Prepared for

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HISTORY OF CONSTRUCTION REPORT – SOUTH ASH POND
WINYAH GENERATING STATION

Prepared by

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Project Number: GSC5242

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EXECUTIVE SUMMARY

Winyah Generating Station (WGS) is a 1,260 megawatt coal-fired steam electric generating facility owned and operated by South Carolina Public Service Authority (Santee Cooper). The Site is situated between Pennyroyal and Turkey Creeks and is located at 661 Steam Plant Drive in Georgetown, South Carolina. Coal combustion residuals (CCR) generated at WGS have been historically managed in existing CCR surface impoundments.

On April 17, 2015 the United States Environment Protection Agency (EPA) published the Final Rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule). CCR Rule Section §257.73(c)(1) requires the owner of existing CCR surface impoundments to compile a history of construction containing information pertaining to the location, purpose, design, construction, and maintenance of the unit.

The purpose of this report is to provide a detailed history of construction record for the South Ash Pond at WGS. The South Ash Pond is a 75 acre unlined CCR surface impoundment located within the Sampit River Watershed. The unit historically received fly ash, boiler slag, bottom ash, low volume wastewater, and stormwater. The South Ash Pond provides treatment for solids removal from wastewater by gravitational settling. Although South Ash Pond foundation materials are variable, foundation materials and dike fill soils primarily consist of poorly graded to silty sands. Original drawings depict the design geometry of the South Ash Pond dikes and appurtenances. Construction records describe improvements to the South Ash Pond including the construction of slurry cutoff walls. A topographic survey conducted in 2011 reveals the maximum height of the South Ash Pond perimeter dike to be 22 ft. The South Ash Pond discharges to the Discharge Canal through a concrete riser structure located in the East end of the pond. A staff gauge installed in the South Ash Pond provides information on the water surface elevation. Facility personnel utilize the perimeter dikes for periodic pond surveillance and maintenance.

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Geosyntec consultants

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1. INTRODUCTION

In response to the recently published Coal Combustion Residual (CCR) Rule (40 Code of Federal Regulations (CFR) Part 257), Santee Cooper retained Geosyntec Consultants, Inc. (Geosyntec) to prepare documentation for existing surface impoundments (SIs) at Winyah Generating Station (WGS or the Site), located southwest of Georgetown, South Carolina (SC). Four coal-fired generating units are operated at WGS with a total generating capacity of 1,260 megawatts.

Section §257.73(c)(1) of the CCR Rule states that "No later than October 17, 2016, the owner or operator of the CCR unit must compile a history of construction, which shall contain, to the extent feasible, the information specified in paragraphs (c)(1)(i) through (xii) of this section."

This History of Construction Report (Report) is intended to meet the requirements of Part 257.73(c)(1)(i–xii) of the CCR Rule for the South Ash Pond at WGS by documenting the dike geometry, engineering properties, material parameters, instrumentation, and other required information. The remaining sections of this Report are organized to satisfy specific requirements of the CCR Rule as follows:

Report Section	Regulatory Citation
Section 2 - provides owner and unit information	*40 CFR §257.73(c)(1)(i)*
Section 3 - provides the location of the unit	*40 CFR §257.73(c)(1)(ii)*
Section 4 - describes the purpose of the CCR unit	*40 CFR §257.73(c)(1)(iii)*
Section 5 - describes the contributing watersheds	*40 CFR §257.73(c)(1)(iv)*
Section 6 - describes the physical and engineering properties of foundation materials	*40 CFR §257.73)(c)(1)(v)*
Section 7 - presents construction methods and dates, and physical and engineering properties of materials used	*40 CFR §257.73(c)(1)(vi)*
Section 8 - provides dimensional drawings	*40 CFR §257.73(c)(1)(vii)*
Section 9 - describes the existing instrumentation	*40 CFR §257.73(c)(1)(viii)*
Section 10 - presents the area-capacity curves	*40 CFR §257.73(c)(1)(ix)*
Section 11 - describes spillway and diversion features	*40 CFR §257.73(c)(1)(x)*
Section 12 - discusses surveillance, maintenance and repair provisions	*40 CFR §257.73(c)(1)(xi)*
Section 13 - discusses any record or knowledge of instability	*40 CFR §257.73(c)(1)(xii)*
Section 14 - provides the sources referenced within this Report	

2. OWNER AND CCR UNIT INFORMATION

Section §257.73(c)(1)(i) of the CCR Rule requires *"The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and identification number of the CCR unit if one has been assigned by the state."*

WGS is a coal-fired steam electric generating facility owned and operated by Santee Cooper. Santee Cooper's corporate offices are located at One Riverwood Drive, Moncks Corner, SC 29461. The Site is situated between Pennyroyal and Turkey Creeks and is located approximately four miles southwest of Georgetown, SC. WGS is located at 661 Steam Plant Drive in Georgetown, SC, 29440.

The South Ash Pond at WGS is a 75 acre SI which is regulated as a wastewater impoundment by the South Carolina Department of Health and Environmental Control (SCDHEC) Bureau of Water. The South Ash Pond is exempt from the state's dam program and has not been assigned an identification number.

3. UNIT LOCATION

Section §257.73(c)(1)(ii) of the CCR Rule requires *"The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7 ½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available."*

A map depicting the location of the South Ash Pond identified on a United States Geologic Survey (USGS) 7 ½ minute topographic quadrangle map (USGS, 2014) is presented as **Figure 1.** CCR SI boundaries at WGS are provided in **Figure 2**.

The South Ash Pond is situated immediately south of the coal stockpile and power block and is encircled by a coal delivery railroad which loops around the SI. Outside of the rail loop, the northern side of the South Ash Pond is bounded by the Coal Pile, the southern side is bounded by a forested area, the western side is bounded by Pennyroyal Creek and the eastern side is bounded by an access road and the Discharge Channel. Vehicular access to the perimeter dike is limited by the rail loop and provided at a single location along the northern portion of the dike.

4. PURPOSE

Section §257.73(c)(1)(iii) of the CCR Rule requires *"A statement of purpose for which the CCR unit is being used."*

The unit historically received fly ash, boiler slag, bottom ash, low volume wastewater, and stormwater. Currently, the South Ash Pond receives low volume wastewater from Units 3 and 4, Unit 3 and 4 fly ash sluice (when fly ash is not handled dry), and blowdown and stormwater from the SEFA Star Facility. The South Ash Pond is permitted to receive Unit 3 and 4 bottom ash sluice and Coal Pile Runoff from the western half of the coal pile, however, these flows are typically directed to Ash Pond A and Slurry Pond 3 and 4, respectively. The purpose of the South Ash Pond is to contain CCR and treat process wastewater and stormwater to remove solids by gravity settling. Decanted water is discharged through a riser structure to the Discharge Canal.

5. WATERSHED DESCRIPTIONS

Section §257.73(c)(1)(iv) of the CCR Rule requires *"The name and size in acres of the watershed within which the CCR unit is located."*

The South Ash Pond is located in the Sampit River (ID: 03040207-01. The Sampit River Watershed encompasses 105,260 acres (ac) in the Lower Coastal Plain and Coastal Zone regions of South Carolina and consists primarily of the Sampit River and its tributaries (SCDHEC, 2015).

6. FOUNDATION MATERIALS

Section §257.73(c)(1)(v) of the CCR Rule requires *"A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed."*

6.1 Regional Geology

Georgetown County is located in the Atlantic Coastal Plain physiographic province, which is characterized by Quaternary terrace deposits produced by fluctuating sea levels. Coastal plain sediments are underlain by Tertiary and late Cretaceous sediments to a depth of approximately 2,200 ft below ground surface (bgs) in the Georgetown area. Descriptions of geologic units of interest in the area were provided in a paper by Campbell and Coes, 2010. The thickness of each unit was estimated based on information from several borings referenced in Campbell and Coes (2010). Specifically, these borings include: 1) CHN-0820, which is located approximately 12 miles to the south of WGS, 2) GEO-0088, which is located approximately 7 miles to the southeast of WGS, and 3) GEO-0185, which is located less than 1.5 miles to the northwest of WGS. General information about the regional geologic units is summarized below, from the top unit to the bottom unit:

- Undifferentiated Quaternary Sediments: this geologic unit consists of yellowish-brown and reddish-orange poorly sorted, very fine to very coarse, clayey sand and gravel. Accessory minerals include opaque heavy minerals, mica, and feldspar. The Undifferentiated Quaternary sediments thickness ranges between 20 and 42 ft in the area;

- The Williamsburg Formation (Williamsburg): this geologic unit consists of gray to black interbedded clay and coarse quartz sand overlying shelly clay and calcareous clay. The Williamsburg can include sandy shale, fuller's earth, fossiliferous clayey sand (Lower Bridge Member), and fossiliferous clayey sand and mollusk-rich, bioclastic limestones (Chicora Member). The thickness of the Williamsburg in the vicinity of the site ranges between 30 and 90 ft.

- The Lang Syne Formation: As described in the literature by Muthig and Colquhoun (1988), this geologic unit consists of red and yellow (where weathered) or white, gray, and black (where freshly exposed) interbedded sand,

silt, and clay and thin beds of silicified shell debris. Opaline clay stone is the most characteristic lithology of the Lang Syne Formation.

- The Rhems Formation: This geologic unit consists of light-gray to black shale interlaminated with thin seams of fine-grained sand and mica.

- The Peedee Formation: this geologic unit consists of a dark-green to gray, fossiliferous, glauconitic clayey sand and silt. The combined thickness of the Lang Syne, Rhems, and Peedee Formations ranges between 185 and 378 ft in the vicinity of WGS.

Additional late Cretaceous Formations are present to a depth of approximately 2,200 ft bgs in the area. These formations, in descending order, include: Donoho Creek, Bladen, Coachman, Cane Acre, Caddin, Sheppard Grove, Pleasant Creek, Cape Fear and undifferentiated Cretaceous sediments.

6.2 Foundation Materials

Historical soil borings (S&ME, 1978; and PCRA, 1999) and soil borings and Cone Penetrometer Test (CPT) soundings (Geosyntec, 2016) within the vicinity of the South Ash Pond perimeter dikes were evaluated. The foundation materials are described below.

Foundation materials were observed to be variable across the South Ash Pond consisting primarily of poorly graded to silty sands with shells and pockets of clayey sand to high plasticity clay. Uncorrected Standard Penetration Test (SPT) blow counts within the sandy foundations ranged from 2 to 35 blows per foot with tip resistances ranging from 40 to 200 tons per square foot (tsf) (Geosyntec, 2016). A 15 to 20-ft layer of soft clay, with uncorrected blow counts ranging from 0 to 4 blows per foot and CPT resistances below 20 tsf (Geosyntec, 2016), was observed in the west to southwest corner of the South Ash Pond (Geosyntec, 2016). In isolated areas, the foundation materials were relatively poorly graded clean sands (< 10% fines). The poorly graded and silty sands were composed typically of 60% to 90% sand sized material with 15% to 25% fines (Geosyntec, 2016). Some samples, immediately overlying the Chicora stratum, described historically as "shell hash", contained predominantly shells and fine gravel constituting 17% to 35% of the sample by weight. The effective friction angle

computed using the correlation developed by Hatanaka and Uchida (1996) ranged from 26.7° to 45° for sandy foundation soils (Geosyntec, 2016).

7. PHYSICAL AND ENGINEERING MATERIAL PROPERTIES AND CONSTRUCTION METHODS AND DATES

Section §257.73(c)(1)(vi) of the CCR Rule requires *"A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit."*

This section provides a description of the construction materials and site preparation and construction methods and dates for the South Ash Pond. Burns and Roe prepared the original design while Lockwood-Greene prepared the civil construction drawings. All available drawings are included in **Appendix A**.

