STRUCTURAL DRAWING LIST	
Sheet Number	Sheet Name
S0 SERIES: SHEET LIST, GENERAL NOTES, TYPICAL DETAILS	
S000	GENERAL NOTES
S001	GENERAL NOTES
S010	TYPICAL CONCRETE DETAILS
S011	TYPICAL CONCRETE DETAILS
S030	TYPICAL WOOD DETAILS
S031	TYPICAL WOOD DETAILS
S032	TYPICAL WOOD DETAILS
S2 SERIES: FOUNDATION PLAN, FRAMING PLAN, AND SLAB REINFORCING PLANS	
S201	PLANS
S202	ROOF PLAN
S3 SERIES: LATERAL FRAME ELEVATIONS AND BUILDING SECTIONS	
S300	BUILDING SECTIONS
S4 SERIES: SHEAR WALL AND/OR BEARING WALL ELEVATIONS	
S400	WALL ELEVATIONS

CC **CAST IN PLACE CONCRETE**

CC-1 PROPORTION, MIX, TRANSPORT, AND PLACE CAST-IN-PLACE CONCRETE IN ACCORDANCE WITH ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE," UON.

CC-2 CONCRETE IS REINFORCED AND CAST-IN-PLACE UNLESS OTHERWISE NOTED. WHERE REINFORCING IS NOT SPECIFICALLY SHOWN OR WHERE DETAILS ARE NOT GIVEN, PROVIDE REINFORCING SIMILAR TO THAT SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE.

CC-3 ROUGHEN CONCRETE SURFACES OF CONSTRUCTION JOINTS TO 1/4 INCH AMPLITUDE AND CLEAN OF LAITANCE, FOREIGN MATTER, AND LOOSE PARTICLES. LOCATE CONSTRUCTION JOINTS AS SHOWN ON THE DRAWINGS. SUBMIT ALTERNATE JOINT LOCATIONS OR JOINTS NOT SHOWN TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO PROCEEDING WITH THE WORK.

CC-4 AT LOCATIONS WHERE CONCRETE IS CAST AGAINST EXISTING CONCRETE, ROUGHEN CONTACT SURFACES TO 1/4 INCH AMPLITUDE AND CLEAN OF LAITANCE, FOREIGN MATTER, AND LOOSE PARTICLES.

CC-5 AT LOCATIONS WHERE CONCRETE IS CAST AGAINST EXISTING MASONRY, THOROUGHLY ROUGHEN CONTACT SURFACES BY LIGHT SANDBLASTING OR OTHER SUITABLE MEANS AND CLEAN OF LAITANCE, FOREIGN MATTER, AND LOOSE PARTICLES.

CC-6 REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR LOCATIONS OF ADDITIONAL CONCRETE CURBS AND HOUSEKEEPING PADS NOT SHOWN.

CC-7 CONTINUOUSLY MOIST CURE CONCRETE SLABS-ON-GRADE FOR 7 DAYS MINIMUM. WATER FOG SPRAYS, PONDING, SATURATED ABSORPTIVE COVERS, OR MOISTURE RETAINING COVERS MAY BE USED. CURING COMPOUNDS CAN BE USED BASED ON SATISFACTORY PERFORMANCE ON PREVIOUS APPLICATIONS. CONTRACTOR TO SUBMIT SPECIFICATIONS FOR REVIEW AND APPROVAL.

CC-8 NON-SHRINK GROUT: NON-METALLIC AGGREGATE TYPE, COMPLYING WITH ASTM C1107 AND CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 7,000 PSI AT 28 DAYS.

CC-9 CONCRETE TYPES:

CLASS	LOCATION	28 DAY f'c	TYPE	W/C RATIO	MAX AGGREGATE SIZE
B	SHALLOW FOUNDATIONS, MISC CURBS, PADS, ETC.	2500 PSI	NORMAL WEIGHT	0.6	0.75"
C	SLABS ON GRADE	3000 PSI	NORMAL WEIGHT	0.6	0.375"
D	WALL, AND COLUMNS	3000 PSI	NORMAL WEIGHT	0.6	0.75"

CC-10 CONCRETE CLEAR COVER TO REINFORCING BARS IS AS FOLLOWS:

LOCATION	CLEAR COVER
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	
- ALL BARS	3"
CONCRETE EXPOSED TO EARTH OR WEATHER:	
- #6 THROUGH #18 BARS	2"
- #5 BAR, W31 OR D31 WIRE, AND SMALLER	1 1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:	
- SLABS, WALLS, JOISTS: #14 AND #18 BARS	1 1/2"
- SLABS, WALLS, JOISTS: #11 AND SMALLER	3/4"
- BEAMS, COLUMNS: PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS AND HOOPS	1 1/2"

RE **REINFORCING STEEL**

RE-1 FABRICATE AND PLACE REINFORCING STEEL IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING CONCRETE REINFORCING" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE," UON.

RE-2 ACCURATELY POSITION, SUPPORT, AND SECURE REINFORCEMENT FROM DISPLACING DUE TO FORMWORK, CONSTRUCTION, OR CONCRETE PLACEMENT OPERATIONS. LOCATE AND SUPPORT REINFORCING BY METAL CHAIRS, RUNNERS, BOLSTERS, SPACERS, AND HANGERS AT A MAXIMUM 3-FOOT SPACING.

RE-3 MECHANICAL COUPLERS: LENTON THREADED OR INTERLOCK COUPLERS BY ERICO (IAPMO UES ER-0129 & LARR 24507), OR EXTENDER BY HEADED REINFORCEMENT CORPORATION (ICC ESR-2764 & LARR 25347). COUPLERS FOR BEAM AND SLAB BARS AT FORMED CONSTRUCTION JOINTS MAY BE LENTON FORM SAVERS BY ERICO (IAPMO ER-0188 & LARR 25893).

RE-4 WELD REINFORCING STEEL IN ACCORDANCE WITH AWS D1.4 USING QUALIFIED WELDERS.

RE-5 TERMINATE REINFORCING STEEL IN STD HOOKS, UNLESS OTHERWISE SHOWN.

RE-6 PROVIDE REINFORCING SHOWN OR NOTED CONTINUOUS IN LENGTHS AS LONG AS PRACTICABLE.

RE-7 REINFORCING STEEL #8 AND LARGER AND ALL REINFORCING STEEL TO BE WELDED TO BE ASTM A706, 60KSI. ALL OTHER REINFORCING STEEL TO BE ASTM A615, 60KSI.

RE-8 SMOOTH DOWELS IN SLAB ON GRADE TO BE ASTM A36, 36KSI.

FW **FORMWORK**

FW-1 DESIGN AND CONSTRUCT FORMWORK IN ACCORDANCE WITH ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FORMWORK" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE," UON.

FW-2 REMOVE FORMS AND SHORES IN ACCORDANCE WITH THE FOLLOWING:

A. 48 HOURS: FORMS FOR FOOTINGS, PILE CAPS, AND GRADE BEAMS

B. 72 HOURS: FORMS FOR COLUMNS, WALLS, AND SIDE FORMS FOR BEAMS AND GIRDERS.

C. 7 DAYS, AND f'c=3,500 PSI MIN: BOTTOM FORMS AND SHORES FOR MILDLY REINFORCED SLABS, BEAMS, AND GIRDERS

FW-3 PROVIDE POUR POCKETS IN FORMS AND UNDER EXISTING STRUCTURAL MEMBERS AS REQUIRED TO PREVENT AIR POCKETS AND/OR "HONEYCOMB" UNDER OR AROUND THE EXISTING MEMBERS. CONCRETE CAST WITH AIR POCKETS AND/OR "HONEYCOMB" UNDER OR AROUND THE MEMBERS IS NOT ACCEPTABLE.

FW-4 PROVIDE 3/4 INCH x 3/4 INCH CHAMFER STRIPS ON ALL EXTERNAL CORNERS OF BEAMS, COLUMNS, AND WALLS, UON.

FW-5 PROVIDE CURING WHERE FORMS ARE REMOVED IN LESS THAN 7 DAYS, INCLUDING BUT NOT LIMITED TO WALLS, COLUMNS, AND UNDERSIDE OF ELEVATED SLABS.

IO **STRUCTURAL TEST AND INSPECTIONS**

IO-1 AN INDEPENDENT TESTING AGENCY AND SPECIAL INSPECTORS WILL BE RETAINED BY THE OWNER TO PERFORM THE FOLLOWING TESTS AND INSPECTION. PROVIDE ACCESS AND FURNISH SAMPLES TO THE AGENCY AS REQUIRED BY THE CONTRACT DOCUMENTS.

IO-2 CONTRACTORS RESPONSIBLE FOR THE CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/ COMPONENT AS LISTED IN THE "STATEMENT OF SPECIAL INSPECTION" SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS INSPECTORS AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH A SYSTEM OR COMPONENT PER 1704.4.

IO-3 IF INITIAL TESTS OR INSPECTIONS MADE BY THE OWNER'S TESTING AGENCY REVEAL THAT ANY PORTION OF THE WORK DOES NOT COMPLY WITH THE CONTRACT DOCUMENTS, ADDITIONAL TESTS, INSPECTIONS, AND NECESSARY REPAIRS WILL BE MADE AT THE CONTRACTOR'S EXPENSE.

IO-4 THE FOLLOWING ITEMS REQUIRE TESTS AND INSPECTIONS IN ACCORDANCE WITH THE REQUIREMENTS OF THE CHAPTER "STRUCTURAL TEST AND INSPECTIONS" OF THE CODE OF THE GOVERNING JURISDICTION AS NOTED IN THE GENERAL SECTION OF THESE GENERAL NOTES. AN "X" PRESENT IN COLUMN "C" INDICATES CONTINUOUS INSPECTION & "X" PRESENT IN COLUMN "P" INDICATES PERIODIC INSPECTION.

STRUCTURAL STEEL

	VERIFICATION AND INSPECTIONS	C	P
1.	MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS, AND WASHERS:		
	A. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	-	X
	B. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X
2.	INSPECTION OF HIGH-STRENGTH BOLTING:		
	A. SNUG-TIGHT JOINTS.	-	X
	B. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCHMAKING, TWIST-OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION.	-	X
	C. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCHMAKING OR CALIBRATED WRENCH METHODS OF INSTALLATION.	X	-
3.	MATERIAL VERIFICATION OF STRUCTURAL STEEL:		
	A. FOR STRUCTURAL STEEL IDENTIFICATION MARKINGS TO CONFORM TO AISC 360.	-	X
	B. FOR OTHER STEEL, IDENTIFICATION MARKINGS CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X
	C. MANUFACTURER'S CERTIFIED TESTS REPORT.	-	X
4.	MATERIAL VERIFICATION OF WELD FILLER MATERIALS:		
	A. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	X
	B. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	-	X
5. A	INSPECTION OF WELDING - STRUCTURAL STEEL:		
	1. COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS.	X	-
	2. MULTIPASS FILLET WELDS.	X	-
	3. SINGLE-PASS FILLET WELDS > 5/16".	X	-
	4. PLUG AND SLOT WELDS.	X	-
	5. SINGLE-PASS FILLET WELDS < 5/16".	-	X
	6. FLOOR AND ROOF DECK WELDS.	-	X

ROUGH CARPENTRY

	VERIFICATION AND INSPECTIONS	C	P
1.	SHEARWALL HOLDOWNS AND SILL ANCHORS.	-	X
2.	SHEARWALL NAILING WITH NAIL SPACING LESS THAN 4" OC.	-	X
3.	DIAPHRAGM NAILING WITH NAIL SPACING LESS THAN 4" OC.	-	X
4.	STRAPS AT DIAPHRAGM INSTALLATION.	-	X

SO **STRUCTURAL OBSERVATIONS**

SO-1 NOTIFY THE ENGINEER AT SIGNIFICANT CONSTRUCTION STAGES 72 HOURS IN ADVANCE AND PROVIDE ACCESS FOR THE FOLLOWING STRUCTURAL OBSERVATIONS:

- A. FOUNDATIONS
  1. REINFORCEMENT
- B. WOOD FRAMING
  1. GENERAL
  2. SHEAR WALLS AND HOLD-DOWNS
  3. DIAPHRAGMS AND COLLECTORS
- C. CONCRETE
  1. WALL REINFORCEMENT
  2. SLABS AND SLABS-ON-GRADE

A COPY OF THE LARR AND/OR CONDITIONS OF LISTING SHALL BE MADE AVAILABLE AT THE JOB SITE.

LADBS DEPARTMENT OF BUILDING AND SAFETY

Los Angeles Regional Uniform Code Program

Committee I-3: Structural Observation

LARUCP Los Angeles Regional Uniform Code Program

STRUCTURAL OBSERVATION PROGRAM AND DESIGNATION OF THE STRUCTURAL OBSERVER

PROJECT ADDRESS: 7500 N GLENOAKS BLVD, LOS ANGELES CA 91504 PERMIT APPL. NO.:

Description of Work:

Owner: WOODBURY SCHOOL OF ARCHITECTURE Architect: Engineer: MATTHEW MELNYK

STRUCTURAL OBSERVATION
(only checked items are required)

Firm or Individual to be responsible for the Structural Observation:

Name: MATTHEW MELNYK Phone: (213) 627 - 6687 Calif. Registration: S5853

FOUNDATION	WALL	FRAME	DIAPHRAGM
☒ Footing, Stem Walls, Piers	☒ Concrete	☐ Steel Moment Frame	☐ Concrete
☐ Mat Foundation	☐ Masonry	☐ Steel Braced Frame	☐ Steel Deck
☐ Caisson, Piles, Grade Beams	☒ Wood	☐ Concrete Moment Frame	☒ Wood
☐ Stepp b/Retain b Foundation, Hillside Special Anchors	☐ Others:	☐ Masonry Wall Frame	☐ Others:
☐ Others:		☐ Others:	

DECLARATION BY OWNER

I, the Owner of the project, declare that the above listed firm or individual is hired **by me** to be the Structural Observer.

Signature Date

DECLARATION BY ARCHITECT OR ENGINEER OF RECORD (required if the Structural Observer is different from the Architect or Engineer of Record)

I, the Architect or Engineer of record for the project, declare that the above listed firm or individual is designated by me to be responsible for the Structural Observation.

Signature License No. Date

INFform.08 (Part 2) (Rev. 1/1/2007) www.ladbs.org

SU **SUBMITTALS**

SU-1 SUBMITTAL REVIEW FOR ITEMS DESIGNED BY NOUS, 10 BUSINESS DAY REVIEW TIME IS REQUIRED UNLESS OTHERWISE AGREED.

SU-2 RFI REVIEW: ALLOW 5 BUSINESS DAY RESPONSE UNLESS OTHERWISE AGREED.

SU-3 SUBMIT COPIES OF REQUIRED SUBMITTALS TO OWNER'S REPRESENTATIVE FOR REVIEW.

SU-4 CONCRETE REINFORCING STEEL:

- A. SUBMIT CERTIFIED MATERIAL CERTIFICATES FOR REINFORCING STEEL SIGNED BY THE MANUFACTURER AND CONTRACTOR.
- B. SUBMIT SHOP DRAWINGS FOR FABRICATION, BENDING AND PLACEMENT OF CONCRETE REINFORCEMENT IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT."

SU-5 CAST-IN-PLACE CONCRETE:

- A. SUBMIT MIX DESIGNS PREPARED, STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA FOR EACH CLASS OF CONCRETE. INCLUDE RESULTS OF SLUMP, SHRINKAGE AND COMPRESSION TESTS USED TO ESTABLISH MIX PROPORTIONS. ALSO INCLUDE CERTIFIED MATERIAL CERTIFICATES FOR EACH COMPONENT OF THE MIX.
- B. SUBMIT PROPOSED CONSTRUCTION JOINT LOCATIONS FOR REVIEW.
- C. SUBMIT PRODUCT DATA FOR CURING MATERIALS.
- D. SUBMIT PRODUCT DATA FOR NON-SHRINK GROUT.

SU-6 STRUCTURAL STEEL:

- A. SUBMIT MILL CERTIFICATES FOR STRUCTURAL STEEL SHAPES INDICATING STRUCTURAL STRENGTH AND CHEMICAL COMPOSITION FOR EACH HEAT OF STEEL
- B. SUBMIT SHOP DRAWINGS PRIOR TO FABRICATION. INCLUDE AT A MINIMUM ASTM MATERIAL DESIGNATIONS, MEMBER SIZES, SIZES AND TYPES OF WELDS, SIZES AND TYPES OF BOLTS AND DIMENSIONS.
- C. SUBMIT MILL CERTIFICATES FOR FASTENERS AND THREADED RODS.
- D. SUBMIT WELDING PROCEDURE SPECIFICATION FOR EACH TYPE OF WELD TO BE USED AND PRODUCT DATA FOR WELDING ELECTRODES.
- E. SUBMIT MANUFACTURERS PRODUCT DATA FOR PRIMER AND FINISH PAINT INCLUDING COLOR CHARTS.

