

GENERAL STRUCTURAL NOTES



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- *** --- INFORMATION BASED ON ACOE DRAWINGS C-1 THROUGH C-4, S-1, AND S-2 WITH REVISIONS NO. 3 DATED 03/30/07 FOR CONTRACT W912HN-07-C-0027
- ★ --- INSTALLED BY OTHERS UNDER U.S. ARMY CORPS OF ENGINEERS' CONTRACT W912HN-07-C-0027

GENERAL

- Generally the scope of work includes stabilization of lighthouse foundations, for long term stability of the existing structure. Foundation stabilizations will include coordination with WPC Engineering Environmental and Construction Services (WPC), as required to transfer existing foundation loads to new pile foundations. Although new piles will be designed in accordance with IBC 2006, the Owner is advised that the foundation stabilization work does not include structural upgrades for the entire lighthouse to meet current flood, wind, or seismic requirements. The presence of original unreinforced brick masonry, combined with unreinforced cast-in-place concrete foundations, results in a very vulnerable structure under seismic loads, which is not in conformance with current IBC 2006 requirements. In addition, the first floor slab elevation within the lighthouse is below the current FEMA Base Flood Elevation.
- The existing Lighthouse Structure is currently listing in the northeast direction. Correction of the "Northeast List" is beyond the current scope of work.
- All permits shall be secured by others and are beyond the scope of work by Stantec. The Contractor shall verify that all permits are in place prior to construction.
- All materials for design, detailing, fabrication, and erection shall conform with ASTM, AISC, and AASHTO Codes and Standards, with editions as referenced in IBC 2006.
- All dimensions and elevations must be field verified by the Contractor prior to ordering or fabricating new materials. The Contractor shall verify all dimensions, elevations, and details in the field prior to construction.
- The Contractor shall provide adequate bracing, shoring, formwork, protection, and sequencing during construction, and he is responsible for any failures and damages due to the lack of such.
- Extreme diligence and care shall be exercised by the Contractor to protect the existing structure and its appurtenances. Any damages as a result of construction operations are the sole responsibility of the Contractor, and shall be repaired at no additional cost to the Owner.
- Workers and Guests of the lighthouse shall be protected by the Contractor. All OSHA and other applicable safety standards shall be adhered to by the Contractor during all work. Adequate safety nets, barricades, fences, formwork, guardrails, safety lines, platforms, life vests, signage, locks, and other temporary safety devices shall be provided by the Contractor as required to protect all personnel and property. Any damages, accidents, or injuries as a result of construction operations are the sole responsibility of the Contractor.
- Existing utilities, equipment, and other appurtenances conflicting with the proposed work shall be relocated, or removed and reinstalled, by the Contractor as required to complete all work.
- Unless specifically noted in the drawings or specifications, any items to be removed by the Contractor shall be disposed of by the Contractor.
- Upon completion of all work, the Contractor shall clean up and remove from the site all formwork, temporary structures, surplus materials, tools, appliances, rubbish, protection devices, accessing devices, excess materials, cleaning debris, equipment, and other foreign debris such that the site is left in a neat, orderly condition.
- After completion of all work, structural maintenance shall be the responsibility of the Owner.

DESIGN LIVE LOADS

- Foundation design loads are listed as follows:

Concrete Dead Loads	135 pcf
Brick Masonry Dead Loads	120 pcf
Sand Fill and Rip-Rap Dead Loads	110 pcf
Miscellaneous Metals Dead Loads	30 pcf
Roof Live Loads	20 pcf
Floor, Stair, and Landing Live Loads	30 pcf (with no live load reductions)
Flood	VE (EL. 19.0') **
Wind Velocity	130 mph winds per IBC 2006 and ASCE 7-05 **
Seismic	IBC 2006 and ASCE 7-05 **

