

DESIGN NOTES

I. DESIGN LIVE LOADS FOR NEW WORK

A. ROOF LIVE LOAD

- 1. PG = 30 PSF, MIN ROOF DESIGN LOAD = 21 PSF
2. PF = 21 PSF + DRIFTING

B. FLOOR LIVE LOADS

- 1. BEDROOMS = 30 PSF
2. DWELLING AREAS = 40 PSF
3. EXTERIOR DECK = 60 PSF

C. WIND LOAD

- 1. VULT (3-SECOND GUST) = 115 MPH
2. VASD (3-SECOND GUST) = 90 MPH
3. EXPOSURE = B

D. SEISMIC LOAD

- 1. LATERAL FORCE SYSTEM: REINFORCED ICF WALLS
2. SEISMIC USE GROUP = I
3. SITE CLASS = D
4. NO DESIGN REQUIRED PER IRC/R301.2.2

E. CODE: THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL RESIDENTIAL CODE/2015 AND THE 2013 DCMR.

F. ASSUMED SOIL PARAMETERS

- 1. P AT REST = 60H
2. P ACTIVE = 45H
3. P PASSIVE = 300H

G. DEAD LOADS

- 1. ROOF = 12 PSF
2. TYPICAL FLOORS = 12 PSF
3. TILESTONE FLOORS = 20 PSF

II. WOOD

A. ALL JOISTS, BEAMS AND POSTS SHALL BE SPRUCE-PINE-FIR NO.1/NO.2 PER "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION", NFPA. ALL STUDS SHALL BE SPRUCE-PINE-FIR STUD-GRADE. ALL WOOD MEMBERS SHALL BE MANUFACTURED TO COMPLY WITH PS20 OF "AMERICAN SOFTWOOD LUMBER STANDARDS" AND SHALL HAVE 19% MAXIMUM MOISTURE CONTENT.

MINIMUM MEMBER PROPERTIES SHALL BE AS FOLLOWS:

1. WOOD LINTELS, JOISTS AND BEAMS

- A) FLEXURE: FB = 875 PSI
B) SHEAR: FV = 136 PSI
C) MODULUS OF ELASTICITY = 1,400,000 PSI

4. WALL STUDS: STUD GRADE

- A) FLEXURE: FB = 675 PSI
B) COMPRESSION PARALLEL: FC = 725 PSI
D) MODULUS OF ELASTICITY = 1,200,000 PSI

B. ALL FRAMING EXPOSED TO WEATHER IN ACCORDANCE WITH IRC SECTION R317 SHALL BE PRESSURE TREATED SOUTHERN PINE NO.2 PER THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION," NFPA. ALL WOOD MEMBERS SHALL BE MANUFACTURED TO COMPLY WITH PS20 OF THE "AMERICAN SOFTWOOD LUMBER STANDARDS." MINIMUM PROPERTIES SHALL BE IN ACCORDANCE WITH TABLE 4B IN THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION." PRESSURE TREATED WOOD MEMBERS "PT," SHALL BE PROVIDED WHEN:

- 1. WOOD SHEATHING IN THE EXTERIOR OF A BUILDING HAVING A CLEARANCE OF LESS THAN 6-INCHES FROM THE GROUND OR LESS THAN 2-INCHES MEASURED VERTICALLY FROM CONCRETE STEPS, PORCH SLABS, PATIO SLABS OR SIMILAR HORIZONTAL SURFACES EXPOSED TO THE WEATHER.
2. WOOD STRUCTURAL MEMBERS SUPPORT MOISTURE PERMEABLE FLOORS OR ROOFS THAT ARE EXPOSED TO WEATHER, SUCH AS CONCRETE OR MASONRY SLABS, UNLESS SEPARATED FROM SUCH FLOORS OR ROOFS BY AN IMPERVIOUS MOISTURE BARRIER.

C. PROVIDE SIMPSON STRONG-TIE (OR APPROVED EQUAL) POST CAPS AT ALL BEAM-ON-POST BEARING LOCATIONS, U.N.C.

D. ROOF SHEATHING SHALL BE 5/8-INCH, CDX, APA STRUCTURAL I RATED SHEATHING, EXPOSURE I, PER THE "AMERICAN PLYWOOD ASSOCIATION." SHEATHING SHALL BE FASTENED WITH 8D NAILS AT 8-INCHES ON CENTER AT PANEL EDGES AND AT 12-INCHES ON CENTER AT ALL INTERMEDIATE SUPPORTS.