The South Ash Pond was designed by Burns and Roe in 1977 and 1978. Soils from the interior of the pond were excavated as borrow material to construct the perimeter dikes (Lockwood Greene, 1978 Drawing 3-CV-550). Site plans and design cross sections depict toe drains that discharge to a shallow perimeter channel installed outside the perimeter dike of the South Ash Pond. Construction dewatering trenches were excavated in the interior to drawdown and route water through a 30-in diameter bituminous coated corrugated metal pipe (BCCMP) located in the southwest corner (Lockwood Greene, 1978 Drawing 3-CV-549).

In 2008, Santee Cooper constructed a cement-bentonite slurry cutoff wall through the South Ash Pond perimeter dike at the location of abandoned construction drain utilized to dewater the pond footprint for construction. The slurry wall was constructed to a depth of 45 ft bgs and was embedded approximately 1-ft into the underlying cemented Chicora stratum. A construction completion report was not prepared at completion of the maintenance project.

Sometime after 2008, Santee Cooper installed a pump station to collect the toe drain flows and pump back to the pond.

In 2012, Hayward-Baker was subcontracted to abandon a drawdown structure and associated piping located in the south east corner of the West Ash Pond that discharged water to the South Ash Pond. The project consisted of abandoning 350 ft of RCP in-place with low strength (50 pounds per square inch [psi]), non-shrink grout pumped

from the West Ash Pond discharge structure. The non-shrink grout was capped within the discharge structure with approximately 12-inches of neat cement (4,000 psi) (Santee Cooper, 2012). After abandonment of the drawdown structure through early October 2015, a pump station was utilized to convey stormwater from the West Ash Pond to the South Ash Pond.

In 2013, Santee Cooper installed a supplementary toe drain in the northwest corner of the South Ash Pond. The 500-ft long toe drain, west of the existing pipe bridge from the West Ash Pond, was installed to address the presence of wet areas observed during dike inspections (Santee Cooper, 2014).

In 2013, geotechnical investigations were conducted at nine locations within the South Ash Pond (Geosyntec, 2014). Three investigation campaigns were completed from February to December 2013 which included soil borings and CPT soundings (Geosyntec, 2016) advanced within the South Ash Pond. Collected data and historical soil borings (S&ME, 1978) were used to develop a triangular-irregular-network (TIN) surface of the pond bottom using AutoCAD® Civil 3D based on interpolation between available data points.

In 2016, Santee Cooper constructed a rip-rap (South Carolina Department of Transportation (SCDOT) Class A) buttress on the North West side of the South Ash Pond, at an elevation of 25 ft. National Geodetic Vertical Datum of 1929 (NGVD 29). The rip-rap buttress is approximately 400 ft. long with a minimum thickness of 5 ft. and ties into the existing slope with 10H:1V slope. As-built construction drawings were placed in the operating record.

Dike fill soils for South Ash Pond perimeter dikes were observed to be medium dense to very dense, poorly graded to silty sands. Uncorrected SPT blow counts typically ranged from 15 to 60 blows per foot and CPT tip resistances ranged from 100 to 500 tons per square foot (tsf) (Geosyntec, 2016). Grain size distribution testing indicated that dike fill soils typically consist of 60% to 91% sand sized material (smaller than No. 4 sieve but greater than No. 200 sieve) and 10% to 40% silt and clay sized material, with samples containing between 5% to 20% fines (Geosyntec, 2016). The effective friction angle for sandy soils within the dike fill structure (approximate elevations 24.0 to 38.0 ft NGVD 29) was evaluated using the correlation developed by Hatanaka and Uchida (1996). The effective friction angle ranges from 23.8° to 60° (Geosyntec,

2016). Based on the estimated pond bottom, the volume of material in the South Ash Pond is 1,027 acre ft. (Geosyntec, 2014, and Thomas and Hutton, 2011).

8. DIMENSIONAL DRAWINGS

Section §257.73(c)(1)(vii) of the CCR Rule requires *"At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation."*

The purpose of this section is to document information related to the design, construction, operation, and maintenance of the South Ash Pond on dimensional drawings, to the extent this information is available.

Available original design drawings referenced in this section are included in **Appendix A**. The design layout of the pond and perimeter dikes are provided in Drawings 3-CV-548, 3-CV-549, and 3-CV-550, which show that the perimeter dikes were constructed of compacted earth with 3H:1V interior side slopes. The downstream side slopes are typically 3H:1V, except in the western corner where the side slopes are 4H:1V due to the presence of a soft clay zone in the foundation materials (Drawing 3-CV-549). Typical perimeter dike cross sections are provided in Drawing 3-CV-551. The upstream base of dike of the South Ash Pond is located near existing grade (12.5 to 20 ft NGVD 29). It is noted that soils from the interior of the pond were excavated as borrow material to construct the perimeter dikes (Drawing 3-CV-551). Site plans and design cross sections depict toe drains that discharge to a shallow perimeter channel installed outside the perimeter dike of the South Ash Pond. Construction dewatering trenches were excavated to drawdown and route water through a 30-in diameter BCCMP located in the southwest corner (Drawing 3-CV-549). The drawdown pipe was connected to a new catch basin and an existing 54-in diameter CMP to route water away from the excavation.

Water from the West Ash Pond was originally routed to the South Ash Pond through a drawdown structure located in the south east corner of the West Ash Pond. Drawing 3-

CV-555 depicts a 36-in diameter Class III and Class IV RCP routed under the existing rail line into the South Ash Pond with invert elevations of 12.5 ft NGVD 29. Seven (7) anti-seepage collars were specified along the 36-in diameter RCP. This structure was abandoned as described in the previous section.

Drawings 3-CV-555 and 3-C-591 (Lockwood-Greene, 1978) show a concrete riser structure and 36-in diameter Class IV RCP horizontal pipe for managing the discharge from the South Ash Pond. The 36-in diameter Class IV RCP was installed using the jack-and-bore technique beneath the railroad and discharges to a small open channel outside of the railroad embankment. From the small open channel, water is conveyed through a 36-in diameter Class III RCP to the Discharge Canal. The concrete riser structure is equipped with adjustable stop logs. The 36-in diameter RCP discharges into a small open channel outside of the railroad embankment. Water is then conveyed through a 36-in diameter Class III RCP to the Discharge Canal. The design inlet and outlet inverts for each of the RCPs were 16.0 ft. Three (3) anti-seepage collars were installed at 25-ft intervals along the Class IV RCP. Each anti-seepage collar extended 2-ft around the diameter of the pipe and were 2-ft in length (Lockwood-Greene, 1978). A recent survey (Thomas and Hutton, 2016) shows the bottom of the riser structure is 15.7 ft (NGVD 29) and the top of the top wooden stop log is 28.73 ft (NGVD 29).

The maximum height of the perimeter dike is approximately 22 ft with a top of dike elevation between 38.8 ft to 40.3 ft NGVD 29 (Thomas and Hutton, 2011).

Based on available information, a dimensional plan delineating the SI layout and grades within the South Ash Pond is provided in **Figure 3**. Normal and maximum operating pool elevations, and depth of the CCR unit, among other information, is depicted in the cross sections provided in **Figure 4.** Maximum operating pool elevation was calculated based on a 100 yr., 72 hr. storm event. Locations of instrumentation are provided in **Figure 5**.

9. EXISTING INSTRUMENTATION

Section §257.73(c)(1)(viii) of the rule requires *"A description of the type, purpose, and location of existing instrumentation."*

Staff gauges have been installed at WGS to monitor the surface water in the vicinity of the CCR impoundments and the Cooling Pond.

As shown on **Figure 5**, one staff gauge has been installed at the principal outlet for the South Ash Pond (W-SW-SAP) to monitor the water surface elevation. Additionally, staff gauges for the South Ash Pond toe drain sump (PSG-6) and coal pile drainage channel (PSG-7) were installed to monitor the water surface elevation adjacent to the South Ash Pond and coal pile, respectively.

10. AREA-CAPACITY CURVES

Section §257.73(c)(1)(ix) of the rule requires *"Area-Capacity curves for the CCR unit."*

Topographic (2-ft contour interval) and bathymetric data was utilized to create an existing conditions TIN surface in AutoCAD® to represent the top of ash (Thomas and Hutton, 2011). The surface area of each contour within the South Ash Pond was measured and tabulated. The storage capacity in each depth increment was calculated by averaging the surface area of the upper and lower contour and multiplying by the change in elevation between each contour. Surface area and pond capacity by elevation is presented in **Table 1**. The area-capacity curve is provided on **Figure 6**.

11. SPILLWAY AND DIVERSION FEATURES

Section §257.73(c)(1)(x) of the rule requires *"A description of each spillway and diversion design features and capacities and calculations used in their determination."*

The South Ash Pond is not overtopped by the 100 yr., 72 hr. (Geosyntec, 2016) and an emergency spillway for overtopping flows is not provided.

12. SURVEILLANCE, MAINTENANCE, AND REPAIR PROVISIONS

Section §257.73(c)(1)(xi) of the rule requires *"The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit."*

Santee Cooper conducts periodic surveillance and maintenance of the South Ash Pond. Santee Cooper engineers inspect South Ash Pond dikes in accordance with dike inspection procedures that are presented in **Appendix B**. Site personnel conduct weekly and annual inspections of the ash pond embankments. Personnel performing inspections are required to undergo an initial inspector training as well as refresher training every 3 years. Qualified dam safety engineers accompanied by Site personnel conduct annual inspections. Internal inspection of the outlet structure in the South Ash Pond is conducted every five years. Weekly observations and routine inspections are documented on Inspection Checklists (**Appendix B**).

Maintenance of dikes and the outlet structure at the South Ash Pond are conducted as needed, as determined by routine observations conducted by facility personnel. Vegetation on the dike slopes and crest is inspected every day by Site personnel, and cut using a long reach excavator with a 60" rotary cutter head and a flat tractor with a 15' batwing mower.

13. RECORD OF STRUCTURAL INSTABILITY

Section §257.73(c)(1)(xii) of the rule requires *"Any record of knowledge of structural instability of the CCR unit."*

There are no records or knowledge of structural instability associated with the South Ash Pond.

