



DRAWN BY: CJD CHECKED BY: CA

DATE:11/22/2024

PROJ. 24-384

LOWER LEVEL – 25 SQ. FT.

SECOND FLOOR - 964 SQ. FT.

GARAGE

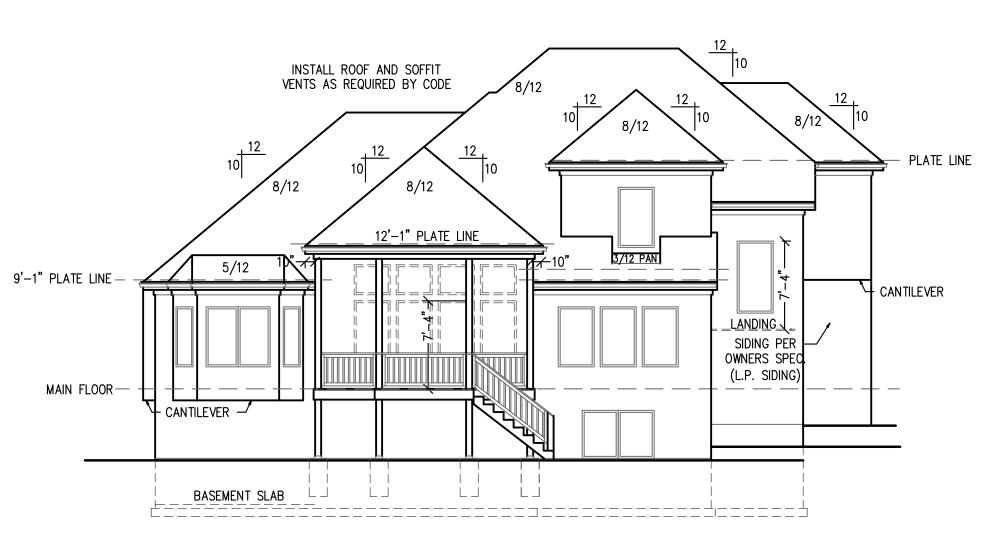
UNFINISHED

264 SQ FT.

650 SQ. FT. 1764 SQ. FT.

<u>DISCLAIMER</u>
ACTUAL PLANS AND ELEVATIONS MAY VARY
FROM ARCHITECTURAL DRAWINGS.
DUE TO TERRAIN/BACKFILL PROCESS.

FRONT ELEVATIONS ARE ARCHITECTURAL DRAWINGS AND MAY VARY DUE TO MATERIAL AVAILABILITY.



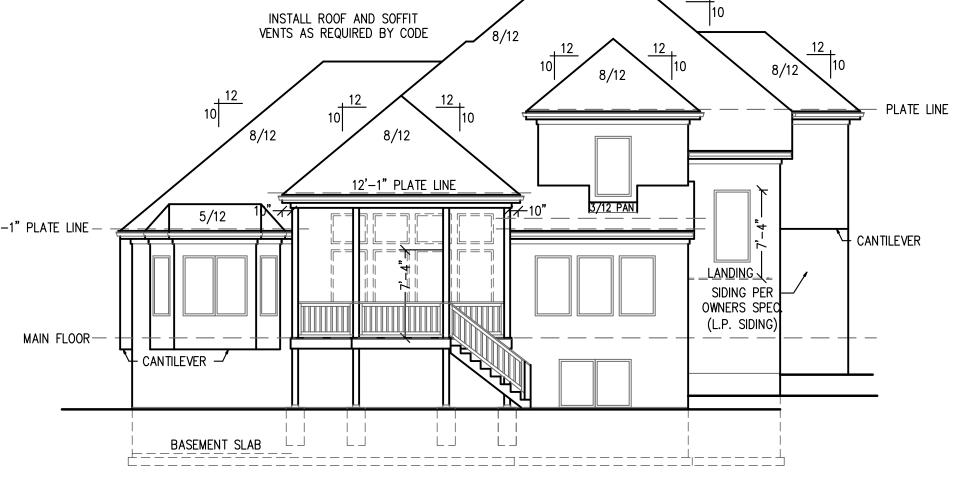
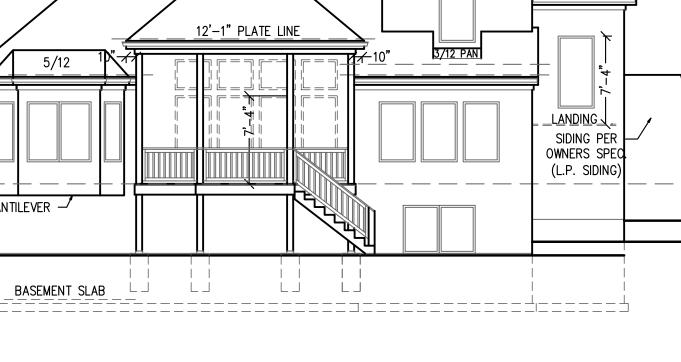


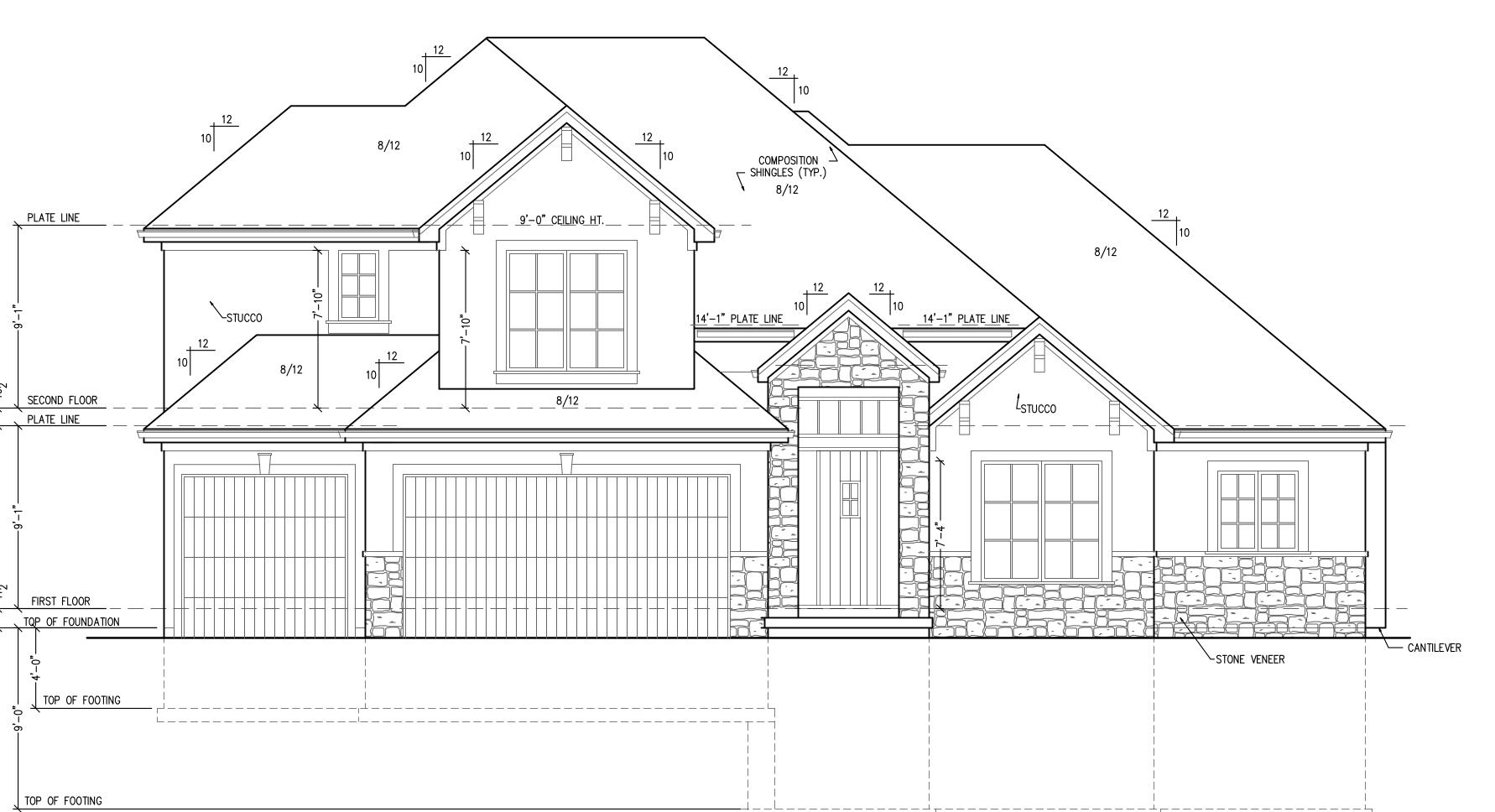
PLATE LINE -

PLATE LINE



# REAR ELEVATION

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



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

10/12

10/12

SIDING PER —/ OWNERS SPEC. (L.P. SIDING)

- ¬\_CANTILEVER—

RIGHT ELEVATION

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

12'-1" PLATE LINE

MAIN FLOOR

AS NOTED FOR PLAN REVIEW DEVELOPMENT SERVICES LEE'S SUMMIT, MISSOURI 01/16/2025

SECOND FLOOR

BASEMENT SLAB

CANTILEVER -

LEFT ELEVATION

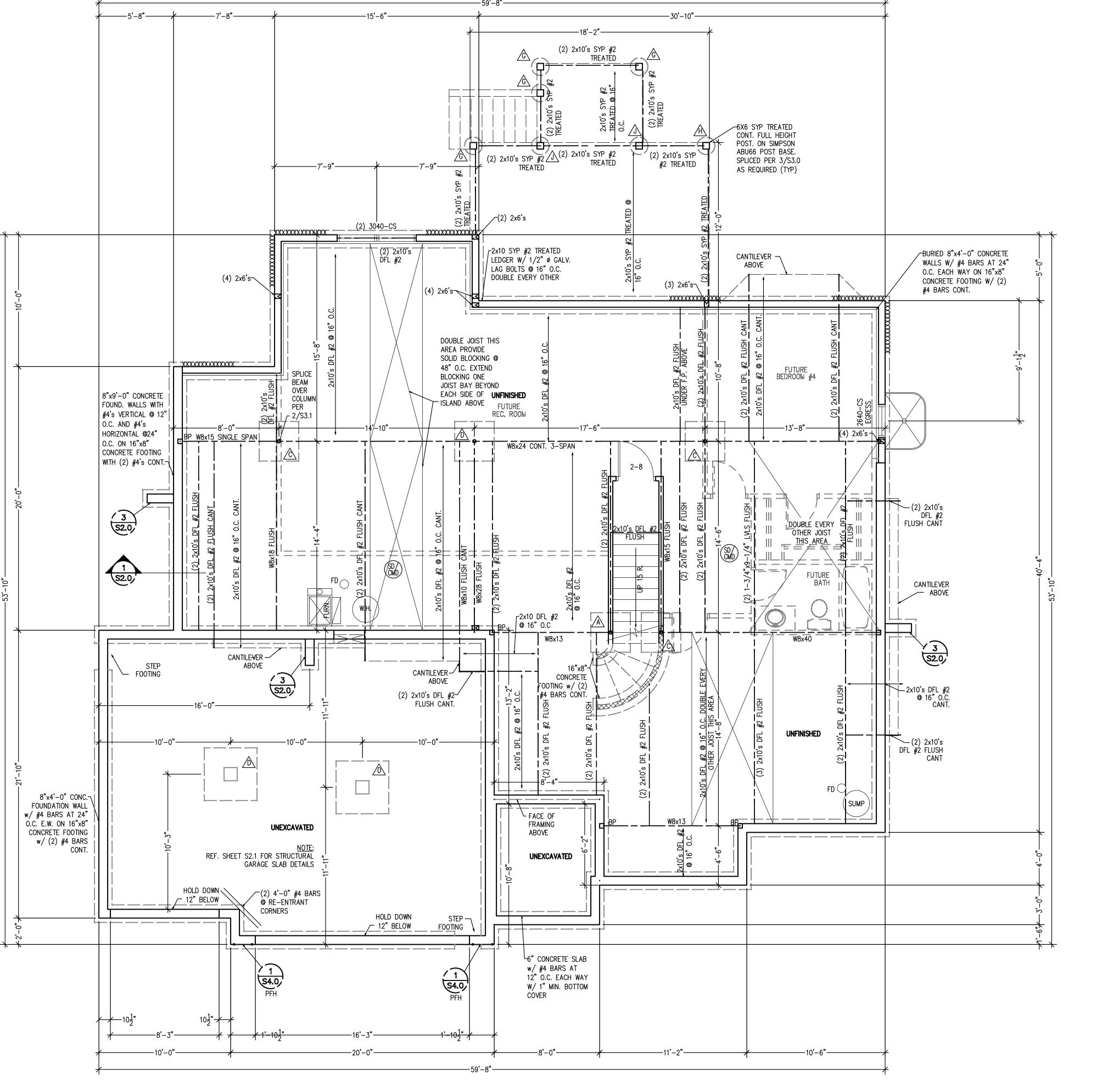
SCALE: 1/8" = 1'-0"

SIDING PER — OWNERS SPEC. (L.P. SIDING)

F------

DATE:11/22/2024





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

# OR

(MIN. 4'-0" SECTION FOR BOTH SIDES.)

UNLESS OTHERWISE NOTED ON THE PLAN

(2)#2-2x10

GRADE DF/L (OR EQ.) - EARING WALL

**BRACED WALL METHODOLOGY** 

XXXX EXTERIOR BRACED WALLS:

- ALL HEADERS AND BEAMS MIN #2

- STRUCTURE NOTED AS FLUSH TO BE FLUSH WITH SUB-FLOOR ABOVE.

//// INTERIOR BRACED WALLS (REF 2-S4.0):

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

GB METHOD: ½" MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH

CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN

COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING

3/4" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d

THICKNESS NOT LESS THAN  $\frac{7}{6}$ " WITH MINIMUM SPAN RATING OF  $\frac{24}{16}$  FOR 24"

OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD. (NOTE: FRAMING MEMBERS 16" OC MAX,UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING

No 6 - 11/4" TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD

COLUMN & PIER PAD SCHEDULE (REF. 5/S2.0)					
COLUMN MARK	PAD SIZE	REINFORCEMENT	COLUMN SIZE		
A	30" x 30" x 12"	(4) #4 BAR E.W.	3" SCH 40 (3.5" OD)		
B	36" x 36" x 12"	(4) #4 BAR E.W.	3" SCH 40 (3.5" OD)		
<u> </u>	42" x 42" x 12"	(5) #4 BAR E.W.	3" SCH 40 (3.5" OD)		
$\triangle$	48" x 48" x 12"	(6) #4 BAR E.W.	3½" SCH 40 (4" OD)		
<u>E</u>	54" x 54" x 16"	(8) #4 BAR E.W.	REF PLAN		
<u></u>	60" x 60" x 16"	(10) #4 BAR E.W.	REF PLAN		

1. COLUMN & PAD SIZES SHOWN ARE FOR MAXIMUM ADJUSTABLE COLUMN HEIGHT OF 9'-1", REQUIRES SEPARATE ENGR'D DESIGN IF GREATER THAN 9'-1" TALL. COLUMNS SIZED AS QWIK-ADJUST COLUMN, BY QUALITY WAY PRODUCTS, LLC. REFER TO SAFE LOADING CAPACITIES PER MANUF SPECS, OR SUBSTITUTION TO ANOTHER PRODUCT ONLY WITH PRIOR APPROVAL BY APEX ENGINEERS. 2. COLUMN & PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM

COLUMN & PIER SCHEDULE				
MARK	COLUMN SIZE PIER DIA.			
A	6x6	12"		
A	6x6	16"		
$\triangle$	6x6	18"		

6x6

6x6

1. ALL PIERS TO BEAR ON ORIGINAL, UNDISTURBED SOIL OF 2,000 PSF BEARING CAPACITY OR FILL COMPACTED AND TESTED TO CONFORM TO THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.

ALLOWABLE SOIL BEARING CAPACITY OF 2,000PSF.

