

STRUCTURAL NOTES

A. GENERAL

- 1. ALL DESIGN AND CONSTRUCTION REQUIRED OF THE CONTRACTORS BY THE CONTRACT DOCUMENTS SHALL BE PERFORMED IN ACCORDANCE WITH THE GOVERNING BUILDING CODE AND OSHA REGULATIONS, SUPPLEMENTED BY THE CONTRACT DOCUMENTS. THE GOVERNING BUILDING CODE SHALL BE THE MASSACHUSETTS STATE BUILDING CODE, SIXTH EDITION, WITH THE LATEST ADDED AMENDMENTS. WHERE THE EDITION OF THE REFERENCE STANDARDS CITED IN THESE NOTES IS NOT GIVEN, THE EDITION SHOWN SHALL BE AS STATED IN THE GOVERNING BUILDING CODE, OR THE LATEST PUBLISHED EDITION IF NOT NOTED IN THE GOVERNING BUILDING CODE.
2. WHERE "DESIGNS" ARE REQUIRED OF THE CONTRACTORS BY THE CONTRACT DOCUMENTS, THE DESIGNS SHALL BE PERFORMED IN ACCORDANCE WITH THE GOVERNING BUILDING CODE AND BY PROFESSIONAL ENGINEERS, REGISTERED IN THE DISCIPLINE OF THE DESIGNS THEY ARE PERFORMING AND IN THE STATE IN WHICH THE PROJECT IS LOCATED. SUCH DESIGNS SHALL BE PREPARED IN A DESIGN DOCUMENT FORMAT (NOT A SHOP DRAWING FORMAT), BE STAMPED AND SIGNED BY THE PROFESSIONAL ENGINEERS WHO PERFORMED THE DESIGNS AND BE SUBMITTED TO THE ENGINEER WHEN REQUESTED FOR EITHER A REVIEW OR RECORD PURPOSES AS SPECIFIED IN THE REQUEST. IN ADDITION, THE PROFESSIONAL ENGINEERS RETAINED BY THE CONTRACTORS TO PERFORM THE DESIGNS REQUIRED BY THE CONTRACT DOCUMENTS SHALL REVIEW THE SHOP DRAWINGS ASSOCIATED WITH THEIR DESIGNS AND VISIT THE CONSTRUCTION SITE TO OBSERVE THAT THE WORK IS BEING PERFORMED IN ACCORDANCE WITH THEIR DESIGNS. THE COSTS ASSOCIATED WITH THE REVIEW OF THE SHOP DRAWINGS AND LABORS, SHALL BE BORNE BY THE CONTRACTORS. THE RESPONSIBILITY FOR DESIGNS REQUIRED OF THE CONTRACTORS SHALL REMAIN SOLELY WITH THE CONTRACTORS.

3. STRUCTURAL CONTRACT DOCUMENTS SHALL BE USED AND COORDINATED BY THE CONTRACTORS IN CONJUNCTION WITH THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION AND EQUIPMENT, KITCHEN AND SITE CONTRACT DOCUMENTS, THE PROJECT SPECIFICATIONS, THE SHOP DRAWINGS AND OTHER SUBMITTALS, AND THE SUBSURFACE/GEOTECHNICAL DATA.

4. ALL DIMENSIONS, ELEVATIONS AND CONDITIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTORS AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK. FOR WORK ATTACHED TO OR WITHIN EXISTING STRUCTURES, THE CONTRACTORS SHALL DETERMINE ALL NECESSARY DIMENSIONS, ELEVATIONS AND CONDITIONS REQUIRED FOR THE ACCURATE FABRICATION AND ERECTION OF THE BUILDING COMPONENTS. UPON RECEIPT OF SHOP DRAWINGS, THE ENGINEER HAS THE RIGHT AS ASSUME THAT ALL FIELD DIMENSIONS, ELEVATIONS AND CONDITIONS HAVE BEEN VERIFIED BY THE CONTRACTORS AND THAT THE SHOP DRAWINGS ACCURATELY REFLECT SUCH VERIFICATIONS UNLESS STATED OTHERWISE ON THE SHOP DRAWINGS.

5. UNLESS OTHERWISE NOTED, DETAILS, SECTIONS AND NOTES CONTAINED IN THE STRUCTURAL CONTRACT DOCUMENTS SHALL BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS.

B. SHOP DRAWINGS

1. CHECKED SHOP DRAWINGS, FIRST REVIEWED AND APPROVED BY THE GENERAL CONTRACTOR, SHALL BE SUBMITTED TO THE ENGINEER FOR ENGINEER'S REVIEW AND COMMENT. FABRICATION OR DELIVERY OF MATERIAL NOT REQUIRING FABRICATION, CAN PROCEED. SHOP DRAWINGS SUBMITTED TO THE ENGINEER WITHOUT FIRST BEING STAMPED "REVIEWED" BY THE GENERAL CONTRACTOR SHALL BE RETURNED WITHOUT BEING REVIEWED BY THE ENGINEER. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTORS FROM CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE ENGINEER'S REVIEW OF SPECIFIC SECTIONS FOR ADDITIONAL SUBMITTAL REQUIREMENTS.

2. SHOP DRAWINGS SHALL BE ORIGINAL DRAWINGS PREPARED BY THE CONTRACTORS. REPRODUCTION OF THE STRUCTURAL CONTRACT DOCUMENTS FOR USE AS A SHOP DRAWING IS UNACCEPTABLE AND WILL BE REJECTED FOR NON-COMPLIANCE.

