PROJECT OVERVIEW:
THE ENCLOSED ONSITE WASTEWATER DESIGN SUBMITTAL IS FOR A PROPOSED RV PARK/RECREATION AREA LOCATED IN CHARLESTON COUNTY. THE PROPOSED WASTEWATER FROM THE DUMP STATION SHALL BE PLUMBED TO GRAVITY FLOW TO THREE (3) 2,000 GALLON SEPTIC TANKS THAT WILL GRAVITY FEED (1) 2,000 GALLON CLARIFICATION TANK & (1) 2,000 GALLON PUMP TANK. THE SEPTIC TANKS WILL ALSO RECEIVE EFFLUENT FROM A GRINDER PUMP STATION (DESIGNED BY OTHERS) LOCATED AT THE RECREATION AREA. EFFLUENT FROM THE SEPTIC PUMP TANK WILL ULTIMATELY FEED THE PROPOSED LARGE ONSITE WASTEWATER SYSTEM AS DEFINED BY REG 61.56 101.1.2.a. TO BE CONSTRUCTED NORTH WEST OF THE PROPOSED DUMP STATION. FIFTY PERCENT REPAIR AREA IS PROPOSED TO THE WEST OF THE PROPOSED DRAIN FIELD LOCATION PER R61.56 150.1.f.

THE SUBJECT SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH SCDHEC R61-56. THE LTAR PROVIDED FOR THE SOILS IN THE SUBJECT AREA IS 0.80, REFERENCING THE PROVIDED SOILS DATA BY PROFESSIONAL SOILS CLASSIFIER MR. TYLER SGRO, DATED JANUARY 10, 2023. THE SYSTEM, INSTALLED PER THE ENCLOSED DESIGN, WILL FUNCTION AS INTENDED AND MEET OR EXCEED ALL REQUIREMENTS OF SCDHEC REGULATION 61-56.

GENERAL NOTES:
1. THESE DRAWINGS INDICATE A GENERAL SCOPE OF WORK AND MAY NOT DESCRIBE THE ENTIRE EXTENT OF WORK REQUIRED FOR PROJECT COMPLETION. CONTRACTOR AND OWNER ARE RESPONSIBLE FOR ALL LABOR, MATERIALS, SUPERVISION, UNSPECIFIED MATERIAL SELECTION, ADHERENCE TO SCDHEC AND LOCAL STANDARDS, AND QUALITY CONTROL.
2. CONTRACTOR SHALL CONTACT 811 TO LOCATE UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION AND SHALL CONSULT WITH CONSTRUCTION SITE MANAGER TO LOCATE NEW AND EXISTING UTILITIES ON SITE PRIOR TO ANY EXCAVATION ACTIVITIES.
3. CONSTRUCTION SHALL CONFORM TO SCDHEC SPECIFICATIONS AND BE PERFORMED BY LICENSED TIER 2 SEPTIC INSTALLER
4. ALL ELECTRICAL AND PLUMBING WORK SHALL BE PERFORMED BY LICENSED CONTRACTORS
5. OWNER/CONTRACTOR TO PROVIDE ADEQUATE BARRIERS/DETERRENTS AROUND PERIMETER OF SEPTIC SYSTEM TO PREVENT VEHICLE PARKING AND TRAFFIC.
6. THE SEPTIC TANK(S) AND TILE FIELD AREA SHALL BE BACKFILLED AND SHAPED TO PROMOTE POSITIVE DRAINAGE.
7. TRENCH SUB-GRADE SHALL BE LEVEL ALONG ITS LENGTH.
8. TRENCH AGGREGATE SHALL BE GRANITE PER SCDHEC SPECIFICATIONS.
9. BASE OF TRENCH TO MAINTAIN 6" MINIMUM OFFSET FROM ZOS/SHWT & 12" OFFSET FROM BORING TERMINATION (CONTROLS)
10. WELL SYSTEMS, IF REQUIRED, SHALL BE INSTALLED MINIMUM OF 100' FROM SEPTIC SYSTEM
11. THE SEPTIC SYSTEM SHALL NOT BE INSTALLED IN WETLANDS; WETLANDS ARE NOT SHOWN ON PROVIDED CIVIL PLANS (REF. CIVIL DRAWINGS). OWNER/CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CHANGE IN SITE CONDITIONS.
12. UPON COMPLETION OF CONSTRUCTION AN AS-BUILT, CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER, MUST BE SUBMITTED TO SCDHEC.
13. CONSTRUCTION SHALL BE INSPECTED AND SUPERVISED BY A REGISTERED PROFESSIONAL ENGINEER. CONTRACTOR TO NOTIFY ENGINEER PRIOR TO START OF CONSTRUCTION TO SCHEDULE INSPECTIONS.

OPERATION & MAINTENANCE:
SEPTIC TANK: THE SEPTIC TANK SHALL BE INSPECTED/PUMPED AT LEAST TWICE EVERY YEAR BY A LICENSED SEPTIC CONTRACTOR FOR THE FIRST TWO YEARS OF OPERATION. PUMPING SCHEDULE MAY BE ADJUSTED AFTER SUCH TIME BASED UPON SITE SPECIFIC CONDITIONS.

PUMPING IS NECESSARY WHEN SOLIDS ARE OBSERVED BETWEEN ONE-THIRD AND ONE-HALF THE HEIGHT OF THE TANK. SEPTIC CONTRACTOR SHALL BE CONTACTED TO INSPECT THE SOLIDS LEVEL AND PUMP SOLIDS. INSPECTOR SHALL NOTE THE FOLLOWING AND RECOMMEND PUMPING WHEN THE THE BOTTOM OF THE SCUM LAYER IS WITHIN 6 INCHES OF THE OUTLET TEE AND/OR WHEN THE TOP OF THE SLUDGE LAYER IS WITHIN 12 INCHES OF THE OUTLET TEE.

DRAIN FIELD: DRAIN FIELD SHALL BE INSPECTED ONCE EVERY 6 MONTHS FOR AT LEAST THE FIRST YEAR OF OPERATION BY A LICENSED SEPTIC CONTRACTOR TO ENSURE IT IS FUNCTIONING ADEQUATELY. THE INSPECTION SCHEDULE CAN BE ADJUSTED BY THE LICENSED CONTRACTOR AFTER THE FIRST YEAR, DEPENDENT UPON SITE SPECIFIC CONDITIONS.

PUMP: PUMP SYSTEM, IF REQUIRED, SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS AND SHALL BE SERVICED AS NEEDED DURING THE LIFE OF THE PUMP. LIBERTY PUMPS ARE DESIGNED WITH A 7-10 YEAR LIFE SPAN, DEPENDENT UPON SITE SPECIFIC CONDITIONS, REPLACE AS NECESSARY (BY A QUALIFIED SEPTIC CONTRACTOR).

*ALL INSPECTION AND PUMPING RECORDS SHALL BE MAINTAINED ON SITE BY THE OWNER.

DESIGN SUMMARY:
LTAR= 0.80 PER SOIL CLASSIFICATION REPORT BY TYLER SGRO, DATED JANUARY 10, 2023.

