

THE MOLONEY / O'HANLON RESIDENCE

4016 92ND AVE SE
MERCER ISLAND, WA 98040

PROPERTY INFO:

PARCEL #: 003100-0020

PROPERTY OWNER: MOLONEY, COLIN AND KELLE

SINGLE FAMILY RESIDENCE

LOT SIZE: 0.16 ACRES

LEGAL DESCRIPTION:

ACKERSON PARK ADD

PLAT BLOCK: A

PLAT LOT: 4

SHEET INDEX:

- C1.1 COVER SHEET
- E1.1 ENERGY FORMS
- D1.1 EXISTING AND DEMO FLOOR PLAN
- A1.1 FOUNDATION AND FIRST FLOOR PLAN
- A1.2 SECOND FLOOR AND ROOF PLAN
- A2.1 ELEVATIONS
- A2.2 ELEVATIONS AND SECTION
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- A3.2 FRAMING PLANS
- ME.1 FIRST FLOOR ELECTRICAL / LIGHTING PLAN

5X.X STRUCTURAL SHEETS BY STRUCTURAL ENGINEER

THESE PLANS ARE TO BE DESIGNED AND BUILT TO THE FOLLOWING APPLICABLE CODES:

- 2018 INTERNATIONAL BUILDING CODE (IBC)
- 2018 INTERNATIONAL RESIDENTIAL CODE (IRC)
- 2018 INTERNATIONAL EXISTING CODE (IEBC)
- 2018 WASHINGTON STATE AMENDMENTS (WAC 51-50)
- 2018 INTERNATIONAL MECHANICAL CODE (IMC)
- 2018 INTERNATIONAL FUEL & GAS CODE (IFGC)
- 2018 UNIFORM PLUMBING CODE (UPC)
- 2020 NATIONAL ELECTRIC CODE (NEC) (NFPA 70)
- +PART 1 & 3, 2020 WASHINGTON CITIES ELECTRICAL CODE
- 2018 WASHINGTON STATE ENERGY CODE, WAC 51-11 (WSEC)

GENERAL NOTES:

TO THE BEST OF MY KNOWLEDGE THESE PLANS ARE DRAWN TO COMPLY WITH OWNERS AND/OR BUILDER'S SPECIFICATIONS AND ANY CHANGES MADE ON THEM AFTER PRINTS ARE MADE WILL BE DONE AT THE OWNERS AND/OR BUILDER'S EXPENSE AND RESPONSIBILITY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ENCLOSED DRAWING. DESIGNER IS NOT LIABLE FOR ERRORS ONCE CONSTRUCTION HAS BEGUN. WHILE EVERY EFFORT HAS BEEN MADE IN THE PREPARATION OF THIS PLAN TO AVOID MISTAKES, THE MAKER CAN NOT GUARANTEE AGAINST HUMAN ERROR. THE CONTRACTOR OF THE JOB MUST CHECK ALL DIMENSIONS AND OTHER DETAILS PRIOR TO CONSTRUCTION AND BE SOLELY RESPONSIBLE THEREAFTER.

- DO NOT SCALE DRAWINGS! WRITTEN DIMENSIONS TAKE PRECEDENCE
- ALL DIMENSIONS ARE FROM ROUGH FRAME (UNO)
- ALL DIMENSIONS TO BE VERIFIED PRIOR TO CONSTRUCTION. UPON DISCOVERY OF ANY DISCREPANCIES, CONFLICTS OR ERRORS THEY SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE DESIGNER/ENGINEER. IF ANY QUESTIONS ARISE DURING CONSTRUCTION TO ANY STRUCTURAL MATTER, DESIGNER/ENGINEER SHALL BE CONSULTED IMMEDIATELY FOR PROMPT RESOLUTION.
- NO CHANGES ARE TO BE MADE TO THE PLANS WITHOUT CONSULTING DESIGNER/ENGINEER OR APPLICABLE BUILDING DEPARTMENT.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE 2018 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC) AND THE INTERNATIONAL RESIDENTIAL CODE (IRC).
- CONTRACTOR AND SUBCONTRACTOR RESPONSIBLE TO ALL CODES, NOTES, INFORMATION AND PRODUCT SPECIFICATIONS PERTAINING TO THIS PROJECT BEFORE PROCEEDING AND ALL PHASES OF CONSTRUCTION OF THIS PROJECT.

FIRE SPRINKLER SYSTEM:

A NFPA 13D FIRE SPRINKLER SYSTEM IN COMPLIANCE WITH NFPA 13D AND COMI STANDARDS SHALL BE INSTALLED THROUGHOUT THE RESIDENCE.

A SEPARATE FIRE PERMIT IS REQUIRED.

NOTE THAT THIS SYSTEM REQUIRES A MINIMUM OF 1" WATER METER AND 1" WATER SUPPLY LINE.

SQUARE FOOTAGE CALCULATIONS:

EXTG FIRST FLOOR	1,690 SQFT
NEW SECOND FLOOR	890 SQFT
TOTAL LIVING	2,580 SQFT
GARAGE	360 SQFT
NEW COVERED FRONT WALKWAY	100 SQFT

LOT COVERAGE CALCULATIONS			
A. Gross Lot Area	7140	Square Feet	
B. Net Lot Area	7140	Square Feet	
C. Allowed Lot Coverage Area	2856	Square Feet	
D. Allowed Lot Coverage	40	% of Lot	
E. Existing Lot Coverage:			
1. Main Structure Roof Area	1690	Square Feet	
2. Accessory Building Roof Area	334	Square Feet	
3. Vehicular Use (driveway, paved access easements (portion used by the lot for access), parking)	304	Square Feet	
4. Covered Patios and Covered Decks	100	Square Feet	

5. Total Existing Lot Coverage Area (E1+E2+E3+E4)	2518	Square Feet	
F. (Total Lot Coverage Area Removed)	0	Square Feet	
G. Proposed Adjustment for Single Story (Area)	N/A	Square Feet	
H. Proposed Adjustment for Flag Lot	N/A	Square Feet	
I. Total New Lot Coverage Area:			
1. Main Structure Roof Area	150	Square Feet	
2. Accessory Structure Roof Area	0	Square Feet	
3. Vehicular Use (driveway, paved access easement (portion used by the lot for access), parking)	0	Square Feet	
4. Covered Patios and Covered Decks	0	Square Feet	
5. Total New Lot Coverage Area (I1 + I2 + I3 + I4)	150	Square Feet	
J. Total Project Lot Coverage Area = (E5 - F) + I5	2618	Square Feet	
K. Proposed Lot Coverage Area = (I/B)x100	36.666	% of Lot	
Lot coverage calculations shown on Plan Sheet #			

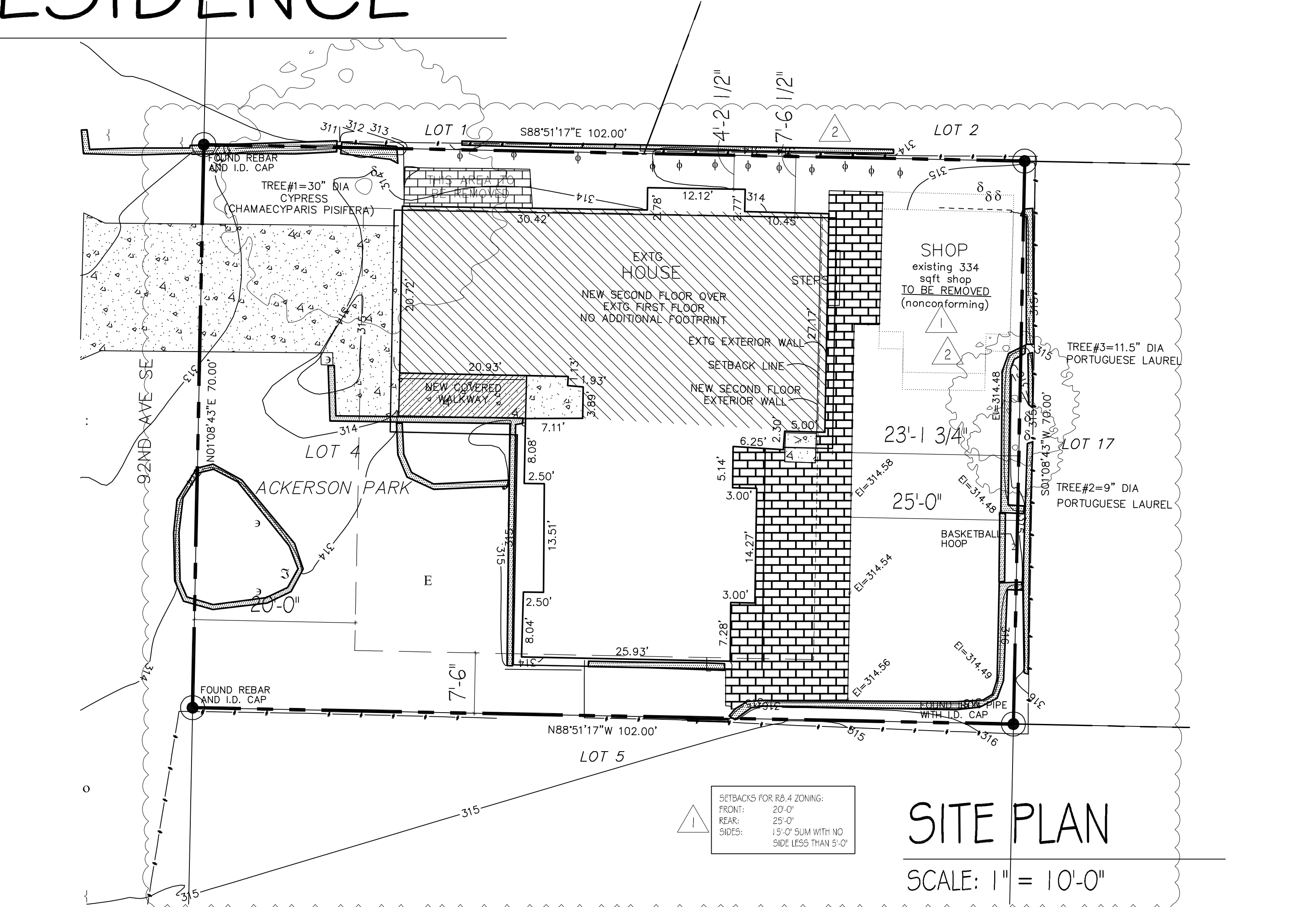
HARDSCAPE CALCULATIONS			
A. Gross Lot Area	7140	Square Feet	
B. Net Lot Area	7140	Square Feet	
C. Area Borrowed from Lot Coverage	0	Square Feet	
D. Allowed Hardship Area = 9% of lot area + C	642.6	Square Feet	
E. Allowed Hardship Area	642.6	Square Feet	
F. Total Existing Hardship Area:			
1. Uncovered Decks	0	Square Feet	
2. Uncovered Patios	637.34	Square Feet	
3. Walkways	138.5	Square Feet	
4. Stairs	0	Square Feet	
5. Rockeries and Retaining Walls	0	Square Feet	
6. Other	0	Square Feet	
7. Total Existing Hardship Area (F1+F2+F3+F4+F5+F6)	775.84	Square Feet	
G. (Total Hardship Area Removed)	133.24	Square Feet	
H. Total New Hardship Area:			
1. Uncovered Decks	0	Square Feet	
2. Uncovered Patios	0	Square Feet	
3. Walkways	0	Square Feet	
4. Stairs	0	Square Feet	
5. Rockeries and Retaining Walls	0	Square Feet	

6. Other	0	Square Feet	
7. Total New Hardship Area (H1+H2+H3+H4+H5+H6)	0	Square Feet	
I. Total Project Hardship Area = (F7 - G) + H7	642.6	Square Feet	
J. Total Project Hardship Area = (I/B)x100	0	% of Lot	
Hardship calculations shown on Plan Sheet #			

GROSS FLOOR AREA CALCULATIONS					
Building Area	Existing Area	Removed Area	New/Addition Area	Total	
Upper Floor	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
Main Floor	1690	0	890	1690	Sq. Ft.
Gross Basement Area	0	0	0	0	Sq. Ft.
Garage/Carport	360	0	0	360	Sq. Ft.
Total Floor Area	2050	0	890	2851	Sq. Ft.
Accessory Buildings	336	0	0	336	Sq. Ft.

Accessory Dwelling Unit	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
2nd & 3rd Story Roofed	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
Decks	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
Basement Area	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
Excluded 150% GFA Modifier*	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
(main and upper floor x2)	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
200% GFA Modifier*	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
(main and upper floor x2)	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
State case GFA Modifier*	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
(x2 for a three story staircase, x3 for a four story staircase)	Sq. Ft.	Sq. Ft.	Sq. Ft.	Sq. Ft.	
TOTAL Building Area	2386	Sq. Ft.	336	Sq. Ft.	2851
Enter the actual room area					
A. Lot Area	7140	Square Feet			
B. Zone R-8.4 [] R-9.6 [] R-12 [] R-15 []					
C. Allowed Gross Floor Area (refer to "allowed GFA")	2856	Square Feet			
D. Allowed Gross Floor Area	80	% of Lot			
E. Proposed Gross Floor Area	2851	Square Feet			
F. Proposed Gross Floor Area	39.9	% of Lot			
Gross floor area calculations found on Plan Sheet #					

Basement exclusion calculations found on Plan Sheet #



Brad Case
ISA Certified Arborist
PN-7332A

THE MOLONEY / O'HANLON RESIDENCE
4016 92ND AVE SE
MERCER ISLAND, WA 98040

DRAWN BY:

KLC

SOLD BY:

RENEWAL

DATE:

10-10-24

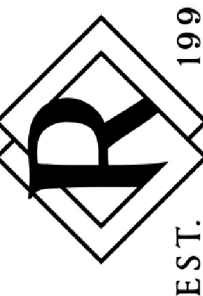
REV: 2

COVER SHEET

C1.1

CLIENT APPROVAL -

INITIALS



EST. 1996

RENEWAL
REMODELS & ADDITIONS

16006 60TH ST E, SUMMER, WASHINGTON 98090
253-682-1990

CARPENTRY:

NAILS: CONNECTION DESIGNS ARE BASED ON "COMMON WIRE" NAILS WITH THE FOLLOWING PROPERTIES:

PENNYWEIGHT	DIAMETER (INCHES)	LENGTH (INCHES)	TRACKER** COLOR CODED NAILS
8d	0.131	2-1/2	BLUE
10d	0.148	3	PURPLE
16d	0.162	3-1/2	ORANGE
20d	0.192	4	-

FOR DIAPHRAGM OR SHEAR WALL NAILING THE FOLLOWING FASTENER TYPES MAY BE USED AT EQUIVALENT SPACING TO THAT SPECIFIED ON PLANS:

FASTENER TYPE	DIAMETER (INCHES)	LENGTH (INCHES)	EQUIVALENT SPACING (INCHES)			TRACKER** COLOR CODED NAILS
8d COMMON WIRE	0.131	2-1/2	6	4	3	BLUE
8d "DIPPED GALV. BOX"	0.131	2-1/2	6	4	3	-
8d "SHINY BOX"	0.113	2-1/2	4-1/2	3	2-1/2	YELLOW
12 GA. STAPLES	0.1055	1-7/8"	6	5-1/2	4	-
14 GA. STAPLES	0.080	1-1/2*	6	4	3	-
15 GA STAPLES	0.072	1-1/2*	5	3	2-1/2	-
10d COMMON WIRE	0.148	3	6	4	3	PURPLE
10d "HOT DIPPED GALV. BOX"	0.148	3	6	4	3	-
10d "SHINY BOX"	0.128	3	4-1/2	3	2-1/4	WHITE

*BASED ON 15/32" PLYWOOD OR OSB.
**REFERENCE TO COLOR CODED NAILS PER TRACKERS SYSTEM.

WOOD SHEATHING (STRUCTURAL): SHEATHING SHALL BE PLYWOOD OR ORIENTED STRAND BOARD. PLYWOOD SHEATHING SHALL BE 5-PLY MINIMUM WHERE INDICATED AS 3/4" OR THICKER. WOOD SHEATHING SHALL BE "STRUCTURAL I" CONFORMING TO PS1-09 AND/OR PS2-10. ALL PANELS SHALL BEAR THE STAMP OF AN APPROVED GRADING AGENCY. SPAN RATING SHALL BE PROVIDED AS FOLLOWS: ROOF FRAMING AT 32"O.C. (48/24); ROOF FRAMING AT 24"O.C. (32/16); WALLS (32/16); FLOORS (48/24) ALL WOOD SHEATHED WALLS SHALL BE BLOCKED AT ALL PANEL EDGES UNLESS NOTED OTHERWISE.

GLUE-LAMINATED MEMBERS: CONFORM TO ANSI/AITC A190.1. MEMBERS SHALL BE COMBINATION 24F-V4 DOUGLAS FIR (DF) FOR SIMPLE SPANS AND 24F-V8 DF FOR CANTILEVERED SPANS (Fb=2400 PSI, Fv=265 PSI, E= 1.8X10^6 PSI) AND DF COMBINATION 2 FOR COLUMNS. ARCHITECTURAL APPEARANCE GRADE WHERE EXPOSED TO VIEW; INDUSTRIAL APPEARANCE GRADE WHERE NOT EXPOSED TO VIEW. ALL MEMBER TO HAVE EXTERIOR GLUE AND HAVE AITC OR APA-EWS STAMP. CAMBER AS SHOWN ON STRUCTURAL DRAWINGS.

FRAMING LUMBER: STANDARDS. EACH PIECE SHALL BEAR THE GRADE TRADEMARK OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLIB), WESTERN WOOD PRODUCTS ASSOCIATION (WWPA), OR OTHER AGENCY ACCREDITED BY THE AMERICAN LUMBER STANDARD COMMITTEE (ALSC) TO GRADE UNDER ALSC CERTIFIED GRADING RULES.

SPECIES AND GRADE (BASE DESIGN VALUE)

1.

6x BEAMS AND HEADERS. "DOUG FIR-LARCH" NO. 1 (Fb=1350 PSI, Fv=170 PSI)
2.

2x TO 4x JOISTS, PURLINS AND HEADERS. "DOUG FIR-LARCH" NO. 2 (Fb=900 PSI, Fv=180 PSI) OR "HEM-FIR" NO. 1 (Fb=975 PSI, Fv=150 PSI)
3.

6x POSTS AND COLUMNS. "DOUG FIR-LARCH" NO. 1 (Fc=1000 PSI)
4.

EXTERIOR STUDS, INTERIOR BEARING WALLS AND 4x COLUMNS. "DOUG FIR-LARCH" NO. 2 (Fb= 900 PSI, Fc= 1350 PSI) OR "HEM-FIR" NO. 1 (Fb=975 PSI, Fc=1350 PSI).
5.

INTERIOR NON-BEARING STUD WALLS. "DOUG FIR-LARCH" NO. 2 (Fb=900 PSI, Fc=1350 PSI) OR "HEM-FIR" NO. 1 (Fb=975 PSI, Fc=1350 PSI)

STRUCTURAL COMPOSITE LUMBER (SCL): SHALL BE MANUFACTURED BY WEYERHOUSER, OR PRE-APPROVED EQUAL IN ACCORDANCE WITH APPROVED SHOP AND INSTALLATION DRAWINGS CONFORMING TO A CURRENT ICC EVALUATION REPORT.

MINIMUM DESIGN VALUES:

1.

2x LVL: Fb = 1700 PSI, Fv = 285 PSI, E = 1300 KSI
2.

1-3/4" LVL: Fb = 2600 PSI, Fv = 285 PSI, E = 1800 KSI
3.

3-1/2" LVL: Fb = 2900 PSI, Fv = 285 PSI, E = 2000 KSI
4.

5-1/4" LVL: Fb = 2900 PSI, Fv = 285 PSI, E = 2000 KSI
5.

RIMBOARD:APA/EWS PERFORMANCE RATED RIM (PRR-401) 1-1/4" MINIMUM THICKNESS

PRESERVATIVE TREATED WOOD REQUIREMENTS:

TREATMENTS OTHER THAN THOSE LISTED BELOW ARE NOT PERMITTED.

		APPLICATION	SPECIFIED MATERIAL	PRESERVATIVE TREATMENT (1)	CONNECTORS & FASTENERS (2)(3)
EXPOSURE	DRY	FOUNDATION SILL PLATES, TOP PLATES & LEDGERS ON CONCRETE OR MASONRY WALLS (4)	2x, 4x, 6x (FIR), OR GLULAM (SP)	SBX	GALV (G60)
				ACQ, CBA, CA	GALV (G185)
	WET	FRAMING, DECKING, POSTS & LEDGERS	2x, & 4x (FIR)	ACQ, CBA, CA	GALV (G185)
			2x, & 4x (CEDAR)	NONE	GALV (G90)
		BEAMS & COLUMNS	6x (FIR), OR GLULAM (SP)	ACQ, CBA, CA	GALV (G185)
			6x OR GLULAM (CEDAR)	NONE	GALV (G90)

1.

CCA: CHROMATED COPPER ARSENATE NOT PERMITTED
SBX: DOT SODIUM BORATE
ACQ: ALKALINE COPPER QUAT
CBA & CA: COPPER AZOLE

FIR: DOUG-FIR OR HEM-FIR
SP: SOUTHERN PINE
2.

CONNECTORS: JOIST HANGERS, STRAPS, FRAMING CONNECTORS, COLUMN CAPS AND BASES, ETC.
FASTENERS: MACHINE BOLTS, ANCHOR BOLTS AND LAG SCREWS WITH ASSOCIATED PLATE WASHERS AND NUTS. NAILS, SPIKES, WOOD SCREWS, ETC.
3.

G60, G90 & G185 PER ASTM A653 FOR COLD-FORMED STEEL CONNECTORS. BATCH/POST HOT-DIP GALVANIZED PER ASTM A123 FOR CONNECTORS. HOT-DIP GALVANIZED PER ASTM A153 FOR FASTENERS OR MECHANICALLY GALVANIZED FASTENERS PER ASTM B695, CLASS 55 OR GREATER.

GENERAL REQUIREMENTS: PROVIDE MINIMUM NAILING PER IBC TABLE 2304.10.1 OR MORE, AS OTHERWISE SHOWN. STAGGER ALL NAILING TO PREVENT SPLITTING OF WOOD MEMBERS. ALL WOOD IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESERVATIVE TREATED WITH THE EXCEPTION OF INTERIOR CONCRETE TOPPINGS ON WOOD FLOOR SYSTEMS. HOLES AND CUTS IN 3x OR 4x PLATES SHOULD BE TREATED WITH A 9% SOLUTION OF COPPER NAPHTHENATE. BOLT HOLES IN WOOD MEMBERS SHALL BE A MINIMUM OF 1/32" TO A MAXIMUM OF 1/16" LARGER THAN THE BOLT DIAMETER. PROVIDE CUT WASHERS WHERE BOLT HEADS, NUTS AND LAG SCREW HEADS BEAR ON WOOD. PROVIDE A MINIMUM 3"x3"x0.229" PLATE WASHER ON ALL ANCHOR BOLTS WHICH CONNECT MUD SILLS TO FOUNDATION. DO NOT NOTCH OR DRILL STRUCTURAL MEMBERS, EXCEPT AS ALLOWED BY IBC SECTIONS 2308.4.2.4, 2308.5.9, 2308.5.10 AND 2308.7.4 OR AS RESTRICTED BY PLANS OR DETAILS, OR AS APPROVED PRIOR TO INSTALLATION. REFER TO PRESERVATIVE TREATED WOOD REQUIREMENTS IN THESE GENERAL NOTES FOR GALVANIZING REQUIREMENTS FOR CONNECTORS AND FASTENERS.

FASTENING SCHEDULE FOR WOOD STRUCTURAL MEMBERS (UNLESS NOTED OTHERWISE ON PLANS)		
ITEM	TYPE	CONNECTION
RAFTER OR TRUSS TO TOP PLATE	TOENAIL & CONNECTOR	(3) 16d H2.5 @ 48" O.C.
CEILING JOIST TO TOP PLATE	TOENAIL	(3) 8d
CEILING JOIST TO PARALLEL RAFTER	FACE NAIL	(3) 16d
CEILING JOIST: LAP OVER PARTITION	FACE NAIL	(3) 16d
COLLAR TIE	FACE NAIL	(3) 16d
BLOCKING TO RAFTER	TOENAIL	(3) 8d
RIM BOARD TO RAFTER	END NAIL	(2) 16d
TOP PLATE TO TOP PLATE	FACE NAIL	(2) 16d @ 12" O.C.
TOP PLATE AT INTERSECTIONS	FACE NAIL	(4) 16d
TOP PLATE LAP	FACE NAIL	(8) 16d
STUD TO STUD	FACE NAIL	(2) 16d @ 24" O.C.
HEADER TO HEADER	FACE NAIL	16d @ 16" O.C. EA. EDGE
TOP OR BOTTOM PLATE TO STUD	END NAIL	(2) 16d
STUD TO SOLE PLATE	TOE NAIL END NAIL	(4) 8d (2) 16d
BOTTOM PLATE TO FLOOR JOIST AT BRACED PANEL	TOE NAIL FACE NAIL	16d @ 16" O.C. (3) 16d @ 16" O.C.
JOISTS TO TOP PLATE, SILL OR GIRDER	TOE NAIL	(4) 8d
BRIDGING TO JOIST	TOE NAIL	(2) 8d
BLOCKING TO JOISTS	TOE NAIL	(3) 8d
BLOCKING TO TOP PLATE	TOE NAIL	(3) 8d
RIM JOIST TO JOIST	FACE NAIL	(3) 16d
RIM JOIST TO SILL OR TOP PLATE	CONNECTOR	A35 @ 24" O.C.
CONTINUOUS HEADER TO STUD	CONNECTOR	A35
BUILT-CORNER STUDS	FACE NAIL	16d @ 24" O.C.
BUILT-UP BEAMS (PER LAYER)	FACE NAIL	16d @ 16" O.C. EA. EDGE
RAFTERS TO RIDGE BOARD	TOE NAIL FACE NAIL	(4) 16d (3) 16d
RAFTERS TO HIP	TOE NAIL FACE NAIL	(4) 16d (3) 16d

FRAMING CONNECTORS: SHALL HAVE ICC APPROVAL AND BE MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, SAN LEANDRO, CA., OR PRE-APPROVED EQUAL. PROVIDE MAXIMUM SIZE AND QUANTITY OF NAILS OR BOLTS PER MANUFACTURER, EXCEPT AS NOTED OTHERWISE. PROVIDE LEAD HOLES AS REQUIRED TO PREVENT SPLITTING OF WOOD MEMBERS. REFER TO PRESERVATIVE TREATED WOOD REQUIREMENTS IN THESE GENERAL NOTES FOR GALVANIZING REQUIREMENTS FOR CONNECTORS AND FASTENERS.

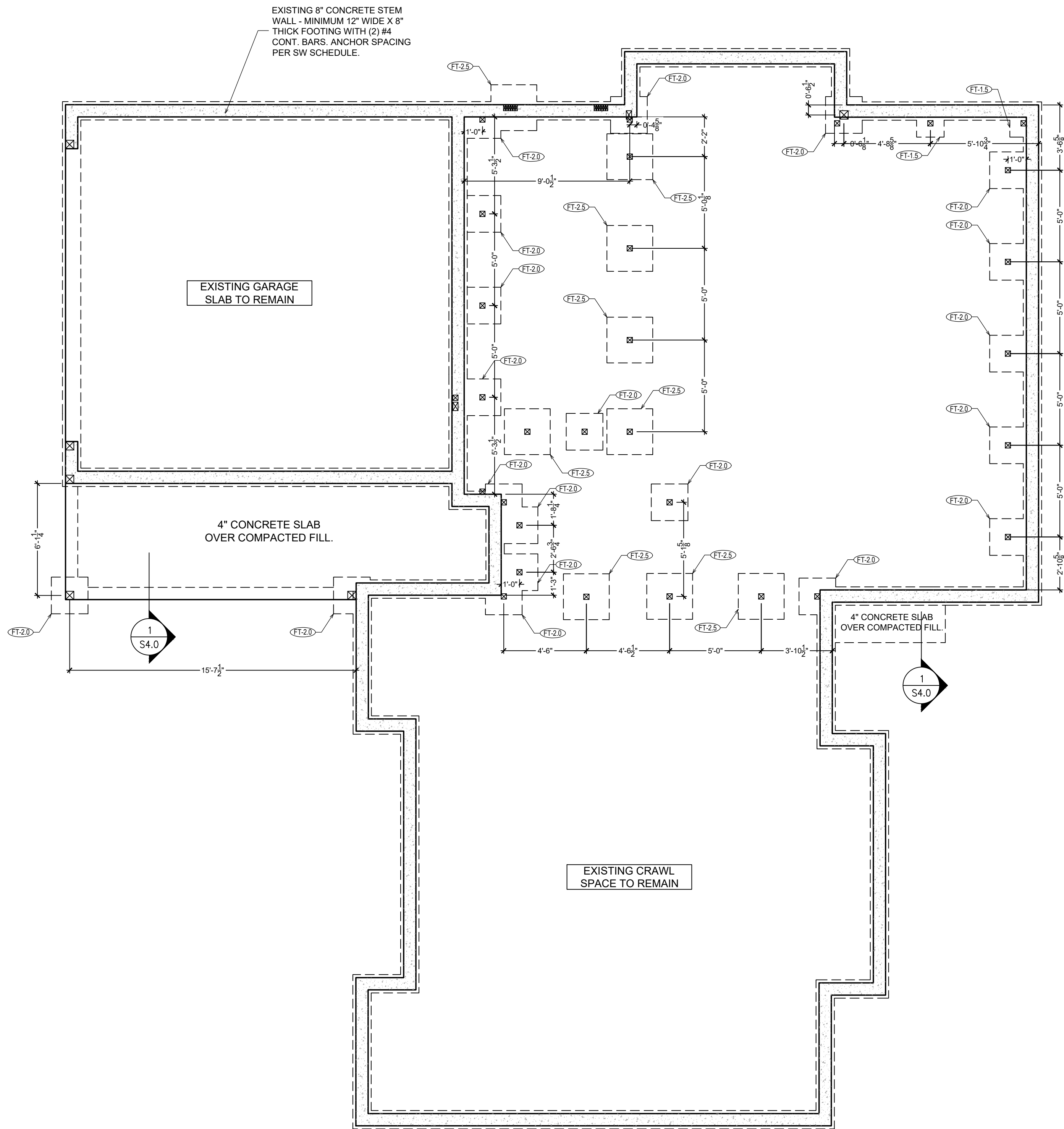
LAG SCREWS: SHALL CONFORM TO ANSI/ASME STANDARD B18.2.1. LAG SCREWS SHALL BE OF A DIAMETER INDICATED ON DRAWINGS WITH A MINIMUM OF 8x DIA. EMBEDMENT IN SUPPORTING MEMBER UNLESS NOTED OTHERWISE. CLEARANCE HOLE FOR THE SHANK SHALL BE THE SAME DIAMETER AS THE SHANK AND THE SAME DEPTH OF PENETRATION AS THE UNTHREADED PORTION OF THE SHANK. THE LEAD HOLE FOR THE THREADED PORTION SHALL HAVE A DIAMETER EQUAL TO 60 TO 75 PERCENT OF THE SHANK DIAMETER AND A LENGTH EQUAL TO AT LEAST THE LENGTH OF THE THREADED PORTION. THE THREADED PORTION OF THE SCREW SHALL BE INSERTED IN ITS LEAD HOLE BY TURNING WITH A WRENCH. SOAP OR OTHER LUBRICANT SHALL BE USED ON THE SCREWS OR IN THE LEAD HOLE TO FACILITATE INSERTION AND PREVENT DAMAGE TO THE SCREW. LAG SCREWS SHALL NOT BE DRIVEN WITH A HAMMER. REFER TO PRESERVATIVE TREATED WOOD REQUIREMENTS IN THESE GENERAL NOTES FOR GALVANIZING REQUIREMENTS FOR CONNECTORS AND FASTENERS.

METAL-PLATE-CONNECTED WOOD TRUSSES: SHALL BE MANUFACTURED AND INSTALLED WITHIN THE JURISDICTION REQUIREMENTS, AND DESIGNED AND DETAILED IN ACCORDANCE WITH ANSI/TP-1, INCLUDING BRACING AND WIND UPLIFT. PROVIDE 2x6 TOP CHORDS, AND 2x4 BOTTOM CHORDS AND WEBS, UNLESS COORDINATED AND APPROVED. TRUSSES SHALL BE DESIGNED TO CARRY THE LOADS LISTED IN THE DESIGN CRITERIA AND ANY ADDITIONAL LOADS INDICATED ON THE FRAMING PLANS AND DETAILS. TRUSSES INDICATED ON PLANS ARE FOR TYPICAL UNIFORMLY LOADED CONDITIONS. MANUFACTURER SHALL PROVIDE ADDITIONAL OR SPECIAL TRUSSES AS REQUIRED TO SUPPORT SPECIAL LOADING CONDITIONS AS INDICATED ON DRAWINGS. PROVIDE INSTALLATION FRAMING PLANS AND DRAWINGS.

PROVIDE CERTIFICATE OF CONFORMANCE FROM AN INDEPENDENT TESTING LABORATORY OR A LICENSED PROFESSIONAL ENGINEER CERTIFYING THAT THEY HAVE INSPECTED THE FINISHED TRUSSES AND THAT ALL TRUSSES ARE CONSTRUCTED IN CONFORMANCE WITH THE TRUSS DESIGN DRAWINGS.

I-JOISTS: SHALL BE APA EWS PERFORMANCE RATED I-JOISTS (PRI) OR PRE-APPROVED EQUAL. I-JOISTS SHALL BE MANUFACTURED IN CONFORMANCE WITH APA PRI-400 CONFORMING TO APPROVED SHOP AND INSTALLATION DRAWINGS.





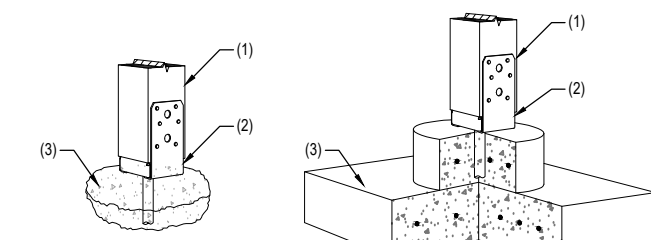
FOUNDATION NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- BOTTOM OF EXTERIOR FOOTINGS SHALL BE MINIMUM 12" BELOW GRADE.
- 4" CONCRETE SLAB OVER 6MIL VAPOR BARRIER ON 6" PF GRAVEL OR CRUSHED ROCK OVER FIRM UNDISTURBED SOIL OR ENGINEERED COMPACTED BACK-FILL. REINFORCE WITH 6 x 6 W1.4 x W1.4 WWF.
- ALL WOOD IN CONTACT WITH CONCRETE SHOULD BE PRESSURE TREATED WOOD.
- REFER TO GENERAL STRUCTURAL NOTES PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS.

FOOTING SCHEDULES

TYPE	DIMENSIONS & REINFORCEMENT				MAX CAPACITY (LBS)		
	LENGTH & WIDTH	DEPTH	ROUND OPTION	LONG. & TRANS.		SQ	RND
				NO.	SIZE		
FT-1.5	18"	10"	18" Ø	3	#4	2750	2200
FT-2.0	24"	10"	24" Ø	4	#4	4750	3750
FT-2.5	30"	10"	30" Ø	5	#4	7500	6000
FT-3.0	36"	12"	36" Ø	5	#4	10500	8500
FT-3.5	42"	12"	-	6	#4	15000	-
FT-4.0	48"	12"	-	8	#4	18500	-
FT-5.0	60"	12"	-	8	#4	30000	-

IMPORTANT NOTE:
EXTERIOR FOOTINGS W/ FROST DEPTH UP TO 12", USE 12" THICK FOOTING. FROST DEPTH GREATER THAN 12", PLEASE USE STANCHION AS SHOWN.



- NOTES:
- POST PER PLAN
 - SIMPSON ABU POST BASE PER PLAN
 - FOOTING PER PLAN

FT-XX TYPICAL FOOTING CALL OUT

ADDITIONAL NOTES

- POSTS SHOWN ON THE FOUNDATION PLAN ARE THOSE DIRECTLY CONNECTED TO THE FOUNDATION WITH A HOLDOWN OR POST BASE CONNECTOR.
- ALL FOOTINGS, FOUNDATIONS, EXCAVATIONS, GRADING, AND FILL SHALL COMPLY TO THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE W/ LOCAL AMENDMENTS.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL MEASUREMENTS AGAINST THE ARCHITECTURAL PLAN SET. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE EOR AND DESIGNER BEFORE FORMING AND/OR POURING CONCRETE.
- ALL FOOTINGS CAPACITIES ARE SHOWN ABOVE BASED ON 1500 PSF SOIL BEARING PRESSURE.

FLOOR FRAMING NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- FLOOR SHEATHING SHALL BE 3/4" TONGUE AND GROOVE A.P.A. RATED PLYWOOD OR OSB PANELS. (EXPOSURE 1, SPAN RATING 48/24). GLUE AND NAIL SHEATHING AT ALL FRAMED PANEL EDGES WITH 10d AT 6" O.C. AND TO ALL INTERMEDIATE FRAMING AT 12" O.C.
- HEADERS OVER DOORS AND WINDOW OPENINGS SHALL BE MINIMUM 4x10'S U.N.O.
- PROVIDE (2) STUDS MINIMUM AT EACH END OF ALL BEAMS U.N.O. ON PLANS. BEAR BEAM FULLY ON BUILT UP COLUMN AND PROVIDE POSITIVE CONNECTION BY EITHER A35 OR LTP4 CLIPS ON EACH SIDE OF BEAM
- ALL EXTERIOR WALLS SHALL BE SW1 U.N.O.
- REFER TO GENERAL STRUCTURAL NOTE PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS

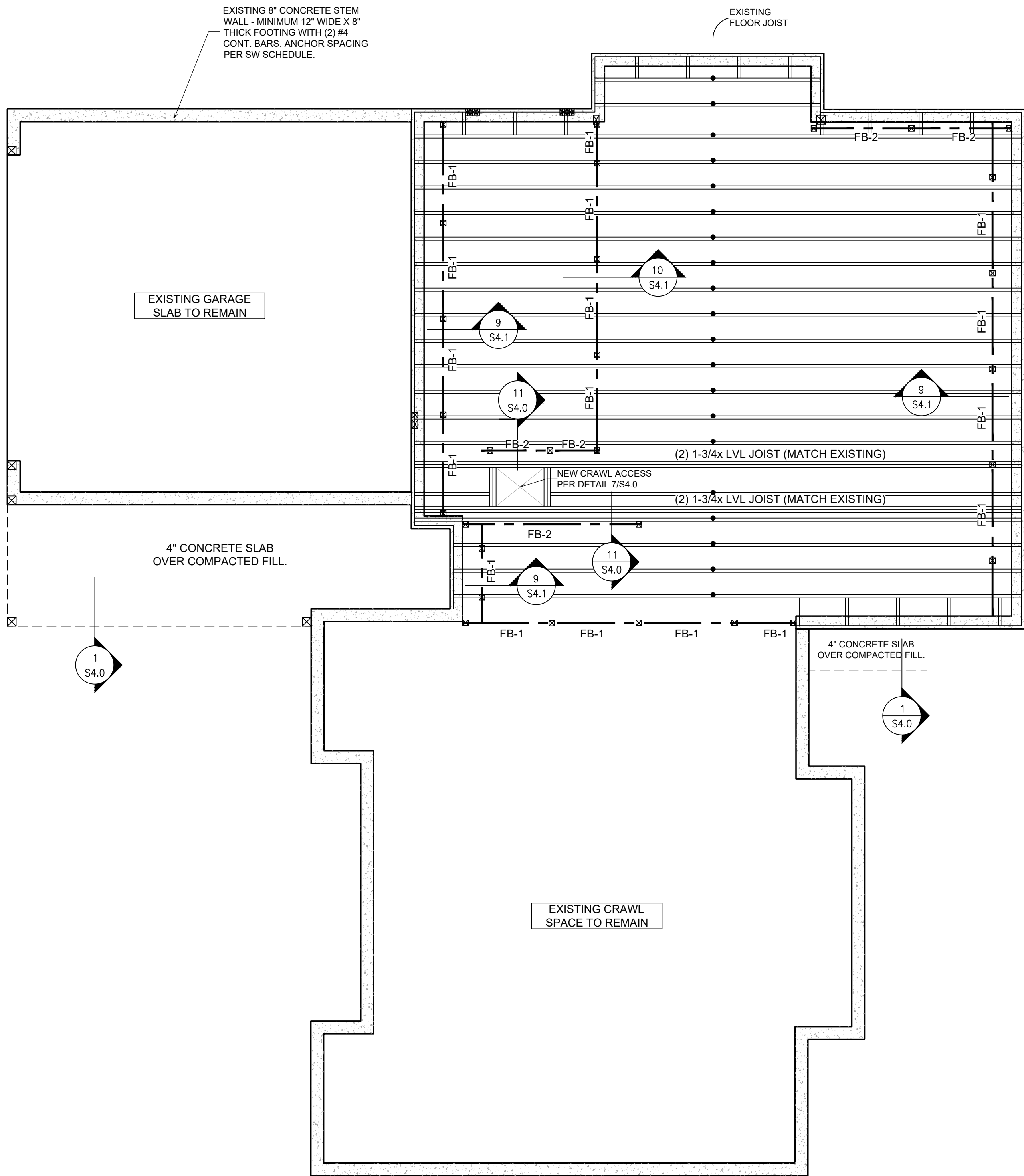
FLOOR BEAM SCHEDULE

FB-1: 4 x 12 DF-L NO.2 (DROP)

HDR: 4 x 8 DF-L NO.2 (UP TO 4'); 4 x 10 DF-L NO.2 (UP TO 6'); 4 x 12 DF-L NO.2 (UP TO 8')

POST & TRIMMER & WALL SCHEDULE

(x3) 2x TRIMMERS + (x3) 2x KING STUDS.	* ALL TRIMMERS AND KING STUDS SHALL CONFORM PER DETAIL 10/S4.1 UNLESS NOTED OTHERWISE.
(x2) 2x TRIMMERS + (x2) 2x KING STUDS.	
POST BELOW	6x6 POST
POST FROM ABOVE	4x4 POST
	4x6 POST
LOAD BEARING WALL	
PARTITION WALL	



MAIN FLOOR FRAMING PLAN

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

FLOOR FRAMING NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- FLOOR SHEATHING SHALL BE 3/4" TONGUE AND GROOVE A.P.A. RATED PLYWOOD OR OSB PANELS. (EXPOSURE 1, SPAN RATING 48/24). GLUE AND NAIL SHEATHING AT ALL FRAMED PANEL EDGES WITH 10d AT 6" O.C. AND TO ALL INTERMEDIATE FRAMING AT 12" O.C.
- HEADERS OVER DOORS AND WINDOW OPENINGS SHALL BE MINIMUM 4x10'S U.N.O.
- PROVIDE (2) STUDS MINIMUM AT EACH END OF ALL BEAMS U.N.O. ON PLANS. BEAR BEAM FULLY ON BUILT UP COLUMN AND PROVIDE POSITIVE CONNECTION BY EITHER A35 OR LTP4 CLIPS ON EACH SIDE OF BEAM
- ALL EXTERIOR WALLS SHALL BE SW1 U.N.O.
- REFER TO GENERAL STRUCTURAL NOTE PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS

FLOOR BEAM SCHEDULE

FB-1: 4 x 12 DF-L NO.2 (DROP)

FB-2: 4 x 12 DF-L NO.2 (FLUSH)

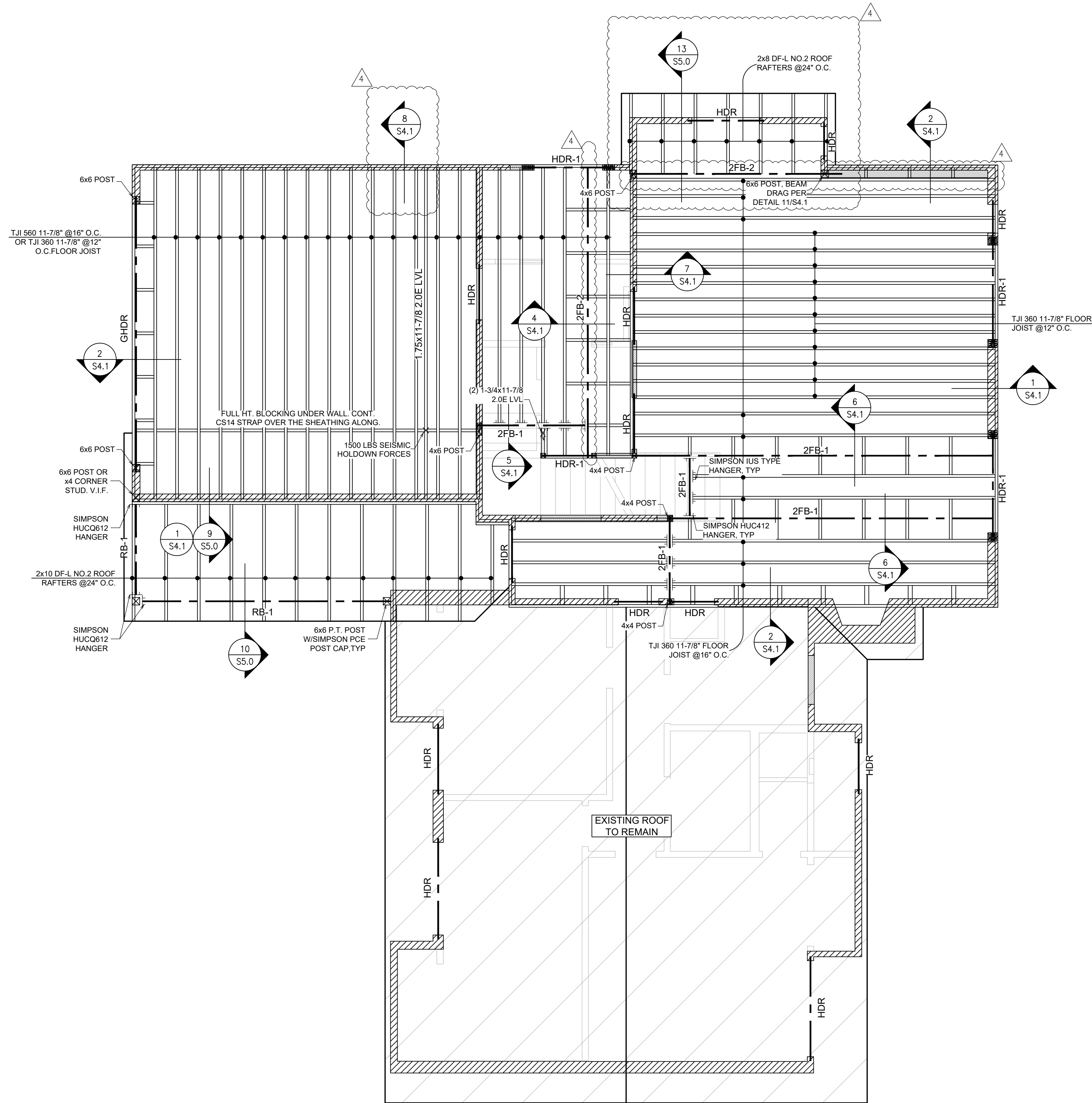
HDR: 4 x 8 DF-L NO.2 (UP TO 4'); 4 x 10 DF-L NO.2 (UP TO 6'); 4 x 12 DF-L NO.2 (UP TO 8')

POST & TRIMMER & WALL SCHEDULE

	(x3) 2x TRIMMERS + (x3) 2x KING STUDS.	* ALL TRIMMERS AND KING STUDS SHALL CONFORM PER DETAIL 10/S4.1 UNLESS NOTED OTHERWISE.
	(x2) 2x TRIMMERS + (x2) 2x KING STUDS.	
	POST BELOW	 6x6 POST
	POST FROM ABOVE	 4x4 POST
		 4x6 POST

LOAD BEARING WALL

PARTITION WALL



LOWER ROOF & UPPER FLOOR FRAMING PLAN

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

ROOF FRAMING NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- ROOF FRAMING SHALL BE PRE-MANUFACTURED ROOF TRUSSES AT 24" O.C. TRUSS DESIGN IS TO BE PROVIDED BY MANUFACTURER.
- HEADERS OVER DOORS AND WINDOW OPENINGS SHALL BE MINIMUM 4X10 U.N.O.
- PROVIDE (2) STUDS MINIMUM AT EACH END OF ALL BEAMS U.N.O. ON PLANS. BEAR BEAM FULLY ON BUILT UP COLUMN AND PROVIDE POSITIVE CONNECTION BY EITHER A35 OR LTP4 CLIPS ON EACH SIDE OF BEAM
- REFER TO GENERAL STRUCTURAL NOTE PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS
- PANELS SHALL NOT BE LESS THAN 4' X 8' EXCEPT AT BOUNDARIES AND CHANGES IN FRAMING WHERE MINIMUM PANEL DIMENSION SHALL BE 24".

ROOF BEAM SCHEDULE

RB-1: 6 x 12 DF-L NO.2

HDR: 4 x 8 DF-L NO.2 (UP TO 4'); 4 x 10 DF-L NO.2 (UP TO 6'); 4 x 12 DF-L NO.2 (UP TO 8')

ROOF SHEATHING SCHEDULE

SNOW LOAD (UP TO)	NOMINAL THICKNESS	SPAN RATING	EDGE NAILING	FIELD NAILING
40LBS	7/16"	24/16	8d @ 6" O.C.	8d @ 12" O.C.
70LBS	15/32", 1/2"	32/16	10d @ 6" O.C.	10d @ 12" O.C.
130LBS	19/32", 5/8"	40/20	10d @ 6" O.C.	10d @ 12" O.C.
175LBS	23/32", 3/4"	48/24	12d @ 6" O.C.	12d @ 12" O.C.

- LONG DIMENSIONS PERPENDICULAR TO ROOF JOIST WITH EDGE SUPPORT R503.2.1.1(1).
- NAIL SHEATHING AT ALL FRAMED PANEL EDGES AND TO ALL INTERMEDIATE FRAMING AS SHOWN ABOVE U.N.O.