2. PIERS SHALL EXTEND BELOW THE FROST LINE: MIN. DEPTH OF 36" BELOW GRADE. 3. POST SHALL BE TREATED OR CEDAR WITH SIMPSON ABU66 POST BASE

## DETAIL REFERENCES

2 S2.1 STRUCTURAL GARAGE SLAB PIER PAD DETAIL (1) TYPICAL FOUNDATION WALL DETAIL

2 TYPICAL "UNRESTRAINED" FOUNDATION WALL DETAIL

3 STRUCTURAL GARAGE SLAB / WALL SECTION

(3) TYPICAL DEAD MAN DETAIL (\$2.0) FOUNDATION WALL JUMP DETAIL

6 TYPICAL OVERDIG DETAIL AT BASEMENT SLAB 1 ALTERNATE BRACED WALL PANEL S4.0 DETAIL

5 S2.0 COLUMN PAD DETAIL

APA NARROW WALL BRACING METHOD WITHOUT HOLD-DOWNS

1 TYPICAL STRUCTURAL GARAGE S2.1 SLAB PLAN

COLUMN AND PIER PAD SCHEDULE (SHEET S2.0)

## EXPANSIVE SOILS DISCLAIMER:

THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING JURISDICTION. APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS BE EVALUATED BY A

LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOUNDATION ELEMENTS.

GEOTECHNICAL INVESTIGATION AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX. APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING BELOW THE BASEMENT SLAB). BY USE OF THESE PLANS WITHOUT AN

ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT, APEX SHALL NOT BE HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING, DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.

NOTE:
PLANS DESIGNED PER IRC AS ADOPTED BY GOVERNING JURISDICTION

ALL WINDOWS SIZES ARE EXPRESSED

IN FEET AND INCHES TO THE UNIT

<u>STRUCTURAL NOTES:</u>
- ALL UNMARKED HEADERS MIN

**BRACED WALL METHODOLOGY** 

XXXX EXTERIOR BRACED WALLS:

//// INTERIOR BRACED WALLS (REF 2-S4.0):

GRADE DF/L (OR EQ.)
- SEARING WALL

- ALL HEADERS AND BEAMS MIN #2

- STRUCTURE NOTED AS FLUSH TO BE FLUSH WITH SUB-FLOOR ABOVE.

CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)

WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN

GB METHOD: ½" MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA.

O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.

( MIN. 4'-0" SECTION FOR BOTH SIDES.)

COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING

3/4" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d

THICKNESS NOT LESS THAN  $\frac{7}{16}$ " WITH MINIMUM SPAN RATING OF  $\frac{24}{16}$  FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.

(NOTE: FRAMING MEMBERS 16" OC MAX, UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING

No 6 - 11/4" TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD

TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16"

UNLESS OTHERWISE NOTED ON THE PLAN

(2)#2-2x10

KANSAS ENGINEERING LICENSE:

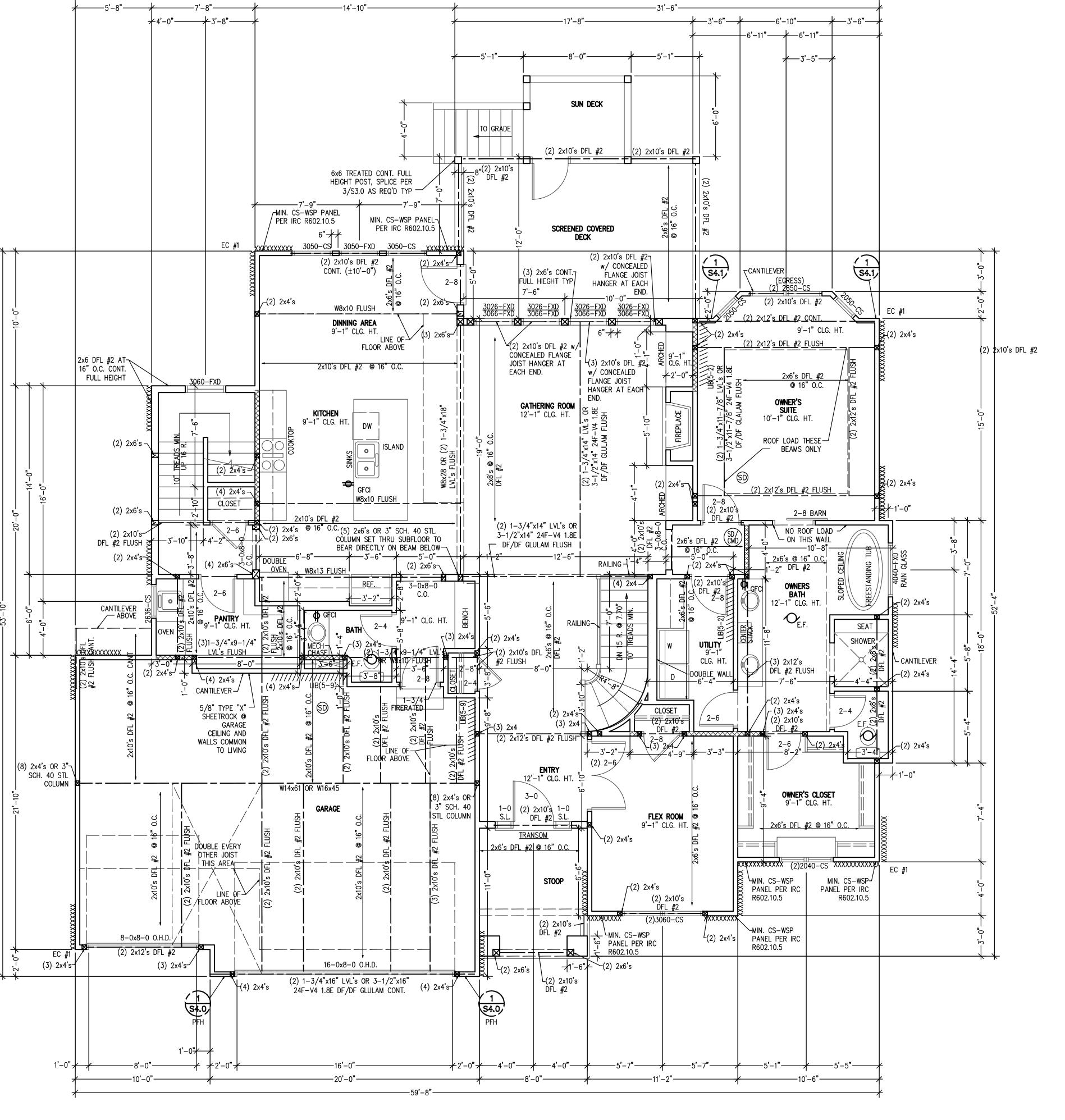
992 MISSOURI ENGINEERING LICENSE:

N BY: CJD

DRAWN BY: **CJD** CHECKED BY: **CA** 

RELEASA FOR CONSTRUCTION
AS NOTED FOR PLAN REVIEW
DEVELOPMENT SERVICES

DATE:11/22/2024



MAIN FLOOR PLAN

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

NOTE:
PLANS DESIGNED PER IRC AS
ADOPTED BY GOVERNING JURISDICTION

ALL WINDOWS SIZES ARE EXPRESSED IN FEET AND INCHES TO THE UNIT



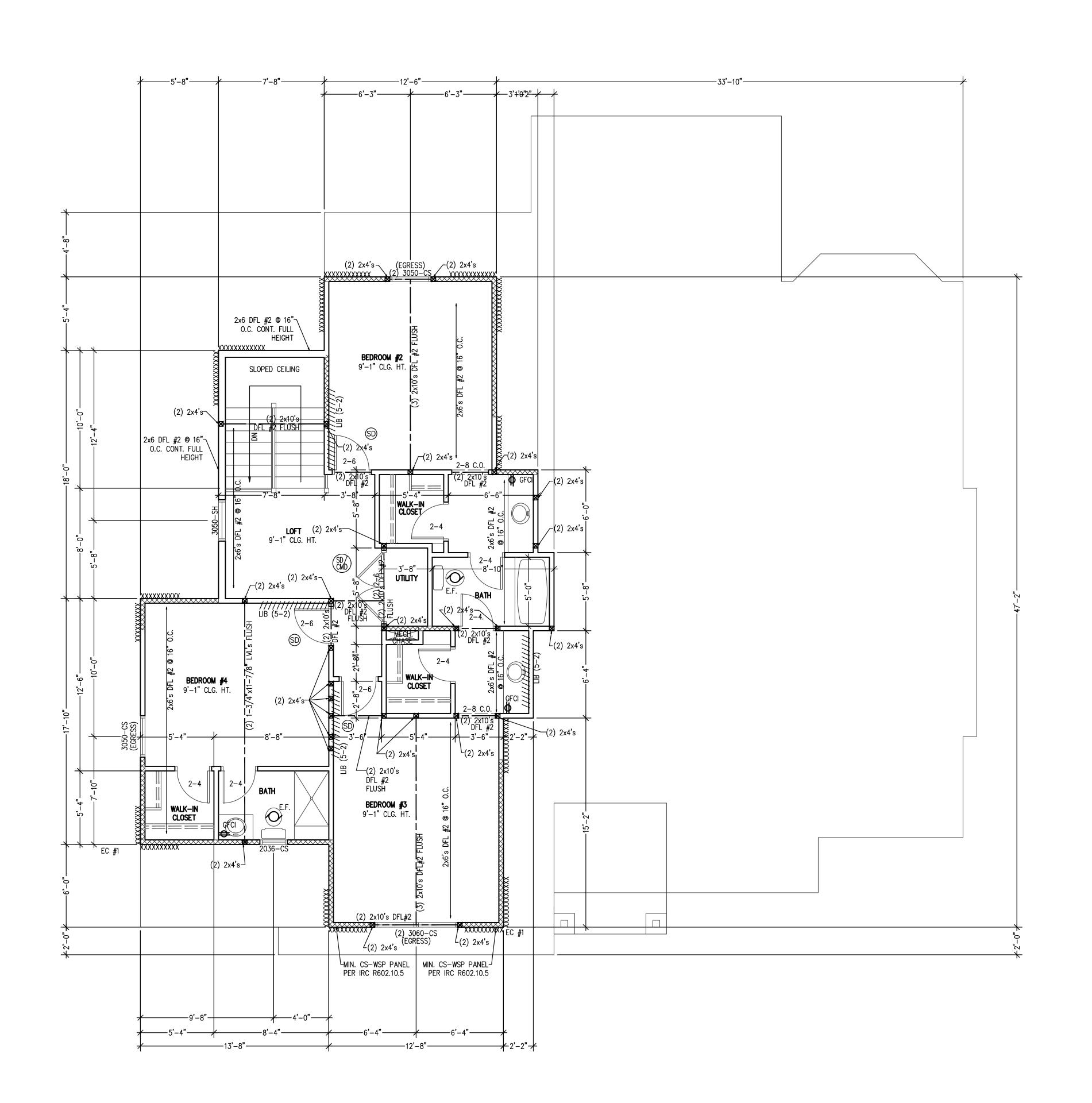
DRAWN BY: CJD CHECKED BY: CA

\*ALL WINDOWS TO HAVE U = 0.4 OR LESS.

ALL WINDOWS SIZES ARE EXPRESSED IN FEET AND INCHES TO THE UNIT SIZE.

DATE:11/22/2024

NOTE:
PLANS DESIGNED PER IRC AS
ADOPTED BY GOVERNING JURISDICTION



SECOND FLOOR PLAN

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

-SLASH IS TOP END OF BRACE -CIRCLE IS BOTTOM END OF BRACE

/ = PURLIN STRUTS AT 48" OC (PER CHART) U.N.O. -SLASH IS TOP END OF BRACE -ARROW IS BEARING LOCATION

— · — · — · — DENOTES BEARING STRUCTURE

THIS IS AN ENGINEERED ROOF STRUCTURE DESIGNED FOR COMPLIANCE WITH IRC 802.3, BUILD AS SHOWN WITH NO DEVIATIONS.

ALL HIPS ARE DESIGNED TO BE

SHEAR AT BEARING WITH MIN 5½" **DEPTH DOES NOT CONTROL** 

STRUCTURAL NOTES:
- ALL UNMARKED HEADERS MIN (2)#2-2x10 - ALL HEADERS AND BEAMS MIN #2 GRADE DF/L (OR EQ.) - STRUCTURE NOTED AS FLUSH TO BE FLUSH WITH SUB-FLOOR ABOVE.

#### ROOF FRAMING NOTES

ROOF DESIGNED FOR LIGHT ROOF COVERING 30psf TOTAL LOAD [10psf DL, 20psf LL (SL)]

ROOF SYSTEM IS DESIGNED TO MEET REQUIREMENTS

\*RAFTERS (HEM-FIR, DOUG-FIR, OR EQUAL): SEE SPAN CHARTS BELOW

CODE MINIMUM	1	
RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	11'-7"
#2-2x6	AT 16" OC	14'-2"
#2-2x8	AT 24" OC	14'-8"
#2-2x8	AT 16" OC	17'-11"
#2-2x10	AT 24" OC	17'-10"
#2-2x10	AT 16" OC	21'-11"

NOTE: CODE MINIMUM ALLOWS FOR A RAFTER DEFLECTION OF L/180 TOTAL LOAD

#### HIGHER PERFORMANCE

RAFTERS	SPACING	MAX HORIZONTAL CLEARSPAN
#2-2x6	AT 24" OC	8'-6"
#2-2x6	AT 16" OC	9'-9"
#2-2x8	AT 24" OC	11'-3"
#2-2x8	AT 16" OC	12'-9"
#2-2x10	AT 24" OC	14'-3"
#2-2x10	AT 16" OC	16'-3"

APEX ENGINEERS, INC. RECOMMENDED DEFLECTION = L/360 LIVE LOAD, L/240 TOTAL LOAD

\*RIDGE BOARDS ARE (UNLESS OTHERWISE NOTED) #2-2x10 UP TO 9:12 PITCH

#2-2x12 OVER 9:12 PITCH \*ALL HIPS AND VALLEYS ARE (UNLESS OTHERWISE NOTED)

#2-2x10 UP TO 9:12 PITCH #2-2x12 OVER 9:12 PITCH

#2-2X10 HIP/VALLEY, MAX CLEAR SPAN: 11'-11"

#2-2X12 HIP VALLEY, MAX HORIZ. CLEAR SPAN: 12'-11" \*PURLINS ARE 2x6 MIN

- PURLIN STRUTS ARE AT 4'-0" OC - PURLIN STRUTS SHALL BE INSTALLED AT NOT LESS THAN A 45 DEGREE ANGLE WITH THE HORIZONTAL - ALL PURLIN STRUTS SHALL HAVE A MAX UNBRACED

LENGTH OF 8'-0" - PURLIN STRUTS SHALL BE CONSTRUCTED IN A "T" CONFIGURATION AND PER THE FOLLOWING CHART:

PURLIN STRUT	MAX PURLIN STRUT LENGTH	
(2)2x4	8'-0"	
(1)2x4 AND (1)2x6	12'-0"	
(1)2x6 AND (1)2x8	20'-0"	
(2)2x6 AND (1)2x8	30'-0"	
CONSULT ARCH ENGR	>30'-0"	

\*EACH END OF STRUT SHALL BE FASTENED WITH MIN (3)8d

OR (2)16d NAILS
\*RIDGE BRACERS ARE SAME AS PURLIN BRACES-SPACING,
SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN

BRACE NOTES ABOVE) \*HIP AND VALLEY BRACES ARE THE SAME AS PURLINS SIZE, CONFIGURATION, AND INSTALLATION (SEE PURLIN BRACE

= ROOF BRACE/STRUT (PER CHART)

XXXXXXXXX DENOTES BEARING WALL ---- DENOTES PURLIN

CONTROLLED BY BENDING.