3. PROPOSED CHANGES, SUBSTITUTIONS OR DELETIONS, MADE BY THE CONTRACTORS TO THE STRUCTURAL CONTRACT DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND COMMENT PRIOR TO THEIR INCORPORATION INTO THE SUBMISSION. THE SUBMISSION SHALL HIGHLIGHT AND NOTE THE PROPOSED CHANGE, SUBSTITUTION OR DELETION. PROPOSED CHANGES, SUBSTITUTIONS OR DELETIONS TO THE STRUCTURAL CONTRACT DOCUMENTS WHICH DO NOT FOLLOW THIS REVIEW PROCEDURE SHALL BE CONSIDERED UNACCEPTABLE.

C. CAST-IN-PLACE CONCRETE

1. REFER TO PROJECT SPECIFICATION SECTION 03300 FOR CAST-IN-PLACE CONCRETE REQUIREMENTS.

2. UNLESS OTHERWISE NOTED, ALL CONCRETE FOR EXTERIOR/PERIMETER FOUNDATION WALLS, EXTERIOR SLABS, AND EXTERIOR CONCRETE CONSTRUCTION IN GENERAL SHALL BE ENR-ENTRAINED, NORMAL WEIGHT AND ATTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4,000 PSI AT THE END OF 28 DAYS AS DETERMINED BY ASTM C39.

3. UNLESS OTHERWISE NOTED, ALL CONCRETE FOR ALL FOOTINGS, INTERIOR FOUNDATION WALLS, INTERIOR SLABS, AND INTERIOR CONCRETE ELEMENTS IN GENERAL THAT ARE NOT EXPOSED TO FROST OR WEATHER, SHALL BE NORMAL WEIGHT AND ATTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 3,000 PSI AT THE END OF 28 DAYS AS DETERMINED BY ASTM C39.

D. CONCRETE AND MASONRY REINFORCING

1. ALL REINFORCING STEEL, UNLESS OTHERWISE NOTED, SHALL BE DEFORMED AND CONFORMING TO ASTM A618 GRADE. WELDED WIRE MESH (W.W.M.) SHALL BE SMOOTH BARS CONFORMING TO ASTM A185.

2. PROVIDE ADDITIONAL REINFORCING IN THE CONCRETE ELEMENTS AS FOLLOWS:

- A. IN CONCRETE BEAMS WHERE HORIZONTAL REINFORCING BARS ARE NOT OTHERWISE SHOWN FOR ALL OR A PORTION OF THE BEAMS, PROVIDE #4 BAR CONTINUOUS AT EACH CORNER TO SECURE THE STRIPPERS.
B. IN CONCRETE BEAMS WHERE STRIPPERS ARE NOT SPECIFIED FOR ALL OR A PORTION OF THE BEAMS, PROVIDE #4 BAR CLOSED STRIPPERS AT 12 INCHES MAXIMUM ON-CENTER.
C. UNLESS OTHERWISE NOTED, IN CONCRETE BEAMS 24 INCHES TO 36 INCHES DEEP INCLUSIVE, PROVIDE 1-#5 BAR CONTINUOUS EACH FACE AT MID-DEPTH. IN CONCRETE BEAMS GREATER THAN 36 INCHES DEEP UP THROUGH 54 INCHES DEEP, PROVIDE 2-#5 BARS CONTINUOUS EACH FACE AT THIRD POINTS OF DEPTH. IN CONCRETE BEAMS GREATER THAN 54 INCHES DEEP, PROVIDE #5 BARS CONTINUOUS EACH FACE AT 18 INCHES ON-CENTER MAXIMUM.
D. UNLESS OTHERWISE NOTED, PROVIDE 1-#6 BAR AT ALL FOUR SIDES OF OPENINGS AND AT RE-ENTRANT CORNERS IN CONCRETE SLABS, TOP AND BOTTOM, EXTENDING 2 FEET BEYOND OPENING AND RE-ENTRANT CORNERS OR STANDARD HOOKED IF NECESSARY WHETHER OR NOT THE OPENINGS ARE SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS.
E. PROVIDE STANDARD HOOKED DOWELS TO FOOTINGS OR OTHER CONCRETE CONSTRUCTION TO MATCH THE VERTICAL REINFORCING'S SIZE AND SPACING.

3. REFER TO PROJECT SPECIFICATION SECTION 03300 FOR ADDITIONAL REQUIREMENTS.

E. STRUCTURAL STEEL

1. REFER TO PROJECT SPECIFICATION SECTION 05120 FOR STRUCTURAL STEEL REQUIREMENTS.

2. ALL STEEL SHALL BE NEW AND UN-SPLICED STEEL CONFORMING TO THE FOLLOWING ASTM DESIGNATIONS:

- A. W-SHAPES: ASTM A992, Fy = 50 KSI.
B. CHANNELS, ANGLES, PLATES, BARS AND RODS: A36, UNLESS OTHERWISE NOTED.
C. SQUARE AND RECTANGULAR HOLLOW STRUCTURAL SECTIONS: A500 GRADE B, Fy = 46 KSI.
D. ANCHOR RODS: F1554, GRADE 55 WITH WELDABILITY SUPPLEMENT S1 AND WITH STANDARD NUTS AND 5/16 INCH THICK PLATE WASHERS, UNLESS OTHERWISE NOTED.
E. SHEAR STUDS: A108, TYPE B, GRADES 1015 TO 1020 WITH ARC SHEAR AND FLUXED ENDS FOR SHOP WELDED STUDS. MINIMUM YIELD POINT OF 50,000 PSI AND MINIMUM TENSILE STRENGTH OF 60,000 PSI.
F. EXPANSION, CHEMICAL, AND SLOPE ANCHORS, AS MANUFACTURED BY HILLI CORPORATION OR APPROVED EQUIVALENT.
G. GALVANIZING: HOT-DIPPED A123 AND A153 AS APPLICABLE.
H. SHOP PRIMER: TNEEC SERIES 10-1009 GREY OR APPROVED EQUIVALENT.