14. REFERENCES

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TABLES

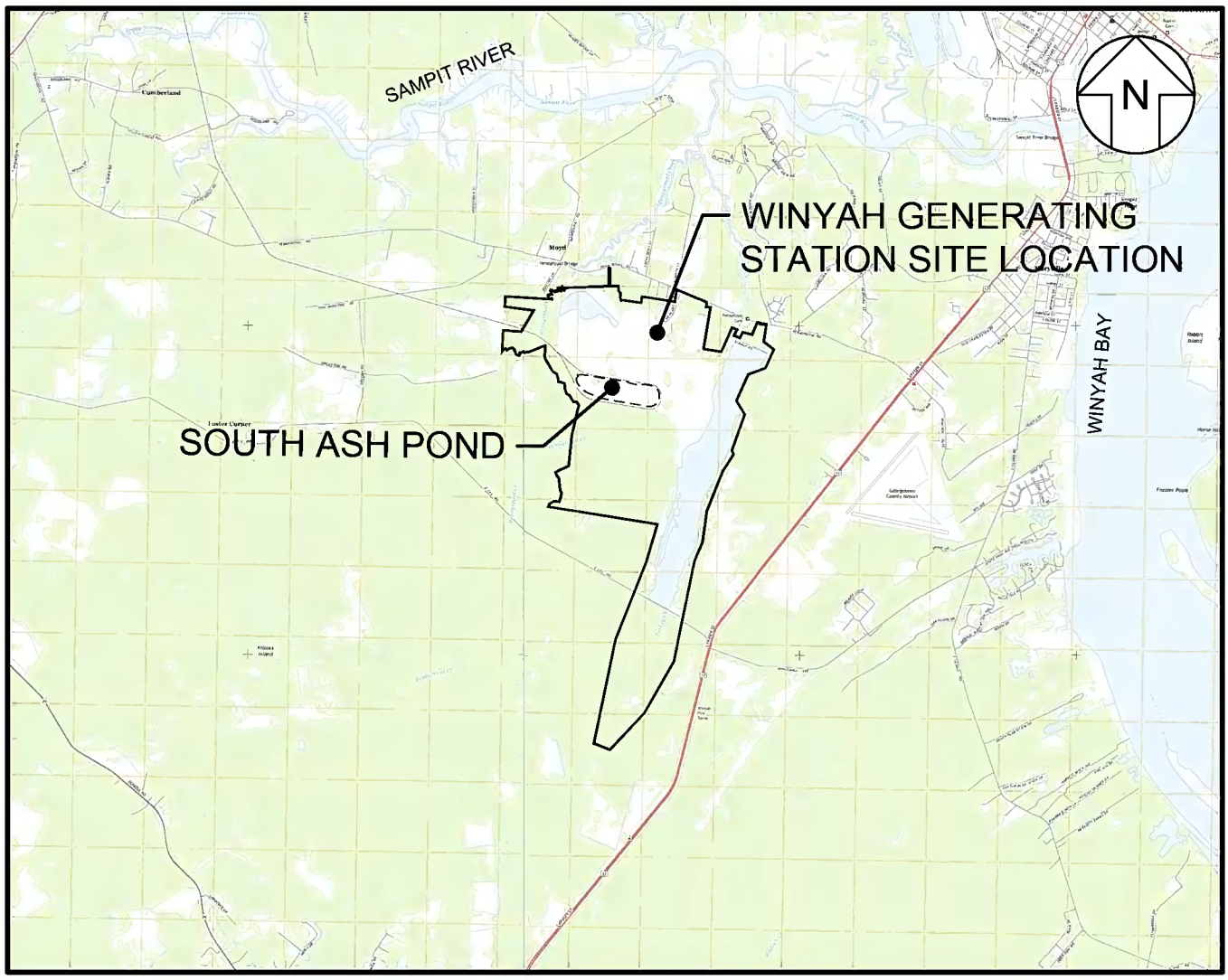
Table 1. Area-Capacity Table for South Ash Pond

Elevation (ft)	Area (ac.)	Volume (ac-ft)
36.9	60.2	295.6
36	56.32	243.21
34	41.03	145.86
32	20.79	84.04
30	10.29	52.96
28	6.46	36.22
26	5.23	24.54
24	4.15	15.16
22	3.08	7.93
20	2.07077	2.78
18	0.31404	0.39
16	0.03284	0.05
14	0.01	0.01
12	0.00	0.00

Notes:

1. Elevations are provided in ft NGVD 29.
2. Δ Volume (ac-ft) computed as the average surface area × the difference in elevation (ft).

FIGURES



LEGEND

APPROXIMATE PROPERTY LINE

APPROXIMATE LIMIT OF POND

NOTES:

1. SOURCE OF USGS TOPOGRAPHIC MAP: https//store.usgs.gov, PUBLISHED BY THE US GEOLOGICAL SURVEY, GEORGETOWN SOUTH QUADRANGLE, DATE 2014, AND KILSOCK ISLAND QUADRANGLE, DATE 2014, 7.5 MINUTE SERIES.
2. THE WGS INCLUDES 2,527.47 ACRES ZONED AS HEAVY INDUSTRIAL.
3. WGS BOUNDARY SHOWN PROVIDED BY THOMAS & HUTTON DATED 10 JANUARY 2014.

0 8,000'

SCALE IN FEET

SOUTH ASH POND LOCATION MAP
SANTEE COOPER
WINYAH GENERATING STATION

Geosyntec consultants

FIGURE 1

PROJECT NO: GSC5242 | JULY 2016

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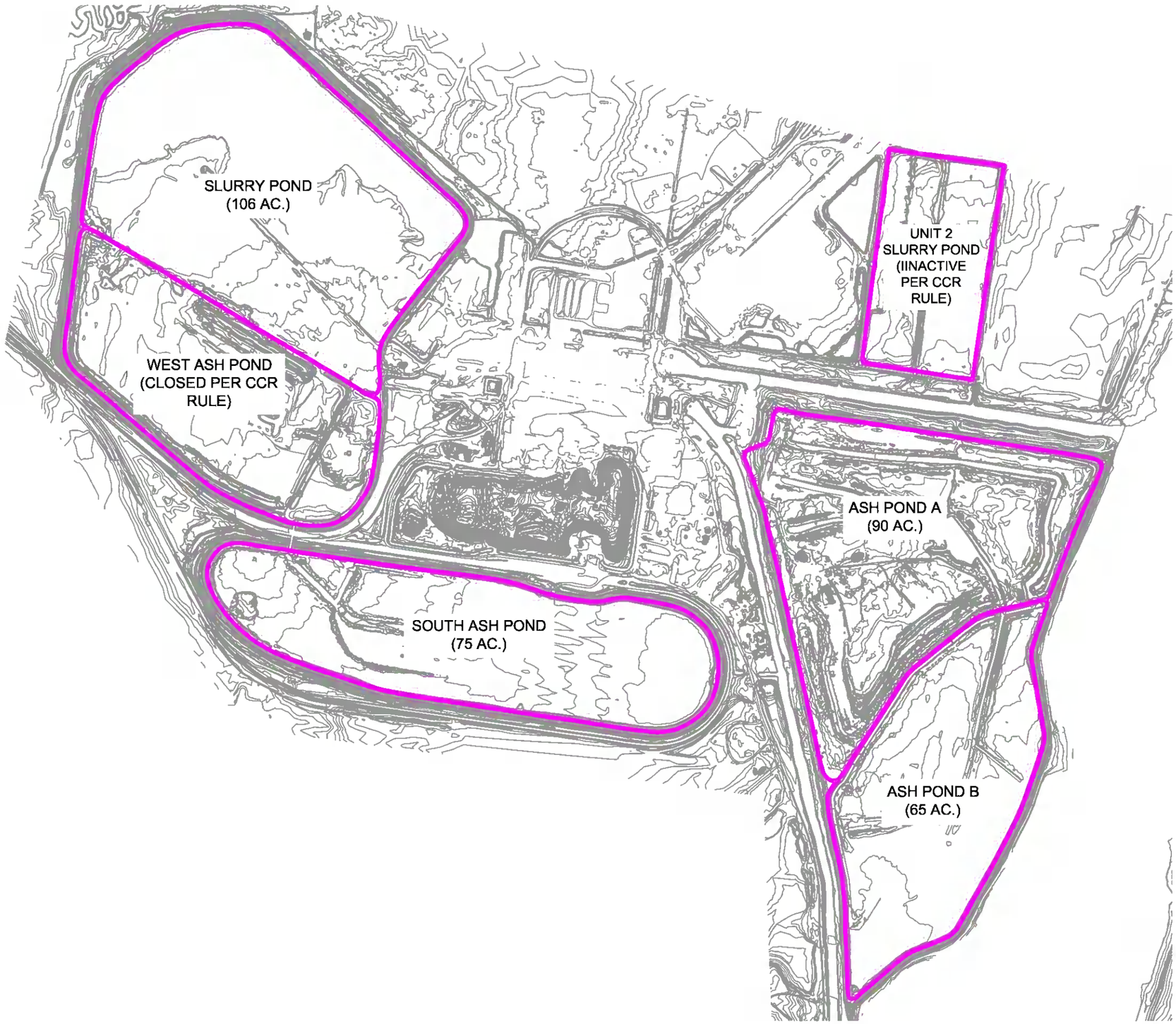

LEGEND

SURFACE IMPOUNDMENT DRAINAGE AREA BOUNDARY

NOTES:

1. TOPOGRAPHIC SURVEY PROVIDED BY THOMAS AND HUTTON (2011).
2. SURFACE IMPOUNDMENT AREAS ESTIMATED BY GEOSYNTEC (2015).

N

0 800'

SCALE IN FEET

SURFACE IMPOUNDMENT BOUNDARIES

Geosyntec consultants

FIGURE 2

PROJECT NO: GSC5242 | JULY 2016

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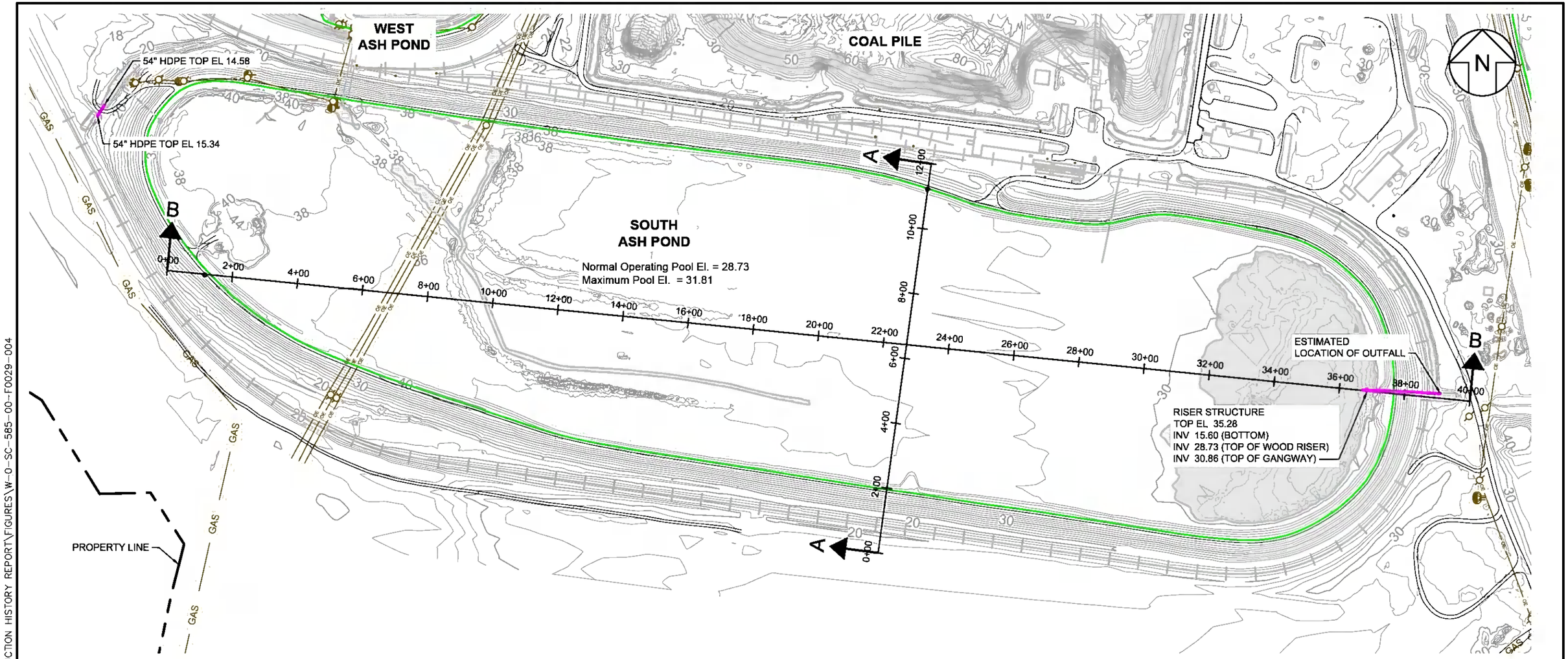