**DESIGN. FOR VALLEYS REF 4/S3.2** 

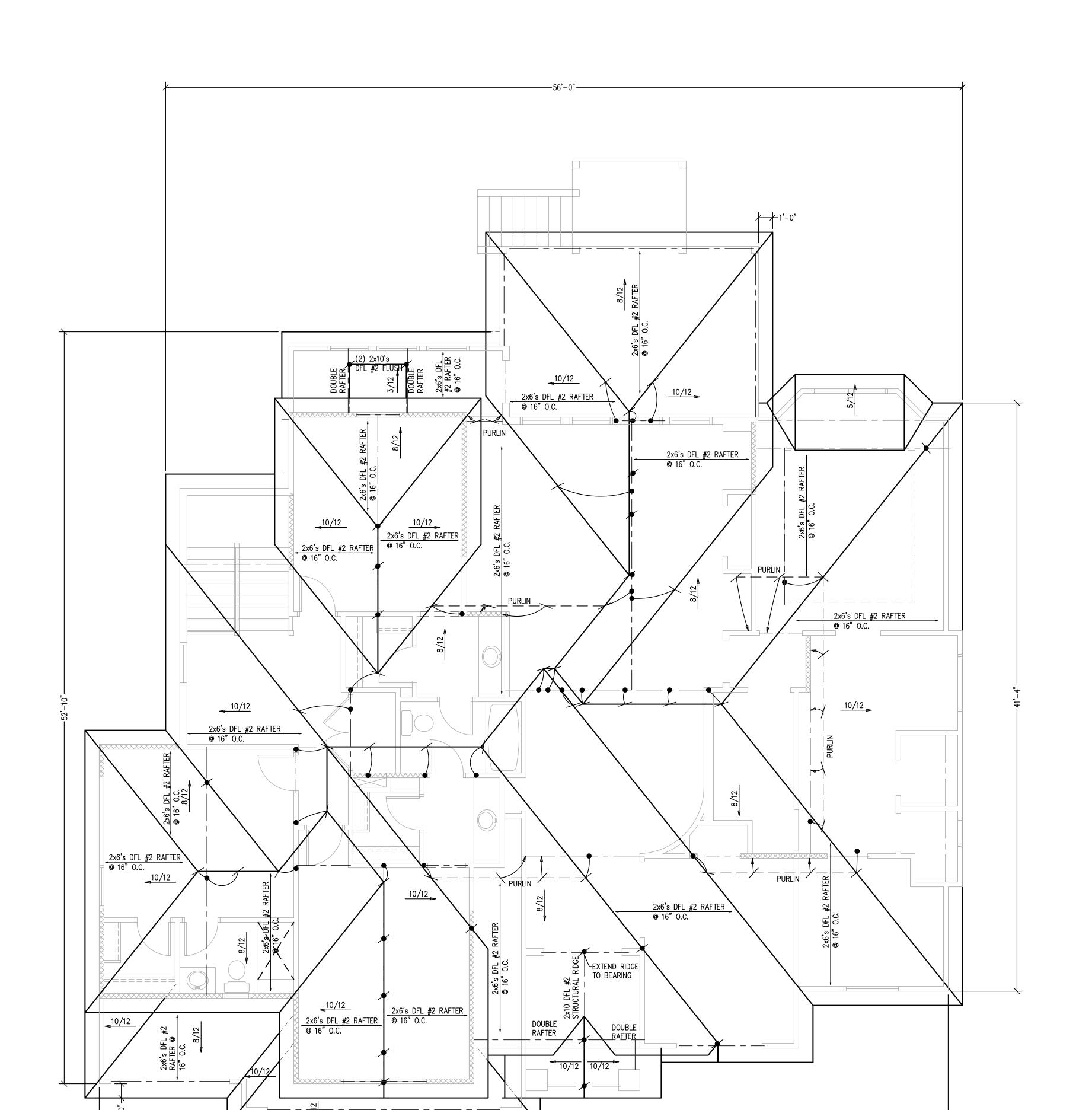
DRAWN BY: CJD CHECKED BY: CA

DATE:11/22/2024

NOTE:
PLANS DESIGNED PER IRC AS
ADOPTED BY GOVERNING JURISDICTION



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



BUILDING COMPONENT	MATERIAL	FASTENING
7/16" PLYWOOD		16 GA x 1-3/4" STAPLES AT 3"
ROOF SHEATHING <sup>1</sup>	1x4 #3 FURRING	OC EDGES AND 6" OC IN FIELD  1/2" CROWN STAPLES
	TAT HOT ORKING	8d COMMON NAILS AT 6" OC EDGES
FLOOR SHEATHING <sup>1</sup>	3/4" T&G YELLOW PINE PLYWOOD OOR SHEATHING1 APPLIED PERPENDICULAR TO JOISTS AND ENDS STAGGERED AND 12" OC IN THE FIELD 14 GA x 2" STAPLES AT 4" OC EDGES AND 8" OC IN THE FIELD 12.5 GA x 1-1/2" RING OR SCREW SHANK NAILS AT 6" OC EDGES	
CEILING COVERING <sup>1</sup>	1/2" GYPSUM SHEATHING	AND 8" OC IN THE FIELD  7" OC NAILED / 12" OC SCREWED WITH  13 GA, 1-3/8" LONG, 19/64" HEAD; 0.098  DIA, 1-1/4" LONG, ANGRINGED; 5d  COOLER NAIL, 0.086 DIA, 1-5/8" LONG,  15/64" HEAD; OR GYP BD NAIL, 0.086 DIA,  1-5/8" LONG, 9/32" HEAD
INTERIOR WALL COVERING <sup>1</sup>	1/2" GYPSUM SHEATHING	6d COMMON NAILS; 1-5/8" GALVANIZED STAPLES; 1-1/4" SCREWS, TYPE W OR S- AT 4" OC EDGES AND 8" OC IN THE FIELD
EXTERIOR WALL SHEATHING	MIN 3/8" APA RATED SHEATHING	8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN THE FIELD
CONVENTIONAL WOOD FRAMED WALLS	*SUPPORTING 2 FLOORS, ROOF, AND CEILING OR LESS. *HEIGHT: 10'-0" OR LESS SIZE: NOM 2x4 (NOM 2x6 WHEN SUPPORTING 2 FLOORS, CEILING, AND ROOF) *SPECIES: DOUG-FIR, HEM-FIR, SOUTH PINE, SPRUCE-PINE-FIR *MAXIMUM SPACING 16" OC *STUDS 10' LENGTH OR LESS SHALL BE #3 STANDARD, OR STUD GRADE *STUDS OVER 10' LENGTH SHALL BE MIN #2 GRADE	*TOE NAIL RIM JOIST TO SILL OR TOP PLATE:  *TOE NAIL STUD TO TOP AND SOLE PLATE:  *END NAIL TOP AND SOLE PLATE TO STUD:  *FACE NAIL BUILT-UP CORNER STUDS:  *FACE NAIL BUILT-UP CORNER STUDS:  *FACE NAIL BUILT-UP CORNER STUDS:  *FACE NAIL JACK STUDS/TRIMMERS  SUPPORTING HEADERS WITH:  *FACE NAIL DBL TOP PLATE:  *DBL TOP PLATES WITH MIN 48" OFFSET OF EACH. FACE NAIL LAPPED AREA WITH:  *FACE NAIL DBL TOP PLATES AT LAPPED CORNERS AND INTERSECTIONS WITH:  *FACE NAIL SOLE PLATE TO FRAMING SYSTEM WITH:  *TOENAIL BRIDGING TO JOIST, EACH END:  *FACE NAIL LEDGER STRIPS SUPPORTING JOISTS OR RAFTERS WITH:  (8) 16d COMMON; (4) 3"x0.131" AT 6" OC; 3"x0.131" AT 12" OC  10d NAILS AT 6" OC  16d COMMON AT 16" OC; 3"x0.131" AT 12" OC  16d COMMON; (12) 3"x0.131"; (12) 3"x0.128"  (2) 16d COMMON; (3) 3"x0.131"; (3) 3"x0.128"  16d COMMON AT 16" OC; 3"x0.131" AT 12" OC  16d COMMON; (12) 3"x0.131"; (3) 3"x0.128"  16d COMMON; (2) 3"x0.131"; (3) 3"x0.128"  16d COMMON; (4) 3"x0.131"; (4) 3"x0.128"
CONVENTIONAL WOOD HEADER FRAMING	PER PLAN	*TOE NAIL HEADERS TO WALL STUDS WITH (4) 8d NAILS AT EACH END. *FACE NAIL DOUBLE PIECE HEADERS WITH 16d NAILS AT 16" CENTERS ALONG EACH EDGE.
RAFTER TIES <sup>2</sup>	MIN 2x4 MEMBERS AT EACH RAFTER	REF TABLE R802.5.2
		FACENAIL TO RAFTERS IN UPPER 1/3 OF ATTIC SPACE WITH (3) 10d NAILS AT EACH AR TO JOISTS AND ENDS STAGGERED. DGE HAS BEEN PROVIDED AND ADEQUATELY
ESIGNED (AS IN A FULLY VA	ULTED ROOM). SUCH SHALL BE NOTED	O AS "STRUCTURAL" ON THE PLAN.
BUILDING COMPONENT	FASTEN TO	FASTEN WITH
RAFTERS	TO RIDGE/VALLEY/HIP RAFTERS	TOENAIL WITH (4) 16d ENDNAIL WITH (3) 16d
RAFTERS	TO PLATE	TOENAIL WITH (2) 16d
	TO TOP PLATE	TOENAIL WITH (3) 8d AT EACH END
CEILING JOISTS		OISTS RUN PARALLEL TO RAFTERS
	TO SILL OR GIRDER	O RAFTERS WITH (3) 10d MIN  TOENAL WITH: (3) 8d COMMON; (3) 3"x0.131"; (4) 3"x0.12
FLOOR JOISTS	TO RIM JOIST	ENDNAIL WITH: (3) 16d COMMON; (4) 3"x0.131"; (4) 3"x0.1
RACED WALL PANELS	TO FRAMING MEMBER	SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x0.131"
RP TO FRAMING EMBERS ABOVE/BELOW: ARALLEL TO FRAMING EMBERS ABOVE/BELOW:	TO FRAMING AND BLOCKING AT 16" OC	TOP PL, 6" OC WITH: 8d COMMON; 3"x0.131"  SOLE PL, 16" OC WITH: (3) 16d COMMON; (4) 3"x0.131"  AND AT EACH BLOCK: (3) 16d COMMON; (4) 3"x0.131"  TOP PL, 6" OC WITH: 8d COMMON; 3"x0.131"  AND AT EACH BLOCK: (3) 8d COMMON; 3"x0.131"

## **GLAZING**

GLAZING IN HAZARDOUS LOCATIONS AS IDENTIFIED IN IRC SECTION R308.4 SHALL BE OF APPROVED SAFETY GLAZING MATERIALS: GLASS IN STORM DOORS; INDIVIDUAL FIXED OR OPENABLE PANELS ADJACENT TO A DOOR WHERE THE NEAREST VERTICAL EDGE IS WITHIN A 24" ARCH OF THE DOOR IN A CLOSED POSITION AND WHOSE BOTTOM EDGE IS WITHIN 60" OF THE FLOOR; WALLS ENCLOSING STAIRWAYS AND LANDINGS WHERE THE GLAZING IS WITHIN 60" OF THE TOP OR BOTTOM OF THE STAIR; ENCLOSURES FOR SPAS, TUBS, SHOWERS, AND WHIRLPOOLS; GLAZING IN FIXED OR OPENABLE PANELS EXCEEDING 9 SQUARE FEET AND WHOSE BOTTOM EDGE IS LESS THAN 18" ABOVE THE FLOOR OR WALKING SURFACE WITHIN 36".

#### **ENERGY REQUIREMENTS**

1. LIGHTING FIXTURES PENETRATING THE THERMAL ENVELOPE SHALL BE IC-RATED, LEAKAGE RATED, AND SEALED TO THE GYPSUM WALLBOARD AS REQUIRED PER N1102.4.5.

2. PROGRAMMABLE THERMOSTATS SHALL BE INSTALLED AS REQUIRED PER

3. AIR HANDLERS SHALL BE RATED FOR MAXIMUM 2% AIR LEAKAGE RATE PER 4. BUILDING FRAMING CAVITIES SHALL NOT BE USED AS DUCTS OR

5. HOT WATER PIPES SHALL BE INSULATED AS REQUIRED PER N1103.4. 6. ALL EXHAUST FANS SHALL TERMINATE TO THE BUILDING EXTERIOR AS REQUIRED PER M1501.1.

PLENUMBS PER N1103.3.5

7. MAKEUP AIR SYSTEMS SHALL BE INSTALLED FOR KITCHEN EXHAUST HOODS THAT EXCEED 400 CFM AS REQUIRED PER M1503.6. 8. AN AIR HANDLING SYSTEM SHALL NOT SERVE BOTH THE LIVING SPACE AND THE GARAGE PER M1601.6.

#### **ENERGY CONSERVATION**

THE ENERGY EFFICIENCY OF THE DWELLING SHALL COMPLY WITH THE FOLLOWING TABLE(S) (WHERE THERE ARE DISCREPANCIES BETWEEN THIS TABLE AND THE PLÀNS, THE MOST RESTRICTIVE SHALL APPLY). IF TABLE 1 IS NOT COMPLETED AND ACCOMPANIED BY RESCHECK CALCULATIONS, THEN TABLE 2 SHALL BE APPLIED.

DIUI DINO EL EMENT	BAILLY/ALLIE
BUILDING ELEMENT	MIN VALUE
WALLS - FRAMED	R-
WALLS - BASEMENT	R-
FLOORS - UNCONDITIONED SPACE	R-
FLOORS - OVER OUTSIDE AIR	R-
FLOORS - CRAWL SPACE	R-
SLAB - PERIMETER	R-
CEILING - FLAT	R-
CEILING - CATHEDRAL	R-
DOORS - GLASS	U-
DOORS - SOLID	U-
WINDOWS - OPERABLE	U-
WINDOWS - FIXED	U-
WINDOWS - OTHER	U-
FURNACE	AFUE-
AIR CONDITIONER	SEER-

NOTE: FOR USE OF TABLE 1 A ResCheck COMPLIANCE FORM MUST BE SUBMITTED WITH PLANS. TABLE 2 - PRESCRIPTIVE ENVELOPE (MIN PRESCRIPTIVE APPROACH ACCEPTABLE FOR ANY DWELLING.) **BUILDING ELEMENT MIN VALUE** 

02.2	1
CEILING - CATHEDRAL**	R-30
CEILING - CATHEDRAL	R-38
FLOORS - UNCONDITIONED SPACED	R-19
FLOORS - OVER OUTSIDE AIR	R-30
WALLS - BASEMENT	R-10 (CONT) OR R-13 (CAVITY)
CONCRETE SLAB ON GRADE	R-10 (FOR 2FT)
SKYLIGHTS	U=0.55
WALLS - EXTERIOR (2x4)	R-13 (CAVITY) + R-5 (CONT)
WALLS - EXTERIOR (2x6)	R-20
WALLS - CRAWL SPACE	R-19
GLAZING*	U<=0.32
GLAZING*	SHGF<=0.40

TABLE 2 PER IRC TABLE N1102.1.2 \*DEFAULT U-FACTOR FOR DOUBLE PANE, ARGON FILLED LOW-E

## **DEFERRED SUBMITTALS**

\*LIMITED TO AREAS LESS THAN 500 SQ-FT OR 20% OF CEILING AREA.

1. THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE PLANS FOR REVIEW BY THE BUILDING OFFICIAL. DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN THE GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL. DEFERRED SUBMITTALS ARE DEFINED AS THOSE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF THE APPLICATION AND THAT ARE TO BE SUBMITTED TO THE BUILDING OFFICIAL WITH A SPECIFIED PERIOD. DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE THE PRIOR APPROVAL OF THE BUILDING OFFICIAL.

2. DEFERRED SUBMITTAL ITEMS (WHEN APPLICABLE):

A. TRUSSES

**CEILING - FLAT** 

- B. I-JOISTS
- C. GUARDRAILS AND HANDRAILS
- D. STEEL FABRICATED STAIRS E. PRE-MANUFACTURED CANOPIES AND AWNINGS
- F. PRECAST HOLLOW CORE SLABS
- G. GROUND IMPROVEMENT AND/OR STRUCTURAL FOUNDATION SOLUTIONS (SUCH AS DRILLED PIERS)

#### CONCRETE SCHEDULE MINIMUM STRUCTURAL CONCRETE COVER **COVER** FORMED SURFACES EXPOSED TO GROUND OR WEATHER UNFORMED SURFACE IN CONTACT WITH THE GROUND WALLS AND SLABS NOT EXPOSED TO GROUND OR WEATHER INTERIOR BEAMS AND COLUMNS (TO TIES OF STIRRUPS) 1 1/2" **EPOXY GROUTING APPLICATIONS** THREADED ROD ANCHORS HILTI HIT-HY 200 A OR SIMPONS SET XP HILTI HIT-HY 200 R OR SIMPONS SET XP REINFORCING BARS CONCRETE USE 28 DAY STRENGTH TYPE W/C RATIO SLUMP % AIR LIMIT (in.) ENTRAINED 3000 psi | N/A | 0.55 (MAX) | 5" (+/-1") | 6% +/- 1%

FOUNDATION WALLS | 3500 psi | N/A | 0.50 (MAX) | 4" (+/-1") | 6% +/- 1%

INTERIOR SLABS | 4000 psi | N/A | 0.50 (MAX) | 3" (+/-1") | 3% MAX

SUSPENDED SLABS | 4000 psi | N/A | 0.50 (MAX) | 3" (+/-1") | 3% MAX

#### **EMERGENCY EGRESS AND RESCUE**

1. PROVIDE ONE WINDOW FROM EACH BEDROOM THAT HAS A MINIMUM OPENABLE AREA OF 5.7 SQUARE FEET WITH A MINIMUM OPENABLE HEIGHT OF 24 INCHES AND WIDTH OF 20 INCHES.