F. MISCELLANEOUS METALS

1. ALL STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST EDITION OF AISC DETAILING FOR STEEL CONSTRUCTION. THE DETAILING SHALL INCORPORATE ALL CLEARANCES NECESSARY TO PRODUCE PROPER ERECTION, CONNECTING AND FIT-UP.
2. ALL FIRE AND MONUMENTAL STAIR COMPONENTS, HAND-, BALCONY- AND GUARD-RAIL ASSEMBLIES, WALL MOUNTING BRACKETS AND CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH THE FOLLOWING: ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN, AND BE SUBMITTED TO THE ENGINEER FOR RECORD PURPOSES ONLY. THE GOVERNING BUILDING CODE SHALL BE REFERRED TO FOR DETERMINING DEAD AND LIVE LOAD REQUIREMENTS. THE CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR ADDITIONAL LOADING CONDITIONS. MEMBERS, SIZES AND CONNECTIONS SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS ARE SCHEMATIC ONLY, UNLESS STATED OTHERWISE:

- A. AISC "MANUAL OF STEEL CONSTRUCTION - ASD NINTH EDITION AND/OR LRFD, SECOND EDITION".
B. AISC "MANUAL OF STEEL CONSTRUCTION - VOL. 2 - CONNECTIONS (ASD AND/OR LRFD VERSIONS)".
C. NAAMM "METAL STAIRS MANUAL".
D. AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".

3. ALL CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH THE APPLICABLE AISC "MANUAL OF STEEL CONSTRUCTION - ASD, NINTH EDITION AND/OR LRFD, SECOND EDITION" AND AISC "MANUAL OF STEEL CONSTRUCTION - VOL. 2 - CONNECTIONS (ASD) AND/OR LRFD VERSIONS". ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN AND BE SUBMITTED TO THE ENGINEER FOR REVIEW.

A. HANGER CONNECTIONS SHALL USE LOCK-NUTS OR DOUBLE NUTS WITH 5/16 INCH THICK MINIMUM PLATE WASHERS 1 INCH MINIMUM LARGER THAN THE HOLE.

4. ALL SHOP AND FIELD WELDERS SHALL BE CURRENTLY CERTIFIED IN ACCORDANCE WITH THE APPLICABLE AWS D1.1 REQUIREMENTS FOR THE TYPE, POSITION AND PROCESS REQUIRED. ELECTRODES FOR SHOP AND FIELD WELDS SHALL COMPLY WITH THE APPLICABLE AWS D1.1 REQUIREMENTS AND AS FOLLOWS:

- A. MINIMUM YIELD STRENGTH OF ELECTRODES, 70 KSI. USE HIGHER YIELD STRENGTHS WHERE REQUIRED BY DESIGN OR BY AWS D1.1 STRUCTURAL WELDING CODE.
5. FITTED FULL DEPTH WEB STIFFENERS, EACH SIDE OF BEAMS AND GIRDERS, EQUAL TO WEB THICKNESS, SHALL BE PROVIDED AT ALL BEAMS AND GIRDERS SUPPORTING COLUMN OR POST LOADS OR CANTILEVERING OVER COLUMNS OR POSTS.

6. ALL STEEL EXPOSED TO WEATHER OR MOISTURE, WHETHER NOTED AS SUCH IN THE CONTRACT DRAWINGS OR NOT, INCLUDING BUT NOT LIMITED TO: STRUCTURAL STEEL, LINTELS, BOLTS, NUTS, WASHERS, BOLLARDS, SIGN ANGLES, JAMBS AND STEEL EMBEDDED IN EXTERIOR MASONRY OR CONCRETE, SHALL BE CLEANED IN ACCORDANCE WITH SSPC-SP8, "PICKLING", THEN HOT-DIPPED GALVANIZED AFTER FABRICATION, THEN CLEANED IN ACCORDANCE WITH SSPC-SP7 "BRUSH OFF BLAST CLEANING" TO PREPARE THE MATERIALS FOR COATINGS.

G. CONVENTIONAL WOOD FRAMING

1. UNLESS OTHERWISE NOTED, ALL SAWN LUMBER FRAMING MEMBERS SHALL BE ENR-ENTRAINED, NORMAL WEIGHT LUMBER, WITH A MINIMUM SPECIFIC GRAVITY = 0.42. MINIMUM PROPERTIES TO BE IN ACCORDANCE WITH TABLE 4A OF THE LATEST EDITION OF THE "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION" SUPPLEMENT, WITH THE FOLLOWING MINIMUM GRADES:

- A. JOISTS, RAFTERS, SOLID AND BUILT-UP BEAMS AND HEADERS; NO 2 OR BETTER GRADE.
B. WALL STUDS; NO. 2 OR BETTER GRADE.
C. GROUND AND FIRST FLOOR SILLS AND PLATES; NO 2 OR BETTER GRADE.
D. SECOND, THIRD AND FOURTH FLOOR SILLS AND PLATES; NO. 2 OR BETTER GRADE.
E. 4X SOLID WOOD POSTS; NO. 2 OR BETTER GRADE.
F. 6X AND LARGER SOLID WOOD POSTS; NO. 1 OR BETTER GRADE.
G. BRIDGING, BLOCKING AND NAILERS; STUD GRADE.