POST & TRIMMER & WALL SCHEDULE

(x3) 2x TRIMMERS + (x3) 2x KING STUDS.	* ALL TRIMMERS AND KING STUDS SHALL CONFORM PER DETAIL 10/S4.1 UNLESS NOTED OTHERWISE.
(x2) 2x TRIMMERS + (x2) 2x KING STUDS.	
POST BELOW	6x6 POST
POST FROM ABOVE	4x4 POST
	4x6 POST

LOAD BEARING WALL	EXISTING WALL
PARTITION WALL	EXISTING STRUCTURE

ADDITIONAL NOTES

- PLEASE SUBMIT TRUSS MANUFACTURER'S TRUSS LAYOUT FOR OUR APPROVAL PRIOR TO CONSTRUCTION.

FLOOR FRAMING NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- FLOOR SHEATHING SHALL BE 3/4" TONGUE AND GROOVE A.P.A. RATED PLYWOOD OR OSB PANELS, (EXPOSURE 1, SPAN RATING 48/24). GLUE AND NAIL SHEATHING AT ALL FRAMED PANEL EDGES WITH 10d AT 6" O.C. AND TO ALL INTERMEDIATE FRAMING AT 12" O.C.
- HEADERS OVER DOORS AND WINDOW OPENINGS SHALL BE MINIMUM 4X10'S U.N.O.
- PROVIDE (2) STUDS MINIMUM AT EACH END OF ALL BEAMS U.N.O. ON PLANS. BEAR BEAM FULLY ON BUILT UP COLUMN AND PROVIDE POSITIVE CONNECTION BY EITHER A35 OR LTP4 CLIPS ON EACH SIDE OF BEAM
- ALL EXTERIOR WALLS SHALL BE SW1 U.N.O.
- REFER TO GENERAL STRUCTURAL NOTE PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS

FLOOR BEAM SCHEDULE

2FB-1: 3-1/2" x 11-7/8" 2.0E LVL

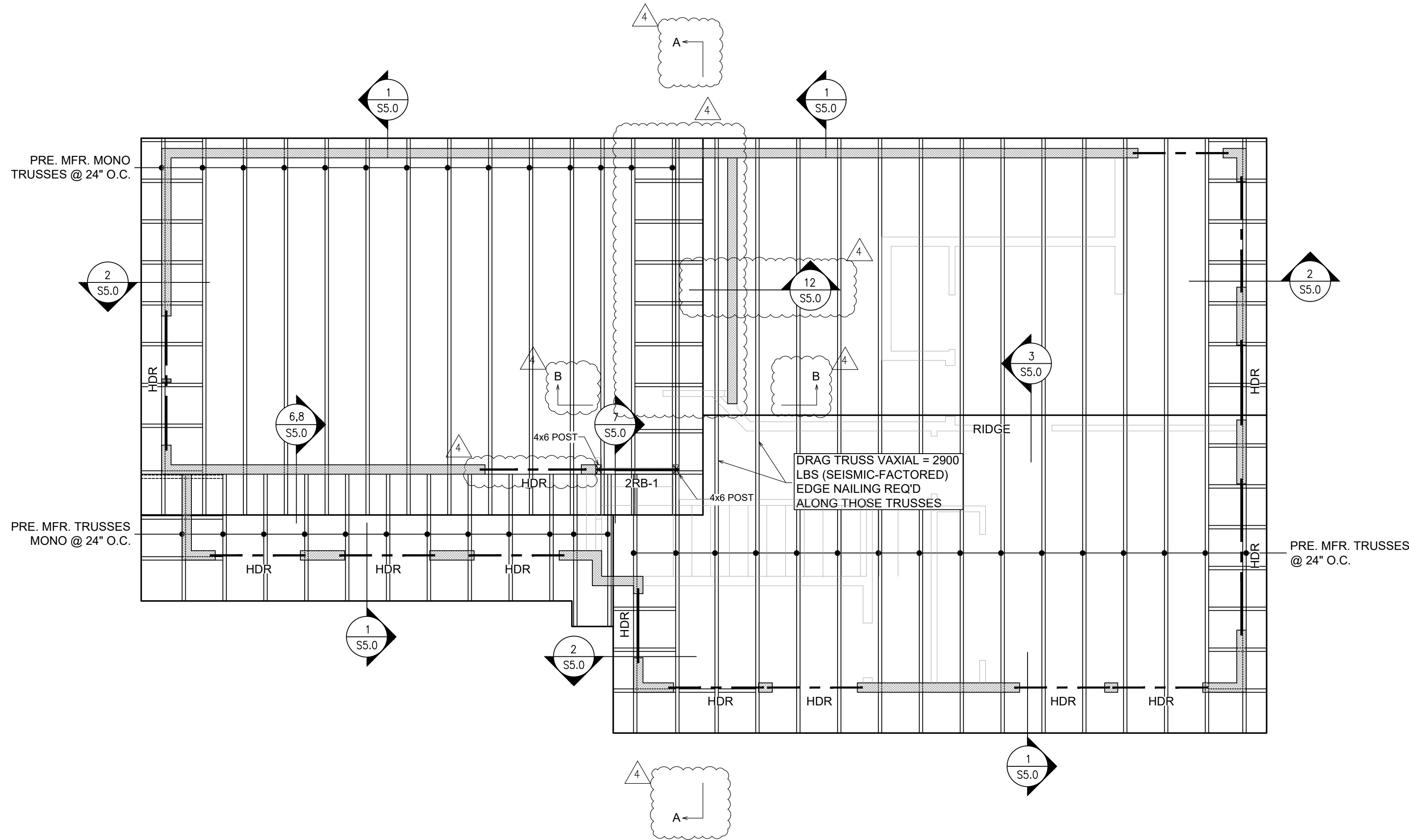
2FB-2: 5-1/4" x 11-7/8" 2.0E LVL

HDR-1: 3-1/2" x 12" 24F-V4 DF GLULAM

GHDR: 3-1/2" x 12" 24F-V4 DF GLULAM

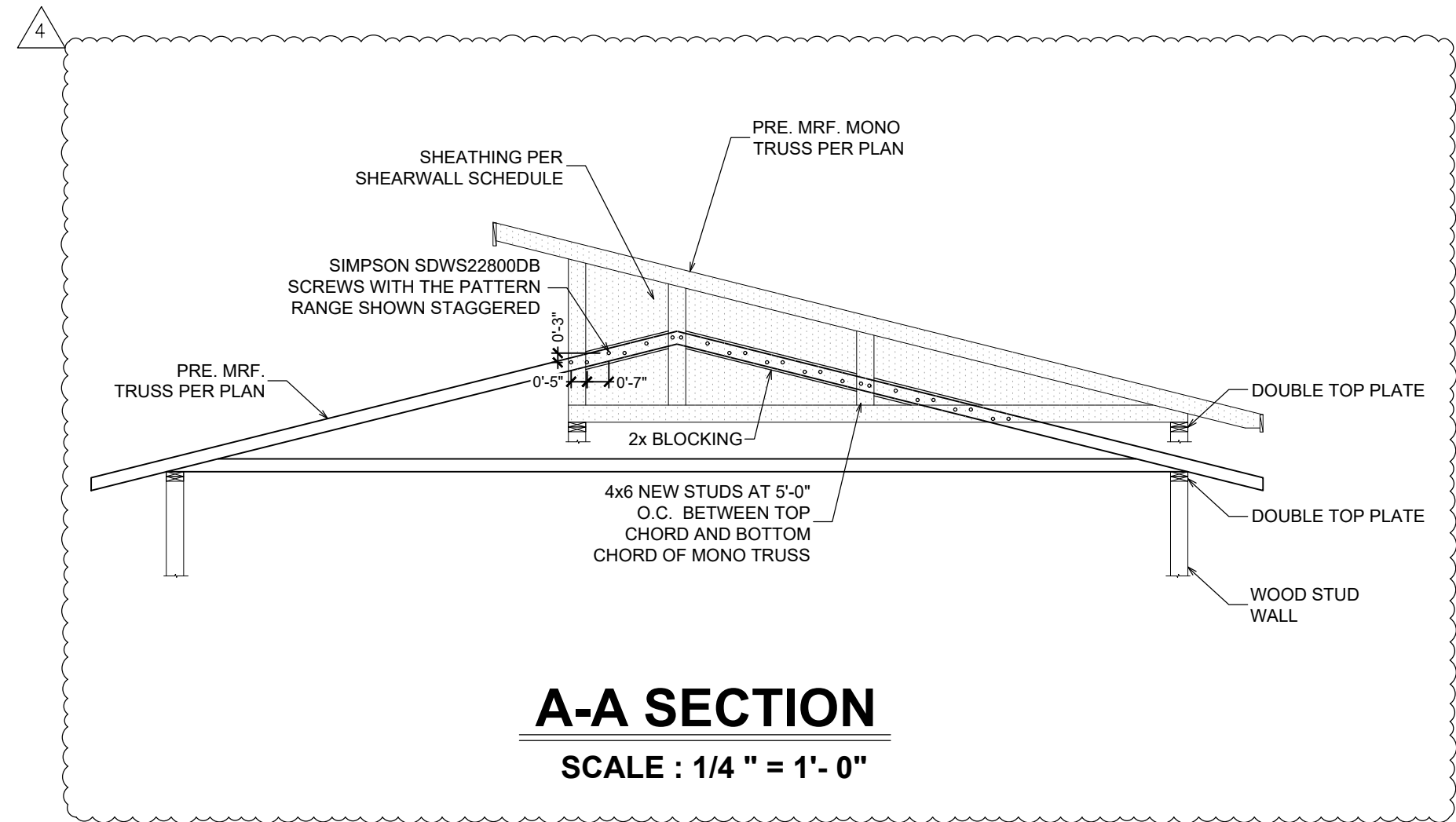
HDR: 4 x 8 DF-L NO.2 (UP TO 4'); 4 x 10 DF-L NO.2 (UP TO 6'); 4 x 12 DF-L NO.2 (UP TO 8')





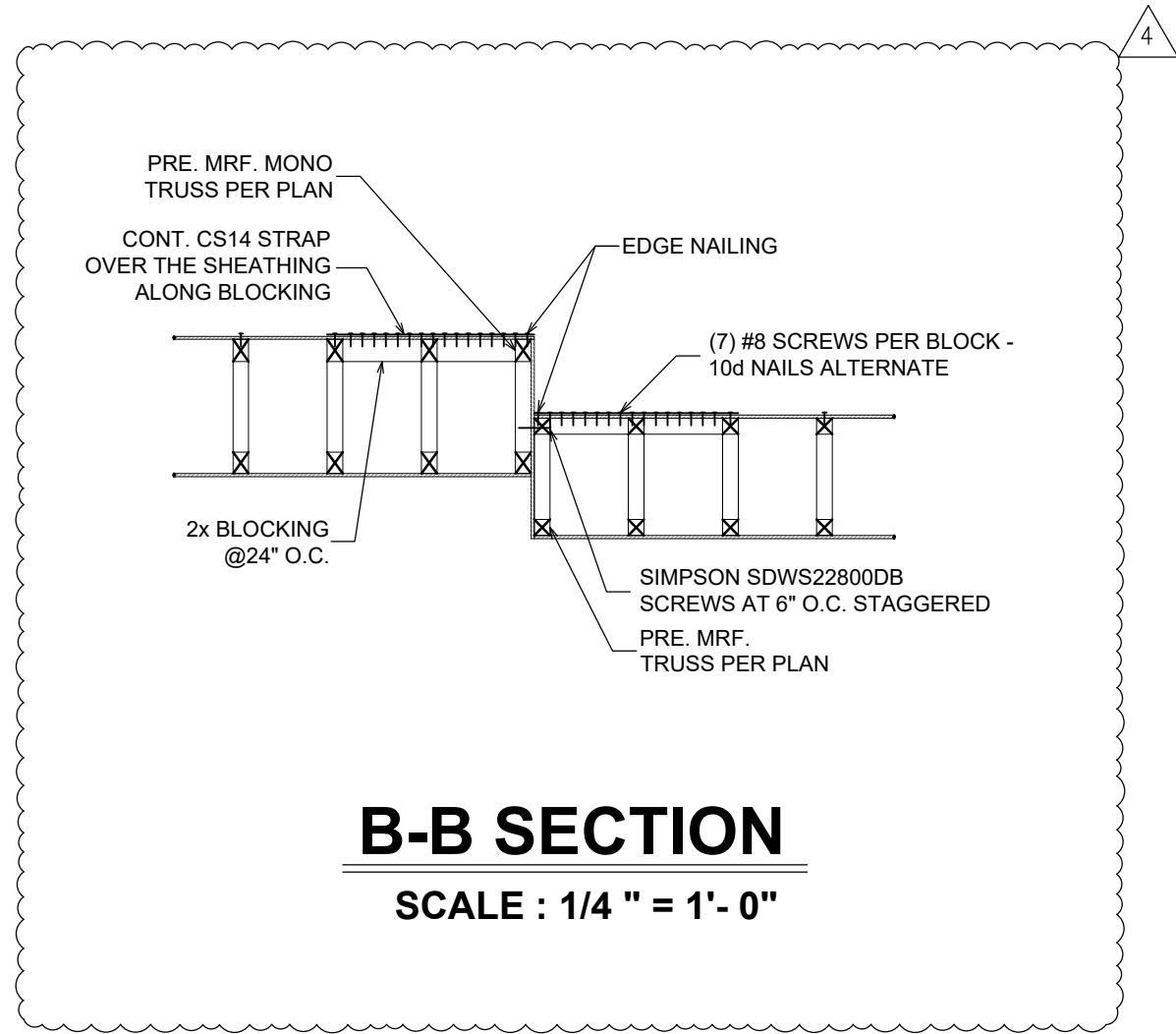
UPPER ROOF FRAMING PLAN

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



A-A SECTION

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



B-B SECTION

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

ROOF FRAMING NOTES:

- DO NOT SCALE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS.
- ROOF FRAMING SHALL BE PRE-MANUFACTURED ROOF TRUSSES AT 24" O.C. TRUSS DESIGN IS TO BE PROVIDED BY MANUFACTURER.
- HEADERS OVER DOORS AND WINDOW OPENINGS SHALL BE MINIMUM 4X10 U.N.O.
- PROVIDE (2) STUDS MINIMUM AT EACH END OF ALL BEAMS U.N.O. ON PLANS. BEAR BEAM FULLY ON BUILT UP COLUMN AND PROVIDE POSITIVE CONNECTION BY EITHER A35 OR LTP4 CLIPS ON EACH SIDE OF BEAM
- REFER TO GENERAL STRUCTURAL NOTE PAGE ON S0.0 FOR ADDITIONAL REQUIREMENTS
- PANELS SHALL NOT BE LESS THAN 4' X 8' EXCEPT AT BOUNDARIES AND CHANGES IN FRAMING WHERE MINIMUM PANEL DIMENSION SHALL BE 24".

ROOF BEAM SCHEDULE

2RB-1: 6 x 12 DF-L NO.2

HDR: 4 x 8 DF-L NO.2 (UP TO 4'); 4 x 10 DF-L NO.2 (UP TO 6'); 4 x 12 DF-L NO.2 (UP TO 8')

ROOF SHEATHING SCHEDULE

SNOW LOAD (UP TO)	NOMINAL THICKNESS	SPAN RATING	EDGE NAILING	FIELD NAILING
40LBS	7/16"	24/16	8d @ 6" O.C.	8d @ 12" O.C.
70LBS	15/32", 1/2"	32/16	10d @ 6" O.C.	10d @ 12" O.C.
130LBS	19/32", 5/8"	40/20	10d @ 6" O.C.	10d @ 12" O.C.
175LBS	23/32", 3/4"	48/24	12d @ 6" O.C.	12d @ 12" O.C.

- LONG DIMENSIONS PERPENDICULAR TO ROOF JOIST WITH EDGE SUPPORT R503.2.1.1(1).
- NAIL SHEATHING AT ALL FRAMED PANEL EDGES AND TO ALL INTERMEDIATE FRAMING AS SHOWN ABOVE U.N.O.

POST & TRIMMER & WALL SCHEDULE

(x3) 2x TRIMMERS + (x3) 2x KING STUDS.	ALL TRIMMERS AND KING STUDS SHALL CONFORM PER DETAIL 10/S4.1 UNLESS NOTED OTHERWISE.
(x2) 2x TRIMMERS + (x2) 2x KING STUDS.	
POST BELOW	6x6 POST
POST FROM ABOVE	4x4 POST
	4x6 POST

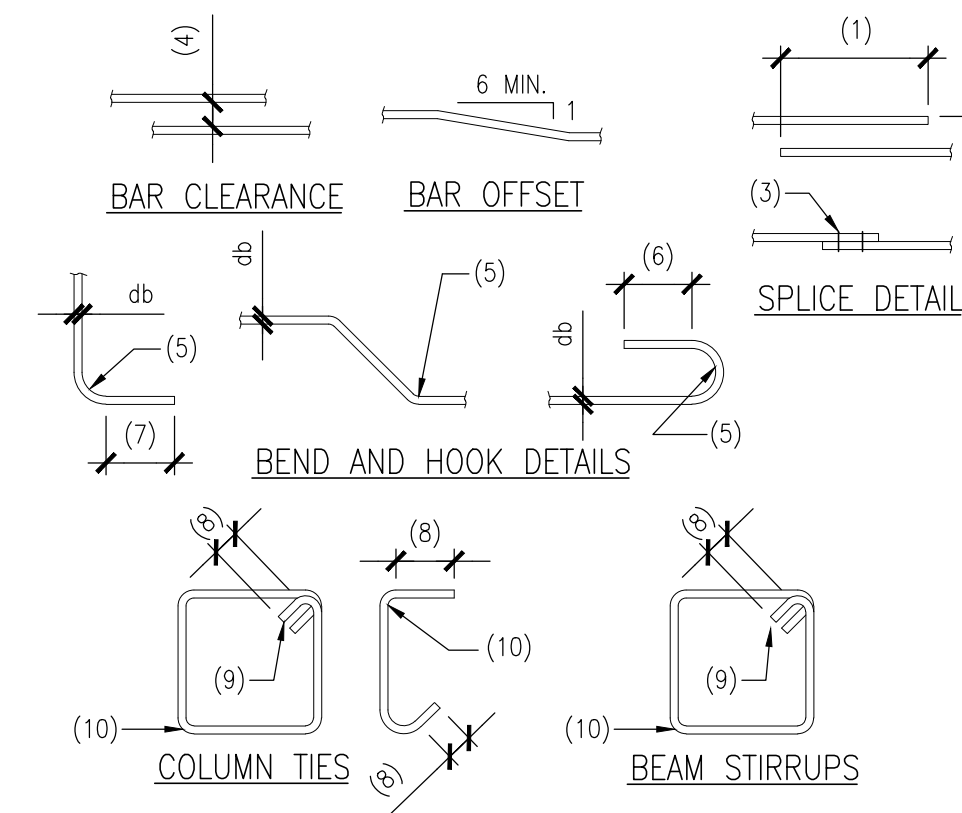
LOAD BEARING WALL	EXISTING WALL
PARTITION WALL	EXISTING STRUCTURE

ADDITIONAL NOTES

- PLEASE SUBMIT TRUSS MANUFACTURER'S TRUSS LAYOUT FOR OUR APPROVAL PRIOR TO CONSTRUCTION.

1 THICKENED EDGE CONCRETE SLAB

SCALE: N.T.S.

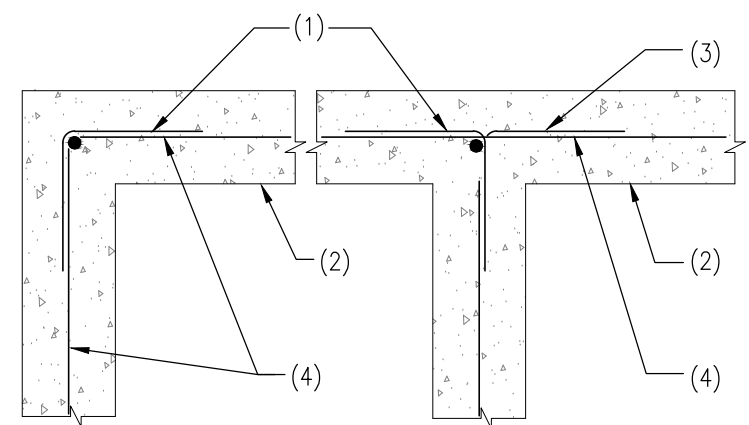


NOTES:

1. CONCRETE SLAB ON GRADE
2. (1) #4 BAR CONTINUOUS TOP AND BOTTOM
3. TOOLED EDGE
4. CONCRETE SLAB OR FINISH GRADE AS OCCURS

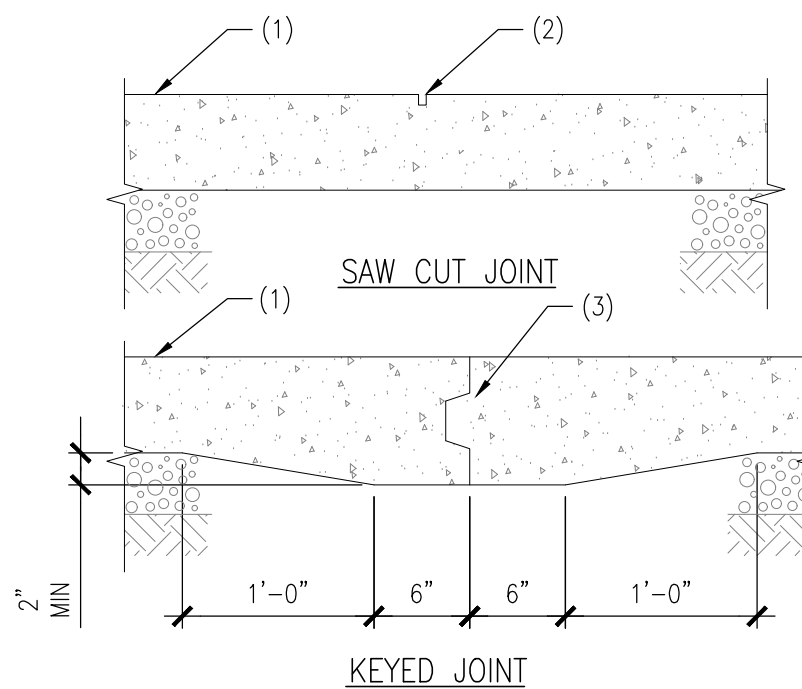
2 PLAN-CORNER REINFORCING IN CONCRETE FOOTING STEM/WALL

SCALE: N.T.S.



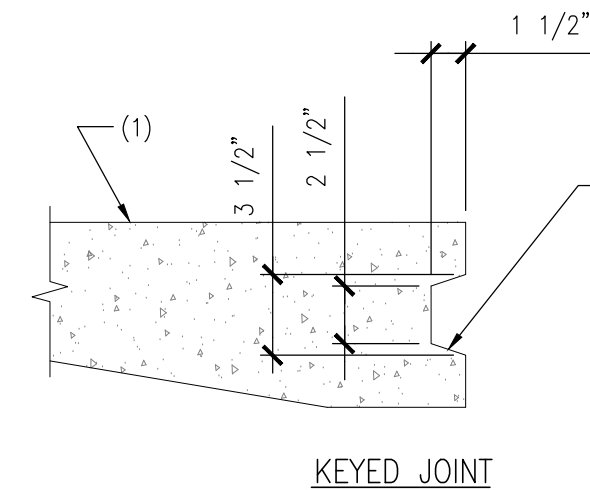
NOTES:

1. CORNER BARS SAME SIZE AND SPACING AS HORIZONTAL REINFORCING LAP PER GSN (24\"/>



NOTES:

1. CONCRETE SLAB ON GRADE
2. SAWCUT – 1/8\"/>



NOTES:

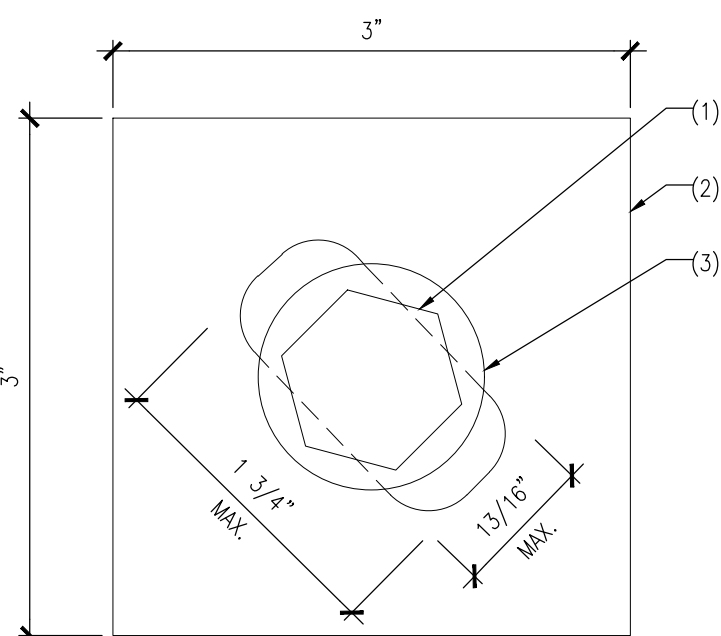
1. CONCRETE SLAB
2. KEYED JOINT – REMOVE FORM MATERIAL PRIOR TO PLACING ADJACENT CONCRETE

NOTES:

- A. ALL DIMENSIONS ARE ±1/2"

3 CONTROL JOINTS (C.J.) IN CONCRETE SLAB ON GRADE

SCALE: N.T.S.

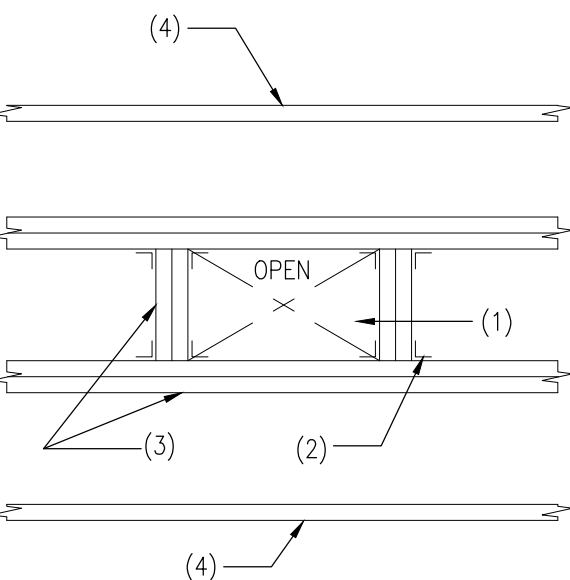


NOTES:

1. ANCHOR BOLT PER SHEAR WALL SCHEDULE
2. SLOTTED PLATE WASHER
3. STANDARD CUT WASHER

4 TYPICAL KEY IN CONCRETE

SCALE: N.T.S.

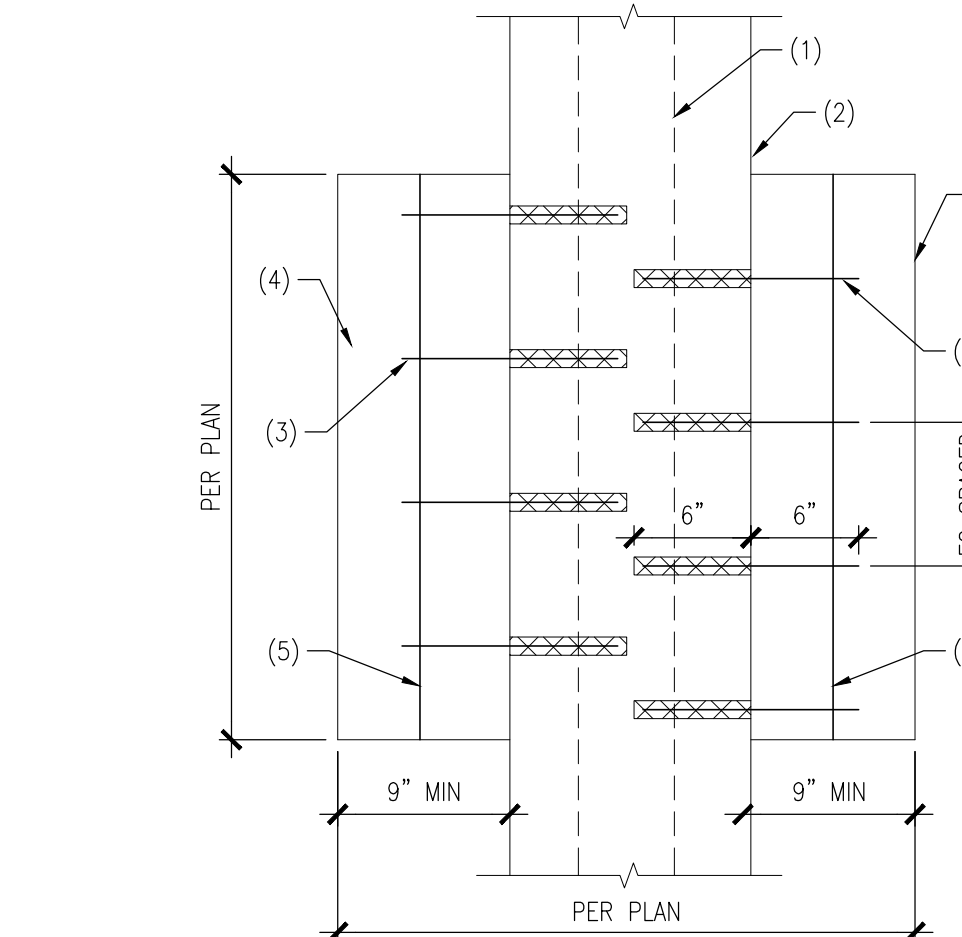


NOTES:

1. CRAWL SPACE OPENING
2. SIMPSON LU OR SIMILAR HANGER
3. DOUBLE JOISTS SISTERED – IF TJI USE LVL'S OR LSL'S
4. WOOD JOIST PER PLAN
5. USE EDGE NAILING AROUND OPENINGS

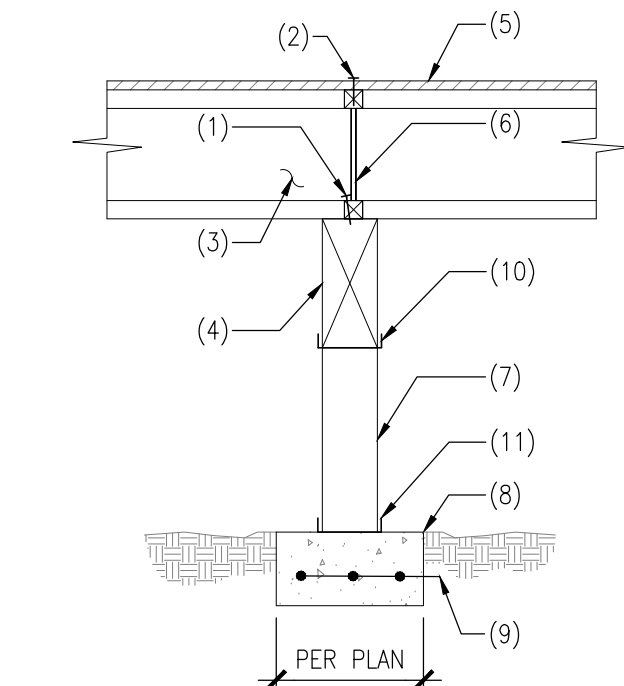
5 TYPICAL CONCRETE REINFORCING BARS LAP SPlice SCHEDULE FOR REINFORCING IN CONCRETE

SCALE: N.T.S.



NOTES:

1. EXISTING CONCRETE STEM WALL
2. EXISTING CONCRETE FOOTING
3. 1'-0\"/>

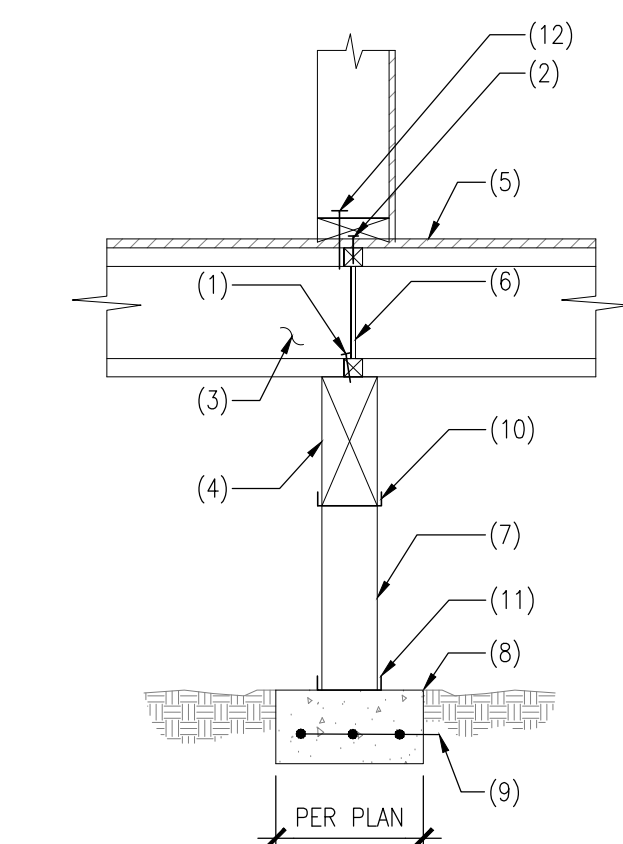


NOTES:

1. (3) 10d NAILS PER BLOCK
2. EDGE NAILING
3. PLYWOOD WEB JOISTS PER PLAN
4. WOOD BEAM PER PLAN
5. PLYWOOD SHEATHING
6. BLOCKING BY JOIST MANUFACTURER
7. WOOD POST PER PLAN
8. CONCRETE SPREAD FOOTING PER PLAN
9. (3) #4 BARS EACH WAY
10. SIMPSON POST CAP
11. SIMPSON POST BASE

6 SILL PLATE ANCHOR BOLT SLOTTED PLATE WASHER

SCALE: N.T.S.

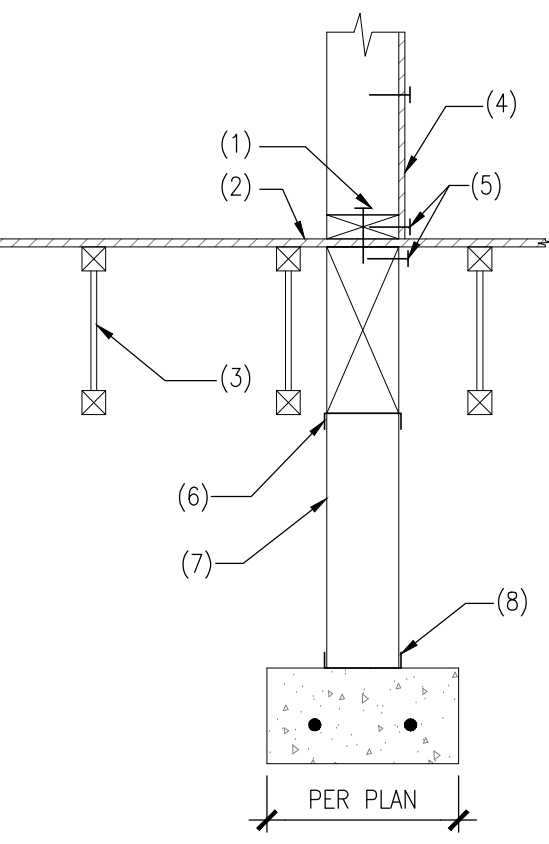


NOTES:

1. (3) 10d NAILS PER BLOCK
2. EDGE NAILING
3. PLYWOOD WEB JOISTS PER PLAN
4. WOOD BEAM PER PLAN
5. PLYWOOD SHEATHING
6. BLOCKING BY JOIST MANUFACTURER
7. WOOD POST PER PLAN
8. CONCRETE SPREAD FOOTING PER PLAN
9. (3) #4 BARS EACH WAY
10. SIMPSON POST CAP
11. SIMPSON POST BASE
12. BASE PLATE NAILING PER SHEARWALL SCHEDULE

7 TYPICAL CRAWL SPACE OPENING

SCALE: N.T.S.



NOTES:

1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
2. PLYWOOD SHEATHING
3. PLYWOOD WEB JOISTS PER PLAN
4. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
5. EDGE NAILING
6. SIMPSON POST CAP
7. POST PER PLAN
8. SIMPSON POST BASE

8 FOOTING ADDITION AT EXISTING FOOTING

SCALE: N.T.S.

9 INTERIOR SPREAD FOOTING WITH PLYWOOD WEB JOIST

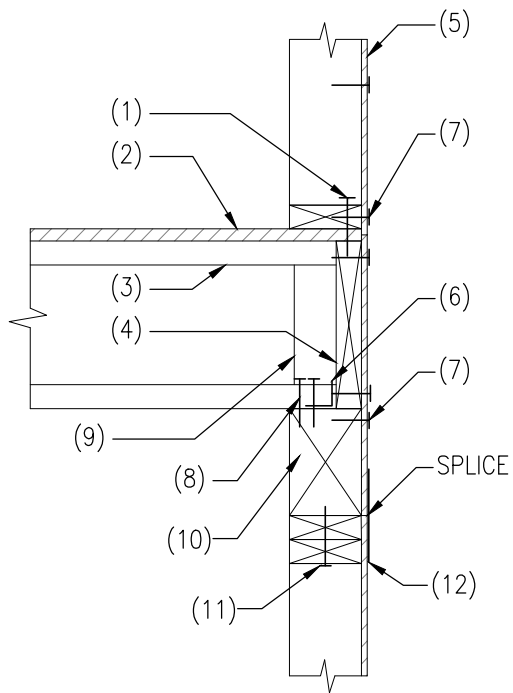
SCALE: N.T.S.

10 INTERIOR SPREAD FOOTING WITH PLYWOOD WEB JOIST

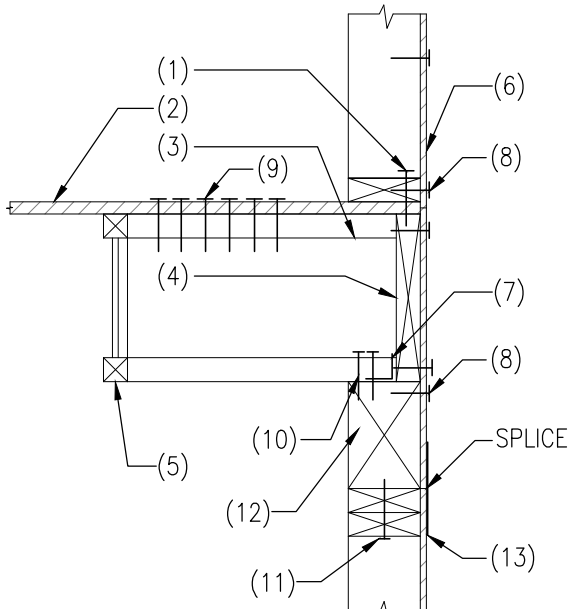
SCALE: N.T.S.

11 WOOD BEAM PARALLEL TO FLOOR JOIST (FLUSH)

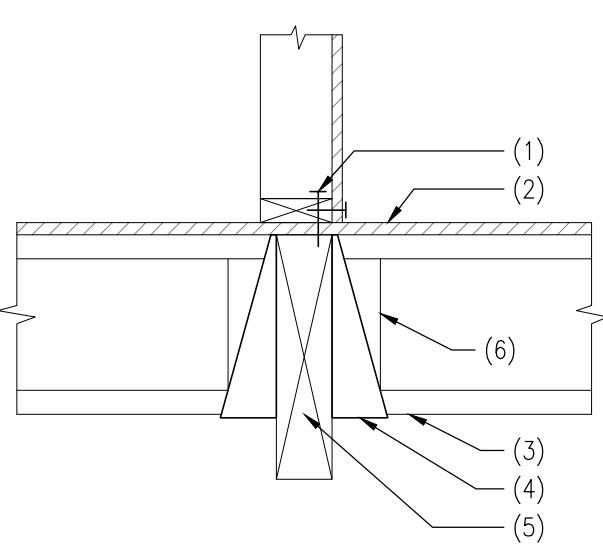
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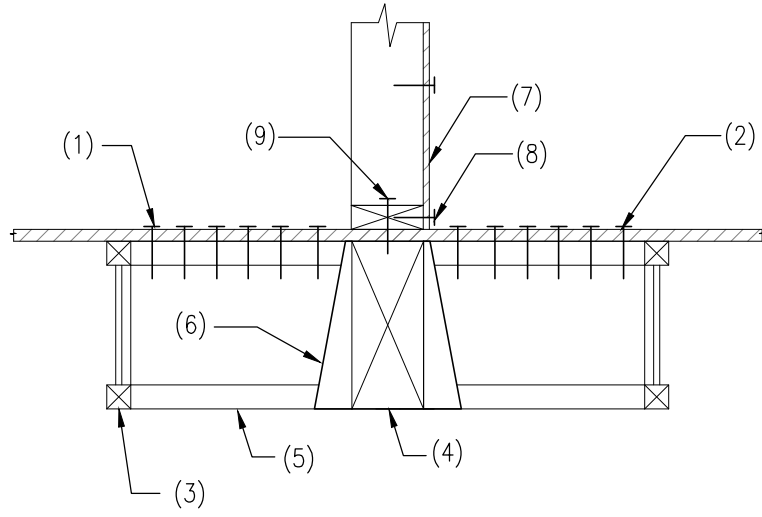
- NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB WOOD JOIST PER PLAN
 4. RIM JOIST BY JOIST MANUFACTURER – ATTACH WITH (2) 10d NAILS PER JOIST
 5. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 6. SIMPSON A35 CLIPS PER SHEARWALL SCHEDULE MIN. 24" O.C. – IF THE SHEATHING IS CONTINUOUS ABOVE EXISTING DOUBLE TOP PLATE A35 CLIPS CAN BE OMITTED.
 7. EDGE NAILING
 8. NAIL BRG PER MNF. – MIN (2) 12D NAILS
 9. WEB STIFFENER
 10. 4x10 BEAM
 11. TOP PLATE NAILING PER SHEARWALL SCHEDULE (20D NAILS)
 12. SIMPSON LTP @24" O.C.



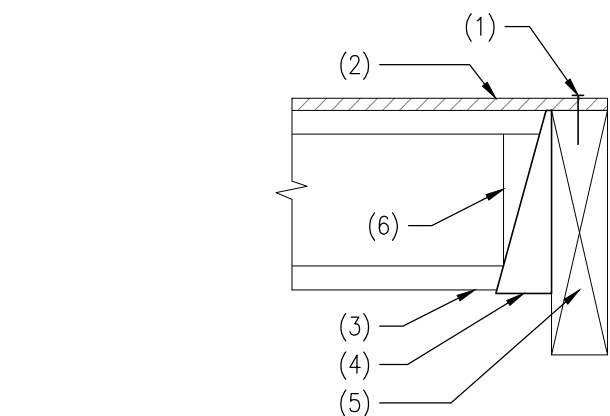
- NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 2. PLYWOOD SHEATHING
 3. BLOCKING AT 48" O.C. BY JOIST MANUFACTURER
 4. RIM JOIST BY JOIST MANUFACTURER – ATTACH WITH (2) 10d NAILS PER PLAN
 5. PLYWOOD WEB JOIST PER PLAN
 6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 7. SIMPSON A35 CLIPS PER SHEARWALL SCHEDULE MIN. 24" O.C. – IF THE SHEATHING IS CONTINUOUS ABOVE EXISTING DOUBLE TOP PLATE A35 CLIPS CAN BE OMITTED.
 8. EDGE NAILING
 9. (6) #8 SCREWS PER BLOCK – 10d NAILS ALTERNATE
 10. NAIL BRG PER MNF. – MIN (2) 12D NAILS
 11. TOP PLATE NAILING PER SHEARWALL SCHEDULE (20D NAILS)
 12. 4X10 BEAM



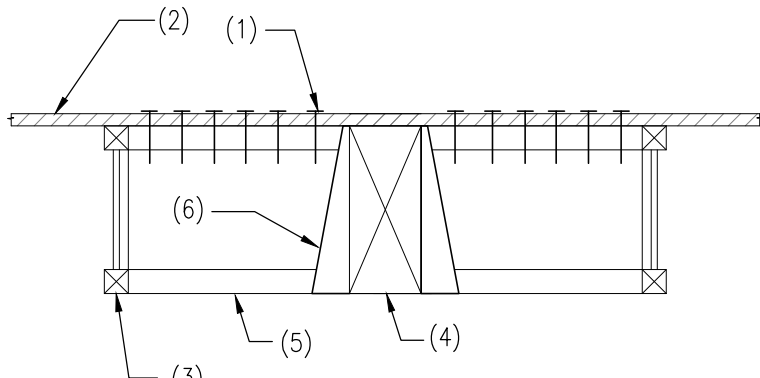
- NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB JOIST PER PLAN
 4. JOIST HANGER BY JOIST MANUFACTURER
 5. WOOD BEAM PER PLAN
 6. WEB STIFFENER



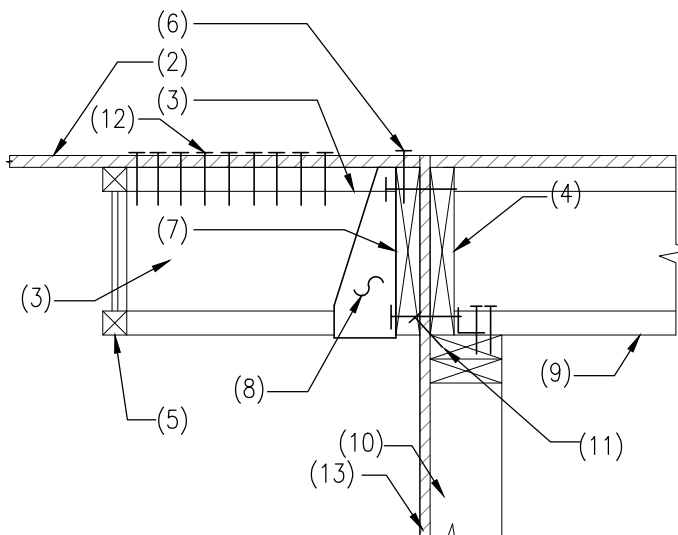
- NOTES:
1. (6) #8 SCREWS PER BLOCK – 10d NAILS ALTERNATE
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB JOISTS PER PLAN
 4. WOOD BEAM PER PLAN
 5. BLOCKING AT 32" O.C. BY JOIST MANUFACTURER
 6. SIMPSON LLU TYPE HANGER
 7. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 8. EDGE NAILING
 9. BASE PLATE NAILING PER SHEARWALL SCHEDULE



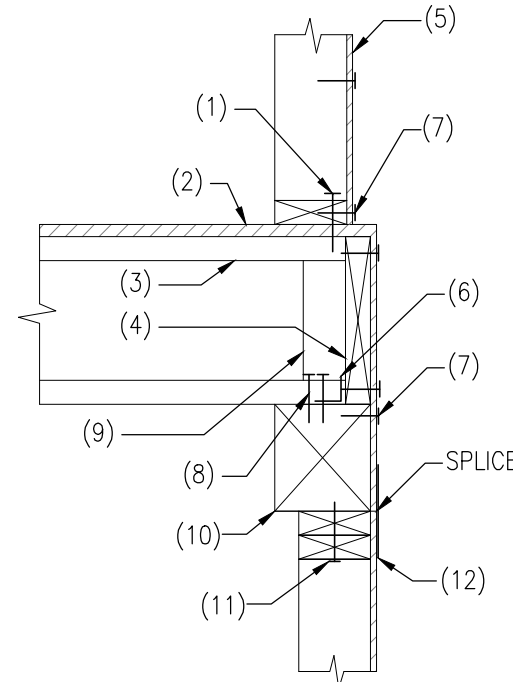
- NOTES:
1. DOUBLE EDGE NAILING
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB JOIST PER PLAN
 4. JOIST HANGER BY JOIST MANUFACTURER
 5. WOOD BEAM PER PLAN
 6. WEB STIFFENER



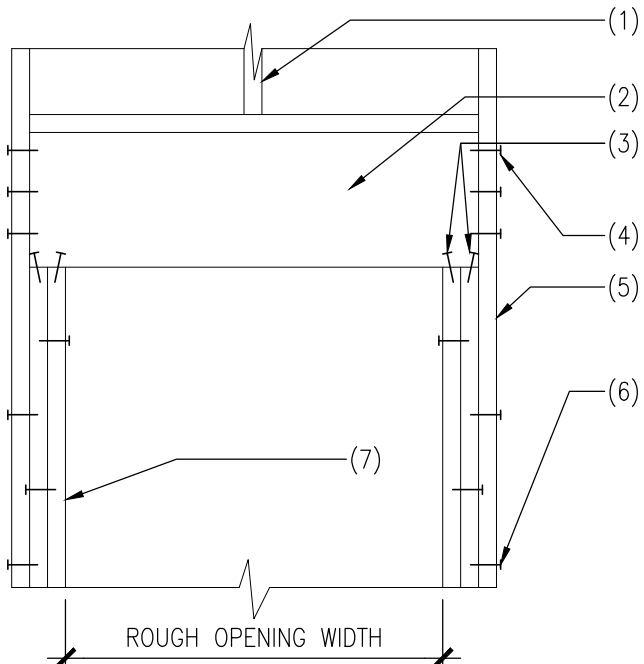
- NOTES:
1. (6) #8 SCREWS PER BLOCK – 10d NAILS ALTERNATE
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB JOISTS PER PLAN
 4. WOOD BEAM PER PLAN
 5. BLOCKING AT 48" O.C. BY JOIST MANUFACTURER
 6. SIMPSON LLU TYPE HANGER



- NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 2. PLYWOOD SHEATHING
 3. BLOCKING AT 32" O.C. BY JOIST MANUFACTURER
 4. RIM JOIST
 5. PLYWOOD WEB JOIST PER PLAN
 6. EDGE NAILING
 7. 2X LEDGER ATTACH TO RIM JOIST WITH (2) SDS 1/4" x 3 1/2" WOOD SCREWS AT 8" O.C.
 8. SIMPSON HANGER
 9. PLYWOOD WEB JOIST PER PLAN
 10. WOOD STUD WALL
 11. 16d TOENAILS AT 6" O.C.
 12. (9) #8 SCREWS PER BLOCK – 10d ALTERNATE
 13. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE



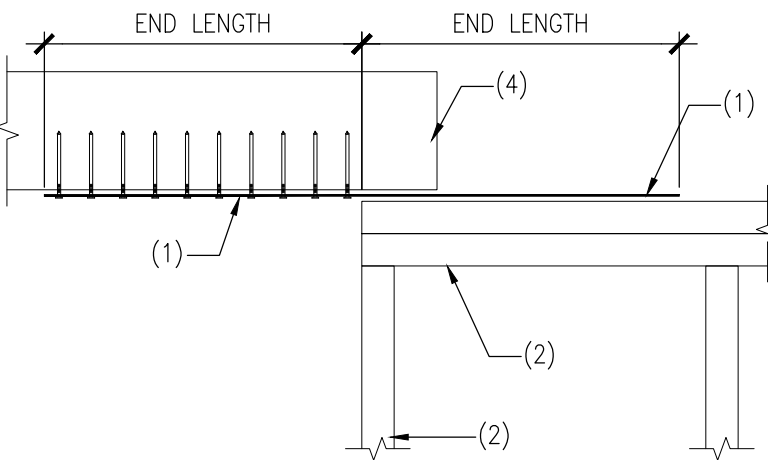
- NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 2. PLYWOOD SHEATHING
 3. PLYWOOD WEB WOOD JOIST PER PLAN
 4. RIM JOIST BY JOIST MANUFACTURER – ATTACH WITH (2) 10d NAILS PER JOIST
 5. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 6. SIMPSON A35 CLIPS PER SHEARWALL SCHEDULE MIN. 24" O.C. – IF THE SHEATHING IS CONTINUOUS ABOVE EXISTING DOUBLE TOP PLATE A35 CLIPS CAN BE OMITTED.
 7. EDGE NAILING
 8. NAIL BRG PER MNF. – MIN (2) 12D NAILS
 9. WEB STIFFENER
 10. 10x10 BEAM
 11. TOP PLATE NAILING PER SHEARWALL SCHEDULE (20D NAILS)
 12. SIMPSON LTP @24" O.C.