Occupancy Category	II
Importance Factor (I)	1.0
S(S)	1.189
S(1.0)	0.296
S(DS)	0.812
S(D)	0.357
Site Class	D
Seismic Design Category	D
Seismic Response Coef. C(S)	0.137
Response Mod. Factor (R)	3
Force Resisting System	Nonreinforced Masonry Structure
Analysis Procedure	Equivalent Lateral Force Procedure
Design Base Shear	1235k

- ** 2. The existing super-structure does not meet current flood, wind, or seismic requirements of IBC 2006. In addition, the current foundation stabilization work does not include structural upgrades for the entire lighthouse to meet current flood, wind, or seismic requirements. See General Note 1 above concerning the specific scope of work.
- *** 3. Seismic soil parameters and seismic foundation analyses are based on assumed soil properties, which must be confirmed following results of WPC's geotechnical explorations and analyses.

FOUNDATION NOTES

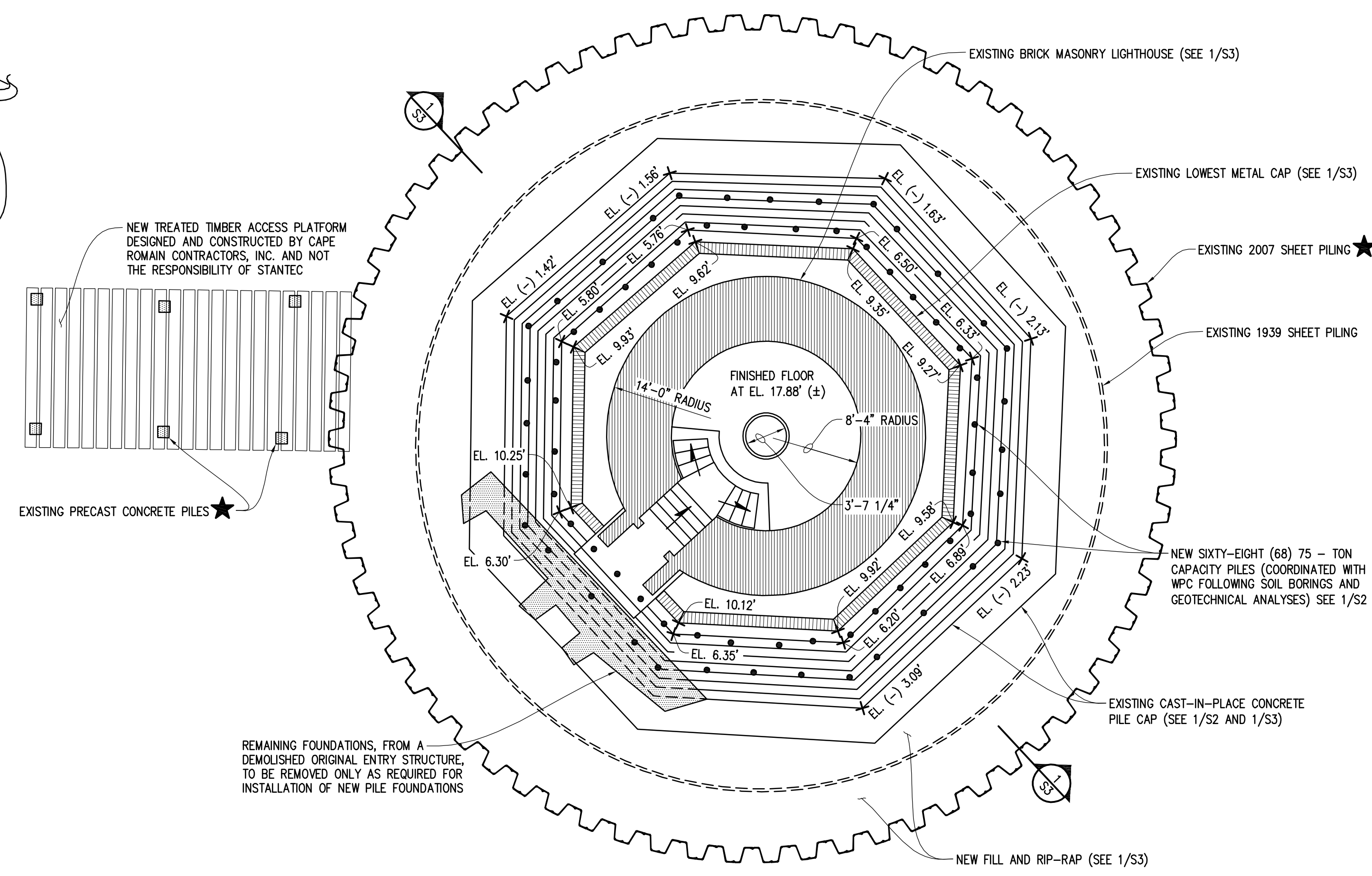
- To date, no geotechnical explorations have been completed on site. Geotechnical investigations, analyses, and pile designs are required by WPC prior to installation of any new pile foundations.
- Pile layouts are based on allowable access to the perimeter of the existing structure, 3'-0" minimum pile spacings, and offset clearances from existing grillage lines.
- Existing grillage lines have been accurately located in the northeast / southwest direction as shown on Sheet S2. However, grillage lines in the northwest / southeast direction have been approximated, based on five (5) located points at the southeast corner of the existing pile cap. Locations of existing piles are assumed at intersections of existing grillage lines, which must be field verified during core-drilling operations. Any conflicts with existing wood framing during core-drilling operations, and / or pile installations, shall be brought to the attention of Stantec and WPC for review and analysis.
- Foundation designs are based on concrete "micro-piles," with minimum "allowable" capacities of 75 tons in compression, which must be designed by WPC following geotechnical investigations and analyses. New piles, in conjunction with original unreinforced brick masonry / concrete foundations, are designed to completely support the existing structure, without any assistance from original piles.
- Analyses of existing brick masonry / concrete foundations are based on the following properties, as presented by WPC in their "Core Compressive Strength and Unit Weight Data" dated 4/12/10:

A. Brick Masonry Average Unit Weight	120 pcf
B. Concrete Average Unit Weight	135 pcf
C. Brick Masonry Minimum Compressive Strength	1900 psi
D. Concrete Minimum Compressive Strength	2850 psi

Upon completion of all material testing, WPC shall submit a final report of all investigations, testing, and results, including core-drilled locations and logs.

- Prior to pile installations, existing conditions of the existing structure shall be documented by WPC and equipment installed by WPC for monitoring vibrations and / or displacements during construction. Construction vibrations and displacements shall be continually monitored by WPC as required to protect the existing structure until completion of all new work. Any displacements or significant vibrations noted during construction shall be brought to the immediate attention of Stantec for review and analysis.
- Sequencing of pile installations shall be coordinated between Palmetto Gunite, WPC, and Stantec as required to provide continual stabilization of the existing lighthouse, until completion of all new work.
- In conjunction with pile installations, all voids beneath existing foundations and all voids in original timber framing shall be filled with 3000 psi cementitious grout, as required to re-establish loads on original piles as much as practical and protect remaining timber from additional "teredo" damages.
- Concrete protective covering for all pile reinforcing steel shall be 3" on top, plus 2" on each side.
- A set of three test cylinders shall be made in accordance with ASTM C94 for every 50 cubic yards, for each week of grout and concrete placement. Cylinders shall be tested in accordance with ASTM C39 by WPC at 7 days, 28 days and one retained for a spare.
- Pile installations shall be monitored under the supervision of a Registered Geotechnical Engineer from WPC, who (or his representative) shall keep a log showing: 1) pile number, 2) pile location, 3) date, 4) penetration length, 5) volumes of grout applied at each pile, and 6) effects of pile installations on the existing structure.
- Upon completion of all geotechnical / material investigations, analyses, and testing by WPC, WPC shall submit a report, or series of reports, including but not limited to:

- A. A summary of all investigations, analyses, and tests,
- B. Required pile lengths, diameters, reinforcement, and strengths as required for 75 ton "allowable" compressive capacities,
- C. "Allowable" lateral load capacities for the specified pile length and diameter,
- D. Any recommended pile installation procedures,
- E. Results of pile load tests,
- F. File installation logs,
- G. Sealed certification of 75 ton "allowable" pile capacities,
- H. Results of concrete and grout cylinder tests,
- I. Recommended geotextile fabrics for adequate containment of new fill soils, and
- J. Results of lighthouse monitoring equipment for displacements and vibrations.



1 NEW SITE PLAN
S1 SCALE: 1/8" = 1' - 0"

IN COORDINATION WITH 2007 U.S. ARMY CORPS OF ENGINEERS' DRAWINGS, ACOE CONTRACT W912HN-07-C-0027, ALL ELEVATIONS SHOWN ARE IN FEET AND ARE RELATIVE TO NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929.

FOR CONSTRUCTION

Revision	By	Appd.	Date

File Name: 170603030-S1.DWG SFO ECP ECP 04/27/10
Dwn. Chkd. Dsgn. Date

Permit-Seal

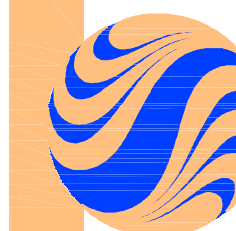
Client/Project
Palmetto Gunite Construction Co., Inc.

Morris Island Lighthouse
Foundation Stabilization, Phase II
Charleston, SC

Title
New Site Plan and General Notes

Project No. 170603030 Scale As Noted

Drawing No. S1 Sheet 1 of 3 Revision 0



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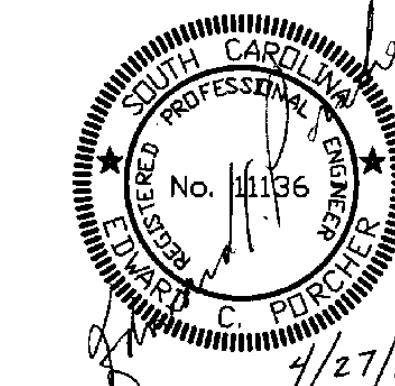
★ INSTALLED BY OTHERS UNDER U.S. ARMY CORPS OF ENGINEERS' CONTRACT W912HN-07-C-0027

- EXISTING GRILLAGE LINES LOCATED AT EACH END BY STANTEC SURVEY CREWS ON 04/01/10
- EXISTING GRILLAGE LINES LOCATED ON ONE END ONLY BY STANTEC SURVEY CREWS ON 04/01/10 AND ASSUMED TO PROJECT PERPENDICULAR TO TRANSVERSE GRILLAGE LINES
- ASSUMED EXISTING GRILLAGE LINES, NOT EXPOSED FOR STANTEC'S REVIEW, BASED ON PREVIOUS REPORTS PREPARED BY OTHERS
- NEW COLUMN LINES FOR LOCATION OF NEW PILES