2. ALL "MICROLAM" AND "LVL" MEMBERS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

- A. E = 1,900,000 PSI
B. Fb = 2600 PSI
C. F1 = 1555 PSI
D. Fc (perpendicular) = 750 PSI
E. Fc (parallel) = 2510 PSI
F. Fv = 285 PSI

3. ALL HORIZONTAL "PARALLAM" MEMBERS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

- A. E = 2,000,000 PSI
B. Fb = 2025 PSI
C. F1 = 2250 PSI
D. Fc (perpendicular) = 750 PSI
E. Fc (parallel) = 2900 PSI
F. Fv = 290 PSI

4. ALL VERTICAL "PARALLAM" MEMBERS SHALL HAVE THE FOLLOWING MINIMUM PROPERTIES:

- A. E = 1,800,000 PSI
B. Fb = 2400 PSI
C. Fc (parallel) = 2500 PSI

5. UNLESS OTHERWISE NOTED, ALL PRESSURE TREATED SAWN LUMBER FRAMING MEMBERS SHALL BE SOUTHERN YELLOW PINE. MINIMUM PROPERTIES TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION" SUPPLEMENT, WITH THE FOLLOWING MINIMUM GRADES:

- A. JOISTS, RAFTERS, SOLID AND BUILT-UP BEAMS AND HEADERS; NO. 2 OR BETTER GRADE.
B. WALL STUDS, SILLS AND PLATES; STUD GRADE.
C. SOLID WOOD POSTS; NO. 1 OR BETTER GRADE.
D. BRIDGING, BLOCKING AND NAILERS; STUD GRADE.

6. UNLESS OTHERWISE NOTED, ALL NAILING AND FASTENING SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE.
7. WOOD SILLS SUPPORTED ON CONCRETE OR MASONRY BENEATH ALL INTERIOR AND EXTERIOR BEARING WALLS AND ALL MEMBERS EXPOSED TO WEATHER OR MOISTURE SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH THE "AMERICAN WOOD PRESERVERS ASSOCIATION, STANDARD C1".

8. ALL LUMBER AND PLYWOOD NOTED IN THE CONTRACT DOCUMENTS AS FIRE RETARDANT TREATED (F.R.T.) SHALL BE SO TREATED IN ACCORDANCE WITH THE "AMERICAN WOOD PRESERVERS ASSOCIATION, STANDARDS C20 AND C27" AND EACH PIECE SHALL BEAR A U.L. LABEL INDICATING SUCH TREATMENT.

9. ALL NON-PRESSURE TREATED WOOD SHALL BE KILN DRIED TO A MOISTURE CONTENT OF 19 PERCENT OR LESS FOR LUMBER AND 15 PERCENT OR LESS FOR PLYWOOD AND OSB BEFORE INSTALLATION AND PRIOR TO THE APPLICATION OF ROOFING AND FINISHES.

10. ADDITIONAL FLOOR JOISTS SHALL BE PROVIDED UNDER ALL PARTITIONS OVER 3 FEET LONG WHICH RUN PARALLEL TO THE SPAN OF THE FLOOR JOISTS.

- 11. ALL STUD WALLS, BEARING AND NON-BEARING, SHALL HAVE ONE ROW OF CONTINUOUS 2X SOLID BLOCKING BETWEEN STUDS AT MID-HEIGHT, UNLESS OTHERWISE NOTED. BLOCKING SIZE TO MATCH STUD SIZE.
12. FRAMING MEMBERS SHALL ONLY BE NOTCHED, CUT OR ALTERED IN THE FIELD IN ACCORDANCE WITH THE STRUCTURAL DETAILS. DEVIATIONS FROM THESE DETAILS IS ONLY PERMITTED WITH THE SPECIFIC APPROVAL OF THE ENGINEER.

G. CONVENTIONAL WOOD FRAMING (CONT.)

13. WHERE REQUIRED BY THE CONTRACT DOCUMENTS, ALL METAL CONNECTIONS FOR WOOD FRAMING SHALL BE LIMITED TO: JOIST, BEAM AND SADDLE HANGERS, POST AND COLUMN BASES AND CAPS, BRIDGING, HOLDDOWS, HINGE CONNECTORS AND THE DE-WATERING SHALL BE PERFORMED IN ACCORDANCE WITH THE GOVERNING BUILDING CODE AND OSHA REGULATIONS, SUPPLEMENTED BY THE CONTRACT DOCUMENTS. THE GOVERNING BUILDING CODE SHALL BE THE MASSACHUSETTS STATE BUILDING CODE, SIXTH EDITION, WITH THE LATEST ADDED AMENDMENTS. WHERE THE EDITION OF THE REFERENCE STANDARDS CITED IN THESE NOTES IS NOT GIVEN, THE EDITION SHOWN SHALL BE AS STATED IN THE GOVERNING BUILDING CODE, OR THE LATEST PUBLISHED EDITION IF NOT NOTED IN THE GOVERNING BUILDING CODE.
2. ALL FIRE AND MONUMENTAL STAIR COMPONENTS, HAND-, BALCONY- AND GUARD-RAIL ASSEMBLIES, WALL MOUNTING BRACKETS AND CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH THE FOLLOWING: ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN, AND BE SUBMITTED TO THE ENGINEER FOR RECORD PURPOSES ONLY. THE GOVERNING BUILDING CODE SHALL BE REFERRED TO FOR DETERMINING DEAD AND LIVE LOAD REQUIREMENTS. THE CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR ADDITIONAL LOADING CONDITIONS. MEMBERS, SIZES AND CONNECTIONS SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS ARE SCHEMATIC ONLY, UNLESS STATED OTHERWISE:

- A. AISC "MANUAL OF STEEL CONSTRUCTION - ASD NINTH EDITION AND/OR LRFD, SECOND EDITION".
B. AISC "MANUAL OF STEEL CONSTRUCTION - VOL. 2 - CONNECTIONS (ASD AND/OR LRFD VERSIONS)".
C. NAAMM "METAL STAIRS MANUAL".
D. AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".

