

DATE	NO.	REVISION

STRUCTURAL NOTES for RUTHERFORD COUNTY CENTRAL MSW FACILITY

A. GENERAL

- The structure is designed in accordance with the North Carolina State Building Code – 2012 Edition (2009 International Building Code with current North Carolina amendments).
- Special Inspections per Chapter 17 of the NC State Building Code are required for this project. Refer to the Project Specifications for the Statement of Special Inspections, Statement of Contractor Responsibility, and the Quality Assurance Plan for Seismic Resistance.
- The design loads are as follows:

Live Load	
Roof	20 psf
Floor (Typical, U.O.N.)	250 psf
Snow Load	
Ground Snow Load P_G	15 psf
Flat roof Snow Load P_f	15 psf
Snow Exposure Factor C_E	1.0
Snow Load Importance Factor I	1.0
Thermal Factor C_T	1.1
Wind Load	
Basic Wind Speed V_{3s}	90 mph
Wind Importance Factor	1.0
Occupancy Category	II
Wind Exposure	C
Internal Pressure Coefficient GC_{pi}	± 0.18
Components and Cladding	+27 psf
Design Code Reference Publication	ASCE 7-05
Design Base Shear	$V_y =$ Determined by Bldg Mfr
	$V_x =$ Determined by Bldg Mfr
Seismic Load	
Seismic Occupancy Category	II
Seismic Design Category	C
Spectral Response Coefficients S_{ps}	35%g
S_{p1}	17%g
Spectral Response Acceleration S_{MS}	53%g
S_{M1}	25%g
Site Class	D
Seismic Importance Factor I_E	1.0
Basic Seismic-Force-Resisting System	Structural Steel System Not Specifically Detailed for Seismic Resistance
Response Modification Factor R	3.0
Seismic Response Coefficient C_s	0.12
Design Base Shear	Determined by Bldg Mfr
Analysis Procedure	Determined by Bldg Mfr
Lateral Design Control	Determined by Bldg Mfr

Pre-engineered systems and components shall be designed based on the minimum load requirements per ASCE-7 and the above basic load parameters.

- The structure has been designed to withstand In-Service loads only. Methods, procedures, and sequences of construction are the responsibility of the Contractor. The Contractor shall take all necessary precautions to maintain and insure the integrity of the structure at all stages of construction.
- Where conflicts occur between Notes, Drawings, or Specifications, the Contractor shall not proceed with the affected work until the Structural Engineer issues a clarification.
- Horizontal and vertical clearances from the existing adjacent structure shall be verified before construction is begun. Variations from the dimensions indicated on the contract documents shall be brought to the attention of the Designer.

B. FOUNDATION

- All footings shall be founded on undisturbed soil or a controlled fill having a bearing capacity of 3,000 psf, at the elevations shown on the structural drawings.

C. CONCRETE

- Concrete in the following areas shall have natural sand fine aggregate and normal weight coarse aggregates conforming to ASTM C33, Type I Portland Cement conforming to ASTM C150, and shall have the following minimum compressive strength (f_c) at 28 days:

Footings	3000 psi w/ (3% Entrained Air & Fly Ash optional)
Building Walls	4000 psi w/ 5% Entrained Air and Fly Ash

 New Building Slab, Existing Building Slab Replacement, and Exterior Slab Apron:

Maximum 28 Day Shrinkage Test Results of 0.03% in accordance with the Modified ASTM C157	
Minimum 28 Day Compressive Strength (f_c) = 5000psi	

 Cement type: 1
 Flyash: 15%-25% flyash by weight of cement
 Maximum Water / Cementitious Material Ratio (W/CM): 0.40
 Nominal Size of Coarse Aggregate: 3/4" normal weight
 Total Air Content: 6% (F_2' exposure)
 Admixtures: high range water reducing admixture (super-plasticizer)
 Slump: 3"-5" (prior to adding super-plasticizer) 5"-7" (after adding super-plasticizer)
 Curing Method and Time: wet cure for 10 days using 'UltraCure NCF' curing blanket manufactured by McTech Group, or approved equivalent.
- All concrete shall be made in accordance with approved design mixes as required for the job.
- All concrete shall contain entrained air in accordance with ACI 318, Table 4.2.1, U.O.N.
- Concrete that arrives at the jobsite with a slump greater than 5" shall be rejected. Concrete with a slump less than 3" shall have an approved super-plasticizer added such that the minimum 3" slump may be achieved. The addition of water at the jobsite, beyond that held-back at the concrete plant, for the purpose of increasing the slump is prohibited.
- Schedule of Concrete Finishes:

Interior slab on grade	Light-Broom Finish
Exterior Slab Apron	Light-Broom Finish
Exterior steps and sidewalks	Non-slip Broom Finish.
All unexposed concrete surfaces, U.O.N.	Rough Form Finish.
All exposed concrete surfaces, U.O.N.	Smooth Rubbed Finish.
Tops of exposed wall surfaces	Trowel Finish.
- The Contractor shall be responsible for furnishing and installing anchor bolts, clips, inserts, connection plates, sleeves, slots, and other required items in accordance with the Contract Drawings, and in cooperation with other trades prior to placing the concrete.

D. CONCRETE REINFORCEMENT

- Concrete reinforcement bars shall conform to ASTM A615, Grade 60. Reinforcement designated as continuous shall lap 36 bar diameters at splices, unless noted otherwise.
- All concrete reinforcement bars shall be accurately and securely tied and anchored in place to prevent dislocation during the concrete placement operation.
- Provide corner reinforcement, 36 bar diameters X 36 bar diameters, at each continuous footing change in direction.
- Provide 1 - #4 reinforcement bar X 4'-0" at re-entrant corners and around the perimeter of rectangular holes in the slab, unless otherwise noted. Place bar diagonal to the corner with 1" clearance from the top and the side of the slab at the corner.
- Minimum concrete cover protection for reinforcement bars shall conform to the American Concrete Institute Committee 318, Section 7.7, unless noted otherwise.

E. STRUCTURAL STEEL

- Structural steel wide-flange shapes shall conform to ASTM A992, minimum strength of 50 ksi, unless otherwise noted.
- Structural steel angles, channels, and plates shall conform to ASTM A36, grade 36 unless otherwise noted.
- Structural steel tubing shall conform to ASTM A500, Grade B, $f_y = 46$ ksi.
- Structural steel pipe shall conform to ASTM A53, Type E or S, Grade B, $f_y = 35$ ksi.
- Bolts for connecting structural steel shall be 3/4" diameter, conforming to ASTM A325-N, U.O.N.
- Anchor Bolts shall be headed and conform to ASTM F1554, grade 36.
- All ferrous metal structures shall be hot-dip galvanized after fabrication, unless otherwise noted. The Metal Building Structure is excluded from this requirement.
- Fabrication and erection of all structural steel shall be in accordance with the latest AISC Specifications. Any connection not detailed on the Structural Drawings shall be designed and detailed by the Structural Steel fabricator. The connections for hollow structural sections shall be designed in accordance with the AISC Hollow Structural Sections Connection Manual, latest edition. All steel-to-steel joint connections types shall be "Snug-Tight", unless otherwise noted.
- Welding shall conform to the American Welding Society Standard D1.1. Electrodes for shop and field welds shall conform to AWS A5.1 or AWS 5.5, Class E70XX, low hydrogen, unless noted otherwise. Only welders who have been qualified by tests as prescribed in the referenced Standards to perform the type of work required shall make welds.
- Splicing of structural steel members where not detailed on the Contract Documents is prohibited without the prior approval of the Structural Engineer as to the location, type of splice, and connection to be made.
- Encase all structural steel below grade with concrete with a minimum coverage of 3".

F. PRE-ENGINEERED METAL BUILDINGS

- The new Pre-Engineered Metal Building Addition shall match the existing VULCAN Building in finish-color, as closely as practical. The spans, eave heights, roof slope, roof panel gauge, and wall panel gauge shall match the existing building, U.O.N.
- Configuration, including bracing, shall be as shown on the drawings. Should building manufacturer wish to furnish a system that will differ from that shown, written approval shall be obtained from the Designer prior to bidding.
- Building design and load application shall conform to the current North Carolina State Building Code. The collateral load shall not be used to reduce the effects of wind loads on the building.

