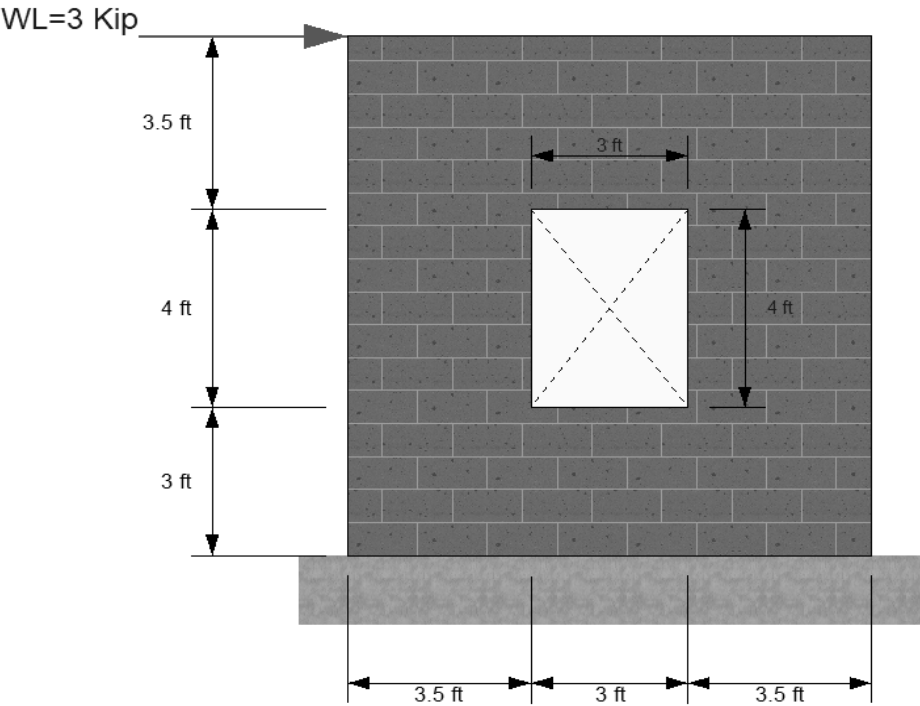
Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentag e of Lateral Force	V
1	10.5	3.5	3	0.278	0.5	1501.521
2	10.5	3.5	3	0.278	0.5	1501.521
				0.556		

Wall Segment 1/2

l =	3.5	ft
P =	2.82975	kips
Wind Segment =	1.501521	kips
M =	189.1917	kip*in
l =	42	in
t =	5.625	in
fa =	0.011978	ksi
r =	1.9	in
h/r =	66.31579	
Fa =	0.290859	psi
Try no 5 at end of wall		
d =	38	in
b =	5.625	in
As =	0.3	in^2
p =	0.001404	
n =	21.5	
pn =	0.030175	
k =	0.217335	
j =	0.927555	
fb =	231.0856	psi
Fb =	855	psi
fs =	17891.94	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	13.2386	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partially Grouted

> 231.0856 psi OK
> 17891.94 psi OK
> 13.2386 psi OK
Doesn't Control



WALL LOADS

D =	750	lb/ft
L =	400	lb/ft
Self =	64	psf
	39	psf
Wind =	45	psf
	-31.02886	psf
Wind in plane =	3003	lbs
Wind out of plane =	45	psf

Relative Rigidities of Piers

Pier No.	Height	Length	h/l	Relative Rigidity Table ASD-89	Percentag e of Lateral Force	V
1	10.5	3	3.5	0.187	0.109613	329.1729
2	10.5	7	1.5	1.27	0.744431	2235.559
3	10.5	3	3.5	0.187	0.109613	329.1729
4	10.5	2	5.25	0.062	0.036342	109.1375
				1.706		

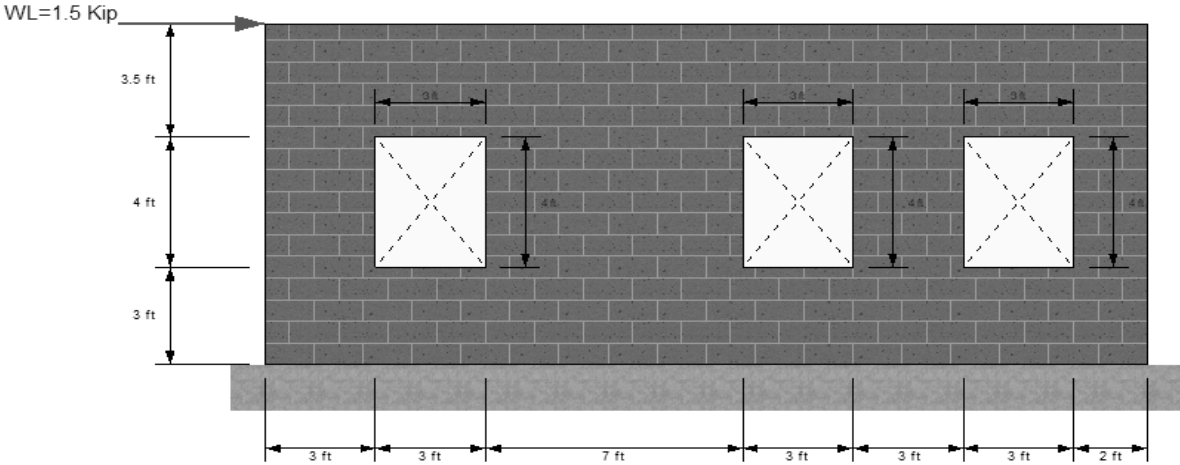
Fully Grouted
At 32" O.C.
windward
leeward

Wall Segment 1/3

l =	3	ft
P =	2.45475	kips
Wind Segment =	0.329173	kips
M =	41.47579	kip*in
l =	36	in
t =	5.625	in
fa =	0.012122	ksi
r =	1.9	in
h/r =	66.31579	
Fa =	0.290859	psi
Try no 5 at end of wall		
d =	32	in
b =	5.625	in
As =	0.3	in^2
p =	0.001667	
n =	21.5	
pn =	0.035833	
k =	0.234261	
j =	0.921913	
fb =	66.68267	psi
Fb =	855	psi
fs =	4686.336	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	13.6375	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partiall Grouted