Revision	By	Appd.	Date

File Name:	SFO	ECP	ECP	Date
170603030-S2.DWG	Dwn.	Chkd.	Dsgn.	04/27/10

Permit-Seal



FOR CONSTRUCTION

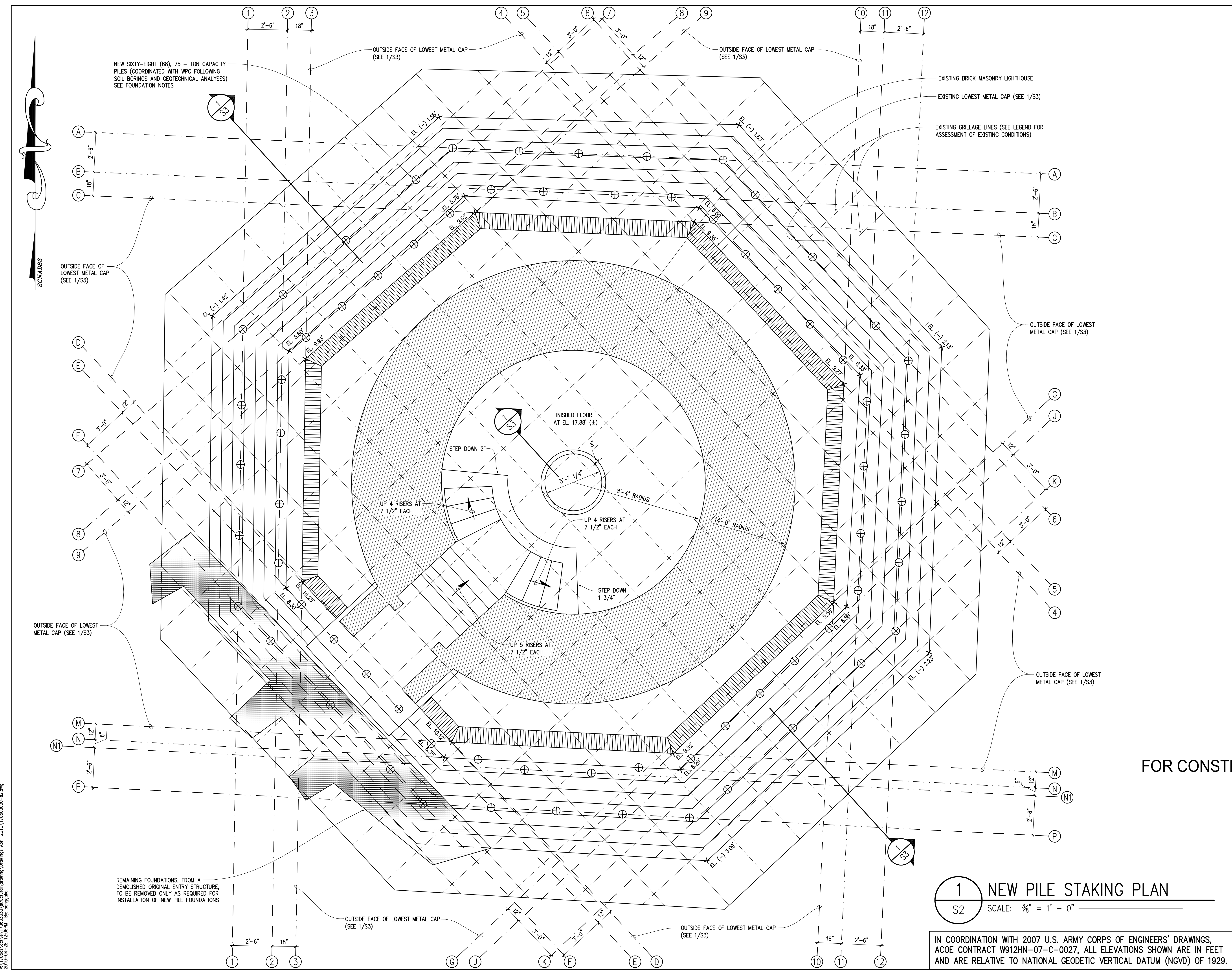
Client/Project
 Palmetto Gunite Construction Co., Inc.

Morris Island Lighthouse
 Foundation Stabilization, Phase II
 Charleston, SC

Title
 New Pile Staking Plan

Project No. 170603030 Scale As Noted

Drawing No. S2 Sheet 2 of 3 Revision 0



1 NEW PILE STAKING PLAN
 S2 SCALE: 3/8" = 1' - 0"

IN COORDINATION WITH 2007 U.S. ARMY CORPS OF ENGINEERS' DRAWINGS, ACOE CONTRACT W912HN-07-C-0027, ALL ELEVATIONS SHOWN ARE IN FEET AND ARE RELATIVE TO NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929.

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