

# ABBREVIATIONS

ABV ABOVE	LA LENGTH
A/C AIR CONDITIONING	LA LAUNDRY
A/D AREA DRAIN	LVR LOOPER
A/DJ ADJUSTABLE	MAX MAXIMUM
ALT ALTERNATE	MCH MECHANICAL
ALM ALUMINUM	MFR MANUFACTURER
ARCH ARCHITECTURAL	MIN MINIMUM
BA BATHROOM	MISC MISCELLANEOUS
BD BOARD	N NORTH
BF BI-FIELD (DOOR)	N.T.S. NOT TO SCALE
BLDG BUILDING	O.G.D. OVERHEAD GARAGE DOOR
BLK BLOCK (CMU)	OH OVERHEAD
BLN BELOW	OPT OPTIONAL
BM BEAM	PAR PARALLEL
BP BI-PASS (DOOR)	P.B. PUSH BUTTON
BTM BOTTOM	PDR POWDER
BTWN BETWEEN	RFESTAL
CAB CABINET	PL PLATE
CER CERAMIC	PT. PRESSURE TREATED WOOD
C.J. CONTROL JOINT OR CONSTRUCTION JOINT	PVC POLYVINYL CHLORIDE PIPE
CL CLOSET OR CENTER LINE	PVMT PAVEMENT
CLS CEILING	PRE-IRE PRE-PAVED
CMU CONCRETE MASONRY UNIT	PVD PLYWOOD
COL COLUMN	R RISER
CONC CONCRETE	RAG RETURN AIR GRILL
C CARPET	REF REFERENCE
CR CORROSION RESISTANT	REFR REFRIGERATOR
CGMT CASEMENT	REG REQUIRED
C.T. CERAMIC TILE	S SOUTH
D DRYER	SD SMOKE DETECTOR
DBL DOUBLE	S.F. SQUARE FEET
DN DOUBLE HING	S.G.D. SLIDING GLASS DOOR
DNV DIMENSION	SH SINGLE HING OR SHELF
DISP DISPOSAL	SL SLOPE / SLIDING
DN DOWN	SHP SHELF AND POLE
DR DOOR	SPEC SPECIFICATIONS
DS DOWNSPOUT	STD STANDARD
DW DISH WASHER	STR STRUCTURAL
DWG DRAWING	SQ SQUARE
E EAST	SIM SYMBOL
ELEV ELEVATION	S4S SMOOTH FOUR SIDES
ELEC ELECTRICAL	T TREAD (AT STAIRS) OR TILE
EG EGWAL	T.B. TONEL BAR
EXT EXTERIOR	TEMP. TEMPERED (GLASS)
FAU FORCED AIR UNIT	T16 TONGUE & GROOVE
F.C. FLOOR CHANGE	T.O.C. TOP OF CURB
F.D. FLOOR DRAIN	TV TELEVISION
F.FL FINISH FLOOR LINE	TYP TYPICAL
F.G. FINISHED GRADE	UNLS. UNLESS NOTED OTHERWISE
FLR FLOORING	V.B. VAPOR BARRIER
FL FLOURESCENT (LIGHT)	VERT VERTICAL
FND FOUNDATION	V.T.R. VENT THRU ROOF
F.Z.S. FACE OF STUD	WASHING MACHINE
FTG FOOTING	WD WOOD
FX FIXED GLASS	WH WINDOW
GALV GALVANIZED	WH WATER HEATER
GAR GARAGE	WI WROUGHT IRON
G.B. GYPSUM BOARD	W.C. WALK-IN CLOSET
GD GRADE OR GRADING	W/WO WITH OR WITHOUT
G.D.O. GARAGE DOOR OPERATOR	W/ W/ WATERPROOFING
GFI GROUND FAULT INTERRUPTER	WHM WELDED WIRE MESH
GL GLASS OR GLAZING	
GYP BD GYPSUM BOARD	R PROPERTY LINE
HB HOSE BIBB	Ø ROUND / DIAMETER
HD HEAD OR HARD	I AND
HDR HEADER	G CENTERLINE
HGT HEIGHT	# ROUND / NUMBER
HVAC HEATING/VENTILATING/AIR COND.	
HWD HARDWOOD	
INT INTERIOR	
IST ISLET	
JT JOINT	
KIT KITCHEN	

# INDEX

MODEL 'PENWELL'			
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		2.2	ELEVATION OPTIONS
		2.3	ELEVATION OPTIONS
3 MS A	MONOLITHIC SLAB PLAN 'A'		
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4.1 B	1ST FLOOR PLAN 'B'	1.1.B J	ROOF PLAN 'J'
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1 E	FRONT ELEVATION 'E'		
1.1.4 E	ROOF PLAN 'E'	2.2 J	SIDE AND REAR ELEVATIONS 'J'-W/ BASEMENT
2 E	SIDE AND REAR ELEVATIONS 'E'	3.8 MS J	MONOLITHIC SLAB PLAN 'J'
		3.8 SW J	STEM WALL PLAN 'J'
		3.8 BS J	BASEMENT PLAN 'J'
2.2 E	SIDE AND REAR ELEVATIONS 'E'-W/ BASEMENT	4.8 J	1ST FLOOR PLAN 'J'
		5.8 J	2ND FLOOR PLAN 'J'
3.4 MS E	MONOLITHIC SLAB PLAN 'E'		
3.4 SW E	STEM WALL PLAN 'E'	1 K	FRONT ELEVATION 'K'
3.4 BS E	BASEMENT PLAN 'E'	1.1.9 K	ROOF PLAN 'K'
4.4 E	1ST FLOOR PLAN 'E'		
5.4 E	2ND FLOOR PLAN 'E'	2K	SIDE AND REAR ELEVATIONS 'K'
1 F	FRONT ELEVATION 'F'	2.2 K	SIDE AND REAR ELEVATIONS 'K'-W/ BASEMENT
1.1.5 F	ROOF PLAN 'F'	3.9 MS K	MONOLITHIC SLAB PLAN 'K'
		3.9 SW K	STEM WALL PLAN 'K'
		3.9 BS K	BASEMENT PLAN 'K'
		4.9 K	1ST FLOOR PLAN 'K'
		5.9 K	2ND FLOOR PLAN 'K'
2 F	SIDE AND REAR ELEVATIONS 'F'		
2.2 F	SIDE AND REAR ELEVATIONS 'F'-W/ BASEMENT		
3.5 MS F	MONOLITHIC SLAB PLAN 'F'		
3.5 SW F	STEM WALL PLAN 'F'		
3.5 BS F	BASEMENT PLAN 'F'		
4.5 F	1ST FLOOR PLAN 'F'		
5.5 F	2ND FLOOR PLAN 'F'		

# BUILDING CODE COMPLIANCE / PROJECT INFORMATION

ALL CONSTRUCTION TO COMPLY WITH LOCAL CODES AND ORDINANCES CURRENTLY IN USE WITH THE LOCAL JURISDICTION.

APPLICABLE CODES:  
FOLLOW ALL APPLICABLE STATE AND LOCAL CODES.  
2018 NORTH CAROLINA STATE SUPPLEMENTS AND AMENDMENTS

CONTRACTOR AND BUILDER SHALL REVIEW ENTIRE PLAN TO VERIFY CONFORMANCE WITH ALL CURRENT APPLICABLE CODES IN EFFECT AT TIME OF CONSTRUCTION. BY USING THESE DRAWINGS FOR CONSTRUCTION IT IS UNDERSTOOD THAT CONFORMANCE WITH ALL APPLICABLE CODES IS THE RESPONSIBILITY OF THE BUILDER AND CONTRACTOR.

PRODUCT:  
SINGLE FAMILY RESIDENCE

OCCUPANCY CLASSIFICATION  
RESIDENTIAL R-3

CONSTRUCTION TYPE:  
TYPE VB

ALL CONSULTANT DRAWINGS ACCOMPANYING THESE ARCHITECTURAL DRAWINGS HAVE NOT BEEN PREPARED BY OR UNDER THE DIRECTION OF GMD DESIGN GROUP, INC. GMD DESIGN GROUP INC. THEREFORE ASSUMES NO LIABILITY FOR THE COMPLETENESS OR CORRECTNESS OF THESE DRAWINGS.

# EXPRESS HOMES

## 40' SERIES

### MODEL 'PENWELL' - LH

EXPRESS DRIVE  
A, E, J / B, F, K  
PLAN ID: 2163/2164

WOODGROVE LOT 229  
44 RED CEDAR WAY  
PIN 0653-65-8998.000  
FUQUAY VARINA, NC 27526

# PLAN CHANGES:

DATE:	DESCRIPTION:
10.18.18	INITIAL PLAN RELEASE
11.4.19	CLIENT REVISIONS
01.02.20	CLIENT REVISIONS
02.28.20	CLIENT REVISIONS
01.26.21	CLIENT REVISIONS
02.18.21	ADDED EXTENDED PORCH OPT

NOTICE TO CONTRACTOR  
All construction must comply with current NC Building Codes and is subject to field inspection and verification.

**APPROVED**  
Contractor building only review  
Permit holder responsible for full compliance with the code

10/21/2021



# CONSULTANTS:

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# GENERAL NOTES DESIGNER NORTH CAROLINA:

THESE DOCUMENTS ARE THE PROPERTY OF THE DESIGNER AND SHALL NOT BE COPIED, DUPLICATED, ALTERED, MODIFIED OR REVISED IN ANY WAY WITHOUT THE EXPRESSED WRITTEN APPROVAL OF THE DESIGNER.

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE AND ALL INCONSISTENCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DEVELOPER AND THE DESIGNER BEFORE PROCEEDING WITH WORK.

ANY ERRORS OR OMISSIONS FOUND IN THESE DRAWINGS SHALL BE BROUGHT TO DEVELOPERS AND DESIGNERS ATTENTION IMMEDIATELY.

DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.

ALL DIMENSIONS ARE TO FACE OF STUD OR TO FACE OF FRAMING UNLESS OTHERWISE NOTED.

ALL TRUSS DRAWINGS TO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO ISSUANCE OF BUILDING PERMIT.

ALL OR EQUAL SUBSTITUTIONS MUST BE SUBMITTED TO AND APPROVED BY CITY BUILDING OFFICIAL PRIOR TO INSTALLATION.

ALL ANGLED PARTITIONS ARE 45 DEGREES UNLESS OTHERWISE NOTED.

PROVIDE FIREBLOCKING. (PER LOCAL CODES)

ALL ELECTRICAL AND MECHANICAL EQUIPMENT AND METERS ARE SUBJECT TO RELOCATION DUE TO FIELD CONDITIONS, CONTRACTOR TO VERIFY.

PROVIDE BLOCKING AND/OR BACKING AT ALL TONEL BAR, TONEL RING AND/OR TOILET PAPER HOLDER LOCATIONS, AS SHOWN PER PLAN. TYPICAL AT ALL BATHROOMS AND POWDER ROOMS. VERIFY LOCATIONS AT FRAMING WALK.

ELASTOMERIC SHEET WATERPROOFING: FURNISH AND INSTALL ALL WATERPROOFING COMPLETE. A 40 MIL. SELF-ADHERING MEMBRANE OF RUBBERIZED ASPHALT INTEGRALLY BONDED TO POLYETHYLENE SHEETINGS, OR EQUAL. INSTALL PER MANUFACTURER'S AND TRADE ASSOCIATION'S PRINTED INSTALLATION INSTRUCTIONS. 6" MINIMUM LAP AT ALL ADJACENT WALL SURFACES.

TO THE BEST OF THE DESIGNER'S KNOWLEDGE THESE DOCUMENTS ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE BUILDING AUTHORITIES HAVING JURISDICTION OVER THIS TYPE OF CONSTRUCTION AND OCCUPANCY.

SHOP DRAWING REVIEW AND DISTRIBUTION, ALONG WITH PRODUCT SUBMITTALS, REQUESTED IN THE CONSTRUCTION DOCUMENTS, SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR, UNLESS DIRECTED OTHERWISE UNDER A SEPARATE AGREEMENT.

DEVIATIONS FROM THESE DOCUMENTS IN THE CONSTRUCTION PHASE SHALL BE REVIEWED BY THE DESIGNER AND THE OWNER PRIOR TO THE START OF WORK IN QUESTION. ANY DEVIATIONS FROM THESE DOCUMENTS WITHOUT PRIOR REVIEW, SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK AND MATERIALS REPRESENTED ON THESE DOCUMENTS INCLUDING THE WORK AND MATERIALS FURNISHED BY SUBCONTRACTORS AND VENDORS.

THE BUILDER SHALL FURNISH ANY AND ALL REPORTS RECEIVED FROM THE GEOTECHNICAL ENGINEER (SOILS REPORT), ON THE STUDY OF THE PROPOSED SITE, TO THE DESIGNER, STRUCTURAL ENGINEER, AND GENERAL CONTRACTOR. IN THE EVENT THE GEOTECHNICAL REPORTS DO NOT EXIST, THE SOILS CONDITION SHALL BE ASSUMED TO BE A MINIMUM DESIGN SOIL PRESSURE STATED BY THE STRUCTURAL ENGINEER OF RECORD FOR THE PURPOSE OF STRUCTURAL DESIGN. GENERAL CONTRACTOR SHALL ASSURE THE SOIL CONDITIONS MEET OR EXCEED THE CRITERIA.

ALL WORK PERFORMED BY THE GENERAL CONTRACTOR SHALL COMPLY AND CONFORM WITH LOCAL AND STATE BUILDING CODES, ORDINANCES AND REGULATIONS, ALONG WITH ALL OTHER AUTHORITIES HAVING JURISDICTION. THE GENERAL CONTRACTOR IS RESPONSIBLE TO BE AWARE OF THESE REQUIREMENTS AND GOVERNING REGULATIONS.

PROVIDE AN APPROVED WASHER DRAIN PAN AT SECOND FLOOR ONLY THAT DRAINS TO EXTERIOR.

WINDOW SUPPLIER TO VERIFY AT LEAST ONE WINDOW IN ALL BEDROOMS TO HAVE A CLEAR OPENABLE AREA OF 4.0 SQ FT. THE MINIMUM NET CLEAR OPENING HEIGHT SHALL BE 22" AND THE MINIMUM NET CLEAR OPENING WIDTH SHALL BE 20". GLAZING TOTAL AREA OF NOT LESS THAN 5.0 SQ FT IN THE CASE OF A GROUND WINDOW AND NOT LESS THAN 5.7 SQ FT IN THE CASE OF AN UPPER STORY WINDOW. (PER N.C.G.C. SECTION R310.1.1)

ALL HANDRAIL BALLUSTERS TO BE SPACED SUCH THAT A 4" SPHERE CANNOT PASS BETWEEN BALLUSTERS. (PER LOCAL CODES)

PROVIDE STAIR HANDRAILS AND GUARDRAILS PER LOCAL CODES.

# BUILDER SET:

THE SCOPE OF THIS SET OF PLANS IS TO PROVIDE A "BUILDER'S SET" OF CONSTRUCTION DOCUMENTS AND GENERAL NOTES HERINAFTER REFERRED TO AS "PLANS". THIS SET OF PLANS IS SUFFICIENT TO OBTAIN A BUILDING PERMIT; HOWEVER, ALL MATERIALS AND METHODS OF CONSTRUCTION NECESSARY TO COMPLETE THE PROJECT ARE NOT NECESSARILY DESCRIBED. THE PLANS DELINEATE AND DESCRIBE ONLY LOCATIONS, DIMENSIONS, TYPES OF MATERIALS, AND GENERAL METHODS OF ASSEMBLING OR FASTENING. THEY ARE NOT INTENDED TO SPECIFY PARTICULAR PRODUCTS OR OTHER METHODS OF ANY SPECIFIC MATERIALS, PRODUCT OR METHOD. THE IMPLEMENTATION OF THE PLANS REQUIRES A CLIENT / CONTRACTOR THOROUGHLY KNOWLEDGEABLE WITH THE APPLICABLE BUILDING CODES AND METHODS OF CONSTRUCTION SPECIFIC TO THIS PRODUCT TYPE AND TYPE OF CONSTRUCTION.

CONSTRUCTION REQUIREMENTS AND QUALITY: PROVIDE WORK OF THE SPECIFIC QUALITY, WHERE QUALITY LEVEL IS NOT INDICATED, PROVIDE WORK OF QUALITY CUSTOMARY IN SIMILAR TYPES OF WORK. WHERE THE PLANS AND SPECIFICATIONS, CODES, LAWS, REGULATIONS, MANUFACTURER'S RECOMMENDATIONS OR INDUSTRY STANDARDS REQUIRE WORK OF HIGHER QUALITY OR PERFORMANCE, PROVIDE WORK COMPLYING WITH THOSE REQUIREMENTS AND QUALITY. WHERE TWO OR MORE QUALITY PROVISIONS OF THOSE REQUIREMENTS CONFLICT WITH THE MOST STRINGENT REQUIREMENT; WHERE REQUIREMENTS ARE DIFFERENT BUT APPARENTLY EQUAL, AND WHERE IT IS UNCERTAIN WHICH REQUIREMENT IS MOST STRINGENT, OBTAIN CLARIFICATION FROM THE GMD DESIGN GROUP BEFORE PROCEEDING.

# AREA CALCULATIONS:

MODEL 'PENWELL' SQUARE FOOTAGES	
AREA	ELEV 'F'
1st FLOOR	865 SF
2nd FLOOR	1310 SF
TOTAL LIVING	2175 SF
GARAGE	404 SF
PORCH	63 SF
OPT. COVERED PORCH	
OPT. BASEMENT	

\*\*BASEMENT AREA IS TAKEN TO INSIDE OF CONCRETE WALL\*\*

NO:	DATE:	REVISION:
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:

40' Series

FOR CONSTRUCTION

CLIENTS NAME:



PROJECT NO: GMD17049

SHEET TITLE: TITLE SHEET

PRINT DATE: October 18, 2019

SHEET NO: 0



### ATTIC VENT CALCULATION FOR PLAN 'PENWELL': 1:150 RATIO.

THE NET FREE VENTILATING AREA SHALL NOT BE LESS THAN 1/150 OF THE AREA OF THE SPACE VENTILATED, PROVIDED THAT AT LEAST 50 PERCENT AND NOT MORE THAN 80 PERCENT OF THE REQUIRED VENTILATING AREA IS PROVIDED BY VENTILATORS LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED AT LEAST 3 FEET ABOVE THE EAVE OR CORNICE VENTS WITH THE BALANCE OF THE REQUIRED VENTILATION PROVIDED BY EAVE OR CORNICE VENTS.

EXCEPTIONS:  
 1. ENCLOSED ATTIC/RAFTER SPACES REQUIRING LESS THAN 1 SQ. FT. OF VENTILATION MAY BE VENTED WITH CONTINUOUS SOFFIT VENTILATION ONLY.  
 2. ENCLOSED ATTIC/RAFTER SPACES OVER UNCONDITIONED SPACE MAY BE VENTED WITH CONTINUOUS SOFFIT VENT ONLY.

GENERAL CONTRACTOR SHALL VERIFY THE NET FREE VENTILATION OF THE VENT PRODUCT SELECTED BY OWNER. VERIFY WITH MANUFACTURER OF HIGH AND LOW VENTS TO BE USED FOR MINIMUM CALCULATED VENTS REQUIRED. THE REQUIRED VENTILATION SHALL BE MAINTAINED. PROVIDE INSULATION STOP SUCH THAT INSULATION DOES NOT OBSTRUCT FREE AIR MOVEMENT AS REQUIRED BY THE BUILDING OFFICIAL.

ALL OVERLAP FRAMED ROOF AREAS SHALL HAVE OPENINGS BETWEEN THE ADJACENT ATTICS IN THE ROOF SHEATHING (AS ALLOWED BY THE STRUCTURAL ENGINEER) TO ALLOW PASSAGE AND ATTIC VENTILATION BETWEEN THE TWO OR ISOLATED ATTIC SPACES SHALL BE VENTED INDEPENDENTLY TO CBC REQUIREMENTS.

PER DEVELOPER, AT ALL CANTILEVERED FLOORS, CANTILEVERED ARCHITECTURAL POP-OUTS, AND ANY DOUBLE FRAMING PROJECTIONS THAT ARE SEPARATED FROM THE VENTING CALCULATIONS SHOWN ABOVE, PROVIDE A CONTINUOUS 2" CORROSION RESISTANT SOFFIT VENT AT UNDERSIDE OF FRAMED ELEMENT.

(PER SECTION R206.2)  
 1 SQUARE INCH VENT FOR EVERY 150 SQUARE INCHES OF CEILING  
 \*144 SQ. IN. = 1 SQ. FT.  
 BLDG. CEILING (SF) X 144 = BLDG (SQ. IN.)  
 BLDG. (SQ. IN.) / 150 = SQ. IN. OF VENT REQUIRED

ROOF AREA 1 = 1331 SF  
 1331 SQ. FT. X 144 = 192528 SQ. IN.  
 192528 SQ. IN. / 150 = 1283.52 SQ. IN. OF VENT REQ'D

ROOF AREA 2 = 80 SF  
 80 SQ. FT. X 144 = 11520 SQ. IN.  
 11520 SQ. IN. / 150 = 76.80 SQ. IN. OF VENT REQ'D

#### NOTES:

- ALL ROOF DRAINAGE SHALL BE PIPED TO STREET OR APPROVED DRAINAGE FACILITY.
- DASHED LINES INDICATE WALL BELOW.
- LOCATE GUTTER AND DOWNSPOUTS PER BUILDER.
- PITCHED ROOFS AS NOTED.
- TRUSS MANUFACTURER SHALL SUBMIT STRUCTURAL CALCS AND SHOP DRAWINGS TO THE BUILDER'S GENERAL CONTRACTOR AND BUILDING DEPARTMENT FOR REVIEW PRIOR TO FABRICATIONS.
- ALL PLUMBING VENTS SHALL BE COMBINED INTO A MINIMUM AMOUNT OF ROOF PENETRATIONS. ALL ROOF PENETRATIONS SHALL OCCUR TO THE REAR OF THE MAIN RIDGE.

### ATTIC VENT CALCULATION FOR PLAN 'PENWELL': 1:300 RATIO.

AS AN ALTERNATE TO THE 1/150 RATIO LISTED ABOVE, THE NET FREE CROSS-VENTILATION AREA MAY BE REDUCED TO 1/300 WHEN A CLASS I OR II VAPOR RETARDER IS INSTALLED ON THE WARM - IN - WINTER SIDE OF THE CEILING.

GENERAL CONTRACTOR SHALL VERIFY THE NET FREE VENTILATION OF THE VENT PRODUCT SELECTED BY OWNER. VERIFY WITH MANUFACTURER OF HIGH AND LOW VENTS TO BE USED FOR MINIMUM CALCULATED VENTS REQUIRED. THE REQUIRED VENTILATION SHALL BE MAINTAINED. PROVIDE INSULATION STOP SUCH THAT INSULATION DOES NOT OBSTRUCT FREE AIR MOVEMENT AS REQUIRED BY THE BUILDING OFFICIAL.

ALL OVERLAP FRAMED ROOF AREAS SHALL HAVE OPENINGS BETWEEN THE ADJACENT ATTICS IN THE ROOF SHEATHING (AS ALLOWED BY THE STRUCTURAL ENGINEER) TO ALLOW PASSAGE AND ATTIC VENTILATION BETWEEN THE TWO OR ISOLATED ATTIC SPACES SHALL BE VENTED INDEPENDENTLY TO CBC REQUIREMENTS.

PER DEVELOPER, AT ALL CANTILEVERED FLOORS, CANTILEVERED ARCHITECTURAL POP-OUTS, AND ANY DOUBLE FRAMING PROJECTIONS THAT ARE SEPARATED FROM THE VENTING CALCULATIONS SHOWN ABOVE, PROVIDE A CONTINUOUS 2" CORROSION RESISTANT SOFFIT VENT AT UNDERSIDE OF FRAMED ELEMENT.

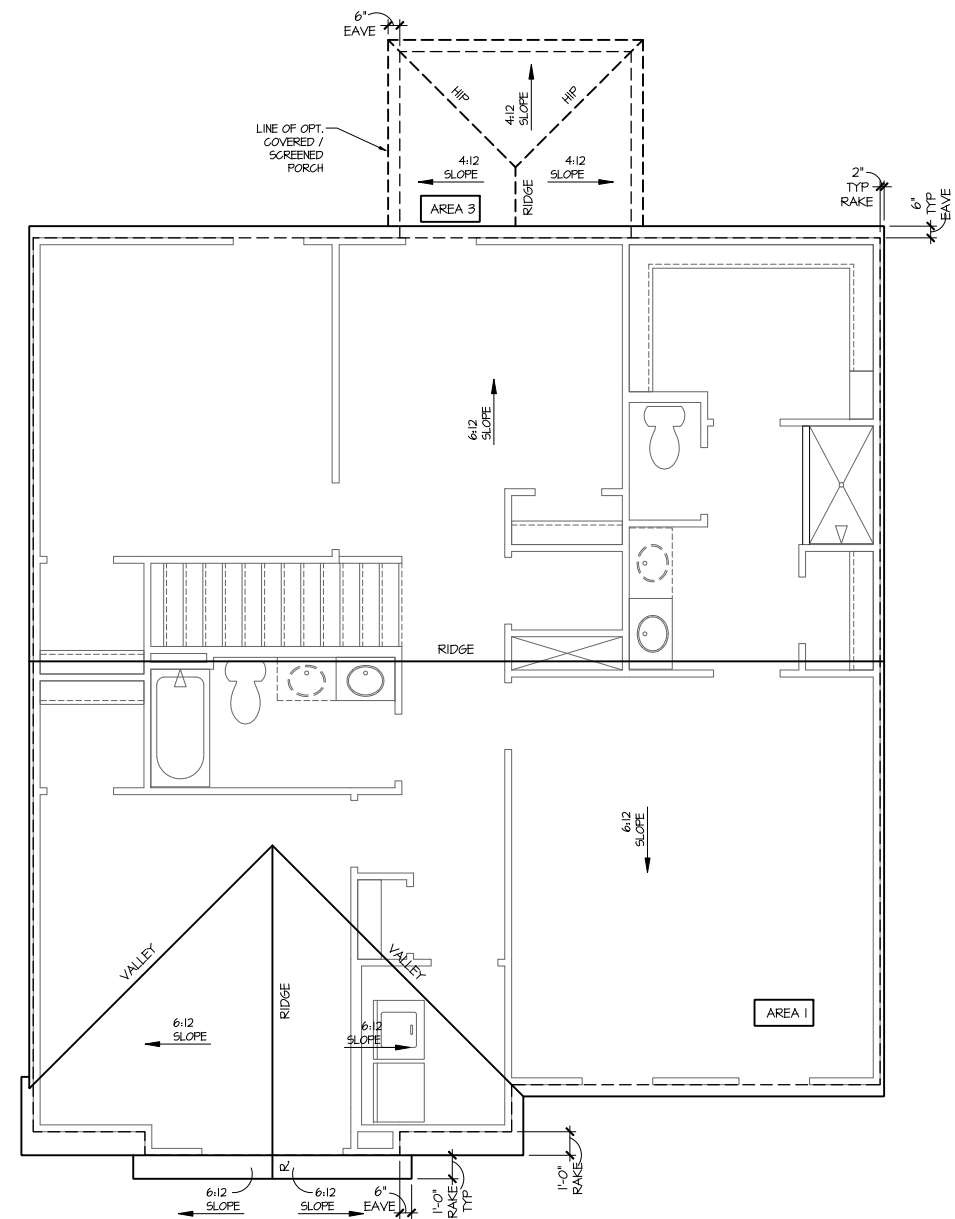
(PER SECTION R206.2)  
 1 SQUARE INCH VENT FOR EVERY 300 SQUARE INCHES OF CEILING  
 \*144 SQ. IN. = 1 SQ. FT.  
 BLDG. CEILING (SF) X 144 = BLDG (SQ. IN.)  
 BLDG. (SQ. IN.) / 300 = SQ. IN. OF VENT REQUIRED  
 SQ. IN. OF VENT REQUIRED / 2 = 50% AT HIGH & 50% AT LOW

ROOF AREA 1 = 1331 SF  
 1331 SQ. FT. X 144 = 192528 SQ. IN.  
 192528 SQ. FT. / 300 = 641.76 SQ. IN. OF VENT REQ'D  
 641.76 SQ. IN. / 2 = 320.88 SQ. IN.  
 320.88 SQ. IN. OF VENT AT HIGH & 320.88 SQ. IN. OF VENT AT LOW REQUIRED.

ROOF AREA 2 = 80 SF  
 80 SQ. FT. X 144 = 11520 SQ. IN.  
 11520 SQ. FT. / 300 = 38.40 SQ. IN. OF VENT REQ'D  
 38.40 SQ. IN. / 2 = 19.20 SQ. IN.  
 19.20 SQ. IN. OF VENT AT HIGH & 19.20 SQ. IN. OF VENT AT LOW REQUIRED.

BUILDER TO PROVIDE (2) LAYERS OF UNDERLAYMENT AT ANY ROOF W/ A SLOPE FROM 2:12 TO LESS THAN 4:12

AT SINGLE FAMILY DETACHED PLANS:  
 PREFINISHED VENTED SOFFIT AT EAVE PER MANUFACTURER.  
 (VERIFY FIRE SEPARATION DISTANCE FOR SOFFIT PROTECTION PER NCRS SECTION R302.1.1 AND TABLE R302.1)



Roof Plan 'F'

SCALE: 1/4"=1'-0" AT 22"X34" LAYOUT 1/8"=1'-0" AT 11"X11" LAYOUT

NO.	DATE	REVISION
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:

40' Series

FOR CONSTRUCTION

CLIENTS NAME:



PROJECT NO: GMD1049

SHEET TITLE:  
 'PENWELL'  
 ROOF PLAN  
 '4EPF-F'

PRINT DATE:

October 18, 2019

SHEET NO:

1.1.5 F

**NOTES:**

- GRADE CONDITIONS MAY VARY FOR INDIVIDUAL SITE FROM THAT SHOWN. BUILDER SHALL VERIFY AND COORDINATE PER ACTUAL SITE CONDITIONS.
- WINDOW HEAD HEIGHTS:  
1ST FLOOR = 6'-8" UNO. ON ELEVATIONS.  
2ND FLOOR = 7'-0" UNO. ON ELEVATIONS.
- ROOFING: PITCHED SHINGLES PER DEVELOPER.
- WINDOWS: MANUFACTURER PER DEVELOPER. DIVIDED LITES AS SHOWN ON THE EXTERIOR ELEVATIONS.
- ENTRY DOOR: AS SELECTED BY DEVELOPER.
- GARAGE DOORS: AS SELECTED BY DEVELOPER. RAISED PANEL AS SHOWN.
- ALL EXTERIOR MATERIALS TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
- PROTECTION AGAINST DECAY:  
(ALL PORTIONS OF A PORCH, SCREEN PORCH OR DECK FROM THE BOTTOM OF THE HEADER DOWN, INCLUDING POST, RAILS, PICKETS, STEPS AND FLOOR STRUCTURE.)
- INSULATION: PER TABLE N1021.2.  
EXTERIOR WALLS: R-15 BATTIS MINIMUM. VERIFY  
CEILING WITH ATTIC ABOVE: R-38 BATTIS MINIMUM. VERIFY  
FLOOR OVER GARAGE: R-14 BATTIS MINIMUM. VERIFY  
ATTIC KNEEWALL: R-14 BATTIS MINIMUM. VERIFY  
CRAWL SPACE FLOORING: R-14 BATTIS MINIMUM. VERIFY

**KEY NOTES:**

**MASONRY:**

- ADHERED STONE VENEER AS SELECTED BY DEVELOPER. HEIGHT AS NOTED.
- MASONRY FULL BRICK AS SELECTED BY DEVELOPER. HEIGHT AS NOTED.
- MASONRY FULL STONE AS SELECTED BY DEVELOPER. HEIGHT AS NOTED.
- 8" SOLDIER COURSE.
- ROWLOCK COURSE
- N/A

**TYPICALS:**

- CORROSION RESISTANT SCREEN LOUVERED VENTS, SIZE AS NOTED.
- CODE APPROVED TERMINATION CHIMNEY CAP.
- CORROSION RESISTANT ROOF TO WALL FLASHING. CODE COMPLIANT FLASHING PER NCRG R405.2.8.3
- STANDING SEAM METAL ROOF, INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
- DECORATIVE WROUGHT IRON. SEE DETAILS.