> 66.68267 psi OK
> 4686.336 psi OK
> 13.6375 psi OK
Doesn't Control



Wall Segment 2

l =	7	ft
P =	5.45475	kips
Wind Segment =	2.235559	kips
M =	281.6805	kip*in
l =	84	in
t =	5.625	in
fa =	0.011544	ksi
r =	1.9	in
h/r =	66.31579	
Fa =	0.290859	psi
Try no 5 at end of wall		
d =	80	in
b =	5.625	in
As =	0.3	in^2
p =	0.000667	
n =	21.5	
pn =	0.014333	
k =	0.155585	
j =	0.948138	
fb =	106.083	psi
Fb =	855	psi
fs =	12378.66	psi
Fs =	32000	psi
M/Vd =	3.50	
fv =	12.12167	psi
Fv =	21.79	psi
Fv =	77.46	psi

Partiall Grouted

> 106.083 psi OK
> 12378.66 psi OK
> 12.12167 psi OK
Doesn't Control

Wall Segment 4

l =	2	ft		
P =	1.70475	kips		
Wind Segment =	0.109138	kips		
M =	13.75133	kip*in		
l =	24	in		
t =	5.625	in		
fa =	0.012628	ksi		
r =	1.9	in	Partiall Grouted	
h/r =	66.31579			
Fa =	0.290859	psi		
Try no 5 at end of wall				
d =	20	in		
b =	5.625	in		
As =	0.3	in^2		
p =	0.002667			
n =	21.5			
pn =	0.057333			
k =	0.286111			
j =	0.90463			
fb =	47.22666	psi		
Fb =	855	psi	>	47.22666 psi OK
fs =	2533.51	psi		
Fs =	32000	psi	>	2533.51 psi OK
M/Vd =	3.50			
fv =	15.15333	psi		
Fv =	21.79	psi	>	15.15333 psi OK
Fv =	77.46	psi		Doesn't Control

BY INSPECTION: Module 20' wall with one window will work with similar reinforcing

Twelve Foot Opening Design

DL roof =	20	psf	
Lr =	40	psf	
Half of Roof Width =	12.65	ft	
Height Above Opening =	1	ft	
Header DL =	252.98	lb/ft	
Header LL =	505.96	lb/ft	
Effective wind area =	21.33	sf	
D+L =	758.95	lb/ft	
0.6W =	-221.56	lb/ft	
Try 5.25 x 12			
b =	5.25		
d =	12.00		
Sx =	126.00	in^3	
Ix =	756.00	in^4	
Sy =	55.13	in^3	
Iy =	144.70	in^4	
Mapp D+L =	13661.04	lb ft	
Applied Stress D + L =	1301.05	psi	
Allowable Stress 2.6F-1.9E =	2600.00	psi	OK
Use L/360 defl criteria for brittle windows =	0.4	in	
Applied Live Load Deflection =	0.164343332	in	OK
Moment 0.6W =	-3988.106198	lb ft	
Applied Stress 0.6W =	-868.1591724	psi	
Fby =	1600	psi	OK
V app =	-1329.368733	lbs	OK
fv applied =	216.8418967	psi	
Fv =	300	psi	OK
V out of plane =	-997.0265495		
Use HGA10 KT =	1165	lbs	OK

LVL PLY Connector Design

Max Shear Wind Loads =	-1329.368733	lbs	
Ply width =	1.75	in	
Ply height =	9.25	in	
Total width =	5.25	in	
Q =	14.1640625	in^3	
I =	111.5419922	in^4	
VQ/I =	-2025.704736	lbs/ft	
TRY 2 SDW22500-R50 screws			
Z' =	275	lbs/ft	
Spacing Required =	3.258125374	in	OK
USE 2 SDW22500-R50 screws staggered at 3" on center			

Three Foot Opening Out of Plane Check

V (D+L) =	1138.42		
V(0.6W) =	-332.342		
HGA10kt out of plane =	1165	lbs	> -332.342 lbs OK

Six Foot Opening Out of Plane Check

V (D+L) =	2276.84		
V(0.6W) =	-664.684		
HGA10kt out of plane =	1165	lbs	> -664.684 lbs OK

Use HGA10 KT for 3' and 6' openings
for gravity conn. check see "Wall Design Calcs per WFCM"
for uplift see "Wall Design Calcs"

12' Lintel

Span/2 = 6' therefore not a deep beam.

Dead = 481.25 lb/ft
Live = 550 lb/ft
Self = 192 lb/ft
1223.25 lb/ft

V = 4281.375 lb
b = 5.625
d = 30
applied
shear stress = 25.37111 psi
 $F_v = 2 \cdot \sqrt{1900} = 87.17798$ psi
M = 22018.5 lb-ft
dv = 30 in
 $M/(Vdv) = 1$
Fvm = 49.03761

OK
No stirrups req.

M app = 264222 lb in
As pro = 0.6 sq in
b = 5.625
d = 30
Rho = 0.003556
n = 21.5
nRho = 0.076444
k = 0.321968
j = 0.892677
fsteel = 16443.79 lb in
fbmasonry = 363.1838 lb in

2 NO 5
Check spacing
1.375 > 1" OK
OK < 32000
OK < $0.45 \cdot 1900 = 855$

Masonry Lintel Deflection

b = 5.625 in
h = 22.875 in
Ig = 5610.797 in^4
fr = 1047.318 psi
yt = 11.4375 in
Mcr = 513773.9 lb in
M = 264222 lb in
Mcr/Ma = 7.352063
Em = 1350 ksi
n = 21.48148
d = 32 in
As = 0.31 in^2
p = 0.001722
np = 0.036996
c = 7.600727 in
Icr = 4787.737 in^4
Ie = 331872 in^4
w = 0.05125 k/in
L = 144 in
Defl = 0.00064 in
L/600 = 0.24 in

OK

Out of plane loading

Wind Load = -92.31727 psf
Span = 12 ft
M = -1661.711 lb ft
Fb all = 65 psi
Fv = 38.72983 psi
S = 168.75 in³
M/S = -118.1661 psi NG