USERS=	LOOP A & B RV SITES W/ DUMP STATION SERVICE=	32
	LOOP A & B PRIMITIVE CAMP SITE W/ BATH HOUSE ACCESS=	13
	LOOP A & B HOST CAMP SITES - FULL SERVICE=	2
	PHASE 2 GROUP TENT SITES W/ VAULT TOILET ACCESS ONLY=	14
	PUBLIC RESTROOM USERS - CONCESSION OUTFITTER BLDG=	50
	PUBLIC RESTROOM USERS - BOAT LANDING/EVENT SPACE=	288
	FULL TIME EMPLOYEES (MAINT. & CONCESSIONS)=	2

DESIGN FLOWRATE= 4814 GPD (REF. R.61-56 SECTION 501)
120 GAL/FULL SERVICE CAMP SITE/DAY
15 GAL/EMP./DAY
90 GAL/BATH HOUSE & DUMP STATION USER/DAY
50 GAL/BATH HOUSE USER/DAY
3 GAL/PUBLIC RESTROOM USER/DAY

DESIGN TRENCH WIDTH/AGGREGATE DEPTH= 3' @ 14" DEPTH, GRANITE #57 STONE PER SCDHEC SPECS

TOTAL MIN. REQUIRED SYSTEM LENGTH= 2006 LF
DESIGN SYSTEM LENGTH= 2200 LF, (10) TRENCHES AT 220' EA. (1 EA. 4" DIAMETER DRAIN TILE PIPE IN TRENCH)

PRIMARY SEPTIC TANK SELECTION= (3) EACH 2,000 GALLON KNIGHTS SEPTIC TANKS INSTALLED WITH 2" MAX FALL FROM TANK 1 INLET TO TANK 3 OUTLET WITH ACCESS RISERS & LIDS. 12" SLUDGE LINE TO BE INSTALLED LEVEL BETWEEN EACH TANK, 12" FROM BOTTOM OF TANKS. CONTRACTOR SHALL SUBMIT ALTERNATE SPECIFICATION FOR ENGINEER APPROVAL IF DESIRED.

PRIMARY CLARIFICATION TANK SELECTION= (1) EACH 2,000 GALLON KNIGHTS SEPTIC TANK OR APPROVED EQUAL WITH ACCESS RISERS. CONTRACTOR SHALL SUBMIT ALTERNATE SPECIFICATION FOR ENGINEER APPROVAL IF DESIRED.

PRIMARY PUMP TANK/PUMP SELECTION= (1) EACH 2,000 GALLON KNIGHTS SEPTIC TANK OR APPROVED EQUAL WITH ACCESS RISERS. CONTRACTOR SHALL SUBMIT ALTERNATE SPECIFICATION FOR ENGINEER APPROVAL IF DESIRED. INSTALL A MIN. ½ HP. ZOELLER MODEL N161 OR APPROVED EQUAL CONTRACTOR PROPOSED ALTERNATIVES. INSTALL PER MANUFACTURER SPECIFICATIONS

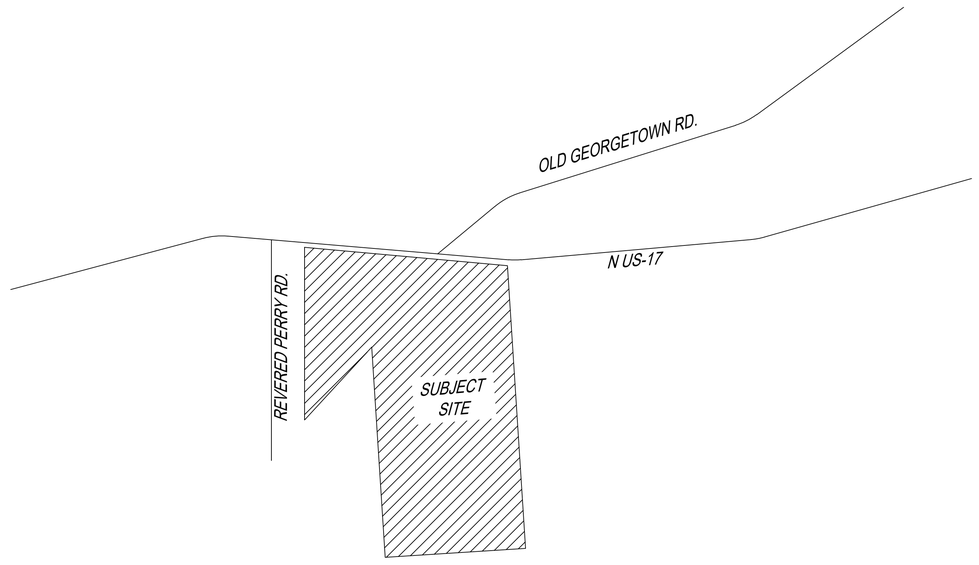
PHASE 2 SEPTIC TANK=(1) EACH 1,000 GALLON KNIGHTS SEPTIC TANK FOR HOST SITE, AND (1) EACH 1,500 GALLON KNIGHTS SEPTIC TANK FOR BATH HOUSE EACH WITH ACCESS RISERS AND LIDS

PHASE 2 PUMP TANK= (1) EACH 1,000 GALLON KNIGHTS SEPTIC TANK WITH A ½ HP ZOELLER MODEL N161 EFFLUENT PUMP

PROJECT NAME: JLA - BUCK HALL RECREATION AREA

PROJECT LOCATION: 1099 BUCK HALL LANDING RD.
MCCLELLANVILLE, SC 29458
CHARLESTON COUNTY

INSTALLER MUST BE LICENSED TIER 3 SEPTIC INSTALLER OR TIER 2 INSTALLER APPROVED BY ONSITE SEPTIC ENGINEERING PRIOR TO BID. INSTALLER SHALL CONTACT ONSITE SEPTIC ENGINEERING 2 WEEKS PRIOR TO CONSTRUCTION TO SCHEDULE PRE-CONSTRUCTION MEETING AND CONSTRUCTION OBSERVATIONS PRIOR TO INSTALLATION



VICINITY MAP
SCALE N.T.S.

DRAWING INDEX:

OSWW1	VICINITY MAP, GENERAL NOTES & DESIGN CRITERIA
OSWW2	ONSITE WASTEWATER OVERALL SITE PLAN
OSWW3	ONSITE WASTEWATER SYSTEM LAYOUT PLAN
OSWW4	ONSITE WASTEWATER DRAIN FIELD DETAIL
OSWW5	ONSITE WASTEWATER TANK DETAILS
OSWW6	ONSITE WASTEWATER TANK PLAN
OSWW7	ONSITE WASTEWATER EFFLUENT PUMP SPECIFICATIONS

811 Know what's below. Call before you dig.

USDA Forest Service
United States Department of Agriculture
Forest Service

R-08
Southern Region

STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA CPR ENGINEERING SOLUTIONS, LLC No. 5170 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA No. 32006 01/30/2025 CALEB P RODGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

