SANTA BARBARA CENTER FOR ART, SCIENCE & TECHNOLOGY

513 GARDEN STREET
SANTA BARBARA, CA 93101

STATEMENT OF SPECIAL INSPECTIONS

CONCRETE CONSTRUCTION SPECIAL INSPECTIONS* *(per CBC 1704.4 & Table 1704.4)*

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REF. STANDARD	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	–	X	ACI 318: 3.5, 7.1-7.7	1913.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5b.	–	–	AWS D1.4; ACI 318: 3.5.2	–
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased.	X	–	–	1911.5
4. Verifying use of required design mix.	–	X	ACI 318: Ch. 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	–	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	–	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
7. Inspection for maintenance of specified curing temperature and techniques.	–	X	ACI 318: 5.11-5.13	1913.9
8. Verification of in-situ concrete strength, prior to removal of shores and forms from beams and structural slabs.	–	X	ACI 318: 6.2	–
9. Inspect formwork for shape, location, and dimensions of the concrete member being formed.	–	X	ACI 318: 6.1.1	–
10. Inspection of Adhesive/Epoxied Anchors and their installation	X	–	*ICC Evaluation Report*	–
11. Post-installed anchors (wedge/expansion type)	–	X	*ICC Evaluation Report*	–

- *Concrete inspections are not required for concrete patios, driveways, and sidewalks on grade.*

SOIL SPECIAL INSPECTIONS* *(per CBC 1704.7 & Table 1704.7)*

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. Verify materials below footings are adequate to achieve the design bearing capacity.	–	X
2. Verify excavations are extended to proper depth and have reached proper material.	–	X
3. Perform classification and testing of controlled fill materials.	–	X
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill.	X	–
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.	–	X

* Soils inspections are not required for placement of fill less than 12" thick per Exception in CBC 1704.7

PIER FOUNDATION SPECIAL INSPECTIONS *(per CBC 1704.9 & Table 1704.9)*

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. Observe drilling operations and maintain complete and accurate records for each pier.	X	–
2. Verify placement locations and plumbness, confirm pier diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity.	X	–
3. For concrete piers, perform additional inspections in accordance with CBC Section 1704.4.	–	–

STEEL CONSTRUCTION SPECIAL INSPECTIONS *(per CBC 1704.3 & Table 1704.3)*

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REF. STANDARD	IBC REF.
1. Material verification of high-strength bolts, nuts, and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	–	X	Applicable ASTM material specifications; AISC 360, Section A3.3	–
b. Manufacturer's certificate of compliance required.	–	X	–	–
2. Inspection of high-strength bolting:				
a. Bearing-type connections.	–	X	AISC 360, Section M2.5	1704.3.3
b. Slip-critical connections.	X	X		
3. Material verification of structural steel:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	–	–	ASTM A6 or ASTM A568	1708.4
b. Manufacturers' certified mill tests	–	–	ASTM A6 or ASTM A568	
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS standards specified in the approved construction documents.	–	–	AISC 360, Section A3.5	–
b. Manufacturer's certificate of compliance required.	–	–		
5. Inspection of welding:				
a. Structural steel:				
1) Complete and partial penetration groove welds.	X	–		
2) Multipass fillet welds.	X	–	AWS D1.3	–
3) Single-pass fillet welds > 5/16"	X	–	AWS D1.4; ACI 318: 3.5.2	–
4) Single-pass fillet welds ≤ 5/16"	–	X		
5) Floor and roof deck welds.	–	X		
b. Reinforcing steel:				
1) Verification of weldability of reinforcing steel other than ASTM A706.	–			
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	–	–	1704.3.2
3) Shear reinforcement.	X	–		
4) Other reinforcing steel.	–	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:		X		

ADDITIONAL SPECIAL INSPECTIONS *(per CBC 1704.2, 1704.6, & 1707.3)*

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. Review of procedures for fabrication of structural load-bearing members and assemblies performed on the premises of a fabricator's shop, where the fabricator is not registered and approved to perform such work without special inspection. See CBC 1704.2.	–	X
2. Verify that high-load wood diaphragm installation per CBC Table 2306.3.2 (including panel grade and thickness, nominal size of framing members at adjoining panel edges, nail or staple diameter and length, number of fastener lines, and spacing between fasteners in each line) agrees with the approved building plans.	–	X
3. Field gluing operations of wood elements of the seismic-force-resisting system.	X	–
4. Nailing, bolting, anchoring and other fastening of components within the seismic-force resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and holdowns. *(Exception: These inspections are not required for these elements where the fastener spacing of the sheathing is more than 4" o.c.)*	–	X

ADDITIONAL NOTES REGARDING SPECIAL INSPECTORS

CBC 1704.1: The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring inspection.

The special inspector shall observe the work assigned for conformance with the approved design drawings, approved specifications, and the applicable workmanship provisions of the CBC. The special inspector shall furnish inspection reports to the building official, the engineer or architect of record, and other designated persons as directed in Chapter 17 of the CBC. All discrepancies shall be brought to the immediate attention of the contractor for correction and then, if uncorrected, to the appropriate design authority and to the building official.

Taylor & Syfan may be commissioned, upon request, to perform Special Inspections of wood construction.

GENERAL NOTES

1. The notes on this S-1.0 sheet apply to and are in effect for all parts of the project, unless specifically noted otherwise. Refer to the Structural Specifications on Sheet S-1.1 (or in a separate specifications book), for additional structural requirements. See architectural notes and specifications for additional non-structural requirements.

2. **Do not scale these drawings.** The Contractor shall use dimensions from the architectural plans to lay out walls, foundations, and other elements. The Contractor shall verify all dimensions and conditions and report any discrepancies to Taylor & Syfan Consulting Engineers, Inc., ("Taylor & Syfan") before proceeding with work. If dimensional questions occur, the Contractor must consult with the Architect.

3. Taylor & Syfan's details are prepared to convey only structural aspects of each element shown. Architectural information, including but not limited to fenestrations, fire-resistance, insulation, finishes, waterproofing, drainage, and flashing may not be included on the structural plans. The Contractor shall obtain non-structural information for each detail from the Architect and the architectural plans.

4. No deviations from these structural plans, details, and specifications are allowed without written approval from Taylor & Syfan. Approval by a Building Agency Inspector, a Special (or "Deputy") Inspector, or any other party does not constitute authority to deviate from these plans. Plan changes and addenda are subject to approval by the governing Building Enforcement Agency. The Contractor shall be responsible for processing changes, assembling permit documents, and acquiring permits.

5. Substitutions of equivalent products for specified products are not recommended. For substitutions to be considered, the Contractor must provide Taylor & Syfan with satisfactory evidence of product equivalence. If satisfactory, Taylor & Syfan shall revise the structural plans and reprint. The Contractor shall be responsible to pay all related expenses and acquire Building Enforcement Agency approval for revised plans.

6. All construction and materials shall comply with and be installed in accordance with the requirements of all legally-constituted public authorities having jurisdiction, including all county, city, and local ordinances, as well as the Safety Orders of the State Industrial Accident Commission, OSHA.

7. The Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the construction delineated by these plans. The Contractor or his/her agent(s) shall supervise and direct all work and shall be solely and completely responsible for all construction means, methods, techniques, sequences, procedures, and conditions on the job site, including the safety of all persons and property during the entire period of construction. Periodic observations by Taylor & Syfan personnel or representatives are not intended to include verfication of dimensions or review the adequacy of the Contractor's safety measures on or near the construction site.

8. The Contractor shall be responsible for shoring and providing bracing during construction and/or erection to support all loads to which the structure may be subjected. Per OSHA and the governing Building Enforcement Agency, shoring is required for all vertical cuts in excess of 5'-0".

9. Where inspection is required, the Special (or "Deputy") Inspector is to obtain clearance from the governing Building Enforcement Agency prior to the commencement of work. Copies of the inspection report(s) to be filed by the Special Inspector(s) shall be provided to Taylor & Syfan. The Contractor is responsible for inspection-related scheduling, coordination, and expenses.

10. All construction projects require inspection and maintenance following completion. Operation, inspection, and maintenance are the sole responsibility of the Owner. Taylor & Syfan shall have no responsibility for any failures by the Owner or others to properly operate, inspect, or maintain the project(s) shown in these plans.

11. It is unlawful for any portion of a building to have load placed on it exceeding the design loads per CBC Section 106.3. Portions of commercial and industrial buildings designed for live loads exceeding 50 psf shall have signage installed per CBC Section 106.1.

12. The plans, calculations, and specifications contained herein and provided herewith are the exclusive property of Taylor & Syfan Consulting Engineers Inc., Copyright © 2013 . The use of these plans and specifications shall be restricted to the original site for which they were prepared and publication thereof is expressly limited to such use. Reproduction or publication by any method, in whole or in part, is prohibited. Title to these plans and specifications shall remain with Taylor & Syfan without prejudice. Visual contact with these plans and specifications shall constitute prima facie evidence of the acceptance of these restrictions.

STRUCTURAL DESIGN PARAMETERS

GENERAL PARAMETERS

Building Code	2010 CBC
Construction Type	Type V
Occupancy Category	II
Number of Stories	3 Max.
Max. Height (above grade)	34 ft.
Roof (Green) DL/LL (psf)	43/20
Roof (PV Panels) DL/LL (psf)	15/20*
Floor DL/LL (psf)	17/40

SOILS VALUES

Bearing Pressure	650 psf DL, 1250 psf TL
Lateral Passive	150 psf/ft
EFP (at-rest, level)	n/a pcf
EFP (active, level)	n/a pcf
Pier Skin Friction	150 psf/ft
Soil Classifications	Alluvial Deposits (Silts, Sands, Clay)

Roof Loading at Areas Excluding Green Roofs Have Been Evaluated Considering a Maximum of 2-5/8" of Water Overflow

WIND DESIGN DATA (per CBC 1603.1.4):

Basic Wind Speed	85 mph
Wind Importance Factor, I	1.00
Exposure Category	C
Internal Pressure Coefficient, GC_{pi}	+/- 0.18

SEISMIC DESIGN DATA (per CBC 1603.1.5):

Seismic Importance Factor, I	1.00
Site Class	E
Spectral Response Accelerations	$S_S = 2.083$, $S_1 = 0.794$
Spectral Response Coefficients	$S_{DS} = 1.250$, $S_{D1} = 1.271$
Seismic Design Category	E
Seismic Force Resisting System(s)	A.13**
Response Modification Factor, R	6.5
Seismic Response Coefficient, C_s	0.192
Design Base Shear (ASD ~ $0.7C_sW$)	43 kips
Redundancy Factor, ρ	1.3
Analysis Procedure Used	Equiv. Lat. Force

****See ASCE 7-05 Table 12.2-1***

STANDARD ABBREVIATIONS

Abbreviation	Meaning
AB	anchor bolt
Abv.	above
A/C	air conditioning
Add'l	additional
Add'm	addendum
Adj.	adjacent, adjustable
Alum.	aluminum
Alt.	alternate
Approx.	approximate
Arch.	architect (ural)
ASTM	American Society of Testing & Materials
Auto.	automatic
Avg.	average
Bd.	board
Bldg.	building
Blk(g).	block (ing)
Bm.	beam
BN	boundary nailing
Bot.	bottom
BP	base plate
Brg.	bearing
Btwn.	between
BW	both ways
Cant.	cantilever (ed)
CBC	California Building Code
CDX	grade C-D plywood w/ exterior glue
Cem.	cement
CHBC	California Historic Building Code
CJ	ceiling joist (s)
CJP	complete joint penetration
CL	center line
Clg.	ceiling
Clr.	clear (ance)
CM	centimeter (s)
CMU	concrete masonry unit
Coeff.	coefficient
Col.	column
Com.	common
Conc.	concrete
Conn.	connect (ion)
Const.	construction
Cont.	continuous, continue
Corr.	corrugated
Ctr.	center
Cu.	cubic
d	penny
Dbl.	double
Deg.	degree
Demo	demolish, demolition
Dep.	depressed
DF	Douglas Fir
Dia(m).	diameter
Diag.	diagonal
Dim.	dimension (s)
Dist.	distance
Div.	division, divider
DJ	deck joist (s)
DL	dead load
Dn.	down
DSA	Division of the State Architect
Dwg.	drawing
(E)	existing
Ea.	each
EFP	effective fluid pressure
El.	elevation (grade)
Elec.	electric (al)
Elev.	elevator, elevation
Encl.	enclose (d), (ure)
Eng(r).	engineer (ed)
Eq.	equal
Equip.	equipment
Equiv.	equivalent
Est.	estimate (d)
Etc.	et cetera
EW	each way
Exist.	existing
Exp.	expand, expansion
Ext.	exterior, extended
Extn.	extension
Fdn.	foundation
FF	finished floor
Fin.	finish (ed)
FJ	floor joist (s)
Fl.	flange
Flr(g).	floor (ing)
FOC	face of concrete
FOM	face of masonry
FOP	face of panel
FOS	face of studs
Found.	foundation
FR	fire rate (d), (ing)
Ft.	foot, feet
Ftg.	footing
Fut.	future
Ga.	gage, gauge
Galv.	galvanized
GC	general contractor
Gen.	general
GI	galvanized iron
Gl.	glass, glazing, glazed
GLB	glue-laminated beam
Gr.	grade, grading
Gyp.	gypsum
Hdr.	header
Hex	hexagonal
Hor (iz).	horizontal
HS	high strength
Ht.	height
HVAC	Heating/Ventilation/ Air Conditioning
IBC	International Building Code
ICC	International Code Council
ID	inside diameter
In.	inch (es)
Incl.	include (d), (s), (ing)
Insp.	inspect (ion), (or)
Instl.	installation, install
Insul.	insulate (d), (ion)
Int.	interior
Inv.	invert (ed)
Jst.	joist
K	kip (1000 pounds)
KLF	kips per linear foot
KP	king post
KSF	kips per square foot
KSI	kips per square inch
LABC	Los Angeles City Building Code
Lam.	laminate (d), (tion)
LARR	Los Angeles Research Report
Lb(s).	pound (s)
Lg.	large
LF	linear (l) foot
Lin.	linear, lineal
LL	live load
Lt(g).	light (ing)
Ltwt.	lightweight
Mas.	masonry
Mat'l	material (s)
Max.	maximum
MB	machine bolt
Mbr.	member
Mech.	mechanic (al)
Med.	medium
Memb.	membrane
Mezz.	mezzanine
MF	moment frame
Mfr.	manufacture (r)
Min.	minimum, minute (s)
Misc.	miscellaneous
MM	millimeter (s)
Mod.	modify, modified, modular
MS	machine screw
(N)	new
N	north
N/A	not applicable
Nat.('l)	natural, national
Neg.	negative
NIC	not in contract
No.	number
Nom.	nominal
NTS	not to scale
OC	on center (s)
OD	outside diameter
OMRF	ordinary moment resisting frame
Opp.	opposite
OSB	oriented strand board
OSHPD	Office of Statewide Health Planning & Development
OT	overturning
Par.	parallel
PCF	pounds per cubic foot
Pen.	penetrate (ion)
Perf.	perforate (d), (tion)
Perim.	perimeter
Perp.	perpendicular
Pl.	plate
PL	property line
PLF	pounds per linear foot
Ply(wd).	plywood
Prefab.	prefabricated (ion)
Prelim.	preliminary
Proj.	project
Prop.	property
PSF	pounds per square foot
PSI	pounds per square inch
PT	pressure treated, point
PVC	polyvinyl chloride
Qtr.	quarter
Qty.	quantity
R(ad).	radius
Rd.	road, roof drain
Rdwd.	redwood
Rebar	reinforcing bar (s)
Rec('d).	receive (d)
Rect.	rectangular
Ref.	reference
Reinf.	reinforce (d), (ing), (ment)
Req('d).	require (d), (ment)
Ret.	retain (ing)
Rev.	revision (s), revised
RJ	roof joist (s)
Rm.	room
RR	roof rafter (s)
Sim.	similar
SMRF	special moment resisting frame
Spec(s)	specification (s)
ST1	grade Structural 1 panel
Std(s).	standard (s)
Stl.	steel
Str(uct).	structural, structure
Surf.	surface
Susp.	suspended
SW	shearwall
Sym.	symmetry (ical), symbol
Syn.	synthetic
T&B	top and bottom
T&G	tongue and groove
Temp.	temporary, tempered
Th(k).	thick, thickness
Thru	through
TOB	top of beam
TOC	top of concrete
TOG	top of grade
Tol.	tolerance
TOP	top of plate
TOS	top of slab
TOW	top of wall
Typ.	typical
UBC	Uniform Building Code
UNO	unless noted otherwise
Util.	utility (ies)
Var.	varies, varnish
Vent.	ventilate (ion), (or)
Vert.	vertical
VIF	verify in field
Vol.	volume
W	width, wide, water
W/	with
Wd.	wood
WF	wide flange
W/IN	within
Win.	window
W/O	without
WP	waterproof (ing)
WS	wood screw
Wt.	weight
WWF	welded wire fabric
WWM	welded wire mesh
Yd.	yard
Đ	angle
@	at
Ñ	delta
#	number, pound (s)
/	per
+/-	plus or minus

SHEET INDEX

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Project Name:

SANTA BARBARA CENTER FOR ARTS, SCIENCE & TECHNOLOGY

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Drawing Notes:

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DO NOT SCALE THESE DRAWINGS. See the Architectural plans for dimensions. The Contractor shall verify and be responsible for all dimensions and existing conditions on the job and shall report any discrepancies to the Engineer and the Architect for resolution prior to commencing with the work in question.

Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	-
Job No.:	11521

Sheet Title:

STRUCTURAL TITLE SHEET

Sheet No.:

S-1.0

FOUNDATIONS & CONCRETE

1. GENERAL

1.1 Soils values are per Geotechnical Report (or "Soils Report") by Braun Associates, Inc., W.O. No. 2406, dated March 24, 2011. This report and the recommendations contained therein shall be considered a part of the construction documents. [Per soils engineer recommendations, fence foundation designs soils values per Table 1804.2 of the 2010 California Building Code (CBC).] *It is the Contractor's responsibility to obtain a copy of the soils report and any addenda from the owner or owner's representative.*

1.2 Refer to the Structural Design Parameters on the Structural Title Sheet for soil/foundation design values.

1.3 Refer to the Statement of Special Inspections on S-1.0 for information related to inspections as required by the governing building code.

1.4 The Building Inspector shall inspect and approve grading and excavations prior to placement of forms, reinforcing steel or concrete.

1.5 The Contractor is responsible for geotechnical follow-up services as defined in the soils report.

1.6 Prior to the Contractor requesting a building department foundation inspection, the soils engineer shall advise the building inspector in writing that the building pad was prepared in accordance with the soils report and that the foundation excavations, the soil's expansive characteristics and bearing capacity conform to the soils report.

1.7 Refer the structural plans for foundation embedments; however mat edge foundations shall not be embedded less than 27" into approved competent soil, unless specifically noted otherwise. Foundations shall be deepened where necessary to conform to 2010 CBC Section 1805 setback requirements which require a minimum distance from the face of the foundation to the face of the descending slope equal to H/3 (where H is the height of the slope). The setback must be at least 5'-0" but need not exceed 40'-0".

1.8 Prior to construction, the soils engineer of record should review and approve the structural plans. Additionally, it is recommended that there be a preconstruction meeting between the owner, Contractor, and soils engineer to discuss testing procedures, scheduling, and inspections.

2. MATERIALS

2.1 Concrete shall have a strength of 3000 psi at 28 days, and a maximum slump of 5". W/C ratio is 0.55 max. for slabs, walls and columns, and is 0.60 max. for foundations.

2.2 Cementitious Material: Portland cement shall conform to ASTM C150, Type II, low-alkali. Fly ash shall conform to ASTM C618, Class F.

2.3 Special Inspection is required for structural slabs, walls, piles, caissons, flat plates, columns and beams. Exception: if the construction is of a minor nature and the Building Department waives the special inspection requirement and special inspection is not specified on the structural plans. (2010 *CBC 1701.1 and 1701.5.1]*

2.4 Reinforcing steel shall be to ASTM A615, deformed, clean and free of rust. Bars shall be 60 grade minimum (unless specified otherwise), except that #3 bars may be 40 grade. Reinforcing steel that is to be welded shall conform to ASTM A706 in lieu of A615, and shall conform to UBC Standard 19-1.

2.5 Mechanical Bar Splice Couplers: May be used in lieu of lap splices in concrete and shall be used where specified on the plans. Use Dayton Superior Bar-Lock S- or L-series couplers per the plans, or approved equal. Bar-Lock coupler fabrication and installation shall be per ICC ESR-2495. Special inspection is required for installation. Stagger adjacent mechanical splices 2'-0" minimum.

2.6 Aggregates shall be per ASTM C33. Maximum size 1½" for footings and 1" for all other work. Reduce maximum aggregate size as required to conform to ACI 318 Section 3.3.2. Coarse aggregate shall be crushed rock.

2.7 Drypack/grout material for baseplates, concrete tilt-panels, sill plates or other specified use shall be non-shrink grout by Five Star Products Inc., Quikrete, or approved equal, and installed at a "plastic" consistency, in accordance with approved methods and techniques. Surfaces shall be properly cleaned of foreign material prior to grouting operation.

2.8 Epoxy/Adhesive: Use Simpson SET-XP Epoxy (ICC ESR-2508), Hilti RE-500 SD Adhesive (ICC ESR-2322), or approved equal specifically for concrete, unless noted otherwise. Refer to the ICC Evaluation Report for product and installation requirements. Install only where specifically detailed by the Engineer. (Contact the Engineer for product substitution when needed for special conditions, such as temperature extremes, fast cure or slow cure, low or high viscosity, etc.). Anchor rods shall conform to ASTM A193, Grade B7, UNO.

2.9 Concrete Floor Underlayment: Only use where specifically detailed. Gypcrete density shall not exceed 115 pcf and lightweight concrete density shall not exceed 125 pcf, unless noted otherwise on the plans. Refer to the architectural plans for additional requirements.

2.10 Anchor Bolts: A307 or F1554 Grade 36 hex-headed, unless noted otherwise.

2.11 The Building Department may require the testing of any materials used in concrete construction to determine if materials are quality specified. Tests of materials and of concrete shall be made by an approved agency and at the expense of the Contractor; such tests shall be made in accordance with the standards listed in CBC Section 1903. Tests and materials of reinforced concrete, and concrete durability, quality, mixing and placing, shall conform to CBC Sections 1903, 1904 and 1905. Refer to the Building Department for additional testing and materials requirements.

3. EXECUTION

3.1 Slabs on Grade: See the plans and details for thickness, reinforcing, and supporting materials. Provide sawcuts or other control joints as directed by the architect and soils engineer, and per the structural plans when specified. Refer to the architectural plans for finishes.

3.2 Minimum lengths for rebar development, lap splices, and compression splices shall be as follows, UNO:

2500 psi Concrete:

Bar Size	*Dev. Length*	*Class B Lap Splice*	*Comp. Splice*
#3	*14" Min.*	*20" Min.*	*16" Min.*
#4, #5, #6	*40 bar dia.*	*50 bar dia.*	*40 bar dia.*
#7, #8	*60 bar dia.*	*78 bar dia.*	*40 bar dia.*
#9, #10, #11	*74 bar dia.*	*96 bar dia.*	*40 bar dia.*
#14, #18	*102 bar dia.*	*NOT ALLOWED*	*40 bar dia.*

3000 psi Concrete:

Bar Size	*Dev. Length*	*Class B Lap Splice*	*Comp. Splice*
#3	*14" Min.*	*18" Min.*	*12" Min.*
#4, #5, #6	*36 bar dia.*	*46 bar dia.*	*30 bar dia.*
#7, #8	*54 bar dia.*	*70 bar dia.*	*30 bar dia.*
#9, #10, #11	*68 bar dia.*	*88 bar dia.*	*30 bar dia.*
#14, #18	*92 bar dia.*	*NOT ALLOWED*	*30 bar dia.*

3.3 Dowels shall be provided forvertical and horizontal reinforcing bars in walls, columns, etc., and shall be of the same size and spacing as the supporting wall, columns, etc. Footing reinforcement shall be hooked into intersecting footings with standard 90 degree end hooks per Detail 20/S-3.0, unless noted otherwise on the plans.

3.4 Reinforcing clearances for foundations shall be 3" min. when against earth and 2" min. when against a formed surface UNO. Other reinforcing clearances shall be 1 1/2" minimum UNO.

3.5 Removal of forms (formwork) supporting vertical surfaces shall be after 2 days min. and supporting beams or girders shall be after 15 days minimum.

3.6 Construction joints shall be prepared by wire brushing and cleaning and brushing in a paste of neat cement mortar immediately prior to pouring. Location of construction joints shall be approved by the Engineer.

3.7 Concrete Curing: Concrete shall be maintained above 50 deg. F and in a moist condition for at least the first 7 days after placement. When formwork is removed from a surface prior to 7 days after placement of concrete, the surface shall be kept continuously moist by spraying or by covering with wet burlap or curing cover. During hot weather, proper attention shall be given to ingredients, production methods, handling, placing, protection and curing to prevent excessive concrete temperatures or water evaporation that may impair required strength or serviceability of the member or structure. (Finishes are per the architect.)

3.8 Sill Plate Anchorage: Wood sill plates in bearing walls and shearwalls shall be secured with minimum 5/8" dia. x 10" long anchor bolts (AB) with 7" minimum embedment into concrete (note that longer anchor bolts may be necessary for 3x sill plates or for other conditions). Anchorage shall include 3"x3"x0.229" plate washers (Simpson BP5/8-3 or BPS5/8-3, or Equivalent). The hole in the plate washer may be diagonally slotted, provided that a standard cut washer is placed between the plate washer and nut. The plate washer shall extend to within 1/2" of edge of the sill plate on the sheathed side(s) of shearwalls. Spacing of anchor bolts shall not exceed 6'-0" o.c. Bolts shall be placed a maximum of 12" from wall corners, wall ends, and sill plate splices (but not less than $4^3/_8$"), and a minimum of two bolts per piece of sill plate are required. Refer to the Shearwall Schedule for maximum anchor bolt spacing at shearwalls, however the spacing shall not exceed 4'-0" o.c. (Holdown anchors shall not be counted as any of the required sill plate anchor bolts.) Use anchor bolt holders and stabilizers per the manufacturer's recommendations, or approved equivalent. Interior non-bearing partitions may be secured with shotpins per the "Wood" section of these specifications.

3.9 Coordinate holdown locations with all structural plans prior to installation. Holdown hardware shall be secured in place prior to foundation inspection and re-tightened just prior to enclosure. Holdowns shall be installed per manufacturer's specifications. Set holdowns tight on top of sill plate and against post; do not raise up off of sill plate UNO. Use anchor bolt holders and stabilizers per the manufacturer's recommendations.

3.10 Epoxy/Adhesive: Install only where specifically detailed by the Engineer. Install epoxy and adhesive anchors in accordance with the manufacturer's instructions and the requirements of the product's current code approval report.

STRUCTURAL STEEL

1. GENERAL

1.1. Structural steel shall conform to the requirements of ASTM and shall be fabricated according to AISC practice and specifications for building.

1.2. Refer to the Statement of Special Inspections on S-1.0 for information related to inspections as required by the governing building code.

1.3. Fabricator: Should be AISC Certified or IAS Accredited and shall be approved by the Building Department. Comply with applicable provisions of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

1.4. Structural steel shop drawings shall be submitted to the engineer for review prior to fabrication.

1.5. Continuous special inspection of structural welding is required, by an inspector pre-qualified by the Building Department, in accordance with 2010 CBC Section 1704.3 and Table 1704.3. The following exceptions are permitted for welds not a part of the seismic-force-resisting system:
- a) Welding performed in a fabricator's shop where the fabricator is specifically registered and approved to perform such work without special inspection (2010 CBC 1704.2.2).
- b) The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of welds is made prior to completion or prior to shipment of shop welding:
  - i) Single-pass fillet welds not exceeding 5/16" in size
  - ii) Floor and roof deck welding
  - iii) Welded studs when used for structural diaphragm or composite systems (but not part of the seismic-force-resisting system).
  - iv) Welded sheet steel for cold-formed steel framing members such as studs and joists
  - v) Welding of stairs and railing systems

1.6. Nondestructive Testing (NDT) of Welds of the seismic-force-resisting system is required per Appendix Q of AISC 341-05.

2. MATERIALS

2.1. Structural shapes, plates, and bars shall conform to ASTM A36, unless noted otherwise.

2.2. Wideflange sections ("W" shapes) shall conform to ASTM A992.

2.3. Steel plate material used in steel moment frame connections shall conform to ASTM A572 Grade 50.

2.4. HSS tube steel sections (rectangular, square and round) shall conform to ASTM A500, Grade B.

2.5. Pipe sections shall conform to ASTM A53 Grade B. "STD" indicates Standard Weight, "EXT" indicates Extra Strong, and "DBL" indicates Double-Extra Strong.

2.6. Stainless Steel: Where stainless steel is specified on the plans, plates, sheets, and strips shall be per ASTM A240 and Grade Type 304 (or 316 if welded). Bars and shapes shall be ASTM A276 and Type 304 (or 316 if welded).

2.7. Shop and field bolted connections shall use American Standard Regular Bolts conforming to ASTM A307 and tightened to the AISC "snug-tight" condition, unless noted otherwise. Threaded rod shall conform to ASTM A36 or A307, unless noted otherwise. Refer to the plans for connections requiring high-strength bolts.

2.8. Drypack and grout for base plates shall be "Five-Star" non-shrink grout or an approved equal. Surfaces shall be properly cleaned of foreign material prior to grouting operation.

3. EXECUTION

3.1. Welding shall be performed using SMAW, SAW, GMAW, or FCAW processes with approved electrodes conforming to ASTM A-233 and applicable AWS specifications. Welds shall use E70XX electrodes, unless noted otherwise, with a minimum CVN toughness of 20 ft-lb at -20° F, using AWS A5 classification test methods.

3.2. Minimum preheat and interpass temperatures shall be provided for welds, including tack welds, in accordance with AWS D1.1, Table 3.2. The maximum preheat and maximum interpass temperature permitted is 550° F, measured at a distance of 1 in. from the point of arc initiation.

3.3. Welding shall be performed by welders certified in accordance with AWS D1.1. Special inspections (see General above) shall be arranged, with Building Department approval, at the expense of the Contractor.

3.4. Use weld tabs (backing bars) at flange plate and shear plate to column connections. After welding, remove the weld tabs and finish to a smooth contour per 3.12.3 of AWS D1.1-2000. Weld tab removal may be performed by air carbon arc cutting (CAC-A), air carbon arc gouging (ACAG), grinding, chipping, or thermal cutting. In addition, after removing the backing bar backgouge the weld root to sound metal, weld backgouged region and finish welding using a reinforcing fillet weld with a minimum leg size of 5/16" or the root opening plus 1/16", whichever is larger.

3.5. Sections, plates and bars shall not be sheared – they shall be gas-cut or saw-cut.

3.6. Exposed welds shall be filled and ground smooth where metal will come in contact with the public, unless reasonably smooth and uniform welds have been provided. Additional finish requirements are per the architect.

3.7. Bolt holes in steel plates and shapes shall be AISC "standard holes," unless specifically noted otherwise. Bolt holes shall be drilled 1/32" min. to 1/16" max. larger than the bolt diameter.

3.8. Powder-Actuated or Power-Driven Fasteners (or "Shot Pins"):
- i) Shall be by Hilti Inc., Simpson Strong-Tie or approved equal. Product and installation shall be per the manufacturer's respective ICC report: ICC ESR-2269 (Hilti X-U), ICC ESR-2811 (Simpson GDP), or per approved equal.
- ii) Shank diameter of shot-pins shall be 0.145" min. , with a min. 3/4" diameter washer and 1 1/4" embedment (UNO).
- iii) Shotpins may be used for attachment of miscellaneous furring, framing, and interior non-bearing walls to concrete or masonry. (Anchor bolts, per the "Foundations & Concrete" section of these specifications, must be used for sill plates in shearwalls and bearing walls.)

3.9. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel will be permitted without prior consent of the Engineer.

3.10. Steel exposed to weather, soil, or moisture shall be galvanized or have similar corrosion protection. Steel embedded in concrete shall have the same cover requirements as for reinforcing steel (rebar), unless the embedded steel is galvanized or has similar corrosion protection. Finishing requirements for exposed steel are per the Architect.

WOOD

1. GENERAL

1.1. The framing notes on the drawings form a part of this section and have the same force and effect as written out in full herein. Refer to the architectural specifications for additional requirements.

1.2. Refer to the Statement of Special Inspections on S-1.0 for information related to inspections as required by the governing building code.

2. MATERIALS

2.1. Lumber: shall be Douglas Fir-Larch, S4S, unless noted otherwise (this does not include Douglas Fir-Larch-North or Douglas Fir-South), and it shall be manufactured, graded, and bear the grade mark of WCLIB Standard Grading Rules 16 or WWPA Grading Rules; moisture content at time of installations shall not be over 19% or less than 7%.
- a) Light framing: 1x, 2x and 3x shall be Douglas Fir-Larch #2 or better UNO; 4x and larger shall be Douglas Fir-Larch #1 or better UNO. Posts shall be Douglas Fir #1 or better. "SS" indicates Select Structural grade where specified.
- b) Preservative Treatment: Lumber in contact with concrete or masonry, or where exposed to weather, moisture or soil, shall be preservative pressure-treated per AWPA Standards (or "wolmanized" for PSL members) and 2010 CBC Section 2304.11. Each piece of lumber shall bear the mark of an approved testing agency. ACQ-treated shall be used when it is exposed to weather or may come into contact with soil, moisture or "liquid" water (e.g. rain, seepage, surface run-off, etc.). Borate-treated wood may be used for interior dry conditions (such as a sill plate on a concrete or masonry wall that will be covered and waterproofed). The maximum moisture content of treated wood is 14%. When necessary to cut, notch, bore or splice treated lumber, thoroughly paint newly cut surfaces with same preservative used in the original treatment of the lumber.
- c) Clearances to Soil: The floor assembly (including posts, girders, joists and subfloor) shall be of naturally durable or preservative-treated wood, in accordance with AWPA U1 (Commodity Specifications A or F) for above-ground use (per 2010 CBC 2304.11) where any of the following conditions occur:
  - i) Wood joists or the bottom of a wood structural floor without joists are closer than 18", or wood girders are closer than 12" to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation.
  - ii) Wood framing members, including wood sheathing, which rest on exterior foundation walls and are less than 8" from exposed earth.

2.2. Sheathing: Shall be APA rated; thickness per plan; Panel Index (PI) or "Roof/Floor span rating" per plan, however rating shall not be less than 40/20 for floor sheathing or 24/0 for roof sheathing. Additionally, sheathing shall conform to DOC PS 1 or PS 2, 2010 CBC Section 2306.1, and to the following (or better), except where noted otherwise:
- a) Where sheathing may be subjected to repeated wetting and redrying or long-term exposure to weather or similar conditions:
  - i) "Exterior Plywood" – Grade C-C or Structural 1 C-C with exterior glue, 4-ply minimum, per APA PS 1-09.
- b) Other conditions:
  - i) Plywood – Grade C-D with exterior glue (aka "CDX"), Exposure 1 and 4-ply minimum, per APA PS 1-09.
  - ii) Composite Panel, Oriented Strand Board (OSB), or other Mat-Formed Structural-Use Panel – Exposure 1, per APA 1-09 or 2-10.
  - iii) Where "Structural 1" (or "Struct 1" or "ST1") is required per the plans, use Grade Structural 1 sheathing per APA PS 1-09 or 2-10.

2.3. Rough Hardware:
- a) Nails: Provide common wire nails as indicated in the Fastening Schedule (2010 CBC Table 2304.9.1) and the Structural Plans. See requirements below for fasteners in treated wood.
- b) Bolts, Nuts, Washers, Lag & Wood Screws shall be of standard manufacture, conforming to the National Design Specification (NDS) of the American Forest & Paper Association (AF&PA), 2005 Edition.
- c) Framing Connectors:
  - i) Metal connectors for wood construction shall be Simpson Strong-Tie, KC Metals, or approved equal, unless noted otherwise. Product callouts on plans refer to Simpson Strong-Tie model number and KC Metals reference number. Approved Equals may only be used with prior approval from the Building Department and the Engineer.
  - ii) Provide the type of nails specified by the manufacturer and fully drive nails into all holes of the connector (including round and triangular holes), unless specifically noted otherwise on the plans.
  - iii) Connectors shall be galvanized or have another factory-applied protective finish.
  - iv) Connectors and hardware exposed to weather shall have minimum G185 factory galvanized coating (or equivalent) or shall be post hot-dip galvanized or shall be stainless steel.
  - v) Connectors in contact with pressure-treated or fire-retardant treated wood shall be minimum G185 factory galvanized coating (or equivalent) or shall be post hot-dip galvanized or shall be stainless steel per 2010 CBC 2304.9.5. *[Exception: If pre-approved by the Building Department, G90 or standard coating shall be allowed.]*
  - vi) Bolts shall conform to ASTM A307 or F1554 Grade 36 unless noted otherwise.
  - vii) Substitute LTP5 connectors for LTP4 connectors in cases where plywood thickness prevents all nails in the LTP4s from being driven into solid wood framing as detailed. (If the LTP5 nails cannot be driven into solid wood framing, contact T&S.)
- d) Powder-Actuated or Power-Driven Fasteners (or "Shot Pins"):
  - i) Shall be by Hilti Inc., Simpson Strong-Tie or approved equal. Product and installation shall be per the manufacturer's respective ICC report: ICC ESR-2379 (Hilti X-P), ICC ESR-2811 (Simpson GDP), or per approved equal.
  - ii) Shank diameter of shot-pins shall be 0.145" min. , with a min. 3/4" diameter washer and 1 1/4" embedment (UNO).
  - iii) Shotpins may be used for attachment of miscellaneous furring, framing, and interior non-bearing walls to concrete or masonry. (Anchor bolts, per the "Foundations & Concrete" section of these specifications, must be used for sill plates in shearwalls and bearing walls.)
- e) Quik Drive WSNTL Wood Screws may be used in lieu of nails specified on the plans for attachment of floor and roof sheathing, unless specifically prohibited otherwise. Screws must be by Quik Drive USA, Inc. and installed in strict accordance with ICC ESR-1472. Substitutions by other manufacturers will only be allowed if substitute has an ICC approval with shear values equal to or greater than those in ESR-1472. Refer to the General Notes on the Structural Title Sheet.

