- 1.1 "2018 North Carolina State Building Code" and "International Building Code", 2015.
- 1.2 "Minimum Design Loads for Buildings and other Structures" SEI/ASCE 7-10.
- 1.3 "Building Code Requirements for Structural Concrete (ACI 318—14)" American Concrete Institute 2014.
- 1.4 "Manual of Standard Practice", Concrete Reinforcing Steel Institute, latest edition.
- 1.5 "Specification for Structural Steel Buildings (AISC 360-10)" American Institute of Steel Construction, 2011 - 14th Edition
- 1.6 "Structural Welding Code Steel (AWS D1.1)" and "Structural Welding Code Reinforcing Steel (AWS D1.4)", American Welding Society.
- 2.0 DESIGN LOADS:
- Project Located in: City of Lillington, County of Harnett, State of North Carolina.
- 2.1 Gravity Loads and Lateral Loads as per Stephens job #64032 sheet 3 of 3 Revision 3 dated 4—20—2021

ALL Loads are in KIPS								
Description of Item	Vertical Loads			Horizontal Shear				
Description of item	DEAD (D)	LIVE (L)	WIND (ASD)	SEISMIC (ASD)	DEAD (D)	LIVE (L)	WIND (ASD)	SEISMIC (ASD)
Column Line AA-1069 BBL (2) COMP. CEM. SILO	15.4	114.5	55.8	114.1	1.0	8.0	4.3	8.9
Column Line BB-1069 BBL (2) COMP. CEM. SILO	15.4	114.5	55.8	114.1	1.0	8.0	4.3	8.9
Column Line A-1069 BBL (2) COMP. CEM. SILO	15.4	114.5	55.8	114.1	1.0	8.0	4.3	8.9
Column Line B-1069 BBL (2) COMP. CEM. SILO	15.4	114.5	55.8	114.1	1.0	8.0	4.3	8.9
Column Line E-150 TON/12 YD AGGREGATE SECTION	13.8	96.3	21.2	28.0	0	0	3.8	5.1
Column Line F-150 TON/12 YD AGGREGATE SECTION	13.8	96.3	21.2	28	0	0	3.8	5.1
Column Line C-36" BELT CONVEYOR SUPPORT	1.8	0.9	9.1	2.0	0	0	1.4	0.3
Column Line D-36" BELT CONVEYOR SUPPORT	1.0	0.9	3.4	1.0	0	0	0.8	0.2
Column Line W-36" BELT CONVEYOR SUPPORT	1.0	0.9	1.3	0.5	0	0	0.5	0.2

1. All dimensions are to the centers of the piers and base plates U.N.O.

- 2. Plant Operations Procedure: The owner shall incorporate in their operating manual that in the event of a hurricane; the aggregate bin shall to be 25% full or greater and silos shall be 50% full or greater.
- 2.2 Drifting Snow Loads per N.C. Building Code.
 - Pg = 10 psfI = 1.0
 - Ce = 1.0Ct = 1.0
- 2.3 Risk Category = II
- 2.4 Wind Loads per N.C. State Building Codes, 2018 edition (IBC 2015) & ASCE 7-10 (3-second gust)

Main Wind Force Resisting System: V 117 mph Exposure Category "C"

Building is enclosed & Internal Pressure coefficient (GCpi) = +0.18 & -0.18Topographic Factor Kzt = 1.0Wind Directionality Factor, Kd = 0.85

Calculated Wind Base Shear (For MWFRS) Vx = BY OTHERS Vy = BY OTHERS

2.5 Seismic Loads per 2018 North Carolina State Building Code (IBC 2015) & ASCE 7-10

Risk Category = IISite class = "D" Spectral Response Coefficients: SDS = 0.195aSD1 = 0.138qCs = 0.098g

Seismic Design Category = B Seismic Importance Factor = 1.0 Basic Seismic - Force - Resisting System Building Frame System - ASYMMETRICALLY BRACED OR UNBRACED LEGS (Table 15.4-2 ASCE 7_10) RX=RY=2.0, Ω X= Ω Y=2.0, CDX=CDY=2.5 Design Base Shear Vx = BY OTHERS Vy = BY OTHERS Building Height Limit = NL Analysis Procedure - 12.8.1 ASCE 7-10 Equivalent Lateral Force Procedure