2. BASEMENT EGRESS TO MEET THE REQUIREMENTS OF IRC SECTION 310. 3. SMOKE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R314. 4. PROVIDE SMOKE ALARMS IN EACH SLEEPING ROOM, OUTSIDE OF EACH SLEEPING AREA. ON EACH FLOOR INCLUDING BASEMENTS AND HABITABLE ATTICS, AND NOT LESS THAN 3'-0" HORIZONTALLY FROM DOOR OR OPENING OF A BATHROOM THAT CONTAINS A BATHTUB OR SHOWER. ALARMS SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM

WILL ACTIVATE ALL OF THE ALARMS IN THE DWELLING. 5. CARBON MONOXIDE ALARMS SHALL BE INSTALLED AS REQUIRED PER IRC 2018 SECTION R315.

6. CARBON MONOXIDE ALARMS SHALL BE INSTALLED OUTSIDE OF EACH SEPARATE SLEEPING AREA. WHERE A FUEL-BURNING APPLIANCE IS LOCATED WITHIN A BEDROOM OR ITS ATTACHED BATHROOM, A CARBON MONOXIDE ALARM SHALL BE INSTALLED WITHIN THE BEDROOM.

#### FRAMING GENERAL

1. ALL LUMBER SIZES ARE FOR DOUGLAS FIR-LARCH UNLESS NOTED OTHERWISE 2. ALL HEADERS TO BE MIN (2) #2-2x10 UNLESS NOTED OTHERWISE. 3. BLOCK CANTILEVERS, DOORJAMBS, AND OVER BEAMS.

4. ALL HEADERS TO BEAR ON A MINIMUM OF (2) 2x4 STUD POSTS UNLESS NOTED **OTHERWISE** 5. INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE.

6. WHERE JOISTS RUN PARALLEL TO FOUNDATION WALLS, SOLID BLOCKING FOR A MINIMUM OF (2) JOIST SPACES BE PROVIDED TO A MAXIMUM OF 2'-0" CENTERS TO TRANSFER LATERAL LOADS ON THE WALL TO THE FLOOR DIAPHRAGM. THE BLOCKING SHALL BE SECURELY NAILED TO THE JOISTS AND FLOORING. NAIL JOISTS AND BLOCKING TO SILL PLATE WITH (3) 10d NAILS (IRC SECTION R602.3.(1) 7. IF DUCTS ARE INSTALLED IN THE FIRST JOIST SPACE(S), NAIL 2x4s FLAT AT 2'-0" CENTERS WITHIN THE JOIST SPACE(S) AND THEN PROVIDE SOLID BLOCKING. INSTALLED UPRIGHT, IN THE NEXT TWO JOIST SPACES. SECURE THE 2x4s TO THE

SILL PLATE WITH (4) 10d NAILS. 8. ALL SILLS AND SLEEPERS SUPPORTED ON CONCRETE OR MASONRY AND FURRING ATTACHED TO CONCRETE OR MASONRY SHALL BE OF DECAY RESISTANT MATERIALS.

9. JOISTS UNDER BEARING PARTITIONS SHALL BE DOUBLED AND COMPLY WITH IRC SECTION R502.4.

10. JOISTS FRAMING FROM OPPOSITE SIDES OVER BEARING SUPPORTS SHALL LAP A

1. THE FOUNDATION DESIGN SHALL BE BASED ON A MINIMUM SOIL BEARING MINIMUM 3" AND SHALL BE NAILED TOGETHER WITH A MINIMUM 10d FACE NAILS. 11. JOISTS FRAMING INTO A WOOD GIRDER OR BEAM SHALL BE SUPPORTED BY APPROVED FRAMING ANCHORS OR MINIMUM 2"x2" LEDGER STRIPS. 12. FRAMING OF OPENINGS - HEADERS AND TRIMMERS SHALL BE OF SUFFICIENT CROSS SECTION TO SUPPORT THE FLOOR FRAMING. TRIMMER JOISTS SHALL BE DOUBLED WHEN THE HEADER IS SUPPORTED MORE THAN 3'-0" FROM THE TRIMMER JOIST BEARING. WHEN THE HEADER SPAN EXCEEDS 4'-0", THE

HEADER AND TRIMMER SHALL BE DOUBLED. 13. JOISTS AT SUPPORTS SHALL BE SUPPORTED LATERALLY AT THE ENDS BY FULL-DEPTH SOLID BLOCKING NOT LESS THAN 2" NOMINAL THICKNESS OR BY ATTACHMENT TO A HEADER, BAND OR RIM JOIST OR TO AN ADJOINING STUD OR OTHERWISE PROVIDED WITH LATERAL SUPPORT TO PREVENT ROTATION. 14. WATER-RESISTIVE BARRIER SHALL BE PROVIDED OVER ALL EXTERIOR WALLS. ONE LAYER OF No 15 ASPHALT FELT OR ANY OTHER BARRIER THAT MEETS ASTM D226 TYPE 1 FELT. (R703.2)

15. WHERE CEILING JOISTS ARE NOT INSTALLED CONNECTED TO THE RAFTERS AT THE TOP PLATE AND/OR WHERE CEILING JOISTS ARE NOT INSTALLED PARALLEL TO THE RAFTERS, RAFTER TIES SHALL BE INSTALLED IN THE LOWER 1/3 OF THE ATTIC SPACE AND IN ACCORDANCE WITH TABLE 1-S1.0. 16. COLLAR TIES SHALL BE PROVIDED IN THE UPPER 1/3 OF THE ATTIC SPACE IN ACCORDANCE WITH TABLE 1-S1.0.

## **GARAGE**

1. THE GARAGE FLOOR SHALL SLOPE TOWARDS THE GARAGE DOORWAYS. 2. DOORS BETWEEN THE GARAGE AND THE DWELLING - MINIMUM 1-3/8" SOLID CORE OR HONEY COMBED STEEL DOOR OR 20-MINUTE FIRE RATED. 3. THE GARAGE SHALL BE SEPARATED FROM THE RESIDENCE AND ITS ATTIC AREA BY 5/8", TYPE X GYPSUM BOARD, OR EQUIVALENT MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION, APPLIED TO GARAGE SIDE. WHERE THE SEPARATION IS A FLOOR-CEILING ASSEMBLY, THE STRUCTURE SUPPORTING THE SEPARATION SHALL ALSO BE PROTECTED BY 5/8", TYPE X GYPSUM BOARD, OR MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION OR EQUIVALENT, APPLIED TO THE GARAGE SIDE. PULL DOWN STAIRS LOCATED WITHIN GARAGE SHALL BE RATED TO BE ADEQUATELY PROTECTED WITH MATERIALS APPROVED FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION. ATTIC ACESS PANELS LOCATED WITHIN GARAGE SHALL BE OF 5/8", TYPE X GYPSUM BOARD, OR MATERIALS FOR ONE-HOUR FIRE-RESISTIVE CONSTRUCTION.

4. GARAGE DOOR AND FRAME- THE H-FRAME FOR THE ATTACHMENT OF THE TRACK AND COUNTER BALANCE SHALL CONSIST OF THE FOLLOWING: 2x6 VERTICAL JAMBS RUNNING FROM THE FLOOR TO CEILING ATTACHED WITH 1-3/4" x 0.120" NAILS AT 7" OC STAGGERED WITH (7) 3-1/4" x 0.120" NAILS THRU THE JAMB INTO THE HEADER, MINIMUM 2x8 HEADER FOR ATTACHMENT OF COUNTER BALANCE SYSTEM.

5. SELF-CLOSING DEVICES SHALL BE INSTALLED FOR GARAGE AND/OR DWELLING SEPARATION DOORS PER R302.5.1.

## **STAIRWAYS**

1. STAIRWAYS SHALL PROVIDE A MAXIMUM 7-3/4" RISE AND MINIMUM 10" RUN. 2. PROVIDE MINIMUM 36" GUARDRAILS ON THE OPEN SIDES OF RAISED FLOORS, PORCHES, AND BALCONIES; MINIMUM 34" GUARDRAILS ON THE OPEN SIDES OF STAIRWAYS LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE BELOW. GUARDRAIL ENCLOSURES SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL PATTERNS THAT DO NOT ALLOW PASSAGE OF A SPHERE 4" IN DIAMETER. 3. EACH STAIRWAY OF THREE OR MORE RISERS SHALL PROVIDE A CONTINUOUS HANDRAIL ON AT LEAST ONE SIDE BETWEEN 34" AND 38" ABOVE THE NOSING OF

THE TREADS. 4. HANDRAILS SHALL HAVE A CIRCULAR CROSS SECTION OF 1-1/4" MINIMUM TO 2" MAXIMUM OR OTHER APPROVED GRASPABLE SHAPER PER IRC SECTION

5. PROVIDE A MINIMUM 6'-8" OF HEADROOM CLEARANCE IN STAIRWAYS. 6. ENCLOSED ACCESSIBLE SPACE UNDER STAIRWAYS SHALL HAVE WALLS AND THE UNDERSIDE OF THE STAIR AND LANDING PROTECTED WITH 1/2" GYPSUM BOARD ON ENCLOSURE SIDE PER IRC SECTION 302.7.

7. SPIRAL STAIRS TO BE CONSTRUCTED PER IRC SECTION 311.7.10.1. 8. SPACE STRINGERS AT 16" OC MAX.

**GENERAL** 

1. PLANS SHALL COMPLY WITH THE 2018 INTERNATIONAL RESIDENTIAL CODE WITH AMENDMENTS AS ADOPTED BY THE GOVERNING JURISDICTION. IF ANY CHANGES OR DEVIATIONS FROM THE PLANS ARE MADE DURING CONSTRUCTION, CONTRACTOR SHALL NOTIFY THE APPROPRIATE AUTHORITY AND ENGINEER OF RECORD, EITHER (OR BOTH) OF WHOM MAY REQUIRE REVISED DRAWINGS OR CALCULATIONS AT ITS DISCRETION.

2. REPRODUCTION, ALTERATION, OR RE-USE BY ANY METHOD OF ALL OR PORTIONS OF THESE STRUCTURAL PLANS OR VARIATIONS THEREOF WITHOUT WRITTEN PERMISSION FROM APEX ENGINEERS, INC IS STRICTLY PROHIBITED. THE DRAWINGS AND DETAILS OF THIS SHEET SET, BEING INSTRUMENTS OF SERVICE, ARE AND SHALL REMAIN THE PROPERTY OF APEX ENGINEERS, INC. AN UNSEALED VERSION, OR A VERSION VOID OF APEX ENGINEERS LOGO AND/OR TITLE BLOCK, SHALL BE CONSIDERED AN UNAUTHORIZED REPRODUCTION.

3. WHERE DISCREPENCIES EXIST BETWEEN THE STANDARD COMMENTS, NOTES FROM THE DESIGN PROFESSIONAL OR THE CODE, THE MOST RESTRICTIVE SHALL APPLY THE DWELLING SHALL COMPLY WITH THE FOLLOWING LOAD CONDITIONS

APPLY. THE DWELLING SHALL COMPLY WITH THE FOLLOWING LOAD COND					
	AREA	MIN DEAD LOAD	MIN LIVE LOAD		
	EXTERIOR BALCONIES	10 PSF	60 PSF		
	DECKS	10 PSF	40 PSF		
	CEILING JOISTS/ATTICS NO STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE 3:12 OR LESS	5 PSF	10 PSF		
	CEILING JOISTS/ATTICS WITHOUT STORAGE - SCUTTLE ACCESS ONLY ROOF SLOPE OVER 3:12 OR LESS	10 PSF	10 PSF		
	CEILING JOISTS/ATTICS WITH STORAGE - DOOR/PULL DOWN LADDER ACCESS	10 PSF	20 PSF		
	ROOMS - NON-SLEEPING	10 PSF	40 PSF		
	ROOMS - SLEEPING	10 PSF	30 PSF		
	ROOF - LIGHT ROOF COVERING	10 PSF	20 PSF		
	ROOF - HEAVY ROOF COVERING CONCRETE/TILE/SLATE	20 PSF	20 PSF		

NOTE: HEAVY ROOF COVERING WILL NOT BE INSTALLED OR USED IN THE DESIGN CALCULATIONS UNLESS IT IS SPECIFICALLY NOTED ON

THE PLANS THAT THE DESIGN IS FOR HEAVY ROOF COVERINGS.

#### **FOUNDATIONS**

CAPACITY OF 2000 PSF. UNLESS OTHERWISE INDICATED ON THE PLANS OR IF MODIFIED BY AN ENGINEERING REPORT BASED ON ACTUAL SITE CONDITIONS. . REFERENCE CONCRETE SCHEDULE, THIS SHEET, FOR APPLICABLE FOUNDATION CONCRETE MIX DESIGNS.

3. FOOTINGS SHALL EXTEND BELOW THE FROST LINE; MINIMUM DEPTH 36 INCHES BELOW GRADE.

4. UNLESS OTHERWISE NOTED ON THE PLANS OR IF SITE CONDITIONS REQUIRE OTHERWISE, FOOTINGS SHALL BE A MINIMUM OF 16" WIDE AND 8" DEEP WITH (2) #4 BARS CONTINUOUS.

5. COLUMN PADS SHALL BE A MINIMUM 30"x30"x12" WITH (4) #4 BARS EACH WAY UNLESS NOTED OTHERWISE 6. UNLESS NOTED OTHERWISE ON THE PLANS, FOUNDATION WALLS SHALL BE MINIMUM 8" THICK x 8'-0" (OR 9'-0") TALL AND REINFORCED PER DETAIL 1-S2.0

(AND 2-S2.0 WHERE APPLICABLE). FOUNDATION WALLS GREATER THAN 10'-0" TALL REQUIRE A SEPERATE ENGINEERED DESIGN. PROVIDE A 2'-0" LONG INTERIOR OR EXTERIOR DEAD-MAN FOR ANY STRAIGHT WALL PANELS EXCEEDING 20'-0" IN LENGTH (REF 3-S2.0) 7. REINFORCEMENT SHALL BE MINIMUM GRADE 40 UNLESS NOTED OTHERWISE.

REINFORCEMENT SHALL LAP A MINIMUM OF 24" AT ENDS, SPLICES, AND AROUND

CORNERS 8. FOUNDATION WALLS SHALL BE BACKFILLED WITH A CLEAN LEAN CLAY (OR BETTER) LOW VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER OF RECORD. 9. FOUNDATION WALLS WILL NOT ACHIEVE FULL STRENGTH UNTIL THE BASEMENT SLAB AND THE FIRST FLOOR DECK HAVE BEEN PROPERLY PLACED. IF BACKFILLING THE INTERIOR OF THE FOUNDATION WALL WITH GREATER THAN 8" OF EARTHEN FILL OR 24" OF GRANULAR FILL, A STRUCTURAL BASEMENT SLAB, OR ALTERNATE ENGINEERED SOLUTION (i.e. ENGINEERED FILL) WILL BE

10. WHERE JUMPS OR STEPS IN ELEVATION OCCUR FOUNDATION WALLS AND FOOTINGS SHALL BE FORMED CONTINUOUS AND POURED PER DETAIL 4-S2.0. 11. CONCRETE FLOOR SLABS SHALL BE A MINIMUM 4" THICK OVER A MINIMUM 4" BASE OF 1/2" OR 3/4" CLEAN GRADED ROCK, UNLESS NOTED OTHERWISE OR IF SITE CONDITIONS REQUIRE OTHERWISE

12. PROVIDE A MIN 6 MIL THICK POLYETHYLENE MOISTURE BARRIER OVER POURUS GRAVEL BASE UNDER BASEMENT FLOOR SLAB PER R405.2.2. LAP JOINTS MINIMUM 6" (NOT REQUIRED FOR GARAGE SLABS OR DETACHED ACCESSORY BUILDINGS).

13. FOR A STRUCTURAL REINFORCED CONCRETE FLOOR OVER A USABLE AREA, SUCH AS A GARGE FLOOR LOCATED OVER A STORAGE AREA, SUBMIT SEALED ENGINEERED DETAILS AND CALCULATIONS.

