

GENERAL STRUCTURAL NOTES:

BUILDING CODE:
2006 INTERNATIONAL BUILDING CODE.

LOADS:
ROOF LIVE LOAD = 20 PSF
WIND LOAD = 90 MPH WIND SPEED, EXPOSURE B.
SEISMIC ZONE C

FOUNDATIONS:
SPREAD FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL. THIS CAN BE ENGINEERED FILL, NATURAL SOILS, OR BOTH.
SOIL BELOW FOOTINGS SHALL BE COMPACTED TO 95% MINIMUM.
DESIGN SOIL BEARING VALUE = 1,000 PSF WITHOUT SOILS REPORT

CONCRETE:
MINIMUM 28 DAY STRENGTH 2,500 PSI EXCEPT AS FOLLOWS:

SLABS ON GRADE ----- 2,500 PSI
FOUNDATIONS ----- 2,500 PSI

ALL CONCRETE CONSTRUCTION PER A.C.I. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AROUND TRENCHES, TURNDOWNS, UNDER-FLOOR DUCTS, ETC. MAXIMUM SLUMP 4 1/2" FOR CONCRETE WITHOUT PLASTICIZER. IF PLASTICIZER IS USED, A HIGHER FINAL SLUMP MAY BE ALLOWED UPON STRUCTURAL ENGINEER'S APPROVAL. UNLESS APPROVED OTHERWISE IN WRITING BY THE ARCHITECT, ALL CONCRETE SLABS ON GRADE SHALL BE BOUND BY CONTROL JOINTS (KEYED OR SAW CUT), SUCH THAT THE ENCLOSED AREA DOES NOT EXCEED 150 SQUARE FEET. KEYED CONTROL JOINTS NEED ONLY OCCUR AT EXPOSED EDGES DURING POURING; ALL OTHER JOINTS MAY BE SAW CUT.

FLY ASH - IF PERMITTED BY ARCHITECTURAL SPECIFICATIONS, SHALL BE LIMITED TO 12% OF CEMENTITIOUS MATERIALS AND SHALL HAVE A REPLACEMENT FACTOR OF 1.2 RELATIVE TO CEMENT REPLACED. NO FLY ASH ADDITIVES SHALL BE USED IN FLATWORK OR ARCHITECTUREALLY EXPOSED CONCRETE.

MASONRY:
HOLLOW CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, GRADE N, TYPE 1, F_m = 1,500 PSI, RUNNING BOND, MORTAR TYPE S, 1,800 PSI. GROUT 2,000 PSI.

MECHANICALLY VIBRATE GROUT IMMEDIATELY AFTER POURING. PROVIDE CLEANOUTS IF GROUT LIFT EXCEEDS 5'-0" IN BLOCK WALLS. MAXIMUM GROUT LIFT SHALL BE 8'-0". FILL CELLS WITH GROUT IN LIFTS AND STOP POURS 1 1/2" BELOW TOP OF A COURSE TO FORM A KEY (EXCEPT AT BOND BEAMS). PLACE CONTROL JOINTS IN MASONRY WALLS SUCH THAT NO STRAIGHT RUN OF WALL EXCEEDS 24'-0". CONTROL JOINTS SHALL NOT OCCUR AT WALL CORNERS, INTERSECTIONS OR ENDS. ALL MASONRY BELOW FINISHED FLOOR OR GRADE SHALL BE GROUTED SOLID.

VERTICAL REINFORCING:
#4 IN CENTER OF GROUT AT CENTER OF WALL, CONTINUOUS FULL HEIGHT OF WALL AT ALL CORNERS, INTERSECTIONS, WALL ENDS, EACH SIDE OF CONTROL JOINTS AND AT INTERVALS NOT TO EXCEED 48" O.C. UNLESS NOTED OTHERWISE. DOWEL ALL VERTICAL REINFORCING TO FOUNDATION WITH DOWELS TO MATCH VERTICAL REINFORCING.

HORIZONTAL REINFORCING:
2 #4 IN MINIMUM 8" DEEP GROUTED CONTINUOUS BOND BEAM AT TOP OF A FREESTANDING WALL. PLACE THESE BARS CONTINUOUS THROUGH CONTROL JOINTS. PROVIDE BENT BARS TO MATCH HORIZONTAL BOND BEAM REINFORCING AT CORNERS AND WALL INTERSECTION TO MAINTAIN BOND BEAM CONTINUITY. STANDARD WEIGHT (NO. 9 GAGE WIRE) DUR-O-WAL OR DUR-O-WIRE (OR EQUIVALENT) LADDER TYPE JOINT REINFORCEMENT AT 16" O.C. IN MASONRY WALLS.