Count on Bars at Bottom and top

As 0.6 two number fives
d = 2.8125
b = 32
p = 0.006667
n = 21.5
pn = 0.143333
k = 0.410933 OK
j = 0.863022
Fs = -13692.13 psi < 32000 psi OK
Fbm = -444.2615 psi Fb all = 855

3 fully grouted cells next to masonry wall

As = 0.9
Point load = -553.9036 lb
b = 15.625
d = 2.8125
M = 1.55 kip ft
M = 1550 lb ft
As 0.9 three number fives
d = 2.8125
b = 15.625
p = 0.02048
n = 21.5
pn = 0.44032
k = 0.596271
j = 0.801243
Fs = 9170.937 psi OK
Fbm = 629.9843 psi OK

6' Lintel

Dead = 411 lb/ft not a load bearing wall
Live = 80 lb/ft
Self = 42 lb/ft

533 lb/ft

V = 1599 lb
b = 5.625
d = 11.125 two grouted cores
applied
shear stress = 25.55206 psi
F'v = 2 *sqrt(1500) = 77.45967 psi
M = 2398.5 lb-ft
dv = 11.125 in
M/(Vdv) = 1
Fvm = 43.57106 OK no stirrups Fvm > applied

M app =	28782 lb in	
As pro =	0.3 sq in	
b =	5.625	
d =	11.125	
Rho =	0.004794	
n =	21.5	
nRho =	0.103071	
k =	0.36251	
j =	0.879163	
fsteel =	9809.122 lb in	< 32000 psi OK
fbmasonry	259.441 lb in	Fb all = 675

Masonry Lintel Deflection

b =	5.625 in	
h =	15.25 in	
Ig =	1662.458 in^4	
fr =	290.4738 psi	
yt =	7.625 in	
Mcr =	63331.22 lb in	
M =	28782 lb in	
Mcr/Ma =	10.65346	
Em =	1350 ksi	
n =	21.48148	
d =	12.5 in	
As =	0.62 in^2	
p =	0.008818	
np =	0.189419	
c =	5.682083 in	
Icr =	963.0706 in^4	
Ie =	846612 in^4	
w =	0.05125 k/in	
L =	144 in	
Defl =	0.000251 in	OK
L/600 =	0.24 in	

12' Lintel

Span/2 = 6' therefore not a deep beam.

Dead = 475 lb/ft
Live = 200 lb/ft
Self = 85.33333 lb/ft
760.3333 lb/ft

V = 2661.167 lb
b = 5.625
d = 17.375
applied
shear stress = 27.22856 psi
F'v = 2 *sqrt(1900) = 87.17798 psi
M = 13686 lb-ft
dv = 17.375 in
M/(Vdv) = 1
Fvm = 49.03761

No Stirrups Pro

M app = 164232 lb in
As pro = 0.6 sq in
b = 5.625
d = 17.375
Rho = 0.006139
n = 21.5
nRho = 0.13199
k = 0.398483
j = 0.867172
fstee = 18166.71 lb in
fbmasonry = 559.7579 lb in

2 no 5

Check spacing
1.375 > 1" OK

OK < 32000
OK < 0.45*1900 =

855

Masonry Lintel Deflection

b = 5.625 in
h = 14 in
Ig = 1286.25 in^4
fr = 1047.318 psi
yt = 7 in
Mcr = 192444.7 lb in
M = 164232 lb in
Mcr/Ma = 1.608957
Em = 1350 ksi
n = 21.48148
d = 32 in
As = 0.31 in^2
p = 0.001722
np = 0.036996
c = 7.600727 in
Icr = 4787.737 in^4
Ie = -9796.567 in^4
w = 0.05125 k/in
L = 144 in
Defl = -0.021696 in
L/600 = 0.24 in

OK

Foundation and Porch Conc. Design

DL =	20	psf
LL =	40	psf
Lr =	20	psf
Wall Weight Wood=	20	psf
Wall Weight Masonry =	39	psf
Wall Height CMU =	10.5	ft
Wall Height Wood =	8	ft
Bearing Width Footing =	2	ft
Slab Wt.	75	psf
Trib 24' wall	10	ft
D+ (24' wall)	1050.75	lb/ft
L (24' wall)	225	lb/ft
Trib 20' wall	3	ft
D (20' wall)	854.5	lb/ft
Increase for Gaps in Wall Carried by beam =	2.823529412	
D INTERIOR WALL =	2647.058824	lb/ft
L INTERIOR WALL =	1411.764706	lb/ft
Footing Weight =	300	lb/ft
Bearing Pressure/ft =	787.875	psf/ft
Allowed Bearing Pressure =	1500.00	psf
Uplift Check:		
Dead Load into Ram 24' wall =	1516.00	lb/ft
Dead Load into Ram 20' wall =	854.50	lb/ft
Live Load into Ram 24' wall =	225.00	lb/ft
Wind Uplift =	-94.70103178	psf
Wind Uplift into Ram 24' wall =	-947.0103178	lb/ft
Wind Wall Pressure =	94.45	psf
Wind Overturning Moment =	16163.48	lb/ft/ft
Wind Overturning into Ram 24' wall =	808.1741511	lb/ft
Total Uplift Wind Only =	1755.184469	lb/ft
Uplift on Compression Wall =	-138.8361667	lb/ft

2' wide footing
OK

Uplift transferred through trusses
Combined

Compression or Uplift

Safe Room Loads:

DL Roof =	75	psf
LL =	150	psf
Wall Wt. =	512	lb/ft
Wind Speed =	250	mph
Kd =	0.85	
Kzt =	1	
G =	0.85	
Kh =	1.03	
qz =	140.08	psf
G =	0.85	
Cp windward =	0.8	
Cp leeward =	-0.5	
Cp Side =	-0.7	
Cp roof =	-0.9	
Gcpi =	0.55	
Windward load =	18.2104	psf
Leeward load =	-136.578	psf
Upward Load =	-184.2052	psf
Sidewall Load =	-160.3916	psf