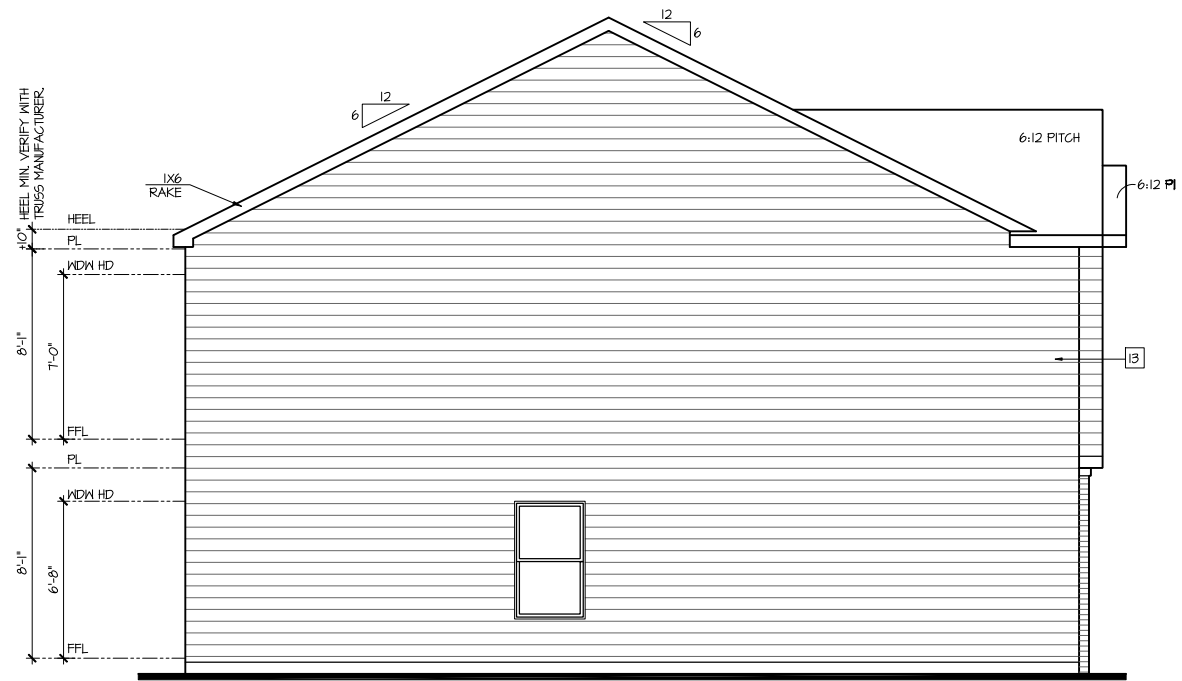
**SIDING:**

- VINYL SHAKE SIDING PER DEVELOPER WITH VINYL CORNER TRIM PER DEVELOPER.  
(AT SPECIFIED LOCATIONS:  
FIBER CEMENT SHAKE SIDING PER DEVELOPER W/ 1X4 CORNER TRIM BOARD.)
- VINYL LAP SIDING PER DEVELOPER WITH VINYL CORNER TRIM PER DEVELOPER.  
(AT SPECIFIED LOCATIONS:  
FIBER CEMENT LAP SIDING PER DEVELOPER W/ 1X4 CORNER TRIM BOARD.)
- VINYL NAVY SIDING PER DEVELOPER WITH VINYL CORNER TRIM PER DEVELOPER.  
(AT SPECIFIED LOCATIONS:  
FIBER CEMENT NAVY SIDING PER DEVELOPER W/ 1X4 CORNER TRIM BOARD.)
- VINYL BOARD AND BATT SIDING PER DEVELOPER WITH VINYL CORNER TRIM PER DEVELOPER.  
(AT SPECIFIED LOCATIONS:  
FIBER CEMENT BOARD SIDING W/ 1X3 BATTIS AT 12" O.C. PER DEVELOPER W/ 1X4 CORNER TRIM BOARD.)
- VINYL TRIM SIZE AS NOTED  
(AT SPECIFIC LOCATIONS:  
1X FIBER CEMENT TRIM OR EQUAL, UNO. SIZE AS NOTED
- PYRON SHUTTERS, TYPE AS SHOWN. SIZE AS NOTED.  
(AT SPECIFIC LOCATIONS: FALSE VINYL SHUTTERS, TYPE AS SHOWN. SIZE AS NOTED.)

ALL WINDOWS WHOSE OPENING IS LESS THAN 24" ABOVE THE FINISH FLOOR AND WHOSE OPENING IS GREATER THAN 12" ABOVE THE OUTSIDE WALKING SURFACE MUST HAVE WINDOW OPENING LIMITING DEVICES COMPLYING WITH THE NCRG SECTION R312.2.1 AND R312.2.2.

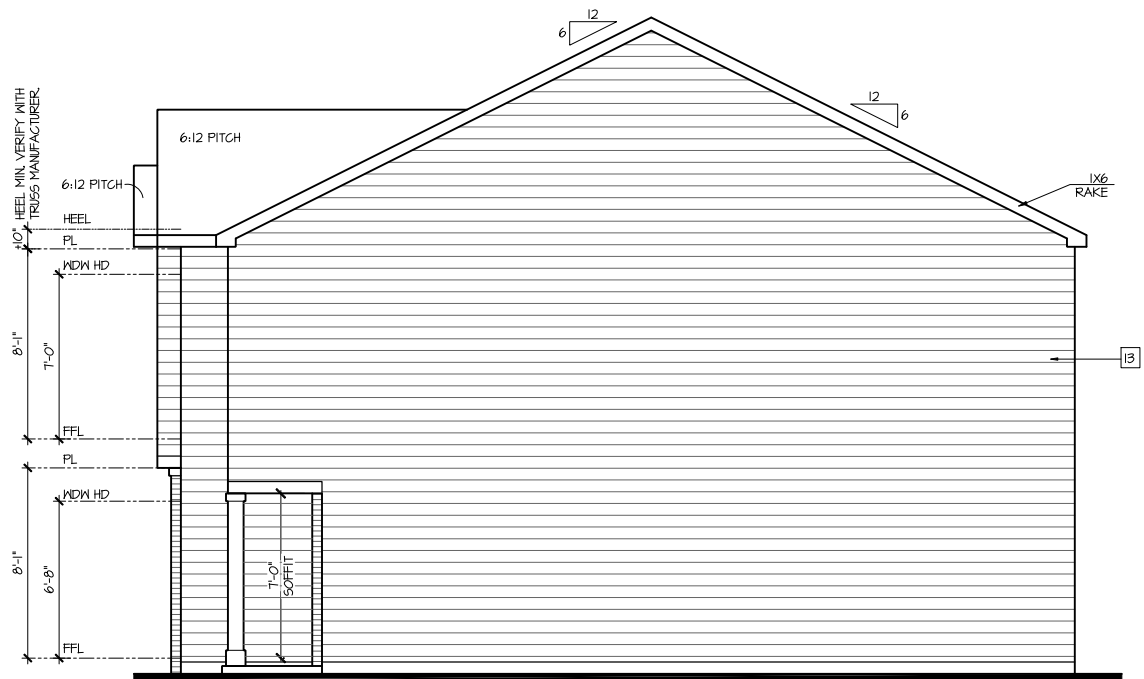
AVAILABLE WITH OPTIONAL  
9'-1" FIRST FLOOR PLATE

NOTES AT OPT 9'-1" PLT:  
- WDW HT SET AT 7'-6"  
- INTERIOR SOFFITS AT 8'-0"  
- EXTERIOR SOFFITS AT 8'-0"



Left Elevation 'F'

SCALE: 1/4"=1'-0" AT 22'X34' LAYOUT 1/8"=1'-0" AT 11'X11" LAYOUT



Right Elevation 'F'

SCALE: 1/4"=1'-0" AT 22'X34' LAYOUT 1/8"=1'-0" AT 11'X11" LAYOUT



Rear Elevation 'F'

SCALE: 1/4"=1'-0" AT 22'X34' LAYOUT 1/8"=1'-0" AT 11'X11" LAYOUT

NO.	DATE:	REVISION:
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:

40' Series

FOR CONSTRUCTION

CLIENTS NAME:



PROJECT NO: GMD17049

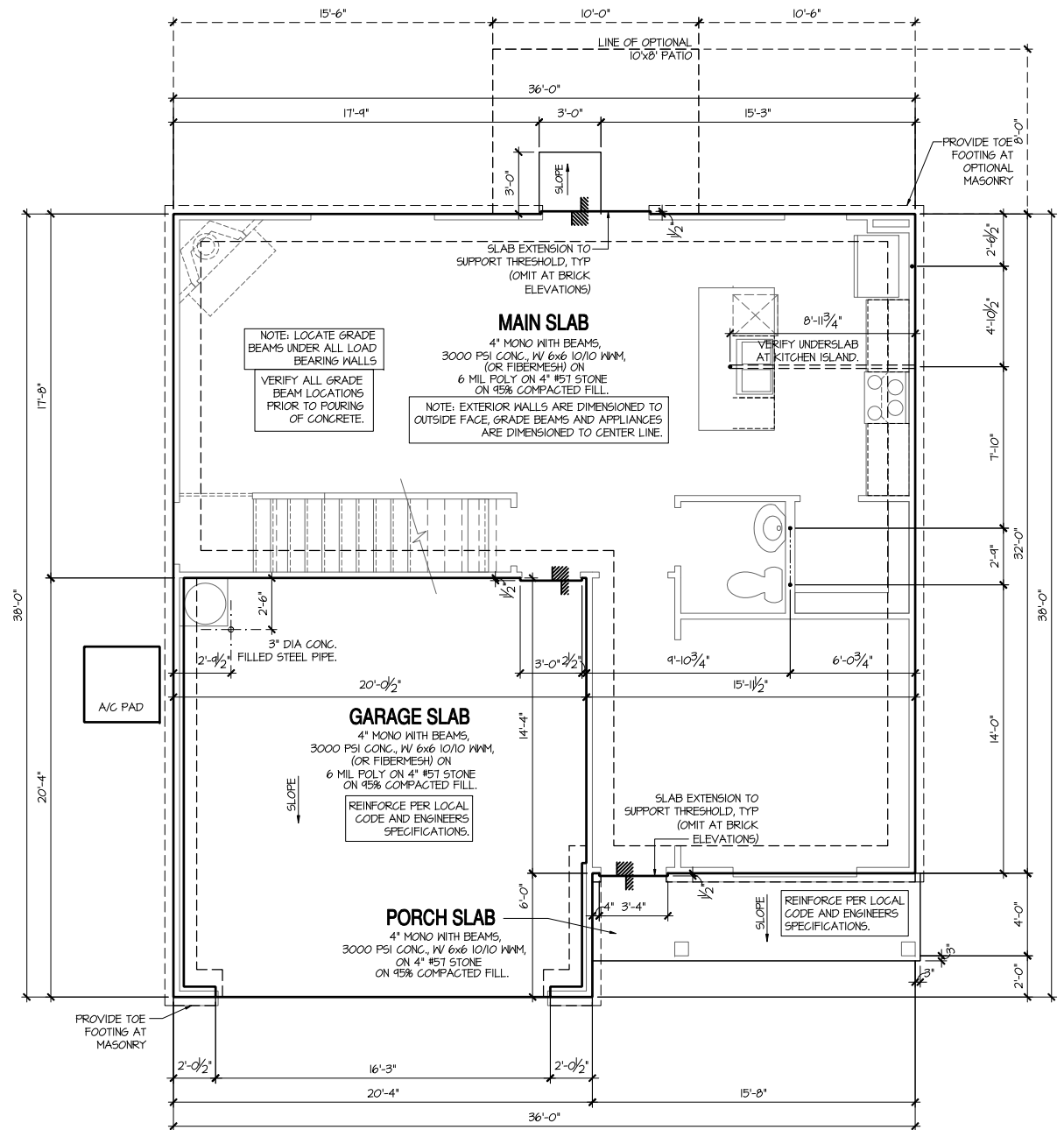
SHEET TITLE:  
'PENWELL'  
EXTERIOR  
ELEVATIONS  
'4EPF-F'

PRINT DATE:  
October 18, 2019

SHEET NO:  
2F



- NOTES FOR NORTH CAROLINA:**
- IRRIGATION SYSTEM SHALL BE DESIGNED TO PREVENT THE SATURATION OF SOIL ADJACENT TO BUILDING.
  - THIS PERIMETER DIMENSION PLAN IS FOR DIMENSIONAL INFORMATION ONLY.
  - SLOPE ALL STOOPS AND HARDSCAPE MATERIAL AWAY FROM BUILDING - TYPICAL.
  - SLOPE GARAGE FLOOR 1/8" PER FOOT TO GARAGE DOOR OPENING.
  - VERIFY CURB CUT BLOCKOUT WITH GARAGE DOOR MANUFACTURER.
  - REFER TO CIVIL DRAWINGS FOR FINISH SURFACE ELEVATIONS.
  - FINISH GRADE SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING. REFER TO SOILS REPORT FOR ANY SPECIFIC REQUIREMENTS.
  - REFER TO STRUCTURAL DRAWINGS FOR HOLDDOWNS, FOOTING DETAILS, CURB THICKNESS, AND INFORMATION NOT SHOWN ON THIS PLAN.
  - PLUMBING FIXTURES, VENT LOCATIONS, ETC. ARE APPROXIMATE. CONTRACTOR TO VERIFY COUNT AND LOCATION.
  - VERIFY THE SUPPLY FOR SEPARATE CONDUITS TO ANY ISLAND FOR GAS, WATER OR ELECTRIC.
  - VERIFY ALL DOOR THRESHOLD HEIGHTS TO HARD SURFACES.  
8 1/4" MAX AT INSWING DOORS, (PER NCG SECTION R311.3.1)
  - TYP STOOP AT INSWING/SLIDER DOORS: 36" DEEP BY THE WIDTH OF THE DOOR SERVED, MINIMUM. (PER NCG SECTION R311.3) PROVIDE A SLIP-RESISTANT FINISH.
  - FOR THE USE OF EXPOSED GAS WATER HEATERS IN THE GARAGE, PROTECT THE WATER HEATER WITH 3" DIA CONCRETE FILLED STEEL PIPE EMBEDDED INTO CONCRETE FOOTING.
  - SOILS TREATMENT:  
BORACARE TERMITICIDE TO BE APPLIED TO FRAMING PER PRODUCT SPECIFICATIONS.  
(PROVIDE CHEMICAL TREATMENT FOR PROTECTION FROM TERMITICIDE INVESTIGATION ACCORDING TO THE STANDARDS OF THE NC DEPT OF AGRICULTURE.)
  - WOOD CONTACTING CONCRETE OR MASONRY OR LESS THAN CODE REQUIRED SEPARATION TO GRADE SHALL BE PRESSURE TREATED OR FOUNDATION GRADE REDWOOD. SET ALL EXTERIOR WALL SILLS IN MASTIC.



## Monolithic Slab Plan 'F'

SCALE: 1/4"=1'-0" AT 22'x34" LAYOUT 1/8"=1'-0" AT 11'x17" LAYOUT

NO.	DATE	REVISION
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:  
**40' Series**



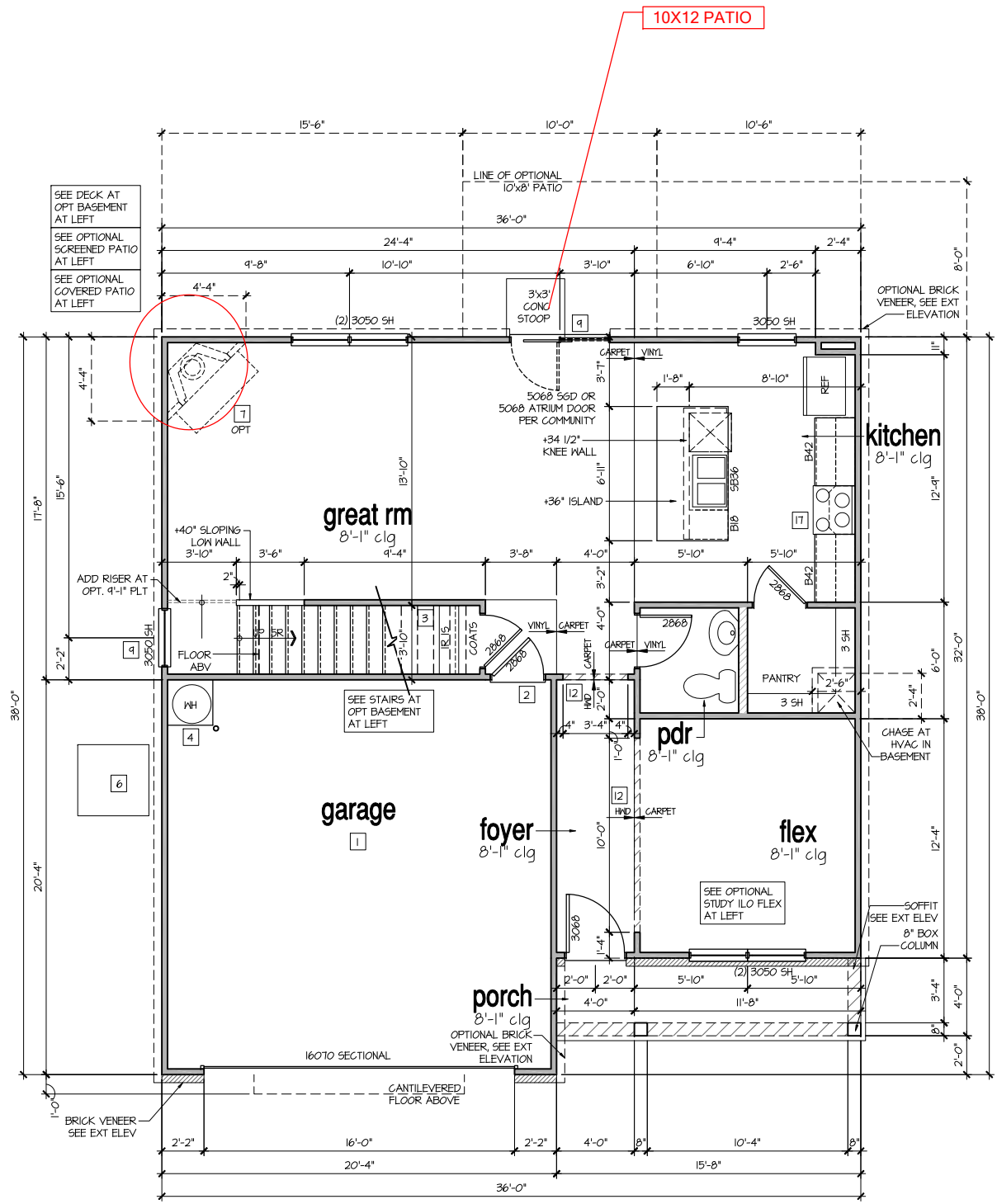
CLIENTS NAME:

PROJECT NO: GMD1049  
SHEET TITLE:  
**'PENWELL'  
MONOLITHIC  
SLAB  
PLAN '4EPF-F'**

PRINT DATE:  
October 18, 2019

SHEET NO:  
**3.5 MS F**

**FOR CONSTRUCTION**



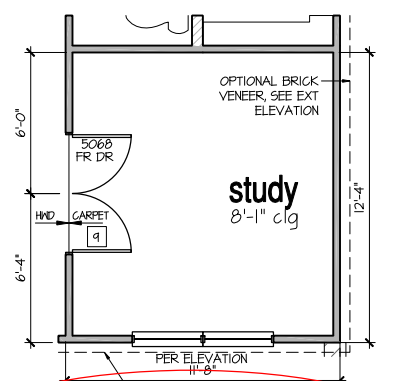
1st Floor Plan 'F'

SCALE: 1/4"=1'-0" AT 22"x34" LAYOUT 1/8"=1'-0" AT 11"x17" LAYOUT

**9'-1" STAIR NOTE:**  
 (USE 14" T.J.I WITH 3/4" PLYWOOD SUBFLOOR)  
 16 TREADS AT 10" EACH VERIFY  
 17 RISERS AT +/- 1.21" = 123 3/4" TOTAL  
 RISE VERIFY

**8'-1" STAIR NOTE:**  
 (USE 14" T.J.I WITH 3/4" PLYWOOD SUBFLOOR)  
 14 TREADS AT 10" EACH VERIFY  
 15 RISERS AT +/- 1.45" = 111 3/4" TOTAL  
 RISE VERIFY

**8'-9 1/2" STAIR NOTE:**  
 (USE 14" T.J.I WITH 3/4" PLYWOOD SUBFLOOR)  
 15 TREADS AT 10" EACH VERIFY  
 16 RISERS AT +/- 1.50" = 120 1/4" TOTAL  
 RISE VERIFY



Opt Study I/O Flex

SCALE: 1/4"=1'-0" AT 22"x34" LAYOUT 1/8"=1'-0" AT 11"x17" LAYOUT

- FOR ADDITIONAL NOTES SEE GENERAL NOTES ON TITLE SHEET AND DETAILS.  
 - WINDOW HEAD HEIGHTS:  
 1ST FLOOR = 6'-8" UNO. ON ELEVATIONS.  
 2ND FLOOR = 7'-0" UNO. ON ELEVATIONS.  
 ALL DIMENSIONS TO WINDOWS AND DOORS ARE TO CENTERLINE.

**WALL LEGEND:**

	FULL HEIGHT 2x4 WOOD STUD PARTITION		FULL HEIGHT 2x6 WOOD STUD PARTITION
	BRICK / STONE VENEER		STUD WALL BELOW HEIGHT AND STUD SIZE AS NOTED
	LOW GYPSUM BOARD WALL HEIGHT AND STUD SIZE AS NOTED		DRYWALL OPENING HEIGHT AS NOTED ON PLAN

**KEY NOTES FOR NORTH CAROLINA:**

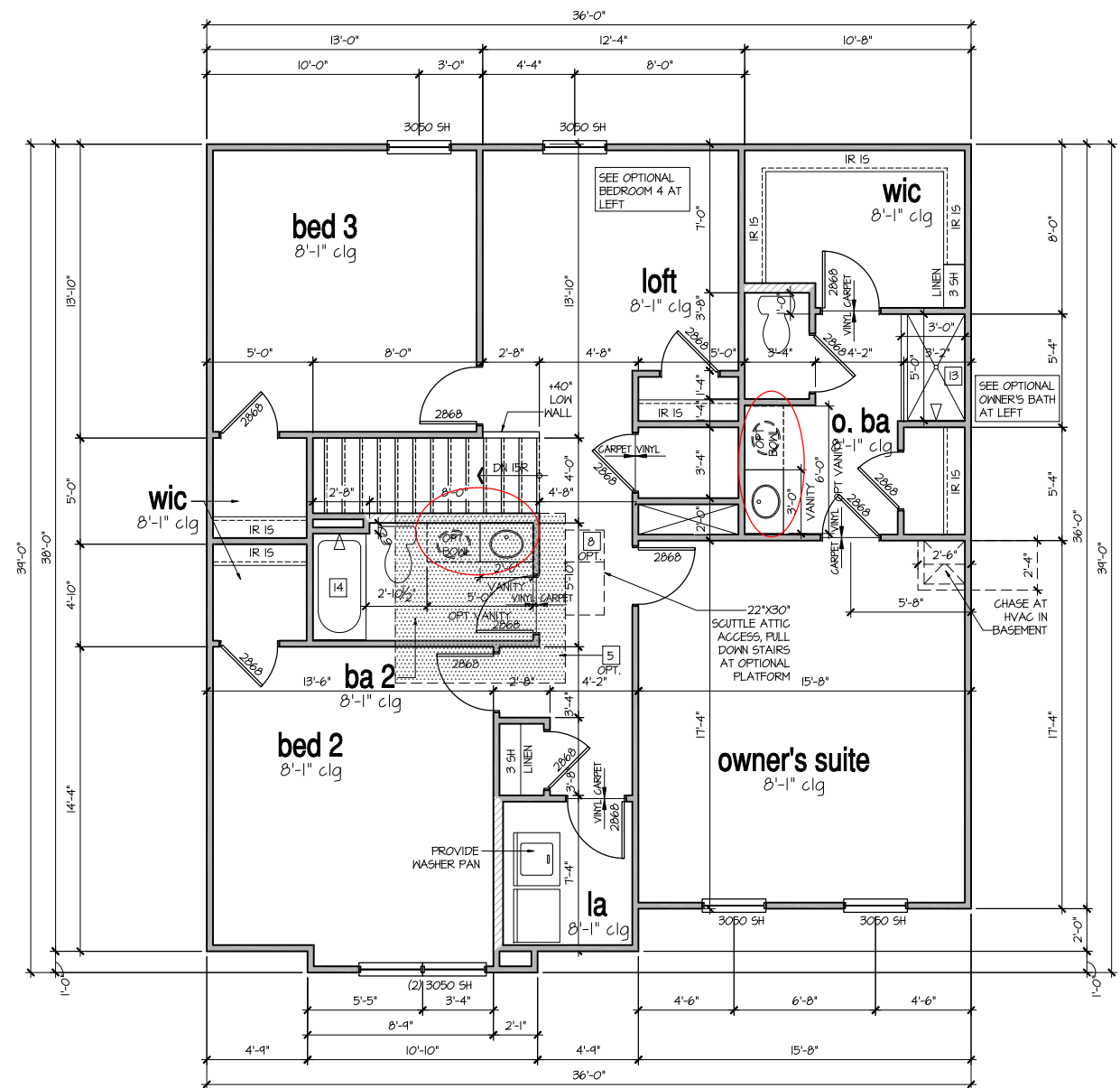
- FIRE PROTECTION:**
- HOUSE TO GARAGE FIRE SEPARATION. GARAGE/HOUSE SEPARATION AT VERTICAL SURFACES SHALL BE PROTECTED WITH ONE (1) LAYER 1/2" GYPSUM BOARD. (PER NCRG TABLE R302.6) GARAGE/HOUSE SEPARATION AT HORIZONTAL SURFACES SHALL BE PROTECTED WITH ONE (1) LAYER 5/8" TYPE 'X' GYPSUM BOARD. (PER NCRG TABLE R302.6)
  - HOUSE TO GARAGE DOOR SEPARATION. PROVIDE 1-3/8" SOLID CORE DOOR OR APPROVED 20 MINUTE RATED DOOR. (PER NCRG SECTION R302.5.1)
  - BENEATH STAIRS AND LANDINGS. 1/2" GYPSUM BOARD ON WALLS AND CEILING OF ENCLOSED ACCESSIBLE AREAS. (PER NCRG SECTION R302.1) IN CONCEALED SPACES BETWEEN STAIR STRINGERS PROVIDE FIREBLOCKING PER R302.11
  - MEPS
  - GAS WATER HEATER ON 18" HIGH PLATFORM. (PER CHAPTER 5 NCRG-PLUMBING)
  - FAU 8'x8' PLATFORM. VERIFY WITH TRUSS MANUFACTURER. (6'-6" MIN. CLEAR HEIGHT TO HORIZONTAL MEMBERS, 2'x6" OVER 2'x4" BOTTOM CHORD. OF TRUSS. VERIFY W/ TRUSSES.)
  - A/C CONDENSER PAD. (VERIFY)
  - PRE-FABRICATED METAL FIREPLACE. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - ATTIC ACCESS LARGE ENOUGH TO REMOVE LARGEST PIECE OF EQUIPMENT BUT NOT LESS THAN 30"x22". FIRE RATED ACCESS AS NOTED. (PER NCRG 801.1) ATTIC ACCESS LADDER. VERIFY LOCATION AND SIZE WITH TRUSSES. (25 1/2" X 54" SIZE) FOR GARAGE TO ATTIC SEPARATION PER NCRG 302.5.1 EXCEPTION.
  - TEMPERED SAFETY GLASS. (PER NCRG SECTION 308.4)
  - PLYWOOD SHELF ABOVE WITH DRYWALL FINISH OVER. HEIGHT AS NOTED.
  - HALF WALL, HEIGHT AS NOTED.
  - INTERIOR SOFFITS: FFL = 8'-1" UNO. SFL = 7'-6" UNO. BATHS:
  - SHOWER. TEMPERED GLASS ENCLOSURE.
  - TUB-SHOWER COMBO. TEMPERED GLASS ENCLOSURE.
  - CERAMIC TILE SHOWER AND FLOOR. TEMPERED GLASS ENCLOSURE.
  - ACRYLIC TUB W/ CERAMIC PLATFORM KITCHEN:
  - 30" SLIDE-IN ELECTRICAL RANGE W/ HOOD AND MICRO ABV. VENT PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - 30" GAS COOKTOP AND HOOD. VENT PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - ELECTRIC OVEN WITH MICROWAVE OVEN.

NO.	DATE	REVISION
1	02.18.21	

PROFESSIONAL SEAL:  
 PROJECT TITLE:  
**40' Series**

CLIENTS NAME:  
  
 PROJECT NO: GMD17049  
 SHEET TITLE:  
**'PENWELL' 1st FLOOR PLAN '4EPF-F'**  
 PRINT DATE:  
 October 18, 2019  
 SHEET NO:  
**4.5 F**

FOR CONSTRUCTION



**2nd Floor Plan 'F'**  
 SCALE: 1/4"=1'-0" AT 22'X34' LAYOUT 1/8"=1'-0" AT 11'X11' LAYOUT

**9'-1" STAIR NOTE:**  
 (USE 14" TJI WITH 3/4" PLYWOOD SUBFLOOR)  
 16 TREADS AT 10" EACH VERIFY  
 17 RISERS AT +/- 1.21" = 123 3/4" TOTAL  
 RISE VERIFY

**8'-1" STAIR NOTE:**  
 (USE 14" TJI WITH 3/4" PLYWOOD SUBFLOOR)  
 14 TREADS AT 10" EACH VERIFY  
 15 RISERS AT +/- 1.45" = 111 3/4" TOTAL  
 RISE VERIFY

- FOR ADDITIONAL NOTES SEE GENERAL NOTES ON TITLE SHEET AND DETAILS.  
 - WINDOW HEAD HEIGHTS:  
 1ST FLOOR = 6'-8" U.N.O. ON ELEVATIONS.  
 2ND FLOOR = 7'-0" U.N.O. ON ELEVATIONS.

ALL DIMENSIONS TO WINDOWS AND DOORS ARE TO CENTERLINE.

**WALL LEGEND:**

	FULL HEIGHT 2X4 WOOD STUD PARTITION		FULL HEIGHT 2X6 WOOD STUD PARTITION
	BRICK / STONE VENEER		STUD WALL BELOW HEIGHT AND STUD SIZE AS NOTED
	LON GYPSUM BOARD WALL HEIGHT AND STUD SIZE AS NOTED		DRYWALL OPENING HEIGHT AS NOTED ON PLAN

**KEY NOTES FOR NORTH CAROLINA:**

- FIRE PROTECTION:**
- HOUSE TO GARAGE FIRE SEPARATION. GARAGE/HOUSE SEPARATION AT VERTICAL SURFACES SHALL BE PROTECTED WITH ONE (1) LAYER 1/2" GYPSUM BOARD. (PER NCR TABLE R302.6) GARAGE/HOUSE SEPARATION AT HORIZONTAL SURFACES SHALL BE PROTECTED WITH ONE (1) LAYER 5/8" TYPE 'X' GYPSUM BOARD. (PER NCR TABLE R302.6)
  - HOUSE TO GARAGE DOOR SEPARATION. PROVIDE 1-3/8" SOLID CORE DOOR OR APPROVED 20 MINUTE RATED DOOR. (PER NCR SECTION R302.5.1)
  - BENEATH STAIRS AND LANDINGS, 1/2" GYPSUM BOARD ON WALLS AND CEILING OF ENCLOSED ACCESSIBLE AREAS. (PER NCR SECTION R302.1) IN CONCEALED SPACES BETWEEN STAIR STRINGERS PROVIDE FIREBLOCKING PER R302.11
  - GAS WATER HEATER ON 18" HIGH PLATFORM. (PER CHAPTER 5 NCR-PLUMBING)
  - FAU 8'X8' PLATFORM. VERIFY WITH TRUSS MANUFACTURER. (6'-6" MIN. CLEAR HEIGHT TO HORIZONTAL MEMBERS, 2'X6" OVER 2'X4" BOTTOM CHORD. OF TRUSS, VERIFY W/ TRUSSES.)
  - A/C CONDENSER PAD. (VERIFY)
  - PRE-FABRICATED METAL FIREPLACE. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - ATTIC ACCESS LARGE ENOUGH TO REMOVE LARGEST PIECE OF EQUIPMENT BUT NOT LESS THAN 30"X22". FIRE RATED ACCESS AS NOTED. (PER NCR 807.1) ATTIC ACCESS LADDER. VERIFY LOCATION AND SIZE WITH TRUSSES. (25 1/2" X 54" SIZE) FOR GARAGE TO ATTIC SEPARATION PER NCR 302.5.1 EXCEPTION.
  - TEMPERED SAFETY GLASS. (PER NCR SECTION 308.4)
  - PLYWOOD SHELF ABOVE WITH DRYWALL FINISH OVER. HEIGHT AS NOTED.
  - HALF WALL, HEIGHT AS NOTED.
  - INTERIOR SOFFITS: FFL = 8'-4" U.N.O. SFL = 7'-6" U.N.O. BATHS:
  - SHOWER. TEMPERED GLASS ENCLOSURE.
  - TUB-SHOWER COMBO. TEMPERED GLASS ENCLOSURE.
  - CERAMIC TILE SHOWER AND FLOOR. TEMPERED GLASS ENCLOSURE.
  - ACRYLIC TUB W/ CERAMIC PLATFORM KITCHEN:
  - 30" SLIDE-IN ELECTRICAL RANGE W/ HOOD AND MICRO ADV. VENT PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - 30" GAS COOKTOP AND HOOD. VENT PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
  - ELECTRIC OVEN WITH MICROWAVE OVEN.