SU-7 MECHANICAL ANCHORS: SUBMIT PRODUCT DATA FOR EACH TYPE OF ANCHOR USED.

SU-8 ADHESIVE ANCHORS: SUBMIT PRODUCT DATA FOR EACH TYPE OF ADHESIVE ANCHORING SYSTEM USED.

GR **GENERAL REQUIREMENTS**

GR-1 MATERIALS AND WORKMANSHIP TO CONFORM WITH THE 2019 EDITION OF THE CALIFORNIA BUILDING CODE, WITH CITY OF LOS ANGELES AMENDMENTS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

GR-2 REFERENCE TO CODES, RULES, REGULATIONS, STANDARDS, MANUFACTURER'S INSTRUCTIONS OR REQUIREMENTS OF REGULATORY AGENCIES IS TO THE LATEST PRINTED EDITION OF EACH IN EFFECT AT THE DATE OF SUBMISSION OF BID UNLESS THE DOCUMENT DATE IS SHOWN.

GR-3 VERIFY ALL DIMENSIONS, ELEVATIONS, & SITE CONDITIONS BEFORE STARTING WORK. NOTIFY STRUCTURAL ENGINEER OF DISCREPANCIES.

GR-4 REFER TO ARCHITECTURAL & CIVIL DRAWINGS FOR EXTERIOR SLABS.

GR-5 DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, USE SIMILAR DETAILS OF CONSTRUCTION, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE.

GR-6 THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND FOR CHECKING DIMENSIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES AND RESOLVE BEFORE PROCEEDING WITH THE WORK.

GR-7 DO NOT SCALE THE DRAWINGS.

GR-8 PROVIDE MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES INCLUDE, BUT MAY NOT BE LIMITED TO, BRACING AND SHORING FOR LOADS DURING CONSTRUCTION. RETAIN A REGISTERED CIVIL ENGINEER WHOM IS PROPERLY QUALIFIED TO DESIGN BRACING, SHORING, ETC. VISITS TO THE SITE BY THE OWNER'S REPRESENTATIVE WILL NOT INCLUDE OBSERVATION OF THE ABOVE NOTED ITEMS.

GR-9 INFORMATION SHOWN ON THE DRAWINGS RELATED TO EXISTING CONDITIONS REPRESENTS THE PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. REPORT CONDITIONS THAT CONFLICT WITH THE CONTRACT DOCUMENTS TO THE OWNER'S REPRESENTATIVE. DO NOT DEVIATE FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN DIRECTION FROM THE OWNER'S REPRESENTATIVE.

GR-10 REFER TO ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATION OF FLOOR, ROOF AND WALL OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS. COORDINATE THE SIZE AND LOCATION OF OPENINGS ASSOCIATED WITH, BUT NOT LIMITED TO, ELECTRICAL, MECHANICAL AND PLUMBING TRADES. SUBMIT FINAL SIZING AND LOCATION REQUIREMENTS OF OPENINGS TO THE OWNER'S REPRESENTATIVE FOR REVIEW.

GR-11 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING A SAFE PLACE TO WORK AND MEETING THE REQUIREMENTS OF ALL APPLICABLE JURISDICTIONS. EXECUTE WORK TO ENSURE THE SAFETY OF PERSONS AND ADJACENT PROPERTY AGAINST DAMAGE BY FALLING DEBRIS AND OTHER HAZARDS IN CONNECTION WITH THIS WORK.

FN **FOUNDATION AND SITE WORK**

FN-1 LOCATE AND PROTECT EXISTING UTILITIES TO REMAIN DURING AND/OR AFTER CONSTRUCTION.

FN-2 REMOVE ABANDONED FOOTINGS, UTILITIES, ETC. WHICH INTERFERE WITH NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED.

FN-3 NOTIFY THE OWNER'S REPRESENTATIVE IF ANY BURIED STRUCTURES NOT INDICATED, SUCH AS CESSPOOLS, CISTERNS, FOUNDATIONS, ETC., ARE FOUND.

FN-4 THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, UNDERPINNING AND PROTECTION OF EXISTING CONSTRUCTION.

FN-5 REMOVE LOOSE SOIL AND STANDING WATER FROM FOUNDATION EXCAVATIONS PRIOR TO PLACING CONCRETE.

FN-6 IF ADVERSE SOIL CONDITIONS ARE ENCOUNTERED, NOTIFY STRUCTURAL ENGINEER AND SOILS REPORT MAY BE REQUIRED.

DC **DESIGN CRITERIA**

DC-1 APPLICABLE CODE: 2019 CALIFORNIA BUILDING CODE WITH CITY OF LOS ANGELES AMENDMENTS

DC-2 PROJECT TYPE: NEW CONSTRUCTION

DC-3 FOUNDATION DESIGNS ARE IN ACCORDANCE WITH THE MINIMUM DESIGN RECOMMENDATIONS FOUND IN CHAPTER 18 OF THE CALIFORNIA BUILDING CODE.

ALLOWABLE NET SOIL PRESSURE =1500 PSF
COHESION =130 PSF
PASSIVE RESISTANCE =100 PCF

DC-4 GRAVITY LOADS:

DEAD LOADS

ROOF = 24 PSF
CLADDING/WALL WEIGHT
STUD WALLS = 15 PSF
6" RC WALLS = 75 PSF

LIVE LOADS

ROOF = 20 PSF (REDUCIBLE)

DC-5 SEISMIC DESIGN:
THE STRUCTURE HAS BEEN EVALUATED IN ACCORDANCE WITH THE CALIFORNIA BUILDING CODE.

SEISMIC DESIGN CATEGORY = D
SITE CLASS = D
ANALYSIS PROCEDURE = EQUIVALENT LATERAL FORCE PROCEDURE
RHO = 1.3

S_S = 2.001
S_1 = 0.729
S_{DS} = 1.601
S_{D1} = 0.826
S_{M1} = 1.239
I = 1.0 FOR OCCUPANCY CATEGORY (II)

STRUCTURE: MAIN RESIDENCE
LFRS = SPECIAL REINFORCED CONCRETE SHEAR WALLS
R = 5
OVERSTRENGTH = 2.5
Cs = 0.32
BASE SHEAR V= 22.8K

STRUCTURE: MAIN RESIDENCE
LFRS = SPECIAL REINFORCED CONCRETE CANTILEVER COLUMN
R = 2.5
OVERSTRENGTH = 1.25
Cs = 0.64
BASE SHEAR V = 45.8 K

DC-6 WIND DESIGN:

BASIC WIND SPEED, V = 95 MPH (3 SECOND GUST)
EXPOSURE CATEGORY = B
GUST EFFECT FACTOR = 0.85
Kd = 0.85
Kz = 0.7
ENCLOSURE CLASSIFICATION = ENCLOSED
INTERNAL PRESSURE COEFFICIENT GCpi = ±0.18
qz = 13.75 PSF
TOTAL WIND FORCE (X-DIRECTION) = 2.72 K
TOTAL WIND FORCE (Y-DIRECTION) = 15.8 K

ABBREVIATIONS

(E)	EXISTING
(N)	NEW
[UP]	UPSTANDING BEAM
[VIF]	VERIFY IN FIELD
AB	ANCHOR BOLT
ARCH	ARCHITECTURAL
B	BOTTOM BAR(S)
BLKG	BLOCKING
BM	BEAM
BN	BOUNDARY NAILING
BOE	BASE OF EXCAVATION
BOT	BOTTOM
CA	COLUMN ABOVE
CB	COLUMN BELOW
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
DBL	DOUBLE
DEG	DEGREE(S)
DIA	DIAMETER
DWG	DRAWING
EA	EACH
EF	EACH FACE
ELEV	ELEVATION
EMBED	EMBEDDED OR EMBEDMENT
EN	EDGE NAILING
EQ	EQUAL
ES	EACH SIDE
EW	EACH WAY
EXT	EXTERIOR
FDN	FOUNDATION
FG	FINISHED GRADE
FN	FIELD NAILING
FS	FAR SIDE
FTG	FOOTING
GA	GAUGE
GB	GRADE BEAM
HDR	HEADER
HGR	HANGER

ABBREVIATIONS

HORIZ	HORIZONTAL
INT	INTERIOR
LWC	LIGHTWEIGHT CONCRETE
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
NO. OR #	NUMBER
NS	NEAR SIDE
OC	ON CENTER
OH	OPPOSITE HAND
OMF	ORDINARY MOMENT FRAME
PC	PILE CAP
PEN	PENETRATION
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
RC	REINFORCED CONCRETE
REINF	REINFORCEMENT OR REINFORCING STEEL
REQ'D	REQUIRED
SCBF	SPECIAL CONCENTRICALLY BRACED FRAME
SCHED	SCHEDULE
SHTHG	SHEATHING
SIM	SIMILAR
SMRF	SPECIAL MOMENT RESISTING FRAME
SOG	SLAB ON GRADE
STD	STANDARD
SYM	SYMMETRIC
T	TOP BAR(S)
T&B	TOP AND BOTTOM
T.O.	TOP OF
THK	THICK / THICKNESS
TOC	TOP OF CONCRETE
TOD	TOP OF DECK
TOF	TOP OF FOOTING
TOFR	TOP OF FRAMING
TOG	TOP OF GRADE
TOPC	TOP OF PILE CAP
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VERT	VERTICAL
WP	WORK POINT

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U.S. Department of Energy Solar Decathlon Build Challenge 2023

DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE

GENERAL NOTES

S000

SHEET OF

AD-C **ADHESIVE ANCHORS AND REBAR IN HARDENED CONCRETE**

AD-C1 ADHESIVE ANCHORS SYSTEM IN CONCRETE: HILTI HIT-RE 500-V3 (ICC ESR-3814 & LARR 26028) AND SIMPSON STRONG TIE SET-XP (ICC-ES ESR 2508 & LARR 25744). USE ONLY ADHESIVE ANCHOR SYSTEMS THAT HAVE BEEN PRE-QUALIFIED IN ACCORDANCE WITH THE PROVISIONS OF ICC ES AC386, APPROVED FOR USE IN CRACKED CONCRETE. ANCHOR SYSTEMS SHALL BE INSTALLED PER THE REQUIREMENTS OF THE ICC ES EVALUATION SERVICES REPORT TO THE SPECIFIC ANCHOR.

AD-C2 ADHESIVE ANCHORS IN UNREINFORCED MASONRY: SIMPSON STRONG TIE "SET" (ICC-ES ESR-1772 & LARR 25279).

AD-C3 REMOVE GREASE, OIL, RUST AND ANY OTHER LAITANCE FROM RODS AND DOWELS PRIOR TO INSTALLATION.

AD-C4 WHERE ADHESIVE ANCHOR SYSTEMS ARE USED TO INSTALL REINFORCING DOWEL BARS, ONLY 25% OF THE DOWELS NEED TO BE TESTED IF THE FOLLOWING CONDITIONS ARE MET.

- A. THE DOWELS ARE USED EXCLUSIVELY TO TRANSMIT SHEAR FORCES ACROSS JOINTS BETWEEN EXISTING AND NEW CONSTRUCTION.
- B. THE NUMBER OF DOWELS IN ANY ONE MEMBER EQUALS OR EXCEEDS 12.
- C. THE DOWELS ARE UNIFORMLY DISTRIBUTED ACROSS SEISMIC FORCE RESISTING SYSTEM IS NOT REQUIRED.

AD-C5 TESTING OF SHEAR DOWELS ACROSS COLD JOINTS IN SLABS ON GRADE WHERE THE SLAB IS NOT PART OF THE LATERAL FORCE-RESISTING SYSTEM IS NOT REQUIRED.

AD-C6 REPLACE ANCHORS AND DOWELS THAT FAIL DURING TESTING AND RETEST. IF MORE THAN 10% OF THE TESTED DOWELS AND ANCHORS FAIL TO ACHIEVE THE SPECIFIED TEST LOAD, TEST 100% OF THE DOWELS AND ANCHORS IN THE LAST 2 DAYS OF ANCHOR INSTALLATION.

AD-C7 A HYDRAULIC CYLINDER SHALL BE USED TO APPLY THE TENSION TEST LOAD TO THE ANCHOR WITH THE CYLINDER SUPPORTED ON A LOADING PLATE HAVING A HOLE DIAMETER EQUAL TO 1.5 TO 2.0 TIMES THE ANCHOR HOLE DIAMETER (CONFINED CONFIGURATION) UNLESS OTHERWISE APPROVED BY ENFORCEMENT AGENCY.

AD-C8 THE ACCEPTABLE CRITERIA FOR INSTALLED ANCHORS IS THE HYDRAULIC RAM METHOD: THE ANCHOR SHALL HAVE NO OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD

AD-C9 ALL HOLES FOR POST-INSTALLED ANCHORS SHALL BE DRILLED, CLEANED, AND PREPARED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS OR THE APPLICABLE ICC ESR. ALL DEBRIS SHALL BE REMOVED BY IN-HOLE BRUSHING COMBINED WITH VACUUM OR OIL-FREE COMPRESSED AIR. JETTING HOLES WITH WATER IS NOT PERMITTED.

AD-C10 WHERE AN ANCHOR DOES NOT SET PROPERLY, OR FAILS A TENSION TEST, OR REINFORCEMENT IS ENCOUNTERED DURING DRILLING, THE DRILLED HOLE MAY NOT BE REUSED. ABANDONED HOLES SHALL BE FILLED WITH NON-SHRINK GROUT. THE MINIMUM CLEAR SPACING BETWEEN AN ABANDONED HOLE AND A DRILLED HOLE USED FOR A POST INSTALLED ANCHOR SHALL NOT BE LESS THAN 1 1/2 ANCHOR DIAMETERS UNLESS OTHERWISE APPROVED BY THE ENFORCEMENT AGENCY. IF THE ANCHOR OR DOWEL MAY NOT BE SHIFTED AS NOTED ABOVE, THE ENGINEER OF RECORD WILL DETERMINE A NEW LOCATION.

AD-C11 REQUIRED TEST LOADS SHALL BE DETERMINED AS THE LESSER OF 1.25 TIMES THE MAXIMUM DESIGN STRENGTH AS PROVIDED IN THE ICC ESR FOR THE SPECIFIC ANCHOR OR 80% OF THE NOMINAL YIELD STRENGTH OF THE ANCHOR ELEMENT. AS SUMMARIZED IN THE TABLE BELOW (NOTE: FOR LIGHT WEIGHT CONCRETE, REDUCE THE CAPACITY OF TESTING LOAD BY 50%):

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-2322)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	NOMINAL REBAR SIZE	EMBEDMENT DEPTH Hef (IN)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)	LIGHT WEIGHT CONCRETE (F'c = 5000 psi)
			CARBON STEEL	CARBON STEEL
1/2	#4	3	2000	2130
1/2	#4	6 1/2	4350	4610
5/8	#5	8	6500	4890
3/4	#6	10	9330	9880
7/8	#7	12	10170	10780
1	#8	14	12530	13280

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-3027)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	NOMINAL REBAR SIZE	INSTALLATION TORQUE (FT-LB)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)	LIGHT WEIGHT CONCRETE (F'c = 5000 psi)
			CARBON STEEL	CARBON STEEL
1/2	#4	3	2190	2320
1/2	#4	6 1/2	4750	5030
5/8	#5	8	7860	8330
3/4	#6	10	12650	13410
7/8	#7	12	17870	18910
1	#8	14	24010	25450

AD-S **SCREW ANCHORS IN HARDENED CONCRETE**

AD-S1 SCREW ANCHOR SYSTEM: HILTI KWIK HUS-EZ CARBON STEEL SCREW ANCHORS (ICC ESR-3027 & LARR 25897) OR SIMPSON STRONG TIE "TITEN-HD" (ICC-ES ESR-2713 & LARR 25714).

AD-S2 INSTALL ANCHORS IN DRY INTERIOR APPLICATIONS ONLY.

AD-S3 ANCHORS MAY NOT BE ATTACHED TO UNDERSIDE OF A BEAM, SLAB, OR METAL DECK W/ CONCRETE FILL.

AD-S4 RE-USE OF SCREW ANCHORS OR SCREW ANCHOR HOLES IS NOT PERMITTED.