Porch Wind lods

DL Roof =	self	
LL =	40	psf
Wind Speed =	190	mph
Kd =	0.85	
Kzt =	1	
G =	0.85	
Kh =	1.1	
qz =	86.40896	psf
G =	0.85	
Cn =	1.2	
Cf =	2	
Wall Wind Load =	146.8952	psf
Roof Uplift =	88.13714	psf
Wall Span =	11.5	ft
Mu (wind) =	2.428362	k ft
As req prelim =	0.151773	sq in
As min =	0.144	sq in
Vu =	2.111619	kip
Phi Vc =	3.943602	kip
a =	0.575163	in
d =	3.625	in
Phi Mn =	6.608088	kip ft

No.6 at 12"

8" Wall d =4"

OK

make roof steel similar to wall steel (roof has less loads and smaller span)

RAM Results:

Max Uplift =	0.05	in
Max Slab Stress =	0.36	ksi
Modulus of Rupture/Safety Factor =	0.205395959	ksi
Max Bearing Pressure =	755	psf

Minimal

Need Tensile Reinforcement

OK < 1500 psf

Applied Moment (ASD)

M =	810	ft lb
MOR =	410.7919181	psi
b =	12	in
h =	4	in
Mcr =	1095.445115	ft lb
M*FS =	1620	ft lb
As =	0.017910448	
As subdrag=	0.02	
As provided =	0.28	
d =	2	
a =	0.039215686	
c =	0.046136101	
Es =	0.12705	> 0.005
Ma =	2772.54902	ft lb > Mapplied x FS

