

## COLD-FORMED STEEL

- CODES. COMPLY WITH UBC CHAPTER 22, DIV. VII & VIII.
- PRODUCTS
- METAL STUDS, JOIST, AND ACCESSORIES
- 2.1.1. GALVANIZED STEEL MUST MEET THE MINIMUM REQUIREMENTS OF ASTM A446 GRADE D (Fy=50KSI) FOR 12, 14 AND 16 GAUGE, AND ASTM A446 GRADE A (Fy=33KSI) FOR 18 GAUGE AND LIGHTER FOR THE ITEM USE INTENDED. GALVANIZED COATINGS MUST MEET THE ASTM A525 SPECIFICATION.
- 2.1.2. CARBON SHEET STEEL MUST MEET THE MINIMUM REQUIREMENTS OF ASTM A570 GRADE 50KSI FOR 12, 14 AND 16 GAUGE AND GRADE 33KSI FOR 18 GAUGE AND LIGHTER MEMBERS. CARBON SHEET STEEL PRODUCTS MUST BE THOROUGHLY COATED WITH A RUST INHIBITIVE PAINT.
- 2.1.3. ALL STRUCTURAL MEMBERS SHALL BE DESIGNED IN ACCORDANCE WITH AMERICAN IRON AND STEEL INSTITUTE (AISI) "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURE MEMBERS" 1986 EDITION, WITH 1989 AMENDMENTS.
- 2.1.4. METAL STUDS AND/OR JOISTS:
- 2.1.4.1. FOR STUD WALLS, UNLESS OTHERWISE SHOWN ON THE DRAWINGS, PROVIDE STANDARD PUNCHED STEEL MEMBERS OF THE GAUGES SHOWN ON THE DRAWINGS. RAFTERS AND JOISTS SHALL BE UNPUNCHED.
- 2.1.4.2. USE ONLY ONE TYPE THROUGHOUT THE WORK, UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFICALLY APPROVED IN ADVANCE BY THE ENGINEER.
- 2.1.5. ACCESSORIES: PROVIDE ALL ACCESSORIES INCLUDING, BUT NOT NECESSARILY LIMITED TO, TRACKS, CLIPS, WEB STIFFENERS, ANCHORS, FASTENING DEVICES, RESILIENT CLIPS, AND OTHER ACCESSORIES REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, AND AS RECOMMENDED BY THE MANUFACTURER FOR THE STEEL MEMBERS USED.
- 2.1.6. FASTENING OF COMPONENTS SHALL BE WITH SELF-DRILLING SCREWS OR WELDING. ALL WELDS OF GALVANIZED STEEL SHALL BE TOUCHED UP WITH A ZINC-RICH PAINT. ALL WELDS OF CARBON SHEET STEEL SHALL BE TOUCHED-UP WITH PAINT.

- 2.1.6.1. SCREWS.
  1. SCREW HEAD STYLE TO BE AS FOLLOWS:  
PAN HEAD . . . FOR STUD TO TRACK, BRIDGING, STRAPPING, FURRING TO STUD OR JOIST, DOOR FRAMES TO STUD AND PLYWOOD SHEATHING TO STEEL JOIST.  
HEAX WASHER HEAD . . . FOR PENETRAING THICKER STEEL MATERIALS, 1/4" OR 5/16" HEAD SIZE TYPICALLY.  
BUGLE HEAD . . . FOR GYPSUM WALL BOARD TO STUD RO JOIST
  2. SCREW POINT TYPE AND THREAD CONFIGURATION:  
S . . . . . ASTM C-1002 FOR STEEL UP TO 0.035"  
S-12 . . . . . ASTM C-594 FOR STEEL UP TO 0.112"

- 2.1.6.2. POWDER DRIVEN FASTENERS. COMPLY WITH ICBO ER #2388
  - i. CONCRETE: 0.177" SHANK DIAMETER DS HEAVY DUTY PINS BY "HILTI". MINIMUM DEPTH OF PENETRATION INTO CONCRETE TO BE 1-7/16". SPACING SEE PLAN.
  - ii. STEEL: .177" SHANK DIAMETER EDS HEAVY DUTY PINS BY "HILTI".