- NOTES:
1. WOOD STUD WALL
 2. WOOD HEADER PER PLAN
 3. (2) 16d TOENAILS – EACH SIDE, EACH END
 4. (3) 16d NAILS AS SHOWN
 5. RUN VERTICAL STUDS UP PAST HEADER AS SHOWN
 6. (2) 16d NAILS AT 12" O.C.
 7. DOUBLE STUDS UNDER HEADER BEARINGS FOR OPENING WIDTHS GREATER THAN 5'-0"

HEADER AND BEAM SCHEDULE FOR LOAD BEARING WALLS					
OPENING SIZE	HEADER SIZE	TRIMMERS REQ'D		KING STUDS REQ'D	
		2X4	2X6	2X4	2X6
UP TO 3'-6"	SEE PLAN	1	1	1	1
3'-6"> TO 5'-0"	SEE PLAN	2	1	2	2
5'-0"> TO 8'-0"	SEE PLAN	2	1	2	2
8'-0"> TO 10'-6"	SEE PLAN	3	2	3	3
10'-6"> TO 16'-0"	SEE PLAN	4	3	3	3

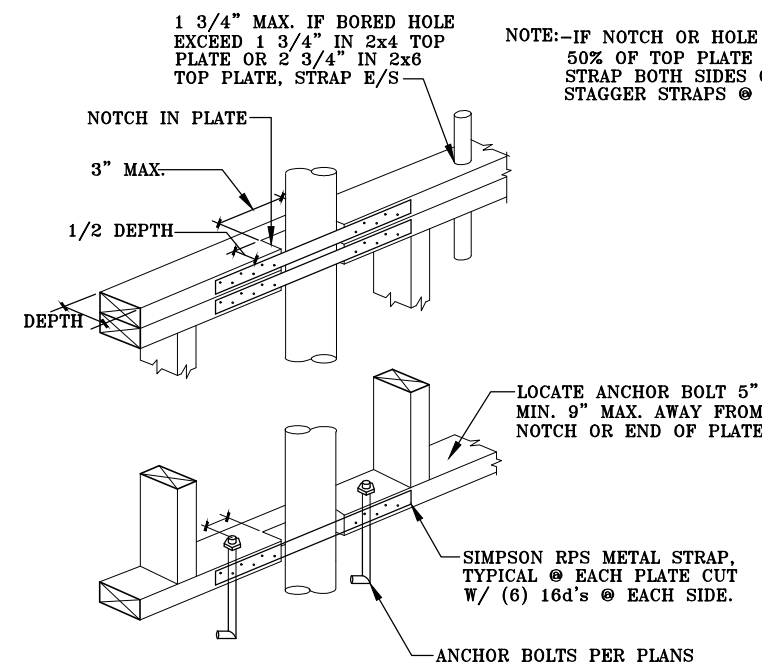
- NOTES:
- UNLESS NOTED OTHERWISE, ALL BEAM AND HEADER SUPPORTS SHALL CONFORM TO THIS SCHEDULE
 - ALL BUILT-UP SUPPORTS WILL MATCH OR EXCEED WIDTH OF SUPPORTED BEAM
 - ALL HEADERS ARE TO BE 4X10 DF-L NO.2 UNLESS NOTED OTHERWISE



- NOTES:
1. SIMPSON CS16 STRAP PER TABLE
 2. DBL TOP PLATE
 3. 2X STUD OR POST PER PLAN
 4. BEAM PER PLAN

STRAP SELECTION				
TYPE	END LENGTH (INCH)	FASTENERS	TOTAL FASTENERS PER MEMBER	CAPACITY (LBS)
A	24"	(2) 16d @ 4" O.C.	12	1705
B	36"	(2) 16d @ 4" O.C.	18	2557
C	48"	(2) 16d @ 4" O.C.	24	3410
D	72"	(2) 16d @ 4" O.C.	36	5115

SELECT TYPE D UNLESS NOTED

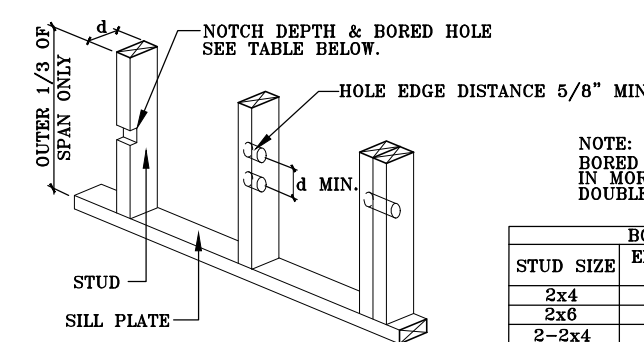


NOTE: IF NOTCH OR HOLE EXCEEDS 50% OF TOP PLATE WIDTH, STRAP BOTH SIDES OF PLATES. STAGGER STRAPS @ EA. SIDE.

LOCATE ANCHOR BOLT 5" MIN. 4" MAX. AWAY FROM NOTCH OR END OF PLATE

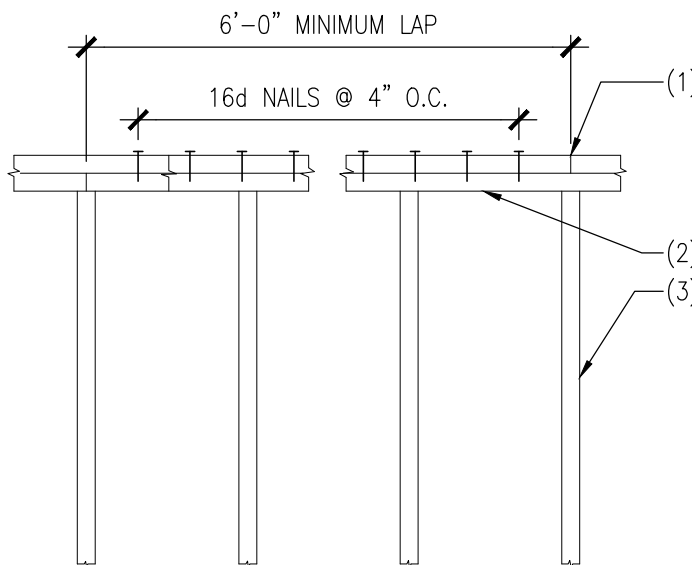
SIMPSON RPS METAL STRAP, TYPICAL @ EACH PLATE CUT 7/8" (6) 16d s @ EACH SIDE.

ANCHOR BOLTS PER PLANS

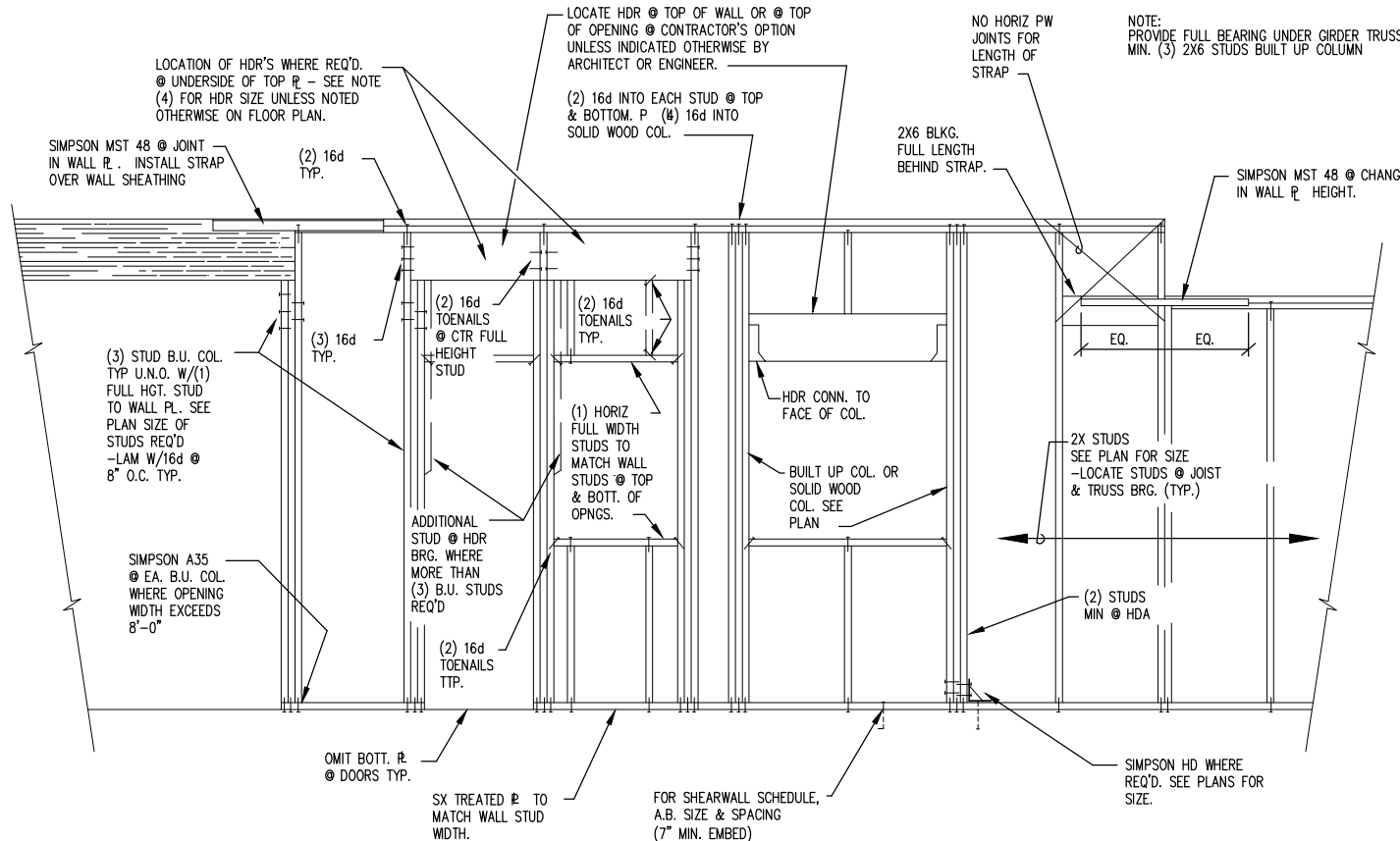


BORED HOLES			
STUD SIZE	EXT. & BRN'G. WALLS	NON-BRN'G. WALLS	
2x4	1 5/16"	2 1/8"	
2x6	2 5/16"	3 1/8"	
2-2x4	2 1/8"	2 1/8"	
2-2x6	3 5/16"	3 5/16"	

NOTCH DEPTH			
STUD SIZE	EXT. & BRN'G. WALLS	NON-BRN'G. WALLS	
2x4	1 5/8"	1 7/16"	
2x6	1 5/8"	2 3/16"	



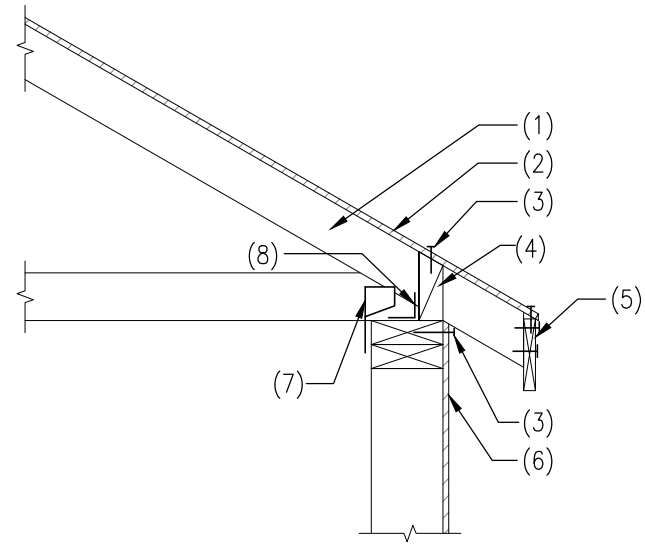
- NOTES:
1. TOP PLATE SPLICE OVER STUD ONLY.
 2. DOUBLE TOP PLATE.
 3. WOOD STUDS.



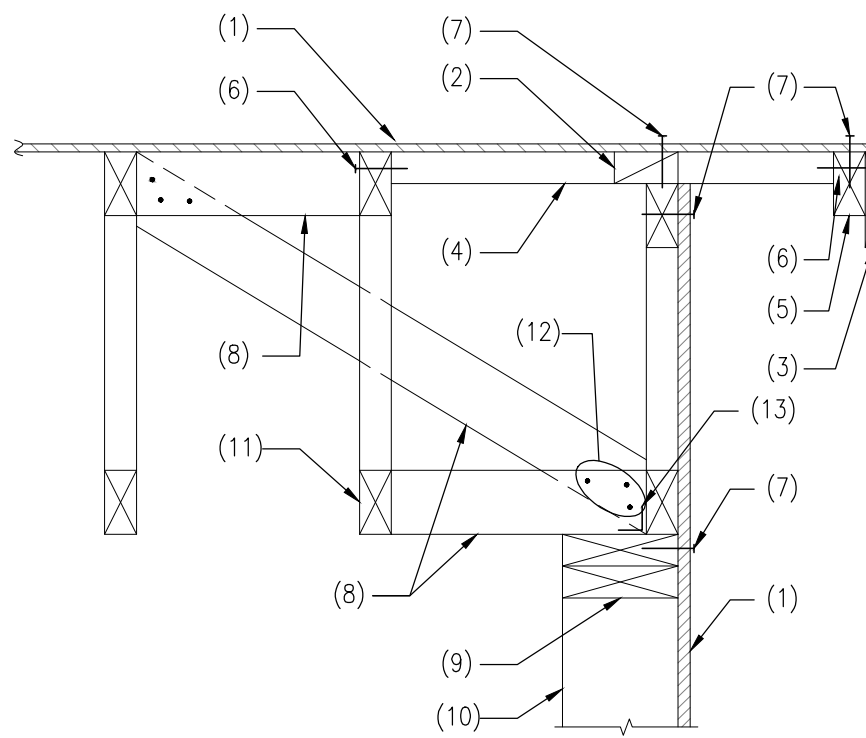
- NOTES:
1. TOP PLATE SPLICE OVER STUD ONLY.
 2. DOUBLE TOP PLATE.
 3. WOOD STUDS.

- NOTES:
1. TOP PLATE SPLICE OVER STUD ONLY.
 2. DOUBLE TOP PLATE.
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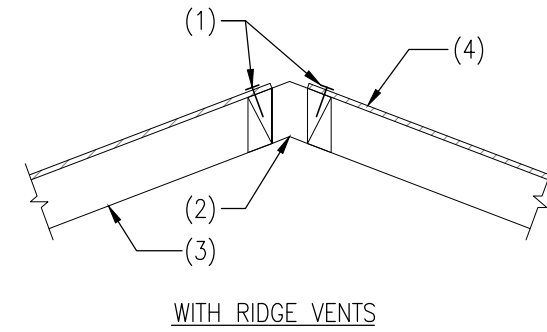
- NOTES:
1. TOP PLATE SPLICE OVER STUD ONLY.
 2. DOUBLE TOP PLATE.
 3. WOOD STUDS.



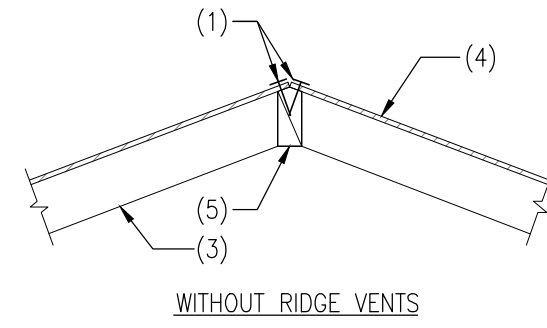
- NOTES:
1. WOOD TRUSS PER PLAN
 2. PLYWOOD SHEATHING
 3. EDGE NAILING
 4. 2x BLOCKING WITH (3) 16d NAILS PER BLOCK
 5. WOOD FASCIA WITH (2) 10d NAILS PER TRUSS MANUFACTURER
 6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 7. SIMPSON H1 AT EACH TRUSS - USE SIMPSON H2.5 EACH SIDE OF GIRDER TRUSS
 8. SIMPSON A35 CLIP PER SHEARWALL SCHEDULE



- NOTES:
1. PLYWOOD SHEATHING
 2. 2x BLOCKING
 3. ARCHITECTURAL FASCIA
 4. 2x4 OUTRIGGERS AT 24" O.C.
 5. 2x STRUCTURAL FASCIA
 6. (2) 10d EACH OUTRIGGER
 7. EDGE NAILING
 8. 2x4 BRACE AT 48" O.C.
 9. 2x DOUBLE TOP PLATE
 10. WOOD STUD WALL
 11. PRE-MFR'D WOOD TRUSS
 12. (3) 10d EACH END
 13. SIMPSON A35 CLIPS PER SHEARWALL SCHEDULE

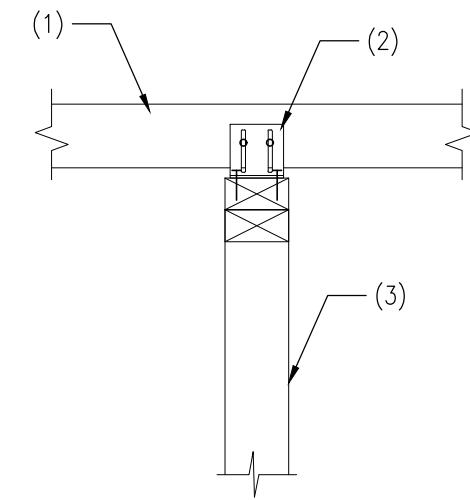


WITH RIDGE VENTS

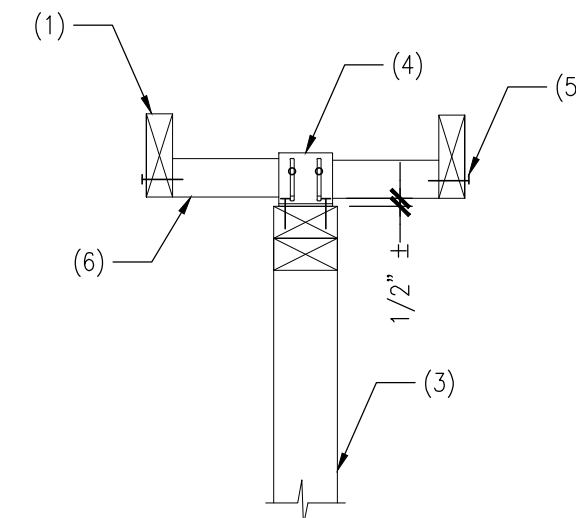


WITHOUT RIDGE VENTS

- NOTES:
1. EDGE NAILING
 2. RIDGE VENTS
 3. WOOD TRUSS PER PLAN
 4. PLYWOOD SHEATHING
 5. 2x SOLID BLOCKING

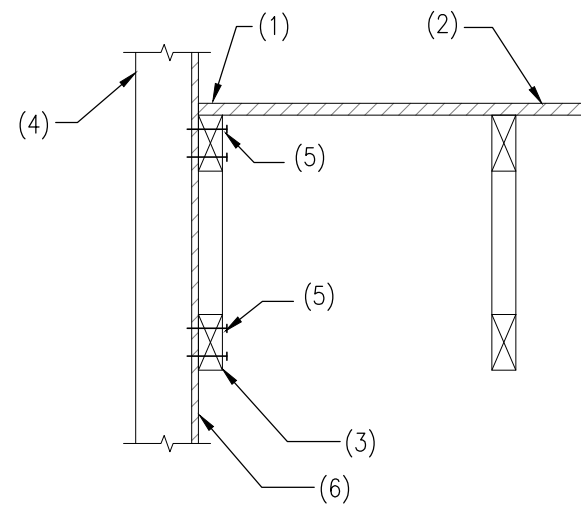


PERPENDICULAR TO FRAMING

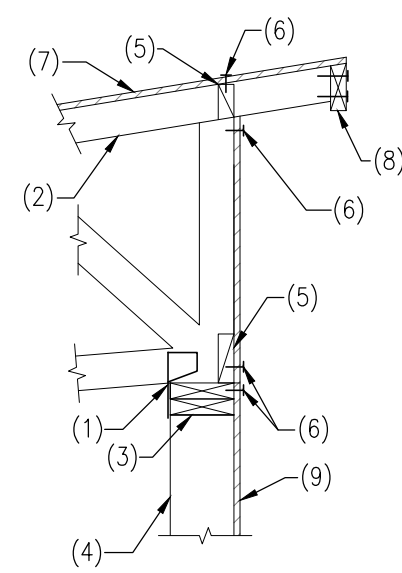


PARALLEL TO FRAMING

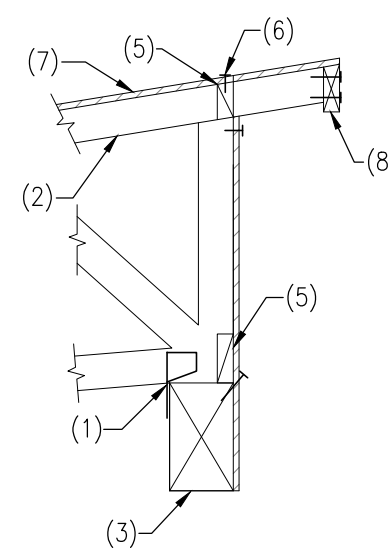
- NOTES:
1. CEILING FRAMING/BOTTOM CHORD
 2. SIMPSON DTC CLIP AT EACH BOTTOM CHORD
 3. WOOD STUD WALL
 4. SIMPSON DTC CLIP AT 2' O.C.
 5. (2) 16d NAILS
 6. 2x4 FLAT AT 2' O.C.



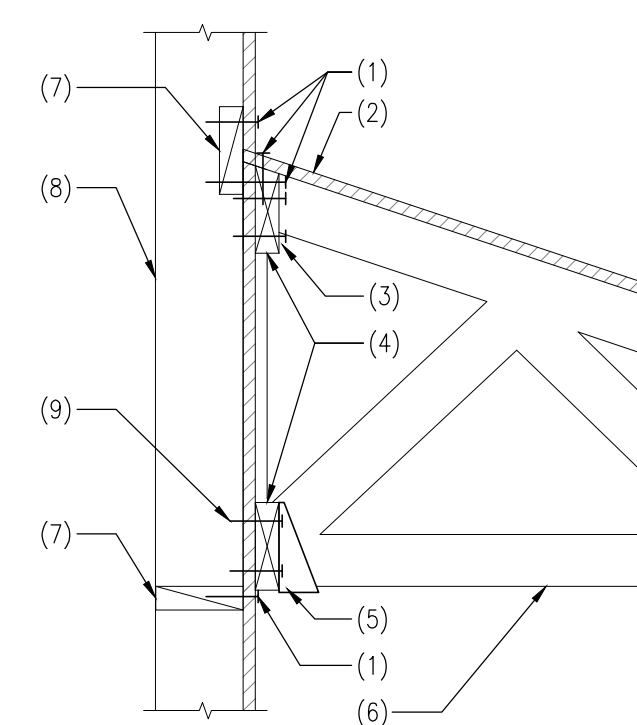
- NOTES:
1. EDGE NAILING
 2. PLYWOOD SHEATHING
 3. PREFABRICATED WOOD TRUSS
 4. WOOD STUD WALL
 5. (2) 16d NAILS PER STUD
 6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE



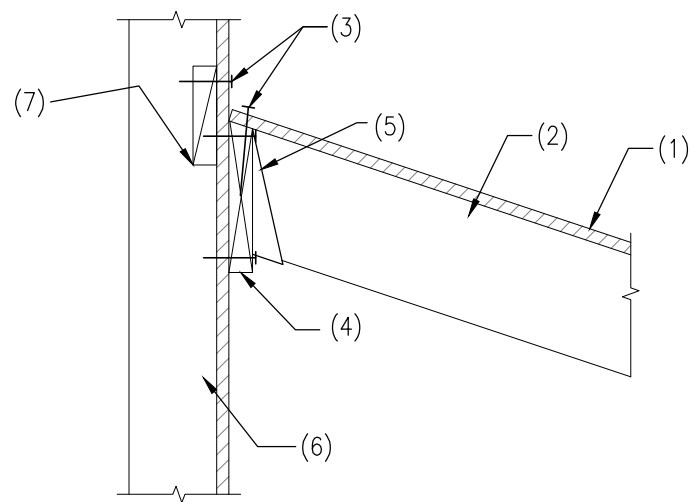
- NOTES:
1. SIMPSON H1 CLIP AT EACH TRUSS - AT GIRDER TRUSS, USE SIMPSON H2.5 EACH SIDE OF GIRDER TRUSS
 2. WOOD TRUSS PER PLAN
 3. DOUBLE 2x TOP PLATE
 4. WOOD STUD WALL AS OCCURS
 5. 2x BLOCKING
 6. EDGE NAILING
 7. PLYWOOD SHEATHING
 8. FASCIA WITH (2) 10d NAILS PER TRUSS
 9. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE



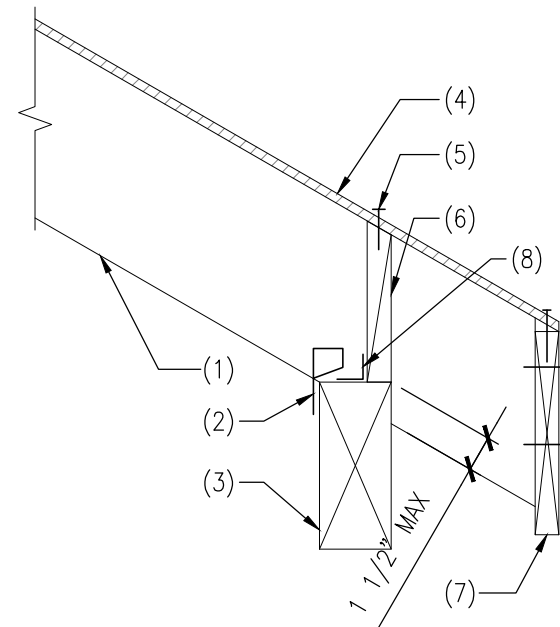
- NOTES:
1. SIMPSON H1 CLIP AT EACH TRUSS - AT GIRDER TRUSS, USE SIMPSON H2.5 EACH SIDE OF GIRDER TRUSS
 2. WOOD TRUSS PER PLAN
 3. EXISTING WOOD BEAM
 4. WOOD STUD WALL AS OCCURS
 5. 2x BLOCKING
 6. EDGE NAILING
 7. PLYWOOD SHEATHING
 8. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE



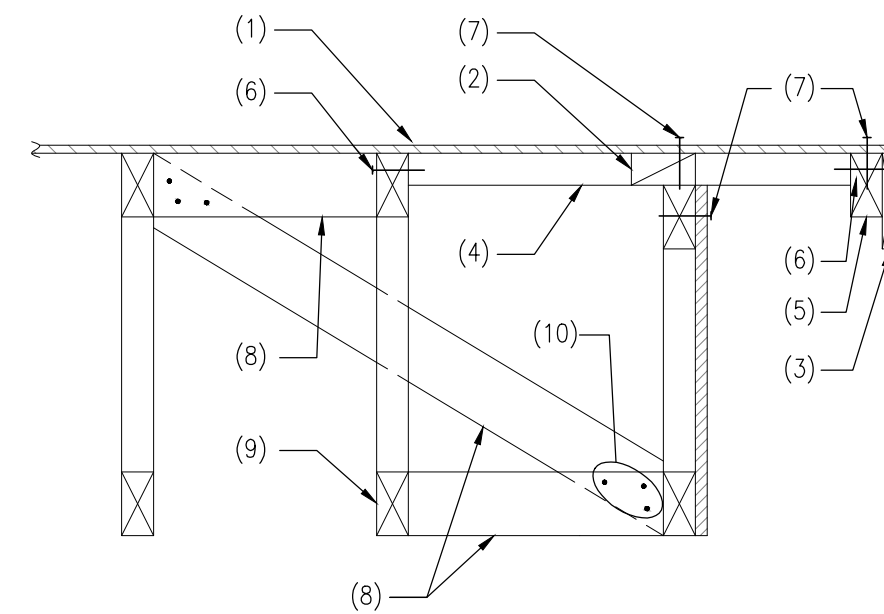
- NOTES:
1. EDGE NAILING
 2. PLYWOOD SHEATHING
 3. (2) 16d NAILS PER STUD
 4. CONTINUOUS 2x LEDGER
 5. SIMPSON LU TYPE HANGER
 6. WOOD TRUSS PER PLAN
 7. 2x SOLID BLOCKING
 8. WOOD STUD WALL
 9. (2) 16d NAILS PER STUD



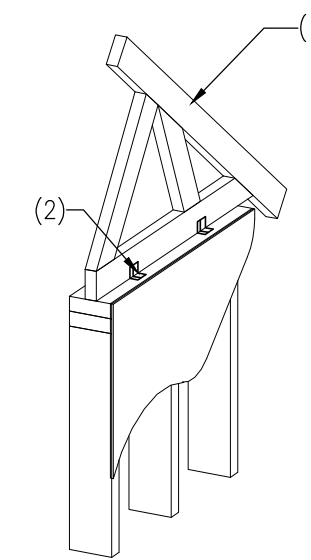
- NOTES:
1. PLYWOOD SHEATHING
 2. RAFTERS PER PLAN AT 24" O.C.
 3. EDGE NAILING
 4. 2x LEDGER WITH (3) 16d NAILS PER BLOCK
 5. SIMPSON LRUZ HANGER
 6. STUD WALL
 7. 2x SOLID BLOCKING



- NOTES:
1. WOOD RAFTER PER PLAN
 2. SIMPSON H1 CLIPS AT EACH RAFTER
 3. WOOD BEAM
 4. PLYWOOD SHEATHING
 5. EDGE NAILING
 6. 2x BLOCKING WITH (3) 16d NAILS PER BLOCK
 7. WOOD FASCIA WITH (2) 10d PER JOIST
 8. SIMPSON A35 CLIPS AT 24" O.C.

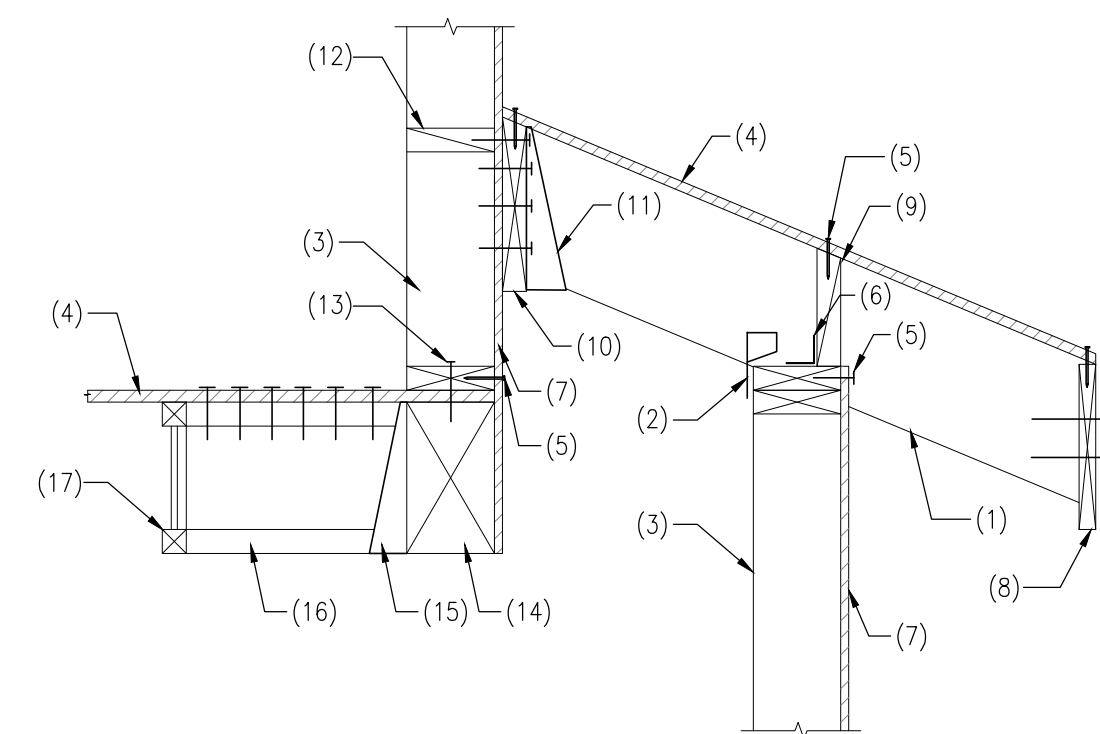


- NOTES:
1. PLYWOOD SHEATHING
 2. 2x BLOCKING
 3. ARCHITECTURAL FASCIA
 4. 2x4 OUTRIGGERS AT 24" O.C.
 5. 2x STRUCTURAL FASCIA
 6. (2) 10d EACH OUTRIGGER
 7. EDGE NAILING
 8. 2x4 BRACE AT 48" O.C.
 9. PRE-MFR'D WOOD TRUSS
 10. (3) 10d EACH END



INTERIOR SHEARWALL TO PARALLEL TRUSS

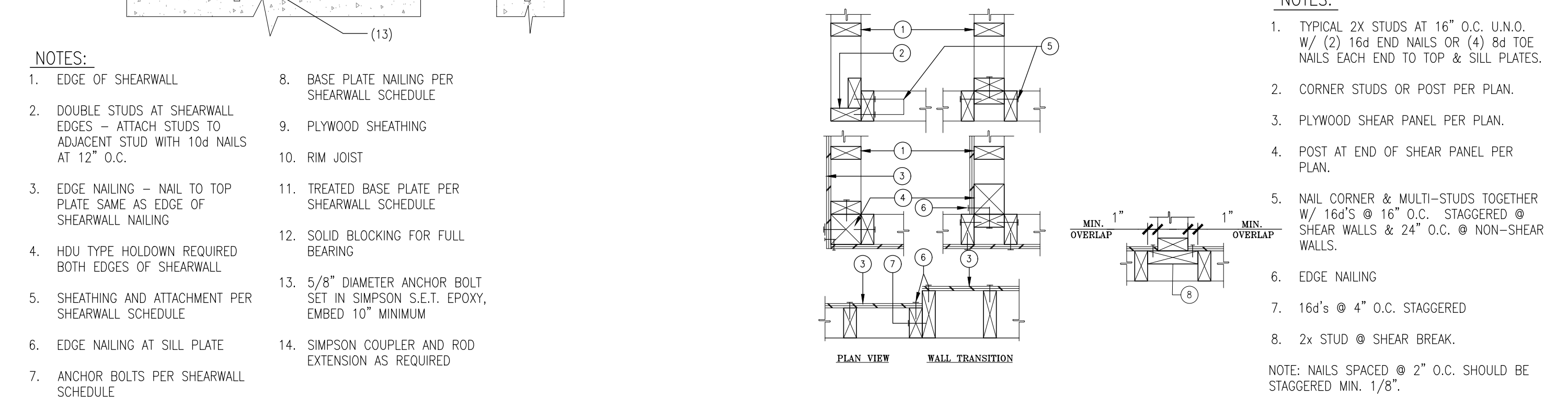
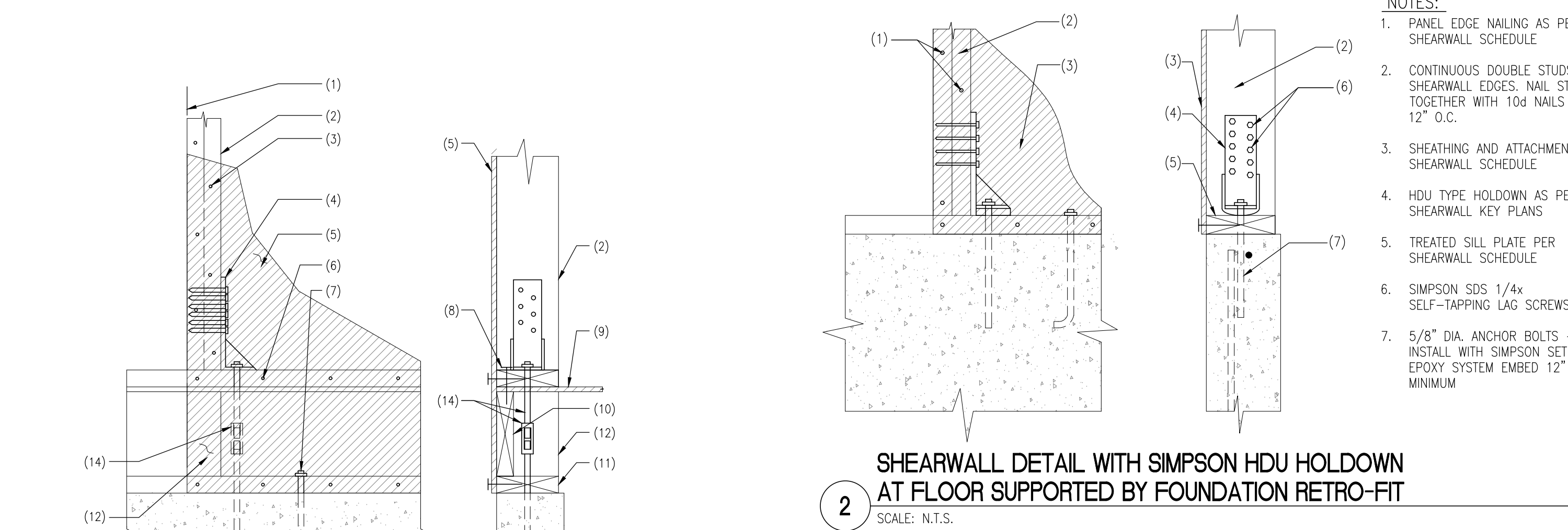
- NOTES:
1. TRUSS PER PLAN
 2. SIMPSON HTC4 12" O.C.
 3. (3) 16d NAILS
 4. 2x6 FLAT 12" O.C.



- NOTES:
1. WOOD RAFTER PER PLAN
 2. SIMPSON H1 CLIP AT EACH RAFTER
 3. WOOD STUD WALL
 4. PLYWOOD SHEATHING
 5. EDGE NAILING
 6. SIMPSON A35 CLIPS AT 24" O.C.
 7. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
 8. WOOD FASCIA WITH (2) 10d NAILS PER RAFTER
 9. 2x BLOCKING WITH (3) 16d NAILS PER BLOCK
 10. 2x LEDGER WITH (3) 16d NAILS PER BLOCK
 11. SIMPSON LRUZ HANGER
 12. 2x BLOCKING
 13. BASE PLATE NAILING PER SHEARWALL SCHEDULE
 14. WOOD BEAM PER PLAN
 15. SIMPSON LRUZ HANGER
 16. BLOCKING AT 32" O.C. BY JOIST MANUFACTURER
 17. PLYWOOD WEB JOIST PER PLAN

13 ROOF AT FLOOR FRAMING

SCALE: N.T.S.



SHEAR WALL SCHEDULE									
WALL MARK	SHEATHING	SIDES	PANEL EDGE NAILING	FIELD NAILING	FRAMING AT ADJACENT PANEL EDGES	BASE PLATE ATTACHMENT	ANCHOR BOLT SPACING	FOUNDATION SILL PLATE/FLOOR BASE PLATE	BLOCKING/RIM JOIST ATTACHMENT
SW1	7/16" OSB	ONE	8d NAILS AT 6" O.C.	12" O.C.	2x	16d NAILS AT 6" O.C.	5/8" DIAMETER BOLTS AT 48" O.C.	2x	SIMPSON A35 CLIPS AT 18" O.C.
SW2	7/16" OSB	ONE	8d NAILS AT 4" O.C.	12" O.C.	3x OR (2) 2x	16d NAILS AT 3" O.C.	5/8" DIAMETER BOLTS AT 32" O.C. 5/8" DIAMETER BOLTS AT 12" O.C.	3x 2x	SIMPSON A35 CLIPS AT 12" O.C.

SHEAR WALL SCHEDULE NOTES:

FRAMING STUDS SHALL BE DOUGLAS-FIR #2 SPACED AT 16" O.C. MAXIMUM. THICKNESS OF STUDS SHALL BE 2x UNLESS OTHERWISE NOTED IN SCHEDULE.

SHEATHING PANELS MAY BE PLACED VERTICAL OR HORIZONTAL. BLOCK ALL HORIZONTAL EDGES WITH 2x OR 3x BLOCKING TO MATCH STUD WIDTH UNLESS NOTED OTHERWISE.