3. ALL CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH THE APPLICABLE AISC "MANUAL OF STEEL CONSTRUCTION - ASD, NINTH EDITION AND/OR LRFD, SECOND EDITION" AND AISC "MANUAL OF STEEL CONSTRUCTION - VOL. 2 - CONNECTIONS (ASD) AND/OR LRFD VERSIONS". ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN AND BE SUBMITTED TO THE ENGINEER FOR REVIEW.

A. HANGER CONNECTIONS SHALL USE LOCK-NUTS OR DOUBLE NUTS WITH 5/16 INCH THICK MINIMUM PLATE WASHERS 1 INCH MINIMUM LARGER THAN THE HOLE.

4. ALL SHOP AND FIELD WELDERS SHALL BE CURRENTLY CERTIFIED IN ACCORDANCE WITH THE APPLICABLE AWS D1.1 REQUIREMENTS FOR THE TYPE, POSITION AND PROCESS REQUIRED. ELECTRODES FOR SHOP AND FIELD WELDS SHALL COMPLY WITH THE APPLICABLE AWS D1.1 REQUIREMENTS AND AS FOLLOWS:

- A. MINIMUM YIELD STRENGTH OF ELECTRODES, 70 KSI. USE HIGHER YIELD STRENGTHS WHERE REQUIRED BY DESIGN OR BY AWS D1.1 STRUCTURAL WELDING CODE.
5. FITTED FULL DEPTH WEB STIFFENERS, EACH SIDE OF BEAMS AND GIRDERS, EQUAL TO WEB THICKNESS, SHALL BE PROVIDED AT ALL BEAMS AND GIRDERS SUPPORTING COLUMN OR POST LOADS OR CANTILEVERING OVER COLUMNS OR POSTS.

6. ALL STEEL EXPOSED TO WEATHER OR MOISTURE, WHETHER NOTED AS SUCH IN THE CONTRACT DRAWINGS OR NOT, INCLUDING BUT NOT LIMITED TO: STRUCTURAL STEEL, LINTELS, BOLTS, NUTS, WASHERS, BOLLARDS, SIGN ANGLES, JAMBS AND STEEL EMBEDDED IN EXTERIOR MASONRY OR CONCRETE, SHALL BE CLEANED IN ACCORDANCE WITH SSPC-SP8, "PICKLING", THEN HOT-DIPPED GALVANIZED AFTER FABRICATION, THEN CLEANED IN ACCORDANCE WITH SSPC-SP7 "BRUSH OFF BLAST CLEANING" TO PREPARE THE MATERIALS FOR COATINGS.

H. PREFABRICATED WOOD WALL PANELS (IF UTILIZED)

1. PREFABRICATED WOOD WALL PANELS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONVENTIONAL WOOD FRAMING REQUIREMENTS.

2. VERTICAL PANEL JOINTS AT CORNERS AND IN THE RUN OF THE WALLS SHALL HAVE THE SHEATHING LAPPED ONTO THE ADJACENT PANEL. AT CORNERS, THE SHEATHING SHALL FULLY LAP THE END OF THE PANEL THAT EXTENDS INTO THE CORNER. AT JOINTS IN THE RUN OF THE WALL, THE SHEATHING SHALL LAP A MINIMUM OF 3/4 INCHES.

3. AT EXTERIOR WALL PANELS, THE SHEATHING SHALL LAP ABOVE AND BELOW THE FLOOR LEVEL AS SHOWN IN THE STRUCTURAL CONTRACT DOCUMENTS.

4. COORDINATE THE LOCATIONS OF THE POSTS ASSOCIATED WITH THE ANCHOR TIEDOWN SYSTEM (A.T.S.) SO THAT THEY ALIGN HORIZONTALLY FROM FLOOR TO FLOOR.

- 5. ALL THE CONTRACT DOCUMENTS, INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, KITCHEN, AND EQUIPMENT SHALL BE REFERRED TO FOR DETERMINING THE TOTAL NUMBER, SIZE, AND LOCATIONS OF OPENINGS IN THE PREFABRICATED WOOD WALL PANELS, WHETHER SHOWN IN THE STRUCTURAL DRAWINGS OR NOT, AND PROVIDE FRAMING IN ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS AT EACH OPENING.
1. WOOD I JOISTS (W.I. JOISTS)

1. ALL W.I. JOISTS SHALL BE TJI/PRO JOISTS AS MANUFACTURED BY "TRUS JOIST MACMILLAN" OR APPROVED EQUIVALENT AND INSTALLED BY THE GENERAL CONTRACTOR AS PER THE "TRUS JOIST MACMILLAN SPECIFICATIONS" OR APPROVED EQUIVALENT.

2. ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN AND BE SUBMITTED TO THE ENGINEER FOR DIMENSIONAL REVIEW AND RECORD PURPOSES ONLY.

