

# GENERAL STRUCTURAL NOTES

## A. GENERAL REQUIREMENTS

METHOD OF CONSTRUCTION: THE CONTRACT STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION VISITS TO THE SITE BY THE STRUCTURAL ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS

TYPICAL DETAILS: TYPICAL DETAILS AND NOTES ON THESE SHEETS SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE ALL WORK OR CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATIONS AND SAFETY REQUIREMENTS. WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE IF HE CHOOSES AN OPTION, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES AND SHALL COORDINATE ALL DETAILS

DISCREPANCIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS, EXISTING CONDITIONS AND ELEVATIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ARCHITECT OF ANY DISCREPANCIES OR OMISSIONS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS AND GENERAL STRUCTURAL NOTES, 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.

SHORING IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SHORING, BRACING AND FORM-WORK, ETC., AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.

## B. BASIS FOR DESIGN

BUILDING CODE 1991 EDITION OF THE UNIFORM BUILDING CODE

VERTICAL LOADS.

| DESCRIPTION | LIVE LOAD PSF  | DEAD LOAD PSF |
|-------------|----------------|---------------|
| ROOF        | 20 (REDUCIBLE) | 12            |
| FLOOR       | NOT APPLICABLE | 14            |

LATERAL LOADS SEISMIC ZONE ZB, IMPORTANCE FACTOR 1  
WIND - 75 MPH WIND SPEED ZONE, EXPOSURE B

## C. CONCRETE

CONCRETE STRENGTH AND QUALITY SHALL BE AS FOLLOWS

| CONCRETE USE      | STRENGTH AT 28 DAYS | SUMP | AGGREGATE SIZE | AGGREGATE TYPE |
|-------------------|---------------------|------|----------------|----------------|
| CURBS WATER TOWER | 3000                | 4"   | 3/4"           | HARDROCK       |
| GRADE SLAB        | 2500                | 4"   | 1"             | HARDROCK       |
| FOOTINGS          | 2500                | 4"   | 1-1/2"         | HARDROCK       |

CEMENT PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE V FOR CONCRETE IN CONTACT WITH EARTH, AND TYPE II ELSEWHERE

CONCRETE AGE: NO MORE THAN 90 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT UNLESS APPROVED BY TESTING AGENCY

CONCRETE PLACEMENT AND QUALITY SHALL BE PER RECOMMENDATIONS IN ACI 614, ACI 301 AND ACI 318. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED, EXCEPT THAT SLABS ON GRADE NEED BE VIBRATED ONLY AROUND UNDER FLOOR DUCTS, ETC

## D. REINFORCING STEEL

REINFORCING QUALITY: ASTM A615 GRADE 60 (FY = 60 KSI) DEFORMED BARS FOR ALL BARS #5 AND LARGER, ASTM A615 GRADE 40 (FY = 40 KSI) DEFORMED BARS FOR ALL BARS #4 AND SMALLER

REINFORCING COVER: ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" ARE TO CENTER OF STEEL. MINIMUM COVER FOR NONPRESTRESSED CONCRETE REINFORCING SHALL BE AS FOLLOWS:

| CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH                   | MINIMUM COVER | TOLERANCES + OR - |
|---|---------------|-------------------|
| EXPOSED TO EARTH OR WEATHER NO 5 AND SMALLER BARS               | 1-1/2"        | 3/8 INCH          |
| NO 6 AND LARGER BARS  | 2"            | 3/8 INCH          |
| NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND ROOF SLAB: | 1"            | 1/8 INCH          |
| SLABS ON GRADE:   | 1-1/2"        | 1/4 INCH          |

LAP SLICES IN CONCRETE: LAP SPICES UNLESS NOTED OTHERWISE, SHALL BE CLASS "B" TENSION LAPS PER LATEST EDITION OF ACI 318. STAGGER SPICES A MINIMUM OF ONE LAP LENGTH. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE STRUCTURAL ENGINEER. LATEST ACI CODE AND DETAILING MANUAL APPLY

## E. STEEL

MATERIALS: STANDARD STRUCTURAL STEEL SHAPES, ROLLED SECTIONS, BARS AND PLATES SHALL CONFORM TO ASTM A36 (FY = 36 KSI). ALL PIPE STEEL SHALL BE ASTM A501 (FY = 36 KSI) OR ASTM A53, TYPE E OR S, GRADE B (FY = 35 KSI). ALL TUBULAR STEEL SHALL BE ASTM A500 (FY = 46 PSI). ALL BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE.