- 3.0 FOUNDATIONS:
- 3.1 Foundation design is based on geotechnical report #66Z-0128 by Froehling and Robertson, Raleigh NC dated August 17, 2021. This report is available for inspection at the office of the architect or owner. The recommendations contained in this report are herein made part of the requirements of these contract documents.
- 3.2 Footings shall bear on strata capable of sustaining a minimum bearing pressure of 1500 psf
- 3.3 Top of footing (T/FTG) elevations are shown on the drawings or are to be determined by the Contractor in the field in accordance with the guidelines set forth in the drawings.
- 3.4 Bottom of exterior footings, grade beams and walls shall bear at a minimum depth of 1'-0" below final grade for frost protection.
- 3.5 Testing and Inspection:
 - a. All areas to have slabs on grade shall be proof rolled in accordance with and under observation fo the Geotechnical Engineer and approved prior to preparation for concrete placement.
 - b. All foundation bearing strata shall be inspected and approved by the Geotechnical Engineer prior to any concrete placement.
 - c. Geotechnical Engineer shall be the sole judge as to suitability of all foundation and/or slab bearing
 - d. Footing bearing elevations shall be adjusted in the field as required to meet the design bearing pressures by additional excavation or compaction and/or backfilling or by other means acceptable to the Geotechnical Engineer.
- 3.6 Undercutting to remove existing fill beneath footings and slab shall be performed at the direction of the Geotechnical Engineer.
- 3.7 Engineered Fill: All fill material shall be selected in accordance with the Geotechnical Report Material shall be a clean, low plastic soil with a plasticity index less than 30 (less than 15 is preferred), liquid limit less than 50, and unit weight of 120 pcf (+ 5 pcf)

- 3.8 Compaction: All fill shall be placed in loose lifts not exceeding 8 inches in thickness and compacted to a minimum of 96 percent Standard Proctor (ASTM D-698) except that the top 12 inches shall be compacted to a minimum of 98 percent Standard Proctor. Moisture shall be controlled to within 3 percent above or below optimum content.
- 3.9 Remove all topsoil and organic materials. The stripping should extend at least 10' beyond the proposed construction limits.
- 3.10 Contractor shall review all construction considerations as outlined in the Geotechnical report and bid

4.0 CONCRETE:

- 4.1 Concrete Strength:
- All concrete shall be in accordance with the American Concrete Institute (ACI) 301 and 318.
- 4.2 Concrete shall have a 28 day compressive strength and density as follows:
- a. Footings, Walls, and Piers............3,000psi, Density = ± 145 pcf
- 4.3 Concrete Mix Designs:
- a. Submittals: Submit written reports of each proposed concrete mix not less than 15 days prior to the
- b. Mix designs, including water, cement ratios and slumps, shall be prepared in accordance with ACI 301-05, Section 4, Cement shall conform to ASTM C 150 Type 1 or at contractor's option, ASTM C 595 Type IP where fly ash is permitted. Normal weight aggregate shall conform to ASTM C 33 and light weight aggregate shall conform to ASTM C 330. No admixtures containing calcium chloride shall be permitted in any concrete.
- c. Aggregate size shall be #67 stone for supported slabs or other formed concrete elements; #57 stone for slabs on grade and footings or other concrete elements formed from and poured against earth; #89 stone for masonry grout.
- d. Water reducing admixture shall be used in all concrete.
- e. Air entraining admixture in accordance with ACI 301 shall be used in all concrete exposed freezing and thawing during construction or service conditions.
- f. Concrete subjected to freezing/thawing shall have a maximum water/cement ratio of 0.45 and shall contain the amount of air entraining agent specified in ACI 301-05 Section 4.
- 4.4 Curing:
- See specifications for curing method options and apply within two (2) hours after completion of finishing to all concrete flatwork and walls, U.N.O., other than footings and grade beams.
- 4.5 Use a non-corrosive, non-chloride accelerating admixture in concrete exposed to temperatures below 40 degrees. Uniformly heat the water and aggregates to a temperature of not less than 50 degrees. Place and cure concrete in accordance with ACI 306.
- 4.6 When hot weather conditions exist, place and cure concrete in accordance with ACI 301. Cool ingredients before mixing to maintain concrete temp. at time of placement below 90 degrees.
- 4.7 Reinforcing in all abutting concrete, including footings shall be continuous through or around all corners or intersections. Dowels or splices shall be equal in size and spacing to the reinforcing in the abutting members.
- 4.8 Base plates, anchor rods, support angles and other steel exposed to earth or granular fill shall be covered with a minimum of 3" of concrete.
- 4.9 Non-shrink grout shall be pre-mixed, non-corrosive, non-metallic, non-staining containing silica sands, Portland cement, shrinkage compensating and water reducing agents. Product shall only require the addition of water. Minimum compressive strength shall be 2500 psi after one day and 7000 psi after 28 days. Grout shall be free of gas producing or air releasing and oxidizing agents and contain no corrosive iron, aluminum or gypsum.
- 4.10 Tolerance for anchor rods and other embedded items shall be per the AISC Code of Standard Practice Section
- 4.11 Unless otherwise shown in the architectural drawings, provide 3/4—inch chamfers at all column, wall, slab or beam edges that are exposed to view in the finished structure.
- 4.12 Concrete cover for cast—in—place concrete reinforcement: Concrete cast against & permanently exposed to earth:...3 Inches Concrete exposed to earth or weather: No. 6 through No. 18 Bars:... ...2 Inches No. 5 Bar and smaller:.. ..1½" Inches Concrete not exposed to weather or in contact with around: Slabs, Walls, Joists: No. 11 Bar and smaller:.. $..\frac{3}{4}$ " Inches Beams, Columns: ..1½" Inches Primary Reinforcement, Ties, Stirrups:....
- 5.0 REINFORCING STEEL:
- 5.1 Reinforcing shall be domestic new billet steel conforming to ASTM A615, Grade 60 or 60S including stirrups and ties, except that reinforcing which is required to be welded shall conform to ASTM A706.
- 5.2 Field bending of concrete reinforcing steel is not permitted.
- 5.3 Welded wire mat and fabric shall conform to ASTM A184 and A185 respectively and shall be provided in flat sheets. Welded wire mat/fabric snall be lapped 0'-6" at all splices.
- 5.4 Bar Splices:

		f'c = 3,000psi		f'c = 4,000psi	f'c = 5,000psi		
Bar Size	Size Ld (in) Class "B" Lap Splice (in)		Ld (in) Class "B" Lap Splice (in)		Ld (in)	Class "B" Lap Splice (in)	
#3	17	22	15	19	13	17	
#4	22	29	19	25	17	23	
#5	28	36	24	31	22	28	
#6	33	43	29	37	26	34	
#7	48	63	42	54	38	49	
#8	55	72	48	62	43	56	

- 1. Values are based on normal weight concrete. 2. Ld = minimum embed of rebar
- 3. Class "B" lap splice refers to minimum distance bars must be lapped for a full tension splice.
- 6.0 CONSTRUCTION AND SAFETY:
- 6.1 Woods Engineering P.A.'s responsibility is limited to the details and information shown on these drawings. It is the responsibility of the Contractor to provide adequate safety measures required by local codes as well as OSHA Standards for the Construction Industry.
- This should include, but not be limited to the following:
- Shoring to protect new as well as existing structures. Necessary Scaffolding.
- Material Handling Equipment.
- Trench Boxing.

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Release Dates

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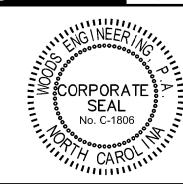
SCHEDULE FOR MATERIAL INSPECTIONS							
BUILDING COMPONENTS OR MATERIAL	MATERIAL SUBMITTAL	INSPECTION / MONITORING	INSPECTION FREQUENCY	INSPECTOR QUALIFICATIONS	TEST REQUIREMENTS	TEST FREQUENCY	INSPECTION AGENCY
SOILS	1. REVIEW FROEHLING & ROBERTSON, INC. GEOTECHNICAL REPORT #66Z-0128, DATED AUGUST 17, 2021. ALLOWABLE SOIL BEARING CAPACITY = 1500 psf 2. FILL MATERIAL SPECIFICATIONS.	12. INSPECT SOILS PER ATTACHED 2009 IBC, TABLE 1704.7 FOR REQUIRED VERIFICATION AND INSPECTION.	ALL INSPECTIONS ARE PERIODIC EXCEPT FILL PLACEMENT AND COMPACTION WHICH IS CONTINUOUS.	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.	PROVIDE VISUAL AND DCP TESTS PER ASTM STP-399 SUBGRADE DENSITY VERIFICATION	EACH ISOLATED FOOTING AND AT 20' INTERVALS FOR CONTINUOUS FOOTINGS.	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.
CONCRETE	SUBMIT CONCRETE MIX DESIGN. SUBMIT MATERIAL CERTIFICATION SUBMIT REBAR SHOP DRAWINGS.	INSPECT CONCRETE CONSTRUCTION PER ATTACHED 2009 IBC, TABLE 1704.4	AS OUTLINED PER TASK IN TABLE 1704.4	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.	TEST CONCRETE FOR COMPRESSIVE STRENGTH, SLUMP, AIR CONTENT, TEMPERATURE AND BATCH TO PLACEMENT TIME.	1. SAMPLES FOR STRENGTH TESTS FOR EACH CLASS OF CONCRETE PLACED EACH DAY SHALL BE TAKEN NOT LESS THAN ONCE A DAY, NOR LESS THAN ONCE FOR EACH 150 YD ³ OF CONCRETE, NOR LESS THAN ONCE FOR EACH 5,000FT ² OF SURFACE AREA FOR SLABS OR WALLS.	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.
STEEL	1. SUBMIT ANCHOR ROD SETTING PLAN. 2. SUBMIT STEEL SHOP DRAWINGS. 3. SUBMIT MATERIAL CERTIFICATES. 4. FABRICATOR CERTIFICATE OF COMPLIANCE WITH 2009 IBC, 1704.2.2.	INSPECT STEEL PER ATTACHED 2009 IBC, TABLE 1704.3	AS OUTLINED PER TASK IN TABLE 1704.3	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.	VISUAL INSPECTION BY A QUALIFIED STEEL INSPECTOR. ALL FIELD BOLTING SHALL BE SNUG TIGHT.	INSPECT ALL FIELD CONNECTIONS.	QUALIFIED INSPECTION AGENCY A) INSPECTION AGENCY TO BE APPROVED BY SPECIAL INSPECTION COORDINATOR & BUILDING OFFICIAL.