LEGEND

- APPROXIMATE LIMIT OF ASH PONDS
- PROPERTY LINE
- DIRT/GRAVEL ROAD
- 4 — EXISTING GRADES
- GAS — GAS LINE
- OUTFALL PIPE AND STRUCTURE
- OE — OVERHEAD ELECTRIC LINE
- RAILROAD
- ROADWAY
- WATER

NOTES:

1. TOPOGRAPHIC SURVEY PROVIDED BY THOMAS & HUTTON DATED 06/29/11 AND REVISED ON 01/14/12.
2. PROPERTY BOUNDARY LINE PROVIDED BY THOMAS & HUTTON, DRAWING TITLED "PLAT OF THE BOUNDARY AND COMBINATION OF VARIOUS PARCELS CONTAINING 2527.47 ACRES TOTAL COMPRISING WINYAH GENERATING STATION AND THE SUBDIVISION TO CREATE TRACT A AND TRACT B", PLAT DATE 11/25/13.
3. DIKE CREST ELEVATIONS, OUTFALL STRUCTURES, AND PIPES SOURCE: THOMAS AND HUTTON SURVEY, RECEIVED FILE ON 2/5/201. FILE NAME: 23021T12_DikeCrests.dwg.
4. COORDINATES AND DIRECTIONS SHOWN ON THIS DRAWING ARE BASED ON SOUTH CAROLINA STATE PLANE COORDINATE SYSTEM (NAD83) (CORS) (INT'L FT). DISTANCES SHOWN ARE GROUND DISTANCES, NOT GRID DISTANCES.
5. ELEVATIONS ON THIS SURVEY ARE REFERENCED TO NGVD 1929 DATUM AS DERIVED FROM NGS MONUMENT PID#DD1957.
6. SECTIONS WERE CUT TO PASS THROUGH LOWEST POINT ON DIKE CREST.
7. MAXIMUM POOL EL. ESTIMATED BASED ON A 100 YR, 72- HR STORM EVENT.

0 300'
SCALE IN FEET

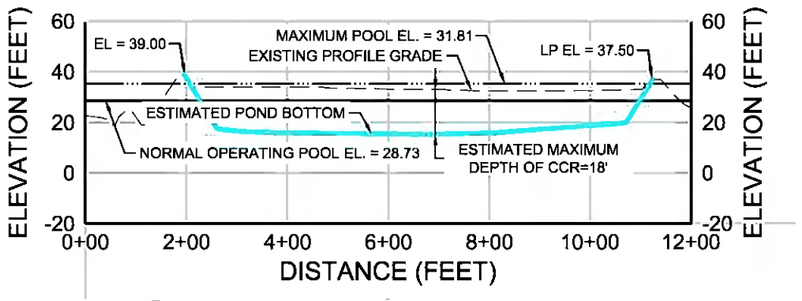
SANTEE COOPER
WINYAH GENERATING STATION
SOUTH ASH POND SITE PLAN

Geosyntec consultants

PROJECT NO: GSC5242 | JULY 2016

FIGURE 3

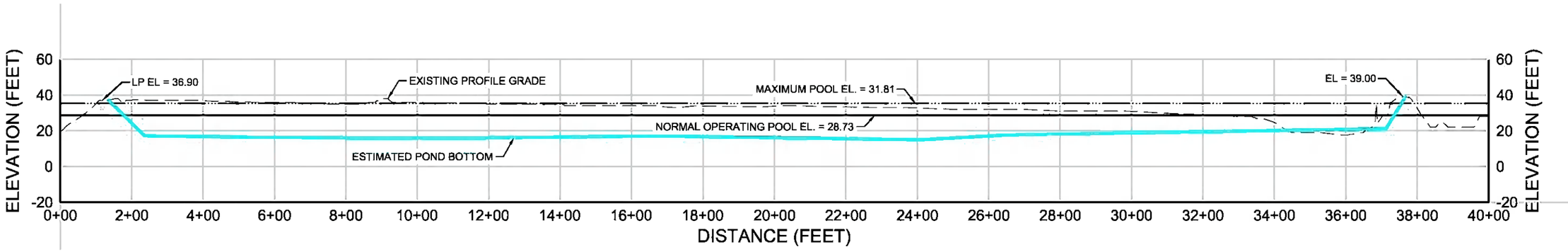
M:\S\SANTEE COOPER\SANTEE COOPER-WINYAH\0029-CONSTRUCTION HISTORY REPORT\FIGURES\W-0-SC-585-00-F0029-004



A/3 PROFILE

SECTION AT DIKE CREST LOW POINT

SCALE: 1"=300' (HORIZONTAL); 1"=60' (VERTICAL)



B/3 PROFILE

SECTION AT DIKE CREST LOW POINT

SCALE: 1"=300' (HORIZONTAL); 1"=60' (VERTICAL)

LEGEND

- ESTIMATED POND BOTTOM
- EXISTING PROFILE GRADE
- MAXIMUM POOL ELEVATION
- NORMAL OPERATING POOL ELEVATION

NOTE:

1. POND BOTTOM WAS ESTIMATED FROM HISTORICAL BORINGS AND FIELD INVESTIGATIONS PERFORMED BY GEOSYNTEC IN 2013 AND 2014.

0 300'

HORIZONTAL SCALE IN FEET

0 300'

VERTICAL SCALE IN FEET

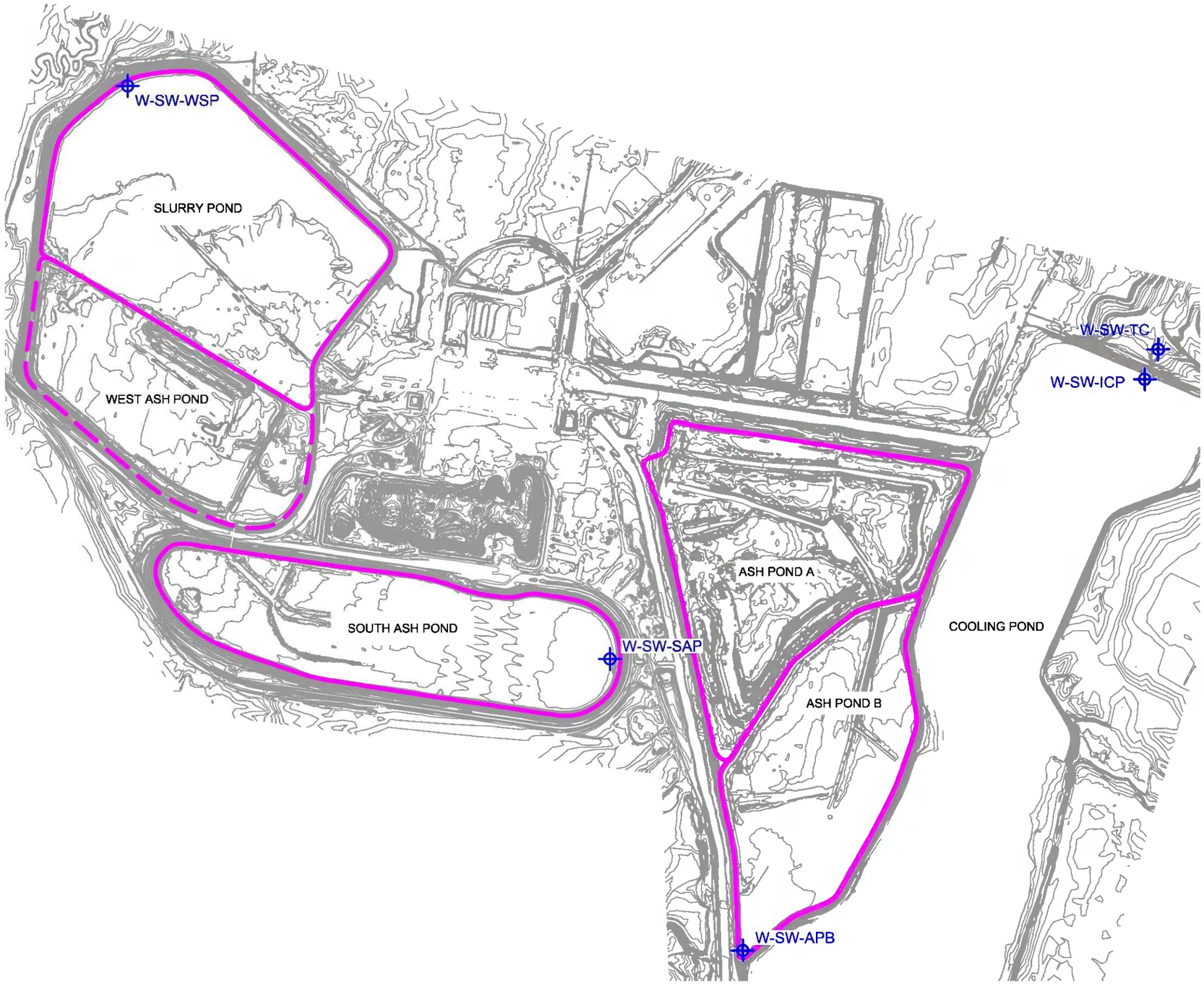
SANTEE COOPER
WINYAH GENERATING STATION
SOUTH ASH POND
DIKE LOW POINT SECTIONS

Geosyntec consultants

FIGURE 4

PROJECT NO: GSC5242 | JULY 2016

M:\S\SANTEE COOPER\SANTEE COOPER - WINYAH\0029 - CONSTRUCTION HISTORY REPORT\FIGURES\W-0-SC-585-00-F0029-004



LEGEND

SURFACE IMPOUNDMENT DRAINAGE AREA BOUNDARY

CCR EXEMPT SURFACE IMPOUNDMENT WITH AREA DRAINAGE TO EXISTING SURFACE IMPOUNDMENT

NOTE:

1. TOPOGRAPHIC SURVEY PROVIDED BY THOMAS AND HUTTON (2011).

N

0 900'

