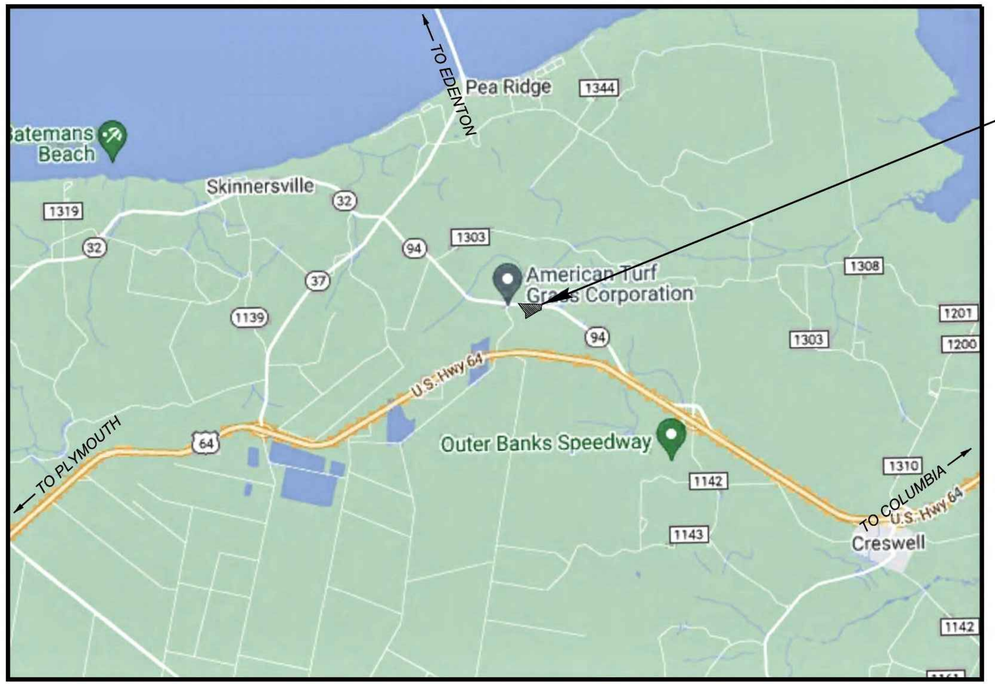
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

WASHINGTON COUNTY
CRESWELL MAINTENANCE YARD

ON SITE SEPTIC SYSTEM REPAIRS
CONSTRUCTION DOCUMENTS



PROJECT SITE

CIVIL ENGINEER
VAUGHN & MELTON
1318–F PATTON AVE.
ASHEVILLE, NC 28806
828–253–2796

INDEX OF SHEETS

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CIVIL

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ELECTRICAL

E1.0 ELECTRICAL SITE LAYOUT PLAN
E2.0 ELECTRICAL DETAILS

THE PROJECT CONSISTS OF REPAIRS TO THE EXISTING ON-SITE WASTE WATER SYSTEM SERVING THE WASHINGTON COUNTY DOT MAINTENANCE YARD. A NEW SEPTIC TANK, PUMP TANK, FORCE MAINS AND A NEW LOW PRESSURE PIPE DRAINFIELD SYSTEM ARE PROPOSED TO REPLACE THE EXISTING ON SITE DISPOSAL SYSTEM.

REVISIONS

NO.	DATE	DESCRIPTION
1	11/23/21	SURVEY UPDATE
2	11/29/21	PERMIT APPROVAL
3	11/18/22	SCO ELECTRICAL REVIEW COMMENTS
4	01/20/23	SCO 01/04/23 REVIEW COMMENTS
5	04/28/23	DESIGN MODIFICATIONS
6	06/12/23	ADDENDUM 1

NORTH CAROLINA PROFESSIONAL SEAL 052052 ENGINEER BENJAMIN C ANDERSON

NCDOT MAINTENANCE FACILITY
CRESWELL SEPTIC SYSTEM
SCO ID#22-25127-01A
WASHINGTON COUNTY, NORTH CAROLINA

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JMT NO. 22-03774-001

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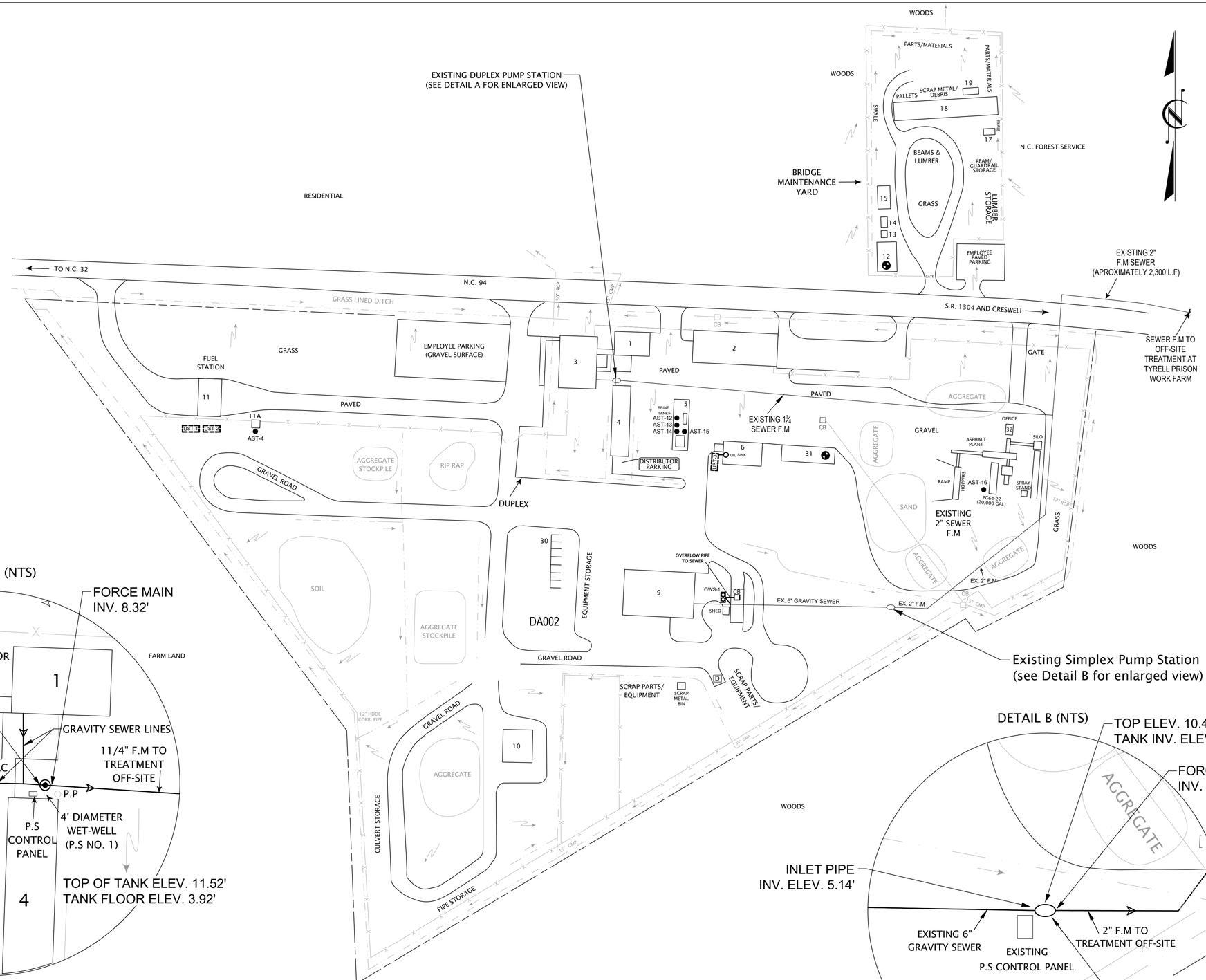
FILE NAME:	CS1.0_Cover Sheet.dwg

DRAWING TITLE:
COVER SHEET

DRAWING NO:
CS-1

LEGEND

- PROPERTY LINE
- FENCE LINE
- STORM DRAINAGE AREA BOUNDARY LINE
- SDO-00X — STORMWATER DISCHARGE OUTFALL
- SURFACE WATER BODY
- STORMWATER DRAINAGE PIPE
- STORMWATER DRAINAGE DITCH
- DI / CB — STORMWATER DRAINAGE INLET/ CATCH BASIN
- SANITARY SEWER LINE
- MH — SANITARY SEWER MANHOLE
- OWS-X — OIL/ WATER SEPARATOR
- FD — FLOOR DRAIN TO SANITARY
- SURFACE FLOW DIRECTION
- AST-X — ABOVEGROUND STORAGE TANK
- UST-X — UNDERGROUND STORAGE TANK
- D — DUMPSTER
- G — GENERATOR
- T — TRANSFORMER
- DRUM STORAGE AREA
- SPILL KIT
- NON-STORMWATER DISCHARGE
- 9 — EQUIPMENT SHOP BUILDING
- 3 — MAIN OFFICE BUILDING
- 1 — OFFICE BUILDING



DETAIL A (NTS)

DETAIL B (NTS)

80 160 320 480
0 16
1" = 80'

1 / C1.0 EXISTING SITE LAYOUT PLAN

4 THE PROJECT SITE IS NOT LOCATED IN A NY SPECIAL FLOOD HAZARD AREA OR FUTURE CONDITIONS FLOOD HAZARD AREAS, AS SHOWN ON FIRM MAP NUMBER 3702774800J FROM SEPTEMBER 19, 2007.