	VERIFICATION & INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1.	INSPECTION OF REINFORCING STEEL AND PLACEMENT.	_	X
2.	INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE 1704.3, ITEM 5B.	-	_
3.	INSPECTION OF ANCHORS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED OR WHERE STRENGTH DESIGN IS USED	Х	-
4.	INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE.	_	Х
5.	VERIFYING USE OF REQUIRED DESIGN MIX.	-	Х
6.	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMP. OF THE CONCRETE.	Х	-
7.	INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	Х	-
8.	INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	Х
9.	INSPECTION OF PRESTRESSED CONCRETE:		
	a. APPLICATION OF PRESTRESSING FORCES.	Х	-
	b. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC-FORCE-RESISTING SYSTEM.	х	-
10.	ERECTION OF PRECAST CONCRETE MEMBERS.	_	Х
11.	VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POSTTENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	Х
12.	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	_	X

	REQUIRED VERIFICATION & INSPECTION OF SOILS FREQUENCY CHART					
	VERIFICATION & INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED			
1.	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	_	Х			
2.	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	_	Х			
3.	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	_	X			
4.	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	Х	-			
5.	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	_	X			

NOTE: SEE IBC 2009, TABLE 1704.7 FOR REFERENCE STANDARDS.

VERIFICATION & INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY TASK LIS
1. MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS	<u>.</u>	ı
a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.	_	Х
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	-	Х
2. INSPECTION OF HIGH-STRENGTH BOLTING:		
a. SNUG-TIGHT JOINTS.	_	Х
b. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCHMARKING, TWIST-OFF BOLT OR DIRECT TENSION	_	Х
INDICATOR METHODS OF INSTALLATION. c. PRETENSIONED AND SLIP—CRITICAL JOINTS USING TURN—OF—NUT WITHOUT MATCHMARKING OR CALIBRATED WRENCH METHODS OF INSTALLATION.	Х	_
MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD—FORMED ST DECK:	EEL	
a. FOR STRUCTURAL STEEL, IDENTIFICATION MARKINGS TO CONFORM TO AISC 360	-	Х
 FOR OTHER STEEL, INDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS. 	-	х
c. MANUFACTURER'S CERTIFIED TEST REPORTS.		Х
4. MATERIAL VERIFICATION OF WELD FILLER MATERIALS:		_
a. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.	-	Х
b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.	_	Х
5. INSPECTION OF WELDING:		
a. STRUCTURAL STEEL AND COLD-FORMED STEEL DECK:		
1) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	Х	_
2) MULTIPASS FILLET WELDS.	Х	_
3) SINGLE-PASS FILLET WELDS > 5/6"	Х	_
4) PLUG AND SLOT WELDS.	Х	_
5) SINGLE-PASS FILLET WELDS ≤ 5/16"	-	Х
6) FLOOR AND ROOF DECK WELDS.	-	Х
b. REINFORCING STEEL:		
1) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	-	Х
2) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL STRUCTURAL WALLS OF CONCRETE AND SHEAR REINFORCEMENT.	Х	_
3) SHEAR REINFORCEMENT.	Х	_
4) OTHER REINFORCING STEEL	_	Х
6. INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE:		
a. DETAILS SUCH AS BRACING AND STIFFENING.	-	Х
b. MEMBER LOCATIONS.	-	Х
c. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.		х