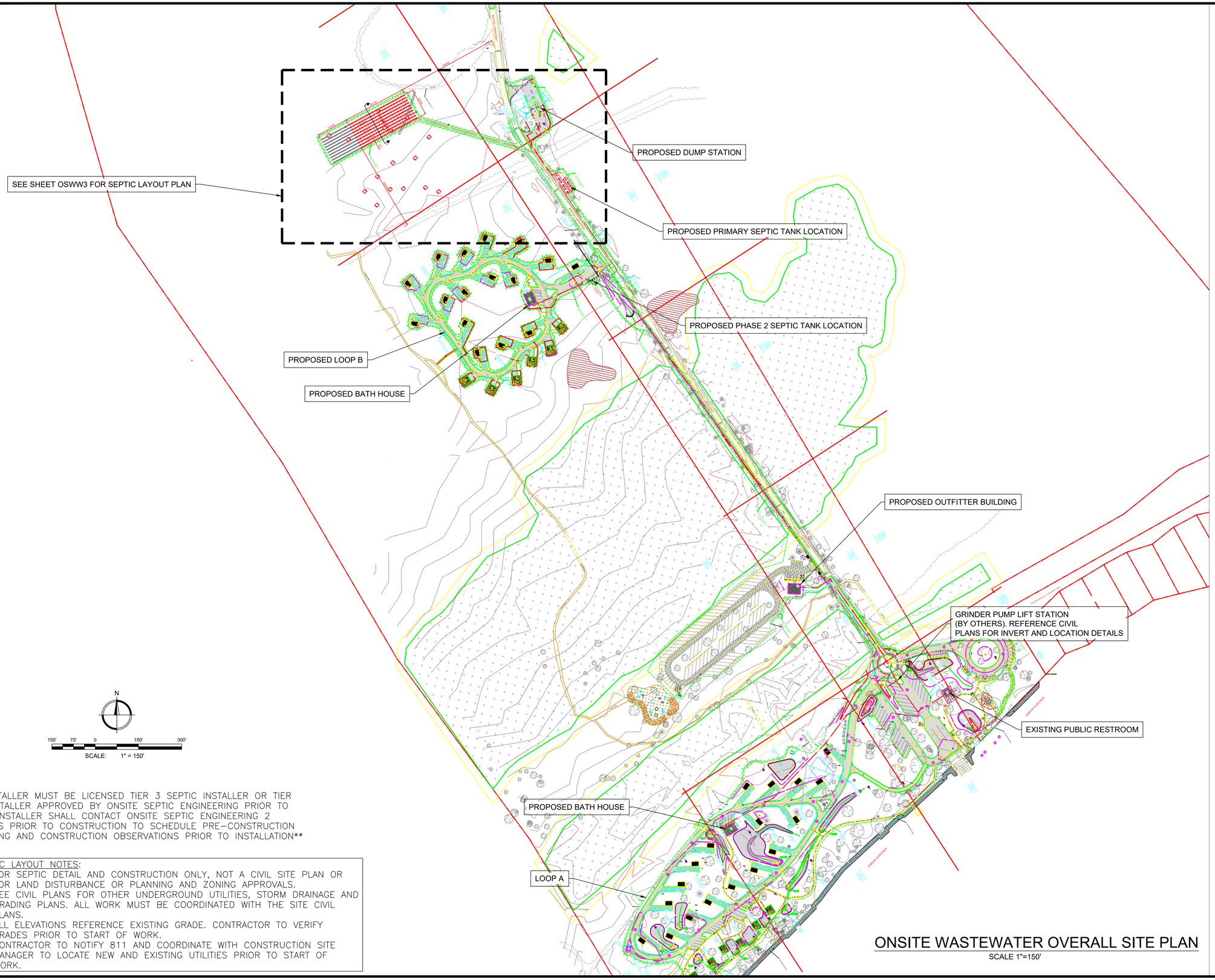
FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
Project Status: Final Construction Documents
Task Order Number: 1244522F0051

PREPARED BY:
JOHNSON, LASCHOBER & ASSOCIATES, P.C.
ARCHITECTS ENGINEERS
LANDSCAPE ARCHITECTS
1296 BROAD ST., AUGUSTA, GEORGIA 30901
PHONE: (706) 724-5756 FAX: (706) 724-3955
WEBSITE: www.theJLAgroup.com

DRAWING TITLE
ONSITE WASTEWATER GENERAL NOTES

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW1
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 110 OF 138



N

150' 75' 0 150' 300'

SCALE: 1" = 150'

INSTALLER MUST BE LICENSED TIER 3 SEPTIC INSTALLER OR TIER 2 INSTALLER APPROVED BY ONSITE SEPTIC ENGINEERING PRIOR TO BID. INSTALLER SHALL CONTACT ONSITE SEPTIC ENGINEERING 2 WEEKS PRIOR TO CONSTRUCTION TO SCHEDULE PRE-CONSTRUCTION MEETING AND CONSTRUCTION OBSERVATIONS PRIOR TO INSTALLATION

SEPTIC LAYOUT NOTES:

1. FOR SEPTIC DETAIL AND CONSTRUCTION ONLY, NOT A CIVIL SITE PLAN OR FOR LAND DISTURBANCE OR PLANNING AND ZONING APPROVALS.
2. SEE CIVIL PLANS FOR OTHER UNDERGROUND UTILITIES, STORM DRAINAGE AND GRADING PLANS. ALL WORK MUST BE COORDINATED WITH THE SITE CIVIL PLANS.
3. ALL ELEVATIONS REFERENCE EXISTING GRADE. CONTRACTOR TO VERIFY GRADES PRIOR TO START OF WORK.
4. CONTRACTOR TO NOTIFY 811 AND COORDINATE WITH CONSTRUCTION SITE MANAGER TO LOCATE NEW AND EXISTING UTILITIES PRIOR TO START OF WORK.

ONSITE WASTEWATER OVERALL SITE PLAN

SCALE 1"=150'

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STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA — CPR ENGINEERING SOLUTIONS, LLC — No. 5170 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — No. 32006 — 01/30/2025 — CALEB P RODGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
Project Status: Final Construction Documents
Task Order Number: 12445222F0051

PREPARED BY:
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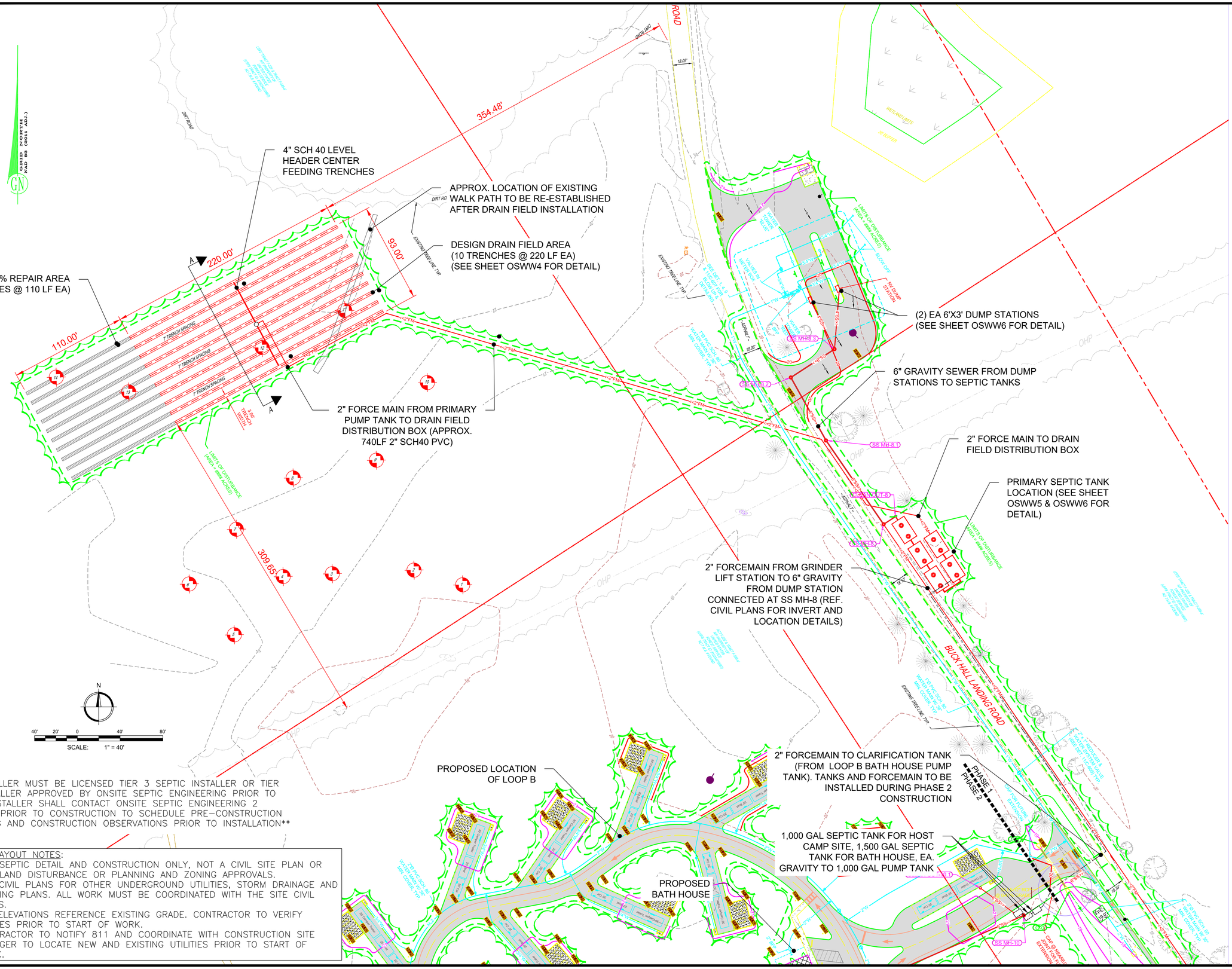
DRAWING TITLE
ONSITE WASTEWATER OVERALL SITE PLAN