E. WALL SHEATHING SHALL BE 1/2-INCH, CDX, APA STRUCTURAL I RATED SHEATHING, EXPOSURE I, PER THE "AMERICAN PLYWOOD ASSOCIATION." SHEATHING SHALL BE FASTENED WITH 8D NAILS AT 8-INCHES ON CENTER AT PANEL EDGES AND AT 12-INCHES ON CENTER AT ALL INTERMEDIATE SUPPORTS.

F. ALL PLYWOOD SUBFLOORING SHALL BE 3/4-INCH THICK T&G, APA RATED 32/16 ADVANTECH SHEATHING OR STURD-FLOOR 20 OC RATED. SHEATHING SHALL BE GLUED WITH SUB-FLOOR ADHESIVE AND BE FASTENED WITH 8D NAILS AT 8-INCHES ON CENTER AT PANEL EDGES AND AT 12-INCHES ON CENTER AT ALL INTERMEDIATE SUPPORTS.

G. LAMINATED VENEER LUMBER (L.V.L.) SHALL BE INSTALLED AND FASTENED PER THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM MEMBER PROPERTIES SHALL BE AS FOLLOWS:

- 1. FLEXURE: FB = 2,800 PSI
2. SHEAR: FV = 285 PSI
3. MODULUS OF ELASTICITY: E = 2,000,000 PSI

CONTRACTOR SHALL PROVIDE MANUFACTURER'S PRODUCT SHEETS FOR APPROVAL BY ENGINEER FOR ALL LVL BEAMS

H. PARALLEL STRAND LUMBER (P.S.L.) SHALL BE INSTALLED AND FASTENED PER THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM MEMBER PROPERTIES SHALL BE AS FOLLOWS FOR P.S.L. BEAMS:

- 1. FLEXURE: FB = 2900 PSI
2. SHEAR: FV = 280 PSI
3. MODULUS OF ELASTICITY: E = 2,000,000 PSI

CONTRACTOR SHALL PROVIDE MANUFACTURER'S PRODUCT SHEETS FOR APPROVAL BY ENGINEER FOR ALL PSL POSTS AND BEAMS

L. ALL MULTIPLE MEMBERS ARE TO BE FASTENED TOGETHER WITH THE FOLLOWING NAILS AND SIMPSON SDS (STRONG-DRIVE SCREWS), USING THE FASTENER-TO-FASTENER SPACING NOTED WITHIN EACH ROW OF FASTENERS. ALL FASTENERS SHALL BE INSTALLED IN THE QUANTITY OF ROWS SPECIFIED, IN A STAGGERED PATTERN:

Table with 5 columns: PILES, DEPTH, FASTENERS, SPACING, ROWS. Rows include specifications for 1/2" and 3/4" piles at various depths.

* - ALL QUADRUPLE-PLY MEMBERS SHALL BE FASTENED FROM BOTH SIDES WITH THE NUMBER OF ROWS AND FASTENERS SPECIFIED. SIDE-TO-SIDE SPACING SHALL ALSO BE STAGGERED.

M. PROVIDE SOLID BLOCKING BETWEEN JOISTS AND RAFTERS AT ALL BEARING POINTS.

N. ALL MISCELLANEOUS WOOD CONNECTIONS SHALL BE FASTENED PER 2015 IBC, TABLE 2304.10.1 "FASTENING SCHEDULE."

O. NAILS INDICATED IN THE DRAWINGS, DETAILS, AND NOTES SHALL BE DEFINED AS FOLLOWS: 8D=0.131"x2.5", 10D=0.148"x3", 16D=0.162"x3.5", 30D=0.207"x4.5". SUBSTITUTIONS FOR THESE NAIL SIZES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR APPROVAL.

P. DOUBLE JOISTS SHALL BE LOCATED BENEATH ALL PARTITIONS WHEN THE LENGTH OF THE PARTITION EXCEEDS ONE HALF THE SPAN.

Q. JOIST HANGERS SHALL BE SIZED ACCORDING TO THE FOLLOWING SCHEDULE (U.N.C.):

Table with 2 columns: SUPPORTED MEMBER, HANGER. Lists hanger types like LUS20-2, LUS210, LRU212, etc. for different supported members.

SOME HANGERS MAY REQUIRE 16D NAILS - REFER TO THE SIMPSON STRONG-TIE CATALOG FOR REQUIREMENTS. CONTRACTOR SHALL PROVIDE MANUFACTURER'S CUT SHEETS FOR ALL HANGER SUBSTITUTIONS.

