GENERAL STRUCTURAL NOTES (GSN)

BUILDING CODE:

2015 EDITION OF THE INTERNATIONAL BUILDING CODE.

LOADS:

ROOF LIVE LOAD = 25 PSF (SNOW).
ROOF DEAD LOAD = 16 PSF.
FLOOR LIVE LOAD = 40 PSF.
DECK LIVE LOAD = 60 PSF.
FLOOR DEAD LOAD = 12 PSF.
WIND LOAD = 110 MPH ULTIMATE DESIGN WIND SPEED, EXPOSURE C.
RISK CATEGORY II
SEISMIC IMPORTANCE FACTOR, Ie = 1.0
SEISMIC SITE CLASS D
SEISMIC DESIGN CATEGORY D
Ss = 1.268
S1 = 0.506
Sds = 0.846
Sd1 = 0.506
SEISMIC FORCE RESISTING SYSTEM: WOOD STUD SHEAR WALLS
DESIGN SEISMIC BASE SHEAR = 6884 LBF
Cs = 0.130
R = 6.5
ANALYSIS PROCEDURE USED: EQUIVALENT LATERAL FORCE PROCEDURE

FOUNDATIONS:

SPREAD FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL 18" MINIMUM BELOW FINISHED GRADE. FINISHED GRADE IS DEFINED AS TOP OF SLAB FOR INTERIOR FOOTINGS AND LOWEST ADJACENT GRADE WITHIN 5 FEET FOR PERIMETER FOOTINGS. DESIGN SOIL BEARING VALUE = 1,500 PSF.

CONCRETE:

MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 3,000 PSI TO COMPLY WITH EXPOSURE REQUIREMENT OF IBC TABLE 1904.2. STRUCTURAL DESIGN IS BASED ON f'c OF 2,500 PSI. PER IBC 1705.3, NO SPECIAL INSPECTION REQUIRED.

ALL CONCRETE CONSTRUCTION SHALL CONFORM TO A.C.I. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AT TRENCHES, FLOOR DUCTS, TURNDOWNS, ETC. MAXIMUM SLUMP 4 1/2" FOR CONCRETE WITHOUT PLASTICIZER. IF PLASTICIZER IS USED, A HIGHER FINAL SLUMP MAY BE ALLOWED UPON STRUCTURAL ENGINEER'S APPROVAL. UNLESS APPROVED OTHERWISE IN WRITING BY THE ARCHITECT, ALL CONCRETE SLABS ON GRADE SHALL BE BOUND BY CONTROL JOINTS (KEYED OR SAW CUT), AS SHOWN ON THE FOUNDATION PLAN, SUCH THAT THE ENCLOSED AREA DOES NOT EXCEED 225 SQUARE FEET. KEYED CONTROL JOINTS NEED ONLY OCCUR AT EXPOSED EDGES DURING POURING, ALL OTHER JOINTS MAY BE SAW CUT.

FLY ASH, IF PERMITTED BY ARCHITECTURAL SPECIFICATIONS, SHALL BE LIMITED TO 18% OF CEMENTITIOUS MATERIALS AND SHALL HAVE A REPLACEMENT FACTOR OF 1.2 RELATIVE TO CEMENT REPLACED. NO FLY ASH ADDITIVES SHALL BE USED IN FLATWORK OR ARCHITECTURALLY EXPOSED CONCRETE.

REINFORCING:

ASTM A615 (Fy = 60 KSI) DEFORMED BARS FOR ALL BARS #4 AND LARGER. ASTM A615 (Fy = 40 KSI) DEFORMED BARS FOR ALL BARS #3 AND SMALLER. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE STRUCTURAL ENGINEER. LATEST A.C.I. CODE AND DETAILING MANUAL APPLY. CLEAR CONCRETE COVERAGES AS FOLLOWS:

CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
EXPOSED TO EARTH OR WEATHER	
#6 OR LARGER	2"
#5 AND SMALLER	1 1/2"
ALL OTHER PER A.C.I. 318-14.	

LAP SPLICES IN CONCRETE:

LAP SPLICES, UNLESS NOTED OTHERWISE, SHALL BE CLASS "B" TENSION LAP SPLICES PER LATEST EDITION OF A.C.I. 318. STAGGER SPLICES A MINIMUM OF ONE LAP LENGTH. ALL REINFORCING SHALL BE CHAIRED TO ENSURE PROPER CLEARANCES. SUPPORT OF FOUNDATION REINFORCING MUST PROVIDE ISOLATION FROM MOISTURE/CORROSION.

ALL SPLICE LOCATIONS SUBJECT TO APPROVAL BY THE STRUCTURAL ENGINEER. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. REINFORCING BAR SPACINGS GIVEN ARE MAXIMUM ON CENTERS. ALL BARS PER CRSI SPECIFICATIONS AND HANDBOOK. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION WITH STANDARD 90 DEGREE HOOKS UNLESS NOTED OTHERWISE. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

STRUCTURAL STEEL:

ALL BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE. ALL ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 36. ALL CONSTRUCTION PER LATEST AISC HANDBOOK. ALL EXPANSION AND EPOXY BOLTS TO HAVE I.C.C. RATING FOR MATERIAL INTO WHICH INSTALLATION TAKES PLACE. ALL BOLTS, ANCHOR BOLTS, EXPANSION BOLTS, ETC., SHALL BE INSTALLED WITH STEEL WASHERS AT FACE OF WOOD.

WOOD:

SAWN LUMBER:

FRAMING LUMBER SHALL COMPLY WITH THE LATEST EDITION OF THE GRADING RULES OF THE WESTERN WOOD PRODUCTS ASSOCIATION OR THE WEST COAST LUMBER INSPECTION BUREAU. ALL SAWN LUMBER SHALL BE STAMPED WITH THE GRADE MARK OF AN APPROVED LUMBER GRADING AGENCY AND SHALL HAVE THE FOLLOWING UNADJUSTED DESIGN MINIMUM PROPERTIES:

JOISTS:	2x4	H.F. #2
	2x6 OR LARGER	H.F. #2
BEAMS:	WIDTH 4" OR LESS	H.F. #2
	WIDTH GREATER THAN 4"	H.F. #2
LEDGERS AND TOP PLATES:	ALL SIZES	H.F. #2
STUDS:	2x4	H.F. #2
	2x6 OR LARGER	H.F. #2
POSTS:	4x4	H.F. #2
	4x6 OR LARGER	D.F. #2
	6x6 OR LARGER	D.F. #2

GLUED-LAMINATED BEAMS (GLULAM):

GLUED-LAMINATED BEAMS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: Fb = 2,400 PSI, Fv = 265 PSI, Fc (PERPENDICULAR) = 650 PSI, E = 1,800,000 PSI. CONTINUOUS BEAMS OR BEAMS CANTILEVERING OVER SUPPORTS SHALL HAVE THE SPECIFIED MINIMUM PROPERTIES TOP AND BOTTOM. ALL BEAMS SHALL BE FABRICATED USING WATERPROOF GLUE. FABRICATION AND HANDLING PER LATEST AITC AND WCLA STANDARDS. BEAMS TO BEAR GRADE STAMP AND AITC STAMP AND CERTIFICATE. CAMBER AS SHOWN ON DRAWINGS.

ENGINEERED WOOD BEAMS (PARALLAM):

PARALLAM BEAMS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: Fb = 2,900 PSI, Fv = 290 PSI, Fc (PERPENDICULAR) = 750 PSI, E = 2,000,000 PSI. DESIGN, FABRICATION AND ERECTION IN ACCORDANCE WITH THE LATEST EDITION I.C.C. REPORT ESR-1387.

ENGINEERED WOOD BEAMS (LAMINATED VENEER LUMBER):

LAMINATED VENEER LUMBER SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: Fb = 2,250 PSI, Fv = 285 PSI, Fc (PERPENDICULAR) = 650 PSI, E = 1,500,000 PSI.
DESIGN, FABRICATION AND ERECTION IN ACCORDANCE WITH THE LATEST EDITION I.C.C. REPORT ESR-1533.

ENGINEERED WOOD BEAMS (TIMBERSTRAND):

TIMBERSTRAND LUMBER SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: Fb = 2325 PSI, Fv = 310 PSI, Fc (PERPENDICULAR) = 800 PSI, E = 1,550,000 PSI. DESIGN, FABRICATION AND ERECTION IN ACCORDANCE WITH THE LATEST EDITION I.C.C. REPORT ESR-1387.