AD-S5 SCREW ANCHORS SET WITH AN IMPACT WRENCH TO ALSO BE TESTED PER THE RELIABILITY TEST SECTION 8.8.2.2.3 OF AC 193.

AD-S6 SCREWS TO BE TESTED PER TEST REQUIREMENTS FOR EXPANSION ANCHORS EXCEPT AS NOTED.

- A. SCREW ANCHORS MAY BE LOOSENED A MAX. OF ONE FULL TURN TO FACILITATE THE POSITIONING OF A TEST COLLAR. FOLLOWING THE TENSION TEST, THE ANCHOR SHALL BE RE-TORQUED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- B. TEST LOADS(TWICE MAX. ALLOWABLE LOAD OR ONE AND QUARTER TIMES MAX. DESIGN STRENGTH OF ANCHORS AS PROVIDED IN THE ICC ESR).
- C. TESTING WITH TORQUE WRENCH IS NOT PERMITTED.

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-3027)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	EMBEDMENT DEPTH Hnom (IN)	INSTALLATION TORQUE (FT-LB)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)	LIGHT WEIGHT CONCRETE (F'c = 4000 psi)
			CARBON STEEL	CARBON STEEL
1/4	2 1/2	18	900	540
3/8	1 5/8	40	565	340
3/8	2 1/2	40	1670	1000
3/8	3 1/4	40	2590	1555
1/2	2 1/4	45	1230	735
1/2	3	45	2080	1248
1/2	4 1/4	45	3790	2275
5/8	3 1/4	85	2420	1450
5/8	4	85	5000	3000

AD-M **MECHANICAL ANCHORS IN HARDENED CONCRETE**

AD-M1 EXPANSION ANCHOR SYSTEM (CONCRETE): HILTI KWIK BOLT TZ (ICC ESR-1917 & LARR 25701) OR SIMPSON STRONG BOLT II (ICC ESR-3037 & LARR 25891). USE ONLY EXPANSION ANCHOR SYSTEMS THAT HAVE BEEN PRE-QUALIFIED IN ACCORDANCE WITH THE PROVISIONS OF ICC ES AC193, APPROVED FOR USE IN CRACKED CONCRETE AND RECOGNIZED WITH ANCHOR CATEGORY 1 LISTINGS. ANCHOR SYSTEMS SHALL BE INSTALLED PER THE REQUIREMENTS OF THE ICC ESR FOR THE SPECIFIC ANCHOR.

AD-M2 UNDERCUT ANCHOR SYSTEM (CONCRETE): HILTI HDA (ICC ESR-1546). USE ONLY UNDERCUT ANCHOR SYSTEMS THAT HAVE BEEN PRE-QUALIFIED IN ACCORDANCE WITH THE PROVISIONS OF ICC ES AC193, APPROVED FOR USE IN CRACKED CONCRETE AND RECOGNIZED WITH ANCHOR CATEGORY 1 LISTINGS. ANCHOR SYSTEMS SHALL BE INSTALLED PER THE REQUIREMENTS OF THE ICC ESR FOR THE SPECIFIC ANCHOR.

AD-M3 WHERE THE MANUFACTURER'S INSTALLATION INSTRUCTIONS OR APPLICABLE ICC ESR CALL OF THE APPLICATION OF AN INSTALLATION TORQUE SHALL BE APPLIED WITH A CALIBRATED TORQUE WRENCH. FOLLOWING ATTAINMENT OF 10% OF THE SPECIFIED TORQUE, 100% OF COMPLETE TURNS OF THE NUT. THE SPECIFIED INSTALLATION TORQUE SHALL NOT BE EXCEEDED.

AD-M4 USE OF ZINC-COATED CARBON STEEL ANCHORS IS LIMITED TO DRY, INTERIOR LOCATIONS, UNLESS OTHERWISE NOTED. PROVIDE STAINLESS STEEL ANCHORS FOR APPLICATIONS EXPOSED TO EXTERIOR WEATHER CONDITIONS.

AD-M5 EXPANSION ANCHORS FOR NON-VIBRATION ISOLATED MECHANICAL EQUIPMENT RATED OF 10HP ARE NOTE PERMITTED BY ASCE 7-05 SECTION 13.6.5.5. ANCHORS INSTALLED IN OVERHEAD CONDITIONS FOR NON-VIBRATION ISOLATED EQUIPMENT WITH RECIPPROCATING OR ROTATING MECHANISMS SHALL BE UNDERCUT ANCHORS.

AD-M6 WHERE MECHANICAL ANCHORS ARE USED IN A STANDOFF CONFIGURATION (I.E., WHERE THE ATTACHMENT IS SEPARATED FROM THE CONCRETE IN WHICH THE ANCHOR IS INSTALLED): A NUT AND WASHER SHALL BE PROVIDED AT THE CONCRETE SURFACE TO FACILITATE SETTING OF THE ANCHOR AND TO TRANSMIT AXIAL COMPRESSION LOADS INTO THE CONCRETE.

AD-M7 UNDERCUT ANCHORS THAT ALLOW VISUAL CONFIRMATION OF FULL SET NEED NOT BE TESTED. UNLESS OTHERWISE NOTED BY ENFORCEMENT AGENCY OR ENGINEER OF RECORD.

AD-M8 WHERE THE DESIGN TENSION ON ANCHORS IS LESS THAN 100 POUNDS AND THOSE ANCHORS ARE CLEARLY IDENTIFIED ON THE CONTRACT DOCUMENTS. ONLY 10% OF THOSE ANCHORS NEED TO BE TESTED, UNLESS OTHERWISE NOTED BY OSHPD OR STRUCTURAL ENGINEER OF RECORD.

AD-M9 THE TEST LOAD MAY BE APPLIED BY ANY METHOD THAT WILL EFFECTIVELY TRANSMIT A MEASURABLE TENSION LOAD TO THE ANCHOR. ACCEPTABLE METHODS INCLUDE:

- A. USE OF A HYDRAULIC JACK WHEREBY EITHER UNCONFINED OR CONFINED TESTING SHALL BE ACCEPTABLE.
- B. USE OF CALIBRATED SPRING LOADED DEVICES: OR
- C. USE OF CALIBRATED TORQUE WRENCH FOR TORQUE-CONTROLLED EXPANSION ANCHORS.

AD-M10 THE FOLLOWING CRITERIA APPLY FOR THE ACCEPTANCE OF INSTALLED ANCHORS:

- A. HYDRAULIC RAM METHOD: THE ANCHOR SHALL HAVE OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD. FOR EXPANSION ANCHORS, A PRACTICAL WAY TO DETERMINE OBSERVABLE MOVEMENT IS THAT THE WASHER UNDER THE NUT BECOMES LOOSE
- B. TORQUE WRENCH METHOD: THE APPLICABLE TEST TORQUE MUST BE REACHED WITHIN ONE-HALF (1/2) TURN OF THE NUT

AD-M11 WHEN INSTALLING DRILLED-IN ANCHORS AND/OR POWDER DRIVEN PINS IN EXISTING NON-PRESTRESSED REINFORCED CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. WHEN INSTALLING THEM INTO EXISTING PRESTRESSED CONCRETE (PRE-OR POST-TENSIONED) LOCATE THE PRESTRESSED TENDONS BY USING A NON-DESTRUCTIVE METHOD PRIOR TO INSTALLATION. EXERCISE EXTREME CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE TENDONS DURING INSTALLATION. MAINTAIN WHICH EVER IS GREATER, BETWEEN THE REINFORCEMENT AND THE DRILLED-IN ANCHOR AND/OR PIN.

AD-M12 IF REBAR:

- A. IF THE ANCHOR MAY BE SHIFTED, FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT. THE MINIMUM CLEAR SPACING BETWEEN AN ABANDONED HOLE AND A DRILLED HOLE USED FOR A POST INSTALLED ANCHOR SHALL NOT BE LESS THAN 1-1/2 ANCHOR DIAMETERS UNLESS OTHERWISE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD AND OSHPD.
- B. IF THE ANCHOR LOCATION MAY NOT BE SHIFTED, CORE AN OVERSIZED HOLE AT THE DIRECTION OF THE ENGINEER OF RECORD AND INSTALL AN APPROVED ADHESIVE ANCHOR IN PLACE.

AD-M13 IF THE CONCRETE CRACKS DURING THE INSTALLATION OF THE ANCHOR. THE ANCHOR SHALL BE REMOVED.

AD-M14 POWER ACTUATED FASTENERS SHALL BE "HILTI" PER ICC ESR-2269 & LARR 25684 OR SIMPSON STRONG TIE (ICC-ES ESR-2138 & LARR 25469).

POWER ACTUALTED FASTENERS SHALL BE TENSION TESTED TO TWICE THE ALLOWABLE TENSION LOAD AS LISTED IN THE ICC ESR. THE ANCHOR SHOULD HAVE NO OBSERVABLE MOVEMENT AT THE APPLICABLE TEST LOAD. TESTING IS NOT REQUIRED OF POWER ACTUATED FASTENERS USED TO ATTACH TRACKS OF INTERIOR NON-SHEAR WALL PARTITIONS FOR SHEAR ONLY, WHERE THERE ARE AT LEAST THREE FASTENERS PER SEGMENT OF TRACK. THE TEST LOAD MAY BE APPLIED BY ANY METHOD THAT WILL EFFECTIVELY MEASURE THE TENSION IN THE FASTENER, SUCH AS DIRECT PULL WITH A HYDRAULIC JACK, CALIBRATED SPRING LOADED DEVICES, ETC.

AD-M15 REQUIRED TEST LOADS SHALL BE DETERMINED AS THE LESSER OF 1.25 TIMES THE MAXIMUM DESIGN STRENGTH AS PROVIDED IN THE ICC ESR FOR THE SPECIFIC ANCHOR OR 80% OF THE NOMINAL YIELD STRENGTH OF THE ANCHOR ELEMENT, AS SUMMARIZED IN THE TABLES BELOW (NOTE: HILTI HDA UNDERCUT ANCHORS CAN BE EXEMPT FROM PROOF LOADING REQUIREMENTS WITH VISUAL CONFIRMATION):

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-3027)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	EMBEDMENT DEPTH Hef (IN)	INSTALLATION TORQUE (FT-LB)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)
			CARBON STEEL
3/8"	2	25	1750
1/2"	2	40	1850
1/2"	3 1/4	40	3780
5/8"	3 1/8	60	3620
5/8"	4	60	5240
3/4"	3 3/4	110	4760
3/4"	4 3/4	110	6780

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-3027)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	EMBEDMENT DEPTH Hef (IN)	INSTALLATION TORQUE (FT-LB)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)	LIGHT WEIGHT CONCRETE (F'c = 4000 psi)
			CARBON STEEL	STAINLESS STEEL
3/8"	1 1/2	30	700	900

TENSION TEST LOADS (POUNDS)
HILTI KWIK HUS EZ (ICC ESR-3027)
CRACKED CONCRETE SEISMIC CONDITION B

NOMINAL ANCHOR DIA (IN)	EMBEDMENT DEPTH Hef (IN)	INSTALLATION TORQUE (FT-LB)	NOMINAL WEIGHT CONCRETE (F'c = 4000 psi)
			CARBON STEEL
M10	3.94	37	6821
M12	4.92	59	8664
M16	7.48	84	17328
M20	9.84	221	25993

RC **ROUGH CARPENTRY**

RC-1 FRAMING LUMBER: DOUGLAS FIR (COAST REGION) GRADED AND MARKED IN ACCORDANCE WITH THE STD GRADING RULES NO. 17 OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLIB) OR WESTERN LUMBER GRADING RULES, OF THE WESTERN WOOD PRODUCTS ASSOCIATION (WWPA). USE LUMBER OF THE FOLLOWING GRADES:

- A. SILLS: STUD GRADE PRESSURE OR PRESERVATIVE TREATED, NATURALLY DURABLE, OR FOUNDATION GRADE REDWOOD; 19% MOISTURE CONTENT, UON.
- B. STUDS: STUD GRADE; 19% MOISTURE CONTENT, UON.
- C. JOISTS, PLANKS AND PLATES: DF #2; 15% MOISTURE CONTENT, UON.
- D. BEAMS, DF #1; 19% MOISTURE CONTENT, UON.
- E. POSTS, DF #1; 19% MOISTURE CONTENT, UON.
- F. FRAMING, BLOCKING AND BRIDGING: STUD GRADE; 15% MOISTURE CONTENT, UON.
- G. PLYWOOD BLOCKING: DF #2; 19% MOISTURE CONTENT.
- H. BACKING: PER CONSTRUCTION; 19% MOISTURE CONTENT

RC-2 MANUFACTURED LUMBER:

- A. TJI: DEPTH AND SPACING PER PLAN, ICC ESR-1153 & LARR 25538. SEE SHEET TJI-1 FOR FRAMING AND INSTALLATION GUILDELINES.
- B. LVL: MICROLAM LVL 1.9E. ICC ESR-1387 & LARR 25202.
- C. PSL: PARALLAM PSL 2.0E, ICC ESR-1387 & LARR 25202.

RC-3 PANEL SHEATHING: IDENTIFY WOOD STRUCTURAL PANELS WITH THE APPROPRIATE TRADEMARK OF APA-THE ENGINEERED WOOD ASSOCIATION AND MEET THE REQUIREMENTS OF THE VOLUNTARY PRODUCT STD PS-1 OR PS-2 AND APA PRP-108 PERFORMANCE STD.

- A. PANEL SHEATHING TO BE EXPOSURE 1.
- B. PLYWOOD PANELS TO BE 5-PLY MINIMUM, EXCEPT 3/8" PANELS TO BE 3-PLY MINIMUM.
- C. OSB PANELS MAY BE USED WITH APPROVAL OF SEOR.
- D. PLYWOOD TO BE C-C GRADE AT LOCATIONS EXPOSED TO WEATHER; CD GRADE ELSEWHERE.
- E. SHEATH ALL EXTERIOR WALLS WITH 15/32" PLYWOOD WITH 10d NAILS WITH (6",6",12") OC, (BN, EN, FN).
- F. PROVIDE THE FOLLOWING GRADE AND SPAN RATINGS:

PANEL THICKNESS	MINIMUM GRADE	ROOF/FLOOR RATING
3/8	STRUCTURAL 1	24/0
7/16	STRUCTURAL 1	24/16
15/32	STRUCTURAL 1	32/16
19/32 AND 5/8	CD/CC	40/20
3/4	CD/CC	48/24
7/8 AND 1	CD/CC	54/32
1 1/8	CD/CC	60/48

RC-4 ROUGH HARDWARE:

- A. NAILS: COMMON WIRE NAILS, FEDERAL SPECIFICATION FF-N-105B, STANDARD LENGTHS UON USE HOT-DIPPED ZINC-COATED GALVANIZED NAILS FOR EXTERIOR INSTALLATIONS AND WHEN PENETRATING PRESSURE TREATED OR FIRE-RETARDANT LUMBER.
- B. BOLTS AND THREADED RODS: ASTM A307, SQ OR HEXAGONAL HEAD MACHINE BOLTS WITH ASTM A563 NUTS. USE MALLEABLE IRON WASHERS UNDER HEAD AND NUT WHEN IN CONTACT WITH WOOD. AT SILL PLATES USE 2"x2"x3/16" MINIMUM PLATE WASHERS. AT ALL SHEARWALL SILL PLATE ANCHORS, USE THE FOLLOWING PLATE WASHERS:

5/8" DIA ANCHOR BOLTS = 3"X3"X1/4" SQ. WASHER
3/4" DIA ANCHOR BOLTS = 3"X3"X5/16" SQ. WASHER
7/8" DIA ANCHOR BOLTS = 3"X3"X5/16" SQ. WASHER
1" DIA ANCHOR BOLTS = 3 1/2"X3 1/2"X3/8" SQ. WASHER

- C. LAG SCREWS: ASTM A307, ANSI/ASME STANDARD B18.2.1. USE ANSI B18.22.1 WASHERS UNDER HEAD WHEN IN CONTACT WITH WOOD.
- D. SCREWS: ASTM A307, ANSI/ASME STANDARD B18.6.1. USE CADMIUM-PLATED PAN OR ROUND HEADED SCREWS AT STEEL TO WOOD AND WOOD TO WOOD CONNECTIONS.
- E. BOLTS, NUTS, WASHERS, STRAPS AND OTHER HARDWARE EXPOSED TO THE WEATHER TO BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL.
- F. FRAMING CLIPS, SHEET METAL STRAPS, ETC., SIMPSON, UNIVERSAL, OR EQUIVALENT, WITH LARR REPORTS. DESIGNATIONS ON DRAWINGS ARE BASED ON SIMPSON CATALOGUE NUMBERS (IAPMO UES ER 112 & LARR 25814). PROVIDE THE TYPE OF NAILS SPECIFIED BY THE MANUFACTURER AND FULLY DRIVE NAILS INTO ALL HOLES OF THE CONNECTOR UNLESS NOTED OTHERWISE ON THE PLANS. ALL CONNECTORS SHALL BE GALVANIZED OR HAVE ANOTHER FACTORY APPLIED FINISH. ALL STEEL FRAMING HANGERS TO BE TORSIONAL RESTRAINT. SOLID BLOCKING REQUIRED BETWEEN JOISTS WHERE TORSIONAL RESTRAINT HANGERS DO NOT OCCUR.