- 2.2. GROUT -SEE NOTES THIS SHEET FOR "STEEL".
- 2.3. STUD/JOIST DESIGNATOR SYSTEM  
COMPLY WITH METAL STUBS MANUFACTURER'S ASSOCIATION.  
S - STUD AND JOIST SECTIONS WITH 5/8" FLANGE STIFFENERS (LIPS)  
T - TRACK SECTIONS (NO LIPS)  
DS- DRYWALL STUD AND JOIST SECTIONS WITH 3/16" FLANGE STIFFENERS (LIPS)  
DT- TRACK SECTIONS (NO LIPS)  
U - COLD ROLLED CHANNEL AND CHANNEL STUDS (NO LIPS)  
F - FURRING CHANNEL

EXAMPLE: 5505162-33  
THICKNESS IN 1/1000 INCH  
WIDTH OF FLANGE 1.625"  
DEPTH OF THE MEMBER (5.50") EXPRESSED IN 0.01

TYPICAL STEEL SHEET THICKNESSES

THICKNESS (IN)	GAUGE (#)	DESIGNATED THK. (1/1000 in)
0.0179	25	18
0.0269	22	27
0.0329	20	33
0.0428	18	43
0.0538	16	54
0.0677	14	68
0.0966	12	97
0.1180	10	118

## SCREW SCHEDULE

LOCATION OF CONNECTION	TYPE OF CONNECTION	#-SCREWS
1. JOIST TO SILL OR GIRDER 350SXX OR 400SX . . . . . 600SX . . . . . 800SX . . . . . 100SXX . . . . .	FRAMING CLIP . . . . . FRAMING CLIP . . . . . FRAMING CLIP . . . . . FRAMING CLIP . . . . .	3 #10-16 4 #10-16 5 #10-16 6 #10-16
2. BRIDGING TO JOIST . . . . .	TO JST FLANGE . . . . .	2 #10-16
3. TRACK TO JOIST OR BLOCKING . . . . .	FACE SCREW . . . . .	2 #10-16/JST
4. STUD TO TRACK . . . . .	END SCREW . . . . .	2 #8-16
5. DOUBLE FRAMING MEMBERS . . . . .	THRU WEB . . . . .	2 #10-16/2@ 16" O/C
6. DOUBLE NESTED JOISTS . . . . .	FLANGES . . . . .	8@-18 @ 16" O/C
7. TOP TRACK SPLICES . . . . .	STRAP . . . . .	9 #10-16
8. TRACK INTERSECTIONS . . . . .	STRAP . . . . .	4 #10-16
9. JOISTS AT LAPS OVER SUPP. . . . .	WEBS . . . . .	3 #10-16
10. STUD TO STUD AT INTERSECT. . . . .	WEBS . . . . .	2 #10-16 @ 16"O/C

11. PLYWOOD AND PARTICLE BOARD: ①  
SUBFLOOR, ROOF AND WALL SHEATHING (TO FRAMING) EXCEPT WHERE OTHERWISE STATED:  

1/2" AND LESS . . . . .	#8-18
19/32" - 3/4" . . . . .	#10-16
7/8" - 1" . . . . .	#10-16
1 1/8" - 1 1/4" . . . . .	#10-16

① SCREWS SPACED AT 6" O.C. AT EDGES, 12" AT INTERMEDIATE SUPPORTS EXCEPT 6" AT ALL SUPPORTS WHERE SPANS ARE 48 INCHES OR MORE.

## MASONRY

CONTINUED

- 3.6. GROUT: FOR PROPORTIONS COMPLY WITH UBC TABLE 21-B, AND STANDARD 21-19.
- 3.7. WATER: WATER USED FOR MORTAR AND GROUT SHALL BE CLEAN, POTABLE AND FREE FROM DELETERIOUS AMOUNTS OF ACIDS, SALTS, ALKALI, AND ORGANIC MATERIALS.
- 3.8. METAL REINFORCEMENT  
DEFORMED REINFORCING SHALL BE NEW STOCK CONFORMING TO ASTM A615 INCLUDING SUPPLEMENT S1.  
#3 AND SMALLER BARS . . . . . GRADE 40  
#4 AND LARGER BARS . . . . . GRADE 60  
WELDED PLAIN WIRE FABRIC TO COMPLY WITH ASTM 185 GRADE 60.  
3.9. REBAR POSITIONERS: RODDOGS BY RFI COMPONENT SYSTEMS,LLC TEL: 1-800-763-3647.
4. GROUTING: GROUT ALL CELLS AND SPACES CONTAINING REBAR. COMPLY WITH TABLE No. 21-C FOR GROUTING LIMITATIONS.
5. REINFORCING: ALL VERTICAL WALL REINFORCEMENT SHALL HAVE DOWELS EQUAL IN SIZE EMBEDDED INTO FOOTING. DO NOT BEND DOWELS MORE THAN ONE TIME HORIZONTAL TO SIX VERTICAL. REBAR LAPS TO BE 48 BAR DIAMETERS LONG, U.O.N.
6. EXPANSION JOINTS: SEE PLAN FOR LOCATION, USE DUR-O-WALL RAPID CONTROL JOINT.