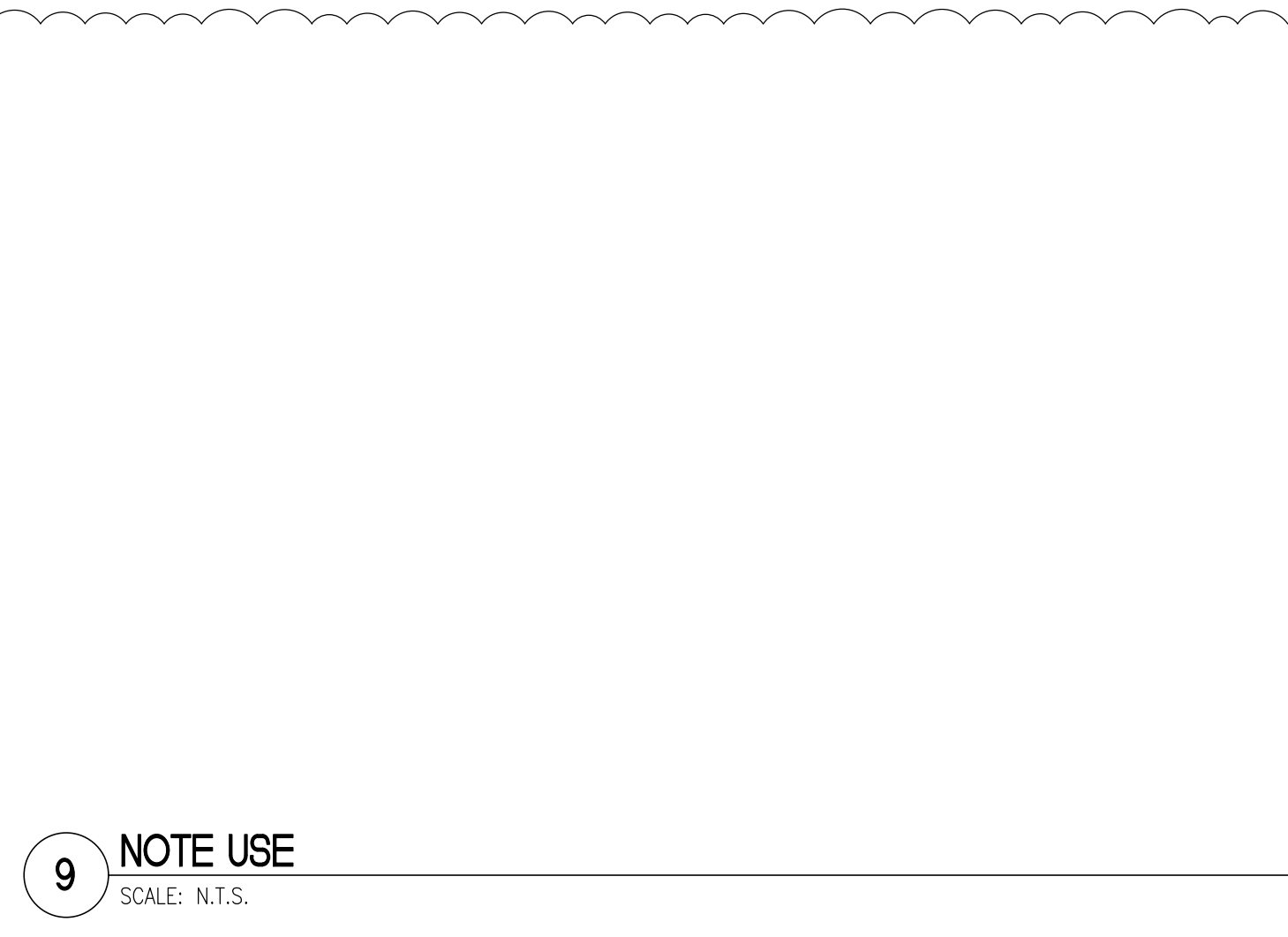
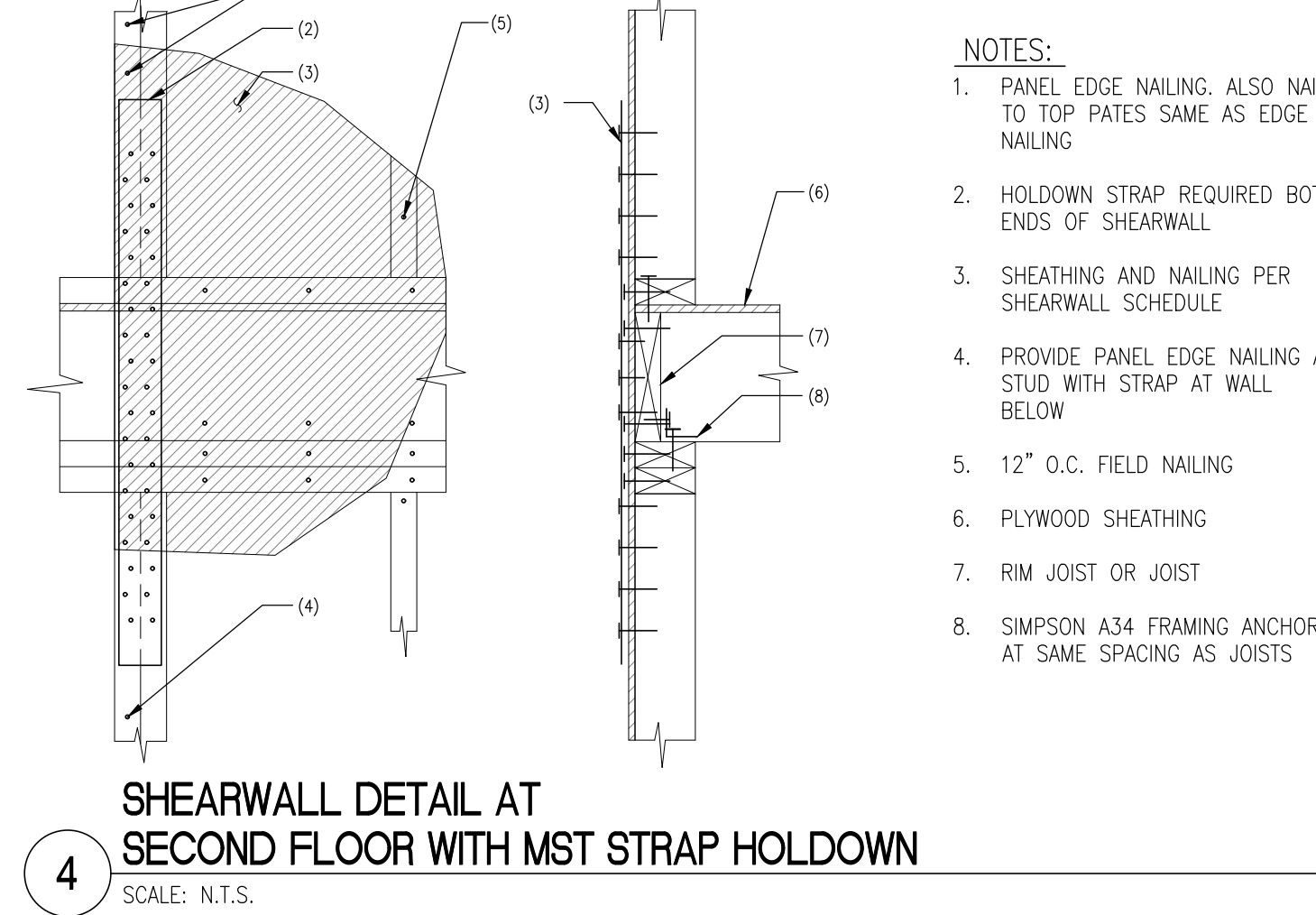
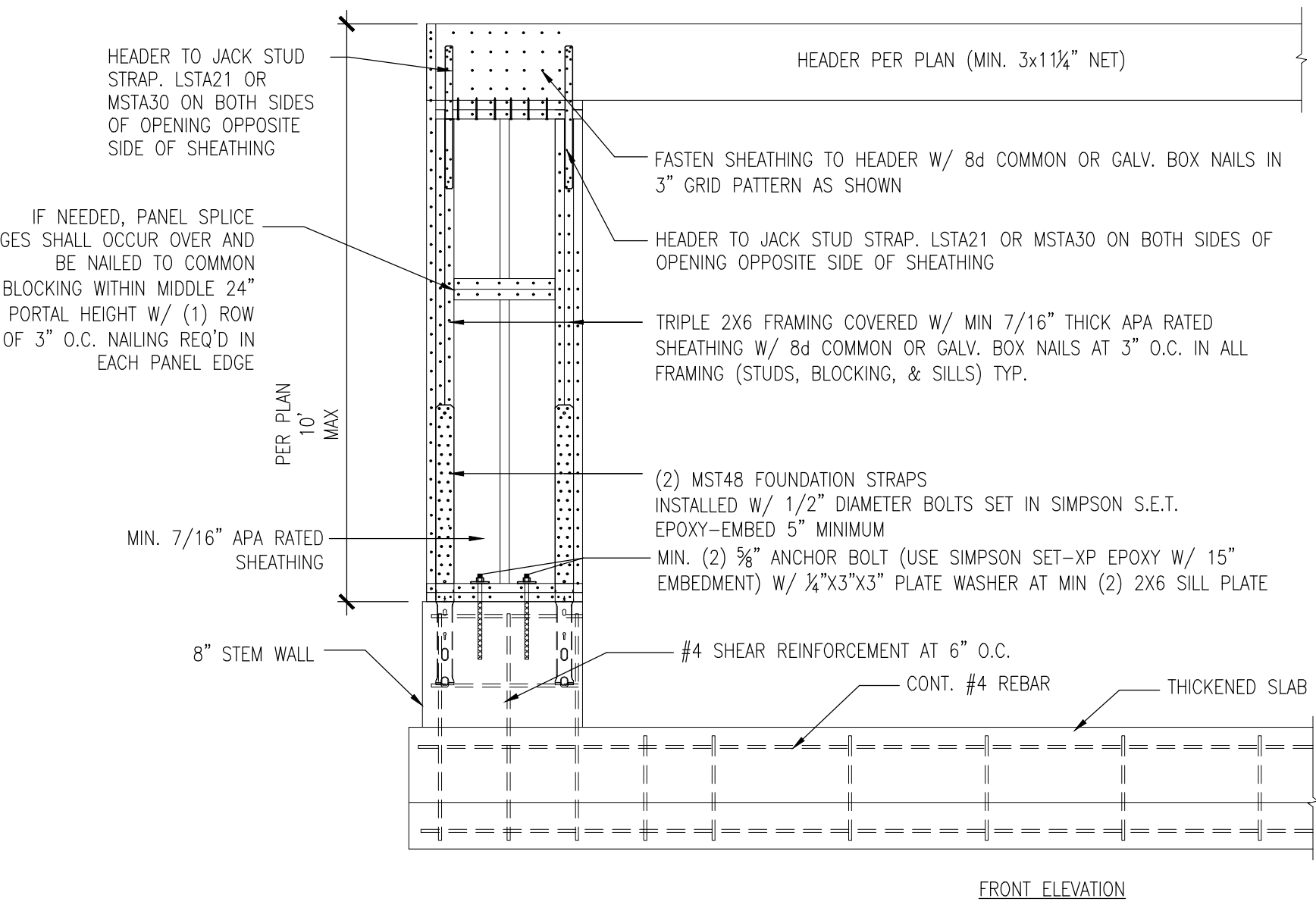
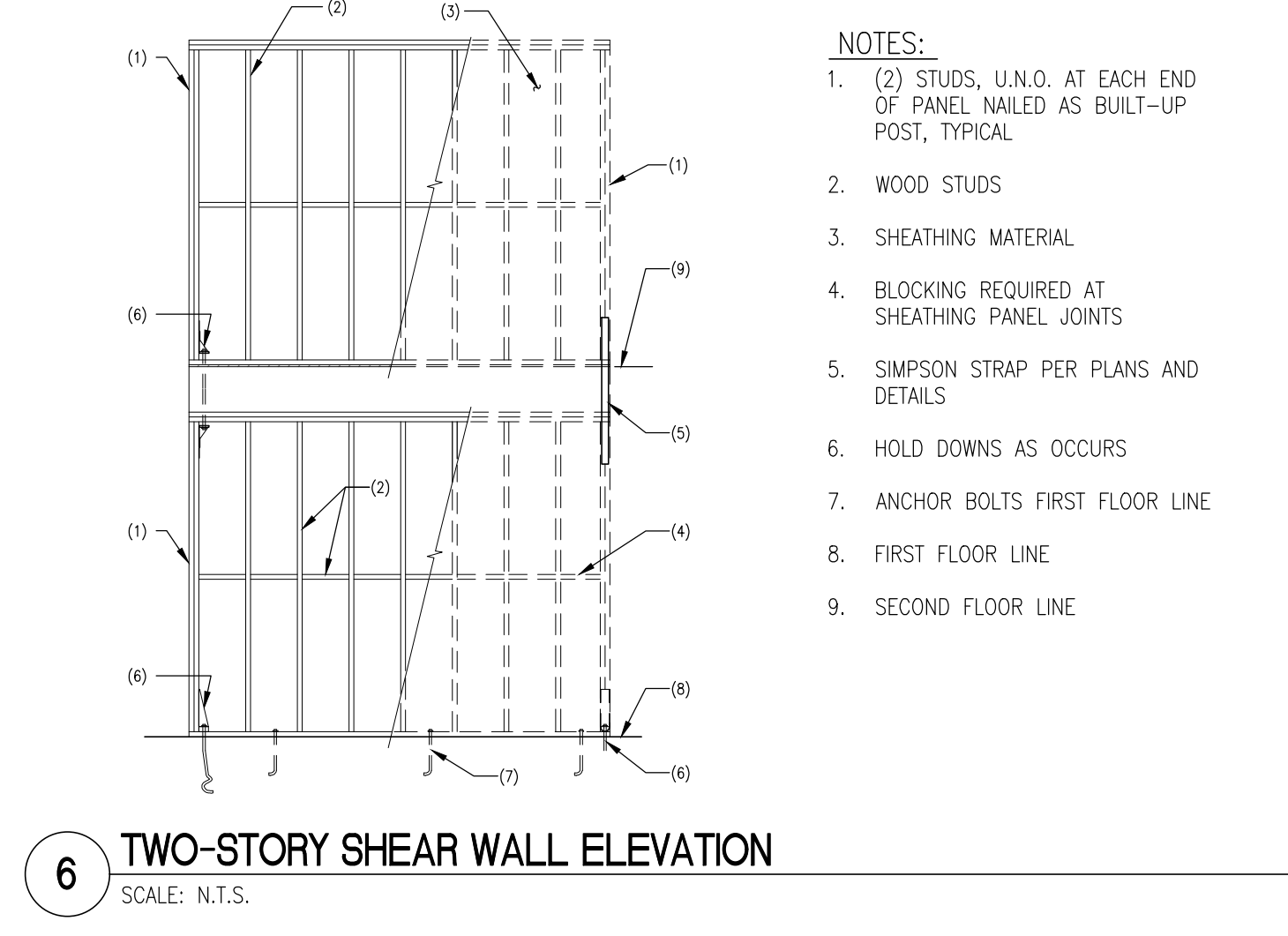
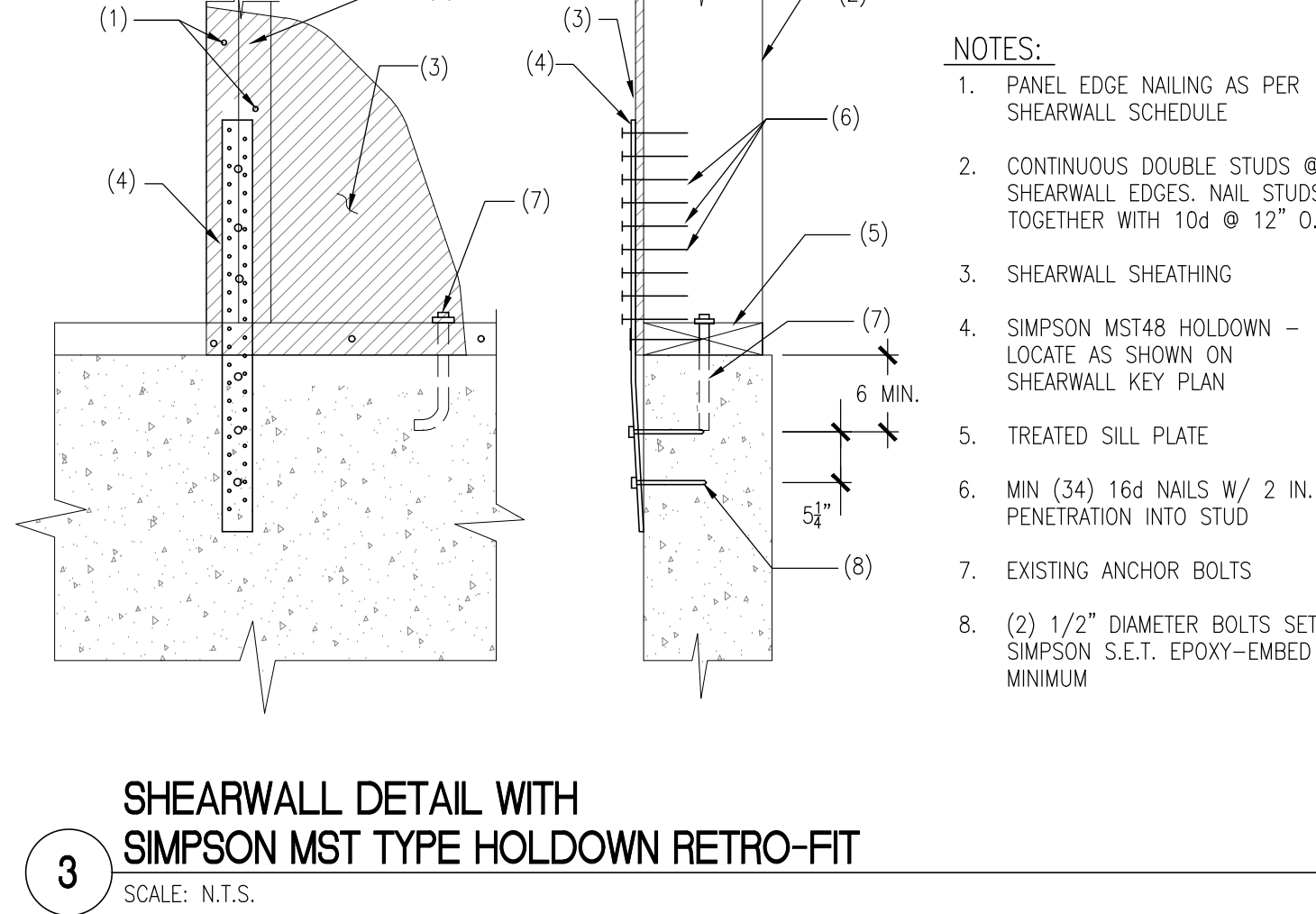
ALL EXTERIOR WALLS NOT DESIGNATED AS SHEARWALLS SHALL RECEIVE APA RATED SHEATHING, FULLY BLOCKED WITH MINIMUM EDGE ATTACHMENT OF 8d NAILS @ 6" O.C., 12" O.C. FIELD. NAILING APPLIES TO ALL STUDS, TOP AND BOTTOM PLATES AND BLOCKING.

MINIMUM ANCHOR BOLT SPACING OF 48" O.C. UNLESS OTHERWISE NOTED IN SCHEDULE. MINIMUM OF 2 ANCHORS PER WALL. PROVIDE 3"x3"x0.25" SQUARE WASHERS AT EACH ANCHOR BETWEEN THE SILL PLATE AND WASHER. A DIAGONAL SLOT IN THE PLATE WASHER MAY BE USED WITH A WIDTH OF UP TO 3/16" LARGER THAN THE BOLT DIAMETER AND A SLOT NOT TO EXCEED 1-3/4", PROVIDED A STANDARD CUT WASHER IS PLACED BETWEEN THE PLATE WASHER AND THE NUT. DO NOT RECESS BOLTS.

TABLES BASED ON 8d NAILS (2 1/2" LONG x 0.113" COMMON OR 2 1/2" x 0.113" GALVANIZED BOX).

BLOCKING/RIM JOIST ATTACHMENT NEED NOT BE USED WHERE THE SHEATHING IS DIRECTLY ATTACHED WITH EDGE NAILING TO THE DOUBLE TOP PLATES AT UPPER STORY SHEARWALLS AND TO THE BASE/SILL PLATE BELOW AT LOWER STORY SHEARWALLS.

WHERE 3x BASE/SILL ARE SPECIFIED, 20d COMMON NAILS SHALL BE USED FOR THE BASE PLATE ATTACHMENT IN LIEU OF THE ORIGINALLY SPECIFIED 16d COMMON NAILS.



STRUCTURAL CALCULATIONS

Project: The Moloney / O'Hanlon Residence Remodel
Address: 4016 92nd Ave SE,
Mercer Island, WA 98040
Project No.: 2458
Date: October 31, 2024

PERMIT SUBMITTAL



Client:
Collin & Kelle Moloney

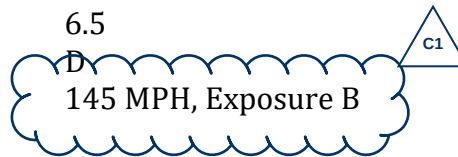
Contents:
Calculations 2 – 97

These enclosed documents are to be used in conjunction with the plans referenced on the cover. It is essential that the contractor study the engineering requirements and required changes to the architectural plan prior to start of work. Changes may include additional foundation or footings, beam size changes, siding changes, etc.

Scope of Engineering: Engineering analyses and design to resist lateral and gravity loads in accordance with the 2018 IBC have been performed and incorporated into stamped "S" sheets. All analyses and calculations are included in this engineering report. Engineering assumptions are listed below. If these conditions are not present at the site, these calculations are void and Structural Works, PLLC must be contacted immediately.

Loading Criteria

- Building Code	2018 International Building Code
- Seismic Design Category	D
- Sds	1.126
- Response Mod Factor	6.5
- Site Class	D
- Basic Wind Speed	145 MPH, Exposure B



Live Loads U.N.O.

- Uninhabitable attics without storage	10 psf
- Uninhabitable attics with storage	20 psf
- Habitable attics and sleeping areas	30 psf
- Decks	60 psf
- All other areas	40 psf

Dead Loads U.N.O.

- Roof with composition roofing	15 psf
- Floor	10 psf

Snow Loads U.N.O.

- Snow	25 psf
--------	--------

Soils Criteria

- Soils consultant	None
- Soils Report #	None
- Bearing Pressure Required	1500 psf (min required – Assumed)
- Min Frost Depth	12"

Structural Works PLLC
1412 Beach Drive NE #A
Tacoma, WA 98422
(253) 533-0835

DATE:	03/02/24	COMPANY:	
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--		

PROJECT SUMMARY

Project Name: 2458

Governing Codes:

Building Code: 2018 International Building Code

ASCE: ASCE 7-16

Steel: AISC 360-16

Concrete: ACI 318-14

Masonry: TMS 402/602-16

Module Location: 2RB-1

Module Level: Roof

Module Type: Roof Beam

Material Type: Solid Sawn Douglas Fir-Larch No. 2

Member Dimensions: (1) 5.5 in. X 11.5 in. X 7 ft

Section Adequacy: 75.03%

Controlling Factor: Bending Stress Y

Module Location: RB-1

Module Level: Upper Floor

Module Type: Roof Beam

Material Type: Solid Sawn Douglas Fir-Larch No. 2

Member Dimensions: (1) 5.5 in. X 11.5 in. X 15 ft

Section Adequacy: 51.74%

Controlling Factor: Bending Stress Y

Module Location: New Roof Rafter

Module Level: Upper Floor

Module Type: Roof Rafter

Material Type: Solid Sawn Douglas Fir-Larch No. 2

Member Dimensions: (1) 1.5 in. X 7.25 in. X 7.5 ft @ 24 in. Spacing

Section Adequacy: 78.5%

Controlling Factor: Bending-Tension

Module Location: New Floor Joist

Module Level: Upper Floor

Module Type: Floor Joist

Material Type: I-Joists Weyerhaeuser TJI 210

Member Dimensions: (1) 2.063 in. X 11.875 in. X 16 ft

Section Adequacy: 41.42%

Controlling Factor: Bending Moment

Module Location: New Floor Joist-1

Module Level: Upper Floor

Module Type: Floor Joist

Material Type: I-Joists Weyerhaeuser TJI 360

Member Dimensions: (1) 2.313 in. X 11.875 in. X 22 ft

Section Adequacy: 8.51%

Controlling Factor: Deflection Y

Module Location: 2FB-1

Module Level: Upper Floor

Module Type: Floor Beam

Material Type: Structural Composite Lumber Louisiana Pacific 2.0E LVL

Member Dimensions: (1) 3.5 in. X 11.875 in. X 3.5 ft

Section Adequacy: 90.85%

Controlling Factor: Bearing Stress

Module Location: 2FB-1 VERTICAL

Module Level: Upper Floor

Module Type: Floor Beam

Material Type: Structural Composite Lumber Louisiana Pacific 2.0E LVL
Member Dimensions: (1) 3.5 in. X 11.875 in. X 17.33 ft
Section Adequacy: **42.51%**
Controlling Factor: Deflection Y

Module Location: 2FB-2
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Structural Composite Lumber Louisiana Pacific 2.0E LVL
Member Dimensions: (1) 5.25 in. X 11.875 in. X 17.75 ft
Section Adequacy: **56.09%**
Controlling Factor: Deflection Y

Module Location: HDR-1
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 11.25 in. X 4.25 ft
Section Adequacy: **27.97%**
Controlling Factor: Shear Stress Y

Module Location: POST TO 2FB-1
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 3.5 in. X 8 ft
Section Adequacy: **56.81%**
Controlling Factor: Compressive Stress

Module Location: POST TO 2FB-2
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 5.5 in. X 8 ft
Section Adequacy: **78.18%**
Controlling Factor: Compressive Stress

Module Location: TRIMMER TO HDR-1
Module Level: Upper Floor
Module Type: Column
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (3) 1.5 in. X 3.5 in. X 8 ft
Section Adequacy: **54.27%**
Controlling Factor: Compressive Stress

Module Location: GHDR
Module Level: Upper Floor
Module Type: Floor Beam
Material Type: Glulams Stress Class Rated 24F-1.8E 24F-V4 DF/DF
Member Dimensions: (1) 5.5 in. X 12 in. X 16 ft
Section Adequacy: **56.45%**
Controlling Factor: Deflection Y

Module Location: FB-1
Module Level: Main Floor
Module Type: Floor Beam
Material Type: Solid Sawn Douglas Fir-Larch No. 2
Member Dimensions: (1) 3.5 in. X 11.25 in. X 5 ft
Section Adequacy: **25.66%**
Controlling Factor: Shear Stress Y

Module Location: New Continuous Footing
Module Level: Main Floor
Module Type: Continuous Footing
Material Type: Concrete
Member Dimensions: 1 ft. wide X 8 in. tall
Section Adequacy: **16.75%**
Controlling Factor: Soil Bearing Pressure
Reinforcement: #4 - Longitudinal: 0 Bars. Transversal: 12" O.C. Spacing

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Roof	LOADING:	ASD
MEMBER NAME:	2RB-1	CODE:	2018 International Building Code
MEMBER TYPE:	ROOF BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 5.5 X 11.5	DRY

2RB-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 7 Member Slope: 0/12 Actual Length (ft): 7

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
63.25	697.07	159.44	14.43	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	875	425	170	600	625	1300	470
Adjusted Values	875	425	170	600	625	1300	470
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	7	0	7	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Stress Y (psi)	PASS (82.4%)	34.4	195.5	0	D+S	1.15	
Bending Stress Y (psi)	PASS (75.0%)	251.3	1006.3	3.5	D+S	1.15	
Deflection Y (in)	PASS (95.3%)	0.022 (=L/3818)	0.467 (=L/180)	3.5	D+Lr	1.25	
Bearing Stress (psi)	PASS (85.9%)	87.9	625.0	0	D+S	1.15	

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE ROOF	SNOW	TOTAL
A	575	700	875	2150
B	575	700	875	2150

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lb/ft)	Uniform	200	200	0	7	RoofLive	Y
Uniform (lb/ft)	Uniform	150	150	0	7	Dead	Y
Uniform (lb/ft)	Uniform	250	250	0	7	Snow	Y
Self Weight (lb/ft)	-	14.43	14.43	0	7	Dead	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	RB-1	CODE:	2018 International Building Code
MEMBER TYPE:	ROOF BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 5.5 X 11.5	DRY

RB-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 15 Member Slope: 0/12 Actual Length (ft): 15

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lb _f /ft)			Creep Factor
63.25	697.07	159.44	14.43	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	875	425	170	600	625	1300	470
Adjusted Values	875	425	170	600	625	1300	470
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	15	0	15	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Stress Y (psi)	PASS (84.1%)	31.0	195.5	15	D+S	1.15	
Bending Stress Y (psi)	PASS (51.7%)	485.6	1006.3	7.5	D+S	1.15	
Deflection Y (in)	PASS (80.6%)	0.194 (=L/928)	1.000 (=L/180)	7.5	D+Lr	1.25	
Bearing Stress (psi)	PASS (87.3%)	79.3	625.0	0	D+S	1.15	

REACTIONS

Units for V: lb_f Units for M: lb_f-ft

Y axis	DEAD	LIVE ROOF	SNOW	TOTAL
A	558	600	750	1908
B	558	600	750	1908

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	15	RoofLive	Y
Uniform (lbf/ft)	Uniform	60	60	0	15	Dead	Y
Uniform (lbf/ft)	Uniform	100	100	0	15	Snow	Y
Self Weight (lbf/ft)	-	14.43	14.43	0	15	Dead	Y

DATE:	03/02/24			COMPANY:	--
STRUCALC BUILD:	StruCalc Pro			DESIGNED BY:	Ercin Sahin
CUSTOMER:				REVIEWED BY:	--
PROJ. ADDRESS:	--			PROJECT NAME:	2458
	--				
LEVEL:	Upper Floor			LOADING:	ASD
MEMBER NAME:	New Roof Rafter			CODE:	2018 International Building Code
MEMBER TYPE:	ROOF RAFTER			NDS:	2018 NDS
MATERIAL:	Solid Sawn				
Douglas Fir-Larch	No. 2	(1) 1.5 X 7.25	24(in) O.C.	DRY	

New Roof Rafter DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 7.5 Member Slope: 3/12 Actual Length (ft): 7.73 Roof Pitch: 3/12 O.C. Spacing(in): 24

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lb _f /ft)			Creep Factor
10.88	47.63	2.04	2.48	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1242	690	180	1418	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.2	1.2	1	1.05	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1.15

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	6	0	6	1.5				
2	1.5	0	1.5	0.375				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Stress Y (psi)	PASS (82.5%)	36.3	207.0	6	D+S	1.15	
Bending Stress Y (psi)	PASS (78.5%)	307.0	1428.3	2.775	D+S	1.15	
Deflection Y (in)	PASS (92.0%)	0.017 (=L/5294)	0.206 (=L/437)	7.5	D+Lr	1.25	
Compressive Stress (psi)	PASS (99.6%)	5.3	1496.0	0	D+S	1.15	
Tensile Stress (psi)	PASS (99.2%)	6.0	793.5	6	D+S	1.15	
Bearing Stress (psi)	PASS (88.1%)	83.4	703.1	6	D+S	1.15	
Bending-Compression (Unit)	PASS (78.5%)	0.22	1.00	2.775	D+S	1.15	
Bending-Tension (Unit)	PASS (78.5%)	0.22	1.00	2.85	D+S	1.15	

REACTIONS		Units for V: lbf		Units for M: lbf-ft	
Y axis	DEAD	LIVE ROOF	SNOW	TOTAL	
A	94	116	145	355	
B	157	193	242	592	
C	0	0	0	0	

Reaction Location

A

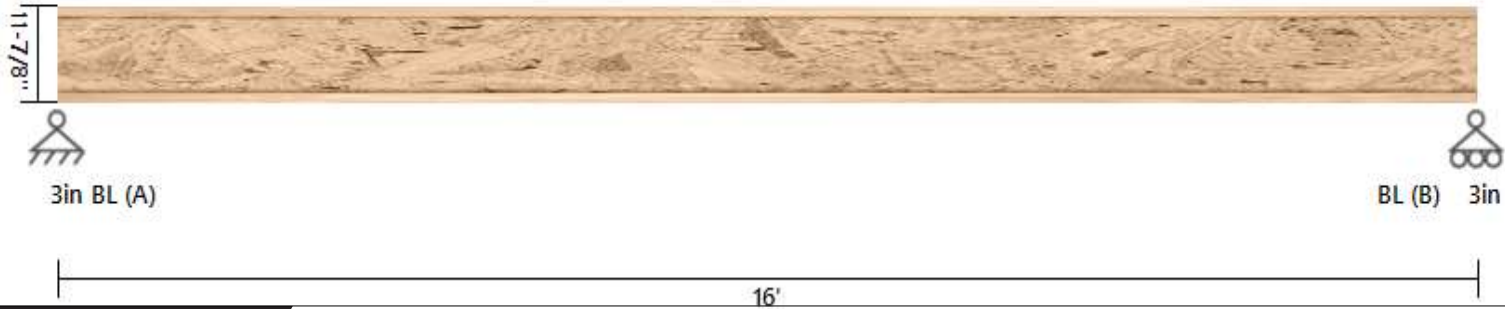
B

C

LOAD LIST							
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft ²)	Uniform	20	20	0	7.5	RoofLive	Y
Uniform (lbf/ft ²)	Uniform	15	15	0	7.5	Dead	Y
Uniform (lbf/ft ²)	Uniform	25	25	0	7.5	Snow	Y
Self Weight (lbf/ft)	-	2.48	2.48	0	7.5	Dead	Y

DATE:	03/02/24			COMPANY:	--
STRUCALC BUILD:	StruCalc Pro			DESIGNED BY:	Ercin Sahin
CUSTOMER:				REVIEWED BY:	--
PROJ. ADDRESS:	--			PROJECT NAME:	2458
	--				
LEVEL:	Upper Floor			LOADING:	ASD
MEMBER NAME:	New Floor Joist			CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR JOIST			NDS:	2018 NDS
MATERIAL:	I-Joists				
Weyerhaeuser	TJI 210	(1) 11.875	0(in) O.C.	DRY	

New Floor Joist DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 16 Member Slope: 0/12 Actual Length (ft): 16 O.C. Spacing(in): 16

El x10 ⁶	BSW	Lams	K x10 ⁶	Mcap	Vcap	End Rcap	End Rcap	End Rcap	End Rcap	Int Rcap	Int Rcap	Int Rcap	Int Rcap
(lb/in ²)	(lb/ft)		(lb)	(lb-ft)	(lb)	1.75 NS	3.5 NS	1.75 WS	3.5 WS	3.5 NS	5.25 NS	3.5 WS	5.25 WS
315	2.8	1	4.5	3795	1655	1005	1460	1365	1655	2145	2565	2505	2925

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End	
		Top	Bottom	Elev. Diff (ft)	
1	16	0	16	0	

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Force (lbf)	PASS (66.4%)	555.7	1655.0	0	D+L	1	
Bending Moment (lbf-ft)	PASS (41.4%)	2222.9	3795.0	8	D+L	1	
Deflection Y (in)	PASS (53.2%)	0.250 (=L/768)	0.533 (=L/360)	8	L	0	
Bearing Load (lbf)	PASS (58.2%)	555.7	1330.0	0	D+L	1	

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	129	427	556
B	129	427	556

Reaction Location WS-Web Stiffener Required NSR-No Stiffener Required

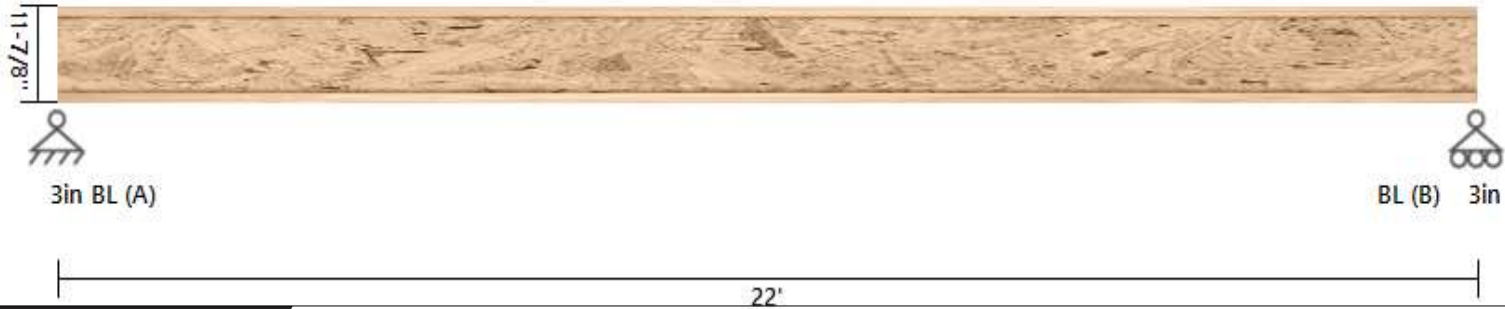
A	B
NSR	NSR

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft ²)	Uniform	40	40	0	16	Live	Y
Uniform (lbf/ft ²)	Uniform	10	10	0	16	Dead	Y
Self Weight (lbf/ft)	-	2.8	2.8	0	16	Dead	Y

DATE:	03/02/24			COMPANY:	--
STRUCALC BUILD:	StruCalc Pro			DESIGNED BY:	Ercin Sahin
CUSTOMER:				REVIEWED BY:	--
PROJ. ADDRESS:	--			PROJECT NAME:	2458
	--				
LEVEL:	Upper Floor			LOADING:	ASD
MEMBER NAME:	New Floor Joist-1			CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR JOIST			NDS:	2018 NDS
MATERIAL:	I-Joists				
Weyerhaeuser	TJI 360	(1) 11.875	0(in) O.C.	DRY	

New Floor Joist-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0	End (ft): 22	Member Slope: 0/12	Actual Length (ft): 22	O.C. Spacing(in): 16									
El x10 ⁶	BSW	Lams	K x10 ⁶	Mcap	Vcap	End Rcap	End Rcap	End Rcap	End Rcap	Int Rcap	Int Rcap	Int Rcap	Int Rcap
(lb-ft-in ²)	(lb-ft)		(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)	(lb-ft)
419	3	1	4.5	6180	1705	1080	1505	1440	1705	2460	3000	2815	3360

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End
		Top	Bottom	
1	22	0	22	0

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Force (lb-ft)	PASS (55.1%)	766.3	1705.0	0	D+L	1	
Bending Moment (lb-ft)	PASS (31.8%)	4214.8	6180.0	11	D+L	1	
Deflection Y (in)	PASS (8.5%)	0.671 (=L/393)	0.733 (=L/360)	11	L	0	
Bearing Load (lb-ft)	PASS (44.6%)	766.3	1383.6	0	D+L	1	

REACTIONS

Y axis	Units for V: lbf		Units for M: lbf-ft	
	DEAD	LIVE	TOTAL	
A	180	587	767	
B	180	587	767	

Reaction Location WS-Web Stiffener Required NSR-No Stiffener Required

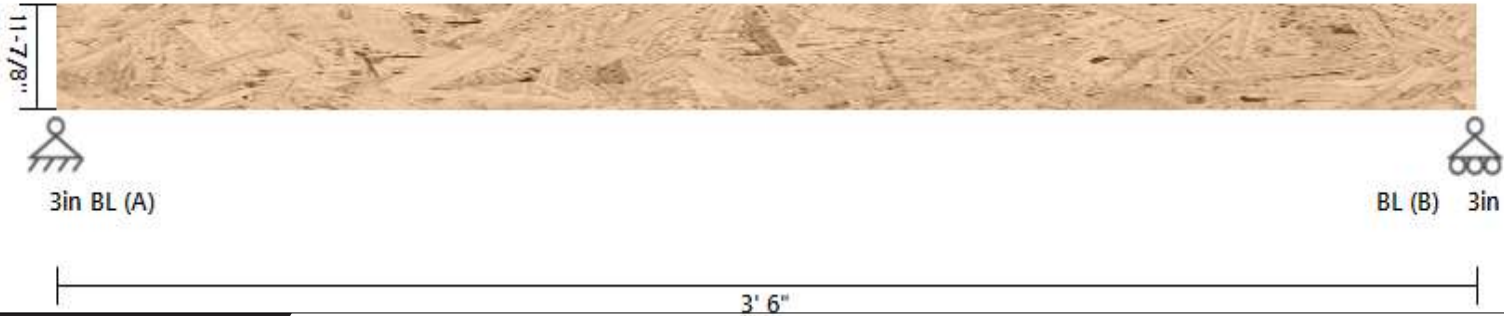
A B
NSR NSR

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lb-ft ²)	Uniform	40	40	0	22	Live	Y
Uniform (lb-ft ²)	Uniform	10	10	0	22	Dead	Y
Self Weight (lb-ft)	-	3	3	0	22	Dead	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Structural Composite Lumber		
Louisiana Pacific	2.0E LVL	(1) 3.5 X 11.875	DRY

2FB-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 3.5 Member Slope: 0/12 Actual Length (ft): 3.5

Area	I _x	I _y	BSW	Lams	C _{fn}	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
41.56	488.41	42.43	11.83	1	9	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	2900	1800	285	3200	750	2000	1000
Adjusted Values	2900	1800	285	3200	750	2000	1000
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1

Bending Adjustment Factors C_V = 1 C_r = 1 Volume factor Is applied on a load combination basis And Is Not reflected in the adjusted values

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	3.5	0	3.5	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (90.9%)	26.0	285.0	0	D+L	1
Bending Stress Y (psi)	PASS (96.8%)	92.0	2903.4	1.75	D+L	1
Deflection Y (in)	PASS (99.1%)	0.001 (=L/42000)	0.117 (=L/359)	1.75	L	0
Bearing Stress (psi)	PASS (90.8%)	68.6	750.0	0	D+L	1

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	TOTAL
A	161	560	721
B	161	560	721

Reaction Location

A

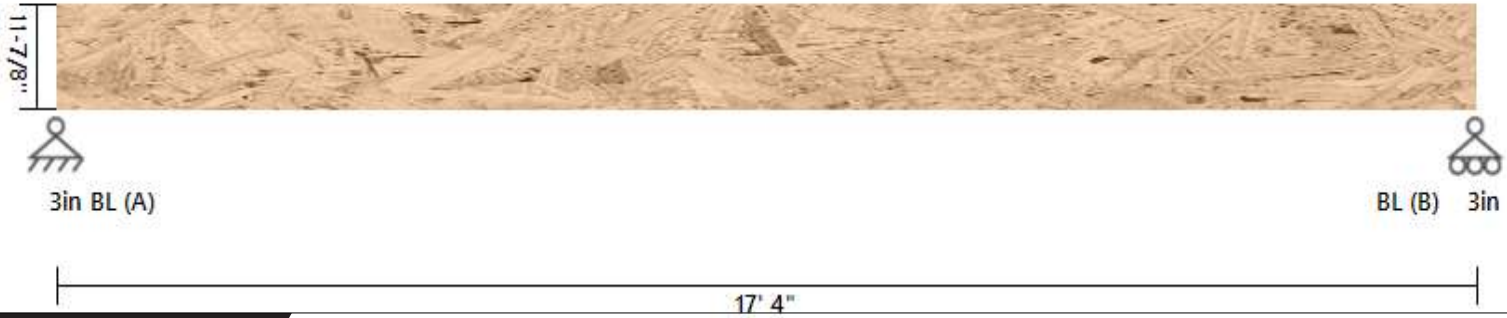
B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lb/ft)	Uniform	320	320	0	3.5	Live	Y
Uniform (lb/ft)	Uniform	80	80	0	3.5	Dead	Y
Self Weight (lb/ft)	-	11.83	11.83	0	3.5	Dead	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-1 VERTICAL	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Structural Composite Lumber		
Louisiana Pacific	2.0E LVL	(1) 3.5 X 11.875	DRY

2FB-1 VERTICAL DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 17.333 Member Slope: 0/12 Actual Length (ft): 17.333

Area	I _x	I _y	BSW	Lams	C _{fn}	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
41.56	488.41	42.43	11.83	1	9	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	2900	1800	285	3200	750	2000	1000
Adjusted Values	2900	1800	285	3200	750	2000	1000
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1

Bending Adjustment Factors C_V = 1 C_r = 1 Volume factor Is applied on a load combination basis And Is Not reflected in the adjusted values

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	17.333	0	17.333	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (66.6%)	109.6	327.8	17.333	D+0.75L+0.75S	1.15
Bending Stress Y (psi)	PASS (55.1%)	1303.7	2903.4	8.493	D+L	1
Deflection Y (in)	PASS (42.5%)	0.498 (=L/418)	0.867 (=L/240)	8.667	D+L	1
Bearing Stress (psi)	PASS (61.4%)	289.3	750.0	17.333	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1361	753	350	438	2902
B	1411	1194	780	974	4359

Reaction Location

A

B

LOAD LIST

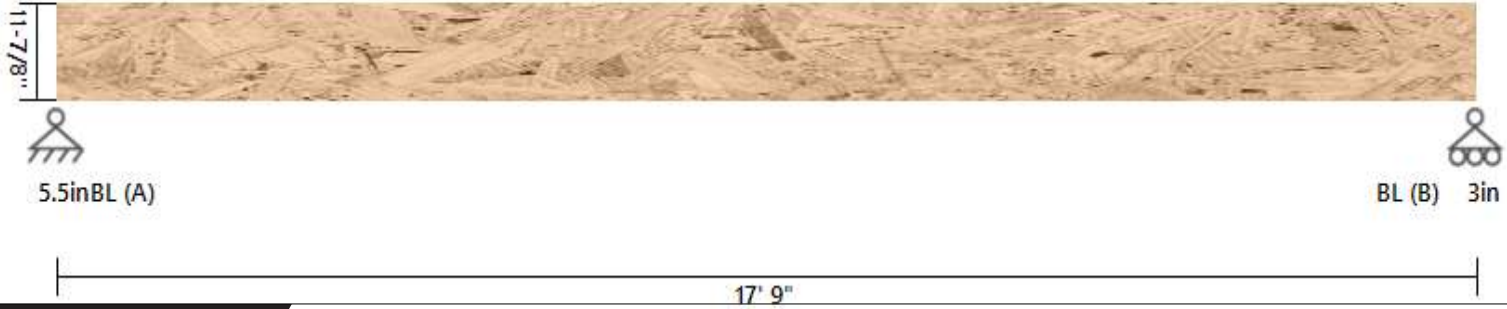
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	17.333	Live	Y
Uniform (lbf/ft)	Uniform	20	20	0	17.333	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	10.75	Dead	Y
Uniform (lbf/ft)	ROOF	30	30	0	10.75	Dead	Y
Uniform (lbf/ft)	ROOF	40	40	0	10.75	RoofLive	Y
Uniform (lbf/ft)	ROOF	50	50	0	10.75	Snow	Y
Self Weight (lbf/ft)	-	11.83	11.83	0	17.333	Dead	Y

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2RB-1	B	575.489	-	16	-	Dead	Y
Point (lbf)	2RB-1	B	875	-	16	-	Snow	Y
Point (lbf)	2RB-1	B	700	-	16	-	RoofLive	Y
Point (lbf)	2FB-1	B	160.709	-	15.5	-	Dead	Y
Point (lbf)	2FB-1	B	560	-	15.5	-	Live	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	2FB-2	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Structural Composite Lumber		
Louisiana Pacific	2.0E LVL	(1) 5.25 X 11.875	DRY

2FB-2 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 17.75 Member Slope: 0/12 Actual Length (ft): 17.75

Area	I _x	I _y	BSW	Lams	C _{fn}	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lb/ft)			Creep Factor
62.34	732.62	143.2	17.75	1	9	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	2900	1800	285	3200	750	2000	1000
Adjusted Values	2900	1800	285	3200	750	2000	1000
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1

Bending Adjustment Factors C_V = 1 C_r = 1 Volume factor Is applied on a load combination basis And Is Not reflected in the adjusted values

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	17.75	0	17.75	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (80.8%)	54.6	285.0	0	D+L	1
Bending Stress Y (psi)	PASS (66.3%)	979.4	2903.4	8.875	D+L	1
Deflection Y (in)	PASS (56.1%)	0.390 (=L/546)	0.887 (=L/240)	8.875	D+L	1
Bearing Stress (psi)	PASS (79.8%)	151.2	750.0	17.75	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1560	710	355	444	3069
B	1525	710	345	431	3011

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	17.75	Live	Y
Uniform (lbf/ft)	Uniform	20	20	0	17.75	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	17.5	Dead	Y
Uniform (lbf/ft)	ROOF	30	30	0	17.5	Dead	Y
Uniform (lbf/ft)	ROOF	40	40	0	17.5	RoofLive	Y
Uniform (lbf/ft)	ROOF	50	50	0	17.5	Snow	Y
Self Weight (lbf/ft)	-	17.75	17.75	0	17.75	Dead	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	HDR-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 3.5 X 11.25	DRY

HDR-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 4.25 Member Slope: 0/12 Actual Length (ft): 4.25

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
39.38	415.28	40.19	8.98	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	990	575	180	1350	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	4.25	0	4.25	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Stress Y (psi)	PASS (28.0%)	129.6	180.0	0	D+L	1	
Bending Stress Y (psi)	PASS (69.0%)	306.6	990.0	1.955	D+L	1	
Deflection Y (in)	PASS (95.6%)	0.009 (=L/5667)	0.213 (=L/239)	2.082	D+L	1	
Bearing Stress (psi)	PASS (42.6%)	358.5	625.0	0	D+0.75L+0.75S	1.15	

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	2017	1386	755	944	5102
B	838	807	446	557	2648

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	360	360	0.25	4.25	Live	Y
Uniform (lbf/ft)	Uniform	90	90	0.25	4.25	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	4.25	Dead	Y
Uniform (lbf/ft)	ROOF	150	150	0	4.25	Dead	Y
Uniform (lbf/ft)	ROOF	200	200	0	4.25	RoofLive	Y
Uniform (lbf/ft)	ROOF	250	250	0	4.25	Snow	Y
Self Weight (lbf/ft)	-	8.98	8.98	0	4.25	Dead	Y

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2FB-1 VERTICAL	A	1360.607	-	0.25	-	Dead	Y
Point (lbf)	2FB-1 VERTICAL	A	752.544	-	0.25	-	Live	Y
Point (lbf)	2FB-1 VERTICAL	A	438.114	-	0.25	-	Snow	Y
Point (lbf)	2FB-1 VERTICAL	A	350.491	-	0.25	-	RoofLive	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	POST TO 2FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 3.5 X 3.5	DRY

POST TO 2FB-1 DIAGRAM



COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area	Ix	Iy	BSW	Lams	G	Kcr
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
12.25	12.51	12.51	2.79	1	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc _⊥ (psi)	E (psi) x10 ³	Emin (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1350	862	180	1552	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.5	1.5	1	1.15	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	27.43	27.43			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Compressive Stress (psi)	PASS (56.8%)	249.8	578.3	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1433	1194	780	974	4381
B	0	0	0	0	0

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	2.79	2.79	0	8	Dead	Z

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	2FB-1 VERTICAL	B	-1410.928	-1410.928	8	8	Dead	Z
Axial (lbf)	2FB-1 VERTICAL	B	-1194.14	-1194.14	8	8	Live	Z
Axial (lbf)	2FB-1 VERTICAL	B	-974.402	-974.402	8	8	Snow	Z
Axial (lbf)	2FB-1 VERTICAL	B	-779.523	-779.523	8	8	RoofLive	Z

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	POST TO 2FB-2	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 3.5 X 5.5	DRY

POST TO 2FB-2 DIAGRAM



8'

COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
19.25	48.53	19.65	4.39	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1170	748	180	1485	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.3	1.3	1	1.1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	17.45	27.43			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR
Compressive Stress (psi)	PASS (78.2%)	125.5	575.3	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	1560	710	345	431	3046
B	0	0	0	0	0

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	4.39	4.39	0	8	Dead	Z

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	2FB-2	B	-1525.219	-1525.219	8	8	Dead	Z
Axial (lbf)	2FB-2	B	-709.75	-709.75	8	8	Live	Z
Axial (lbf)	2FB-2	B	-431	-431	8	8	Snow	Z
Axial (lbf)	2FB-2	B	-345	-345	8	8	RoofLive	Z

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	TRIMMER TO HDR-1	CODE:	2018 International Building Code
MEMBER TYPE:	COLUMN	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(3) 1.5 X 3.5	DRY

TRIMMER TO HDR-1 DIAGRAM



COLUMN PROPERTIES

Start(ft) 0 End(ft): 8

Area	Ix	Iy	BSW	Lams	G	Kcr
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
15.75	16.08	26.58	3.59	3	0.5	1

STRENGTH PROPERTIES

	Fb (psi)	Ft (psi)	Fv (psi)	Fc (psi)	Fc _⊥ (psi)	E (psi) x10 ³	Emin (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	1350	862	180	1552	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.5	1.5	1	1.15	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

COLUMN DATA

		Unbraced Length (ft)		Column End					
Span	Length (ft)	X	Y	Offset	CP	Ke(X Axis)	Ke(Y Axis)	KeL/d (X Axis)	KeL/d (Y Axis)
1	8	8	8	0	27.43	21.33			

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR
Compressive Stress (psi)	PASS (54.3%)	240.8	526.7	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Z axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	2046	1386	755	944	5131
B	0	0	0	0	0

Reaction Location

A

B

LOAD LIST

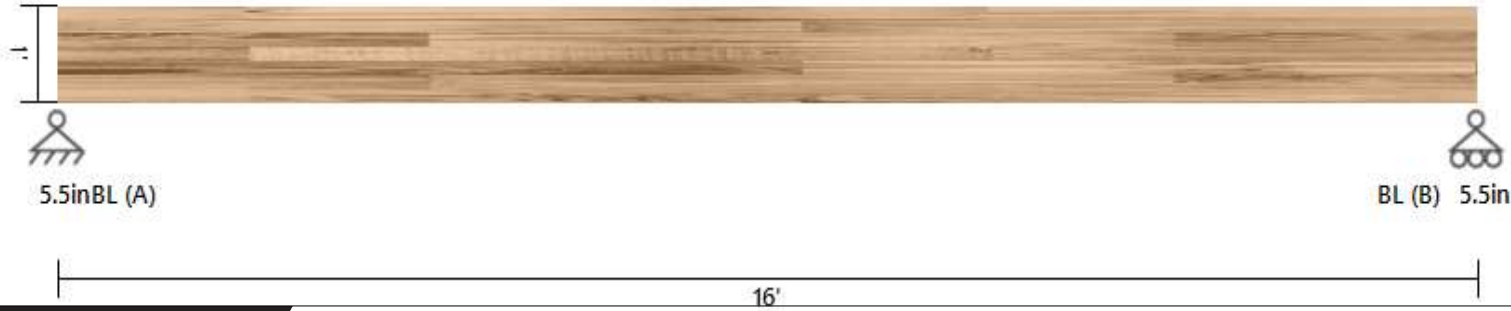
Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Self Weight (lbf/ft)	-	3.59	3.59	0	8	Dead	Z

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Axial (lbf)	HDR-1	A	-2017.31	-2017.31	8	8	Dead	Z
Axial (lbf)	HDR-1	A	-1385.922	-1385.922	8	8	Live	Z
Axial (lbf)	HDR-1	A	-943.594	-943.594	8	8	Snow	Z
Axial (lbf)	HDR-1	A	-754.867	-754.867	8	8	RoofLive	Z

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Upper Floor	LOADING:	ASD
MEMBER NAME:	GHDR	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Glulams		
Stress Class Rated 24F-1.8E	24F-V4 DF/DF	(1) 5.5 X 12	DRY

GHDR DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 16 Member Slope: 0/12 Actual Length (ft): 16

Area	Ix	Iy	BSW	Lams	G	Kcr
(in ²)	(in ⁴)	(in ⁴)	(lbf/ft)			Creep Factor
66	792	166.38	15.05	1	0.5	1

STRENGTH PROPERTIES

	Fbx+	Fbx-	Fby	Ft	Fvx	Fvy	Fc	Fc⊥	Ex	Exmin	Ey	Eymin
	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)	(psi)
Base Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
Adjusted Values	2400	1850	1450	1100	265	230	1650	650	1800000	950000	1600000	850000
C _M	1	1	1	1	1	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1	1	1	1	1	1

Bending Adjustment Factors C_{vr} = 1

BEAM DATA

		Unbraced Length (ft)		Beam End				
Span	Length (ft)	Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	16	0	16	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR CD
Shear Stress Y (psi)	PASS (65.6%)	91.1	265.0	0	D+L	1
Bending Stress Y (psi)	PASS (60.1%)	956.9	2400.0	6.88	D+L	1
Deflection Y (in)	PASS (56.4%)	0.348 (=L/552)	0.800 (=L/240)	7.68	D+L	1
Bearing Stress (psi)	PASS (74.7%)	141.7	560.0	0	D+0.75L+0.75S	1.15

REACTIONS

Units for V: lbf Units for M: lbf-ft

Y axis	DEAD	LIVE	LIVE ROOF	SNOW	TOTAL
A	2749	1261	631	788	5429
B	1579	729	364	455	3127

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lbf/ft)	Uniform	80	80	0	16	Live	Y
Uniform (lbf/ft)	Uniform	20	20	0	16	Dead	Y
Uniform (lbf/ft)	WALL	108	108	0	16	Dead	Y
Uniform (lbf/ft)	ROOF	30	30	0	16	Dead	Y
Uniform (lbf/ft)	ROOF	40	40	0	16	RoofLive	Y
Uniform (lbf/ft)	ROOF	50	50	0	16	Snow	Y
Self Weight (lbf/ft)	-	15.05	15.05	0	16	Dead	Y

LINKED LOAD LIST

Type	Member	Support	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Point (lbf)	2FB-2	A	1559.55	-	2	-	Dead	Y
Point (lbf)	2FB-2	A	710.003	-	2	-	Live	Y
Point (lbf)	2FB-2	A	443.664	-	2	-	Snow	Y
Point (lbf)	2FB-2	A	354.931	-	2	-	RoofLive	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Main Floor	LOADING:	ASD
MEMBER NAME:	FB-1	CODE:	2018 International Building Code
MEMBER TYPE:	FLOOR BEAM	NDS:	2018 NDS
MATERIAL:	Solid Sawn		
Douglas Fir-Larch	No. 2	(1) 3.5 X 11.25	DRY

FB-1 DIAGRAM



BEAM PROPERTIES

Start (ft): 0 End (ft): 5 Member Slope: 0/12 Actual Length (ft): 5

Area	I _x	I _y	BSW	Lams	G	K _{cr}
(in ²)	(in ⁴)	(in ⁴)	(lb _f /ft)			Creep Factor
39.38	415.28	40.19	8.98	1	0.5	1

STRENGTH PROPERTIES

	F _b (psi)	F _t (psi)	F _v (psi)	F _c (psi)	F _{c⊥} (psi)	E (psi) x10 ³	E _{min} (psi) x10 ³
Base Values	900	575	180	1350	625	1600	580
Adjusted Values	990	575	180	1350	625	1600	580
C _M	1	1	1	1	1	1	1
C _T	1	1	1	1	1	1	1
C _i	1	1	1	1	1	1	1
C _F	1.1	1	1	1	1	1	1

Bending Adjustment Factors C_{fu} = 1 C_r = 1

BEAM DATA

Span	Length (ft)	Unbraced Length (ft)		Beam End				
		Top	Bottom	Elev. Diff (ft)	CL(Top)	CL(Bottom)	CL(Left)	CL(Right)
1	5	0	5	0				

PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOCATION (ft)	LOAD COMBO	DURATION FACTOR	CD
Shear Stress Y (psi)	PASS (25.7%)	133.8	180.0	0	D+L	1	
Bending Stress Y (psi)	PASS (27.9%)	713.6	990.0	2.5	D+L	1	
Deflection Y (in)	PASS (86.8%)	0.022 (=L/2727)	0.167 (=L/359)	2.5	L	0	
Bearing Stress (psi)	PASS (46.5%)	334.5	625.0	0	D+L	1	

REACTIONS

Units for V: lb_f Units for M: lb_f-ft

Y axis	DEAD	LIVE	TOTAL
A	912	2600	3512
B	912	2600	3512

Reaction Location

A

B

LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lb/ft)	1ST FLOOR	600	600	0	5	Live	Y
Uniform (lb/ft)	1ST FLOOR	150	150	0	5	Dead	Y
Uniform (lb/ft)	WALL	96	96	0	5	Dead	Y
Uniform (lb/ft)	2ND FLOOR	440	440	0	5	Live	Y
Uniform (lb/ft)	2ND FLOOR	110	110	0	5	Dead	Y
Self Weight (lb/ft)	-	8.98	8.98	0	5	Dead	Y

DATE:	03/02/24	COMPANY:	--
STRUCALC BUILD:	StruCalc Pro	DESIGNED BY:	Ercin Sahin
CUSTOMER:		REVIEWED BY:	--
PROJ. ADDRESS:	--	PROJECT NAME:	2458
	--		
LEVEL:	Main Floor	LOADING:	ASD
MEMBER NAME:	New Continuous Footing	CODE:	2018 International Building Code
MEMBER TYPE:	CONTINUOUS FOOTING	ACI:	ACI 318-14
MATERIAL:	Concrete		
1 (ft) Wide X 8 (in) Deep		Soil Depth TOF: 0 (ft)	Long. (2) #4 Bars, Transv. #4 @12(in) O.C.