PLYWOOD:

ALL PLYWOOD SHALL BE AMERICAN PLYWOOD ASSOCIATION CDX-RATED SHEATHING OR BETTER, AND SHALL BEAR THE STAMP OF AN APPROVED TESTING AGENCY. LAY UP PLYWOOD WITH FACE GRAIN PERPENDICULAR TO SUPPORTS (ON ROOFS WHERE PLYWOOD IS LAID UP WITH FACE GRAIN PARALLEL TO SUPPORTS, USE A MINIMUM OF 5-PLY PLYWOOD). STAGGER JOINTS. ALL NAILING SHALL BE WITH COMMON NAILS. WHERE SCREWS ARE INDICATED FOR WOOD-TO-WOOD ATTACHMENTS, USE WOOD SCREWS MEETING THE REQUIREMENTS OF A.N.S.I./A.S.M.E. B18.6.1 OF GRADE ASTM A584, GRADE 1013 TO 1022 STEEL (Fy=193,600 PSI). HORIZONTAL DIAPHRAGM AND SHEARWALL CAPACITIES SHALL BE PER THE LATEST EDITION OF I.C.C. REPORT ESR-1539. ALL PLYWOOD SHALL BE OF THE FOLLOWING NOMINAL THICKNESS, SHALL HAVE THE FOLLOWING SPAN/INDEX RATIO, AND SHALL BE ATTACHED AS FOLLOWS, UNLESS NOTED OTHERWISE:

USE	THICKNESS	SPAN/INDEX RATIO	EDGE ATTACHMENT	INTERMEDIATE ATTACHMENT
ROOF	1/2"	32/16	8d AT 6" O.C.	8d AT 12" O.C.
FLOOR	3/4" T & G	40/20	SCREWS AT 6" O.C.	SCREWS AT 10" O.C.
SHEAR WALL	1/2"	24/0	8d AT 6" O.C.	8d AT 12" O.C.

SCREWS AT FLOOR SHEATHING SHALL BE #8 x 2 1/2" LONG FOR SHEATHING LESS THAN 1" NOMINAL THICKNESS, AND SHALL HAVE CURRENT I.C.C. APPROVAL AS A REPLACEMENT FOR 10d NAILS IN WOOD PANEL DIAPHRAGMS. SCREWS PER I.C.C. ER-5280 OR APPROVED EQUAL. ALL FLOOR SHEATHING SHALL BE GLUED TO SUPPORT MEMBERS WITH AN A.P.A. AFG-01 OR ASTM D3498 QUALIFIED GLUE IN ACCORDANCE WITH A.P.A. FORM E30. AT CONTRACTOR'S OPTION, 10d NAILS MAY BE USED IN LIEU OF SCREWS AT FLOOR SHEATHING WITH PRIOR APPROVAL OF OWNER OR ARCHITECT.

ALTERNATE SHEATHING:

AMERICAN PLYWOOD ASSOCIATION PERFORMANCE RATED SHEATHING MAY BE USED AS AN ALTERNATE TO PLYWOOD WITH PRIOR APPROVAL OF OWNER, ARCHITECT AND ROOFING CONTRACTOR. RATED SHEATHING SHALL COMPLY WITH I.C.C. ESR-2586, EXPOSURE 1, AND SHALL HAVE A SPAN RATING AND SHEAR VALUE EQUIVALENT TO OR BETTER THAN THE PLYWOOD IT REPLACES. ATTACHMENT AND THICKNESS (WITHIN 1/16") SHALL BE THE SAME AS THE PLYWOOD IT REPLACES. INSTALL SHEATHING PER MANUFACTURER'S RECOMMENDATIONS.

NAILING:

ALL NAILS SHALL CONFORM TO ASTM F1667. ALL NAILING SHALL BE WITH COMMON WIRE NAILS OR APPROVED EQUAL. ALL NAILING SHALL BE WITH POWER-DRIVEN FASTENERS MEETING THE REQUIREMENTS OF I.C.C. ESR-1539 OR APPROVED EQUAL. ALL NAILS AND FASTENERS IN PRESSURE-TREATED OR FIRE RETARDANT WOOD SHALL BE HOT-DIPPED ZINC COATED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE, COPPER, OR APPROVED EQUAL, TYPICAL UNLESS NOTED OTHERWISE TO MEET THE REQUIREMENTS OF I.B.C. SECTION 2304.10.5. NAILS SPECIFIED BY PENNYWEIGHT SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

PENNY-WEIGHT	SHANK DIAMETER	NAIL BENDING YIELD STRENGTH, Fby
8d	0.131"	100,000 PSI
10d	0.148"	90,000 PSI
16d	0.162"	90,000 PSI

WOOD GENERAL:

DO NOT NOTCH OR DRILL JOISTS, BEAMS OR LOAD BEARING STUDS WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER THROUGH THE ARCHITECT. DOUBLE UP FLOOR JOISTS AND BLOCKING UNDER PARTITIONS. PROVIDE 2" SOLID BLOCKING AT SUPPORTS OF ALL JOISTS. DOUBLE UP STUDS AT JAMBS AND UNDER BEAMS. EVERY OTHER STUD OF WOOD FRAME BEARING WALL SHALL HAVE A SIMPSON H3 ANCHOR TOP AND BOTTOM, EXCEPT AT THOSE WALLS WHERE PLYWOOD SHEATHING IS DIRECTLY ATTACHED TO THE TOP AND BOTTOM PLATES WITH EDGE NAILING. PROVIDE 2x SOLID BLOCKING AT MID-HEIGHT OF BEARING STUD WALLS. ALL NAILING NOT NOTED SHALL BE ACCORDING TO TABLE 2304.10.1 OF THE INTERNATIONAL BUILDING CODE. ALL FIELD CUT ENDS, NOTCHES AND DRILLED HOLES OF PRESSURE TREATED WOOD SHALL BE RETREATED IN THE FIELD IN ACCORDANCE WITH AWPA M4. WOOD CONNECTORS SHALL BE AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC. OR OTHER MANUFACTURER WITH CURRENT AND EQUIVALENT I.C.C. APPROVAL. ALL WOOD CONNECTORS IN CONTACT WITH PRESSURE TREATED OR FIRE RETARDANT WOOD SHALL BE HOT-DIPPED GALVANIZED, STAINLESS STEEL OR APPROVED EQUAL, TYPICAL UNLESS NOTED OTHERWISE. TYPICAL CONNECTIONS SHALL USE THE FOLLOWING SIMPSON STRONG-TIE CONNECTORS, UNLESS NOTED OTHERWISE:

CONNECTION TYPE	TYPICAL CONNECTOR
POST TO FOUNDATION	PBS TYPE POST BASE
POST TO BEAM	PC TYPE POST CAP
JOIST TO BEAM	LU TYPE HANGER
BEAM TO BEAM	HU TYPE HANGER

HANGERS SHALL BE THOSE SIZED FOR THE APPLICABLE FRAMING MEMBER. I.E.-AN LU26 HANGER SHALL BE USED FOR A 2x6, NOT AN LU24. TOP FLANGE HANGERS WITH EQUIVALENT OR GREATER CAPACITY SHALL BE SUBSTITUTED FOR FACE-MOUNTED HANGERS AS APPLICABLE.

SHOP DRAWINGS:

SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS IN ADDITION TO ITEMS REQUIRED BY ARCHITECTURAL SPECIFICATIONS.

THE CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMITTAL. ITEMS NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS SHALL BE FLAGGED UPON CONTRACTOR'S REVIEW.

VERIFY ALL DIMENSIONS WITH ARCHITECT.

ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DOCUMENTS SHALL BE CLOUDED BY MANUFACTURER OR FABRICATOR. ANY OF THE AFOREMENTIONED WHICH ARE NOT CLOUDED OR FLAGGED BY SUBMITTING PARTIES SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEER'S REVIEW, UNLESS NOTED ACCORDINGLY.

THE ENGINEER HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY CHANGES TO CONTRACT DOCUMENTS AT ANY TIME BEFORE OR AFTER SHOP DRAWING REVIEW.

THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. ITEMS OMITTED OR SHOWN INCORRECTLY AND NOT FLAGGED BY THE STRUCTURAL ENGINEER OR ARCHITECT SHALL NOT BE CONSIDERED CHANGES TO CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE ITEMS ARE CONSTRUCTED TO CONTRACT DOCUMENTS.