## ROUGH CARPENTRY

1. FRAMING LUMBER.  
ALL MATERIALS SHALL BE IDENTIFIED BY THE GRADE MARK OR A CERTIFICATE OF INSPECTION ISSUED BY AN APPROVED OR THE REFERENCED AGENCY.
- 1.1 DIMENSION LUMBER AND TIMBERS. GRADE STAMPED IN CONFORMANCE WITH WCLB OR WMPA GRADING RULES AND PS 20, AMERICAN SOFTWOOD LUMBER STANDARD AND STANDARD GRADING RULES FOR WESTERN LUMBER.

END USE	SPECIES	SIZE	GRADE	MC AT SURFACING
BLOCKING STUDS, PLATES	DF-L	2"-4" THICK 2"-4" WIDE	NO. 2 & BTR	S-DRY OR KD
RAFTERS JOISTS, HEADERS	DF-L	2"-4" THICK 2"-4" WIDE	NO. 2 & BTR	S-DRY OR KD
RAFTERS, JOISTS HEADERS, BEAMS STUDS, PLATES	DF-L	2"-4" THICK 5" & WIDER	NO. 1 & BTR	S-DRY OR KD
BEAMS & STRINGERS	DF-L	BEAMS 5" THICK WIDTH > THICK + 2"	NO. 1	S-GRN FOHC
POSTS & TIMBERS	DF-L	5" X 5" AND LARGER	NO. 1	S-GRN
SILLS	DF-L, PT		NO. 1	S-GRN PRESSURE TREAT WITH ACZA OR ACQ.

### 1.2 GLUED LAMINATED TIMBER

- A. STANDARDS. ANSI/AITC A190.1-1992 AND UBC

#### B. QUALITY OF MATERIALS

END USE	SPECIES	COMBINATION	APPEARANCE	MC AT USE	COMMENTS
SINGLE SPAN BEAMS	DF-L	24F-V4	INDUSTRIAL	DRY	-
CANTILEVERED BEAMS	DF-L	24F-V8	INDUSTRIAL	DRY	-

#### C. CAMBER. R= 1600 FT U.N.O. ON DRAWINGS

- D. CERTIFICATE. SUBMIT CERTIFICATE TO THIS ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. SUBMIT APPROVED COPY TO BUILDING OFFICIAL. CERTIFICATE BY TIMBER PRODUCTS INSPECTION, INC OR APA OR AITC.

- E. SHOP DRAWINGS. SUBMIT FOR REVIEW AND APPROVAL BY THIS ENGINEER PRIOR TO FABRICATION.

- F. PROTECTION. APPLY COLORLESS END SEALER TO THE ENDS OF ALL MEMBERS IMMEDIATELY AFTER FABRICATION AND FIELD TRIMMING. ALL MEMBERS SHALL BE DELIVERED WRAPPED INDIVIDUALLY.

- G. TREATMENT FOR DECAY. PRESSURE TREAT ALL MEMBERS EXPOSED TO WEATHER AND NOT PROTECTED BY ROOF OR OTHER MEANS. TREAT ALL FIELD CUTS, HOLES ETC AS RECOMMENDED BY MANUFACTURER.

- H. SHAPED MEMBERS. PROVIDE ADDITIONAL COMPRESSION/TENSION LAMINATIONS WHERE TOP/BOTTOM LAMINATIONS HAVE BEEN SHAPED. THE SPECIFIED DEPTH DOES NOT INCLUDE THE SHAPED LAMINATIONS.