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DRAWING TITLE:	EXISTING SITE LAYOUT PLAN
DRAWING NO:	C1.0

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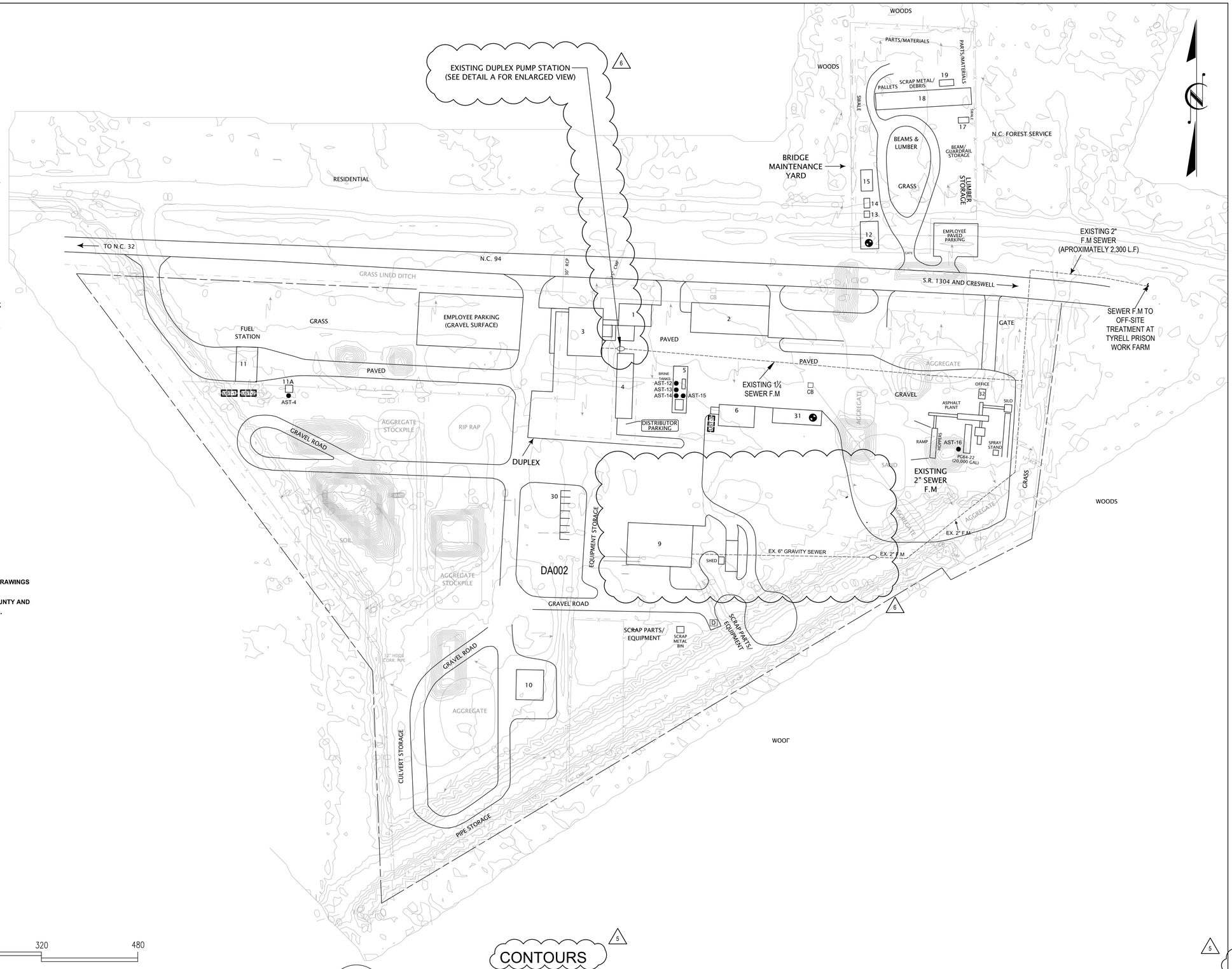
- SPILL KIT
- NON-STORMWATER DISCHARGE
- 9 — EQUIPMENT SHOP BUILDING
- 3 — MAIN OFFICE BUILDING
- 1 — OFFICE BUILDING

NOTE:
THIS SITE PLAN IS A COMPILATION OF DRAWINGS OBTAINED FROM THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION COUNTY AND OTHER AVAILABLE MAPPINGS SOURCES.



0 16 80 160 320 480
1" = 80'

1 / C2.0

CONTOURS
EXISTING SITE LAYOUT PLAN
NOT TO SCALE

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JOB NO:	32120-05
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DRAWING TITLE:	CONTOURS
DRAWING NO:	C2.0

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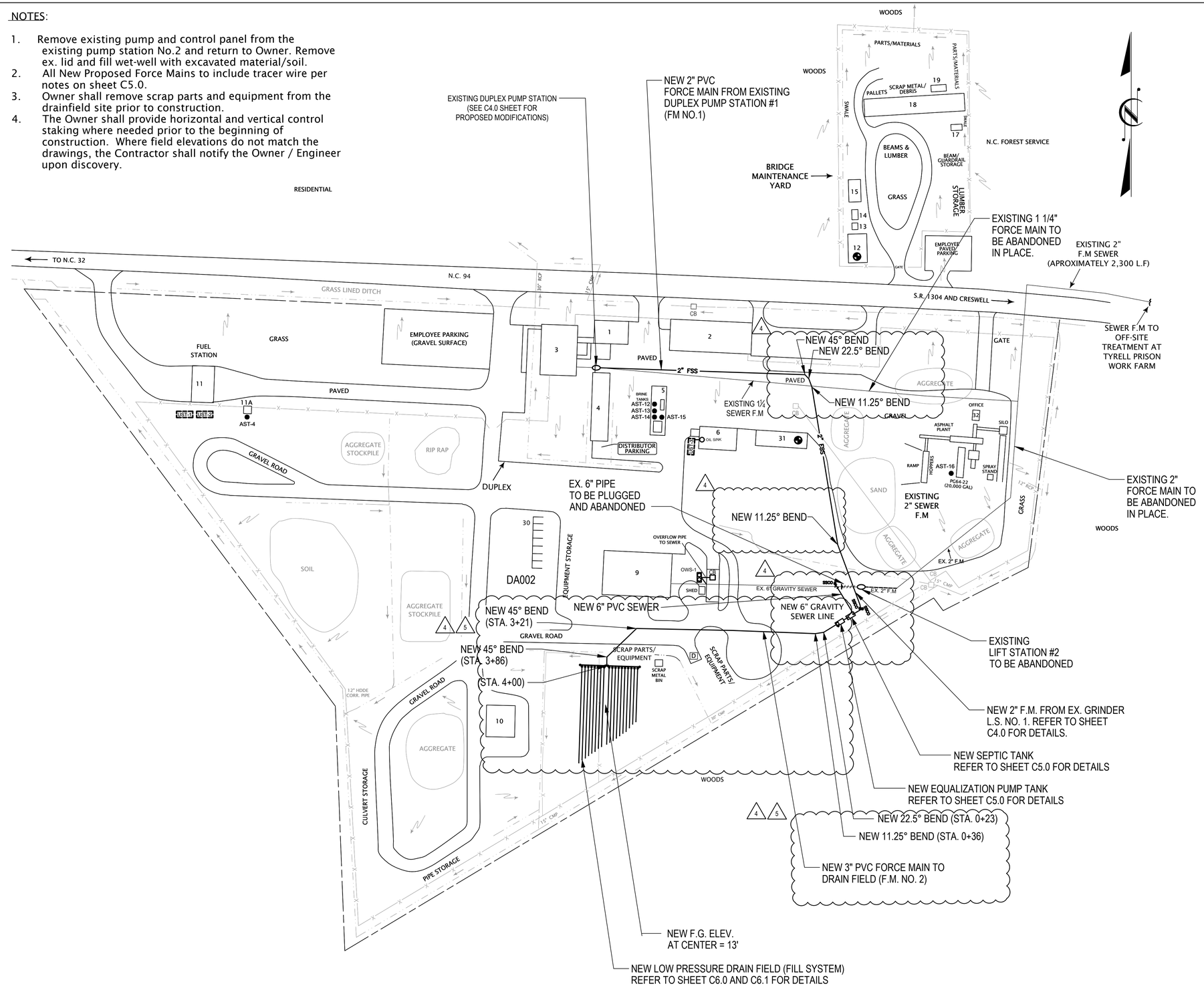
NOTES:

1. Remove existing pump and control panel from the existing pump station No.2 and return to Owner. Remove ex. lid and fill wet-well with excavated material/soil.
2. All New Proposed Force Mains to include tracer wire per notes on sheet C5.0.
3. Owner shall remove scrap parts and equipment from the drainfield site prior to construction.
4. The Owner shall provide horizontal and vertical control staking where needed prior to the beginning of construction. Where field elevations do not match the drawings, the Contractor shall notify the Owner / Engineer upon discovery.