14. GARAGE SLABS AND BASEMENT OVERDIGS SUPPORTED BY FILL CONSISTING OF MORE THAN 24" OF GRANULAR FILL OR 8" OF EARTH SHALL BE REINFORCED PER DETAILS 1-S2.1 AND 6-2.1 RESPECTIVELY. WHERE THE LIMITATIONS OF DETAILS 1-S2.1 AND 6-S2.1 ARE NOT MET. A SEPARATE ENGINEERED DESIGN SHALL BE REQUIRED.

15. BASEMENT FOUNDATION SILL PLATES SHALL BE BOLTED TO THE FOUNDATION WITH A MINIMUM OF 1/2" ANCHOR BOLTS EMBEDDED AT LEAST 7" INTO THE CONCRETE AND SPACED NOT MORE THAN 3'-0" ON CENTER AND

WITHIN 12" OF EACH END PIECE. 16. FOUNDATION WALLS SHALL BE DAMP-PROOFED PER IRC SECTION R406. 17. PROVIDE A MINIMUM 4" PERFORATED DRAIN AROUND USABLE SPACE BELOW GRADE OR OTHER EQUIVALENT MATERIALS PER IRC SECTION 405.1. THE PIPE SHALL BE PLACED ON A MINIMUM OF 2" OF WASHED GRAVEL OR CRUSHED ROCK AND COVERED WITH NOT LESS THAN 6". THE DRAIN SHALL DAYLIGHT TO THE EXTERIOR BELOW THE FLOOR LEVEL OR TERMINATE IN A MINIMUM 24" DIAMETER OR 20" SQUARE SUMP PIT EXTENDING A MINIMUM 24" BELOW THE BOTTOM OF BASEMENT FLOOR.

18. INTERIOR BEARING WALLS AND COLUMNS SHALL BE ISOLATED FROM THE BASEMENT FLOOR SLAB.

19. INTERIOR NON-BEARING WALLS, OTHER THAN THOSE RESTING DIRECTLY ON THE FOOTING, SHALL BE ISOLATED FROM THE FLOOR FRAMING ABOVE. 20. ALL EARTH RETAINING STRUCTURES ON THE SITE GREATER THAN 4'-0" TALL (EXCLUDING CONCRETE FOUNDATION WALLS RESTRAINED AT BOTH TOP AND BOTTOM) SHALL REQUIRE A SEPARATE ENGINEERED DESIGN (i.e. RETAINING WALLS, WING WALLS, ETC.).

21. INSULATION SHALL BE INSTALLED FOR ALL BASEMENT WALLS AS REQUIRED PER N1102.2.9. 22. A CONCRETE ENCASED GROUNDING ELECTRODE CONNECTION SHALL BE PROVIDED TO THE ELECTRICAL SERVICES PER E3608.1.

23. ANY GEOTECHNICAL IMPROVEMENT METHODS AND/OR STRUCTURAL SOLUTIONS (SUCH AS DRILLED PIERS) EMPLOYED TO ADDRESS UNACCEPTABLE SUBGRADE CONDITIONS SHALL BE SUBMITTED TO EOR AS ENGINEERED SHOP DRAWINGS FOR REVIEW AND APPROVAL.

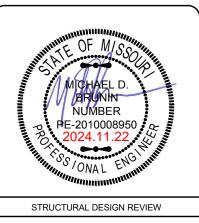
### **EXPANSIVE SOILS DISCLAIMER:**

THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING JURISDICTION.

APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS BE EVALUATED BY A LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF ANY FOUNDATION ELEMENTS. GEOTECHNICAL INVESTIGATION AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX.

APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING BELOW THE BASEMENT SLAB). BY USE OF THESE PLANS WITHOUT AN ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT. APEX SHALL NOT BE HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING, DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.





KANSAS ENGINEERING LICENSE MISSOURI ENGINEERING LICENSE: 2003004673

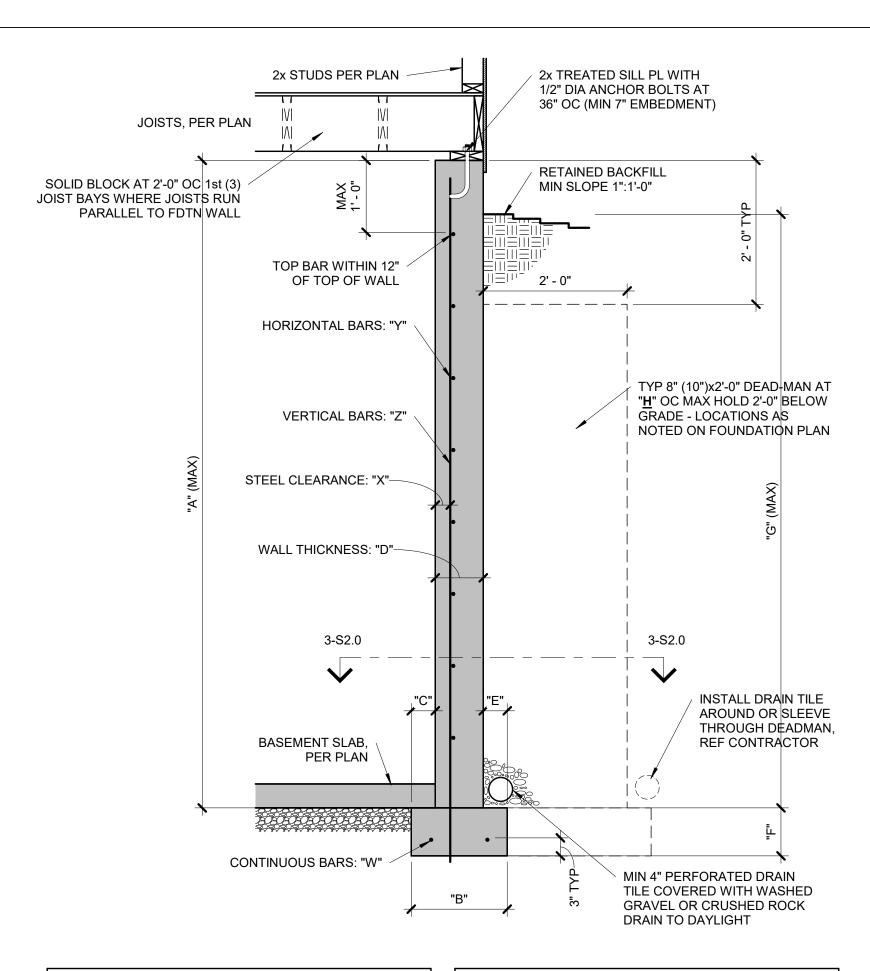
PROJECT #: 24-2047 DRAWN BY: CJH CHECKED BY: BDC SUBMITTAL DATE: 2024.11.22

30JE 32 SV 32 SV 3'S Su

SHEET:

**GENERAL NOTES** 

01/16/2025



## **CONCRETE DIMENSIONS** "A" "B" "C" "D" "E" "F" "G" "H"<sup>1</sup> 8'-0" 1'-4" 4" 8" 4" 8" 7'-6" 20'-0" 9'-0" 1'-4" 4" 8" 4" 8" 8'-6" 20'-0" 10'-0" 1'-8" 5" 10" 5" 10" 9'-6" 20'-0"

REINFORCING BARS(GRADE 40 BARS) (2) #4 | 2 1/2" | #4 BARS AT 24" OC | #4 BARS AT 24" OC (2) #4 | 2 1/2" | #4 BARS AT 24" OC | #4 BARS AT 24" OC (2) #4 | 2 1/2" | #4 BARS AT 18" OC | #4 BARS AT 18" OC

1. DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH. 2. VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF

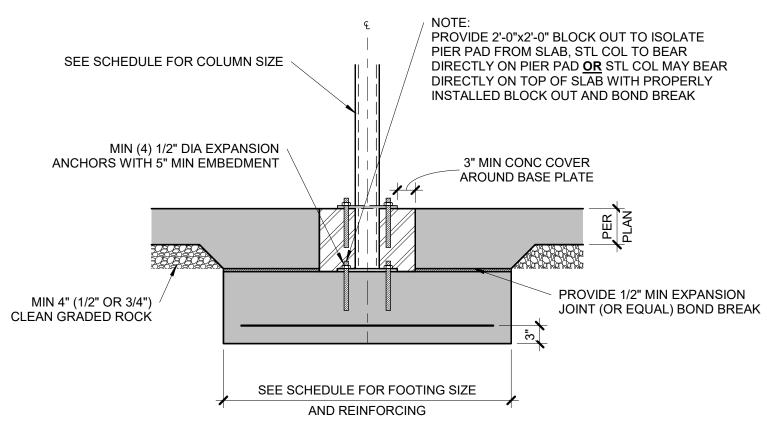
TOP AND BOTTOM OF WALL. 3. BURIED CONCRETE FOUNDATION WALLS UP TO 9'-0" TALL MAY BE 8" NOMINAL THICKNESS WITH #4 BARS AT 24" OC BOTH WAYS OVER 16"x8" CONCRETE FOOTINGS WITH (2) #4 BARS CONTINUOUS, UNLESS OTHERWISE REQUIRED BY

ENGINEERING REPORT BASED ON ACTUAL SITE CONDITIONS. 4. WALL WILL NOT ACHIEVE FULL STRENGTH UNTIL FIRST FLOOR DECK AND BASEMENT SLAB HAVE BEEN PLACED.

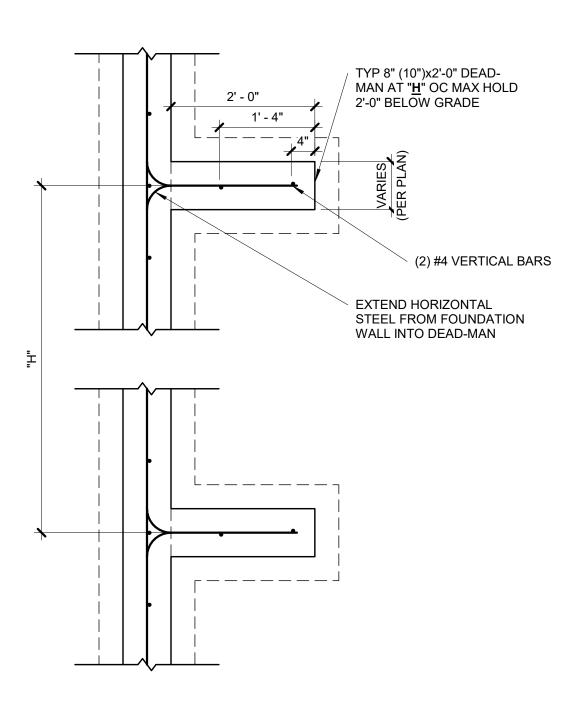
## TYPICAL FOUNDATION WALL

COLUMN AND PIER PAD SCHEDULE			
COLUMN MARK	PAD SIZE	REINFORCING	COL SIZE
À	30"x30"x12"	(4) #4 BARS E-W	3" SCH 40 (3.5" OD)
Ê	36"x36"x12"	(4) #4 BARS E-W	3" SCH 40 (3.5" OD)
Ê	42"x42"x12"	(5) #4 BARS E-W	3" SCH 40 (3.5" OD)
<u>Á</u>	48"x48"x12"	(6) #4 BARS E-W	3 1/2" SCH 40 (4" OD)
Æ	54"x54"x16"	(8) #4 BARS E-W	REF PLAN
Æ	60"x60"x16"	(10) #4 BARS E-W	REF PLAN

1. COLUMN AND PIER PAD SIZES SHOWN ARE FOR MAXIMUM ADJUSTABLE COLUMN HEIGHT OF 9'-1", REQUIRES SEPARATE ENGINEERED DESIGN IF GREATER THAN 9'-1' TALL. COLUMNS SIZED AS QWIK-ADJUST COLUMN, BY QUALITY WAY PRODUCTS, LLC. REFER TO SAFE LOADING CAPACITIES PER MANUF SPECS, OR SUBSTITUTION TO ANOTHER PRODUCT ONLY WITH PRIOR APPROVAL BY APEX ENGINEERS. 2. COLUMN AND PIER PAD SIZES SHOWN ARE BASED ON AN ASSUMED MINIMUM ALLOWABLE SOIL BEARING CAPACITY OF 2,000 PSF



5 COLUMN PAD DETAIL



1. MIN 3000 PSI FOOTING COMPRESSIVE CONCRETE STRENGTH 2. MIN 3000 PSI WALL COMPRESSIVE CONCRETE STRENGTH. 3. AIR ENTRAINED BETWEEN 5% & 7% OF CONCRETE VOLUME 4. GRADE 40 REINFORCING STEEL UNLESS OTHERWISE NOTED. 5. LAP SPLICES 24" MIN. 6. WALL SHALL BE BACK-FILLED WITH CLEAN, LEAN CLAY (OR BETTER) LOW

VOLUME CHANGE MATERIAL. ON-SITE MATERIAL MAY BE USED IF DEEMED ACCEPTABLE BY THE GEOTECHNICAL ENGINEER 7. ASSUMED 2,000 PSF BEARING (TO BE VERIFIED BY GEOTECHNICAL ENGINEER).

3 TYPICAL DEAD-MAN SECTION

**S2.0** 3/4" = 1'-0"

THESE PLANS HAVE BEEN PREPARED BASED ON A PRESUMPTIVE ALLOWABLE

APEX ENGINEERS, INC. (APEX) RECOMMENDS THAT ALL FOOTING EXCAVATIONS

PLACEMENT OF ANY FOUNDATION ELEMENTS. GEOTECHNICAL INVESTIGATION

CHARACTERISTICS OF THE SUBGRADE SOIL AND THEREFORE CANNOT BE HELD

ACCOMPANYING GEOTECHNICAL ENGINEERING REPORT, APEX SHALL NOT BE

HELD LIABLE FOR ANY FUTURE MOVEMENT AND/OR DIFFERENTIAL MOVEMENT

OF THE PROPOSED STRUCTURE AND THE POSSIBLE DAMAGE THAT MAY BE CAUSED AS A RESULT OF SUCH MOVEMENT. DAMAGE FROM EXPANSIVE SOILS

FOLLOWING: BASEMENT SLAB HEAVE, SHEETROCK CRACKS, WINDOWS AND

BEARING CAPACITY AS ALLOWED BY IRC CODE AND THE LOCAL ENFORCING

BE EVALUATED BY A LICENSED GEOTECHNICAL ENGINEER PRIOR TO THE

RESPONSIBLE FOR THE VOLUMETRIC CHANGES OF THE SOIL (INCLUDING

AND/OR TESTING IS NOT A SERVICE PROVIDED OR OFFERED BY APEX.

APEX HAS NOT BEEN RETAINED TO DETERMINE THE EXPANSIVE SOIL

BELOW THE BASEMENT SLAB). BY USE OF THESE PLANS WITHOUT AN

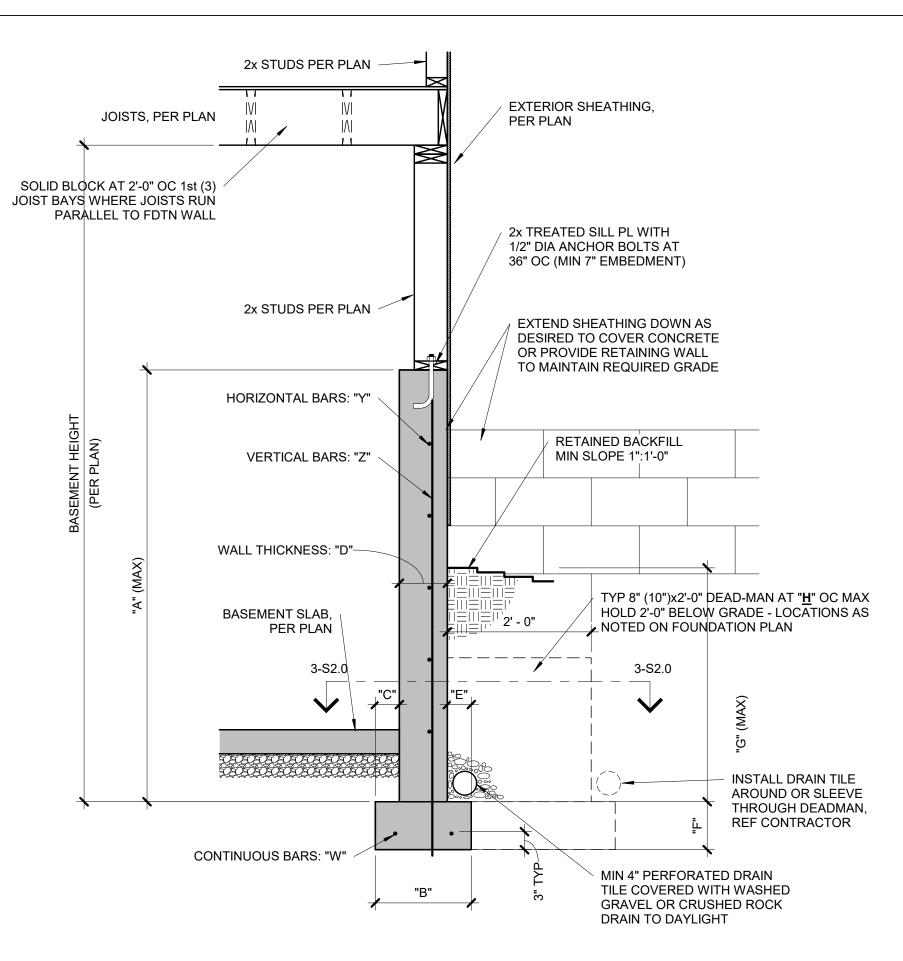
AND/OR SETTLEMENT CAN RESULT IN AMONGST OTHER THINGS, THE

DAMAGE TO TILE, MOULDING, AND OTHER COSMETIC FINISHES.