3. THE GOVERNING BUILDING CODE AND THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION AND EQUIPMENT CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR DETERMINING DEAD AND LIVE LOAD REQUIREMENTS. ARCHITECTURAL CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR EXTENTS AND LOCATIONS OF OCCUPANCIES. SHOP DRAWINGS AND CALCULATIONS SHALL INDICATE LOADS WHICH MEMBERS HAVE BEEN DESIGNED FOR. DEFLECTION LIMITATIONS ARE AS FOLLOWS:

- A. L/240; TOTAL LOAD.
B. L/360; ROOF LIVE LOAD.

4. SUBMIT W.I. JOIST DESIGN DOCUMENTS WHICH SHALL INCLUDE W.I. JOIST PROPERTIES AND LOADING AND A DIMENSIONED ERECTION PLAN INDICATING THE LOCATION OF EACH W.I. JOIST, ALL OF WHICH SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED.

5. THE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, AND FIRE PROTECTION CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR LAYOUT AND CONFIGURATION REQUIREMENTS NOT SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS. ADDITIONAL W.I. JOISTS SHALL BE PROVIDED UNDER ALL PARTITIONS OVER 3 FEET LONG WHICH RUN PARALLEL TO THE SPAN OF THE W.I. JOISTS.

6. W.I. JOIST FLANGES SHALL NOT BE NOTCHED, CUT, OR ALTERED. HOLES IN W.I. JOISTS WEBS SHALL BE CREATED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

J. WOOD TRUSSES

1. WOOD TRUSS MEMBERS, BRACING (TEMPORARY AND PERMANENT), AND CONNECTIONS SHALL BE DESIGNED BY THE MANUFACTURER AND FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING. ALL DESIGNS SHALL BE PREPARED IN ACCORDANCE WITH GENERAL NOTE #2 HEREIN AND BE SUBMITTED TO THE ENGINEER FOR DIMENSIONAL REVIEW AND RECORD PURPOSES ONLY.

- A. NFGPA "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" AND "SUPPLEMENT - DESIGN VALUES FOR WOOD CONSTRUCTION".
B. AITC "TIMBER CONSTRUCTION MANUAL".
C. TPI "DESIGN SPECIFICATIONS FOR METAL PLATE CONNECTED WOOD TRUSSES".
D. WICA "BRACING WOOD TRUSSES: COMMENTARY AND RECOMMENDATIONS".

2. TRUSS MEMBER, BRACING (TEMPORARY AND PERMANENT), AND CONNECTION DESIGNS SHALL BE MODIFIED BY THE APPLICABLE FACTORS LISTED IN AITC "TIMBER CONSTRUCTION MANUAL", SUCH AS EXPOSURE CONDITION, FIRE RETARDANT TREATMENT, DURATION OF LOAD, ETC.

3. UNLESS OTHERWISE NOTED, PROVIDE THE FOLLOWING MINIMUM PRIMARY REINFORCING IN CMU WALLS AS FOLLOWS:

- A. ALL WALLS: VERTICALS: 1-#6 BAR AT 24 INCHES ON-CENTER, DOWELED TO THE STRUCTURE. HORIZONTALS: 2-#5 BARS IN BOND BEAMS AT EACH FLOOR AND ROOF LEVELS. JOINT REINFORCING AT 16 INCHES ON-CENTER.

C. ALL CMU WALLS SHALL HAVE VERTICAL REINFORCING (AT ENDS, CORNERS, INTERSECTIONS, AND JAMBS OF OPENINGS) AND HORIZONTAL REINFORCING (AT PARTITIONS AND CORNERS) AS SHOWN IN THE MASONRY REINFORCING LAYOUT DETAIL. THE REINFORCING SIZE SHALL MATCH THAT WHICH IS SPECIFIED FOR THE WALL TYPE'S PRIMARY REINFORCING.

D. REFER TO THE CONTRACT DOCUMENTS FOR REINFORCING REQUIREMENTS ABOVE AND BEYOND THAT WHICH IS SPECIFIED IN THESE NOTES.

J. WOOD TRUSSES (CONT.)

3. THE GOVERNING BUILDING CODE AND THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, KITCHEN AND EQUIPMENT CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR DETERMINING DEAD AND LIVE LOAD REQUIREMENTS. ARCHITECTURAL CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR EXTENTS AND LOCATIONS OF OCCUPANCIES. SHOP DRAWINGS AND CALCULATIONS SHALL INDICATE LOADS WHICH MEMBERS HAVE BEEN DESIGNED FOR. DEFLECTION LIMITATIONS ARE AS FOLLOWS:

- A. L/240; TOTAL LOAD.
B. L/480; FLOOR LIVE LOAD (WITHOUT CONSIDERING THE COMPOSITE ACTION OF THE GLUE/NAILED SHEATHING).
C. L/360; ROOF LIVE LOAD.

4. SUBMIT SHOP DRAWINGS WHICH SHALL INCLUDE DIMENSIONED INDIVIDUAL TRUSS MEMBER CONFIGURATIONS, MEMBER LOADING AND SIZES WITH ACCOMPANYING WOOD SPECIES AND LUMBER GRADE, TEMPORARY AND PERMANENT BRACING REQUIREMENTS, CONNECTIONS WITH THEIR ASSOCIATED SPECIFICATIONS, AND A DIMENSIONED ERECTION PLAN INDICATING THE LOCATION OF EACH TRUSS, ALL OF WHICH SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED. WOOD TRUSS SHOP DRAWINGS WILL NOT BE REVIEWED UNTIL THE ENGINEER RECEIVES A CERTIFICATION FROM THE TRUSS MANUFACTURER STATING THAT THEY HAVE "RECEIVED AND REVIEWED A COMPLETE SET OF CONTRACT DRAWINGS AND SPECIFICATIONS".