R. PRE-ENGINEERED WOOD ROOF TRUSSES, TRUSS SUPPORT HANGERS, AND TRUSS LATERAL BRACING ARE TO BE DESIGNED BY THE MANUFACTURER FOR THE LOADS GIVEN IN CONFORMANCE WITH TPI 1-2007 "NATIONAL DESIGN STANDARD FOR METAL-PLATE-CONNECTED WOOD TRUSS CONSTRUCTION". PERMANENT TRUSS BRACING SHALL BE PROVIDED IN ACCORDANCE WITH BCSI-B3: "PERMANENT RESTRAINT/BRACING OF CHORDS AND WEB MEMBERS." REFER TO THE ARCHITECTURAL DRAWINGS FOR ALL TRUSS DIMENSIONS AND TRUSS CONFIGURATIONS. SHOP DRAWINGS SHALL INCLUDE A TRUSS LAYOUT DRAWING. ALL SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY MARYLAND REGISTERED ENGINEER AND SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.

S. WOOD ROOF TRUSS SHOP DRAWINGS SHALL INDICATE BOTH TEMPORARY AND PERMANENT LATERAL BRACING IN ACCORDANCE WITH THE STANDARD INDUSTRY DETAILS CONTAINED IN BCSI-B3 AND BCSI-B7.

T. TRUSS MEMBER PERMANENT BRACING SHALL BE DESIGNED TO THE REQUIREMENTS OF BCSI-2008, SECTION 2303.4.1.5. THE PERMANENT BRACING OF TRUSS MEMBERS IS REQUIRED AS A PART OF THE TRUSS DESIGN. ALL TRUSSES SHALL BE DESIGNED SO THAT THE BUCKLING OF ANY INDIVIDUAL TRUSS MEMBER IS RESISTED INTERNALLY BY THE STRUCTURE (E.G. BUCKLING MEMBER T-BRACING, L-BRACING ETC.). THE BUCKLING REINFORCEMENT OF THE TRUSS MEMBERS SHALL BE INSTALLED AS SHOWN ON THE TRUSS DESIGN DRAWINGS OR AS PROVIDED ON A SUPPLEMENTAL TRUSS MEMBER BUCKLING REINFORCEMENT DIAGRAM PROVIDED BY THE TRUSS DESIGNER. IF BUCKLING REINFORCEMENT DIAGRAM IS NOT PROVIDED BY TRUSS DESIGNER, PROVIDE PERMANENT RESTRAINT PER BCSI-B3 SUMMARY SHEET.

U. ALL OPEN WEB WOOD TRUSSES SHALL BE DESIGNED, FABRICATED, ERECTED AND INSTALLED PER THE MANUFACTURER'S REQUIREMENTS; PERMANENT LATERAL BRACING AND TEMPORARY BRACING SHALL BE PROVIDED IN ACCORDANCE WITH BCSI-B7: "TEMPORARY AND PERMANENT RESTRAINT/BRACING FOR PARALLEL CHORD TRUSSES." SPACING OF PERMANENT BRACING SHALL NOT EXCEED 6-FEET O.C. TRUSS DEFLECTION SHALL NOT EXCEED THE FOLLOWING CRITERIA:

- Δ LIVE LOAD < L/480
• Δ LIVE LOAD < 1/4 -INCH
• Δ TOTAL LOAD < L/960

V. PRE-ENGINEERED WOOD TRUSS ENGINEER SHALL CONSIDER ALL APPLICABLE DESIGN LOAD CASES AS REQUIRED BY THE IBC 2015 CODE.

W. PROVIDE HURRICANE TIES FASTENED TO THE OUTSIDE FACE OF THE DOUBLE TOP PLATE AT ALL ROOF TRUSS BEARING POINTS. CONTRACTOR SHALL CONTACT STRUCTURAL ENGINEER FOR THE SELECTION AFTER SUBMISSION OF ROOF TRUSS SHOP DRAWINGS.

X. PRE-ENGINEERED OPEN WEB WOOD TRUSSES SHALL BE DESIGNED FOR THE LOADS AND DEFLECTION CRITERIA GIVEN. PROVIDE SHOP DRAWING CONTAINING A JOIST LAYOUT INDICATING LOCATION AND BRACING REQUIREMENTS FOR ALL TRUSSES. SHOP DRAWINGS SHALL INCLUDE TRUSS SUPPORT HANGERS AND BOTH TEMPORARY AND PERMANENT BRACING REQUIREMENTS. ALL SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A MARYLAND REGISTERED PROFESSIONAL ENGINEER AND SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW. IF BUCKLING REINFORCEMENT DIAGRAM IS NOT PROVIDED BY TRUSS DESIGNER, PROVIDE PERMANENT RESTRAINT PER BCSI-B7 SUMMARY SHEET.