### 1.3 PREFABRICATED TRUSSES

- A. FABRICATION. BY A FABRICATOR APPROVED BY BUILDING OFFICIAL AND THIS ENGINEER.
- B. PLATES. SUBMIT ICBO PRODUCT APPROVED EVALUATION REPORT.
- C. LUMBER. GRADE STAMPED DOUGLAS FIR.
- D. DESIGN CRITERIA.

ITEM	LOADS	DEFLECTION		
ROOF TRUSSES		T.C.	B.C.	
TOP CHORD	DEAD LOAD = 15 PSF ** LIVE LOAD = 20 PSF **	L/180		
BOTTOM CHORD	DEAD LOAD = 5 PSF ** LIVE LOAD = 10 PSF **		L/360	
TRUSS	TOTAL LOAD = 40 PSF	L/180	L/240	
FLOOR TRUSSES		T.C.	B.C.	
TOP CHORD	DEAD LOAD = 12 PSF ** LIVE LOAD = 40 PSF **	L/480		
BOTTOM CHORD	DEAD LOAD = 5 PSF ** LIVE LOAD = 0 PSF **		-	
TRUSS	TOTAL LOAD = 58 PSF	L/480	L/480	

- \* DOES NOT INCLUDE TRUSS OWN WEIGHT.  
\*\* NOT APPLIED SIMULTANEOUSLY WITH TOP CHORD LIVE LOAD.

- E. CALCULATIONS AND DRAWINGS. SUBMIT FOR REVIEW SHOP DRAWINGS AND STRUCTURAL CALCULATIONS PREPARED AND SIGNED BY A CALIFORNIA REGISTERED CIVIL OR STRUCTURAL ENGINEER PRIOR TO FABRICATION. SUBMIT REVIEWED SHOP DRAWINGS AND CALCULATIONS TO THE BUILDING OFFICIAL. SPECIFY REQUIRED HANGERS AND BRACING. SHOW REQUIRED DETAILS AND TRUSS LAYOUT.
- F. DOUBLE NESTED BLOCKING, PLATES, BRIDGING, HANGERS AND CLIPS.
- G. CHANGES. SUBMIT DRAWINGS AND CALCULATIONS FOR REVIEW PRIOR TO ANY CHANGES.

### 1.4 PRE-FABRICATED WOOD I-JOISTS ( CONTRACTOR'S OPTION)

- A. FABRICATION. IN ACCORDANCE WITH ICBO OR NER REPORT. SUBMIT COPY OF REPORT.

#### B. DESIGN CRITERIA.

ITEM	LOADS	DEFLECTION
FLOOR JOISTS	DEAD LOAD = 17 PSF DOES NOT INCLUDE JST WEIGHT LIVE LOAD = 40 PSF TOTAL LOAD = 60 PSF	L/480 L/360

## MASONRY

CONTINUED

- C. PRIOR TO FABRICATION SUBMIT SHOP DRAWINGS AND STRUCTURAL CALCULATIONS PREPARED AND SIGNED BY A CALIFORNIA REGISTERED CIVIL OR STRUCTURAL ENGINEER FOR REVIEW. SUBMIT REVIEWED DRAWINGS TO BUILDING OFFICIAL. SPECIFY REQUIRED HANGERS AND BRACING. SHOW REQUIRED DETAILS AND JOIST LAYOUT.
- D. PANEL NAILING. USE A STAGGERED NAILING PATTERN IN CONFORMANCE WITH MANUFACTURER'S MINIMUM NAIL SPACINGS.
- E. SUPPLY REQUIRED BLOCKING, PLATES, BRIDGING, HANGERS AND CLIPS.
- F. CHANGES. SUBMIT DRAWINGS AND CALCULATIONS FOR REVIEW PRIOR TO ANY CHANGES.