THE ADEQUACY OF ENGINEERING DESIGNS AND LAYOUT PERFORMED BY OTHERS RESTS WITH THE DESIGNING OR SUBMITTING AUTHORITY.

REVIEWING IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR.

GENERAL:

THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO.

CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED CONSTRUCTION. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA.

ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL WITH APPROPRIATE TRADES, DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF AN OPTION IS CHOSEN, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES AND SHALL COORDINATE ALL DETAILS.

NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT.

CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. RESOLVE ANY DISCREPANCY WITH THE ARCHITECT.

TYPICAL DETAILS MAY NOT NECESSARILY BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

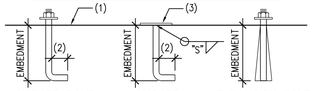
WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.

ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER RECOGNIZED BY THE BUILDING CODE JURISDICTION OF THIS PROJECT.

ABBREVIATIONS

A.B.C.	AGGREGATE BASE COURSE	H/C	HOLLOW CORE
A.F.F.	ABOVE FINISHED FLOOR	HORIZ.	HORIZONTAL
ALT.	ALTERNATE	I.F.W.	INSIDE FACE OF WALL
A.B.	ANCHOR BOLT	I.E.	INVERT ELEVATION
BM	BEAM	K (KIP)	1,000 POUNDS
B.F.F.	BELOW FINISHED FLOOR	L.L.	LIVE LOADS
B.O.B.	BOTTOM OF BEAM	LBS (#)	POUNDS
B.O.D.	BOTTOM OF DECK	L.L.H.	LONG LEG HORIZONTAL
B.O.F.	BOTTOM OF FOOTING	L.L.V.	LONG LEG VERTICAL
B.O.P.	BOTTOM OF PLATE	MFR('S)	MANUFACTURER('S)
B.O.S.	BOTTOM OF STEEL	MAS. C.J.	MASONRY CONTROL JOINT
BRG	BEARING	MECH'L	MECHANICAL
C.I.P.	CAST-IN-PLACE	N/A	NOT APPLICABLE
C.L.	CENTERLINE	N.T.S.	NOT TO SCALE
C.L.B.	CENTERLINE OF BEAM	O.C.	ON CENTERS
C.L.C.	CENTERLINE OF COLUMN	O.F.W.	OUTSIDE FACE OF WALL
C.L.F.	CENTERLINE OF FOOTING	OPP.	OPPOSITE
C.L.W.	CENTERLINE OF WALL	P.C.	PRE-CAST CONCRETE
CLR	CLEAR	P.L.F.	POUNDS PER LINEAR FOOT
CONC.	CONCRETE	PREFAB	PRE-FABRICATED
CONC. C.J.	CONCRETE CONTROL JOINT	P.S.F.	POUNDS PER SQUARE FOOT
CONC. S.J.	CONCRETE SAWCUT JOINT	P.S.I.	POUNDS PER SQUARE INCH
C.M.U.	CONCRETE MASONRY UNIT	REINF.	REINFORCING
CONN.	CONNECTION	S.L.H.	SHORT LEG HORIZONTAL
CONT.	CONTINUOUS	S.L.V.	SHORT LEG VERTICAL
D.L.	DEAD LOAD	SIM.	SIMILAR
DIA.	DIAMETER	SQ.	SQUARE
DN	DOWN	STD	STANDARD
DWG(S)	DRAWING(S)	T.L.	TOTAL LOAD
E.O.S.	EDGE OF SLAB	T.O.B.	TOP OF BEAM
EL.	ELEVATION	T.O.D.	TOP OF DECK
EQ.	EQUAL	T.O.F.	TOP OF FOOTING
EQUIP.	EQUIPMENT	T.O.G.	TOP OF GRATING
EXP.	EXPANSION BOLT	T.O.L.	TOP OF LEDGER
EXP. JT. (E.J.)	EXPANSION JOINT	T.O.M.	TOP OF MASONRY
E.W.	EACH WAY	T.O.P.	TOP OF PLATE
F.F.	FINISHED FLOOR	T.O.S.	TOP OF STEEL
F.O.M.	FACE OF MEMBER	T.O.W.	TOP OF WALL
F.O.S.	FACE OF STEEL	TYP.	TYPICAL
F.O.W.	FACE OF WALL	U.N.O.	UNLESS NOTED OTHERWISE
GA.	GAUGE	VERT.	VERTICAL
GALV.	GALVANIZED	W/TP	WATERSTOP
G.S.N	GENERAL STRUCTURAL NOTES	W.W.R.	WELDED WIRE REINFORCEMENT
GLB (GLULAM)	GLUE-LAMINATED BEAM		

BOLT DIAMETER	VERT. BOLT EMBEDMENT LENGTH	HORIZ. BOLT EMBEDMENT LENGTH	HEADED STUD FILLET WELD SIZE, "S"
1/2"	7"	4"	1/4"
5/8"	7"	4"	5/16"
3/4"	7"	5"	5/16"
7/8"	8"	6"	5/16"
1"	9"	7"	3/8"
1 1/8"	10"	8"	---
1 1/4"	11"	9"	---



ANCHOR BOLT | ANCHOR (HEADED STUD SIMILAR) | EXPANSION BOLT (EPOXY BOLT SIMILAR)

NOTES:
1. FACE OF WALL, TOP OF WALL, COLUMN, ETC.
2. 2" MIN. STANDARD HOOK OR BOLT HEAD, TYPICAL
3. PLATE, ANGLE, CHANNEL, ETC.

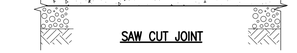
NOTES:
A. PROVIDE ANCHORS, ANCHOR BOLTS AND EXPANSION BOLTS PER THIS SCHEDULE UNLESS NOTED ON THE PLANS OR DETAILS.
B. EXPANSION BOLTS SHALL HAVE I.C.C. REPORT FOR SAME INSTALLATION.
C. USE 3/16" FILLET AT "ANCHORS."
D. THICKNESS OF DRYPACK DOES NOT APPLY TOWARD EMBEDMENT.

01 TYPICAL ANCHOR, ANCHOR BOLT, AND EXPANSION BOLT SCHEDULE
SCALE: N.T.S.

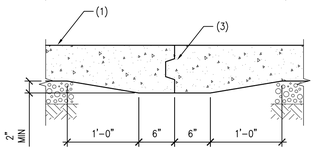
	CLASS "B" LAP SPLICE LENGTH (IN INCHES)							
	f'c=2,500 PSI		f'c=3,000 PSI		f'c=4,000 PSI		f'c=5,000 PSI	
	REG	TOP	REG	TOP	REG	TOP	REG	TOP
#3	16	22	16	20	16	18	16	16
#4	32	42	30	38	26	34	24	30
#5	40	52	36	48	32	42	28	36
#6	48	62	44	56	38	50	34	44
#7	70	90	64	82	54	72	50	64
#8	78	102	72	94	62	82	56	72
#9	88	116	82	106	70	92	64	82
#10	100	130	92	118	80	102	72	92
#11	110	144	102	132	88	114	78	102

NOTES:
A. TOP BARS ARE ANY HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.
B. UNLESS NOTED OTHERWISE, LAP SPLICES IN CONCRETE BEAMS, SLABS, WALLS, AND FOOTINGS SHALL BE CLASS "B" TENSION LAP SPLICES.
C. CONTACT STRUCTURAL ENGINEER IF CENTER-TO-CENTER SPACING OF REINFORCEMENT IS LESS THAN (3) BAR DIAMETERS (<3db).
D. LAP SPLICES BASED UPON THE FOLLOWING STEEL PROPERTIES:
#3 fy = 40 KSI
#4 AND LARGER fy = 60 KSI

02 LAP SPLICE SCHEDULE FOR REINFORCING IN CONCRETE
SCALE: N.T.S.



SAW CUT JOINT

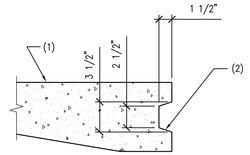


KEYED JOINT

NOTES:
1. CONCRETE SLAB ON GRADE
2. SAWCUT - 1/8" WIDE x 1/4 SLAB THICKNESS IN DEPTH - CUT SHALL BE MADE SOON ENOUGH TO PREVENT SHRINKAGE CRACKING, BUT NOT TO CAUSE SPALLING OF THE CONCRETE WHILE SAWING - WORK MUST BE ACCOMPLISHED WITHIN (24) HOURS OF CONCRETE PLACEMENT
3. CONTINUOUS KEY - SEE TYPICAL DETAIL