SCALE IN FEET

STAFF GAUGE LOCATIONS

Geosyntec consultants

PROJECT NO: GSC5242 | JULY 2016

FIGURE 5

M:\S\SANTEE COOPER\SANTEE COOPER-WINYAH\0029-CONSTRUCTION HISTORY REPORT\FIGURES\W-0-SC-585-00-F0029-008

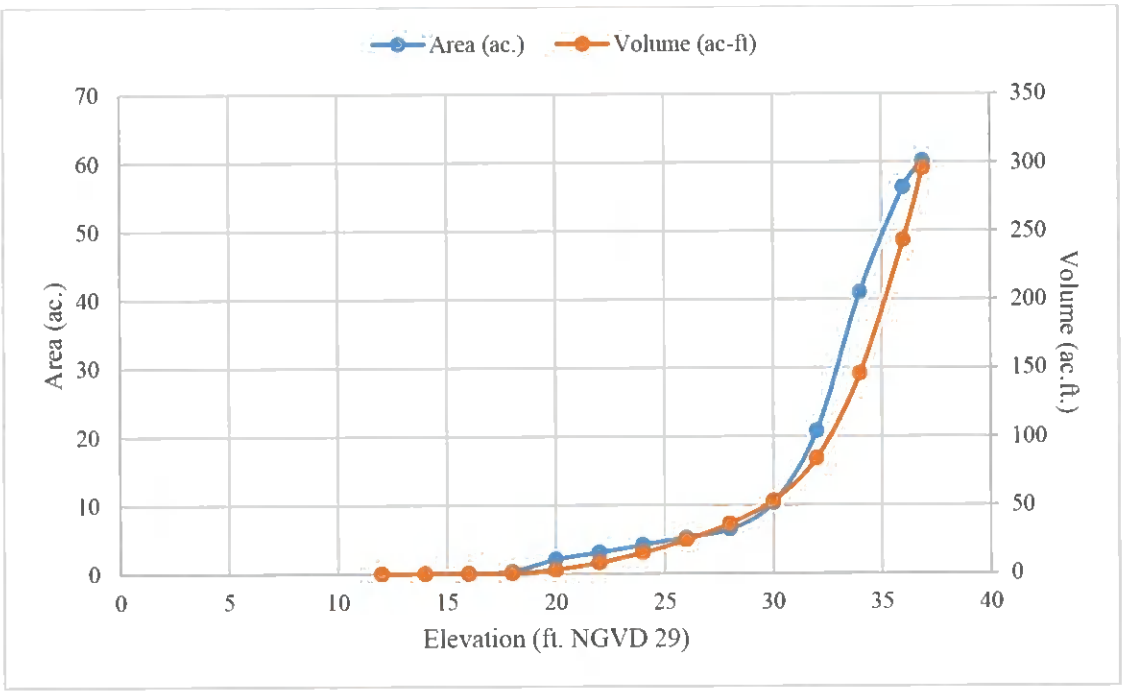


Figure 6. Area- Capacity Curve for South Ash Pond

Notes:

1. Elevations are provided in ft NGVD 29.
2. Δ Volume (ac-ft) computed as the average surface area × the difference in elevation (ft).

APPENDIX A

Lockwood-Greene Design Drawings

W 45+00 | W 42+50 | W 40+00 | W 37+55

S 17+50

S 20+00

S 22+50

S 25+00

S 27+50

EXISTING DRAIN PIPES

THE CONTRACTOR SHALL FILL EXISTING DITCHES WITH TOPSOIL AND PROVIDE DRAINAGE SWALES TO EXISTING PIPES. BETWEEN THE TWO EXISTING DITCHES THE SUBGRADE SHALL BE GRADED TO DRAIN TO THE SWALES. SEE SECTION 1 BELOW. GRASS ALL DISTURBED AREAS.

TOPSOIL STOCKPILE AREA

1 / 3-CV-548

MATCH LINE SEE THIS SHEET

SWALE DRAINING TO EXISTING PIPES. (TYP.)

FINAL GRADE DEPENDS ON VOLUME OF TOPSOIL STRIPPED

GRADE TO DRAIN

GRADE TO DRAIN

EXISTING GRADE

TOPSOIL

EBK

EBK

1 SECTION
3-CV-548 SCALE: NONE

SWALE EL 14.0

PLANT NORTH

W 37+55 | W 37+50 | W 35+00 | W 32+50

S 22+50

S 25+00

S 27+50

S 30+00

S 32+50

MONITORING WELL: SEE DWG. 3-CV-554 FOR DETAIL

S23+15
W34+50

SWALE EL. 18.0

SWALE EL. 19.0

1 / 3-CV-551

S 24+62
W32+50

15' (TYP)

BOTTOM TOE DRAIN EL. 21.1

SC-68

S 25+86.60
W35+82.93

TOE DRAIN 2

BOTTOM T.P. EL. 20.9

100' TRANSITION FROM 4:1 SLOPES TO 3:1 SLOPES

SC-80

BOTTOM T.P. EL. 20.5

BOTTOM T.P. EL. 18.0

ASH POND SOUTH

S 28+82.94
W35+03.14

BOTTOM T.P. EL. 17.5

2 / 3-CV-551

SC-78

S 30+93.18
W32+89.14

BOTTOM T.P. EL. 18.0

OUTLET PIPE (TYP)

TOE DRAIN 1

BOTTOM TOE DRAIN EL. 18.4

BEGIN 1' OVERFILL SEE DET. 3, SHT. 5 OF 7

SWALE EL 15.0

100' TRANSITION

BEGIN 2' OVERFILL SEE DET 3, SHT. 5 OF 7

MATCH LINE SEE DRWG. 3-CV-549

KEY PLAN

SOUTH CAROLINA REGISTERED 5444 ENGINEER P. R. DURALIA

1" = 50' scale 50 0 50 100 feet

DATUM NOTE:
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no	date	REVISION	by	ck.	appr.
1	12-12-79	REVISED AS PER AS BUILT DRAWINGS	BKB		
0	10-6-78	ISSUED FOR BIDS - CONTR. 3B6	GS	PRD	
B	6-23-78	ISSUED FOR OWNER'S REVIEW	G		
A	5-5-78	B&R REVIEW			

drawn by B TURNER III
dept. ck. P.R. DURALIA
dept. appr. Fred Lyles
coord. ck.
p.m. appr. WK
B&R appr. M. J. Burns 1/29/80

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ATLANTA DALLAS NEW YORK
LOCKWOOD GREENE
ARCHITECTS · ENGINEERS
SPARTANBURG, S.C.

job name
SANTEE COOPER
WINYAH GENERATING STATION UNIT 3
GEORGETOWN. SOUTH CAROLINA

sheet title
PLAN - ASH POND SOUTH
SHEET 1

scale	1" = 50'	L-G JOB NO. 77043.01	
date	5-1-78	B&R W.O. NO. 3389	
		dwg. no. 3-CV-548	rev. 1

W.S. SOUTH ASH AREA

386	CONST	2-7-79	0
366	BID	10-6-78	0
FKG	ISSUE	DATE	REV.

POLYTRACT 033

FROM ASH POND 3&4

40 LF - 30" RCCMP SEE DWG. 3-CV-547 FOR INVERTS & DETAILS

W 32+50 | W 30+00 | W 27+50 | W 25+00 | W 22+50 | W 20+00 | W 17+50 | W 15+00

SWALE EL. 20.0 | SWALE EL. 21.0 | SWALE EL. 22.0 | SWALE ELEV. 21.0

DETAIL 1 / 3-CV-554

S 24+22 / W 32+50 ℄ — VOID

S 24+55 / W 27+80 ℄ — VOID

S 24+85 / W 27+80 ℄ N.T.S.

S 24+25.97 / W 15+00 ℄ — VOID

BOTTOM T.D. EL. 21.5 | BOTTOM T.D. EL. 21.5 | BOTTOM T.D. EL. 21.7 | BOTTOM T.D. EL. 21.9 | BOTTOM T.D. EL. 22.1 | BOTTOM T.D. EL. 22.3 | BOTTOM T.D. EL. 22.5 | BOTTOM TOE DRAIN EL. 22.7

15' (TYP)

INV. 12.5

FLAT BOTTOM AS RECVD TO "DAYLIGHT" @ ELEV. 16.5

EL. 12.5±

SC-64 | SC-65 | SC-66 | SC-67

S 25+00

S 27+50

S 30+00

S 32+50

S 35+00

MATCH LINE SEE DRWG. 3-CV-548

MATCH LINE SEE DRWG. 3-CV-550

PLANT NORTH

ASH POND SOUTH

SC-81 | SC-82 | AP 3 | SC-83

200' TRANSITION FROM 4:1 SLOPES TO 3:1 SLOPES

S 33+49.25 / W 25+95.22 ℄

30" & CMP CONSTRUCTION DRAIN 210 LF. (FINAL LENGTH AND INVERT TO BE FIELD DETERMINED)

ANTI-SEEPAGE COLLARS (5 REQ'D) FOR DETAIL SEE DRWG. 3-CV-551

BOTTOM T.D. EL. 18.6 | BOTTOM T.D. EL. 18.8 | BOTTOM T.D. EL. 19.0 | BOTTOM T.D. EL. 20.5 | BOTTOM T.D. EL. 21.0

TOE DRAIN

CONSTRUCTION DRAIN TO BE CONNECTED TO NEW CATCH BASIN

S 32+95.27 / W 28+89.81 ℄

EXIST. 54" ϕ CMP

S 34+03 / W 23+02 ℄

S 34+15 / W 15+00 ℄

SC-76 | SC-75 | SC-74

BOTTOM T.D. EL. 21.5 | BOTTOM T.D. EL. 22.0 | BOTTOM T.D. EL. 21.5 | BOTTOM T.D. EL. 22.0 | BOTTOM T.D. EL. 21.5 | BOTTOM T.D. EL. 22.0

BEGIN 2' OVERFILL SEE DETAIL 3, 3-CV-554 | 100' TRANSITION | BEGIN 1' OVERFILL SEE DETAIL 3, SHT 3-CV-554

SWALE EL. 18.0

REMOVE EXIST 24" RCP

KEY PLAN

DETAIL 1 / 3-CV-554

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no	date	REVISION	by	ck.	appr.
I	12-12-79	REVISED AS PER AS BUILT DRAWINGS	BKB		
O	10-6-78	ISSUED FOR BIDS CONTR. 3B6	CW	PRD	
B	6-29-78	ISSUE FOR OWNERS REVIEW	BT III		
A	5-5-78	B&R REVIEW			

drawn by B. TURNER III
dept. ck. P.R. DURALIA
dept. appr. Fred Salem
coord. ck.
p.m. appr.
B&R appr. M.J. Bri 1/29/80

BURNS AND ROE, INC.
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ATLANTA DALLAS NEW YORK
LOCKWOOD GREENE
ARCHITECTS · ENGINEERS
SPARTANBURG, S.C.

1" = 50' scale — 50 0 50 100 feet

job name
SANTEE COOPER
WINYAH GENERATING STATION — UNIT 3
GEORGETOWN, SOUTH CAROLINA

sheet title
PLAN - ASH POND SOUTH
SHEET 2

scale 1" = 50'
B&R W.O. NO. 3389
date 5-1-78
dwg. no. 3-CV-549
rev. 1

W3-366-60-01.02

PKG.	ISSUE	DATE	REV.
366	CONST.	2-7-79	C
366	BID	10-6-78	O

SOUTH CAROLINA REGISTERED 5444 ENGINEER P. R. DURALIA

POLYTRACE 033

ASH POND SOUTH

MATCH LINE SEE DRWG. 3-CV-549

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KEY PLAN.

SOUTH CAROLINA REGISTERED 5444 ENGINEER P. R. DURALIA

no	date	REVISION	by	ck.	appr.
2	12-17-79	ADDED AS BUILT COORDINATES TO E DIKE	BKB		
1	8-7-79	REVISED NOTE - FOR CONST. CONTR. 386	CO	PRD	
0	10-6-78	ISSUED FOR BIDS-CONTR. 386	CWJ	PRD	
B	6-23-78	ISSUED FOR OWNER'S REVIEW	G		
A	5-5-78	B&R REVIEW			

drawn by B TURNER III.
dept. ck. P.R. DURALIA
dept. appr. Fred Allen
coord. ck.
p.m. appr. WJS
B&R appr. M. J. Piri 1/29/80

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SPARTANBURG, S.C.