RC-5 BOLT AND SCREW INSTALLATION

- A. DRILL BOLT HOLES 1/32 TO 1/16 (MAX) INCH LARGER IN DIA THAN THE BOLT NOMINAL DIA.
- B. DRILL PRE-BORED LEAD HOLES FOR WOOD SCREWS AS FOLLOWS.
  1. PROVIDE LEAD HOLE 40% - 70% OF THREADED SHANK DIA AND FULL DIA FOR SMOOTH SHANK PORTION.
  2. DRILL LEAD HOLE FOR THE SHANK TO A DEPTH EQUAL TO THE LENGTH OF THE UNTHREADED PORTION IN THE MAIN MEMBER. USE A DRILL BIT 7/8 THE DIA OF THE WOOD SCREW.
  3. EXTEND THE LEAD HOLE FOR THE THREADED PORTION OF THE SCREW WITH A DRILL BIT WHOSE DIA IS 40%-70% THE DIA OF THE SCREW AT THE ROOT OF THE THREAD.
  4. INSERT THE SCREW INTO LEAD HOLE BY TURNING. DO NOT DRIVE WITH A HAMMER.
  5. LUBRICATE WITH SOAP OR BEESWAX TO FACILITATE INSTALLATION.
- C. DRILL PRE-BORED LEAD HOLES FOR LAG SCREWS AS FOLLOWS.
  1. PROVIDE LEAD HOLE 40% - 70% OF THREADED SHANK DIA AND FULL DIA FOR SMOOTH SHANK PORTION.
  2. DRILL LEAD HOLE FOR THE SHANK TO A DEPTH EQUAL TO THE LENGTH OF THE UNTHREADED PORTION IN THE MAIN MEMBER. USE A DRILL BIT OF THE SAME DIA AS THE LAG SCREW.
  3. EXTEND THE LEAD HOLE FOR THE THREADED PORTION OF THE LAG SCREW WITH A DRILL BIT WHOSE DIA IS 60 PERCENT OF THE NOMINAL LAG SCREW DIA.
  4. INSERT LAG SCREW INTO LEAD HOLE BY TURNING. DO NOT DRIVE WITH A HAMMER.
  5. LUBRICATE WITH SOAP OR BEESWAX TO FACILITATE INSTALLATION.

RC **ROUGH CARPENTRY**

RC-6 HOLD DOWN CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE APPROVED PLATE WASHERS; AND HOLD DOWNS SHALL BE FINGER TIGHT AND 1/2 WRENCH TURNED JUST PRIOR TO COVERING WALL FRAMING. CONNECTOR BOLTS INTO WOOD FRAMING REQUIRE STEEL PLATE WASHERS ON THE POST ON THE OPPOSITE SIDE OF ANCHORAGE DEVICE. PLATE SHALL BE 0.299x3x3 IN MIN.

RC-7 HOLD-DOWN HARDWARE MUST BE SECURED IN PLACE PRIOR TO FOUNDATION INSPECTION.

RC-8 INSTALL SOLID BLOCKING BETWEEN JOISTS AT ENDS AND OVER SUPPORTS. PROVIDE 2 INCH BY 3 INCH CROSS BRIDGING, METAL BRIDGING, OR SOLID BLOCKING BETWEEN JOISTS IN SPANS EQUALLY SPACED 8 FEET OC MAXIMUM AND WHERE INDICATED.

RC-9 DO NOT USE WOOD SHINGLE SHIMS UNDER STUDS, JOISTS, BEAMS, OR POSTS.

RC-10 NAILING:

- A. DRIVE NAILS PERPENDICULAR TO THE GRAIN, UON
- B. PREDRILLED HOLES TO 3/4 OF NAIL DIA WHERE SPECIFIED AND WHEN WOOD TENDS TO SPLIT.
- C. AIR-DRIVEN NAILS TO BE FULL-HEADED NAILS. DO NOT OVERDRIVE NAILS.
- D. PANEL SHEATHING
  1. AT DIAPHRAGM SHEATHING, USE RING SHANK NAILS. USE SMOOTH SHANK NAILS AT WALLS.
  2. USE OF MACHINE NAILING IS SUBJECT TO A SATISFACTORY JOB SITE DEMONSTRATION FOR EACH PROJECT AND APPROVAL BY THE OWNER'S REPRESENTATIVE. NAIL HEADS THAT PENETRATE THE OUTER PLY MORE THAN WOULD BE NORMAL FOR A HAND HAMMER OR IF THE MINIMUM ALLOWABLE EDGE DISTANCES ARE NOT MAINTAINED THE INSTALLATION IS UNSATISFACTORY. MACHINE NAILING IS NOT APPROVED IN 5/16" OR LESS SHEATHING.
  3. DIAPHRAGM NAILING TO BE INSPECTED BEFORE COVERING. FACE GRAIN OF PLYWOOD TO BE PERPENDICULAR TO SUPPORTS. DIAPHRAGM SHEATHING MUST BE BLOCKED AT EDGES. PLYWOOD SPANS SHALL CONFORM WITH TABLE 2304.8(1).
  4. GLUE FLOOR SHEATHING AT ALL POINTS OF CONTACT.
- E. PROVIDE MINIMUM NAILING PER TABLE 2304.9.1 OF THE IBC/CBC, UON

FASTENING SCHEDULE

	CONNECTION	NAILING	STAPLES	LOCATION
1	JOIST TO SILL OR GIRDER	3-8d COMMON	3-3" 14 GA STAPLES	TOE NAIL
2	BRIDGING TO JOISTS	2-8d COMMON	2-3" 14 GA STAPLES	TOE NAIL, EA END
3	SOLE PLATE TO JOISTS OR BLOCKING	16d COMMON @ 16" OC	3" 14 GA STAPLES @ 12" OC	TYP FACE
4	TOP PLATE TO STUD	2-16d COMMON	3-3" 14 GA STAPLES	END NAIL
5A	STUD TO SOLE PLATE	4-8d COMMON	3-3" 14 GA STAPLES	TOE NAIL
5B	STUD TO SOLE PLATE	2-16d COMMON	3-3" 14 GA STAPLES	END NAIL
6	DOUBLE STUDS	16d COMMON @ 24" OC	3" 14 GA STAPLES @ 8" OC	FACE
7A	DOUBLE TOP PLATE	16d COMMON @ 16" OC	3" 14 GA STAPLES @ 12" OC	TYP FACE
7B	DOUBLE TOP PLATE	8-16d COMMON	12-3" 14 GA STAPLES	LAP
8	BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE	3-8d COMMON	3-3" 14 GA STAPLES	TOE NAIL
9	RIM JOISTS TO TOP PLATE	8d COMMON @ 6" OC	3" 14 GA STAPLES @ 6" OC	TOE NAIL
10	TOP PLATES, LAPS AND INTERSECTIONS	2-16d COMMON	3-3" 14 GA STAPLES	FACE
11	CONT HEADER, TWO PIECES	16d COMMON	-	16" OC ALONG EDGE
12	CEILING JOISTS TO PLATE	3-8d COMMON	5-3" 14 GA STAPLES	TOE NAIL
13	CONT HEADER TO STUD	4-8d COMMON	-	TOE NAIL
14	CEILING JOISTS, LAPS OVER PARTITIONS	3-16d COMMON	3-3" 14 GA STAPLES	FACE
15	CEILING JOISTS PARALLEL TO RAFTERS	3-16d COMMON	4-3" 14 GA STAPLES	FACE
16	RAFTER TO PLATE	3-8d COMMON	3-3" 14 GA STAPLES	TOE NAIL
17A	BUILT-UP GIRDER BEAMS	20d COMMON @ 32" OC	3" 14 GA STAPLES @ 24" OC	FACE NAIL @ T&B STAGGERED
17B	BUILT-UP GIRDER BEAMS	2-20d COMMON	3-3" 14 GA STAPLES	FACE NAIL @ ENDS & EACH SPLICE
18	JOIST TO BAND JOIST	3-16d COMMON	4-3" 14 GA STAPLES	TOE NAIL

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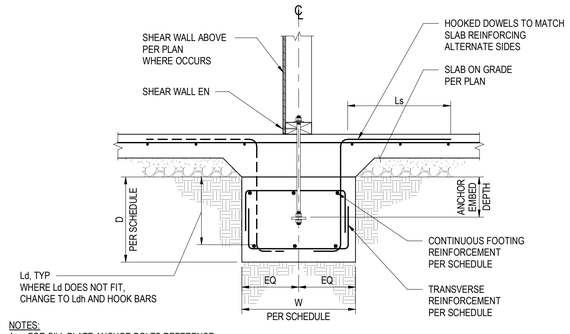
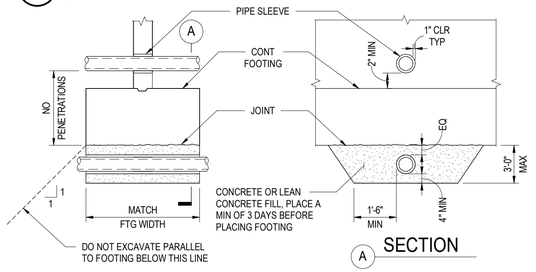
SHEET TITLE
GENERAL NOTES

S001
SHEET OF



NOTES:
1. FOR SILL PLATE ANCHOR BOLTS REFERENCE

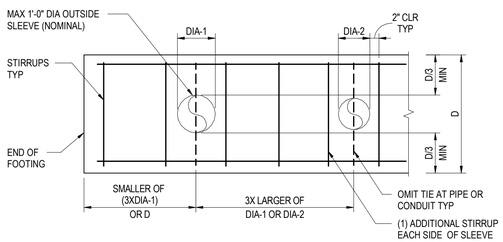
13 INTERIOR CONTINUOUS FOOTING
3/4" = 1'-0"



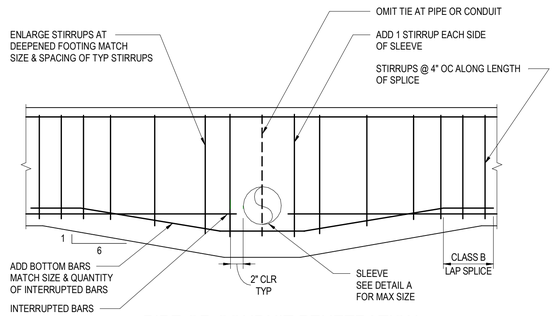
A SECTION

NOTES:
1. REINFORCING OPENINGS FOR SLEEVES OR GROUPS OF SLEEVES LARGER THAN 10" PER THE WALL REINFORCING AT OPENINGS TYPICAL DETAIL.
2. SEE MECHANICAL & CIVIL DRAWINGS FOR ADDITIONAL REQUIREMENTS AT SLEEVES. DEPTH OF FOOTING MAY BE DETERMINED BY LOCATION OF PIPES. CONSULT WITH MECHANICAL CONTRACTOR TO DETERMINE EXACT DEPTH.

14 WALL & FOUNDATION - PENETRATIONS
3/8" = 1'-0"

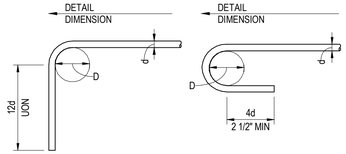


A PIPE OR CONDUIT PENETRATION THROUGH MIDDLE THIRD



B PIPE OR CONDUIT PENETRATION BELOW MIDDLE THIRD

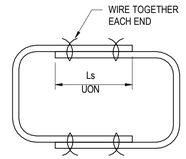
16 CONTINUOUS FOOTINGS - PENETRATIONS
NOT TO SCALE



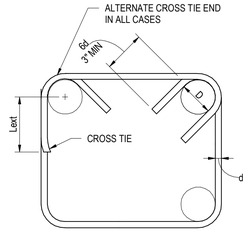
A STANDARD HOOK DETAILS

FOR DEFORMED BARS IN TENSION:
D = 6d FOR #3 THRU #8 BARS
D = 8d FOR #9 THRU #11 BARS
D = 10d FOR #14 AND #18 BARS

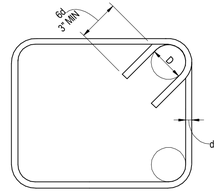
FOR STIRRUPS, TIES, AND HOOPS:
FOR #3 THRU #5 BARS: D = 4d, Lext = 6d, 3" MIN
FOR #6 THRU #8 BARS: D = 6d, Lext = 12d



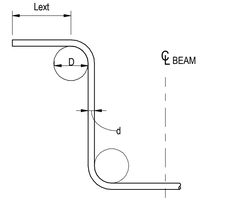
B TWO PIECE STRAIGHT BAR CLOSED STIRRUPS



C TWO-PIECE BEAM TIE

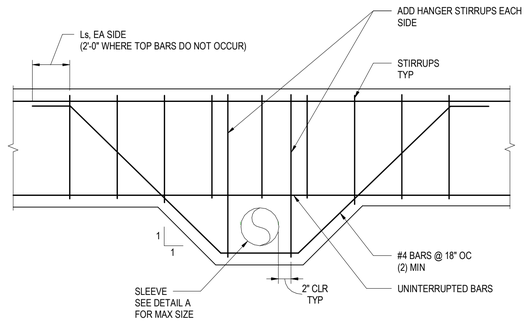


D BEAM AND COLUMN CLOSED TIE



E BEAM & JOIST STIRRUP

10 BAR BENDING DETAIL
1 1/2" = 1'-0"



C PIPE OR CONDUIT BELOW BOTTOM REINFORCEMENT

NOTES:
1. DO NOT CUT REINFORCING AT DETAIL A OR C. ONLY CUT INTERRUPTED REINFORCING AT DETAIL B.
2. PROVIDE MINIMUM 2" CLEAR BETWEEN SLEEVE AND REINFORCING.
3. SEE DETAIL 1 ON THIS SHEET FOR SLEEVE-TO-PIPE/CONDUIT CLEARANCE & INFO NOT NOTED.
4. CAULK SEAL GAP AT SLEEVE-TO-PIPE/CONDUIT INTERFACE ON EXTERIOR SIDE OF FOOTING.
5. IF PIPE OR CONDUIT PENETRATION OCCURS AT EITHER TOP OR BOTTOM REBAR SPLICE LOCATION PROVIDE (2) ADDITIONAL SHEAR STIRRUPS FOR A TOTAL OF 4 SHEAR STIRRUPS ON EACH SIDE OF PENETRATION.
6. IF PIPE OR CONDUIT SLEEVE IS ASTM A53 SCHEDULE 40 OR GREATER PIPE, ADDITIONAL STIRRUPS MAY BE ELIMINATED. SLEEVE SHALL BE GALVANIZED.