BOLTS / STUDS: ALL BOLTS SHALL BE ASTM A307, UNLESS NOTED OTHERWISE. ALL EXPANSION BOLTS TO HAVE CURRENT I.C.B.O. RATING FOR MATERIAL INTO WHICH INSTALLATION TAKES PLACE. ALL BOLTS, ANCHOR BOLTS, EXPANSION BOLTS, ETC. SHALL BE INSTALLED WITH STEEL WASHERS AT FACE OF WOOD OR AT SLOTTED HOLES IN STEEL SECTIONS.

STEEL FABRICATION: ALL STRUCTURAL AND MISCELLANEOUS STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, LATEST EDITION

WELDING: WELDING SHALL BE BY WELDERS HOLDING VALID CERTIFICATES AND HAVING CURRENT EXPERIENCE IN THE TYPE OF WELD SHOWN ON THE DRAWINGS OR NOTES. ALL WELDING DONE BY E70 SERIES LOW HYDROGEN RODS FOR ASTM A615-GRADE 60 REINFORCING BARS, USE E90 SERIES. ALL WELDING PER LATEST AMERICAN WELDING SOCIETY STANDARDS. ALL WELDS ON DRAWINGS ARE SHOWN AS SHOP WELDS. CONTRACTOR MAY SHOP WELD OR FIELD WELD AT HIS DISCRETION

DRYPACK: DRYPACK SHALL BE 5,000 PSI FIVE STAR NON-SHRINK GROUT OR EQUIVALENT. INSTALL DRYPACK UNDER BEARING PLATES BEFORE FRAMING MEMBER IS INSTALLED. AT COLUMNS, INSTALL DRYPACK UNDER BASEPLATES AFTER COLUMN HAS BEEN PLUMBED BUT PRIOR TO FLOOR OR ROOF INSTALLATION

## F. WOOD

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

USE JOISTS TYPE

|                        |                      |
|------------------------|----------------------|
| 2 X 4                  | Douglas Fir No 2     |
| 2 X 6 or LARGER BEAMS  | Douglas Fir No. 2    |
| WIDTH 4" OR LESS       | Douglas Fir No 1     |
| WIDTH GREATER THAN 4"  | Douglas Fir No 1     |
| LEDGERS AND TOP PLATES | Douglas Fir No 2     |
| STUDS                  | Douglas Fir Standard |
| 2 X 4                  | Douglas Fir No 2     |
| 2 X 6 OR LARGER POSTS  | Douglas Fir No 2     |
| 4 X 4                  | Douglas Fir No 2     |
| 4 X 6 OR LARGER        | Douglas Fir No 2     |
| 6 X 6 OR LARGER        | Douglas Fir No 1     |

PLYWOOD: ALL PLYWOOD SHALL BE C-D OR C-C SHEATHING CONFORMING TO STANDARD PS 1-74. LAY UP PLYWOOD WITH FACE GRAIN IN PERPENDICULAR TO SUPPORTS (ON ROOFS WHERE PLYWOOD IS LAID UP WITH FACE GRAIN PARALLEL TO SUPPORTS, USE A MINIMUM OF 5-PLY PLYWOOD, STAGGER JOINTS). ALL NAILING, COMMON NAILS BLOCKING AT PANEL EDGES. ALL PLYWOOD SHALL BE OF THE FOLLOWING NOMINAL THICKNESS, SPAN/INDEX RATIO AND SHALL BE NAILED AS FOLLOWS UNLESS NOTED OTHERWISE:

| USE   | THICKNESS  | NAILING       | NAILING        |
|-------|------------|---------------|----------------|
| ROOF  | 1/2"       | 8d @ 6" O.C.  | 8d @ 12" O.C.  |
| FLOOR | 5/8" (TAG) | 10d @ 6" O.C. | 10d @ 10" O.C. |