3. EXECUTION

3.1. General Installation Requirements: Fabricate, size, install, connect, fasten, bore, notch, and cut wood and plywood with joints true, tight, and well-nailed, screwed or bolted as required, members to have solid bearing without being shimmed, unless noted otherwise. Set horizontal members subject to bending with the crown up. Install framing plumb, square, true and cut for full bearing. Splices are not permitted between bearings. Use full lengths unless otherwise specified. Notching, drilling, splicing, or cutting of any structural member is not permitted without prior approval. Reinforce or replace wood framing members damaged by erroneous cutting as directed by the engineer. Perform cutting for other trades under the direction of trade involved. Whenever necessary to avoid splitting, sub-drill for nails and screws with the diameter of the hole smaller than that of nails or screws.

3.2. Nailing: Conform to 2010 CBC Table 2304.9.1, unless specifically noted otherwise. Nail plywood as specified on the plans with perimeter nails not closer than ½" from the edges. Do not overdrive nails through the face grain of the plywood; over-driven plywood nails may result in rejection and replacement of plywood panel by Inspector or Engineer. Except for plywood, nails shall not be driven closer together than half their length nor closer to the edge or end of lumber than one-quarter their length. The penetration of nails or spikes into pieces receiving the point shall not be less than half the nail length, except that 16d may be used to connect pieces of 2" nominal thickness.

3.3. Lag Screws: Install lag bolts (or "screws") with the base of the head flush with the surface of the connected member. Bore lead holes approximately three-quarters of the diameter and same depth as shank (except when not required by the manufacturer, such as for Simpson SDS Screws). Provide a standard washer under the head of the lag when bearing upon wood. Install by using a wrench, not by driving with a hammer. Soap or other lubricant shall be used on the lag screws or in the lead holes to facilitate insertion and prevent damage to the lag screws.

3.4. Bolts: Drill bolt holes 1/32" to 1/16" larger than bolt diameter such that bolts fit tight. Provide standard washers under the heads and nuts when bearing upon wood. Holdown bolts shall be torqued tight. The inspector is to verify that the bolts are installed and tight.

3.5. Hardware Approvals: The following hardware shall be installed per the appropriate ICC approvals listed below. (Verify current report number with the mfr. For hardware not listed, obtain report numbers from the mfr.)

HTT, LTP4, RSP4 & UFP10:	per ICC ESR-5313
HDU, HDQ, HHDQ, & DTT2:	per ICC ESR-2330
LU, LUP, AB, EPB & LCB/CB:	per ICC ESR-5708
SSTB anchors:	per ICC ESR-2611
SDS Screws:	per ICC ESR-2236
Straps (some):	per ICC ESR-2105 & ESR-2615

3.6. Sills on Concrete or Masonry: Anchor per "Foundations & Concrete" section of the Specifications. Tighten with washers and nuts to level bearing. Use pressure treated lumber per "Wood" Section of the Specifications.

3.7. Wood Stud Walls, Partitions, and Furring: Use studs of sizes and spacing shown on the plans, with single plate at bottom and doubled plate at top unless otherwise shown. Stagger joints in double members at top plate by at least four feet and splice joints per the Structural Title Sheet. Additionally:
- a) Wall Stud Sizes: (Unless specifically noted otherwise on the plans.) Use 2x4 studs at 16" o.c. for walls less than 10'-0" tall. Walls 10'-0" to 16'-0" tall shall be constructed of 2x6 studs at 16" o.c. Request specifically engineered wall details for walls greater that 16'-0" tall.
- b) Blocking: Provide min. one row of nominal 2" thick blocking of same width as stud, fitted snugly and spiked into studs at mid-height of partitions or walls over 8'-0" high. Provide blocking at a maximum spacing of 8'-0" o.c. Cripple walls (or "pony walls") less than 14" in height shall be solid blocking.
- c) Notching: In exterior and bearing walls, notches in studs shall not exceed 25% of the stud depth (7/8" for 2x4 and 1 3/8" for 2x6). Non-bearing partition walls may be notched not greater than 40% of the stud depth.
- d) Drilling Holes: In exterior and bearing walls holes in studs shall not exceed 40% of the stud depth (1 3/8" for 2x4 and 2 1/4" for 2x6). Non-bearing partition walls may be drilled not greater than 60% of the stud depth.
- e) Angles and Overhangs: Form corners (and where stud partitions and wood vertical furring meet) with blocked triple studs or as detailed. Form openings in wood partitions with double studs at each side, and 4x headers across top resting on short studs at each end. Headers shall be 4x6 min., unless noted otherwise on the plans.
- f) Bearing: Provide a minimum of 1½" of bearing for headers unless noted otherwise on plans. Members bearing on prefabricated hangers are to have full bearing and nailing per manufacturer's specifications.

3.8. Posts: Posts on upper levels shall be stacked on posts of equal size at levels below, unless a larger post is specified on the plans. Blocking shall be used to fully transfer the post area through floors. This arrangement shall continue until the post is supported by a designed beam or the foundations. Posts inside walls shall bear on sill plates, and isolated posts shall be seated in Simpson post or column bases, unless noted otherwise on the plans. Posts shall be continuous between top and bottom plates, unless specifically noted otherwise. Headers framing into continuous posts without trimmer studs shall be supported in Simpson HUC hangers unless noted otherwise on the plans.

3.9. Floor Framing: Provide wood joists as indicated laid with the crown up and with a minimum of 1½" end bearing unless otherwise shown. Wood floors shall be level to within 1/8" in 48" (or ¼" in 96"). Additionally:
- a) Bridging/Blocking: Provide min. 2x thick solid blocking of same depth as the joists, cut in between the joists under walls and partitions where the wall or partition is perpendicular to the floor framing. Also provide min. 2x thick solid blocking or approved bridging between the joists at a spacing of not greater than 8'-0" o.c. Provide blocking at plywood panel edges, unless noted otherwise (see below).
- b) Bridging/Blocking in I-Joist Framing: When using I-joists, additional solid blocking or cross-bridging at 8'-0" o.c. may not be required. In I-joist floors, install blocking or cross-bridging in accordance with the manufacturer's specifications, and only omit the blocking or cross-bridging when specifically allowed by the manufacturer. Note that blocking is required at supports, under walls, and in other locations specified herein and on the plans.
- c) Spacing: Space wood joists as indicated on plans. Provide a double joist under partitions that lie parallel to framing.
- d) Headers, Tail and Trimmer Joists: Unless notes otherwise, provide doubled header joists and single tail joists installed with joist hangers, and doubled trimmer joists where supporting header joists.
- e) Floor Sheathing: Install with the face grain across supports, end supports staggered and the edges of sheets centered over supports. Provide min. 2x thick blocking of the same depth as the joists or 3x4 flat blocking under plywood edges, unless noted otherwise. (Full-depth blocking is required under walls.) Glue to joists and fully nail, while glue is still wet, with common nails per the plans. Floor sheathing shall be 3/4" thick unless noted otherwise, although 1-1/8" T&G sheathing is recommended for improved floor performance. Sheathing installation shall conform to APA recommendations.

3.10. Roof and Ceiling Framing: Provide the rafters, joists, and purlins as shown on the plans. Place with the crown edge up. Conform to the following requirements unless noted otherwise:
- a) Bridging/Blocking: Provide min. 2x thick solid wood blocking, cut in between and the same depth as the joists at a spacing of no greater than 8'-0" o.c., unless noted otherwise. Provide blocking at plywood panel edges, unless noted otherwise (see below). Refer to the plan for additional requirements (e.g. where 3x blocking or closer nail spacing is required).
- b) Bridging/Blocking in I-Joist Framing: When using I-joists, bridging or blocking at 8'-0" o.c. may not be required. In I-joist roofs and ceilings, install blocking or cross-bridging in accordance with the manufacturer's specifications, and only omit the blocking or cross-bridging when specifically allowed to by the manufacturer. Note that blocking is required in other locations specified herein and on the plans.
- c) Roof Sheathing: Install plywood panels with the face grain across the framing and close joints and nail at each support. Nail with common nails specified on the framing plans. Provide cant strips and saddles where shown or necessary to pitch water to drain. Sheathing installation shall conform to APA recommendations.
- d) Sheathing Joints: Provide min. 2x thick solid blocking of the same depth as the joists (or top chords) or 3x4 flat blocking under plywood edges.

3.11. Shearwalls: Shearwall type and nailing shall be per the plans and the shearwall schedule on plans. Shearwalls shall extend horizontally between openings unless noted otherwise. Shearwall lengths shown on plans are minimum required. Upper floor shearwalls shall extend through attics to the roof diaphragm. (OSB may be used in lieu of Plywood per the "Sheathing" section of these specifications; plywood may not be substituted for OSB without consent of T&S.) Conform to the following requirements unless noted otherwise:
- a) Transfer nailing and anchorage shall be per the structural details. Over driving of nails through the panel surface may be cause for rejection of panel by the Inspector or the Engineer. Shearwall and holdown anchors shall be nailed with common nails. Edge nails to have a minimum ½" edge distance.
- b) Fasteners in pressure-treated wood (including foundation sill plates) shall be of hot-dipped zinc coated galvanized steel or stainless steel (per 2010 CBC 2304.3).
- c) Where 3x framing is required, stagger edge nails. 3x framing, as noted on the shearwall schedule, is required as follows:
  - i) At panel joints.
  - ii) Sill plates on masonry or concrete.
  - iii) Sill plates at two-sided shearwalls, i.e. sheathing on both sides. (At existing conditions, where approved by the engineer, plates may be double 2x's spiked w/ 2-16d at 6" o.c. with boundary nails staggered between alternate plates.)

3.12. I-Joists:
- a) Refer to the plans for I-Joist manufacturer and type. Substitutions will only be permitted with prior written approval by Taylor & Syfan.
- b) Installation shall be in accordance with the ICC evaluation report, and per the manufacturer's specifications and installation guide.
- c) I-joists shall not be used in exterior conditions or where exposed to weather or moisture, unless fully protected from moisture per the architect's details and specifications.
- d) I-joists shall not be cut, notched or drilled without specific written approval of the manufacturer.
- e) I-joist minimum bearing at end supports is 1¾" and at intermediate supports is 3½", unless noted otherwise. Lateral support of joists at bearing points is required, per manufacturer specifications. Provide web stiffeners to I-joists as required per the manufacturer's specifications.
- f) Bridging/Blocking: additional bridging or blocking @ 8'-0" o.c. may or may not be required with prefabricated I-joists. Install blocking or cross-bridging in accordance with the manufacturer's specifications, and only omit the blocking or cross-bridging when specifically allowed to by the manufacturer. Note that blocking is always required at supports, under walls, and in other locations specified herein and on the plans.
- g) Rim boards shall be minimum 1½" thick members. Refer to the plans for increased rim member requirements. Installation is per the approved ICC report.

3.13. Laminated Veneer Lumber (LVL) Beams:
- a) Shall be 1¾" minimum thickness members, manufactured by iLevel, Roseburg Forest Products, or approved equal, in accordance with the approved ICC Evaluation Report.
- b) Product data from other manufacturers may be submitted to the Engineer for consideration as a substitute. Substitutions will only be allowed with prior written approval of the Engineer.
- c) Minimum Required Design Properties:
  - i) E = 1900 ksi (unless allowed otherwise)
  - ii) Fb = 2600 psi
  - iii) Fv = 285 psi
  - iv) Specific Gravity = 0.50
  - v) Fc (parallel) = 2500 psi
  - vi) Fc (perp.) = 750 psi
  - vii) Ft (parallel) = 1500 psi
- d) Installation shall be in accordance with the approved ICC report and per the manufacturer's specifications.
- e) Beams shall comprise of multiple 1¾" thick members and be connected with 16d common nails, ½" bolts or ¼" lag screws in accordance with the manufacturer's specifications. If thicker LVL beams are available from the manufacturer (e.g. Roseburg Forest Products), a single solid piece may be used in lieu connecting multiple 1¾" thick pieces.
- f) Beam bearing shall be 1½" minimum length and the full width of the beam. Lateral support of beams at bearing points is required. Additionally, lateral support of beam compression edge is required at 24" o.c.
- g) Beams shall not be cut, notched or drilled without specific written approval of the manufacturer.
- h) Nailing down into the top edge of an LVL beam shall not be spaced any closer than 6" for 16d commons, 4" for 12d and 10d commons, and 3" for 8d commons. When nailing must be reduced, stagger rows ½" apart minimum while maintaining minimum required edge distances.
- i) LVL members shall not be used in locations subject to weather or moisture, unless fully protected from moisture. When LVL members are delineated on the plans for use in exterior or exposed conditions, provide protection per the architect, or use wolmanized-PSL or preservative-treated lumber or similar wood with weather resistance. Obtain approval from the Engineer prior to any substitutions.
- j) Other LVL-manufacturers' products will be considered, however they may only be used with prior written approval from the Engineer.

1.1. Parallel Strand Lumber (PSL) Beams:
- a) Shall be 1¾" minimum thickness members, manufactured by iLevel, Roseburg Forest Products, or approved equal, in accordance with the approved ICC Evaluation Report.
- b) Product data from other manufacturers may be submitted to the Engineer for consideration as a substitute. Substitutions will only be allowed with prior written approval of the Engineer.
- c) Minimum Required Design Properties:
  - i) E = 2000 ksi (unless allowed otherwise)
  - ii) Fb = 2900 psi
  - iii) Fv = 290 psi
  - iv) Specific Gravity = 0.50
  - v) Fc (parallel) = 2900 psi
  - vi) Fc (perp.) = 750 psi
  - vii) Ft (parallel) = 2025 psi
- d) Installation shall be in accordance with the approved ICC Report and per the manufacturer's specifications.
- e) Beam bearing shall be 1½" minimum length and the full width of the beam. Lateral support of beams at bearing points is required. Additionally, lateral support of beam compression edge is required at 24" o.c.
- f) Beams shall not be cut, notched or drilled without specific written approval of the manufacturer.
- g) Nailing down into the top edge of an PSL beam shall not be spaced any closer than 6" for 16d commons, 4" for 12d and 10d commons, and 3" for 8d commons. When nailing must be reduced, stagger rows ½" apart minimum while maintaining minimum required edge distances.
- h) PSL members shall not be used in locations subject to weather or moisture, unless fully protected from moisture. When PSL members are delineated on the plans for use in exterior or exposed conditions, provide protection per the architect, or use wolmanized-PSL or preservative-treated lumber or similar wood with weather resistance. Obtain approval from the Engineer prior to any substitutions.
- i) Other PSL-manufacturers' products will be considered, however they may only be used with prior written approval from the Engineer.

3.14. Hardy Frame Panels and Brace Frames:
- a) Shall be fabricated and provided by Hardy Frames, Inc. in accordance with the Manufacturing Standards submitted to the Building Department. No substitutions are allowed without the written consent of Taylor & Syfan.
- b) Installation shall be in accordance with (ICC ESR-2089) LARR 25759. Refer to the manufacturer's "shop drawings," provided by the manufacturer, for additional requirements, details and specifications.
- c) Refer to the structural plans for locations of Hardy Frame Panels and Hardy Frame Brace Frames. Hardy Frame Panels and Hardy Frame Brace Frames shall be located only at the first floor between the concrete foundation and the double top plate, beam or header.
- d) Continuous deputy inspection is required during installation of holdown anchor bolts.
- e) Structural Observation is required for the construction of portal systems.

Engineer:

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REGISTERED PROFESSIONAL ENGINEER
BRET ROO...
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SENIOR MANAGING ENGINEER

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SOILS/GEO. ENGINEER
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805.688.5429

Project Name:

SANTA BARBARA CENTER FOR ARTS, SCIENCE & TECHNOLOGY

513 Garden Street
Santa Barbara, CA 93101

Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

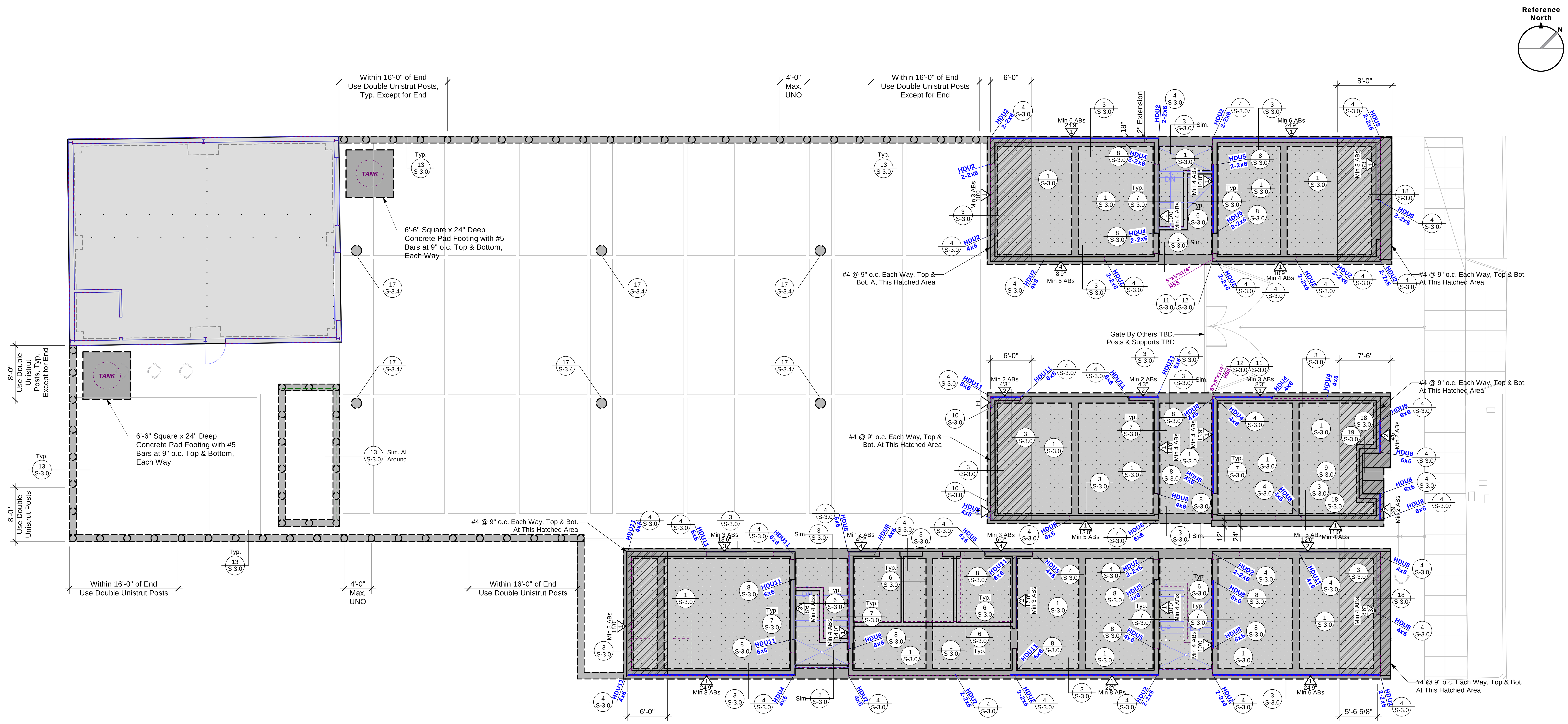
Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	-
Job No.:	11521

Sheet Title:

STRUCTURAL SPECIFICATIONS

Sheet No.:

S-1.1



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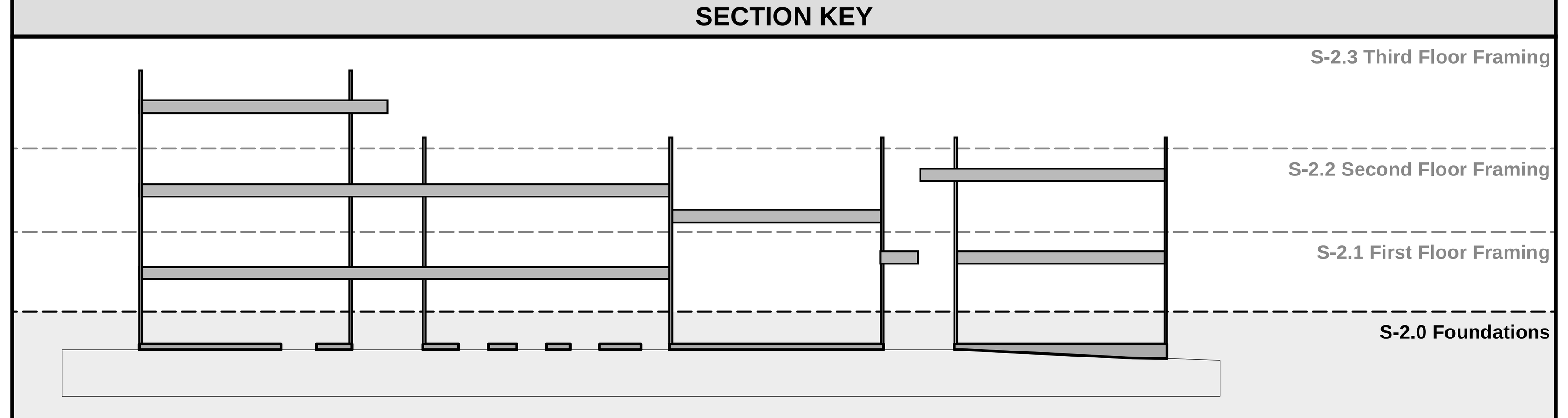
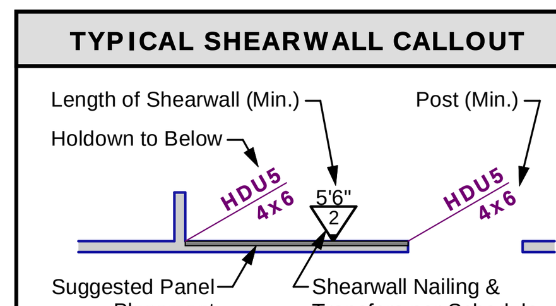


TYPICAL SHEARWALL CALLOUT



See Specs, Schedule, Notes, and Detail 2/S-3.1 for Add'l Requirements

2010 CBC SHEARWALL SCHEDULE

DESCRIPTION			NAILING[1]			TRANSFER ALTERNATIVES									
						(1888#)[6]	(294#)[7]	(256#)[7]	(536#)[7]	(444#)[7]	(556#)[7]	(348#)[7]	(932#)[7]	(111#)[7]	
NO.	SHEATHING MATERIAL	NO. OF SIDES	SIZE	BOUNDARY SPACING	EDGE SPACING	5/8" A.B.[2]	SDS Screw[3]	3/8" Lag[4]	LTP4	LTP5	A35	RBC	HGA10	16d Common[5]	VALUE (plf)
1	1/2" CDX PLYWOOD/OSB	1	10d	4"	4"	48"	7"	6"	14"	11"	14"	9"	24"	2.5"	460
2	1/2" CDX PLYWOOD/OSB	1	10d	3"	3"	37"	5.5"	5"	10"	8"	11"	7"	18"	2"	600
3	1/2" CDX PLYWOOD/OSB	1	10d	2"	2"	29"	4.5"	4"	8"	6"	8"	5"	14"	1.5"	770
4	1/2" CDX PLYWOOD/OSB	2	10d	4"	4"	24"	3.5"	3"	7"	5.5"	7"	-	12"	-	920
5	1/2" CDX PLYWOOD/OSB	2	10d	3"	3"	18"	2.5"	2"	5"	-	5.5"	-	9"	-	1200

FOOTNOTES:

1 Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel edges UNO.
2 Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2008 AFPA SDPWS 4.3.6.4.3
3 Use 1/4" x 4 1/2" SDS screws through 2x sills and 1/4" x 6" SDS screws through 3x sills. [ICC ESR-2236]
4 Embed 3/8" lags 2" min. into framing below per plan (usually 5" lags at 2x sills & 6" lags at 3x sills, V.I.F.).
5 16d transfers are NOT allowed through 3x sills or sheathing thicker than 3/4", 1" min. penetration into rim is required.
6 Value based on 2005 NDS Table 11E for light-framed construction. [2010 CBC 2305.1.4]
7 Allowable loads have been reduced to (1/1.25) of allowable values due to plan irregularity. [ASCE 7-05 12.3.3.4]

GENERAL FOUNDATION NOTES

FOUNDATION & SYMBOL KEY:

- = Mat Foundation per Plan (Add'l Reinf. Req'd at Hatched Areas)
- = New Deepened Foundation per Plan UNO
- = Existing Slab on Grade per Plan UNO
- = Stud Walls at Level Above UNO
- = Step per Arch. in Mat
- HF = Hardy Frame HFX-18x10 1-1/8" STD Install per Mfr. Specs & ICC ESR-2089
- HDU# (Post) = Holdown per Plan, Install per Detail 3/S-3.0 at Mat Edges & per Detail 7/S-3.0 at Int. Beams

See Soils Report, General Notes & Specifications for Additional Requirements and Material Specifications

Dimensions per Architectural Plans, Contractor to Verify Dimensions PRIOR to Commencement of Construction

Prior to the Contractor Requesting a Building Department Foundation Inspection, the Soils Engineer Shall Advise the Building Inspector in Writing that:

a) The Building Pad was Prepared in Accordance with the Soils Report,

b) The Utility Trenches have been Properly Backfilled and Compacted,

c) The Foundation Excavations, the Soil's Expansive Characteristics and Bearing Capacity Conform to the Soils Report.

Engineer:

(800) 579.3881
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REGISTERED PROFESSIONAL ENGINEER — BRET ROOT — CIVIL — STATE OF CALIFORNIA
BID SET — NOT FOR CONSTRUCTION

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Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

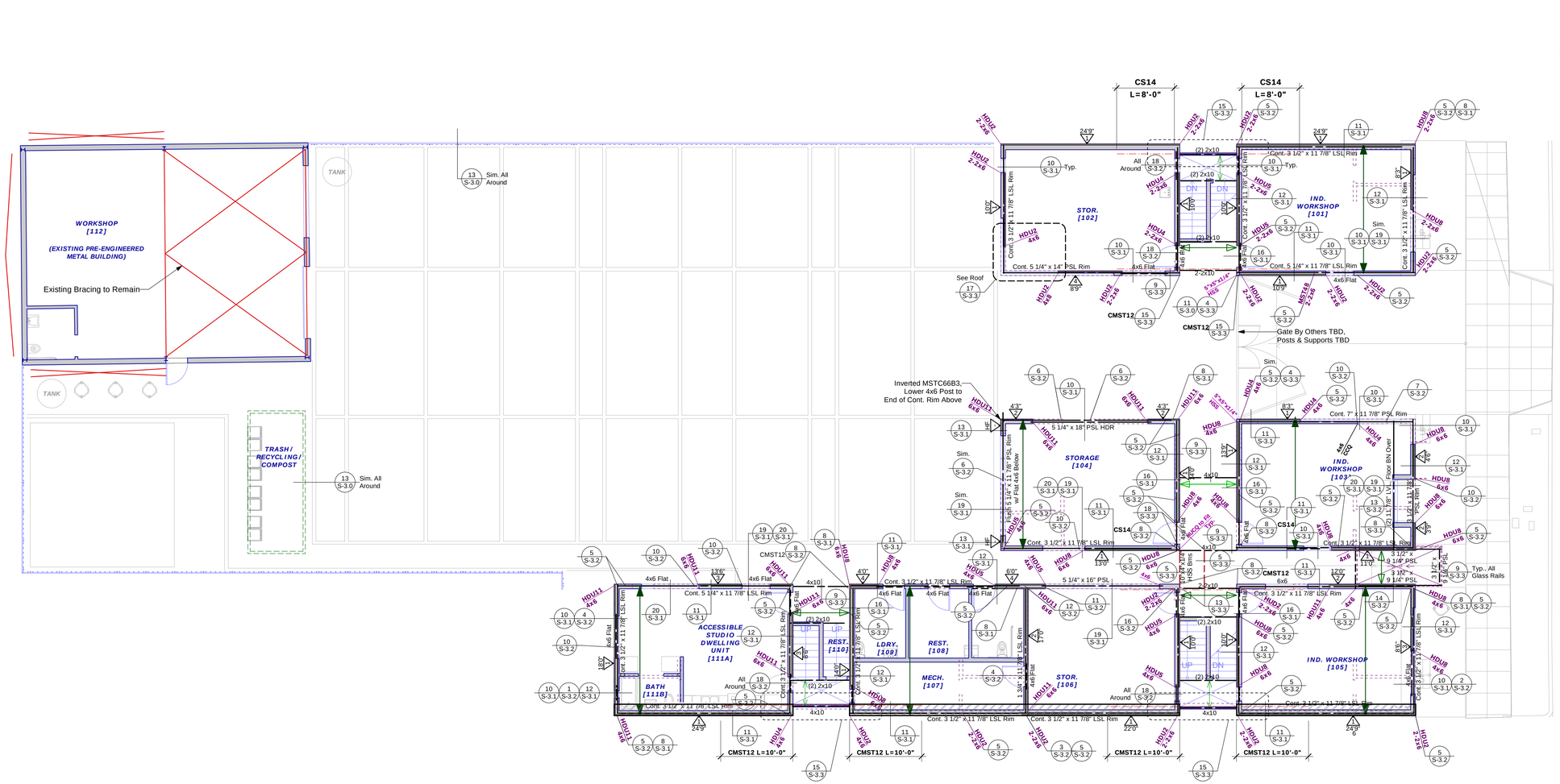
Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	1/8" = 1'-0"
Job No.:	11521

Sheet Title:

FOUNDATION PLAN

Sheet No.:

S-2.0



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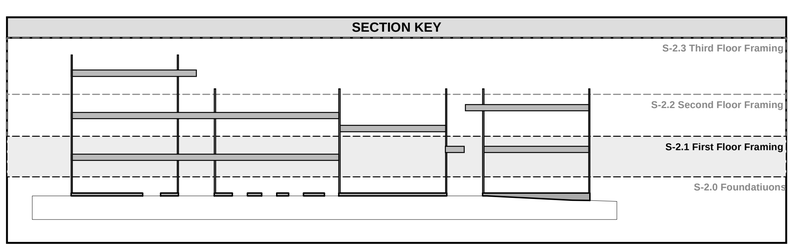
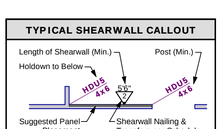


TYPICAL SHEARWALL CALLOUT



See Specs, Schedule, Notes, and Detail 2/S-3.1 for Add'l Requirements

2010 CBC SHEARWALL SCHEDULE

NO.	DESCRIPTION: SHEATHING MATERIAL	NO. OF SIDES	NAILING[1]: SIZE	NAILING[1]: BOUNDARY SPACING	NAILING[1]: EDGE SPACING	TRANSFER ALTERNATIVES: 5/8" A.B. (1588#)[6]	SDS Screw (2940#)[3]	3/8" Lag (2356#)[3]	LTP4 (536#)[4]	LTP5 (444#)[4]	A35 (556#)[7]	RBC (340#)[7]	HGA10 (932#)[7]	16d Common (1112#)[7]	VALUE (plf)
1	1/2" CDX PLYWOOD/OSB	1	10d	4"	4"	48"	7"	6"	14"	11"	14"	9"	24"	2.5"	460
2	1/2" CDX PLYWOOD/OSB	1	10d	3"	3"	37"	5.5"	5"	10"	8"	11"	7"	18"	2"	600
3	1/2" CDX PLYWOOD/OSB	1	10d	2"	2"	29"	4.5"	4"	8"	6"	8"	5"	14"	1.5"	770
4	1/2" CDX PLYWOOD/OSB	2	10d	4"	4"	24"	3.5"	3"	7"	5.5"	7"	-	12"	-	920
5	1/2" CDX PLYWOOD/OSB	2	10d	3"	3"	18"	2.5"	2"	5"	-	5.5"	-	9"	-	1200

FOOTNOTES:

[1] Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel edges UNO.
[2] Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2008 AFPA SDPWS 4.3.6.4.3
[3] Use 1/4" x 4 1/2" SDS screws through 2x sills and 1/4" x 6" SDS screws through 3x sills. [ICC ESR-2236]
[4] Embed 3/8" lags 2" min. into framing below per plan (usually 5" lags at 2x sills & 6" lags at 3x sills, V.I.F.).
[5] 16d transfers are NOT allowed through 3x sills or sheathing thicker than 3/4", 1" min. penetration into rim is required.
[6] Value based on 2005 NDS Table 11E for light-framed construction. [2010 CBC 2305.1.4]
[7] Allowable loads have been reduced to (1/1.25) of allowable values due to plan irregularity. [ASCE 7-05 12.3.3.4]

GENERAL FRAMING NOTES

FRAMING CALLOUT KEY:

11 7/8" TJI 360 FJ @ 24" o.c. UNO, Align Over Studs

2x10 DF#2 FJ @ 24" o.c. UNO, Align Over Studs, Ripped For Drainage to 2x8 Max.

11 7/8" TJI 360 RJ @ 24" o.c. UNO, Align Over Studs

2x6 DF#2 FJ @ 24" o.c. UNO, Align Over Studs

Beam per Plan (Interconnect Multi-LVL Beams per Detail 20/S-3.2)

Constuct Headers per Detail 10/S-3.1 Typ., Install Cont. 1 3/4" x 11 7/8" LSL Rims at All Building Edges UNO

WALL & SYMBOL KEY:

= Wall w/ 2x6 Studs @ 24" o.c. (Max. Ht. = 10') Wall w/ 2x6 Studs @ 16" o.c. (Max. Ht. = 14')

= Stud Walls at Level Above UNO

= Step per Arch. in Framing or Slab

= Section of Fully Blocked 3/4" CDX Plywood or OSB PI 40/20, Glued & Nailed Floor Diaphragm w/ 10 Commons at 6", 6" 12" UNO

HF = Hardy Frame HFX-18x10 1-1/8" HS Install per Mfr. Specs & ICC ESR-2089

See General Notes & Specifications for Additional Requirements and Material Specifications

Dimensions per Architectural Plans UNO, Contractor to Verify Dimensions PRIOR to Commencement of Construction

Install Diaphragm Sheathing with Strong Axis Parallel to Framing As Shown at Right (Case 1 per 2010 CBC Table 2306.3.1)

Roof Sheathing Shall be 1/2" CDX Plywood or OSB., PI 24/0, Nailed w/ 10d Commons at 6", 6", 12" UNO

Floor Sheathing Shall be 3/4" CDX Plywood or OSB, PI 40/20, Glued & Nailed w/ 10d Commons at 6", 6", 12" UNO

Beams Shall Bear on Plates w/ Indicated Post or Doubler Below Unless Noted Otherwise

Provide Wall-Length, Continuous, Full-Depth, Solid Blocking (Where Floor Joists are Perpendicular) or Double Floor Joist (Where Floor Joists are Parallel) For All Walls at Level Above

Support Custom Steel Stairs on Adj. Walls per Detail 10/S-3.3

Framed Walls Shall Have Continuous Double Top Plates UNO, Splice as Necessary Using Detail 4/S-3.1

Engineer:

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Project Name:

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513 Garden Street
Santa Barbara, CA 93101

Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

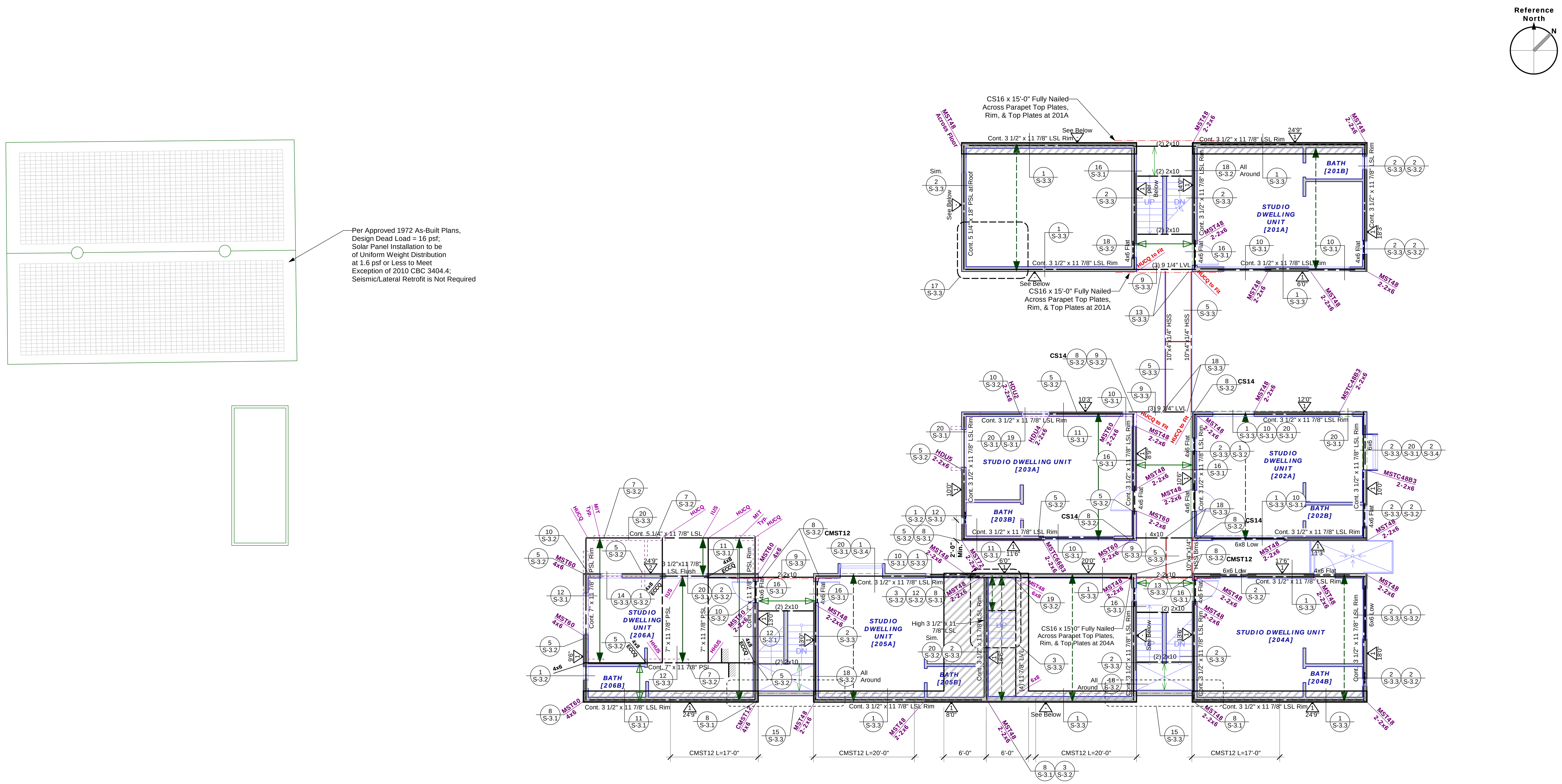
Project Engineer:	**BHR/GDM**
Checked By:	**BHR**
Date:	**April 10, 2014**
Scale:	**1/8" = 1'-0"**
Job No.:	**11521**

Sheet Title:

FIRST-FLOOR FRAMING PLAN

Sheet No.:

S-2.1



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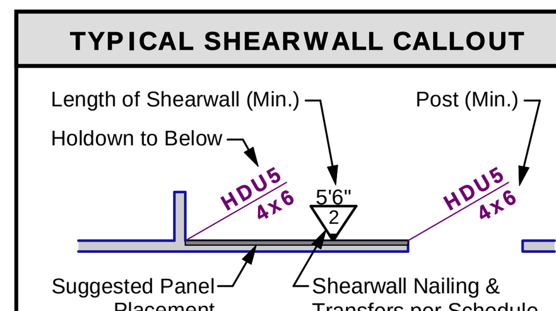
TYPICAL SHEARWALL CALLOUT



See Specs, Schedule, Notes, and Detail 2/S-3.1 for Add'l Requirements

2010 CBC SHEARWALL SCHEDULE

DESCRIPTION			NAILING[1]			TRANSFER ALTERNATIVES									
						(1888#)[6]	(294#)[7]	(256#)[7]	(536#)[7]	(444#)[7]	(556#)[7]	(348#)[7]	(932#)[7]	(111#)[7]	
NO.	SHEATHING MATERIAL	NO. OF SIDES	SIZE	BOUNDARY SPACING	EDGE SPACING	5/8" A.B.[2]	SDS Screw[3]	3/8" Lag[4]	LTP4	LTP5	A35	RBC	HGA10	16d Common[5]	VALUE (plf)
1	1/2" CDX PLYWOOD/OSB	1	10d	4"	4"	48"	7"	6"	14"	11"	14"	9"	24"	2.5"	460
2	1/2" CDX PLYWOOD/OSB	1	10d	3"	3"	37"	5.5"	5"	10"	8"	11"	7"	18"	2"	600
3	1/2" CDX PLYWOOD/OSB	1	10d	2"	2"	29"	4.5"	4"	8"	6"	8"	5"	14"	1.5"	770
4	1/2" CDX PLYWOOD/OSB	2	10d	4"	4"	24"	3.5"	3"	7"	5.5"	7"	-	12"	-	920
5	1/2" CDX PLYWOOD/OSB	2	10d	3"	3"	18"	2.5"	2"	5"	-	5.5"	-	9"	-	1200

FOOTNOTES:

1 Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel edges UNO.
2 Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2008 AFPA SDPWS 4.3.6.4.3
3 Use 1/4" x 4 1/2" SDS screws through 2x sills and 1/4" x 6" SDS screws through 3x sills. [ICC ESR-2236]
4 Embed 3/8" lags 2" min. into framing below per plan (usually 5" lags at 2x sills & 6" lags at 3x sills, V.I.F.).
5 16d transfers are NOT allowed through 3x sills or sheathing thicker than 3/4", 1" min. penetration into rim is required.
6 Value based on 2005 NDS Table 11E for light-framed construction. [2010 CBC 2305.1.4]
7 Allowable loads have been reduced to (1/1.25) of allowable values due to plan irregularity. [ASCE 7-05 12.3.3.4]

GENERAL FRAMING NOTES

FRAMING CALLOUT KEY:

11 7/8" TJI 360 FJ @ 24" o.c. UNO, Align Over Studs

2x10 DF#2 FJ @ 24" o.c. UNO, Align Over Studs, Ripped For Drainage to 2x8 Max.