0 16 80 160 320 480

1" = 80'

1 C3.0 PROPOSED SITE LAYOUT PLAN

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FILE NAME:	C3.0 Proposed Site Layout Plan.dwg
DRAWING TITLE:	PROPOSED SITE LAYOUT PLAN
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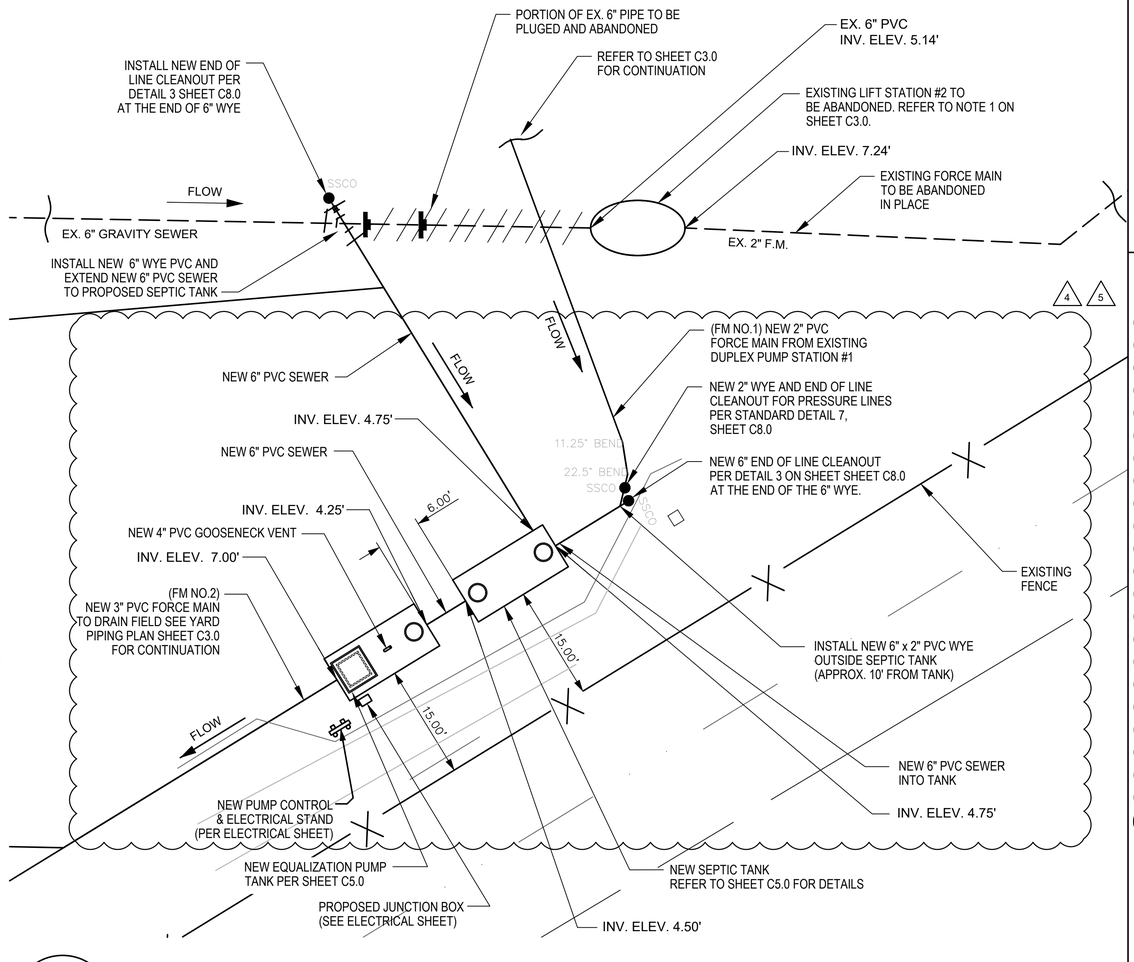
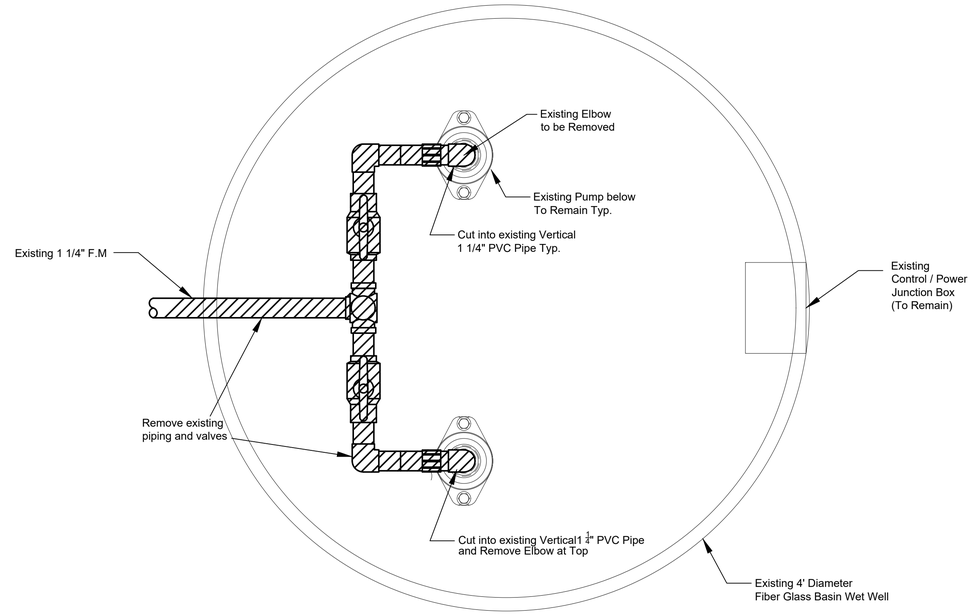


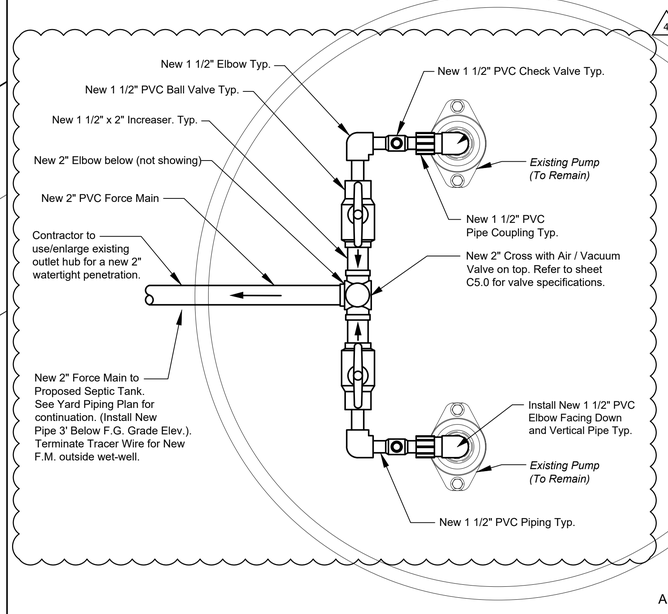
1 / C4.0 PROPOSED SEPTIC AND PUMP TANK LAYOUT PLAN

SCALE:1"=10'



2 / C4.0 MODIFICATIONS TO EX. DUPLEX PUMP STATION NO. 1 PLAN VIEW

NOT TO SCALE

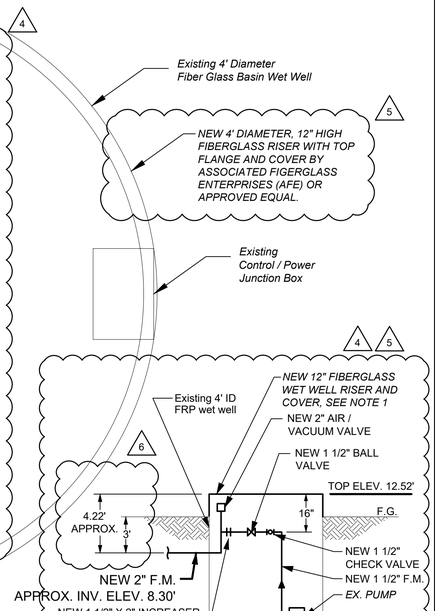


3 / C4.0 PROPOSED PIPING MODIFICATIONS IN EXISTING DUPLEX PUMP STATION NO. 1

NOT TO SCALE

NOTES:

1. FIBERGLASS RISER INSTALLATION REQUIRES 1/8" FIBERGLASS AND RESIN ON THE INSIDE AND OUTSIDE OF WET WELL AT THE TRANSITION. CONTRACTOR SHALL INSTALL FIBERGLASS RISER IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.