NOTES:
A. KEYED JOINTS NEED ONLY OCCUR AT EXPOSED EDGES DURING PLACEMENT UNLESS SPECIFICALLY NOTED ON THE PLANS

03 CONTROL JOINTS (C.J.) IN CONCRETE SLAB ON GRADE
SCALE: N.T.S.



KEYED JOINT

NOTES:
1. CONCRETE SLAB
2. KEYED JOINT - REMOVE FORM MATERIAL PRIOR TO PLACING ADJACENT CONCRETE

NOTES:
A. ALL DIMENSIONS ARE ±1/2"

04 TYPICAL KEY IN CONCRETE
SCALE: N.T.S.

REVISIONS

APPROVALS
DESIGNED SDS
DRAWN SDS
CHECKED EAB
DATE 02/04/2020
SCALE AS NOTED

SEAL
STATE OF WASHINGTON EDMOND ALLEN BROWN REGISTERED PROFESSIONAL ENGINEER 02/05/20

PREPARED BY
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KINGSTON, WA. 98436

SHEET TITLE
GENERAL STRUCTURAL NOTES

SHEET NO.
S1.0

PROJECT NO.
18,720

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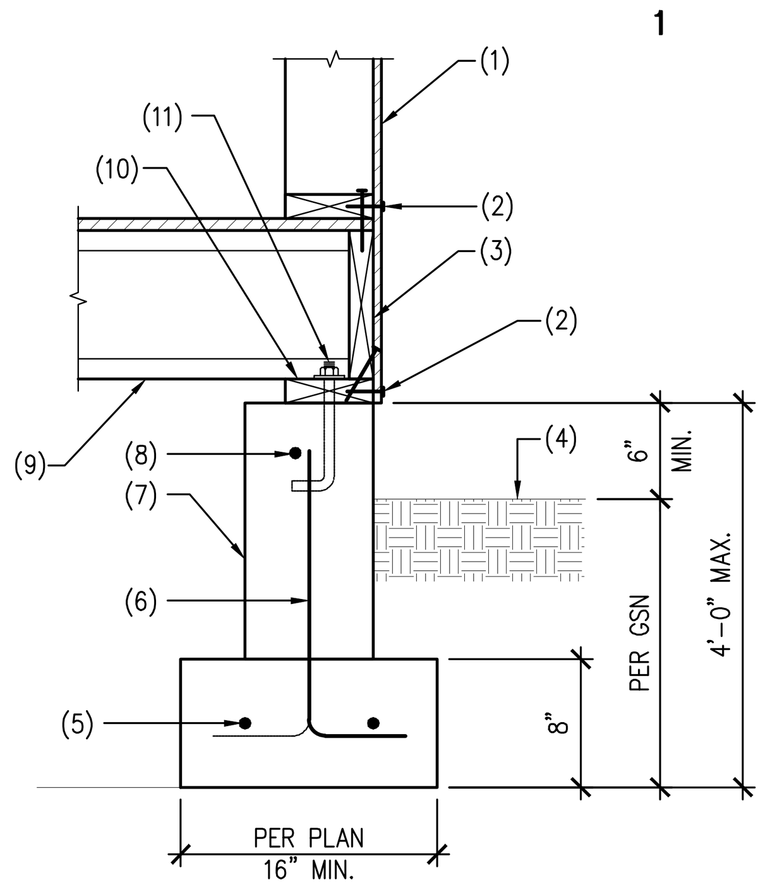
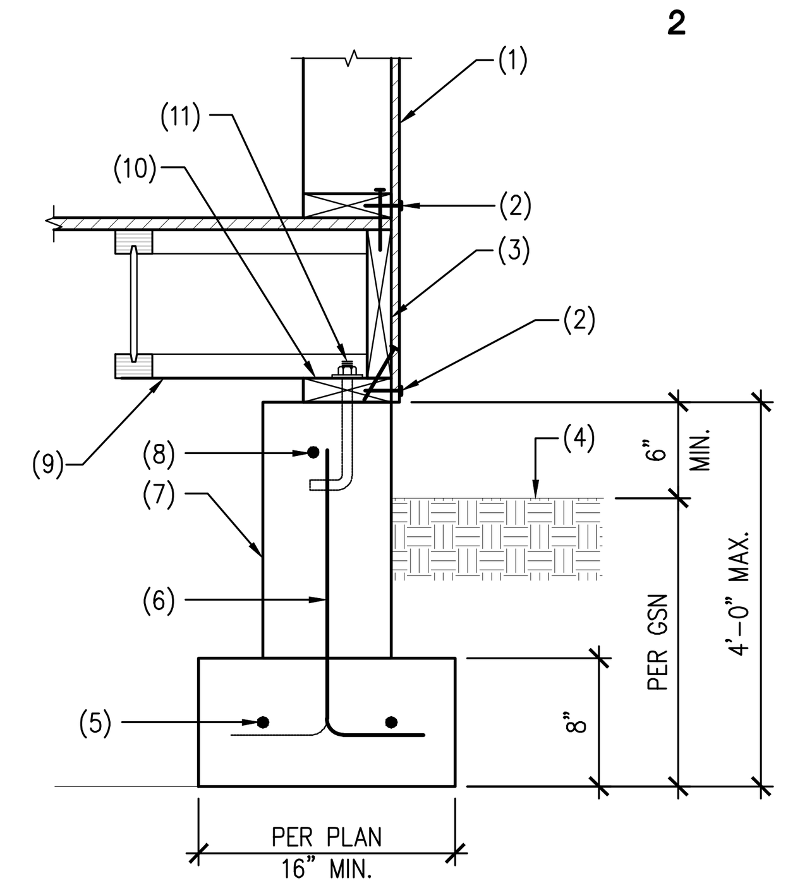
Permit Number: 20-00976



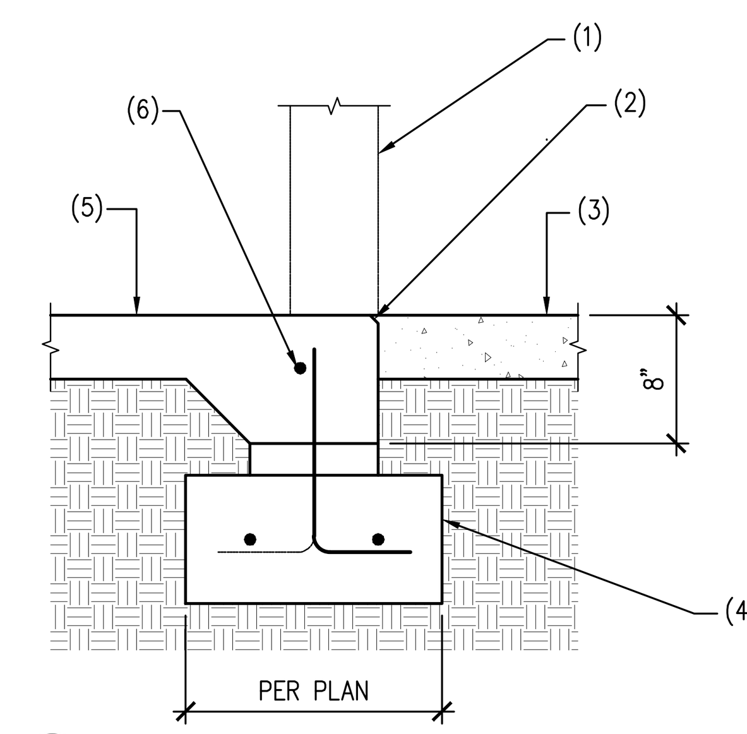
NOTES:
1. WOOD STUD WALL PER PLAN
2. EDGE NAILING
3. MFR. RIM JOIST. ATTACH TO MUD SILL WITH 16d TOENAILS @ 6" O.C.
4. FINISH GRADE
5. (2) #4 BARS CONTINUOUS
6. #4 HOOKED DOWELS AT 18" O.C. ALTERNATE BENDS
7. 6" CONCRETE STEM WALL
8. #4 CONTINUOUS. USE #4 BARS @ 12" HORIZONTAL FOR WALLS TALLER THAN 24"
9. JOISTS PER PLAN
10. 2x TREATED PLATE
11. ANCHOR BOLTS @ 4'-0" O.C. UNLESS NOTED OTHERWISE IN SHEARWALL SCHEDULE.