NO.	DATE:	REVISION:
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:  
**40' Series**



CLIENTS NAME:  
 PROJECT NO: GMD1049

SHEET TITLE:  
**'PENWELL'  
 2nd FLOOR  
 PLAN '4EPF-F'**

PRINT DATE:  
 October 18, 2019

SHEET NO:  
**5.5 F**

FOR CONSTRUCTION

**9'-1" STAIR NOTE:**  
 (USE 14" T.J.I WITH 3/4" PLYWOOD SUBFLOOR)  
 16 TREADS AT 10" EACH VERIFY  
 17 RISERS AT +/- 1.21" = 123 3/4" TOTAL  
 RISE VERIFY

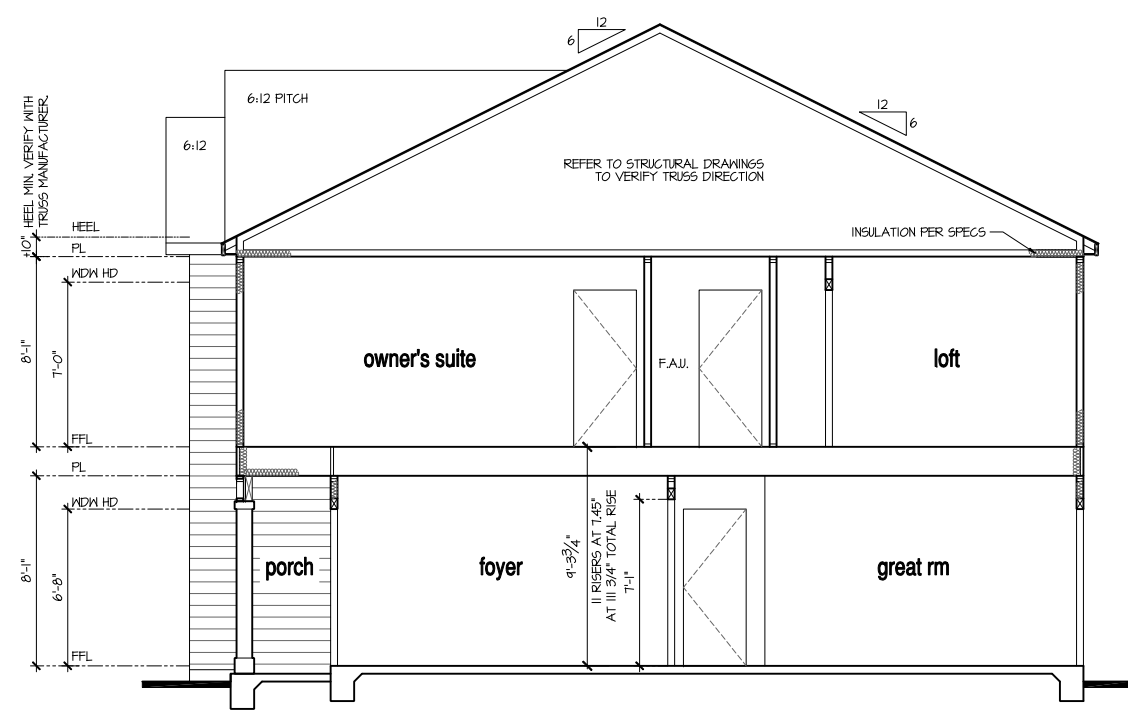
**8'-1" STAIR NOTE:**  
 (USE 14" T.J.I WITH 3/4" PLYWOOD SUBFLOOR)  
 14 TREADS AT 10" EACH VERIFY  
 15 RISERS AT +/- 1.45" = 111 3/4" TOTAL  
 RISE VERIFY

**NOTES:**

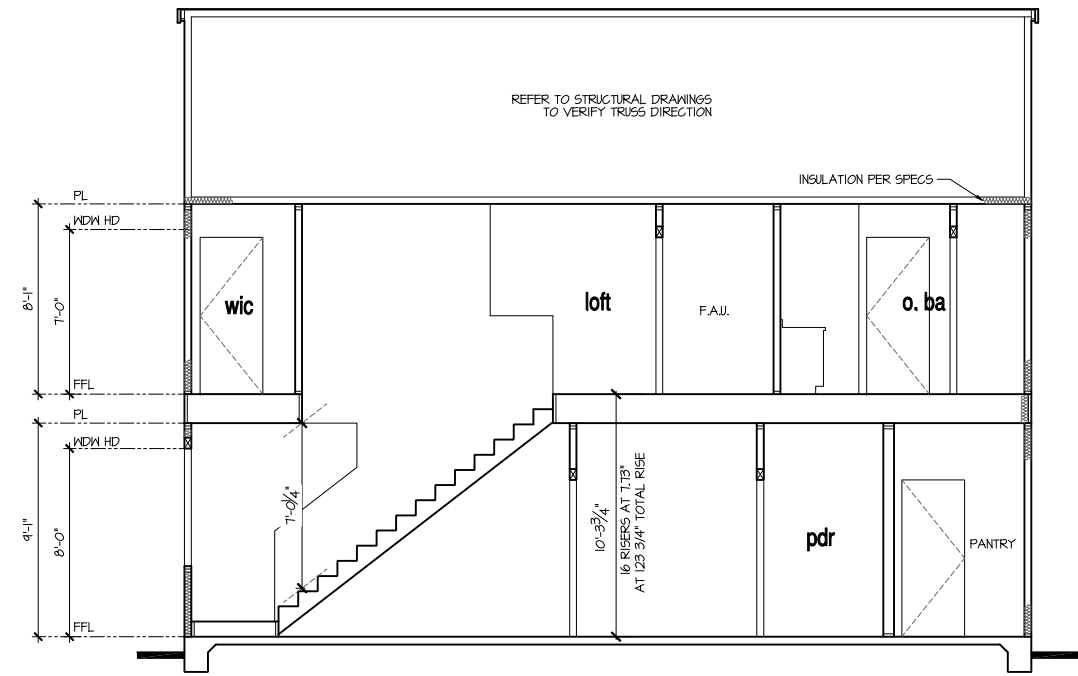
- REFER TO FLOOR PLAN NOTES FOR TYPICAL FIRE PROTECTION NOTES AND LOCATIONS.
- THESE BUILDING SECTIONS MAY VARY AT ALTERNATE ELEVATION STYLES AND AT "PLAN OPTION" CONDITIONS. REFER TO MAIN FLOOR PLAN AND ALTERNATE FLOOR PLANS FOR INFORMATION NOT SHOWN HERE.
- BUILDING SECTIONS SHOWN HERE DEPICT VOLUME SPACES WITHIN THE STRUCTURE. REFER TO STRUCTURAL DRAWINGS, TRUSS DRAWINGS, STRUCTURAL DETAILS AND CALCULATIONS BY OTHER FOR ALL STRUCTURAL INFO.
- ROOFING: PITCHED SHINGLE ROOF. REFER TO ROOF PLAN FOR TYPICALS.
- WOOD FLOORS: FLOOR SHEATHING OVER FLOOR JOIST. REFER TO STRUCTURAL AND TRUSS DRAWINGS BY OTHERS.
- VERIFY STAIRS MINIMUM AND MAXIMUM REQUIREMENTS FOR CONSTRUCTION CLEARANCES WITH LOCAL CODES.
- INSULATION:  
 EXTERIOR WALLS ZONE 3: R-13 BATTS MINIMUM VERIFY  
 EXTERIOR WALLS ZONE 4: R-15 BATTS MINIMUM VERIFY  
 CEILING WITH ATTIC ABOVE COMPRESSED INSULATION:  
 R-30 BATTS MINIMUM VERIFY  
 CEILING WITH ATTIC ABOVE UNCOMPRESSED INSULATION (HEELS IN TRUSSES):  
 R-30 BATTS MINIMUM VERIFY
- FLOOR OVER GARAGE: R-19 BATTS MINIMUM VERIFY  
 ATTIC KNEEWALL: R-19 BATTS MINIMUM VERIFY  
 GRAVEL SPACE FLOORING: R-19 BATTS MINIMUM VERIFY

WINDOW GLAZING "U" FACTOR: 0.35

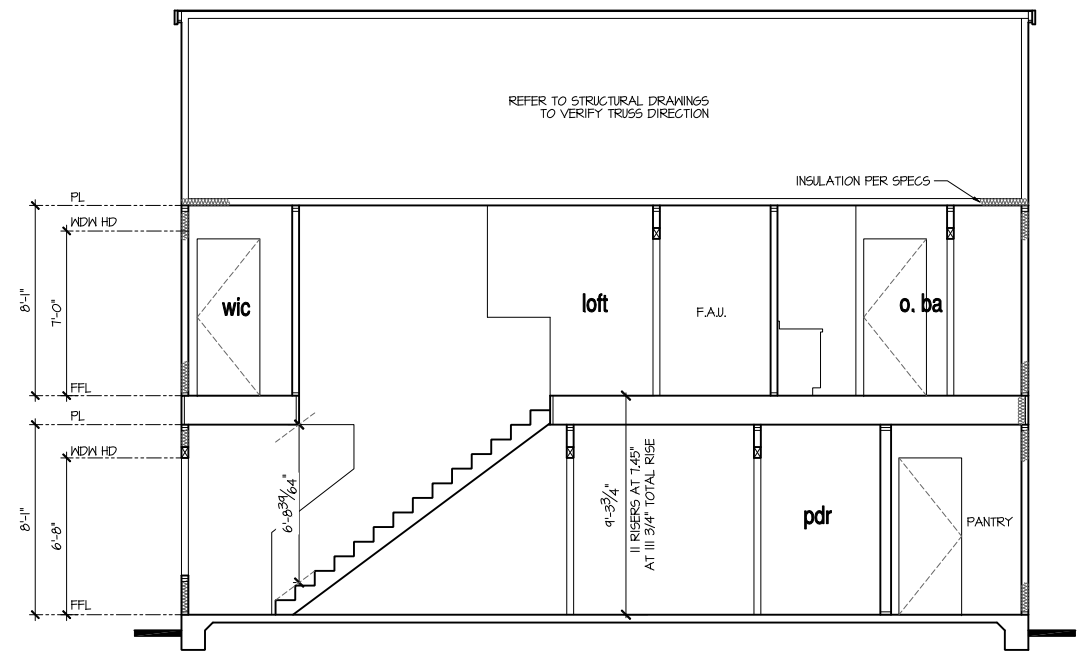
PER STATE RESIDENTIAL CODE COMPLIANCE METHOD TO BE DETERMINED BY BUILDER.



**Building Section I at Monolithic Slab**  
 SCALE: 1/4"=1'-0" AT 22'x34" LAYOUT 1/8"=1'-0" AT 11'x17" LAYOUT



**Building Section 2 at Optional 9' Plt**  
 SCALE: 1/4"=1'-0" AT 22'x34" LAYOUT 1/8"=1'-0" AT 11'x17" LAYOUT



**Building Section 2 at Monolithic Slab**  
 SCALE: 1/4"=1'-0" AT 22'x34" LAYOUT 1/8"=1'-0" AT 11'x17" LAYOUT

NO.	DATE	REVISION
1	02.19.21	

PROFESSIONAL SEAL:

PROJECT TITLE:

**40' Series**

CLIENTS NAME:



PROJECT NO: GMD17049

SHEET TITLE:

**'PENWELL'  
 BUILDING  
 SECTIONS**

PRINT DATE:

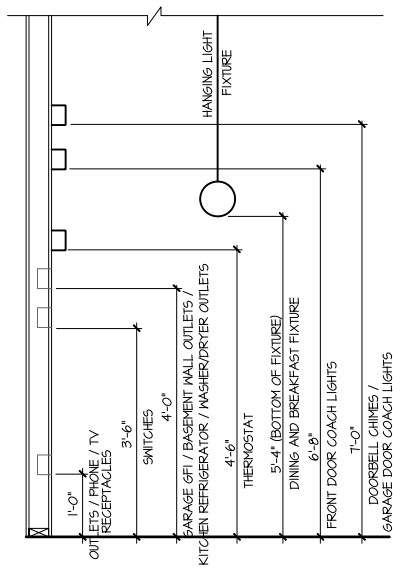
October 18, 2019

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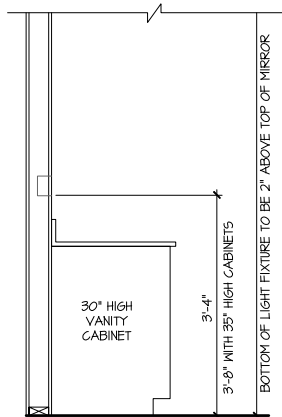
**1A S**

**FOR CONSTRUCTION**

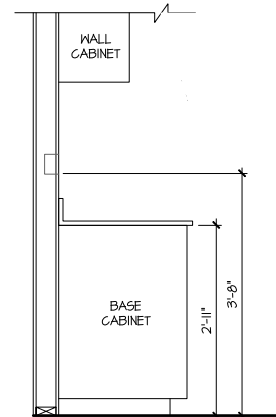




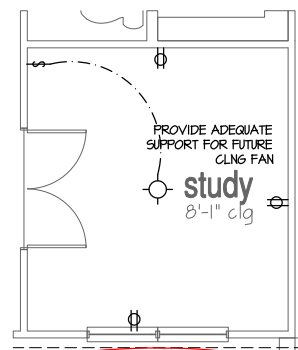
STANDARD ELECTRICAL BOX HEIGHTS



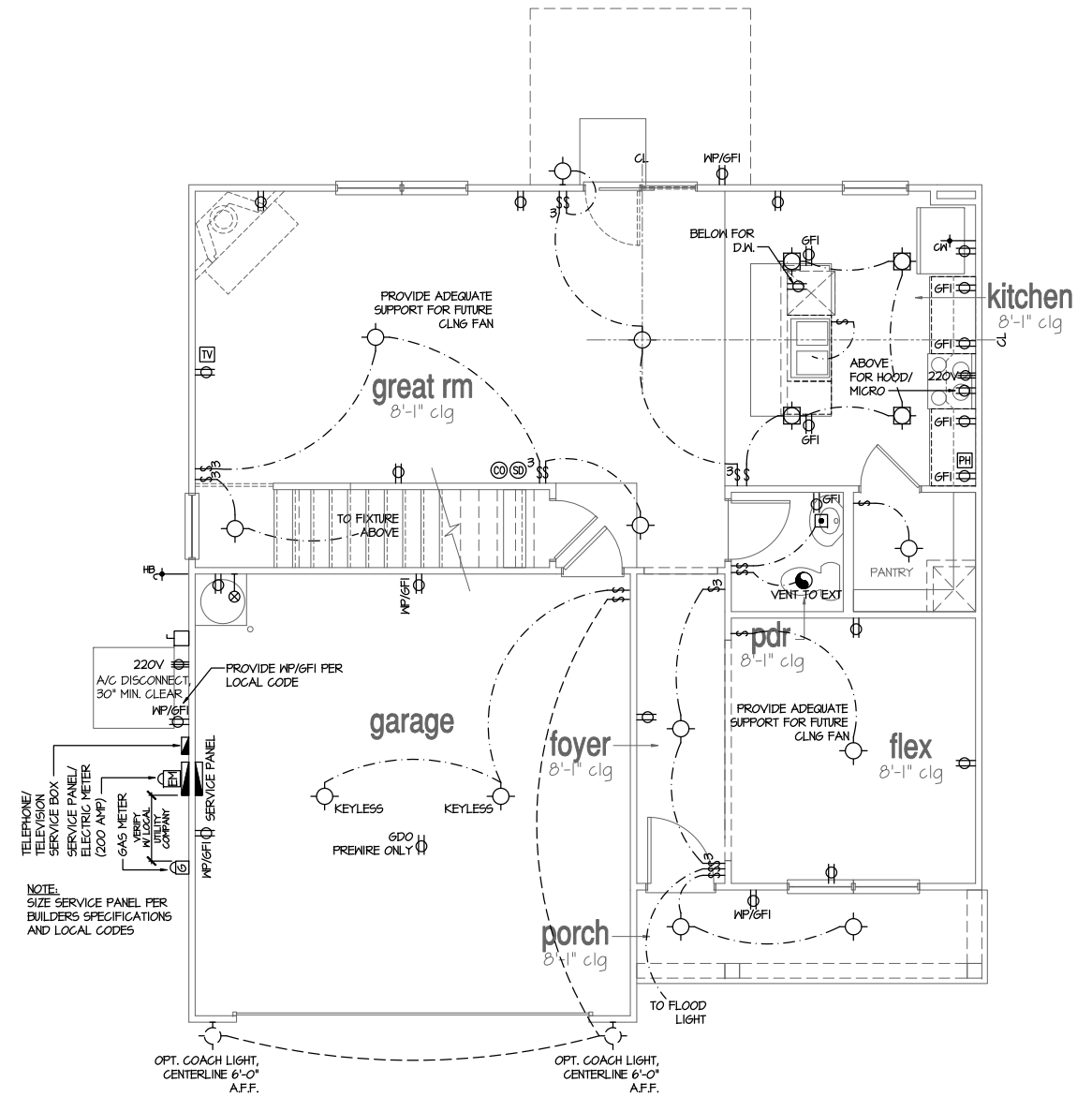
SWITCH AND RECEPTACLE BOXES OVER BATH CABINETS



SWITCH AND RECEPTACLE BOXES OVER KITCHEN CABINETS



Opt Study ILO Flex  
SCALE: 1/4"=1'-0" AT 22"x34" LAYOUT 1/8"=1'-0" AT 11"x11" LAYOUT



1st Floor Plan

SCALE: 1/4"=1'-0" AT 22"x34" LAYOUT 1/8"=1'-0" AT 11"x11" LAYOUT

NOTES:

- PROVIDE GROUNDING ELECTRICAL ROD PER LOCAL CODES.
- PROVIDE AND INSTALL ARC FAULT CIRCUIT-INTERRUPTERS (AFCI) AS REQUIRED BY NATIONAL ELECTRICAL CODE (NEC) AND MEETING THE REQUIREMENTS OF ALL GOVERNING CODES.
- ALL EXHAUST FANS SHALL HAVE BACKDRAFT DAMPERS.
- FANLIGHTS IN WET/DAMP LOCATIONS SHALL BE LABELED "SUITABLE FOR WET OR DAMP LOCATIONS."
- ELECTRICAL SYSTEMS ARE SHOWN FOR INTENT ONLY. THESE SYSTEMS SHALL BE ENGINEERED BY OTHERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND PLACEMENT.
- PROVIDE AND INSTALL LOCALLY CERTIFIED SMOKE DETECTORS AND CO2 DETECTORS AS REQUIRED BY NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND MEETING THE REQUIREMENTS OF ALL GOVERNING CODES.
- PROVIDE AND INSTALL GROUND FAULT CIRCUIT-INTERRUPTERS (GFI) AS REQUIRED BY NATIONAL ELECTRICAL CODE (NEC) AND MEETING THE REQUIREMENTS OF ALL GOVERNING CODES.
- ELECTRICAL CONTRACTOR TO PROVIDE REQUIRED DIRECT HOOK-UPS/CUTOFFS.
- HVAC CONTRACTOR TO VERIFY THERMOSTAT LOCATIONS.
- ALL ELECTRICAL AND MECHANICAL EQUIPMENT (FURNACES, A/C UNITS, ELECTRICAL PANELS, SANITARY SUMP PITS, DRAIN TILE SUMP, AND WATER HEATERS) ARE SUBJECT TO RELOCATION DUE TO FIELD CONDITIONS.
- PROVIDE POWER, LIGHT AND SWITCH AS REQUIRED FOR ATTIC FURNACE PER CODE AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

LEGEND:

⊕	DUPLEX OUTLET	⊕	FLUSH-MOUNT LED CEILING FIXTURE	⊠	CHIMES
⊕WP/GFI	WEATHERPROOF GFI DUPLEX OUTLET	⊕	HANGING FIXTURE	⊠	PUSHBUTTON SWITCH
⊕GFI	GROUND-FAULT CIRCUIT-INTERRUPTER DUPLEX OUTLET	⊕	FLUSH-MOUNT LED CEILING FIXTURE (PROVIDE CEILING FAN SUPPORT)	⊠	110V SMOKE DETECTOR W/ BATTERY BACKUP
⊕	HALF-SWITCHED DUPLEX OUTLET	⊕	2-LIGHT VANITY FIXTURE	⊠	CO2 DETECTOR
⊕220V	220 VOLT OUTLET	⊕	3-LIGHT VANITY FIXTURE	⊠	THERMOSTAT
⊕	REINFORCED JUNCTION BOX	⊕	4-LIGHT VANITY FIXTURE	⊠	TELEPHONE
⊕	WALL SWITCH	⊕	WALL MOUNT FIXTURE	⊠	TELEVISION
⊕3	THREE-WAY SWITCH	⊕	EXHAUST FAN (VENT TO EXTERIOR)	⊠	ELECTRIC METER
⊕4	FOUR-WAY SWITCH	⊕		⊠	ELECTRIC PANEL
		⊕		⊠	DISCONNECT SWITCH

NO.	DATE	REVISION
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:

40' Series

CLIENTS NAME:



PROJECT NO: GMD1049

SHEET TITLE:  
**'PENWELL'**  
**1st FLOOR**  
**UTILITY PLAN**

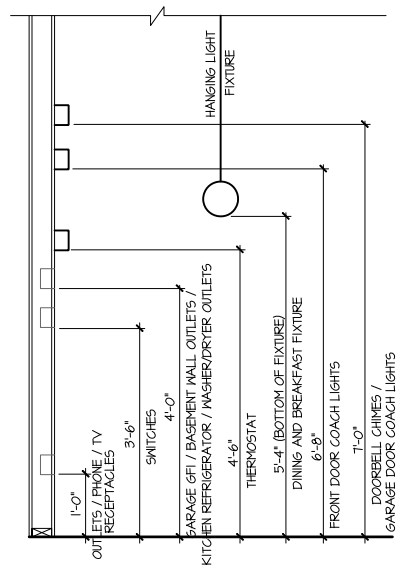
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October 18, 2019

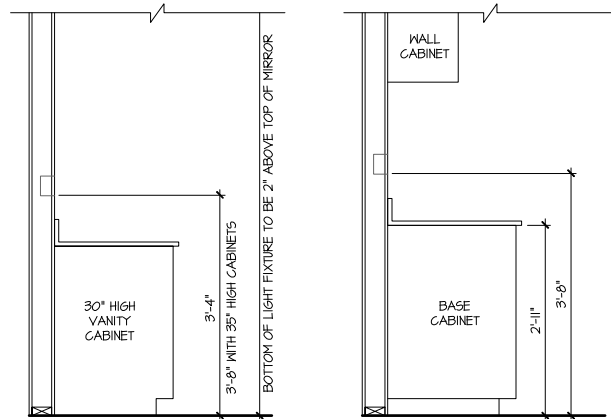
SHEET NO:

7

FOR CONSTRUCTION



STANDARD ELECTRICAL BOX HEIGHTS



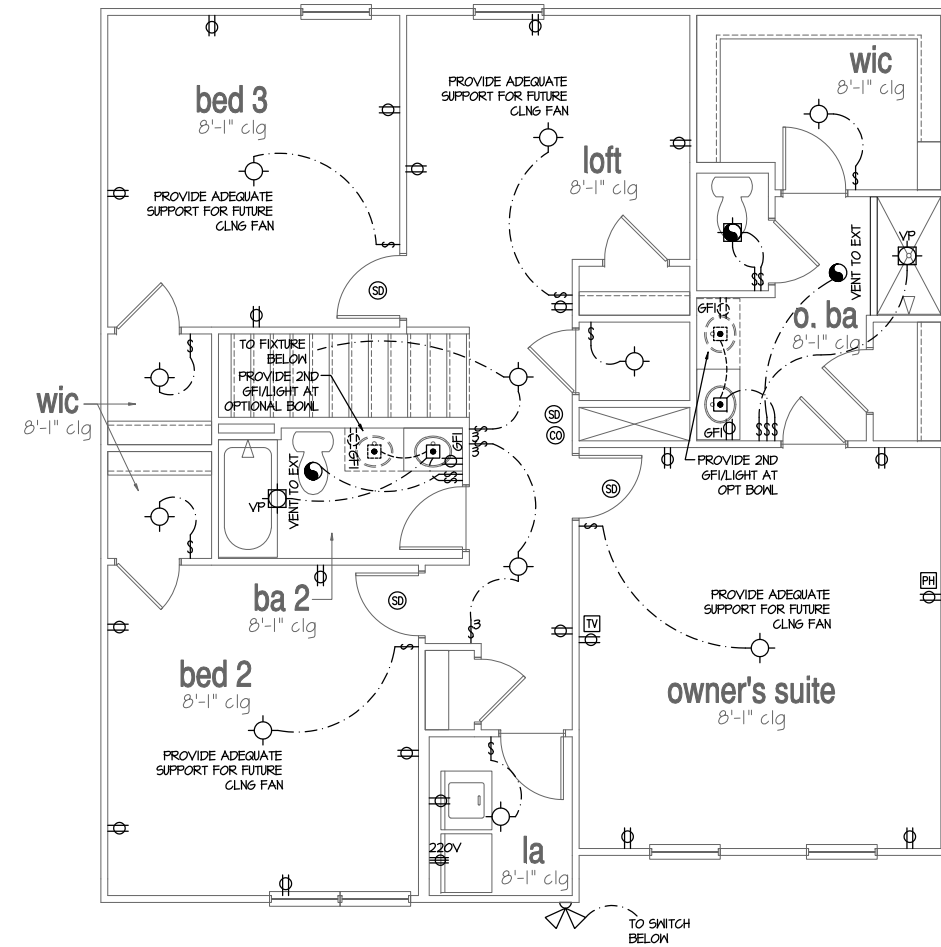
SWITCH AND RECEPTACLE BOXES OVER BATH CABINETS

SWITCH AND RECEPTACLE BOXES OVER KITCHEN CABINETS

- NOTES:**
- PROVIDE GROUNDING ELECTRICAL ROD PER LOCAL CODES.
  - PROVIDE AND INSTALL ARC FAULT CIRCUIT-INTERRUPTERS (AFCI) AS REQUIRED BY NATIONAL ELECTRICAL CODE (NEC) AND MEETING THE REQUIREMENTS OF ALL GOVERNING CODES.
  - ALL EXHAUST FANS SHALL HAVE BACKDRAFT DAMPERS.
  - FANLIGHTS IN WET/DAMP LOCATIONS SHALL BE LABELED "SUITABLE FOR WET OR DAMP LOCATIONS."
  - ELECTRICAL SYSTEMS ARE SHOWN FOR INTENT ONLY. THESE SYSTEMS SHALL BE ENGINEERED BY OTHERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND PLACEMENT.
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  - ELECTRICAL CONTRACTOR TO PROVIDE REQUIRED DIRECT HOOK-UPS/CUTOFFS.
  - HVAC CONTRACTOR TO VERIFY THERMOSTAT LOCATIONS.
  - ALL ELECTRICAL AND MECHANICAL EQUIPMENT (FURNACES, A/C UNITS, ELECTRICAL PANELS, SANITARY SUMP PITS, DRAIN TILE SUMP, AND WATER HEATERS) ARE SUBJECT TO RELOCATION DUE TO FIELD CONDITIONS.
  - PROVIDE POWER, LIGHT AND SWITCH AS REQUIRED FOR ATTIC FURNACE PER CODE AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

**LEGEND:**

⊕	DUPLEX OUTLET	⊕	FLUSH-MOUNT LED CEILING FIXTURE	⊕	CHIMES
⊕WP/GFI	WEATHERPROOF GFI DUPLEX OUTLET	⊕	HANGING FIXTURE	⊕	PUSHBUTTON SWITCH
⊕GFI	GROUND-FAULT CIRCUIT-INTERRUPTER DUPLEX OUTLET	⊕	FLUSH-MOUNT LED CEILING FIXTURE (PROVIDE CEILING FAN SUPPORT)	⊕	110V SMOKE DETECTOR W/ BATTERY BACKUP
⊕	HALF-SWITCHED DUPLEX OUTLET	⊕	2-LIGHT VANITY FIXTURE	⊕	CO2 DETECTOR
⊕220V	220 VOLT OUTLET	⊕	3-LIGHT VANITY FIXTURE	⊕	THERMOSTAT
⊕	REINFORCED JUNCTION BOX	⊕	4-LIGHT VANITY FIXTURE	⊕	TELEPHONE
⊕	WALL SWITCH	⊕	WALL MOUNT FIXTURE	⊕	TELEVISION
⊕3	THREE-WAY SWITCH	⊕	EXHAUST FAN (VENT TO EXTERIOR)	⊕	ELECTRIC METER
⊕4	FOUR-WAY SWITCH	⊕		⊕	ELECTRIC PANEL
		⊕		⊕	DISCONNECT SWITCH



2nd Floor Plan

SCALE: 1/4"=1'-0" AT 22"x34" LAYOUT 1/8"=1'-0" AT 11"x11" LAYOUT

NO.	DATE	REVISION
1	02.18.21	

PROFESSIONAL SEAL:

PROJECT TITLE:  
**40' Series**

FOR CONSTRUCTION



CLIENTS NAME:

PROJECT NO: GMD1049

SHEET TITLE:  
**'PENWELL'  
 2nd FLOOR  
 UTILITY PLAN**

PRINT DATE:  
 October 18, 2019

SHEET NO:  
**8**

**DESIGN SPECIFICATIONS:**

Construction Type: Commercial  Residential

**Applicable Building Codes:**

- 2018 North Carolina Residential Building Code with All Local Amendments
- ASCE 7-10: Minimum Design Loads for Buildings and Other Structures

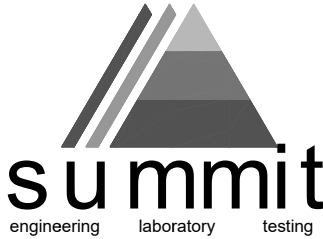
**Design Loads:**

- Roof Live Loads
  - Conventional 2x ..... 20 PSF
  - Truss ..... 20 PSF
    - Attic Truss ..... 60 PSF
- Roof Dead Loads
  - Conventional 2x ..... 10 PSF
  - Truss ..... 20 PSF
- Snow ..... 15 PSF
  - Importance Factor ..... 1.0
- Floor Live Loads
  - Typ Dwelling ..... 40 PSF
  - Sleeping Areas ..... 30 PSF
  - Decks ..... 40 PSF
  - Passenger Garage ..... 50 PSF
- Floor Dead Loads
  - Conventional 2x ..... 10 PSF
  - I-Joist ..... 15 PSF
  - Floor Truss ..... 15 PSF
- Ultimate Design Wind Speed (3 sec. gust) ..... 130 MPH
  - Exposure ..... B
  - Importance Factor ..... 1.0
  - Wind Base Shear
    - 6.3.1. Vx =
    - 6.3.2. Vy =

MEAN ROOF HT.	UP TO 30'	30'-1"-35'	35'-1"-40'	40'-1"-45'
ZONE 1	16.7-18.0	17.5-18.9	18.2-19.6	18.7-20.2
ZONE 2	16.7-21.0	17.5-22.1	18.2-22.9	18.7-23.5
ZONE 3	16.7-21.0	17.5-22.1	18.2-22.9	18.7-23.5
ZONE 4	18.2-19.0	19.2-20.0	19.9-20.7	20.4-21.3
ZONE 5	18.2-24.0	19.2-25.2	19.9-26.1	20.4-26.9

**8. Seismic**

- Site Class ..... D
- Design Category ..... C
- Importance Factor ..... 1.0
- Seismic Use Group ..... I
- Spectral Response Acceleration
  - S<sub>1</sub>, S<sub>m</sub> = %g
  - S<sub>2</sub>, S<sub>m</sub>l = %g
- Seismic Base Shear
  - S<sub>1</sub>, Vx =
  - S<sub>2</sub>, Vy =
- Basic Structural System (check one)
  - Bearing Wall
  - Building Frame
  - Moment Frame
  - Dual w/ Special Moment Frame
  - Dual w/ Intermediate R/C or Special Steel
  - Inverted Pendulum
- Arch/Mech Components Anchored ..... No
- Lateral Design Control: Seismic  Wind
- Assumed Soil Bearing Capacity ..... 2000psf



STRUCTURAL PLANS PREPARED FOR:

**PENWELL (B,K)**

**PROJECT ADDRESS:** TBD  
**OWNER:** DR Horton, Inc.  
 8001 Arrowledge Blvd.  
 Charlotte, NC 28273

**DESIGNER:**  
 GMD Design Group  
 102 Fountain Brook Circle  
 Suite C  
 Cary, NC 27511

These drawings are to be coordinated with the architectural, mechanical, plumbing, electrical, and civil drawings. This coordination is not the responsibility of the structural engineering of record (SER). Should any discrepancies become apparent, the contractor shall notify SUMMIT Engineering, Laboratory & Testing, P.C. before construction begins.