PUMP ELEVATION DETAIL TYP. OF 2

NOT TO SCALE

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JOB NO:	32120-05
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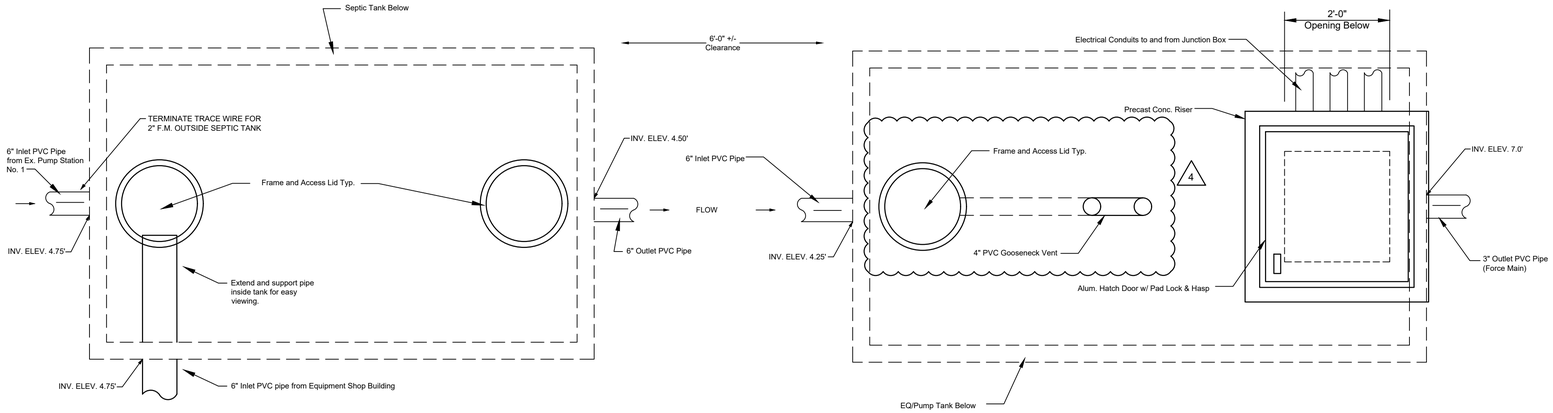
DATE:	OCTOBER 2021
FILE NAME:	C4.0_Pump Station.dwg

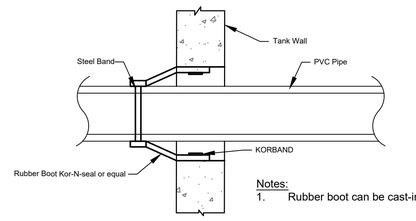
DRAWING TITLE:
PROPOSED SEPTIC AND PUMP TANK LAYOUT PLAN

DRAWING NO:
C4.0



1 C5.0 SEPTIC TANK - PLAN

NOT TO SCALE



Notes:
1. Rubber boot can be cast-in-place or inserted.

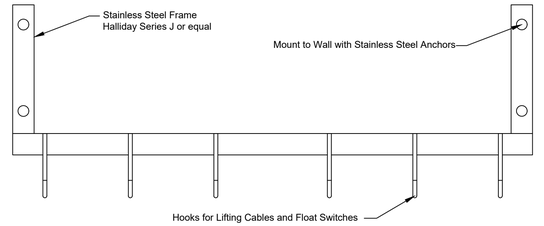
7 C5.0 TANK PIPE PENETRATION DETAIL

(TYP. AT ALL WALL PENETRATIONS)
NOT TO SCALE

2 C5.0 EQUALIZATION/PUMP TANK - PLAN

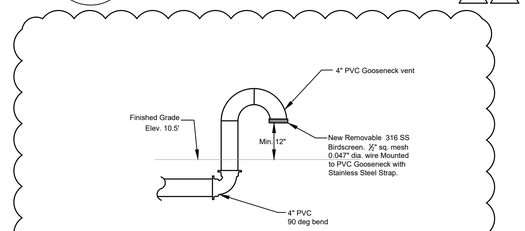
NOT TO SCALE

Notes:
1. Pre-cast tanks by Shoaf Precast Septic Inc. or equal. Tanks shall be traffic rated.
2. Access frames and lids shall be cast iron Neenah model R-5900-E or approved equal.
3. Float assemblies at the septic and pump tanks shall include floats, float stem, float collar and stainless steel hardware as manufactured by Orenco, Model MF or approved equal.
4. Contractor to install trace wire on new force main for future access and use. Trace wire shall be per #12 AWG HS-CCS high strength copper clad steel conductor, insulated with 30 mil of green HMWPE. Install wire a maximum of 2 feet from finished grade. Terminate trace wire on a rebar outside the proposed structures using Stainless Steel hardware.



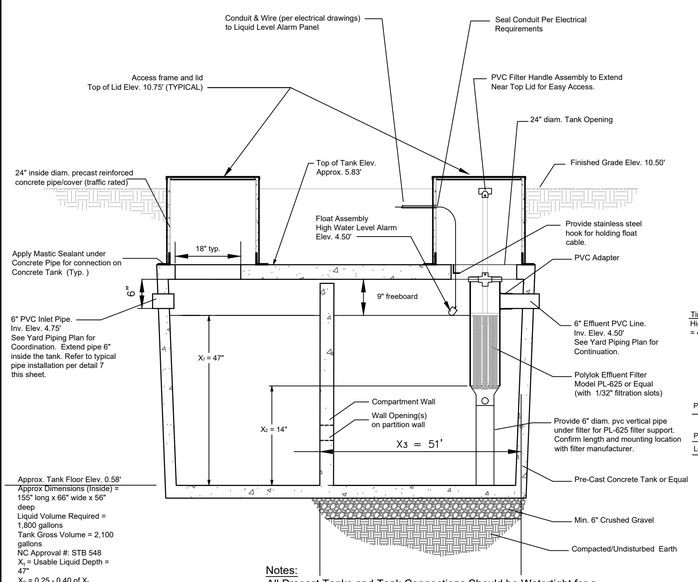
3 C5.0 CABLE HOLDER DETAIL

NOT TO SCALE



8 C5.0 GOOSENECK VENT PIPE DETAIL

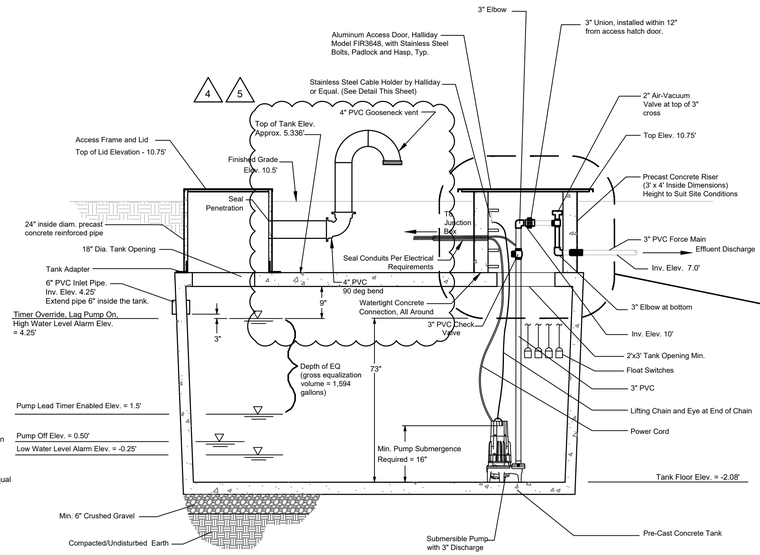
NOT TO SCALE



Notes:
All Precast Tanks and Tank Connections Should be Watertight for a Period of 24 Hours, and Meet State Approval 1ww 2004-01 Requirements

4 C5.0 SEPTIC TANK - SECTION

NOT TO SCALE

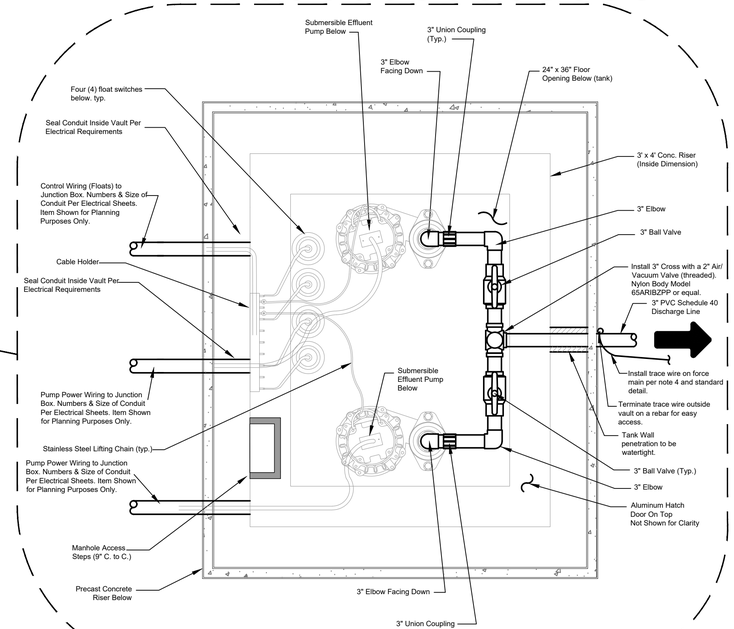


Approx. Dimensions (Inside) = 66" wide x 155" length x 82" deep
Minimum Liquid Volume Required = 2,200 gallons
Tank Gross Volume = 3,600 gallons
NC Approval #: PT-498