101 TYPICAL FOUNDATION STEM WALL
SCALE: N.T.S.



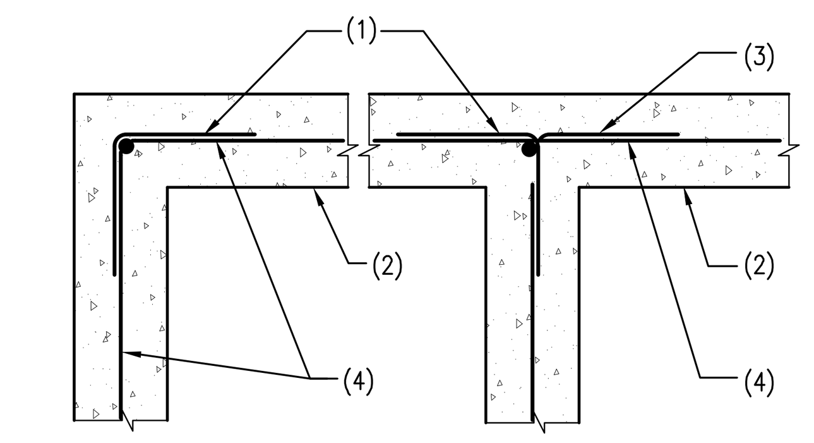
NOTES:
1. WOOD STUD WALL PER PLAN
2. EDGE NAILING
3. MFR. RIM JOIST. ATTACH TO MUD SILL WITH 16d TOENAILS @ 6" O.C.
4. FINISH GRADE
5. (2) #4 BARS CONTINUOUS
6. #4 HOOKED DOWELS AT 18" O.C. ALTERNATE BENDS
7. 6" CONCRETE STEM WALL
8. #4 CONTINUOUS. USE #4 BARS @ 12" HORIZONTAL FOR WALLS TALLER THAN 24"
9. BLOCKING BY JOIST MFR @ 48" O.C. MAX.
10. 2x TREATED PLATE
11. ANCHOR BOLTS @ 4'-0" O.C. UNLESS NOTED OTHERWISE IN SHEARWALL SCHEDULE.

102 TYPICAL FOUNDATION STEM WALL
SCALE: N.T.S.



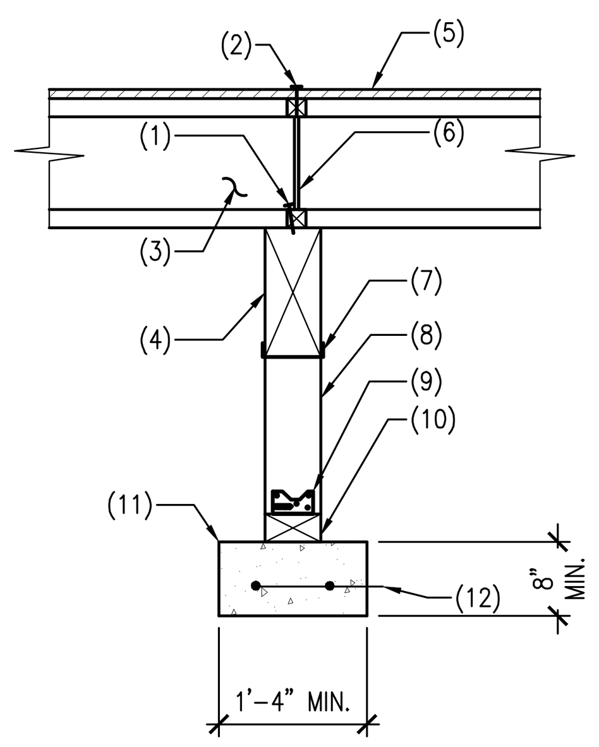
NOTES:
1. WALL BEYOND
2. TOOLED EDGE
3. FINISH GRADE OR CONCRETE SLAB AS OCCURS
4. CONCRETE FOOTING AND STEM WALL PER PLAN. BUCK OUT STEM WALL AS REQUIRED AT OPENING.
5. CONCRETE SLAB
6. #4 CONTINUOUS

103 WOOD STUD WALL FOOTING AT OPENING
SCALE: N.T.S.



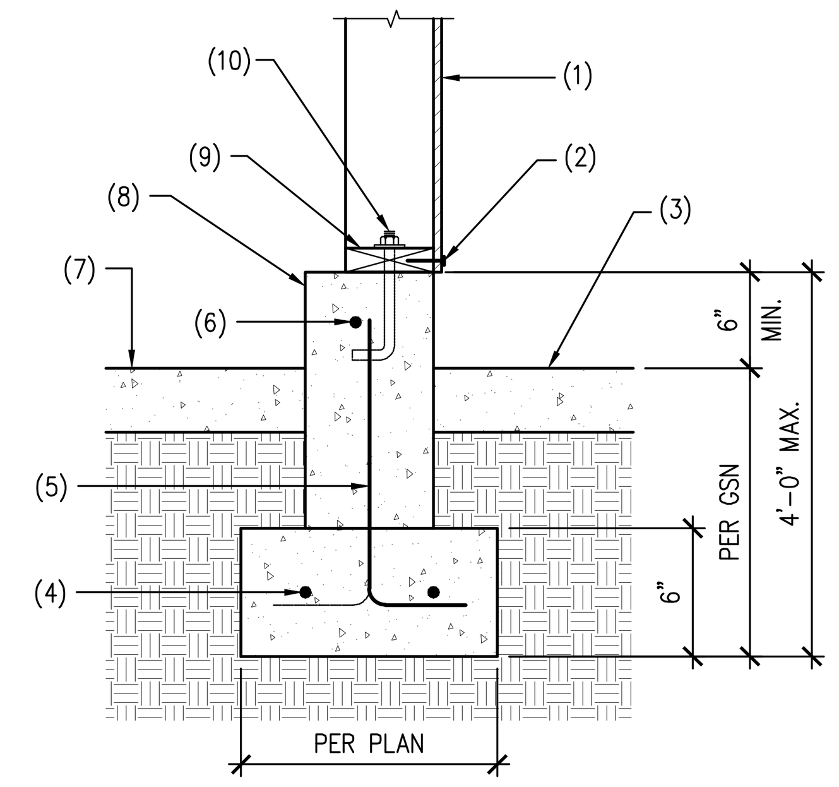
NOTES:
1. CORNER BARS SAME SIZE AND SPACING AS HORIZONTAL REINFORCING LAP PER GSN (24" MINIMUM)
2. CONCRETE STEM WALL OR FOOTING
3. ALTERNATE BENDS
4. REINFORCING PER PLANS AND/OR DETAILS

104 PLAN-CORNER REINFORCING IN CONCRETE FOOTING STEM/WALL
SCALE: N.T.S.



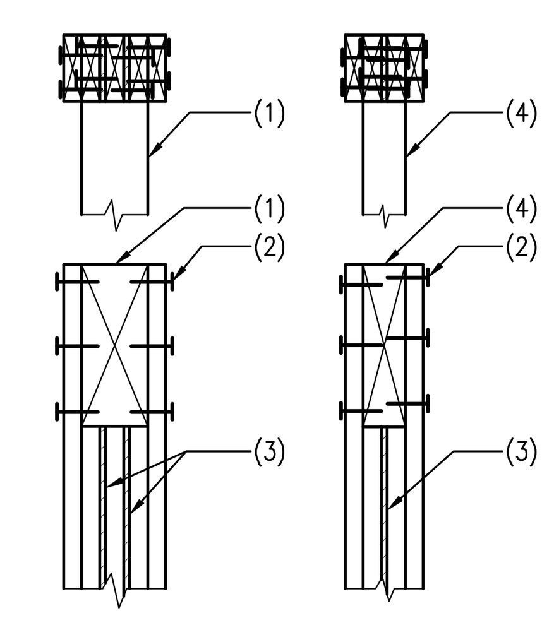
NOTES:
1. (3) 10d NAILS PER BLOCK
2. EDGE NAILING
3. PLYWOOD WEB JOISTS PER PLAN
4. WOOD BEAM PER PLAN
5. PLYWOOD SHEATHING
6. BLOCKING BY JOIST MANUFACT.
7. SIMPSON POST CAP OR 2x4 CLEAT EACH SIDE
8. WOOD POST PER PLAN
9. SIMPSON A34 CLIP EACH SIDE
10. 2x TREATED BASE PLATE WITH 1/2" DIAMETER ANCHOR BOLTS AT 48" O.C.
11. CONT. CONC. FOOTING PER PLAN
12. (2) #4 BARS CONTINUOUS