**PLAN ABBREVIATIONS:**

AB	ANCHOR BOLT	PT	PRESSURE TREATED
AFF	ABOVE FINISHED FLOOR	RS	ROOF SUPPORT
CJ	CEILING JOIST	SC	STUD COLUMN
CLR	CLEAR	SJ	SINGLE JOIST
DJ	DOUBLE JOIST	SFF	SPRUCE PINE FIR
DSP	DOUBLE STUD POCKET	SST	SIMPSON STRONG-TIE
EE	EACH END	STP	SOUTHERN YELLOW PINE
EW	EACH WAY	TJ	TRIPLE JOIST
NTS	NOT TO SCALE	TSP	TRIPLE STUD POCKET
OC	ON CENTER	TYF	TYPICAL
PSF	POUNDS PER SQUARE FOOT	UNO	UNLESS NOTED OTHERWISE
PSI	POUNDS PER SQUARE INCH	WUF	WELDED WIRE FABRIC

Roof truss and floor joist layouts, and their corresponding loading details, were not provided to SUMMIT Engineering, Laboratory & Testing, P.C. (SUMMIT) prior to the initial design. Therefore, truss and joist directions were assumed based on the information provided by DR Horton, Inc. Subsequent plan revisions based on roof truss and floor joist layouts shall be noted in the revision list, indicating the date the layouts were provided. Should any discrepancies become apparent, the contractor shall notify SUMMIT immediately.

**SHEET LIST:**

Sheet No.	Description
CSI	Cover Sheet, Specifications, Revisions
51.0m	Monolithic Slab Foundation
51.0c	Stem Wall Foundation
51.0c	Crawl Space Foundation
51.0b	Basement Foundation
52.0	Basement Plan
53.0	First Floor Plan
54.0	Second Floor Plan
55.0	Roof Framing Plan

**DR HORTON PROJECT SIGN-OFF:**

Manager	Signature
Operations	
Operations System	
Operations Product Development	

**REVISION LIST:**

Revision No.	Date	Project No.	Description
1	3/16/21	10082	Added OX-15 Bracing Plan
2	7/12/21	10082	Added crawlspace, updated OX-15 chart, added SFF note and updated date

**GENERAL STRUCTURAL NOTES:**

- The design professional whose seal appears on these drawings is the structural engineer of record (SER) for this project. The SER bears the responsibility of the primary structural elements and the performance of this structure. No other party may revise, alter, or delete any structural aspects of these construction documents without written permission of SUMMIT Engineering, Laboratory & Testing, P.C. (SUMMIT) or the SER. For the purposes of these construction documents the SER and SUMMIT shall be considered the same entity.
- The structure is only stable in its completed form. The contractor shall provide all required temporary bracing during construction to stabilize the structure.
- The SER is not responsible for construction sequences, methods, or techniques in connection with the construction of this structure. The SER will not be held responsible for the contractor's failure to conform to the contract documents, should any non-conformities occur.
- Any structural elements or details not fully developed on the construction drawings shall be completed under the direction of a licensed professional engineer. These shop drawings shall be submitted to SUMMIT for review before any construction begins. The shop drawings will be reviewed for overall compliance as it relates to the structural design of this project. Verification of the shop drawings for dimensions, or for actual field conditions, is not the responsibility of the SER or SUMMIT.
- Verification of assumed field conditions is not the responsibility of the SER. The contractor shall verify the field conditions for accuracy and report any discrepancies to SUMMIT before construction begins.
- The SER is not responsible for any secondary structural elements or non-structural elements, except for the elements specifically noted on the structural drawings.
- This structure and all construction shall conform to all applicable sections of the International Residential Code.
- This structure and all construction shall conform to all applicable sections of local building codes.
- All structural assemblies are to meet or exceed to requirements of the current local building code.

**FOUNDATIONS:**

- The structural engineer has not performed a subsurface investigation. Verification of this assumed value is the responsibility of the owner or the contractor. Should any adverse soil condition be encountered the SER must be contacted before proceeding.

- The bottom of all footings shall extend below the frost line for the region in which the structure is to be constructed. However, the bottom of all footings shall be a minimum of 12" below grade.
- Any fill shall be placed under the direction or recommendation of a licensed professional engineer.
- The resulting soil shall be compacted to a minimum of 95% maximum dry density.
- Excavations of footings shall be lined temporarily with a 6 mil polyethylene membrane if placement of concrete does not occur within 24 hours of excavation.
- No concrete shall be placed against any subgrade containing water, ice, frost, or loose material.

**STRUCTURAL STEEL:**

- Structural steel shall be fabricated and erected in accordance with the American Institute of Steel Construction "Code of Standard Practices for Steel Buildings and Bridges" and the manual of Steel Construction "Load Resistance Factor Design" latest editions.
- Structural steel shall receive one coat of shop applied rust-inhibitive paint.
- All steel shall have a minimum yield stress (F<sub>y</sub>) of 36 ksi unless otherwise noted.
- Welding shall conform to the latest edition of the American Welding Society's Structural Welding Code AWS D11. Electrodes for shop and field welding shall be class E10XX. All welding shall be performed by a certified welder per the above standards.

**CONCRETE:**

- Concrete shall have a normal weight aggregate and a minimum compressive strength (f'<sub>c</sub>) at 28 days of 3000 psi, unless otherwise noted on the plan.
- Concrete shall be proportioned, mixed, and placed in accordance with the latest editions of ACI 318: "Building Code Requirements for Reinforced Concrete" and ACI 301: "Specifications for Structural Concrete for Buildings".
- Air entrained concrete must be used for all structural elements exposed to freeze/thaw cycles and deicing chemicals. Air entrainment amounts (in percent) shall be within -1% to +2% of target values as follows:
  - Footings: 5%
  - Exterior Slabs: 5%
- No admixtures shall be added to any structural concrete without written permission of the SER.

- Concrete slabs-on-grade shall be constructed in accordance with ACI 302.1R-96: "Guide for Concrete Slab and Slab Construction".
- The concrete slab-on-grade has been designed using a subgrade modulus of k=250 pci and a design loading of 200 psf. The SER is not responsible for differential settlement, slab cracking or other future defects resulting from unreported conditions not in accordance with the above assumptions.
- Control or saw cut joints shall be spaced in interior slabs-on-grade at a maximum of 15'-0" O.C. and in exterior slabs-on-grade at a maximum of 10'-0" unless otherwise noted.
- Control or saw cut joints shall be produced using conventional process within 4 to 12 hours after the slab has been finished.
- Reinforcing steel may not extend through a control joint.
- Reinforcing steel may extend through a saw cut joint.
- All welded wire fabric (WUF) for concrete slabs-on-grade shall be placed at mid-depth of slab. The WUF shall be securely supported during the concrete pour.

**CONCRETE REINFORCEMENT:**

- Fibrous concrete reinforcement, or fibermesh specified in concrete slabs-on-grade may be used for control of cracking due to shrinkage and thermal expansion/contraction, lowered water migration, an increase in impact capacity, increased abrasion resistance, and residual strength.
- Fibermesh reinforcing to be 100% virgin polypropylene fibers containing no reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement.
- Application of fibermesh per cubic yard of concrete shall equal a minimum of 0.1% by volume (15 pounds per cubic yard).
- Fibermesh shall comply with ASTM C116, any local building code requirements, and shall meet or exceed the current industry standard.
- Steel reinforcing bars shall be new billet steel conforming to ASTM A615, grade 60.
- Detailing, fabrication, and placement of reinforcing steel shall be in accordance with the latest edition of ACI 318: "Manual of Standard Practice for Detailing Concrete Structures"
- Horizontal footing and wall reinforcement shall be continuous and shall have 90° bends, or corner bars with the same size/spacing as the horizontal reinforcement with a class B tension splice.
- Lap reinforcement as required, a minimum of 40 bar diameters for tension or compression unless otherwise noted. Splices in masonry shall be a minimum of 48 bar diameters.

- Where reinforcing dowels are required, they shall be equivalent in size and spacing to the vertical reinforcement. The dowel shall extend 48 bar diameters vertically and 20 bar diameters into the footing.
- Where reinforcing steel is required vertically, dowels shall be provided unless otherwise noted.

**WOOD FRAMING:**

- Solid sawn wood framing members shall conform to the specifications listed in the latest edition of the "National Design Specification for Wood Construction" (NDS). Unless otherwise noted, all wood framing members are designed to be Southern Yellow Pine (STP) #2 or South-Spruce Pine (SFP) #2. LVL or PSL engineered wood shall have the following minimum design values:
  - E = 1,300,000 psi
  - F<sub>b</sub> = 2,600 psi
  - F<sub>v</sub> = 225 psi
  - F<sub>c</sub> = 1,000 psi
- Wood in contact with concrete, masonry, or earth shall be pressure treated in accordance with AUPA standard C-15. All other moisture exposed wood shall be treated in accordance with AUPA standard C-2.
- Nails shall be common wire nails unless otherwise noted.
- Lag screws shall conform to ANSI/ASME standard B821-1981. Lead holes for lag screws shall be in accordance with NDS specifications.
- All beams shall have full bearing on supporting framing members unless otherwise noted.
- Exterior and load bearing stud walls are to be 2x4 STP #2 @ 16" O.C. unless otherwise noted. Studs shall be continuous from the sole plate to the double top plate. Studs shall only be discontinuous at headers for window/door openings. A minimum of one king stud shall be placed at each end of the header. King studs shall be continuous.
- Individual studs forming a column shall be attached with one 10d nail @ 6" O.C. staggered. The stud column shall be continuous to the foundation or beam. The column shall be properly blocked at all floor levels to ensure proper load transfer.
- Multi-ply beams shall have each ply attached with (3) 10d nails @ 24" O.C.
- Four and five ply beams shall be bolted together with (2) rows of 1/2" diameter through bolts staggered @ 16" O.C. unless noted otherwise.

**WOOD TRUSSES:**

- The wood truss manufacturer/fabricator is responsible for the design of the wood trusses. Submit sealed shop drawings and supporting calculations to the SER for review prior to fabrication. The SER shall have a minimum of five (5) days for review. The review by the SER shall review for overall compliance with the design documents. The SER shall assume no responsibility for the correctness for the structural design for the wood trusses.
- The wood trusses shall be designed for all required loadings as specified in the local building code, the ASCE Standard "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-10), and the loading requirements shown on these specifications. The truss drawings shall be coordinated with all other construction documents and provisions provided for loads shown on these drawings including but not limited to HVAC equipment, piping, and architectural fixtures attached to the trusses.
- The trusses shall be designed, fabricated, and erected in accordance with the latest edition of the "National Design Specification for Wood Construction" (NDS) and "Design Specification for Metal Plate Connected Wood Trusses".
- The truss manufacturer shall provide adequate bracing information in accordance with "Commentary and Recommendations for Handling, Installing and Bracing Metal Plate Connected Wood Trusses" (HIB-91). This bracing, both temporary and permanent, shall be shown on the shop drawings. Also, the shop drawings shall show the required attachments for the trusses.
- Any chords or truss webs shown on these drawings have been shown as a reference only. The final design of the trusses shall be per the manufacturer.

**EXTERIOR WOOD FRAMED DECKS:**

- Decks are to be framed in accordance with local building codes and as referenced on the structural plans, either through code references or construction details.

**WOOD STRUCTURAL PANELS:**

- Fabrication and placement of structural wood sheathing shall be in accordance with the APA Design/Construction Guide "Residential and Commercial," and all other applicable APA standards.
- All structurally required wood sheathing shall bear the mark of the APA.

- Wood wall sheathing shall comply with the requirements of local building codes for the appropriate state as indicated on these drawings. Refer to wall bracing notes in plan set for more information. Sheathing shall be applied with the long direction perpendicular to framing, unless noted otherwise.
- Roof sheathing shall be APA rated sheathing exposure 1 or 2. Roof sheathing shall be continuous over two supports and attached to its supporting roof framing with (1)-8d CC nail at 6" o/c at panel edges and at 12" o/c in panel field unless otherwise noted on the plans. Sheathing shall be applied with the long direction perpendicular to framing. Sheathing shall have a span rating consistent with the framing spacing. Use suitable edge support by use of plywood clips or lumber blocking unless otherwise noted. Panel end joints shall occur over framing. Apply building paper over the sheathing as required by the state Building Code.
- Wood floor sheathing shall be APA rated sheathing exposure 1 or 2. Attach sheathing to its supporting framing with (1)-8d CC ring-nail at 6" o/c at panel edges and at 12" o/c in panel field unless otherwise noted on the plans. Sheathing shall be applied perpendicular to framing. Sheathing shall have a span rating consistent with the framing spacing. Use suitable edge support by use of T&G plywood or lumber blocking unless otherwise noted. Panel end joints shall occur over framing. Apply building paper over the sheathing as required by the state Building Code.
- Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the APA.

**STRUCTURAL FIBERBOARD PANELS:**

- Fabrication and placement of structural fiberboard sheathing shall be in accordance with the applicable AFA standards.
- All structurally required fiberboard sheathing shall bear the mark of the AFA.
- Fiberboard wall sheathing shall comply with the requirements of local building codes for the appropriate state as indicated on these drawings. Refer to wall bracing notes in plan set for more information.
- Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the AFA.



CLIENT:  
 DR Horton, Inc.  
 8001 Arrowledge Blvd.  
 Charlotte, NC 28273

PROJECT:  
 Penwell LH  
 Coversheet



STRUCTURAL MEMBERS ONLY

DRAWING  
 DATE: 07/12/21  
 SCALE: 20x4 1/4" = 1'-0"  
 BY: JCB  
 PROJECT: 180-2888  
 DRAWN BY: JCB  
 CHECKED BY: CBE

ORIGINAL APPROVED  
 PROJECT: 180-2888  
 DATE: 07/12/21

REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS

SHEET

CSI

**FOUNDATION NOTES:**

- FOUNDATIONS TO BE CONSTRUCTED IN ACCORDANCE WITH CHAPTER 4 OF THE 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE WITH ALL LOCAL AMENDMENTS.
- STRUCTURAL CONCRETE TO BE  $F_c = 3000$  PSI, PREPARED AND PLACED IN ACCORDANCE WITH ACI STANDARD 318.
- FOOTINGS TO BE PLACED ON UNDISTURBED EARTH, BEARING A MINIMUM OF 12" BELOW ADJACENT FINISHED GRADE, OR AS OTHERWISE DIRECTED BY THE CODE ENFORCEMENT OFFICIAL.
- FOOTING SIZES BASED ON A PRESUMPTIVE SOIL BEARING CAPACITY OF 2000 PSF. CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING THE SUITABILITY OF THE SITE SOIL CONDITIONS AT THE TIME OF CONSTRUCTION. FOOTINGS AND PIERS SHALL BE CENTERED UNDER THEIR RESPECTIVE ELEMENTS. PROVIDE 2" MINIMUM FOOTING PROJECTION FROM THE FACE OF MASONRY.
- MAXIMUM DEPTH OF UNBALANCED FILL AGAINST MASONRY WALLS TO BE AS SPECIFIED IN SECTION R404.1 OF THE 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE.
- FILASTERS TO BE BONDED TO PERIMETER FOUNDATION WALL.
- PROVIDE FOUNDATION WATERPROOFING AND DRAIN WITH POSITIVE SLOPE TO OUTLET AS REQUIRED BY SITE CONDITIONS.
- PROVIDED PERIMETER INSULATION FOR ALL FOUNDATIONS PER 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE.
- CORBEL FOUNDATION WALL AS REQUIRED TO ACCOMMODATE BRICK VENEERS.
- CRAWL SPACE TO BE GRADED LEVEL, AND CLEARED OF ALL DEBRIS.
- FOUNDATION ANCHORAGE SHALL BE CONSTRUCTED PER THE 2018 NORTH CAROLINA RESIDENTIAL CODE SECTION R403.16. MINIMUM 1/2" DIA. BOLTS SPACED AT 6'-0" ON CENTER WITH A 1" MINIMUM EMBEDMENT INTO MASONRY OR CONCRETE. ANCHOR BOLTS SHALL BE 12" FROM THE END OF EACH PLATE SECTION. MINIMUM (2) ANCHOR BOLTS PER PLATE SECTION. ANCHOR BOLTS SHALL BE LOCATED IN THE CENTER THIRD OF THE PLATE.
- ABBREVIATIONS:
 

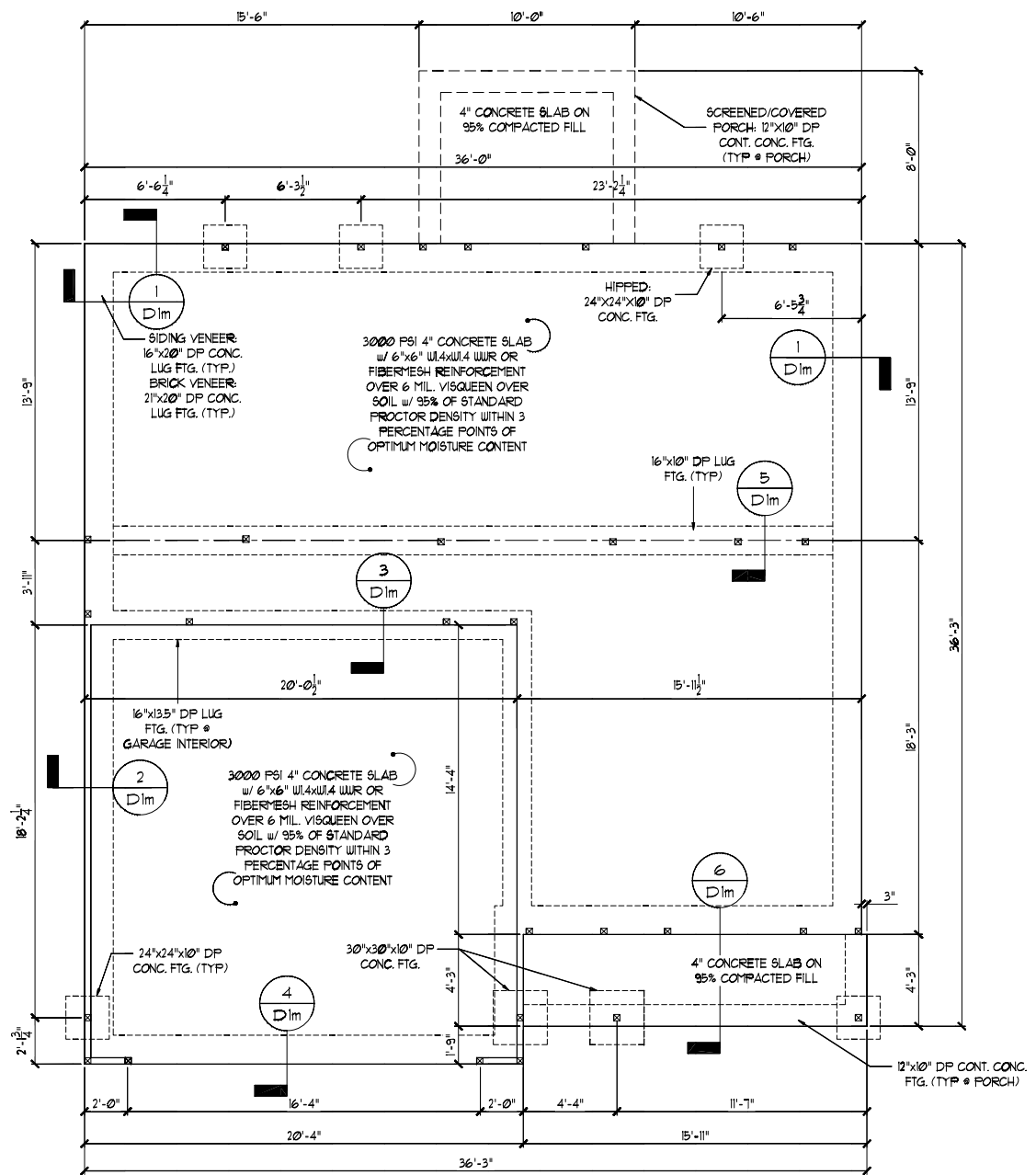
DJ = DOUBLE JOIST	SJ = SINGLE JOIST
GT = GIRDER TRUSS	FT = FLOOR TRUSS
SC = STUD COLUMN	DR = DOUBLE RAFTER
EE = EACH END	TR = TRIPLE RAFTER
TJ = TRIPLE JOIST	OC = ON CENTER
CL = CENTER LINE	FL = POINT LOAD
- ALL PIERS TO BE 16"x16" MASONRY AND ALL PILASTERS TO BE 8"x16" MASONRY, TYPICAL. (UNO).
- WALL FOOTINGS TO BE CONTINUOUS CONCRETE, SIZES PER STRUCTURAL PLAN.
- A FOUNDATION EXCAVATION OBSERVATION SHOULD BE CONDUCTED BY A PROFESSIONAL GEOTECHNICAL ENGINEER, OR HIS QUALIFIED REPRESENTATIVE. IF ISOLATED AREAS OF YIELDING MATERIALS AND/OR POTENTIALLY EXPANSIVE SOILS ARE OBSERVED IN THE FOOTING EXCAVATIONS AT THE TIME OF CONSTRUCTION, SUMMIT ENGINEERING LABORATORY & TESTING, P.C. MUST BE PROVIDED THE OPPORTUNITY TO REVIEW THE FOOTING DESIGN PRIOR TO CONCRETE PLACEMENT.
- ALL FOOTINGS & SLABS ARE TO BEAR ON UNDISTURBED SOIL OR 95% COMPACTED FILL, VERIFIED BY ENGINEER OR CODE OFFICIAL.

REFER TO BRACED WALL PLAN FOR PANEL LOCATIONS AND ANY REQUIRED HOLDINGS. ADDITIONAL INFORMATION PER SECTION R602.10.8 AND FIGURES R602.10.6.5, R602.10.7, R602.10.8(1) AND R602.10.8(2) OF THE 2018 IRC.

NOTE: ALL EXTERIOR FOUNDATION DIMENSIONS ARE TO FRAMING AND NOT BRICK VENEER UNO.

NOTE: A 4" CRUSHED STONE BASE COURSE IS NOT REQUIRED WHEN SLABS ARE INSTALLED ON WELL-DRAINED OR SAND-GRAVEL MIXTURE SOILS CLASSIFIED AS GROUP 1 PER TABLE R403.1.

THESE PLANS ARE DESIGNED IN ACCORDANCE WITH ARCHITECTURAL PLANS PROVIDED BY THE ARCHITECT. IF ANY CHANGES ARE MADE TO THE ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION, SUMMIT ENGINEERING LABORATORY & TESTING, P.C. CANNOT GUARANTEE THE ADEQUACY OF THESE STRUCTURAL PLANS WHEN USED WITH ARCHITECTURAL PLANS DATED DIFFERENTLY THAN THE DATE LISTED ABOVE.



ELEVATION BFK

**STRUCTURAL MEMBERS ONLY**  
 ENGINEERING SEAL APPLIES ONLY TO STRUCTURAL COMPONENTS ON THIS DOCUMENT. SEAL DOES NOT INCLUDE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES OR SAFETY PRECAUTIONS. ANY DEVIATIONS OR DISCREPANCIES ON PLANS ARE TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. FAILURE TO DO SO WILL VOID SUMMIT LIABILITY.

STRUCTURAL ANALYSIS BASED ON 2018 NCR.

**MONOLITHIC SLAB FOUNDATION PLAN**

SCALE: 1/4"=1'-0" ON 22'x34" OR 1/8"=1'-0" ON 17'x17"



CLIENT:  
 DR. HERTON, INC.  
 8001 Arrowridge Blvd.  
 Charlotte, NC 28213

PROJECT:  
 Pamela LH  
 Monolithic Slab Foundation



STRUCTURAL MEMBERS ONLY

DRAWING  
 DATE: 06/12/21  
 SCALE: 204 1/4"=1'-0"  
 811 1/4"=1'-0"  
 PROJECT: 4 180-2888  
 DRAWN BY: JCP  
 CHECKED BY: CBS

ORIGINAL INFORMATION  
 PROJECT # DATE  
 2108 06/12/21

REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS



REQUIRED BRACED WALL PANEL CONNECTIONS				
METHOD	MATERIAL	MIN. THICKNESS	REQUIRED CONNECTION	
			# PANEL EDGES	# INTERMEDIATE SUPPORTS
CS-WSP	WOOD STRUCTURAL PANEL	3/8"	6d COMMON NAILS # 6" O.C.	6d COMMON NAILS # 12" O.C.
GB	GYPSPUM BOARD	1/2"	5d COOLER NAILS** # 1" O.C.	5d COOLER NAILS** # 1" O.C.
WSP	WOOD STRUCTURAL PANEL	3/8"	6d COMMON NAILS # 6" O.C.	6d COMMON NAILS # 12" O.C.
FF	WOOD STRUCTURAL PANEL	1/6"	PER FIGURE R602.10.6.4	PER FIGURE R602.10.6.4

\*OR EQUIVALENT PER TABLE R102.3.5

**GENERAL STRUCTURAL NOTES:**

- CONSTRUCTION SHALL CONFORM TO 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE WITH ALL LOCAL AMENDMENTS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS. CONTRACTOR SHALL COMPLY WITH THE CONTENTS OF THE DRAWING FOR THIS SPECIFIC PROJECT. ENGINEER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THIS PLAN.
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY BRACING REQUIRED TO RESIST ALL FORCES ENCOUNTERED DURING ERECTION.
- PROPERTIES USED IN THE DESIGN ARE AS FOLLOWS:  
MICRO-LAM (LVL):  $F_b = 2600$  PSI,  $F_v = 285$  PSI,  $E = 1.9 \times 10^6$  PSI  
PARALLAM (PSL):  $F_b = 2300$  PSI,  $F_v = 290$  PSI,  $E = 1.25 \times 10^6$  PSI
- ALL WOOD MEMBERS SHALL BE #2 SYP #2 SFF UNLESS NOTED ON PLAN. ALL STUD COLUMNS AND JOISTS SHALL BE #2 SYP #2 SFF (UNO).
- ALL BEAMS SHALL BE SUPPORTED WITH A (2) 2x4 #2 SYP #2 SFF STUD COLUMN AT EACH END UNLESS NOTED OTHERWISE.
- ALL REINFORCING STEEL SHALL BE GRADE #6 BARS CONFORMING TO ASTM A615 AND SHALL HAVE A MINIMUM COVER OF 3".
- FOUNDATION ANCHORAGE SHALL BE CONSTRUCTED PER THE 2018 NORTH CAROLINA RESIDENTIAL CODE SECTION R403.1.6. MINIMUM 1/2" DIA. BOLTS SPACED AT 6'-0" ON CENTER WITH A 1" MINIMUM EMBEDMENT INTO MASONRY OR CONCRETE. ANCHOR BOLTS SHALL BE 12" FROM THE END OF EACH PLATE SECTION. MINIMUM (2) ANCHOR BOLTS PER PLATE SECTION. ANCHOR BOLTS SHALL BE LOCATED IN THE CENTER THIRD OF THE PLATE.
- CONTRACTOR TO PROVIDED LOCKOUTS WHEN CEILING JOISTS SPAN PERPENDICULAR TO RAFTERS.
- FLITCH BEAMS, 4-PLY LVL'S AND 3-PLY SIDE LOADED LVL'S SHALL BE BOLTED TOGETHER WITH 1/2" DIA. THRU BOLTS SPACED AT 24" O.C. (MAX) STAGGERED OR EQUIVALENT CONNECTIONS PER DETAIL 1/D3. MIN. EDGE DISTANCE SHALL BE 2" AND (2) BOLTS SHALL BE LOCATED MINIMUM 6" FROM EACH END OF THE BEAM.
- ALL NON-LOAD BEARING HEADERS SHALL BE (1) FLAT 2x4 SYP #2 SFF #2, DROPPED FOR NON-LOAD BEARING HEADERS EXCEEDING 8'-0" IN WIDTH AND/OR WITH MORE THAN 2'-0" OF CRIPPLE WALL ABOVE, SHALL BE (2) FLAT 2x4 SYP #2 SFF #2, DROPPED. (UNLESS NOTED OTHERWISE)
- ABBREVIATIONS:

DJ = DOUBLE JOIST	SJ = SINGLE JOIST
GT = GIRDER TRUSS	FT = FLOOR TRUSS
SC = STUD COLUMN	DR = DOUBLE RAFTER
EE = EACH END	TR = TRIPLE RAFTER
TJ = TRIPLE JOIST	OC = ON CENTER
CL = CENTER LINE	PL = POINT LOAD

NOTE: ----- DESIGNATES JOIST SUPPORTED LOAD BEARING WALL ABOVE. PROVIDE BLOCKING UNDER JOIST SUPPORTED LOAD BEARING WALL.

JOIST & BEAM SIZES SHOWN ARE MINIMUMS. BUILDER MAY INCREASE DEPTH FOR EASE OF CONSTRUCTION.

INSTALL ANY REQUIRED HOLD-DOWNS PER SECTION R602.10.8 AND FIGURES R602.10.6.5, R602.10.1, R602.10.8(1) AND R602.10.8(2) OF THE 2018 IRC

NOTE: MEMBER NOTED AS PRESSURE TREATED MAY BE FRAMED WITH NON-PRESSURE TREATED LUMBER PROVIDED THE ENTIRETY OF THE MEMBER IS WRAPPED TO PREVENT MOISTURE INTRUSION.

NOTE: REDUCE JOIST SPACING UNDER TILE FLOORS, GRANITE COUNTERTOPS AND/OR ISLANDS.