Dosing Regimen:
Pump ON: 5 minutes
Pump Flow Rate: 30 gpm
Pumps OFF: 6 hours
Repeat Above Cycle 7 Times Per Day

5 C5.0 EQUALIZATION/PUMP TANK - SECTION

NOT TO SCALE



6 C5.0 PUMP VAULT DETAIL - PLAN VIEW

NOT TO SCALE

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PROPOSED SEPTIC AND PUMP TANK DETAILS

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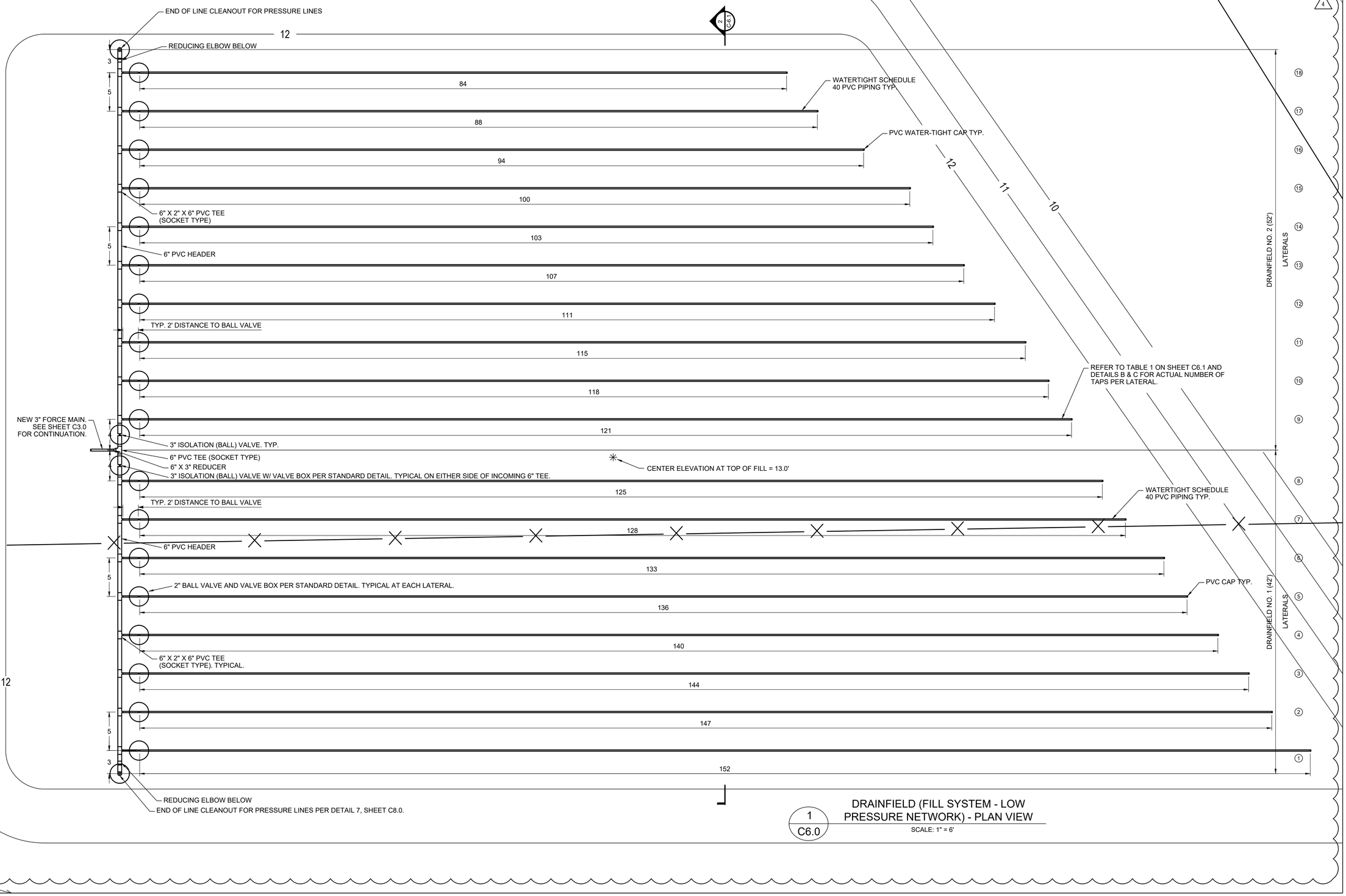

1 C6.0 DRAINFIELD (FILL SYSTEM - LOW PRESSURE NETWORK) - PLAN VIEW

SCALE: 1" = 6'

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DRAWING TITLE: PROPOSED DRAINFIELD PLAN VIEW

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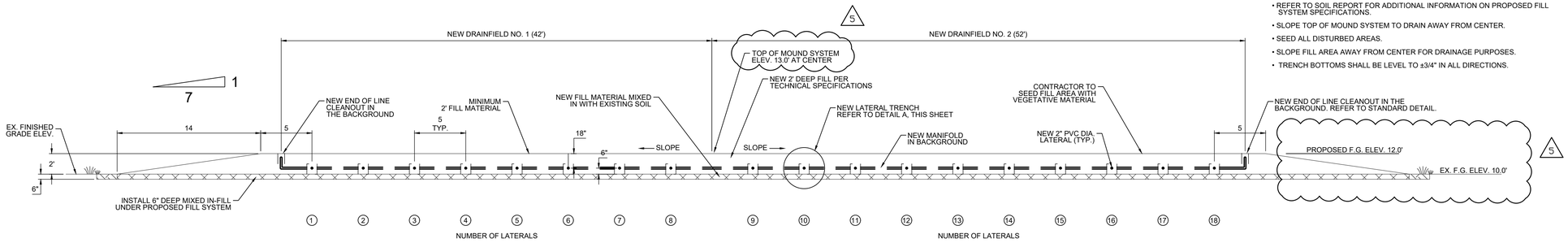


1 / C6.1 — DRAINFIELD (FILL SYSTEM) CROSS SECTION VIEW

SCALE: 1" = 6'

NOTES:

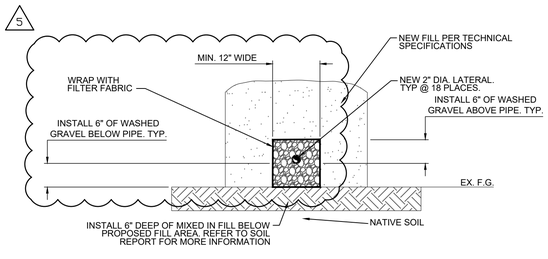
- FILL MATERIAL TO BE FREE OF VEGETATIVE COVER OR ORGANIC LITTER.
- FILL MATERIAL SHALL BE CLASSIFIED AS SAND OR LOAMY SAND (SOIL GROUP I) UP TO THE TOP OF THE NITRIFICATION TRENCH. THE LAST SIX INCHES OF FILL SHALL HAVE A FINER TEXTURE (SUCH AS GROUP II, III) FOR ESTABLISHING A VEGETATIVE COVER.
- REFER TO SOIL REPORT FOR ADDITIONAL INFORMATION ON PROPOSED FILL SYSTEM SPECIFICATIONS.
- SLOPE TOP OF MOUND SYSTEM TO DRAIN AWAY FROM CENTER.
- SEED ALL DISTURBED AREAS.
- SLOPE FILL AREA AWAY FROM CENTER FOR DRAINAGE PURPOSES.
- TRENCH BOTTOMS SHALL BE LEVEL TO ±3/4" IN ALL DIRECTIONS.

OPERATIONAL NOTES:

1. ONE DRAIN FIELD WILL BE OPERATED AT A TIME. THE OTHER DRAIN FIELD WILL BE PLACED OFF-LINE BY CLOSING THE ISOLATION VALVE NEXT TO THE 6" TEE AT THE MANIFOLD.
2. SYSTEM OPERATOR WILL ALTERNATE USE OF THE DRAIN FIELDS APPROXIMATELY EVERY SIX MONTHS.
3. BALL VALVE AT THE BEGINNING OF EACH LATERAL SHALL BE USED TO ADJUST FLOW / HEAD TO EACH LATERAL DURING SYSTEM INSTALLATION / INSPECTION. DO NOT COVER DRAINFIELD PIPING UNTIL SYSTEM IS INSPECTED AND APPROVED BY LHD.

