

STRUCTURAL NOTES

GENERAL

THESE DRAWINGS, AS INSTRUMENTS OF PROFESSIONAL SERVICE, ARE THE PROPERTY OF LYSAGHT & ASSOCIATES, P.A., FOR USE SOLELY WITH THIS PROJECT AND SHALL NOT BE REPRODUCED FOR OTHER PURPOSES.

THE PROFESSIONAL ENGINEER WHOSE SEAL APPEARS ON THESE DRAWINGS IS THE PROJECT STRUCTURAL ENGINEER-OF-RECORD (SER) WHO BEARS LEGAL RESPONSIBILITY FOR THE PERFORMANCE OF THE STRUCTURAL FRAMING RELATING TO PUBLIC HEALTH, SAFETY, AND WELFARE. NO OTHER PARTY, WHETHER OR NOT A PROFESSIONAL ENGINEER, MAY COMPLETE, CORRECT, REVISE, DELETE, OR ADD TO THESE CONSTRUCTION DOCUMENTS OR PERFORM INSPECTIONS OF THE WORK WITHOUT THE WRITTEN PERMISSION OF THE SER.

USE STRUCTURAL DRAWINGS IN CONJUNCTION WITH JOB SPECIFICATIONS, AND OTHER DRAWINGS.

SECTIONS AND DETAILS SHOWN SHALL BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS.

ALL NON-STRUCTURAL ELEMENTS INDICATED ON THE STRUCTURAL DRAWINGS HAVE BEEN SHOWN IN GENERAL RELATIONSHIP TO THE STRUCTURAL ELEMENTS. THEY SHALL NOT BE ASSUMED TO BE ACCURATE AND REFERENCE MUST BE MADE TO THE APPROPRIATE CONSULTANT(S) PLANS AND SPECIFICATIONS.

CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND TAKE ALL NECESSARY FIELD MEASUREMENTS.

CONTRACTOR SHALL TAKE SUCH ACTION AS NECESSARY TO PREVENT MOVEMENT OF OR DAMAGE TO THE ADJACENT STRUCTURE DURING CONSTRUCTION.

THE STRUCTURE SHOWN ON THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETED FORM. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BRACING TO STABILIZE THE BUILDING DURING CONSTRUCTION.

SCOPE OF STRUCTURAL ENGINEERING SERVICES

LYSAGHT & ASSOCIATES, P.A. HAS PERFORMED THE STRUCTURAL DESIGN AND PREPARED THE STRUCTURAL WORKING DRAWINGS FOR THIS PROJECT. "CONSTRUCTION REVIEW" SERVICES ARE NOT A PART OF THIS CONTRACT. THE CONSTRUCTION MUST BE PERFORMED IN STRICT ACCORDANCE WITH THE STRUCTURAL DRAWINGS. ANY DEVIATION FROM THE DRAWINGS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. ERRORS AND/OR OMISSIONS FOUND ON THE STRUCTURAL DRAWINGS MUST BE BROUGHT TO THE STRUCTURAL ENGINEER'S ATTENTION IMMEDIATELY.

PORTIONS OF THE STRUCTURAL DESIGN (AS NOTED ON THE DRAWINGS AND IN THESE NOTES) ARE THE RESPONSIBILITY OF THE MATERIAL SUPPLIERS. SHOP DRAWINGS FOR EACH OF THE STRUCTURAL COMPONENTS MUST BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION AND ERECTION.

THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR THE DESIGN OF THE PRIMARY STRUCTURAL SYSTEM, EXCEPT FOR THE COMPONENTS NOTED ABOVE. RESPONSIBILITY FOR ANY SECONDARY STRUCTURAL AND NON-STRUCTURAL SYSTEMS NOT SHOWN ON THE STRUCTURAL PLANS RESTS WITH SOMEONE OTHER THAN THE STRUCTURAL ENGINEER.