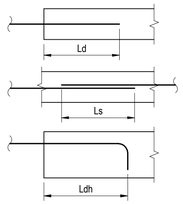
CONCRETE REINFORCING DEVELOPMENT & SPLICING LENGTHS (IN) FOR f'c = 2.5 KSI

CONDITION	CONCRETE TYPE	REINFORCING BAR SIZE																											
		#3			#4			#5			#6			#7			#8			#9			#10			#11		
		Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh
THICKNESS OF FRESH CONCRETE PLACED BELOW HORIZONTAL REINFORCEMENT > 12"																													
A	NWC	15	19	7	19	25	10	24	31	12	29	37	14	41	54	17	47	61	19	53	69	21	60	78	24	66	86	27
B	NWC	24	31	7	32	41	10	39	51	12	47	61	14	69	89	17	78	102	19	88	115	21	100	129	24	110	143	27
C	NWC	36	46	7	47	61	10	59	77	12	71	92	14	103	134	17	117	153	19	132	172	21	149	194	24	165	215	27
THICKNESS OF FRESH CONCRETE PLACED BELOW HORIZONTAL REINFORCEMENT ≤ 12"																													
A	NWC	12	15	7	15	19	10	18	24	12	22	29	14	32	41	17	36	47	19	41	53	21	46	60	24	51	66	27
B	NWC	18	24	7	24	32	10	30	39	12	36	47	14	53	69	17	60	78	19	68	88	21	77	100	24	85	110	27
C	NWC	27	36	7	36	47	10	45	59	12	54	71	14	79	103	17	90	117	19	102	132	21	115	149	24	127	165	27

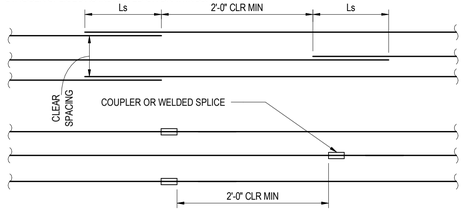
CONCRETE REINFORCING DEVELOPMENT & SPLICING LENGTHS (IN) FOR f'c = 3.0 KSI

CONDITION	CONCRETE TYPE	REINFORCING BAR SIZE																											
		#3			#4			#5			#6			#7			#8			#9			#10			#11		
		Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh	Ld	Ls	Ldh
THICKNESS OF FRESH CONCRETE PLACED BELOW HORIZONTAL REINFORCEMENT > 12"																													
A	NWC	13	17	7	18	23	9	22	28	11	26	34	13	38	49	15	43	56	17	49	63	20	55	71	22	61	79	24
B	NWC	22	28	7	29	38	9	36	47	11	43	56	13	63	81	15	72	93	17	81	105	20	91	118	22	101	131	24
C	NWC	33	42	7	43	56	9	54	70	11	65	84	13	94	122	15	107	139	17	121	157	20	136	177	22	151	196	24
THICKNESS OF FRESH CONCRETE PLACED BELOW HORIZONTAL REINFORCEMENT ≤ 12"																													
A	NWC	12	13	7	14	18	9	17	22	11	20	26	13	29	38	15	33	43	17	38	49	20	42	55	22	47	61	24
B	NWC	17	22	7	22	29	9	28	36	11	33	43	13	48	63	15	55	72	17	62	81	20	70	91	22	78	101	24
C	NWC	25	33	7	33	43	9	42	54	11	50	65	13	72	94	15	83	107	17	93	121	20	105	136	22	116	151	24

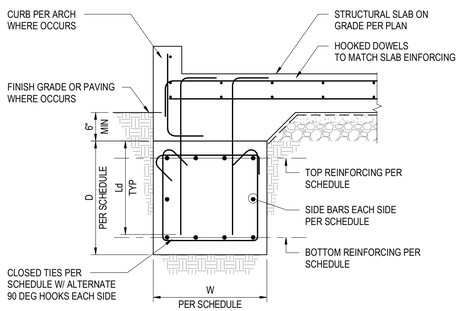
NOTES:
1. YIELD STRENGTH OF REINFORCEMENT = 60 KSI (TYPICAL)
2. UNCOATED OR ZINC-COATED (GALVANIZED) REINFORCEMENT
3. VALUES SHOWN FOR NORMAL WEIGHT CONCRETE ONLY, MULTIPLY BY 1.3 FOR LIGHTWEIGHT.
4. FOR GRADE 75 REINFORCEMENT MULPTIPL BY 1.25; FOR GRADE 80 REINFORCEMENT MULTIPLY BY 1.33.
5. MORE THAN 12" OF CONCRETE CAST BELOW THE BARS ARE MOST TOP BARS. LESS THAN 12" OF CONCRETE CAST BELOW HORIZONTAL BARS ARE ALL VERTICAL BARS AND MOST BOTTOM BARS.
6. Ld = DEVELOPMENT LENGTH (ACI 318-14 TABLE 25.4.2.2)
7. Ls = LAP SPLICE LENGTH (ACI 318-14 TABLE 25.5.2.1)
8. Ldh = HOOK DEVELOPMENT LENGTH (ACI 318-14 25.4.3)



9. WHEN SPLICING BARS OF DIFFERENT SIZE, USE THE GREATER OF Ld OF THE LARGER BAR AND Ls OF THE SMALLER BAR.
10. STAGGER SPLICES AS INDICATED ON DRAWINGS.



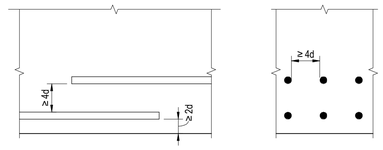
7 REINFORCING DEVELOPMENT & SPLICE LENGTHS
NOT TO SCALE



8 GRADE BEAM - EXTERIOR
NOT TO SCALE

CONDITION A

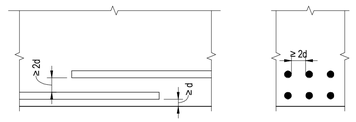
CLEAR SPACING OF BARS OR WIRES BEING DEVELOPED OR LAP SPLICED ≥ 4d AND CLEAR COVER ≥ 2d



ELEVATION SECTION

CONDITION B

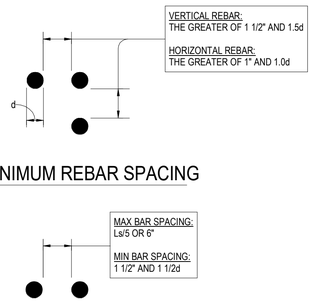
CLEAR SPACING OF BARS OR WIRES BEING DEVELOPED OR LAP SPLICED ≥ 2d AND CLEAR COVER ≥ d



ELEVATION SECTION

CONDITION C

OTHER CASES - WHERE CLEAR SPACING OF BARS OR WIRES < 2d OR CLEAR COVER <d.



A MINIMUM REBAR SPACING

B BAR SPACING FOR BARS SPLICED WITH A NON-CONTACT LAP

4 BAR SPACING IN CONCRETE
1 1/2" = 1'-0"

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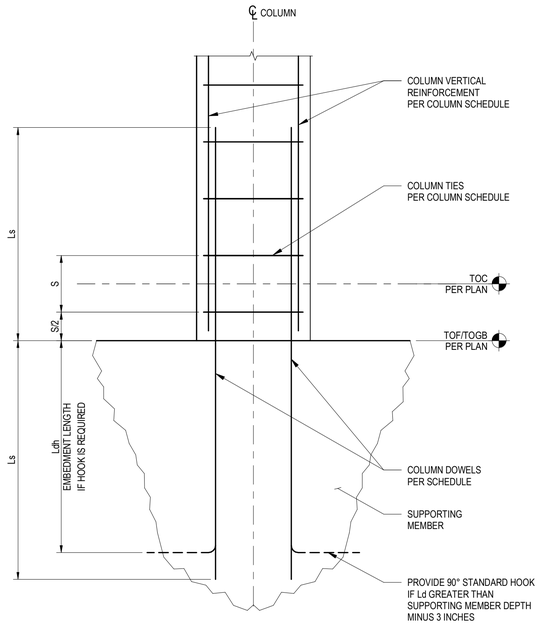
U.S. Department of Energy Solar Decathlon Build Challenge 2023

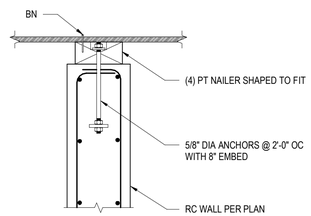
DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE
TYPICAL CONCRETE DETAILS

S010
SHEET OF

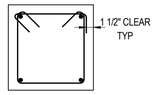


NOTES:
1. S = COLUMN TIE SPACING

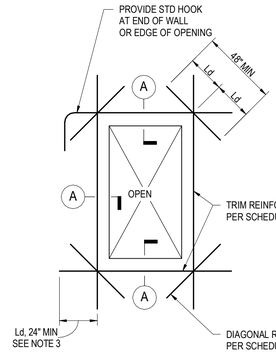


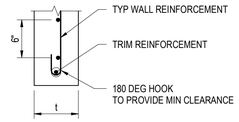
NOTES:
1. WOOD DIAPHRAGM ANCHORAGE AT CONCRETE WALL.

9 WOOD DECK TO RC WALL
NOT TO SCALE

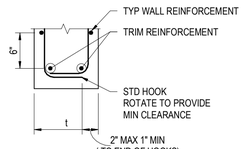


A 4 BARS





A PLAN
SINGLE CURTAIN

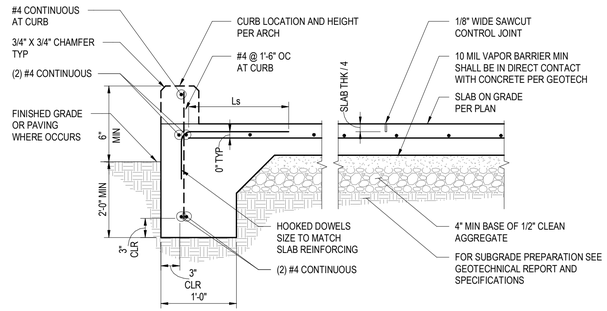


A PLAN
DOUBLE CURTAIN

TRIM REINFORCING SCHEDULE		
WALL THICKNESS, t	MIN TRIM REINFORCING	DIAGONAL REINFORCING
6" < t < 9"	(2) #5	#5
9" < t < 12"	(2) #6	#5
12" < t < 16"	(2) #7	#5
t > 16"	(2) #8	#7

NOTES:
1. SCHEDULE REINFORCEMENT APPLIES TO ALL OPENINGS UNLESS OTHERWISE SHOWN.
2. MIN TRIM REINFORCEMENT TO BE LARGER OF TYPICAL WALL REINFORCEMENT OR SIZE SHOWN IN SCHEDULE.
3. AT SERIES OF OPENINGS WHERE PIER OR SPANDREL IS NARROWER THAN THREE TIMES Ld, RUN TRIM REINFORCEMENT CONTINUOUS ACROSS ALL OPENINGS.
4. MAY OMIT DIAGONALS IF THE LARGEST OPENING DIMENSION IS LESS THAN 3'-0".
5. DETAIL IS NOT REQUIRED FOR OPENINGS SMALLER THAN THE WALL THICKNESS OR 12", WHICHEVER IS SMALLER.
6. COORDINATE OPENING LOCATIONS AND SIZES WITH OTHER TRADES INCLUDING BUT NOT LIMITED TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING.

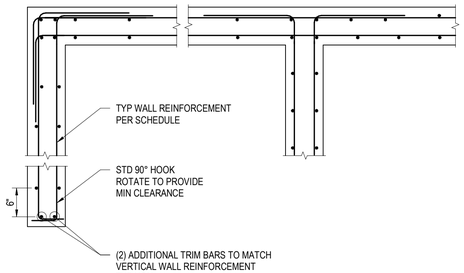
5 WALL REINFORCEMENT AT OPENINGS
NOT TO SCALE



A EDGE OF SLAB ON GRADE

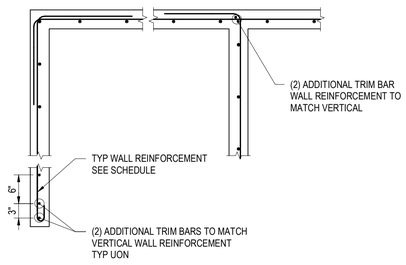
B SLAB-ON-GRADE

14 COLUMN FOUNDATION JOINT
NOT TO SCALE



A DOUBLE CURTAIN
REINFORCEMENT AT WALL

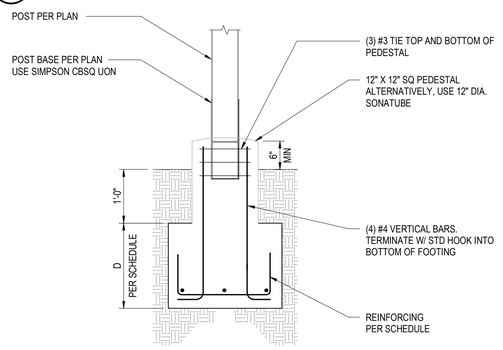
10 COLUMN TYPES AND REINFORCEMENT LAYOUT
NOT TO SCALE



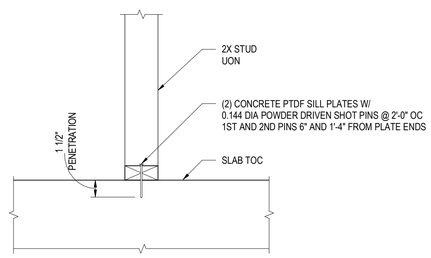
B SINGLE CURTAIN
REINFORCEMENT AT WALL

15 WALL REINFORCING AT CORNERS AND INTERSECTIONS
NOT TO SCALE

6 SLAB ON GRADE & CONTROL JOINT
NOT TO SCALE

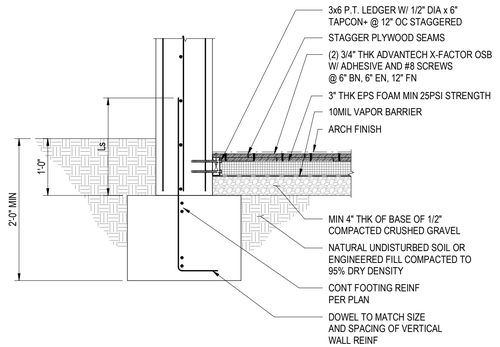


7 ISOLATED POST FOOTING
NOT TO SCALE



NOTES:
1. SHOT PINS SHALL BE MANUFACTURED BY RAMSET OR EQUAL (SEE ICBO REPORT NO.1639).

NON-BEARING WALL TO CONCRETE SLAB CONNECTION DETAIL
3 NOT TO SCALE



4 ALTERNATE FLOOR ASSEMBLY
NOT TO SCALE

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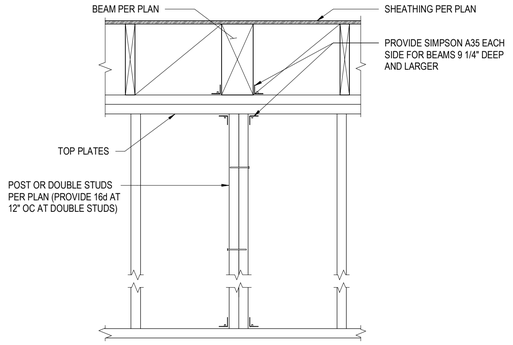
U.S. Department of Energy Solar Decathlon Build Challenge 2023

DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

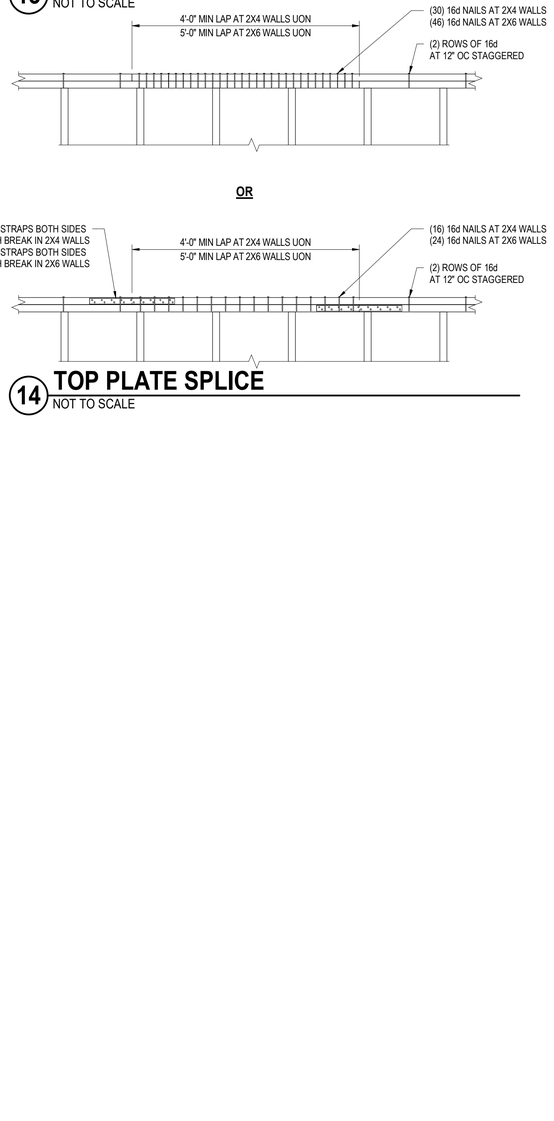
SHEET TITLE
TYPICAL CONCRETE DETAILS

S011
SHEET OF



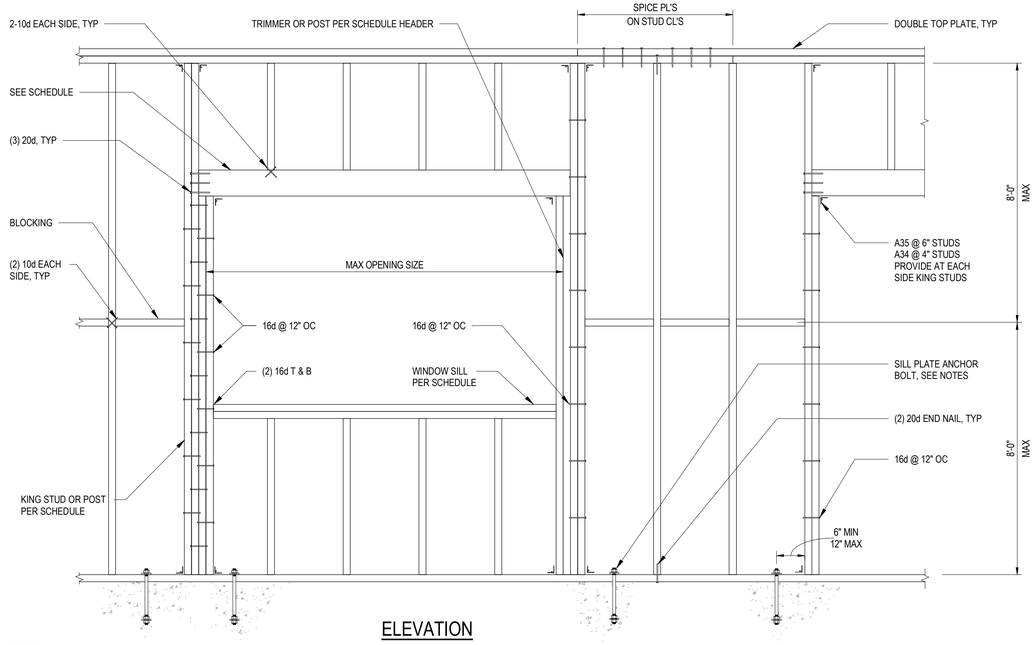
13 FLUSH BEAM PERPENDICULAR TO STUD WALL