MASONRY LAP SPLICES:
MASONRY LAP SPLICES SHALL BE 40 BAR DIAMETERS FOR GRADE 40 BARS. STAGGER SPLICES A MINIMUM OF 40 BAR DIAMETERS. DO NOT SPLICE HORIZONTAL BARS WITHIN 8"-0" OF CONTROL JOINTS. LAP HORIZONTAL JOINT REINFORCING 8" MINIMUM.

REINFORCING:
ASTM A615 (F_y = 40 KSI) DEFORMED BARS FOR ALL BARS #4 AND SMALLER. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE STRUCTURAL ENGINEER. LATEST A.C.I. CODE AND DETAILING MANUAL APPLY. CLEAR CONCRETE COVERAGES AS FOLLOWS:
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ----- 3"
EXPOSED TO EARTH OR WEATHER ----- 1 1/2"
#5 AND SMALLER ----- 3/4"
FLAT SLAB ----- 3/4"
ALL OTHER PER LATEST EDITION OF A.C.I. 318.

LAP SPLICES IN CONCRETE:
LAP SPLICES, UNLESS NOTED OTHERWISE, SHALL BE CLASS "B" TENSION LAP SPLICES PER LATEST EDITION OF A.C.I. 318. STAGGER SPLICES A MINIMUM OF ONE LAP LENGTH.

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

ALL REINFORCING SHALL BE CHAIRED TO ENSURE PROPER CLEARANCES. SUPPORT OF FOUNDATION REINFORCING MUST PROVIDE ISOLATION FROM MOISTURE/CORROSION.

STRUCTURAL STEEL:
ALL STRUCTURAL STEEL SHALL BE ASTM A36 (F_y = 36 KSI). ALL BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE. ALL CONSTRUCTION PER LATEST AISC HANDBOOK. ALL BOLTS, ANCHOR BOLTS, EXPANSION BOLTS, ETC. SHALL BE INSTALLED WITH STEEL WASHERS AT FACE OF WOOD.

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

WOOD TYPE	
JOISTS	
2 X 4 -----	D.F. LARCH #2
2 X 6 OR LARGER -----	D.F. LARCH #2
BEAMS	
WIDTH 4" OR LESS -----	D.F. LARCH #2
WIDTH GREATER THAN 4" -----	D.F. LARCH #1
LEDGERS AND TOP PLATES	
2 X 4 -----	D.F. LARCH #2
2 X 6 OR LARGER -----	D.F. LARCH #2
POSTS	
4 X 4 -----	D.F. LARCH #2
4 X 6 OR LARGER -----	D.F. LARCH #2
6 X 6 OR LARGER -----	D.F. LARCH #1

GLUED-LAMINATED BEAMS (GLULAM):
GLUED-LAMINATED BEAMS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES: F_b = 2,400 PSI, F_v = 155 PSI, F_c (PERPENDICULAR) = 650 PSI, E = 1,700,000 PSI (24F -V3, -V4, -V5 OR -V11). BEAMS CANTILEVERING OVER SUPPORTS SHALL HAVE THE SPECIFIED MINIMUM PROPERTIES TOP AND BOTTOM (24F AND 24B). ALL GLULAM BEAMS SHALL BE FABRICATED USING WATERPROOF GLUE. FABRICATION AND HANDLING PER LATEST AITC AND WCLA STANDARDS. BEAMS TO BEAR GRADE STAMP AND AITC STAMP AND CERTIFICATE. CAMBER AS SHOWN ON DRAWINGS.

PLYWOOD:
ALL PLYWOOD SHALL BE CDX OR BETTER AND SHALL BEAR THE STAMP OF AN APPROVED TESTING AGENCY. LAY UP PLYWOOD WITH FACE GRAIN PERPENDICULAR TO SUPPORTS. STAGGER JOINTS, ALL NAILING, COMMON NAILS. WHERE SCREWS ARE INDICATED FOR WOOD TO WOOD ATTACHMENTS, USE WOOD SCREWS. ALL PLYWOOD SHALL BE OF THE FOLLOWING NOMINAL THICKNESS, SPAN/INDEX RATIO AND SHALL BE ATTACHED AS FOLLOWS UNLESS NOTED OTHERWISE:

USE	THICKNESS	SPAN/INDEX RATIO	EDGE ATTACHMENT	INTERMEDIATE ATTACHMENT
ROOF -----	1/2"	32/16	8d @ 6" O.C.	8d @ 12" O.C.
TILE ROOF -----	5/8"	32/16	8d @ 6" O.C.	8d @ 12" O.C.
SHEAR WALL -----	3/8"	24/0	8d @ 6" O.C. U.N.O.	8d @ 12" O.C. U.N.O.