5. ALL METAL CONNECTIONS FOR TRUSSES, INCLUDING BUT NOT LIMITED TO: TRUSS HANGERS, HOLDDOWS, SEISMIC AND HURRICANE ANCHORS AND STRAPPING, SHALL BE HOT-DIPPED GALVANIZED METAL SHAPES AS MANUFACTURED BY "SIMPSON STRONG-TIE COMPANY, INC." AND BE ATTACHED BY THE GENERAL CONTRACTOR AS PER THE "SIMPSON STRONG-TIE" SPECIFICATIONS. ALL ROOF TRUSSES SHALL BE ATTACHED TO THE STRUCTURE WITH RIFTERS, JOISTS, OR TRUSSES AND CONTINUOUS OVER TWO OR MORE SPANS. INSTALL PANEL CLIPS ALONG PANEL ENDS BETWEEN EACH RAFTER, JOIST, OR TRUSS. ATTACH PANELS WITH 8d COMMON NAILS AT 6 INCHES ON CENTER AT INTERMEDIATE SUPPORTS. LEAVE 1/4 INCH SPACE AT ALL PANEL EDGE JOINTS AND 1/8 INCH SPACE AT ALL PANEL END JOINTS UNLESS OTHERWISE RECOMMENDED BY THE MANUFACTURER.

6. ALL TRUSSES NOTED IN THE CONTRACT DOCUMENTS AS FIRE RETARDANT TREATED (F.R.T.) SHALL BE SO TREATED IN ACCORDANCE WITH THE "AMERICAN WOOD PRESERVERS ASSOCIATION, STANDARD C20" AND EACH PIECE SHALL BEAR A U.L. LABEL INDICATING SUCH TREATMENT. ALL WOOD TRUSSES SHALL BE KILN DRIED TO A MOISTURE CONTENT OF 19 PERCENT OR LESS BEFORE INSTALLATION AND PRIOR TO THE APPLICATION OF ROOFING AND FINISHES.

7. THE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION AND EQUIPMENT CONTRACT DOCUMENTS SHALL BE REFERRED TO FOR LAYOUT AND CONFIGURATION REQUIREMENTS NOT SHOWN ON THE STRUCTURAL CONTRACT DOCUMENTS. THE TRUSS SUPPLIER SHALL DESIGN AND PROVIDE HEADERS, HANGERS, TRUSSES, AND GIRDER TRUSSES AS REQUIRED TO ACCOMMODATE ALL FLOOR PENETRATIONS.

8. ADDITIONAL FLOOR TRUSSES SHALL BE PROVIDED UNDER ALL PARTITIONS OVER 3 FEET LONG WHICH RUN PARALLEL TO THE SPAN OF THE FLOOR.

9. CENTERLINES OF INDIVIDUAL TRUSS MEMBERS SHALL ALIGN AT JOINTS AND OVER SUPPORTS OR DUE CONSIDERATION SHALL BE TAKEN BY THE TRUSS DESIGNER TO ACCOUNT FOR ANY ECCENTRICITY.

10. BEAM CONFIGURATIONS SHOWN IN THE CONTRACT DOCUMENTS ARE NOT MANDATORY, UNLESS SO NOTED, AND MAY BE ALTERED WITH THE APPROVAL OF THE ENGINEER TO SUIT THE MANUFACTURER'S STANDARDS OR TRANSPORTATION REQUIREMENTS.

11. TRUSS MEMBERS SHALL NOT BE NOTCHED, CUT OR ALTERED IN THE FIELD WITHOUT THE SPECIFIC APPROVAL OF THE ENGINEER.

K. STRUCTURAL CONCRETE MASONRY UNITS

1. THE STRUCTURAL CONCRETE MASONRY UNIT NOTES SHALL GOVERN FOR STRUCTURAL MASONRY WALLS, WHICH ARE DEFINED AS THE INTERIOR ELEVATOR SHAFT AND TRASH ROOM WALLS. REFER TO THE ARCHITECTURAL DOCUMENTS FOR INSULATION REQUIRED IN STRUCTURAL MASONRY WALLS.

2. ALL MASONRY MATERIALS AND CONSTRUCTIONS SHALL CONFORM WITH ACI 530.1-95/ASCE 6-95/TMS 602-95 - "SPECIFICATIONS FOR MASONRY STRUCTURES", EXCEPT WHERE STRICTER REQUIREMENTS ARE NOTED IN THE CONTRACT DOCUMENTS.

3. ALL HOLLOW AND SOLID CONCRETE MASONRY UNITS (CMU) SHALL ATTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 2,800 PSI AS DETERMINED BY ASTM C140. ALL HOLLOW AND SOLID CMU SHALL ATTAIN A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 2,000 PSI MINIMUM AS DETERMINED BY ASTM E447. LAY CMU IN RUNNING BOND USE TWO-CORE CMU THROUGHOUT THE PROJECT EXCEPT WHERE SOLID CMU IS SPECIFIED IN THE CONTRACT DOCUMENTS OR REQUIRED FOR MAINTAINING A FIRE-RATED ASSEMBLY.

4. TO ACHIEVE A REQUIRED ONE HOUR FIRE RATING, THE CMU SHALL BE GROUDED AS 19 INCHES ON-CENTER. TO ACHIEVE A REQUIRED TWO HOUR FIRE RATING, THE CMU SHALL BE GROUDED AT 24 INCHES ON-CENTER.