7. CURING: KEEP THE SURFACE OF THE WALL DAMP WITH A VERY LIGHT FOG SPRAY DURING CURING PERIOD FOR THE MORTAR FOR THREE DAYS. DO NOT SATURATE THE WALL WITH WATER AFTER IT IS COMPLETED.
8. REINFORCING STEEL ALLOWANCE: PROVIDE 250 LBS OF STEEL REINFORCEMENT FOR THE ENGINEER TO USE AT HIS DISCRETION DURING CONSTRUCTION. REIMBURSE OWNER FOR UNUSED STEEL.
9. FIELD FOREMAN: THE FIELD FOREMAN RESPONSIBLE FOR THE PLACEMENT OF ALL MASONRY UNITS, REINFORCING AND GROUTING SHALL HAVE A MINIMUM OF (3) YEARS OF EXPERIENCE IN THIS CAPACITY FOR THIS TYPE OF CONSTRUCTION.

## ROUGH CARPENTRY (CONT'D...)

### 1.5 GLUED LAMINATED VENEER OR STRAND LUMBER.

- A. FABRICATION. IN ACCORDANCE WITH ICBO OR NER REPORT. SUBMIT COPY OF REPORT.

#### B. DESIGN CRITERIA

- LAMINATED STRAND LUMBER: 1.5E WESTERN SPECIES (NOTED AS LSL)  
EXTREME FIBER IN BENDING  
MODULUS OF ELASTICITY . . . . . F<sub>b</sub> = 1,700 PSI  
E = 1,500,000 PSI  
LAMINATED VENEER LUMBER : 1.9E WESTERN SPECIES (NOTED AS LVL)  
EXTREME FIBER IN BENDING  
COMPRESSION PERPENDICULAR TO GRAIN . . . . . F<sub>b</sub> = 2,600 PSI  
F<sub>cL</sub> = 750 PSI  
HORIZONTAL SHEAR . . . . . F<sub>v</sub> = 285 PSI  
MODULUS OF ELASTICITY . . . . . E = 1,900,000 PSI

- LAMINATED PARALLEL STRAND LUMBER: 2.0E WESTERN SPECIES (NOTED AS PSL)  
EXTREME FIBER IN BENDING  
COMPRESSION PERPENDICULAR TO GRAIN . . . . . F<sub>b</sub> = 2,800 PSI  
F<sub>cL</sub> = 750 PSI  
HORIZONTAL SHEAR . . . . . F<sub>v</sub> = 285 PSI  
MODULUS OF ELASTICITY . . . . . E = 2,000,000 PSI

- C. PRIOR TO FABRICATION SUBMIT SHOP DRAWINGS AND STRUCTURAL CALCULATIONS PREPARED AND SIGNED BY A CALIFORNIA REGISTERED CIVIL OR STRUCTURAL ENGINEER FOR REVIEW. SUBMIT REVIEWED DRAWINGS TO BUILDING OFFICIAL. SPECIFY REQUIRED HANGERS AND BRACING. SHOW REQUIRED DETAILS AND LAYOUT.
- D. SUPPLY REQUIRED BLOCKING, PLATES, BRIDGING, HANGERS AND CLIPS.
- E. CHANGES. SUBMIT DRAWINGS AND CALCULATIONS FOR REVIEW PRIOR TO ANY CHANGES.

### 2. WOOD STRUCTURAL PANELS

- A. FABRICATION STANDARDS.
  1. VOLUNTARY PRODUCT STANDARD PS 1-95 FOR "CONSTRUCTION AND INDUSTRIAL PLYWOOD".
  2. VOLUNTARY PRODUCT STANDARD PS 2-92 " PERFORMANCE STANDARD FOR WOOD-BASED STRUCTURAL USE PANELS".
  3. APA PRP-108 "PERFORMANCE STANDARD AND POLICIES FOR STRUCTURAL USE PANELS".

#### B. QUALITY

END USE	TYPE	GRADE	EXPOSURE	COMMENTS
WALL PANEL	STR. PANEL	RATED SHEATHING	EXP. 1	-
FLOOR PANEL	PLYWOOD	STURD-I-FLOOR	EXP. 1	-
ROOF PANEL	STR. PANEL	RATED SHEATHING	EXP. 1	-

SEE DRAWINGS FOR THICKNESS, SPAN RATING, EDGE SUPPORT AND NAILING.

#### C. QUALITY ASSURANCE. GRADE STAMPED BY AMERICAN PLYWOOD ASSOCIATION.

- D. NAILING. DRIVE NAILS SO THAT THE HEAD IS FLUSH WITH THE SURFACE OF THE PANEL. NAILS SHALL BE PLACED NOT LESS THAN 3/8" IN FROM THE PANEL EDGE. NAIL SPACING SHALL NOT EXCEED 6" ALONG THE EDGES AND 12" ALONG INTERMEDIATE SUPPORTS. REMOVE ALL SHINNERS.