GENERAL: DO NOT NOTCH OR DRILL JOISTS, BEAMS OR LOAD BEARING STUDS WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER THROUGH THE ARCHITECT. DOUBLE UP FLOOR JOISTS AND BLOCKING UNDER PARTITIONS PROVIDE 2" (NOMINAL) SOLID BLOCKING AT SUPPORTS OF ALL JOISTS. UNLESS NOTED OTHERWISE ON PLANS/DETAILS PROVIDE 2 X SOLID BLOCKING AT MID-HEIGHT OF BEARING STUD WALLS. ALL NAILING NOT NOTED SHALL BE ACCORDING TO TABLE 25Q OF THE UBC. JOIST HANGERS AND OTHER MISCELLANEOUS FRAMING ANCHORS SHALL BE AS MANUFACTURED BY SIMPSON COMPANY OR OTHER MANUFACTURER WITH CURRENT I.C.B.O. APPROVAL. DO NOT SUSPEND ANY SPRINKLERS, PIPING, CEILING OR ANY OTHER ITEMS FROM 2X JOISTS IN PANELIZED ROOF SYSTEM.

BOLTING: ALL BOLTS SHALL CONFORM TO ASTM A307 BOLTS SHALL BE INSTALLED IN HOLES BORED WITH A BIT 1/16 INCH LARGER THAN THE DIAMETER OF THE BOLT. BOLTS AND NUTS SEATING ON WOOD SHALL HAVE CUT STEEL WASHERS UNDER HEADS AND NUTS. NICK THREADS TO PREVENT LOOSENING.

# INTERPRETATION OF DRAWINGS

| LOCATION OF INFORMATION |   |                                   |       |
|-------------------------|---|-----------------------------------|-------|
| ITEM                    | INFORMATION                                   | LOCATION                          | SHEET |
| FOOTINGS                | SIZE, REINFORCING                             | SEE PLAN                          | S2    |
|                         | DEPTH OF FOOTING                              | GENERAL STRUCTURAL NOTES (G.S.N.) | S1    |
| FRAMING MEMBERS         | TYPE, SIZE, CONNECTION CAMBER, BEARING PLATES | SCHEDULE (L)                      | S2    |
| COLUMNS                 | TYPE, SIZE, BASE PLATES, REINFORCING          | SEE PLANS AND DETAILS             | S2,S3 |
| CONCRETE WALLS          | REINFORCING                                   | SEE DETAILS                       | S3    |

| PLAN LEGEND |                            |   |
|-------------|----------------------------|---|
| SYMBOL      | DESCRIPTION                | REMARKS   |
| 201         | DETAIL CUTS SHOWN ON PLANS | TYPICAL DETAILS ARE TWO DIGIT SERIES NUMBERS FOUNDATION DETAILS ARE 100 SERIES NUMBERS FRAMING DETAILS ARE 200 SERIES NUMBERS |
| 2           | KEY NOTES SHOWN ON PLANS   | INDICATES PANEL NUMBER  |
| [Symbol]    | MECHANICAL EQUIPMENT       | SEE PLANS FOR UNIT WEIGHTS  |
| [Symbol]    | OPENING IN FRAMING PLAN    |   |
| [Symbol]    | STEEL STUD WALL            |   |
| [Symbol]    | MASONRY WALL               |   |
| [Symbol]    | EXISTING WALL              |   |