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW2
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 111 OF 138



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SEPTIC LAYOUT NOTES:

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2. SEE CIVIL PLANS FOR OTHER UNDERGROUND UTILITIES, STORM DRAINAGE AND GRADING PLANS. ALL WORK MUST BE COORDINATED WITH THE SITE CIVIL PLANS.
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STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA — CPR ENGINEERING SOLUTIONS, LLC — No. 5170 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 32006 — 01/30/2025 — CALEB P RODGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

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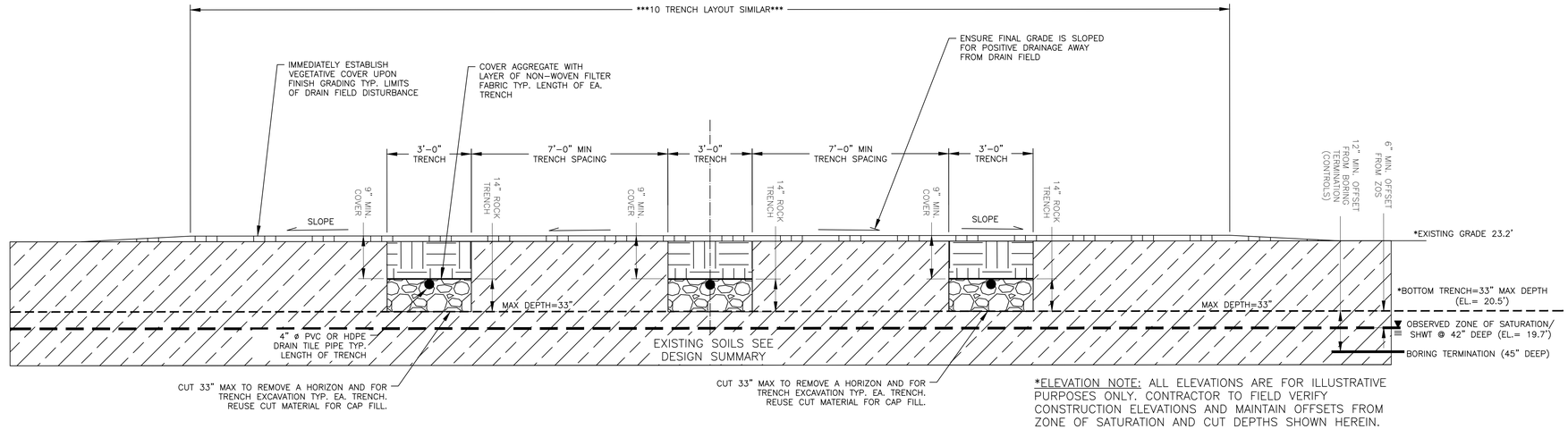
DRAWING TITLE
ONSITE WASTEWATER SYSTEM LAYOUT PLAN

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW3
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 112 OF 138



DRAIN FIELD SECTION A-A

SCALE NTS

INSTALLER MUST BE LICENSED TIER 3 SEPTIC INSTALLER OR TIER 2 INSTALLER APPROVED BY ONSITE SEPTIC ENGINEERING PRIOR TO BID. INSTALLER SHALL CONTACT ONSITE SEPTIC ENGINEERING 2 WEEKS PRIOR TO CONSTRUCTION TO SCHEDULE PRE-CONSTRUCTION MEETING AND CONSTRUCTION OBSERVATIONS PRIOR TO INSTALLATION

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STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA — CPR ENGINEERING SOLUTIONS, LLC — No. 5170 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — COLEB P. RODGERS — No. 32006 — LICENSED PROFESSIONAL ENGINEER — 01/30/2025

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
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PREPARED BY:

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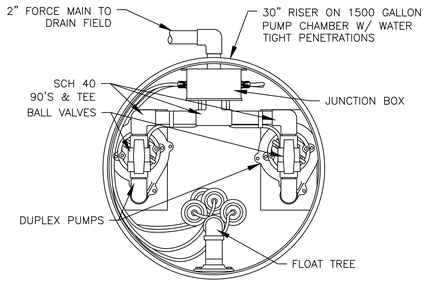
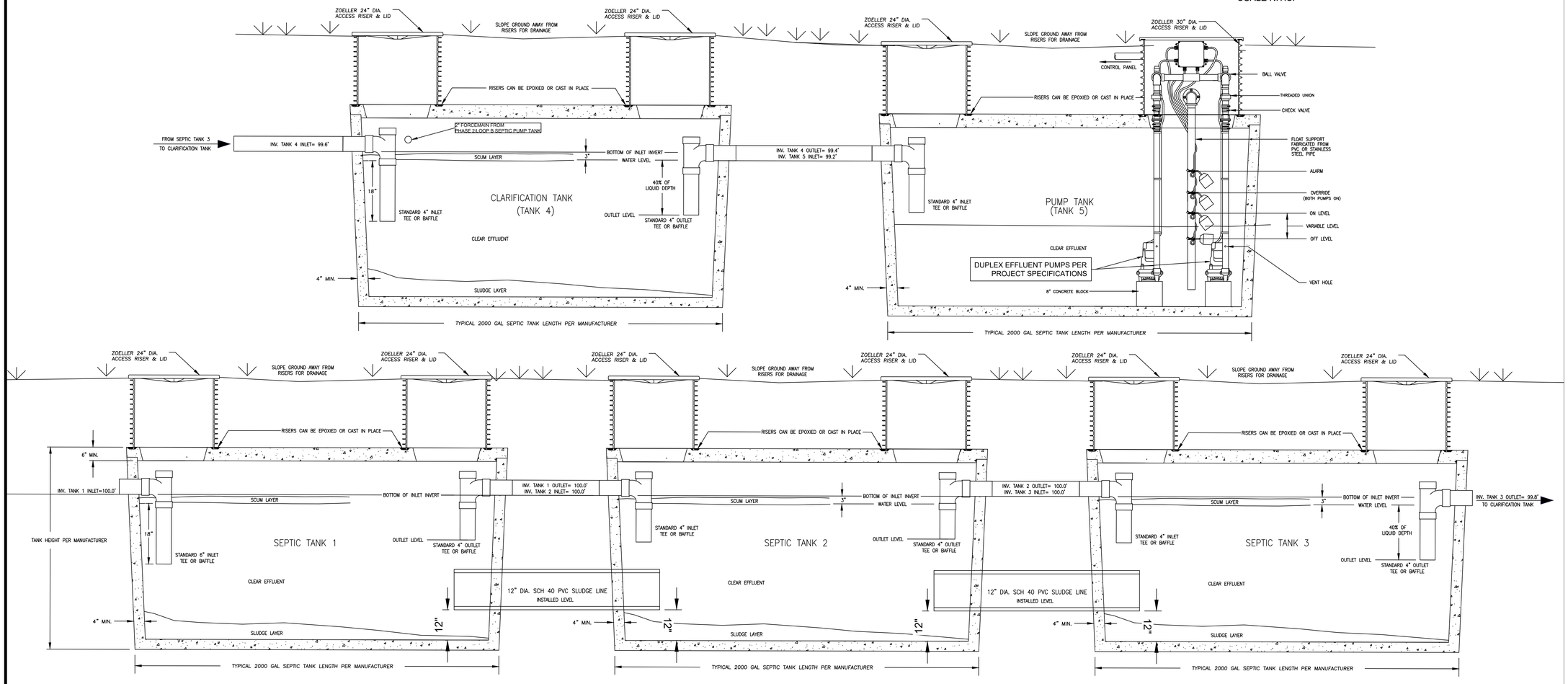
DRAWING TITLE
ONSITE WASTEWATER DRAIN FIELD DETAIL

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW4
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 113 OF 138



PUMP HEAD WORKS PLAN

SCALE N.T.S.