5. ALL VERTICAL CELL, BOND BEAM, AND LINTEL REINFORCING AND DOWELS SHALL CONFORM WITH ASTM A615, GRADE 60.

6. ALL MORTAR SHALL CONFORM TO ASTM C270, TYPE M OR S, WITH THE FOLLOWING CONSTITUENTS AND PROPORTIONS:

- A. PORTLAND CEMENT; ASTM C150, TYPE I OR TYPE II. MASONRY GEMENT, BLENDED HYDRAULIC CEMENTS, POZZOLANS, AND GROUND GRANULATED BLAST-FURNACE SLAG SHALL NOT BE USED.
B. HYDRATED LIME; ASTM C207, TYPE S.
C. SAND; ASTM C144.
D. WATER; POTABLE.
E. COLOR; AS PER ARCHITECT/ENGINEER.
F. PROPORTIONS: ONE PART PORTLAND CEMENT, 1 1/4 TO 1/2 PARTS HYDRATED LIME, AND SAND EQUAL TO 2 TO 1 TO 3 TIMES THE SUM OF THE VOLUME OF CEMENT AND LIME.

7. ALL GROUT SHALL CONFORM TO ASTM C476 WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 3,000 PSI AT THE END OF 28 DAYS AS DETERMINED BY ASTM C1019. A SLUMP AT POINT OF DISCHARGE OF 8 INCHES TO 10 INCHES AS DETERMINED BY ASTM C143 AND WITH THE FOLLOWING CONSTITUENTS AND PROPORTIONS:

- A. PORTLAND CEMENT; ASTM C150, TYPE I OR TYPE II. MASONRY GEMENT, BLENDED HYDRAULIC CEMENTS, POZZOLANS, AND GROUND GRANULATED BLAST-FURNACE SLAG SHALL NOT BE USED.
B. AGGREGATES; ASTM C404.
C. WATER; POTABLE.
D. FINE GROUT PROPORTIONS: ONE PART PORTLAND CEMENT, 2 1/4 TO 3 PARTS FINE AGGREGATE - ALL MEASURED BY VOLUME OF CEMENT.
E. COARSE GROUT PROPORTIONS: ONE PART PORTLAND CEMENT, 2 1/4 TO 3 PARTS FINE AGGREGATE, 1 TO 2 PARTS COARSE AGGREGATE (3/8 INCH MAXIMUM STONE SIZE) - ALL MEASURED BY VOLUME OF CEMENT.

8. ALL JOINT REINFORCING SHALL CONFORM WITH ASTM A951 AND THE FOLLOWING:

- A. TWO W1.7 DEFORMED LONGITUDINAL STEEL WIRES CONFORMING WITH ASTM A498.
B. W1.7 SMOOTH TRUSS-TYPE STEEL CROSS WIRES CONFORMING WITH ASTM A82, WELDED TO THE LONGITUDINAL WIRES AT 16 INCHES ON CENTER.
C. HOT-DIPPED GALVANIZED COATING AFTER FABRICATION CONFORMING WITH ASTM A153.
D. PRE-FABRICATED CORNERS AND INTERSECTIONS.
E. MINIMUM LAP LENGTH OF 12 INCHES.

9. UNLESS OTHERWISE NOTED, PROVIDE THE FOLLOWING MINIMUM PRIMARY REINFORCING IN CMU WALLS AS FOLLOWS:

- A. ALL WALLS: VERTICALS: 1-#6 BAR AT 24 INCHES ON-CENTER, DOWELED TO THE STRUCTURE. HORIZONTALS: 2-#5 BARS IN BOND BEAMS AT EACH FLOOR AND ROOF LEVELS. JOINT REINFORCING AT 16 INCHES ON-CENTER.

C. ALL CMU WALLS SHALL HAVE VERTICAL REINFORCING (AT ENDS, CORNERS, INTERSECTIONS, AND JAMBS OF OPENINGS) AND HORIZONTAL REINFORCING (AT PARTITIONS AND CORNERS) AS SHOWN IN THE MASONRY REINFORCING LAYOUT DETAIL. THE REINFORCING SIZE SHALL MATCH THAT WHICH IS SPECIFIED FOR THE WALL TYPE'S PRIMARY REINFORCING.

D. REFER TO THE CONTRACT DOCUMENTS FOR REINFORCING REQUIREMENTS ABOVE AND BEYOND THAT WHICH IS SPECIFIED IN THESE NOTES.

K. STRUCTURAL CONCRETE MASONRY UNITS (CONT.)

10. OPENINGS REQUIRED IN MASONRY ELEMENTS AND NOT SHOWN IN THE STRUCTURAL CONTRACT DOCUMENTS, SHALL BE INSTALLED ONLY WITH THE SPECIAL APPROVAL OF THE ENGINEER AND WITH THE PROPER ADDITIONAL REINFORCING AS SHOWN IN THE CONTRACT DOCUMENTS.

11. ALL CLEAN-OUT AND GROUTING PROCEDURES SHALL CONFORM TO ACI 530.1-95/ASCE 6-95/TMS 602-95, SECTIONS 3.2 AND 3.5. ALL BOND BEAMS, MASONRY LINTELS, KNOCK-OUT WEB BLOCK, REINFORCED VERTICAL CORERS AND ALL OTHER CORERS SHOWN IN THE CONTRACT DOCUMENTS TO BE GROUDED, SHALL BE GROUDED SOLID AND MECHANICALLY V