THE STRUCTURAL ENGINEER HAS NOT DONE A SUBSURFACE INVESTIGATION (HE IS NOT A SOILS SPECIALIST). THE FOUNDATION DESIGN IS BASED UPON AN ASSUMED ALLOWABLE BEARING PRESSURE AS SHOWN IN THE "FOUNDATION" STRUCTURAL NOTES. THIS ALLOWABLE BEARING PRESSURE MUST BE VERIFIED BY THE CONTRACTOR OR OWNER. IF PROBLEMS ARE ENCOUNTERED, A SOILS ENGINEER SHOULD BE RETAINED TO EVALUATE THE CONDITIONS AND RECOMMEND THE APPROPRIATE FOUNDATION SYSTEM.

THE STRUCTURAL ENGINEER HAS NOT DESIGNED THE STRUCTURE FOR SPECIFIC VIBRATION LIMITS. VIBRATION LIMITATIONS ARE BASED ON STANDARD ENGINEERING PRACTICES AND PAST EXPERIENCE WITH SIMILAR CONSTRUCTION.

THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR, AND WILL NOT HAVE CONTROL OF, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION WORK. NOR WILL HE BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE CONSTRUCTION WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

FIELD MEASUREMENTS AND THE VERIFICATION OF FIELD DIMENSIONS ARE NOT PART OF THE STRUCTURAL ENGINEER'S RESPONSIBILITY. THE CONTRACTOR MUST CHECK ALL (ASSUMED) EXISTING CONDITIONS SHOWN ON THESE DRAWINGS FOR ACCURACY AND NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCIES.

ABBREVIATIONS

- A.B. ANCHOR BOLT
- A.F.F. ABOVE FINISH FLOOR
- C/C CENTER TO CENTER
- E.W. EACH WAY
- N.T.S. NOT TO SCALE
- O.C. ON CENTER
- P.A.F. POWDER ACTUATED FASTENER
- T.O.F. TOP OF FOOTING
- T.O.S. TOP OF STEEL
- U.N.O. UNLESS NOTED OTHERWISE
- W.W.F. WELDED WIRE FABRIC

CODE

NORTH CAROLINA STATE BUILDING CODE - 2009 EDITION
BUILDING OCCUPANCY CATEGORY II

DESIGN LOADS

FLOOR DEAD LOAD

FLOOR LIVE LOAD

SNOW LOAD DATA :

GROUND SNOW LOAD

SNOW EXPOSURE FACTOR

SNOW LOAD IMPORTANCE FACTOR

THERMAL FACTOR

FLAT ROOF SNOW LOAD

ROOF SLOPE FACTOR

PITCHED ROOF SNOW LOAD

WIND LOAD DATA :

DESIGN WIND SPEED (ASCE 7-05)

WIND IMPORTANCE FACTOR

WIND EXPOSURE

INTERNAL PRESSURE COEFFICIENTS

WIND BASE SHEAR (X-Y DIRECTION)

WIND BASE SHEAR (Y-Z DIRECTION)

WIND PRESSURE FOR COMPONENTS / CLADDING

PER ASCE 7-05

SEISMIC LOAD DATA :

SEISMIC IMPORTANCE FACTOR

MAPPED SPECTRAL RESPONSE ACCELERATION

SITE CLASS

SPECTRAL RESPONSE COEFFICIENT

SEISMIC DESIGN CATEGORY

BASIC STRUCTURAL SYSTEM

SEISMIC RESISTING SYSTEM

RESPONSE MODIFICATION COEFFICIENT

SYSTEM OVERSTRENGTH FACTOR

DEFLECTION AMPLIFICATION FACTOR

SEISMIC RESPONSE COEFFICIENT

ANALYSIS PROCEDURE

SEISMIC BASE SHEAR

LATERAL DESIGN CONTROL

WIND

FOUNDATIONS

ALL FOOTINGS SHALL REST ON SOIL CAPABLE OF SAFELY SUPPORTING 2000 PSF CONTACT STRUCTURAL ENGINEER IF UNSATISFACTORY SUBSURFACE CONDITIONS ARE ENCOUNTERED.