SEPTIC TANK SECTION, DETAILS & ELEVATION SCHEMATIC

SCALE N.T.S.

INSTALLER MUST BE LICENSED TIER 3 SEPTIC INSTALLER OR TIER 2 INSTALLER APPROVED BY ONSITE SEPTIC ENGINEERING PRIOR TO BID. INSTALLER SHALL CONTACT ONSITE SEPTIC ENGINEERING 2 WEEKS PRIOR TO CONSTRUCTION TO SCHEDULE PRE-CONSTRUCTION MEETING AND CONSTRUCTION OBSERVATIONS PRIOR TO INSTALLATION

SEPTIC TANK & PUMP CHAMBER NOTES:

1. SEPTIC TANKS MUST BE FABRICATED BY AN SCDHEC APPROVED SEPTIC TANK MANUFACTURER PER SPECIFICATIONS (SHEET SP100).
2. PROPOSED ALTERNATIVE MATERIALS MUST BE TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

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United States Department of Agriculture
Forest Service

R-08
Southern Region

STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA — CPR ENGINEERING SOLUTIONS, LLC — No. 5170 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — PROFESSIONAL ENGINEER — No. 32006 — 01/30/2025 — CHARLES P. ROGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
Project Status: Final Construction Documents
Task Order Number: 1244522F0051

PREPARED BY:

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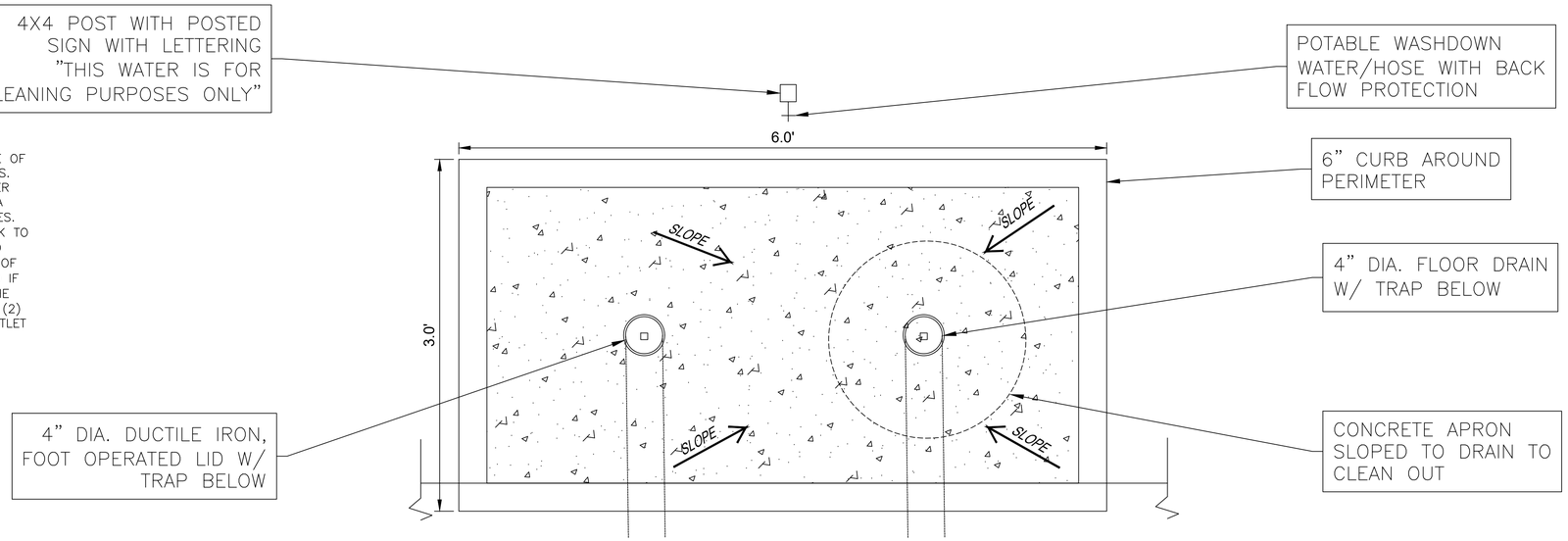
WEBSITE: www.theJLAgroup.com

DRAWING TITLE
ONSITE WASTEWATER SYSTEM TANK SECTION & DETAILS

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW5
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 114 OF 138

INSTALLER MUST BE LICENSED TIER 3 SEPTIC INSTALLER OR TIER 2 INSTALLER APPROVED BY ONSITE SEPTIC ENGINEERING PRIOR TO BID. INSTALLER SHALL CONTACT ONSITE SEPTIC ENGINEERING 2 WEEKS PRIOR TO CONSTRUCTION TO SCHEDULE PRE-CONSTRUCTION MEETING AND CONSTRUCTION OBSERVATIONS PRIOR TO INSTALLATION

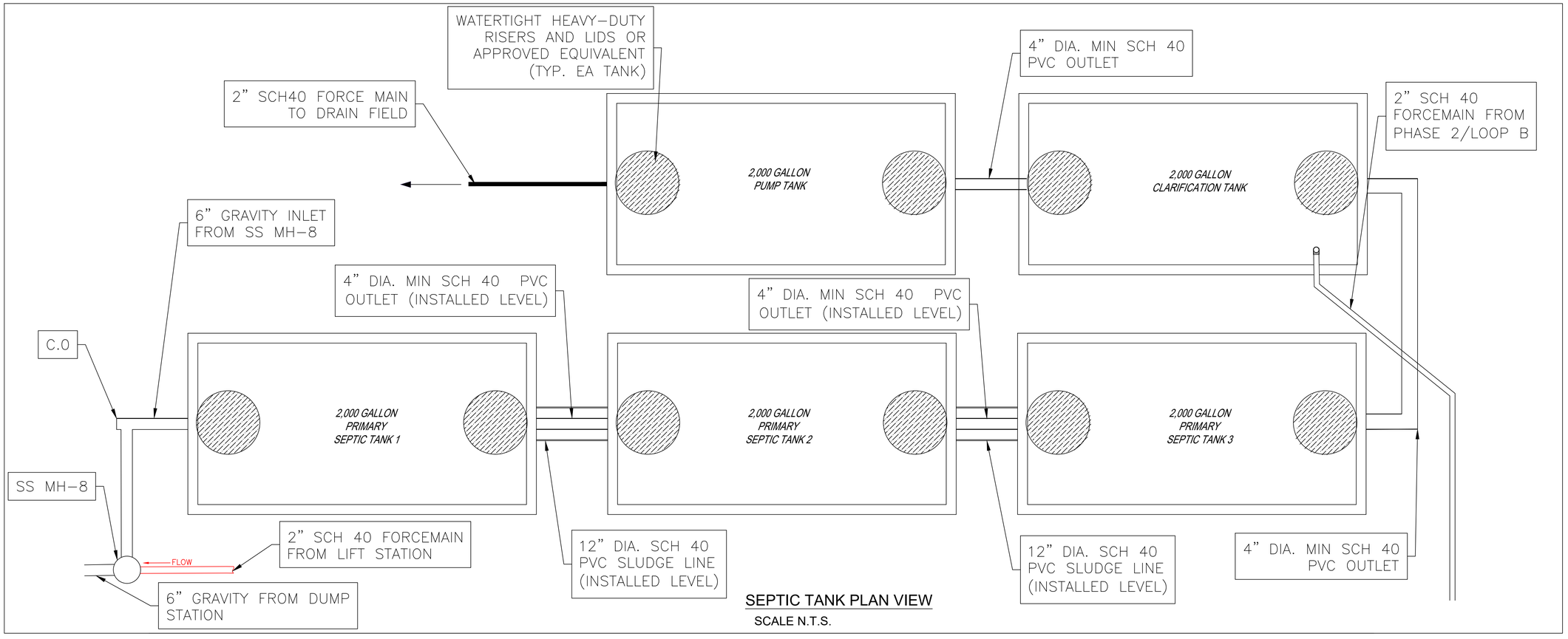
SCDHEC REGULATION 61-56 SECTION 201.1 (6):
THE MINIMUM LIQUID CAPACITY REQUIREMENTS SHALL BE MET BY THE USE OF A SINGLE SEPTIC TANK OR TWO (2) OR MORE TANKS INSTALLED IN SERIES. SEPTIC TANKS JOINED IN SERIES SHALL BE INTERCONNECTED BY AN UPPER EFFLUENT PIPE(S) WITH A MINIMUM DIAMETER OF FOUR (4) INCHES AND A LOWER SLUDGE PIPE(S) WITH A MINIMUM DIAMETER OF TWELVE (12) INCHES. THE UPPER CONNECTION(S) SHALL SHALL BE INSTALLED LEVEL FROM TANK TO TANK, AND THE LOWER SLUDGE PIPE CONNECTION(S) SHALL BE INSTALLED LEVEL AND SHALL BE PLACED TWELVE (12) INCHES ABOVE THE BOTTOMS OF THE TANKS. THE LOWER SLUDGE PIPE CONNECTION(S) CAN BE ELIMINATED IF THE FIRST TANK IN SERIES CONTAINS AT LEAST TWO-THIRDS (2/3) OF THE TOTAL REQUIRED LIQUID CAPACITY. THERE SHALL BE NO MORE THAN TWO (2) INCHES OF FALL FROM THE INLET INVERT OF THE FIRST TANK TO THE OUTLET INVERT OF THE LAST TANK IN SERIES.