1" = 50' scale 50 0 50 100 feet

job name
SANTEE COOPER
WINYAH GENERATING STATION UNIT 3
GEORGETOWN, SOUTH CAROLINA

sheet title
PLAN - ASH POND SOUTH
SHEET 3

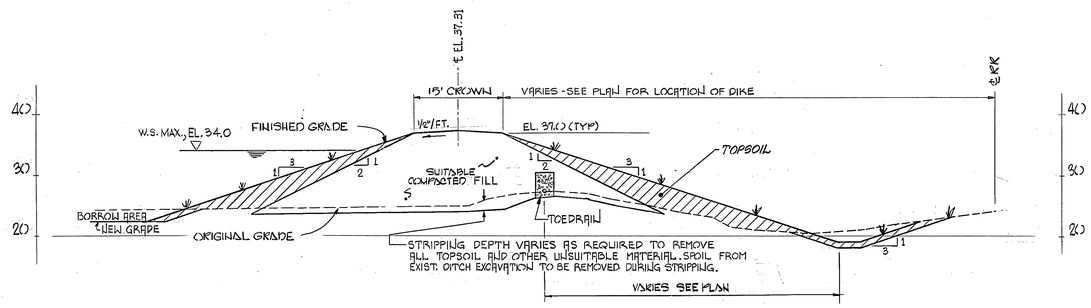
scale 1" = 50'
date 5-1-78

L-G JOB NO. 77043.01
B&R W.O. NO. 3389
deg. no. 3-CV-550
rev. 2

W3-300-00-0335

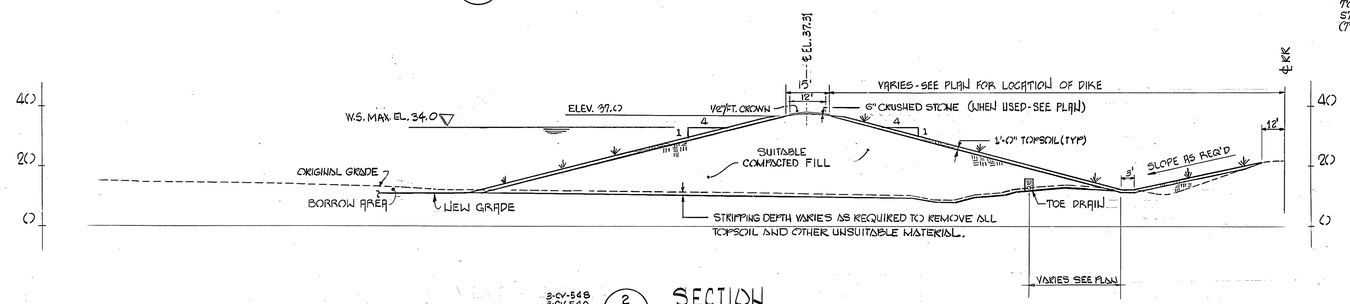
PKG.	ISSUE	DATE	REV.
386	CONST	8-7-79	1
386	BID	10-6-78	0

POLYSTRAGE 033



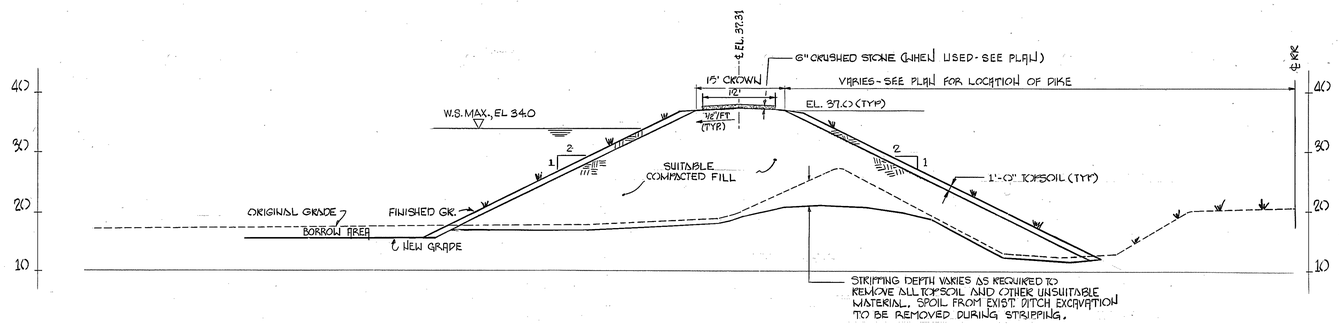
3-CV-549 3-CV-550 (1) 3-CV-551 — SECTION

SCALE 1" = 10'



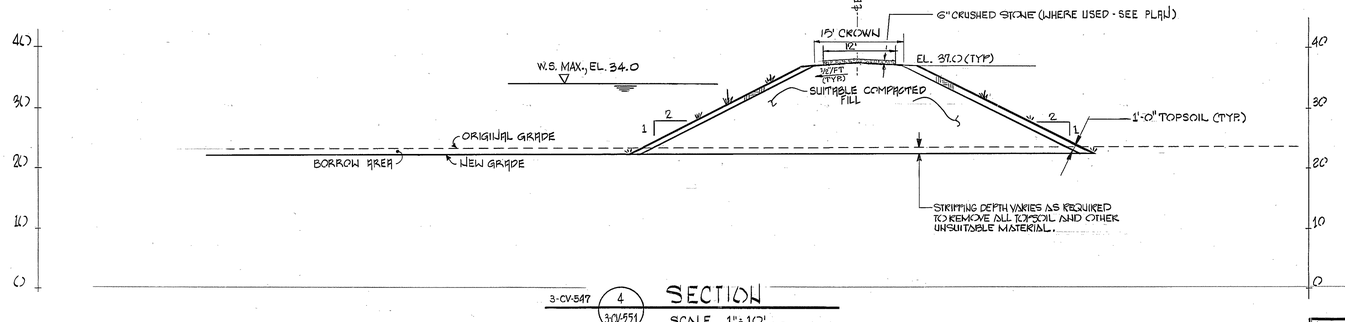
3-CV-548 3-CV-549 (2) 3-CV-551 — SECTION

SCALE 1" = 20'



3-CV-547 3-CV-548 (3) 3-CV-551 — SECTION

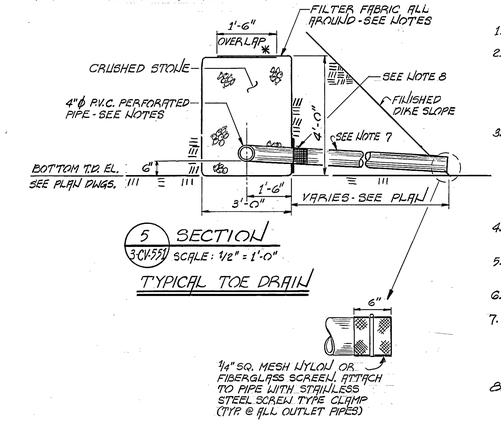
SCALE 1" = 10'



3-CV-547 (4) 3-CV-551 — SECTION

SCALE 1" = 10'

* LAP FILTER FABRIC 1'-6" AT ENDS OF ROLL IN DIRECTION PARALLEL TO PERFORATED PIPE.



5 3-CV-551 — SECTION

SCALE: 1/2" = 1'-0"

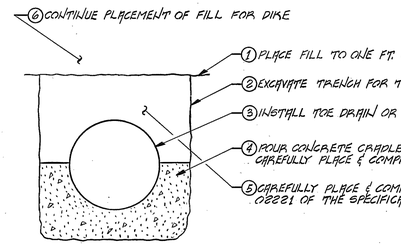
TYPICAL TOE DRAIN

TOE DRAIN NOTES

1. THE CRUSHED STONE SHALL BE GRADATION #57 ACCORDING TO SOUTH CAROLINA STATE HIGHWAY DEPT. STD. SPECIFICATIONS. CRUSHED STONE SHALL BE GRANITE.
2. FILTER FABRIC SHALL BE WOVEN OR SPUNBONDED POLYESTER OR POLYPROPYLENE FABRIC. APPROVED MANUFACTURERS:
   DUPONT "TYPAR" STYLE 3401
   ADVANCE COMST. SPECIALTIES "LAUREL EROSION CLOTH, TYPE 1."
   CARTHAGE MILLS, INC. "FILTER-X"
   MONSANTO TEXTILES "BIDIM C-38"
3. PERFORATED PIPE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

ASTM	TITLE
D 1784	RIGID POLY (VINYL CHLORIDE) COMPOUNDS AND CHLORINATED POLY (VINYL CHLORIDE) COMPOUNDS
D 3034	TYPE PSM POLY (VINYL CHLORIDE) (PVC) SEWER PIPE AND FITTINGS

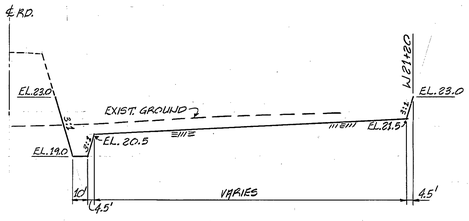
4. THE PIPE SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B AND THE SDR SHALL NOT BE GREATER THAN 35.
5. PERFORATIONS SHALL BE IN ACCORDANCE WITH ASTM C 700 "VITRIFIED CLAY PIPE, EXTRA STRENGTH, STANDARD STRENGTH AND PERFORATED."
6. PERFORATED PIPE SHALL BE LAID WITH PERFORATIONS DOWN.
7. OUTLET PIPE, 4"ϕ U.O.N. PERFORATED P.V.C., SPACED AT 200' O/ CENTER MAXIMUM. FIELD ADJUST WHERE NECESSARY SO THAT OUTLET PIPE IS INSTALLED AT ALL LOW POINTS ON TOE DRAIN. SLOPE OUTLET PIPE @ 0.5% MIN. GRADE AREA AT TOE OF DIKES SO THAT NO PONDING OF WATER CAN OCCUR AND SO THAT OUTLET PIPES ARE FREE TO DRAIN.
8. CONTRACTOR SHALL WRAP ANY PIPE PENETRATION THRU FILTER FABRIC WITH 12" WIDE BY 4'-0" LONG PIECE OF FILTER FABRIC TO INSURE THAT NO AGGREGATE IS EXPOSED TO EARTH.



INSTALLATION OF PIPES OR TOE DRAINS UNDER DIKES

6 3-CV-551 — DETAIL

N.T.S.



SECTION 7 3-CV-550, 551 3-CV-551

SCALE: 1"=40' HORZ. 1"=8' VERT.