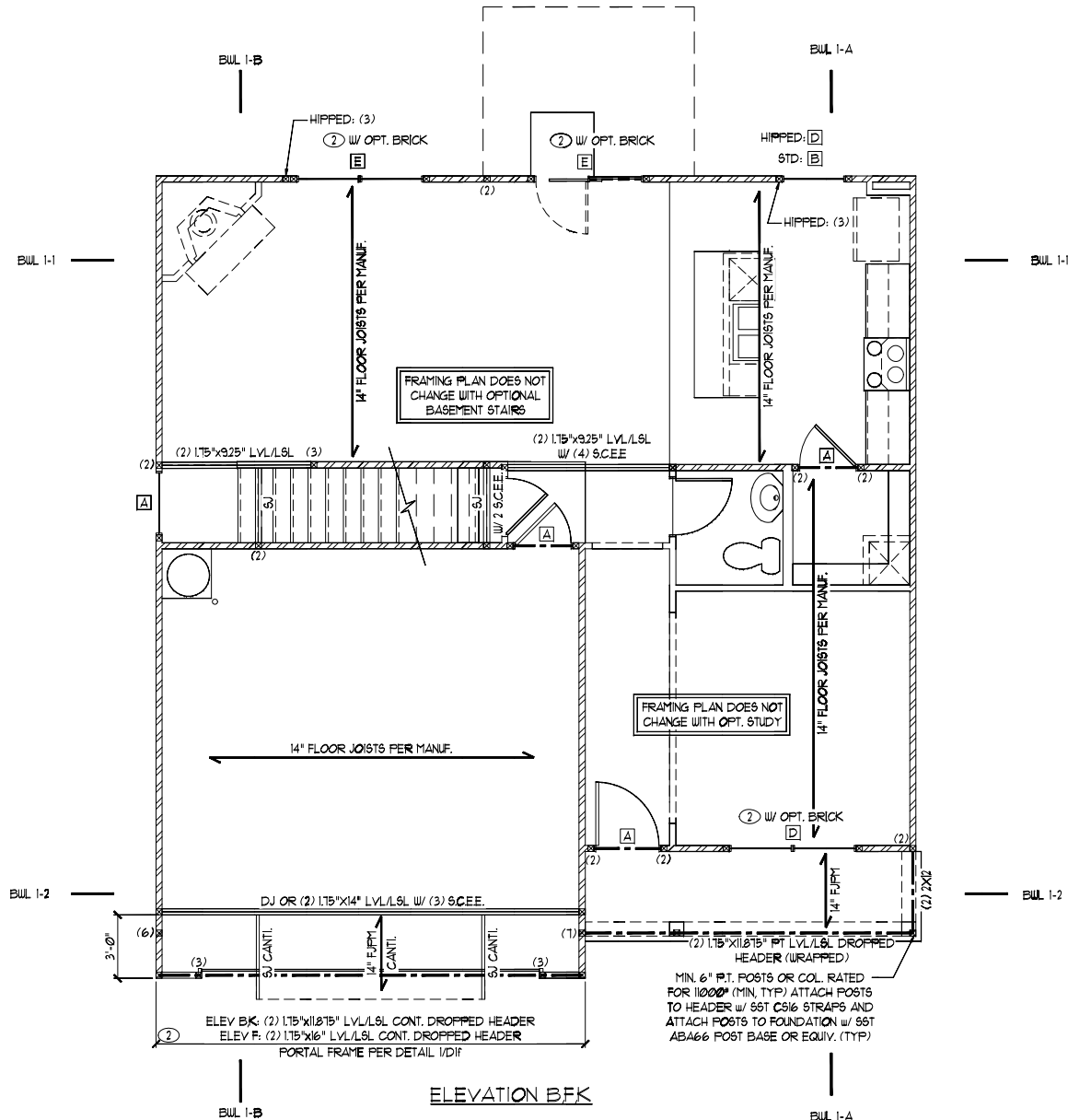
THESE PLANS ARE DESIGNED IN ACCORDANCE WITH ARCHITECTURAL PLANS PROVIDED BY DR. HORTON. COMPLETED/REVISED ON 02/18/20. IT IS THE RESPONSIBILITY OF THE CLIENT TO NOTIFY SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. IF ANY CHANGES ARE MADE TO THE ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION. SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. CANNOT GUARANTEE THE ADEQUACY OF THESE STRUCTURAL PLANS WHEN USED WITH ARCHITECTURAL PLANS DATED DIFFERENTLY THAN THE DATE LISTED ABOVE.

**STRUCTURAL MEMBERS ONLY**  
ENGINEERING SEAL APPLIES ONLY TO STRUCTURAL COMPONENTS ON THIS DOCUMENT. SEAL DOES NOT INCLUDE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES OR SAFETY PRECAUTIONS. ANY DEVIATIONS OR DISCREPANCIES ON PLANS ARE TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. FAILURE TO DO SO WILL VOID SUMMIT LIABILITY.

STRUCTURAL ANALYSIS BASED ON 2018 NCR.

**FIRST FLOOR FRAMING PLAN**

SCALE: 1/4"=1'-0" ON 22'x34' OR 1/8"=1'-0" ON 11'x11'



FIRST FLOOR BRACING (FT)		
CONTINUOUS SHEATHING METHOD		
	REQUIRED	PROVIDED
BUL 1-1	9.5	21.9
BUL 1-2	9.5	12.6
BUL 1-A	8.9	32.0
BUL 1-B	8.9	35.0

HEADER SCHEDULE		
TAG	SIZE	JACKS (EACH END)
A	(2) 2x6	(1)
B	(2) 2x8	(2)
C	(2) 2x10	(2)
D	(2) 2x12	(2)
E	(2) 9-1/4" LVL/LVL	(3)
F	(3) 2x6	(1)
G	(3) 2x8	(2)
H	(3) 2x10	(2)
I	(3) 2x12	(2)

HEADER SIZES SHOWN ON PLANS ARE MINIMUMS. GREATER HEADER SIZES MAY BE USED FOR EASE OF CONSTRUCTION. ALL HEADERS TO BE DROPPED UNLESS NOTED OTHERWISE. SC NOTED ON PLAN OVERRIDE SC LISTED ABOVE.

LINTEL SCHEDULE		
TAG	SIZE	OPENING SIZE
①	L3x3x1/4"	LESS THAN 6'-0"
②	L5x3x1/4"	6'-0" TO 10'-0"
③	L5x3-1/2"x5/16"	GREATER THAN 10'-0"
④	L5x3-1/2"x5/16" ROLLED OR EQUIV.	ALL ARCHED OPENINGS

SECURE LINTEL TO HEADER W/ (2) 1/2" DIAMETER LAG SCREWS STAGGERED # 16" O.C. (TYP FOR ③)

ALL HEADERS WHERE BRICK IS USED, TO BE: ① (UNO)

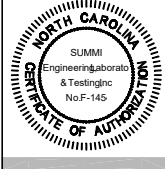
WALL STUD SCHEDULE	
1ST & 2ND FLOOR LOAD BEARING STUDS:	2x4 STUDS # 16" O.C. OR 2x6 STUDS # 24" O.C.
1ST FLOOR LOAD BEARING STUDS W/ WALK-UP ATTIC:	2x4 STUDS # 12" O.C. OR 2x6 STUDS # 16" O.C.
BASEMENT LOAD BEARING STUDS:	2x4 STUDS # 12" O.C. OR 2x6 STUDS # 16" O.C.
NON-LOAD BEARING STUDS (ALL FLOORS):	2x4 STUDS # 24" O.C.
2ND STORY WALLS:	2x4 STUDS # 12" O.C. OR 2x6 STUDS # 16" O.C. BALLOON FRAMED W/ CROSS BRACING # 6'-0" O.C. VERTICALLY

KING STUD REQUIREMENTS	
OPENING WIDTH	KING# (EACH END)
LESS THAN 3'-0"	(1)
3'-0" TO 4'-0"	(2)
4'-0" TO 8'-0"	(3)
8'-0" TO 12'-0"	(5)
12'-0" TO 16'-0"	(6)

KING STUD REQUIREMENTS ABOVE DO NOT APPLY TO PORTAL FRAMED OPENINGS

- BRACED WALL NOTES:**
- WALLS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION R602.10 FROM THE 2018 INTERNATIONAL RESIDENTIAL CODE AS ALLOWED PER SECTION R602.10 OF THE 2018 NC RESIDENTIAL CODE.
  - WALLS ARE DESIGNED FOR SEISMIC ZONES A-C AND ULTIMATE WIND SPEEDS UP TO 130 MPH.
  - REFER TO ARCHITECTURAL PLAN FOR DOOR/WINDOW OPENING SIZES.
  - BRACING MATERIALS, METHODS AND FASTENERS SHALL BE IN ACCORDANCE WITH IRC TABLE R602.10.4.
  - ALL BRACED WALL PANELS SHALL BE FULL WALL HEIGHT AND SHALL NOT EXCEED 10 FEET FOR ISOLATED PANEL METHOD AND 12 FEET FOR CONTINUOUS SHEATHING METHOD WITHOUT ADDITIONAL ENGINEERING CALCULATIONS.
  - MINIMUM PANEL LENGTH SHALL BE PER TABLE R602.10.5.
  - THE INTERIOR SIDE OF EXTERIOR WALLS AND BOTH SIDES OF INTERIOR WALLS SHALL BE SHEATHED CONTINUOUSLY WITH MINIMUM 1/2" GYPSPUM BOARD (UNO).
  - FOR CONTINUOUS SHEATHING METHOD, EXTERIOR WALLS SHALL BE SHEATHED ON ALL SHEATHABLE SURFACES INCLUDING INFILL AREAS BETWEEN BRACED WALL PANELS, ABOVE AND BELOW WALL OPENINGS, AND ON GABLE END WALLS.
  - FLOORS SHALL NOT BE CANTILEVERED MORE THAN 24" BEYOND THE FOUNDATION OR BEARING WALL BELOW WITHOUT ADDITIONAL ENGINEERING CALCULATIONS.
  - A BRACED WALL PANEL SHALL BE LOCATED WITHIN 10 FEET OF EACH END OF A BRACED WALL LINE.
  - THE MAXIMUM EDGE DISTANCE BETWEEN BRACED WALL PANELS SHALL NOT EXCEED 10 FEET.
  - MASONRY OR CONCRETE STEIN WALLS WITH A LENGTH OF 48" OR LESS SUPPORTING A BRACED WALL PANEL SHALL BE DESIGNED IN ACCORDANCE WITH FIGURE R602.10.9 OF THE 2018 IRC.
  - BRACED WALL PANEL CONNECTIONS TO FLOOR/CEILING SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION R602.10.8
  - BRACED WALL PANEL CONNECTIONS TO ROOF SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION R602.10.8(2) AND FIGURES R602.10.8(1)&(2)&(3).
  - CRIPPLE WALLS AND WALK OUT BASEMENT WALLS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION R602.10.1
  - PORTAL WALLS SHALL BE DESIGNED IN ACCORDANCE WITH FIGURE R602.10.6.4 (UNO)
  - ON SCHEMATIC, SHADED WALLS INDICATE BRACED WALL PANELS.
  - ABBREVIATIONS:

GB = GYPSPUM BOARD WSP = WOOD STRUCTURAL PANEL  
CS-XXX = CONT. SHEATHED ENG = ENGINEERED SOLUTION  
FF = PORTAL FRAME FF-ENG = ENG. PORTAL FRAME



CLIENT: DR. Horton, Inc. 8001 Arrowledge Blvd. Charlotte, NC 28213

PROJECT: Parcel LH First Floor Framing Plan



STRUCTURAL MEMBERS ONLY  
DRAWING DATE: 02/18/20  
SCALE: 1/4"=1'-0" ON 22'x34' OR 1/8"=1'-0" ON 11'x11'  
PROJECT: Parcel LH  
DRAWN BY: JCP  
CHECKED BY: CBS  
ORIGINAL APPROVAL: [Signature]  
PROJECT: [Blank]  
DATE: [Blank]

REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS  
SHEET 53.0

REQUIRED BRACED WALL PANEL CONNECTIONS				
METHOD	MATERIAL	MIN. THICKNESS	REQUIRED CONNECTION	
			• PANEL EDGES	• INTERMEDIATE SUPPORTS
CS-USP	WOOD STRUCTURAL PANEL	3/8"	6d COMMON NAILS @ 6" O.C.	6d COMMON NAILS @ 12" O.C.
GB	GYPSUM BOARD	1/2"	5d COOLER NAIL@ 1" O.C.	5d COOLER NAIL@ 1" O.C.
USP	WOOD STRUCTURAL PANEL	3/8"	6d COMMON NAILS @ 6" O.C.	6d COMMON NAILS @ 12" O.C.
FF	WOOD STRUCTURAL PANEL	1/16"	PER FIGURE R602.10.6.4	PER FIGURE R602.10.6.4

\*OR EQUIVALENT PER TABLE R102.3.5

**GENERAL STRUCTURAL NOTES:**

- CONSTRUCTION SHALL CONFORM TO 2018 NORTH CAROLINA RESIDENTIAL BUILDING CODE WITH ALL LOCAL AMENDMENTS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS. CONTRACTOR SHALL COMPLY WITH THE CONTENTS OF THE DRAWING FOR THIS SPECIFIC PROJECT. ENGINEER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THIS PLAN.
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY BRACING REQUIRED TO RESIST ALL FORCES ENCOUNTERED DURING ERECTION.
- PROPERTIES USED IN THE DESIGN ARE AS FOLLOWS:  
MICROLLAM (LVL):  $F_b = 2600$  PSI,  $F_v = 285$  PSI,  $E = 1.9 \times 10^6$  PSI  
PARALLAM (PSL):  $F_b = 2900$  PSI,  $F_v = 290$  PSI,  $E = 1.25 \times 10^6$  PSI
- ALL WOOD MEMBERS SHALL BE 1/2 SYP/1/2 SFF UNLESS NOTED ON PLAN. ALL STUD COLUMNS AND JOISTS SHALL BE 1/2 SYP/1/2 SFF (INO).
- ALL BEAMS SHALL BE SUPPORTED WITH A (2) 2x4 1/2 SYP/1/2 SFF STUD COLUMN AT EACH END UNLESS NOTED OTHERWISE.
- ALL REINFORCING STEEL SHALL BE GRADE 60 BARS CONFORMING TO ASTM A615 AND SHALL HAVE A MINIMUM COVER OF 3".
- FOUNDATION ANCHORAGE SHALL BE CONSTRUCTED PER THE 2018 NORTH CAROLINA RESIDENTIAL CODE SECTION R403.1.6. MINIMUM 1/2" DIA. BOLTS SPACED AT 6'-0" ON CENTER WITH A 1" MINIMUM EMBEDMENT INTO MASONRY OR CONCRETE. ANCHOR BOLTS SHALL BE 12" FROM THE END OF EACH PLATE SECTION. MINIMUM (2) ANCHOR BOLTS PER PLATE SECTION. ANCHOR BOLTS SHALL BE LOCATED IN THE CENTER THIRD OF THE PLATE.
- CONTRACTOR TO PROVIDE LOOKOUTS WHEN CEILING JOISTS SPAN PERPENDICULAR TO RAFTERS.
- FITCH BEAMS, 4-PLY LVL'S AND 3-PLY SIDE LOADED LVL'S SHALL BE BOLTED TOGETHER WITH 1/2" DIA. THRU BOLTS SPACED AT 24" O.C. (MAX) STAGGERED OR EQUIVALENT CONNECTIONS PER DETAIL 1D3. MIN. EDGE DISTANCE SHALL BE 2" AND (2) BOLTS SHALL BE LOCATED MINIMUM 6" FROM EACH END OF THE BEAM.
- ALL NON-LOAD BEARING HEADERS SHALL BE (1) FLAT 2x4 SYP 1/2 SFF 1/2, DROPPED, FOR NON-LOAD BEARING HEADERS EXCEEDING 8'-0" IN WIDTH AND/OR WITH MORE THAN 2'-0" OF CRIPPLE WALL ABOVE, SHALL BE (2) FLAT 2x4 SYP 1/2 SFF 1/2, DROPPED, (UNLESS NOTED OTHERWISE)
- ABBREVIATIONS:

DJ = DOUBLE JOIST	SJ = SINGLE JOIST
GT = GIRDER TRUSS	FT = FLOOR TRUSS
SC = STUD COLUMN	DR = DOUBLE RAFTER
EE = EACH END	TR = TRIPLE RAFTER
TJ = TRIPLE JOIST	OC = ON CENTER
CL = CENTER LINE	PL = POINT LOAD

NOTE:  
----- DESIGNATES JOIST SUPPORTED LOAD BEARING WALL ABOVE. PROVIDE BLOCKING UNDER JOIST SUPPORTED LOAD BEARING WALL.

JOIST 4 BEAM SIZES SHOWN ARE MINIMUMS. BUILDER MAY INCREASE DEPTH FOR EASE OF CONSTRUCTION.

INSTALL ANY REQUIRED HOLDOWNS PER SECTION R602.10.8 AND FIGURES R602.10.6.5, R602.10.1, R602.10.8(1) AND R602.10.8(2) OF THE 2018 IRC

NOTE: MEMBER NOTED AS PRESSURE TREATED MAY BE FRAMED WITH NON-PRESSURE TREATED LUMBER PROVIDED THE ENTIRETY OF THE MEMBER IS WRAPPED TO PREVENT MOISTURE INTRUSION.

THESE PLANS ARE DESIGNED IN ACCORDANCE WITH ARCHITECTURAL PLANS PROVIDED BY DR. HORTON COMPLETED/REVISED ON 02/18/20. IT IS THE RESPONSIBILITY OF THE CLIENT TO NOTIFY SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. IF ANY CHANGES ARE MADE TO THE ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION. SUMMIT ENGINEERING, LABORATORY & TESTING, P.C. CANNOT GUARANTEE THE ADEQUACY OF THESE STRUCTURAL PLANS WHEN USED WITH ARCHITECTURAL PLANS DATED DIFFERENTLY THAN THE DATE LISTED ABOVE.

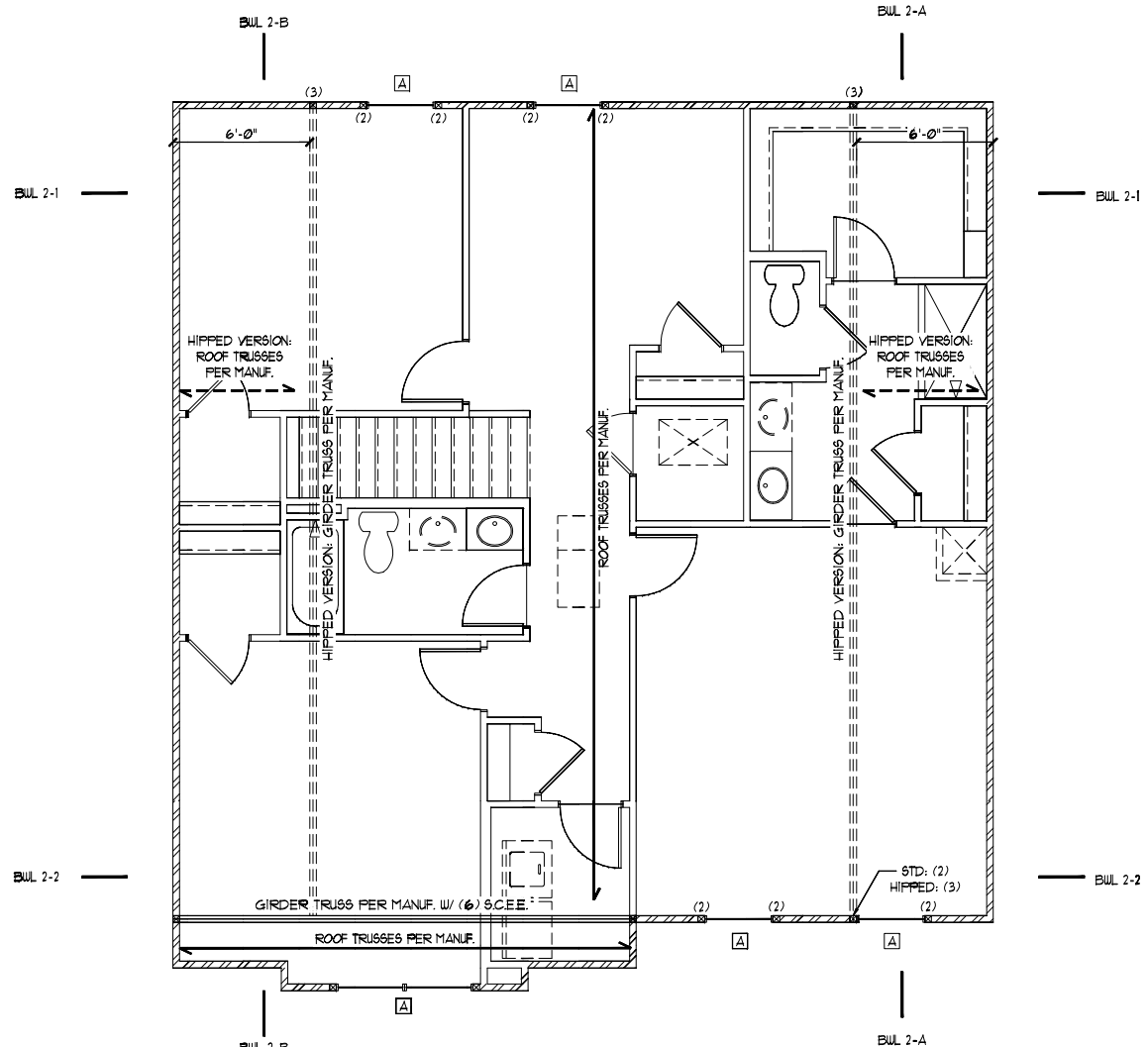
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STRUCTURAL ANALYSIS BASED ON 2018 NCR.

**FIRST FLOOR FRAMING PLAN**

SCALE: 1/4"=1'-0" ON 22'x34' OR 18'-11"=0" ON 11'x11'



ELEVATION BFK

	SECOND FLOOR BRACING (FT)	
	REQUIRED	PROVIDED
BUL 2-1	4.1	30.0
BUL 2-2	4.1	24.0
BUL 2-A	3.1	36.0
BUL 2-B	3.1	38.0

HEADER SCHEDULE		
TAG	SIZE	JACKS (EACH END)
A	(2) 2x6	(1)
B	(2) 2x8	(2)
C	(2) 2x10	(2)
D	(2) 2x12	(2)
E	(2) 9-1/4" LSL/LVL	(3)
F	(3) 2x6	(1)
G	(3) 2x8	(2)
H	(3) 2x10	(2)
I	(3) 2x12	(2)

HEADER SIZES SHOWN ON PLANS ARE MINIMUMS. GREATER HEADER SIZES MAY BE USED FOR EASE OF CONSTRUCTION. ALL HEADERS TO BE DROPPED UNLESS NOTED OTHERWISE. SC NOTED ON PLAN OVERRIDE SC LISTED ABOVE.

LINTEL SCHEDULE		
TAG	SIZE	OPENING SIZE
1	L3x3x1/4"	LESS THAN 6'-0"
2	L5x3x1/4"	6'-0" TO 10'-0"
3	L5x3-1/2'x5/16"	GREATER THAN 10'-0"
4	L5x3-1/2'x5/16"	ALL ARCHED OPENINGS

SECURE LINTEL TO HEADER w/ (2) 1/2" DIAMETER LAG SCREWS STAGGERED @ 16" O.C. (TYP FOR 3)

ALL HEADERS WHERE BRICK IS USED, TO BE: 1 (UNO)

WALL STUD SCHEDULE	
1ST & 2ND FLOOR LOAD BEARING STUDS:	2x4 STUDS @ 16" O.C. OR 2x6 STUDS @ 24" O.C.
1ST FLOOR LOAD BEARING STUDS w/ WALK-UP ATTIC:	2x4 STUDS @ 12" O.C. OR 2x6 STUDS @ 16" O.C.
BASEMENT LOAD BEARING STUDS:	2x4 STUDS @ 12" O.C. OR 2x6 STUDS @ 16" O.C.
NON-LOAD BEARING STUDS (ALL FLOORS):	2x4 STUDS @ 24" O.C.
TWO STORY WALLS:	2x4 STUDS @ 12" O.C. OR 2x6 STUDS @ 16" O.C. BALLOON FRAMED w/ CROSS BRACING @ 6'-0" O.C. VERTICALLY

KING STUD REQUIREMENTS	
OPENING WIDTH	KINGS (EACH END)
LESS THAN 3'-0"	(1)
3'-0" TO 4'-0"	(2)
4'-0" TO 8'-0"	(3)
8'-0" TO 12'-0"	(5)
12'-0" TO 16'-0"	(6)

KING STUD REQUIREMENTS ABOVE DO NOT APPLY TO PORTAL FRAMED OPENINGS

**BRACED WALL NOTES:**

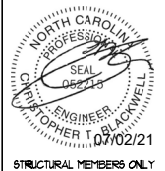
- WALLS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION R602.10 FROM THE 2018 INTERNATIONAL RESIDENTIAL CODE AS ALLOWED PER SECTION R602.10 OF THE 2018 NC RESIDENTIAL CODE.
- WALLS ARE DESIGNED FOR SEISMIC ZONES A-C AND ULTIMATE WIND SPEEDS UP TO 130 MPH.
- REFER TO ARCHITECTURAL PLAN FOR DOOR/WINDOW OPENING SIZES.
- BRACING MATERIALS, METHODS AND FASTENERS SHALL BE IN ACCORDANCE WITH IRC TABLE R602.10.4.
- ALL BRACED WALL PANELS SHALL BE FULL WALL HEIGHT AND SHALL NOT EXCEED 10 FEET FOR ISOLATED PANEL METHOD AND 12 FEET FOR CONTINUOUS SHEATHING METHOD WITHOUT ADDITIONAL ENGINEERING CALCULATIONS.
- MINIMUM PANEL LENGTH SHALL BE PER TABLE R602.10.5.
- THE INTERIOR SIDE OF EXTERIOR WALLS AND BOTH SIDES OF INTERIOR WALLS SHALL BE SHEATHED CONTINUOUSLY WITH MINIMUM 1/2" GYPSUM BOARD (UNO).
- FOR CONTINUOUS SHEATHING METHOD, EXTERIOR WALLS SHALL BE SHEATHED ON ALL SHEATHABLE SURFACES INCLUDING INFILL AREAS BETWEEN BRACED WALL PANELS, ABOVE AND BELOW WALL OPENINGS, AND ON GABLE END WALLS.
- FLOORS SHALL NOT BE CANTILEVERED MORE THAN 24" BEYOND THE FOUNDATION OR BEARING WALL BELOW WITHOUT ADDITIONAL ENGINEERING CALCULATIONS.
- A BRACED WALL PANEL SHALL BE LOCATED WITHIN 10 FEET OF EACH END OF A BRACED WALL LINE.
- THE MAXIMUM EDGE DISTANCE BETWEEN BRACED WALL PANELS SHALL NOT EXCEED 20 FEET.
- MASONRY OR CONCRETE STEM WALLS WITH A LENGTH OF 40' OR LESS SUPPORTING A BRACED WALL PANEL SHALL BE DESIGNED IN ACCORDANCE WITH FIGURE R602.10.3 OF THE 2018 IRC.
- BRACED WALL PANEL CONNECTIONS TO FLOOR/CEILING SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION R602.10.8.
- BRACED WALL PANEL CONNECTIONS TO ROOF SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION R602.10.2 AND FIGURES R602.10.2(1)&(2)&(3).
- CRIPPLE WALLS AND WALK OUT BASEMENT WALLS SHALL BE DESIGNED IN ACCORDANCE WITH SECTION R602.10.11.
- PORTAL WALLS SHALL BE DESIGNED IN ACCORDANCE WITH FIGURE R602.10.6.4 (UNO).
- ON SCHEMATIC, SHADED WALLS INDICATE BRACED WALL PANELS. ABBREVIATIONS:

GB = GYPSUM BOARD USP = WOOD STRUCTURAL PANEL  
CS-XXX = CONT. SHEATHED ENG = ENGINEERED SOLUTION  
FF = PORTAL FRAME FF-ENG = ENG. PORTAL FRAME



CLIENT:  
DR. Horton, Inc.  
8001 Arrowedge Blvd.  
Charlotte, NC 28213

PROJECT:  
Pamell LH  
Second Floor Framing Plan

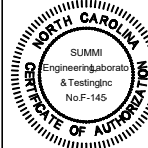


STRUCTURAL MEMBERS ONLY

DRAWN: 06/12/20  
DATE: 06/12/20  
SCALE: 1/4" = 1'-0"  
BY: JAP  
PROJECT: 188-2888  
DRAWN BY: JAP  
CHECKED BY: CEB

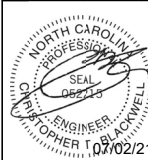
ORIGINAL INFORMATION  
PROJECT: 188-2888  
DATE: 06/12/20

REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS



CLIENT:  
 DR. Horton, Inc.  
 8001 Arrowridge Blvd.  
 Charlotte, NC 28213

PROJECT:  
 Penell LH  
 Roof Framing Plan



STRUCTURAL MEMBERS ONLY

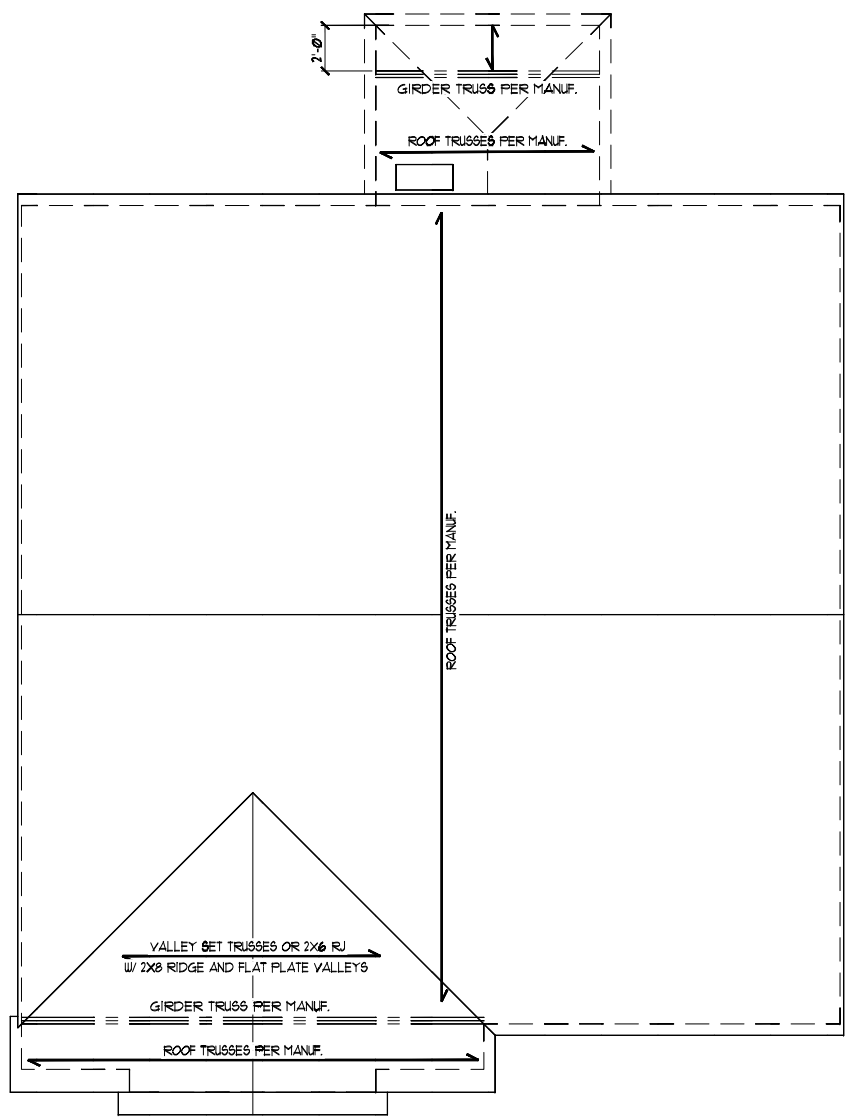
DRAWING  
 DATE: 06/12/2018  
 SCALE: 20'-0" 1/4"=1'-0"  
 PROJECT: 180-20000  
 DRAWN BY: JCP  
 CHECKED BY: CBS

ORIGINAL INFORMATION  
 PROJECT # DATE  
 180-20000 06/12/2018

REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS

SHEET  
 55.0

OPTIONAL SCREENED/COVERED PORCH



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NOTE: 1ST FLY OF ALL SHOWN GIRDER TRUSSES TO ALIGN WITH INSIDE FACE OF WALL (TYP, UNO)

NOTE: ROOF TRUSSES SHALL BE SPACE TO SUPPORT FALSE FRAMED DORMER WALLS (TYP, UNO)

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 STRUCTURAL ANALYSIS BASED ON 2018 NCRC.