- E. BLOCKING AT WALLS. BLOCK ALL UNSUPPORTED EDGES WITH 3X-, OR 4X-.

- F. BLOCKING AT ROOFS AND FLOORS. WHERE SPECIFIED ON THE DRAWINGS, BLOCK UNSUPPORTED EDGES WITH 3X4 FLAT BLOCKING.

- G. GUN-NAILING. SUBJECT TO SATISFACTORY JOB SITE DEMONSTRATION FOR THIS PROJECT AND REVIEW BY THE ENGINEER. THE CRITERIA FOR SATISFACTORY PERFORMANCE ARE THOSE NOTED IN PARAGRAPH C. THE USE OF GUN-NAILING IS SUBJECT TO SATISFACTORY PERFORMANCE.

- H. INSTALLATION AT FLOORS. INSTALL PANELS WITH THE LONG DIMENSION PERPENDICULAR TO THE SUPPORTS. FIELD GLUE TO ALL SUPPORTS WITH A GLUE MEETING THE APA SPECIFICATION AFG-01. LEAVE 1/8" SPACE AT ALL PANEL END AND EDGE JOINTS. PANELS SHAL BE CONTINUOUS OVER TWO OR MORE SPANS.

- I. INSTALLATION AT ROOFS. INSTALL PANELS WITH THE LONG DIMENSION PERPENDICULAR TO THE SUPPORTS. LEAVE 1/8" SPACE AT ALL PANEL END AND EDGE JOINTS. PANELS SHALL BE CONTINUOUS OVER TWO OR MORE SPANS.

- J. INSTALLATION AT WALLS. INSTALL PANELS WITH THE LONG DIMENSION PERPENDICULAR OR HORIZONTAL TO THE STUDS AT INTERIOR WALLS. SEE DRAWINGS FOR ORIENTATION OF EXTERIOR PLYWOOD. LEAVE 1/8" SPACE AT ALL PANEL END AND EDGE JOINTS. WHERE WALLS ADJACENT TO OPENINGS ARE PANELED, INSTALL PANELS OVER AND UNDER THE OPENINGS.

- K. MINIMUM SIZE. 24" WIDE OR BLOCK ALL EDGES.

3. WOOD PROTECTION FOR DECAY. WOOD EXPOSED TO THE WEATHER, FOUNDATION PLATES ON CONCRETE STEMS OR SLABS IN DIRECT CONTACT WITH EARTH, FLOOR JOISTS LOCATED CLOSER THAN 18 IN. AND GIRDER LOCATED CLOSER THAN 12 IN. TO EXPOSED GROUND IN CRAWL SPACESOR UNEXCAVATED AREAS WITHIN THE PERIPHERY OF THE BUILDING FOUNDATION SHALL BE APPROVED WOOD OF NATURAL RESISTANCE TO DECAY OR TREATED WOOD. NEWLY EXPOSED SURFACES RESULTING FROM CUTTING, BORING OR HANDLING SHALL BE TREATED IN ACCORDANCE WITH AMPA M-4. ALL PRESERVATIVELY TREATED WOOD SHALL BE IDENTIFIED BY THE QUALITY MARK OF AN APPROVED AGENCY.