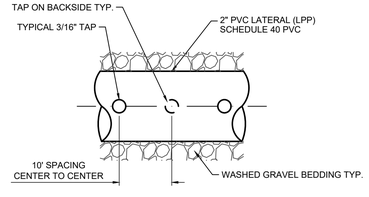
TABLE 1 - TAP SPACING AND FLOW INFORMATION PER DRAINFIELD

		ASSUME TAP DIAMETER = 3/16	FLOW PER TAP = 0.646 gpm		ASSUME TAP SPACING, FT = 10	
	FIELD LINE	LENGTH OF LATERAL	DISTANCE TO FIRST TAP	NUMBER OF TAPS PER LATERAL	FLOW PER LATERAL	
DRAINFIELD NO. 1	1	152	2	15	9.69	
	2	147	2	14	9.044	
	3	144	2	14	9.044	
	4	140	2	13	8.398	
	5	136	2	13	8.1396	
	6	133	2	13	9.398	
	7	128	2	12	7.6228	TOTAL FLOW = 68.7654
	8	125	2	12	7.429	
DRAINFIELD NO. 2	9	121	2	11	7.106	
	10	118	2	11	6.9768	
	11	115	2	11	6.783	
	12	111	2	10	6.5246	
	13	107	2	10	6.2662	
	14	103	2	10	6.46	
	15	100	2	9	5.814	
	16	94	2	9	5.814	
	17	88	2	8	5.0388	TOTAL FLOW = 61.9514
	18	84	2	8	5.168	



2 / C6.1 — DETAIL "A" - LATERAL TRENCH TYP.

NOT TO SCALE



3 / C6.1 — DETAIL "B" - LATERAL TAPS - ELEVATION

NOT TO SCALE

4 / C6.1 — DETAIL "C" - LATERAL TAPS - PLAN VIEW - TYPICAL

NOT TO SCALE

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6	06/12/23	ADDENDUM 1

NORTH CAROLINA PROFESSIONAL SEAL 052052 ENGINEER BENJAMIN C. ANDERSON

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DRAWN:	HEW
CHECKED:	DH
JOB NO:	32120-05
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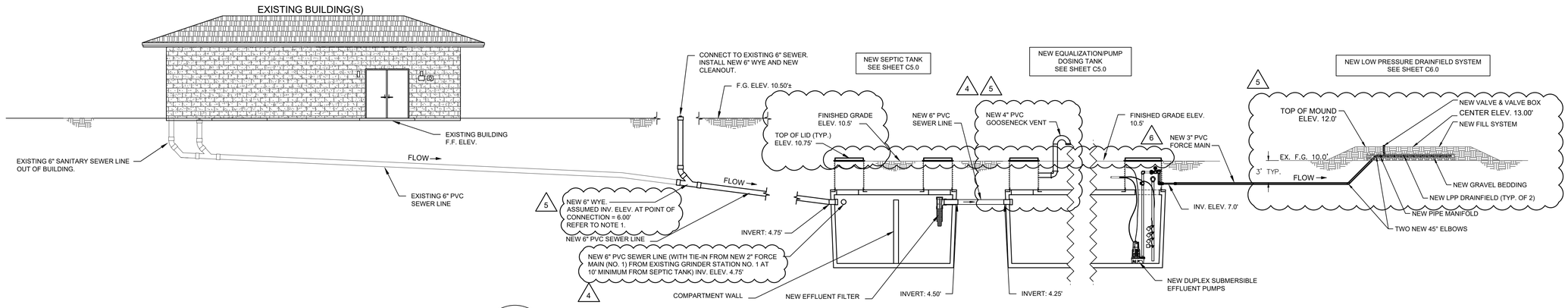
DATE:	OCTOBER 2021
FILE NAME:	C6.1 Proposed Drainfield Section & Details.dwg

DRAWING TITLE: PROPOSED DRAINFIELD SECTION & DETAILS

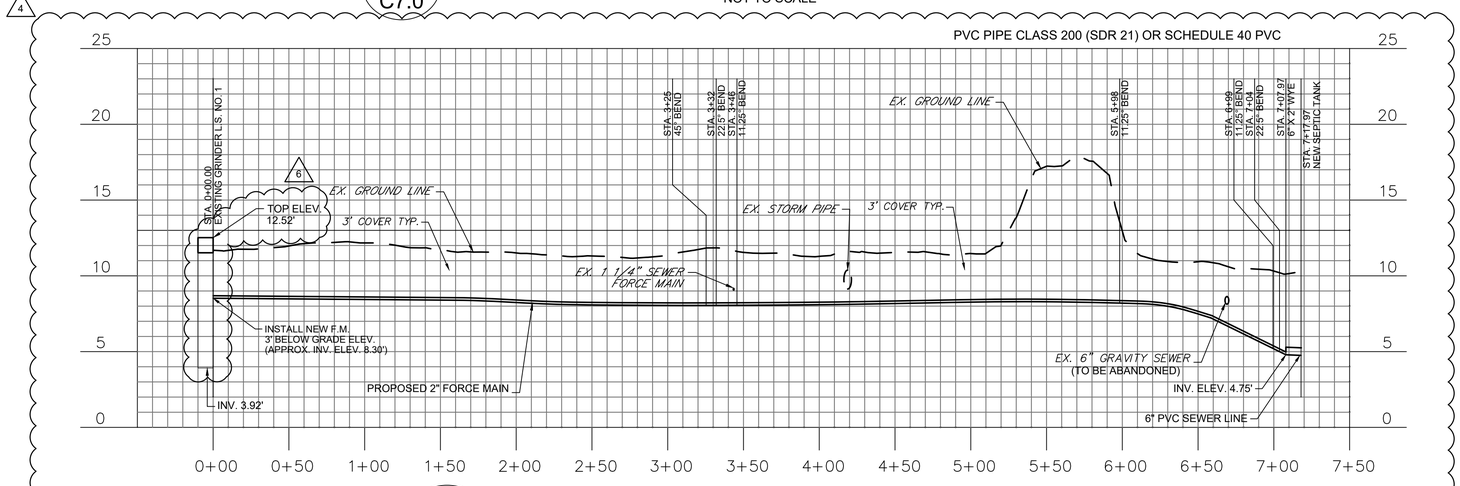
DRAWING NO: C6.1



1 C7.0

NEW SEPTIC AND PUMP TANK SYSTEM SCHEMATIC

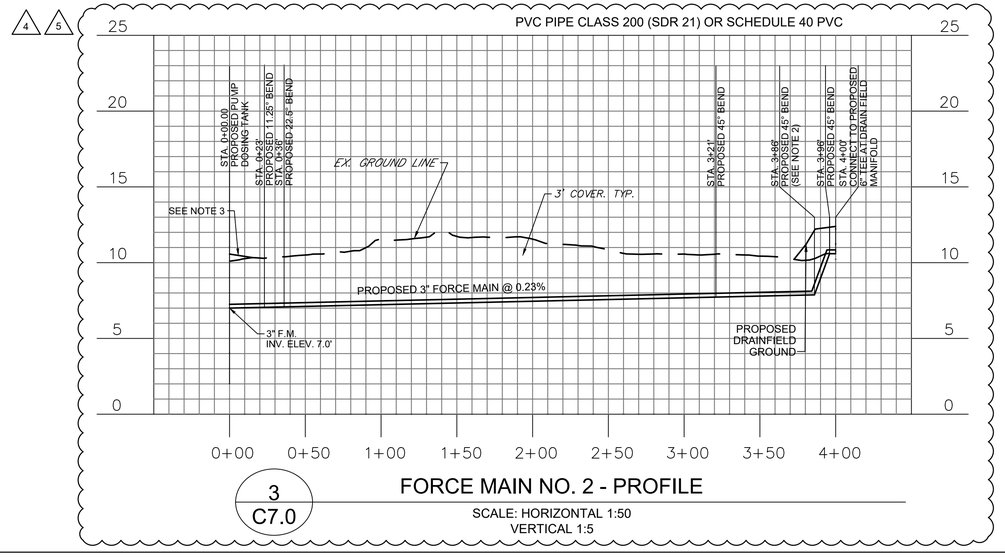
NOT TO SCALE



2 C7.0

FORCE MAIN NO. 1 - PROFILE

SCALE: HORIZONTAL 1:50
VERTICAL 1:5



3 C7.0

FORCE MAIN NO. 2 - PROFILE

SCALE: HORIZONTAL 1:50
VERTICAL 1:5

5

NOTES:
1. IF INVERT ELEVATION OF EXISTING 6" GRAVITY LINE IS DIFFERENT THAN WHAT IS NOTED ON THE DRAWINGS, PLEASE NOTIFY ENGINEER. CONTRACTOR TO FIELD VERIFY EXISTING INVERT ELEVATION PRIOR TO SHOP DRAWING SUBMITTALS.
2. ROTATE 45° BEND AS NEEDED.
3. GRADE AWAY FROM PUMP AND SEPTIC TANKS.