ALTERNATE:
AMERICAN PLYWOOD ASSOCIATION PERFORMANCE RATED SHEATHING MAY BE USED AS AN ALTERNATE TO PLYWOOD WITH PRIOR APPROVAL OF OWNER, ARCHITECT AND ROOFING CONTRACTOR. WHERE ROOF IS TO BE GUARANTEED, IT MAY NOT BE USED WITHOUT PRIOR APPROVAL FROM BUILDING DEPARTMENT. SHEATHING SHALL BE OF THE FOLLOWING NOMINAL THICKNESS, SPAN/INDEX RATIO AND SHALL HAVE A SPAN RATING AND SHEAR VALUES EQUIVALENT TO OR BETTER THAN THE PLYWOOD IT REPLACES (2 - M - W MIN). ATTACHMENT AND THICKNESS (WITHIN 1/32") SHALL BE THE SAME AS THE PLYWOOD IT REPLACES. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

GENERAL:
ALL NAILING, COMMON NAILS, DO NOT NOTCH OR DRILL JOISTS, BEAMS OR LOAD BEARING STUDS WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER THROUGH THE ARCHITECT. DOUBLE UP FLOOR JOISTS AND BLOCKING UNDER PARTITIONS. PROVIDE 2" SOLID BLOCKING AT SUPPORTS OF ALL JOISTS. DOUBLE UP STUDS AT JAMBS AND AS REQUIRED UNDER BEAMS IN BEARING WALLS. EVERY OTHER STUD OF WOOD FRAME BEARING WALL SHALL HAVE A SIMPSON H3 ANCHOR TOP AND BOTTOM, EXCEPT AT THOSE WALLS WHERE PLYWOOD SHEATHING IS NAILED DIRECTLY TO THE TOP AND BOTTOM PLATES. PROVIDE 2X SOLID BLOCKING AT MID-HEIGHT OF BEARING STUD WALLS. ALL NAILING NOT NOTED SHALL BE ACCORDING TO 2000 INTERNATIONAL RESIDENTIAL CODE. WOOD CONNECTORS SHALL BE AS MANUFACTURED BY SIMPSON STRONG-TIE COMPANY, INC. U.N.O. SUBSTITUTION OF OTHER I.C.B.O. APPROVED HANGERS REQUIRES PRIOR APPROVAL OF OWNER, ARCHITECT AND STRUCTURAL ENGINEER.

PREFABRICATED ROOF TRUSSES:

1. PREFABRICATED WOOD TRUSSES SHALL BE FACTORY FABRICATED TO THE DIMENSIONS AND CONFIGURATION SHOWN ON THE DRAWINGS, AND SHALL BE DESIGNED TO SUPPORT THE LOADS NOTED HEREIN AND ON THE DRAWINGS, BASED ON THE LAYOUT SHOWN. TRUSSES SHALL BE AS DESIGNED AND MANUFACTURED BY AN EXPERIENCED MANUFACTURER.
2. ALL LUMBER USED FOR TRUSS MEMBERS SHALL BE S4S, S-DRY, AND CONFORM TO THE REFERENCE PUBLICATIONS LISTED IN THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION STANDARD 101-72. THE MOISTURE CONTENT OF ALL LUMBER SHALL BE WITHIN THE PROPER LIMITS, AS STATED IN THE REFERENCED SPECIFICATIONS, BUT SHALL NOT IN ANY CASE EXCEED 19% NOR BE LESS THAN 7% AT THE TIME OF FABRICATION.
3. ALL TRUSS DESIGNS SHALL BEAR NAME, SEAL, REGISTRATION NUMBER AND STATE OF REGISTRY OF A LICENSED PROFESSIONAL ENGINEER, SIGNIFYING THAT HE HAS PERSONALLY ACCEPTED SAID TRUSS DESIGNS AS BEING SUITABLE AND PERTINENT TO THIS PROJECT.

MINIMUM DESIGN GUIDELINES:
SUPERIMPOSED DEAD LOAD ON ROOF TRUSSES = 24 PSF
(16 PSF TOP CHORD, 8 PSF BOTTOM CHORD)

GENERAL:
THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS).