DOOR BECOMING OUT OF PLUMB AND STICKING AND/OR NOT OPENING,

**EXPANSIVE SOILS DISCLAIMER** 

JURISDICTION.



## CONCRETE DIMENSIONS "A" "B" "C" "D" "E" "F" "G" "H"¹¹ 4'-0" 1'-4" 4" 8" 4" 8" 3'-4" 20'-0" 6'-0" 1'-4" 4" 8" 4'-4" 20'-0" 9'-0" 1'-8" 5" 8" 4" 8" 4'-4" 20'-0"

REINFORCING BARS(GRADE 40 BARS) (2) #4 N/A #4 BARS AT 24" OC #4 BARS AT 24" OC (2) #4 N/A #4 BARS AT 24" OC #4 BARS AT 24" OC (2) #4 N/A #4 BARS AT 24" OC #4 BARS AT 24" OC

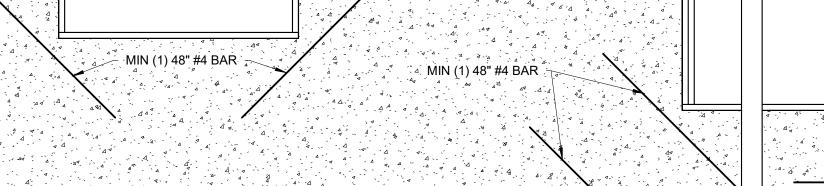
1. DIMENSION SHOWN IS FOR MAXIMUM UNINTERRUPTED WALL PANEL LENGTH BEFORE A DEAD-MAN SHALL BE

INSTALLED. NOTE, A MINIMUM 2'-0" RETURN OR OFFSET IN THE FOUNDATION WALL SHALL SUBSTITUTE AS A DEAD-MAN AND/OR BREAK IN THE WALL PANEL LENGTH.

2. VERTICAL REINFORCING STEEL TO EXTEND TO WITHIN 8" OF TOP WALL. MINIMUM (1) #4 HORIZONTAL BAR WITHIN 12" OF TOP AND BOTTOM OF WALL.

3. THE BASEMENT SLAB IS AN INTEGRAL PART OF THE 'UNRESTRAINED' FOUNDATION WALL DESIGN THEREFORE, IF THE WALL IS BACKFILLED PRIOR TO PLACEMENT OF THE BASEMENT SLAB, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY BRACING THE WALL UNTIL THE BASEMENT SLAB HAS BEEN PLACED.

## TYPICAL 'UNRESTRAINED' 2 FOUNDATION WALL DETAIL

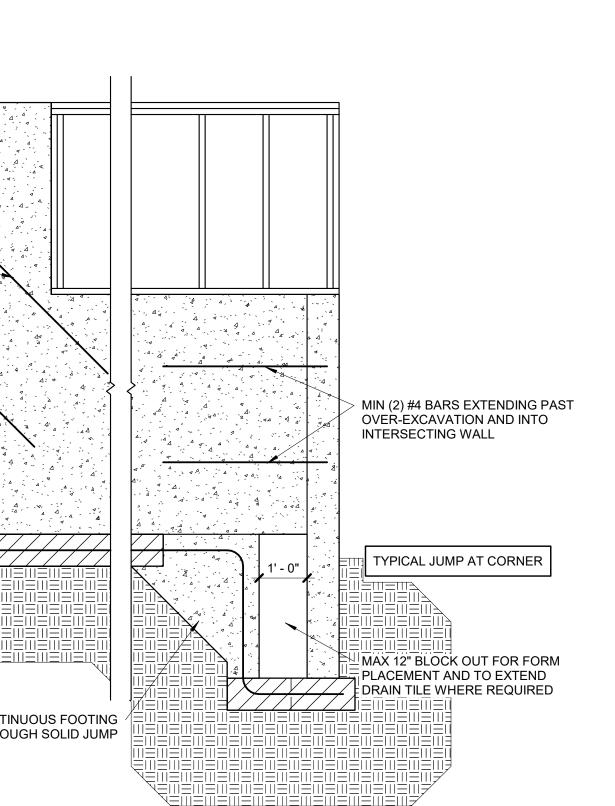


CONTINUOUS FOOTING THROUGH SOLID JUMP L

TYPICAL JUMP AT STRAIGHT WALL PANEL

CONTINUOUS FOOTING THROUGH SOLID JUMP

4 | FOUNDATION WALL JUMP DETAIL



01/16/2025

**ENGINEERS,INC** 1625 LOCUST ST KANSAS CITY, MO 64108 816.421.3222 www.apex-engineers.com

BRUNIN NUMBER STRUCTURAL DESIGN REVIEW KANSAS ENGINEERING LICENSE: MISSOURI ENGINEERING LICENSE: 2003004673

PROJECT #:

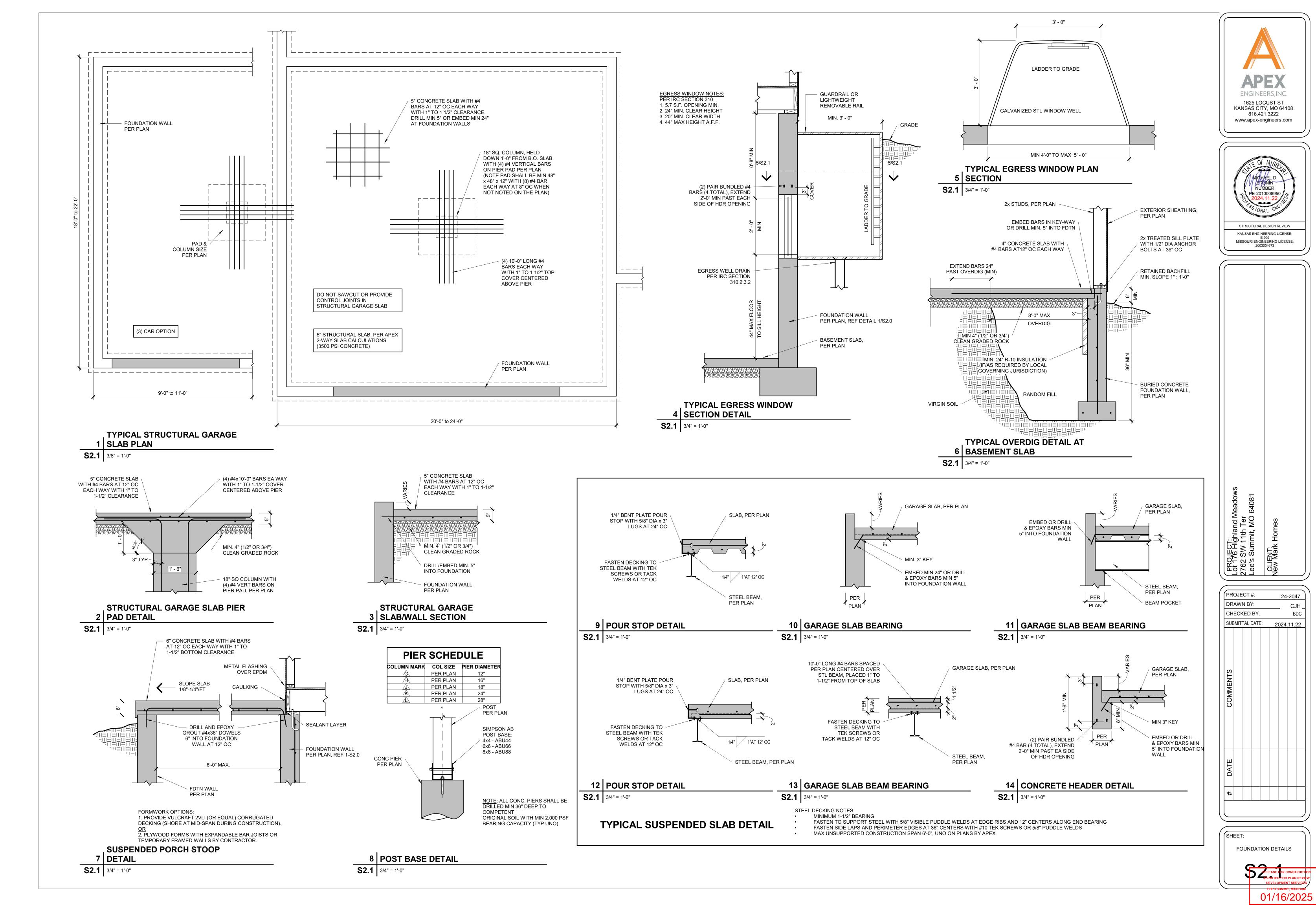
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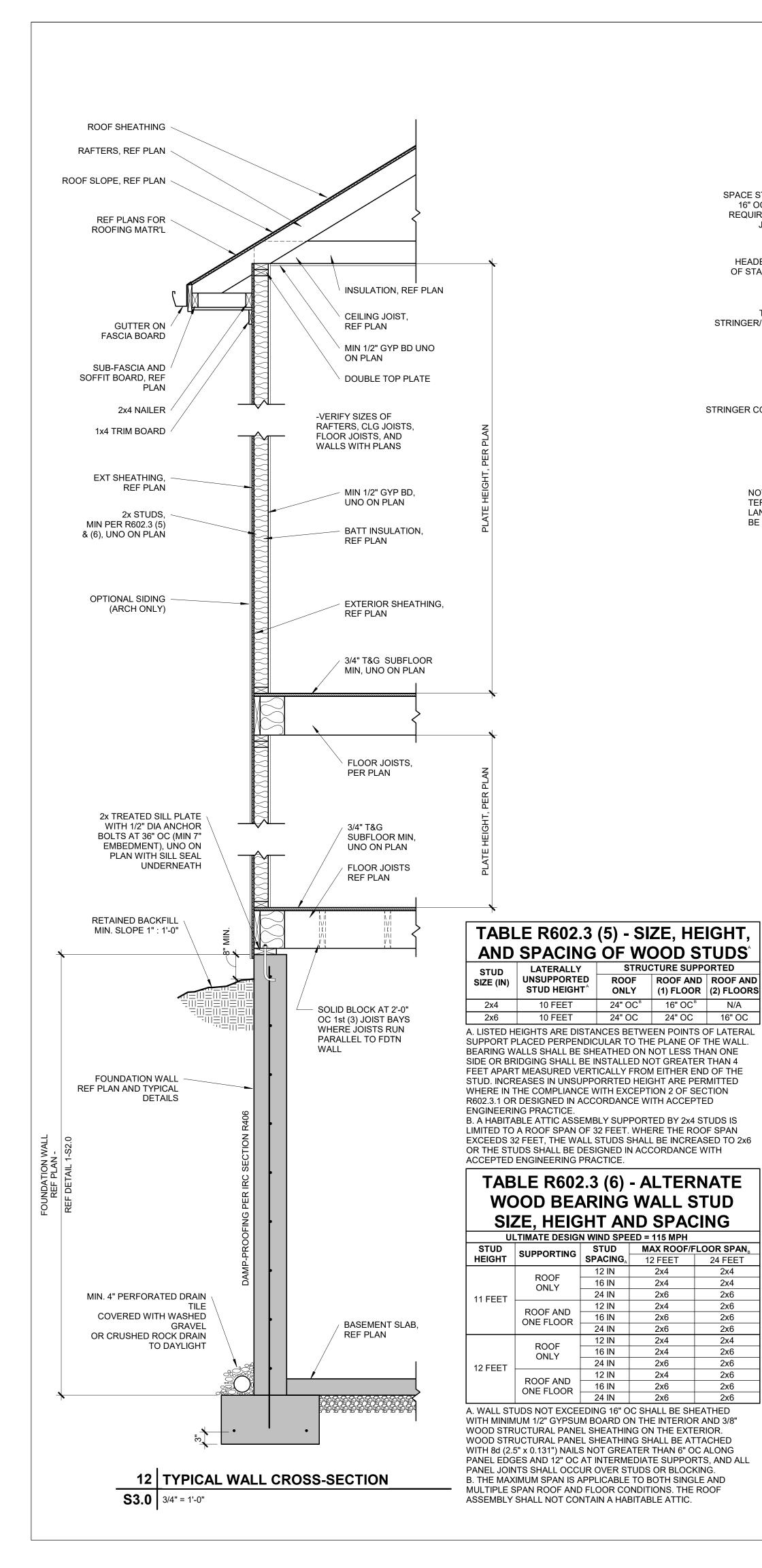
CHECKED BY: BDC SUBMITTAL DATE: 2024.11.22

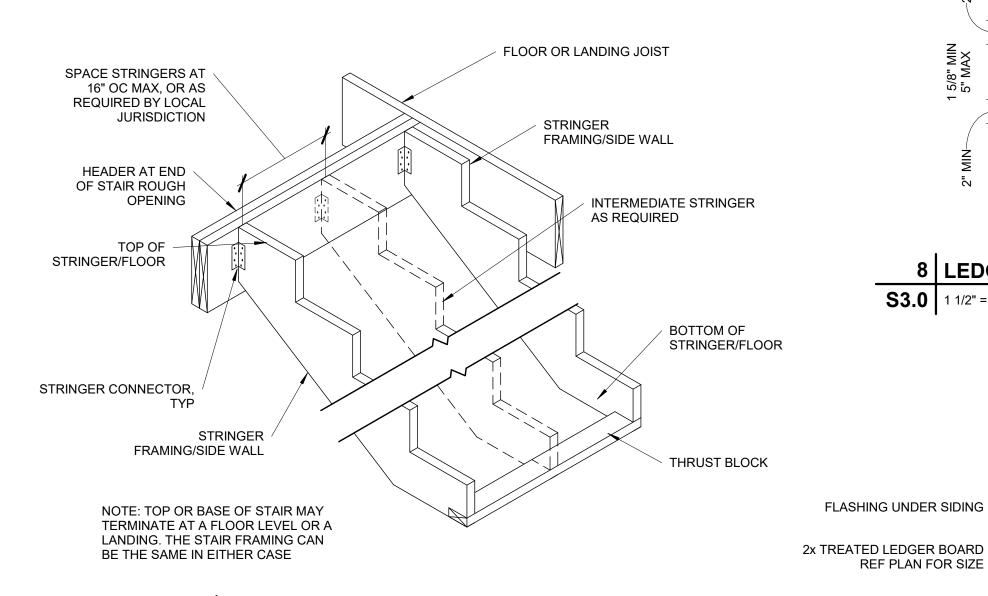
24-2047

CJH

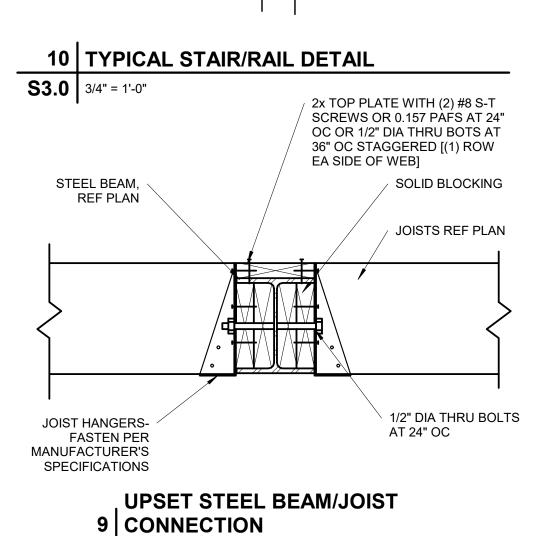
SHEET: **FOUNDATION DETAILS** 







# 11 TYPICAL STRINGER DETAIL **S3.0** 3/4" = 1'-0" **GUARDRAIL** 3 7/8" DIA SPHERE MUST NOT PASS THRU AT ANY POINT USE AT ALL FLOOR OPENINGS GREATER THAN 30" ABOVE GRADE OR THE FLOOR BELOW AND/OR 10" MIN. STAIRS WITH THREE OR MORE