MATERIAL PROPERTIES

FOOTING					
Width (ft)	Depth (in)	Footing Weight (lb/ft)	Stemwall Weight (lb/ft)		
1	8	96.66666	193.3333		
CONCRETE					
fc' (psi)	Ec (psi)	Density (lb/ft ³)	Agg. Dia. (in)		
2500	2850000	145	0.75		
STEM WALL					
Width (in)	Height (in)	Material	Stemwall Offset (in)		
8	24	Concrete	0		
SOIL					
Bearing Strength (lb/ft ²)	Density (lb/ft ³)	Cohesion	Friction Angle	Depth (ft)	Rankine Coefficient (Kp)
1500	110	0	30	0	3
REBAR					
Bottom Bar Size #	Bottom Bar Spacing (in.)	fy (psi)	Es (psi)		
4	12	40000	2.9E+07		
COVER					
Top Cover (in.)	Bottom Cover (in.)	Side Cover (in.)			
3	3	3			

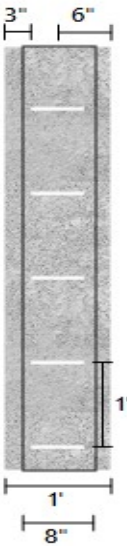
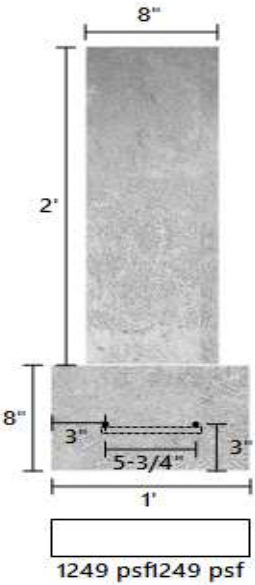
PASS-FAIL

	PASS/FAIL	MAGNITUDE	STRENGTH	LOAD COMBO	CALCULATION TYPE
Soil Bearing Pressure (lb/ft ²)	PASS (16.8%)	1248.8	1500.0	D+0.75L+0.75S	ASD
Moment (lb-ft)	PASS (99.3%)	19.7	2707.0	1.2D+1.6S+L	LRFD
Compression (ft ²)	PASS (100.0%)	1.0	1.0	D	LRFD

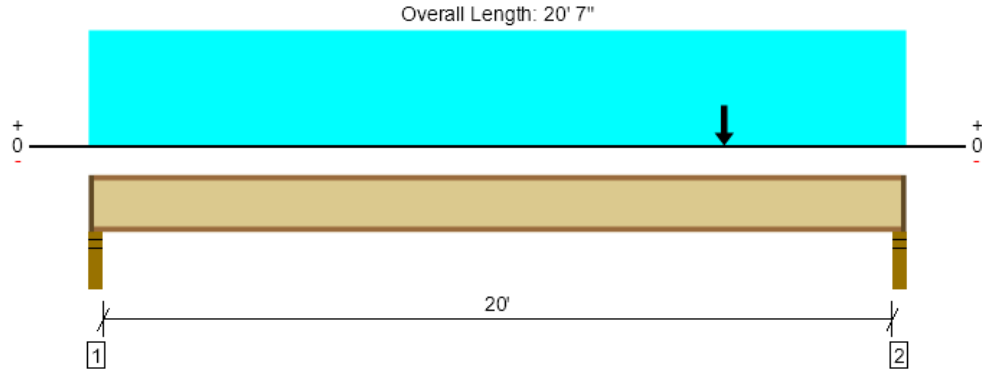
LOAD LIST

Type	Name	Left Magnitude	Right Magnitude	Load Start (ft)	Load End (ft)	Load Type	Direction
Uniform (lb/ft)	Uniform	400	400	0	1	Live	Z
Uniform (lb/ft)	Uniform	100	100	0	1	Dead	Z
Uniform (lb/ft)	Uniform	195	195	0	1	Dead	Z
Uniform (lb/ft)	Uniform	260	260	0	1	RoofLive	Z
Uniform (lb/ft)	Uniform	325	325	0	1	Snow	Z
Uniform (lb/ft)	Uniform	120	120	0	1	Dead	Z

New Continuous Footing DIAGRAMS



Level, Floor: Joist
1 piece(s) 11 7/8" TJI® 560 @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	949 @ 20' 4 1/2"	1396 (2.25")	Passed (68%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	936 @ 20' 3 1/2"	2050	Passed (46%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	4183 @ 11' 4 15/16"	9500	Passed (44%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.317 @ 10' 3 1/2"	0.504	Passed (L/764)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.494 @ 10' 6 7/16"	1.008	Passed (L/490)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	43	40	Passed	--	--

Member Length : 20' 4 1/2"
System : Floor
Member Type : Joist
Building Use : Residential
Building Code : IBC 2018
Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

Supports	Bearing Length			Loads to Supports (lbs)					Accessories
	Total	Available	Required	Dead	Floor Live	Roof Live	Snow	Factored	
1 - Stud wall - SPF	3.50"	2.25"	1.75"	212	549	58	72	761	1 1/4" Rim Board
2 - Stud wall - SPF	3.50"	2.25"	1.75"	407	549	209	261	1014	1 1/4" Rim Board

• Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	8' 8" o/c	
Bottom Edge (Lu)	20' 5" o/c	

- TJI joists are only analyzed using Maximum Allowable bracing solutions.
- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 20' 7"	16"	10.0	40.0	-	-	Floor Load
2 - Point (PLF)	16'	16"	108.0	-	-	-	Wall Dead Load
3 - Point (PLF)	16'	16"	150.0	-	200.0	250.0	Roof Load

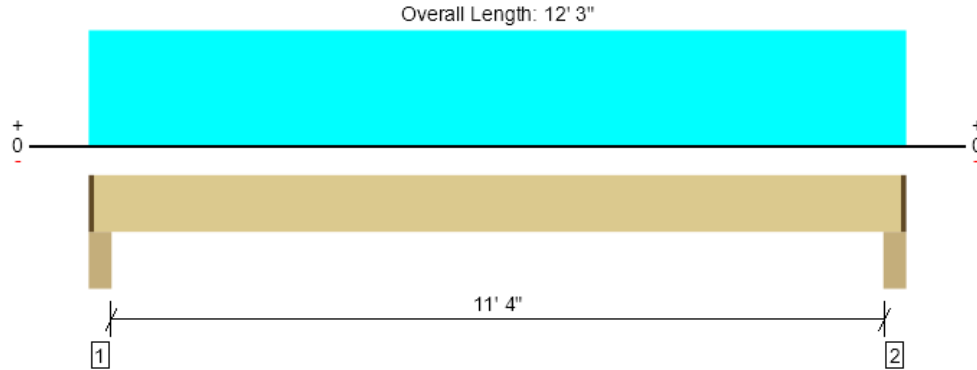
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The product application, input design loads, dimensions and support information have been provided by UG

Level, 2FB-2 (2458)

1 piece(s) 5 1/4" x 11 7/8" 2.0E Parallam® PSL



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4573 @ 4"	13945 (4.25")	Passed (33%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	3552 @ 1' 5 3/8"	13861	Passed (26%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	12738 @ 6' 1 1/2"	34332	Passed (37%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.115 @ 6' 1 1/2"	0.290	Passed (L/999+)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.233 @ 6' 1 1/2"	0.579	Passed (L/595)	--	1.0 D + 1.0 S (All Spans)

- Deflection criteria: LL (L/480) and TL (L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.

Member Length : 12' 1/2"
System : Floor
Member Type : Flush Beam
Building Use : Residential
Building Code : IBC 2021
Design Methodology : ASD

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Floor Live	Snow	Factored	
1 - Column - DF	5.50"	4.25"	1.50"	2353	490	2297	4650	1 1/4" Rim Board
2 - Column - DF	5.50"	4.25"	1.50"	2353	490	2297	4650	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 1" o/c	
Bottom Edge (Lu)	12' 1" o/c	

- Maximum allowable bracing intervals based on applied load.

Vertical Loads	Location (Side)	Tributary Width	Dead (0.90)	Floor Live (1.00)	Snow (1.15)	Comments
0 - Self Weight (PLF)	1 1/4" to 12' 1 3/4"	N/A	19.5	--	--	
1 - Uniform (PSF)	0 to 12' 3" (Front)	15'	15.0	-	25.0	roof
2 - Uniform (PSF)	0 to 12' 3" (Front)	10'	12.0	-	-	WALL
3 - Uniform (PSF)	0 to 12' 3" (Front)	2'	10.0	40.0	-	Floor

- Side loads are assumed to not induce cross-grain tension.

Weyerhaeuser Notes

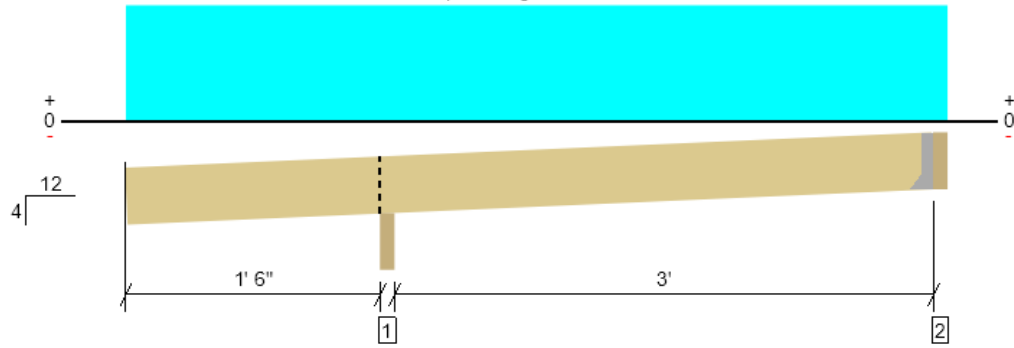
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The product application, input design loads, dimensions and support information have been provided by ForteWEB Software Operator

Level, Roof: Joist

1 piece(s) 2 x 8 DF No.2 @ 24" OC

Sloped Length: 5' 4 5/16"



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	298 @ 1' 7 3/4"	3459 (3.50")	Passed (9%)	--	1.0 D + 1.0 S (All Spans)
Shear (lbs)	105 @ 2' 4 3/8"	1501	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	-111 @ 1' 7 3/4"	1564	Passed (7%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.003 @ 0	0.200	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)
Total Load Defl. (in)	0.004 @ 0	0.231	Passed (2L/999+)	--	1.0 D + 1.0 S (Alt Spans)

- Deflection criteria: LL (L/240) and TL (L/180).
- Overhang deflection criteria: LL (0.2") and TL (2L/180).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 15% increase in the moment capacity has been added to account for repetitive member usage.
- Applicable calculations are based on NDS.

Member Length : 5' 3"
 System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC 2021
 Design Methodology : ASD
 Member Pitch : 4/12

Supports	Bearing Length			Loads to Supports (lbs)				Accessories
	Total	Available	Required	Dead	Roof Live	Snow	Factored	
1 - Beveled Plate - DF	3.50"	3.50"	1.50"	115	146	182	298	Blocking
2 - Hanger on 7 1/4" SPF beam	3.50"	Hanger ¹	1.50"	45	66	82	127	See note ¹

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	5' 1" o/c	
Bottom Edge (Lu)	5' 1" o/c	

- Maximum allowable bracing intervals based on applied load.
- Dimensions for lateral bracing intervals are measured along the length of the member for sloped conditions.

Connector: Simpson Strong-Tie

Support	Model	Seat Length	Top Fasteners	Face Fasteners	Member Fasteners	Accessories
2 - Face Mount Hanger	LSSR26Z	2.00"	N/A	11-10dx2.5	7-10dx1.5	

- Refer to manufacturer notes and instructions for proper installation and use of all connectors.

Vertical Load	Location (Side)	Spacing	Dead (0.90)	Roof Live (1.25)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 5' 1"	24"	15.0	20.0	25.0	Default Load

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ATC Hazards by Location

Search Information

Address: 4016 92nd Ave SE, Mercer Island, WA 98040

Coordinates: 47.5740522, -122.2158426

Elevation: 314 ft

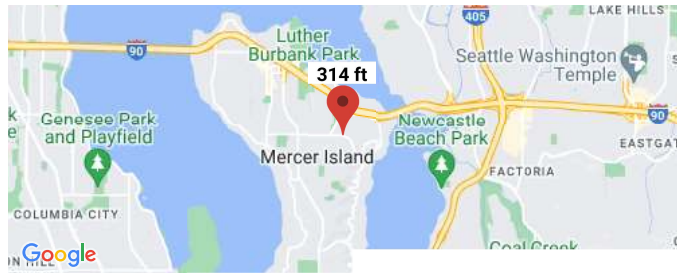
Timestamp: 2024-03-02T12:19:43.520Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D-default



Basic Parameters

Name	Value	Description
S_S	1.408	MCE_R ground motion (period=0.2s)
S_1	0.489	MCE_R ground motion (period=1.0s)
S_{MS}	1.689	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	1.126	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▼Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.903	Coefficient of risk (0.2s)
CR_1	0.897	Coefficient of risk (1.0s)
PGA	0.602	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.723	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
S_{sRT}	1.408	Probabilistic risk-targeted ground motion (0.2s)
S_{sUH}	1.56	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S_{sD}	3.622	Factored deterministic acceleration value (0.2s)
S_{1RT}	0.489	Probabilistic risk-targeted ground motion (1.0s)
S_{1UH}	0.545	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S_{1D}	1.447	Factored deterministic acceleration value (1.0s)
PGA_d	1.234	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

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Disclaimer

Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

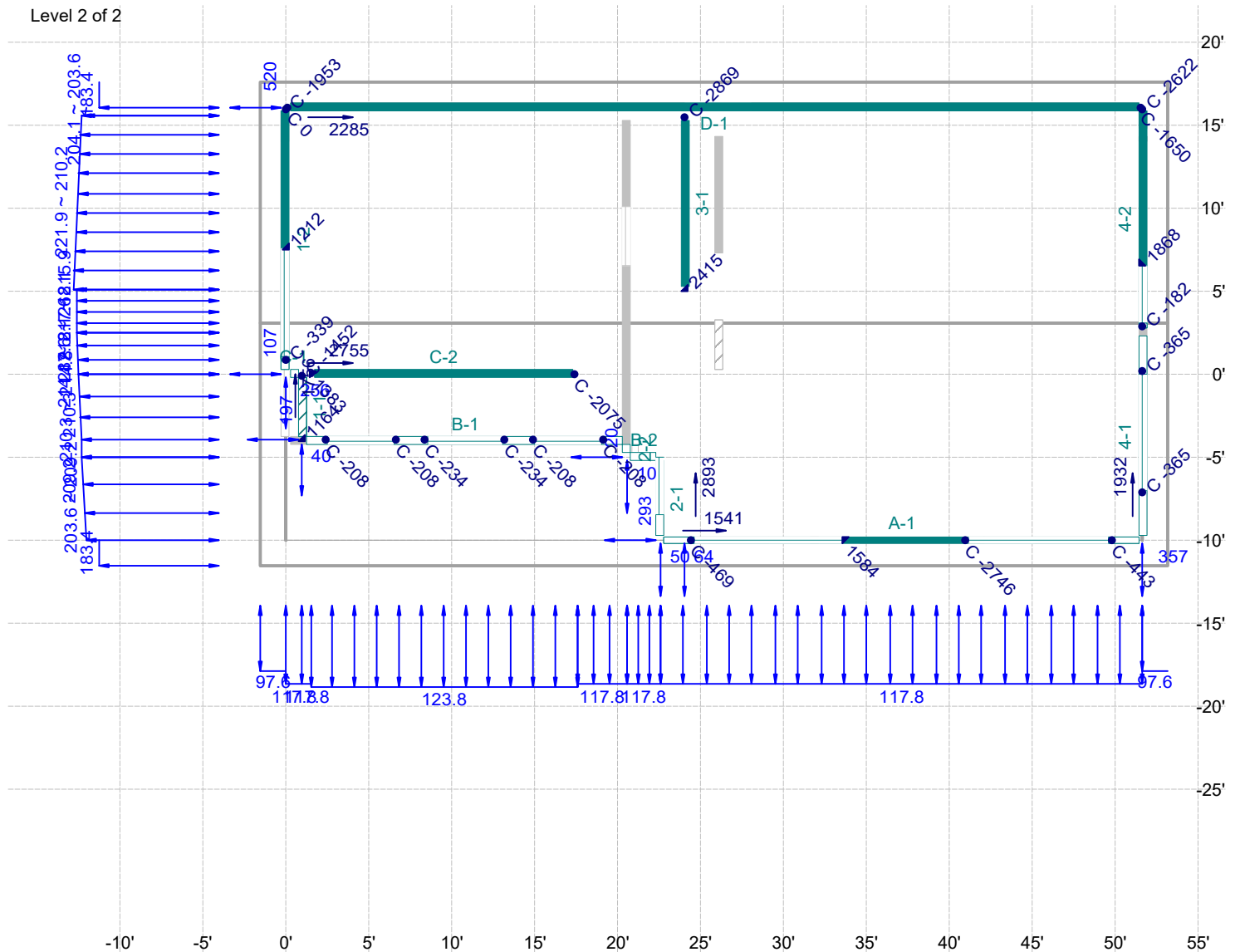
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2458 C1.wsw

WoodWorks® Shearwalls 13.1.2

Oct. 31, 2024 09:50:45

Level 2 of 2



- Factored shearline force (lbs)
- ▲ Factored hold-down force (lbs)
- C Factored compression force (lbs)
- Vertical element required
- ||| Unfactored applied shear load (plf)
- ⊗ Unfactored dead load (plf, lbs)
- || Applied point load or discontinuous shearline force (lbs)

Loads: Seismic (Q_e); Forces: $0.7E + 0.6D$; $E = pQ_e + 0.2 S_d s D$; $p(NS) = 1.3$; $p(EW) = 1.3$; $S_d s = 1.13$; Flexible distribution

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ATC Hazards by Location

Search Information

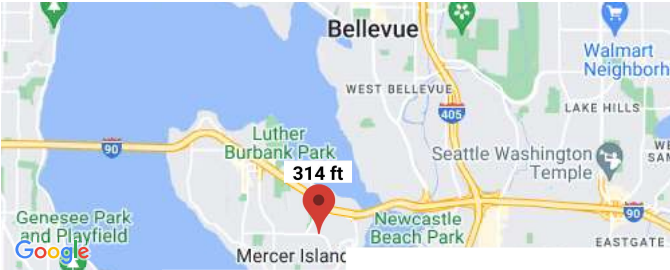
Address: 4016 92nd Ave SE, Mercer Island, WA 98040

Coordinates: 47.5740522, -122.2158426

Elevation: 314 ft

Timestamp: 2024-03-02T12:19:16.041Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year 67 mph

MRI 25-Year 73 mph

MRI 50-Year 78 mph

MRI 100-Year 83 mph

Risk Category I 92 mph

Risk Category II 98 mph

Risk Category III 105 mph

Risk Category IV 108 mph

ASCE 7-10

MRI 10-Year 72 mph

MRI 25-Year 79 mph

MRI 50-Year 85 mph

MRI 100-Year 91 mph

Risk Category I 100 mph

Risk Category II 110 mph

Risk Category III-IV 115 mph

ASCE 7-05

ASCE 7-05 Wind Speed 85 mph

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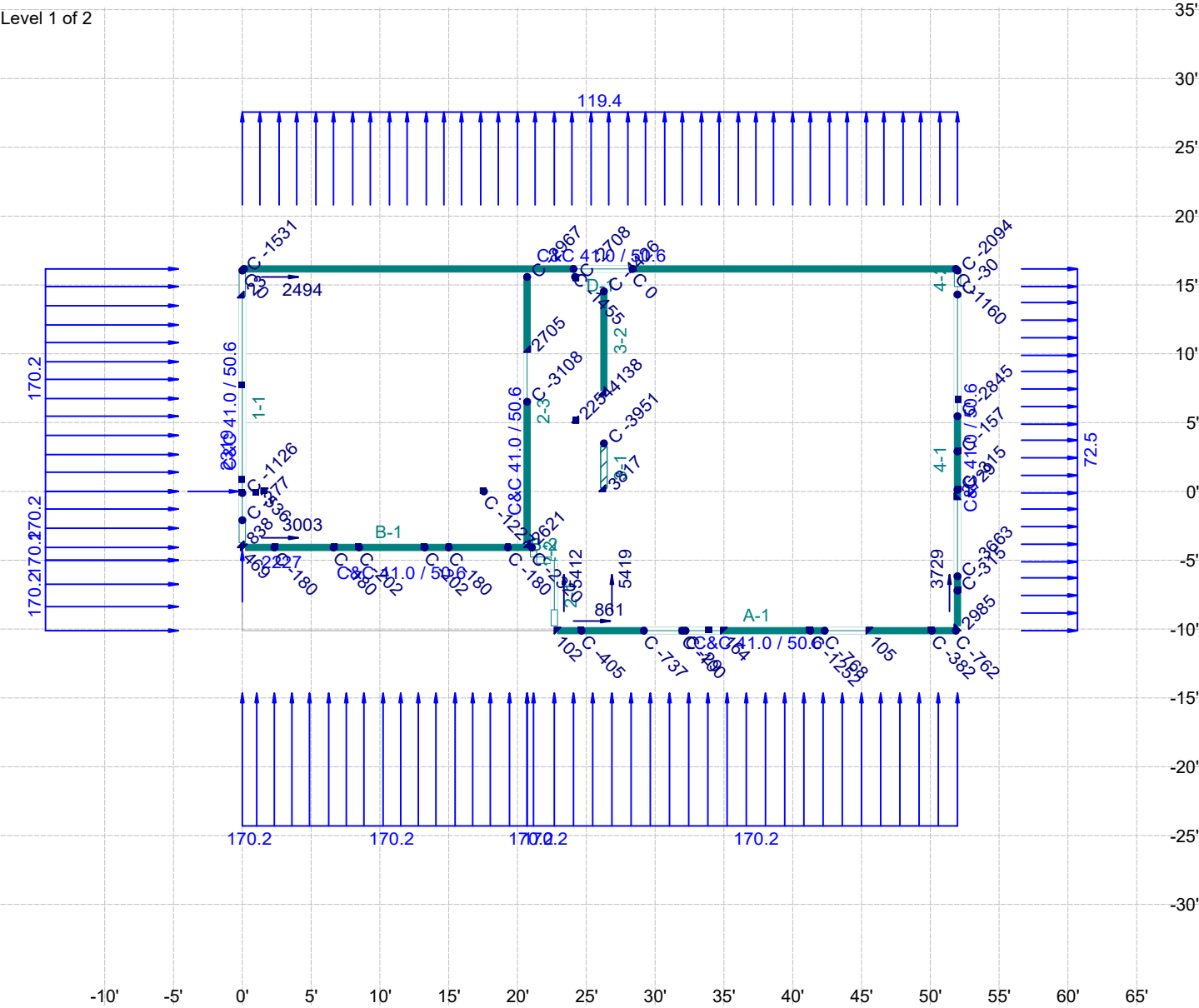
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Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

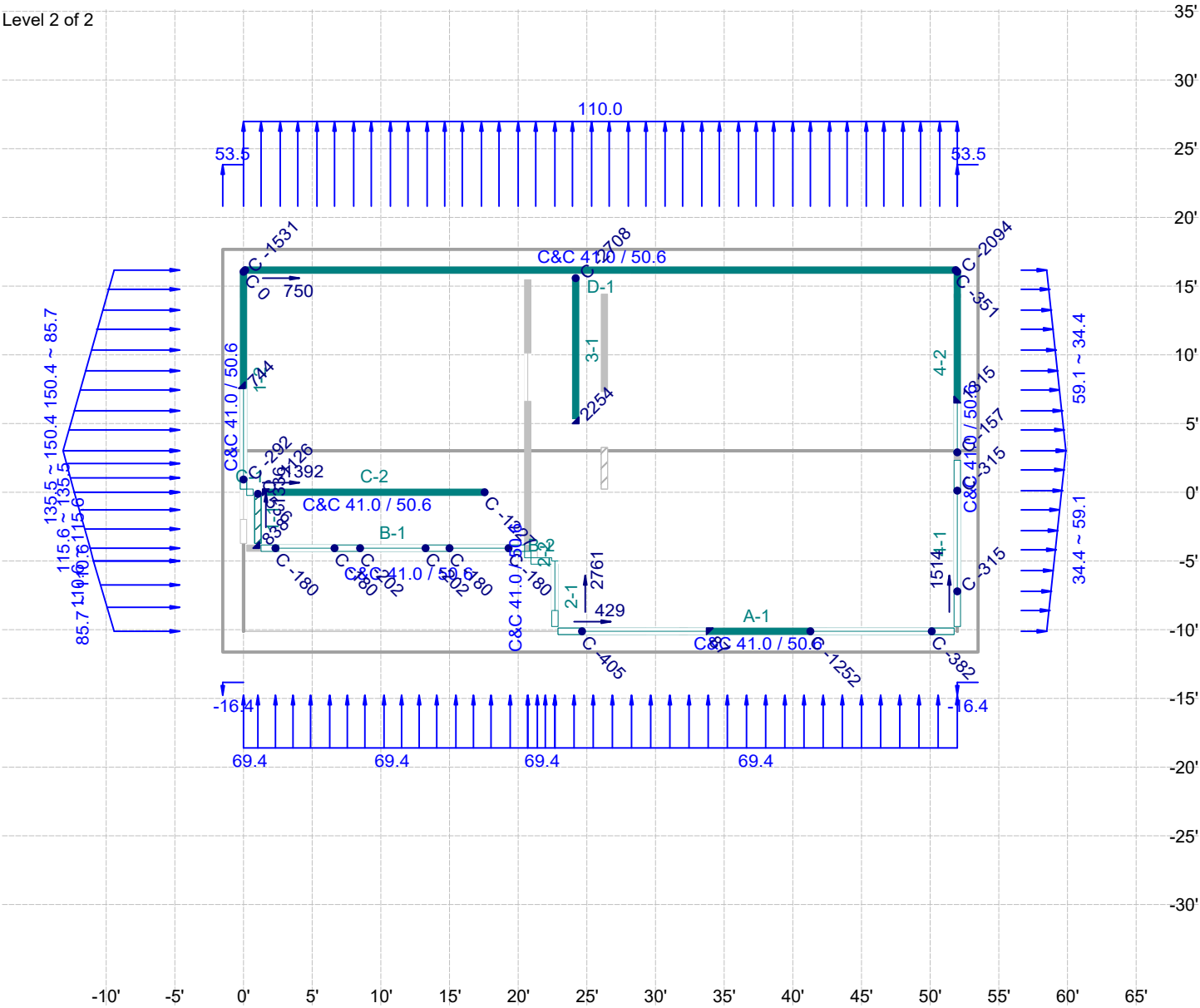
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→ Factored shearline force (lbs) ↓↓↓ Unfactored applied shear load (plf)
▲ Factored hold-down force (lbs) ⊗⊗ Unfactored dead load (plf,lbs)
● C Factored compression force (lbs) ⊙⊙ Unfactored uplift wind load (plf,lbs)
■ Vertical element required →|| Applied point load or discontinuous shearline force (lbs)

Loads: Directional Case 1 Wind (W); Forces: 0.6W + 0.6D; Flexible distribution

Level 2 of 2



- | | | | |
|---|----------------------------------|-----|---|
| → | Factored shearline force (lbs) | ↑↑↑ | Unfactored applied shear load (plf) |
| ▲ | Factored hold-down force (lbs) | ⊗ | Unfactored dead load (plf, lbs) |
| • | Factored compression force (lbs) | ⊙ | Unfactored uplift wind load (plf, lbs) |
| ■ | Vertical element required | → | Applied point load or discontinuous shearline force (lbs) |
- Loads: Directional Case 1 Wind (W); Forces: 0.6W + 0.6D; Flexible distribution

WoodWorks® Shearwalls 13.1.2

2458 C1.wsw

Oct. 31, 2024 09:55:24

Project Information

DESIGN SETTINGS

Design Code		Wind Standard		Seismic Standard	
IBC 2021/AWC SDPWS 2021		ASCE 7-16 Directional (All heights)		ASCE 7-16	
Load Combinations				Building Code Capacity Modification	
For Design and MWFRS Deflection		For Deflection (Wind:Serviceability)		Wind	Seismic
0.7 Seismic + 0.6 Dead		1.0 Seismic + 0.9 Dead		1.00	1.00
0.6 Basic wind + 0.6 Dead		1.0 MRI wind + 1.0 Dead			
Duration Factor	Service Conditions and Load Duration			Max Shearwall Offset [ft]	
	Temperature	Moisture Content		Plan	Elevation
	Range	Fabrication	Service	(within story)	(between stories)
1.60	T<=100F	19% (<=19%)	10% (<=19%)	2.00	2.00
Maximum Height-to-width Ratio					
Wood panels		Fiberboard	Lumber	Gypsum	
Blocked	Unblocked		Wind	Seismic	Blocked
3.5	2.0	-	-	-	Unblocked
					-
Ignore shear resistance contribution of...				Forces based on...	
Wall segments		Seismic		Hold-downs	Applied loads
Side with invalid aspect ratio		Any gypsum, lumber, fiberboard		Drag struts	Applied loads
Shearwall relative rigidity: Wall capacity					
Non-identical materials and construction on the shearline: Allowed, except for material type					
Deflection Equation: 3-term from SDPWS 4.3-1					
Drift limit for wind design: 1 / 500 story height					
FTAO strap: Continuous at top of highest opening and bottom of lowest					
Dead load in chord force for overturning design					
Tension end		Compression end		When completely counteracts overturning	
Wall length / 2		Wall length / 2		Wall length / 2	

SITE INFORMATION

Wind			Seismic		
ASCE 7-16 Directional (All heights)			ASCE 7-16 12.8 Equivalent Lateral Force Procedure		
Design Wind Speed	145 mph		Risk Category	Category II - All others	
Serviceability Wind Speed	100 mph		Structure Type	Regular	
Exposure	Exposure B		Building System	Bearing Wall	
Enclosure	Partially open		Design Category	D	
Min Wind Loads: Walls	16 psf		Site Class	D	
Roofs	8 psf		Spectral Response Acceleration		
Topographic Information [ft]			S1: 0.490g Ss: 1.410g		
Shape	Height	Length	Fundamental Period	E-W	N-S
-	-	-	T Used	0.186s	0.186s
Site Location: -			Approximate Ta	0.186s	0.186s
Elev: 0ft			Maximum T	0.261s	0.261s
Rigid building - Static analysis			Response Factor R	6.50	6.50
Case 2	E-W loads	N-S loads	Fa: 1.20 Fv: 1.81		
Eccentricity (%)	15	15			
Loaded at	75%				

Structural Data

STORY INFORMATION

	Story Elev [ft]	Floor/Ceiling Depth [in]	Wall Height [ft]	Hold-down Length subject to shrinkage [in]	Bolt length [in]
Ceiling	21.00	0.0			
Level 2	12.00	12.0	9.00	15.75	16.5
Level 1	3.00	12.0	8.00	15.75	16.5
Foundation	2.00				

BLOCK and ROOF INFORMATION

Block Dimensions [ft]			Roof Panels			
			Face	Type	Slope	Overhang [ft]
Block 1	2	Story	E-W Ridge			
Location X,Y =	0.00		-10.00	North	Side	14.0
Extent X,Y =	51.50		26.00	South	Side	14.0
Ridge Y Location, Offset	3.00		0.00	East	Gable	90.0
Ridge Elevation, Height	24.24		3.24	West	Gable	90.0

SHEATHING MATERIALS by WALL GROUP

Grp	Surf	Material	Ratng	Sheathing					Gvtv lbs/in	Size	Fasteners					Apply Notes
				Thick in	GU in	Ply	Or				Type	RS	Eg in	Fd in	Bk	
1	Ext	Struct I OSB	24/16	7/16	-	-	Horz		83500	8d	Common	N	6	12	Y	3
2	1	Struct I OSB	24/16	7/16	-	-	Horz		83500	8d	Common	N	6	12	Y	3
3	1	Struct I OSB	24/16	7/16	-	-	Horz		83500	8d	Common	N	4	12	Y	2,3
4	Ext	Struct I OSB	24/16	7/16	-	-	Horz		83500	8d	Common	N	4	12	Y	3

Legend:

Grp – Wall Design Group number, used to reference wall in other tables (created by program)

Surf – Exterior or interior surface when applied to exterior wall

Ratng – Span rating, see SDPWS Table C4.2.3C

Thick – Nominal panel thickness

GU – Gypsum underlay thickness

Ply – Number of plies (or layers) in construction of plywood sheets

Or – Orientation of longer dimension of sheathing panels or lumber planks. Dbl. = Double diagonal.

Gvtv – Shear stiffness in lb/in. of depth from SDPWS Tables C4.2.3A-B

Type – Fastener type from SDPWS Tables 4.3A-D:

Common: common wire nail; Box: galvanized box nail; Casing: casing nail; Roof: galvanized roofing nail; Cooler: cooler nail; WBoard: wallboard nail; Screw: drywall screw; Gauge: nail measured by gauge; Galv: galvanized gauge nail; GWB: Gypsum wallboard blued nail

Size – From Tables 4.3A-D and Table A1; shown in Wall Input fastener dropdown

Common nails: 6d = 0.113 x 2", 8d = 0.131 x 2.5", 10d = 0.148 x 3", 12d = 0.148 x 3.5"

Box or casing nails: 6d = 0.099 x 2", 8d = 0.113 x 2.5", 10d = 0.128 x 3", 12d = 0.126 x 3.5"

Gauge, roofing and GWB nails: 13 ga = 0.92" x 1-1/8"; 11 ga = 0.120" x 1-1/8" (GWB nail for gypsum lath & plaster), 1-1/4" (gyp. L&P), 1-1/2" (wire lath & plaster, 1/2" fiberboard, 1/2" GWB), 1-3/4" (GSB, 5/8" GWB, 25/32" fiberboard, 2-ply GWB base), 2-3/8" (2-ply GWB face)

Cooler or wallboard nail: 5d = .086" x 1-5/8"; 6d = .092" x 1-7/8"; 8d = .113" x 2-3/8"; 6/8d = 6d base ply, 8d face ply for 2-ply GWB.

Drywall screws: No. 6, 1-1/4" long.

RS – Ring-shank nails (non-shearwalls only), with increased withdrawal capacity as per NDS 12.2.3.2.

Eg – Panel edge fastener spacing. For lumber sheathing, no. of nails per board at shear wall boundary. For 2-ply GWB, spacing of all nails in face ply.

Fd – Field spacing interior to panels. For lumber sheathing, no. of nails per board at interior studs. For 2-ply GWB, spacing of all nails in face ply.

Bk – Sheathing is nailed to blocking at all panel edges; Y(es) or N(o)

Apply Notes – Notes below table legend which apply to sheathing side

Notes:

2. Framing at adjoining panel edges must be 3" nominal or wider with staggered nailing according to SDPWS 4.3.7.1 (5)

3. Shear capacity for current design has been increased to the value for 15/32" sheathing with same nailing because stud spacing is 16" max. or panel orientation is horizontal. See SDPWS Table 4.3A Note 2.

FRAMING MATERIALS and STANDARD WALL by WALL GROUP

Wall Grp	Species	Grade	b in	d in	Spcg in	SG	E psi^6	Fcp	Standard Wall
1	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
2	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
3	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	
4	D.Fir-L	No.2	1.50	5.50	16	0.50	1.60	625	

Legend:

Wall Grp – Wall Design Group

b – Stud breadth (thickness)

d – Stud depth (width)

Spcg – Maximum on-centre spacing of studs for design, actual spacing may be less.

SG – Specific gravity

E – Modulus of elasticity

Standard Wall – Standard wall designed as group.

Fcp – Compressive strength perpendicular to grain

Notes:

Check manufacture requirements for stud size, grade and specific gravity (G) for all shearwall hold-downs.

The following factors are applied to Fcp for compressive design and deformation under wall segment end studs :

Bearing area factor Cb from NDS 3.10.4, under window openings.

SHEARLINE, WALL and OPENING DIMENSIONS

North-south Shearlines	Type	Wall Group	Location X [ft]	Extent [ft] Start	End	Length [ft]	FHS [ft]	Aspect Ratio	Height [ft]	Studs S N
Line 1										
Level 2										
Line 1		1	0.20	-4.00	16.00	20.00	12.50	-	9.00	- -
Wall 1-1	Seg	1	1.00	-4.00	0.00	4.00	3.75	2.25	-	2 2
Wall 1-2	Seg	1	0.00	0.00	16.00	16.00	8.50	-	-	2 2
Segment 1	-	-	-	0.00	1.00	1.00	-	9.00	-	2 2
Opening 1	-	-	-	1.00	7.50	6.50	-	-	5.00	2 2
Segment 2	-	-	-	7.50	16.00	8.50	8.25	1.06	-	2 2
Level 1										
Line 1		1	0.00	-4.00	16.00	20.00	0.00	-	8.00	- -
Wall 1-1	Seg	1	0.00	-4.00	16.00	20.00	0.00	-	-	2 2
Segment 1	-	-	-	-4.00	-2.00	2.00	-	4.00	-	2 2
Opening 1	-	-	-	-2.00	14.00	16.00	-	-	5.00	2 2
Segment 2	-	-	-	14.00	16.00	2.00	-	4.00	-	2 2
Line 2										
Level 2										
Line 2			20.50	-10.00	15.50	25.50	0.00	-	9.00	- -
Wall 2-1	NSW		22.50	-10.00	-5.00	5.00	0.00	-	-	2 2
Segment 1	-	-	-	-10.00	-8.50	1.50	-	-	-	2 2
Opening 1	-	-	-	-8.50	-5.00	3.50	-	-	5.00	2 2
Segment 2	-	-	-	-5.00	-5.00	0.00	-	-	-	2 2
Wall 2-2	NSW		20.50	-5.00	-4.00	1.00	0.00	1.00	-	2 2
Level 1										
Line 2		3,1	20.91	-10.00	16.00	26.00	16.00	-	8.00	- -
Wall 2-1	Seg	1	22.50	-10.00	-5.00	5.00	0.00	-	-	2 2
Segment 1	-	-	-	-10.00	-8.50	1.50	-	5.33	-	2 2
Opening 1	-	-	-	-8.50	-5.00	3.50	-	-	5.00	2 2
Segment 2	-	-	-	-5.00	-5.00	0.00	-	-	-	2 2
Wall 2-2	Seg	1	21.00	-5.00	-4.00	1.00	0.00	8.00	-	2 2
Wall 2-3	Seg	3	20.50	-4.00	15.50	19.50	16.00	-	-	2 2
Segment 1	-	-	-	-4.00	6.50	10.50	10.25	0.76	-	2 2
Opening 1	-	-	-	6.50	10.00	3.50	-	-	5.00	2 2
Segment 2	-	-	-	10.00	15.50	5.50	5.25	1.45	-	2 2
Line 3										
Level 2										
Line 3	Seg	3	24.00	-10.00	16.00	26.00	10.25	-	9.00	- -
Wall 3-1	Seg	3	24.00	5.00	15.50	10.50	10.25	0.86	-	2 2
Level 1										
Line 3		4	26.00	-10.00	16.00	26.00	11.00	-	8.00	- -
Wall 3-1	Seg	4	26.00	0.00	3.50	3.50	3.25	2.29	-	2 2
Wall 3-2	Seg	4	26.00	7.00	14.50	7.50	7.25	1.07	-	2 2
Line 4										
Level 2										
Line 4		1	51.50	-10.00	16.00	26.00	9.50	-	9.00	- -
Wall 4-1	NSW		51.50	-10.00	2.50	12.50	0.00	-	-	2 2
Segment 1	-	-	-	-10.00	-7.00	3.00	-	-	-	2 2
Opening 1	-	-	-	-7.00	0.00	7.00	-	-	5.00	2 2
Segment 2	-	-	-	0.00	2.50	2.50	-	-	-	2 2
Wall 4-2	Seg	1	51.50	2.50	16.00	13.50	9.50	-	-	2 2
Segment 1	-	-	-	2.50	3.00	0.50	-	18.00	-	2 2
Opening 1	-	-	-	3.00	6.50	3.50	-	-	5.00	2 2
Segment 2	-	-	-	6.50	16.00	9.50	9.25	0.95	-	2 2
Level 1										
Line 4		4	51.50	-10.00	16.00	26.00	10.00	-	8.00	- -
Wall 4-1	Seg	4	51.50	-10.00	14.50	24.50	10.00	-	-	2 2
Segment 1	-	-	-	-10.00	-6.00	4.00	3.75	2.00	-	2 2
Opening 1	-	-	-	-6.00	-0.50	5.50	-	-	5.00	2 2
Segment 2	-	-	-	-0.50	5.50	6.00	5.75	1.33	-	2 2
Opening 2	-	-	-	5.50	14.00	8.50	-	-	5.00	2 2
Segment 3	-	-	-	14.00	14.50	0.50	-	16.00	-	2 2
Wall 4-2	NSW		51.50	14.50	16.00	1.50	0.00	1.00	-	2 2
East-west Shearlines	Type	Wall Group	Location Y [ft]	Extent [ft] Start	End	Length [ft]	FHS [ft]	Aspect Ratio	Height [ft]	Studs W E
Line A										
Level 2										
Line A		1	-10.00	22.50	51.50	29.00	7.50	-	9.00	- -
Wall A-1	Seg	1	-10.00	22.50	51.50	29.00	7.50	-	-	2 2
Segment 1	-	-	-	22.50	24.50	2.00	-	4.50	-	2 2
Opening 1	-	-	-	24.50	33.50	9.00	-	-	5.00	2 2
Segment 2	-	-	-	33.50	41.00	7.50	7.25	1.20	-	2 2
Opening 2	-	-	-	41.00	49.50	8.50	-	-	5.00	2 2

SHEARLINE, WALL and OPENING DIMENSIONS (continued)

Segment 3	-	-	49.50	51.50	2.00	-	4.50	-	2	2
Level 1										
Line A	1	-10.00	22.50	51.50	29.00	20.50	-	8.00	-	-
Wall A-1	Seg 1	-10.00	22.50	51.50	29.00	20.50	-	-	2	2
Segment 1	-	-	22.50	29.00	6.50	6.25	1.23	-	2	2
Opening 1	-	-	29.00	31.50	2.50	-	-	5.00	2	2
Segment 2	-	-	31.50	32.00	0.50	-	16.00	-	2	2
Opening 2	-	-	32.00	34.50	2.50	-	-	5.00	2	2
Segment 3	-	-	34.50	42.00	7.50	7.25	1.07	-	2	2
Opening 3	-	-	42.00	45.00	3.00	-	-	5.00	2	2
Segment 4	-	-	45.00	51.50	6.50	6.25	1.23	-	2	2
Line B										
Level 2										
Line B	1	-4.00	1.00	51.50	50.50	0.00	-	9.00	-	-
Wall B-1	Seg 1	-4.00	1.00	20.50	19.50	0.00	-	-	2	2
Segment 1	-	-	1.00	2.50	1.50	-	6.00	-	2	2
Opening 1	-	-	2.50	6.50	4.00	-	-	5.00	2	2
Segment 2	-	-	6.50	8.50	2.00	-	4.50	-	2	2
Opening 2	-	-	8.50	13.00	4.50	-	-	5.00	2	2
Segment 3	-	-	13.00	15.00	2.00	-	4.50	-	2	2
Opening 3	-	-	15.00	19.00	4.00	-	-	5.00	2	2
Segment 4	-	-	19.00	20.50	1.50	-	6.00	-	2	2
Wall B-2	NSW	-5.00	20.50	22.50	2.00	0.00	1.00	-	2	2
Level 1										
Line B	1	-4.07	0.00	51.50	51.50	21.00	-	8.00	-	-
Wall B-1	Seg 1	-4.00	0.00	21.00	21.00	20.75	0.38	-	2	2
Wall B-2	Seg 1	-5.00	21.00	22.50	1.50	0.00	5.33	-	2	2
Line C										
Level 2										
Line C	2	0.00	0.00	51.50	51.50	15.75	-	9.00	-	-
Wall C-1	NSW	0.00	0.00	1.00	1.00	0.00	1.00	-	2	2
Wall C-2	Seg 2	0.00	1.50	17.50	16.00	15.75	0.56	-	2	2
Line D										
Level 2										
Line D	Seg 1	16.00	0.00	51.50	51.50	51.25	-	9.00	-	-
Wall D-1	Seg 1	16.00	0.00	51.50	51.50	51.25	0.17	-	2	2
Level 1										
Line D	1	16.00	0.00	51.50	51.50	47.50	-	8.00	-	-
Wall D-1	Seg 1	16.00	0.00	51.50	51.50	47.50	-	-	2	2
Segment 1	-	-	0.00	24.00	24.00	23.75	0.33	-	2	2
Opening 1	-	-	24.00	28.00	4.00	-	-	5.00	2	2
Segment 2	-	-	28.00	51.50	23.50	23.25	0.34	-	2	2

Legend:

Type – Seg: Segmented, Prf: Perforated, FTAO (force transfer around openings), NSW: Non-shearwall, NW: Non-wood/Proprietary, ND: Not designed

Location – Position in structure perpendicular to wall

Length – Shear line: Distance between exterior perpendicular walls defining the shear line extent

Wall, segment, or opening: End-to-end length of the element

FHS – Depending on element, shows different definitions of full-height sheathing length (FHS):

Shear lines with multiple walls, segmented walls, or FTAO walls: Total shear-resisting FHS

Individual wall segments or walls without openings: Distance between hold-downs beff

Perforated walls: Sum of factored segment lengths bi defined in SDPWS 4.3.5.6

Aspect Ratio – Ratio of wall height to segment length (h/b); for FTAO walls, the aspect ratio of the central pier

Wall Group – Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall

Studs: Number of end studs at the south and north or west and east ends of a wall segment or a perforated or FTAO wall.