NOT TO SCALE



14 TOP PLATE SPLICE

NOT TO SCALE



ELEVATION

NOTES:
1. SILL PLATE ANCHOR BOLT TO BE 5/8" DIA. WITH 2X2X3/16 PLATE WASHER AND 0'-8" MIN EMBED AT 4'-0" OC UON.
2. SILL PLATE ANCHOR BOLTS TO BE 6" MIN./12" MAX. FROM END OF SILL PLATE. MINIMUM (2) BOLTS PER PLATE.
3. NOTCHES TO SILL PER DETAIL **W59**
4. AT NON BEARING WALLS, ACCEPTABLE TO REPLACE ANCHOR BOLTS WITH SIMPSON PDPW-300 @ 24"OC (LARR 25469)
5. STUD SIZE AND SPACING PER STUD WALL SCHEDULE (2X4 @ 16"oc OR 2X6 @ 16"OC MINIMUM)

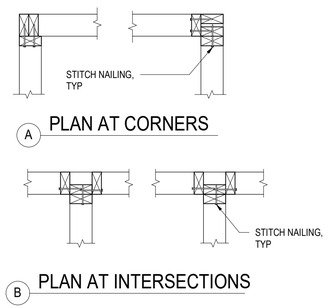
HEADER SCHEDULE (UON ON DRAWINGS)						
MAX OPENING SIZE	LOAD BEARING HEADER				NON-LOAD BEARING HEADER	
	HEADER SIZE AT FLOOR		HEADER SIZE AT ROOF		HEADER SIZE AT FLOOR AND ROOF	
	4" WALL	6" WALL	4" WALL	6" WALL	4" WALL	6" WALL
4'-0"	4X8	6X6	4X6	6X6	4X4	4X6 FLAT
6'-0"	4X10	6X8	4X8	6X6	4X4	6X6
8'-0"	3 1/2 X 11 7/8 LVL	6X10	4X10	6X8	4X6	6X6

WILLOW SILL SCHEDULE	
SILL MEMBER	SILL SPAN
2X	<= 4'-0"
(2)-2X	<= 8'-0"
4X	<= 12'-0"
6X	<= 15'-0"

KING/TRIMMER SCHEDULE UON		
KING	TRIMMER	SPAN
2X OR POST	2X	<= 4'-0"
(2)-2X OR POST	(2) 2X	<= 8'-0"
(3)-2X	(3)-2X OR POST	> 8'-0"

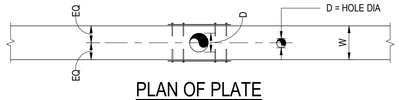
11 STUD WALL FRAMING

NOT TO SCALE

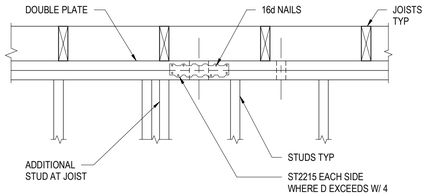


8 STUD WALL CORNERS AND INTERSECTIONS

NOT TO SCALE



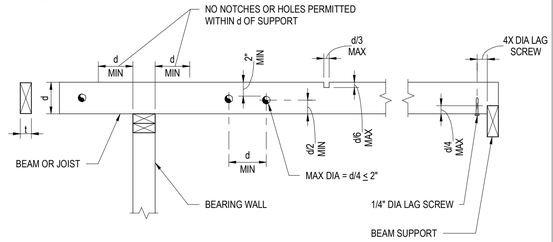
PLAN OF PLATE



ELEVATION OF PLATE

1 HOLES IN PLATES OF WALLS

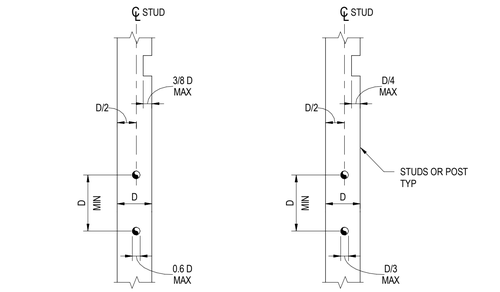
NOT TO SCALE



NOTES:
1. HOLES & NOTCHES NOT PERMITTED FOR d=5 1/2" OR LESS.
2. NOTCHES NOT PERMITTED WITHIN MIDDLE THIRD OF SPAN
3. NOTCHES NOT PERMITTED IN BOTTOM OF MEMBER UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS OR WRITTEN APPROVAL IS OBTAINED FROM THE OWNER'S REPRESENTATIVE.

2 HOLES AND NOTCHES IN BEAMS AND JOISTS

NOT TO SCALE



NOTES:
1. NOTCHING OF MEMBER IS NOT PERMITTED WITHOUT WRITTEN APPROVAL FROM THE OWNER'S REPRESENTATIVE.
2. DO NOT PLACE HOLES IN MEMBERS WITH HOLDOWN ANCHORS.
3. BORED HOLES SHALL NOT BE LOCATED AT THE SAME SECTION OF STUD AS A NOTCH.

4 HOLES AND NOTCHES IN STUDS OR POSTS

NOT TO SCALE

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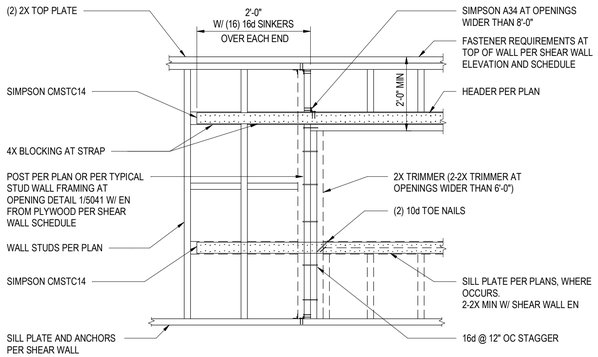
PROJECT MANAGER: KDS

SHEET TITLE

TYPICAL WOOD DETAILS

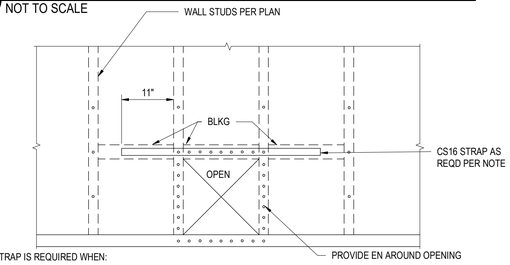
S030

SHEET OF



NOTES:
1. REFERENCE SHEAR WALL ELEVATION AND SCHEDULE FOR PANEL FASTENER INFORMATION NOT SHOWN.

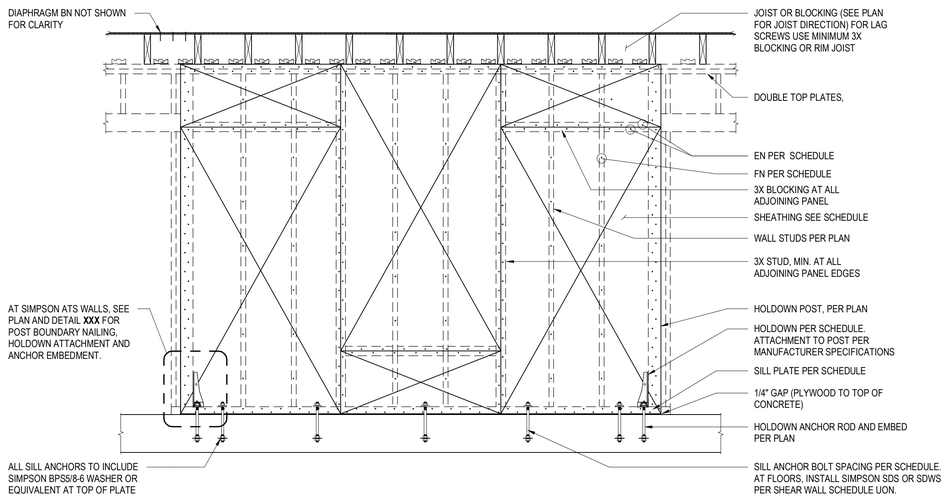
13 SHEAR WALL FRAMING AT OPENING
NOT TO SCALE



NOTE:
1. CS16 STRAP IS REQUIRED WHEN:
   - A. THE PENETRATION IS LARGER THEN 25% OF WALL LENGTH.
   - B. THE PENETRATIONS ARE CLOSER THAN 32" OC.
   - C. A SECOND HORIZONTAL STRAP IS REQUIRED AT THE BOTTOM OF OPENING WHEN BOTTOM OF OPENING IS NOT AT BOTTOM PLATE.

- 16X16 MAXIMUM OPENING SIZE.
- BLOCKING AND STRAPS NOT REQUIRED WHEN PENETRATION IS LESS THAN OR EQUAL TO 6"
- AND SPACED AT 2 OR MORE STUD BAYS.

14 SHEAR WALL PENETRATION (16"X16") DETAIL
NOT TO SCALE

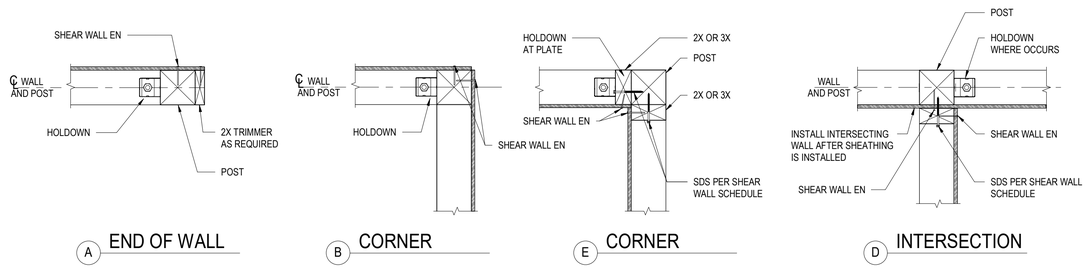


NOTES:
1. REFER TO ROUGH CARPENTRY NOTES FOR ADDITIONAL FRAMING REQUIREMENTS.
2. REFER TO PLAN & SHEAR WALL LEGEND FOR SHEAR WALL TYPE.
3. PLYWOOD FACE GRAIN TO BE VERTICAL.
4. SHEATHING FOR SINGLE-SIDED SHEAR WALLS MAY BE PLACED ON EITHER FACE OF WALL UON. PROVIDE MINIMUM LENGTH SPECIFIED ON PLAN AND COORDINATE WITH ARCHITECTURAL FINISHES.
5. NAILING SHALL BE 10d COMMON WITH 1 1/2" MINIMUM PENETRATION. NAILING SHALL BE 1/2" DISTANCE FROM PANEL EDGE AND 3/8" DISTANCE FROM EDGE OF CONNECTING MEMBERS.
6. PLYWOOD JOINT AND SILL NAILING SHALL BE STAGGERED IN ALL CASES.
7. WHEN SHEATHING IS APPLIED ON BOTH SIDES OF STUDS, NAILS ON EACH SIDE OF SHEATHING JOINT, SILL PLATES, HOLDOWN POSTS AND TOP PLATES SHALL BE STAGGERED.
8. PLYWOOD PANELS SHALL ABUT ALONG CENTERLINES OF FRAMING MEMBERS. THE MINIMUM PLYWOOD DIMENSION FOR USE SHALL BE 12".
9. A35 OR LTP4 SHEAR TRANSFER SHALL BE CONNECTING TO PLATE AND BLOCKING, JOIST OR RAFTER.
10. SILL PLATES ON MASONRY OR CONCRETE SHALL BE PRESSURE TREATED AND 3X MIN.
11. USE OF EQUIVALENT SIMPSON PAB ANCHORS AS ALTERNATIVE FOR SILL ANCHORS IS ACCEPTABLE.
12. ANCHOR BOLTS SHALL HAVE 3"X3"X0.229" PLATE WASHERS OR SIMPSON BPS-5/8-6, MINIMUM.
13. SEE PLAN AND TYPICAL DETAILS FOR SPECIFIC SHEAR CONNECTION DETAILS.
14. AT ALL EXTERIOR AND INTERIOR BEARING WALLS NOT NOTED AS SHEAR WALLS, BLOCKING SHALL BE PROVIDED BETWEEN JOISTS AND/OR RAFTERS WITH A35, LTP4, OR LTP5 TO TOP PLATES AT 16"OC AT FLOOR AND 24"OC AT ROOF CONDITIONS UON.