Y. WOOD JOISTS SHALL HAVE THE FOLLOWING MINIMUM EI PROPERTIES (IN 2-LBS.):

- 9 1/2" TJI230 = 206,000,000

Z. ALL ROOF SHEATHING SHALL BE LAID CONTINUOUSLY BETWEEN THE EDGES OF THE ROOF. NO INTERRUPTIONS ARE PERMITTED AT CAP TRUSSES OR AT ROOF OVERBUILDS.

AA. ALL NOTCHED STAIR STRINGERS SHALL HAVE AN EFFECTIVE MINIMUM DEPTH OF 5 1/2". PRE-DRILL NOTCH CORNERS WITH A 1/4" Ø HOLE TO REDUCE STRESS CONCENTRATION AND DO NOT OVER-CUT NOTCHES.

BB. ALL PSL FRAMING EXPOSED TO WEATHER OR DESIGNATED "WOLMANIZED" SHALL UNDERGO PRESERVATIVE TREATMENT UNDER USE CATEGORY SYSTEM UCSA, DEFINED BY THE "AMERICAN WOOD PROTECTION ASSOCIATION", AWPA. PRESERVATION TREATMENT SHALL CONSIST OF COPPER AZOLE (CA) OR CHROMATED COPPER ARSENATE (CCA).

III. CONCRETE

A. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH ACI 301, ACI 318 AND ACI 302.

B. CEMENT SHALL COMPLY WITH ASTM C150, TYPE I OR II.

C. REINFORCING STEEL SHALL BE DEFORMED BILLET STEEL CONFORMING TO ASTM A615 GRADE 60. ALL REINFORCEMENT SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS.

D. CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH FC = 3000 PSI FOR FOOTINGS AND FOUNDATION WALLS. FC = 3500 PSI FOR EXTERIOR EXPOSED SLABS/STEPS, GARAGE SLABS AND FOUNDATIONS WALLS.

E. PROVIDE 6X8-W1.4XW1.4 W.W.F. IN ALL SLAB-ON-GRADE. ALL WIRE FABRIC SHALL CONFORM TO ASTM A1084. ALL MESH EDGES SHALL LAP A MINIMUM OF TWO (2) SQUARES.

F. CONCRETE SLUMP SHALL = 4" ± 1".

G. MINIMUM CONCRETE COVER BETWEEN FACE OF REINFORCING BAR AND FACE OF CONCRETE SHALL BE AS FOLLOWS:

- 1. CONCRETE CAST AGAINST EARTH = 3"
2. FORMED CONCRETE EXPOSED TO WEATHER OR EARTH = 2"

H. ALL SLABS AND FOUNDATION WALLS EXPOSED TO WEATHER SHALL HAVE A MINIMUM AIR ENTRAINMENT OF 6% ± 1.5% PER ACI-318 4.2.1.

I. PROVIDE CORNER BARS AT ALL WALL INTERSECTIONS WITH SIZE AND SPACING TO MATCH HORIZONTAL WALL REINFORCEMENT.

J. PROVIDE KEYED JOINTS BETWEEN ALL NON-MONOLITHIC INTERSECTING CONCRETE WALLS AND AT ALL CONCRETE JOINTS.

K. GROUT SHALL BE NON-SHRINKABLE, NON-METALLIC CONFORMING TO ASTM C1107, AND SHALL HAVE A SPECIFIED COMPRESSIVE STRENGTH AT 28 DAYS OF 5,000 PSI. PREGROUTING OF BASE PLATES SHALL NOT BE PERMITTED.

L. PROVIDE AN 8-MIL VAPOR BARRIER OVER A 4-INCH LAYER OF GRAVEL BENEATH ALL SLAB-ON-GRADE.

M. ALL VERTICAL WALL REINFORCEMENT INTERRUPTED BY WALL OPENINGS SHALL BE PLACED IMMEDIATELY ADJACENT TO EACH OF THE OPENINGS.

N. PROVIDE DOWELS WITH STANDARD BAR HOOK IN FOOTING TO MATCH DIAMETER AND SPACING OF VERTICAL REINFORCEMENT. MINIMUM SPLICE LENGTH = 40X BAR DIAMETER.