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SOUTH CAROLINA REGISTERED 5444 ENGINEER P. R. DURALIA

no	date	REVISION	by	ck.	appr.
O	10-6-78	ISSUED FOR BIDS - CONTR. 3BG	GG	PRD	
B	6-23-78	ISSUED FOR OWNER'S REVIEW	G		
A	5-5-78	B&R REVIEW			

no	date	REVISION	by	ck.	appr.

drawn by B. TURNER III
dept. ck. P.R. DURALIA
dept. appr. [illegible]
coord. ck.
p.m. appr.
B&R appr. W.J. Davis 1/29/80

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ATLANTA DALLAS NEW YORK
LOCKWOOD GREENE
ARCHITECTS · ENGINEERS
SPARTANBURG, S.C.

job name
SANTEE COOPER
WINYAH GENERATING STATION UNIT 3
GEORGETOWN, SOUTH CAROLINA

sheet title
MISCELLANEOUS SECTIONS
SHEET 1

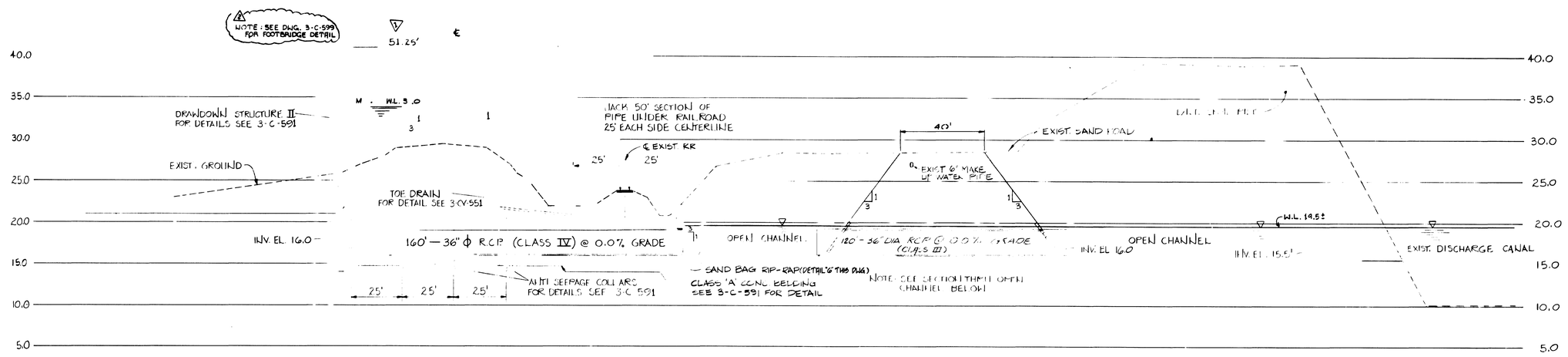
scale AS NOTED
date 5-1-78

WS-300-00-0336

3BG	CONST	2-7-79	0
3BG	BID	10-6-78	0
PKG	ISSUE	DATE	REV.

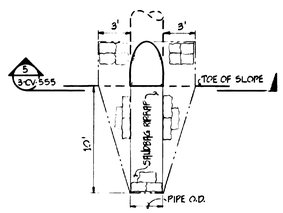
L-G JOB NO. 77043.01
B&R W.O. NO. 3389
dwg. no. 3-CV-551
rev. no. C

EF POLYTRACE 033



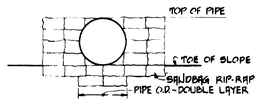
3-CV-550 (1) 3-CV-555 SECTION
SCALE HORIZ. 1" = 20'
VERT. 1" = 5'

NOTE:
1. "O" RING JOINTS PER SPECIFICATION SECTION 02510 ARE REQUIRED ON CLASS IV CONCRETE PIPE.
2. SEE DETAIL 6, DWG. 3-CV-551 FOR PIPE INSTALLATION UNDER DIKES.

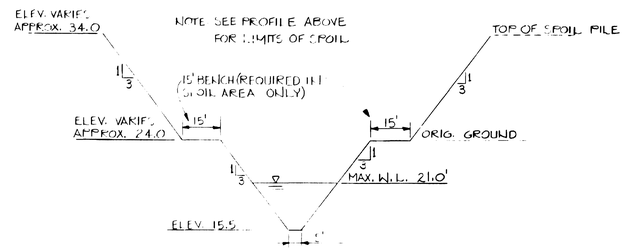


DETAIL (6) 3-CV-556 N.T.S.

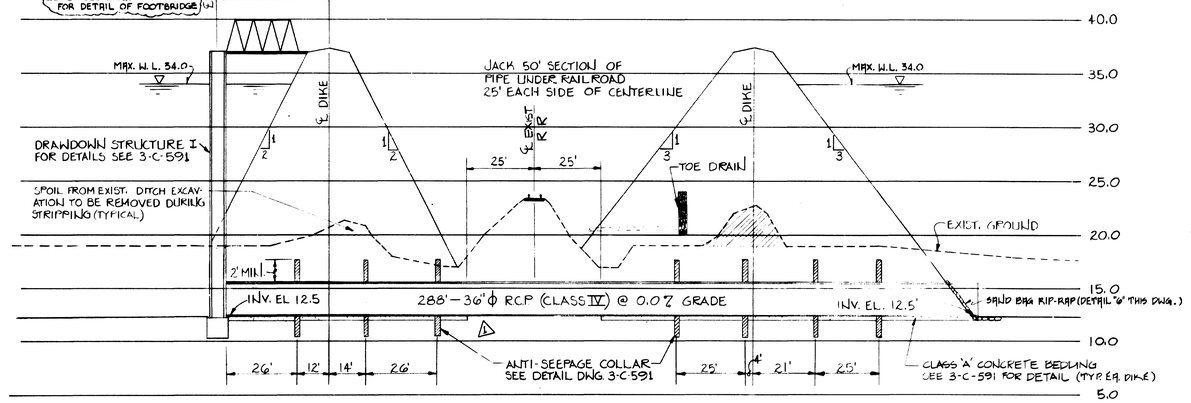
NOTE:
SANDBAGS SHALL BE FILLED WITH A MIXTURE OF 5 PARTS SAND AND 1 PART CEMENT BY WEIGHT.



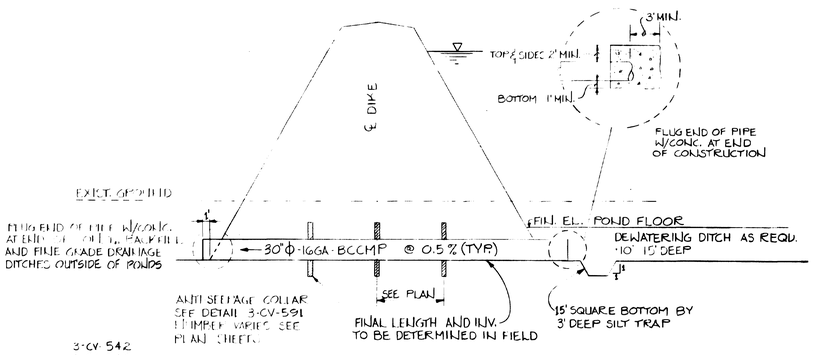
SECTION (5) 3-CV-555 N.T.S.



(4) 2-CV-555 TYPICAL SECTION THRU OPEN CHANNEL
SCALE: HORIZ. 1"=20', VERT. 1"=5'



3-CV-547, 3-CV-549 (2) 3-CV-555 SECTION
SCALE: HORIZ. 1"=20'
VERT. 1"=5'



3-CV-542
3-CV-546
3-CV-549
(3) 3-CV-555 TYPICAL CONSTRUCTION DRAINAGE OUTLET PIPE
NO SCALE

DATUM NOTE:
ALL ELEVATIONS SHOWN ON THIS DRAWING ARE RELATIVE TO UNITS 3 AND 4 CONSTRUCTION BENCH MARKS ESTABLISHED BY ASSOCIATED SURVEYORS, INC. UNDER CONTRACT 3389-366.
TO DETERMINE TRUE ELEVATION RELATIVE TO MEAN SEA LEVEL UNIT 1 AND 0.42' TO THE EVATION SHOWN.

no	date	REVISION	by	ch.	appr.	no	date	REVISION	by	ch.	a
		MEP DR - WP									

BURNS AND ROE, INC.
ENGINEERS AND CONSTRUCTORS
ORADELL, N. J. HEMPSTEAD, N. Y. LOS ANGELES, CALIF.

drawn by
dept. ck.
dept. appr.
coord. ck.
p.m. appr.
B&R appr.

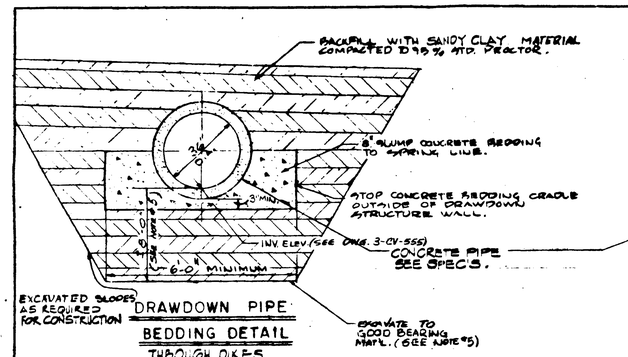
ATLANTA DALLAS NEW YORK
LOCKWOOD GREENE
ARCHITECTS · ENGINEERS
SPARTANBURG, S.C.

job name
SANTEE COOPER
WINYAH GENERATING STATION UNIT 3
GEORGETOWN, SOUTH CAROLINA

sheet title
MISCELLANEOUS SECTIONS
SHEET 2

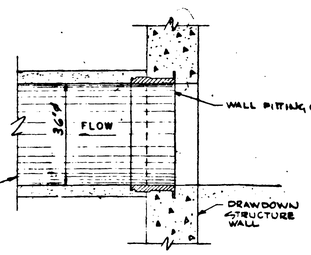
386 CON'T	8-7-	E
386 BID	10-6-78	O
PKG ISSUE	DATE	RE

scale AS NOTED
L-G JOB NO. 77043.01
B&R W.O. NO. 3389
date 5-1-78
dwg. no. 3-CV-555
rev. 2

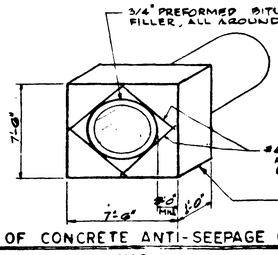


DRAWDOWN PIPE BEDDING DETAIL THROUGH DIKES

NO SCALE



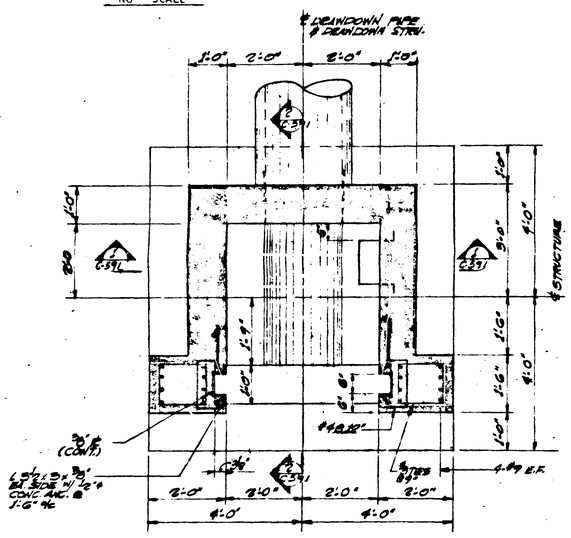
SPIGOT WALL FITTING DETAIL



NOTE:
INSTALL CONCRETE ANTI-SEEPAGE COLLARS AROUND THE CMP PIPE THAT PASSES THRU THE EARTH DAM & DIKES. SEE SECTION 1 & 2 CY-555 FOR COLLAR SPACING