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

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

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

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

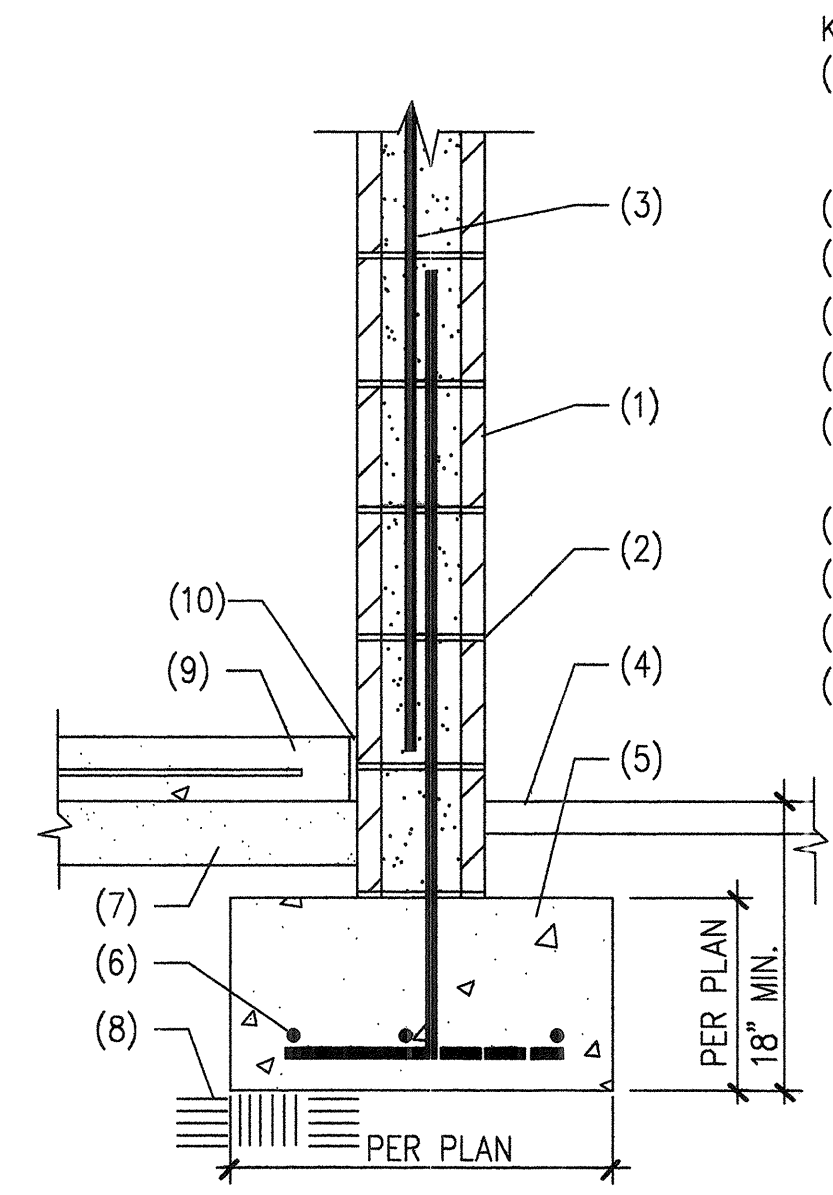
NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT.

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

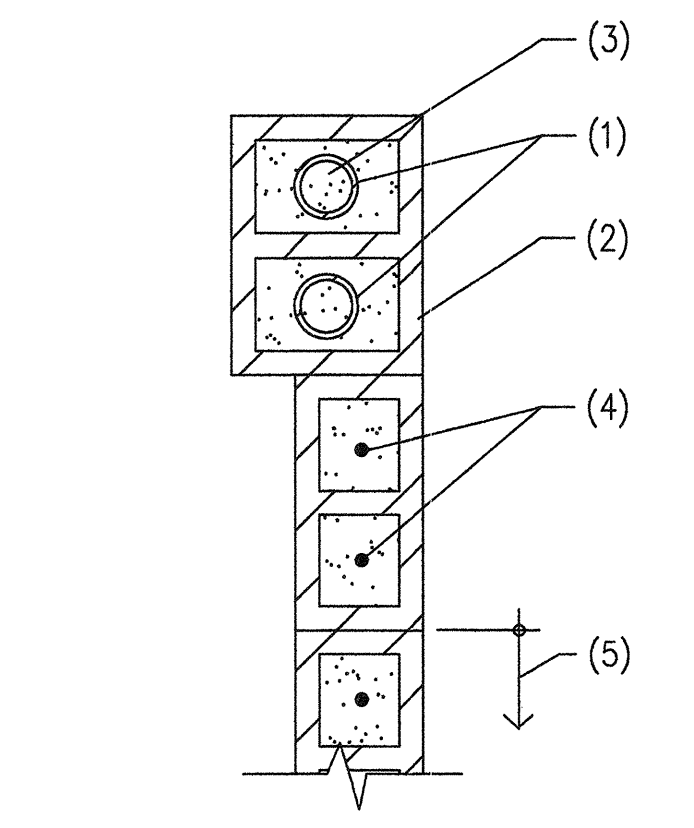
TYPICAL DETAILS MAY NOT NECESSARILY BE OUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