IV. STRUCTURAL STEEL

A. ALL STRUCTURAL STEEL SHALL BE ASTM FABRICATED AND ERECTED IN ACCORDANCE WITH AISC "STEEL CONSTRUCTION MANUAL" WITH A MINIMUM YIELD STRENGTH AS FOLLOWS:

- 1. PLATES, ANGLES: FY = 36 KSI PER ASTM A36.

B. ALL STEEL PIPE COLUMNS SHALL CONFORM TO ASTM A53, GRADE B, FY = 35 KSI. STANDARD SCHEDULE 40 PIPE TO BE USED UNLESS NOTED OTHERWISE.

C. ALL ANCHOR RODS SHALL BE ASTM F1554 GRADE 36.

D. ALL BOLTS SHALL BE ASTM A307.

E. WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE "STRUCTURAL WELDING CODE" AWS D1.1-2015. USE 70 X X LOW-HYDROGEN ELECTRODES.

F. NO OPENINGS IN COLUMNS ARE PERMITTED WITHOUT STRUCTURAL ENGINEER'S APPROVAL.

G. SPLICING OF STRUCTURAL STEEL MEMBERS WHERE NOT DETAILED ON THE CONTRACT DOCUMENTS IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER AS TO LOCATION, TYPE OF SPLICE AND CONNECTION TO BE MADE.

H. ALL MISCELLANEOUS STEEL CONNECTIONS SHALL BE WELDED ALL AROUND WITH ONE-QUARTER-INCH FILLET WELD UNLESS OTHERWISE NOTED, EXCEPT FOR SLOTTED CONNECTIONS.

I. ALL WORK SHALL COMPLY WITH THE AISC CODE "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

V. TESTING AND INSPECTION

THE CONTRACTOR SHALL RETAIN THE SERVICES OF AN INSPECTION AGENCY TO PERFORM THE FOLLOWING SERVICES:

A. INSPECTION OF SUBGRADE BELOW ALL FOUNDATIONS AND SLAB-ON-GRADE TO VERIFY THE ADEQUACY OF THE BEARING MATERIAL.

B. WRITTEN REPORTS SHALL BE SUBMITTED TO THE ARCHITECT STATING COMPLIANCE OR NONCOMPLIANCE WITH DESIGN DOCUMENTS AND SPECIFICATIONS. ALL REPORTS SHALL BE SIGNED AND SEALED BY A VIRGINIA REGISTERED ENGINEER.

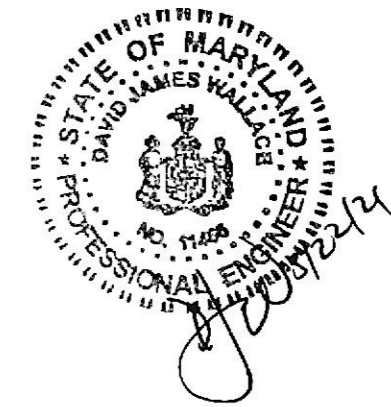
C. INSPECTION AND TESTING OF ALL NEW STRUCTURAL FILL WITH REPORTS SUBMITTED TO ARCHITECT STATING COMPLIANCE OR NONCOMPLIANCE WITH PERCENT COMPACTION REQUIREMENTS.

VI. EARTHWORK

A. ASSUMED ALLOWABLE SOIL BEARING PRESSURE FOR ALL SHALLOW FOOTINGS IS ASSUMED TO BE 2000 PSF. SHOULD UNSUITABLE MATERIAL BE ENCOUNTERED, FOOTINGS SHALL BE OVEREXCAVATED AND REPLACED WITH LEAN CONCRETE, FC = 2000 PSI. BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 2'-6" BELOW EXTERIOR GRADE, UNLESS NOTED OTHERWISE.

B. FOOTING TRENCHES SHALL BE BACKFILLED WITH LEAN CONCRETE IMMEDIATELY UPON EXCAVATION TO PREVENT GROUNDWATER INFILTRATION.

C. PERIMETER DRAIN TILE SHALL CONSIST OF 4-INCH DIAMETER CORRUGATED POLYETHYLENE TUBING PER ASTM D-406 WITH A MAXIMUM SIZE WIDTH OF 1/4-INCH. TUBING SHALL BE PLACED WITH SLOTS DOWN USING STRAIGHT SECTIONS AND STANDARD CONNECTIONS.



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Owner
Project Name
Design Notes

Table with 2 columns: Field (Project number, Date, Drawn by, Checked by) and Value (2021-572, 2-3-2021, Author, Checker)

A-002

Scale