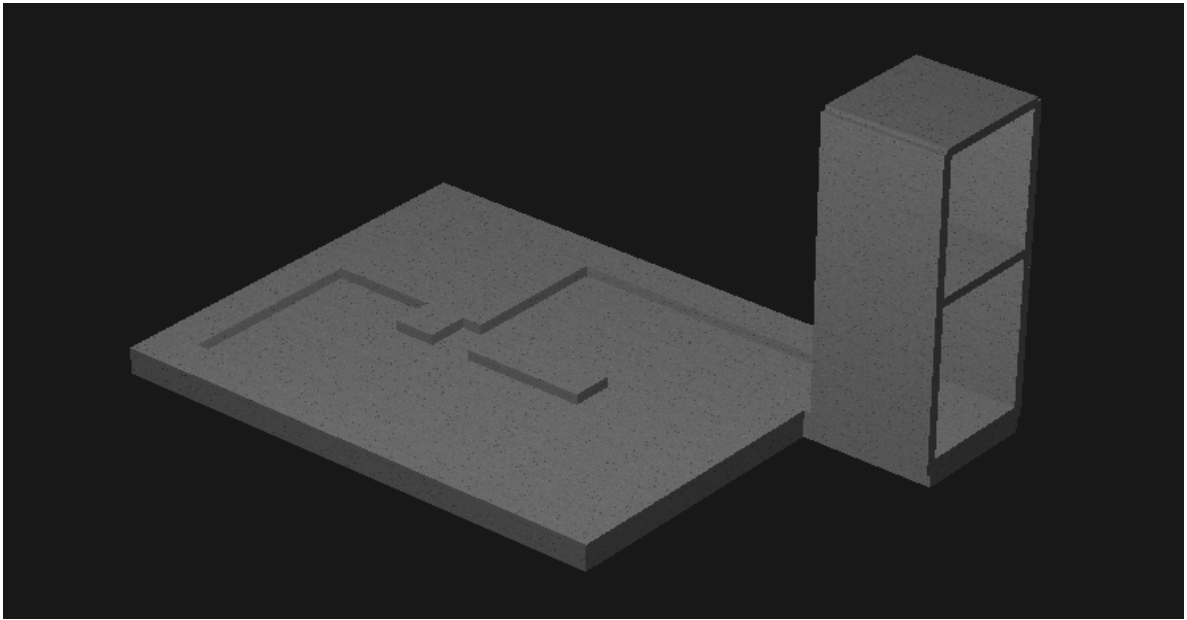
per foot of slab

> Mcr Need to count on reinf

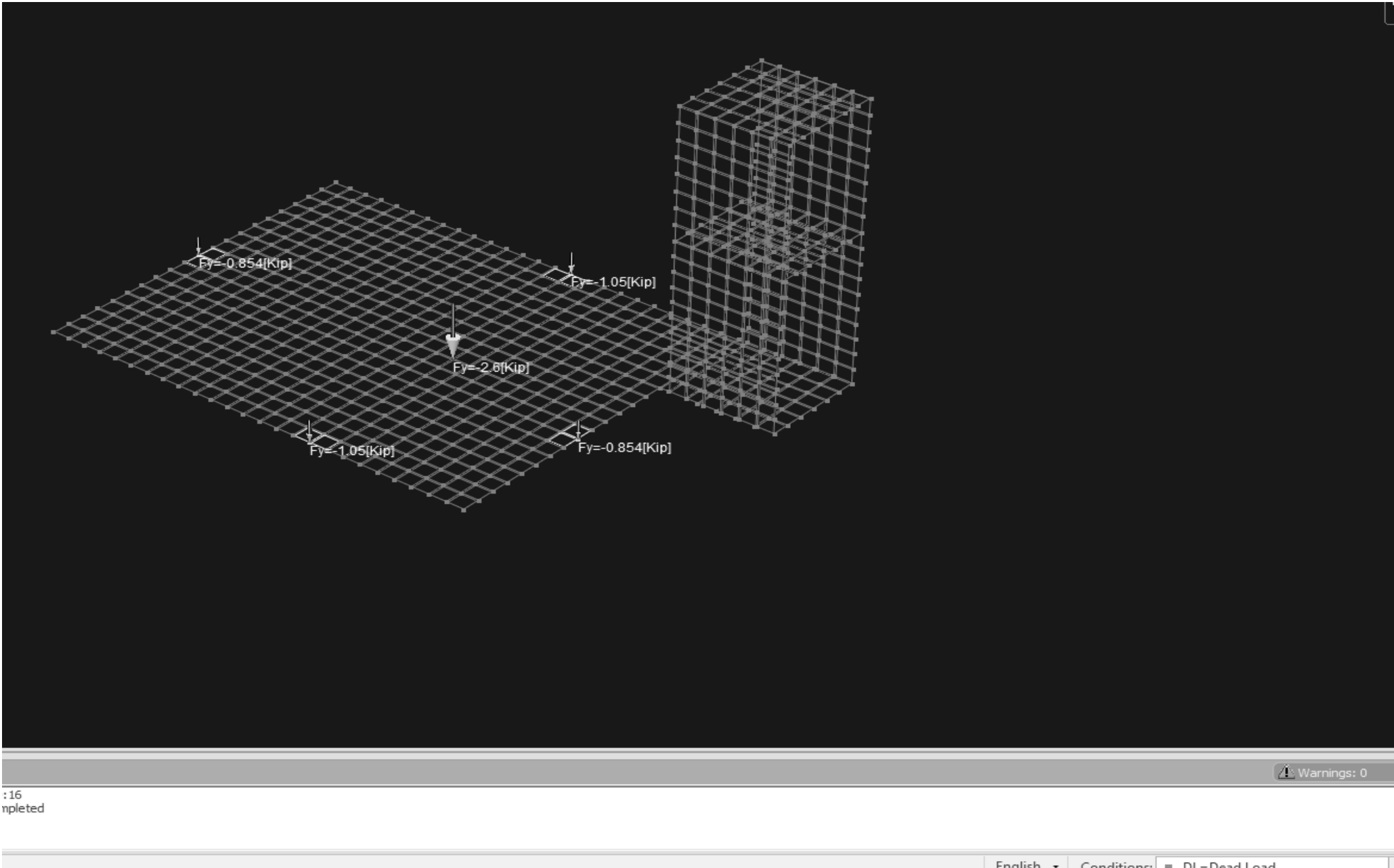
W8 x W8 4" spacing

Assumed Center specify