| NOTES |  |
|-------|--|
| 1.    | FOR MATERIAL STRENGTHS, SEE GENERAL STRUCTURAL NOTES   |
| 2.    | VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION - RESOLVE ANY DISCREPANCY WITH ARCHITECT  |
| 3.    | FOR CLARITY, ALL EXTERIOR SLABS AND SIDEWALKS MAY NOT BE SHOWN FOR EXACT DIMENSIONS, LOCATION, JOINT AND SCORE LINES, SEE ARCHITECTURAL DRAWINGS.                          |
| 4.    | FOR CLARITY, ALL OPENINGS MAY NOT BE SHOWN ON FRAMING PLANS. FOR EXACT SIZE, NUMBER AND LOCATION OF OPENINGS, SEE ARCHITECTURAL, ELECTRICAL AND PLUMBING DRAWINGS          |
| 5.    | VERIFY EXACT SIZE AND LOCATION OF OPENINGS IN PRECAST CONCRETE WALL PANELS WITH ARCHITECTURAL DRAWINGS   |
| 6.    | DETAILS MARKED "TYPICAL" MAY NOT BE CUT ON PLANS.  |
| 7.    | CONC. C.J. - AS SHOWN ON PLAN INDICATES LOCATION OF EITHER KEYED OR SAW CUT CONTROL JOINT IN SLAB ON GRADE AT CONTRACTOR'S OPTION, SEE GENERAL STRUCTURAL NOTES AND PLANS. |
| 8.    | FOR CLARITY, DETAILS MAY SHOW ONLY ONE SIDE OF FRAMING CONDITION   |