11 7/8" TJI 360 RJ @ 24" o.c. UNO, Align Over Studs

2x6 DF#2 FJ @ 24" o.c. UNO, Align Over Studs

Beam per Plan (Interconnect Multi-LVL Beams per Detail 20/S-3.2)

Constuct Headers per Detail 10/S-3.1 Typ.,
Install Cont. 1 3/4" x 11 7/8" LSL Rims at All Building Edges UNO

WALL & SYMBOL KEY:

= Wall w/ 2x6 Studs @ 24" o.c. (Max. Ht. = 10')
Wall w/ 2x6 Studs @ 16" o.c. (Max. Ht. = 14')

= Stud Walls at Level Above UNO

= Step per Arch. in Framing or Slab

= Section of Fully Blocked 3/4" CDX Plywood or OSB PI 40/20, Glued & Nailed Floor Diaphragm w/ 10 Commons at 6", 6" 12" UNO

HF
= Hardy Frame HFX-18x10 1-1/8" HS
Install per Mfr. Specs & ICC ESR-2089

See General Notes & Specifications for Additional Requirements and Material Specifications

Dimensions per Architectural Plans UNO,
Contractor to Verify Dimensions
PRIOR to Commencement of Construction

Install Diaphragm Sheathing with Strong Axis Parallel to Framing As Shown at Right (Case 1 per 2010 CBC Table 2306.3.1)

Roof Sheathing Shall be 1/2" CDX Plywood or OSB,
PI 24/0, Nailed w/ 10d Commons at 6", 6", 12" UNO

Floor Sheathing Shall be 3/4" CDX Plywood or OSB,
PI 40/20, Glued & Nailed w/ 10d Commons at 6", 6", 12" UNO

Beams Shall Bear on Plates w/ Indicated Post or
Doubler Below Unless Noted Otherwise

Provide Wall-Length, Continuous, Full-Depth,
Solid Blocking (Where Floor Joists are Perpendicular)
or Double Floor Joist (Where Floor Joists are Parallel)
For All Walls at Level Above

Support Custom Steel Stairs on Adj. Walls per Detail 10/S-3.3

**Framed Walls Shall Have Continuous Double Top Plates UNO,
Splice as Necessary Using Detail 4/S-3.1**

Engineer:

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Drawing Notes:

Revisions:

1	Bid Set	04.01.2013
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	Bid Set	04.10.2014

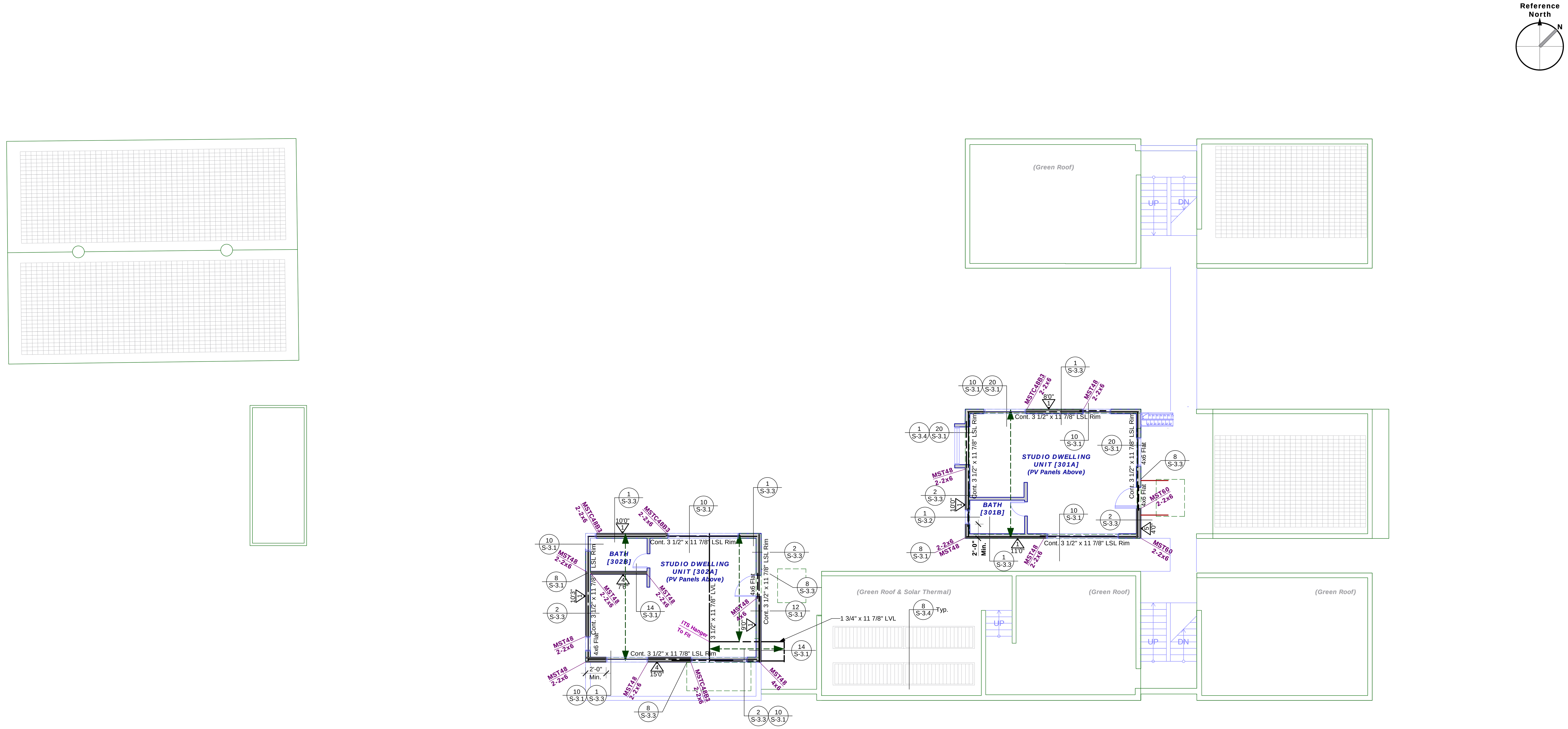
Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	1/8" = 1'-0"
Job No.:	11521

Sheet Title:

SECOND-FLOOR FRAMING PLAN

Sheet No.:

S-2.2



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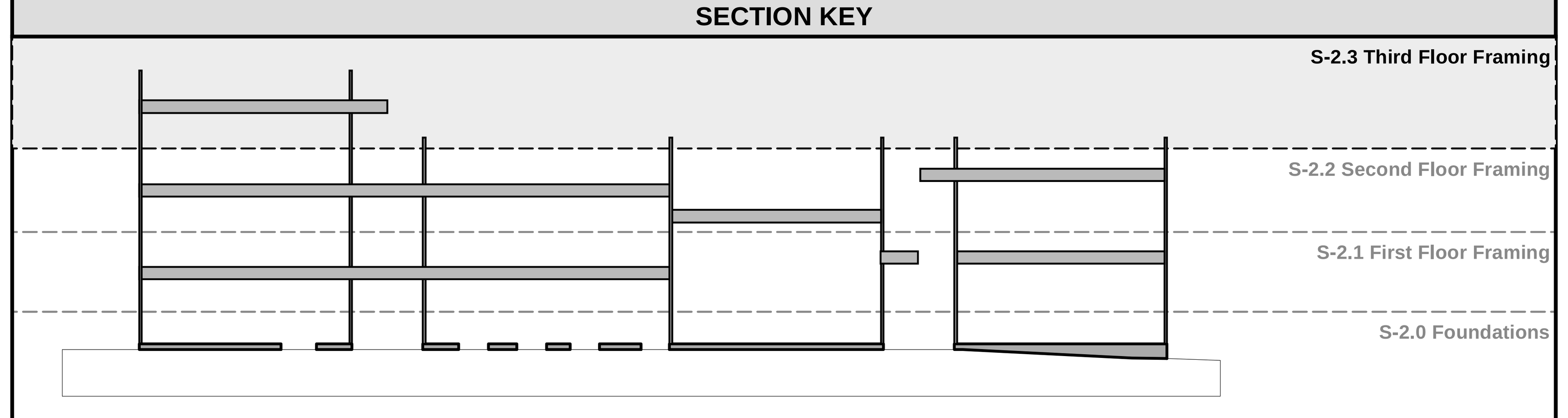
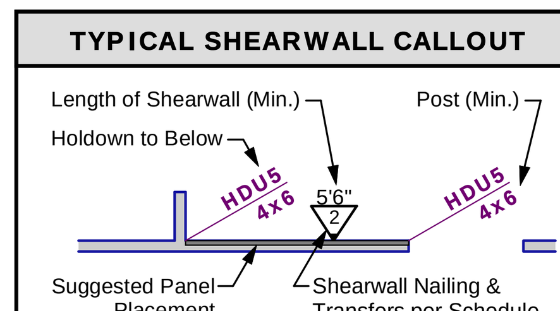


TYPICAL SHEARWALL CALLOUT



See Specs, Schedule, Notes, and Detail 2/S-3.1 for Add'l Requirements

2010 CBC SHEARWALL SCHEDULE

DESCRIPTION			NAILING[1]			TRANSFER ALTERNATIVES									
						(1888#)[6]	(294#)[7]	(256#)[7]	(536#)[7]	(444#)[7]	(556#)[7]	(348#)[7]	(932#)[7]	(111#)[7]	
NO.	SHEATHING MATERIAL	NO. OF SIDES	SIZE	BOUNDARY SPACING	EDGE SPACING	5/8" A.B.[2]	SDS Screw[3]	3/8" Lag[4]	LTP4	LTP5	A35	RBC	HGA10	16d Common[5]	VALUE (plf)
1	1/2" CDX PLYWOOD/OSB	1	10d	4"	4"	48"	7"	6"	14"	11"	14"	9"	24"	2.5"	460
2	1/2" CDX PLYWOOD/OSB	1	10d	3"	3"	37"	5.5"	5"	10"	8"	11"	7"	18"	2"	600
3	1/2" CDX PLYWOOD/OSB	1	10d	2"	2"	29"	4.5"	4"	8"	6"	8"	5"	14"	1.5"	770
4	1/2" CDX PLYWOOD/OSB	2	10d	4"	4"	24"	3.5"	3"	7"	5.5"	7"	-	12"	-	920
5	1/2" CDX PLYWOOD/OSB	2	10d	3"	3"	18"	2.5"	2"	5"	-	5.5"	-	9"	-	1200

FOOTNOTES:

[1] Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel edges UNO.
[2] Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2008 AFPA SDPWS 4.3.6.4.3
[3] Use 1/4" x 4 1/2" SDS screws through 2x sills and 1/4" x 6" SDS screws through 3x sills. [ICC ESR-2236]
[4] Embed 3/8" lags 2" min. into framing below per plan (usually 5" lags at 2x sills & 6" lags at 3x sills, V.I.F.).
[5] 16d transfers are NOT allowed through 3x sills or sheathing thicker than 3/4", 1" min. penetration into rim is required.
[6] Value based on 2005 NDS Table 11E for light-framed construction. [2010 CBC 2305.1.4]
[7] Allowable loads have been reduced to (1/1.25) of allowable values due to plan irregularity. [ASCE 7-05 12.3.3.4]

ROOF FRAMING NOTES

FRAMING CALLOUT KEY:

11 7/8" TJI 360 RJ @ 24" o.c. UNO, Align Over Studs

Beam per Plan (Interconnect Multi-LVL Beams per Detail 20/S-3.2)

Constuct Headers per Detail 10/S-3.1 Typ.,
Install Cont. 1 3/4" x 11 7/8" LSL Rims at All Building Edges UNO

WALL & SYMBOL KEY:

= Wall w/ 2x6 Studs @ 24" o.c. (Max. Ht. = 10')
Wall w/ 2x6 Studs @ 16" o.c. (Max. Ht. = 14')

= Extent of Roof Above UNO

= Step per Arch. in Framing or Slab

= Section of Fully Blocked 3/4" CDX Plywood or OSB PI 40/20, Glued & Nailed Floor Diaphragm w/ 10 Commons at 6", 6" 12" UNO

See General Notes & Specifications for Additional Requirements and Material Specifications

Dimensions per Architectural Plans,
Contractor to Verify Dimensions
PRIOR to Commencement of Construction

Install Diaphragm Sheathing with Strong Axis Parallel to Framing As Shown at Right (Case 1 per 2010 CBC Table 2306.3.1)

Roof Sheathing Shall be 1/2" CDX Plywood or OSB, PI 24/0, Nailed w/ 10d Commons at 6", 6", 12" UNO

Beams Shall Bear on Plates w/ Indicated Post or Doubler Below Unless Noted Otherwise

Provide Wall-Length, Continuous, Full-Depth, Solid Blocking (Where Floor Joists are Perpendicular) or Double Floor Joist (Where Floor Joists are Parallel) For All Walls at Level Above

Framed Walls Shall Have Continuous Double Top Plates UNO, Splice as Necessary Using Detail 4/S-3.1

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REGISTERED PROFESSIONAL ENGINEER — BRET ROOT — CIVIL — STATE OF CALIFORNIA
BID SET — NOT FOR CONSTRUCTION

SENIOR MANAGING ENGINEER

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Braun & Associates Inc.
P.O. Box 2004
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805.688.5429

Project Name:

SANTA BARBARA CENTER FOR ARTS, SCIENCE & TECHNOLOGY

513 Garden Street
Santa Barbara, CA 93101

Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	1/8" = 1'-0"
Job No.:	11521

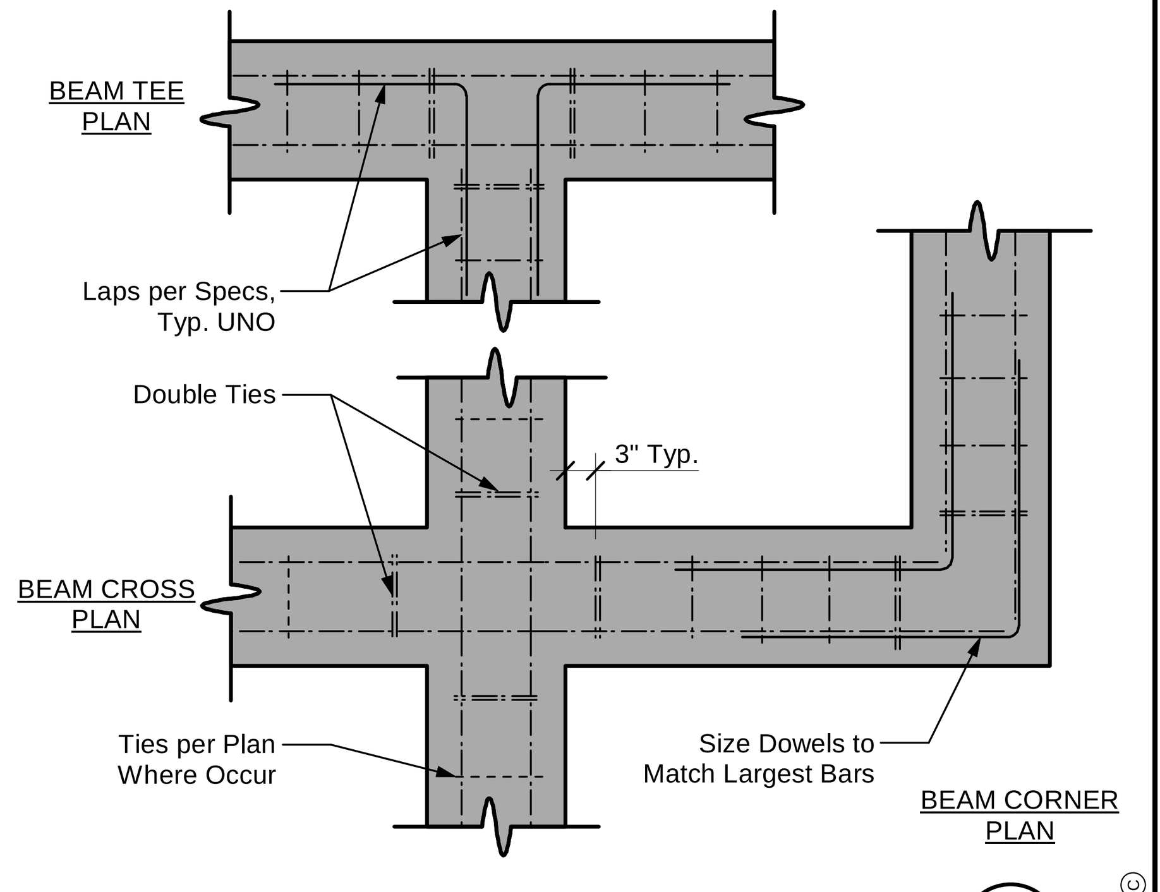
Sheet Title:

THIRD-FLOOR & ROOF FRAMING PLAN

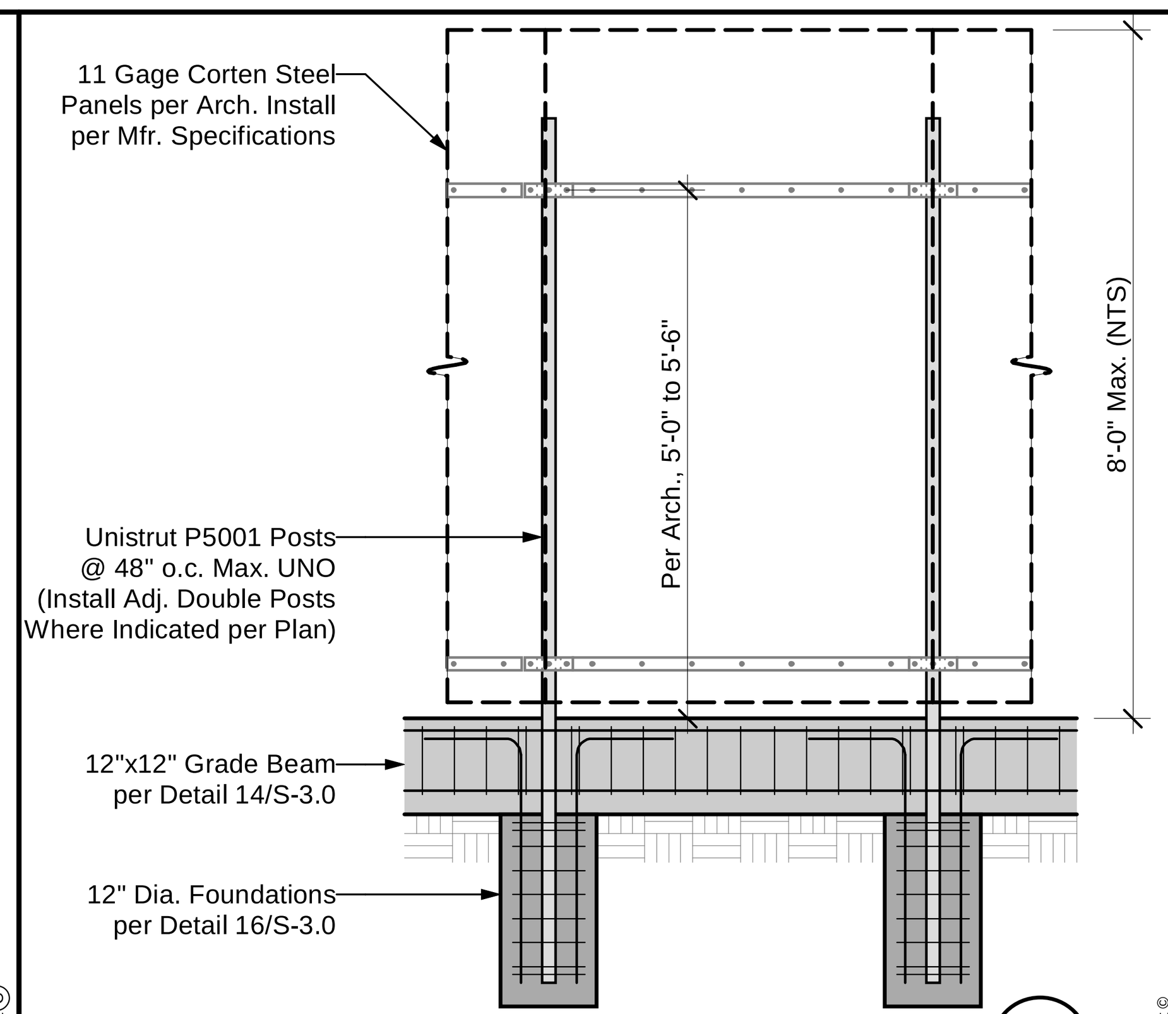
Sheet No.:

S-2.3

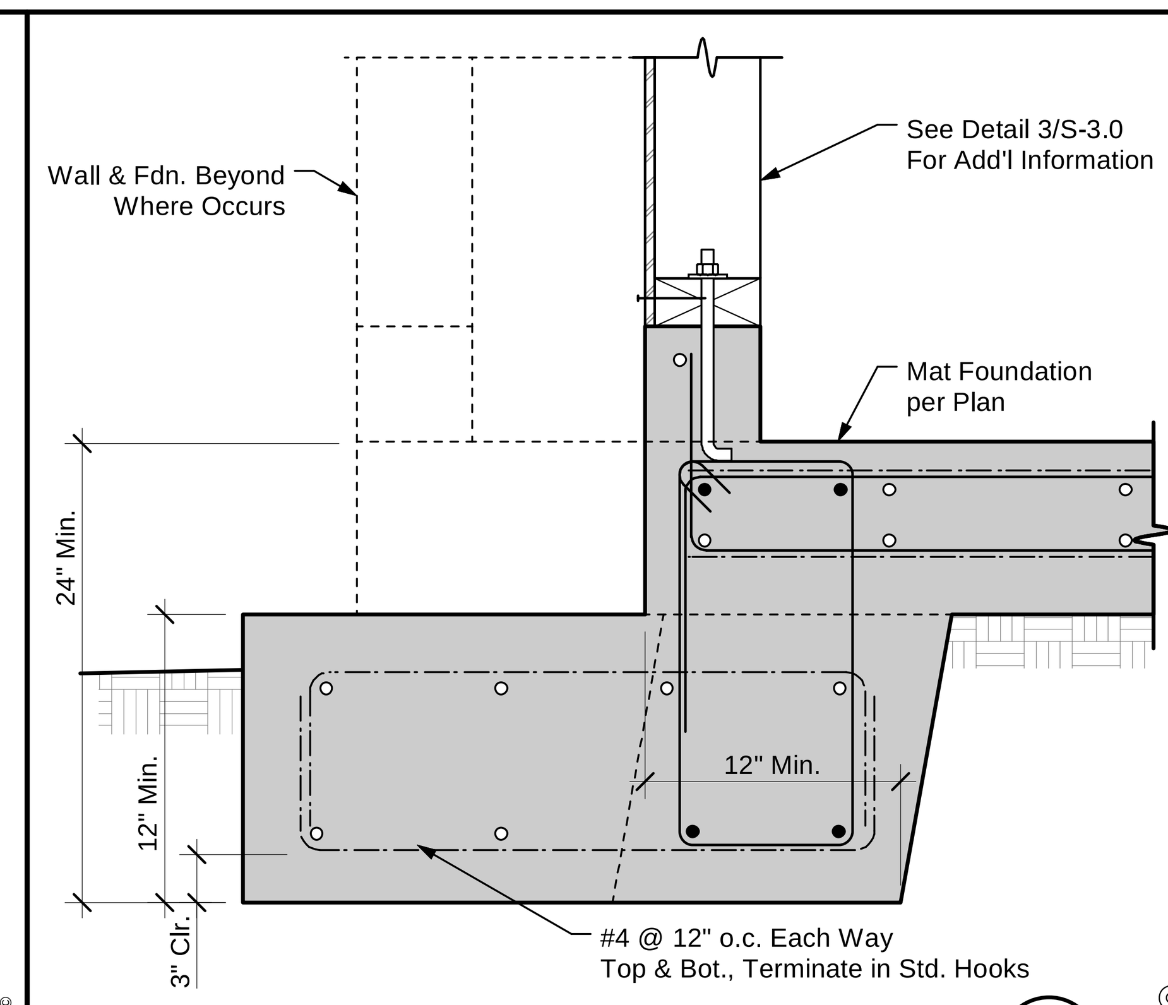
NOTE: Provide #3 Ties @ 6" o.c. Min. over length of lap splices and double ties as shown.



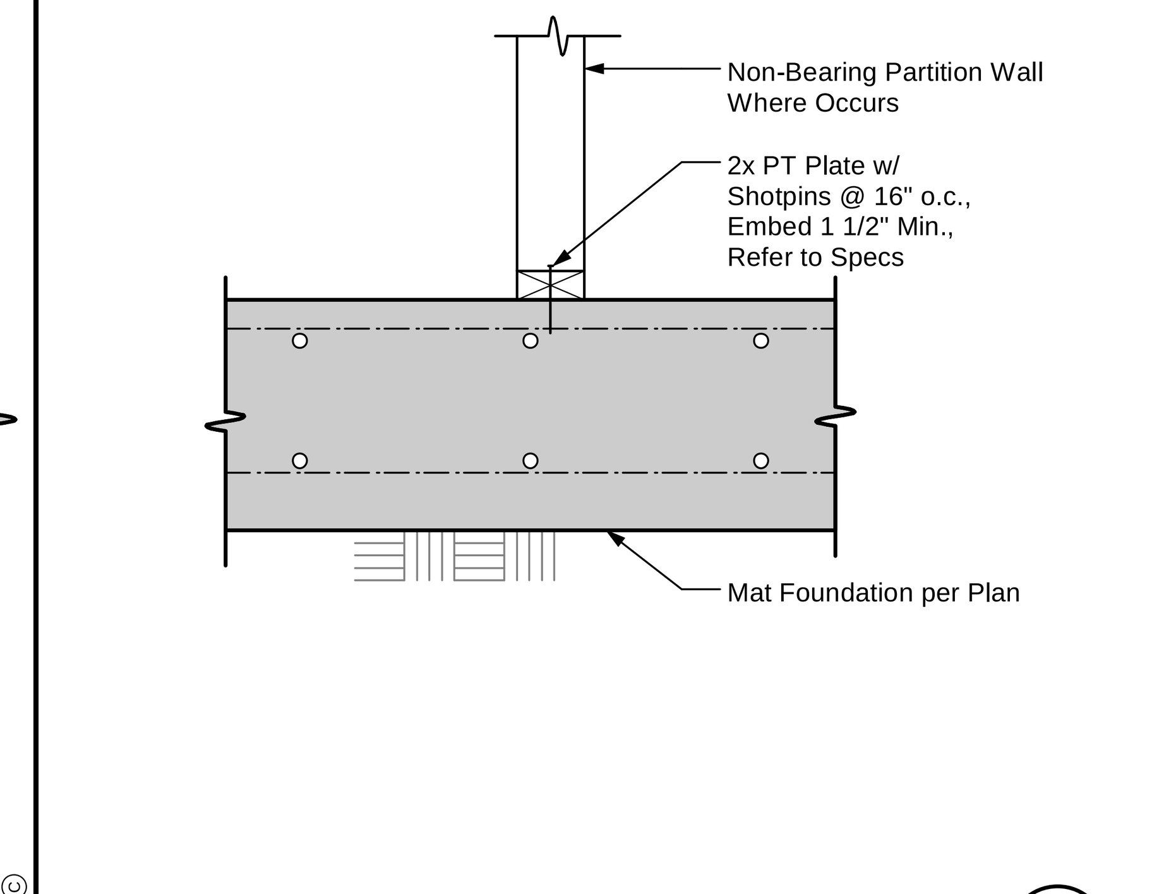
TYP. FOUNDATION CONNECTIONS (17)



PERIMETER FENCE OVERVIEW (13)

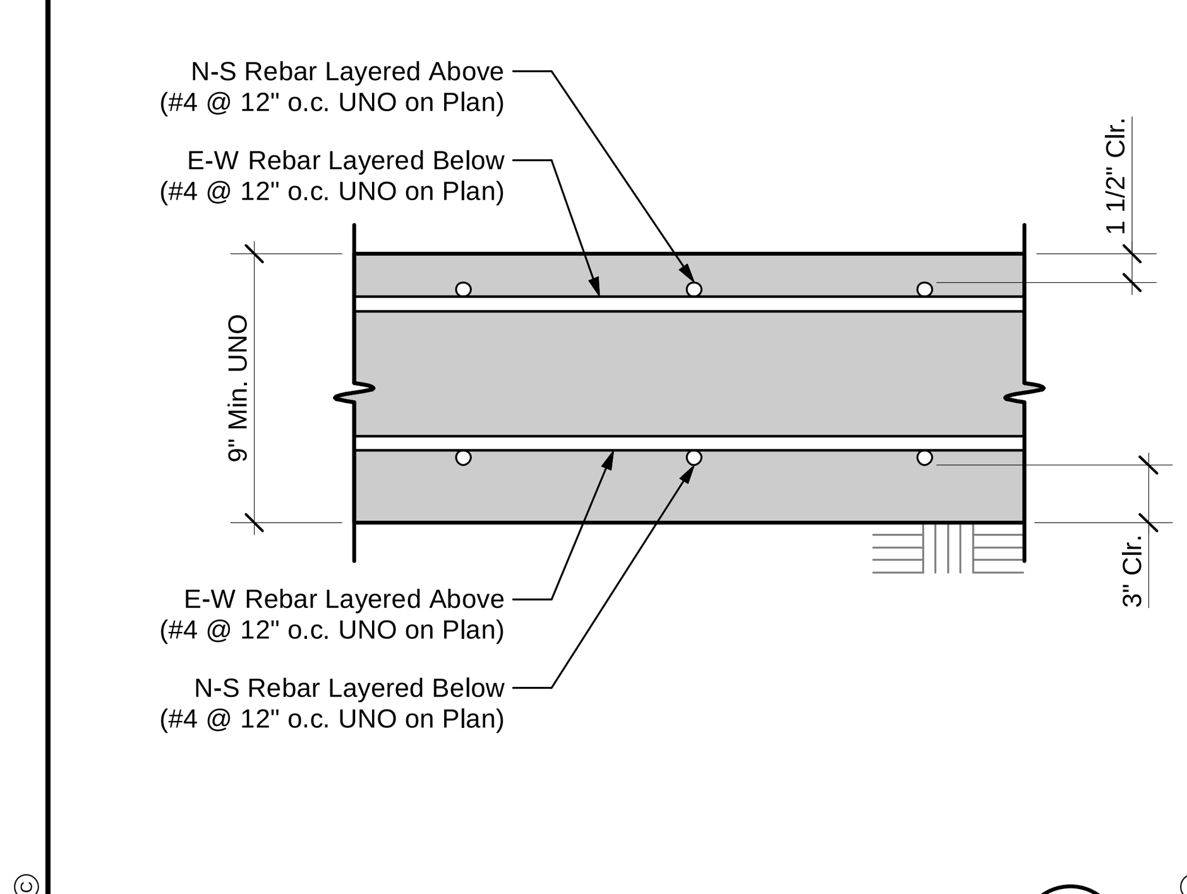


MAT SLAB PERIMETER AT NOTCH (9)

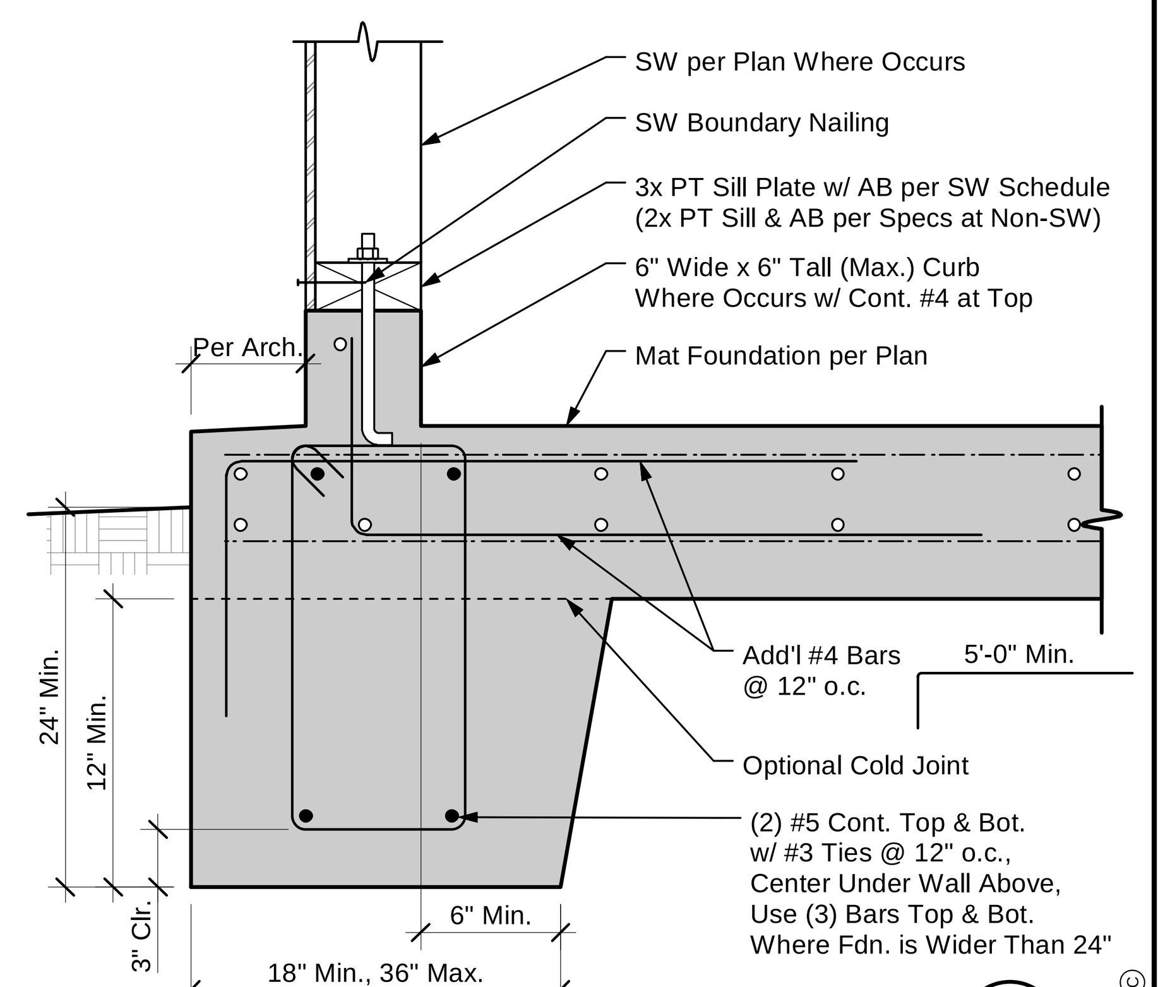


PARTITION WALL TO MAT SLAB (5)

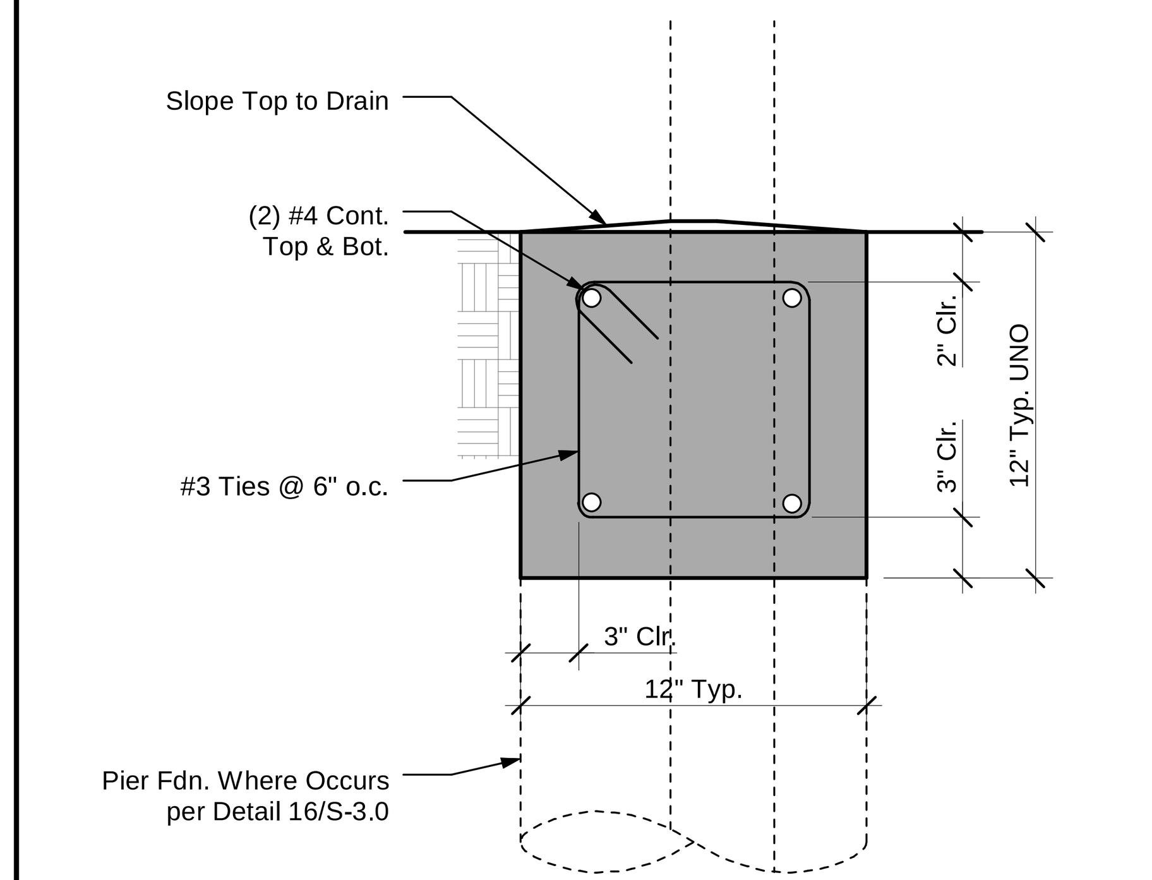
NOTE: Soil Preparation, Subgrade, and Moisture Protection By Others, See Soils Report.
NOTE: See Plan for Size, Number, and Location of Reinforcing Bars.