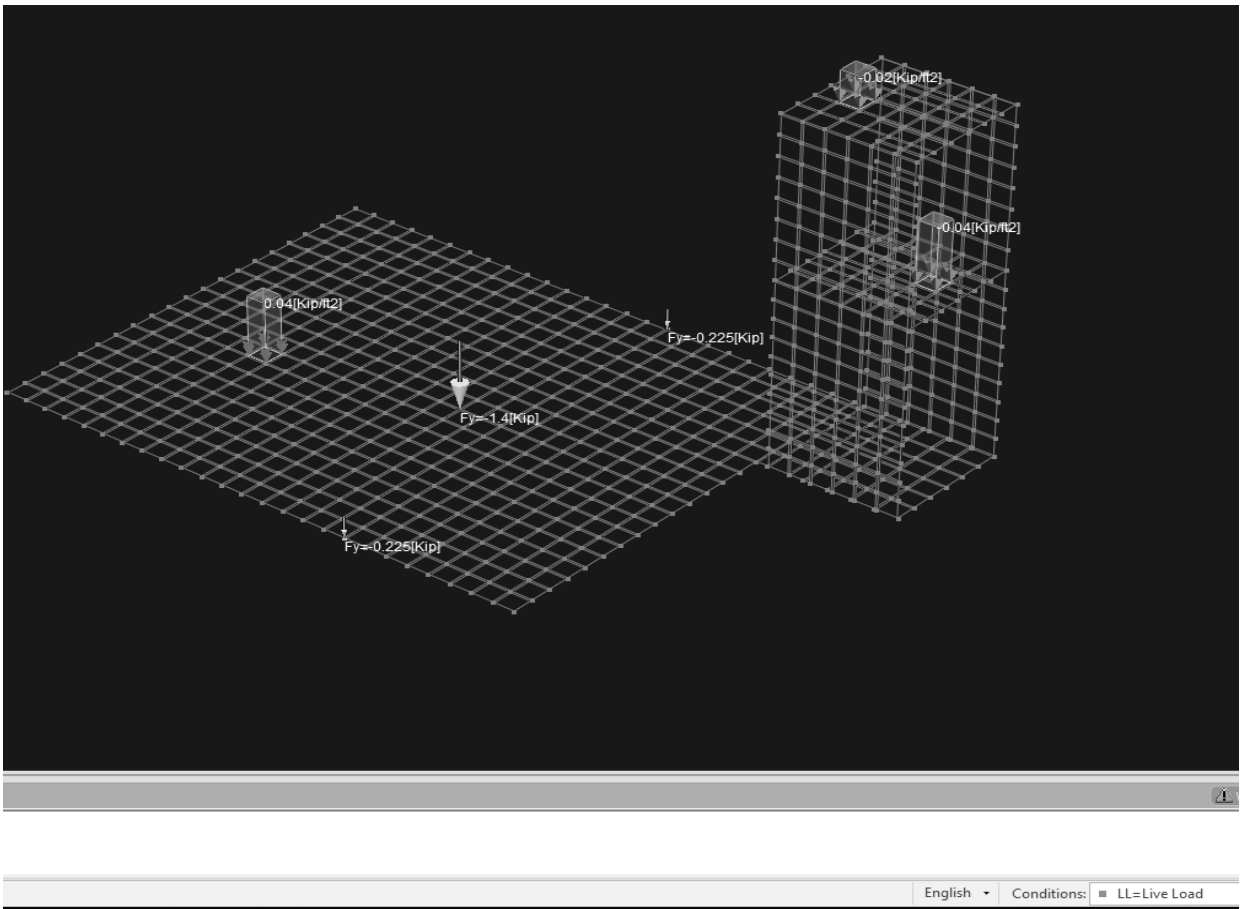
upper 1/3



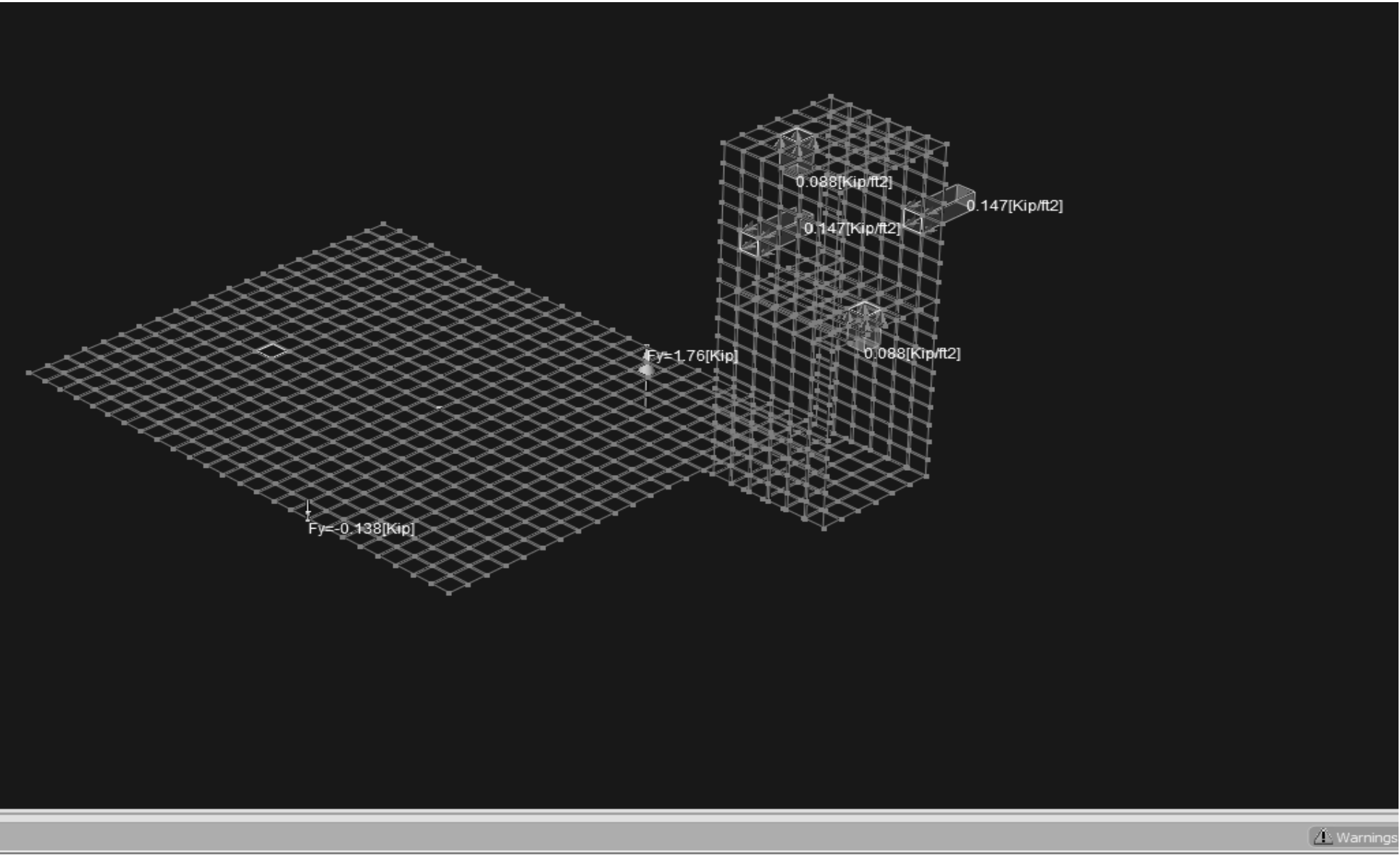
RAM MODEL RENDERING



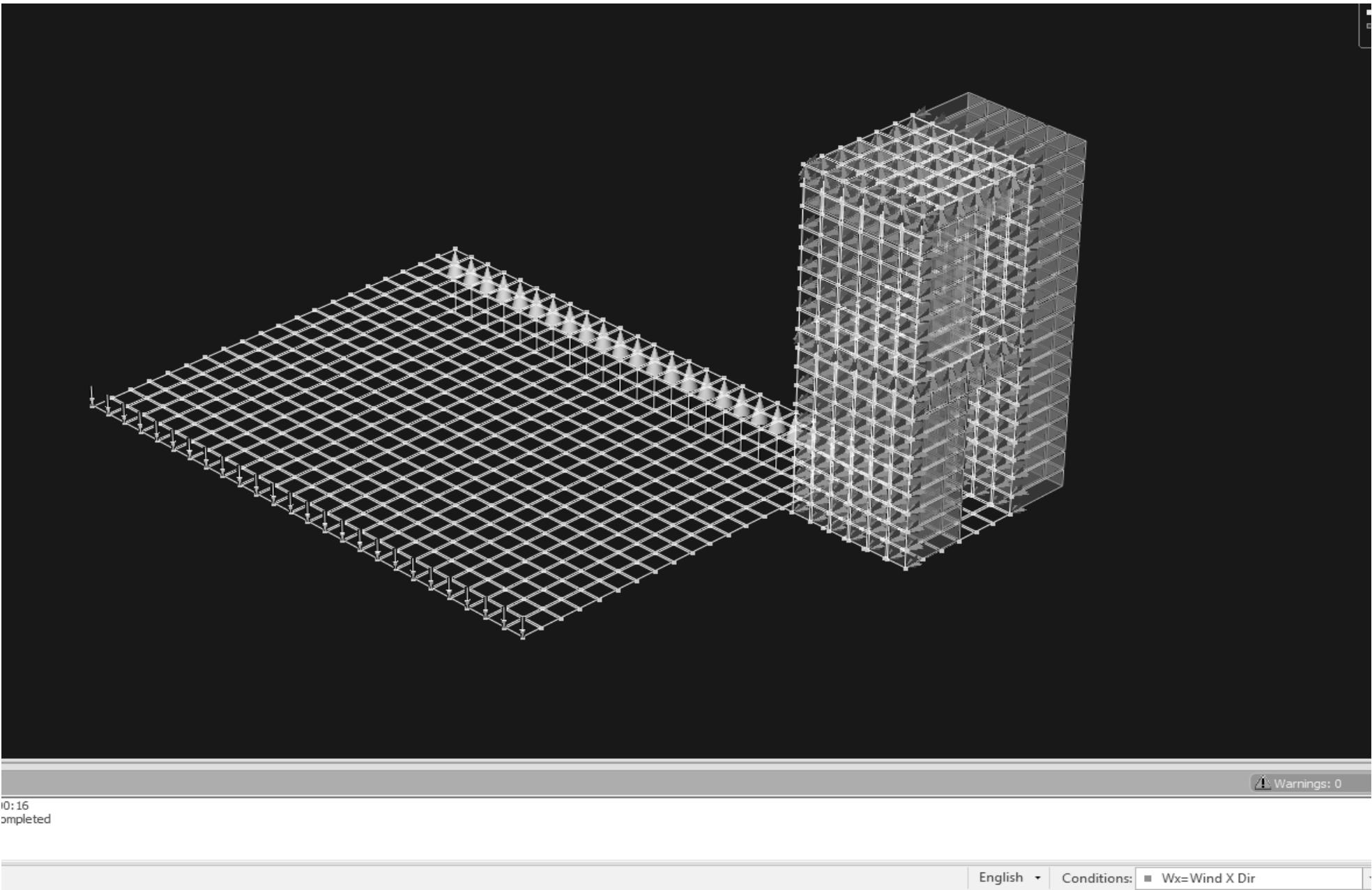