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JOB NO:	32120-05
SCALE:	AS SHOWN
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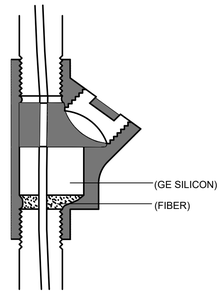
FILE NAME:	C7.0 Proposed Force Main No. 1 and No.2 Profiles.dwg

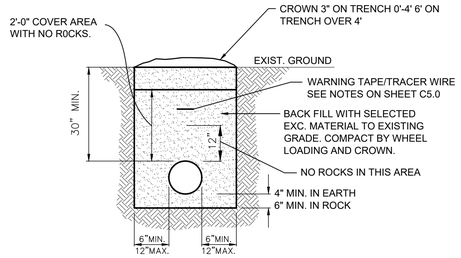
DRAWING TITLE:
PROPOSED FORCE MAIN NO. 1 & NO.2 PROFILES

DRAWING NO:
C7.0



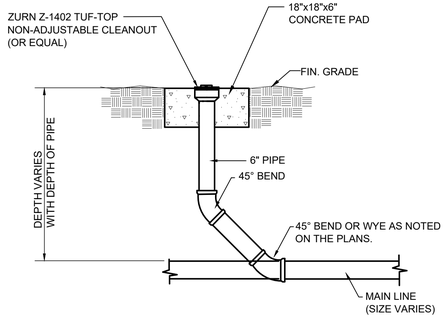
1 C8.0 CONDUIT SEAL DETAIL

NOT TO SCALE



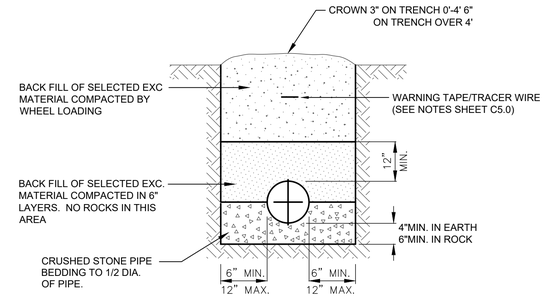
2 C8.0 TYPICAL FORCE MAIN TRENCH

NOT TO SCALE



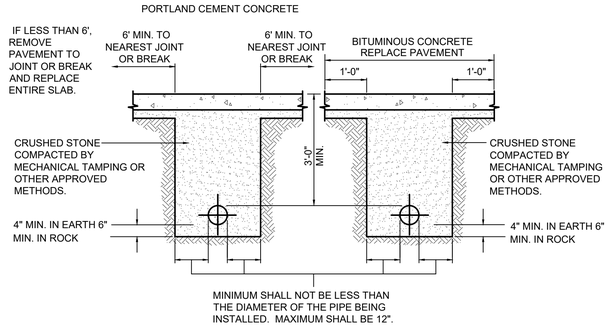
3 C8.0 CLEANOUT FOR GRAVITY LINES

NOT TO SCALE



4 C8.0 GRAVITY SEWER PIPE TRENCH

NOT TO SCALE

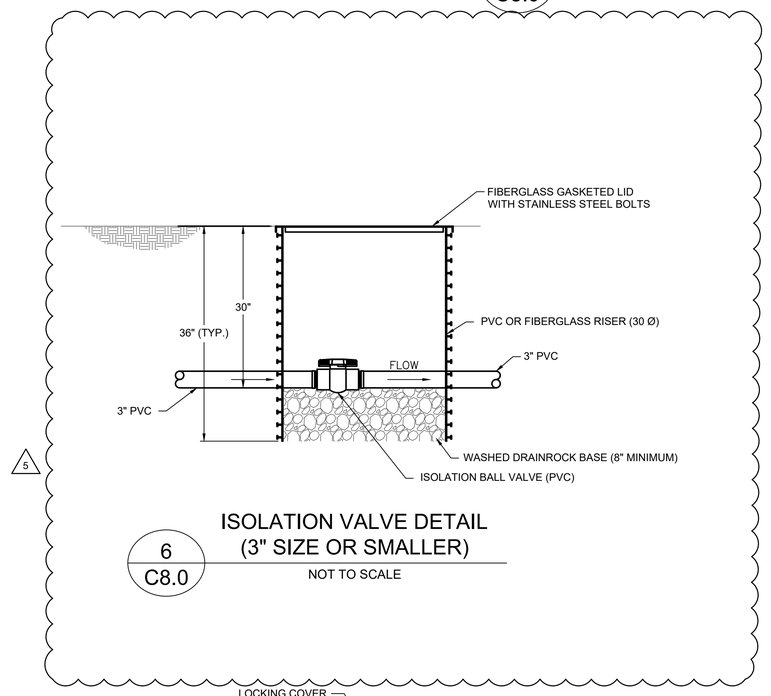


NOTES:

REPLACEMENT PAVEMENT SHALL BE A MINIMUM THICKNESS OF 2" OR SHALL BE THE SAME THICKNESS OF THE EXISTING PAVEMENT WHICHEVER IS GREATEST. PAVEMENT JOINTS SHALL BE SAWED OR OTHERWISE CUT IN NEAT VERTICAL LINES, REPLACEMENT PAVEMENT SHALL BE "HOT MIX" OF THE TYPE DIRECTED BY THE ENGINEER. TRENCHES WITHIN STATE R.O.W. SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE SECTIONS OF N.C. D.O.T. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

5 C8.0 METHODS OF PAVEMENT RESTORATION

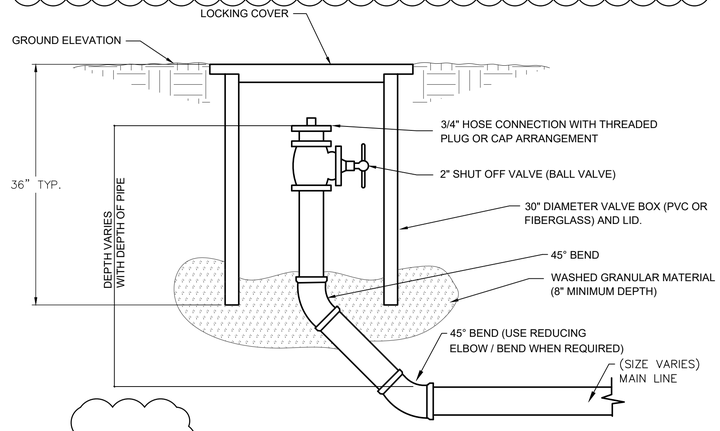
NOT TO SCALE



5

6 C8.0 ISOLATION VALVE DETAIL (3" SIZE OR SMALLER)

NOT TO SCALE



5

7 C8.0 CLEANOUT DETAIL FOR PRESSURE LINES

NOT TO SCALE

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JOB NO:	32120-05
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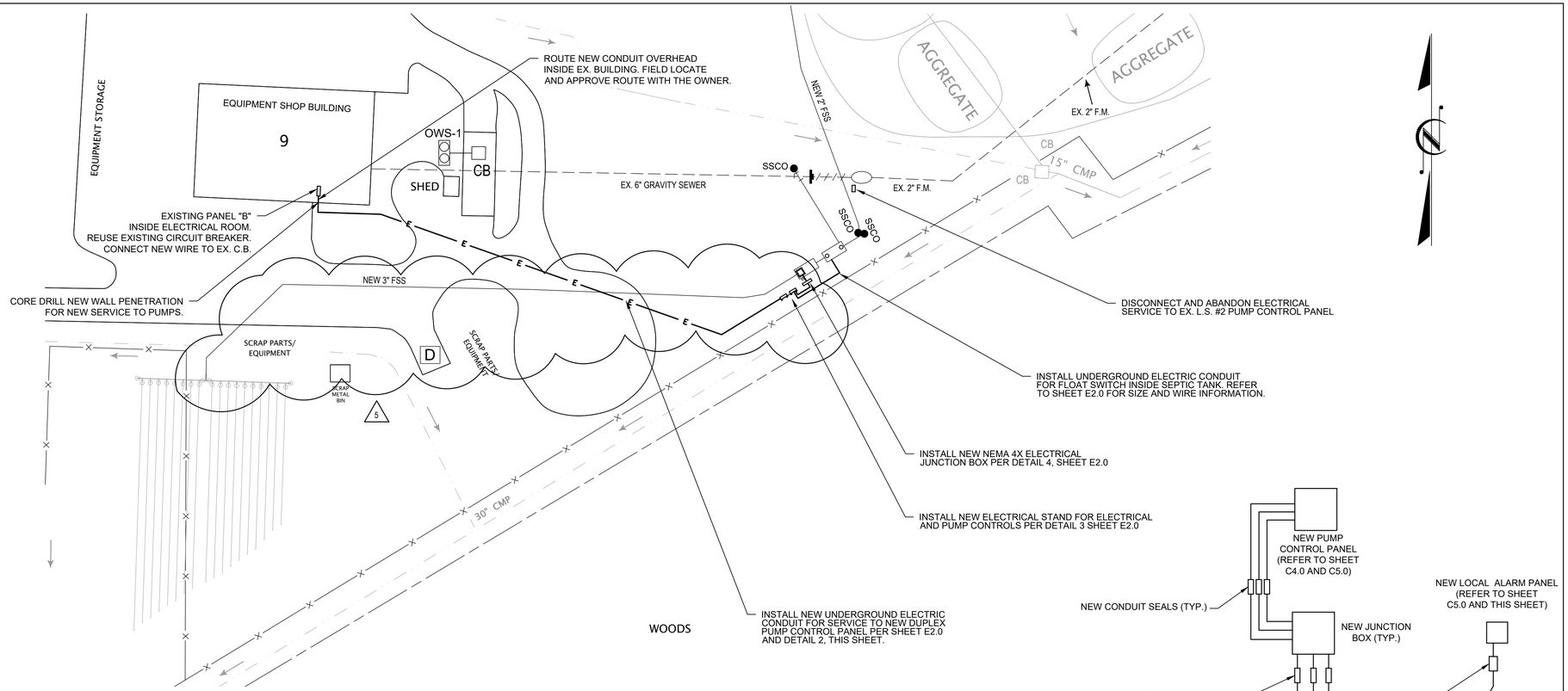
FILE NAME:	C8.0_Const Details.dwg