RV PULL OF AREA

RV DUMP STATION DETAIL

SCALE N.T.S.



SEPTIC TANK PLAN VIEW

SCALE N.T.S.

United States Department of Agriculture
Forest Service

R-08
Southern Region

STAMPS, LOGOS, AND SEALS

CPR ENGINEERING SOLUTIONS, LLC No. 5170 — SOUTH CAROLINA — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — LICENSED PROFESSIONAL ENGINEER — No. 32006 — 01/30/2025 — CALEB P. RODGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
Project Status: Final Construction Documents
Task Order Number: 12445222F0051

PREPARED BY:
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LANDSCAPE ARCHITECTS
1296 BROAD ST., AUGUSTA, GEORGIA 30901
PHONE: (706) 724-5756 FAX: (706) 724-3955
WEBSITE: www.theJLAgroup.com

DRAWING TITLE
ONSITE WASTEWATER TANK PLAN

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW6
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 115 OF 138

Trusted. Tested. Tough.®

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER PUMP COMPANY

SECTION: 2.15.090
FM2785
0422
Supersedes
0821

TECHNICAL DATA SHEET

HIGH HEAD FLOW - MATE SERIES

Models 161/4161, 163/4163, 165/4165 Submersible Effluent Pumps

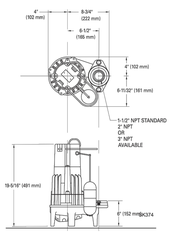
PRODUCT SPECIFICATIONS

MOTOR	Horse Power	1/2 (161/4161, 163/4163) or 1 (165/4165)
	Voltage	115 - 575
	Phase	1 or 3 Ph
	Hertz	60 Hz
	RPM	3450
	Type	Permanent split capacitor or 3 Ph
	Insulation	Class B
	Amps	2.4 - 15.5
PUMP	Operation	Automatic or nonautomatic
	Auto On/Off Points	15-3/4" (400 mm) / 5-1/4" (133 mm)
	Discharge Size	1-1/2" NPT (optional 2" or 3" flange)
	Solids Handling	3/4" (19 mm) spherical solids
	Cord Length	20' (6 m) standard
	Cord Type	1 Ph: UL listed 3-wire neoprene cord and plug or 3 Ph: 4-wire with no plug
	Max. Head	86.5' (26 m)
	Max. Flow Rate	100 GPM (379 LPM)
	Max. Operating Temp.	130 °F (54 °C)
	Cooling	Oil filled
	Motor Protection	Auto reset thermal overload (1 Ph)
MATERIALS	Upper Bearing	Ball bearing
	Lower Bearing	Ball bearing
	Mechanical Seals	Carbon and ceramic
	Impeller Type	Non-clogging vortex
	Impeller	Cast iron, optional bronze
	Hardware	Stainless steel
	Motor Shaft	SAE 1117 carbon steel or 416 stainless steel*
	Gasket	Neoprene square ring and gasket

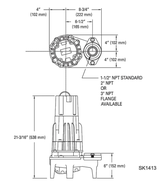
*Single seal models are built with a carbon steel motor shaft, and double seal models are built with a stainless steel motor shaft.

NOTE: The sizing of effluent systems normally requires variable level float(s) controls and properly sized basins to achieve required pumping cycles or dosing timers with nonautomatic pumps.

SINGLE SEAL



DOUBLE SEAL



SSPMA

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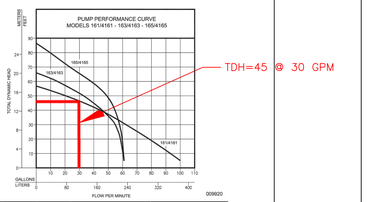
TOTAL DYNAMIC HEAD FLOW PER MINUTE

MODELS		161/4161		163/4163		165/4165	
Feet	Meters	Gal.	Liters	Gal.	Liters	Gal.	Liters
5	1.5	100	379	61	231	61	231
10	3.0	93	352	60	227	60.5	229
15	4.6	86	326	60	227	60.3	228
20	6.1	79	299	59	223	60	227
25	7.6	71	267	57	216	59	223
30	9.1	62	235	55	208	58	220
40	12.2	45	170	46	174	55	208
50	15.2	20	76	33	125	50	189
60	18.3	--	--	15	57	39	148
70	21.3	--	--	--	--	22.5	85
80	24.4	--	--	--	--	10	38
Shut-off Head:		56 ft. (17.1 m)		66 ft. (20.1 m)		86.5 ft. (26.4 m)	



TDH=45 @ 30 GPM

Model	Seal	Mode	Volts	Ph	Amps	HP	Hz	Lbs	Kg	Simplex	Duplex	CERTIFICATIONS
M161	Single	Auto	115	1	15.0	1/2	60	80	36	---	---	cCSAus (1)
BN161	Single	Non	115	1	15.0	1/2	60	80	36	2 or 3 & 5	4 & 5	CSA (2)
N4161	Double	Non	115	1	15.5	1/2	60	87	39	3 & 5	4 & 5	cCSAus (1)(*)
F137	Single	Auto	115	1	15.0	1/2	60	84	38	---	---	CSA (2)
D161	Single	Auto	230	1	7.5	1/2	60	80	36	1	---	cCSAus
E161 / E4161	Single / Double	Non	230	1	7.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* H161	Single	Auto	200	1	8.8	1/2	60	80	36	1	---	cCSAus
* I161 / J4161	Single / Double	Non	200	1	8.8	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* F139 / J4161	Single / Double	Non	200	3	6.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* F161 / F4161	Single / Double	Non	230	3	5.2	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* G161 / G4161	Single / Double	Non	460	3	2.9	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* BA161/BA4161	Single / Double	Non	575	3	2.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE161	Single	Auto	230	1	7.5	1/2	60	84	38	---	---	cCSAus
M163	Single	Auto	115	1	15.0	1/2	60	80	36	1	---	cCSAus (1)
N163 / N4163	Single / Double	Non	115	1	15.0	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	CSA (2)
BN163	Single	Non	115	1	15.0	1/2	60	84	38	---	---	CSA (2)
D163	Single	Auto	230	1	7.5	1/2	60	80	36	1	---	cCSAus
E163 / E4163	Single / Double	Auto	230	1	7.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* H163	Single	Auto	200	1	8.5	1/2	60	80	36	1	---	cCSAus
* I163 / J4163	Single / Double	Non	200	1	8.5	1/2	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* J163 / J4163	Single / Double	Non	200	3	6.0	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* F163 / F4163	Single / Double	Non	230	3	4.8	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* G163 / G4163	Single / Double	Non	460	3	2.9	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* BA163/BA4163	Single / Double	Non	575	3	2.4	1/2	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE163	Single	Auto	230	1	7.5	1/2	60	84	38	---	---	cCSAus
D165	Single	Auto	230	1	10.2	1	60	80	36	1	---	cCSAus
E165 / E4165	Single / Double	Non	230	1	10.2	1	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* H165	Single	Auto	200	1	12.6	1	60	80	36	1	---	cCSAus
* I165 / J4165	Single / Double	Non	200	1	12.6	1	60	80 / 87	36 / 39	2 or 3 & 5	4 & 5	cCSAus
* J165 / J4165	Single / Double	Non	200	3	7.5	1	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* F165 / F4165	Single / Double	Non	230	3	7.4	1	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* G165 / G4165	Single / Double	Non	460	3	3.7	1	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
* BA165/BA4165	Single / Double	Non	575	3	3.0	1	60	80 / 87	36 / 39	3 & 5	4 & 5	cCSAus
BE165	Single	Auto	230	1	10.2	1	60	84	38	---	---	cCSAus