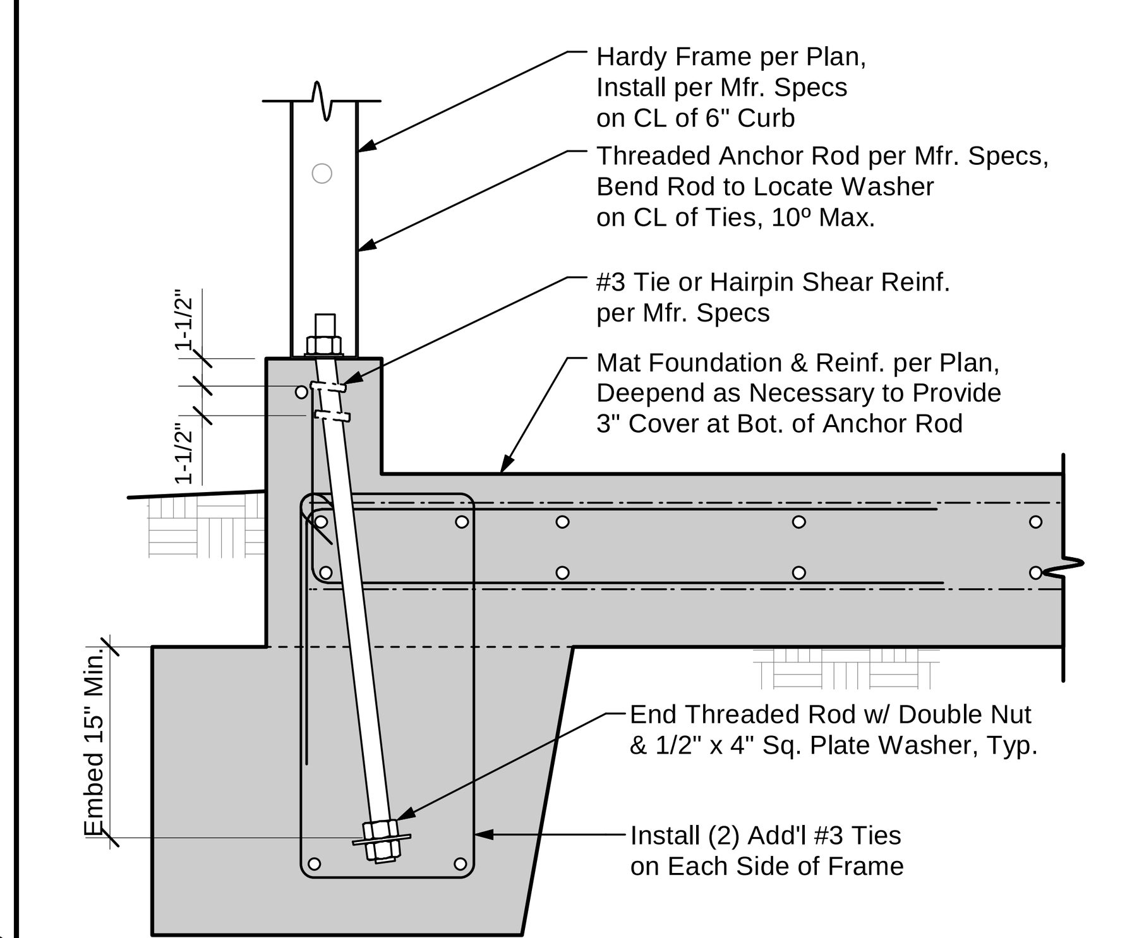
TYP. MAT SLAB SECTION (1)



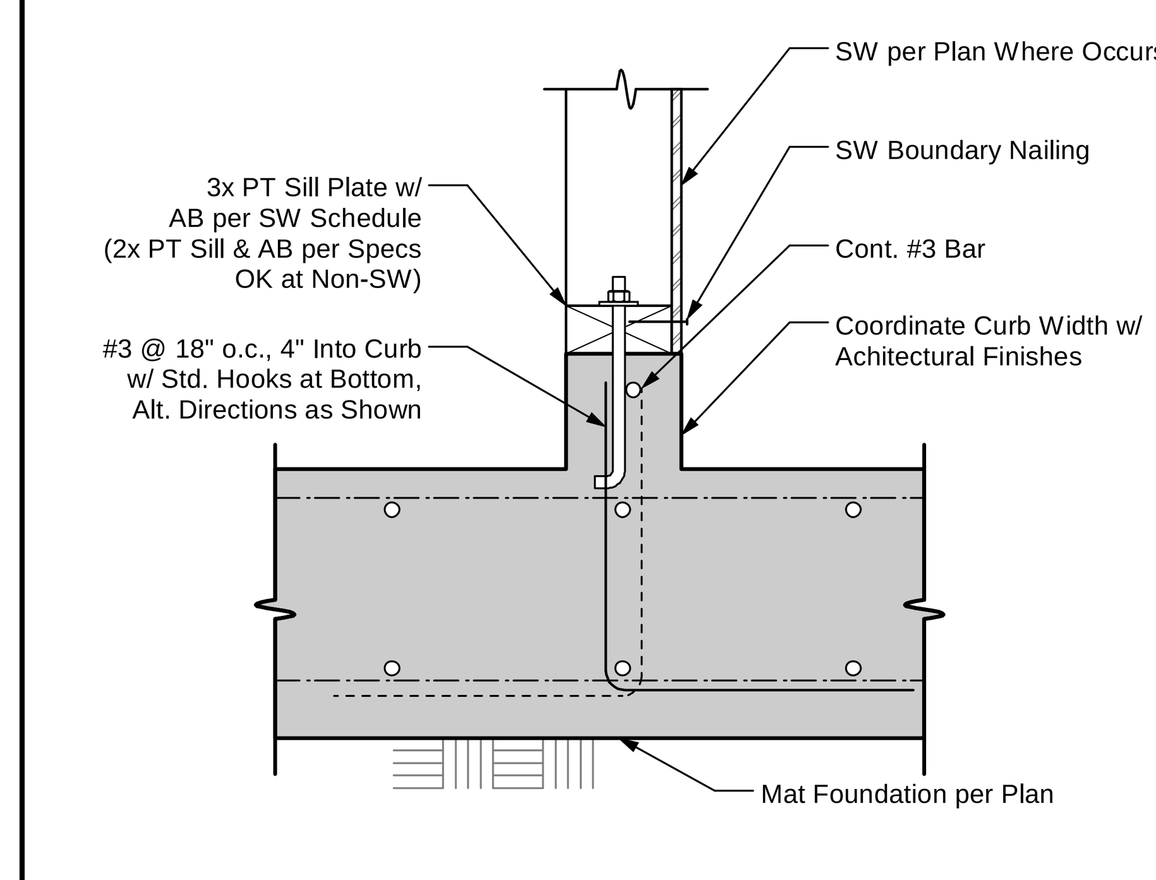
TYP. MAT SLAB PERIMETER (18)



TYP. GRADE BEAM (14)

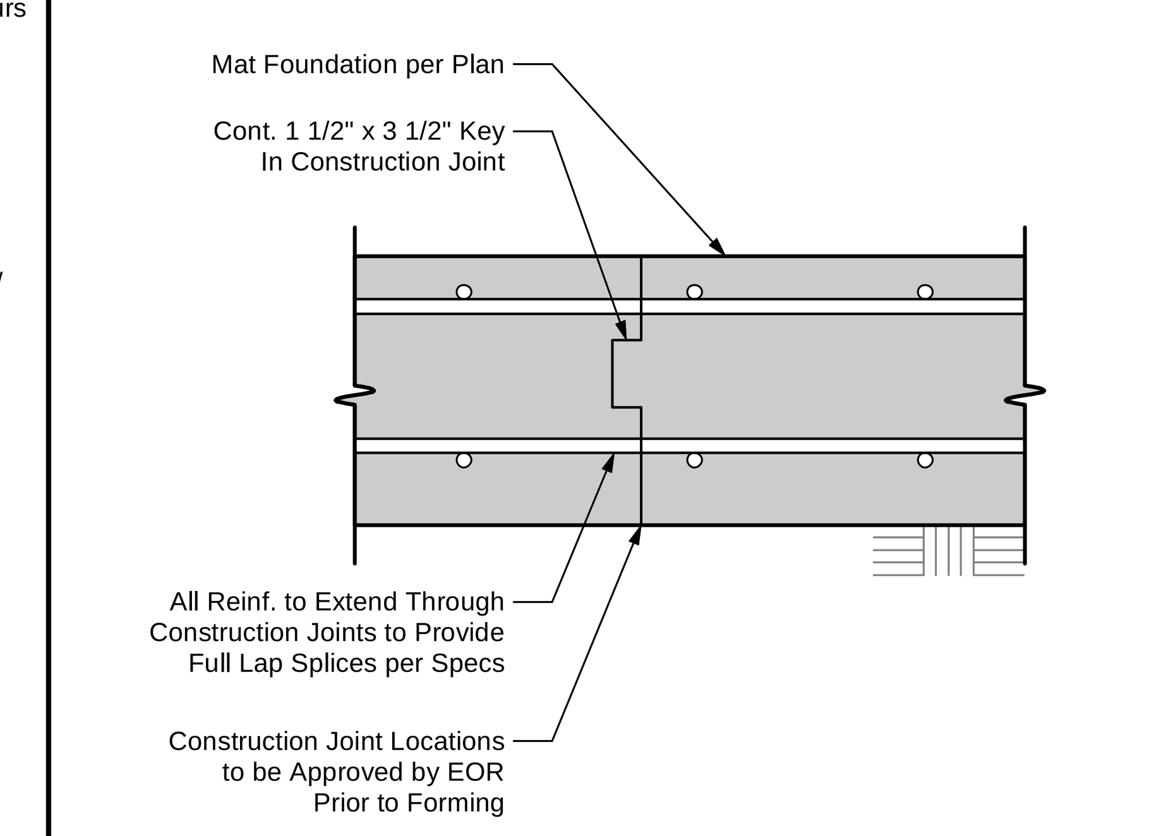


HARDY FRAME TO MAT SLAB EDGE (10)

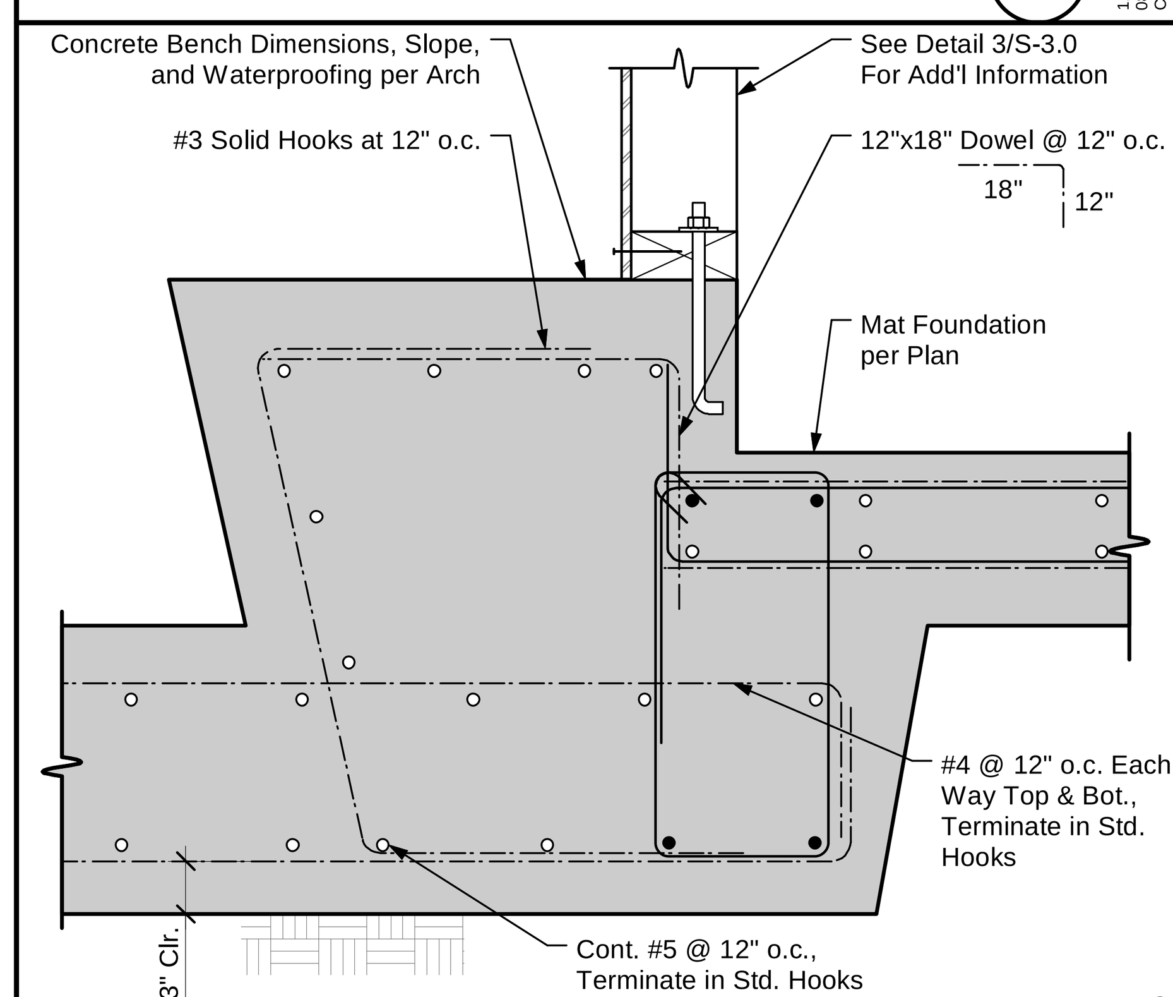


SHEAR TRANSFER TO MAT SLAB (6)

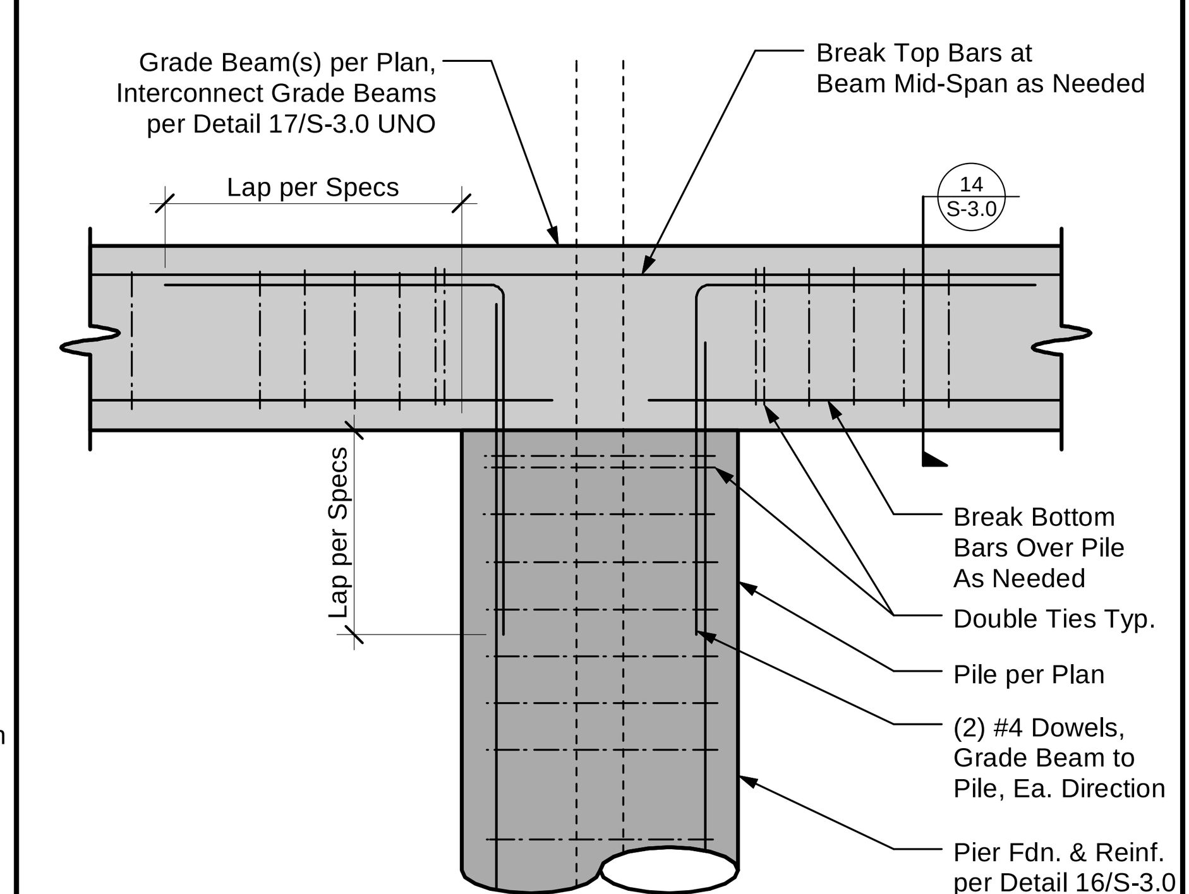
NOTE: Soil Preparation, Subgrade, and Moisture Protection by Others, See Soils Report.



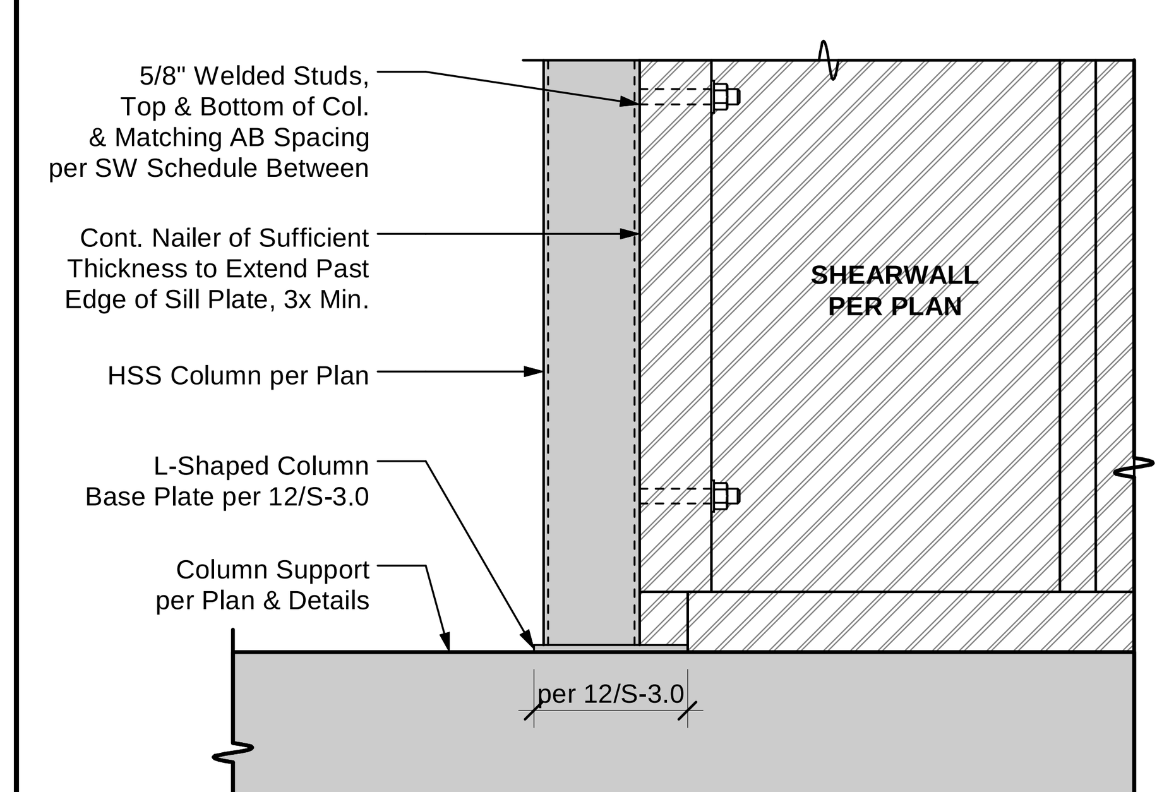
TYP. MAT CONSTRUCTION JOINT (2)



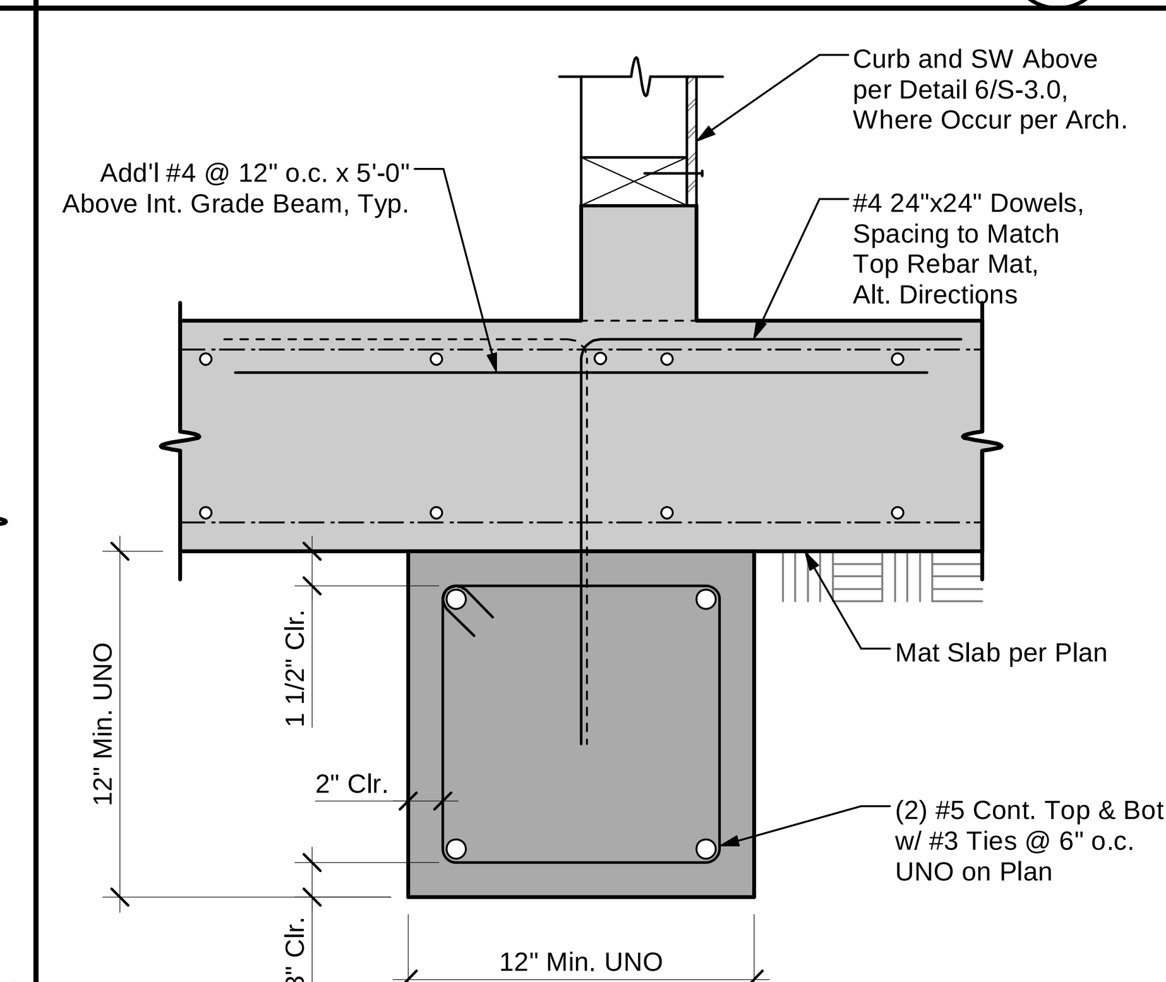
MAT SLAB PERIMETER AT NOTCH (19)



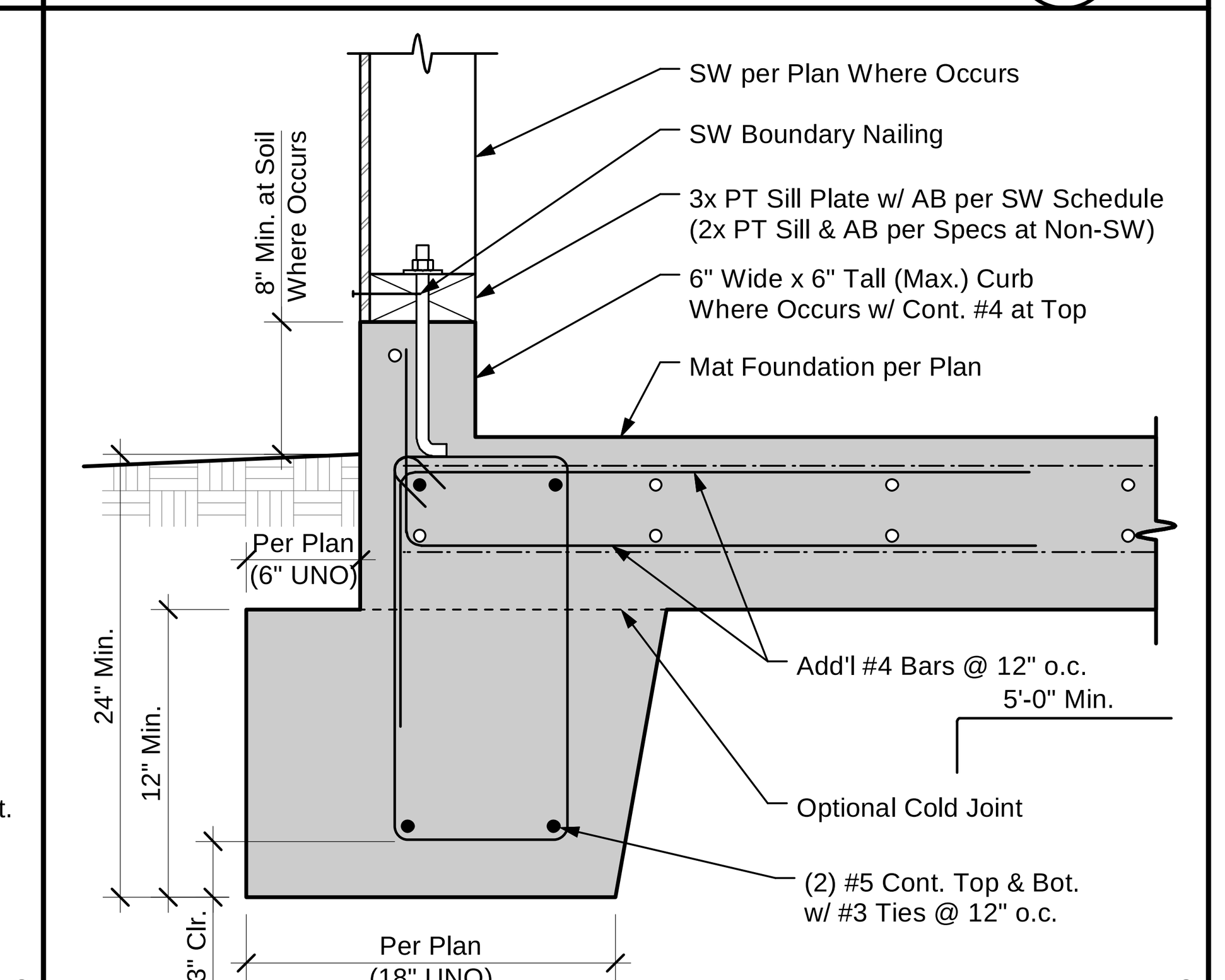
TYP. GRADE BEAM TO PIER FDN. (15)



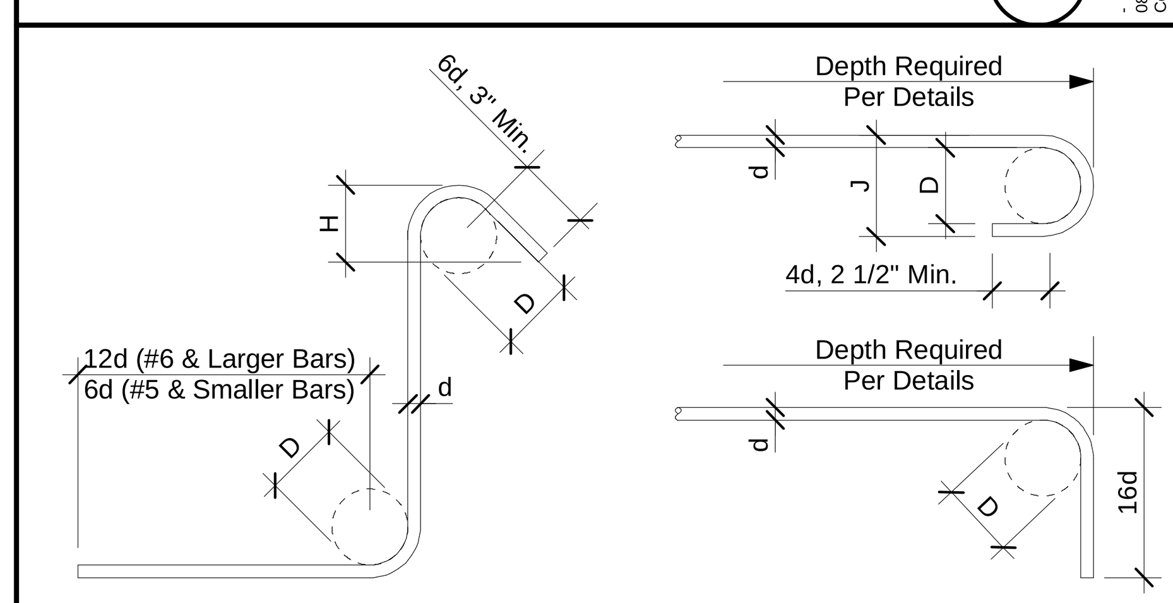
SHEARWALL TO STEEL COLUMN (11)



INT. MAT GRADE BEAM (7)



TYP. MAT SLAB PERIMETER (3)



STANDARD TIES & STIRRUPS

Bar Size	D	H
#3	1 1/2"	2 1/2"
#4	2"	3"
#5	2 1/2"	3 3/4"
#6	4 1/2"	4 1/2"
#7	5 1/4"	5 1/4"
#8	6"	6"

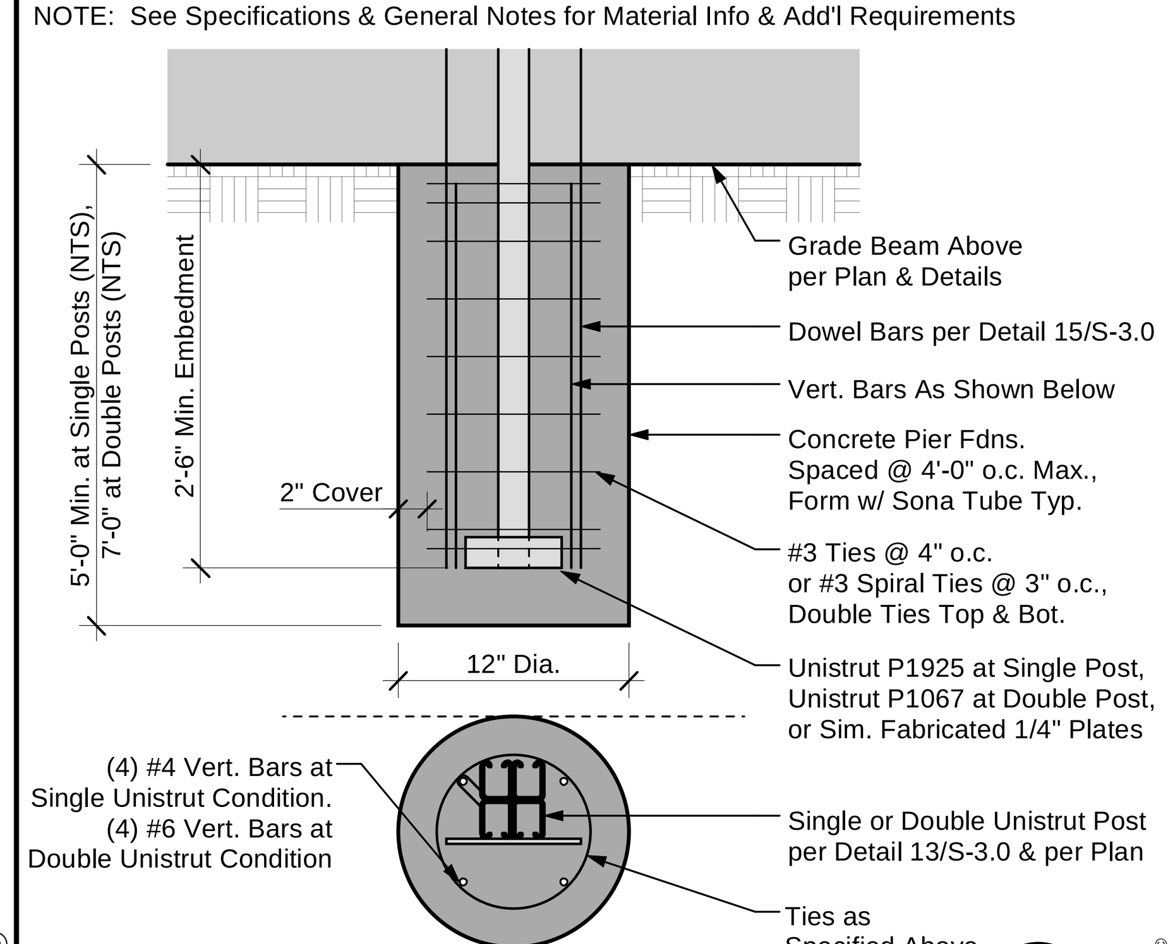
STANDARD END HOOKS

Bar Size	D	J
#3	2 1/4"	3"
#4	3"	4"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9 1/2"	11 3/4"
#10	10 3/4"	13 1/4"

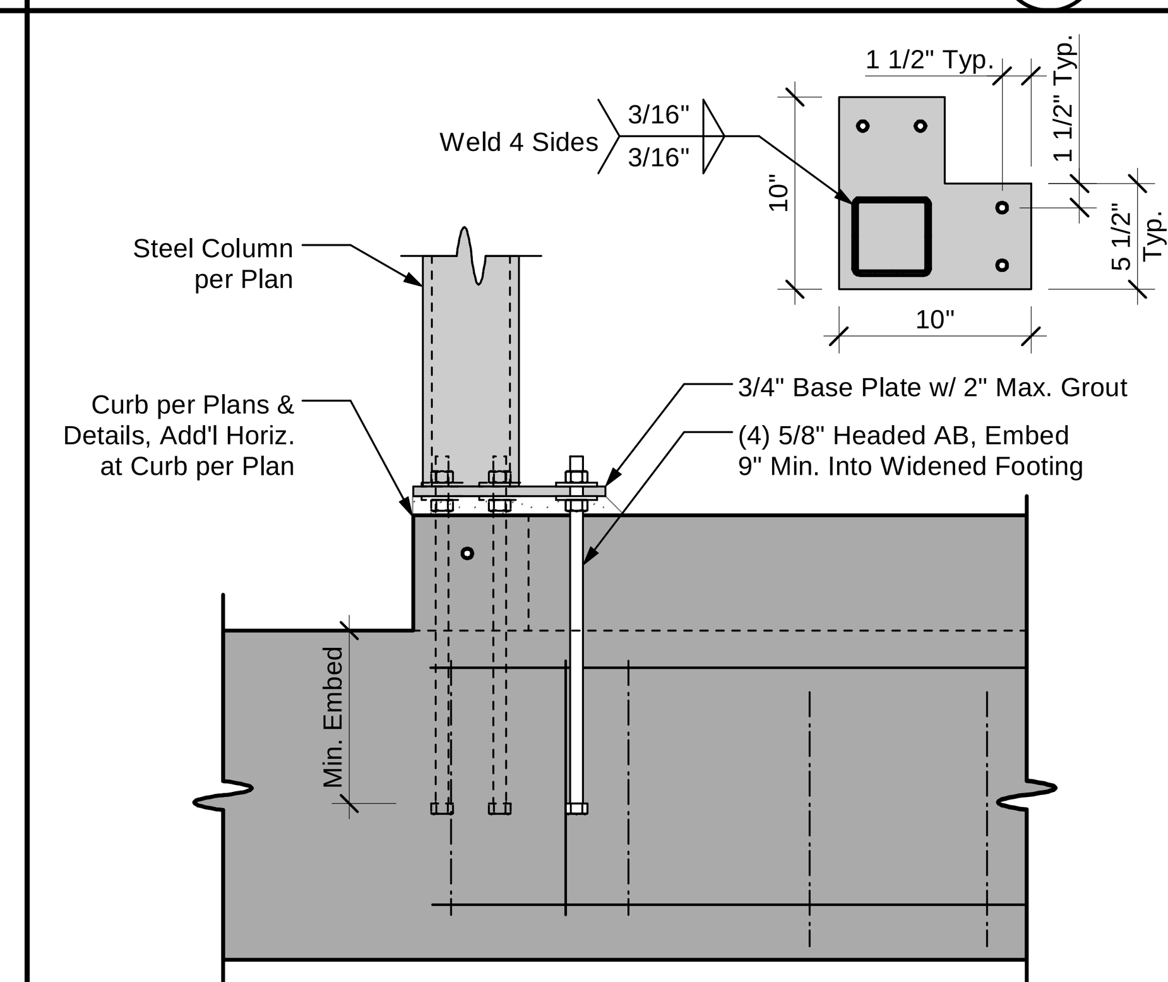
NOTE: All bar bend diameters and end lengths must conform to the CRSI Manual of Standard Practice.