**ROOF FRAMING PLAN**  
 SCALE: 1/4"=1'-0" ON 22'x34' OR 1/8"=1'-0" ON 11'x11'

DESIGN SPECIFICATIONS:

Construction Type: Commercial  Residential

Applicable Building Codes:

- 2018 North Carolina Residential Building Code with All Local Amendments
ASCE 7-10: Minimum Design Loads for Buildings and Other Structures

Design Loads:

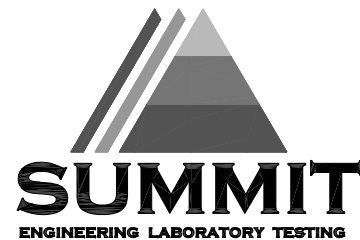
- 1. Roof Live Loads: 11. Conventional 2x... 20 PSF, 12. Truss... 20 PSF, 12.1. Attic Truss... 60 PSF
2. Roof Dead Loads: 21. Conventional 2x... 10 PSF, 22. Truss... 20 PSF
3. Snow... 15 PSF
3.1. Importance Factor... 1.0
4. Floor Live Loads: 41. Typ. Dwelling... 40 PSF, 42. Sleeping Areas... 30 PSF, 43. Decks... 40 PSF, 44. Passenger Garage... 50 PSF
5. Floor Dead Loads: 51. Conventional 2x... 10 PSF, 52. 1-Joist... 15 PSF, 53. Floor Truss... 15 PSF
6. Ultimate Wind Speed (3 sec. gust)... PER PLAN
6.1. Exposure... B
6.2. Importance Factor... 1.0
6.3. Wind Base Shear: 6.3.1. Vx = 6.3.2. Vy =

7. Component and Cladding (in PSF)

Table with 5 columns: MEAN ROOF HT., UP TO 30', 30'1"-35', 35'1"-40', 40'1"-45'. Rows for ZONE 1 through ZONE 5.

8. Seismic

- 8.1. Site Class... D
8.2. Design Category... C
8.3. Importance Factor... 1.0
8.4. Seismic Use Group... I
8.5. Spectral Response Acceleration: 8.5.1. Sm = %g, 8.5.2. Sm = %g
8.6. Seismic Base Shear: 8.6.1. Vx = 8.6.2. Vy =
8.7. Basic Structural System (check one): [x] Bearing Wall, [ ] Building Frame, [ ] Moment Frame, [ ] Dual w/ Special Moment Frame, [ ] Dual w/ Intermediate R/C or Special Steel, [ ] Inverted Pendulum
8.8. Arch/Mech Components Anchored... No
8.9. Lateral Design Control: Seismic [ ] Wind [x]
9. Assumed Soil Bearing Capacity... 2000psf



STRUCTURAL PLANS PREPARED FOR:

STANDARD DETAILS

PROJECT ADDRESS: TBD OUNER: DR Horton Carolinas Division, 8001 Arrowridge Blvd, Charlotte, NC 28273

ARCHITECT/DESIGNER:

These drawings are to be coordinated with the architectural, mechanical, plumbing, electrical and civil drawings. This coordination is not the responsibility of the structural engineering of record (SER). Should any discrepancies become apparent, the contractor shall notify SUMMIT Engineering, Laboratory 4 Testing, P.C. before construction begins.

PLAN ABBREVIATIONS:

Table with 3 columns: Abbreviation, Description, and Material/Type. Includes entries like AB ANCHOR BOLT, AFF ABOVE FINISHED FLOOR, etc.

Roof truss and floor joist layouts, and their corresponding loading details, were not provided to SUMMIT Engineering, Laboratory 4 Testing, P.C. (SUMMIT) prior to the initial design. Therefore, truss and joist directions were assumed based on the information provided by DR Horton, Inc. Subsequent plan revisions based on roof truss and floor joist layouts shall be noted in the revision list, indicating the date the layouts were provided. Should any discrepancies become apparent, the contractor shall notify SUMMIT immediately.

SHEET LIST:

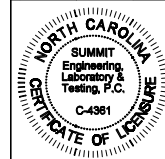
Table with 2 columns: Sheet No., Description. Lists sheets CSI, D1m, D1s, D1c, D1b, D1f.

REVISION LIST:

Table with 4 columns: Revision No., Date, Project No., Description. Lists revisions 1 through 9.

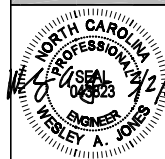
DR HORTON PROJECT SIGN-OFF:

Table with 2 columns: Manager, Signature. Rows for Operations, Operations System, Operations Product Development.



CLIENT: DR Horton Carolinas Division, 8001 Arrowridge Blvd, Charlotte, NC 28273

PROJECT: Standard Details, Cover Sheet



STRUCTURAL MEMBERS ONLY

DRAWN: DATE: 10/28, SCALE: 1/8" = 1'-0", PROJECT: P-3801-DR, CHECKED BY: JAJ, ORIGINAL INFORMATION: PROJECT #, DATE: 10/28/21, REFER TO COVER SHEET FOR A COMPLETE LIST OF REVISIONS

SHEET: CSI

GENERAL STRUCTURAL NOTES:

- 1. The design professional whose seal appears on these drawings is the structural engineer of record (SER) for this project. The SER bears the responsibility of the primary structural elements and the performance of this structure. No other party may revise, alter, or delete any structural aspects of these construction documents without written permission of SUMMIT Engineering, Laboratory 4 Testing, P.C. (SUMMIT) or the SER. For the purposes of these construction documents the SER and SUMMIT shall be considered the same entity.
2. The structure is only stable in its completed form. The contractor shall provide all required temporary bracing during construction to stabilize the structure.
3. The SER is not responsible for construction sequences, methods, or techniques in connection with the construction of this structure. The SER will not be held responsible for the contractor's failure to conform to the contract documents, should any non-conformities occur.
4. Any structural elements or details not fully developed on the construction drawings shall be completed under the direction of a licensed professional engineer. These shop drawings shall be submitted to SUMMIT for review before any construction begins. The shop drawings will be reviewed for overall compliance as it relates to the structural design of this project. Verification of the shop drawings for dimensions, or for actual field conditions, is not the responsibility of the SER or SUMMIT.
5. Verification of assumed field conditions is not the responsibility of the SER. The contractor shall verify the field conditions for accuracy and report any discrepancies to SUMMIT before construction begins.
6. The SER is not responsible for any secondary structural elements or non-structural elements, except for the elements specifically noted on the structural drawings.
7. This structure and all construction shall conform to all applicable sections of the International Residential Code.
8. This structure and all construction shall conform to all applicable sections of local building codes.
9. All structural assemblies are to meet or exceed to requirements of the current local building code.

FOUNDATIONS:

- 1. The structural engineer has not performed a subsurface investigation. Verification of this assumed value is the responsibility of the owner or the contractor. Should any adverse soil condition be encountered the SER must be contacted before proceeding.

- 2. The bottom of all footings shall extend below the frost line for the region in which the structure is to be constructed. However, the bottom of all footings shall be a minimum of 12" below grade.
3. Any fill shall be placed under the direction or recommendation of a licensed professional engineer.
4. The resulting soil shall be compacted to a minimum of 95% maximum dry density.
5. Excavations of footings shall be lined temporarily with a 6 mil polyethylene membrane if placement of concrete does not occur within 24 hours of excavation.
6. No concrete shall be placed against any subgrade containing water, ice, frost, or loose material.

STRUCTURAL STEEL:

- 1. Structural steel shall be fabricated and erected in accordance with the American Institute of Steel Construction "Code of Standard Practice for Steel Buildings and Bridges" and the manual of Steel Construction "Load Resistance Factor Design" latest editions.
2. Structural steel shall receive one coat of shop applied rust-inhibitive paint.
3. All steel shall have a minimum yield stress (Fy) of 36 ksi unless otherwise noted.
4. Welding shall conform to the latest edition of the American Welding Society's Structural Welding Code AWS D11. Electrodes for shop and field welding shall be class E70XX. All welding shall be performed by a certified welder per the above standards.

CONCRETE:

- 1. Concrete shall have a normal weight aggregate and a minimum compressive strength (f'c) at 28 days of 3000 psi, unless otherwise noted on the plan.
2. Concrete shall be proportioned, mixed, and placed in accordance with the latest editions of ACI 318: "Building Code Requirements for Reinforced Concrete" and ACI 308: "Specifications for Structural Concrete for Buildings".
3. Air entrained concrete must be used for all structural elements exposed to freeze/thaw cycles and deicing chemicals. Air entrainment amounts (in percent) shall be within -1% to +2% of target values as follows:
3.1. Footings: 5%
3.2. Exterior Slabs: 5%
4. No admixtures shall be added to any structural concrete without written permission of the SER.

- 5. Concrete slabs-on-grade shall be constructed in accordance with ACI 302.1R-96: "Guide for Concrete Slab and Slab Construction".
6. The concrete slab-on-grade has been designed using a subgrade modulus of k=250 pci and a design loading of 200 psf. The SER is not responsible for differential settlement, slab cracking or other future defects resulting from unreported conditions not in accordance with the above assumptions.
7. Control or saw cut joints shall be spaced in interior slabs-on-grade at a maximum of 15'-0" O.C. and in exterior slabs-on-grade at a maximum of 10'-0" unless otherwise noted.
8. Control or saw cut joints shall be produced using conventional process within 4 to 12 hours after the slab has been finished.
9. Reinforcing steel may not extend through a control joint. Reinforcing steel may extend through a saw cut joint.
10. All welded wire fabric (WWF) for concrete slabs-on-grade shall be placed at mid-depth of slab. The WWF shall be securely supported during the concrete pour.

CONCRETE REINFORCEMENT:

- 1. Fibrous concrete reinforcement, or fibers, specified in concrete slabs-on-grade may be used for control of cracking due to shrinkage and thermal expansion/contraction, lowered water migration, an increase in impact capacity, increased abrasion resistance, and residual strength.
2. Fibers reinforcing to be 100% virgin polypropylene fibers containing no reprocessed olefin materials and specifically manufactured for use as concrete secondary reinforcement.
3. Application of fibrous per cubic yard of concrete shall equal a minimum of 0.1% by volume (15 pounds per cubic yard).
4. Fibers shall comply with ASTM C116, any local building code requirements, and shall meet or exceed the current industry standard.
5. Steel reinforcing bars shall be new billet steel conforming to ASTM A615, grade 60.
6. Detailing, fabrication, and placement of reinforcing steel shall be in accordance with the latest edition of ACI 308: "Manual of Standard Practice for Detailing Concrete Structures".
7. Horizontal footing and wall reinforcement shall be continuous and shall have 90° bends, or corner bars with the same size/spacing as the horizontal reinforcement with a class B tension splice.
8. Lap reinforcement as required, a minimum of 40 bar diameters for tension or compression unless otherwise noted. Splices in masonry shall be a minimum of 48 bar diameters.

- 9. Where reinforcing dowels are required, they shall be equivalent in size and spacing to the vertical reinforcement. The dowel shall extend 48 bar diameters vertically and 20 bar diameters into the footing.
10. Where reinforcing steel is required vertically, dowels shall be provided unless otherwise noted.

WOOD FRAMING:

- 1. Solid sawn wood framing members shall conform to the specifications listed in the latest edition of the "National Design Specification for Wood Construction" (NDS). Unless otherwise noted, all wood framing members are designed to be Spruce-Yellow-Pine (SYP) #2.
2. LVL or PSL engineered wood shall have the following minimum design values:
2.1. E = 1,900,000 psi
2.2. Fv = 2600 psi
2.3. Fx = 285 psi
2.4. Fc = 100 psi
3. Wood in contact with concrete, masonry, or earth shall be pressure treated in accordance with AIAA standard C-15. All other moisture exposed wood shall be treated in accordance with AIAA standard C-2.
4. Nails shall be common wire nails unless otherwise noted.
5. Lag screws shall conform to ANSI/ASME standard B182.1-1981. Lead holes for lag screws shall be in accordance with NDS specifications.
6. All beams shall have full bearing on supporting framing members unless otherwise noted.
7. Exterior and load bearing stud walls are to be 2x4 SYP #2 @ 16" O.C. unless otherwise noted. Studs shall be continuous from the sole plate to the double top plate. Studs shall only be discontinuous at headers for window/door openings. A minimum of one king stud shall be placed at each end of the header. King studs shall be continuous.
8. Individual studs forming a column shall be attached with one 1/2" diameter stud to the foundation or beam. The column shall be properly blocked at all floor levels to ensure proper load transfer.
9. Multi-ply beams shall have each ply attached with (3) 10d nails @ 24" O.C.
10. Fitch beams, 4-ply beams and 3-ply side loaded beams shall be bolted together with (2) rows of 1/2" diameter through bolts staggered @ 16" O.C. unless noted otherwise. Min edge distance shall be 2" and (2) bolts shall be located a min 6" from each end of the beam.

WOOD TRUSSES:

- 1. The wood truss manufacturer/fabricator is responsible for the design of the wood trusses. Submit sealed shop drawings and supporting calculations to the SER for review prior to fabrication. The SER shall have a minimum of five (5) days for review. The review by the SER shall review for overall compliance with the design documents. The SER shall assume no responsibility for the correctness for the structural design of the wood trusses.
2. The wood trusses shall be designed for all required loadings as specified in the local building code, the ASCE Standard "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-05), and the loading requirements shown on these specifications. The truss drawings shall be coordinated with all other construction documents and provisions provided for loads shown on these drawings including but not limited to HVAC equipment, piping, and architectural fixtures attached to the trusses.
3. The trusses shall be designed, fabricated, and erected in accordance with the latest edition of the "National Design Specification for Wood Construction" (NDS) and "Design Specification for Metal Plate Connected Wood Trusses". The truss manufacturer shall provide adequate bracing information in accordance with "Comments and Bracing Recommendations for Handling, Installing and Bracing Metal Plate Connected Wood Trusses" (MIB-9). This bracing, both temporary and permanent, shall be shown on the shop drawings. Also, the shop drawings shall show the required attachments for the trusses.
4. All chords or truss webs shown on these drawings have been shown as a reference only. The final design of the trusses shall be per the manufacturer.
5. EXTERIOR WOOD FRAMED DECKS:
1. Decks are to be framed in accordance with local building codes and as referenced on the structural plans, either through code references or construction details.

EXTERIOR WOOD FRAMED DECKS:

- 1. Decks are to be framed in accordance with local building codes and as referenced on the structural plans, either through code references or construction details.

WOOD STRUCTURAL PANELS:

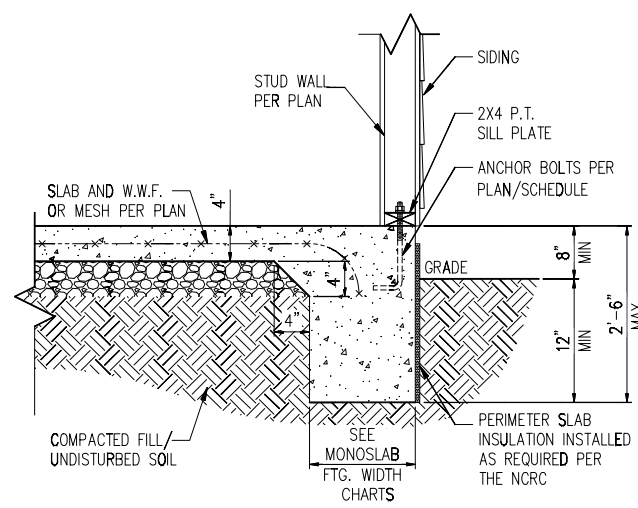
- 1. Fabrication and placement of structural wood sheathing shall be in accordance with the APA Design/Construction Guide "Residential and Commercial," and all other applicable APA standards.
2. All structurally required wood sheathing shall bear the mark of the APA.

- 3. Wood wall sheathing shall comply with the requirements of local building codes for the appropriate state as indicated on these drawings. Refer to wall bracing notes in plan set for more information. Sheathing shall be applied with the long direction perpendicular to framing, unless noted otherwise.
4. Roof sheathing shall be APA rated sheathing exposure 1 or 2. Roof sheathing shall be continuous over two supports and attached to its supporting roof framing with (1)-8d CC nail at 6" o/c at panel edges and at 12" o/c in panel field unless otherwise noted on the plans. Sheathing shall be applied with the long direction perpendicular to framing. Sheathing shall have a span rating consistent with the framing spacing. Use suitable edge support by use of plywood clips or lumber blocking unless otherwise noted. Panel end joints shall occur over framing. Apply building paper over the sheathing as required by the state Building Code.
5. Wood floor sheathing shall be APA rated sheathing exposure 1 or 2. Attach sheathing to its supporting framing with (1)-8d CC ringshank nail at 6" o/c at panel edges and at 12" o/c in panel field unless otherwise noted on the plans. Sheathing shall be applied perpendicular to framing. Sheathing shall have a span rating consistent with the framing spacing. Use suitable edge support by use of T&G plywood or lumber blocking unless otherwise noted. Panel end joints shall occur over framing. Apply building paper over the sheathing as required by the state Building Code.
6. Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the APA.

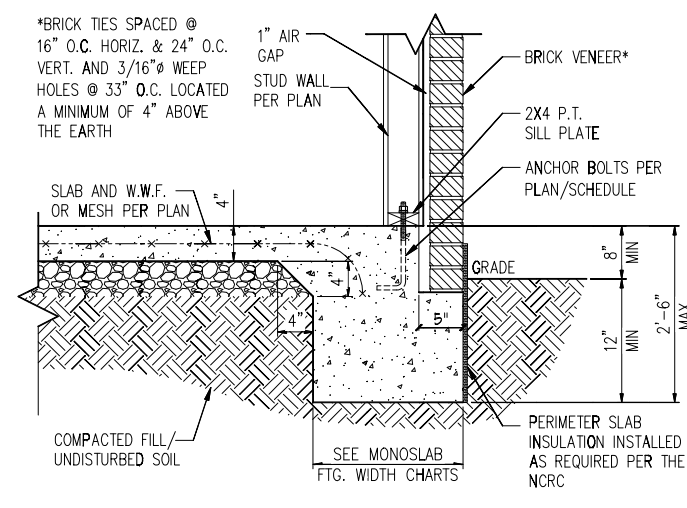
STRUCTURAL FIBERBOARD PANELS:

- 1. Fabrication and placement of structural fiberboard sheathing shall be in accordance with the applicable AFA standards.
2. All structurally required fiberboard sheathing shall bear the mark of the AFA.
3. Fiberboard wall sheathing shall comply with the requirements of local building codes for the appropriate state as indicated on these drawings. Refer to wall bracing notes in plan set for more information.
4. Sheathing shall have a 1/8" gap at panel ends and edges as recommended in accordance with the AFA.

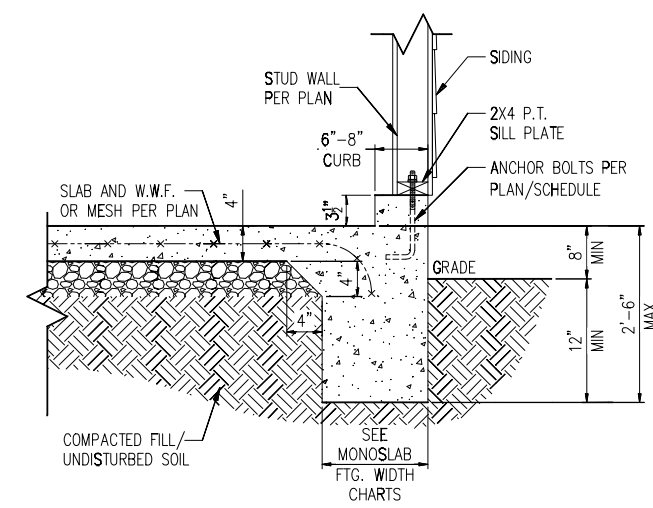




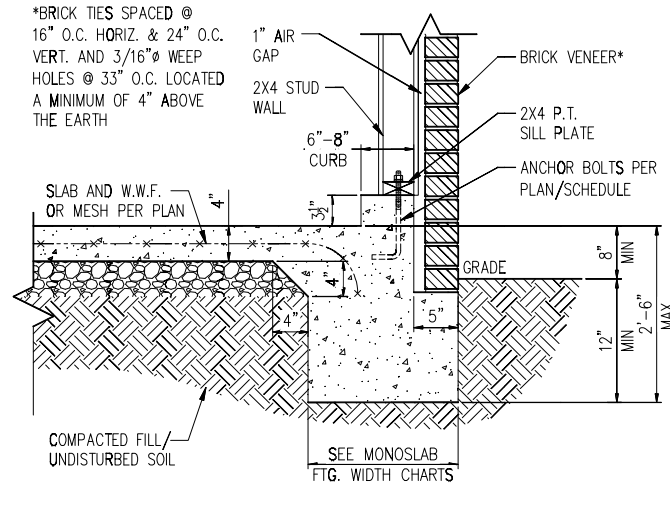
STANDARD - SIDING



STANDARD - BRICK



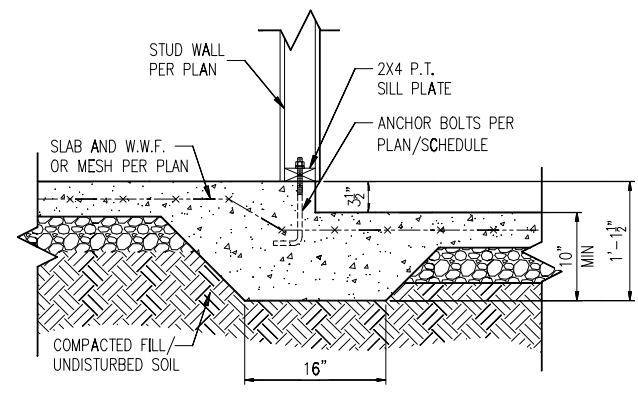
STANDARD - SIDING



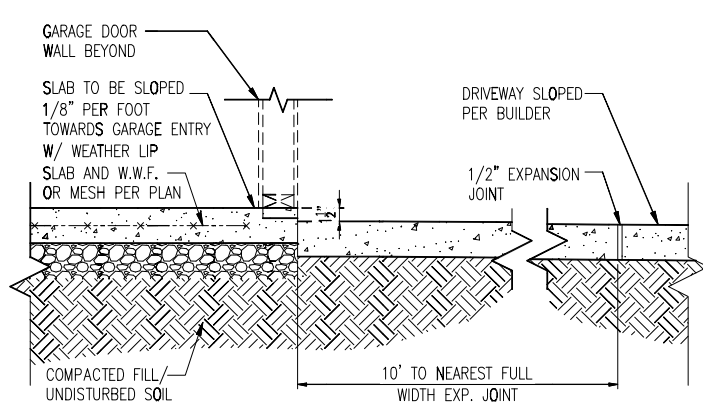
STANDARD - BRICK

1 TYP. SLAB DETAIL  
D1m N.T.S.

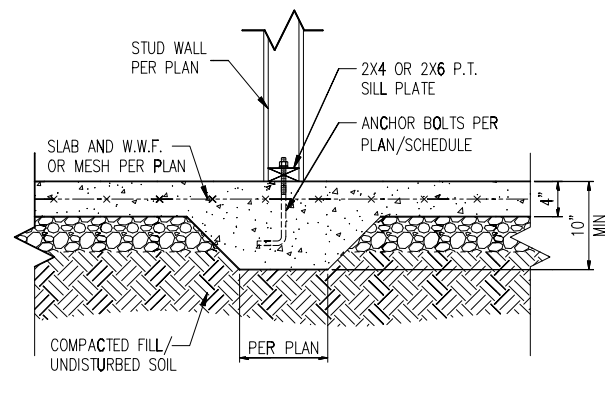
2 TYP. GARAGE CURB DETAIL  
D1m N.T.S.



3 STEP IN GARAGE  
D1m N.T.S.



4 SLAB AT GARAGE DOOR  
D1m N.T.S.



5 TYP. THICKENED SLAB DETAIL  
D1m N.T.S.

MONOLITHIC FOOTING WIDTH

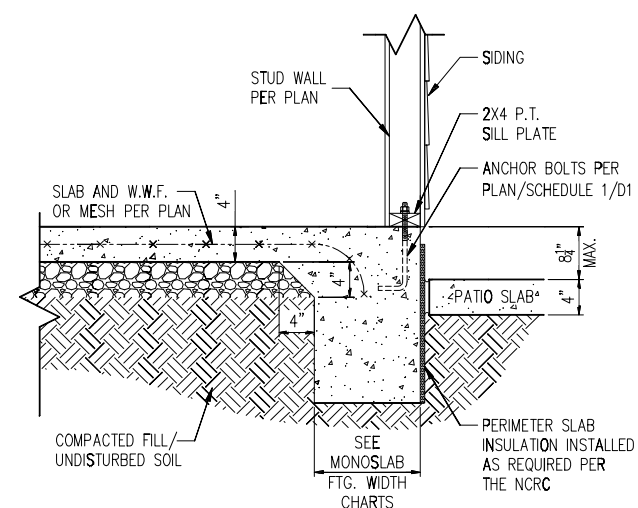
# OF STORIES	WIDTH BASED ON SOIL BEARING CAPACITY		
	1500 PSF	2000 PSF	2500 PSF
1 STORY - STD.	16"	16"	16"
1 STORY - BRICK VENEER	21"	21"	21"
2 STORY - STD.	16"	16"	16"
2 STORY - BRICK VENEER	21"	21"	21"
3 STORY - STD.	23"	18"	18"
3 STORY - BRICK VENEER	32"	24"	24"

\*5" BRICK LEDGE HAS BEEN ADDED TO THE MONOLITHIC FOOTING WIDTH FOR BRICK SUPPORT

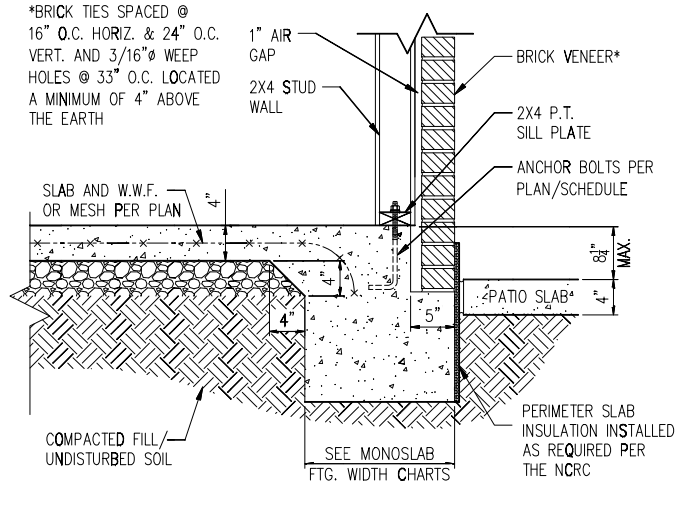
WALL ANCHOR SCHEDULE

TYPE OF ANCHOR	MIN. CONC. EMBEDMENT	SPACING EMBEDMENT	INTERIOR WALL	EXTERIOR WALL
1/2" A307 BOLTS w/ STD. 90° BEND	7"	6'-0"	YES	YES
SST - MAS	4"	5'-0"	NO	YES
HILTI KWIK BOLT KBI 1/2-2-3/4	2-1/4"	6'-0"	YES	NO
1/2" HILTI THREADED ROD w/ HIT HY150 ADHESIVE	7"	6'-0"	YES	YES

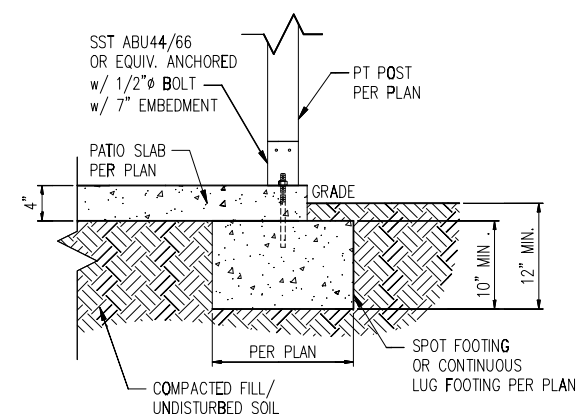
NOTE: INSTALL ALL ANCHORS 12" MAX. FROM ALL BOTTOM PLATE ENDS AND JOINTS.



STANDARD - SIDING



STANDARD - BRICK



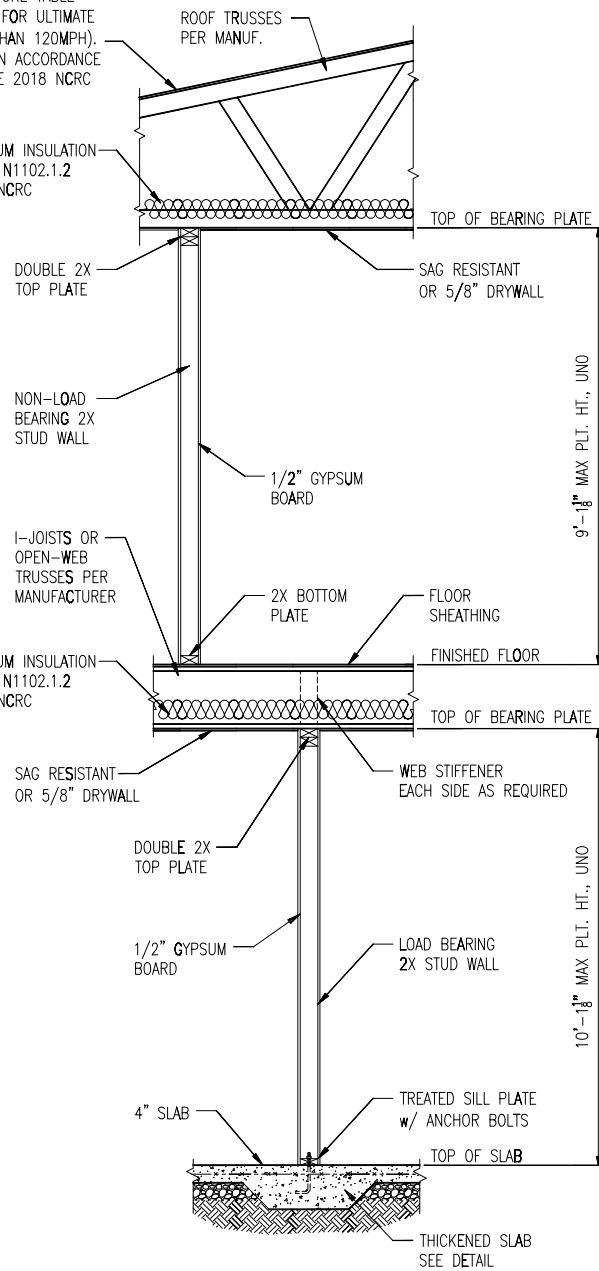
6A COVERED PATIO DETAIL  
D1m N.T.S.