105 INTERIOR CONTINUOUS FOOTING WITH PLYWOOD WEB JOIST
SCALE: N.T.S.



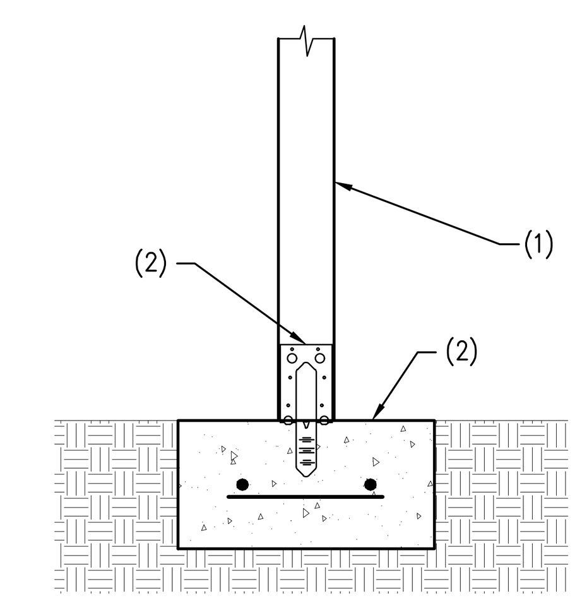
NOTES:
1. WOOD STUD WALL PER PLAN
2. EDGE NAILING
3. FINISH GRADE OR CONCRETE SLAB AS OCCURS
4. (2) #4 BARS CONTINUOUS
5. #4 HOOKED DOWELS @ 18" O.C. ALTERNATE BENDS
6. #4 BAR CONTINUOUS. USE #4 BARS @ 12" O.C. HORIZONTAL FOR WALLS TALLER THAN 24"
7. CONCRETE SLAB
8. CONCRETE STEM WALL
9. 2x TREATED PLATE
10. 5/8" DIA. ANCHOR BOLTS AT 4'-0" O.C. UNO IN SHEAR WALL SCHEDULE

106 WOOD STUD WALL FOOTING
SCALE: N.T.S.



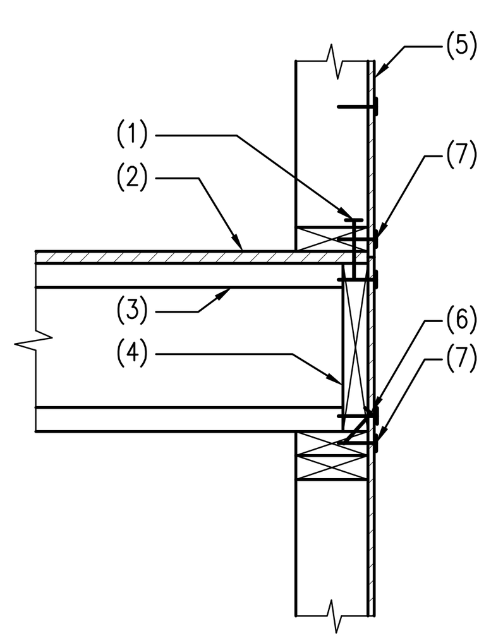
NOTES:
1. 6x SAWN OR 5 1/8" GLB
2. (6) 16d NAILS EACH SIDE, TYP.
3. PLYWOOD FILLER
4. 4x SAWN OR 3 1/8" GLB

107 BUILT-UP POST PERPENDICULAR TO WALL - TYPICAL
SCALE: N.T.S.



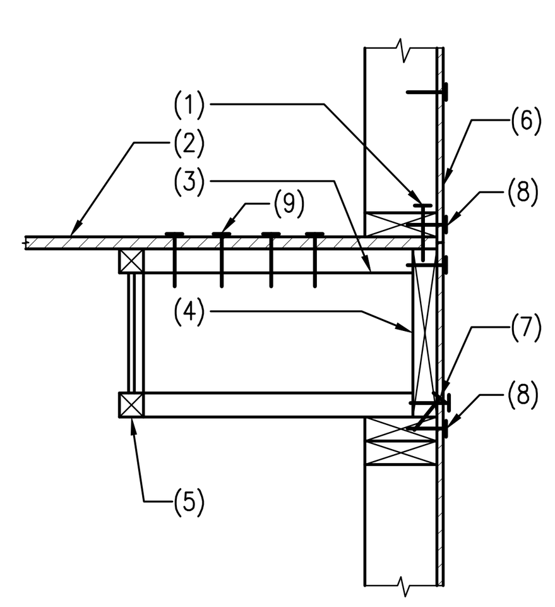
NOTES:
1. POST PER PLAN
2. FOOTING PER PLAN
3. SIMPSON POST BASE

108 TYPICAL INTERIOR FOOTING
SCALE: N.T.S.



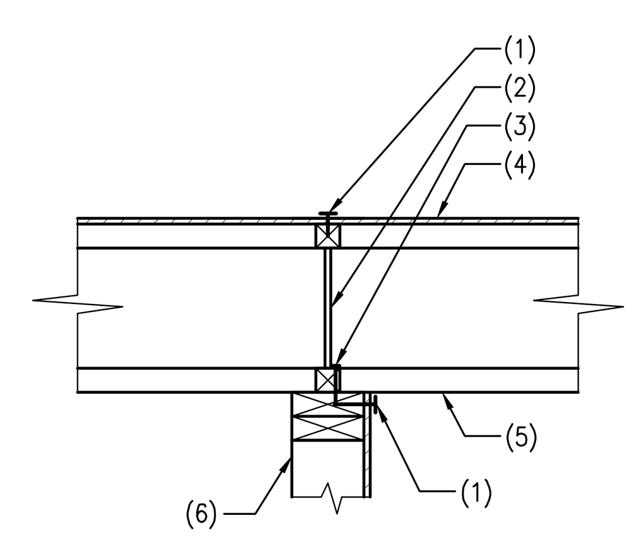
NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
2. PLYWOOD SHEATHING
3. PLYWOOD WEB WOOD JOIST PER PLAN
4. RIM JOIST BY JOIST MANUFACTURER - ATTACH WITH (2) 10d NAILS PER JOIST
5. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
6. 16d TOENAILS AT 6" O.C.
7. EDGE NAILING

201 PLYWOOD WEB JOIST AT WOOD STUD WALL
SCALE: N.T.S.



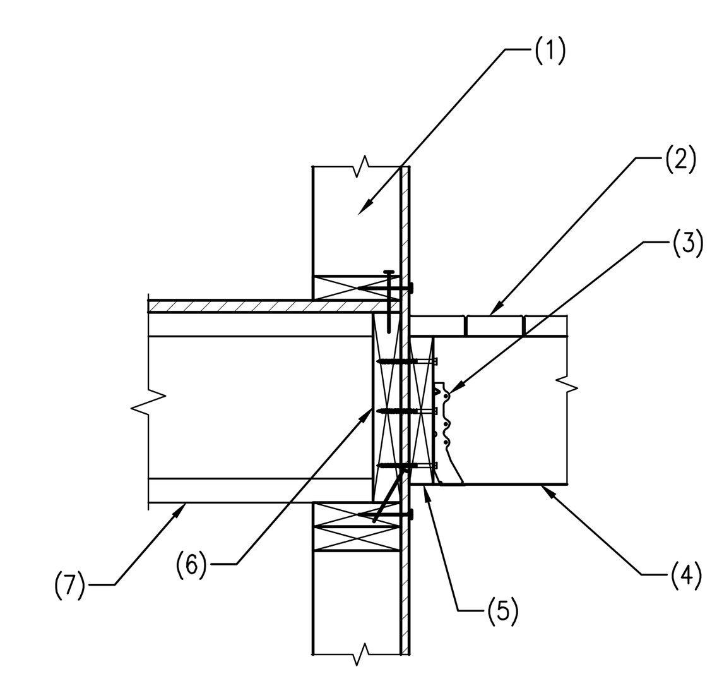
NOTES:
1. BASE PLATE NAILING PER SHEARWALL SCHEDULE
2. PLYWOOD SHEATHING
3. BLOCKING AT 48" O.C. BY JOIST MANUFACTURER
4. RIM JOIST BY JOIST MANUFACTURER - ATTACH WITH (2) 10d NAILS PER PLAN
5. PLYWOOD WEB JOIST PER PLAN
6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
7. 16d TOENAILS AT 6" O.C.
8. EDGE NAILING
9. (4) #8 SCREWS PER BLOCK - 10d NAILS ALTERNATE