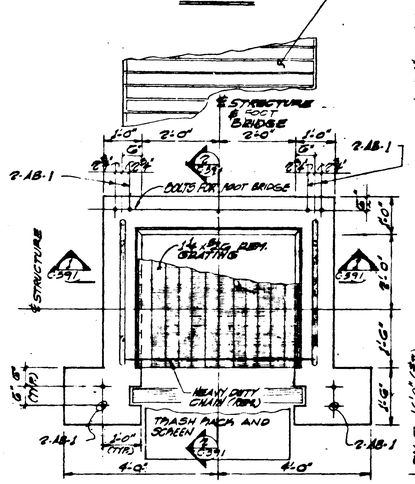
DETAIL OF CONCRETE ANTI-SEEPAGE COLLAR

NO SCALE



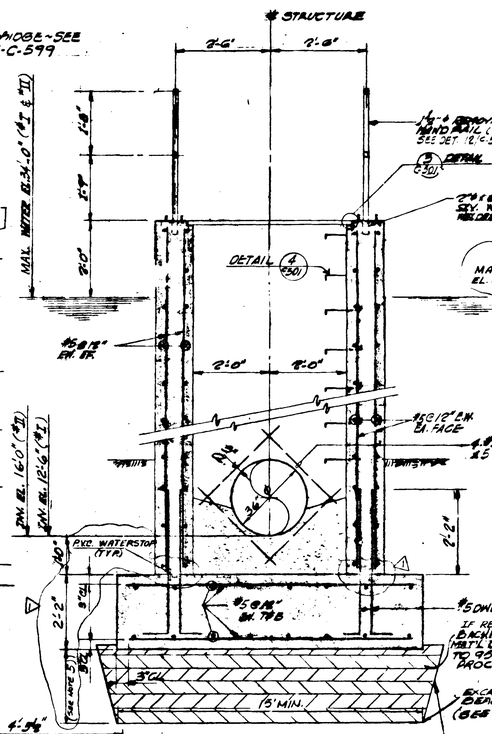
PLAN OF STRUCTURE I & II
DRAWDOWN STRUCTURE @ MAX. WATER LEVEL (2 REQ'D)
SCALE: 3/4" = 1'-0"

NOTE: SEE CIVIL DWG. CY-547, CY-550 FOR LOCATION

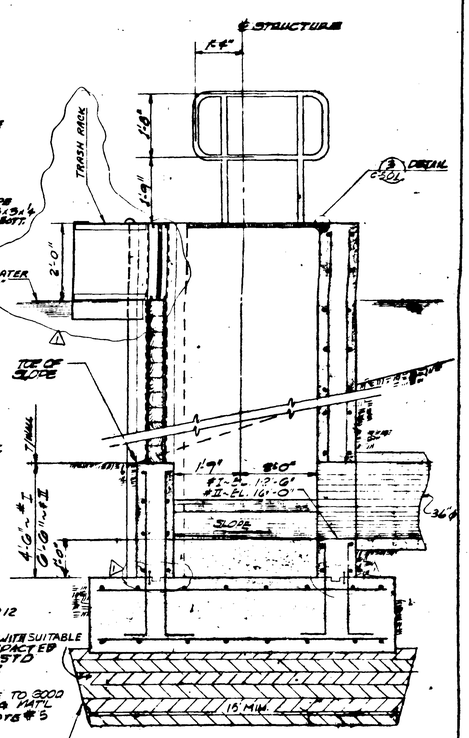


PLAN OF STRUCTURE I & II
DRAWDOWN STRUCTURE @ WALK WAY LEVEL
SCALE: 3/4" = 1'-0"

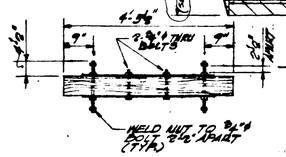
NOTE: FOR TRASH RACK & SCREEN SEE DET. 4/C599



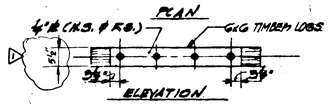
SECTION 1/C591
SCALE: 3/4"=1'-0"



SECTION 2/C591
SCALE: 3/4"=1'-0"

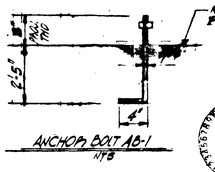


PLAN



TYP STOP LOG FOR DRAWDOWN STRUCTURE
SCALE: 3/4"=1'-0"

39 REQ'D ~ # I
27 REQ'D ~ # II



ANCHOR BOLT AB-1
NTS

NOTES

1. SEE DRAWING C-501 FOR GENERAL NOTES AND STANDARD DETAILS.
2. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS.
3. SEE CIVIL DRAWINGS FOR LOCATION.
4. ALL MISCELLANEOUS STEEL TO BE GALVANIZED & COATED (UNLESS NOTED) SEE SPEC'S.
5. SHOULD SOFT SILT OR CLAY SOILS BE ENCOUNTERED IN THE BOTTOM OF THE EXCAVATION, SUCH MATERIAL SHALL BE REMOVED AND BACKFILLED WITH SUITABLE COMPACTED MATERIAL. ANY OVER EXCAVATION AND BACKFILLING SHALL BE DONE AS DIRECTED BY THE ENGINEER.
6. FOR TIMBER STOP LOG REQUIREMENTS SEE DIVISION 6 OF SPECIFICATIONS.
7. ALL CONCRETE AND STEEL TO BE COATED WITH BITUMASTIC COATING, SEE SPEC'S. ~ EXCEPT HANDRAIL & GRATING

DATUM NOTE:
ELEVATIONS SHOWN ON THIS DRAWING ARE RELATIVE TO UNITS 1 AND 2 CONSTRUCTION BENCH MARKS ESTABLISHED BY ASSOCIATED SURVEYORS, INC. UNDER CONTRACT 3389-164 TO DETERMINE TRUE ELEVATION RELATIVE TO MEAN SEA LEVEL UNIT 1 AND UNIT 2 VERTICAL ALIGNMENT, ADD 0.42' TO THE ELEVATION SHOWN.

no	date	REVISION	by	ck.	appr.
1	8/27/79	REV. DIM. & QUANTITY, ADD TRASHRACK & WATERSTOP	MC	RD	

drawn by J.ROAD
dept. ck. [illegible]
dept. appr. [illegible]
coord. ck.
p.m. appr.
B&R appr.

BURNS AND ROE, INC
ENGINEERS AND CONSTRUCTORS
BRADELL, N. J. HEMPSTEAD, N. Y. LOS ANGELES, CALIF.

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job name
SANTEE COOPER
WINYAH GENERATING STATION UNIT 3
GEORGETOWN, SOUTH CAROLINA

sheet title
DRAWDOWN STRUCTURE
PLANS, SECTIONS & DETAILS

386	ISSUED FOR CONSTR.	12.7.79	1
386	BID	10-9-78	0
386	CHANGES REVISIONS REVIEW	12-7-77	B
386		6-23-77	A
PH6	ISSUE	DATE	REV.

scale AS NOTED
date

L-G JOB NO. 77043.01
B&R W.O. NO. 3389
dwg. no. 3-C-591
rev. no. 1

PILE NUMBER 3000010140

APPENDIX B

Dike Inspection Procedures and Inspection Checklist

4.10.2. The individual inspecting the dike(s) should inspect the crest, the slopes, and the area downstream, and complete the form, noting issues as follows:

Leaks

Any leaks on the dry side of the dike should be described such as the approximate quantity of flow, whether the water is discolored and the exact location of the leak. If a leak is found, Generation Technical Services should be notified immediately so that the appropriate steps to control the situation, and notify agencies if necessary, can be taken.

Seepage

Seepage on the dry side of the dike can be an indication of changes or shifts in the dike structure and possible future leaks. Any seepage should be described in the report.

Wet Spots

The dikes should be inspected when it has been dry for a period of time. Any areas on the dikes where the soil appears damp compared to the surrounding soil should be noted. This could be evidence of seepage.

Aquatic Weed Growth

Any aquatic weeds or wetland weeds, such as cattails, mosses, and algae, seen around the dry side of dikes could signify seepage from the ponds. If wetlands are downstream of the toe on the dry side of the dike, then the aquatic weed growth will not necessarily be a sign of dike seepage and does not need to be included in the report.

Trees and Woody Vegetation

Trees and woody vegetation can obscure problems, provide habitat for burrowing animals, and prevent growth of a protective grass cover. Trees growing along the downstream slope and near the toe of the downstream slope are a special concern and should be noted so maintenance or repair can be made.

Erosion

Any signs of erosion should be included in the report.

Depressions or Ruts

Depressions and ruts can hold water and make maintenance mowing more difficult or can weaken the soil and cause localized sloughing of the slope. These should be filled and graded to drain. Re-establish vegetation if needed.

Water Level in the Pond
Pond levels should be inspected and recorded to be sure freeboard is adequate and the dikes will not be overtopped.

Overall Condition
The overall condition of the dike should be described. The back of the report form can be used to continue any comments or descriptions.

Excessive Sediment Buildup
Stormwater ponds shall be inspected for excessive sediment buildup. Buildup shall be periodically cleaned out of stormwater ponds and properly disposed of.

Discharges and Pipe Crossings
All outlets of hydraulic structures which pass through a dike or abutment or underneath the base of a surface impoundment should be inspected for abnormal discoloration, flow, or discharge of debris or sediment which could indicate a leak. In addition, all pipe crossings, whether through, under, or over a dike, should be inspected.

4.10.3. Driving Inspections should involve a view of both sides of the dike and around the toe of the dike exterior looking up whenever possible. The inspector should walk to evaluate pipe crossings, the area around discharge structures, wet areas, or areas demonstrating erosion.

4.10.4. Inspections by Qualified Dam Safety Engineer shall include participation by station personnel. Documentation shall be as appropriate and shall be provided for station files. When noted, inspections should include internal inspections of principal outlet structures. Consideration should be given to performing the annual walking inspection coincidentally with the Dam Safety Engineer's inspection when required annually.

4.10.5. If any issues are noted, a map or drawing of the dike/pond(s) inspected should be attached to the report form. Sketches of the ponds at each station are available in Appendix E, FORMS. Significant issues shall be immediately communicated to supervision.

4.10.6. Work orders should be written to address any problems noted on the reports. The person performing the inspections is responsible for the writing and follow-up on the work request.

4.10.7. The completed report forms should be reviewed by management, and reviewed and approved by the Station Manager. Copies should be kept in the station's files and sent to Generation Technical Services.

GENERATION - TECHNICAL SERVICES
IMPOUNDMENT INSPECTION REPORT: CCR
WINYAH STATION
SOUTH ASH POND (Unit 3 & 4)

DATE: _____
INSPECTOR: _____ SIGNATURE: _____
REVIEWED BY: Station Manager SIGNATURE: _____

FEATURE	OK √	LOCATION & COMMENTS
1. Crest		
Alignment (H)		
Settlement (V)		
Cracks (Measure Dimensions)		
Excessive Vegetation		
Burrows or Ruts		
2. Slopes		
Seepage (Flow, lush grass, clarity)		
Erosion gullies		
Slides (cracks, bulges, scarps)		
Vegetation (trees present, no grass)		Vegetated slopes not to exceed 6 inches
Animal burrows		
Rip-rap displacement		
Freeboard Adequate		
Settlement/Depression		
3. Area Downstream		
Seepage (Flow, lush grass, clarity)		
Boils		
Drainage Ditches		
Drainage Pipes		
Vegetation (trees present, no grass)		
4. Outlet Works		
Inspect Plastic, Concrete, Metal, and Wood		
Flowing as expected from outlet?		
No abnormal flow, discoloration, debris, or sediment?		
5. Crossings		
No flow, settlement, erosion, voids, or sediment loss visible at pipe crossings (Both sides of dike and crest)		View pipe bridge crossing (northwest side). View lines from stormwater pump (northwest corner). View oil/water separator discharge into pond (northeast corner). View discharge structure to discharge canal (pond-side and canal-side).
6. Overall Condition		
Note any other issues		New pipes?
7. Instrumentation		
Staff gauge reading as expected?		Record reading if applicable

NOTE: SHOW LOCATION OF PROBLEM AREAS ON AN ATTACHED DRAWING and DESCRIBE DEFICIENCY
S I M P L E - Sketch, Inspect, Measure, Photograph, Locate, Engage a Qualified Engineer if necessary

Copies: Station Files (original)
Operating Record - ECM
Generation Technical Services - Tim Swicord