6 PATIO SLAB DETAIL  
D1m N.T.S.

- NOTES:
- REFER TO GENERAL NOTES & SPECIFICATIONS ON COVERSHEET FOR ADDITIONAL INFORMATION.
  - PROVIDE 6 MIL VAPOR BARRIER UNDER ALL SLABS-ON-GRADE.
  - SEE ARCH. DWGS. FOR ALL TOP OF THE SLAB ELEVATIONS, SLOPES AND DEPRESSIONS.
  - REFER TO STRUCTURAL PLANS AND FRAMING DETAILS FOR BRACED WALL PANEL LAYOUT, DIMENSIONS, ATTACHMENT AND CONNECTIONS
  - REFER TO LOCAL AND STATEWIDE CODES FOR ADDITIONAL AMENDMENTS AND REQUIREMENTS NOT SHOWN
  - PERIMETER INSULATION SHOWN AS REQUIRED BY LOCAL CLIMATE ZONE. INSTALL PER TABLE N1102.1.2 OF THE 2018 NCR

MIN. 3/8" ROOF SHEATHING SECURED IN ACCORDANCE WITH FIGURE TABLE R602.3(1) (SEE NOTE G FOR ULTIMATE WIND SPEEDS GREATER THAN 120MPH). PROVIDE UNDERLAYMENT IN ACCORDANCE WITH CHAPTER 9 OF THE 2018 NCRC

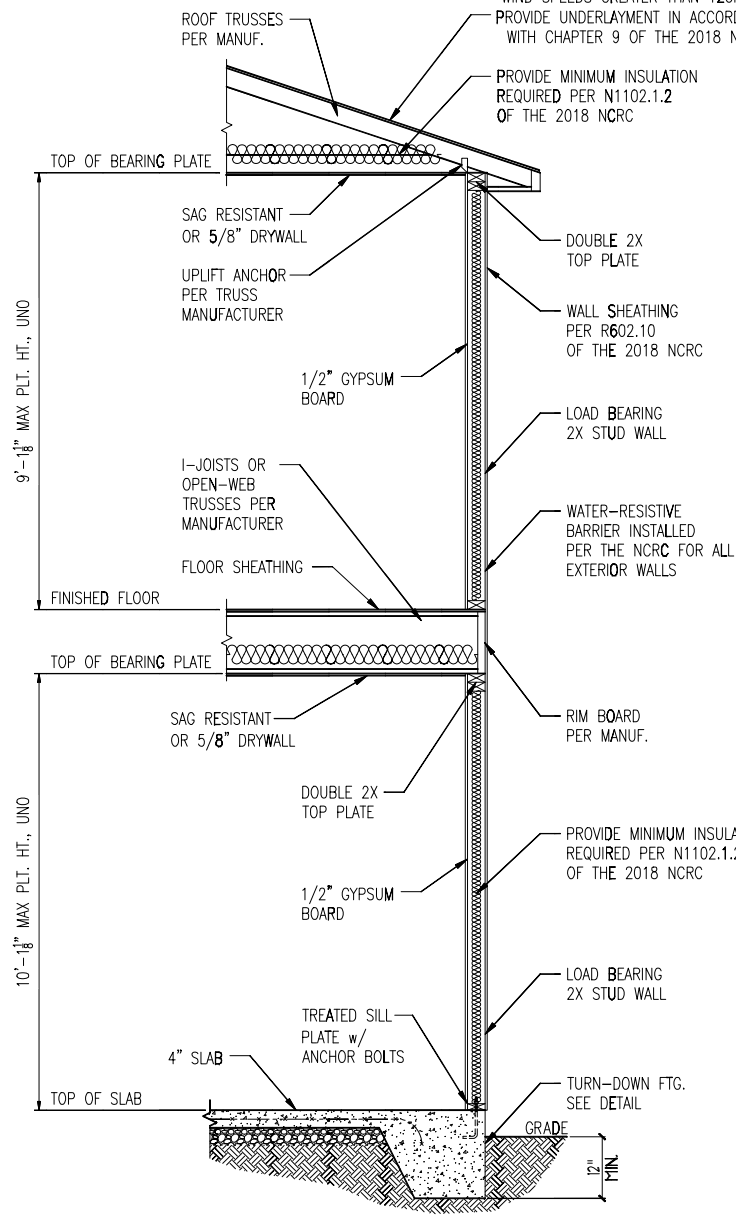
PROVIDE MINIMUM INSULATION REQUIRED PER N1102.1.2 OF THE 2018 NCRC



1 TYP. INTERIOR LOAD BEARING WALL SECTION  
D2m N.T.S.

MIN. 3/8" ROOF SHEATHING SECURED IN ACCORDANCE WITH FIGURE TABLE R602.3(1) (SEE NOTE G FOR ULTIMATE WIND SPEEDS GREATER THAN 120MPH). PROVIDE UNDERLAYMENT IN ACCORDANCE WITH CHAPTER 9 OF THE 2018 NCRC

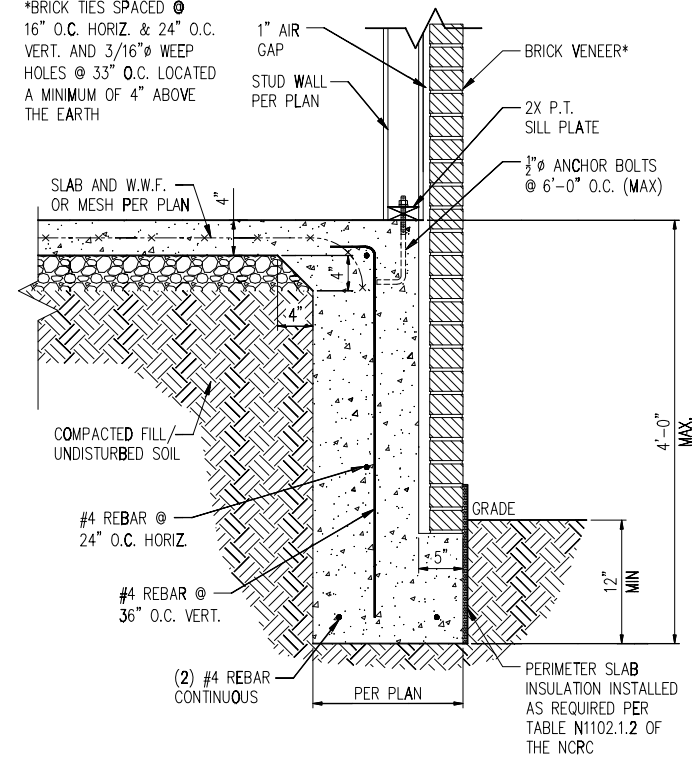
PROVIDE MINIMUM INSULATION REQUIRED PER N1102.1.2 OF THE 2018 NCRC



2 TYP. EXTERIOR LOAD BEARING WALL SECTION  
D2m N.T.S.

-SIMILAR w/ BRICK AND STONE  
-BRICK TIES SPACED @ 16" O.C. HORIZ. & 24" O.C. VERT.  
-MIN. 3/16" WEEP HOLES @ 33" O.C.

\*BRICK TIES SPACED @ 16" O.C. HORIZ. & 24" O.C. VERT. AND 3/16" WEEP HOLES @ 33" O.C. LOCATED A MINIMUM OF 4" ABOVE THE EARTH



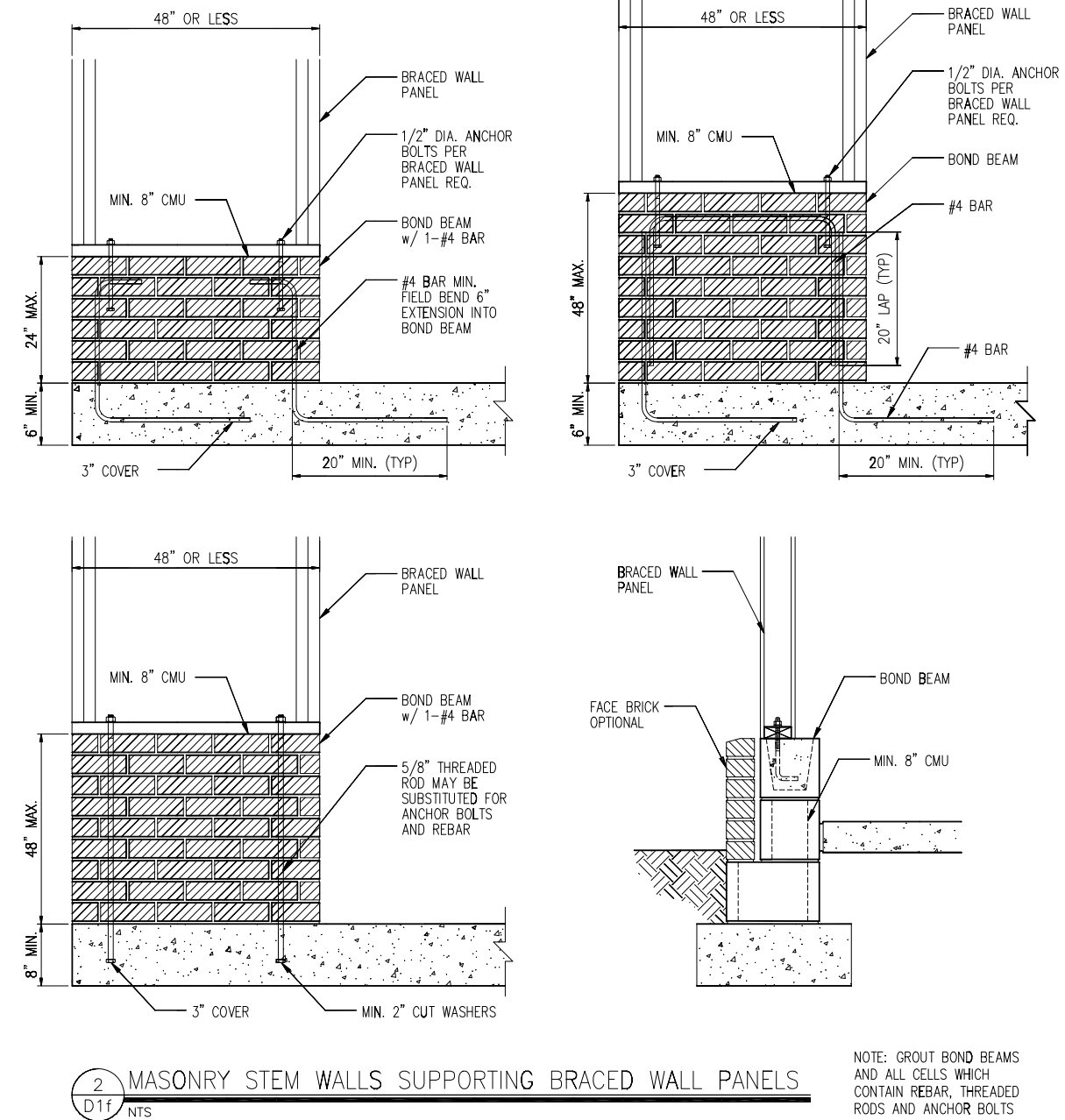
3 TALL SLAB DETAIL  
D2m N.T.S.

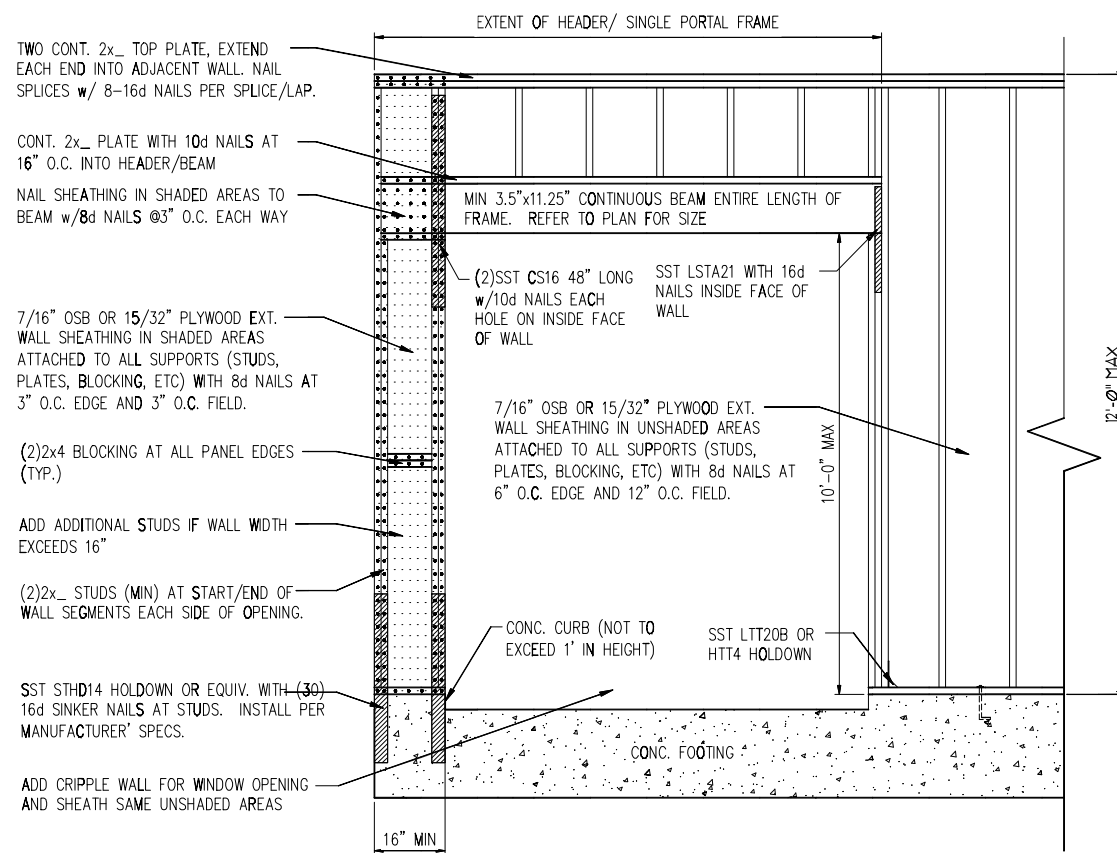
NOTES:

- REFER TO GENERAL NOTES & SPECIFICATIONS ON COVERSHEET FOR ADDITIONAL INFORMATION.
- PROVIDE 6 MIL VAPOR BARRIER UNDER ALL SLABS-ON-GRADE.
- SEE ARCH. DWGS. FOR ALL TOP OF THE SLAB ELEVATIONS, SLOPES AND DEPRESSIONS.
- REFER TO STRUCTURAL PLANS AND FRAMING DETAILS FOR BRACED WALL PANEL LAYOUT, DIMENSIONS, ATTACHMENT AND CONNECTIONS
- REFER TO LOCAL AND STATEWIDE CODES FOR ADDITIONAL AMENDMENTS AND REQUIREMENTS NOT SHOWN
- PERIMETER INSULATION SHOWN AS REQUIRED BY LOCAL CLIMATE ZONE. INSTALL PER TABLE N1102.1.2 OF THE 2018 NCRC

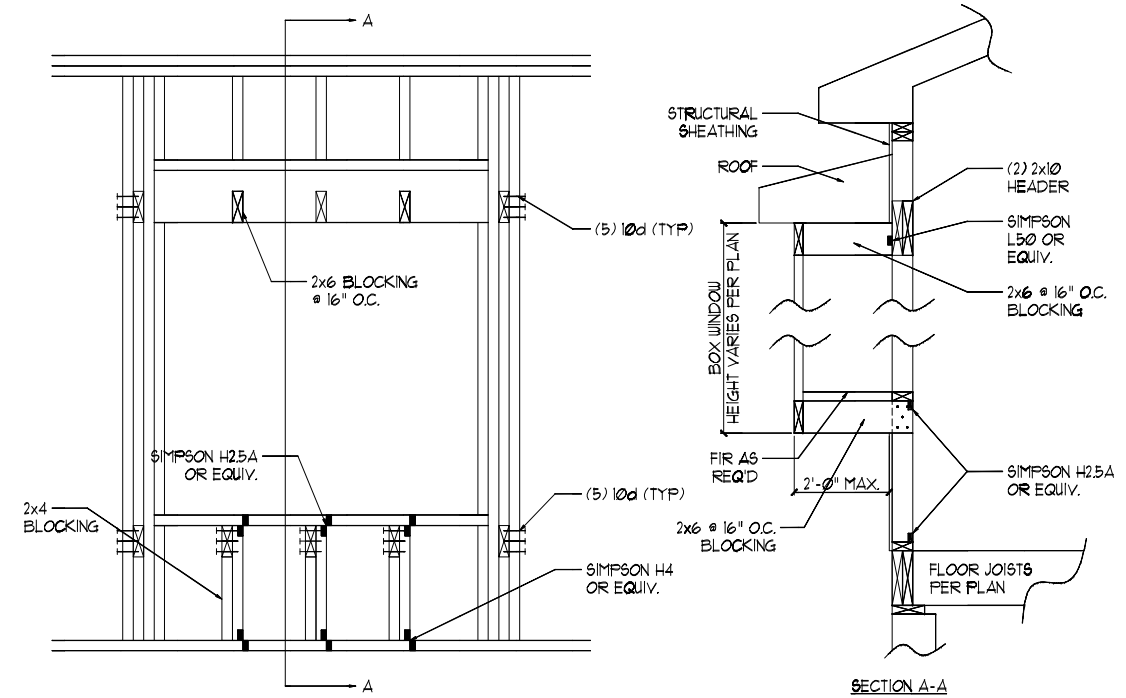
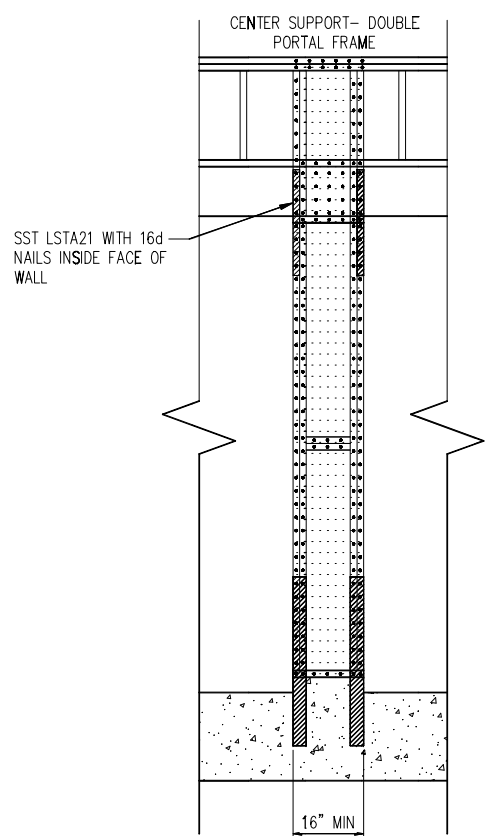


1 METHOD PF: PORTAL FRAME DETAIL  
D1f 3/8" = 1'-0"

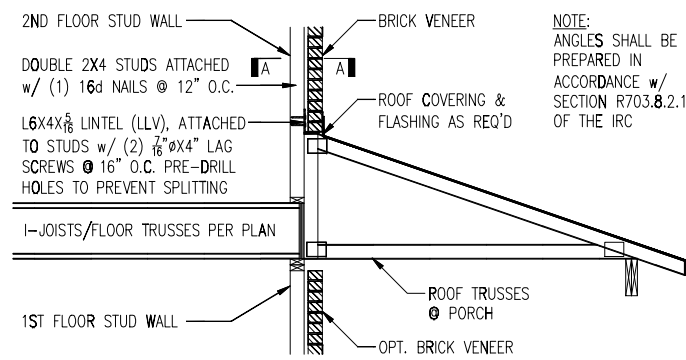




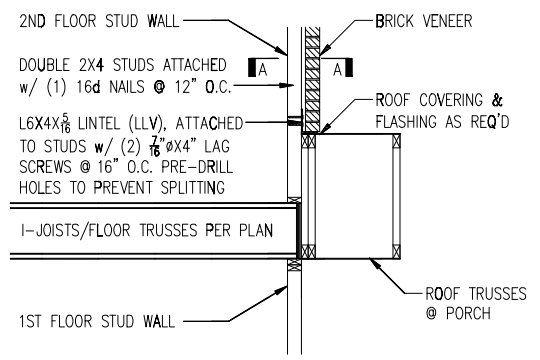
**1 METHOD PF: PORTAL FRAME DETAIL w/ HOLD-DOWNS**  
 D2f 3/4" = 1'-0"



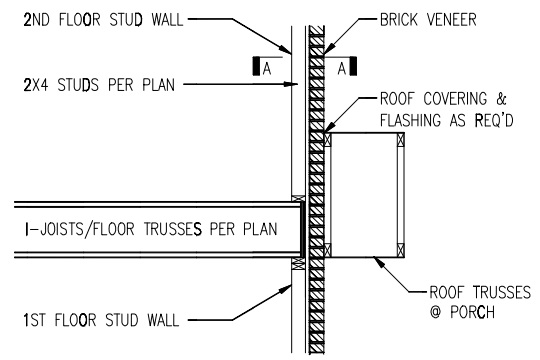
**2 BOX WINDOW DETAIL**  
 D2f N.T.S.



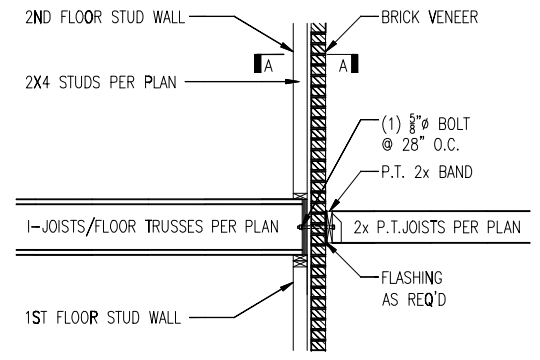
**3 BRICK SUPPORT ABOVE STORAGE/PORCH ROOF DETAIL**  
 D2f N.T.S.



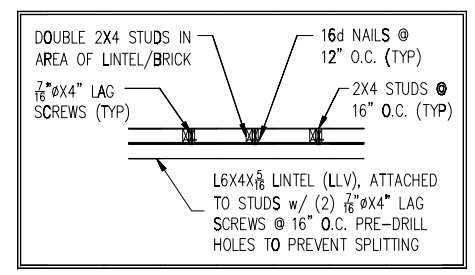
TRUSSES PARALLEL TO STUD WALL



TRUSSES PARALLEL TO STUD WALL w/ CONTINUOUS BRICK VENEER

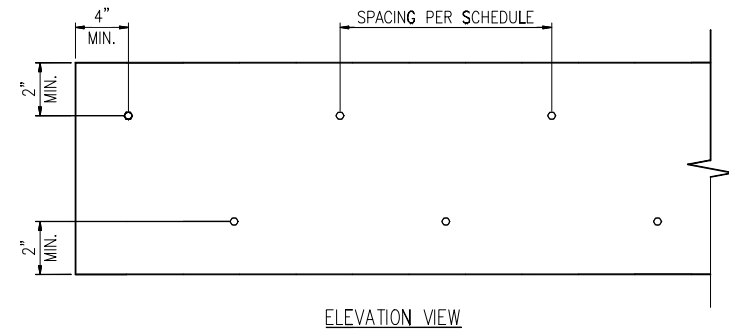


**4 BALCONY JOIST ATTACHMENT**  
 D2f N.T.S.



**SECTION A-A**  
 N.T.S.



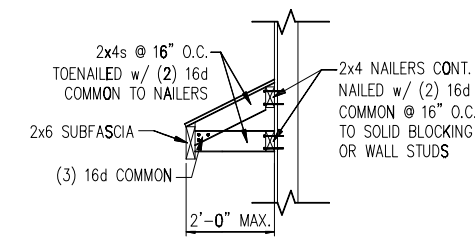


1 MULTI-PLY BEAM CONNECTION DETAIL  
D3f N.T.S.

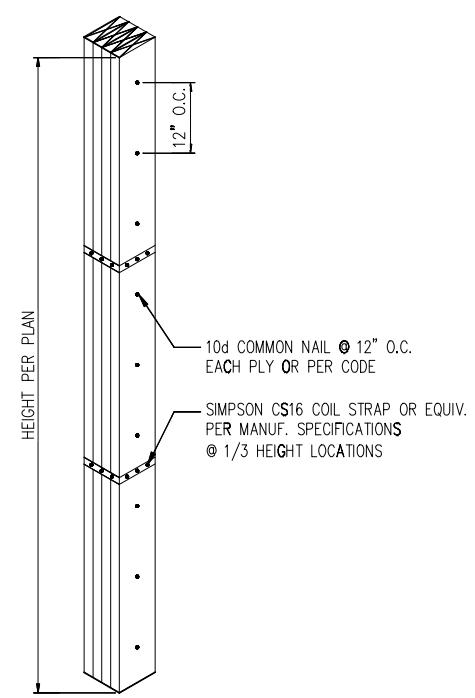
MINIMUM FASTENING REQUIREMENTS FOR TOP- AND SIDE-LOADED MEMBERS

FASTENER TYPE	LVL DEPTH	3 1/2" WIDE		5 1/2" WIDE		7" WIDE	
		2-Ply 1 3/4"	3-Ply 1 3/4"	1 3/4" + 3 1/2"	4-Ply 1 3/4"	2-Ply 1 3/4" + 3 1/2"	2-Ply 3 1/2"
10d (0.128" x 3") Nails	7 1/4" ≤ d < 14"	3 rows @ 12" o.c.	3 rows @ 12" o.c. (ES)	3 rows @ 12" o.c.	-	3 rows @ 12" o.c. (ES)	-
	d ≥ 14"	4 rows @ 12" o.c.	4 rows @ 12" o.c. (ES)	4 rows @ 12" o.c.	-	4 rows @ 12" o.c. (ES)	-
16d (0.162" x 3 1/2") Nails	7 1/4" ≤ d < 14"	2 rows @ 12" o.c.	2 rows @ 12" o.c. (ES)	2 rows @ 12" o.c.	-	2 rows @ 12" o.c. (ES)	-
	d ≥ 14"	3 rows @ 12" o.c.	3 rows @ 12" o.c. (ES)	3 rows @ 12" o.c.	-	3 rows @ 12" o.c. (ES)	-
1/2" Through Bolts		2 rows @ 24" o.c.	2 rows @ 24" o.c.	2 rows @ 24" o.c.	-	2 rows @ 24" o.c.	-
SDS 1/4" x 3 1/2", WS35, 3 1/2" TrussLok	d ≥ 7 1/4"	2 rows @ 24" o.c.	2 rows @ 24" o.c. (ES)	2 rows @ 24" o.c.	-	2 rows @ 24" o.c. (ES)	-
SDS 1/4" x 6", WS6		-	-	-	-	2 rows @ 24" o.c. (ES)	-
5" TrussLok		-	-	2 rows @ 24" o.c.	-	-	-
6 1/4" TrussLok		-	-	-	-	2 rows @ 24" o.c.	-

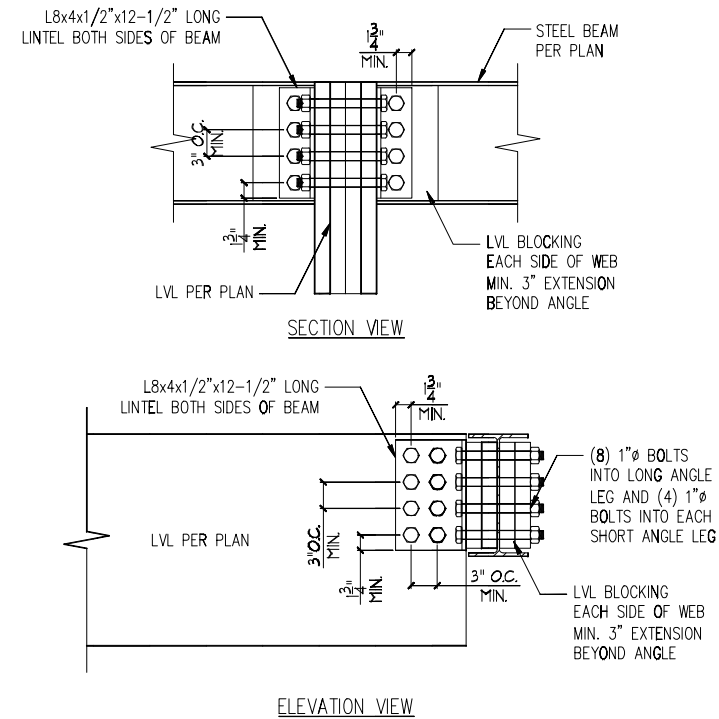
NOTES:  
 1. All fasteners must meet the minimum requirements in the table above. Side-loaded multiple-ply members must meet the minimum fastening and side-loading capacity requirements given on page 48.  
 2. Minimum fastening requirements for depths less than 7 1/4" require special consideration. Please contact your technical representative.  
 3. Three general rules for staggering or offsetting for a certain fastener schedule:  
 (1) If staggering or offsetting is not referenced, then none is required.  
 (2) If staggering is referenced, then fasteners installed in adjacent rows on the front side are to be staggered up to one-half the o.c. spacing, but maintaining the fastener clearances above; and  
 (3) If "ES" is referenced, then the fastener schedule must be repeated on each side, with the fasteners on the back side offset up to one-half the o.c. spacing of the front side (whether or not it is staggered).



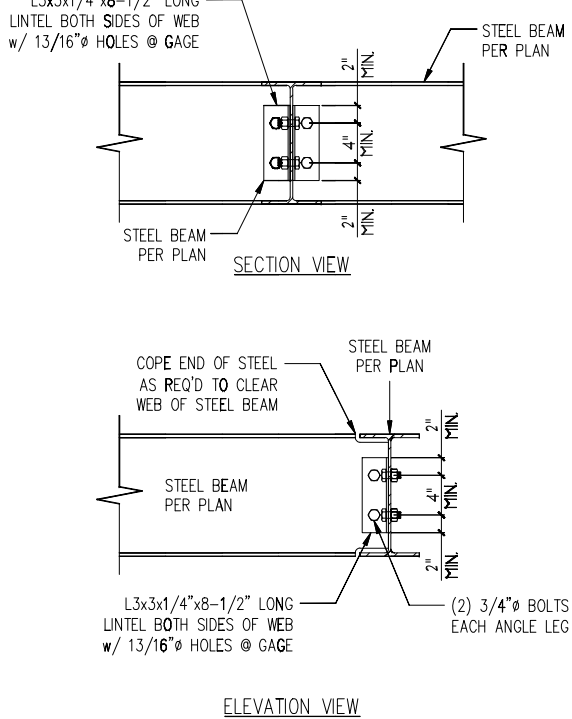
5 GABLE ROOF RETURN  
D3f N.T.S.