FOOTINGS SHALL BE CARRIED TO A LOWER ELEVATION THAN THOSE INDICATED ON THESE DRAWINGS IF NECESSARY TO REACH FIRM UNDISTURBED SOIL.

THE BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE A MINIMUM OF 16" BELOW FINISHED GRADE UNLESS NOTED OTHERWISE.

SLAB ON GRADE SHALL BE FOUNDED ON STABLE NATURAL SOIL OR CONTROLLED COMPACTED FILL. THE MINIMUM BEARING CAPACITY SHALL BE 2000 PSF.

ALL FILL SHALL BE PLACED IN 8" MAXIMUM LOOSE LIFTS AND SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D-698 (STANDARD PROCTOR METHOD). THIS REQUIREMENT SHOULD BE INCREASED TO 98 PERCENT OF ASTM D-698 IN THE FINAL FOOT BENEATH FOOTINGS, FLOOR SLABS, AND PAVEMENTS.

CONCRETE

CONCRETE SHALL BE PROPORTIONED, MIXED AND PLACED IN ACCORDANCE WITH ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", AND ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS. ANY ADMIXTURES MUST BE APPROVED BY THE STRUCTURAL ENGINEER.

ADMIXTURES CONTAINING CHLORIDE SALTS ARE NOT PERMITTED.

MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 3000 PSI. USE NORMAL WEIGHT CONCRETE FOR FOOTINGS AND SLABS ON GRADE.

THE CONCRETE SUPPLIER SHALL ADD POLYPROPYLENE FIBERS (FIBERMESH) TO ALL CONCRETE FOR SLABS ON GRADE. THE FIBER REINFORCING SHALL BE ADDED AT THE PLANT IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

ALL CONCRETE NOT SPECIFICALLY NOTED AS LIGHTWEIGHT CONCRETE SHALL BE NORMAL WEIGHT CONCRETE WITH A UNIT WEIGHT OF 145 PCF (±5 PCF).

DO NOT CAST CONCRETE IN WATER OR ON FROZEN GROUND.

REINFORCING STEEL

ALL DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH THE LATEST MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, ACI 315.

REINFORCING BARS SHALL BE NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. CLEAR CONCRETE COVER OVER BARS SHALL BE 3" FOR FOOTINGS, U.N.O.

ALL SLABS ON GRADE SHALL BE REINFORCED WITH 6 x 6 w 14 x w 14 W.W.F. SUPPORT THE MESH AS REQUIRED TO INSURE THAT IT WILL BE LOCATED IN THE UPPER THIRD OF THE SLAB THICKNESS.

PROVIDE CORNER BARS AT ALL FOOTING STEPS AND CORNERS. BARS SHALL BE A MINIMUM OF 2'-6" LONG AND SHALL HAVE THE SAME SIZE AND SPACING AS HORIZONTAL REINFORCING.

LAP ALL SPLICES IN CAST-IN-PLACE CONCRETE AS SPECIFICALLY CALLED FOR, BUT AT LEAST 48 BAR DIAMETERS. LAP ALL SPLICES IN MASONRY 48 BAR DIAMETERS MINIMUM, UNLESS NOTED OTHERWISE.

STRUCTURAL STEEL

FABRICATE AND ERECT ALL STRUCTURAL STEEL IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (ANSI/AISC 360-05)".

STRUCTURAL STEEL SHALL RECEIVE ONE SHOP COAT OF RUST-INHIBITIVE PAINT. STEEL COLUMNS BELOW GRADE THAT ARE NOT ENGAGED IN CONCRETE SHALL BE FIELD PAINTED WITH A WATERPROOF MASTIC COMPOUND TO PREVENT CORROSION.