# ABBREVIATIONS

|                 |  |
|-----------------|--|
| ⊙               | ... AT (MEASUREMENT)                         |
| A.B.            | ... ANCHOR BOLT                              |
| A.B.C.          | ... AGGREGATE BASE COURSE                    |
| A/C             | ... AIR CONDITIONING                         |
| ACI             | ... AMERICAN CONCRETE INSTITUTE              |
| A.F.F.          | ... ABOVE FINISH FLOOR                       |
| AISC            | ... AMERICAN INSTITUTE OF STEEL CONSTRUCTION |
| ASTM            | ... AMERICAN IRON AND STEEL INSTITUTE        |
| L               | ... ANGLE                                    |
| ALT.            | ... ALTERNATE                                |
| APPROX.         | ... APPROXIMATE                              |
| ARCH'L          | ... ARCHITECTURAL                            |
| B.              | ... BOTTOM                                   |
| BM.             | ... BEAM                                     |
| B.O.B.          | ... BOTTOM OF BEAM                           |
| B.O.D.          | ... BOTTOM OF DECK                           |
| BRG.            | ... BEARING                                  |
| C.G.            | ... CENTER OF GRAVITY                        |
| C.I.P.          | ... CAST IN PLACE                            |
| C.L.            | ... CENTER LINE                              |
| C.L.B.          | ... CENTERLINE OF BEAM                       |
| C.L.C.          | ... CENTERLINE OF COLUMN                     |
| C.L.W.          | ... CENTERLINE OF WALL                       |
| CLR             | ... CLEAR                                    |
| CMU             | ... CONCRETE MASONRY UNIT                    |
| COL             | ... COLUMN                                   |
| CONC.           | ... CONCRETE                                 |
| CONC. C.J.      | ... CONCRETE CONTROL JOINT                   |
| CONC. S.J.      | ... CONCRETE SAWCUT JOINT                    |
| CONN.           | ... CONNECTION                               |
| CONT.           | ... CONTINUOUS                               |
| DET.            | ... DETAIL                                   |
| D.F.            | ... DOUGLAS FIR                              |
| DIA.            | ... DIAMETER                                 |
| DN              | ... DOWN                                     |
| DO              | ... DITTO                                    |
| EA.             | ... EACH                                     |
| EA. END         | ... EACH END                                 |
| E.F.            | ... EACH FACE                                |
| EL. OR ELEV.    | ... ELEVATION                                |
| EQ              | ... EQUAL                                    |
| EQUIP.          | ... EQUIPMENT                                |
| ETC.            | ... ETCETERA                                 |
| E.W.            | ... EACH WAY                                 |
| EXP. JT. (E.J.) | ... EXPANSION JOINT                          |
| FDN.            | ... FOUNDATION                               |
| F.F.            | ... FINISHED FLOOR                           |
| FLR.            | ... FLOOR                                    |
| F.O.S.          | ... FACE OF STEEL                            |
| F.O.W.          | ... FACE OF WALL                             |
| F.S.            | ... FAR SIDE                                 |
| FTG.            | ... FOOTING                                  |
| GA              | ... GAGE                                     |
| GALV.           | ... GALVANIZED                               |
| GLB             | ... GLUED-LAMINATED BEAM                     |
| G.S.N.          | ... GENERAL STRUCTURAL NOTES                 |
| HORIZ.          | ... HORIZONTAL                               |
| I.D.            | ... INSIDE DIAMETER                          |
| I.F.W.          | ... INSIDE FACE OF WALL                      |
| JT.             | ... JOINT                                    |
| LBS             | ... POUNDS                                   |
| LLV             | ... LONG LEG VERTICAL                        |
| MAS. C.J.       | ... MASONRY CONTROL JOINT                    |
| MAX             | ... MAXIMUM                                  |
| MECH'L          | ... MECHANICAL                               |
| MIN             | ... MINIMUM                                  |
| MISC.           | ... MISCELLANEOUS                            |
| NO. (#)         | ... NUMBER                                   |
| NS              | ... NEAR SIDE                                |
| N.T.S.          | ... NOT TO SCALE                             |
| O.C.            | ... ON CENTER                                |
| OO              | ... OUTSIDE DIAMETER                         |
| O.F.W.          | ... OUTSIDE FACE OF WALL                     |
| OPP.            | ... OPPOSITE                                 |
| d               | ... PENNY (NAIL SIZE)                        |
| PC              | ... PIECE                                    |
| PCF             | ... POUNDS PER CUBIC FOOT                    |
| PERP.           | ... PERPENDICULAR                            |
| PL              | ... PLATE                                    |
| PLF             | ... POUNDS PER LINEAR FOOT                   |
| PSI             | ... POUNDS PER SQUARE INCH                   |
| RAD.            | ... RADIUS                                   |
| REINF.          | ... REINFORCING, REINFORCED, REINFORCEMENT   |
| REQ'D           | ... REQUIRED                                 |
| SHT.            | ... SHEET                                    |
| SIM             | ... SIMILAR                                  |
| SLV             | ... SHORT LEG VERTICAL                       |
| SQ.             | ... SQUARE                                   |
| STD             | ... STANDARD                                 |
| STL             | ... STEEL                                    |
| STRUCT (L)      | ... STRUCTURAL                               |
| SYM.            | ... SYMMETRICAL                              |
| T & G           | ... TONGUE AND GROOVE                        |
| T.O.B.          | ... TOP OF BEAM                              |
| T.O.C. SLAB     | ... TOP OF CONCRETE SLAB                     |
| T.O.D.          | ... TOP OF DECK                              |
| T.O.F.          | ... TOP OF FOOTING                           |
| T.O.L.          | ... TOP OF LEDGER                            |
| T.O.M.          | ... TOP OF MASONRY                           |
| T.O.S.          | ... TOP OF STEEL                             |
| TOT.            | ... TOTAL                                    |
| T.O.W.          | ... TOP OF WALL                              |
| TS              | ... TUBE STEEL                               |
| TYP.            | ... TYPICAL                                  |
| U.N.O.          | ... UNLESS NOTED OTHERWISE                   |
| VERT            | ... VERTICAL                                 |
| W               | ... WITH                                     |
| W/O             | ... WITHOUT                                  |
| W.W.F.          | ... WELDED WIRE FABRIC                       |

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GENERAL STRUCTURAL NOTES  
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