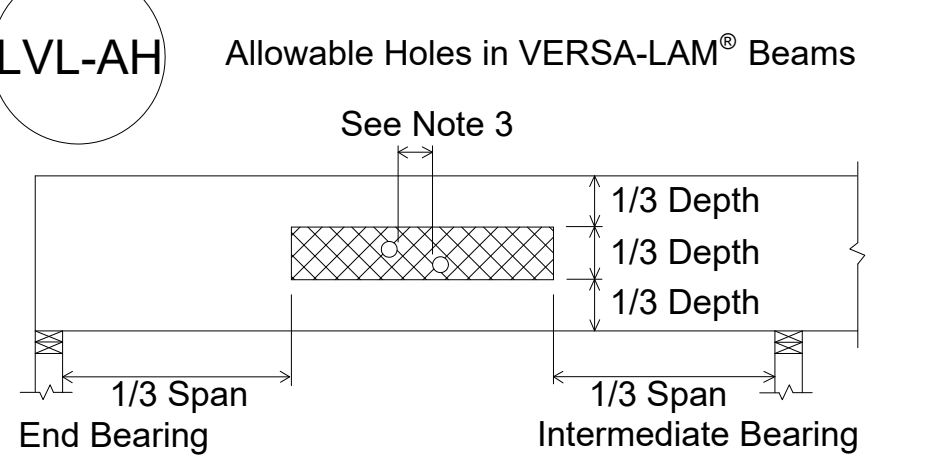
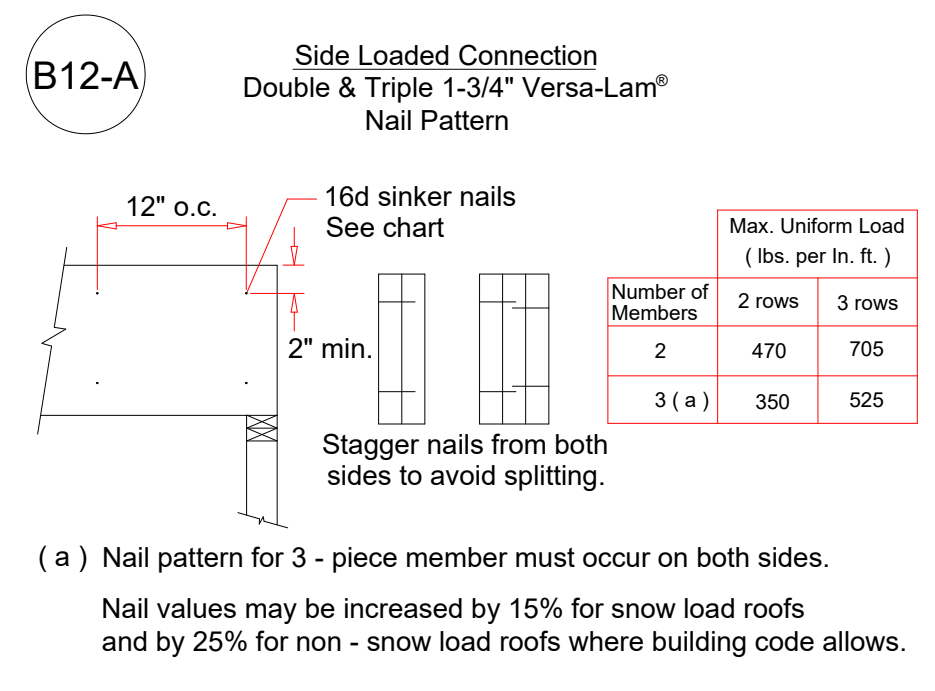
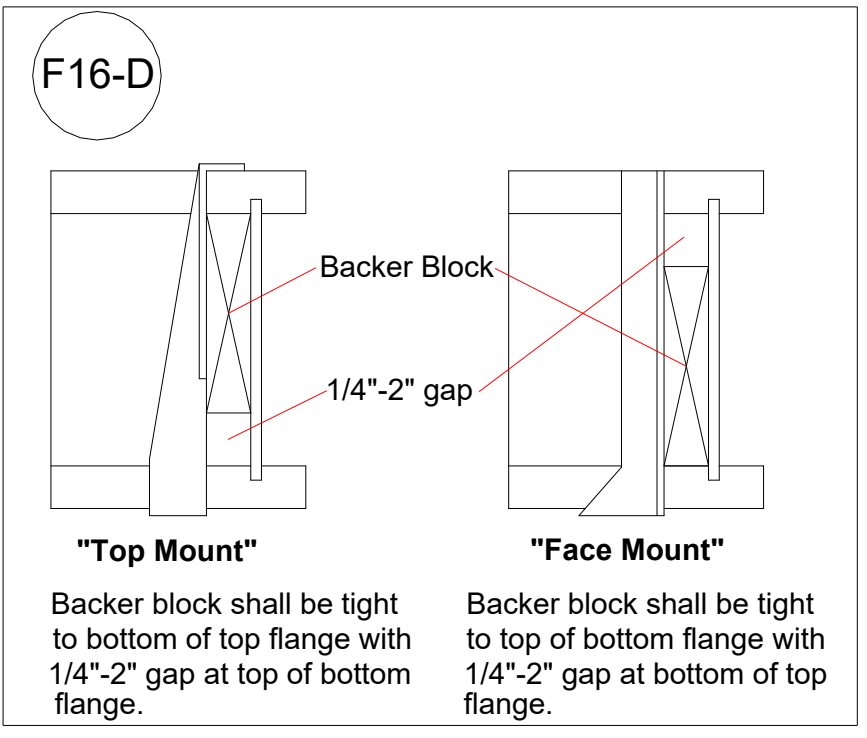
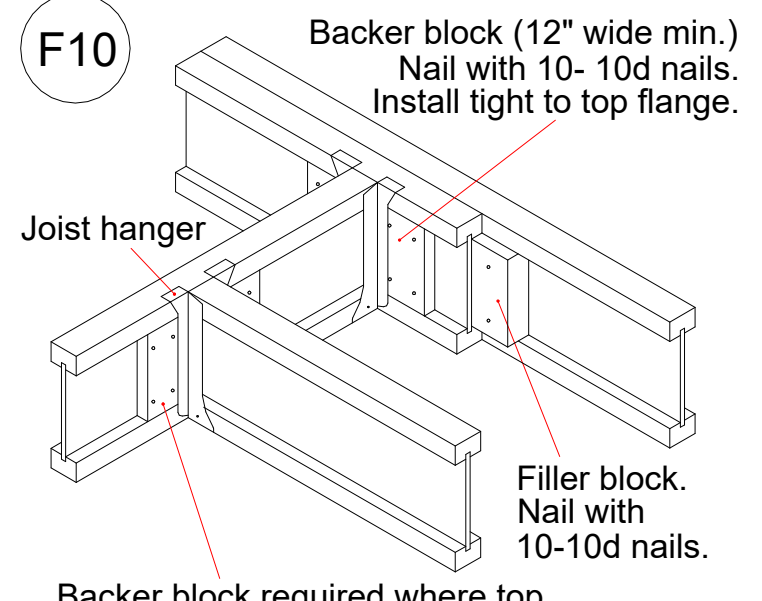
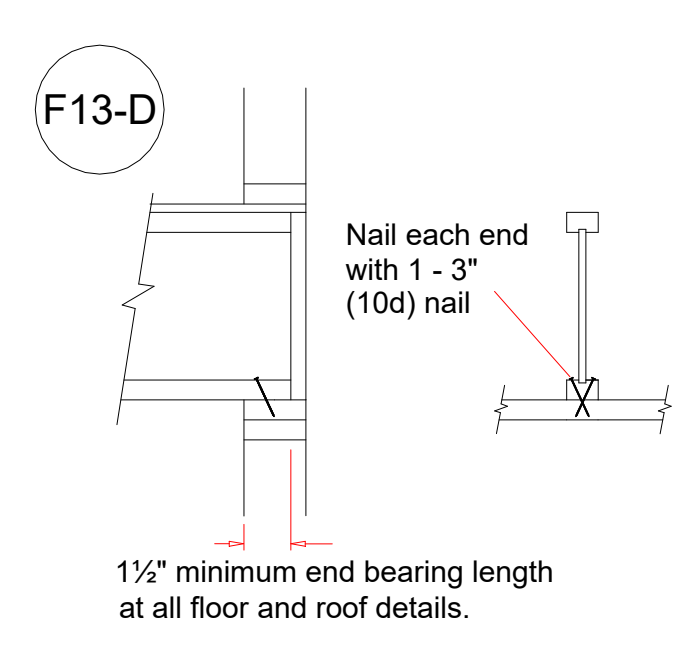
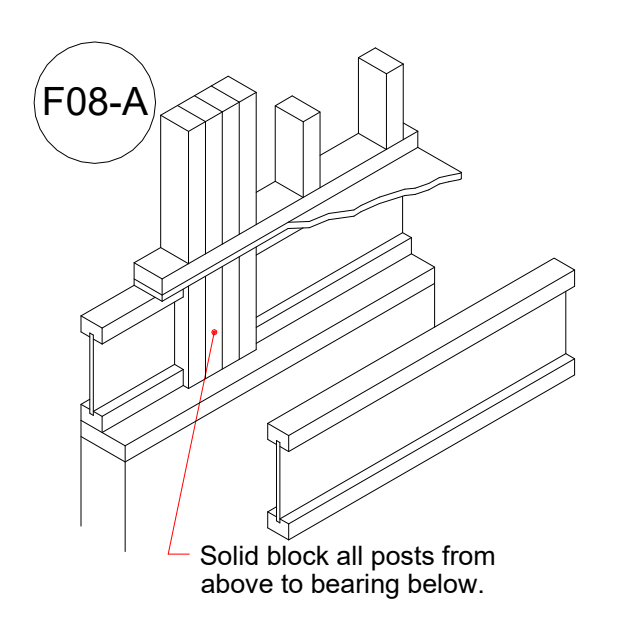
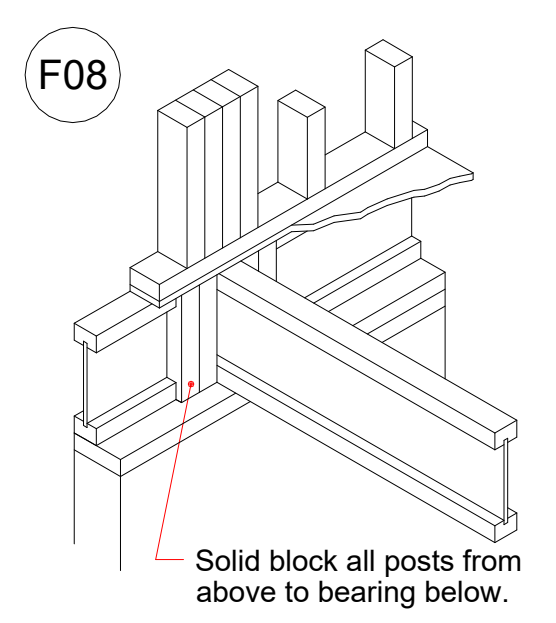
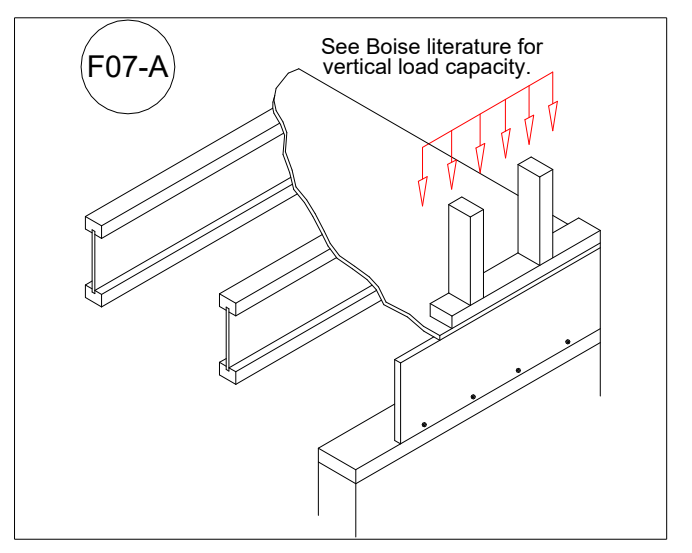
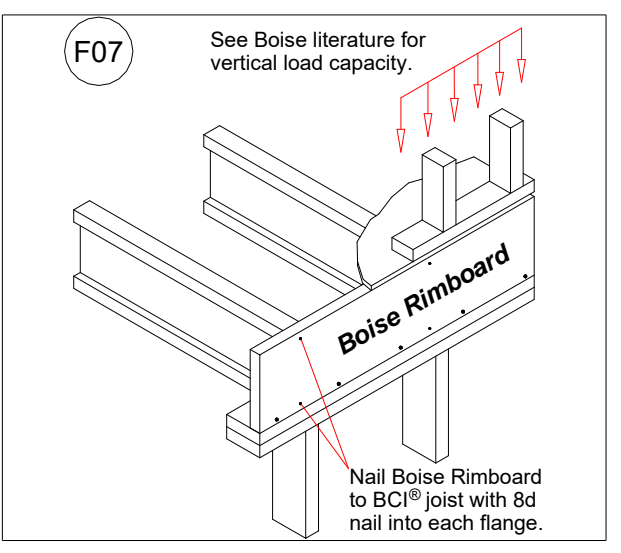
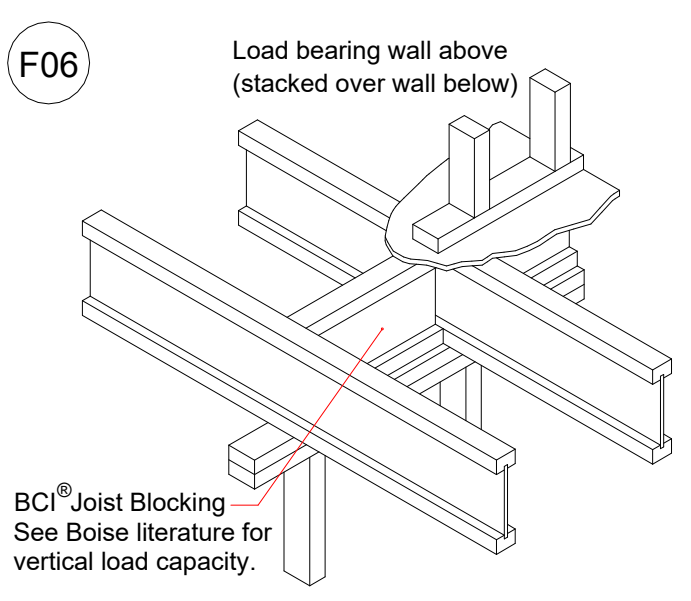
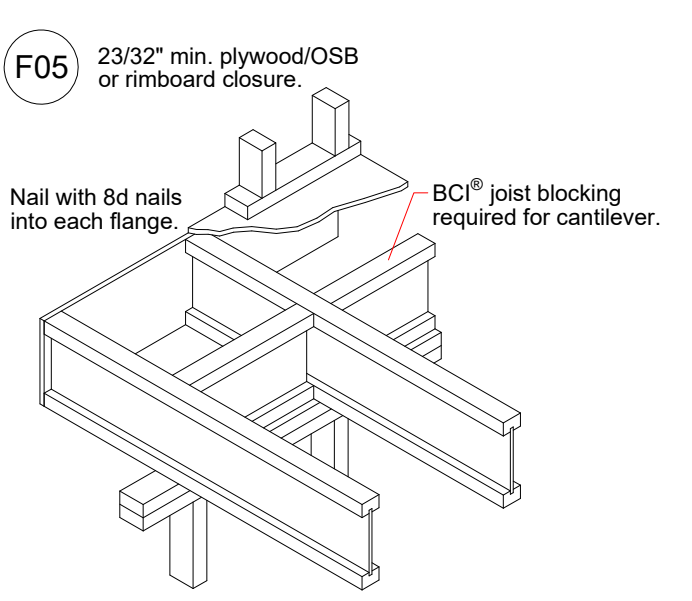
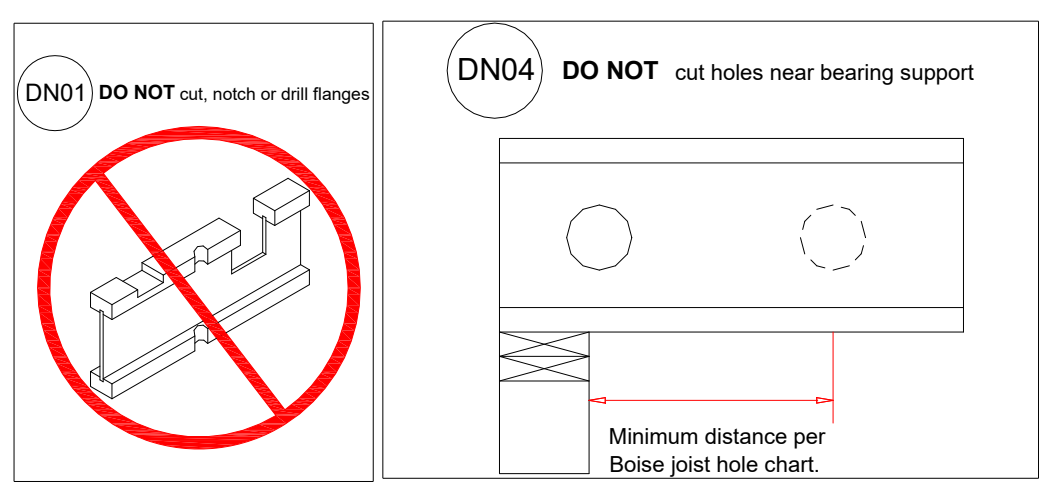
2 MULTI-PLY STUD CONNECTION DETAIL  
D3f N.T.S. 4+ PLYS



3 LVL TO STEEL DETAIL  
D3f N.T.S.



4 STEEL TO STEEL DETAIL  
D3f N.T.S.

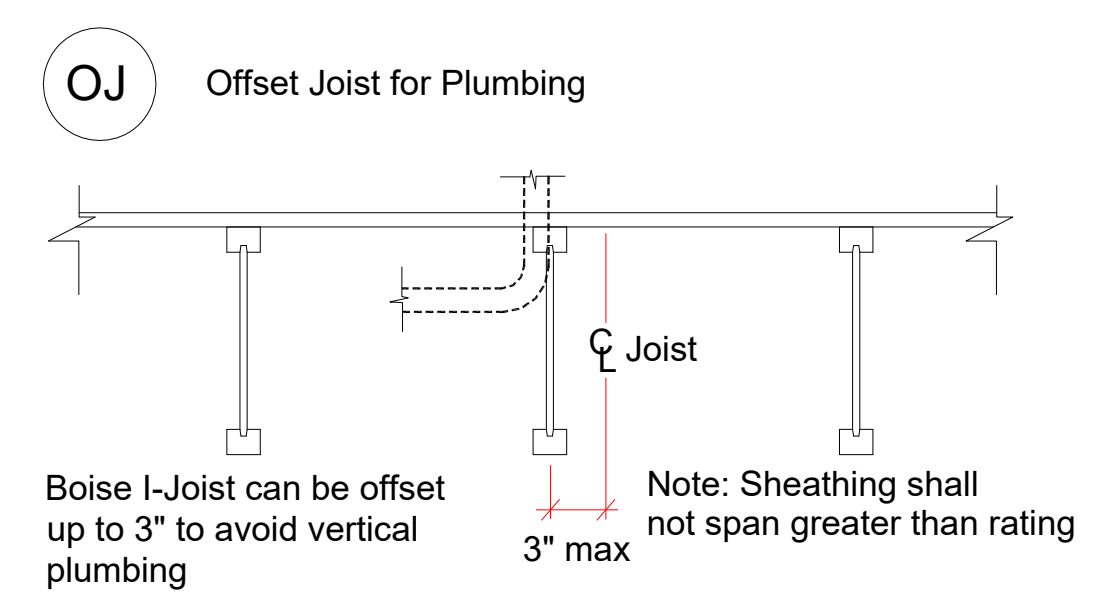
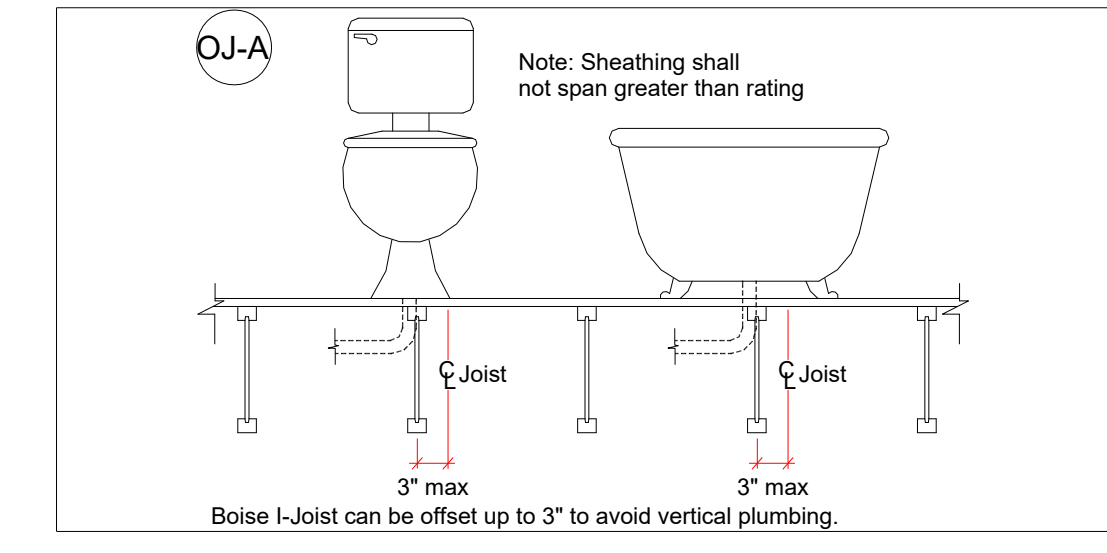


NOTES:

- Square and rectangular holes are NOT permitted.
- Round holes may be drilled or cut with a hole saw anywhere within the hatched area of the beam.
- The horizontal distance between adjacent holes must be at least two times the diameter of the larger hole.
- Do not drill more than three access holes in any four foot long section of beam.
- The maximum round hole diameter permitted is:

Beam Depth	5 1/2"	7 1/4"	9 1/4" +
Maximum Hole Diameter	3/4"	1"	2"

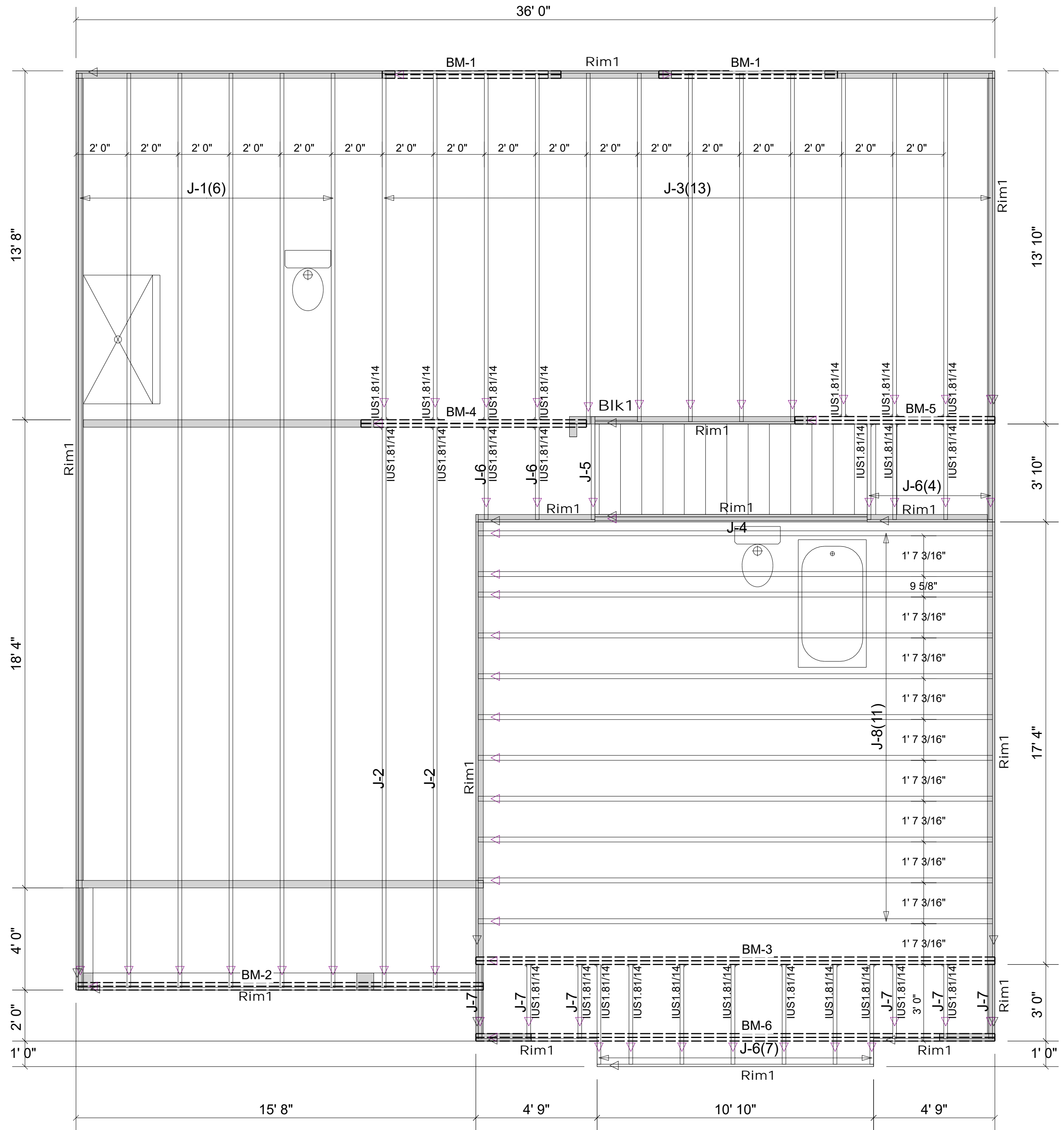
- These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are governed by the provisions of the National Design Specification® for Wood Construction.
- Beams deflect under load. Size holes to provide clearance where required.
- This hole chart is valid for beams supporting uniform load only. For beams supporting concentrated loads or for beams with larger holes, contact Boise® EWP Engineering.



**NOTE PLUMBING DROPS:**  
 PLUMBING SYMBOLS SHOWN ARE APPROXIMATE LOCATIONS ONLY.

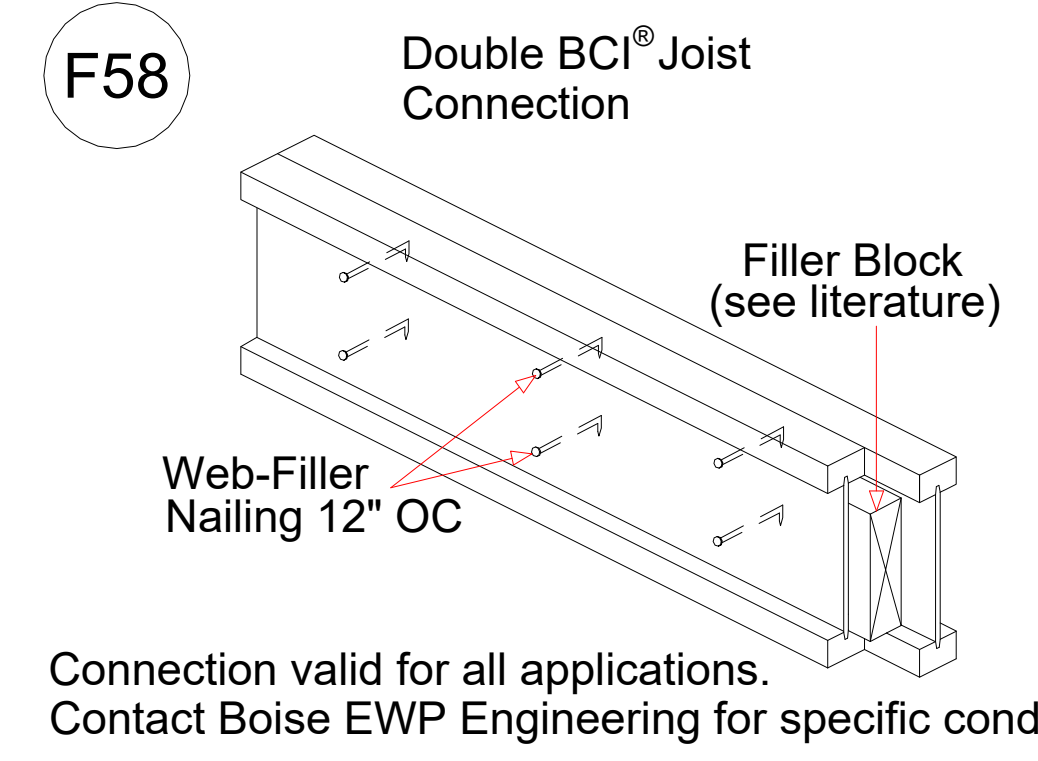
**BUILDER TO FIELD VERIFY ACTUAL LOCATIONS TO AVOID POSSIBLE CONFLICTS WITH JOISTS.**  
 CLEAR DISTANCE FOR FLOOR DECKING NOT TO EXCEED RATING.

**\*\*\* I-JOIST FLANGES ARE NEVER TO BE CUT \*\*\***



Products				
PlotID	Length	Product	Plies	Net Qty
J-1	36' 0"	14" BCI@ 4500s-1.8	1	6
J-2	22' 0"	14" BCI@ 4500s-1.8	1	2
J-3	14' 0"	14" BCI@ 4500s-1.8	1	13
J-4	11' 0"	14" BCI@ 4500s-1.8	1	1
J-5	5' 0"	14" BCI@ 4500s-1.8	1	1
J-6	4' 0"	14" BCI@ 4500s-1.8	1	13
J-7	3' 0"	14" BCI@ 4500s-1.8	1	6
J-8	21' 0"	14" BCI@ 6000s-1.8	1	11
BM-1	8' 0"	1-3/4" x 9-1/2" VERSA-LAM@ 2.0 3100 SP	2	4
BM-2	16' 0"	1-3/4" x 11-7/8" VERSA-LAM@ 2.0 3100 SP	2	2
BM-3	22' 0"	1-3/4" x 14" VERSA-LAM@ 2.0 3100 SP	2	2
BM-4	10' 0"	1-3/4" x 14" VERSA-LAM@ 2.0 3100 SP	2	2
BM-5	8' 0"	1-3/4" x 14" VERSA-LAM@ 2.0 3100 SP	2	2
BM-6	22' 0"	1-3/4" x 16" VERSA-LAM@ 2.0 3100 SP	2	2
Rim1	12' 0"	1-1/8" x 14" BC RIM BOARD OSB	1	17
Blk1	2' 0"	14" BLOCKING	1	1

Connector Summary			
Qty	Manuf	Product	Flange
25	Simpson	IUS1.81/14	None



**NOT FOR CONSTRUCTION**

Client: DR HORTON-RALEIGH

Job: 49786-0229 WOODGROVE

Plan Information: 2164-F

NOT TO SCALE

Drawn By: LSC

Date: / /

Job #: 21-6093-J02

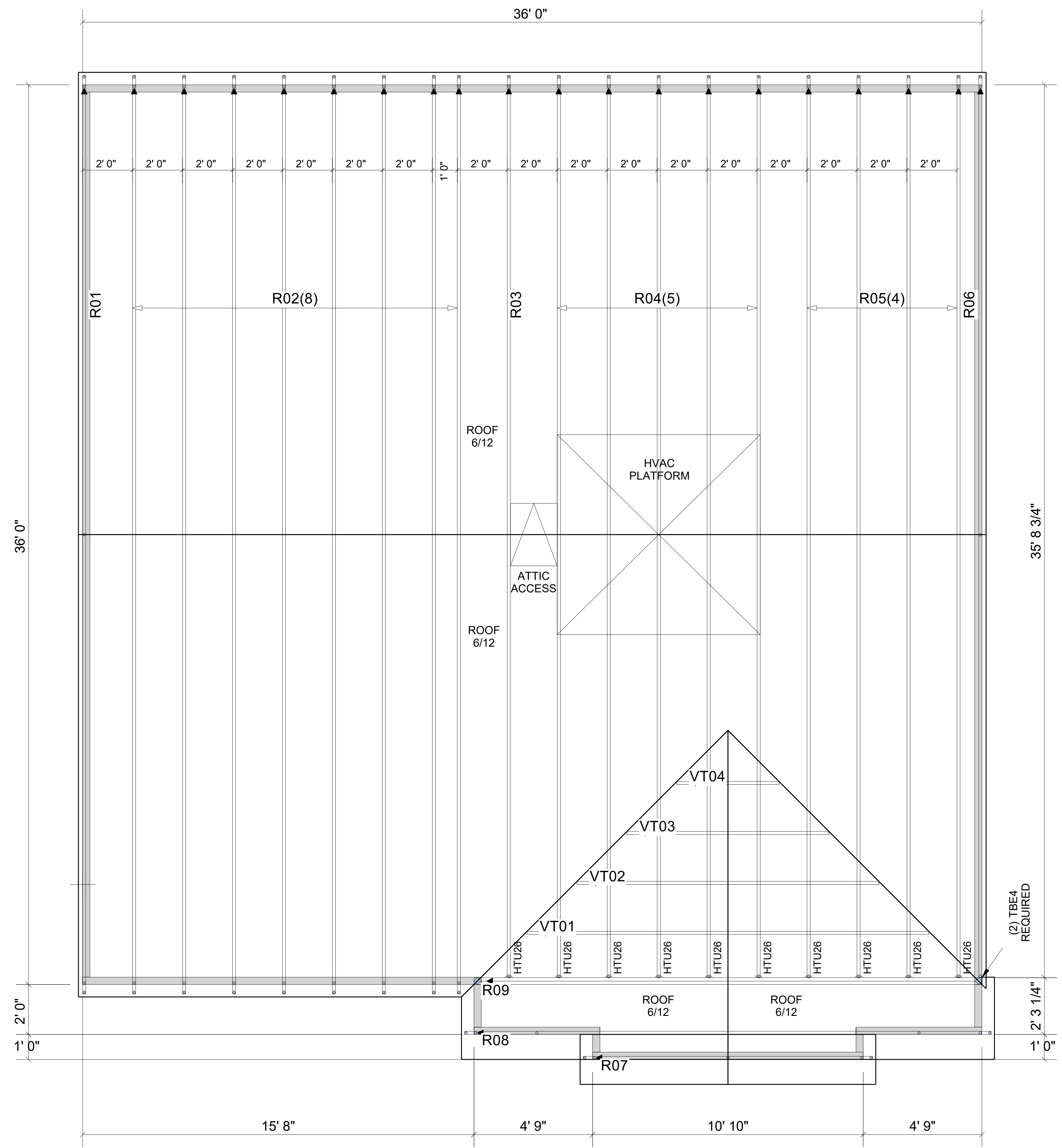
Sales Rep: KYLE GIBSON

Phone:



1998 Cane Gully Road, Moncks Corner SC 29461  
 Phone: (800) 475-3999 Fax (843) 565-3193  
 Web: www.atlantibcs.com





Truss Connector Total List		
Manuf	Product	Qty
	HTU26	10
	TBE4*	2

▲ = LEFT END OF TRUSS

NOT FOR CONSTRUCTION

Client: DR HORTON-RALEIGH		ROOF	
Job: 49786-0229 WOODGROVE			
Plan Information: 2164-F			
NOT TO SCALE	Date: / /		
Drawn By: LSC	Job #: 21-6093-R01	Sales Rep: KYLE GIBSON	
		Phone:	

REVISIONS:



Moncks Corner/Easley, SC (800) 475-3999  
Sparta, NC (336) 372-2226

**WARNING!** Long span trusses, 60' or greater in length, require extreme care and experience for proper and safe handling and installation. For general handling and installation guidance, see the "Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses ("BCSI"), JOINTLY PRODUCED BY SBCA and TPI. For project specific guidance, consult with a registered design professional. ATLANTIC assumes no responsibility for the handling, installation or bracing of trusses.