TYP. REINFORCEMENT BAR BENDS (20)

NOTE: Excavations Shall be Inspected & Approved by the Project Soils Engineer
NOTE: See Specifications & General Notes for Material Info & Add'l Requirements



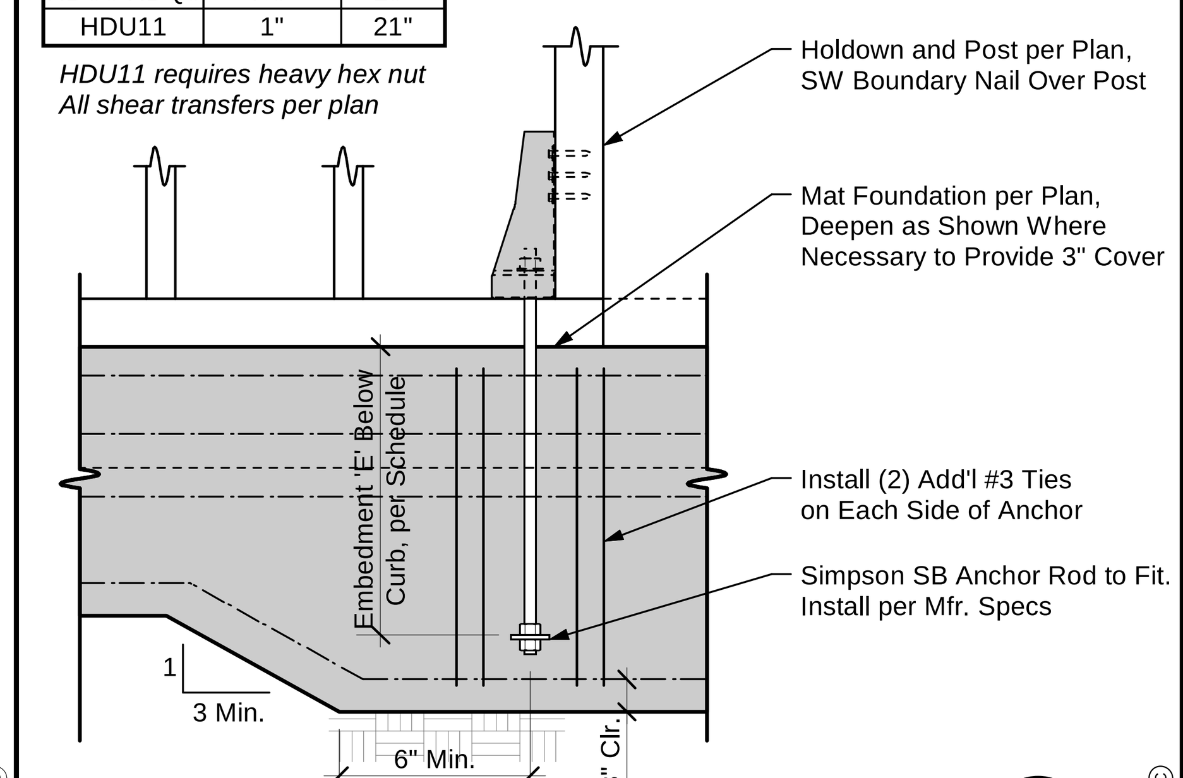
FENCE WALL PIERS (16)



STEEL COL. TO GRADE BEAM (12)

HOLDOWN	ROD DIA.	E
HDU2	5/8"	12"
HDU4	5/8"	12"
HDU5	5/8"	15"
HDU8/HDQ8	7/8"	18"
HDU11	1"	21"

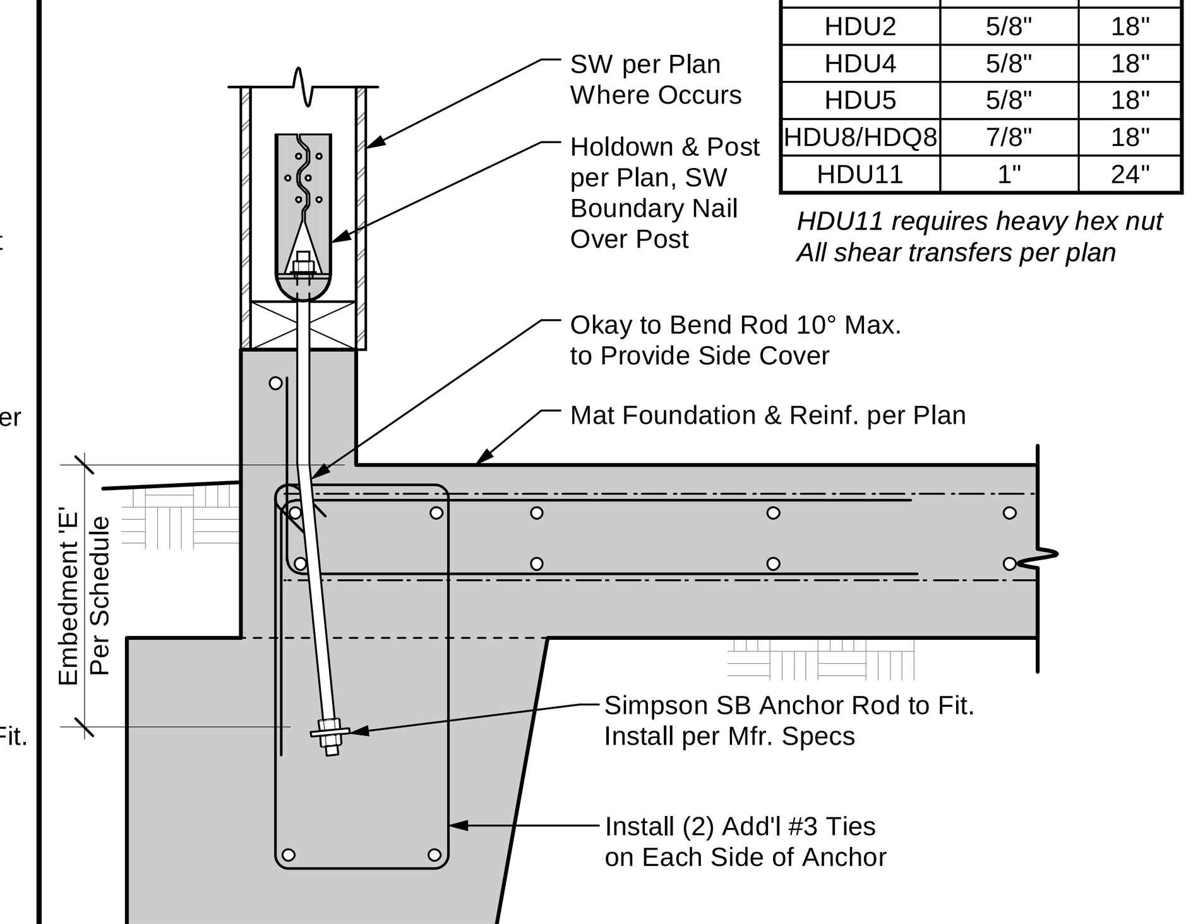
HDU11 requires heavy hex nut
All shear transfers per plan



HOLDOWN TO MAT SLAB AT INT. (8)

HOLDOWN	ROD DIA.	E
HDU2	5/8"	18"
HDU4	5/8"	18"
HDU5	5/8"	18"
HDU8/HDQ8	7/8"	18"
HDU11	1"	24"

HDU11 requires heavy hex nut
All shear transfers per plan



HOLDOWN TO MAT SLAB AT EDGE (4)

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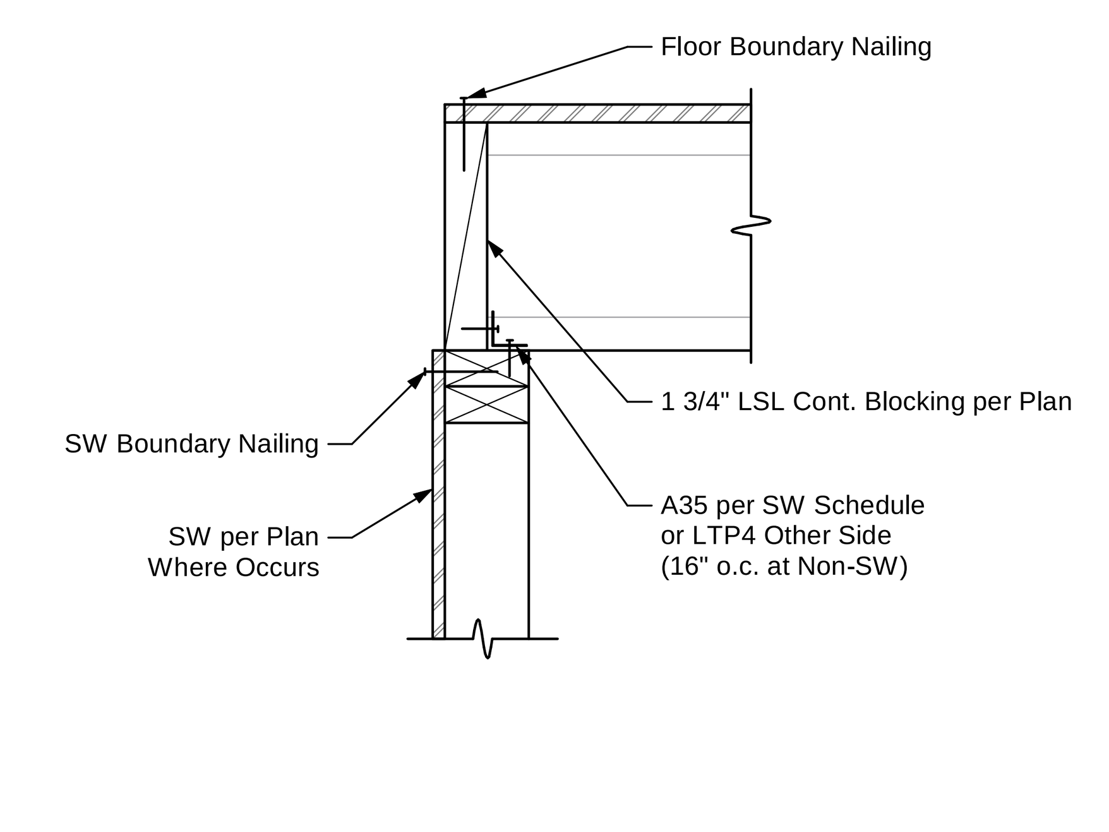
Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	-
Job No.:	11521

Sheet Title:

STRUCTURAL DETAILS

Sheet No.:

S-3.0



TYP. SHEAR TRANSFER (17)

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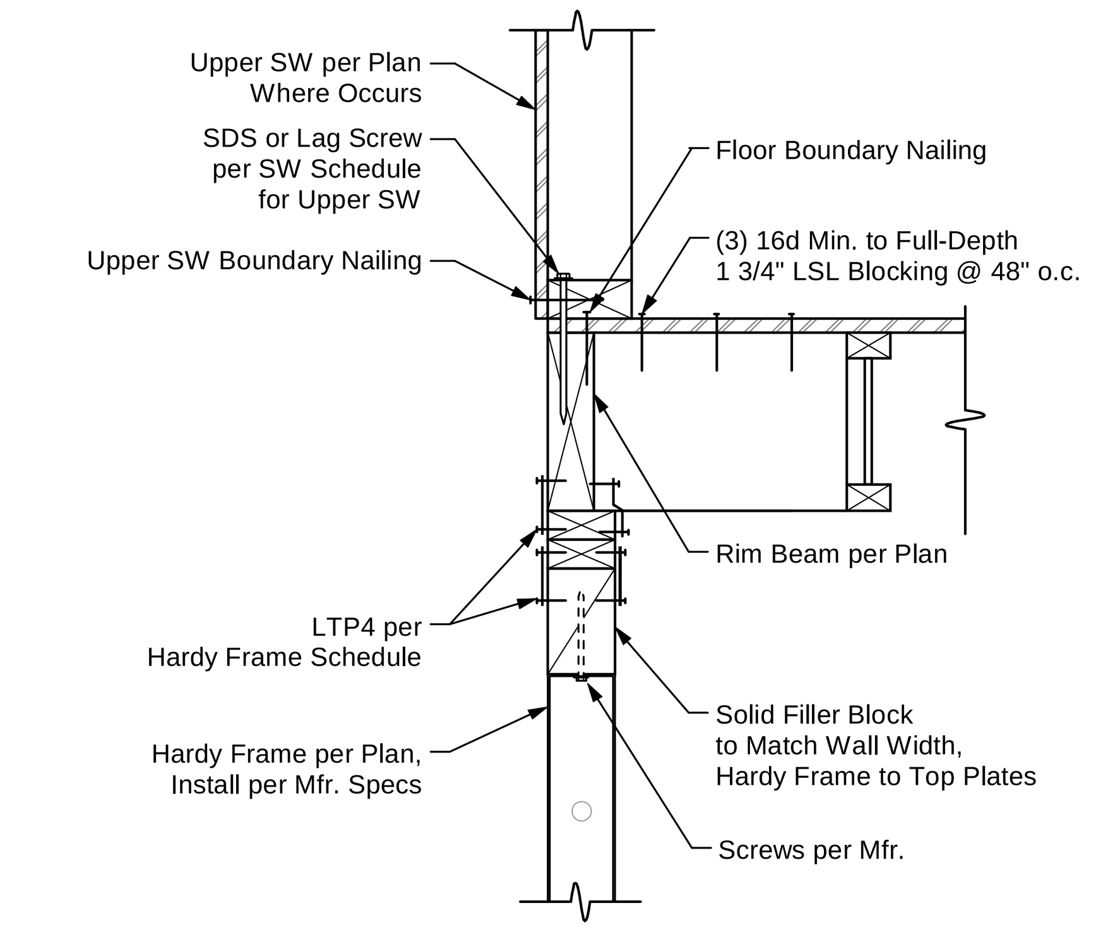
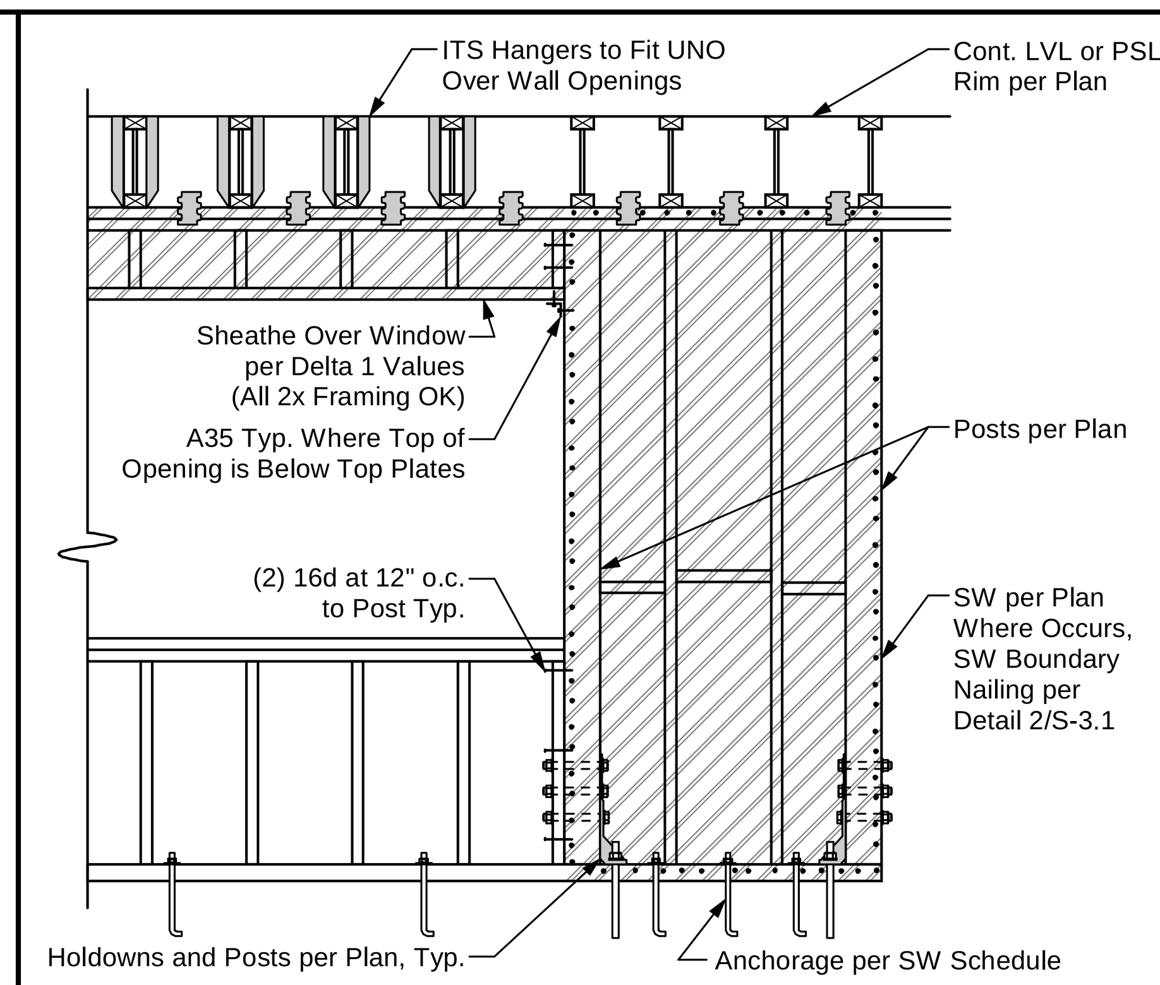


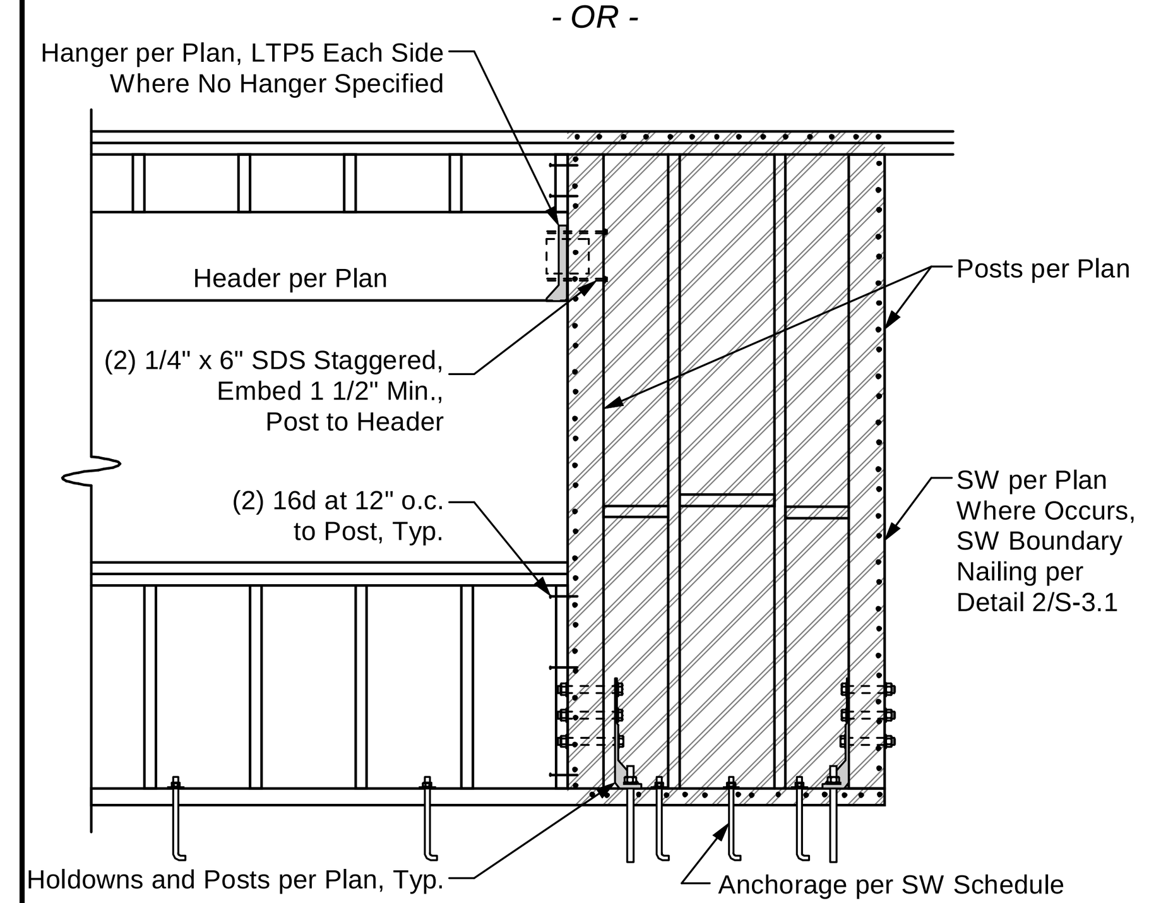
HARDY FRAME SHEAR TRANSFER (13)

3221 07.10.09 Copyright©



RIM ABOVE AS HEADER
(No Header Specified per Plan)

\- OR -



HEADERS PER PLAN

TYPICAL HEADER CONSTRUCTION (10)

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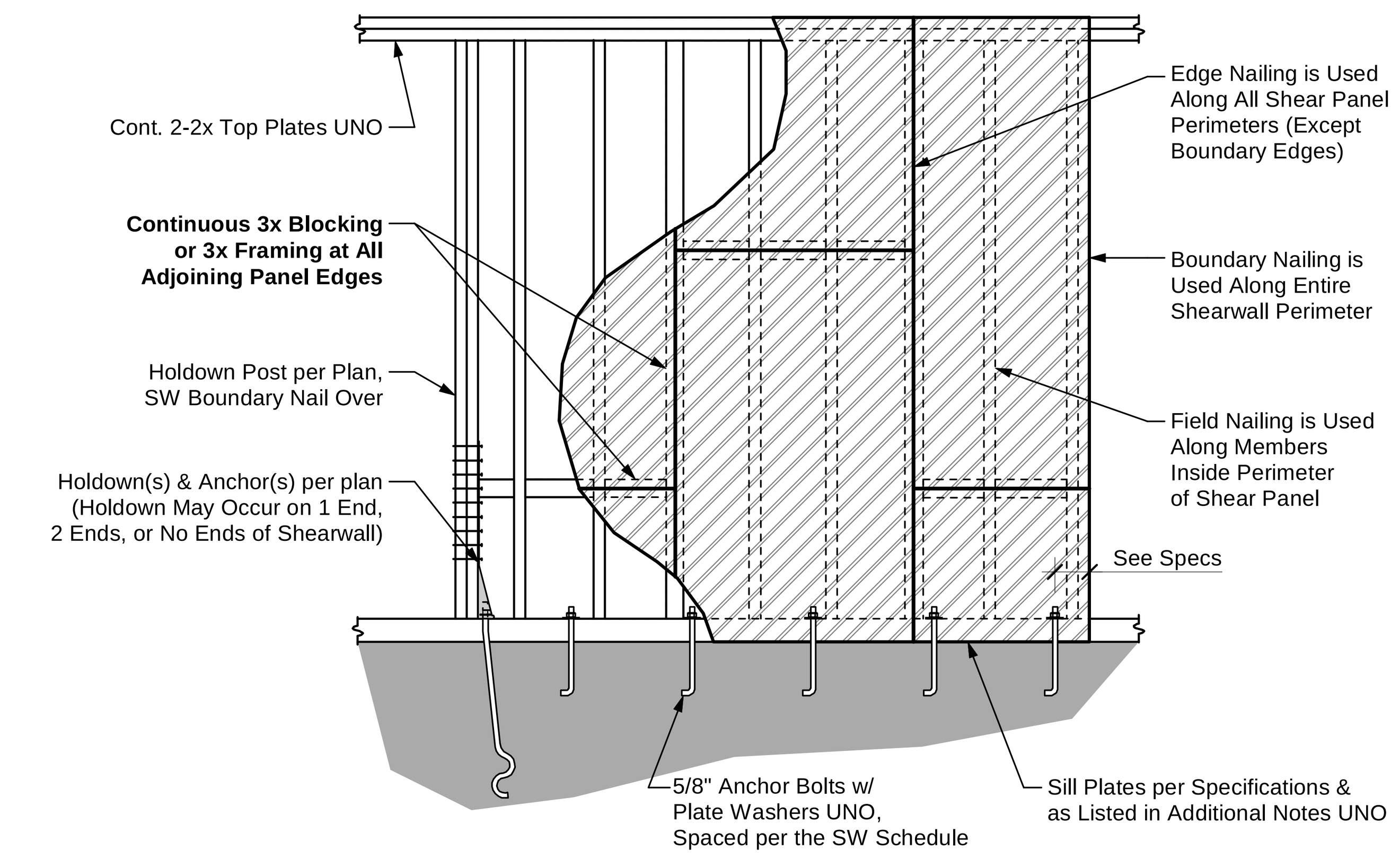
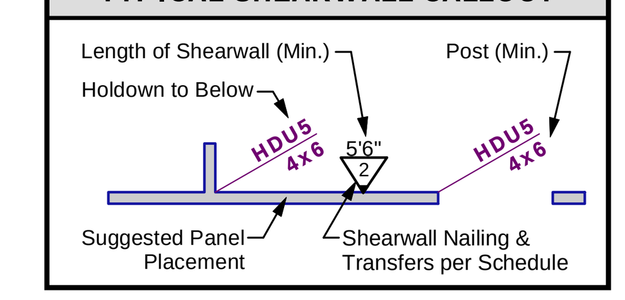
TYPICAL SHEARWALL ELEVATION



See Transfer Details in Plans for Additional Shearwall Connections

TYPICAL SHEARWALL CALLOUT



ADDITIONAL NOTES:

1) Refer to "Wood" Section of the Specifications for additional framing requirements.
2) All nails shall have 3/8" edge distance, min.
3) Sheathing for single-sided shearwalls may be placed on EITHER face of wall UNO. Provide minimum length specified and coordinate w/ arch. finishes.
4) Plywood panels shall abut along centerlines of framing members. The minimum plywood dimension for use in a shearwall shall be 12".
5) For shearwalls with capacity over 350 plf, 3x members are required for all framing members receiving edge nailing from abutting panels. 2-2x members may be used instead of 3x members only if the 2x members are joined with lag or SDS Screws w/ 3 1/2" min. length, spaced per the SW Schedule. Screws should be staggered between interior and exterior faces of the 2-2x member with 1" edge distance.
6) For shearwalls with capacity over 350 plf, panel joint and sill plate nailing shall be staggered in all cases per CBC Table 2306.3, footnote i.
7) Sill plates on masonry or concrete must be 3x pressure treated. All sill plates for two-sided shearwalls must be 3x members. Sill plates on wood framing for one-sided shearwalls may be 2x members. Wall studs and blocking at adjoining panel edges must be 3x or larger.
8) At all exterior walls and interior bearing walls not noted as shearwalls, blocking shall be provided between joists and/or rafters with A35, RBC, or LTP4 to top plates @ 16" o.c. at floor and 24" o.c. at roof conditions UNO per plan

2010 CBC SHEARWALL SCHEDULE

DESCRIPTION			NAILING[1]			TRANSFER ALTERNATIVES									
						(1888#)[6]	(294#)[7]	(256#)[7]	(536#)[7]	(444#)[7]	(556#)[7]	(348#)[7]	(932#)[7]	(111#)[7]	
NO.	SHEATHING MATERIAL	NO. OF SIDES	SIZE	BOUNDARY SPACING	EDGE SPACING	5/8" A.B.[2]	SDS Screw[3]	3/8" Lag[4]	LTP4	LTP5	A35	RBC	HGA10	16d Common[5]	VALUE (plf)
1	1/2" CDX PLYWOOD/OSB	1	10d	4"	4"	48"	7"	6"	14"	11"	14"	9"	24"	2.5"	460
2	1/2" CDX PLYWOOD/OSB	1	10d	3"	3"	37"	5.5"	5"	10"	8"	11"	7"	18"	2"	600
3	1/2" CDX PLYWOOD/OSB	1	10d	2"	2"	29"	4.5"	4"	8"	6"	8"	5"	14"	1.5"	770
4	1/2" CDX PLYWOOD/OSB	2	10d	4"	4"	24"	3.5"	3"	7"	5.5"	7"	-	12"	-	920
5	1/2" CDX PLYWOOD/OSB	2	10d	3"	3"	18"	2.5"	2"	5"	-	5.5"	-	9"	-	1200

FOOTNOTES:
[1] Use COMMON NAILS ONLY for all sheathing. Field nailing is 12" o.c. Provide 3x framing at all panel edges UNO.
[2] Anchor bolts for shearwalls must have 3" x 3" x 0.229" plate washers min., install per 2008 AFPA SDPWS 4.3.6.4.3
[3] Use 1/4" x 4 1/2" SDS screws through 2x sills and 1/4" x 6" SDS screws through 3x sills. [ICC ESR-2236]
[4] Embed 3/8" lags 2" min. into framing below per plan (usually 5" lags at 2x sills & 6" lags at 3x sills, V.I.F.).
[5] 16d transfers are NOT allowed through 3x sills or sheathing thicker than 3/4", 1" min. penetration into rim is required.
[6] Value based on 2005 NDS Table 11E for light-framed construction. [2010 CBC 2305.1.4]
[7] Allowable loads have been reduced to (1/1.25) of allowable values due to plan irregularity. [ASCE 7-05 12.3.3.4]

SHEARWALL SCHEDULE & NOTES (2)

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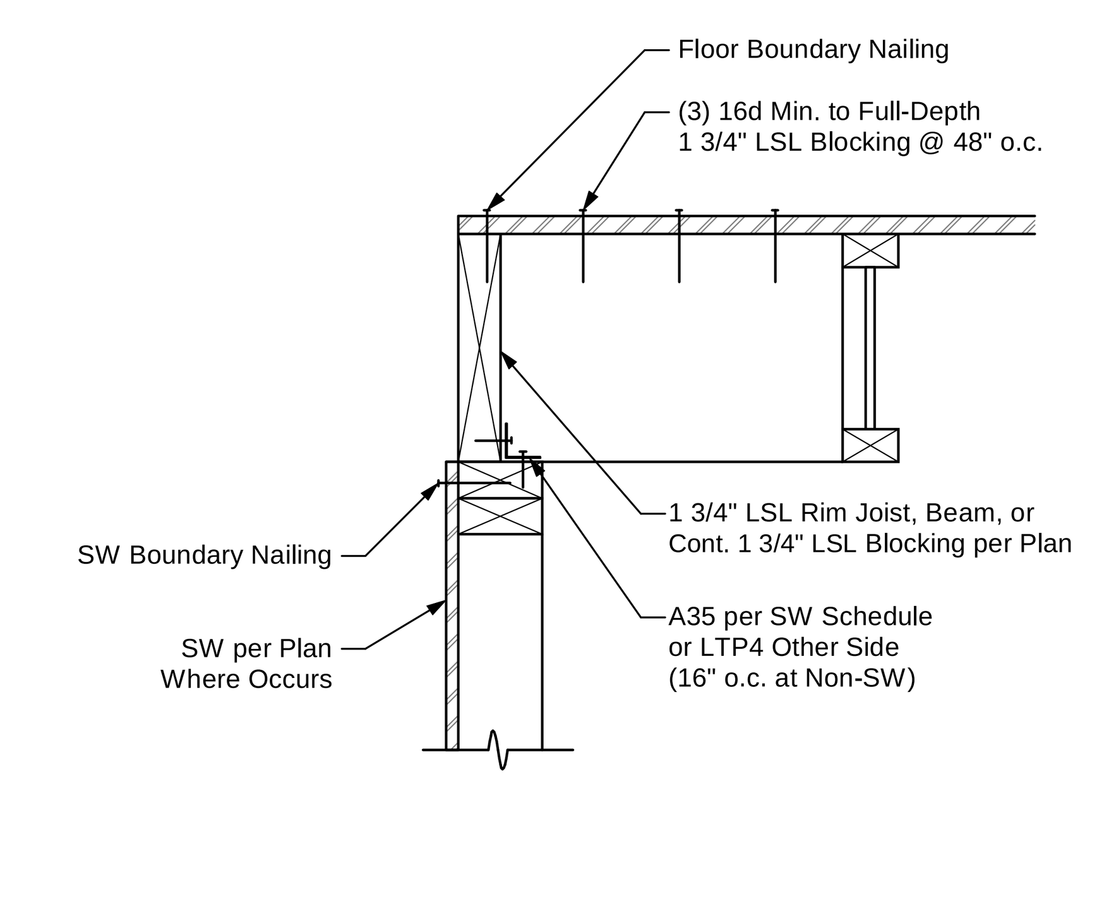

TYP. SHEAR TRANSFER (18)

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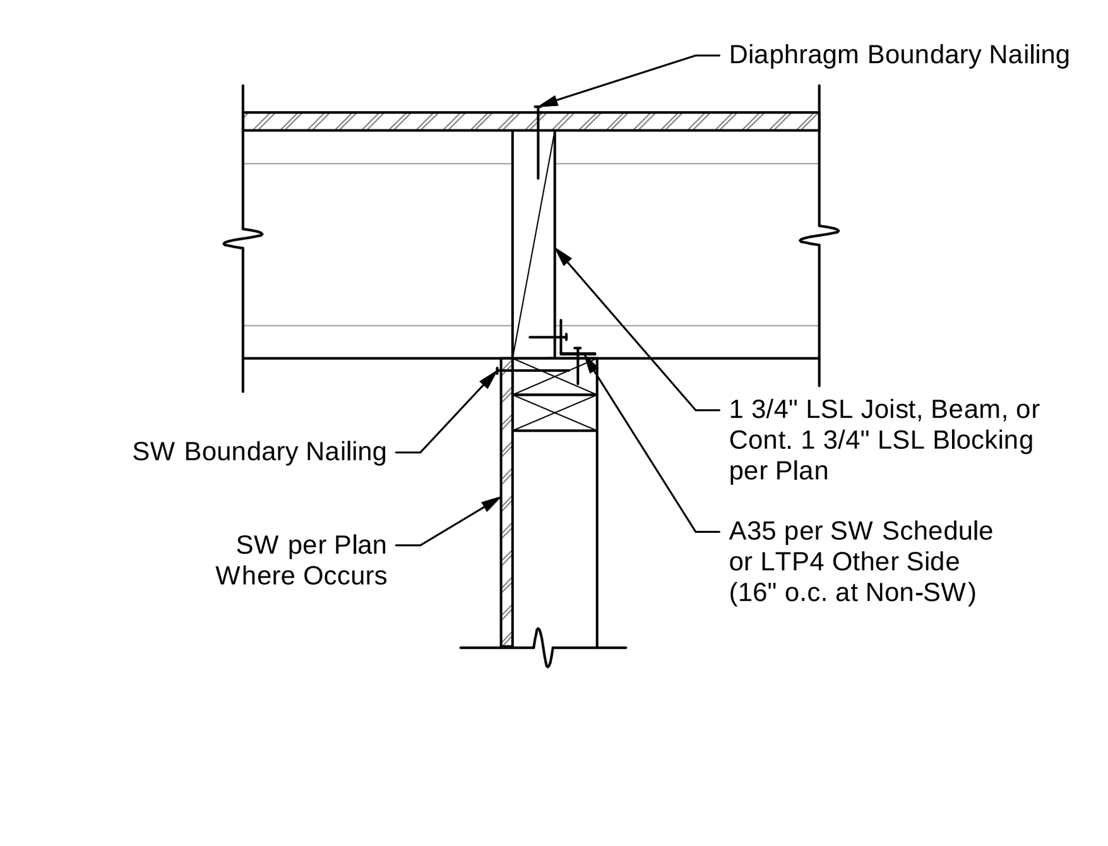

TYP. SHEAR TRANSFER (14)