Loads

WIND SHEAR LOADS (as entered or generated)

Level 2 Block	F	Element	Load Case	Wnd Dir	Surf Dir	Prof	Location [ft]		Magnitude [lbs,plf,psf]		Trib Ht [ft]
							Start	End	Start	End	
Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	85.7		
Block 1	W	L Gable	1	W->E	Wind	Line	-10.00	3.00	0.0	64.7	
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	85.7		
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	0.00	85.7		
Block 1	W	Wall	1	W->E	Wind	Line	0.00	16.00	85.7		
Block 1	W	R Gable	1	W->E	Wind	Line	3.00	16.00	64.7	0.0	
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	34.4		
Block 1	E	L Gable	1	W->E	Lee	Line	-10.00	3.00	0.0	24.8	
Block 1	E	R Gable	1	W->E	Lee	Line	3.00	16.00	24.8	0.0	
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	34.4		
Block 1	W	L Gable	1	E->W	Lee	Line	-10.00	3.00	0.0	24.8	
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	0.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	0.00	16.00	34.4		
Block 1	W	R Gable	1	E->W	Lee	Line	3.00	16.00	24.8	0.0	
Block 1	E	L Gable	1	E->W	Wind	Line	-10.00	3.00	0.0	64.7	
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	85.7		
Block 1	E	R Gable	1	E->W	Wind	Line	3.00	16.00	64.7	0.0	
Block 1	S	Roof	1	S->N	Wind	Line	-1.50	53.00	-16.4		
Block 1	S	Wall	1	S->N	Wind	Line	0.00	1.00	85.7		
Block 1	S	Wall	1	S->N	Wind	Line	1.00	20.50	85.7		
Block 1	S	Wall	1	S->N	Wind	Line	20.50	22.50	85.7		
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	85.7		
Block 1	N	Roof	1	S->N	Lee	Line	-1.50	53.00	53.5		
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	56.5		
Block 1	S	Roof	1	N->S	Lee	Line	-1.50	53.00	53.5		
Block 1	S	Wall	1	N->S	Lee	Line	0.00	1.00	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	1.00	20.50	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	20.50	22.50	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	56.5		
Block 1	N	Roof	1	N->S	Wind	Line	-1.50	53.00	-16.4		
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	85.7		
Level 1 Block	F	Element	Load Case	Wnd Dir	Surf Dir	Prof	Location [ft]		Magnitude [lbs,plf,psf]		Trib Ht [ft]
							Start	End	Start	End	
Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	89.4		
Block 1	W	Wall	1	W->E	Wind	Line	-10.00	-5.00	80.8		
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	89.4		
Block 1	W	Wall	1	W->E	Wind	Line	-5.00	-4.00	80.8		
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	16.00	89.4		
Block 1	W	Wall	1	W->E	Wind	Line	-4.00	0.00	80.8		
Block 1	W	Wall	1	W->E	Wind	Line	0.00	16.00	80.8		
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	38.2		
Block 1	E	Wall	1	W->E	Lee	Line	-10.00	16.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	38.2		
Block 1	W	Wall	1	E->W	Lee	Line	-10.00	-5.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	-5.00	-4.00	38.2		
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	16.00	38.2		
Block 1	W	Wall	1	E->W	Lee	Line	-4.00	0.00	34.4		
Block 1	W	Wall	1	E->W	Lee	Line	0.00	16.00	34.4		
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	89.4		
Block 1	E	Wall	1	E->W	Wind	Line	-10.00	16.00	80.8		
Block 1	S	Wall	1	S->N	Wind	Line	0.00	1.00	80.8		
Block 1	S	Wall	1	S->N	Wind	Line	0.00	21.00	89.4		
Block 1	S	Wall	1	S->N	Wind	Line	1.00	20.50	80.8		
Block 1	S	Wall	1	S->N	Wind	Line	20.50	22.50	80.8		
Block 1	S	Wall	1	S->N	Wind	Line	21.00	22.50	89.4		
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	89.4		
Block 1	S	Wall	1	S->N	Wind	Line	22.50	51.50	80.8		
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	56.5		
Block 1	N	Wall	1	S->N	Lee	Line	0.00	51.50	62.8		
Block 1	S	Wall	1	N->S	Lee	Line	0.00	1.00	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	0.00	21.00	62.8		
Block 1	S	Wall	1	N->S	Lee	Line	1.00	20.50	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	20.50	22.50	56.5		
Block 1	S	Wall	1	N->S	Lee	Line	21.00	22.50	62.8		

WIND SHEAR LOADS (as entered or generated) (continued)

Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	56.5
Block 1	S	Wall	1	N->S	Lee	Line	22.50	51.50	62.8
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	89.4
Block 1	N	Wall	1	N->S	Wind	Line	0.00	51.50	80.8

Legend:

Block - Block used in load generation

Accum. = loads from one block combined with another

Manual = user-entered loads (so no block)

F - Building face (north, south, east or west)

Element - Building surface on which loads generated or entered

Load Case - One of the following:

ASCE 7 All Heights: Case 1 or 2 from Fig 27.3-8 or minimum loads from 27.1.5

ASCE 7 Low-rise: Reference corner and Case A or B from Fig 28.3-1 or minimum loads from 28.3.4

Wind Dir - Direction of wind for loads with positive magnitude, also direction of MWFRS.

Surf Dir - Windward or leeward side of the building for loads in given direction

Prof - Profile (distribution)

Location - Start and end points on building element

Magnitude - Start = intensity of uniform and point loads or leftmost intensity of trapezoidal load, End = right intensity of trap load

Trib Ht - Tributary height of area loads only

Notes:

All loads entered by the user or generated by program are specified (unfactored) loads. The program applies a load factor of 0.60 to wind loads before distributing them to the shearlines.

WIND C&C LOADS

Block	Building Face	Wind Direction	Level	Magnitude [psf]	
				Interior	End Zone
Block 1	West	Windward	2	41.0	50.6
Block 1	West	Windward	2	41.0	50.6
Block 1	East	Leeward	2	41.0	50.6
Block 1	West	Leeward	2	41.0	50.6
Block 1	West	Leeward	2	41.0	50.6
Block 1	East	Windward	2	41.0	50.6
Block 1	South	Windward	2	41.0	50.6
Block 1	South	Windward	2	41.0	50.6
Block 1	South	Windward	2	41.0	50.6
Block 1	North	Leeward	2	41.0	50.6
Block 1	South	Leeward	2	41.0	50.6
Block 1	South	Leeward	2	41.0	50.6
Block 1	South	Leeward	2	41.0	50.6
Block 1	North	Windward	2	41.0	50.6
Block 1	West	Windward	1	41.0	50.6
Block 1	West	Windward	1	41.0	50.6
Block 1	East	Leeward	1	41.0	50.6
Block 1	West	Leeward	1	41.0	50.6
Block 1	West	Leeward	1	41.0	50.6
Block 1	East	Windward	1	41.0	50.6
Block 1	South	Windward	1	41.0	50.6
Block 1	South	Windward	1	41.0	50.6
Block 1	North	Leeward	1	41.0	50.6
Block 1	South	Leeward	1	41.0	50.6
Block 1	South	Leeward	1	41.0	50.6
Block 1	North	Windward	1	41.0	50.6

DEAD LOADS (for hold-down calculations)

Shear Line	Level	Profile	Tributary Width [ft]	Location [ft]		Mag [lbs,psf,psi]	
				Start	End	Start	End
A	2	Line		22.50	51.50	90.0*	
B	2	Line		20.50	22.50	90.0*	
	2	Line		1.00	20.50	90.0*	
C	2	Line		0.00	1.00	90.0*	
C	2	Line		1.50	17.50	54.0*	
D	2	Line		0.00	51.50	90.0*	
1	2	Line		0.00	16.00	90.0*	
	2	Line		-4.00	0.00	90.0*	
2	2	Line		-5.00	-4.00	90.0*	
	2	Line		-10.00	-5.00	90.0*	
3	2	Line		5.00	15.50	54.0*	
4	2	Line		-10.00	2.50	90.0*	
4	2	Line		2.50	16.00	90.0*	
A	1	Line		22.50	51.50	80.0*	
B	1	Line		21.00	22.50	80.0*	
	1	Line		0.00	21.00	80.0*	
D	1	Line		0.00	51.50	80.0*	
1	1	Line		-4.00	16.00	80.0*	
2	1	Line		-4.00	15.50	48.0*	
	1	Line		-5.00	-4.00	80.0*	
	1	Line		-10.00	-5.00	80.0*	
	1	Line		0.00	3.50	48.0*	
	1	Line		7.00	14.50	48.0*	
4	1	Line		-10.00	14.50	80.0*	
4	1	Line		14.50	16.00	80.0*	

BUILDING MASSES

Level 2				Profile	Location [ft]		Magnitude [lbs,plf,psf]		Trib Width [ft]
Force Dir	Building Element	Block	Wall Line		Start	End	Start	End	
E-W	Roof	Block 1	1	Line	-11.50	17.50	408.8	408.8	
E-W	Roof	Block 1	4	Line	-11.50	17.50	408.8	408.8	
E-W	R Gable	Block 1	1	Line	-10.00	3.00	32.4	0.0	
E-W	L Gable	Block 1	1	Line	3.00	16.00	0.0	32.4	
E-W	L Gable	Block 1	4	Line	-10.00	3.00	32.4	0.0	
E-W	R Gable	Block 1	4	Line	3.00	16.00	0.0	32.4	
N-S	Roof	Block 1	A	Line	-1.50	53.00	217.5	217.5	
N-S	Roof	Block 1	D	Line	-1.50	53.00	217.5	217.5	
Both	Wall 1-2	n/a	1	Line	0.00	16.00	45.0	45.0	
Both	Wall 1-1	n/a		Line	-4.00	0.00	45.0	45.0	
Both	Wall 2-2	n/a	2	Line	-5.00	-4.00	45.0	45.0	
Both	Wall 2-1	n/a		Line	-10.00	-5.00	45.0	45.0	
Both	Wall 3-1	n/a	3	Line	5.00	15.50	27.0	27.0	
Both	Wall 4-1	n/a	4	Line	-10.00	2.50	45.0	45.0	
Both	Wall 4-2	n/a	4	Line	2.50	16.00	45.0	45.0	
Both	Wall A-1	n/a	A	Line	22.50	51.50	45.0	45.0	
Both	Wall B-2	n/a	B	Line	20.50	22.50	45.0	45.0	
Both	Wall B-1	n/a		Line	1.00	20.50	45.0	45.0	
Both	Wall C-1	n/a	C	Line	0.00	1.00	45.0	45.0	
Both	Wall C-2	n/a	C	Line	1.50	17.50	27.0	27.0	
Both	Wall D-1	n/a	D	Line	0.00	51.50	45.0	45.0	
Level 1				Profile	Location [ft]		Magnitude [lbs,plf,psf]		Trib Width [ft]
Force Dir	Building Element	Block	Wall Line		Start	End	Start	End	
E-W	Floor F3	n/a	1	Line	-4.00	16.00	257.5	257.5	
Both	Wall 1-2	n/a	1	Line	0.00	16.00	45.0	45.0	
Both	Wall 1-1	n/a		Line	-4.00	0.00	45.0	45.0	
Both	Wall 2-2	n/a	2	Line	-5.00	-4.00	45.0	45.0	
E-W	Floor F2	n/a		Line	-5.00	-4.00	152.5	152.5	
E-W	Floor F1	n/a		Line	-10.00	-5.00	145.0	145.0	
Both	Wall 2-1	n/a		Line	-10.00	-5.00	45.0	45.0	
Both	Wall 3-1	n/a	3	Line	5.00	15.50	27.0	27.0	
E-W	Floor F1	n/a	4	Line	-10.00	-5.00	145.0	145.0	
Both	Wall 4-1	n/a	4	Line	-10.00	2.50	45.0	45.0	
E-W	Floor F2	n/a	4	Line	-5.00	-4.00	152.5	152.5	
E-W	Floor F3	n/a	4	Line	-4.00	16.00	257.5	257.5	
Both	Wall 4-2	n/a	4	Line	2.50	16.00	45.0	45.0	
Both	Wall A-1	n/a	A	Line	22.50	51.50	45.0	45.0	
N-S	Floor F3	n/a	A	Line	22.50	51.50	130.0	130.0	
Both	Wall B-2	n/a	B	Line	20.50	22.50	45.0	45.0	
N-S	Floor F2	n/a	B	Line	21.00	22.50	105.0	105.0	
N-S	Floor F1	n/a		Line	0.00	21.00	100.0	100.0	
Both	Wall B-1	n/a		Line	1.00	20.50	45.0	45.0	
Both	Wall C-1	n/a	C	Line	0.00	1.00	45.0	45.0	
Both	Wall C-2	n/a	C	Line	1.50	17.50	27.0	27.0	
Both	Wall D-1	n/a	D	Line	0.00	51.50	45.0	45.0	
N-S	Floor F1	n/a	D	Line	0.00	21.00	100.0	100.0	
N-S	Floor F2	n/a	D	Line	21.00	22.50	105.0	105.0	
N-S	Floor F3	n/a	D	Line	22.50	51.50	130.0	130.0	
Both	Wall 1-1	n/a	1	Line	-4.00	16.00	40.0	40.0	
Both	Wall 2-3	n/a	2	Line	-4.00	15.50	24.0	24.0	
Both	Wall 2-2	n/a		Line	-5.00	-4.00	40.0	40.0	
Both	Wall 2-1	n/a		Line	-10.00	-5.00	40.0	40.0	

BUILDING MASSES (continued)

Both	Wall 3-1	n/a		Line	0.00	3.50	24.0	24.0
Both	Wall 3-2	n/a		Line	7.00	14.50	24.0	24.0
Both	Wall 4-1	n/a	4	Line	-10.00	14.50	40.0	40.0
Both	Wall 4-2	n/a	4	Line	14.50	16.00	40.0	40.0
Both	Wall A-1	n/a	A	Line	22.50	51.50	40.0	40.0
Both	Wall B-2	n/a	B	Line	21.00	22.50	40.0	40.0
Both	Wall B-1	n/a		Line	0.00	21.00	40.0	40.0
Both	Wall D-1	n/a	D	Line	0.00	51.50	40.0	40.0

Legend:

Force Dir - Direction in which the mass is used for seismic load generation, E-W, N-S, or Both

Building element - Roof, gable end, wall or floor area used to generate mass, wall line for user-applied masses, Floor F# - refer to Plan View for floor area number

Wall line - Shearline that equivalent line load is assigned to

Location - Start and end points of equivalent line load on wall line

Trib Width. - Tributary width; for user applied area loads only

SEISMIC LOADS

Level 2					
Force Dir	Profile	Location [ft]		Mag [lbs,plf,psf]	
		Start	End	Start	End
E-W	Line	-11.50	-10.00	183.4	183.4
E-W	Point	-10.00	-10.00	293	293
E-W	Line	-10.00	-5.00	203.6	209.2
E-W	Point	-5.00	-5.00	20	20
E-W	Line	-5.00	-4.00	209.2	210.3
E-W	Point	-4.00	-4.00	197	197
E-W	Line	-4.00	0.00	210.3	214.8
E-W	Point	0.00	0.00	107	107
E-W	Line	0.00	2.50	214.8	217.6
E-W	Line	2.50	3.00	217.6	218.1
E-W	Line	3.00	5.00	218.1	215.9
E-W	Line	5.00	15.50	221.9	210.2
E-W	Line	15.50	16.00	204.1	203.6
E-W	Point	16.00	16.00	520	520
E-W	Line	16.00	17.50	183.4	183.4
N-S	Line	-1.50	0.00	97.6	97.6
N-S	Point	0.00	0.00	256	256
N-S	Line	0.00	1.00	117.8	117.8
N-S	Point	1.00	1.00	40	40
N-S	Line	1.00	1.50	117.8	117.8
N-S	Line	1.50	17.50	123.8	123.8
N-S	Line	17.50	20.50	117.8	117.8
N-S	Point	20.50	20.50	10	10
N-S	Line	20.50	22.50	117.8	117.8
N-S	Point	22.50	22.50	50	50
N-S	Line	22.50	51.50	117.8	117.8
N-S	Point	24.00	24.00	64	64
N-S	Point	51.50	51.50	357	357
N-S	Line	51.50	53.00	97.6	97.6
Level 1					
Force Dir	Profile	Location [ft]		Mag [lbs,plf,psf]	
		Start	End	Start	End
E-W	Point	-10.00	-10.00	276	276
E-W	Line	-10.00	-5.00	51.6	51.6
E-W	Point	-5.00	-5.00	17	17
E-W	Line	-5.00	-4.00	53.3	53.3
E-W	Point	-4.00	-4.00	193	193
E-W	Line	-4.00	0.00	79.5	79.5
E-W	Point	0.00	0.00	54	54
E-W	Point	0.00	0.00	2083	2083
E-W	Point	0.00	0.00	3028	3028
E-W	Point	0.00	0.00	2083	2083
E-W	Line	0.00	2.50	82.2	82.2
E-W	Line	2.50	3.50	82.2	82.2
E-W	Line	3.50	5.00	79.5	79.5
E-W	Line	5.00	7.00	82.6	82.6
E-W	Line	7.00	14.50	85.2	85.2
E-W	Line	14.50	15.50	82.6	82.6
E-W	Line	15.50	16.00	76.8	76.8
E-W	Point	16.00	16.00	491	491
N-S	Point	0.00	0.00	2347	2347
N-S	Point	0.00	0.00	2347	2347
N-S	Point	0.00	0.00	170	170
N-S	Point	0.00	0.00	1930	1930
N-S	Line	0.00	1.00	41.5	41.5
N-S	Point	1.00	1.00	20	20
N-S	Line	1.00	1.50	41.5	41.5
N-S	Line	1.50	17.50	44.5	44.5
N-S	Line	17.50	20.50	41.5	41.5
N-S	Point	20.50	20.50	58	58
N-S	Line	20.50	21.00	41.5	41.5
N-S	Point	21.00	21.00	4	4
N-S	Line	21.00	22.50	42.6	42.6
N-S	Point	22.50	22.50	48	48
N-S	Line	22.50	51.50	48.2	48.2
N-S	Point	24.00	24.00	32	32

SEISMIC LOADS (continued)

N-S	Point	26.00	26.00	30	30
N-S	Point	51.50	51.50	248	248

Legend:

Loads in table can be accumulation of loads from several building masses, so they do not correspond with a particular building element.

Location - Start and end of load in direction perpendicular to seismic force direction

Notes:

All loads entered by the user or generated by program are specified (unfactored) loads. The program applies a load factor of 0.70 and redundancy factor to seismic loads before distributing them to the shearlines.

Design Summary

SHEARWALL DESIGN**Wind Shear Loads, Flexible Diaphragm**

All shearwalls have sufficient design capacity.

Wind Shear Loads, Rigid Diaphragm

All shearwalls have sufficient design capacity.

Components and Cladding Wind Loads, Out-of-plane Sheathing

All shearwalls have sufficient design capacity.

Components and Cladding Wind Loads, Nail Withdrawal

All shearwalls have sufficient design capacity.

Seismic Loads, Flexible Diaphragm

All shearwalls have sufficient design capacity.

Seismic Loads, Rigid Diaphragm

All shearwalls have sufficient design capacity.

HOLD-DOWN DESIGN**Wind Loads, Flexible Diaphragm**

All hold-downs have sufficient design capacity.

Wind Loads, Rigid Diaphragm

All hold-downs have sufficient design capacity.

Seismic Loads, Flexible Diaphragm

All hold-downs have sufficient design capacity.

Seismic Loads, Rigid Diaphragm

All hold-downs have sufficient design capacity.

COMPRESSION FORCE DESIGN**Wind Loads, Flexible Diaphragm**

Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Wind Loads, Rigid Diaphragm

Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Seismic Loads, Flexible Diaphragm

Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Seismic Loads, Rigid Diaphragm

Bottom plate has sufficient perpendicular-to-grain compressive capacity under all wall end studs.

Refer to the Deflection table for possible issues regarding fastener slippage (SDPWS Table C4.2.3D) for walls that otherwise pass.

Flexible Diaphragm Wind Design
ASCE 7 Directional (All Heights) Loads

SHEAR RESULTS

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub			Allowable Shear [plf]					Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	1336	-	-	-	-	-	-	-	4732	-
Wall 1-1	1	Both	98.5	-	394	-	.89	-	393	-	-	349	1396	0.28
Wall 1-2	1	Both	-	-	942	-	1.0	-	393	-	-	-	3336	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	110.8	-	942	-	1.0	-	393	-	-	393	3336	0.28
Line 2														
Level 1														
Ln2, Lev1	-	Both	-	-	5412	-	-	-	-	-	-	-	9640	-
Wall 2-3	3	Both	-	-	5412	-	1.0	-	602	-	-	-	9640	-
Seg. 1	-	Both	338.2	-	3551	-	1.0	-	602	-	-	602	6326	0.56
Seg. 2	-	Both	338.2	-	1860	-	1.0	-	602	-	-	602	3314	0.56
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	2761	-	-	-	-	-	-	-	6326	-
Wall 3-1	3	Both	263.0	-	2761	-	1.0	-	602	-	-	602	6326	0.44
Level 1														
Ln3, Lev1	-	Both	-	-	5419	-	-	-	-	-	-	-	6364	-
Wall 3-1	4^	Both	448.9	-	1571	-	.88	-	602	-	-	527	1845	0.85
Wall 3-2	4^	Both	513.0	-	3848	-	1.0	-	602	-	-	602	4519	0.85
Line 4														
Level 2														
Ln4, Lev2	-	Both	-	-	1514	-	-	-	-	-	-	-	3729	-
Wall 4-2	1	Both	-	-	1514	-	1.0	-	393	-	-	-	3729	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	159.3	-	1514	-	1.0	-	393	-	-	393	3729	0.41
Level 1														
Ln4, Lev1	-	Both	-	-	3729	-	-	-	-	-	-	-	6025	-
Wall 4-1	4	Both	-	-	3729	-	1.0	-	602	-	-	-	6025	-
Seg. 1	-	Both	372.9	-	1492	-	1.0	-	602	-	-	602	2410	0.62
Seg. 2	-	Both	372.9	-	2237	-	1.0	-	602	-	-	602	3615	0.62
Seg. 3	-	Both	0.0	-	0	-	1.0	-	602	-	-	602	-	-
E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub			Allowable Shear [plf]					Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	429	-	-	-	-	-	-	-	2944	-
Wall A-1	1	Both	-	-	429	-	1.0	-	393	-	-	-	2944	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	57.2	-	429	-	1.0	-	393	-	-	393	2944	0.15
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Level 1														
LnA, Lev1	-	Both	-	-	861	-	-	-	-	-	-	-	8046	-
Wall A-1	1	Both	-	-	861	-	1.0	-	393	-	-	-	8046	-
Seg. 1	-	Both	42.0	-	273	-	1.0	-	393	-	-	393	2551	0.11
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 3	-	Both	42.0	-	315	-	1.0	-	393	-	-	393	2944	0.11
Seg. 4	-	Both	42.0	-	273	-	1.0	-	393	-	-	393	2551	0.11
Line B														
LnB, Lev1	-	Both	-	-	3003	-	-	-	-	-	-	-	8243	-
Wall B-1	1	Both	143.0	-	3003	-	1.0	-	393	-	-	393	8243	0.36
Line C														
Level 2														
LnC, Lev2	-	Both	-	-	1392	-	-	-	-	-	-	-	6280	-
Wall C-2	2	Both	87.0	-	1392	-	1.0	-	393	-	-	393	6280	0.22
Line D														
LnD, Lev2	1	Both	14.6	-	750	-	1.0	-	393	-	-	393	20214	0.04
Level 1														
LnD, Lev1	-	Both	-	-	2494	-	-	-	-	-	-	-	18644	-
Wall D-1	1	Both	-	-	2494	-	1.0	-	393	-	-	-	18644	-
Seg. 1	-	Both	52.5	-	1260	-	1.0	-	393	-	-	393	9420	0.13
Seg. 2	-	Both	52.5	-	1234	-	1.0	-	393	-	-	393	9224	0.13

Legend:

W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.

For Dir - Direction of wind force along shearline.

v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)

vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = $V/FHS/Co$. FHS is factored for narrow segments as per 4.3.3.4

FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.

V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment

Asp/Cub – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum b_i / FHS from 4.3.5.6 with b_i defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.

Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.

Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.

C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.

Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.

V – Total factored shear capacity of shearline, wall or segment.

Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "S" indicates that the seismic design criterion was critical in selecting wall.

Notes:

Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (flexible wind design)

Level 1					Tensile Hold-down						
Line-Wall	Posit'n	Location [ft]		Load Case	or Compressive Stud Force [lbs]					Cap	Crit
		X	Y		Shear	Dead	Uplift	Cmb'd	Hold-down	[lbs]	Resp.
Line 1											
	V Elem	0.00	-3.87	1	946	108		838	Refer to upper level		
	V Elem	0.00	-3.87	1	946	180		1126	Compression		
	V Elem	0.00	-2.12	1	458	1224		1682	Compression		
	V Elem	0.00	-0.12	1	946	108		838	Refer to upper level		
	V Elem	0.00	-0.12	1	946	180		1126	Compression		
	V Elem	0.00	14.13	1	691	668		23	Refer to upper level		
	V Elem	0.00	14.13	1	691	1113		1804	Compression		
	V Elem	0.00	15.88	1	1149	230		919	Refer to upper level		
	V Elem	0.00	15.88	1	1149	383		1531	Compression		
Line 2											
2-3	L End	20.50	-3.87	1	2772	151		2621	HDU8-SDS	6765	0.39
2-3	L End	20.50	-3.87	1	2772	252		3024	Compression	10312	0.29
2-3	L Op 1	20.50	6.38	1	2772	202		2570	HDU8-SDS	6765	0.38
2-3	L Op 1	20.50	6.38	1	2772	336		3108	Compression	10312	0.30
2-3	R Op 1	20.50	10.13	1	2835	130		2705	HDU8-SDS	6765	0.40
2-3	R Op 1	20.50	10.13	1	2835	216		3051	Compression	10312	0.30
2-3	R End	20.50	15.38	1	2835	79		2756	HDU8-SDS	6765	0.41
2-3	R End	20.50	15.38	1	2835	132		2967	Compression	10312	0.29
Line 3											
3-1	L End	26.00	0.12	1	3867	50		3817	HDU5-SDS	5645	0.68
3-1	L End	26.00	0.12	1	3867	84		3951	Compression	10312	0.38
3-1	R End	26.00	3.38	1	3867	50		3817	HDU5-SDS	5645	0.68
3-1	R End	26.00	3.38	1	3867	84		3951	Compression	10312	0.38
	V Elem	24.00	5.13	1	2424	170		2254	Refer to upper level		
	V Elem	24.00	5.13	1	2424	284		2708	Compression		
3-2	L End	26.00	7.13	1	4246	108		4138	HDU5-SDS	5645	0.73
3-2	L End	26.00	7.13	1	4246	180		4426	Compression	10312	0.43
3-2	R End	26.00	14.38	1	4246	108		4138	HDU5-SDS	5645	0.73
3-2	R End	26.00	14.38	1	4246	180		4426	Compression	10312	0.43
	V Elem	24.00	15.38	1	2424	170		2254	Refer to upper level		
	V Elem	24.00	15.38	1	2424	284		2708	Compression		
Line 4											
4-1	L End	51.50	-9.87	1	3182	197		2985	HDU5-SDS	5645	0.53
4-1	L End	51.50	-9.87	1	3182	329		3511	Compression	10312	0.34
	V Elem	51.50	-7.12	1	0	315		315	Compression		
4-1	L Op 1	51.50	-6.12	1	3182	289		2893	HDU5-SDS	5645	0.51
4-1	L Op 1	51.50	-6.12	1	3182	481		3663	Compression	10312	0.36
4-1	R Op 1	51.50	-0.37	1	3113	384		2729	HDU5-SDS	5645	0.48
4-1	R Op 1	51.50	-0.37	1	3113	640		3753	Compression	10312	0.36
	V Elem	51.50	0.12	1	0	315		315	Compression		
	V Elem	51.50	2.88	1	0	158		157	Compression		
4-1	L Op 2	51.50	5.38	1	1667	707		961	HDU5-SDS	5645	0.17
4-1	L Op 2	51.50	5.38	1	1667	1178		2845	Compression	10312	0.28
	V Elem	51.50	14.13	1	221	417		638	Compression		
	V Elem	51.50	15.88	1	1666	257		1410	Refer to upper level		
	V Elem	51.50	15.88	1	1666	428		2094	Compression		
Line A											
A-1	L End	22.63	-10.00	1	350	247		102	HDU2-SDS	3075	0.03
A-1	L End	22.63	-10.00	1	350	412		762	Compression	10312	0.07
	V Elem	24.38	-10.00	1	0	405		405	Compression		
A-1	L Op 1	28.88	-10.00	1	350	233		117	HDU2-SDS	3075	0.04
A-1	L Op 1	28.88	-10.00	1	350	388		737	Compression	10312	0.07
	V Elem	31.63	-10.00	1	0	100		100	Compression		
	V Elem	31.88	-10.00	1	186	360		546	Compression		
A-1	R Op 2	34.63	-10.00	1	694	530		164	HDU2-SDS	3075	0.05
A-1	R Op 2	34.63	-10.00	1	694	883		1576	Compression	10312	0.15
	V Elem	40.88	-10.00	1	533	432		101	Refer to upper level		
	V Elem	40.88	-10.00	1	533	720		1252	Compression		
A-1	L Op 3	41.88	-10.00	1	348	252		96	HDU2-SDS	3075	0.03
A-1	L Op 3	41.88	-10.00	1	348	420		768	Compression	10312	0.07
A-1	R Op 3	45.13	-10.00	1	350	245		105	HDU2-SDS	3075	0.03
A-1	R Op 3	45.13	-10.00	1	350	408		757	Compression	10312	0.07
	V Elem	49.63	-10.00	1	0	383		382	Compression		
A-1	R End	51.38	-10.00	1	350	247		102	HDU2-SDS	3075	0.03
A-1	R End	51.38	-10.00	1	350	412		762	Compression	10312	0.07
Line B											
B-1	L End	0.12	-4.00	1	1158	689		469	HDU2-SDS	3075	0.15
B-1	L End	0.12	-4.00	1	1158	1148		2305	Compression	10312	0.22
	V Elem	2.38	-4.00	1	0	180		180	Compression		
	V Elem	6.63	-4.00	1	0	180		180	Compression		
	V Elem	8.38	-4.00	1	0	203		202	Compression		

Hold-Down and Compression Design (flexible wind design, continued)

Line C	B-1	V Elem	13.13	-4.00	1	0	203	202	Compression		
		V Elem	14.88	-4.00	1	0	180	180	Compression		
		V Elem	19.12	-4.00	1	0	180	180	Compression		
	B-1	R End	20.88	-4.00	1	1158	698	460	HDU2-SDS	3075	0.15
	B-1	R End	20.88	-4.00	1	1158	1163	2320	Compression	10312	0.22
		V Elem	1.63	0.00	1	795	259	536	Refer to upper level		
		V Elem	1.63	0.00	1	795	432	1227	Compression		
		V Elem	17.38	0.00	1	795	259	536	Refer to upper level		
		V Elem	17.38	0.00	1	795	432	1227	Compression		
Line D	D-1	L End	0.12	16.00	1	556	556	0	Not required	3075	0.00
	D-1	L End	0.12	16.00	1	556	604	1160	Compression	10312	0.11
	D-1	L Op 1	23.88	16.00	1	424	424	0	Not required	3075	0.00
	D-1	L Op 1	23.88	16.00	1	424	1030	1455	Compression	10312	0.14
	D-1	R Op 1	28.13	16.00	1	425	425	0	Not required	3075	0.00
	D-1	R Op 1	28.13	16.00	1	425	1030	1455	Compression	10312	0.14
	D-1	R End	51.38	16.00	1	556	556	0	Not required	3075	0.00
	D-1	R End	51.38	16.00	1	556	604	1160	Compression	10312	0.11
Level 2					Tensile Hold-down or Compressive Stud Force [lbs]						
Line-Wall	Posit'n	Location [ft]		Load Case	Shear	Dead	Uplift	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1											
1-1	L End	1.00	-3.87	1	946	108		838	HDU2-SDS	3075	0.27
1-1	L End	1.00	-3.87	1	946	180		1126	Compression	10312	0.11
1-1	R End	1.00	-0.12	1	946	108		838	HDU2-SDS	3075	0.27
1-1	R End	1.00	-0.12	1	946	180		1126	Compression	10312	0.11
	V Elem	0.00	0.88	1	0	293		292	Compression		
1-2	R Op 1	0.00	7.63	1	1149	405		744	HDU2-SDS	3075	0.24
1-2	R Op 1	0.00	7.63	1	1149	675		1823	Compression	10312	0.18
1-2	R End	0.00	15.88	1	1149	230		919	HDU2-SDS	3075	0.30
1-2	R End	0.00	15.88	1	1149	383		1531	Compression	10312	0.15
Line 3											
3-1	L End	24.00	5.13	1	2424	170		2254	HDU2-SDS	3075	0.73
3-1	L End	24.00	5.13	1	2424	284		2708	Compression	10312	0.26
3-1	R End	24.00	15.38	1	2424	170		2254	HDU2-SDS	3075	0.73
3-1	R End	24.00	15.38	1	2424	284		2708	Compression	10312	0.26
Line 4											
4-1	L Op 1	51.50	-7.12	1	0	315		315	Compression		-
	V Elem	51.50	0.12	1	0	315		315	Compression		
	V Elem	51.50	2.88	1	0	158		157	Compression		
4-2	R Op 1	51.50	6.63	1	1666	351		1315	HDU2-SDS	3075	0.43
4-2	R Op 1	51.50	6.63	1	1666	585		2251	Compression	10312	0.22
4-2	R End	51.50	15.88	1	1666	257		1410	HDU2-SDS	3075	0.46
4-2	R End	51.50	15.88	1	1666	428		2094	Compression	10312	0.20
Line A											
	V Elem	24.38	-10.00	1	0	405		405	Compression		
A-1	R Op 1	33.63	-10.00	1	533	446		87	HDU2-SDS	3075	0.03
A-1	R Op 1	33.63	-10.00	1	533	743		1275	Compression	10312	0.12
A-1	L Op 2	40.88	-10.00	1	533	432		101	HDU2-SDS	3075	0.03
A-1	L Op 2	40.88	-10.00	1	533	720		1252	Compression	10312	0.12
	V Elem	49.63	-10.00	1	0	383		382	Compression		
Line B											
	V Elem	2.38	-4.00	1	0	180		180	Compression		
	V Elem	6.63	-4.00	1	0	180		180	Compression		
	V Elem	8.38	-4.00	1	0	203		202	Compression		
	V Elem	13.13	-4.00	1	0	203		202	Compression		
	V Elem	14.88	-4.00	1	0	180		180	Compression		
	V Elem	19.12	-4.00	1	0	180		180	Compression		
Line C											
C-2	L End	1.63	0.00	1	795	259		536	HDU2-SDS	3075	0.17
C-2	L End	1.63	0.00	1	795	432		1227	Compression	10312	0.12
C-2	R End	17.38	0.00	1	795	259		536	HDU2-SDS	3075	0.17
C-2	R End	17.38	0.00	1	795	432		1227	Compression	10312	0.12
Line D											
D-1	L End	0.12	16.00	1	132	132		0	Not required	3075	0.00
D-1	L End	0.12	16.00	1	132	220		351	Compression	10312	0.03
D-1	R End	51.38	16.00	1	132	132		0	Not required	3075	0.00
D-1	R End	51.38	16.00	1	132	220		351	Compression	10312	0.03

Legend:

Line-Wall:

At wall or opening – Shearline and wall number

At vertical element – Shearline

Posit'n – Position of stud pack that hold-down is attached to or which is applying compression force:

V Elem – Vertical element: column or strengthened studs required where not at wall end or opening

L or R End – At left or right wall end

L or R Op n – At left or right side of opening n

t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1

Location – Co-ordinates in Plan View

Load Case – Results are for critical load case:

ASCE 7 All Heights: Case 1 or 2 from Fig. 27.3-8

ASCE 7 Low-rise: Windward corner(s) and Case A or B from Fig. 28.3-1

ASCE 7 Minimum loads (27.1.5 / 28.3.4): "Min"

Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.

Shear – Overturning component = $V \times h / beff$ from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.60; h = wall height, beff = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = $V \times h / Co$ sum (bi) from SDPWS Eqn. 4.3-8.

Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression

Uplift – Uplift wind load component, factored for ASD by 0.60

Cmb'd – Sum of ASD-factored overturning, dead and uplift forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.

Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate

Cap – Hold-downs: Allowable ASD tension load from database; Compression: allowable ASD bearing force = $C_t CM C_b F_{cp} A$; A = cross sectional area of end studs. Refer to Framing materials table for details

Crit. Resp. – Critical Response = Combined ASD force / Allowable ASD tension load

Notes:

HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.

HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.

Most severe of wind load cases is used for overturning calculation.

Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (flexible wind design)

Level 1					Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line-Wall	Position on Wall or Opening	Location [ft]		Load Case	Force [lbs]		Force [lbs]	
		X	Y		--->	<---	--->	<---
Line 2								
2-3	Left Wall End	20.50	-4.00		-1249	1249		
2-3	Left Opening 1	20.50	6.50		117	-117		
2-3	Right Opening 1	20.50	10.00		-611	611		
2-3	Right Wall End	20.50	15.50		104	-104		
Line 3								
3-1	Left Wall End	26.00	0.00		-2084	2084		
3-1	Right Wall End	26.00	3.50		-1242	1242		
3-2	Left Wall End	26.00	7.00		-1972	1972		
3-2	Right Wall End	26.00	14.50		313	-313		
Line 4								
4-1	Left Opening 1	51.50	-6.00		918	-918		
4-1	Right Opening 1	51.50	-0.50		129	-129		
4-1	Left Opening 2	51.50	5.50		1506	-1506		
Line A								
A-1	Left Opening 1	29.00	-10.00		80	-80		
A-1	Right Opening 2	34.50	-10.00		-83	83		
A-1	Left Opening 3	42.00	-10.00		9	-9		
A-1	Right Opening 3	45.00	-10.00		-80	80		
Line B								
B-1	Right Wall End	21.00	-4.00		1779	-1779		
Line D								
D-1	Left Opening 1	24.00	16.00		98	-98		
D-1	Right Opening 1	28.00	16.00		-96	96		
Level 2					Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line-Wall	Position on Wall or Opening	Location [ft]		Load Case	Force [lbs]		Force [lbs]	
		X	Y		--->	<---	--->	<---
Line 1								
1-1	Right Wall End	1.00	0.00		127	-127		
1-2	Right Opening 1	0.00	7.50		-374	374		
Line 3								
3-1	Left Wall End	24.00	5.00		-1593	1593		
3-1	Right Wall End	24.00	15.50		53	-53		
Line 4								
4-2	Right Opening 1	51.50	6.50		-961	961		
Line A								
A-1	Right Opening 1	33.50	-10.00		-163	163		
A-1	Left Opening 2	41.00	-10.00		155	-155		
Line C								
C-2	Left Wall End	1.50	0.00		-41	41		
C-2	Right Wall End	17.50	0.00		919	-919		

Legend:

Line-Wall - Shearline and wall number

Position...- Side of opening or wall end that drag strut is attached to

Location - Co-ordinates in Plan View

Load Case - Results are for critical load case:

ASCE 7 All heights Case 1 or 2

ASCE 7 Low-rise corner; Case A or B

Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.

Based on ASD-factored shearline force (vmax from 4.3.6.4.1.1 for perforated walls)

Strap/Blocking Force - For FTAO walls, force transferred from above and below opening to shearwall pier.

-> Due to shearline force in the west-to-east or south-to-north direction

<- Due to shearline force in the east-to-west or north-to-south direction

MWFRS DEFLECTION (flexible wind design)

These deflections are used to determine shearwall stiffness for force distribution

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	338.2	10.50	8.00	16.5	.005	18.4	201	.034	.147	0.26	0.41
2-3,2		Both	1S	338.2	5.50	8.00	16.5	.010	18.4	201	.034	.147	0.51	0.67
Line 3														
3-1	4	Both	1S	448.9	3.50	8.00	16.5	.020	18.4	201	.034	.195	0.93	1.14
3-2	4	Both	1S	513.0	7.50	8.00	16.5	.011	18.4	201	.034	.223	0.42	0.66
Line 4														
4-1,1	4	S->N	ExtS	372.9	4.00	8.00	16.5	.014	18.4	201	.034	.162	0.76	0.94
		N->S	ExtS	372.9	4.00	8.00	16.5	.014	18.4	201	.034	.162	0.76	0.93
4-1,2		S->N	ExtS	372.9	6.00	8.00	16.5	.010	18.4	201	.034	.162	0.49	0.66
		N->S	ExtS	372.9	6.00	8.00	16.5	.010	18.4	201	.034	.162	0.43	0.60
Line A														
A-1,1	1	W->E	ExtS	42.0	6.50	8.00	16.5	.001	13.8	196	.032	.024	0.37	0.39
		E->W	ExtS	42.0	6.50	8.00	16.5	.001	13.8	196	.032	.024	0.37	0.40
A-1,3		Both	ExtS	42.0	7.50	8.00	16.5	.001	13.8	196	.032	.024	0.33	0.35
A-1,4		Both	ExtS	42.0	6.50	8.00	16.5	.001	13.8	196	.032	.024	0.37	0.39
Line B														
B-1	1	Both	ExtS	143.0	21.00	8.00	16.5	.001	13.8	196	.032	.083	0.12	0.20
Line D														
D-1,1	1	Both	ExtS	52.5	24.00	8.00	16.5	.000	13.8	196	.032	.030	0.00	0.03
D-1,2		Both	ExtS	52.5	23.50	8.00	16.5	.000	13.8	196	.032	.030	0.00	0.03
Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 2														
Line 1														
1-1	1	S->N	ExtS	98.5	4.00	9.00	16.5	.005	13.8	196	.032	.064	0.80	0.87
		N->S	ExtS	98.5	4.00	9.00	16.5	.005	13.8	196	.032	.064	0.75	0.82
1-2,2	1	S->N	ExtS	110.8	8.50	9.00	16.5	.003	13.8	196	.032	.072	0.36	0.44
		N->S	ExtS	110.8	8.50	9.00	16.5	.003	13.8	196	.032	.072	0.34	0.42
Line 3														
3-1	3	S->N	1S	263.0	10.50	9.00	16.5	.006	18.4	201	.034	.128	0.37	0.50
		N->S	1S	263.0	10.50	9.00	16.5	.006	18.4	201	.034	.128	0.31	0.45
Line 4														
4-2,2	1	S->N	ExtS	159.3	9.50	9.00	16.5	.004	13.8	196	.032	.104	0.36	0.46
		N->S	ExtS	159.3	9.50	9.00	16.5	.004	13.8	196	.032	.104	0.32	0.43
Line A														
A-1,2	1	Both	ExtS	57.2	7.50	9.00	16.5	.002	13.8	196	.032	.037	0.36	0.40
Line C														
C-2	2	W->E	1S	87.0	16.00	9.00	16.5	.001	13.8	196	.032	.057	0.18	0.24
		E->W	1S	87.0	16.00	9.00	16.5	.001	13.8	196	.032	.057	0.17	0.23
Line D														
D-1	1	Both	ExtS	14.6	51.50	9.00	16.5	.000	13.8	196	.032	.010	0.00	0.01

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – ASD shear force per unit distance on wall segment.

Unblocked walls = v / C_{ub} as per SDPWS 4.3.4.3, C_{ub} = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = v_{max} from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = $8vh^3 / EA_b$; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table

For i studs at one end and j at the other, $A = 2ij / (i + j) \times$ area of one stud, based on Ex. C4.3.4-3

Shear = $vh / 1000 Ga$; Ga = $vw / (v_{wt} + 0.75 en)$, from SDPWS Ex. C4.3.4-1.

vw = ASD sheathing capacity.

Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

en = Nail slip from Table C4.2.3D of form aVn^b for WSP, varies linearly to value at capacity for other materials.

V_n = Shear force per nail along panel edge at ASD capacity *v_w*.

Hold – Anchorage system (hold-down) = $d_a \times h / b_{eff}$.

d_a = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

b_{eff} = Effective wall segment length = *b* - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
b_{eff} is given in the Shear Wall Dimensions table.

For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.

Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.

For FTAO walls, the average of the values for the segments, as per APA T555.

MWFRS HOLD-DOWN DISPLACEMENT (flexible wind design)

These displacements are used to determine deflections for force distribution

Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement			Slippage		Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
				Manuf in	Add in	da in	Vf lbs	da in					
Level 1													
Line 2													
2-3,1	S->N	HDU8-SDS	2621	.043	.002	0.044	-	-	.283	3108	0.01	0.34	0.26
	N->S	HDU8-SDS	2570	.042	.002	0.043	-	-	.283	3024	0.01	0.33	0.26
2-3,2	S->N	HDU8-SDS	2705	.044	.002	0.046	-	-	.283	2967	0.01	0.34	0.51
	N->S	HDU8-SDS	2756	.045	.002	0.046	-	-	.283	3051	0.01	0.34	0.52
Line 3													
3-1	Both	HDU5-SDS	3817	.078	.005	0.082	-	-	.283	3951	0.01	0.38	0.93
3-2	Both	HDU5-SDS	4138	.084	.005	0.089	-	-	.283	4426	0.01	0.38	0.42
Line 4													
4-1,1	S->N	HDU5-SDS	2985	.061	.004	0.064	-	-	.283	3663	0.01	0.36	0.76
	N->S	HDU5-SDS	2893	.059	.003	0.062	-	-	.283	3511	0.01	0.36	0.76
4-1,2	S->N	HDU5-SDS	2729	.056	.003	0.059	-	-	.283	2624	0.01	0.35	0.49
	N->S	HDU5-SDS	740	.015	.001	0.016	-	-	.283	3753	0.01	0.31	0.43
Line A													
A-1,1	W->E	HDU2-SDS	102	.003	.000	0.003	-	-	.283	737	0.00	0.29	0.37
	E->W	HDU2-SDS	117	.003	.000	0.003	-	-	.283	762	0.00	0.29	0.37
A-1,3	W->E	HDU2-SDS	351	.010	.000	0.010	-	-	.283	768	0.00	0.30	0.33
	E->W	HDU2-SDS	96	.003	.000	0.003	-	-	.283	1763	0.00	0.29	0.32
A-1,4	W->E	HDU2-SDS	105	.003	.000	0.003	-	-	.283	762	0.00	0.29	0.37
	E->W	HDU2-SDS	102	.003	.000	0.003	-	-	.283	757	0.00	0.29	0.37
Line B													
B-1	W->E	HDU2-SDS	469	.013	.001	0.014	-	-	.283	2320	0.01	0.30	0.12
	E->W	HDU2-SDS	460	.013	.001	0.014	-	-	.283	2305	0.01	0.30	0.12
Line D													
D-1,1	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1455	0.00	0.00	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1160	0.00	0.00	0.00
D-1,2	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1160	0.00	0.00	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1455	0.00	0.00	0.00
Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement			Slippage		Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
				Manuf in	Add in	da in	Vf lbs	da in					
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	838	.048	.000	0.048	-	-	.283	1126	0.00	0.33	0.80
	N->S	HDU2-SDS	838	.024	.001	0.025	-	-	.283	1126	0.00	0.31	0.75
1-2,2	S->N	HDU2-SDS	744	.043	.000	0.043	-	-	.283	1531	0.00	0.33	0.36
	N->S	HDU2-SDS	919	.026	.001	0.027	-	-	.283	1824	0.00	0.32	0.34
Line 3													
3-1	S->N	HDU2-SDS	2254	.129	.001	0.130	-	-	.283	2708	0.01	0.42	0.37
	N->S	HDU2-SDS	2254	.065	.003	0.067	-	-	.283	2708	0.01	0.36	0.31
Line 4													
4-2,2	S->N	HDU2-SDS	1315	.075	.001	0.076	-	-	.283	2094	0.01	0.37	0.36
	N->S	HDU2-SDS	1410	.040	.002	0.042	-	-	.283	2251	0.01	0.33	0.32
Line A													
A-1,2	W->E	HDU2-SDS	87	.005	.000	0.005	-	-	.283	1253	0.00	0.29	0.36
	E->W	HDU2-SDS	101	.003	.000	0.003	-	-	.283	1275	0.00	0.29	0.36
Line C													
C-2	W->E	HDU2-SDS	536	.031	.000	0.031	-	-	.283	1227	0.00	0.32	0.18
	E->W	HDU2-SDS	536	.015	.001	0.016	-	-	.283	1227	0.00	0.30	0.17
Line D													
D-1	Both	HDU2-SDS	0	.000	.000	0.000	-	-	.000	351	0.00	0.00	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. – Accumulated ASD hold-down tension force *T* and end stud compression force *C* from overturning, dead and wind uplift loads.