## NAILING SCHEDULE

CONNECTION	TYPE OF NAILING	#-NAILS①
1. JOIST TO SILL OR GIRDER. . . . .	TOENAIL	3-8d
2. BRIDGING TO JOIST. . . . .	TOENAIL EACH END . . . . .	2-8d
3. SOLE PLATE TO JOIST' OR BLOCKING. . . . .	FACE NAIL . . . . .	16d @ 6" O.C.
4. TOP PLATE TO STUD. . . . .	END NAIL . . . . .	2-16d
5. STUD TO SOLE PLATE. . . . .	TOENAIL . . . . .	4-8d
OR . . . . .	END NAIL . . . . .	2-16d
6. DOUBLE FRAMING MEMBERS. . . . .	FACE NAIL . . . . .	16d @ 8" O.C.
7. 2x4, 2x6 . . . . .	. . . . .	216d @ 8" O.C.
8. 2x8, 2x10 . . . . .	. . . . .	216d @ 8" O.C.
9. DOUBLE TOP PLATES. . . . .	FACE NAIL . . . . .	16d @ 6" O.C.
10. TOP PLATES, LAPS & INTERSECTIONS. . . . .	FACE NAIL . . . . .	2-16d
11. CEILING JOISTS TO PLATE. . . . .	TOENAIL . . . . .	3-8d
12. CONTINUOUS HEADER TO STUD. . . . .	TOENAIL . . . . .	4-8d
13. CEILING JOISTS LAPPING OVER PARTITIONS. . . . .	FACE NAIL . . . . .	5-16d
14. CEILING JOISTS TO PARALLEL RAFTERS. . . . .	FACE NAIL . . . . .	5-16d
15. RAFTER TO PLATE. . . . .	TOENAIL . . . . .	3-8d
16. BUILT UP CORNER STUDS. . . . .	FACE NAIL . . . . .	16d @ 6" O.C.
17. BLOCKING BETWEEN JOISTS OR RAFTERS . . . . .		
TO TOP PLATE OR BEAM. . . . .	TOENAIL . . . . .	3-8d
18. RIM JOIST TO SILL. . . . .	TOENAIL . . . . .	8d @ 6" O.C.
19. PLYWOOD AND PARTICLE BOARD: ⑤ SUBFLOOR, ROOF AND WALL SHEATHING (TO FRAMING) EXCEPT WHERE OTHERWISE STATED: 1/2" AND LESS . . . . . 8d② 6d④ 19/32" - 3/4" . . . . . 8d ③ 7/8" - 1" . . . . . 8d ③ 1 1/8" - 1 1/4" . . . . . 10d② OR 8d		

### 20. PANEL SIDING (TO FRAMING):

- 1/2" OR LESS . . . . . 6d③  
5/8" . . . . . 8d③

- ① SINKERS, OR COMMON NAILS MAY BE USED U.N.O.
- ② COMMON
- ③ COMMON OR DEFORMED
- ④ DEFORMED
- ⑤ NAILS SPACED AT 6" O.C. AT EDGES, 12" AT INTERMEDIATE SUPPORTS EXCEPT 6" AT ALL SUPPORTS WHERE SPANS ARE 48 INCHES OR MORE.
- ⑥ CORROSION-RESISTANT SIDING OR CASING NAILS CONFORMING TO THE REQUIREMENTS OF UBC 2325.1

## HARDWARE & ACCESSORIES

ALL HARDWARE TO BE GALVANIZED OR STAINLESS STEEL IF EXPOSED TO EARTH OR TO WEATHER.

### 1.0. NAILS

END USE	SIZE (d)	DIAMETER (in)	REQ'D PENETRATION (in)	LATERAL STRENGTH (LBS)
FRAMING	16 SINKER	0.148	1 5/8	94
STR. PANELS	8 COMMON	0.131	1 1/2	78
OR TN AT FRMG	10 COMMON	0.148	1 5/8	94

PENETRATION IS MEASURED INTO THE PIECE RECEIVING THE NAIL POINT. 1-1/2" PENETRATION FOR 16d AND 10d IS ACCEPTABLE AT TOP PLATES AND DOUBLED 2X MEMBERS. THE SPACING CENTER TO CENTER OF NAILS SHALL NOT BE LESS THAN THE REQUIRED PENETRATION. PENETRATION WILL LEAD HOLES WHERE IS NECESSARY TO PREVENT SPLITTING. THE HOLES SHALL DRILLED TO A DIAMETER SMALLER THAN THE DIAMETER OF THE NAIL.

### 2. BOLTS

- 2.1. ASTM A307
- 2.2. CENTER TO CENTER SPACING: 4 X BOLT DIAMETER OR MORE.  
DISTANCE TO THE END OF THE MEMBER. 7X DIAMETER OF THE BOLT.  
DISTANCE TO A LOADED EDGE: 4X BOLT DIAMETER.  
DISTANCE TO AN UNLOADED EDGE : 1.5X BOLT DIAMETER.  
DIAMETER OF THE HOLE= DIAMETER OF BOLT+ (1/32" TO 1/16")  
THREAD SHALL NOT PROJECT MORE THAN 1/16" BEYOND THE FACE OF THE NUT WHICH IS IN CONTACT WITH THE WASHER.
- 2.4 TIGHTEN NUTS WHEN INSTALLED AND RE-TIGHTEN BEFORE CLOSING IN OR AT THE END OF THE JOB.
- 2.5 INSTALL WASHER, SEE BELOW, BETWEEN THE WOOD AND THE BOLT HEAD AND BETWEEN THE WOOD AND THE NUT.