RAM MODEL APPLIED DEAD LOADS



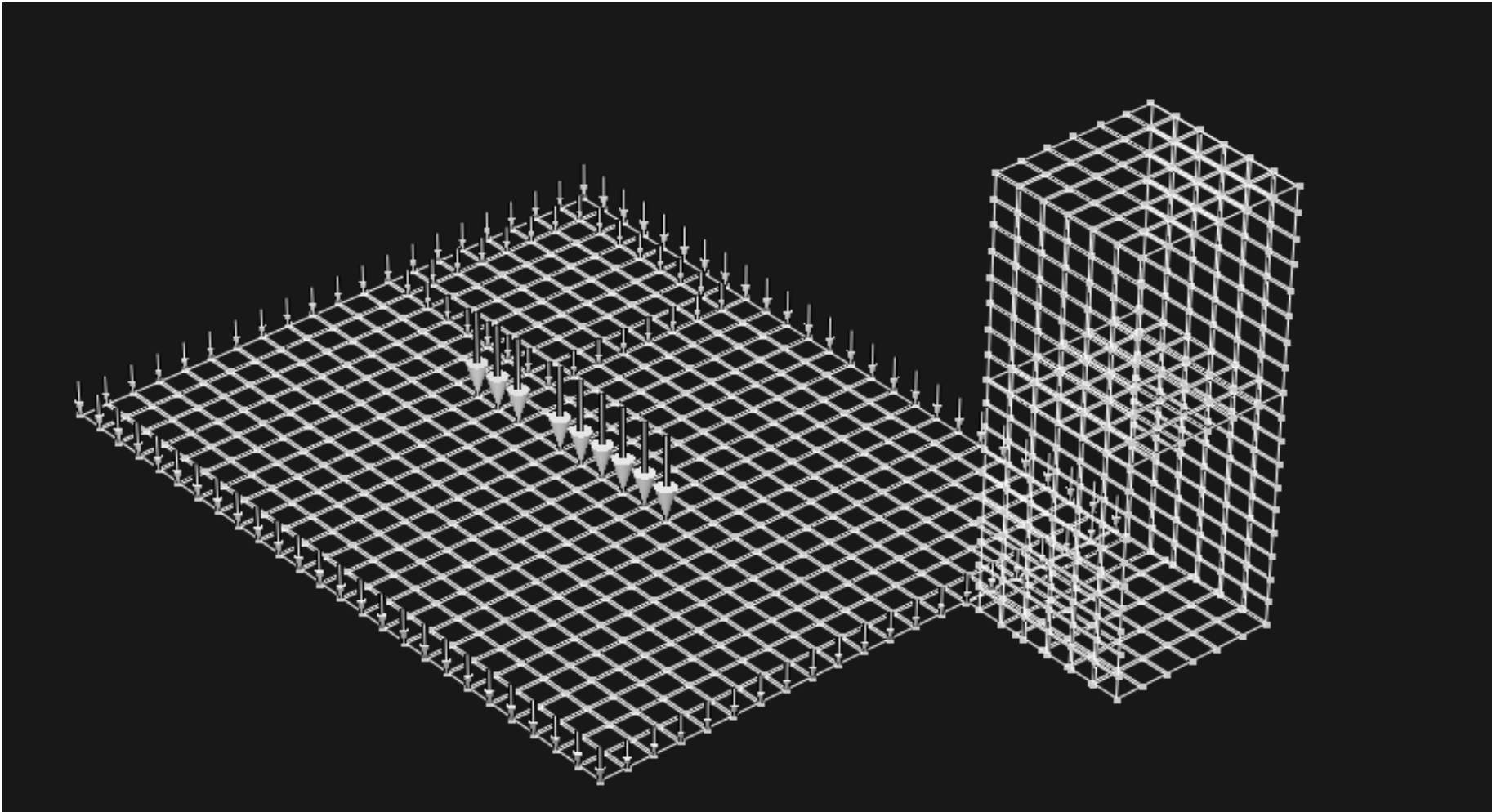
RAM MODEL APPLIED LIVE LOADS (note area Live load not applied to slab to produce maximum tension in slab)