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

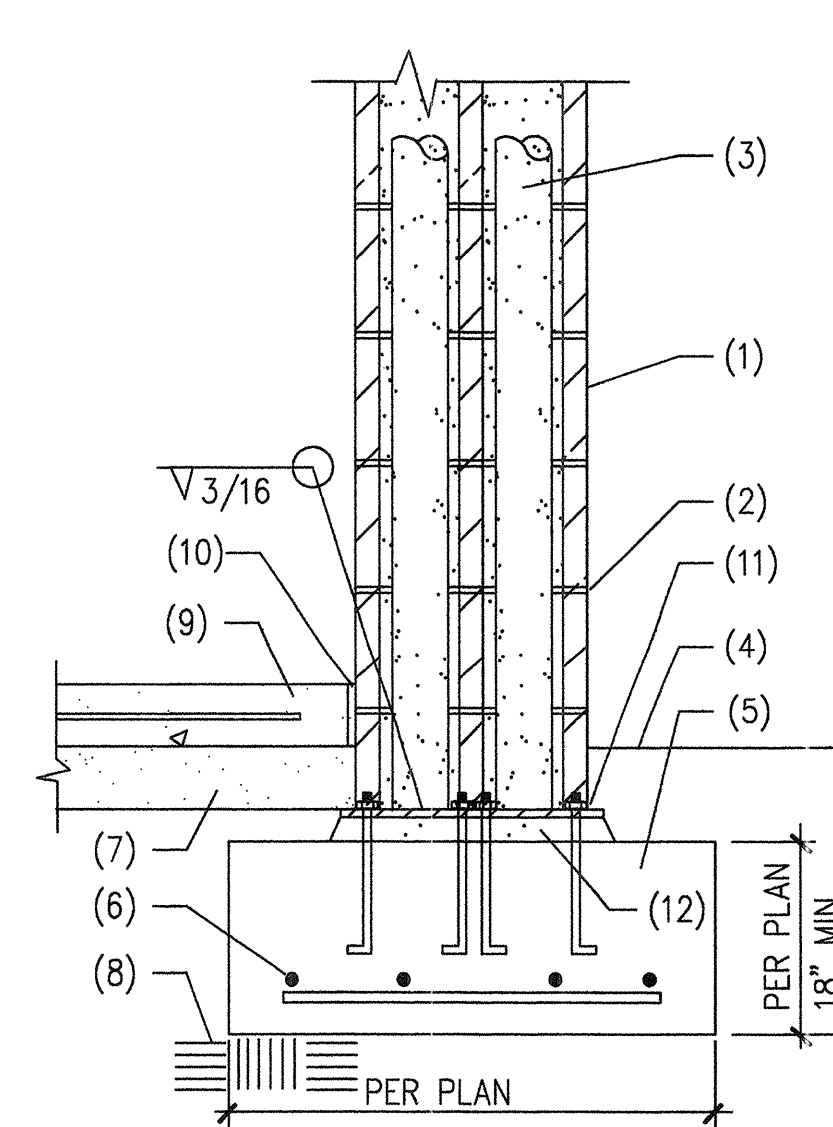
ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF AN ENGINEER REGISTERED IN THE STATE OF ARIZONA.