SHEAR WALL SCHEDULE

SHEAR WALL TYPE	PLYWOOD PANEL			NAILING SIZE (BN, EN, FN)	SILL PLATE ANCHOR TO CONCRETE SLAB	1/4"X6" SDS OR 5" SDWS	A35 OR LTP4 FRAMING CLIPS	SHEAR CAPACITY (PLF)
	APA RATED PLYWOOD							
	THK	TYPE			SIZE & SPACING			
A	15/32"	STRUCT I	ONE SIDE	10d@ 6",6",12"	5/8" DIA X 8" EMBED @ 32"OC	AT 12"OC	AT 12"OC ONE SIDE	340
B	15/32"	STRUCT I	ONE SIDE	10d@ 4",4",12"	5/8" DIA X 8" EMBED @ 32"OC	AT 8"OC	AT 12"OC ONE SIDE	510
C	15/32"	STRUCT I	ONE SIDE	10d@ 3",3",12"	5/8" DIA X 8" EMBED @ 24"OC	AT 4"OC	AT 8"OC ONE SIDE	665
D	15/32"	STRUCT I	ONE SIDE	10d@ 2",2",12"	5/8" DIA X 8" EMBED @ 24"OC	AT 4"OC	AT 8"OC ONE SIDE	870
E	15/32"	STRUCT I	TWO SIDES	10d@ 3",3",12"	5/8" DIA X 8" EMBED @ 12"OC	AT 3"OC	AT 8"OC TWO SIDES	1330

11 SHEAR WALL ELEVATION
NOT TO SCALE



A END OF WALL
B CORNER
E CORNER
D INTERSECTION

12 SHEAR WALL CORNER AND INTERSECTION FRAMING
NOT TO SCALE

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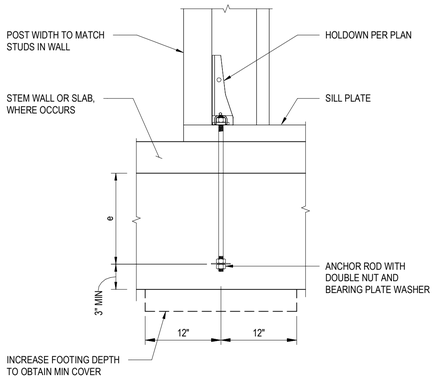
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE
TYPICAL WOOD DETAILS

S031
SHEET OF

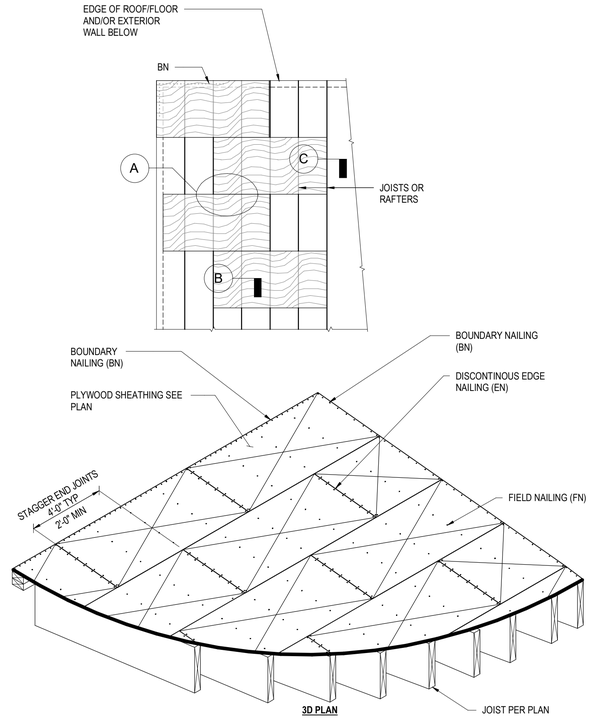


A WALL HOLDOWN AT FOUNDATION

HOLDOWN SCHEDULE			
HOLDOWN	FOUNDATION EMBED e	SLAB EMBED e1	ANCHOR BOLT DIA d
HDU8	18"	N/A	7/8" DIA

NOTES:
1. HD# = SIMPSON HOLD- DOWN (LARR 25720).
2. FOR HDU 14, PROVIDE A HEAVY HEX ANCHOR NUT TO ACHIEVE TABULATED TENSION LOADS.
3. PROVIDE ALL SCREWS AND BOLTS PER MANUFACTURER SPECIFICATIONS

10 SHEAR WALL HOLDOWN DETAILS AND SCHEDULE
NOT TO SCALE



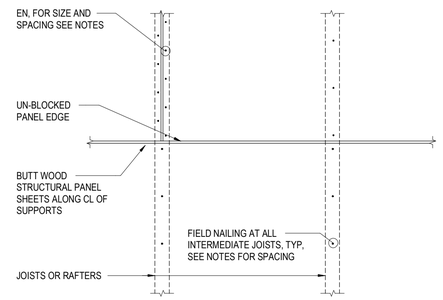
3D PLAN

NOTES:
1. PROVIDE WOOD STRUCTURAL PANEL SHEETS NOT LESS THAN 2'-0" IN LEAST DIMENSION NOR LESS THAN 8'-0" SQ FEET IN AREA. USE FULL SHEETS WHEREVER POSSIBLE.
2. PLACE WOOD STRUCTURAL PANEL SHEET WITH FACE PLIES PERPENDICULAR TO JOISTS AND STAGGER 4'-0" EDGES AS SHOWN.
3. COORDINATE JOIST LAYOUT WITH 4'-0" MODULE AS RELATED TO STRUCTURAL 1 RATED SHEATHING EXPOSURE 1.
4. ADHESIVE (FLOOR SHEATHING ONLY): ADHESIVE SHALL CONFORM TO APA SPECIFICATION AFG-01 OR ASTM D3498, APPLIED IN ACCORDANCE WITH THE ADHESIVE MANUFACTURER'S RECOMMENDATIONS. IF OSB PANELS WITH SEALED SURFACES AND EDGES ARE TO BE USED, USE ONLY SOLVENT-BASED GLUES; CHECK WITH PANEL MANUFACTURER.
   EXECUTION:
   A. APPLY A BEAD OF GLUE ABOUT 1/4 INCH IN DIA TO ALL CONTACT/BEARING SURFACES. ON WIDE AREAS APPLY GLUE IN SERPENTINE PATTERN.
   B. APPLY TWO BEADS OF GLUE ON JOISTS WHERE PANEL ENDS BUTT.
   C. APPLY GLUE PROGRESSIVELY TO BUTTING EDGES OF PANELS AND INTO GROOVED EDGES OF TONGUE AND GROOVE PANELS AS WORK PROCEEDS. COMPLETE NAILING OF EACH PANEL BEFORE GLUE SETS.
5. AT INTERIOR SHEARWALL LOCATIONS, PROVIDE DOUBLE LINES OF DIAPHRAGM NAILING INTO TRANSFER BLOCKING OR TOP PLATES.

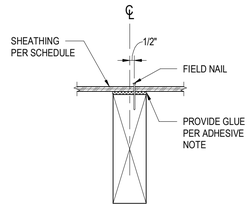
DIAPHRAGM SHEATHING SCHEDULE							
DIAPH TYPE	SHEATHING	NAILING					
		LINES OF FASTENERS	TYPE*	WIDTH OF NAILED FACE	BN	EN	FN
D1	15/32"	1	10d COMMON	2"	6"	6"	12"
D2	23/32"	1	10d COMMON	3"	6"	6"	12"

* NAILING TO BE RING OR SPIRAL SHANK, FULL HEAD.

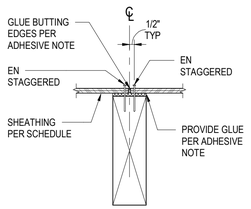
7 UNBLOCKED DIAPHRAGM SHEATHING SCHEDULE
NOT TO SCALE



A PLAN VIEW



B SECTION



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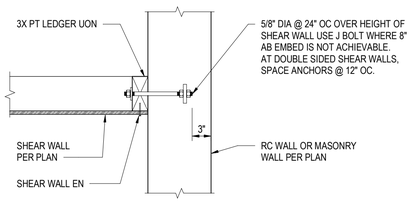

PLAN VIEW

4 SHEAR WALL END POST TO CONCRETE WALL
NOT TO SCALE

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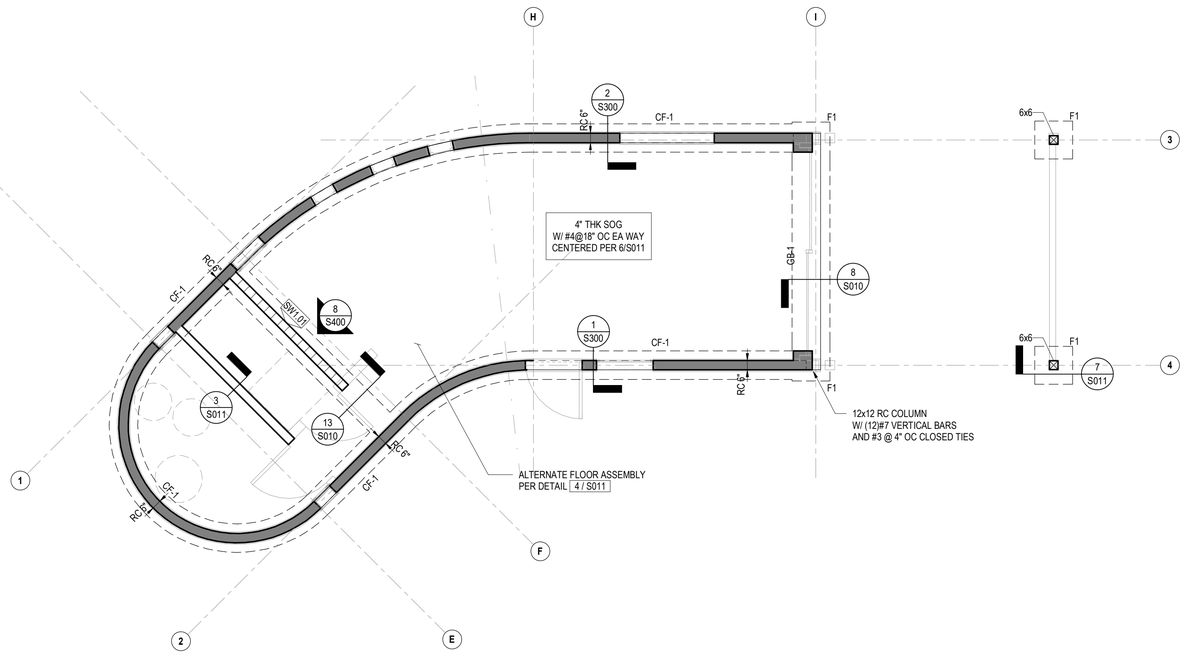
U.S. Department of Energy Solar Decathlon Build Challenge 2023

DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE
TYPICAL WOOD DETAILS

S032
SHEET OF



WOOD SHEAR WALL SCHEDULE			
WALL ID	SHEAR WALL TYPE	LENGTH	WIDTH
SW1.01	D	8'-6"	5 1/2"

CONTINUOUS FOOTING SCHEDULE					
TYPE MARK	WIDTH, W	DEPTH, D	TOP BARS	BOTTOM BARS	TRANSVERSE
CF-1	1' - 6"	1'-6"	(2) #6	(2) #6	#5@12

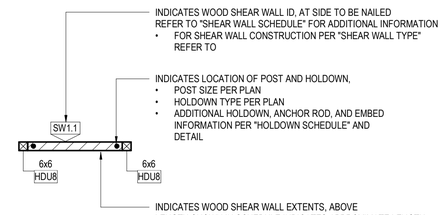
REINFORCED CONCRETE WALL SCHEDULE			
TYPE	WALL THICKNESS	VERTICAL REINFORCEMENT	HORIZONTAL REINFORCEMENT
RC 6"	6"	#5 @ 12" OC , CENTERED	#5 @ 12" OC , CENTERED

GRADE BEAM SCHEDULE					
TYPE MARK	WIDTH, W	DEPTH, D	T1	B1	TIES
GB-1	2' - 0"	1'-6"	(3) #5	(3) #5	#4 CLOSED STIRRUPS AT 6" OC

ISOLATED FOOTING SCHEDULE					
TYPE MARK	WIDTH, W	LENGTH, B	DEPTH, D	TOP BARS	BOTTOM BARS
F1	2' - 0"	2'-0"	1'-6"		(2) #4 BOT EW

FOUNDATION PLAN NOTES

1. TOP OF FOOTING GRADE BEAM ELEVATION TO BE 1'-0" BELOW TOP OF SLAB OR FINISHED GRADE, UON.
2. REFER TO S0 SERIES SHEETS FOR GENERAL NOTES AND TYPICAL DETAILS.
3. ALL SETTING OUT DIMENSIONS ARE TO BE READ IN CONJUNCTION AND CONFIRMED WITH ARCHITECTURAL DRAWINGS.
4. PRIOR TO REQUESTING A BUILDING DEPARTMENT FOUNDATION INSPECTION, THE SOILS ENGINEER/GEOTECHNICAL CONSULTANT SHALL INSPECT AND APPROVE THE FOUNDATION EXCAVATIONS.
5. EXCAVATIONS SHALL BE MADE AS NEAR AS POSSIBLE TO THE NEAT LINES REQUIRED BY THE SIZE AND SHAPE OF THE STRUCTURE. NO MATERIAL IS TO BE EXCAVATED UNNECESSARILY.
6. CURBS AND DEPRESSIONS ARE SHOWN FOR REFERENCE ONLY. SEE ARCH DWGS FOR LOCATIONS, HEIGHT, AND THICKNESS.
7. SEE ARCH DWGS FOR EDGE OF SLAB LOCATIONS.
8. VERIFY LOCATION OF UNDERGROUND UTILITIES BEFORE EXCAVATIONS. NOTIFY ARCHITECT PRIOR TO EXCAVATION IN THE EVENT SUCH UTILITIES ARE ENCOUNTERED.
9. FOR DRAINAGE DETAILS, SUMPS, PITS, DAMP PROOFING, TRENCHES, CURBS, EXTERIOR WALKS, UTILITIES, EQUIPMENT DETAILS, STEPS, ETC., SEE DRAWINGS OTHER THAN STRUCTURAL.
10. SLAB CONSTRUCTION AND CONTROL JOINT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO PLACING ANY CONCRETE.
11. PROVIDE A 6" CURB AT EXTERIOR TIMBER WALLS. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS.



1 LEVEL 1 FLOOR PLAN
1/4" = 1'-0"

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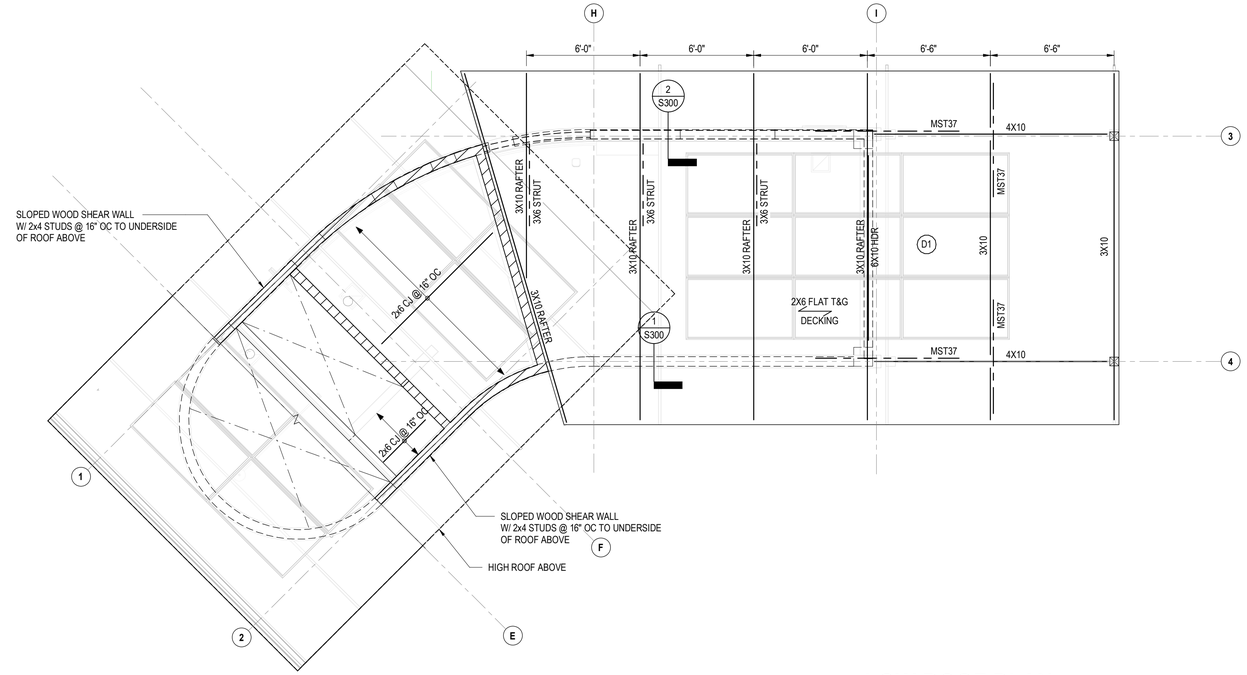
PROJECT MANAGER: KDS

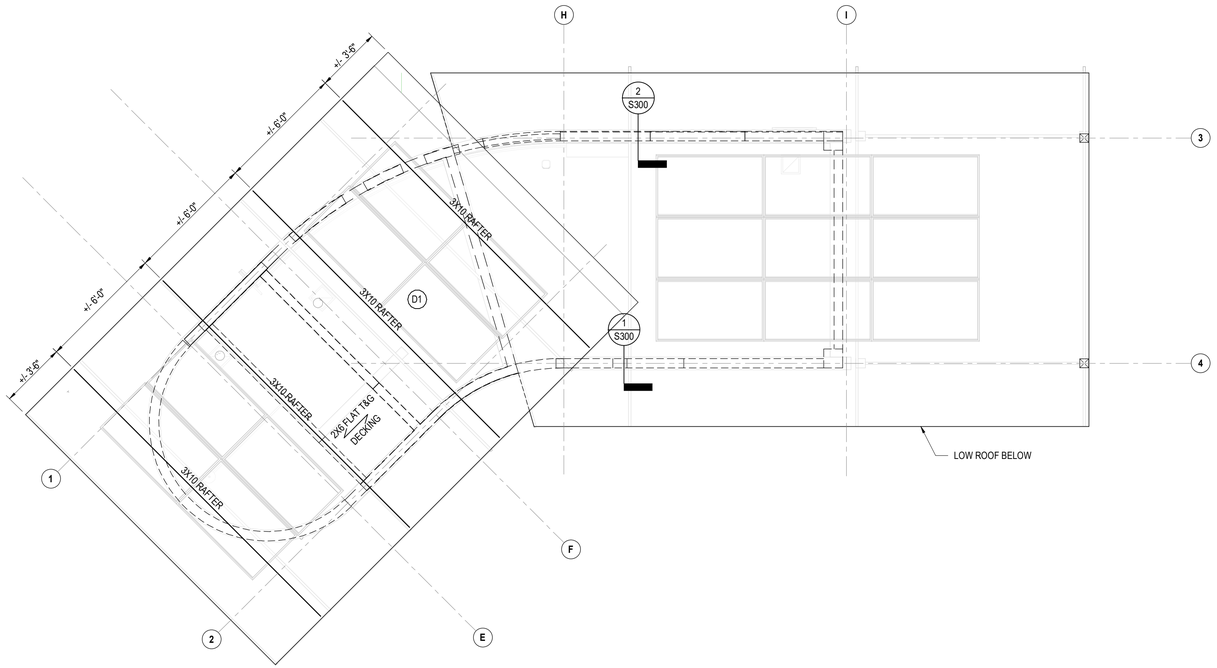
SHEET TITLE
PLANS

S201

SHEET OF



1 LOW ROOF PLAN
1/4" = 1'-0"



2 HIGH ROOF PLAN
1/4" = 1'-0"

FRAMING PLAN NOTES (WOOD DIAPHRAGM - WOOD FRAMING)

1. TOP OF SHEATHING PER PLAN (TOD).
2. REFER TO S0 SERIES SHEETS FOR GENERAL NOTES AND TYPICAL DETAILS.
3. DEPRESSIONS, CURBS, AND OPENINGS SHOWN ON THIS PLAN ARE NOT COMPLETE AS TO NUMBER, SIZE, AND LOCATION. FOR COMPLETE INFORMATION, REFER TO DRAWINGS OTHER THAN STRUCTURAL.
4. GENERAL CONTRACTOR SHALL COORDINATE THE LOCATION OF EQUIPMENT SUPPORT BEAMS AND BEAMS AROUND FLOOR OPENINGS WITH ALL PROJECT REQUIREMENTS.
5. EDGE OF SLAB LOCATIONS ARE APPROXIMATE, SEE ARCH DWGS FOR EDGE OF SLAB DIMENSIONS.