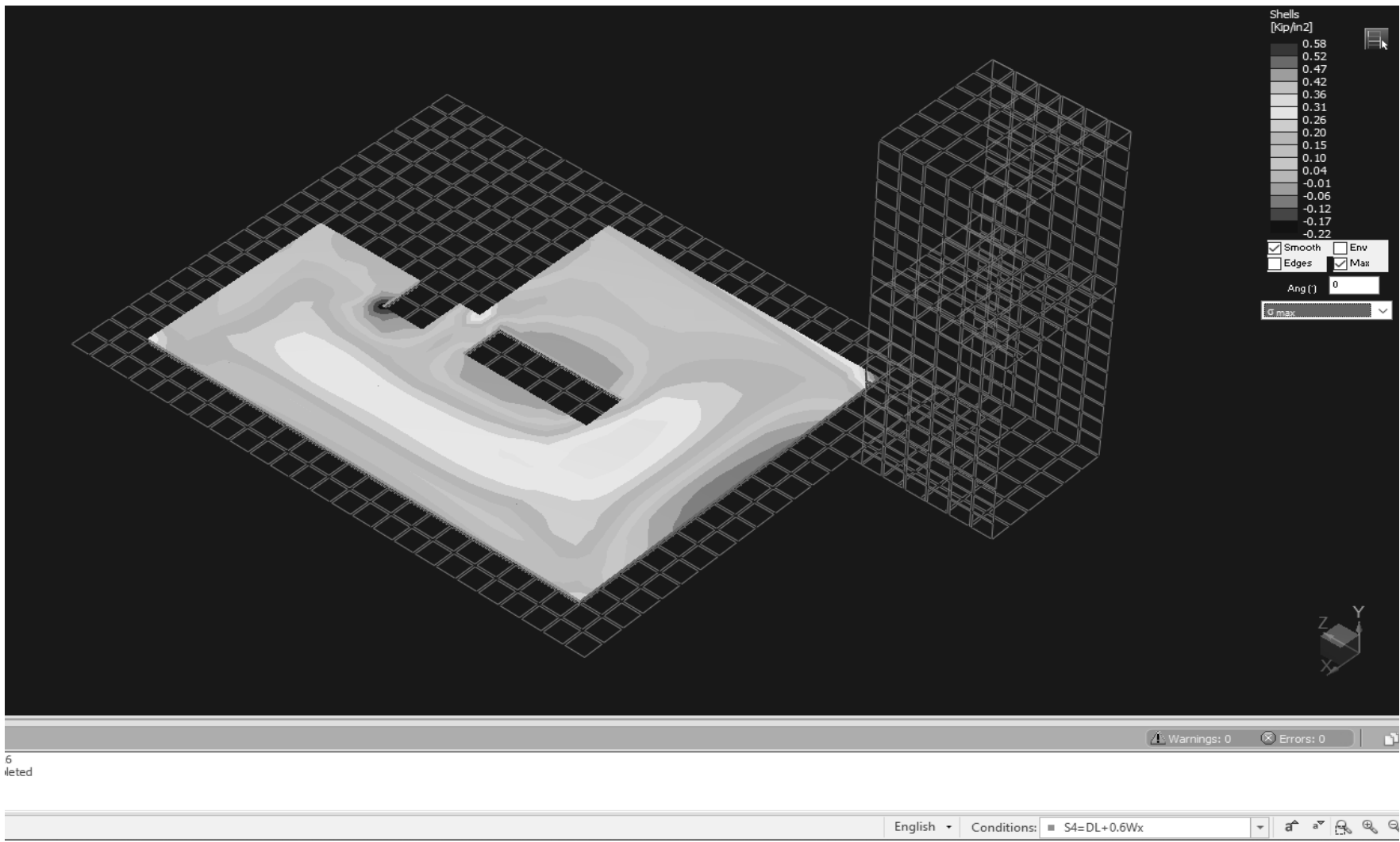
RAM MODEL APPLIED WIND LOADS



RAM MODEL APPLIED WIND LOADS



RAM MODEL APPLIED DEAD LOADS



RAM MODEL APPLIED STRESS

Interior Beam Design

DL =	0.9375	k/ft
LL =	0.5	k/ft
Wu =	1.925	k/ft
Span =	11.33	ft
Vu =	10.905125	kip
Min depth =	8.4975	in
Ceiling Height is 9'-4" minus 6" = 8'-10"		
Even block course at 8'-0" try 10" deep beam		
8" width		
Phi Vc =	8.544471897	kip
Try No. 4 at 18"		
Phi Vs =	8	kip
Phi VC + Phi VS =	16.5444719	kip
Av/s pro =	0.022222222	OK
Av/s Min =	0.006846532	
Av/s Min =	0.005	
d =	13	in
Mu =	30.88876656	k ft
As flexure required =	0.594014742	sq in
As min =	0.213611797	sq in
As min =	0.26	sq in

ACI does have an exception for 10" deep beams
however if the slab is included in the beam depth
then the beam is really 16" deep

2 no 5 with no. 4 stirrups at 18" on center

Elev Slab Design

Span =	11.33	ft
Dl =	0.075	k/ft
LL =	0.04	k/ft
Wu =	0.154	k/ft
Mu =	2.471101325	k*ft
Vu =	0.77	kip
As req =	0.247110133	sq in
As min =	0.144	sq in
Phi Vc =	2.464751509	kip

OK
OK

2 no 5

No. 5 at 12
OK
OK

Exterior Stair Beam Design

DL slab and stairs =	75	psf
LL slab and stairs =	40	psf
Trib =	12.58	ft
Wu =	1.93732	k/ft
Span =	3.5	ft
Vu =	3.39031	kip
Try 10" deep x 8" wide beam		
d =	7.5	in
Phi Vc =	6.161878772	kip
Mu =	2.96652125	k ft
As flexure required =	0.098884042	sq in
As min =	0.205395959	sq in
As min =	0.25	sq in
Tu =	2.23685	kip ft
Acp	100	sq in
Pcp =	40	in
Torsion Threshold =	0.855816496	kip ft
At/s =	1.21833E-06	
No. 4 at 12" At/s =	0.016666667	OK
As min =	0.1	< 0.4 sq in ok

half of stairs and all of landing

Since h<= 10" per ACI Table 9.6.3.1 Min. Stirrups not required.

2 no 5

CONT 2 no 5 As pro = 0.6 sq in.

< 2.23 kip ft Therefore Stirrups Req.

Use No. 4 at 12" Stirrups

Wall Design

Wu =	146.895232	psf
Span =	10.5	ft
Mu =	2.024399916	k*ft
Vu =	0.771199968	kip
As req =	0.202439992	sq in
As min =	0.144	sq in
Phi Vc =	2.464751509	kip

No. 5 at 12

OK

OK

Wall FTG Design

BRG =	760.625	lb/ft
Span =	0.75	ft
As min =	0.288	sq in

2'-0" width OK < 1500

OK No. 5 at 12"