Roof Live Load	As Required by NCSBC
Collateral Roof Dead Load	5 psf
Wind Load	90 mph
Exposure	C
Enclosure Classification	Enclosed
Importance Factor	1.0

 Refer to the "GENERAL" section of the STRUCTURAL NOTES for additional loading information.
- The Metal Building frames shall be designed such that the maximum horizontal drift due to wind and seismic loading shall satisfy an H /180 criteria. The maximum vertical deflection of primary and secondary framing members shall be within the tolerances proscribed by the NC State Building Code. Manufacturer shall verify that the deflection criteria are compatible with exterior and interior finishes supported by the Metal Building structure.
- The footing design is based upon an assumed loading of the Metal Building super-structure. The foundations shall not be constructed until the Structural Engineer has reviewed the actual design reactions supplied by the Manufacturer.

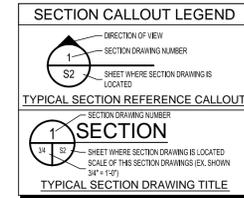
G. MISCELLANEOUS ITEMS

- Epoxy for the setting of dowels or anchor bolts shall be "PE 1000" as manufactured by Powers Fasteners, Inc., New Rochelle, NY, or an approved equivalent. Installation of the dowels/anchor bolts shall be performed in strict accordance with the manufacturer's written instructions.
- GROUT for setting bearing surfaces shall be non-shrink, equal to "Masterflow 928" as manufactured by MBT-BASF.
- Walls retaining earth, other than walls designed as cantilevers, shall be adequately braced until concrete for the supporting slabs has been placed and sufficiently cured.
- Unless specifically shown or noted on the Drawings, no structural member shall be cut, notched, bored, or otherwise weakened without the permission of the Structural Engineer.
- Contractor shall verify all opening sizes and locations with the Mechanical equipment supplier's drawings and Architectural drawings.

H. TYPICAL ABBREVIATIONS

- The following are typical abbreviations used in the structural drawings:

A.B.	-ANCHOR BOLT	H.S.	-HEADED STUD
ADD'L	-ADDITIONAL	JST.	-JOIST
ARCH'L	-ARCHITECTURAL	JT.	-JOINT
BM	-BEAM	LT.	-LIGHT
BP	-BASE PLATE	MAS.	-MASONRY
BRG.	-BEARING	MAX.	-MAXIMUM
BSMT.	-BASEMENT	MECH.	-MECHANICAL
C.I.P.	-CAST IN PLACE	MFR	-MANUFACTURER
C.J.	-CONTROL OR CONSTRUCTION JOINT	MIN.	-MINIMUM
CLR.	-CLEAR	NOM.	-NOMINAL
CMU	-CONCRETE MASONRY UNIT	NTS	-NOT TO SCALE
COL.	-COLUMN	O.H.	-OPPOSITE HAND
CONC.	-CONCRETE	O.C.	-ON CENTER
CONST.	-CONSTRUCTION	PC	-PRECAST OR PILE CAP
CONT.	-CONTINUOUS	PREFAB.	-PREFABRICATED
COORD.	-COORDINATE	REF.	-REFERENCE
DET.	-DETAIL	REINF.	-REINFORCEMENT
DIA	-DIAMETER	SECT.	-SECTION
DWG.	-DRAWING	SIM.	-SIMILAR
E.B.	-EXPANSION BOLT	STD.	-STANDARD
EL.	-ELEVATION	STRUCT.	-STRUCTURAL
F.F.	-FINISHED FLOOR	T.O.S.	-TOP OF SLAB OR STEEL
FIN.	-FINISHED	TYP.	-TYPICAL
FLR.	-FLOOR	U.O.N.	-UNLESS OTHERWISE NOTED
FOUND.	-FOUNDATION	V.I.F.	-VERIFY IN FIELD
FTG.	-FOOTING	VERT.	-VERTICAL
GALV.	-GALVANIZE (D) (ING)	W.P.	-WORK POINT
H.C.	-HOLLOW-CORE	WT.	-WEIGHT
HORIZ.	-HORIZONTAL	W.W.R.	-WELDED WIRE REINF.
HDG	-HOT-DIP GALVANIZED		



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RUTHERFORD COUNTY N.C.
 CENTRAL MSW FACILITY
 TRANSFER STATION UPGRADE
 PERMIT # 81-04T

STRUCTURAL NOTES

DESIGNED BY: EJK	DRAWN BY: KN
CHECKED BY: EJK	PROJECT NO.: RUTH-2
SCALE: AS NOTED	DATE: JULY 2012
FILE NAME: 20120440	
SHEET NO. 18	DRAWING NO. S7