### 3. STUDS ( SEE DETAIL 16/SO.4)

- 3.1. ASTM A307 OR A36 ROUND STOCK
- 3.2. INDICATES ROUND STOCK WITH THREADS AT THE ENDS AND UNTHREADED IN THE MIDDLE. OMIT THREADS WHERE THE SHANK WILL BEAR ON WOOD IN ORDER TO TRANSFER SHEAR AS FOR SILL , LEDGER ANCHORS AND HOLDOWN BOLTS TO STUDS.

### 4. ALL THREADED ROUND STOCK

- 4.1. ASTM A36 OR A307

### 5. LAG BOLTS

- 5.1. ASTM A307 OR A36 OR BETTER
- 5.2. COMPLY WITH INSTALLATION CRITERIA AS NOTED FOR "BOLTS" U.N.O.

- 5.3. DRILL LEAD HOLES FOR LAG BOLTS AS FOLLOWS:

- i. THE LEAD HOLE FOR THE SHANK TO MATCH THE DIAMETER OF THE SHANK AND ITS LENGTH TO MATCH THE LENGTH OF THE UNTHREADED SHANK OF THE BOLT.
- ii. THE LEAD HOLE FOR THE THREADED PORTION TO HAVE A DIAMETER EQUAL TO 60% OF THE SHANK DIAMETER AND ITS DEPTH TO MATCH THE LENGTH OF THE THREADED PORTION.

### 6. ANCHOR BOLTS ( SEE DETAL 20/SO.4)

- 6.1 ASTM A307 OR A36. SEE NOTE BELOW FOR WASHERS.
  - 6.2 MINIMUM BOLT EMBEDMENT INTO CONCRETE OR MASONRY TO BE 7"
  - 6.3 UNLESS NOTED OTHERWISE ON DRAWINGS, THE EMBEDDED PORTION OF BOLTS SHALL HAVE A STANDARD HEAD OR "J" OR "L" DEFORMITY.
  - 6.4 THE SPECIFIED DIAMETER OF THE SHANK IS ACTUAL AND NOT NOMINAL.
  - 6.5 SEE NOTE "BOLTS" ABOVE FOR INSTALLATION AND CRITICAL DIMENSIONS.
7. MECHANICAL ANCHORS
  - 7.1 "WEDGE, ALL" ANCHORS BY SIMPSON STRONG TIE. COMPLY WITH ICBO ER NO.5256. SEE DRAWINGS FOR DIAMETER, MINIMUM EMBEDMENT AND SPACING.

- 7.2 COMPLY WITH CRITERIA FOR "ANCHOR BOLTS" U.N.O.

### 8. WASHERS ( SEE DETAIL 15/SO.2)

- 8.1 ASTM A307 CUT WASHERS OR WALLEABLE IRON.
- 8.2 PROVIDE WASHERS UNDER THE HEADS AND THE NUTS OF BOLTS, ANCHOR BOLTS AND LAG BOLTS

### 9. FRAMING ANCHORS & CONNECTORS

- 9.1 TO BE AS MANUFACTURED BY "SIMPSON STRONG-TIE CO., INC." EXCEPT AS NOTED AT 9.2. INSTALL USING FASTENERS SPECIFIED BY MANUFACTURER AND IN ACCORDANCE WITH INSTALLATION PROCEDURE.

- 9.2 WALL ANCHORS HOLDOWNS AND DRAG STRUTS.

- 9.2.1. ANCHORS NOTED AS "CTXX-X" OR "T2XX-X" OR "STXX-X" OR "DS" INDICATE HARDWARE BY " ZONE FOUR LLC" (24) 2336 MERCED STREET, SAN LEANDRO, CA 94577 TEL: (877) 432-4444
- 9.2.2. INSTALLATION TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND AS NOTED ON DRAWINGS.