1 CMU WALL & FOOTING N.T.S.

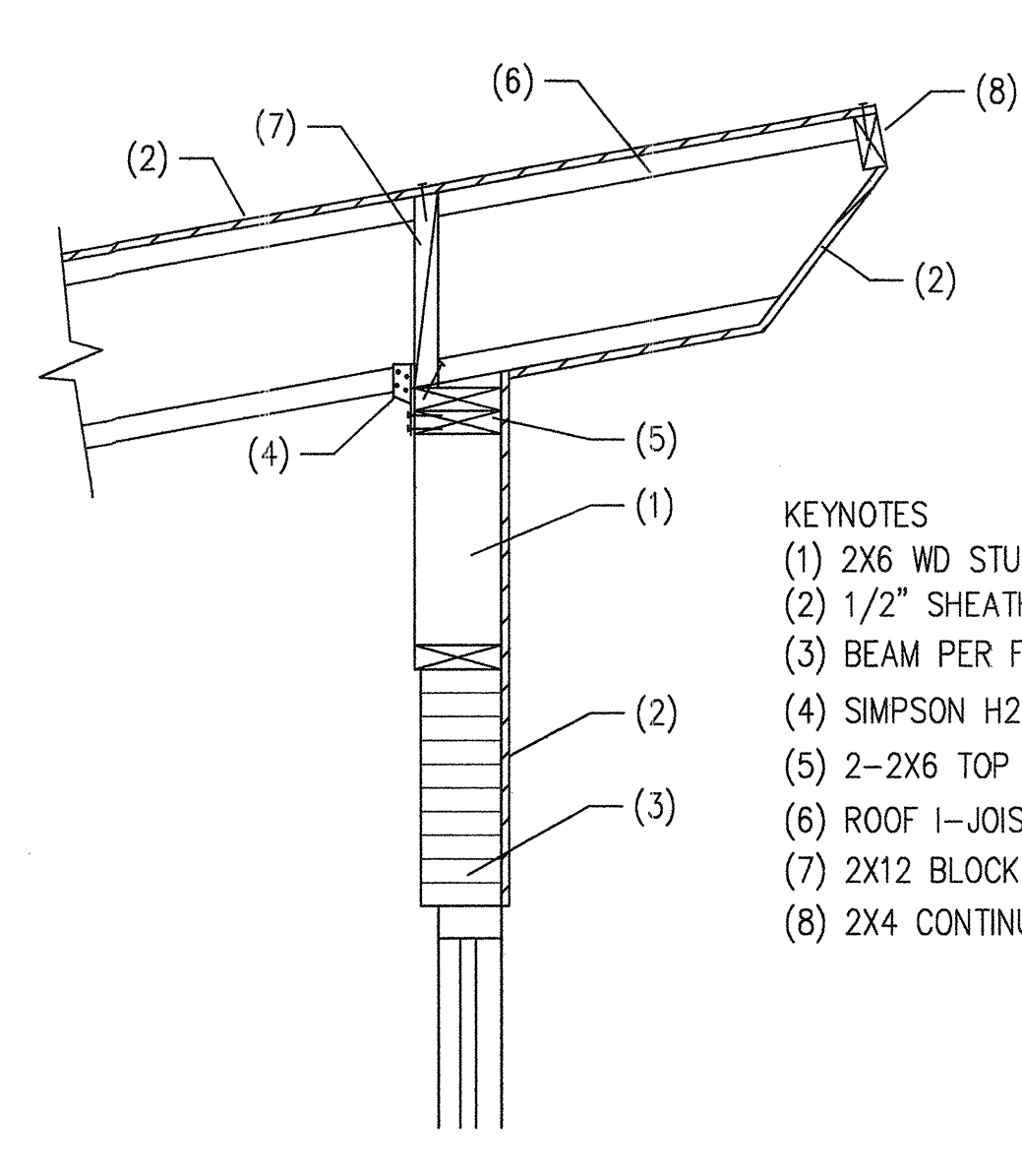


2 CMU & STEEL PIPE COLUMN N.T.S.

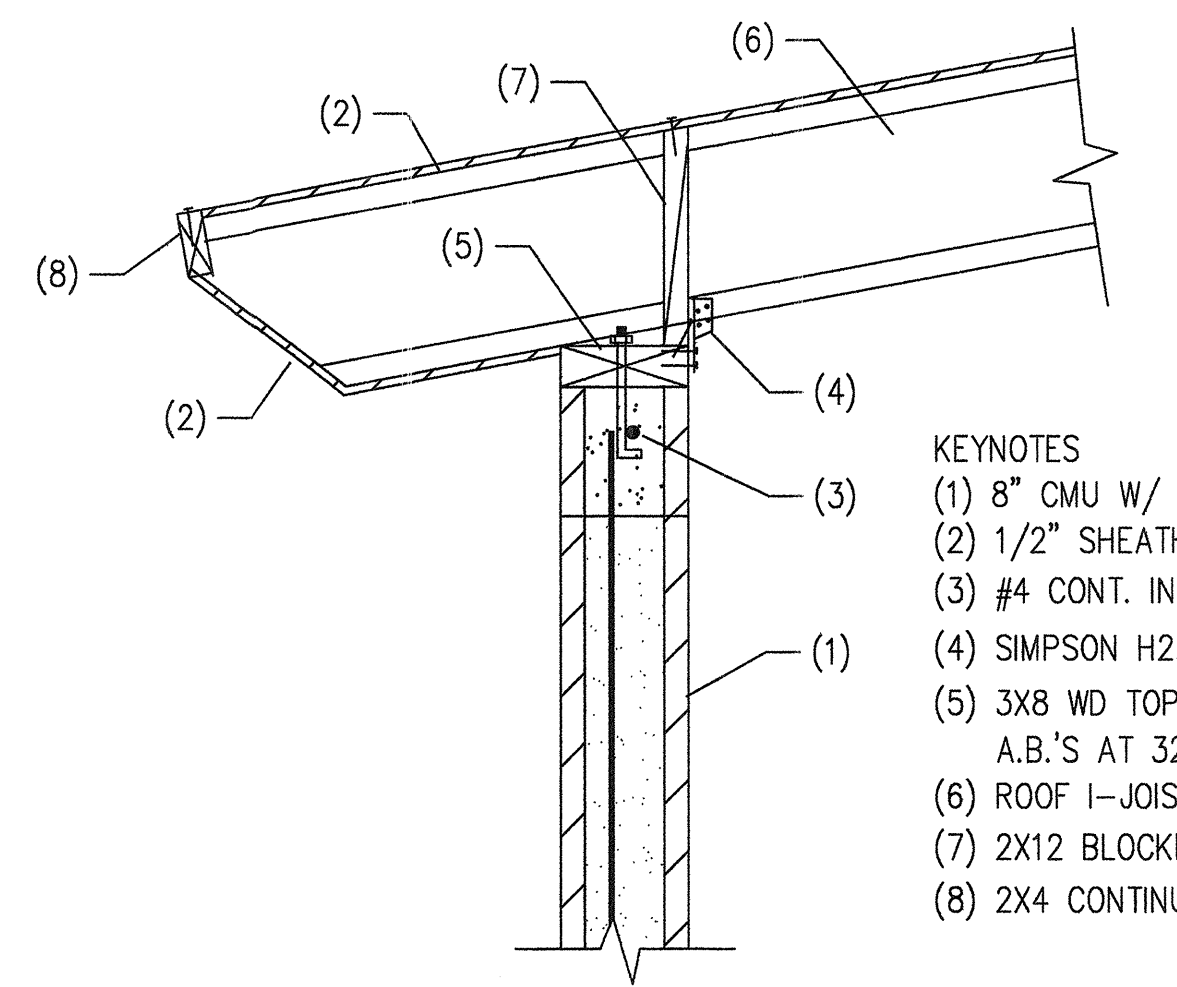


3 CMU & STEEL COL. FOOTING N.T.S.

- KEYNOTES**
- (1) 8"x8"x16" COLORED SPLIT FACE CMU WITH #4 VERTS @ 32" O.C.
 - (2) DURAWALL @ 16" O.C.
 - (3) REBAR MATCH & LAP