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

Unless marked with * = (ASD tension force / ASD hold-down capacity) x max ASD elongation or displacement

* - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = $TL / (Ab \times Es)$

Ab = bolt cross-sectional area

Es = steel modulus = 29000000 psi

L = Lb – Lh

Lb = Total bolt length shown in Storey Information table

L_h = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = *e_n* from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = $V_f / (270,000 D^{1.5})$ (NDS 11.3.6); *D* = bolt diameter, *V_f* = Tension force *T* / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = $0.002 \times (19\% \text{ fabrication} - 10\% \text{ in-service moisture contents}) \times L_s$

L_s = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table

Crush – Deformation of bottom plate at compression end of wall segment

= $0.02'' \times [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2r^3, r > 1]$

r = f_{cp} / F_{cp}' ; $F_{cp}' = C_t CM F_{cp}$; $f_{cp} = C / A$, *A* = cross sectional area of end studs

Total da – Vert. Displacement + Slippage + Shrink + Crush + Extra

Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = $h / b_{eff} \times d_a$

h = Wall height. For end segments in FTAO walls, *h* is the average of the wall height and the distance from the bottom of opening to top of wall

b_{eff} = Effective wall segment length = *b* - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)

h and *b* are shown in Deflection table, *b_{eff}* in the Shear Wall Dimensions table

Rigid Diaphragm Wind Design
ASCE 7 Directional (All Heights) Loads

 SHEAR RESULTS

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	1609	-	-	-	-	-	-	-	4732	-
Wall 1-1	1	Both	118.7	-	475	-	.89	-	393	-	-	349	1396	0.34
Wall 1-2	1	Both	-	-	1135	-	1.0	-	393	-	-	-	3336	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	133.5	-	1135	-	1.0	-	393	-	-	393	3336	0.34
Line 2														
Level 1														
Ln2, Lev1	-	Both	-	-	7192	-	-	-	-	-	-	-	9640	-
Wall 2-3	3^	Both	-	-	7192	-	1.0	-	602	-	-	-	9640	-
Seg. 1	-	Both	449.5	-	4719	-	1.0	-	602	-	-	602	6326	0.75
Seg. 2	-	Both	449.5	-	2472	-	1.0	-	602	-	-	602	3314	0.75
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	2408	-	-	-	-	-	-	-	6326	-
Wall 3-1	3	Both	229.3	-	2408	-	1.0	-	602	-	-	602	6326	0.38
Level 1														
Ln3, Lev1	-	Both	-	-	4467	-	-	-	-	-	-	-	6364	-
Wall 3-1	4	Both	370.1	-	1295	-	.88	-	602	-	-	527	1845	0.70
Wall 3-2	4	Both	423.0	-	3172	-	1.0	-	602	-	-	602	4519	0.70
Line 4														
Level 2														
Ln4, Lev2	-	Both	-	-	1593	-	-	-	-	-	-	-	3729	-
Wall 4-2	1	Both	-	-	1593	-	1.0	-	393	-	-	-	3729	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	167.7	-	1593	-	1.0	-	393	-	-	393	3729	0.43
Level 1														
Ln4, Lev1	-	Both	-	-	2901	-	-	-	-	-	-	-	6025	-
Wall 4-1	4	Both	-	-	2901	-	1.0	-	602	-	-	-	6025	-
Seg. 1	-	Both	290.1	-	1160	-	1.0	-	602	-	-	602	2410	0.48
Seg. 2	-	Both	290.1	-	1740	-	1.0	-	602	-	-	602	3615	0.48
Seg. 3	-	Both	0.0	-	0	-	1.0	-	602	-	-	602	-	-
E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	389	-	-	-	-	-	-	-	2944	-
Wall A-1	1	Both	-	-	389	-	1.0	-	393	-	-	-	2944	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 2	-	Both	51.8	-	389	-	1.0	-	393	-	-	393	2944	0.13
Seg. 3	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Level 1														
LnA, Lev1	-	Both	-	-	1676	-	-	-	-	-	-	-	8046	-
Wall A-1	1	Both	-	-	1676	-	1.0	-	393	-	-	-	8046	-
Seg. 1	-	Both	81.8	-	531	-	1.0	-	393	-	-	393	2551	0.21
Seg. 2	-	Both	0.0	-	0	-	1.0	-	393	-	-	393	-	-
Seg. 3	-	Both	81.8	-	613	-	1.0	-	393	-	-	393	2944	0.21
Seg. 4	-	Both	81.8	-	531	-	1.0	-	393	-	-	393	2551	0.21
Line B														
LnB, Lev1	-	Both	-	-	1633	-	-	-	-	-	-	-	8243	-
Wall B-1	1	Both	77.8	-	1633	-	1.0	-	393	-	-	393	8243	0.20
Line C														
Level 2														
LnC, Lev2	-	Both	-	-	689	-	-	-	-	-	-	-	6280	-
Wall C-2	2	Both	43.0	-	689	-	1.0	-	393	-	-	393	6280	0.11
Line D														
LnD, Lev2	1	Both	29.0	-	1493	-	1.0	-	393	-	-	393	20214	0.07
Level 1														
LnD, Lev1	-	Both	-	-	3049	-	-	-	-	-	-	-	18644	-
Wall D-1	1	Both	-	-	3049	-	1.0	-	393	-	-	-	18644	-
Seg. 1	-	Both	64.2	-	1541	-	1.0	-	393	-	-	393	9420	0.16
Seg. 2	-	Both	64.2	-	1509	-	1.0	-	393	-	-	393	9224	0.16

Legend:

W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.

For Dir - Direction of wind force along shearline.

v – Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)

vmax/vft - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4

FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.

V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment

Asp/Cub – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum b_i / FHS from 4.3.5.6 with b_i defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.

Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.

Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.

C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.

Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.

V – Total factored shear capacity of shearline, wall or segment.

Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "S" indicates that the seismic design criterion was critical in selecting wall.

Notes:

Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (rigid wind design)

Level 1 Line-Wall	Posit'n	Location [ft]		Load Case	Tensile Hold-down or Compressive Stud Force [lbs]				Hold-down	Cap [lbs]	Crit Resp.
		X	Y		Shear	Dead	Uplift	Cmb'd			
Line 1											
	V Elem	0.00	-3.87	1	1139	108		1031	Refer to upper level		
	V Elem	0.00	-3.87	1	1139	180		1319	Compression		
	V Elem	0.00	-2.12	1	551	91		460	Refer to upper level		
	V Elem	0.00	-2.12	1	551	152		704	Compression		
	V Elem	0.00	-0.12	1	1139	108		1031	Refer to upper level		
	V Elem	0.00	-0.12	1	1139	180		1319	Compression		
	V Elem	0.00	14.13	1	832	138		694	Refer to upper level		
	V Elem	0.00	14.13	1	832	230		1062	Compression		
	V Elem	0.00	15.88	1	1384	230		1154	Refer to upper level		
	V Elem	0.00	15.88	1	1384	383		1766	Compression		
Line 2											
2-3	L End	20.50	-3.87	1	3683	151		3532	HDU8-SDS	6765	0.52
2-3	L End	20.50	-3.87	1	3683	252		3935	Compression	10312	0.38
2-3	L Op 1	20.50	6.38	1	3683	151		3532	HDU8-SDS	6765	0.52
2-3	L Op 1	20.50	6.38	1	3683	252		3935	Compression	10312	0.38
2-3	R Op 1	20.50	10.13	1	3767	79		3688	HDU8-SDS	6765	0.55
2-3	R Op 1	20.50	10.13	1	3767	132		3899	Compression	10312	0.38
2-3	R End	20.50	15.38	1	3767	79		3688	HDU8-SDS	6765	0.55
2-3	R End	20.50	15.38	1	3767	132		3899	Compression	10312	0.38
Line 3											
3-1	L End	26.00	0.12	1	3188	50		3138	HDU5-SDS	5645	0.56
3-1	L End	26.00	0.12	1	3188	84		3272	Compression	10312	0.32
3-1	R End	26.00	3.38	1	3188	50		3138	HDU5-SDS	5645	0.56
3-1	R End	26.00	3.38	1	3188	84		3272	Compression	10312	0.32
	V Elem	24.00	5.13	1	2114	170		1944	Refer to upper level		
	V Elem	24.00	5.13	1	2114	284		2397	Compression		
3-2	L End	26.00	7.13	1	3500	108		3392	HDU5-SDS	5645	0.60
3-2	L End	26.00	7.13	1	3500	180		3680	Compression	10312	0.36
3-2	R End	26.00	14.38	1	3500	108		3392	HDU5-SDS	5645	0.60
3-2	R End	26.00	14.38	1	3500	180		3680	Compression	10312	0.36
	V Elem	24.00	15.38	1	2114	170		1944	Refer to upper level		
	V Elem	24.00	15.38	1	2114	284		2397	Compression		
Line 4											
4-1	L End	51.50	-9.87	1	2475	197		2278	HDU5-SDS	5645	0.40
4-1	L End	51.50	-9.87	1	2475	329		2804	Compression	10312	0.27
4-1	L Op 1	51.50	-6.12	1	2475	157		2318	HDU5-SDS	5645	0.41
4-1	L Op 1	51.50	-6.12	1	2475	261		2736	Compression	10312	0.27
4-1	R Op 1	51.50	-0.37	1	2421	252		2169	HDU5-SDS	5645	0.38
4-1	R Op 1	51.50	-0.37	1	2421	420		2841	Compression	10312	0.28
4-1	L Op 2	51.50	5.38	1	899	421		479	HDU5-SDS	5645	0.08
4-1	L Op 2	51.50	5.38	1	899	701		1600	Compression	10312	0.16
	V Elem	51.50	14.13	1	232	34		198	Refer to upper level		
	V Elem	51.50	14.13	1	232	57		289	Compression		
	V Elem	51.50	15.88	1	1754	257		1498	Refer to upper level		
	V Elem	51.50	15.88	1	1754	428		2182	Compression		
Line A											
A-1	L End	22.63	-10.00	1	680	247		433	HDU2-SDS	3075	0.14
A-1	L End	22.63	-10.00	1	680	412		1092	Compression	10312	0.11
A-1	L Op 1	28.88	-10.00	1	680	173		508	HDU2-SDS	3075	0.17
A-1	L Op 1	28.88	-10.00	1	680	288		968	Compression	10312	0.09
	V Elem	31.88	-10.00	1	169	71		98	Refer to upper level		
	V Elem	31.88	-10.00	1	169	118		287	Compression		
A-1	R Op 2	34.63	-10.00	1	990	312		679	HDU2-SDS	3075	0.22
A-1	R Op 2	34.63	-10.00	1	990	519		1510	Compression	10312	0.15
	V Elem	40.88	-10.00	1	483	203		280	Refer to upper level		
	V Elem	40.88	-10.00	1	483	338		820	Compression		
A-1	L Op 3	41.88	-10.00	1	677	180		497	HDU2-SDS	3075	0.16
A-1	L Op 3	41.88	-10.00	1	677	300		977	Compression	10312	0.09
A-1	R Op 3	45.13	-10.00	1	680	173		508	HDU2-SDS	3075	0.17
A-1	R Op 3	45.13	-10.00	1	680	288		968	Compression	10312	0.09
A-1	R End	51.38	-10.00	1	680	247		433	HDU2-SDS	3075	0.14
A-1	R End	51.38	-10.00	1	680	412		1092	Compression	10312	0.11
Line B											
B-1	L End	0.12	-4.00	1	629	629		0	Not required	3075	0.00
B-1	L End	0.12	-4.00	1	629	1036		1665	Compression	10312	0.16
B-1	R End	20.88	-4.00	1	629	629		0	Not required	3075	0.00
B-1	R End	20.88	-4.00	1	629	1063		1692	Compression	10312	0.16
Line C											
	V Elem	1.63	0.00	1	394	259		134	Refer to upper level		
	V Elem	1.63	0.00	1	394	432		825	Compression		
	V Elem	17.38	0.00	1	394	259		134	Refer to upper level		

Hold-Down and Compression Design (rigid wind design, continued)

V Elem	17.38	0.00	1	394	432	825	Compression			
Line D										
D-1	L End	0.12	16.00	1	781	781	0	Not required	3075	0.00
D-1	L End	0.12	16.00	1	781	1302	2083	Compression	10312	0.20
D-1	L Op 1	23.88	16.00	1	519	519	0	Not required	3075	0.00
D-1	L Op 1	23.88	16.00	1	519	865	1384	Compression	10312	0.13
D-1	R Op 1	28.13	16.00	1	519	519	0	Not required	3075	0.00
D-1	R Op 1	28.13	16.00	1	519	865	1384	Compression	10312	0.13
D-1	R End	51.38	16.00	1	781	781	0	Not required	3075	0.00
D-1	R End	51.38	16.00	1	781	1302	2084	Compression	10312	0.20
Level 2										
Line-Wall	Posit'n	Location [ft]		Load Case	Tensile Hold-down or Compressive Stud Force [lbs]				Cap	Crit
		X	Y		Shear	Dead	Uplift	Cmb'd	[lbs]	Resp.
Line 1										
1-1	L End	1.00	-3.87	1	1139	108		1031	HDU2-SDS	0.34
1-1	L End	1.00	-3.87	1	1139	180		1319	Compression	0.13
1-1	R End	1.00	-0.12	1	1139	108		1031	HDU2-SDS	0.34
1-1	R End	1.00	-0.12	1	1139	180		1319	Compression	0.13
1-2	R Op 1	0.00	7.63	1	1384	230		1154	HDU2-SDS	0.38
1-2	R Op 1	0.00	7.63	1	1384	383		1766	Compression	0.17
1-2	R End	0.00	15.88	1	1384	230		1154	HDU2-SDS	0.38
1-2	R End	0.00	15.88	1	1384	383		1766	Compression	0.17
Line 3										
3-1	L End	24.00	5.13	1	2114	170		1944	HDU2-SDS	0.63
3-1	L End	24.00	5.13	1	2114	284		2397	Compression	0.23
3-1	R End	24.00	15.38	1	2114	170		1944	HDU2-SDS	0.63
3-1	R End	24.00	15.38	1	2114	284		2397	Compression	0.23
Line 4										
4-2	R Op 1	51.50	6.63	1	1754	257		1498	HDU2-SDS	0.49
4-2	R Op 1	51.50	6.63	1	1754	428		2182	Compression	0.21
4-2	R End	51.50	15.88	1	1754	257		1498	HDU2-SDS	0.49
4-2	R End	51.50	15.88	1	1754	428		2182	Compression	0.21
Line A										
A-1	R Op 1	33.63	-10.00	1	483	203		280	HDU2-SDS	0.09
A-1	R Op 1	33.63	-10.00	1	483	338		820	Compression	0.08
A-1	L Op 2	40.88	-10.00	1	483	203		280	HDU2-SDS	0.09
A-1	L Op 2	40.88	-10.00	1	483	338		820	Compression	0.08
Line C										
C-2	L End	1.63	0.00	1	394	259		134	HDU2-SDS	0.04
C-2	L End	1.63	0.00	1	394	432		825	Compression	0.08
C-2	R End	17.38	0.00	1	394	259		134	HDU2-SDS	0.04
C-2	R End	17.38	0.00	1	394	432		825	Compression	0.08
Line D										
D-1	L End	0.12	16.00	1	262	262		0	Not required	0.00
D-1	L End	0.12	16.00	1	262	437		699	Compression	0.07
D-1	R End	51.38	16.00	1	262	262		0	Not required	0.00
D-1	R End	51.38	16.00	1	262	437		699	Compression	0.07

Legend:

Line-Wall:

At wall or opening – Shearline and wall number

At vertical element – Shearline

Posit'n – Position of stud pack that hold-down is attached to or which is applying compression force:

V Elem – Vertical element: column or strengthened studs required where not at wall end or opening

L or R End – At left or right wall end

L or R Op n – At left or right side of opening n

t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1

Location – Co-ordinates in Plan View

Load Case – Results are for critical load case:

ASCE 7 All Heights: Case 1 or 2 from Fig. 27.3-8

ASCE 7 Low-rise: Windward corner(s) and Case A or B from Fig. 28.3-1

ASCE 7 Minimum loads (27.1.5 / 28.3.4): "Min"

Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.

Shear – Overturning component = $V \times h / beff$ from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.60; h = wall height, $beff$ = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = $V \times h / Co$ sum (bi) from SDPWS Eqn. 4.3-8.

Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression

Uplift – Uplift wind load component, factored for ASD by 0.60

Cmb'd – Sum of ASD-factored overturning, dead and uplift forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.

Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate

Cap – Hold-downs: Allowable ASD tension load from database; Compression: allowable ASD bearing force = $C_t C_M C_b F_{cp} A$; A = cross sectional area of end studs. Refer to Framing materials table for details

Crit. Resp. – Critical Response = Combined ASD force / Allowable ASD tension load

Notes:

HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.

HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.

Most severe of wind load cases is used for overturning calculation.

Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (rigid wind design)

Level 1	Line-Wall	Position on Wall or Opening	Location [ft]		Load Case	Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
			X	Y		--->	<---	--->	<---
Level 1									
Line 2									
	2-3	Left Wall End	20.50	-4.00		-1660	1660		
	2-3	Left Opening 1	20.50	6.50		156	-156		
	2-3	Right Opening 1	20.50	10.00		-813	813		
	2-3	Right Wall End	20.50	15.50		138	-138		
Line 3									
	3-1	Left Wall End	26.00	0.00		-1718	1718		
	3-1	Right Wall End	26.00	3.50		-1024	1024		
	3-2	Left Wall End	26.00	7.00		-1626	1626		
	3-2	Right Wall End	26.00	14.50		258	-258		
Line 4									
	4-1	Left Opening 1	51.50	-6.00		714	-714		
	4-1	Right Opening 1	51.50	-0.50		100	-100		
	4-1	Left Opening 2	51.50	5.50		1171	-1171		
Line A									
	A-1	Left Opening 1	29.00	-10.00		156	-156		
	A-1	Right Opening 2	34.50	-10.00		-162	162		
	A-1	Left Opening 3	42.00	-10.00		18	-18		
	A-1	Right Opening 3	45.00	-10.00		-156	156		
Line B									
	B-1	Right Wall End	21.00	-4.00		967	-967		
Line D									
	D-1	Left Opening 1	24.00	16.00		120	-120		
	D-1	Right Opening 1	28.00	16.00		-117	117		
Level 2									
	Line-Wall	Position on Wall or Opening	Location [ft]		Load Case	Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
			X	Y		--->	<---	--->	<---
Line 1									
	1-1	Right Wall End	1.00	0.00		153	-153		
	1-2	Right Opening 1	0.00	7.50		-451	451		
Line 3									
	3-1	Left Wall End	24.00	5.00		-1389	1389		
	3-1	Right Wall End	24.00	15.50		46	-46		
Line 4									
	4-2	Right Opening 1	51.50	6.50		-1011	1011		
Line A									
	A-1	Right Opening 1	33.50	-10.00		-147	147		
	A-1	Left Opening 2	41.00	-10.00		141	-141		
Line C									
	C-2	Left Wall End	1.50	0.00		-20	20		
	C-2	Right Wall End	17.50	0.00		455	-455		

Legend:

Line-Wall - Shearline and wall number

Position...- Side of opening or wall end that drag strut is attached to

Location - Co-ordinates in Plan View

Load Case - Results are for critical load case:

ASCE 7 All heights Case 1 or 2

ASCE 7 Low-rise corner; Case A or B

Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.

Based on ASD-factored shearline force (vmax from 4.3.6.4.1.1 for perforated walls)

Strap/Blocking Force - For FTAO walls, force transferred from above and below opening to shearwall pier.

-> Due to shearline force in the west-to-east or south-to-north direction

<- Due to shearline force in the east-to-west or north-to-south direction

MWFRS DEFLECTION (rigid wind design)

These deflections are used to determine shearwall stiffness for force distribution

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	449.5	10.50	8.00	16.5	.007	18.4	201	.034	.195	0.28	0.48
2-3,2		Both	1S	449.5	5.50	8.00	16.5	.013	18.4	201	.034	.195	0.54	0.75
Line 3														
3-1	4	Both	1S	370.1	3.50	8.00	16.5	.016	18.4	201	.034	.161	0.89	1.06
3-2	4	Both	1S	423.0	7.50	8.00	16.5	.009	18.4	201	.034	.184	0.40	0.60
Line 4														
4-1,1	4	Both	ExtS	290.1	4.00	8.00	16.5	.011	18.4	201	.034	.126	0.73	0.86
4-1,2		S->N	ExtS	290.1	6.00	8.00	16.5	.008	18.4	201	.034	.126	0.46	0.60
		N->S	ExtS	290.1	6.00	8.00	16.5	.008	18.4	201	.034	.126	0.41	0.55
Line A														
A-1,1	1	W->E	ExtS	81.8	6.50	8.00	16.5	.002	13.8	196	.032	.047	0.38	0.43
		E->W	ExtS	81.8	6.50	8.00	16.5	.002	13.8	196	.032	.047	0.39	0.44
A-1,3		W->E	ExtS	81.8	7.50	8.00	16.5	.002	13.8	196	.032	.047	0.34	0.39
		E->W	ExtS	81.8	7.50	8.00	16.5	.002	13.8	196	.032	.047	0.33	0.38
A-1,4		W->E	ExtS	81.8	6.50	8.00	16.5	.002	13.8	196	.032	.047	0.39	0.44
		E->W	ExtS	81.8	6.50	8.00	16.5	.002	13.8	196	.032	.047	0.38	0.43
Line B														
B-1	1	Both	ExtS	77.8	21.00	8.00	16.5	.001	13.8	196	.032	.045	0.00	0.05
Line D														
D-1,1	1	Both	ExtS	64.2	24.00	8.00	16.5	.000	13.8	196	.032	.037	0.00	0.04
D-1,2		Both	ExtS	64.2	23.50	8.00	16.5	.000	13.8	196	.032	.037	0.00	0.04
Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 2														
Line 1														
1-1	1	S->N	ExtS	118.7	4.00	9.00	16.5	.007	13.8	196	.032	.077	0.83	0.92
		N->S	ExtS	118.7	4.00	9.00	16.5	.007	13.8	196	.032	.077	0.76	0.85
1-2,2	1	S->N	ExtS	133.5	8.50	9.00	16.5	.003	13.8	196	.032	.087	0.39	0.48
		N->S	ExtS	133.5	8.50	9.00	16.5	.003	13.8	196	.032	.087	0.35	0.44
Line 3														
3-1	3	S->N	1S	229.3	10.50	9.00	16.5	.005	18.4	201	.034	.112	0.35	0.47
		N->S	1S	229.3	10.50	9.00	16.5	.005	18.4	201	.034	.112	0.31	0.42
Line 4														
4-2,2	1	S->N	ExtS	167.7	9.50	9.00	16.5	.004	13.8	196	.032	.109	0.37	0.48
		N->S	ExtS	167.7	9.50	9.00	16.5	.004	13.8	196	.032	.109	0.32	0.44
Line A														
A-1,2	1	W->E	ExtS	51.8	7.50	9.00	16.5	.002	13.8	196	.032	.034	0.37	0.41
		E->W	ExtS	51.8	7.50	9.00	16.5	.002	13.8	196	.032	.034	0.36	0.40
Line C														
C-2	2	W->E	1S	43.0	16.00	9.00	16.5	.001	13.8	196	.032	.028	0.17	0.20
		E->W	1S	43.0	16.00	9.00	16.5	.001	13.8	196	.032	.028	0.17	0.19
Line D														
D-1	1	Both	ExtS	29.0	51.50	9.00	16.5	.000	13.8	196	.032	.019	0.00	0.02

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – ASD shear force per unit distance on wall segment.

Unblocked walls = v / C_{ub} as per SDPWS 4.3.4.3, C_{ub} = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = v_{max} from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = $8vh^3 / EA_b$; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table

For i studs at one end and j at the other, $A = 2ij / (i + j) \times$ area of one stud, based on Ex. C4.3.4-3

Shear = $vh / 1000 G_a$; $G_a = vw / (vw / G_{vtv} + 0.75 en)$, from SDPWS Ex. C4.3.4-1.

vw = ASD sheathing capacity.

Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

en = Nail slip from Table C4.2.3D of form aVn^b for WSP, varies linearly to value at capacity for other materials.

Vn = Shear force per nail along panel edge at ASD capacity vw.

Hold – Anchorage system (hold-down) = $da \times h / beff$.

da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

beff = Effective wall segment length = $b - (\text{tension stud pack width} + \text{hold-down anchor bolt offset}) - (1/2 \text{ compression stud pack width})$

beff is given in the Shear Wall Dimensions table.

For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.

Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.

For FTAO walls, the average of the values for the segments, as per APA T555.

MWFRS HOLD-DOWN DISPLACEMENT (rigid wind design)

These displacements are used to determine deflections for force distribution

Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement			Slippage		Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
				Manuf in	Add in	da in	Vf lbs	da in					
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	3532	.057	.002	0.060	-	-	.283	3935	0.01	0.35	0.28
2-3,2	Both	HDU8-SDS	3688	.060	.002	0.062	-	-	.283	3899	0.01	0.36	0.54
Line 3													
3-1	Both	HDU5-SDS	3138	.064	.004	0.068	-	-	.283	3272	0.01	0.36	0.89
3-2	Both	HDU5-SDS	3392	.069	.004	0.073	-	-	.283	3680	0.01	0.37	0.40
Line 4													
4-1,1	S->N	HDU5-SDS	2278	.046	.003	0.049	-	-	.283	2736	0.01	0.34	0.73
	N->S	HDU5-SDS	2318	.047	.003	0.050	-	-	.283	2804	0.01	0.34	0.73
4-1,2	S->N	HDU5-SDS	2169	.044	.003	0.047	-	-	.283	1368	0.00	0.33	0.46
	N->S	HDU5-SDS	246	.005	.000	0.005	-	-	.283	2841	0.01	0.30	0.41
Line A													
A-1,1	W->E	HDU2-SDS	433	.012	.001	0.013	-	-	.283	968	0.00	0.30	0.38
	E->W	HDU2-SDS	508	.015	.001	0.015	-	-	.283	1093	0.00	0.30	0.39
A-1,3	W->E	HDU2-SDS	848	.024	.001	0.025	-	-	.283	977	0.00	0.31	0.34
	E->W	HDU2-SDS	497	.014	.001	0.015	-	-	.283	1679	0.00	0.30	0.33
A-1,4	W->E	HDU2-SDS	508	.015	.001	0.015	-	-	.283	1093	0.00	0.30	0.39
	E->W	HDU2-SDS	433	.012	.001	0.013	-	-	.283	968	0.00	0.30	0.38
Line B													
B-1	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1692	0.00	0.00	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1665	0.00	0.00	0.00
Line D													
D-1,1	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1384	0.00	0.00	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	2083	0.01	0.01	0.00
D-1,2	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	2084	0.01	0.01	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1384	0.00	0.00	0.00
Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement			Slippage		Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
				Manuf in	Add in	da in	Vf lbs	da in					
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	1031	.059	.001	0.060	-	-	.283	1319	0.00	0.35	0.83
	N->S	HDU2-SDS	1031	.030	.001	0.031	-	-	.283	1319	0.00	0.32	0.76
1-2,2	S->N	HDU2-SDS	1154	.066	.001	0.067	-	-	.283	1766	0.00	0.35	0.39
	N->S	HDU2-SDS	1154	.033	.001	0.034	-	-	.283	1766	0.00	0.32	0.35
Line 3													
3-1	S->N	HDU2-SDS	1944	.111	.001	0.112	-	-	.283	2398	0.01	0.40	0.35
	N->S	HDU2-SDS	1944	.056	.002	0.058	-	-	.283	2398	0.01	0.35	0.31
Line 4													
4-2,2	S->N	HDU2-SDS	1498	.086	.001	0.086	-	-	.283	2182	0.01	0.38	0.37
	N->S	HDU2-SDS	1498	.043	.002	0.045	-	-	.283	2182	0.01	0.33	0.32
Line A													
A-1,2	W->E	HDU2-SDS	280	.016	.000	0.016	-	-	.283	820	0.00	0.30	0.37
	E->W	HDU2-SDS	280	.008	.000	0.008	-	-	.283	820	0.00	0.29	0.36
Line C													
C-2	W->E	HDU2-SDS	134	.008	.000	0.008	-	-	.283	826	0.00	0.29	0.17
	E->W	HDU2-SDS	134	.004	.000	0.004	-	-	.283	826	0.00	0.29	0.17
Line D													
D-1	Both	HDU2-SDS	0	.000	.000	0.000	-	-	.000	699	0.00	0.00	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. – Accumulated ASD hold-down tension force T and end stud compression force C from overturning, dead and wind uplift loads.

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

Unless marked with * = (ASD tension force / ASD hold-down capacity) x max ASD elongation or displacement

* - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = $TL / (Ab \times Es)$

Ab = bolt cross-sectional area

Es = steel modulus = 29000000 psi

L = Lb – Lh

Lb = Total bolt length shown in Storey Information table

Lh = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = en from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = $V_f / (270,000 D^{1.5})$ (NDS 11.3.6); D = bolt diameter, V_f = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = $0.002 \times (19\% \text{ fabrication} - 10\% \text{ in-service moisture contents}) \times L_s$

L_s = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table

Crush – Deformation of bottom plate at compression end of wall segment

= $0.02'' \times [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2r^3, r > 1]$

$r = f_{cp} / F_{cp}'$; $F_{cp}' = C_t CM F_{cp}$; $f_{cp} = C / A$, A = cross sectional area of end studs

Total d_a – Vert. Displacement + Slippage + Shrink + Crush + Extra

Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = $h / b_{eff} \times d_a$

h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall

b_{eff} = Effective wall segment length = $b - (\text{tension stud pack width} + \text{hold-down anchor bolt offset}) - (1/2 \text{ compression stud pack width})$

h and b are shown in Deflection table, b_{eff} in the Shear Wall Dimensions table

Flexible Diaphragm Seismic Design

SEISMIC INFORMATION

Level	Mass [lbs]	Area [sq.ft]	Story Shear Fx [lbs]		Shear Resistance [lbs]		Diaphragm Force [lbs]			
			E-W	N-S	E-W	N-S	E-W		N-S	
							Fpx	Design	Fpx	Design
2	32241	1202.0	5063	5063	21027	10562	5091	5091	5091	5091
1	26678	1205.5	2095	2095	24952	15735	4213	9512	4213	7591
All	58918	-	7157	7157	-	-	-	-	-	-

Legend:

Mass – Sum of all generated and input building masses on level = w_x in ASCE 7 Eqn. 12.8-12.

Story Shear – Total ASD-factored shear force induced at level x from Eqn. 12.8-11.

Shear Resistance – Lateral design strength of all shear-resisting elements on story, for use in weak story evaluation (4.1.8).

Diaphragm Force – used by Shearwalls only for drag strut forces, as per Exception to 12.10.2.1.

Fpx - Minimum ASD-factored force for diaphragm design from Eqns. 12.10-1, -2, and -3.

Design = The greater of the story shear and Fpx + transfer forces from discontinuous shearlines, factored by overstrength (ω) as per 12.10.1.1. $\omega = 2.5$ as per 12.2-1.

Design force for drag struts are determined on a shearline-by-shearline basis, and can use Fx, Fpx, or "Design" depending on the location of transfer forces.

Redundancy Factor ρ (rho):

E-W 1.30, N-S 1.30

Input by user (overriding calculated value).

Applies to shearwall design, hold-down forces and the drag strut force component based on shearline forces; does not apply to story drift, out-of-plane force, or the diaphragm force Fpx and the drag strut force component based on it.

Vertical Earthquake Load E_v

$E_v = 0.2 S_d D$; $S_d = 1.13$; $E_v = 0.226 D$ unfactored; $0.158 D$ factored; total dead load factor: $0.6 - 0.158 = 0.442$ tension, $1.0 + 0.158 = 1.158$ compression.

Weak Story (SDPWS 4.1.8)

The lateral resistance of each story is greater than or equal to that of the story above. This vertical distribution of SFRS is permitted.

SHEAR RESULTS (flexible seismic design)

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	1756	-	-	-	-	-	-	-	3380	-
Wall 1-1	1	Both	129.5	-	518	-	.89	-	280	-	-	249	997	0.52
Wall 1-2	1	Both	-	-	1238	-	1.0	-	280	-	-	-	2383	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	145.7	-	1238	-	1.0	-	280	-	-	280	2383	0.52
Line 2														
Level 1														
Ln2, Lev1	-	Both	-	-	2966	-	-	-	-	-	-	-	6886	-
Wall 2-3	3	Both	-	-	2966	-	1.0	-	430	-	-	-	6886	-
Seg. 1	-	Both	185.4	-	1946	-	1.0	-	430	-	-	430	4519	0.43
Seg. 2	-	Both	185.4	-	1020	-	1.0	-	430	-	-	430	2367	0.43
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	2893	-	-	-	-	-	-	-	4519	-
Wall 3-1	3	Both	275.6	-	2893	-	1.0	-	430	-	-	430	4519	0.64
Level 1														
Ln3, Lev1	-	Both	-	-	3621	-	-	-	-	-	-	-	4546	-
Wall 3-1	4	Both	300.0	-	1050	-	.88	-	430	-	-	377	1318	0.80
Wall 3-2	4	Both	342.9	-	2571	-	1.0	-	430	-	-	430	3228	0.80
Line 4														
Level 2														
Ln4, Lev2	-	Both	-	-	1932	-	-	-	-	-	-	-	2663	-
Wall 4-2	1	Both	-	-	1932	-	1.0	-	280	-	-	-	2663	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	203.3	-	1932	-	1.0	-	280	-	-	280	2663	0.73
Level 1														
Ln4, Lev1	-	Both	-	-	2717	-	-	-	-	-	-	-	4304	-
Wall 4-1	4	Both	-	-	2717	-	1.0	-	430	-	-	-	4304	-
Seg. 1	-	Both	271.7	-	1087	-	1.0	-	430	-	-	430	1721	0.63
Seg. 2	-	Both	271.7	-	1630	-	1.0	-	430	-	-	430	2582	0.63
Seg. 3	-	Both	0.0	-	0	-	1.0	-	430	-	-	430	-	-
E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	1541	-	-	-	-	-	-	-	2103	-
Wall A-1	1	Both	-	-	1541	-	1.0	-	280	-	-	-	2103	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	205.4	-	1541	-	1.0	-	280	-	-	280	2103	0.73
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Level 1														
LnA, Lev1	-	Both	-	-	1934	-	-	-	-	-	-	-	5747	-
Wall A-1	1	Both	-	-	1934	-	1.0	-	280	-	-	-	5747	-
Seg. 1	-	Both	94.4	-	613	-	1.0	-	280	-	-	280	1822	0.34
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 3	-	Both	94.4	-	708	-	1.0	-	280	-	-	280	2103	0.34
Seg. 4	-	Both	94.4	-	613	-	1.0	-	280	-	-	280	1822	0.34
Line B														
LnB, Lev1	-	Both	-	-	3308	-	-	-	-	-	-	-	5888	-
Wall B-1	1	Both	157.5	-	3308	-	1.0	-	280	-	-	280	5888	0.56
Line C														
Level 2														
LnC, Lev2	-	Both	-	-	2755	-	-	-	-	-	-	-	4486	-
Wall C-2	2^	Both	172.2	-	2755	-	1.0	-	280	-	-	280	4486	0.61
Line D														
LnD, Lev2	1	Both	44.4	-	2285	-	1.0	-	280	-	-	280	14438	0.16
Level 1														
LnD, Lev1	-	Both	-	-	4063	-	-	-	-	-	-	-	13317	-
Wall D-1	1	Both	-	-	4063	-	1.0	-	280	-	-	-	13317	-
Seg. 1	-	Both	85.5	-	2053	-	1.0	-	280	-	-	280	6729	0.31
Seg. 2	-	Both	85.5	-	2010	-	1.0	-	280	-	-	280	6588	0.31

Legend:

W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "A" means that this wall is critical for all walls in the Standard Wall group.

For Dir - Direction of seismic force along shearline.

v - Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)

v_{max}/v_{ft} - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4

FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.

V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment

Asp/Cub – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum b_i / FHS from 4.3.5.6 with b_i defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.

Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.

Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.

C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.

Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.

V – Total factored shear capacity of shearline, wall or segment.

Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "W" indicates that the wind design criterion was critical in selecting wall.

Notes:

Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (flexible seismic design)

Level 1 Line-Wall	Posit'n	Location [ft]		Tensile Hold-down or Compressive Stud Force [lbs]				Hold-down	Cap [lbs]	Crit Resp.
		X	Y	Shear	Dead	Ev	Cmb'd			
Line 1										
	V Elem	0.00	-3.87	1243	108	28	1164	Refer to upper level		
	V Elem	0.00	-3.87	1243	180	28	1452	Compression		
	V Elem	0.00	-2.12	602	735	193	60	Refer to upper level		
	V Elem	0.00	-2.12	602	1224	193	2019	Compression		
	V Elem	0.00	-0.12	1243	108	28	1164	Refer to upper level		
	V Elem	0.00	-0.12	1243	180	28	1452	Compression		
	V Elem	0.00	14.13	908	668	176	416	Refer to upper level		
	V Elem	0.00	14.13	908	1113	176	2197	Compression		
	V Elem	0.00	15.88	1510	230	60	1341	Refer to upper level		
	V Elem	0.00	15.88	1510	383	60	1953	Compression		
Line 2										
2-3	L End	20.50	-3.87	1519	151	40	1408	HDU8-SDS	6765	0.21
2-3	L End	20.50	-3.87	1519	252	40	1811	Compression	10312	0.18
2-3	L Op 1	20.50	6.38	1519	202	53	1371	HDU8-SDS	6765	0.20
2-3	L Op 1	20.50	6.38	1519	336	53	1908	Compression	10312	0.19
2-3	R Op 1	20.50	10.13	1554	130	34	1458	HDU8-SDS	6765	0.22
2-3	R Op 1	20.50	10.13	1554	216	34	1804	Compression	10312	0.17
2-3	R End	20.50	15.38	1554	79	21	1495	HDU8-SDS	6765	0.22
2-3	R End	20.50	15.38	1554	132	21	1706	Compression	10312	0.17
Line 3										
3-1	L End	26.00	0.12	2585	50	13	2548	HDU5-SDS	5645	0.45
3-1	L End	26.00	0.12	2585	84	13	2682	Compression	10312	0.26
3-1	R End	26.00	3.38	2585	50	13	2548	HDU5-SDS	5645	0.45
3-1	R End	26.00	3.38	2585	84	13	2682	Compression	10312	0.26
	V Elem	24.00	5.13	2541	170	45	2415	Refer to upper level		
	V Elem	24.00	5.13	2541	284	45	2869	Compression		
3-2	L End	26.00	7.13	2837	108	28	2758	HDU5-SDS	5645	0.49
3-2	L End	26.00	7.13	2837	180	28	3046	Compression	10312	0.30
3-2	R End	26.00	14.38	2837	108	28	2758	HDU5-SDS	5645	0.49
3-2	R End	26.00	14.38	2837	180	28	3046	Compression	10312	0.30
	V Elem	24.00	15.38	2541	170	45	2415	Refer to upper level		
	V Elem	24.00	15.38	2541	284	45	2869	Compression		
Line 4										
4-1	L End	51.50	-9.87	2318	197	52	2173	HDU5-SDS	5645	0.38
4-1	L End	51.50	-9.87	2318	329	52	2699	Compression	10312	0.26
	V Elem	51.50	-7.12	0	315	50	365	Compression		
4-1	L Op 1	51.50	-6.12	2318	289	76	2106	HDU5-SDS	5645	0.37
4-1	L Op 1	51.50	-6.12	2318	481	76	2875	Compression	10312	0.28
4-1	R Op 1	51.50	-0.37	2268	384	101	1985	HDU5-SDS	5645	0.35
4-1	R Op 1	51.50	-0.37	2268	261	41	2570	Compression	10312	0.25
	V Elem	51.50	0.12	0	315	50	365	Compression		
	V Elem	51.50	2.88	0	158	25	182	Compression		
4-1	L Op 2	51.50	5.38	423	1178	186	1786	Compression	10312	0.17
	V Elem	51.50	14.13	281	250	66	97	Refer to upper level		
	V Elem	51.50	14.13	281	417	66	765	Compression		
	V Elem	51.50	15.88	2127	257	68	1938	Refer to upper level		
	V Elem	51.50	15.88	2127	428	68	2622	Compression		
Line A										
A-1	L End	22.63	-10.00	785	247	65	603	HDU2-SDS	3075	0.20
A-1	L End	22.63	-10.00	785	412	65	1262	Compression	10312	0.12
	V Elem	24.38	-10.00	0	405	64	469	Compression		
A-1	L Op 1	28.88	-10.00	785	233	61	614	HDU2-SDS	3075	0.20
A-1	L Op 1	28.88	-10.00	785	388	61	1234	Compression	10312	0.12
	V Elem	31.63	-10.00	0	100	16	116	Compression		
	V Elem	31.88	-10.00	669	216	57	510	Refer to upper level		
	V Elem	31.88	-10.00	669	360	57	1086	Compression		
A-1	R Op 2	34.63	-10.00	2024	530	139	1634	HDU2-SDS	3075	0.53
A-1	R Op 2	34.63	-10.00	2024	883	139	3046	Compression	10312	0.30
	V Elem	40.88	-10.00	1913	432	114	1594	Refer to upper level		
	V Elem	40.88	-10.00	1913	720	114	2746	Compression		
A-1	L Op 3	41.88	-10.00	781	252	66	595	HDU2-SDS	3075	0.19
A-1	L Op 3	41.88	-10.00	781	420	66	1267	Compression	10312	0.12
A-1	R Op 3	45.13	-10.00	785	245	64	605	HDU2-SDS	3075	0.20
A-1	R Op 3	45.13	-10.00	785	408	64	1257	Compression	10312	0.12
	V Elem	49.63	-10.00	0	383	60	443	Compression		
A-1	R End	51.38	-10.00	785	247	65	603	HDU2-SDS	3075	0.20
A-1	R End	51.38	-10.00	785	412	65	1262	Compression	10312	0.12
Line B										
B-1	L End	0.12	-4.00	1275	689	181	768	HDU2-SDS	3075	0.25
B-1	L End	0.12	-4.00	1275	1148	181	2604	Compression	10312	0.25
	V Elem	2.38	-4.00	0	180	28	208	Compression		

Hold-Down and Compression Design (flexible seismic design, continued)

Line C	B-1	V Elem	6.63	-4.00	0	180	28	208	Compression		
		V Elem	8.38	-4.00	0	203	32	234	Compression		
		V Elem	13.13	-4.00	0	203	32	234	Compression		
		V Elem	14.88	-4.00	0	180	28	208	Compression		
		V Elem	19.12	-4.00	0	180	28	208	Compression		
	B-1	R End	20.88	-4.00	1275	698	184	761	HDU2-SDS	3075	0.25
		R End	20.88	-4.00	1275	1163	184	2621	Compression	10312	0.25
	Line D	V Elem	1.63	0.00	1574	259	68	1383	Refer to upper level		
		V Elem	1.63	0.00	1574	432	68	2075	Compression		
		V Elem	17.38	0.00	1574	259	68	1383	Refer to upper level		
		V Elem	17.38	0.00	1574	432	68	2075	Compression		
Level 2	D-1	L End	0.12	16.00	1093	1483	390	0	Not required	3075	0.00
		L End	0.12	16.00	1093	2818	445	4355	Compression	10312	0.42
	D-1	L Op 1	23.88	16.00	691	938	247	0	Not required	3075	0.00
		L Op 1	23.88	16.00	691	2177	344	3213	Compression	10312	0.31
	D-1	R Op 1	28.13	16.00	692	939	247	0	Not required	3075	0.00
		R Op 1	28.13	16.00	692	2178	344	3213	Compression	10312	0.31
	D-1	R End	51.38	16.00	1093	1483	390	0	Not required	3075	0.00
		R End	51.38	16.00	1093	2818	445	4356	Compression	10312	0.42
					Tensile Hold-down or Compressive Stud Force [lbs]						
	Line-Wall	Posit'n	Location [ft]		Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
Line 1	1-1	L End	1.00	-3.87	1243	108	28	1164	HDU2-SDS	3075	0.38
		L End	1.00	-3.87	1243	180	28	1452	Compression	10312	0.14
	1-1	R End	1.00	-0.12	1243	108	28	1164	HDU2-SDS	3075	0.38
		R End	1.00	-0.12	1243	180	28	1452	Compression	10312	0.14
	1-2	V Elem	0.00	0.88	0	293	46	339	Compression		
		R Op 1	0.00	7.63	1510	405	107	1212	HDU2-SDS	3075	0.39
	1-2	R Op 1	0.00	7.63	1510	675	107	2292	Compression	10312	0.22
		R End	0.00	15.88	1510	230	60	1341	HDU2-SDS	3075	0.44
	1-2	R End	0.00	15.88	1510	383	60	1953	Compression	10312	0.19
Line 3	3-1	L End	24.00	5.13	2541	170	45	2415	HDU2-SDS	3075	0.79
		L End	24.00	5.13	2541	284	45	2869	Compression	10312	0.28
	3-1	R End	24.00	15.38	2541	170	45	2415	HDU2-SDS	3075	0.79
		R End	24.00	15.38	2541	284	45	2869	Compression	10312	0.28
Line 4	4-1	L Op 1	51.50	-7.12	0	315	50	365	Compression		-
		V Elem	51.50	0.12	0	315	50	365	Compression		
		V Elem	51.50	2.88	0	158	25	182	Compression		
	4-2	R Op 1	51.50	6.63	2127	351	92	1868	HDU2-SDS	3075	0.61
		R Op 1	51.50	6.63	2127	585	92	2804	Compression	10312	0.27
	4-2	R End	51.50	15.88	2127	257	68	1938	HDU2-SDS	3075	0.63
		R End	51.50	15.88	2127	428	68	2622	Compression	10312	0.25
Line A	A-1	V Elem	24.38	-10.00	0	405	64	469	Compression		
		R Op 1	33.63	-10.00	1913	446	117	1584	HDU2-SDS	3075	0.52
	A-1	R Op 1	33.63	-10.00	1913	743	117	2772	Compression	10312	0.27
		L Op 2	40.88	-10.00	1913	432	114	1594	HDU2-SDS	3075	0.52
	A-1	L Op 2	40.88	-10.00	1913	720	114	2746	Compression	10312	0.27
		V Elem	49.63	-10.00	0	383	60	443	Compression		
Line B	V Elem		2.38	-4.00	0	180	28	208	Compression		
			6.63	-4.00	0	180	28	208	Compression		
			8.38	-4.00	0	203	32	234	Compression		
			13.13	-4.00	0	203	32	234	Compression		
			14.88	-4.00	0	180	28	208	Compression		
			19.12	-4.00	0	180	28	208	Compression		
Line C	C-2	L End	1.63	0.00	1574	259	68	1383	HDU2-SDS	3075	0.45
		L End	1.63	0.00	1574	432	68	2075	Compression	10312	0.20
	C-2	R End	17.38	0.00	1574	259	68	1383	HDU2-SDS	3075	0.45
		R End	17.38	0.00	1574	432	68	2075	Compression	10312	0.20
Line D	D-1	L End	0.12	16.00	401	545	143	0	Not required	3075	0.00
		L End	0.12	16.00	401	1078	170	1650	Compression	10312	0.16
	D-1	R End	51.38	16.00	401	545	143	0	Not required	3075	0.00
		R End	51.38	16.00	401	1078	170	1650	Compression	10312	0.16

Legend:

Line-Wall:*At wall or opening – Shearline and wall number**At vertical element – Shearline**Posit'n – Position of stud pack that hold-down is attached to:**V Elem – Vertical element: column or strengthened studs required where not at wall end or opening**L or R End – At left or right wall end**L or R Op n – At left or right side of opening n**t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1**Location – Co-ordinates in Plan View**Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.**Shear – Overturning component = $V \times h / beff$ from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.70; h = wall height, $beff$ = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = $V \times h / Co$ sum (bi) from SDPWS Eqn. 4.3-8.**Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression**Ev – Vertical seismic load effect from ASCE 7 12.4.2.2 = $-0.2 Sds \times ASD \text{ factor} \times \text{unfactored } D = 0.263 SDS \times \text{factored } D$. Refer to Seismic Information table for more details.**Cmb'd – Sum of ASD-factored overturning, dead and vertical seismic forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.**Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate**Cap – Hold-downs: Allowable ASD tension load from database; Compression: Allowable ASD bearing force = $Ct CM Cb Fcp A$; A = cross sectional area of end studs. Refer to Framing materials table for details.**Crit. Resp. – Critical Response = Combined ASD force/Allowable ASD tension load***Notes:**

HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.

HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

Combined force from ASCE 7 2.4.1 load combination 10 = $-(0.6D - 0.7Ev + 0.7Eh)$; Eh (from 12.4.2.1) = - shear overturning forceRefer to the Shear Line Dimensions table for wall height h , effective segment length $beff$ and perforated wall adjusted sum of bi , to the Story Table for joist depth, and to the Shear Results table for perforated factor Co .

Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (flexible seismic design)

Level 1	Line-Wall	Position on Wall or Opening	Location [ft]		Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line 2			X	Y	--->	<---	--->	<---
		Shearline force			7794	7794		
2-3		Left Wall End	20.50	-4.00	-1799	1799		
2-3		Left Opening 1	20.50	6.50	169	-169		
2-3		Right Opening 1	20.50	10.00	-881	881		
2-3		Right Wall End	20.50	15.50	150	-150		
Line 3		Shearline force			5767	5767		
3-1		Left Wall End	26.00	0.00	-2218	2218		
3-1		Right Wall End	26.00	3.50	-1322	1322		
3-2		Left Wall End	26.00	7.00	-2099	2099		
3-2		Right Wall End	26.00	14.50	333	-333		
Line 4		Shearline force			4733	4733		
4-1		Left Opening 1	51.50	-6.00	1165	-1165		
4-1		Right Opening 1	51.50	-0.50	164	-164		
4-1		Left Opening 2	51.50	5.50	1911	-1911		
Line A		Shearline force			2400	2400		
A-1		Left Opening 1	29.00	-10.00	223	-223		
A-1		Right Opening 2	34.50	-10.00	-232	232		
A-1		Left Opening 3	42.00	-10.00	25	-25		
A-1		Right Opening 3	45.00	-10.00	-223	223		
Line B		Shearline force			6621	6621		
B-1		Right Wall End	21.00	-4.00	3921	-3921		
Line D		Shearline force			5669	5669		
D-1		Left Opening 1	24.00	16.00	222	-222		
D-1		Right Opening 1	28.00	16.00	-218	218		
Level 2	Line-Wall	Position on Wall or Opening	Location [ft]		Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line 1			X	Y	--->	<---	--->	<---
		Shearline force			1756	1756		
1-1		Right Wall End	1.00	0.00	167	-167		
1-2		Right Opening 1	0.00	7.50	-492	492		
Line 3		Shearline force			2893	2893		
3-1		Left Wall End	24.00	5.00	-1669	1669		
3-1		Right Wall End	24.00	15.50	56	-56		
Line 4		Shearline force			1932	1932		
4-2		Right Opening 1	51.50	6.50	-1226	1226		
Line A		Shearline force			1541	1541		
A-1		Right Opening 1	33.50	-10.00	-584	584		
A-1		Left Opening 2	41.00	-10.00	558	-558		
Line C		Shearline force			2755	2755		
C-2		Left Wall End	1.50	0.00	-80	80		
C-2		Right Wall End	17.50	0.00	1819	-1819		

Legend:

Line-Wall - Shearline and wall number

Position...- Side of opening or wall end that drag strut is attached to

Location - Co-ordinates in Plan View

Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.

Based on ASD-factored shearline force shown. For SDC C-F, it is the greater of the design shearline force and the diaphragm force F_{px} , added to shearline force from story above and to forces transferred from discontinuous shearlines factored by overstrength (ω) as per 12.10.1.1.Refer to Seismic Information table for diaphragm forces and ω factor.

For SDC D-F, if horizontal torsional irregularities 2, 3, or 4 are input, or vertical irregularity 4 detected or input, 25% increase from 12.3.3.4 applied.

For perforated walls, this force is converted to v_{max} using 4.3.6.4.1.1.

Strap/Blocking Force - For FTAO walls, force transferred from above and below opening to shearwall pier.