**S3.0** 1 1/2" = 1'-0"

MAX ROOF/FLOOR SPAN<sub>B</sub>

12 FEET 24 FEET

2x6

2x4

2x4

2x6

2x6

2x4

2x6

2x6

2x6

2x6

STUD

SPACING,

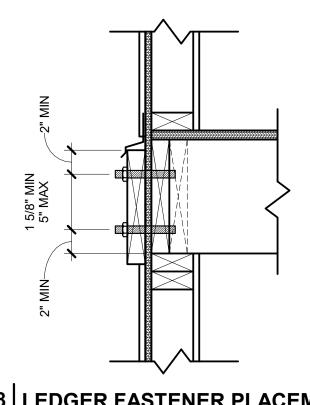
16 IN

24 IN

12 IN

16 IN

24 IN



8 LEDGER FASTENER PLACEMENT

2' - 0" MAX

(OR PER PLAN)

TYPICAL CANTILEVER FRAMING

7 WITH DECK ATTACHMENT

RIM JOIST WITH INVERTED HANGERS

ATTACHED TO CANTILIVERED JOISTS

THE TIP OF THE LAG SHALL FULLY

EXTEND BEYOND THE INSIDE

FACE OF THE BAND JOIST

**S3.0** 1 1/2" = 1'-0"

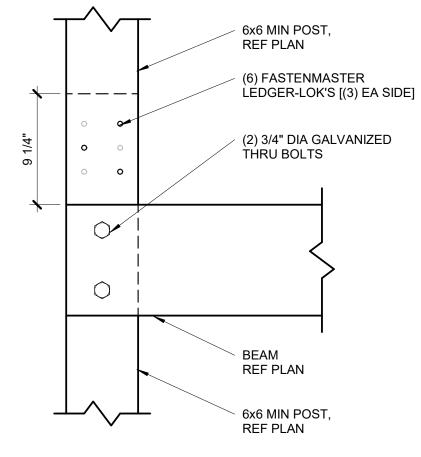
REF PLAN FOR SIZE

GALVANIZED LAG BOLTS

THROUGH LEDGER INTO RIM. (SEE CHART FOR

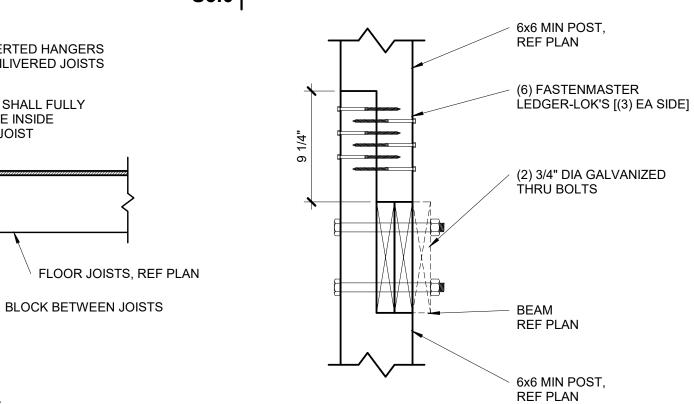
SIZE AND SPACING)

**S3.0** 3/4" = 1'-0"



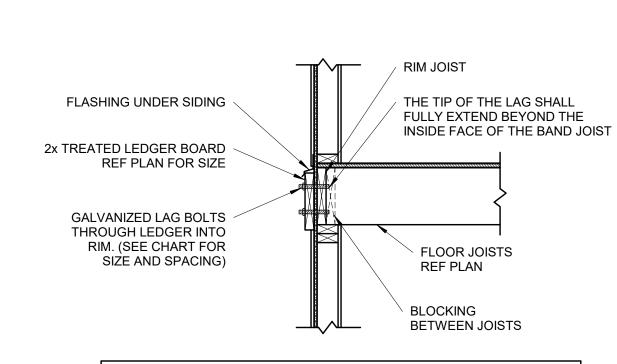
SPLICED DECK COLUMN 4 CONNECTION

**S3.0** 1 1/2" = 1'-0"



. SPLICED DECK COLUMN 3 CONNECTION

**S3.0** 1 1/2" = 1'-0"



DECK LEDGER ATTACHMENT CHART				
DECK JOIST SPAN	1/2" DIA LAG SPACING	EQUIVALENT SPACING FOR 16" OC JOIST BAYS		
UP TO 10'-0"	16" OC	N/A		
10'-1" TO 12'-0"	15" OC	16" OC DBL EVERY OTHER		
12'-1" TO 14'-0"	13" OC	16" OC DBL EVERY OTHER		
14'-1" TO 16'-0"	11" OC	16" OC DBL EVERY JOIST BAY		
16'-1" TO 18'-0"	10" OC	16" OC DBL EVERY JOIST BAY		
NOTE: CHART IS APPLICABLE ONLY WHEN DECK IS SHOWN ON APPROVED PLAN.				

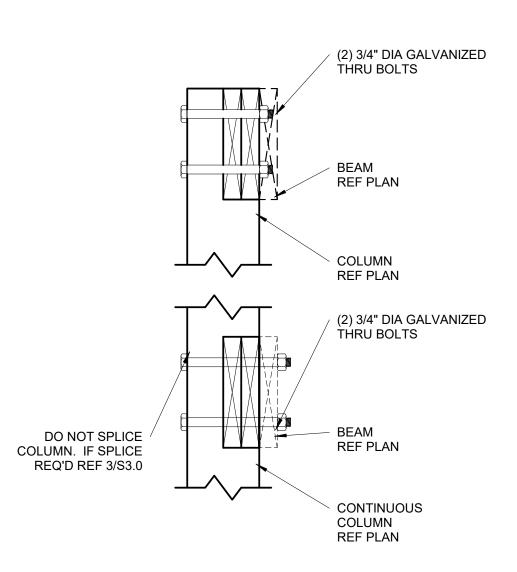
## 6 TYPICAL LEDGER ATTACHMENT

**S3.0** 3/4" = 1'-0"

	BEAM SIZE	"X"	*DISTANCE SHALL BE PERMITTED TO BE
	2x8*	5 1/2" MIN	REDUCED TO 4 1/2" IF LAG SCREWS
	2x10	6 1/2" MIN	ARE USED OR BOLT SPACING IS
	2x12	7 1/2" MIN	REDUCED TO THAT OF LAG SCREWS TO ATTACH 2x8 LEDGERS TO 2x8 BAND
			JOISTS
LAG SCREW OR	o LEDGER, I PLAN FOR	REF	STAGGER FASTENERS IN 2 ROWS

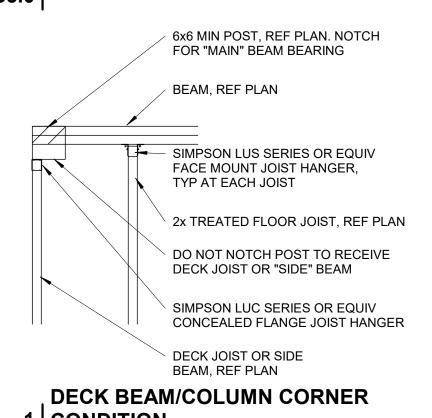
5 TYPICAL LEDGER BOLT SPACING

**S3.0** 3/4" = 1'-0"



## DECK BEAM/COLUMN 2 CONNECTION

**S3.0** 1 1/2" = 1'-0"



1 CONDITION **S3.0** 3/4" = 1'-0"

SHEET: FRAMING DETAILS

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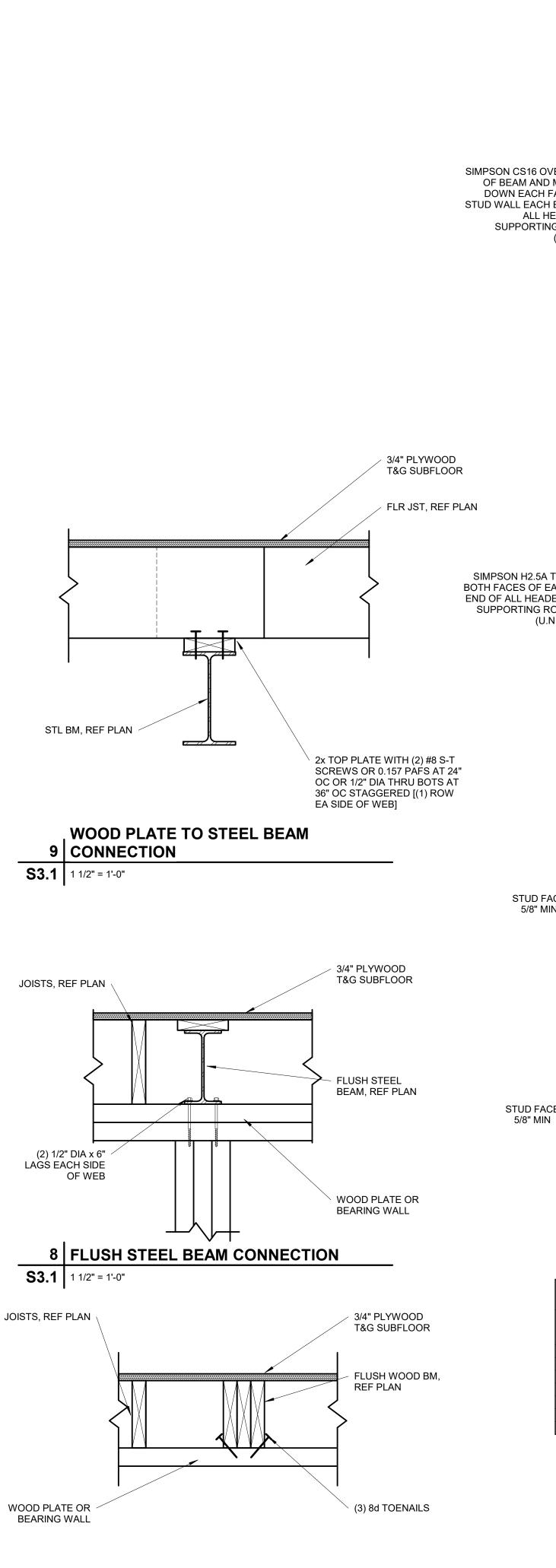
SUBMITTAL DATE:

CJH

BDC

2024.11.22

01/16/2025



7 | FLUSH WOOD BEAM CONNECTION

**S3.1** 1 1/2" = 1'-0"

1 1/4" x 20 GAUGE RIDGE STRAPS

1x4 COLLAR TIES AT 48" OC MAX

UPPER 1/3" OF CEILING SPACE (MEASURED FROM THE PLATE

HEIGHT TO THE RIDGE HEIGHT)

2x PLATE T&B, UNO

FASTEN PLATE TO EACH

VERT MEMBER WITH 10d

HEADER VERT MEMBERS,

BETWEEN VERT MEMBERS

REF MULTIPLE PLY BEAM

4 - PLY

(2) ROWS OF 1/2' DIA

12" OC STAGGERED

3-1/2" NAILS AT 4" A307 THRU-BOLTS A

NAILING SCHEDULE

HEADERS WITH 1" AND LESS GAP

BETWEEN VERT MEMBERS

NAILS AT 16" OC UNO

PLYWOOD PACKOUT

REF PLAN

WITH (3) 10d NAILS AT EACH END IN

RIDGE BEAM,

**RAFTERS** 

PER PLAN

PER PLAN

12 RIDGE BEAM DETAIL

11 TYPICAL WOOD HEADER DETAIL

3 - PLY (3) ROWS OF 16d x

OC

NAILING SHOWN APPLIES UNLESS SPECIFICALLY NOTED

SPACE NAILS EVENLY THROUGHOUT DEPTH OF BEAM.

, MULTIPLE PLY BEAM NAILING

**S3.1** 3/4" = 1'-0"

2x PLATE T&B, UNO

FASTEN PLATE TO EACH

VERT MEMBER WITH 10d

NAILS AT 16" OC UNO

MEMBERS, REF PLAN

AND 4'-0" OC MAX

HEADERS WITH GREATER THAN 1"
GAP BETWEEN VERT MEMBERS

S3.1 NOT TO SCALE

2 - PLY

(3) ROWS OF 16d x

3-1/2" NAILS AT 6"

10 SCHEDULE

S3.1 NOT TO SCALE

IN DETAILS.

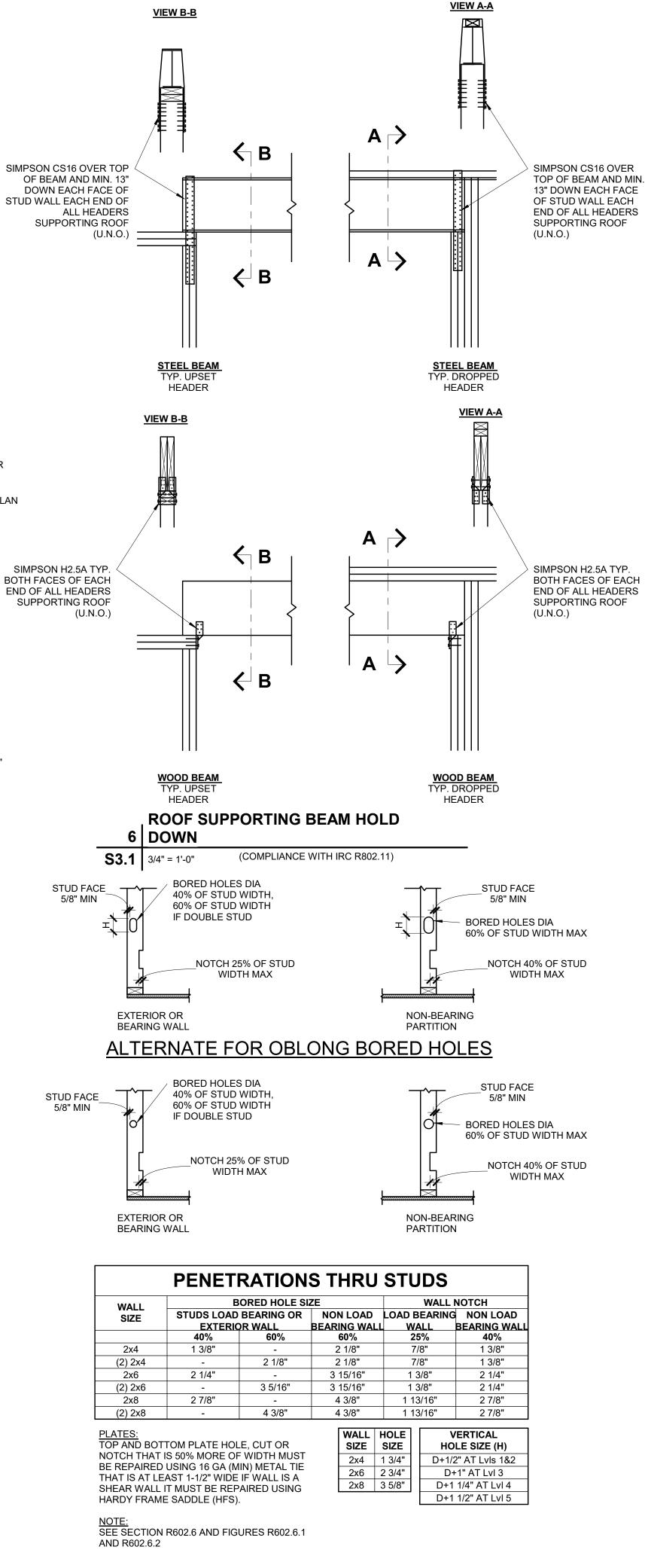
2x PACKOUT AT EACH END

THROUGHOUT HEADER SPAN

FASTEN VERT MEMBERS TO

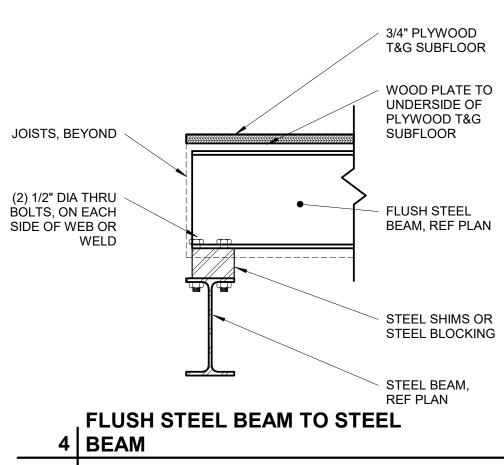
PACKOUT WITH (3) 10d NAILS

**HEADER VERT** 

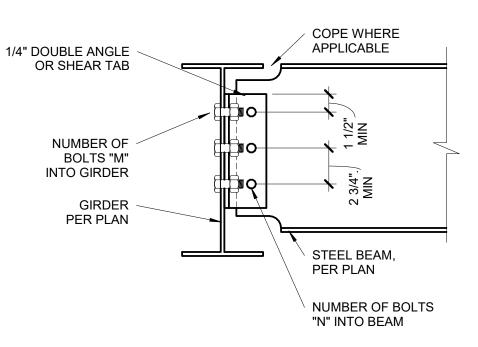


**5 | DRILLING & NOTCHING DETAIL** 

**S3.1** 3/4" = 1'-0"



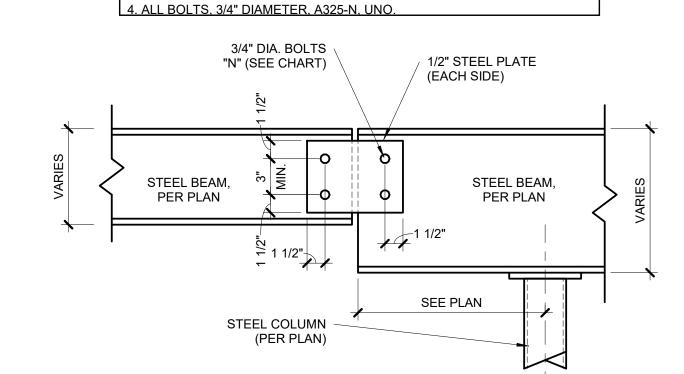
**S3.1** 1 1/2" = 1'-0"