202 PLYWOOD WEB JOIST AT WOOD STUD WALL
SCALE: N.T.S.



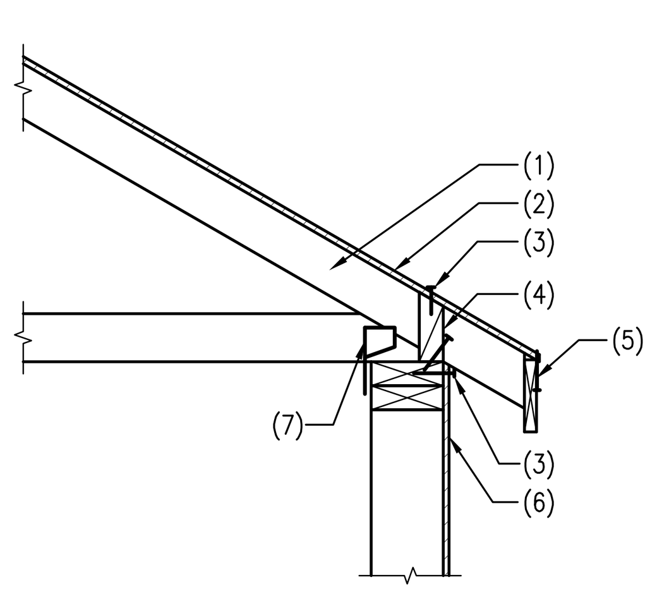
NOTES:
1. EDGE NAILING
2. BLOCKING BY JOIST MANUFACTURER
3. 10d NAILS TO MATCH SPACING OF EDGE NAILING
4. PLYWOOD SHEATHING
5. PLYWOOD WEB JOIST PER PLAN
6. WOOD STUD WALL BELOW

203 PLYWOOD WEB JOIST AT WOOD STUD WALL
SCALE: N.T.S.



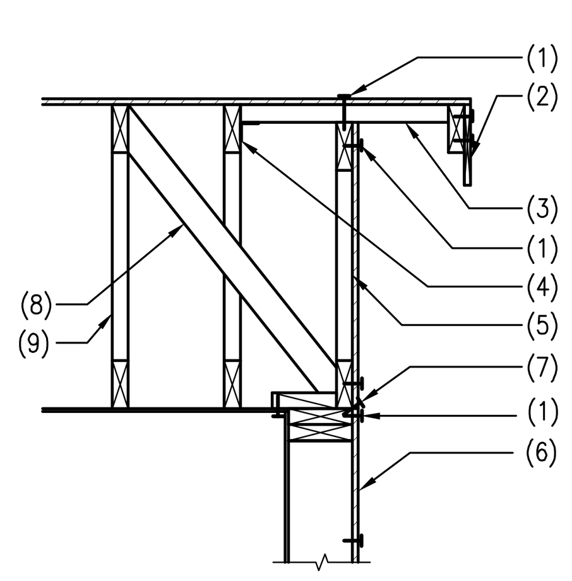
NOTES:
1. WALL FRAMING PER PLAN
2. DECKING PER ARCH
3. SIMPSON LU TYPE HANGER, GALVANIZED. MATCH JOIST TYPE
4. JOIST PER PLAN
5. 2x TREATED LEDGER TO MATCH JOIST DEPTH. ATTACH WITH (3) 1/4" DIAMETER x 3 1/2" LONG SIMPSON SDS SCREWS SPACED AT 16" ON CENTER
6. 1 3/4" LVL RIM AT LEDGER
7. FLOOR JOIST PER PLAN

204 LEDGER ATTACHMENT
SCALE: N.T.S.



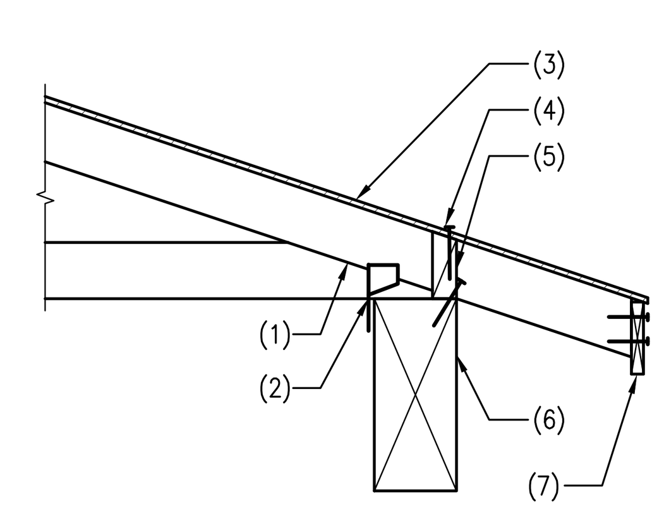
NOTES:
1. WOOD TRUSS PER PLAN
2. PLYWOOD SHEATHING
3. EDGE NAILING
4. 2x BLOCKING WITH (3) 16d NAILS PER BLOCK
5. WOOD FASCIA WITH (2) 10d NAILS PER TRUSS MANUFACTURER
6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE
7. SIMPSON H1 AT EACH TRUSS - USE SIMPSON H2.5 EACH SIDE OF GIRDER TRUSS

301 WOOD TRUSS AT WOOD STUD WALL
SCALE: N.T.S.



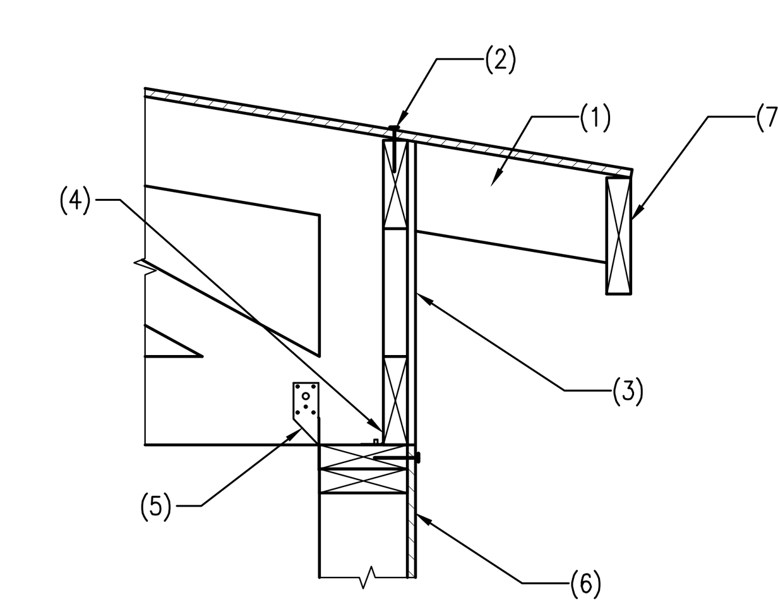
NOTES:
1. EDGE NAILING
2. WOOD FASCIA WITH (2) 10d NAILS PER OUTRIGGER
3. 2x4 OUTRIGGER AT 24" O.C.
4. SIMPSON A35 CLIP AT 24" O.C.
5. GABLE END TRUSS
6. SHEATHING AND ATTACHMENT PER SHEARWALL SCHEDULE, CONTINUE SHEATHING OVER GABLE END TRUSS WHERE AXIAL TRUSS DOES NOT OCCUR
7. 16d TOENAILS AT 6" O.C.
8. 2x4 BRACE AT 48" O.C. WITH SIMPSON A35 CLIP EACH END
9. WOOD TRUSS PER PLAN

302 GABLE END TRUSS
SCALE: N.T.S.



NOTES:
1. WOOD TRUSS PER PLAN
2. SIMPSON H2.5 CLIP AT EACH TRUSS
3. PLYWOOD SHEATHING
4. EDGE NAILING
5. 2x BLOCKING WITH (3) 16d NAILS PER BLOCK
6. WOOD BEAM
7. WOOD FASCIA WITH (2) 10d NAILS PER TRUSS

303 WOOD TRUSS AT WOOD BEAM
SCALE: N.T.S.



NOTES:
1. WOOD TRUSS PER PLAN
2. EDGE NAILING
3. BLOCKING PANEL BY TRUSS MFR
4. SIMPSON A35 AT 24" O.C.
5. SIMPSON H2.5 CLIP
6. WALL PER PLAN
7. WOOD FASCIA WITH (2) 10d NAILS PER TRUSS MANUFACTURER

NOTES:
A. SEE ARCHITECTURAL DRAWINGS FOR VENTING REQUIREMENTS.