 - (4) ASPHALT OR FINISHED GRADE
 - (5) CONC. FTG PER PLAN
 - (6) REBAR PER PLAN, 3" MIN. CLEAR ALL SIDES TO SOIL
 - (7) AGGREGATE BASE COURSE
 - (8) MIN. 95% COMPACTED SUB BASE
 - (9) CONC. SLAB PER PLAN
 - (10) 1/2" EXPANSION MATERIAL



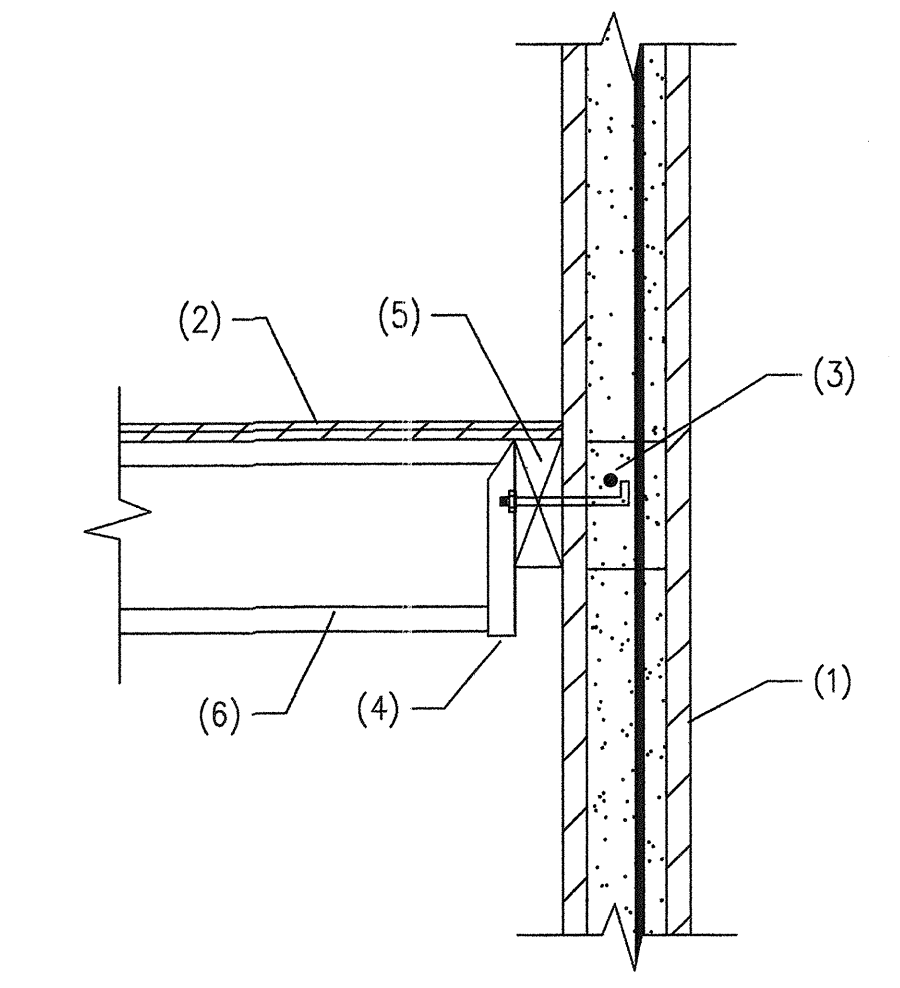
4 ROOF JOISTS AT WOOD FRAMING N.T.S.