Release Dates

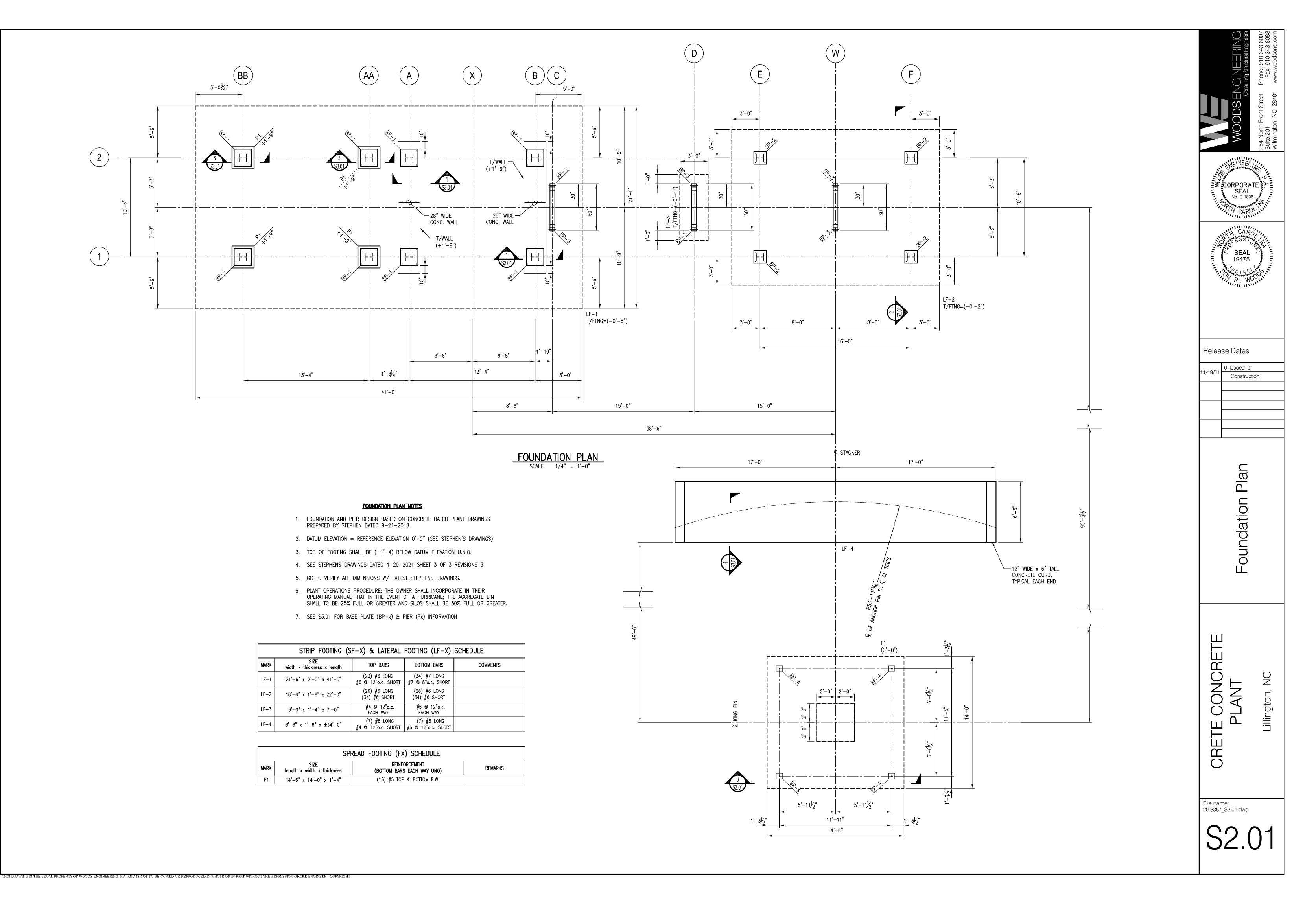
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Material Inspectior Requirements

CRETE CONCRETE
PLANT

Lillington, NC

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