FRAMING PLAN LEGEND

INDICATES WALL BELOW

D1 — INDICATES DIAPHRAGM TYPE, FOR ADDITIONAL INFORMATION REFER TO 7 / S032

S1 — INDICATES STRAP PER SCHEDULE; INDICATES TOTAL STRAP LENGTH (FT)

SW1.1 — INDICATES WOOD SHEAR WALL ID, AT SIDE TO BE NAILED
REFER TO "SHEAR WALL SCHEDULE" FOR ADDITIONAL INFORMATION
- FOR SHEAR WALL CONSTRUCTION PER "SHEAR WALL TYPE" REFER TO

6x6 HDU8 / 6x6 HDU8 — INDICATES LOCATION OF POST AND HOLDOWN,
- POST SIZE PER PLAN
- HOLDOWN TYPE PER PLAN
- ADDITIONAL HOLDOWN, ANCHOR ROD, AND EMBED INFORMATION PER "HOLDOWN SCHEDULE" AND DETAIL

INDICATES WOOD SHEAR WALL EXTENTS, ABOVE LENGTH SHOWN IN SCHEDULE INDICATES APPROXIMATE LENGTH OF SHEAR WALL, ACTUAL LENGTH MAY DEVIATE +/- 6".

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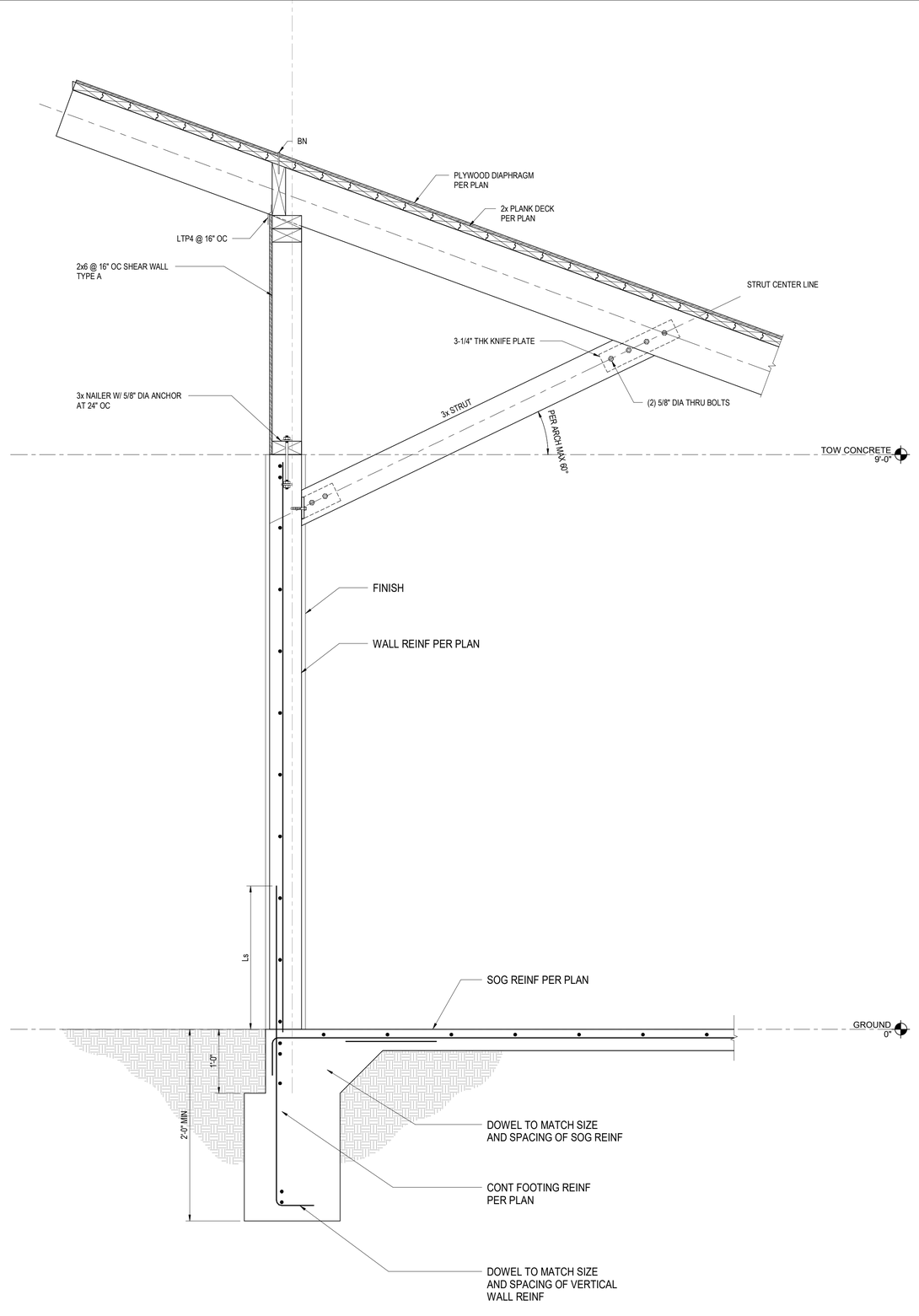
U.S. Department of Energy Solar Decathlon Build Challenge 2023

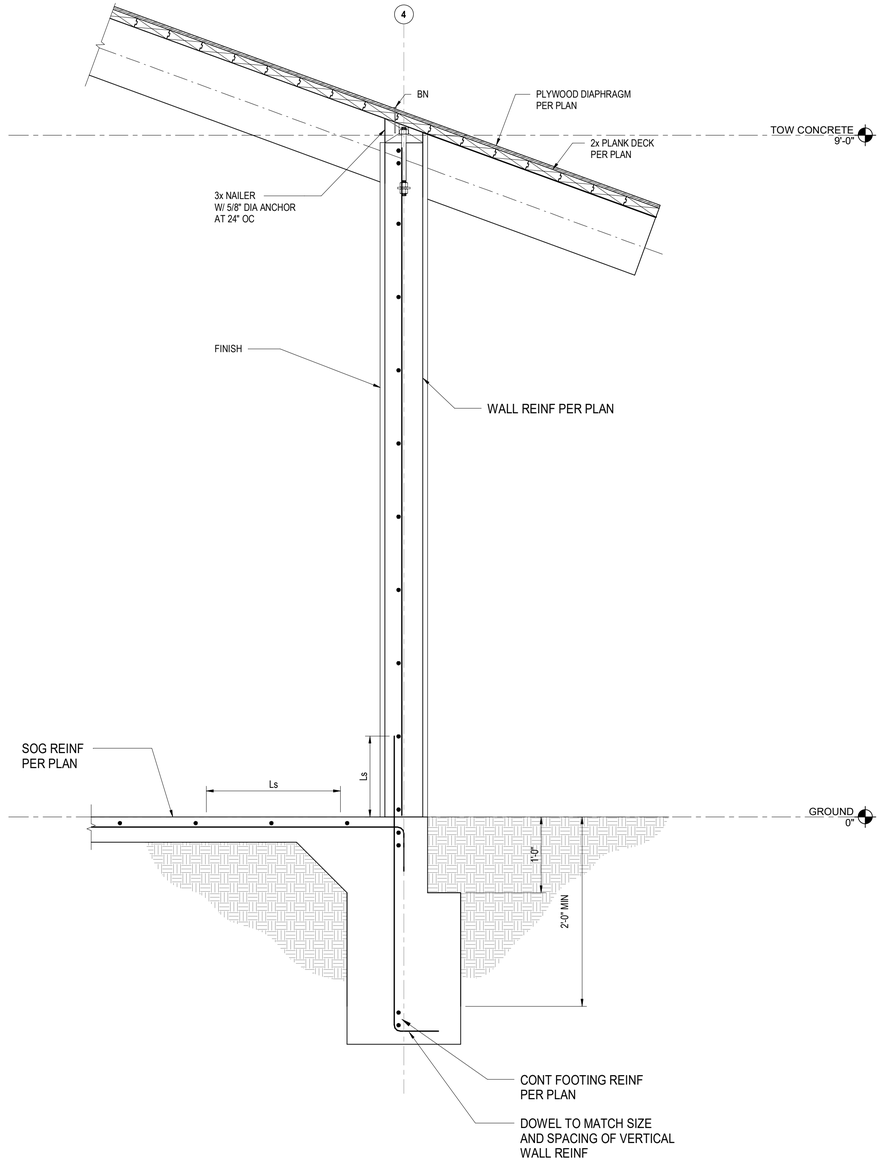
DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE
ROOF PLAN

S202
SHEET OF



2 SECTION
1" = 1'-0"



1 SECTION
1" = 1'-0"

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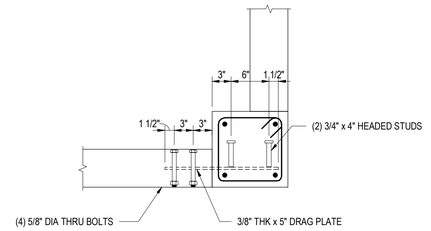
DRAWN BY: Author
CHECKED BY: Checker
PROJECT MANAGER: KDS

SHEET TITLE

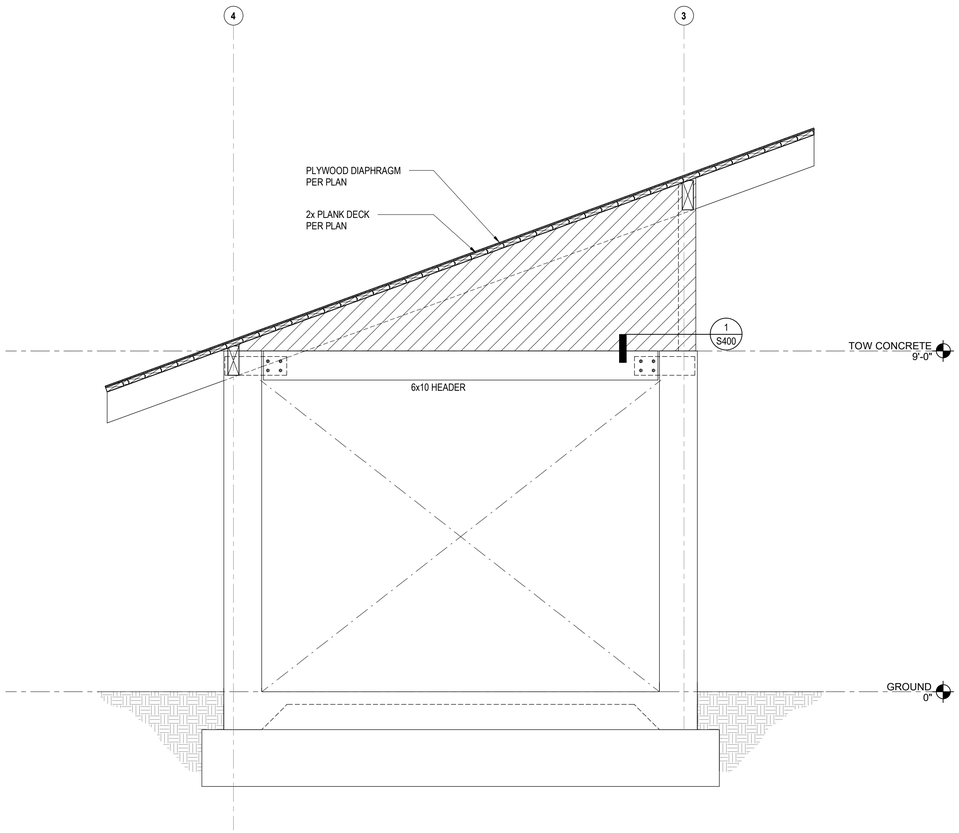
BUILDING SECTIONS

S300

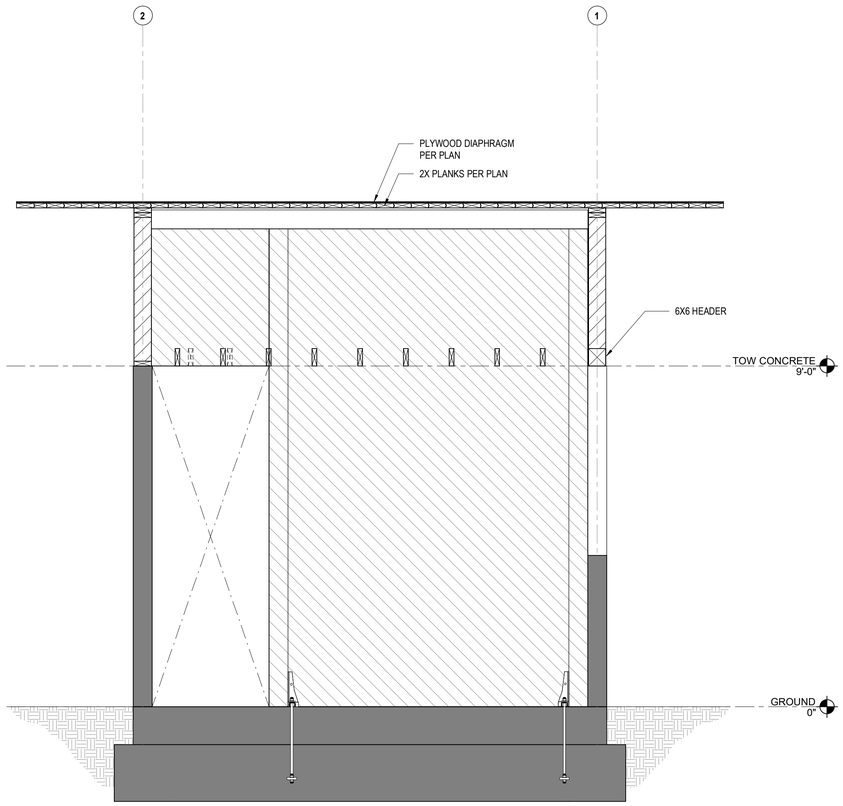
SHEET OF



1 DETAIL
1" = 1'-0"



16 WALL ELEVATION
1/2" = 1'-0"



8 WALL ELEVATION
1/2" = 1'-0"

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PROJECT MANAGER: KDS

SHEET TITLE
WALL ELEVATIONS

S400
SHEET OF