5 ROOF JOISTS BEARING @ CMU N.T.S.

- KEYNOTES**
- (1) 3 1/2" DIA. (4" O.D.) STL COL STRONG PIPE COLUMN (.318" WALL THICKNESS)
 - (2) 12"x8"x16" CMU FULL HT
 - (3) GROUT SOLID, INCLUDING INSIDE PIPE COLUMN
 - (4) 2-#4 IN SOLID GROUTED CELLS
 - (5) 8" CMU W/ #4 VERT. @ 32" O.C.

- KEYNOTES**
- (1) 12"x8"x16" COLORED SPLIT FACE CMU GROUT SOLID FULL HT
 - (2) DURAWALL @ 16" O.C.
 - (3) 3 1/2" DIA. EXTRA STONG PIP COLUMN (.318" WALL THICKNESS) FULL MAS. HEIGHT
 - (4) ASPHALT OR FINISHED GRADE
 - (5) CONC. FTG PER PLAN
 - (6) REBAR PER PLAN, 3" MIN. CLEAR ALL SIDES TO SOIL
 - (7) AGGREGATE BASE COURSE
 - (8) MIN. 95% COMPACTED SUB BASE
 - (9) CONC. SLAB PER PLAN
 - (10) 1/2" EXPANSION MATERIAL
 - (11) STEEL PLATE 1/2"x10" SQ. W/ 4-3/4"x10" A.B.'S
 - (12) 1 1/2" +- DRYPACK



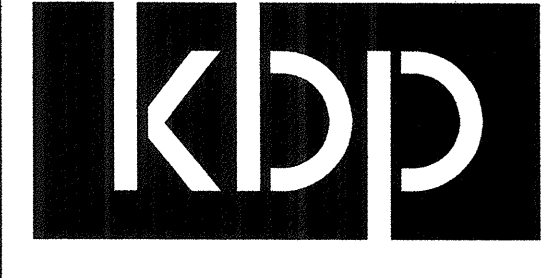
6 FLOOR JOISTS AT LEDGER N.T.S.

- KEYNOTES**
- (1) 2X6 WD STUDS @ 16" O.C.
 - (2) 1/2" SHEATHING PER GEN'L NOTES
 - (3) BEAM PER FRAMING PLAN
 - (4) SIMPSON H2.5 EACH JOIST
 - (5) 2-2X6 TOP PLATE
 - (6) ROOF I-JOISTS PER FRAMING PLAN
 - (7) 2X12 BLOCKING
 - (8) 2X4 CONTINUOUS FASCIA

- KEYNOTES**
- (1) 8" CMU W/ #4 VERT. @ 32" O.C.
 - (2) 1/2" SHEATHING PER GEN'L NOTES
 - (3) #4 CONT. IN HORIZ. BOND BEAM
 - (4) SIMPSON H2.5 EACH JOIST
 - (5) 3X8 WD TOP PLATE W/ 1/2" X 8" A.B.'S AT 32" O.C.
 - (6) ROOF I-JOISTS PER FRAMING PLAN
 - (7) 2X12 BLOCKING
 - (8) 2X4 CONTINUOUS FASCIA



THESE DRAWINGS WERE PREPARED BY OTHERS AND REVIEWED FOR CONFORMANCE WITH MY STRUCTURAL CALCULATIONS

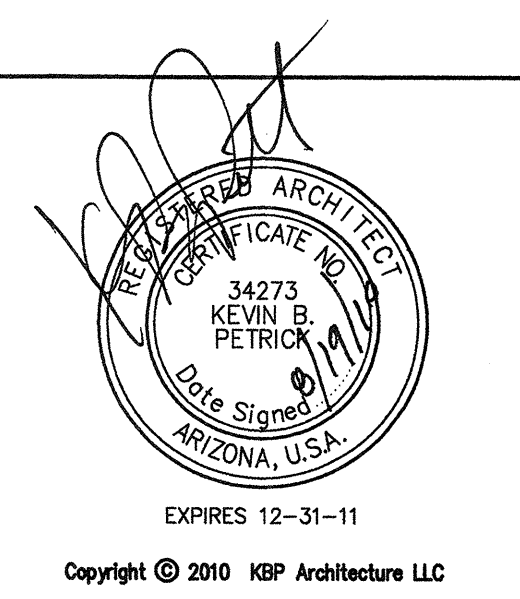


kbp architecture

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Project:

New two story office & garage building

for
Ventana Canyon Car Wash

4888 N. Sabino Canyon Rd.
Tucson, Arizona

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△ drawing revisions:

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date: **AUGUST 19, 2010**

sheet title: **STRUCTURAL NOTES & DETAILS**

sheet number:

S.3