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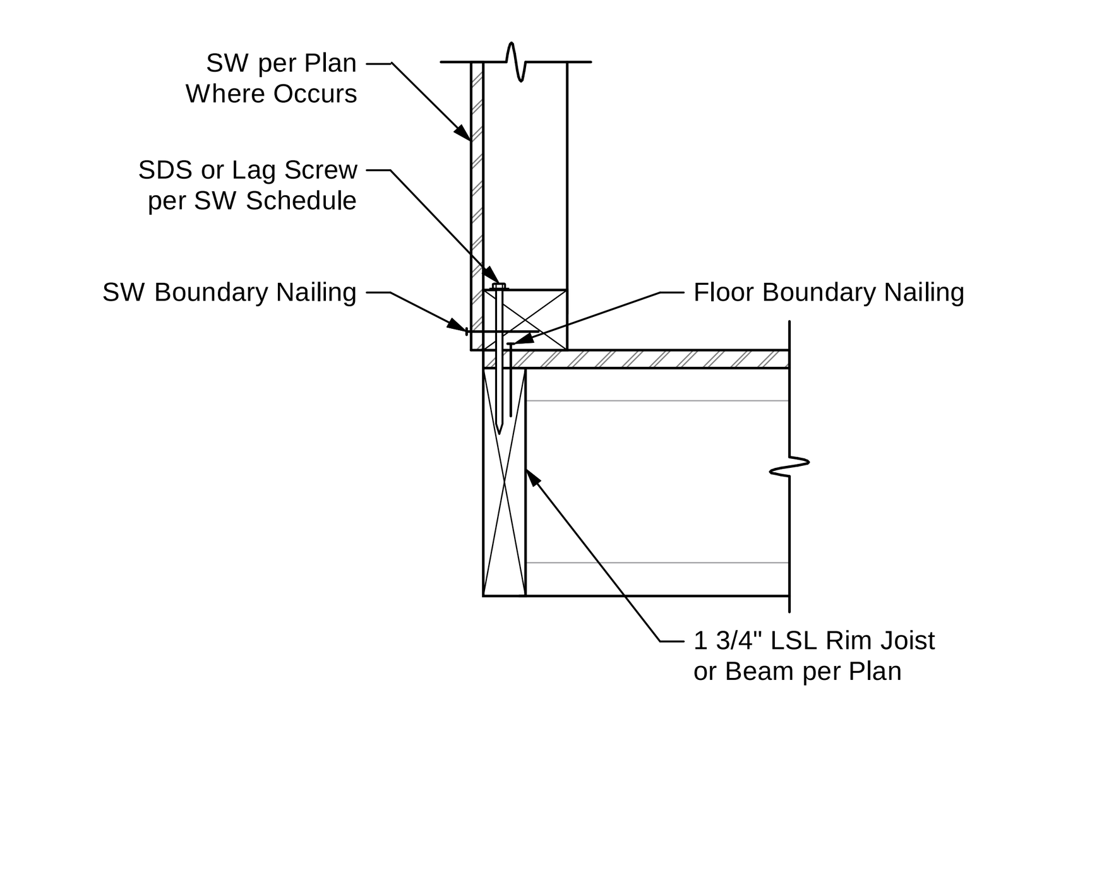

TYP. SHEAR TRANSFER (19)

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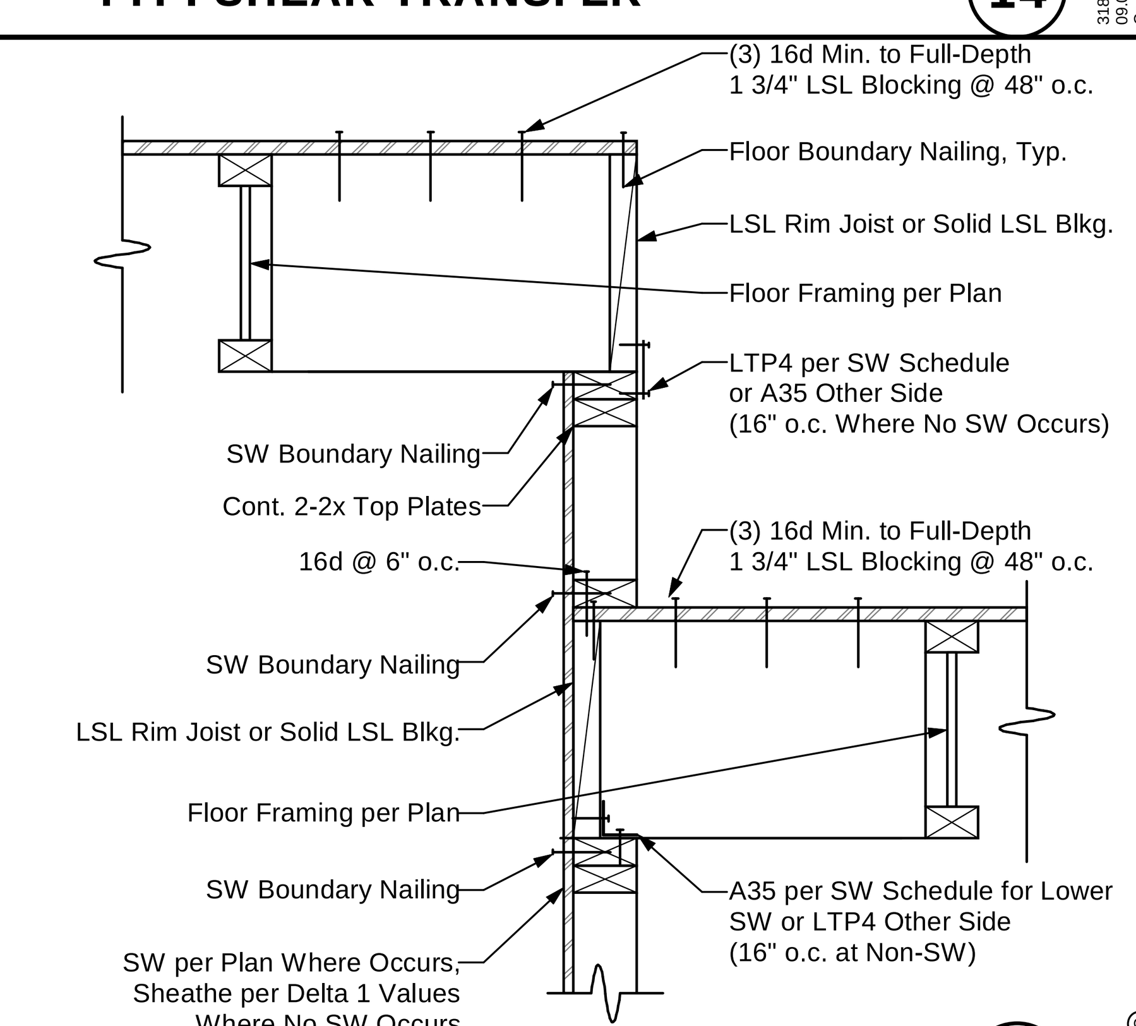

STEP IN FLOOR DIAPHRAGM (15)

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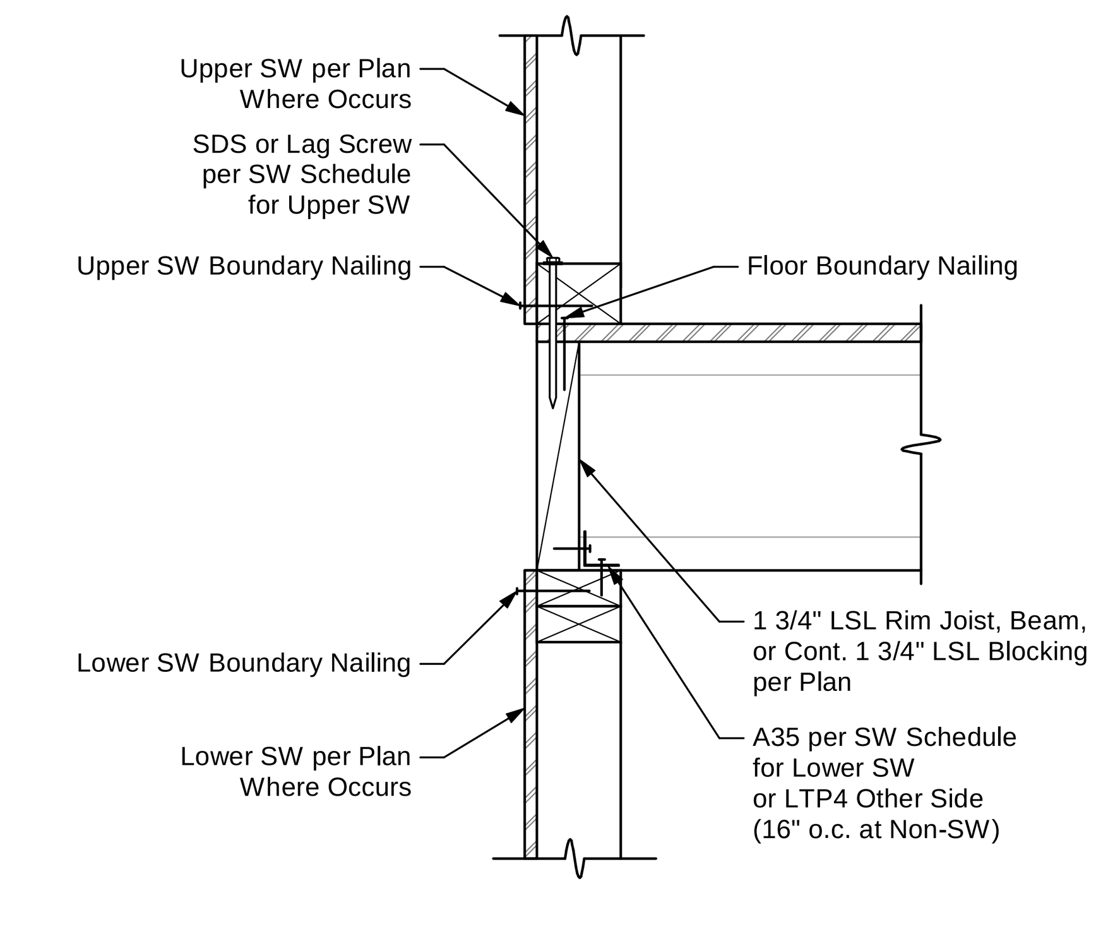

TYP. SHEAR TRANSFER (11)

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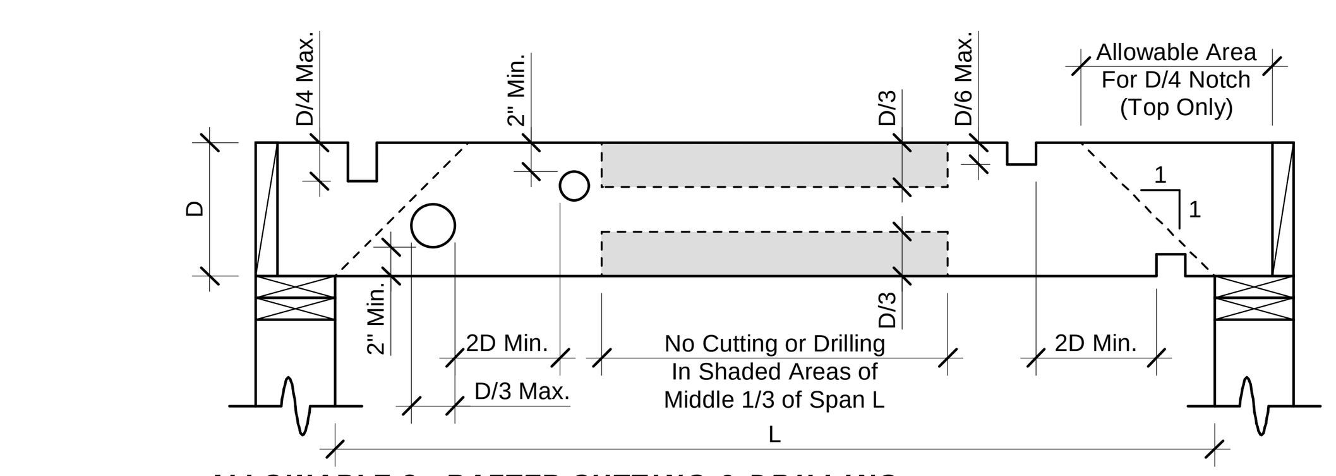
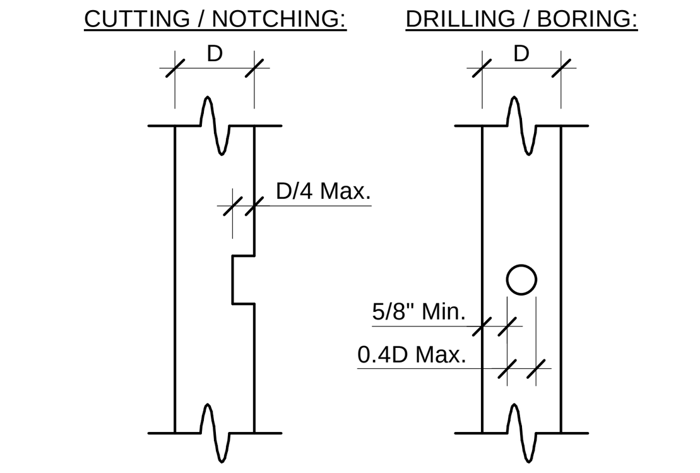
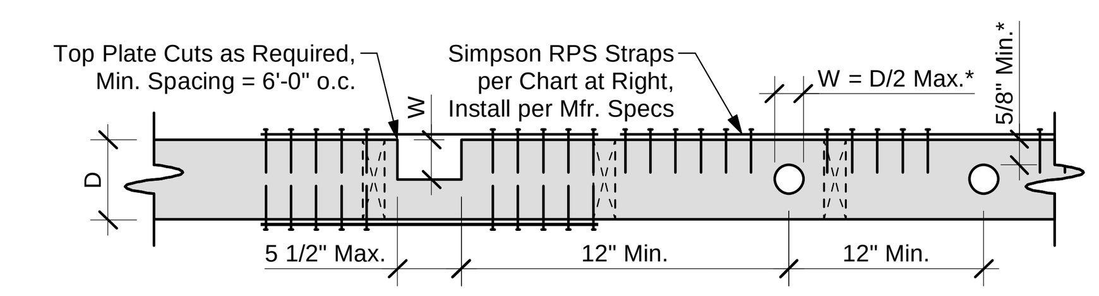


ALLOWABLE 2x RAFTER CUTTING & DRILLING

CUTTING / NOTCHING: DRILLING / BORING:



ALLOWABLE 2x STUD CUTTING & DRILLING



ALLOWABLE 2-2x TOP PLATE CUTTING & DRILLING (Top View)

REQUIRED STRAPS AT CUT / DRILLED TOP PLATES

Max. Cut/Hole Width	*Strap(s) Required*
Drilled Hole: W < D/2	RPS22 Each Side of Plates (Stagger Vertically)
Cut: W < D/2	(2) RPS22 on Side of Cut
Hole or Cut: W > D/2	(2) RPS22 on Each Side of Cut

** Treat drilled holes not meeting these requirements as holes with W > D/2.*

NOTE: These details only apply to the simple structural situations shown. They are not intended to apply to posts, beams, cantilevered members, or other structural members specified on the plans UNO. See the specs for additional related information. Contact T+S regarding cuts or drilling not covered.

7

ALLOWED 2x CUTTING & DRILLING (3)

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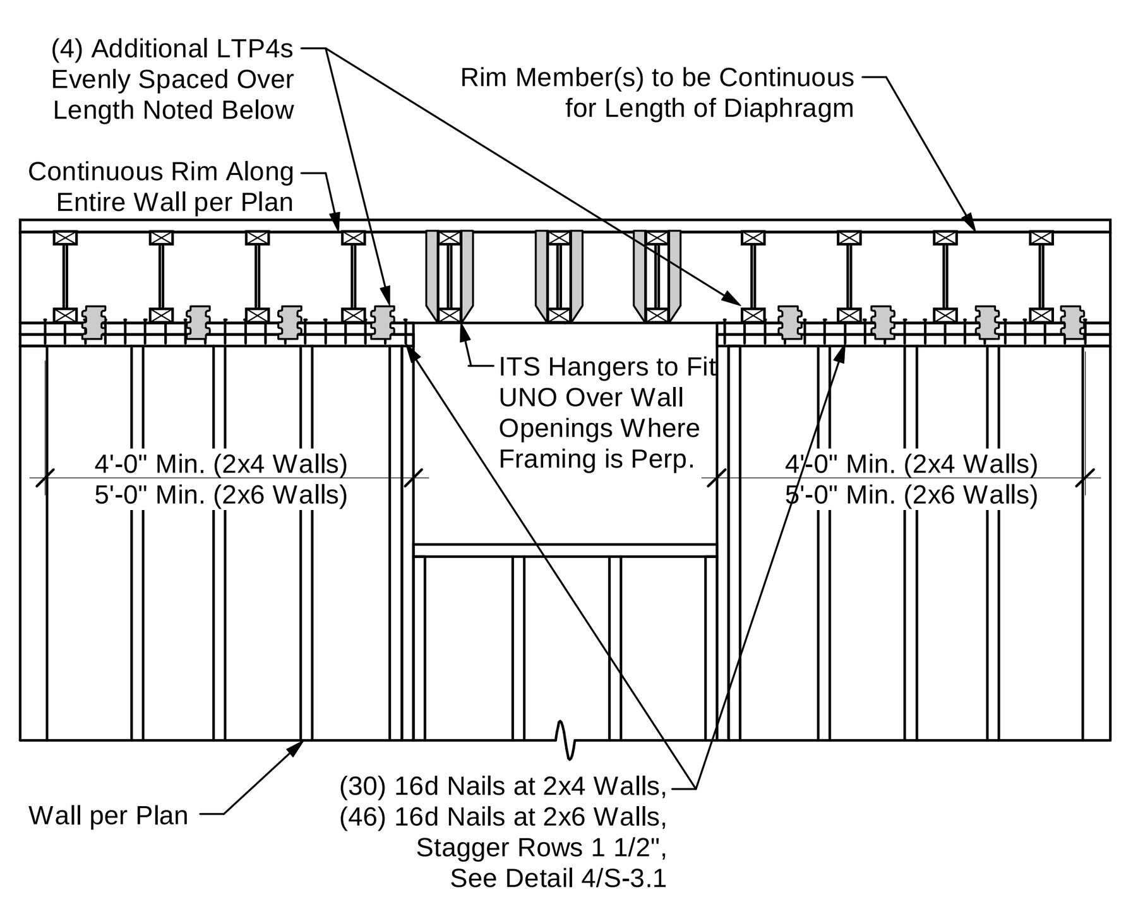

WINDOW AT SINGLE TOP PLATE (20)

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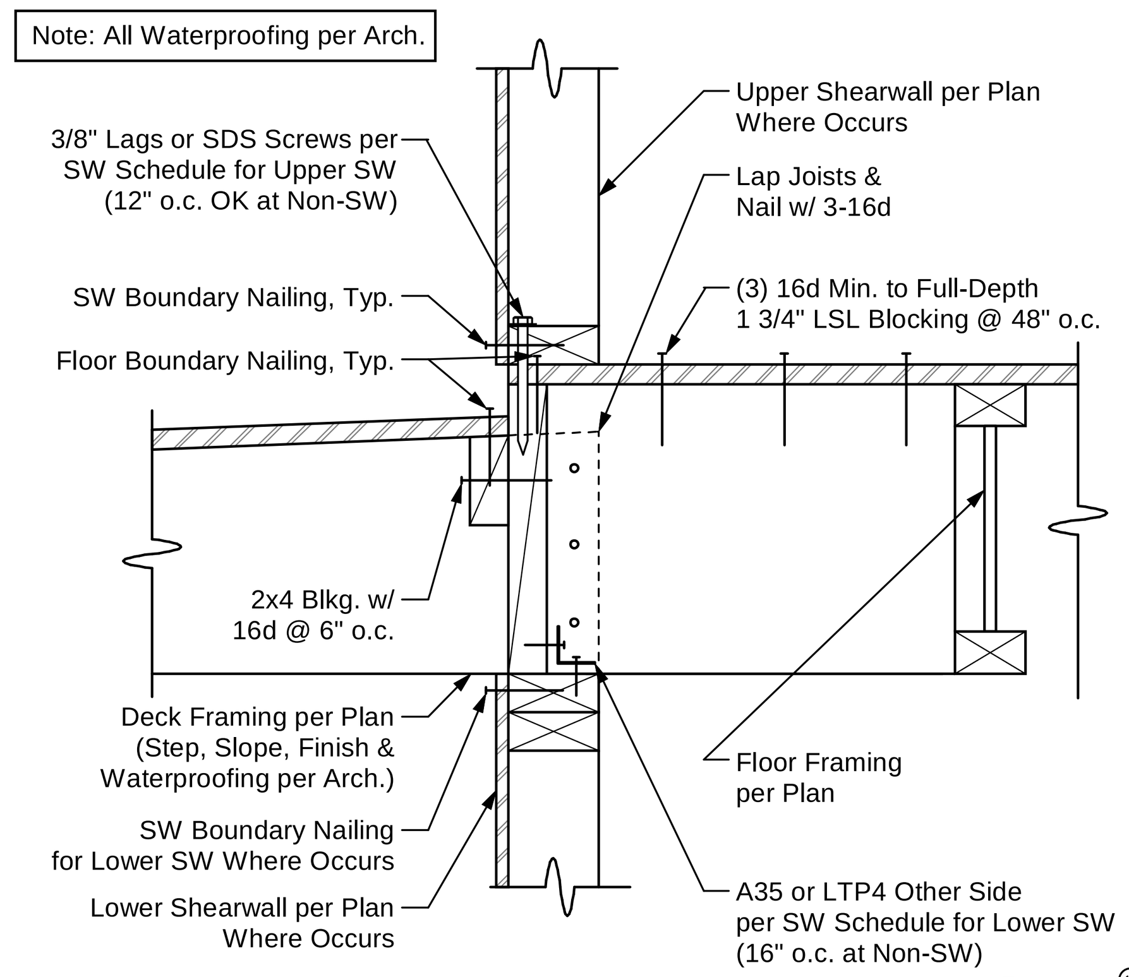
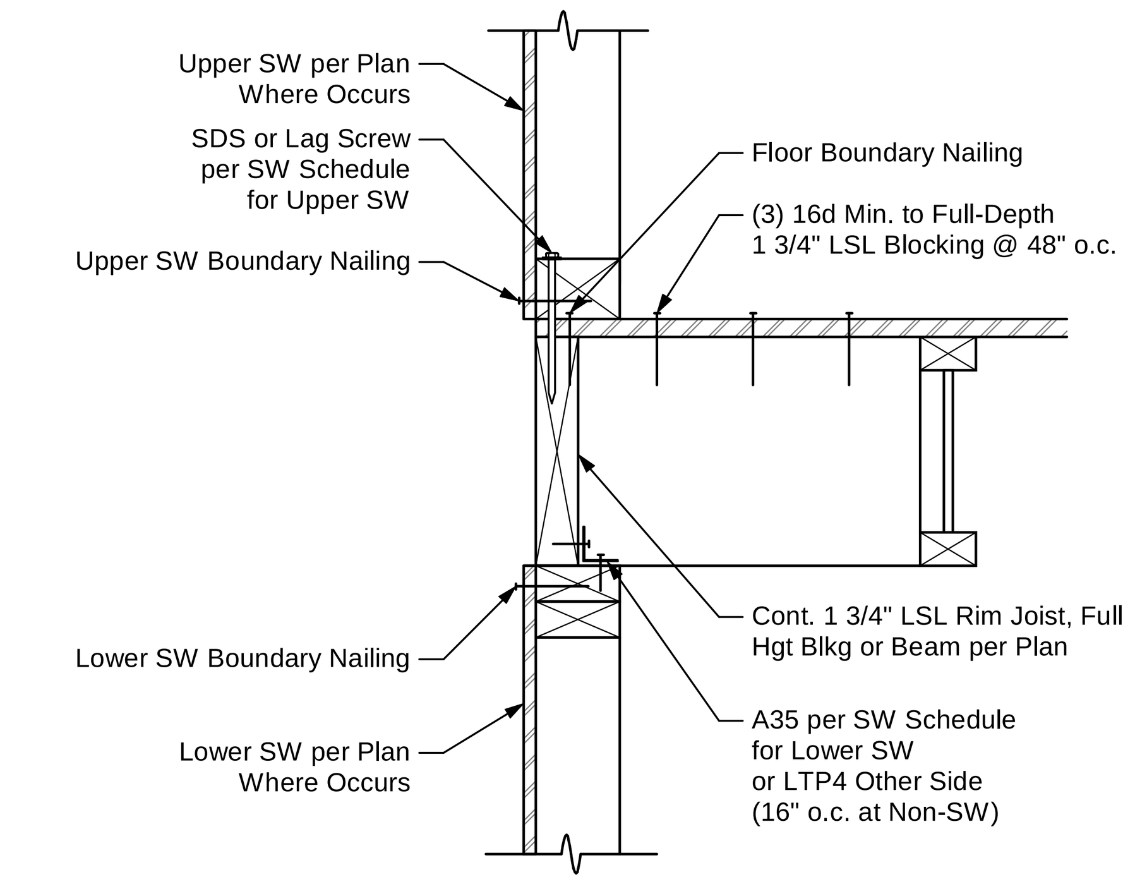
Note: All Waterproofing per Arch.



TRANSFER AT FLOOR / DECK STEP (16)

3120 03.20.02 Copyright©



TYP. SHEAR TRANSFER (12)

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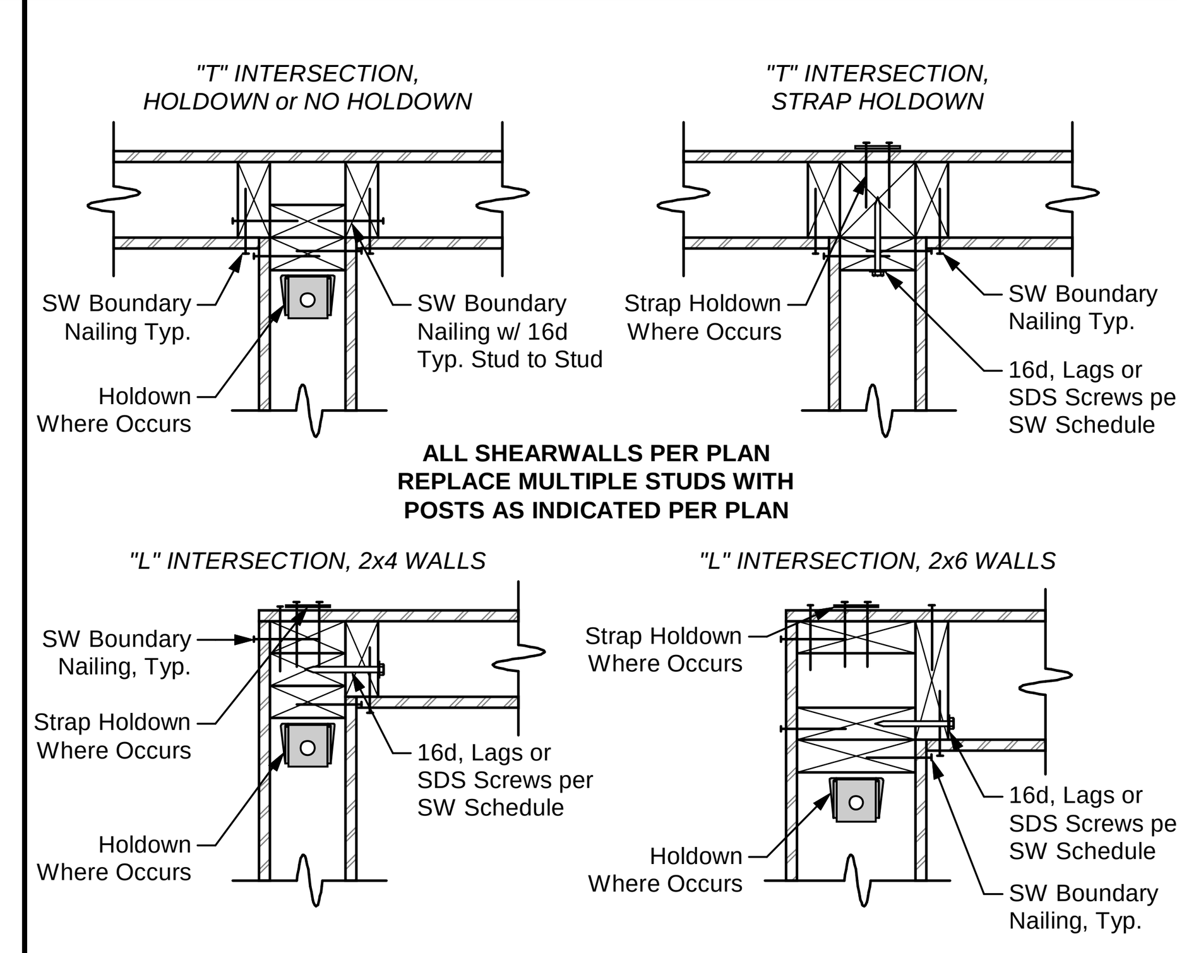

SHEARWALL INTERSECTIONS (8)

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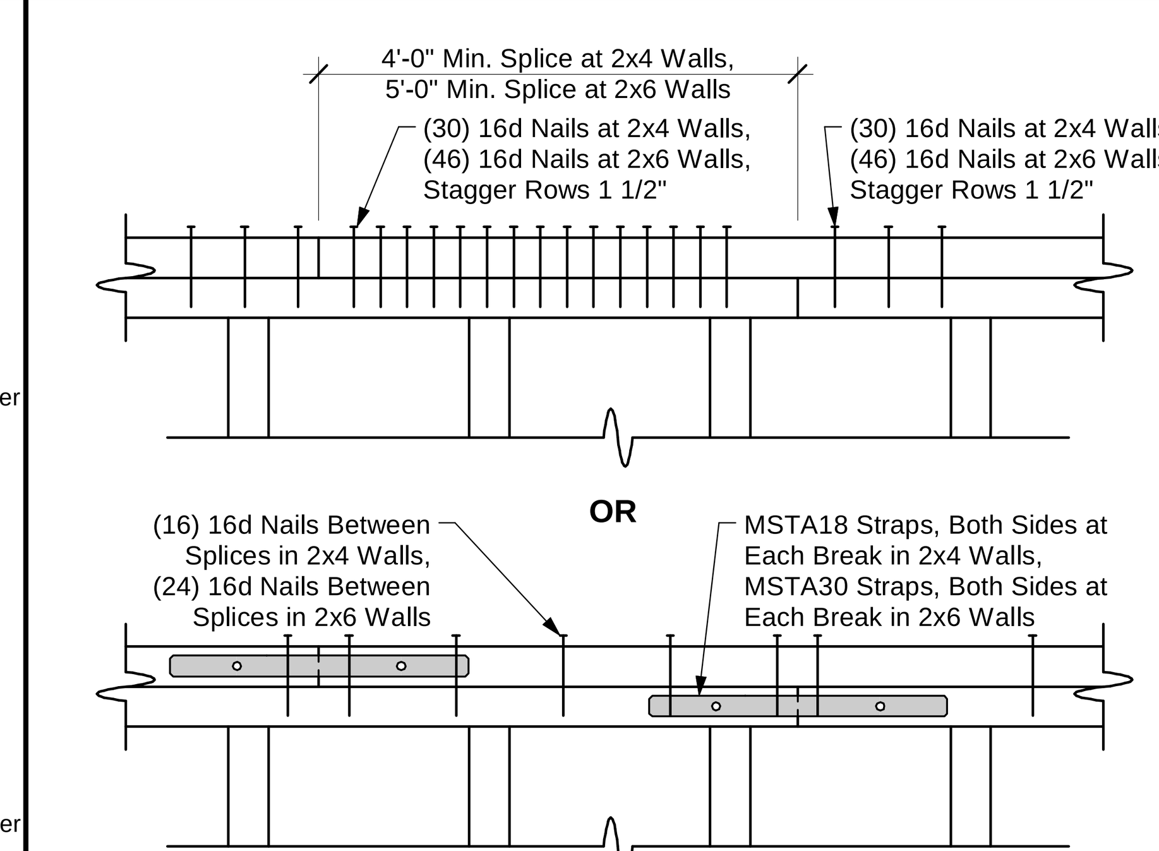

Frame Walls w/ 2x Min. Douglas Fir Studs & Plates, Grade per Specifications UNO on Plan At Plates Wider Than 2x6, Use 2-2x6 Splice Values UNO

TYP. 2-2x TOP PLATE SPLICE (4)

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REGISTERED PROFESSIONAL ENGINEER BRET ROOK C 63... EXP 6/30/14 CIVIL STATE OF CALIFORNIA — BID SET NOT FOR CONSTRUCTION

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805.688.5429

Project Name:

SANTA BARBARA CENTER FOR ARTS, SCIENCE & TECHNOLOGY

513 Garden Street
Santa Barbara, CA 93101

Revisions:

1	Bid Set	04.01.2013
2	Plan Check	06.12.2013
3	Resubmit	11.08.2013
	Bid Set	04.10.2014

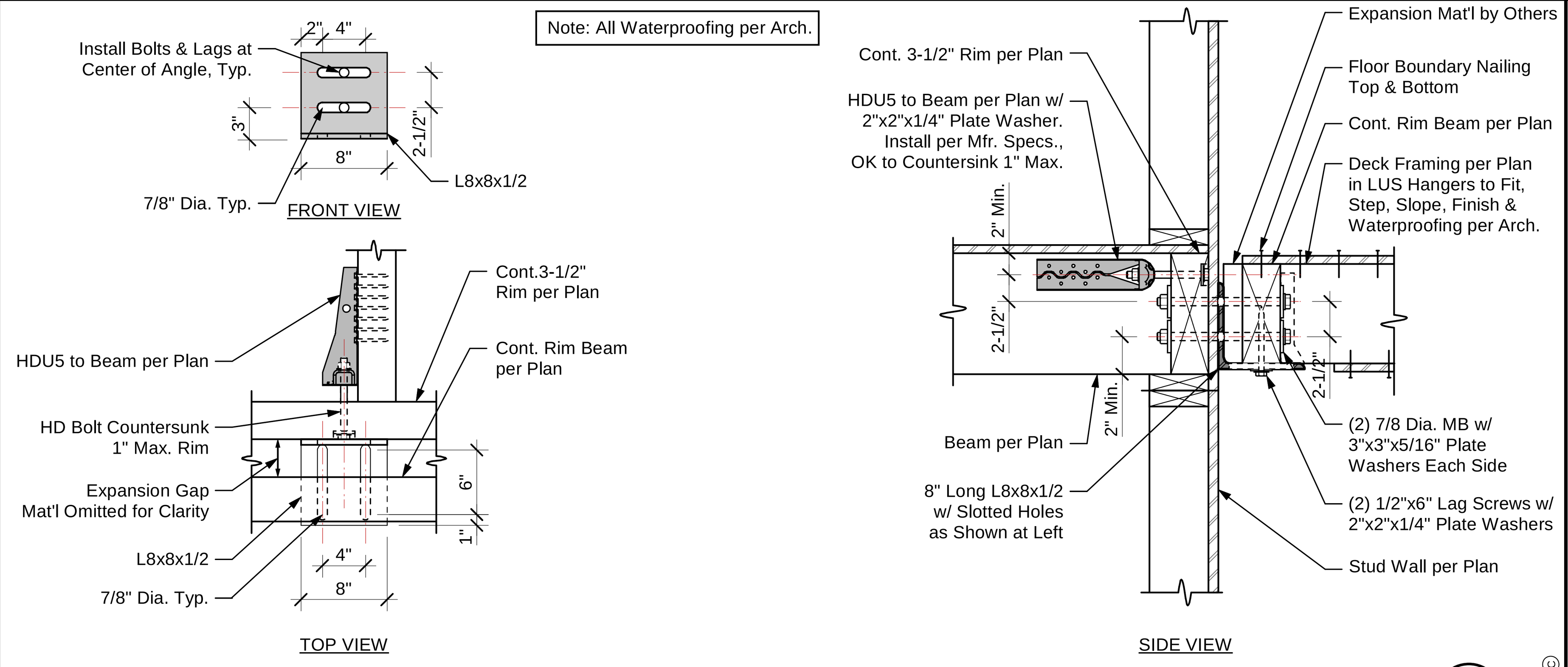
Project Engineer:	BHR/GDM
Checked By:	BHR
Date:	April 10, 2014
Scale:	-
Job No.:	11521

Sheet Title:

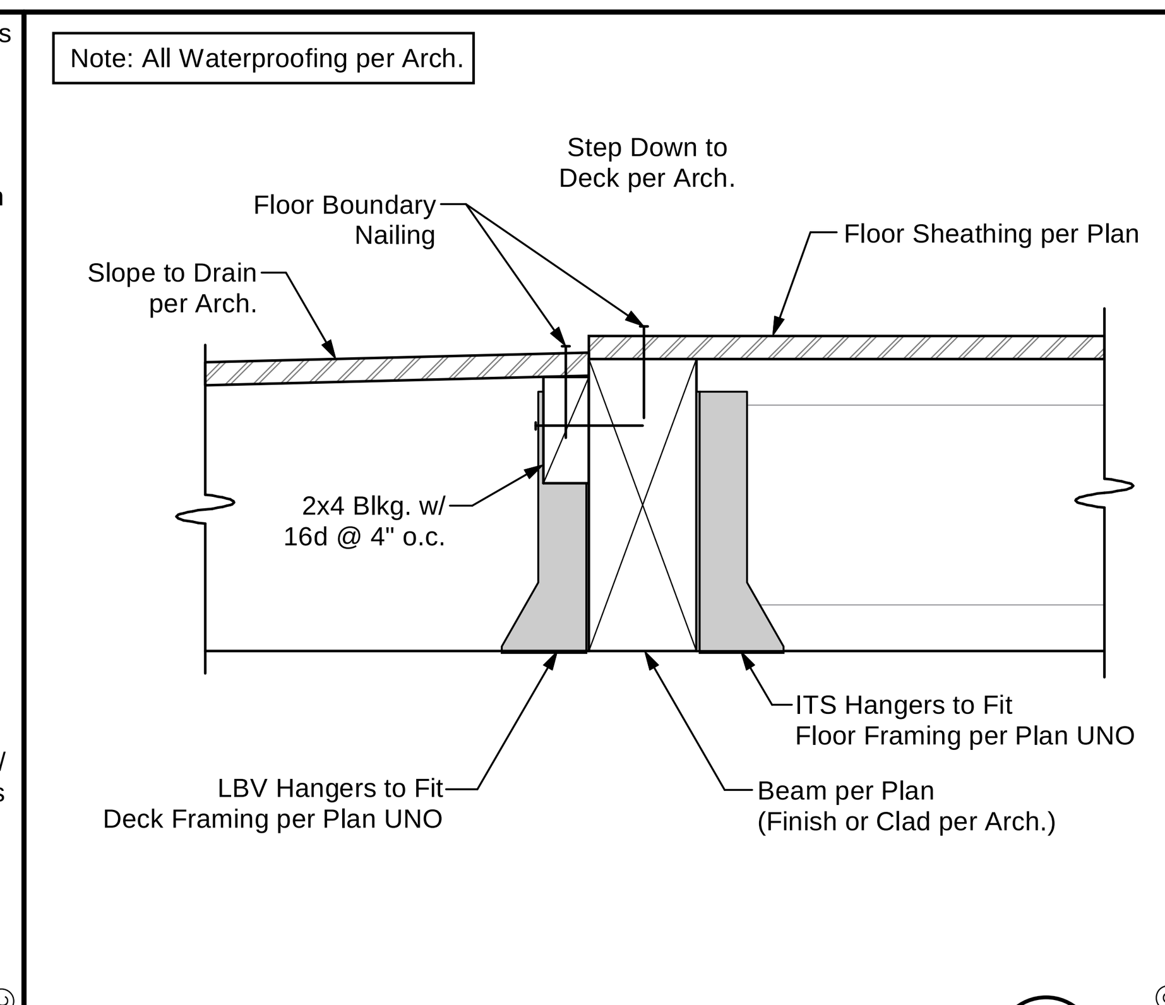
STRUCTURAL DETAILS

Sheet No.:

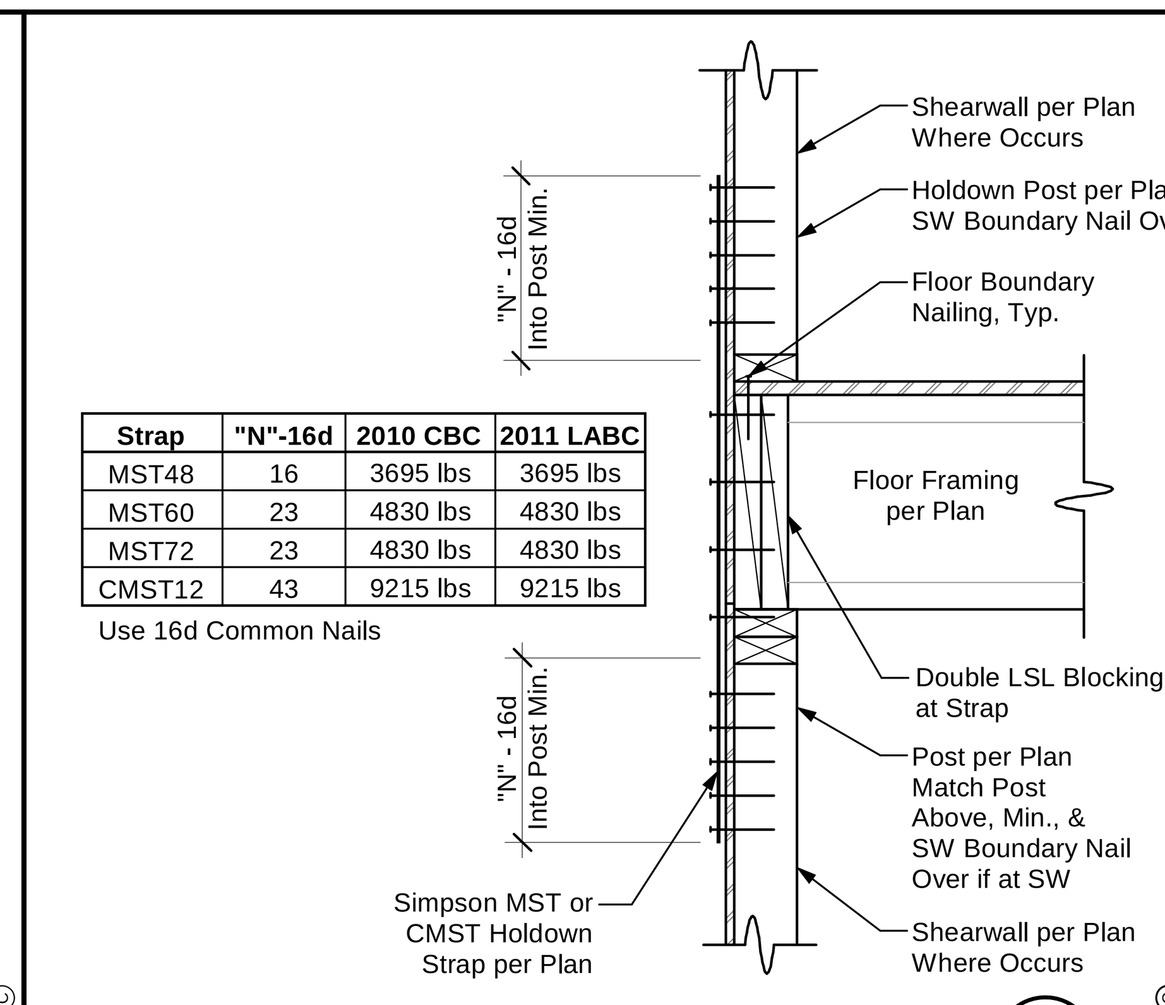
S-3.1



CANTILEVER LANDING TO WALL 13



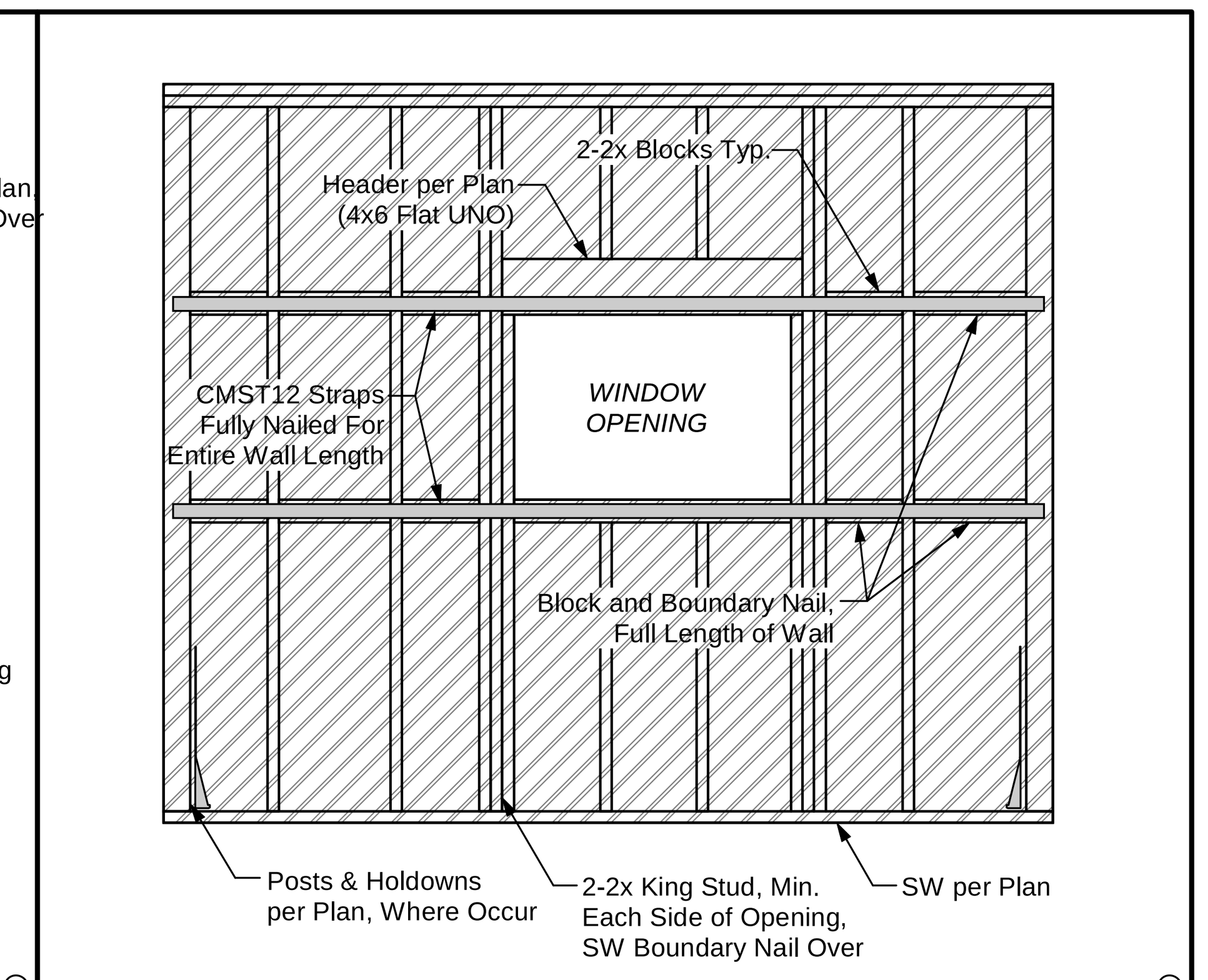
DECK BEAM TO CANTILEVER BEAM 9



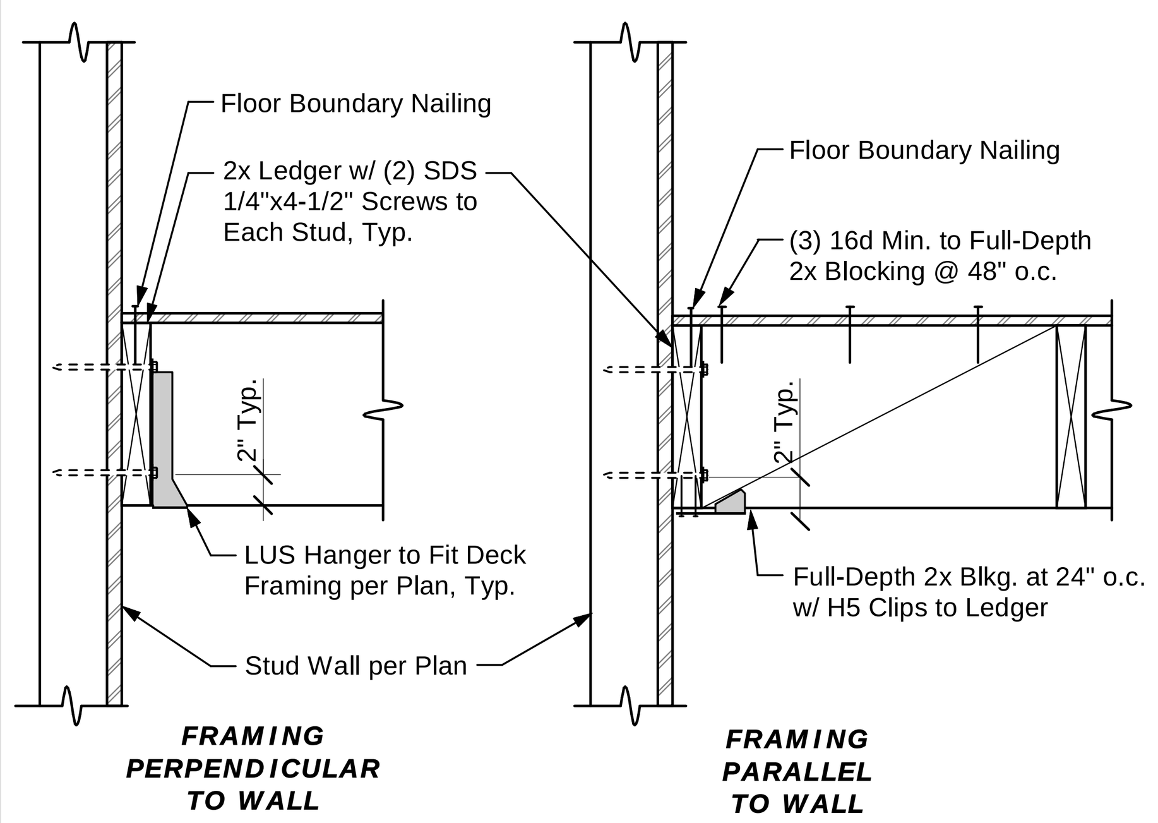
Strap	"N"-16d	2010 CBC	2011 LABC
MST48	16	3695 lbs	3695 lbs
MST60	23	4830 lbs	4830 lbs
MST72	23	4830 lbs	4830 lbs
CMST12	43	9215 lbs	9215 lbs

Use 16d Common Nails

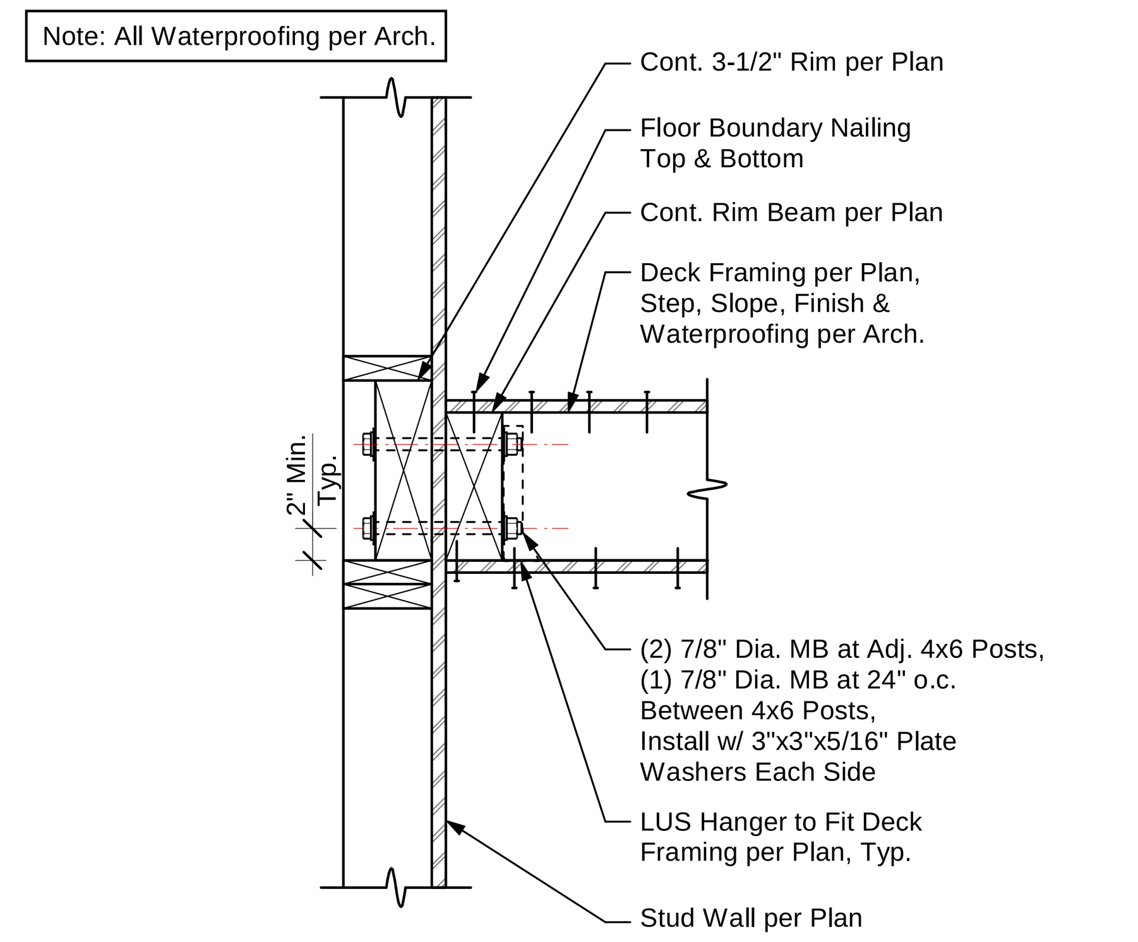
STRAP HOLDOWN TO BELOW 5



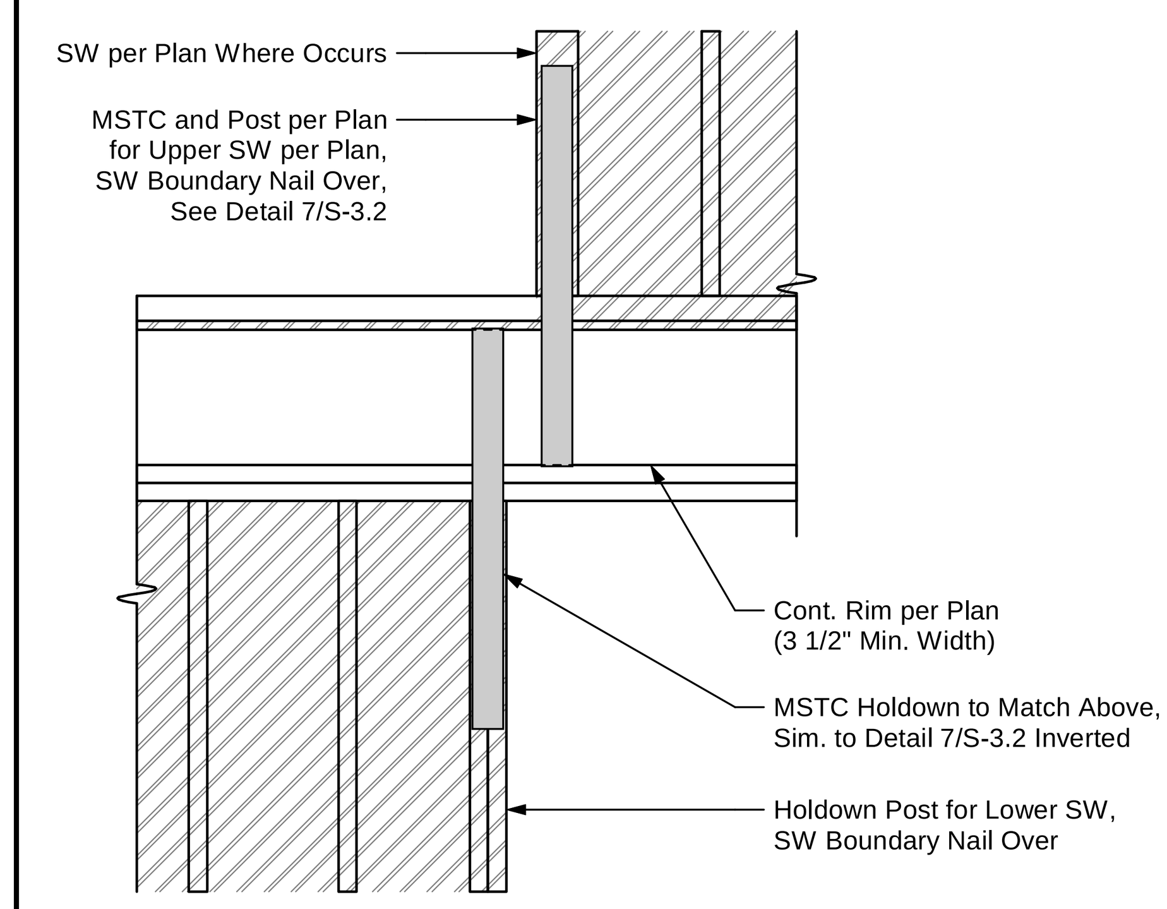
WINDOW OPENING IN SHEARWALL 1



DECK OR STAIR LANDING TO WALL 18

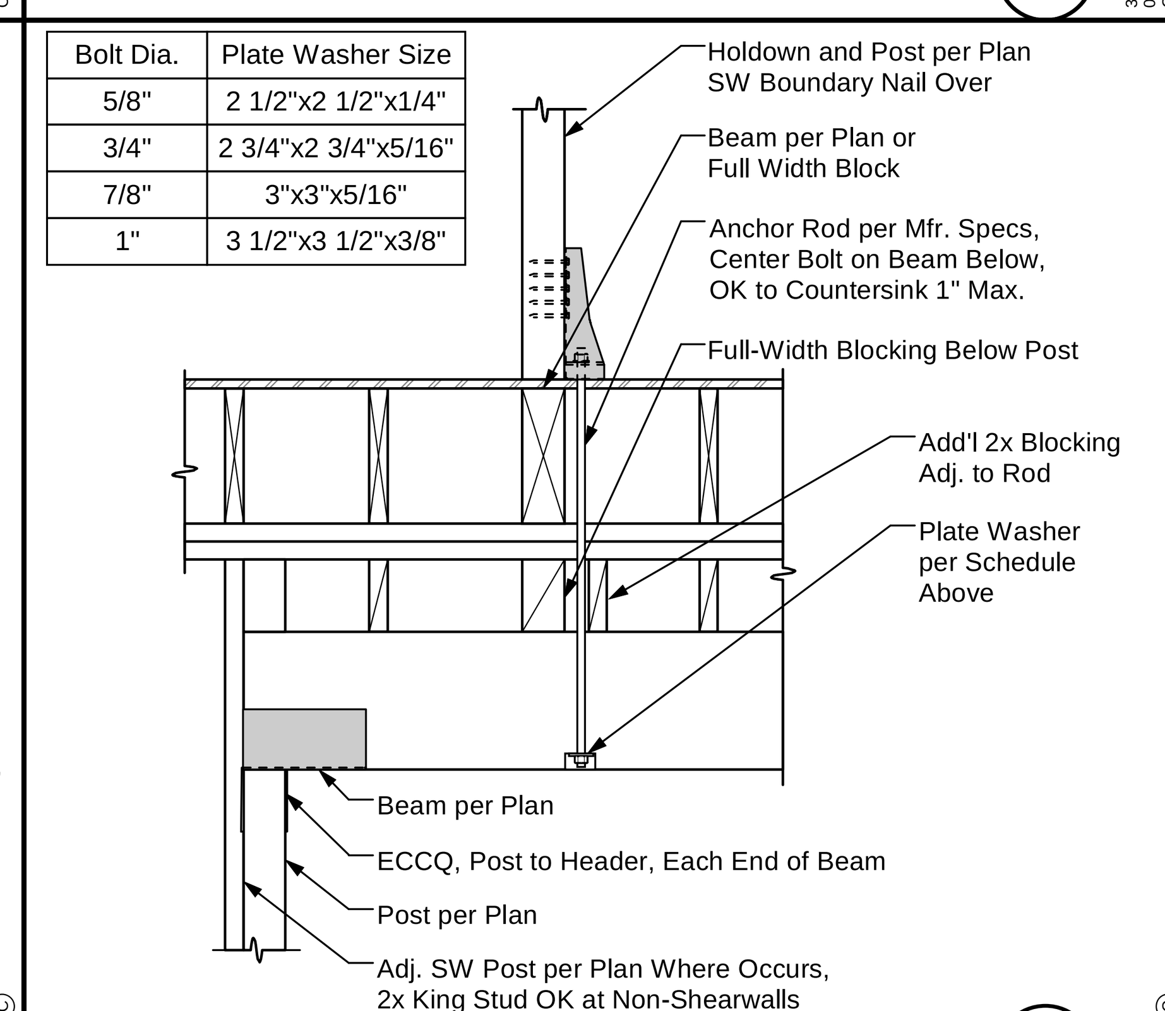


CANTILEVER LANDING TO WALL 14

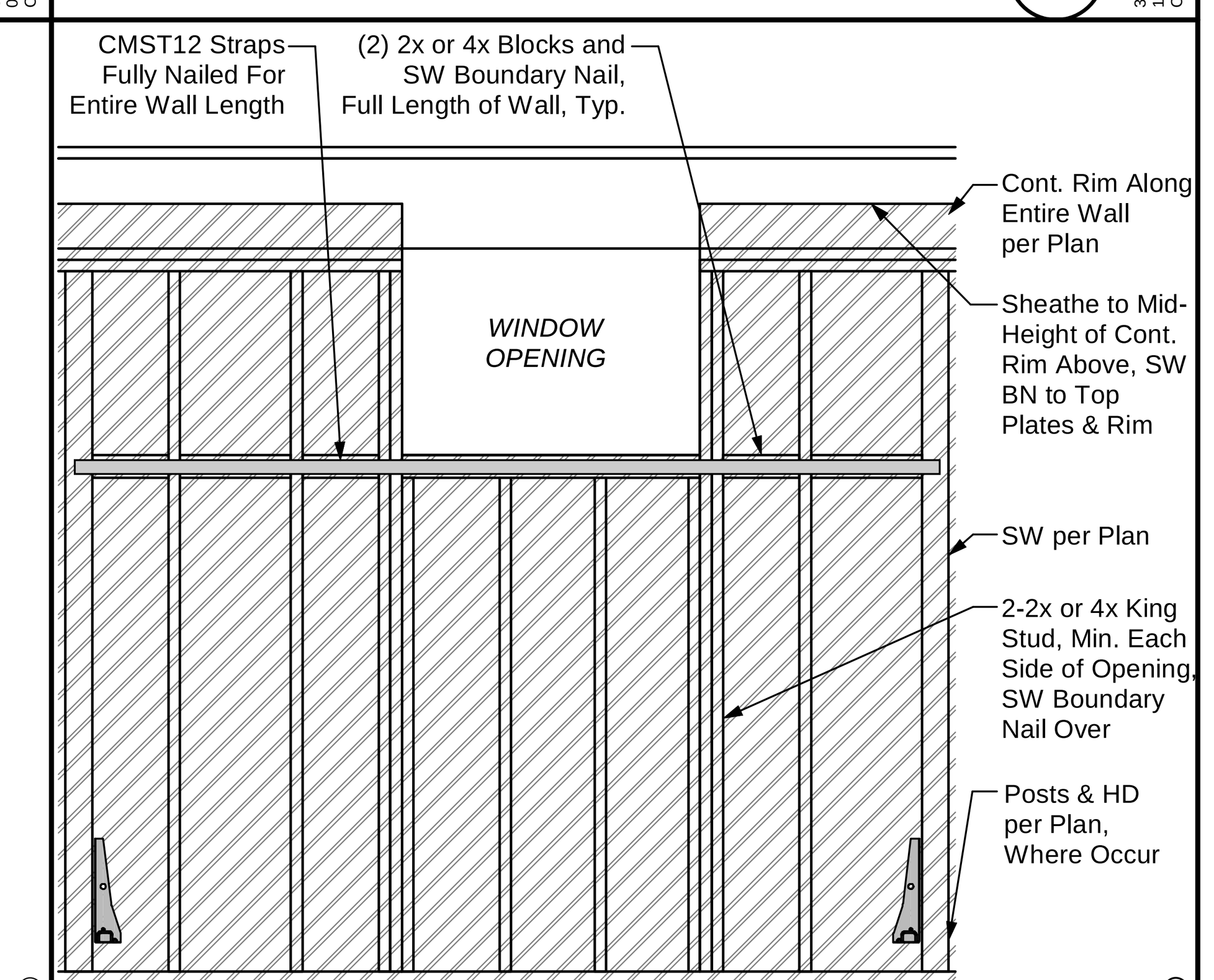


OFFSET STRAP HOLDOWNS 10

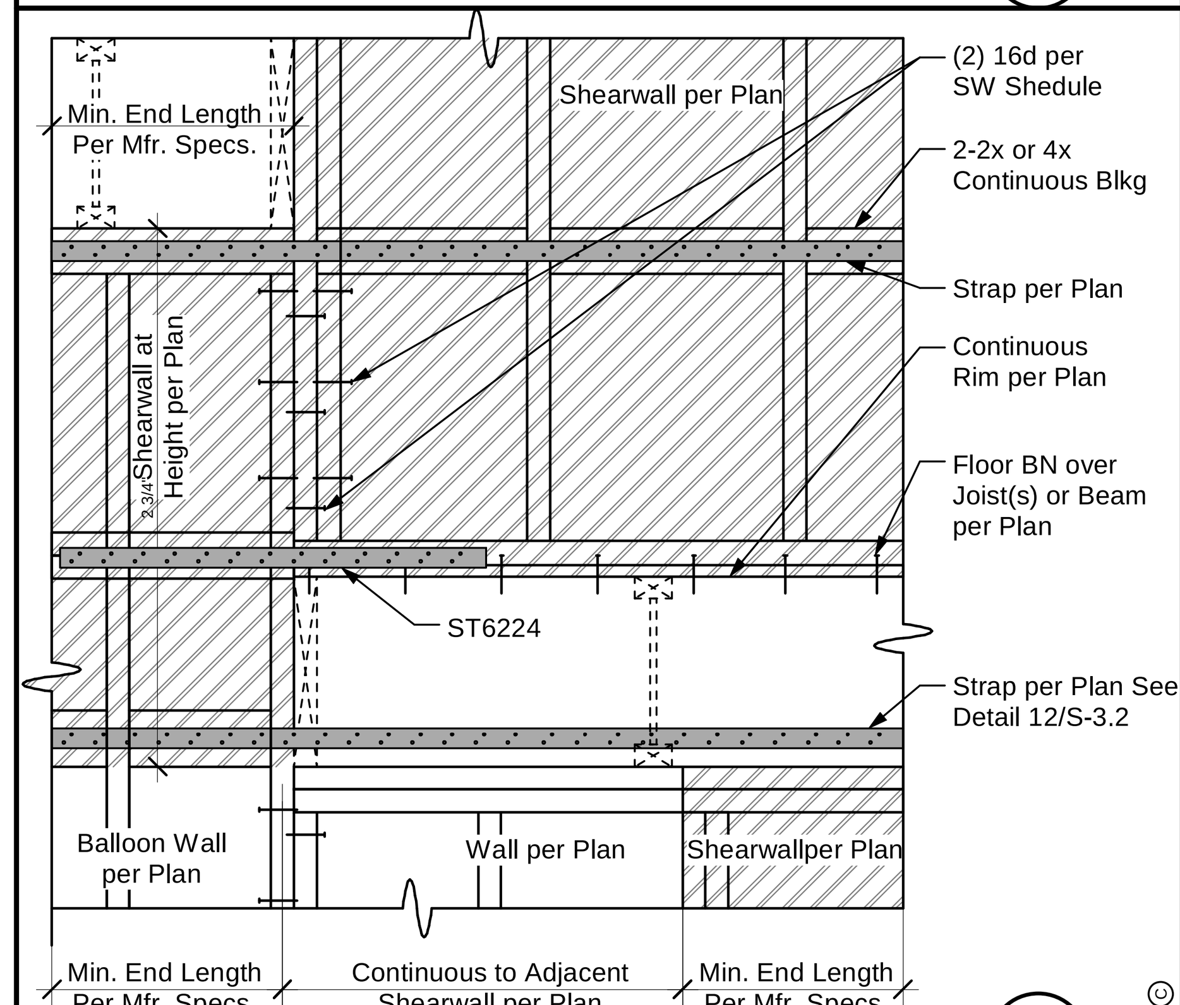
Bolt Dia.	Plate Washer Size
5/8"	2 1/2"x2 1/2"x1/4"
3/4"	2 3/4"x2 3/4"x5/16"
7/8"	3"x3"x5/16"
1"	3 1/2"x3 1/2"x3/8"



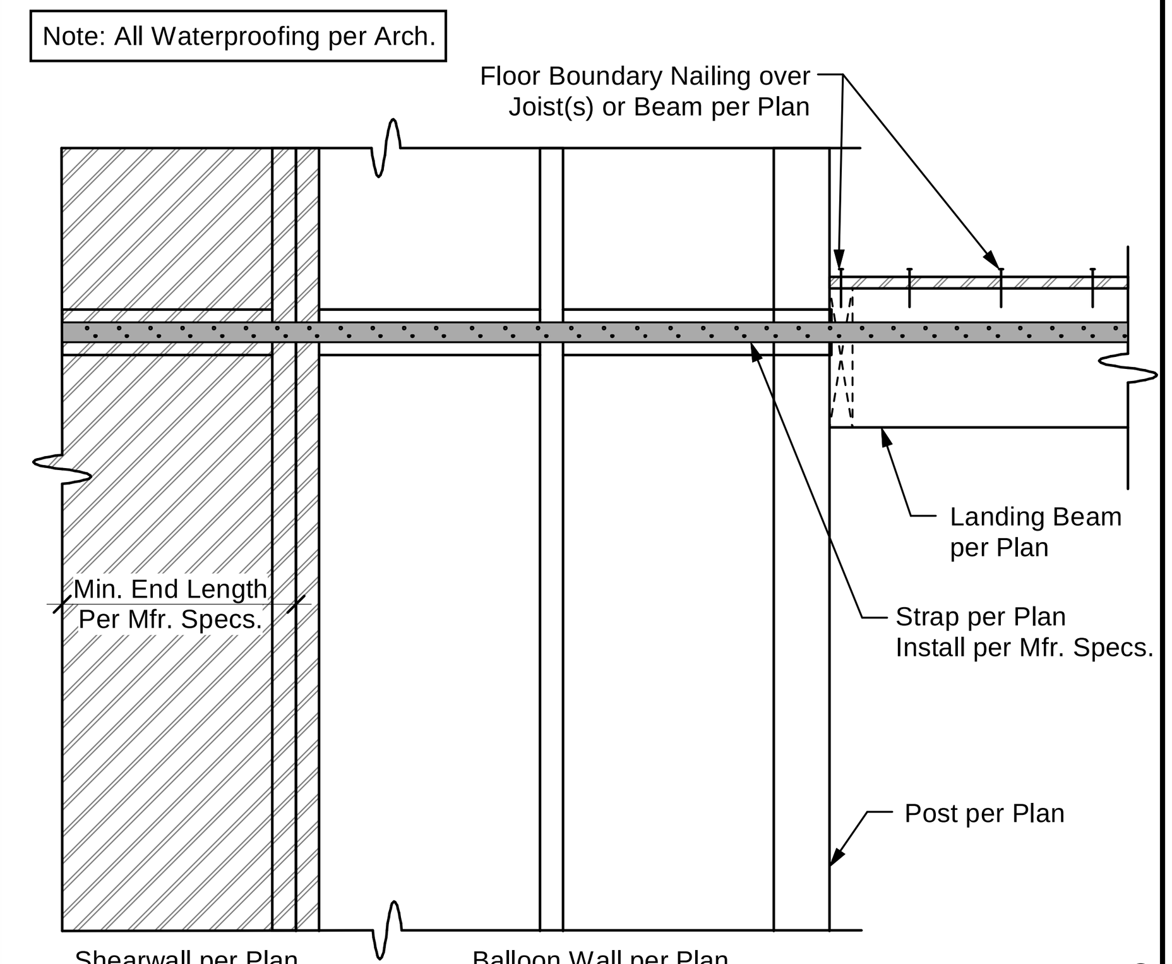
HOLDOWN BOLT THROUGH BEAM 6



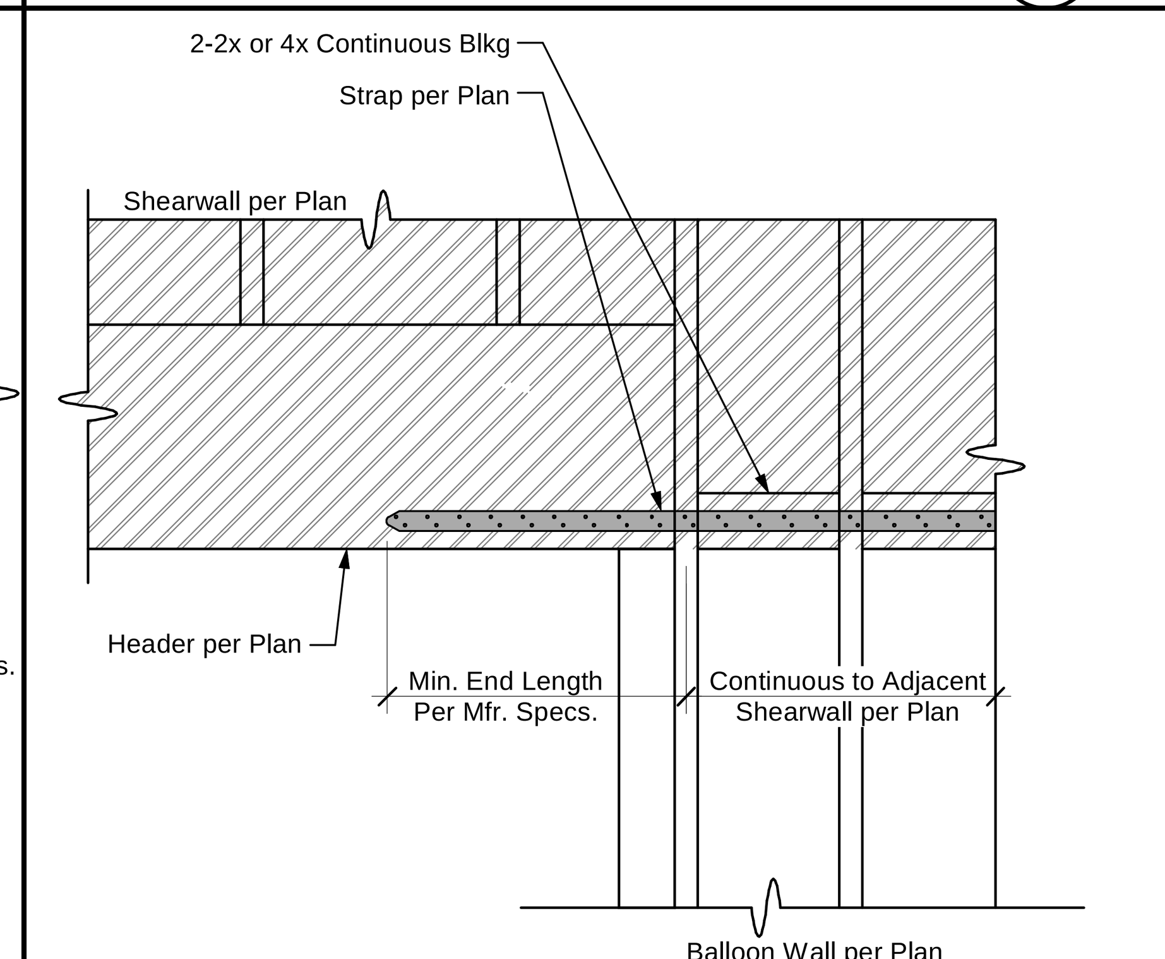
WINDOW IN SW AT TOP PLATES 2



DRAG STRAP TO BLOCKING 19

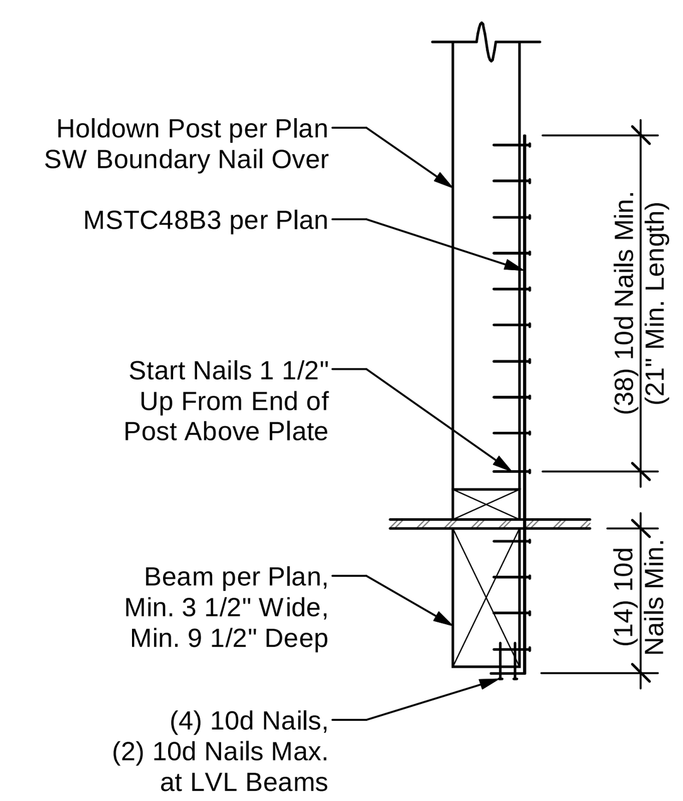


DRAG STRAP TO LANDING 15

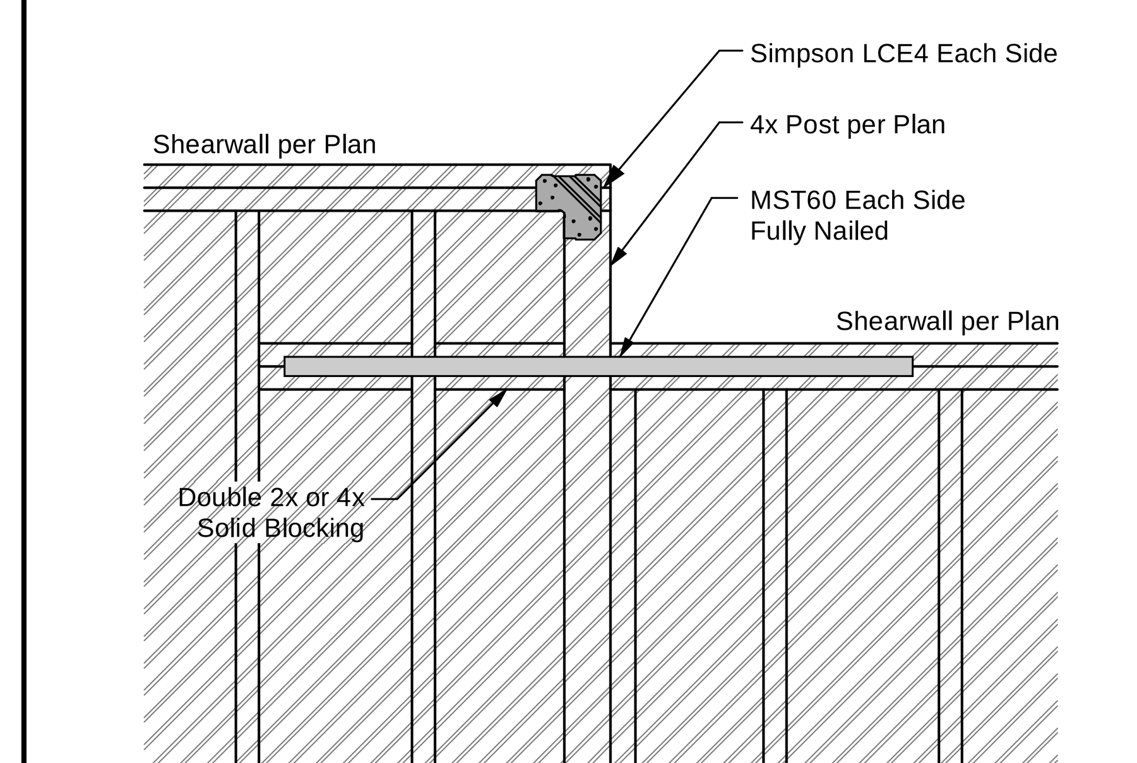


DRAG STRAP TO HEADER 11

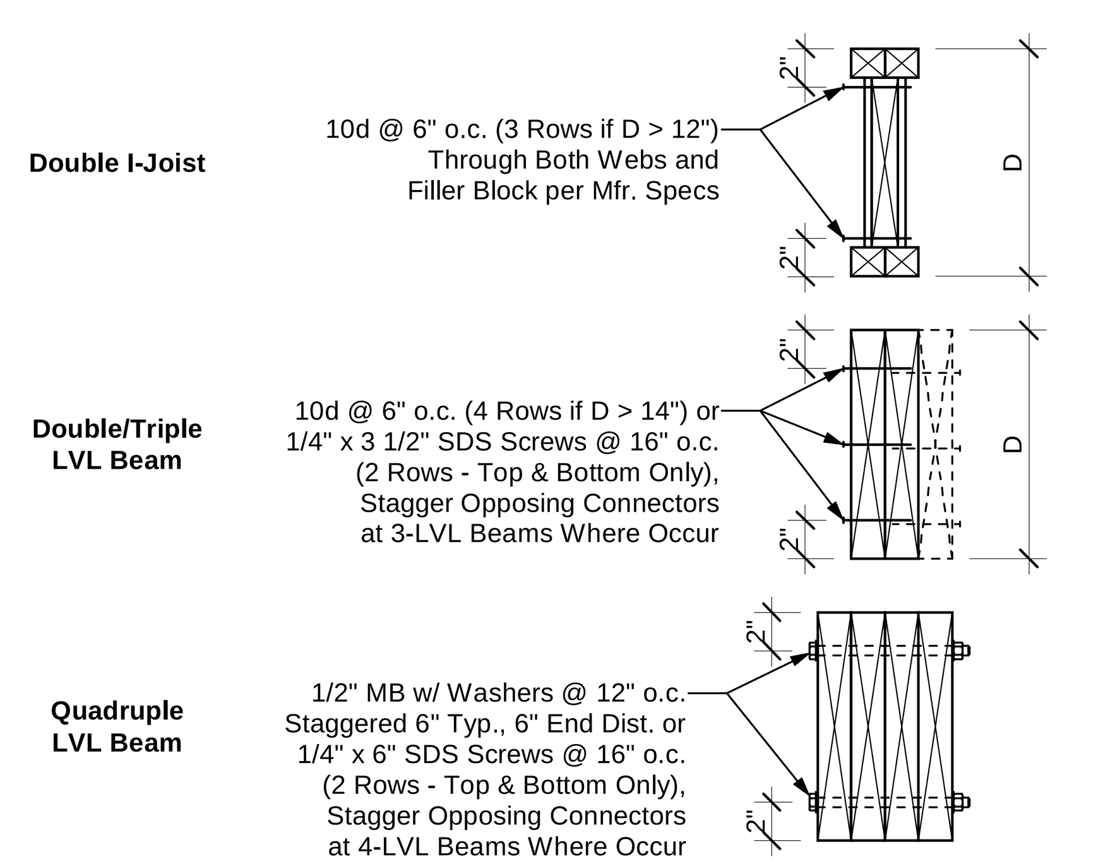
NOTE: Do NOT install outside of wall sheathing