-> Due to shearline force in the west-to-east or south-to-north direction

<- Due to shearline force in the east-to-west or north-to-south direction

DEFLECTION (flexible seismic design)

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/ in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	203.7	10.50	8.00	16.5	.003	18.4	201	.034	.088	0.25	0.34
2-3,2		Both	1S	203.7	5.50	8.00	16.5	.006	18.4	201	.034	.088	0.49	0.59
Line 3														
3-1	4	Both	1S	329.7	3.50	8.00	16.5	.015	18.4	201	.034	.143	0.90	1.06
3-2	4	Both	1S	376.8	7.50	8.00	16.5	.008	18.4	201	.034	.164	0.41	0.58
Line 4														
4-1,1	4	S->N	ExtS	298.5	4.00	8.00	16.5	.012	18.4	201	.034	.130	0.76	0.90
		N->S	ExtS	298.5	4.00	8.00	16.5	.012	18.4	201	.034	.130	0.75	0.89
4-1,2		S->N	ExtS	298.6	6.00	8.00	16.5	.008	18.4	201	.034	.130	0.48	0.62
		N->S	ExtS	298.6	6.00	8.00	16.5	.008	18.4	201	.034	.130	0.01	0.15
Line A														
A-1,1	1	Both	ExtS	103.7	6.50	8.00	16.5	.002	13.8	196	.032	.060	0.40	0.46
A-1,3		W->E	ExtS	103.7	7.50	8.00	16.5	.002	13.8	196	.032	.060	0.42	0.48
		E->W	ExtS	103.7	7.50	8.00	16.5	.002	13.8	196	.032	.060	0.35	0.41
A-1,4		Both	ExtS	103.7	6.50	8.00	16.5	.002	13.8	196	.032	.060	0.40	0.46
Line B														
B-1	1	Both	ExtS	173.1	21.00	8.00	16.5	.001	13.8	196	.032	.100	0.12	0.23
Line D														
D-1,1	1	Both	ExtS	94.0	24.00	8.00	16.5	.001	13.8	196	.032	.055	0.00	0.06
D-1,2		Both	ExtS	94.0	23.50	8.00	16.5	.001	13.8	196	.032	.055	0.00	0.06
Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/ in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 2														
Line 1														
1-1	1	S->N	ExtS	142.3	4.00	9.00	16.5	.008	13.8	196	.032	.093	0.91	1.01
		N->S	ExtS	142.3	4.00	9.00	16.5	.008	13.8	196	.032	.093	0.80	0.90
1-2,2	1	S->N	ExtS	160.1	8.50	9.00	16.5	.004	13.8	196	.032	.104	0.42	0.53
		N->S	ExtS	160.1	8.50	9.00	16.5	.004	13.8	196	.032	.104	0.38	0.48
Line 3														
3-1	3	S->N	1S	302.8	10.50	9.00	16.5	.006	18.4	201	.034	.148	0.42	0.57
		N->S	1S	302.8	10.50	9.00	16.5	.006	18.4	201	.034	.148	0.34	0.49
Line 4														
4-2,2	1	S->N	ExtS	223.4	9.50	9.00	16.5	.005	13.8	196	.032	.146	0.42	0.58
		N->S	ExtS	223.4	9.50	9.00	16.5	.005	13.8	196	.032	.146	0.36	0.51
Line A														
A-1,2	1	W->E	ExtS	225.8	7.50	9.00	16.5	.007	13.8	196	.032	.147	0.51	0.67
		E->W	ExtS	225.8	7.50	9.00	16.5	.007	13.8	196	.032	.147	0.44	0.60
Line C														
C-2	2	W->E	1S	189.2	16.00	9.00	16.5	.003	13.8	196	.032	.123	0.23	0.35
		E->W	1S	189.2	16.00	9.00	16.5	.003	13.8	196	.032	.123	0.20	0.32
Line D														
D-1	1	Both	ExtS	48.8	51.50	9.00	16.5	.000	13.8	196	.032	.032	0.00	0.03

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – Unfactored (strength-level) shear force per unit distance on wall segment = ASD force / 0.70, as per ASCE 7 12.8.6.

Unblocked walls = v / C_{ub} as per SDPWS 4.3.4.3, C_{ub} = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = v_{max} from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = $8vh^3 / EA_b$; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials table

For i studs at one end and j at the other, $A = 2ij / (i + j) \times$ area of one stud, based on Ex. C4.3.4-3

Shear = $vh / 1000 G_a$; $G_a = 1.4 v_s / (1.4 v_s / G_{vtv} + 0.75 e_n)$ from SDPWS Eqn. C4.2.3-3.

v_s = ASD sheathing capacity.

G_{vtv} = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

e_n = Nail slip from Table C4.2.3D, of form aVn^b for WSP, varies linearly to value at capacity for other materials.

V_n = Strength-level shear force per nail along panel edge at ASD capacity = 1.4 vs.

Hold – Anchorage system (hold-down) = $d_a \times h / b_{eff}$.

d_a = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

b_{eff} = Effective wall segment length = *b* - (tension stud pack width + hold-down anchor bolt offset) - (1/2 compression stud pack width)
b_{eff} is given in the Shear Wall Dimensions table.

For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.

Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.

For FTAO walls, the average of the values for the segments, as per APA T555.

HOLD-DOWN DISPLACEMENT (flexible seismic design)

Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Manuf in	Displacement Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	S->N	HDU8-SDS	1408	.034	.001	0.034	-	-	.283	2216	0.01	0.32	0.25
	N->S	HDU8-SDS	1371	.033	.001	0.033	-	-	.283	2079	0.01	0.32	0.25
2-3,2	S->N	HDU8-SDS	1458	.035	.001	0.036	-	-	.283	1922	0.01	0.32	0.49
	N->S	HDU8-SDS	1495	.036	.001	0.036	-	-	.283	2058	0.01	0.33	0.50
Line 3													
3-1	Both	HDU5-SDS	2548	.071	.003	0.074	-	-	.283	2977	0.01	0.37	0.90
3-2	Both	HDU5-SDS	2758	.077	.003	0.080	-	-	.283	3411	0.01	0.37	0.41
Line 4													
4-1,1	S->N	HDU5-SDS	2173	.061	.003	0.063	-	-	.283	3330	0.01	0.36	0.76
	N->S	HDU5-SDS	2106	.059	.002	0.061	-	-	.283	3082	0.01	0.35	0.75
4-1,2	S->N	HDU5-SDS	1985	.056	.002	0.058	-	-	.283	2069	0.01	0.35	0.48
	N->S	HDU5-SDS	0	.000	.000	0.000	-	-	.000	2902	0.01	0.01	0.01
Line A													
A-1,1	W->E	HDU2-SDS	603	.023	.001	0.024	-	-	.283	1493	0.00	0.31	0.40
	E->W	HDU2-SDS	614	.024	.001	0.024	-	-	.283	1533	0.00	0.31	0.40
A-1,3	W->E	HDU2-SDS	2303	.088	.003	0.091	-	-	.283	1541	0.00	0.38	0.42
	E->W	HDU2-SDS	595	.023	.001	0.024	-	-	.283	4395	0.01	0.32	0.35
A-1,4	W->E	HDU2-SDS	605	.023	.001	0.024	-	-	.283	1533	0.00	0.31	0.40
	E->W	HDU2-SDS	603	.023	.001	0.024	-	-	.283	1525	0.00	0.31	0.40
Line B													
B-1	W->E	HDU2-SDS	768	.029	.001	0.030	-	-	.283	3291	0.01	0.32	0.12
	E->W	HDU2-SDS	761	.029	.001	0.030	-	-	.283	3267	0.01	0.32	0.12
Line D													
D-1,1	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	3395	0.01	0.01	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	4210	0.01	0.01	0.00
D-1,2	W->E	HDU2-SDS	0	.000	.000	0.000	-	-	.000	4211	0.01	0.01	0.00
	E->W	HDU2-SDS	0	.000	.000	0.000	-	-	.000	3395	0.01	0.01	0.00
Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Manuf in	Displacement Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	1164	.089	.001	0.090	-	-	.283	1659	0.00	0.38	0.91
	N->S	HDU2-SDS	1164	.045	.001	0.046	-	-	.283	1659	0.00	0.33	0.80
1-2,2	S->N	HDU2-SDS	1212	.093	.001	0.094	-	-	.283	2281	0.01	0.38	0.42
	N->S	HDU2-SDS	1341	.051	.002	0.053	-	-	.283	2757	0.01	0.34	0.38
Line 3													
3-1	S->N	HDU2-SDS	2415	.185	.001	0.187	-	-	.283	3253	0.01	0.48	0.42
	N->S	HDU2-SDS	2415	.093	.003	0.096	-	-	.283	3253	0.01	0.39	0.34
Line 4													
4-2,2	S->N	HDU2-SDS	1868	.143	.001	0.144	-	-	.283	3032	0.01	0.44	0.42
	N->S	HDU2-SDS	1938	.074	.002	0.077	-	-	.283	3288	0.01	0.37	0.36
Line A													
A-1,2	W->E	HDU2-SDS	1584	.122	.001	0.122	-	-	.283	3272	0.01	0.41	0.51
	E->W	HDU2-SDS	1594	.061	.002	0.063	-	-	.283	3309	0.01	0.36	0.44
Line C													
C-2	W->E	HDU2-SDS	1383	.106	.001	0.107	-	-	.283	2432	0.01	0.40	0.23
	E->W	HDU2-SDS	1383	.053	.002	0.055	-	-	.283	2432	0.01	0.34	0.20
Line D													
D-1	Both	HDU2-SDS	0	.000	.000	0.000	-	-	.000	1658	0.00	0.00	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. – Accumulated ASD hold-down tension force T and strength-level end compression force C from overturning, dead and vertical earthquake loads.

Tens. – ASD-factored force, used for proportion of manufacturer's maximum elongation

Comp. – Strength level force as per ASCE 12.8.6

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

Unless marked with * = (ASD tension force / ASD hold-down capacity) x max strength-level elongation or displacement

* - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = $TL / (Ab \times Es)$

T = Strength level tension force (not shown)

Ab = bolt cross-sectional area

E_s = steel modulus = 29000000 psi

$L = L_b - L_h$

L_b = Total bolt length shown in Storey Information table

L_h = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = e_n from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = $V_f / (270,000 D^{1.5})$ (NDS 11.3.6); D = bolt diameter, V_f = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = $0.002 \times (19\% \text{ fabrication} - 10\% \text{ in-service moisture contents}) \times L_s$

L_s = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table

Crush – Deformation of bottom plate at compression end of wall segment

= $0.02'' \times [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2r^3, r > 1]$

$r = f_{cp} / F_{cp}'$; $F_{cp}' = C_t CM F_{cp}$; $f_{cp} = C / A$, A = cross sectional area of end studs

Total d_a – Vert. Displacement + Slippage + Shrink + Crush + Extra

Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = $h / beff \times d_a$

h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall

$beff$ = Effective wall segment length = $b - (\text{tension stud pack width} + \text{hold-down anchor bolt offset}) - (1/2 \text{ compression stud pack width})$

h and b are shown in Deflection table, $beff$ in the Shear Wall Dimensions table

Rigid Diaphragm Seismic Design

SEISMIC INFORMATION

Level	Mass [lbs]	Area [sq.ft]	Story Shear Fx [lbs]		Shear Resistance [lbs]		Diaphragm Force [lbs]			
			E-W	N-S	E-W	N-S	E-W		N-S	
							Fpx	Design	Fpx	Design
2	32241	1202.0	5063	5063	21027	10562	5091	5091	5091	5091
1	26678	1205.5	2095	2095	24952	15735	4213	8588	4213	9143
All	58918	-	7157	7157	-	-	-	-	-	-

Legend:

Mass – Sum of all generated and input building masses on level = w_x in ASCE 7 Eqn. 12.8-12.

Story Shear – Total ASD-factored shear force induced at level x from Eqn. 12.8-11.

Shear Resistance – Lateral design strength of all shear-resisting elements on story, for use in weak story evaluation (4.1.8).

Diaphragm Force – used by Shearwalls only for drag strut forces, as per Exception to 12.10.2.1.

Fpx - Minimum ASD-factored force for diaphragm design from Eqns. 12.10-1, -2, and -3.

Design = The greater of the story shear and Fpx + transfer forces from discontinuous shearlines, factored by overstrength (ω) as per 12.10.1.1. $\omega = 3.0$ as per 12.2-1.

Design force for drag struts are determined on a shearline-by-shearline basis, and can use Fx, Fpx, or "Design" depending on the location of transfer forces.

On at least one level and force direction, a torsional irregularity was detected and torsional amplification factor A_x applied according to 12.8.4.3. Refer to the Torsional Analysis section of the Log File output for the values of A_x .

Redundancy Factor ρ (rho):

E-W 1.30, N-S 1.30

Input by user (overriding calculated value).

Applies to shearwall design, hold-down forces and the drag strut force component based on shearline forces; does not apply to story drift, out-of-plane force, or the diaphragm force Fpx and the drag strut force component based on it.

Vertical Earthquake Load E_v

$E_v = 0.2 S_d S_d$; $S_d = 1.13$; $E_v = 0.226 D$ unfactored; $0.158 D$ factored; total dead load factor: $0.6 - 0.158 = 0.442$ tension, $1.0 + 0.158 = 1.158$ compression.

Weak Story (SDPWS 4.1.8)

The lateral resistance of each story is greater than or equal to that of the story above. This vertical distribution of SFRS is permitted.

SHEAR RESULTS (rigid seismic design)

N-S Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line 1														
Level 2														
Ln1, Lev2	-	Both	-	-	2136	-	-	-	-	-	-	-	3380	-
Wall 1-1	1	Both	157.5	-	630	-	.89	-	280	-	-	249	997	0.63
Wall 1-2	1	Both	-	-	1506	-	1.0	-	280	-	-	-	2383	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	177.2	-	1506	-	1.0	-	280	-	-	280	2383	0.63
Line 2														
Level 1														
Ln2, Lev1	-	Both	-	-	4856	-	-	-	-	-	-	-	6886	-
Wall 2-3	3	Both	-	-	4856	-	1.0	-	430	-	-	-	6886	-
Seg. 1	-	Both	303.5	-	3187	-	1.0	-	430	-	-	430	4519	0.71
Seg. 2	-	Both	303.5	-	1669	-	1.0	-	430	-	-	430	2367	0.71
Line 3														
Level 2														
Ln3, Lev2	-	Both	-	-	2834	-	-	-	-	-	-	-	4519	-
Wall 3-1	3	Both	269.9	-	2834	-	1.0	-	430	-	-	430	4519	0.63
Level 1														
Ln3, Lev1	-	Both	-	-	2938	-	-	-	-	-	-	-	4546	-
Wall 3-1	4	Both	243.4	-	852	-	.88	-	430	-	-	377	1318	0.65
Wall 3-2	4	Both	278.1	-	2086	-	1.0	-	430	-	-	430	3228	0.65
Line 4														
Level 2														
Ln4, Lev2	-	Both	-	-	2100	-	-	-	-	-	-	-	2663	-
Wall 4-2	1^	Both	-	-	2100	-	1.0	-	280	-	-	-	2663	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	221.1	-	2100	-	1.0	-	280	-	-	280	2663	0.79
Level 1														
Ln4, Lev1	-	Both	-	-	2252	-	-	-	-	-	-	-	4304	-
Wall 4-1	4	Both	-	-	2252	-	1.0	-	430	-	-	-	4304	-
Seg. 1	-	Both	225.2	-	901	-	1.0	-	430	-	-	430	1721	0.52
Seg. 2	-	Both	225.2	-	1351	-	1.0	-	430	-	-	430	2582	0.52
Seg. 3	-	Both	0.0	-	0	-	1.0	-	430	-	-	430	-	-
E-W Shearlines	W Gp	For Dir	ASD Shear Force [plf]			Asp-Cub		Allowable Shear [plf]						Resp. Ratio
			v	vmax/vft	V [lbs]	Int	Ext	Int	Ext	Co	C	Cmb	V [lbs]	
Line A														
Level 2														
LnA, Lev2	-	Both	-	-	1119	-	-	-	-	-	-	-	2103	-
Wall A-1	1	Both	-	-	1119	-	1.0	-	280	-	-	-	2103	-
Seg. 1	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 2	-	Both	149.3	-	1119	-	1.0	-	280	-	-	280	2103	0.53
Seg. 3	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Level 1														
LnA, Lev1	-	Both	-	-	2740	-	-	-	-	-	-	-	5747	-
Wall A-1	1	Both	-	-	2740	-	1.0	-	280	-	-	-	5747	-
Seg. 1	-	Both	133.7	-	869	-	1.0	-	280	-	-	280	1822	0.48
Seg. 2	-	Both	0.0	-	0	-	1.0	-	280	-	-	280	-	-
Seg. 3	-	Both	133.7	-	1003	-	1.0	-	280	-	-	280	2103	0.48
Seg. 4	-	Both	133.7	-	869	-	1.0	-	280	-	-	280	1822	0.48
Line B														
LnB, Lev1	-	Both	-	-	2570	-	-	-	-	-	-	-	5888	-
Wall B-1	1	Both	122.4	-	2570	-	1.0	-	280	-	-	280	5888	0.44
Line C														
Level 2														
LnC, Lev2	-	Both	-	-	1896	-	-	-	-	-	-	-	4486	-
Wall C-2	2	Both	118.5	-	1896	-	1.0	-	280	-	-	280	4486	0.42
Line D														
LnD, Lev2	1	Both	80.0	-	4122	-	1.0	-	280	-	-	280	14438	0.29
Level 1														
LnD, Lev1	-	Both	-	-	5134	-	-	-	-	-	-	-	13317	-
Wall D-1	1	Both	-	-	5134	-	1.0	-	280	-	-	-	13317	-
Seg. 1	-	Both	108.1	-	2594	-	1.0	-	280	-	-	280	6729	0.39
Seg. 2	-	Both	108.1	-	2540	-	1.0	-	280	-	-	280	6588	0.39

Legend:

W Gp - Wall design group defined in Sheathing and Framing Materials tables, where it shows associated Standard Wall. "^" means that this wall is critical for all walls in the Standard Wall group.

For Dir - Direction of seismic force along shearline.

v - Design shear force on segment = ASD-factored shear force per unit length of full-height sheathing (FHS)

v_{max}/v_{ft} - Perforated walls: Collector and in-plane anchorage force as per SDPWS eqn. 4.3-9 = V/FHS/Co. FHS is factored for narrow segments as per 4.3.3.4

FTAO walls: Shear force in piers above and below either openings or piers beside opening(s). Aspect ratio factor does not apply to these piers.

V – ASD factored shear force. For shearline: total shearline force. For wall: total of all segments on wall. For segment: force on segment

Asp/Cub – Unblocked wood structural panel factor Cub from SDPWS 4.3.5.3 or Aspect Ratio factor from 4.3.5.5.1, which for perforated walls is sum b_i / FHS from 4.3.5.6 with b_i defined in 4.3.3.4. For multi-segment walls, wall row shows Cub and segment rows show Asp. For single-segment walls and perforated walls, value shown is Asp for blocked walls and Cub for unblocked walls.

Int, Ext - Nominal unit shear capacity of interior and exterior sheathing, factored by Table 4.3-1 Note 3 for framing specific gravity and Note 10 for presence of hold-downs. For wall segments, also include unblocked factor Cub and aspect ratio adjustments.

Co - Adjustment factor for perforated walls from SDPWS Equation 4.3-6.

C - Sheathing combination rule, A = Add capacities, S = Strongest side or twice weakest, G = Stiffness-based using Eqns. 4.3-3,-4.

Cmb - Combined interior and exterior unit shear capacity including perforated wall factor Co.

V – Total factored shear capacity of shearline, wall or segment.

Crit Resp – Response ratio = v/Cmb = design shear force/unit shear capacity. "W" indicates that the wind design criterion was critical in selecting wall.

Notes:

Refer to Elevation View diagrams for individual level for uplift anchorage force t for perforated walls given by SDPWS 4.3.6.4.2,1.

Hold-Down and Compression Design (rigid seismic design)

Level 1	Location [ft]			Tensile Hold-down or Compressive Stud Force [lbs]				Hold-down	Cap [lbs]	Crit Resp.
Line-Wall	Posit'n	X	Y	Shear	Dead	Ev	Cmb'd			
Line 1										
	V Elem	0.00	-3.87	1512	108	28	1432	Refer to upper level		
	V Elem	0.00	-3.87	1512	180	28	1720	Compression		
	V Elem	0.00	-2.12	732	91	24	664	Refer to upper level		
	V Elem	0.00	-2.12	732	152	24	908	Compression		
	V Elem	0.00	-0.12	1512	108	28	1432	Refer to upper level		
	V Elem	0.00	-0.12	1512	180	28	1720	Compression		
	V Elem	0.00	14.13	1105	138	36	1003	Refer to upper level		
	V Elem	0.00	14.13	1105	230	36	1371	Compression		
	V Elem	0.00	15.88	1837	230	60	1667	Refer to upper level		
	V Elem	0.00	15.88	1837	383	60	2279	Compression		
Line 2										
2-3	L End	20.50	-3.87	2487	151	40	2376	HDU8-SDS	6765	0.35
2-3	L End	20.50	-3.87	2487	252	40	2779	Compression	10312	0.27
2-3	L Op 1	20.50	6.38	2487	151	40	2376	HDU8-SDS	6765	0.35
2-3	L Op 1	20.50	6.38	2487	252	40	2779	Compression	10312	0.27
2-3	R Op 1	20.50	10.13	2544	79	21	2485	HDU8-SDS	6765	0.37
2-3	R Op 1	20.50	10.13	2544	132	21	2696	Compression	10312	0.26
2-3	R End	20.50	15.38	2544	79	21	2485	HDU8-SDS	6765	0.37
2-3	R End	20.50	15.38	2544	132	21	2696	Compression	10312	0.26
Line 3										
3-1	L End	26.00	0.12	2097	50	13	2060	HDU5-SDS	5645	0.36
3-1	L End	26.00	0.12	2097	84	13	2194	Compression	10312	0.21
3-1	R End	26.00	3.38	2097	50	13	2060	HDU5-SDS	5645	0.36
3-1	R End	26.00	3.38	2097	84	13	2194	Compression	10312	0.21
	V Elem	24.00	5.13	2488	170	45	2363	Refer to upper level		
	V Elem	24.00	5.13	2488	284	45	2816	Compression		
3-2	L End	26.00	7.13	2302	108	28	2222	HDU5-SDS	5645	0.39
3-2	L End	26.00	7.13	2302	180	28	2510	Compression	10312	0.24
3-2	R End	26.00	14.38	2302	108	28	2222	HDU5-SDS	5645	0.39
3-2	R End	26.00	14.38	2302	180	28	2510	Compression	10312	0.24
	V Elem	24.00	15.38	2488	170	45	2363	Refer to upper level		
	V Elem	24.00	15.38	2488	284	45	2816	Compression		
Line 4										
4-1	L End	51.50	-9.87	1922	197	52	1777	HDU5-SDS	5645	0.31
4-1	L End	51.50	-9.87	1922	329	52	2303	Compression	10312	0.22
4-1	L Op 1	51.50	-6.12	1922	157	41	1807	HDU5-SDS	5645	0.32
4-1	L Op 1	51.50	-6.12	1922	261	41	2224	Compression	10312	0.22
4-1	R Op 1	51.50	-0.37	1880	252	66	1695	HDU5-SDS	5645	0.30
4-1	R Op 1	51.50	-0.37	1880		66	1880	Compression	10312	0.18
4-1	L Op 2	51.50	5.38	126	264	42	349	Compression	10312	0.03
	V Elem	51.50	14.13	306	34	9	281	Refer to upper level		
	V Elem	51.50	14.13	306	57	9	371	Compression		
	V Elem	51.50	15.88	2312	257	68	2123	Refer to upper level		
	V Elem	51.50	15.88	2312	428	68	2807	Compression		
Line A										
A-1	L End	22.63	-10.00	1112	247	65	930	HDU2-SDS	3075	0.30
A-1	L End	22.63	-10.00	1112	412	65	1589	Compression	10312	0.15
A-1	L Op 1	28.88	-10.00	1112	173	45	985	HDU2-SDS	3075	0.32
A-1	L Op 1	28.88	-10.00	1112	288	45	1445	Compression	10312	0.14
	V Elem	31.88	-10.00	486	71	19	434	Refer to upper level		
	V Elem	31.88	-10.00	486	118	19	623	Compression		
A-1	R Op 2	34.63	-10.00	2010	312	82	1780	HDU2-SDS	3075	0.58
A-1	R Op 2	34.63	-10.00	2010	519	82	2611	Compression	10312	0.25
	V Elem	40.88	-10.00	1390	203	53	1240	Refer to upper level		
	V Elem	40.88	-10.00	1390	338	53	1780	Compression		
A-1	L Op 3	41.88	-10.00	1106	180	47	974	HDU2-SDS	3075	0.32
A-1	L Op 3	41.88	-10.00	1106	300	47	1454	Compression	10312	0.14
A-1	R Op 3	45.13	-10.00	1112	173	45	985	HDU2-SDS	3075	0.32
A-1	R Op 3	45.13	-10.00	1112	288	45	1445	Compression	10312	0.14
A-1	R End	51.38	-10.00	1112	247	65	930	HDU2-SDS	3075	0.30
A-1	R End	51.38	-10.00	1112	412	65	1589	Compression	10312	0.15
Line B										
B-1	L End	0.12	-4.00	991	689	181	483	HDU2-SDS	3075	0.16
B-1	L End	0.12	-4.00	991	1148	181	2319	Compression	10312	0.22
B-1	R End	20.88	-4.00	991	698	184	477	HDU2-SDS	3075	0.16
B-1	R End	20.88	-4.00	991	1163	184	2337	Compression	10312	0.23
Line C										
	V Elem	1.63	0.00	1083	259	68	892	Refer to upper level		
	V Elem	1.63	0.00	1083	432	68	1583	Compression		
	V Elem	17.38	0.00	1083	259	68	892	Refer to upper level		
	V Elem	17.38	0.00	1083	432	68	1583	Compression		

Hold-Down and Compression Design (rigid seismic design, continued)

Line D										
D-1	L End	0.12	16.00	1598	1749	460	309	HDU2-SDS	3075	0.10
D-1	L End	0.12	16.00	1598	3222	509	5328	Compression	10312	0.52
D-1	L Op 1	23.88	16.00	874	766	202	309	HDU2-SDS	3075	0.10
D-1	L Op 1	23.88	16.00	874	1277	202	2352	Compression	10312	0.23
D-1	R Op 1	28.13	16.00	874	750	197	321	HDU2-SDS	3075	0.10
D-1	R Op 1	28.13	16.00	874	1250	197	2322	Compression	10312	0.23
D-1	R End	51.38	16.00	1598	1733	456	321	HDU2-SDS	3075	0.10
D-1	R End	51.38	16.00	1598	3195	505	5297	Compression	10312	0.51
Level 2				Tensile Hold-down or Compressive Stud Force [lbs]						
Line-Wall	Posit'n	Location [ft]		Shear	Dead	Ev	Cmb'd	Hold-down	Cap [lbs]	Crit Resp.
		X	Y							
Line 1										
1-1	L End	1.00	-3.87	1512	108	28	1432	HDU2-SDS	3075	0.47
1-1	L End	1.00	-3.87	1512	180	28	1720	Compression	10312	0.17
1-1	R End	1.00	-0.12	1512	108	28	1432	HDU2-SDS	3075	0.47
1-1	R End	1.00	-0.12	1512	180	28	1720	Compression	10312	0.17
1-2	R Op 1	0.00	7.63	1837	230	60	1667	HDU2-SDS	3075	0.54
1-2	R Op 1	0.00	7.63	1837	383	60	2279	Compression	10312	0.22
1-2	R End	0.00	15.88	1837	230	60	1667	HDU2-SDS	3075	0.54
1-2	R End	0.00	15.88	1837	383	60	2279	Compression	10312	0.22
Line 3										
3-1	L End	24.00	5.13	2488	170	45	2363	HDU2-SDS	3075	0.77
3-1	L End	24.00	5.13	2488	284	45	2816	Compression	10312	0.27
3-1	R End	24.00	15.38	2488	170	45	2363	HDU2-SDS	3075	0.77
3-1	R End	24.00	15.38	2488	284	45	2816	Compression	10312	0.27
Line 4										
4-2	R Op 1	51.50	6.63	2312	257	68	2123	HDU2-SDS	3075	0.69
4-2	R Op 1	51.50	6.63	2312	428	68	2807	Compression	10312	0.27
4-2	R End	51.50	15.88	2312	257	68	2123	HDU2-SDS	3075	0.69
4-2	R End	51.50	15.88	2312	428	68	2807	Compression	10312	0.27
Line A										
A-1	R Op 1	33.63	-10.00	1390	203	53	1240	HDU2-SDS	3075	0.40
A-1	R Op 1	33.63	-10.00	1390	338	53	1780	Compression	10312	0.17
A-1	L Op 2	40.88	-10.00	1390	203	53	1240	HDU2-SDS	3075	0.40
A-1	L Op 2	40.88	-10.00	1390	338	53	1780	Compression	10312	0.17
Line C										
C-2	L End	1.63	0.00	1083	259	68	892	HDU2-SDS	3075	0.29
C-2	L End	1.63	0.00	1083	432	68	1583	Compression	10312	0.15
C-2	R End	17.38	0.00	1083	259	68	892	HDU2-SDS	3075	0.29
C-2	R End	17.38	0.00	1083	432	68	1583	Compression	10312	0.15
Line D										
D-1	L End	0.12	16.00	724	983	259	0	Not required	3075	0.00
D-1	L End	0.12	16.00	724	1945	307	2976	Compression	10312	0.29
D-1	R End	51.38	16.00	724	983	259	0	Not required	3075	0.00
D-1	R End	51.38	16.00	724	1945	307	2976	Compression	10312	0.29

Legend:

Line-Wall:

At wall or opening – Shearline and wall number

At vertical element – Shearline

Posit'n – Position of stud pack that hold-down is attached to:

V Elem – Vertical element: column or strengthened studs required where not at wall end or opening

L or R End – At left or right wall end

L or R Op n – At left or right side of opening n

t @ Op n – Uplift force t at opening n from offset opening in perforated wall above, from SDPWS 4.3.6.4.2.1

Location – Co-ordinates in Plan View

Tensile Hold-down or Compressive Stud Force – Upwards force on hold-down at one end of the wall or downward force on bottom plate under studs at the other end, for each force direction. Includes forces transferred from upper levels.

Shear – Overturning component = $V \times h / b_{eff}$ from SDPWS Eqn. 4.3-7; V = force on segment, ASD-factored by 0.70; h = wall height, b_{eff} = wall segment length – (tension stud pack width + hold-down anchor bolt offset) – (1/2 compression stud pack width). For perforated walls = $V \times h / C_o$ sum (bi) from SDPWS Eqn. 4.3-8.

Dead – Dead load resisting component, factored for ASD by 0.60 for tension and 1.0 for compression

Ev – Vertical seismic load effect from ASCE 7 12.4.2.2 = $-0.2 S_d s \times \text{ASD factor} \times \text{unfactored } D = 0.263 \text{ SDS} \times \text{factored } D$. Refer to Seismic Information table for more details.

Cmb'd – Sum of ASD-factored overturning, dead and vertical seismic forces. May also include the uplift force t from perforated walls from SDPWS 4.3.6.4.2.1 when openings are staggered.

Hold-down – Device model number from hold-down database; "Compression" for bearing of end stud pack on bottom plate

Cap – Hold-downs: Allowable ASD tension load from database; Compression: Allowable ASD bearing force = $C_t C_M C_b F_{cp} A$; A = cross sectional area of end studs. Refer to Framing materials table for details.

Crit. Resp. – Critical Response = Combined ASD force/Allowable ASD tension load

Notes:

HDU8-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 20 1/4" x 2.5" SDS heavy-duty screws; 7/8" anchor bolt.

HDU5-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 14 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

HDU2-SDS2.5 for studs with thickness > 0'-3" and depth > 0'-3.5" : Uses 6 1/4" x 2.5" SDS heavy-duty screws; 5/8" anchor bolt.

Combined force from ASCE 7 2.4.1 load combination 10 = - (0.6D - 0.7Ev + 0.7Eh); Eh (from 12.4.2.1) = - shear overturning force

Refer to the Shear Line Dimensions table for wall height h, effective segment length beff and perforated wall adjusted sum of bi, to the Story Table for joist depth, and to the Shear Results table for perforated factor Co.

Designer is responsible for design of connection from wall to floor or foundation for shear force shown in Shear Results table. Refer to SDPWS 4.3.6.4.3 for foundation anchor bolt requirements.

COLLECTOR FORCES (rigid seismic design)

Level 1				Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line-Wall	Position on Wall or Opening	Location [ft]					
		X	Y	--->	<---	--->	<---
Line 2							
	Shearline force			12887	12887		
2-3	Left Wall End	20.50	-4.00	-2974	2974		
2-3	Left Opening 1	20.50	6.50	279	-279		
2-3	Right Opening 1	20.50	10.00	-1456	1456		
2-3	Right Wall End	20.50	15.50	248	-248		
Line 3							
	Shearline force			7280	7280		
3-1	Left Wall End	26.00	0.00	-2800	2800		
3-1	Right Wall End	26.00	3.50	-1669	1669		
3-2	Left Wall End	26.00	7.00	-2649	2649		
3-2	Right Wall End	26.00	14.50	420	-420		
Line 4							
	Shearline force			2713	2713		
4-1	Left Opening 1	51.50	-6.00	668	-668		
4-1	Right Opening 1	51.50	-0.50	94	-94		
4-1	Left Opening 2	51.50	5.50	1096	-1096		
Line A							
	Shearline force			3631	3631		
A-1	Left Opening 1	29.00	-10.00	337	-337		
A-1	Right Opening 2	34.50	-10.00	-351	351		
A-1	Left Opening 3	42.00	-10.00	38	-38		
A-1	Right Opening 3	45.00	-10.00	-337	337		
Line B							
	Shearline force			3508	3508		
B-1	Right Wall End	21.00	-4.00	2077	-2077		
Line D							
	Shearline force			7742	7742		
D-1	Left Opening 1	24.00	16.00	304	-304		
D-1	Right Opening 1	28.00	16.00	-298	298		
Level 2				Drag Strut Force [lbs]		Strap/Blocking Force [lbs]	
Line-Wall	Position on Wall or Opening	Location [ft]					
		X	Y	--->	<---	--->	<---
Line 1							
	Shearline force			2136	2136		
1-1	Right Wall End	1.00	0.00	203	-203		
1-2	Right Opening 1	0.00	7.50	-598	598		
Line 3							
	Shearline force			2834	2834		
3-1	Left Wall End	24.00	5.00	-1635	1635		
3-1	Right Wall End	24.00	15.50	54	-54		
Line 4							
	Shearline force			2100	2100		
4-2	Right Opening 1	51.50	6.50	-1333	1333		
Line A							
	Shearline force			1119	1119		
A-1	Right Opening 1	33.50	-10.00	-425	425		
A-1	Left Opening 2	41.00	-10.00	405	-405		
Line C							
	Shearline force			1896	1896		
C-2	Left Wall End	1.50	0.00	-55	55		
C-2	Right Wall End	17.50	0.00	1252	-1252		

Legend:

Line-Wall - Shearline and wall number

Position...- Side of opening or wall end that drag strut is attached to

Location - Co-ordinates in Plan View

Drag strut Force - Axial force in transfer element at openings, gaps, or changes in design shear along shearline. + : tension; - : compression.

Based on ASD-factored shearline force shown. For SDC C-F, it is the greater of the design shearline force and the diaphragm force F_{px} , added to shearline force from story above and to forces transferred from discontinuous shearlines factored by overstrength (ω) as per 12.10.1.1. Refer to Seismic Information table for diaphragm forces and ω factor.

For SDC D-F, if horizontal torsional irregularities 1a or 1b are detected, or if other horizontal irregularities are input, or if vertical irregularity 4 detected or input, 25% increase from 12.3.3.4 applied.

For perforated walls, this force is converted to v_{max} using 4.3.6.4.1.1.

Strap/Blocking Force – For FTAO walls, force transferred from above and below opening to shearwall pier.

-> Due to shearline force in the west-to-east or south-to-north direction

<- Due to shearline force in the east-to-west or north-to-south direction

DEFLECTION (rigid seismic design)

Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 1														
Line 2														
2-3,1	3	Both	1S	333.5	10.50	8.00	16.5	.005	18.4	201	.034	.145	0.27	0.42
2-3,2		Both	1S	333.5	5.50	8.00	16.5	.009	18.4	201	.034	.145	0.54	0.69
Line 3														
3-1	4	Both	1S	267.4	3.50	8.00	16.5	.012	18.4	201	.034	.116	0.86	0.99
3-2	4	Both	1S	305.6	7.50	8.00	16.5	.006	18.4	201	.034	.133	0.39	0.53
Line 4														
4-1,1	4	Both	ExtS	247.5	4.00	8.00	16.5	.010	18.4	201	.034	.107	0.73	0.85
4-1,2		S->N	ExtS	247.5	6.00	8.00	16.5	.006	18.4	201	.034	.107	0.46	0.58
		N->S	ExtS	247.5	6.00	8.00	16.5	.006	18.4	201	.034	.107	0.01	0.12
Line A														
A-1,1	1	W->E	ExtS	146.9	6.50	8.00	16.5	.004	13.8	196	.032	.085	0.42	0.50
		E->W	ExtS	146.9	6.50	8.00	16.5	.004	13.8	196	.032	.085	0.42	0.51
A-1,3		W->E	ExtS	146.9	7.50	8.00	16.5	.003	13.8	196	.032	.085	0.42	0.50
		E->W	ExtS	146.9	7.50	8.00	16.5	.003	13.8	196	.032	.085	0.37	0.45
A-1,4		W->E	ExtS	146.9	6.50	8.00	16.5	.004	13.8	196	.032	.085	0.42	0.51
		E->W	ExtS	146.9	6.50	8.00	16.5	.004	13.8	196	.032	.085	0.42	0.50
Line B														
B-1	1	Both	ExtS	134.5	21.00	8.00	16.5	.001	13.8	196	.032	.078	0.12	0.20
Line D														
D-1,1	1	W->E	ExtS	118.8	24.00	8.00	16.5	.001	13.8	196	.032	.069	0.10	0.17
		E->W	ExtS	118.8	24.00	8.00	16.5	.001	13.8	196	.032	.069	0.11	0.18
D-1,2		W->E	ExtS	118.8	23.50	8.00	16.5	.001	13.8	196	.032	.069	0.11	0.18
		E->W	ExtS	118.8	23.50	8.00	16.5	.001	13.8	196	.032	.069	0.11	0.17
Wall, segment	W Gp	Dir	Srf	v plf	b ft	h ft	Bending A sq.in	Defl in	Ga kips/in	Nail slip Vn lbs	en in	Shear Defl in	Hold Defl in	Total Defl in
Level 2														
Line 1														
1-1	1	S->N	ExtS	173.1	4.00	9.00	16.5	.010	13.8	196	.032	.113	0.96	1.08
		N->S	ExtS	173.1	4.00	9.00	16.5	.010	13.8	196	.032	.113	0.83	0.95
1-2,2	1	S->N	ExtS	194.7	8.50	9.00	16.5	.005	13.8	196	.032	.127	0.46	0.59
		N->S	ExtS	194.7	8.50	9.00	16.5	.005	13.8	196	.032	.127	0.39	0.52
Line 3														
3-1	3	S->N	1S	296.6	10.50	9.00	16.5	.006	18.4	201	.034	.145	0.42	0.57
		N->S	1S	296.6	10.50	9.00	16.5	.006	18.4	201	.034	.145	0.34	0.49
Line 4														
4-2,2	1	S->N	ExtS	243.0	9.50	9.00	16.5	.006	13.8	196	.032	.159	0.44	0.61
		N->S	ExtS	243.0	9.50	9.00	16.5	.006	13.8	196	.032	.159	0.37	0.53
Line A														
A-1,2	1	W->E	ExtS	164.0	7.50	9.00	16.5	.005	13.8	196	.032	.107	0.48	0.59
		E->W	ExtS	164.0	7.50	9.00	16.5	.005	13.8	196	.032	.107	0.42	0.53
Line C														
C-2	2	W->E	1S	130.2	16.00	9.00	16.5	.002	13.8	196	.032	.085	0.20	0.29
		E->W	1S	130.2	16.00	9.00	16.5	.002	13.8	196	.032	.085	0.19	0.27
Line D														
D-1	1	Both	ExtS	88.0	51.50	9.00	16.5	.000	13.8	196	.032	.057	0.00	0.06

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B.

W Gp – Wall design group, refer to Sheathing and Framing Materials tables.

Dir – Force direction.

Srf – Wall surface = Int(erior) or Ext(erior) for perimeter walls, 1 or 2 for interior partitions; Comb = Combined v and Ga for identical materials on each side; S = Ga from side with stronger shear resistance; W = 2 x Ga of weaker side.

v – Unfactored (strength-level) shear force per unit distance on wall segment = ASD force / 0.70, as per ASCE 7 12.8.6.

Unblocked walls = v / Cub as per SDPWS 4.3.4.3, Cub = Unblocked factor from 4.3.5.3, shown in the Shear Results table.

Perforated walls = v_{max} from Eqn. 4.3-9, as per 4.3.4.2.

FTAO walls = Unit shear force in pier beside opening(s).

b – Wall or segment length.

Segmented wall or FTAO wall segments = Width of wall segment between openings.

Perforated wall = Sum of FHS segments, modified as in 4.3.3.4 per 4.3.4.2.

FTAO wall = Length of wall including openings.

h – Wall height.

FTAO piers = Distance from bottom of opening to top of wall; for end segments, results using that distance and the wall height are averaged.

Defl – Horizontal shear wall deflection due to given term:

Bending = $8vh^3 / EA_b$; A = Effective cross sectional area of segment end stud(s), E = stud mod. of elasticity in Framing Materials tableFor i studs at one end and j at the other, A = $2ij / (i + j)$ x area of one stud, based on Ex. C4.3.4-3Shear = $vh / 1000 Ga$; Ga = $1.4 vs / (1.4 vs / Gvtv + 0.75 en)$ from SDPWS Eqn. C4.2.3-3.

vs = ASD sheathing capacity.

Gvtv = Shear stiffness from C4.3.4, shown in Sheathing Materials table.

en = Nail slip from Table C4.2.3D, of form aVn^b for WSP, varies linearly to value at capacity for other materials.

Vn = Strength-level shear force per nail along panel edge at ASD capacity = 1.4 *vs*.

Hold – Anchorage system (hold-down) = $da \times h / beff$.

da = Vertical hold-down displacement; refer to Hold-down Displacement table for components.

beff = Effective wall segment length = $b - (\text{tension stud pack width} + \text{hold-down anchor bolt offset}) - (1/2 \text{ compression stud pack width})$

beff is given in the Shear Wall Dimensions table.

For FTAO walls, hold-down device at end of wall is applied to all segments, as per APA T555.

Total Defl – Deflection from bending + shear + hold-down, as per Eqn. 4.3-2.

For FTAO walls, the average of the values for the segments, as per APA T555.

HOLD-DOWN DISPLACEMENT (rigid seismic design)

Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 1													
Line 2													
2-3,1	Both	HDU8-SDS	2376	.057	.001	0.058	-	-	.283	3143	0.01	0.35	0.27
2-3,2	Both	HDU8-SDS	2485	.059	.001	0.061	-	-	.283	3010	0.01	0.35	0.54
Line 3													
3-1	Both	HDU5-SDS	2060	.058	.002	0.060	-	-	.283	2441	0.01	0.35	0.86
3-2	Both	HDU5-SDS	2222	.062	.003	0.065	-	-	.283	2822	0.01	0.36	0.39
Line 4													
4-1,1	S->N	HDU5-SDS	1777	.050	.002	0.052	-	-	.283	2537	0.01	0.34	0.73
	N->S	HDU5-SDS	1807	.051	.002	0.053	-	-	.283	2646	0.01	0.34	0.73
4-1,2	S->N	HDU5-SDS	1695	.047	.002	0.049	-	-	.283	-2	0.00	0.33	0.46
	N->S	HDU5-SDS	0	.000	.000	0.000	-	-	.000	2066	0.01	0.01	0.01
Line A													
A-1,1	W->E	HDU2-SDS	930	.036	.001	0.037	-	-	.283	1690	0.00	0.32	0.42
	E->W	HDU2-SDS	985	.038	.001	0.039	-	-	.283	1892	0.01	0.33	0.42
A-1,3	W->E	HDU2-SDS	2266	.087	.003	0.090	-	-	.283	1703	0.00	0.38	0.42
	E->W	HDU2-SDS	974	.037	.001	0.039	-	-	.283	3587	0.01	0.33	0.37
A-1,4	W->E	HDU2-SDS	985	.038	.001	0.039	-	-	.283	1892	0.01	0.33	0.42
	E->W	HDU2-SDS	930	.036	.001	0.037	-	-	.283	1690	0.00	0.32	0.42
Line B													
B-1	W->E	HDU2-SDS	483	.019	.001	0.019	-	-	.283	2978	0.01	0.31	0.12
	E->W	HDU2-SDS	477	.018	.001	0.019	-	-	.283	2954	0.01	0.31	0.12
Line D													
D-1,1	W->E	HDU2-SDS	309	.012	.000	0.012	-	-	.283	3610	0.01	0.31	0.10
	E->W	HDU2-SDS	309	.012	.000	0.012	-	-	.283	7023	0.02	0.31	0.11
D-1,2	W->E	HDU2-SDS	321	.012	.000	0.013	-	-	.283	7024	0.02	0.31	0.11
	E->W	HDU2-SDS	321	.012	.000	0.013	-	-	.283	3611	0.01	0.31	0.11
Wall, segment	Dir	Hold-down	Tens. force lbs	Vert. Displacement Manuf in	Add in	da in	Slippage Vf lbs	da in	Shrink +Extra in	Comp. force lbs	Crush da in	Total da in	Horz Defl in
Level 2													
Line 1													
1-1	S->N	HDU2-SDS	1432	.110	.001	0.111	-	-	.283	1954	0.01	0.40	0.96
	N->S	HDU2-SDS	1432	.055	.002	0.057	-	-	.283	1954	0.01	0.35	0.83
1-2,2	S->N	HDU2-SDS	1667	.128	.001	0.129	-	-	.283	2640	0.01	0.42	0.46
	N->S	HDU2-SDS	1667	.064	.002	0.066	-	-	.283	2640	0.01	0.36	0.39
Line 3													
3-1	S->N	HDU2-SDS	2363	.181	.001	0.183	-	-	.283	3195	0.01	0.47	0.42
	N->S	HDU2-SDS	2363	.091	.003	0.093	-	-	.283	3195	0.01	0.39	0.34
Line 4													
4-2,2	S->N	HDU2-SDS	2123	.163	.001	0.164	-	-	.283	3236	0.01	0.46	0.44
	N->S	HDU2-SDS	2123	.081	.003	0.084	-	-	.283	3236	0.01	0.38	0.37
Line A													
A-1,2	W->E	HDU2-SDS	1240	.095	.001	0.096	-	-	.283	2076	0.01	0.38	0.48
	E->W	HDU2-SDS	1240	.048	.001	0.049	-	-	.283	2076	0.01	0.34	0.42
Line C													
C-2	W->E	HDU2-SDS	892	.068	.000	0.069	-	-	.283	1893	0.01	0.36	0.20
	E->W	HDU2-SDS	892	.034	.001	0.035	-	-	.283	1893	0.01	0.32	0.19
Line D													
D-1	Both	HDU2-SDS	0	.000	.000	0.000	-	-	.000	2991	0.01	0.01	0.00

Legend:

Wall, segment – Wall and segment between openings, e.g. B-3,2 = second segment on Wall 3 on Shearline B

Dir – Force direction

Tens., Comp. – Accumulated ASD hold-down tension force T and strength-level end compression force C from overturning, dead and vertical earthquake loads.

Tens. – ASD-factored force, used for proportion of manufacturer's maximum elongation

Comp. – Strength level force as per ASCE 12.8.6

da – Vertical displacements due to the following components:

Vert. Displacement – Elongation when slippage calculated separately; displacement when combined elongation/slippage used

Manuf – Using manufacturer's value for anchor bolt length, or no bolt contribution for connector-only elongation

Unless marked with * = (ASD tension force / ASD hold-down capacity) x max strength-level elongation or displacement

* - Maximum strength-level elongation or displacement is used. May result in higher than actual displacements for lightly loaded hold-downs, causing the segment to draw less force due to lower than actual stiffness.

Add – Due to longer anchor bolt length than manufacturer's value, or entire bolt length for connector-only elongation = $TL / (Ab \times Es)$

T = Strength level tension force (not shown)

Ab = bolt cross-sectional area

Es = steel modulus = 29000000 psi

L = Lb – Lh

L_b = Total bolt length shown in Storey Information table

L_h = Manufacturer's anchor bolt length for given displacement/elongation from hold-down database

Slippage – Due to vertical slippage of hold-down fasteners attached to stud(s) when not combined with elongation

Nails = e_n from SDPWS Table C4.2.3D using values for wood structural panels

Bolts = $V_f / (270,000 D^{1.5})$ (NDS 11.3.6); D = bolt diameter, V_f = Tension force T / number of fasteners

Shrink + Extra – Wood shrinkage plus extra displacement due to mis-cuts, gaps, etc.

Shrinkage = $0.002 \times (19\% \text{ fabrication} - 10\% \text{ in-service moisture contents}) \times L_s$

L_s = Length between anchor bolt fasteners subject to perp-to-grain shrinkage; see Story Information table

Crush – Deformation of bottom plate at compression end of wall segment

= $0.02" \times [r / 0.73, r < 0.73; (1 + (r - 0.73) / 0.27), 0.73 < r < 1; 2r^3, r > 1]$

$r = f_{cp} / F_{cp}'$; $F_{cp}' = C_t CM F_{cp}$; $f_{cp} = C / A$, A = cross sectional area of end studs

Total d_a – Vert. Displacement + Slippage + Shrink + Crush + Extra

Horz Defl – Anchorage deflection term in SDPWS Eqn. C.4.3.4-1 = $h / b_{eff} \times d_a$

h = Wall height. For end segments in FTAO walls, h is the average of the wall height and the distance from the bottom of opening to top of wall

b_{eff} = Effective wall segment length = $b - (\text{tension stud pack width} + \text{hold-down anchor bolt offset}) - (1/2 \text{ compression stud pack width})$

h and b are shown in Deflection table, b_{eff} in the Shear Wall Dimensions table