THE STEEL USED SHALL HAVE THE FOLLOWING MINIMUM YIELD STRESS:

WIDE FLANGE SHAPES ("W" SHAPES) 50 KSI (A992)

CHANNELS, ANGLES, PLATES, MISC. SHAPES 36 KSI (A36)

STRUCTURAL PIPE SHAPES 35 KSI (A53, B)

HSS TUBE SHAPES 46 KSI (A500, B)

USE 3/4" DIAMETER A-325N BOLTS FOR ALL STEEL TO STEEL CONNECTIONS U.N.O. BOLTS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION UNLESS NOTED OTHERWISE. THE SNUG TIGHT CONDITION IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN ALL PILES IN A JOINT ARE IN FIRM CONTACT.

USE F1554 (GRADE 36) BOLTS FOR ALL ANCHOR BOLTS U.N.O.

USE E-70 ELECTRODES FOR ALL SHOP AND FIELD WELDING.

THE STEEL FABRICATOR SHALL DESIGN ALL STEEL TO STEEL CONNECTIONS FOR THE SERVICE LOAD REACTIONS SHOWN ON THE DRAWINGS (USE 60K MINIMUM WHERE NOT SHOWN) WHERE SINGLE SHEAR PLATES ARE USED. CONNECTIONS FOR WIDE FLANGE BEAMS SHALL HAVE THE FOLLOWING MINIMUM ROWS OF BOLTS :

W8, W10, W12 BEAMS (2) ROWS OF BOLTS

W14, W16 BEAMS (3) ROWS OF BOLTS

W18 BEAMS (4) ROWS OF BOLTS

W21 BEAMS (5) ROWS OF BOLTS

W24 BEAMS (6) ROWS OF BOLTS

THE STEEL SUPPLIER SHALL DESIGN ALL STEEL STAIRS AND LADDERS IN ACCORDANCE WITH THE N.C. STATE BUILDING CODE. STAIR SHOP DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA.

FOR MISCELLANEOUS STEEL NOT SHOWN ON THESE DRAWINGS, SEE ARCHITECTURAL AND OTHER ENGINEERING DRAWINGS.

CONNECTIONS BETWEEN STRUCTURAL STEEL MEMBERS SHALL BE AS SHOWN ON STRUCTURAL DRAWING DETAILS. ALTERNATE CONNECTION DETAILS MUST BE APPROVED IN WRITING, BY THE STRUCTURAL ENGINEER OF RECORD, PRIOR TO THE SUBMITTAL OF SHOP DRAWINGS.

FLOORING FOR ALL LANDINGS AND THE FIRST FLOOR LEVEL IS TO BE TYPE CM4 STEEL GRATING WITH 3/4" x 1/8" BARS SPACED 11/16" O.C. BY IKG INDUSTRIES OR EQUAL. GRATING TO RECEIVE ONE SHOP COAT OF RUSTOLEUM PRIMER AND WILL BE FIELD PAINTED ONCE INSTALLED. INSTALLATION TO BE BY FIELD WELDING OR MECHANICAL ATTACHMENT FURNISHED BY GRATING SUPPLIER. (TO BE CORROBATED WITH ARCHITECT OF RECORD.)

FLOORING FOR SECOND FLOOR LEVEL TO BE 1/4" CHECKERED STEEL PLATE THAT IS TO BE WELDED TO STEEL SUPPORTS IN THE FIELD. FLOOR PLATE TO RECEIVE ONE SHOP COAT OF RUSTOLEUM PRIMER AND WILL BE FIELD PAINTED ONCE INSTALLED. FIELD PAINTING COLOR AND TYPE TO BE CORROBATED WITH ARCHITECT.

SUBMIT ERECTION AND SHOP DRAWINGS TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO FABRICATION.

Paul Lysaght, P.E. 12/17/10



LYSAGHT & ASSOCIATES, P.A.
STRUCTURAL ENGINEER-OF-RECORD
120 EAST LANTANA STREET
WARRENTON, OR 97146
503.863.1400

REV	DESCRIPTION	DATE

WARRENTON PIPE SHOP STAIR TOWER
WARRENTON, NC
FILE NAME: 2156 SDDWG (1/4" = 1'-0" SCALE)

DATE: 12/17/10
DRAWN: MJB
CHECKED: JMH
APPROVED: JMH

SHEET 50 OF 6 SHEETS LA-5756