PRE-BENT STRAP TO BELOW 7

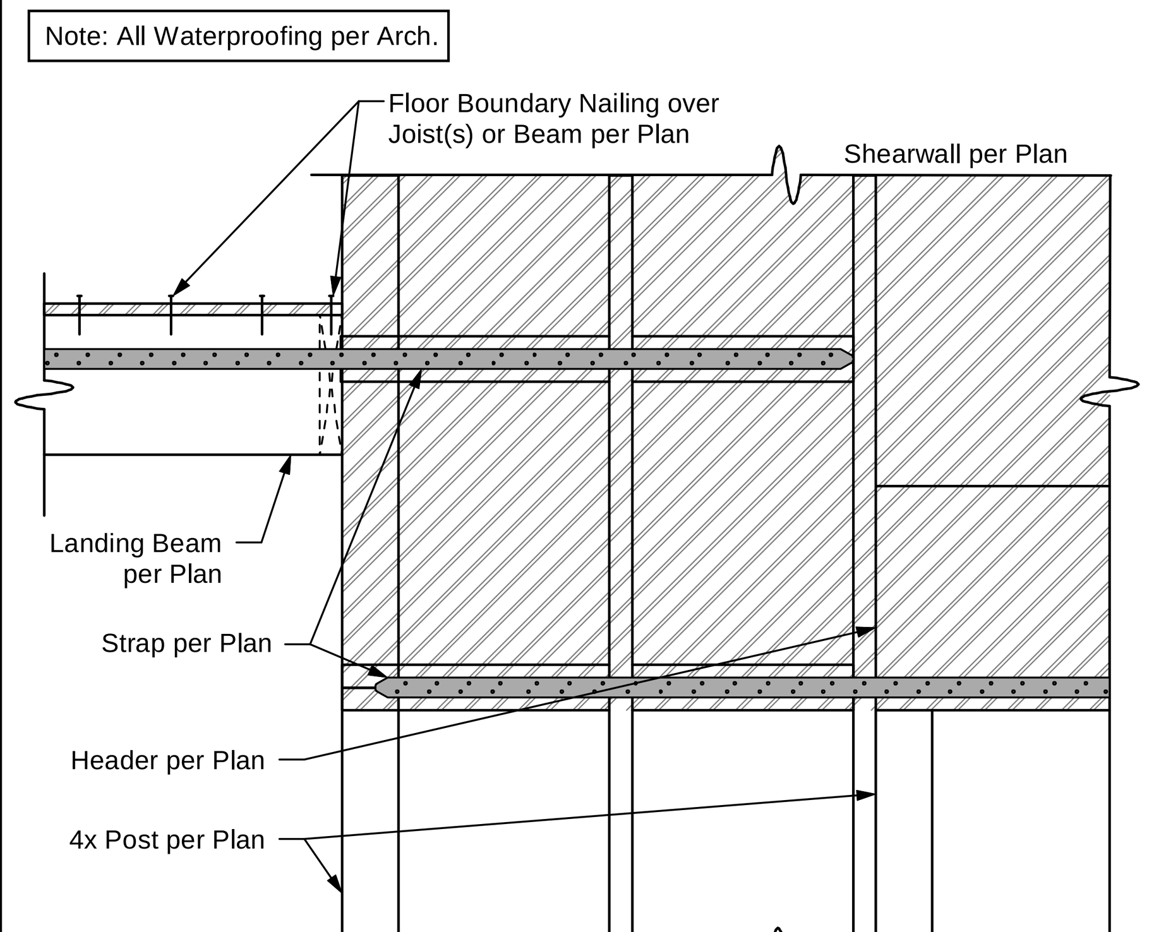


STEP IN TOP PLATES 3

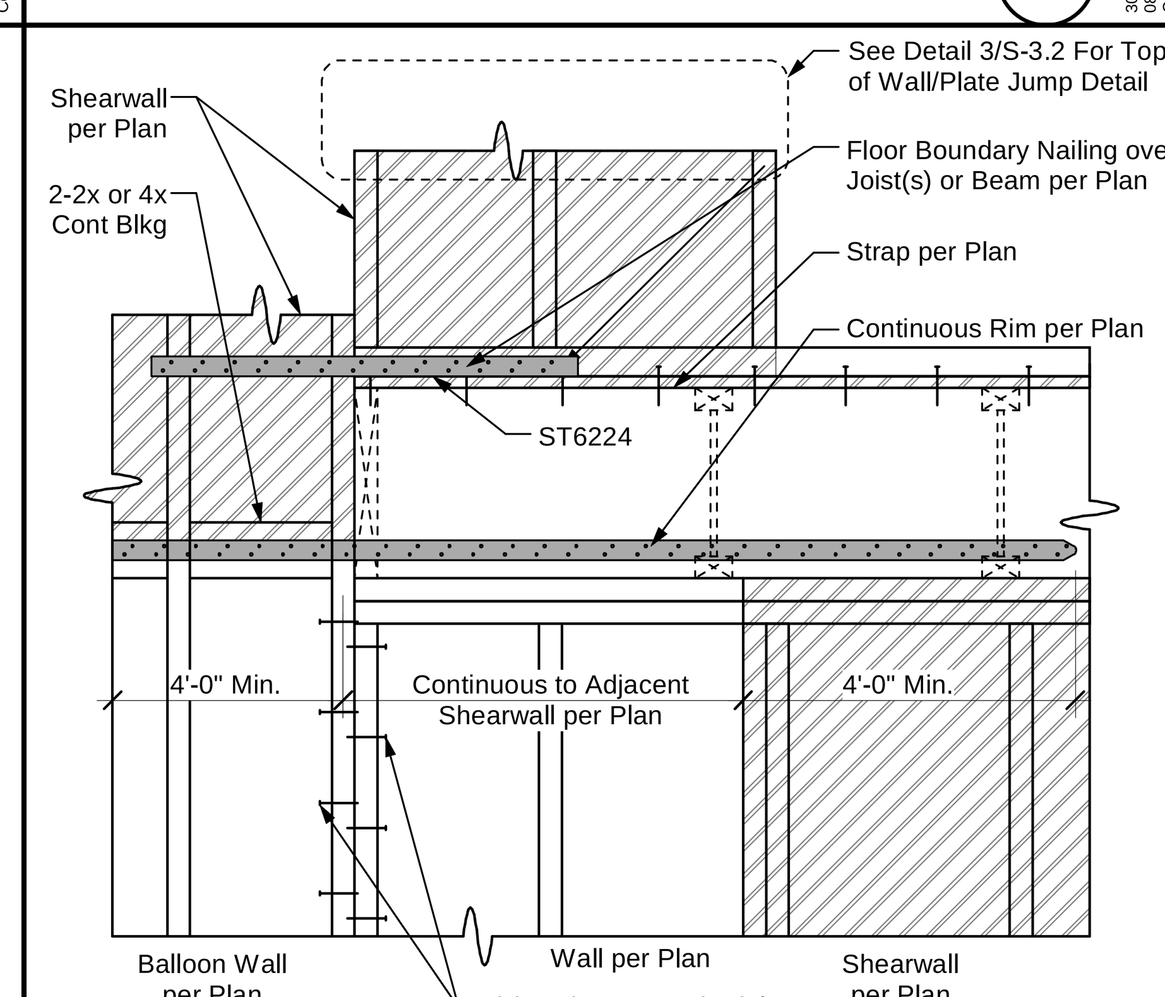


ALL CONNECTIONS SHALL CONFORM TO MANUFACTURER'S SPECS

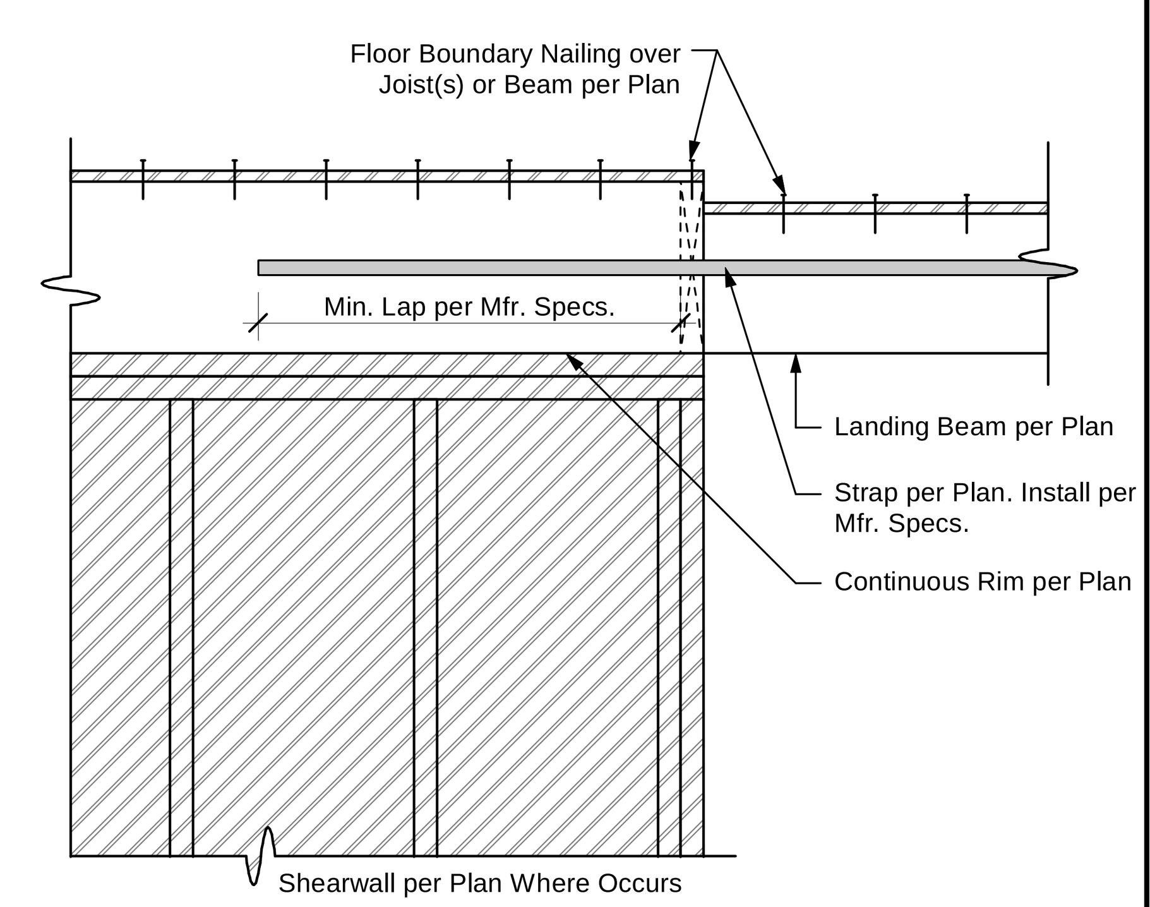
MULTIPLE-MEMBER CONNECTION 20



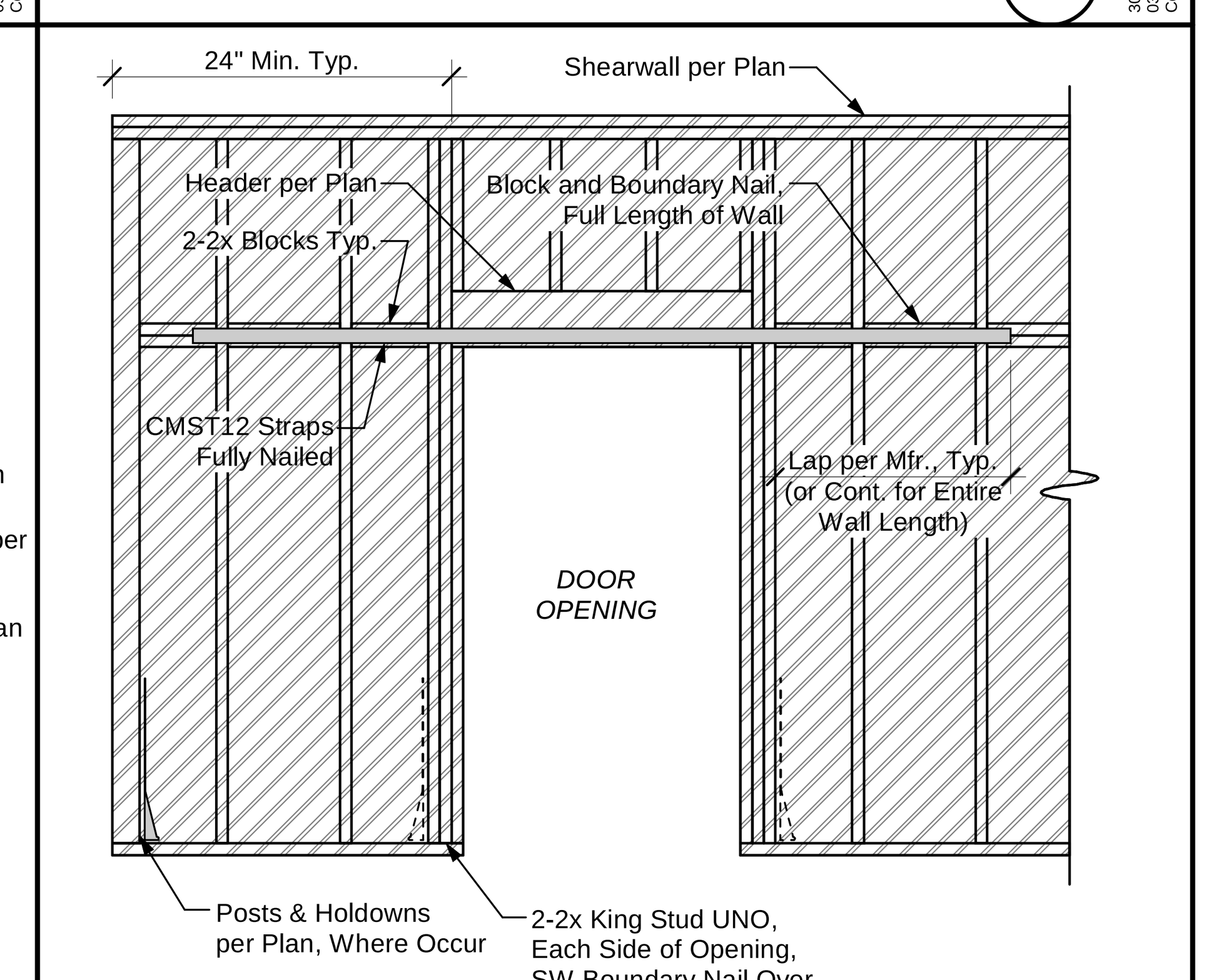
DRAG STRAP TO LANDING 16



DRAG STRAP TO BLOCKING 12



DRAG STRAP TO LANDING 8



DOOR OPENING IN SHEARWALL 4

Engineer:
(800) 579.3881
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TAYLOR & SYFAN CONSULTING ENGINEERS, INC
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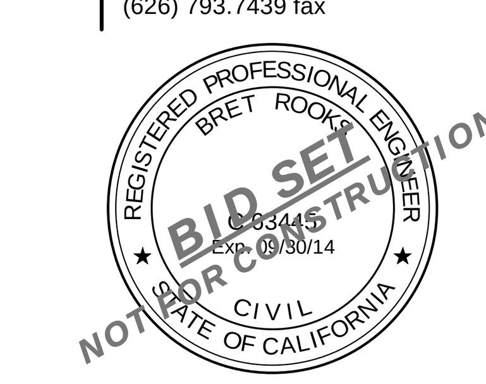
(626) 793.7439 fax



SENIOR MANAGING ENGINEER

Consultants:
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415.551.7630

SOILS/GEO. ENGINEER
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805.688.5429

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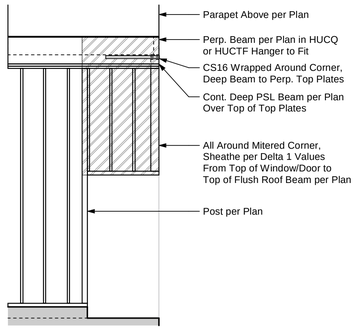
Job No.: 11521

Sheet Title:

STRUCTURAL DETAILS

Sheet No.:

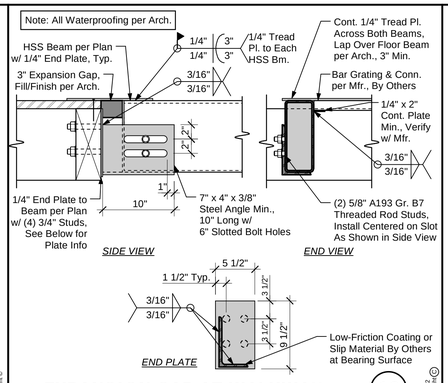
S-3.2



DEEP BEAM AT MITRED WINDOW 17

07.20.12 Copyright ©

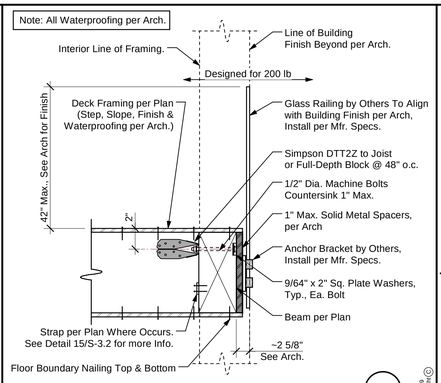
Note: All Waterproofing per Arch.



EXPANSION GAP AT WALKWAY 13

08.30.12 Copyright ©

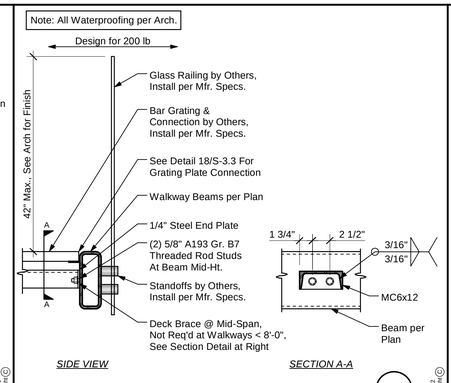
Note: All Waterproofing per Arch.



GLASS RAILING TO FLOOR 9

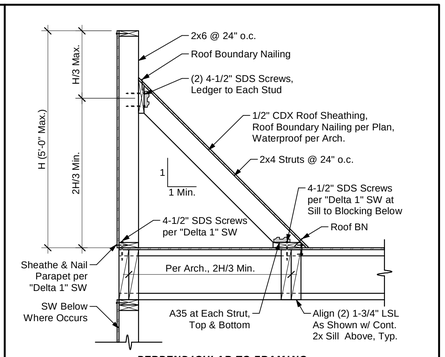
9002 12.14.09 Copyright ©

Note: All Waterproofing per Arch.



RAILING TO WALKWAY FLOOR 5

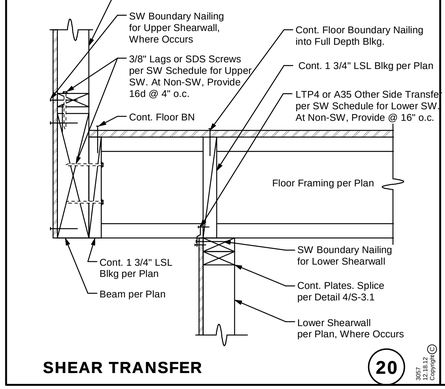
08.31.12 Copyright ©



PARAPET AT ROOF 1

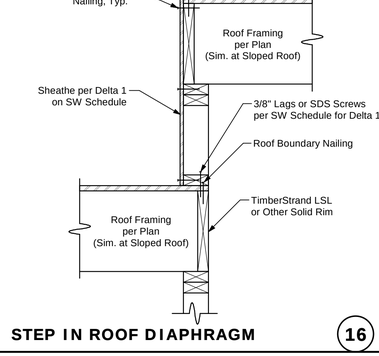
9022 08.30.11 Copyright ©

Note: All Waterproofing per Arch.



BEAM SUPPORT AT WALKWAY 18

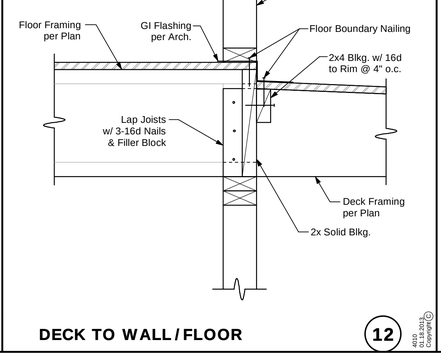
08.30.12 Copyright ©



TYP. SHEAR TRANSFER 14

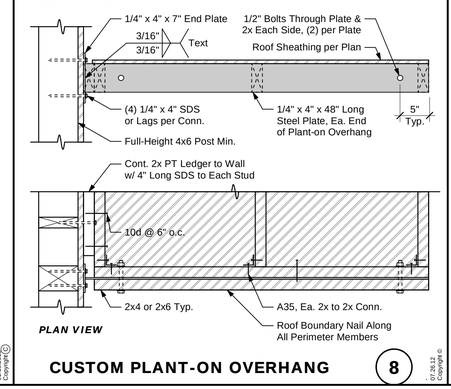
3167 12.17.2012 Copyright ©

Note: All Waterproofing per Arch.



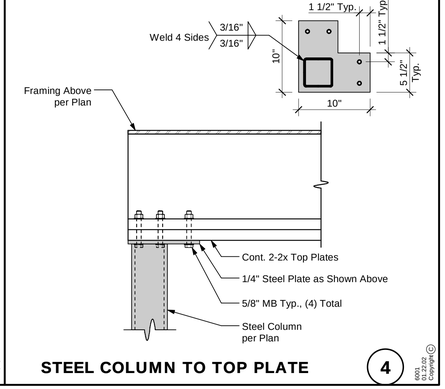
CUSTOM STEEL STAIR SUPPORT 10

9000 09.05.08 Copyright ©



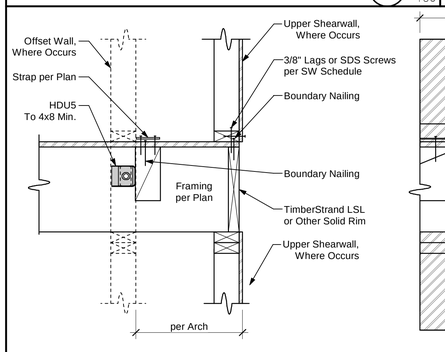
DRAG STRAP TO WALL 6

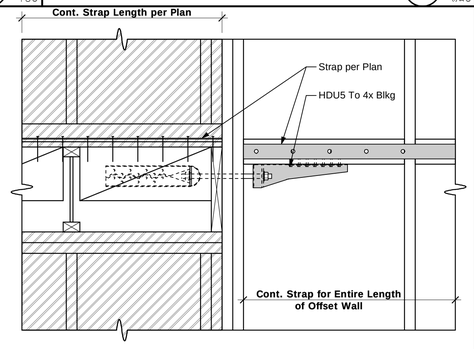
3027 12.19.2012 Copyright ©



PARAPET AT ROOF 2

9001 05.30.11 Copyright ©

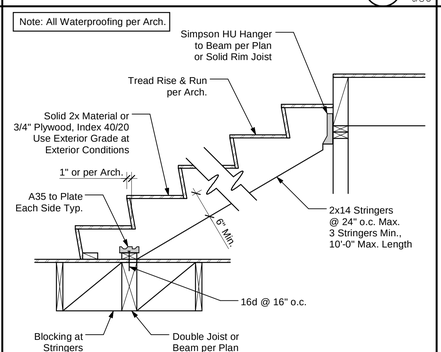




STEP IN DIAPHRAGM 15

3095 12.11.2012 Copyright ©

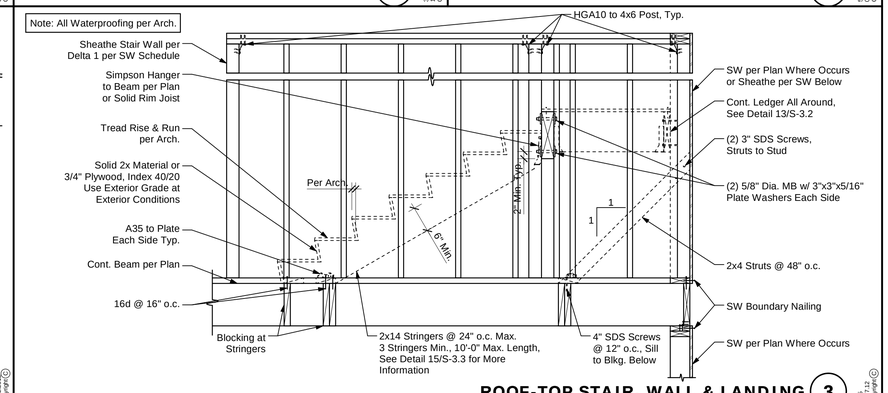
Note: All Waterproofing per Arch.



TYP. WOOD STAIR 11

9015 07.27.12 Copyright ©

Note: All Waterproofing per Arch.



ROOF-TOP STAIR, WALL & LANDING 3

9015 07.27.12 Copyright ©

SHEAR TRANSFER 20

3057 12.18.12 Copyright ©

STEP IN ROOF DIAPHRAGM 16

3095 12.11.2012 Copyright ©

DECK TO WALL/FLOOR 12

4010 01.18.2012 Copyright ©

CUSTOM PLANT-ON OVERHANG 8

3027 12.19.2012 Copyright ©

STEEL COLUMN TO TOP PLATE 4

6001 01.23.08 Copyright ©

Engineer:

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REGISTERED PROFESSIONAL ENGINEER BRET ROOKS CIVIL STATE OF CALIFORNIA

BID SET
NOT FOR CONSTRUCTION
Exp. 09.30.14

SENIOR MANAGING ENGINEER

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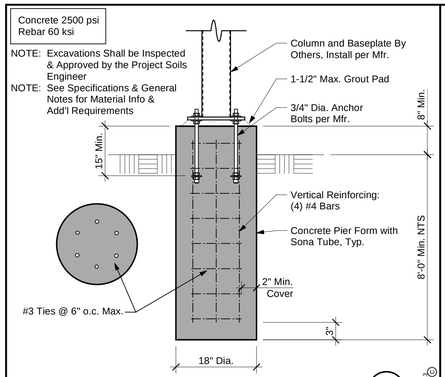
Job No.:	**11521**

Sheet Title:

STRUCTURAL DETAILS

Sheet No.:

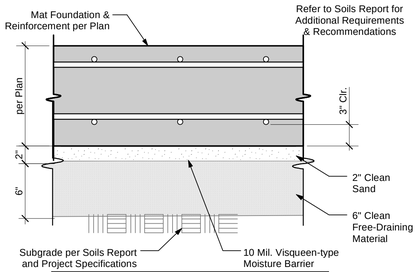
S-3.3



LIGHT POLE FOUNDATION SUPPORT 17

3081 07.03.2013 Copyright ©

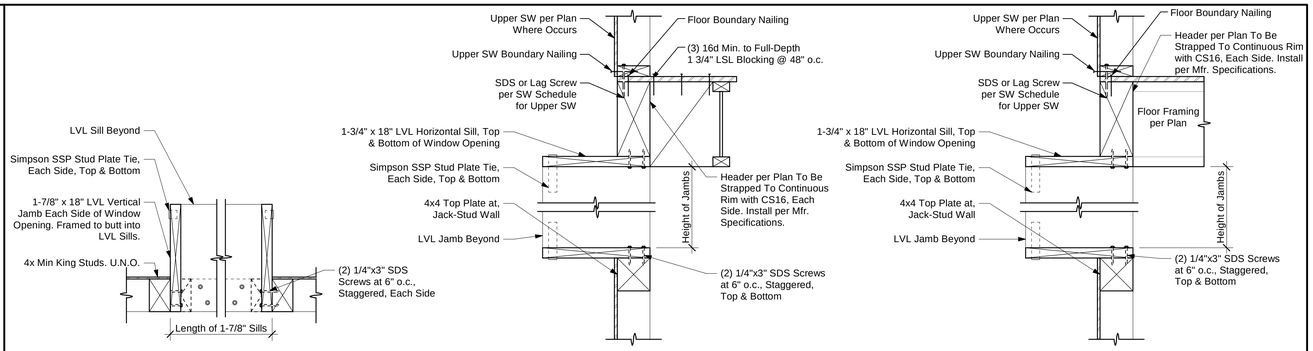
NOTE: Soil Preparation, Subgrade, and Moisture Protection By Others, See Soils Report.
NOTE: See Plan for Size, Number, and Location of Reinforcing Bars.



The soil beneath the sand & visqueen barrier shall be premoistened to a minimum depth and % of optimum moisture content specified by the soil engineer, who shall test and approve prior to slab construction.

MAT SLAB ON GRADE 13

1013 12.4.2013 Copyright ©



WOOD EXTRUDED WINDOW DETAIL 1

01.23.2013 Copyright ©

BLANK

18

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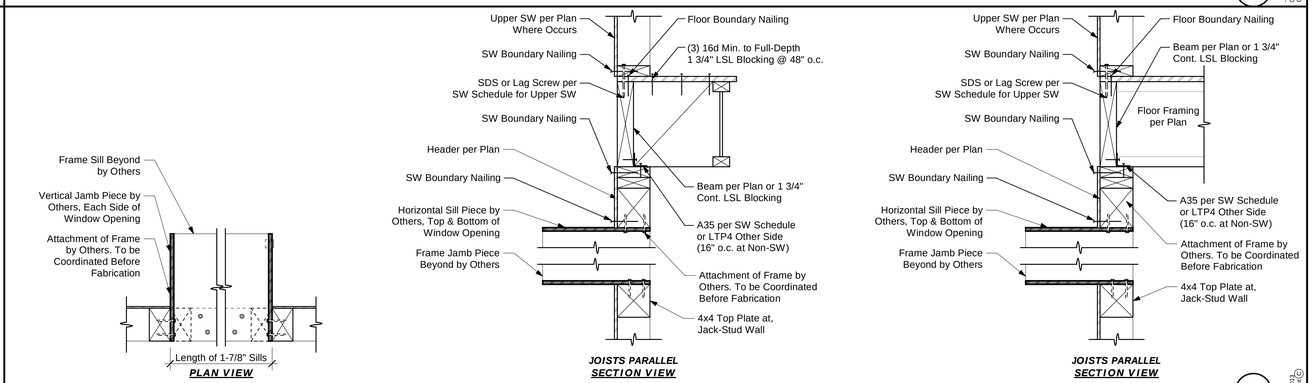
14



WOOD EXTRUDED WINDOW DETAIL 2

01.23.2013 Copyright ©

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19

BLANK

15

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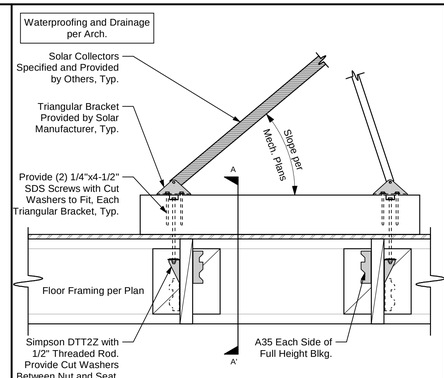
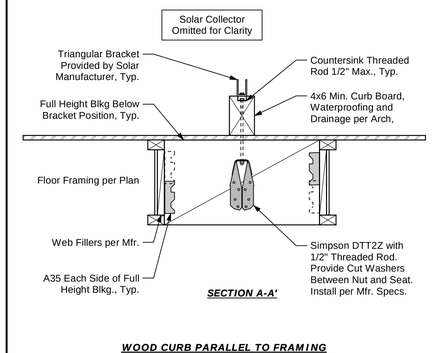
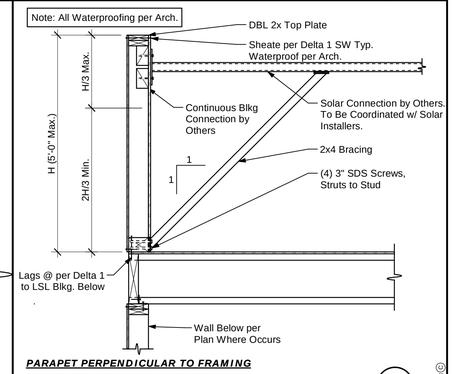
11





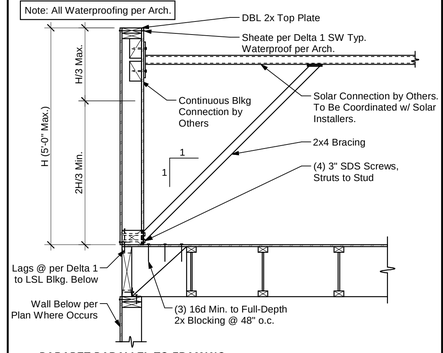
BUILT-UP CURB AT SOLAR THERMAL 8

12.01.2012 Copyright ©



PARAPET AT ROOF 3

5022 06.28.11 Copyright ©



PARAPET AT ROOF 4

5022 06.28.11 Copyright ©

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20

BLANK

16

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12

Engineer:

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