3 BEAM TO GIRDER CONNECTION

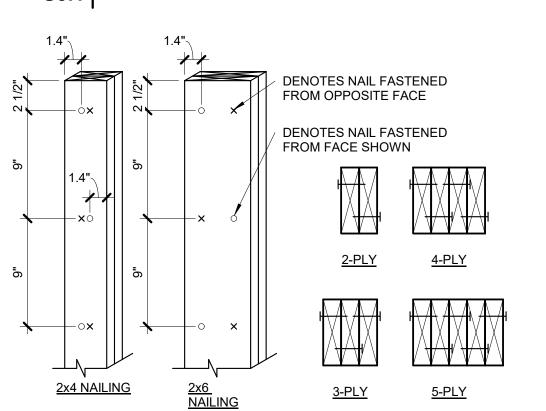
**S3.1** 1 1/2" = 1'-0"

BEAM CONNECTION SCHEDULE			
BEAM SIZE	# OF BOLTS "N"	# OF BOLTS "M"	
W8, W10	2	4	
W12, W14	3	6	
W16, W18	4	8	
2. NUMBER OF BOLTS SMALLER OF TWO BE.	NS ARE TYPICAL, UNO. IN UPSET BEAM CONNECT AMS AT CONNECTION. LLET WELD MAY BE SUBST J.		



2 BEAM SPLICE DETAIL

**S3.1** 1 1/2" = 1'-0"



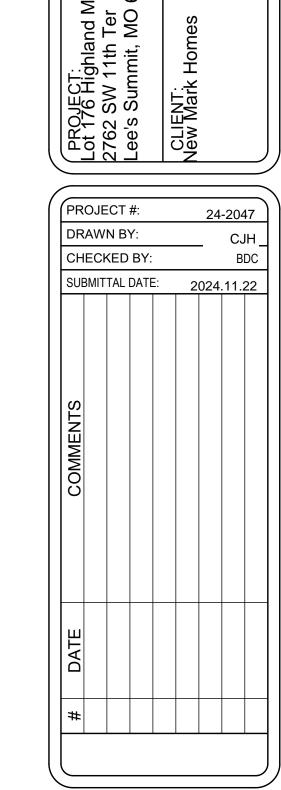
EACH 2x PLY SHALL BE FASTENED WITH (1) ROW OF 10d NAILS AT 9" OC, ALTERNATING SIDE TO SIDE

1.4" MIN EDGE DISTANCE, AND STARTING 2 1/2" FROM EACH END.

EXTEND FULL AREA OF COLUMN AS SOLID BLOCKING THROUGH JOIST BAYS AND WALLS TO LOAD-BERAING BEAM/WALL BELOW

BUILT-UP STUD COLUMN

**S3.1** 1 1/2" = 1'-0"



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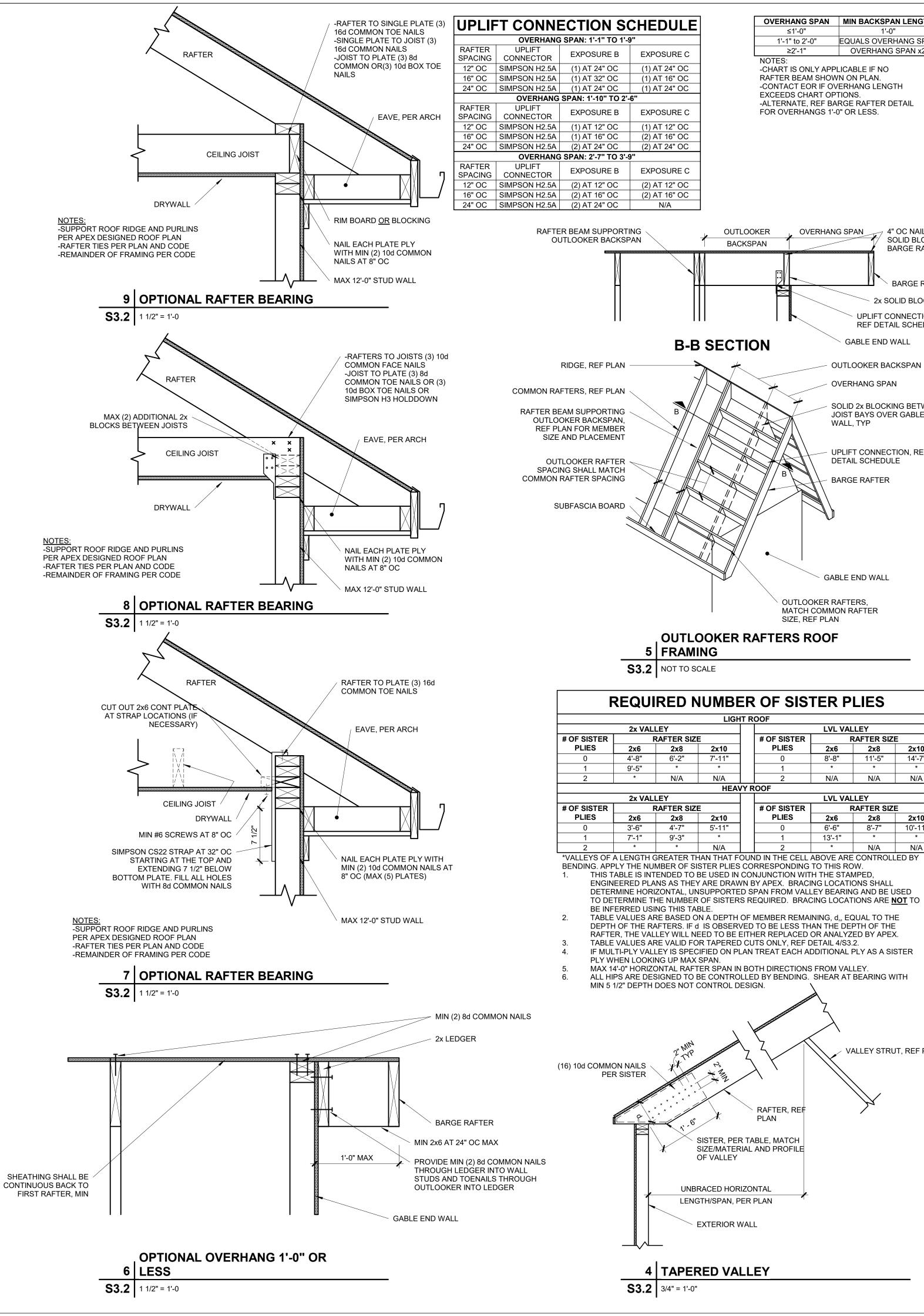
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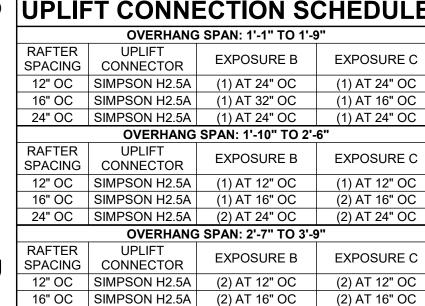
STRUCTURAL DESIGN REVIEW

KANSAS ENGINEERING LICENSE: E-992 MISSOURI ENGINEERING LICENSE: 2003004673

SHEET: FRAMING DETAILS

01/16/2025





<b>OVERHANG SPAN</b>	MIN BACKSPAN LENGTH	
≤1'-0"	1'-0"	
1'-1" to 2'-0"	<b>EQUALS OVERHANG SPAN</b>	
≥2'-1"	OVERHANG SPAN x2	
NOTES:		
-CHART IS ONLY APPLICABLE IF NO		
RAFTER BEAM SHOW	'N ON PLAN.	
-CONTACT EOR IF OV	ERHANG LENGTH	
EXCEEDS CHART OP	TIONS.	
-ALTERNATE, REF BA		
FOR OVERHANGS 1'-0	O" OR LESS.	

OVERHANG SPAN

OUTLOOKER

BACKSPAN

**B-B SECTION** 

4" OC NAIL SPACING AT

BARGE RAFTER

BARGE RAFTER

2x SOLID BLOCKING

UPLIFT CONNECTION,

GABLE END WALL

OUTLOOKER BACKSPAN

SOLID 2x BLOCKING BETWEEN

JOIST BAYS OVER GABLE END

UPLIFT CONNECTION, REF

DETAIL SCHEDULE

BARGE RAFTER

GABLE END WALL

LVL VALLEY

LVL VALLEY

8'-8"

RAFTER SIZE

2x6 2x8 2x10

N/A N/A N/A

RAFTER SIZE

2x6 2x8 2x10

6'-6" 8'-7" 10'-11" 13'-1" \* \*

11'-5" 14'-7" \* \*

VALLEY STRUT, REF PLAN

OUTLOOKER RAFTERS,

SIZE, REF PLAN

OUTLOOKER RAFTERS ROOF

LIGHT ROOF

**HEAVY ROOF** 

N/A

N/A

# OF SISTER

PLIES

# OF SISTER

PLIES

RAFTER, REF

PLAN

SISTER, PER TABLE, MATCH

SIZE/MATERIAL AND PROFILE

OF VALLEY

UNBRACED HORIZONTAL

LENGTH/SPAN, PER PLAN

EXTERIOR WALL

4 TAPERED VALLEY

FRAMING

RAFTER SIZE

6'-2" \*

RAFTER SIZE

4'-7"

9'-3"

N/A

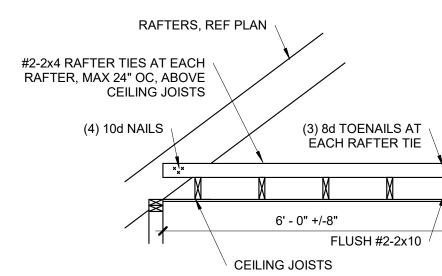
MATCH COMMON RAFTER

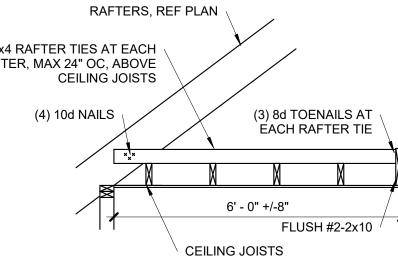
OVERHANG SPAN

WALL, TYP

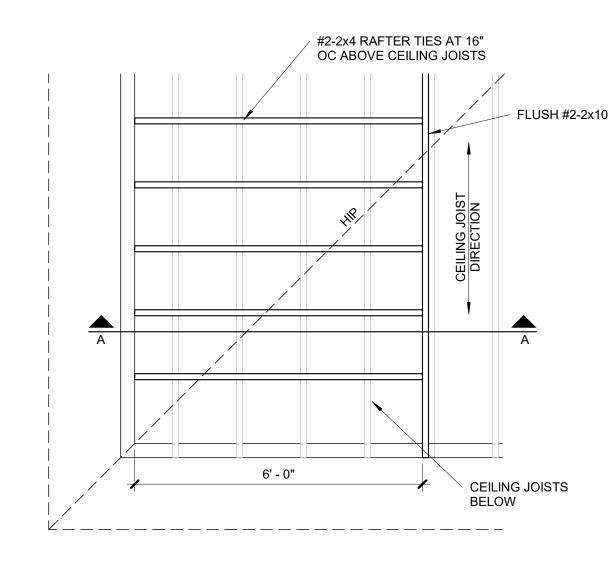
REF DETAIL SCHEDULE

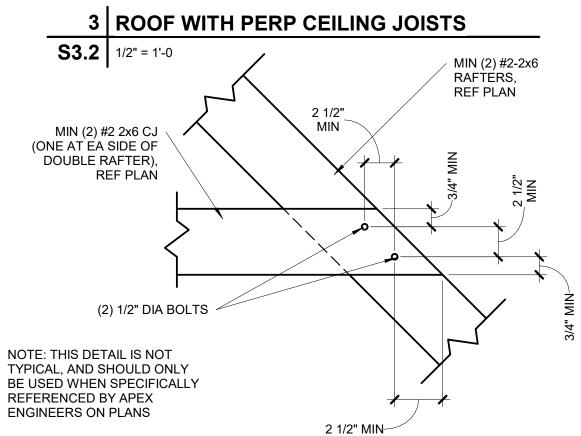
SOLID BLOCKING AND



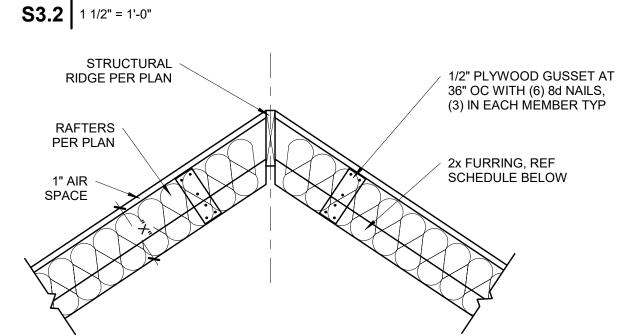


### **A-A SECTION**





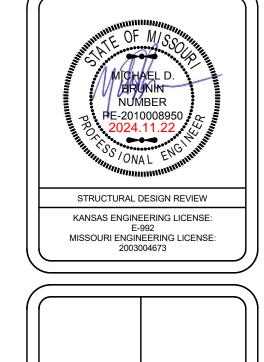
# **BOLTED RAFTER HIP** 2 CONNECTION



FURR OUT SCHEDULE				
RAFTER SIZE	R-30C INSULATION (X= 9 1/4")	R-38C INSULATION (X=11 1/4")		
2x6	2x6	2x8		
2x8	2x4	2x6		
2x10	NOT REQUIRED	2x4		
2x12	NOT REQUIRED	REQUIRED		
2. ALL VAULTS	UNLESS NOTED OTHERWISE.  SHALL BE FURRED DOWN WIT PTH OF INSULATION, PLUS 1" A  ATION = 8 1/4" THICK			

**VAULTED RAFTER INSULATION** 

1 FURR OUT



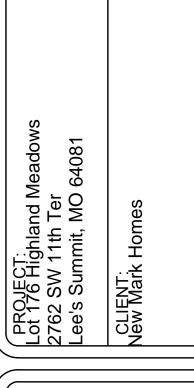
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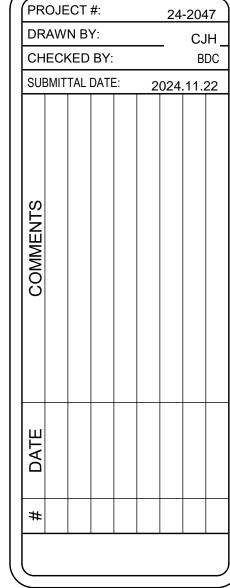
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