PUMP SELECTION

* no molded plug (1) cCSAus approved unit available with 20 Amp plug. (2) CSA approved unit with 15 Amp plug.

Additional cords lengths are available in 25' (8 m), 35' (11 m), and 50' (15 m).

SELECTION GUIDE

1. Integral float operated mechanical switch, no external control required.
2. For automatic use single piggyback variable level float switch or double piggyback variable level float switch. Refer to FM0477.
3. See FM1228 for correct model of simplex control panel.
4. See FM0712 for correct model of duplex control panel.
5. Variable level control switch 10-0743 used as a control activator, specify simplex (3) float or duplex (4) float system. Refer to FM0526.

⚠ CAUTION All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

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Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER PUMP COMPANY

SECTION: 2.50.210
FM0712
0815
Supersedes
1014

MAILTO: P.O. BOX 16347 • Louisville, KY 40256-0347
SHIPTO: 3649 Cane Run Road • Louisville, KY 40211-1961
TEL: (502) 778-2731 • 1 (800) 928-PUMP • **FAX:** (502) 774-3624

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DUPLEX CONTROL PANEL RECOMMENDED APPLICATIONS

PUMP					CONTROL PANEL	
MODEL #	VOLT	PHASE	AMPS	HP	NEMA 1	NEMA 4X
N53	115	1	9.7	0.3	10-1039	10-1041
E53	230	1	4.8	0.3	10-0092	10-1043
N55	115	1	9.7	0.3	10-1039	10-1041
E55	230	1	4.8	0.3	10-0092	10-1043
N57	115	1	9.7	0.3	10-1039	10-1041
E57	230	1	4.8	0.3	10-0092	10-1043
N59	115	1	9.7	0.3	10-1039	10-1041
E59	230	1	4.8	0.3	10-0092	10-1043
N98	115	1	9.4	0.5	10-1039	10-1041
E98	230	1	4.7	0.5	10-0092	10-1043
N137	115	1	10.7	0.5	10-1039	10-1041
E137	230	1	5.8	0.5	10-0092	10-1043
F137	230	3	2.6	0.5	10-1106ε	10-1106
G137	460	3	1.4	0.5	10-1102ε	10-1102
I137	200	1	6.2	0.5	10-1092	10-1043
J137	200	3	2.6	0.5	10-1106ε	10-1106
N139	115	1	10.4	0.5	10-1039	10-1041
E139	230	1	5.8	0.5	10-0092	10-1043
F139	230	3	2.6	0.5	10-1106ε	10-1106
G139	460	3	1.2	0.5	10-1102ε	10-1102
I139	200	1	5.5	0.5	10-0092	10-1043
J139	200	3	2.6	0.5	10-1106ε	10-1106
N140	115	1	12.0	1.0	10-0092	10-1044
E140	230	1	6.0	1.0	10-0092	10-1044
N145	115	1	13.0	0.75	10-1039	10-1041
N151	115	1	6.0	0.3	10-0092	10-1043
E151	230	1	3.2	0.3	10-0092	10-1043
N152	115	1	8.5	0.4	10-1039	10-1041
E152	230	1	4.3	0.4	10-0092	10-1043
N153	115	1	10.5	0.5	10-1039	10-1041
E153	230	1	5.3	0.5	10-0092	10-1043
N161	115	1	15.5	0.5	10-1040	10-1042
E161	230	1	7.5	0.5	10-0092	10-1044
F161	230	3	5.2	0.5	10-1106ε	10-1108
I161	200	1	8.8	0.5	10-0092	10-1044
J161	200	3	6.4	0.5	10-1110ε	10-1110
G161	460	3	2.9	0.5	10-1106ε	10-1106
BA161	575	3	2.4	0.5	10-1154ε	10-1154
N163	115	1	15.0	0.5	10-1040	10-1042
E163	230	1	7.5	0.5	10-0092	10-1044
F163	230	3	4.8	0.5	10-1108ε	10-1108
I163	200	1	8.5	0.5	10-0092	10-1044
J163	200	3	6.0	0.5	10-1110ε	10-1110
G163	460	3	2.9	0.5	10-1106ε	10-1106
BA163	575	3	2.4	0.5	10-1154ε	10-1154
E165	230	1	10.2	1.0	10-0092	10-1044
F165	230	3	7.4	1.0	10-1110ε	10-1110
I165	200	1	12.6	1.0	10-0092	10-1044
J165	200	3	7.5	1.0	10-1110ε	10-1110
G165	460	3	3.7	1.0	10-1106ε	10-1106
BA165	575	3	3.0	1.0	10-1156ε	10-1156
E185	230	1	9.8	1.0	10-0092	10-1044
F185	230	3	7.4	1.0	10-1110ε	10-1110
I185	200	1	11.5	1.0	10-0092	10-1044
J185	200	3	7.5	1.0	10-1110ε	10-1110
G185	460	3	3.7	1.0	10-1106ε	10-1106
BA185	575	3	3.3	1.0	10-1156ε	10-1156
E186	230	1	13.7	1.5	10-0092	10-1044
F186	230	3	9.2	1.5	10-1110ε	10-1110
I186	200	1	17.2	1.5	10-0092	10-1045
J186	200	3	10.3	1.5	10-1111ε	10-1111
G186	460	3	4.6	1.5	10-1108ε	10-1108
BA186	575	3	3.6	1.5	10-1108ε	10-1108