304 TRUSS AT WOOD STUD WALL
SCALE: N.T.S.

REVISIONS

APPROVALS
DESIGNED SDS
DRAWN SDS
CHECKED EAB
DATE 02/04/2020
SCALE AS NOTED

SEAL
EDMOND ALLEN BROWN
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
02/06/20

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PREPARED FOR
ARMSTRONG HOMES OF BREMERTON
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PROJECT
SYGULLA RESIDENCE
34194 BRIDGEVIEW DRIVE NE
KINGSTON, WA 98436

SHEET TITLE
TYPICAL FOUNDATION AND FRAMING DETAILS

SHEET NO.
S1.1

PROJECT NO.
18,720

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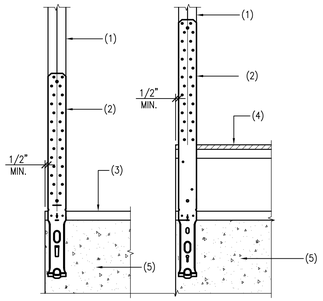
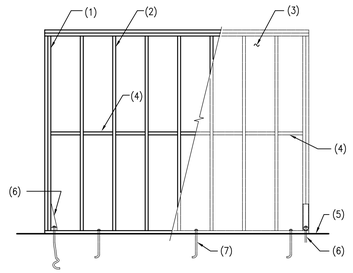


401 TYPICAL STRAP TYPE HOLD-DOWN
SCALE: N.T.S.

NOTES:

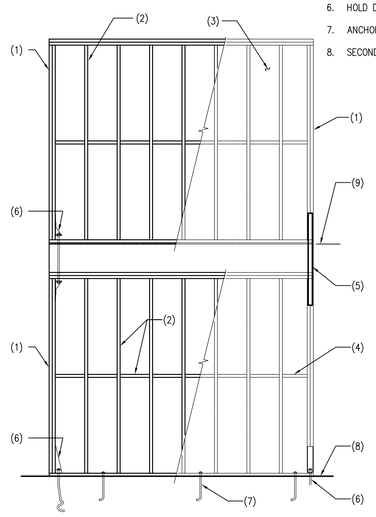
1. DOUBLE STUD AT SHEAR WALL EDGE
2. STRAP TYPE HOLD-DOWN PER PLAN. INSTALL PER MANUFACTURER'S INSTRUCTIONS
3. WOOD BASE PLATE
4. FLOOR FRAMING PER PLAN
5. CONCRETE STEM WALL



402 ONE-STORY SHEAR WALL ELEVATION
SCALE: N.T.S.

NOTES:

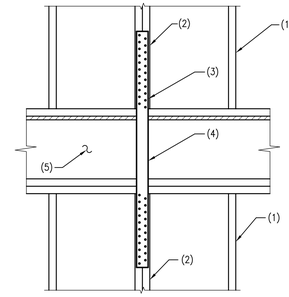
1. (2) STUDS, U.N.O. AT EACH END OF PANEL NAILED AS BUILT-UP POST, TYPICAL
2. WOOD STUDS
3. SHEATHING MATERIAL
4. BLOCKING REQUIRED AT SHEATHING PANEL JOINTS
5. FINISHED FLOOR
6. HOLD DOWNS AS OCCURS
7. ANCHOR BOLTS



403 TWO-STORY SHEAR WALL ELEVATION
SCALE: N.T.S.

NOTES:

1. (2) STUDS, U.N.O. AT EACH END OF PANEL NAILED AS BUILT-UP POST, TYPICAL
2. WOOD STUDS
3. SHEATHING MATERIAL
4. BLOCKING REQUIRED AT SHEATHING PANEL JOINTS
5. SIMPSON STRAP PER PLANS AND DETAILS
6. HOLD DOWNS AS OCCURS
7. ANCHOR BOLTS FIRST FLOOR LINE
8. SECOND FLOOR LINE



404 HOLD-DOWN STRAP AND WOOD STUD WALL
SCALE: N.T.S.

NOTES:

1. WOOD STUD WALL PER PLAN
2. DOUBLE STUD AT SHEAR WALL EDGES
3. STRAP PER PLAN. CENTER STRAP BETWEEN FLOORS
4. SOLID BLOCK UNDER STRAP AS REQUIRED
5. BLOCKING OR RIM JOIST AS OCCURS

NOTE:

A. WALL SHEATHING NOT SHOWN FOR CLARITY

SHEAR WALL SCHEDULE

WALL MARK	SHEATHING	SIDES	PANEL EDGE NAILING (5)	FIELD NAILING	FRAMING AT ADJACENT PANEL EDGES (7)	BASE PLATE ATTACHMENT	ANCHOR BOLT SPACING	FOUNDATION SILL PLATE/FLOOR BASE PLATE	BLOCKING/RIM JOIST ATTACHMENT (6)
P1-6	1/2" NOM.	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.
P1-4	1/2" NOM.	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.	2x	SIMPSON A35 CLIPS AT 12" O.C.
P1-3	1/2" NOM.	ONE	8d NAILS AT 3" O.C.	12" O.C.	3x OR (2) 2x	(2) 16d NAILS AT 4" O.C.	5/8" DIAMETER BOLTS AT 24" O.C.	2x	SIMPSON A35 CLIPS AT 8" O.C.
P1-2	1/2" NOM.	ONE	8d NAILS AT 2" O.C.	12" O.C.	3x OR (2) 2x	(2) 16d NAILS AT 4" O.C.	5/8" DIAMETER BOLTS AT 16" O.C.	2x	SIMPSON A35 CLIPS AT 6" O.C.

SHEAR WALL SCHEDULE NOTES:

1. FRAMING STUDS SHALL BE HEM-FIR #2 SPACED AT 16" O.C. MAXIMUM. THICKNESS OF STUDS SHALL BE 2x UNLESS OTHERWISE NOTED IN SCHEDULE.
2. SHEATHING PANELS MAY BE PLACED VERTICAL OR HORIZONTAL. BLOCK ALL HORIZONTAL EDGES WITH 2x OR 3x BLOCKING TO MATCH STUD WIDTH UNLESS NOTED OTHERWISE.
3. NAILING APPLIES TO ALL STUDS, TOP AND BOTTOM PLATES AND BLOCKING.
4. MAXIMUM ANCHOR BOLT SPACING OF 48" O.C. UNLESS OTHERWISE NOTED IN SCHEDULE. MINIMUM OF 2 ANCHORS PER WALL. PROVIDE 3"x3"x0.229" 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.
5. TABLES BASED ON 8d NAILS (2 1/2" LONG x 0.131" COMMON OR 2 1/2" x 0.131" GALVANIZED BOX).
6. 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.
7. FASTEN DOUBLE STUDS AT PANEL EDGES TOGETHER WITH 10d NAILS. MATCH EDGE NAIL SPACING OF SHEAR WALL.

405 SHEARWALL SCHEDULE
SCALE: N.T.S.

REVISIONS

APPROVALS
DESIGNED SDS
DRAWN SDS
CHECKED EAB
DATE 02/04/2020
SCALE AS NOTED

SEAL
ALLEN BROWN EDMOND STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER 02/05/20

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PREPARED FOR
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PROJECT
SYGULLA RESIDENCE
34194 BRIDGEVIEW DRIVE NE
KINGSTON, WA 98436

SHEET TITLE
TYPICAL SHEAR WALL DETAILS

SHEET NO.
S1.2

PROJECT NO.
18,720