PUMP					CONTROL PANEL	
MODEL #	VOLT	PHASE	AMPS	HP	NEMA 1	NEMA 4X
E188	230	1	14.0	1.5	10-0092	10-1044
F188	230	3	8.9	1.5	10-1110ε	10-1110
I188	200	1	16.8	1.5	10-0092	10-1045
J188	200	3	10.3	1.5	10-1111ε	10-1111
G188	460	3	4.6	1.5	10-1108ε	10-1108
BA188	575	3	3.5	1.5	10-1156ε	10-1156
E189	230	1	17.1	2.0	10-0092	10-1045
F189	230	3	11.2	2.0	10-1111ε	10-1111
I189	200	1	20.5	2.0	10-0092	10-1046
J189	200	3	13.2	2.0	10-1112ε	10-1112
G189	460	3	6.0	2.0	10-1110ε	10-1110
BA189	575	3	5.8	2.0	10-1158ε	10-1158
E191	230	1	14.5	1.5	10-0092	10-1044
N264	115	1	9.4	0.4	10-1039	10-1044
E264	230	1	4.7	0.4	10-0092	10-1043
N266	115	1	10.4	0.5	10-1039	10-1044
E266	230	1	5.5	0.5	10-0092	10-1043
F266	230	3	2.6	0.5	10-1106ε	10-1106
G266	460	3	1.5	0.5	10-1104ε	10-1104
J266	200	3	2.6	0.5	10-1106ε	10-1106
I286	200	1	6.2	0.5	10-0092	10-1043
N267	115	1	10.4	0.5	10-1039	10-1044
E267	230	1	5.5	0.5	10-0092	10-1043
F267	230	3	2.6	0.5	10-1106ε	10-1106
G267	460	3	1.5	0.5	10-1104ε	10-1104
J267	200	3	2.6	0.5	10-1106ε	10-1106
I267	200	1	6.2	0.5	10-0092	10-1043
N268	115	1	10.4	0.5	10-1039	10-1044
E268	230	1	5.5	0.5	10-0092	10-1043
F268	230	3	2.6	0.5	10-1106ε	10-1106
G268	460	3	1.5	0.5	10-1104ε	10-1104
J268	200	3	2.6	0.5	10-1106ε	10-1106
I268	200	1	6.2	0.5	10-0092	10-1043
N270	115	1	15.0	1.0	10-1040	10-1045
E270	230	1	7.5	1.0	10-0092	10-1044
N282	115	1	10.3	0.5	10-1039	10-1044
E282	230	1	5.0	0.5	10-0092	10-1043
F282	230	3	3.0	0.5	10-1106ε	10-1106
I282	200	1	6.1	0.5	10-0092	10-1043
J282	200	3	3.6	0.5	10-1106ε	10-1106
Q282	460	3	1.7	0.5	10-1104ε	10-1104
BA282	575	3	1.4	0.5	10-1152ε	10-1152
E284	230	1	8.9	1.0	10-0092	10-1044
F284	230	3	5.0	1.0	10-1108ε	10-1108
I284	200	1	9.3	1.0	10-0092	10-1044
J284	200	3	5.5	1.0	10-1108ε	10-1108
G284	460	3	2.6	1.0	10-1106ε	10-1106
BA284	575	3	2.2	1.0	10-1154ε	10-1154
N292	115	1	15.0	0.5	10-1040	10-1045
E292	230	1	7.5	0.5	10-0092	10-1044
I292	200	1	8.8	0.5	10-0092	10-1044
F292	230	3	5.2	0.5	10-1108ε	10-1108
J292	200	3	6.4	0.5	10-1110ε	10-1110
G292	460	3	2.9	0.5	10-1106ε	10-1106
BA292	575	3	2.4	0.5	10-1154ε	10-1154
E293	230	1	10.2	1.0	10-0092	10-1044
F293	230	3	7.6	1.0	10-1110ε	10-1110
I293	200	1	12.0	1.0	10-0092	10-1044
J293	200	3	8.2	1.0	10-1110ε	10-1110
G293	460	3	4.0	1.0	10-1108ε	10-1108
BA293	575	3	3.3	1.0	10-1156ε	10-1156

PANEL SELECTION

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DUPLEX EFLFUENT PUMPS, SPECS, AND CONTROL PANEL SELECTION

SCALE N.T.S.

OPERATION & MAINTENANCE:
SEPTIC TANK: THE SEPTIC TANK SHALL BE INSPECTED/PUMPED AT LEAST TWICE EVERY YEAR BY A LICENSED SEPTIC CONTRACTOR FOR THE FIRST TWO YEARS OF OPERATION. PUMPING SCHEDULE MAY BE ADJUSTED AFTER SUCH TIME BASED UPON SITE SPECIFIC CONDITIONS.

PUMPING IS NECESSARY WHEN SOLIDS ARE OBSERVED BETWEEN ONE-THIRD AND ONE-HALF THE HEIGHT OF THE TANK. SEPTIC CONTRACTOR SHALL BE CONTACTED TO INSPECT THE SOLIDS LEVEL AND PUMP SOLIDS. INSPECTOR SHALL NOTE THE FOLLOWING AND RECOMMEND PUMPING WHEN THE THE BOTTOM OF THE SCUM LAYER IS WITHIN 6 INCHES OF THE OUTLET TEE AND/OR WHEN THE TOP OF THE SLUDGE LAYER IS WITHIN 12 INCHES OF THE OUTLET TEE.

DRAIN FIELD: DRAIN FIELD SHALL BE INSPECTED ONCE EVERY 6 MONTHS FOR AT LEAST THE FIRST YEAR OF OPERATION BY A LICENSED SEPTIC CONTRACTOR TO ENSURE IT IS FUNCTIONING ADEQUATELY. THE INSPECTION SCHEDULE CAN BE ADJUSTED BY THE LICENSED CONTRACTOR AFTER THE FIRST YEAR, DEPENDENT UPON SITE SPECIFIC CONDITIONS.

PUMP: PUMP SYSTEM, IF REQUIRED, SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS AND SHALL BE SERVICED AS NEEDED DURING THE LIFE OF THE PUMP. LIBERTY PUMPS ARE DESIGNED WITH A 7-10 YEAR LIFE SPAN, DEPENDENT UPON SITE SPECIFIC CONDITIONS, REPLACE AS NECESSARY (BY A QUALIFIED SEPTIC CONTRACTOR).

*ALL INSPECTION AND PUMPING RECORDS SHALL BE MAINTAINED ON SITE BY THE OWNER.

PUMP CONTROL PANEL ELECTRICAL REQUIREMENTS (EACH TANK AREA):
INSTALLER MUST VERIFY WITH PUMP VENDOR

CONTROLS: (1) EA 15 AMP 115 V DEDICATED CIRCUIT
PUMP 1: (1) EA 20 AMP 115 V DEDICATED CIRCUIT
PUMP 2: (1) EA 20 AMP 115 V DEDICATED CIRCUIT

OPERATIONAL REQUIREMENTS: CONTROL PANEL SHALL OPERATE ON A LEAD-LAG SEQUENCE AND OPERATE ON AN ALTERNATING CYCLE. CONTROL PANEL SHALL BE PROVIDED WITH SHORT CIRCUIT PROTECTION FOR EACH PUMP AND FOR THE CONTROL SYSTEM, INDEPENDENT DISCONNECTS, AUTOMATIC PUMP SEQUENCER, HAND-OFF-AUTOMATIC (H-O-A) SWITCHES, RUN LIGHTS, AND ELAPSED TIME COUNTERS FOR EACH PUMP.

EFFLUENT PUMP NOTES:
1. ELECTRICAL CONNECTIONS FROM ELECTRICAL SUPPLY TO CONTROL PANEL BY OTHERS
2. SEPTIC INSTALLER MUST MAKE ALL CONNECTIONS FROM TANK EQUIPMENT TO CONTROL PANEL.

USDA FOREST SERVICE
United States Department of Agriculture
Forest Service

R-08
Southern Region

STAMPS, LOGOS, AND SEALS

SOUTH CAROLINA — CPR ENGINEERING SOLUTIONS, LLC No. 5170 — CERTIFICATE OF AUTHORIZATION — SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 32006 — 01/30/2025 — CHARLES P. RODGERS

NO.	REVISION/ISSUE	DATE
4		
3		
2		
1	FINAL CDS	01/30/25

PROJECT NAME
BUCK HALL RECREATION AREA RECONSTRUCTION

FRANCIS MARION NATIONAL FOREST

1099 BUCK HALL LANDING RD.,
MCCLELLANVILLE, SC, 29458
Project Issue Date: 01/30/2025
Project Status: Final Construction Documents
Task Order Number: 12445222F0051

PREPARED BY:
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WEBSITE: www.theJLAgroup.com

DRAWING TITLE
ONSITE WASTEWATER EFFLUENT PUMP SPECIFICATIONS

DATE 01/30/2025	ARCHIVE NUMBER
DESIGNER TCB	DRAWING SHEET NO. OSWW7
DRAWN JCR	
CHECKED CPR	
PROJECT NO. 3094.2201	SHEET 116 OF 138