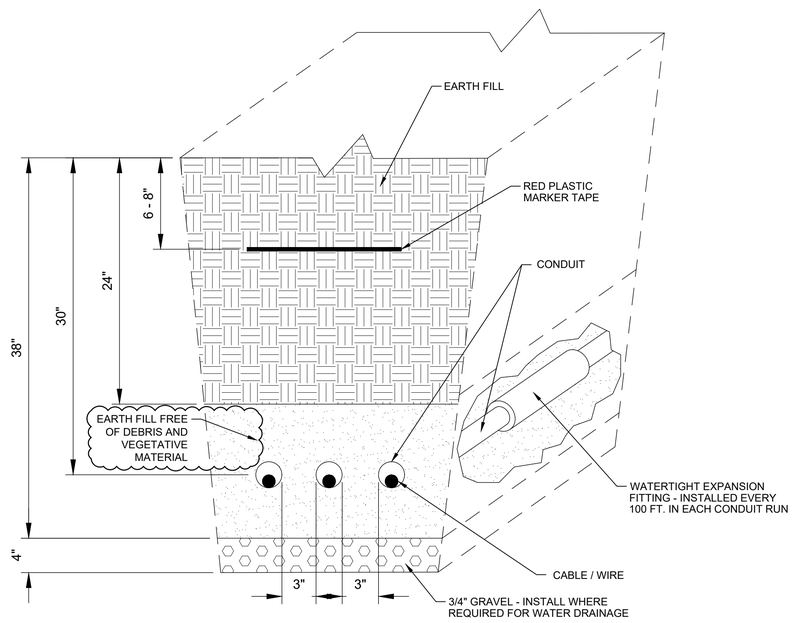
DRAWING TITLE: CONSTRUCTION DETAILS

DRAWING NO: C8.0



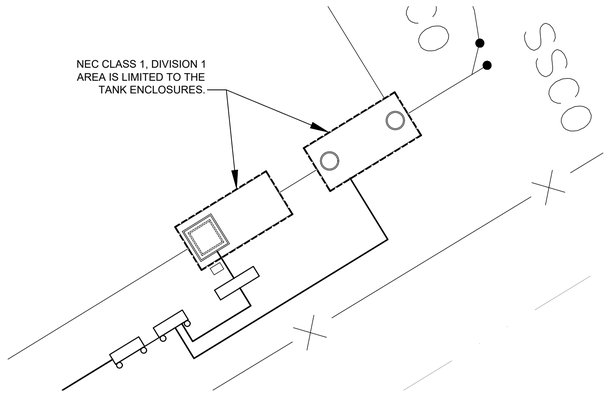
1 E1.0 ELECTRICAL SITE LAYOUT PLAN

SCALE: 1" = 40'



2 E1.0 INSTALLATION OF UNDER-GROUND CONDUITS - TYPICAL

SCALE: NOT TO SCALE



3 E1.0 NEC 500.4 AREA CLASSIFICATION PLAN

SCALE: 1" = 10'

4 E1.0 NEW SEPTIC SYSTEM CONTROL SCHEMATIC

NOT TO SCALE

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NORTH CAROLINA PROFESSIONAL SEAL 033014 ENGINEER DAVID HARTMAN

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JOB NO:	32120-05
SCALE:	AS SHOWN
DATE:	OCTOBER 2021
FILE NAME:	E1.0_Elec Site Plan.dwg

DRAWING TITLE:

ELECTRICAL SITE LAYOUT PLAN

DRAWING NO:

E1.0

PUMP DATA

GPM 20 AT 45 FT HEAD
GPM 60 AT 37 FT HEAD
GPM 100 AT 25 FT HEAD
RPM 3500 .

TYPE EFFLUENT
CASING CAST IRON
HP 1
VOLTS 208 PHASE: 3
AMPS 15 (START) , 6.0 (RUN)
SERVICE FACTOR: 1.0
MANUFACTURER: MYER MODEL WHRIOH OR EQUAL

ELECTRICAL NOTES

1) All Control Panels shall be Deadfront type construction.
2) Panel Wiring Shall be NEMA Type C wiring for controls with direct cable connection to the motor controller.
3) Thermal Overload relay shall be melting alloy type sized per nameplate rating of the motor.
4) Control Voltage shall be 120 volts.
5) Provide GFI receptacle at pump control panel. Provide cast aluminum in-use coverplate, Hubbell or equal.
6) All wiring inside control panel type THHN (90°C) or equal, unless noted otherwise. All other wire shall be THHN-2 or XHHW-2.
7) All outdoor Electrical Enclosures shall be NEMA 4X Stainless Steel with Stainless Steel hasp for padlocking.
8) Refer to Site Plan for actual orientation of Conduit Runs.
9) Provide ALS (across the line starter) with each Pump.

PUMP CONTROL PANEL

MAIN BRK.	50 amp 3 phase
Motor BRK. Breaker (each)	20 amp 3 phase
Motor Controller NEMA size (TYP.)	20 amp
Motor Size Actual Hp.	1 HP
Design Hp.	1 HP
Thermal OL type	Melting alloy
size	Per nameplate rating
120 volt outlet NEMA 5-15R	Power from Service. same
Junction Box	
Conduit	¾", 1", 1.5"
Seals	¾", 1", 1.5"
Control wire Type	#12/2 SJO
Pump power cord Type	3-#10 SOOW
Seal Failure	3-#12
Thermal overload	3-#12

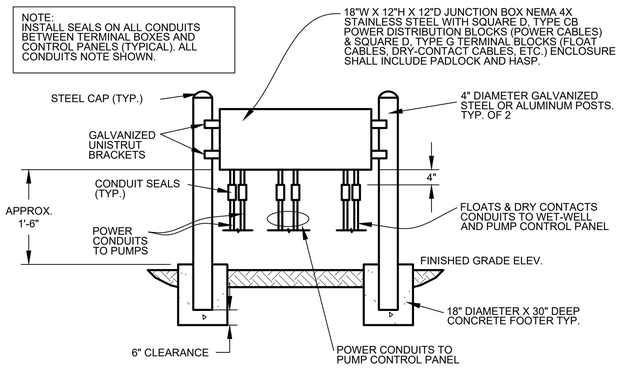
N/A - Not Applicable N/R - Not Required

FEEDER & BRANCH CIRCUIT SCHEDULE

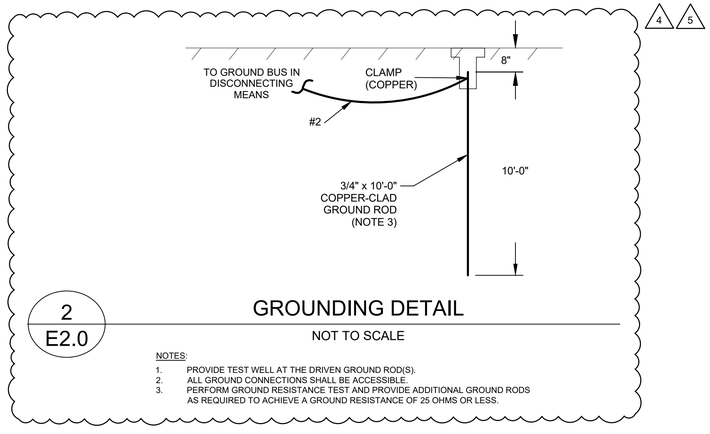
MARK	AMPERE	CONDUCTORS	CONDUIT SIZE*	NOTE
1	50	4 - #6 AWG - 1- #10G	2" RMC	
2	25	4 - #10 AWG AND 1- #10G		
3	20	CONTROL WIRING FOR LEVEL SWITCHES #12/2 SJO CORD	2" PVC	
4	20	120 VOLT 1 PHASE 3 - #12	3/4" PVC	
5	20	PUMP LEADS - #10 WITH #10 EGC	1 1/2" PVC	PER PUMP
6	20	PUMP LEADS - SOOW CORD WITH #10 EGC	1 1/2" PVC	
7	50	4 - #4 AWG AND 1 - #8G	2" PVC	
8	50	4 - #6 AWG AND 1- #10G		
9	20	CONTROL WIRING FOR LEVEL SWITCHES 2 - #12	3/4" PVC	
10	20	CONTROL WIRING FOR LEVEL SWITCHES AND DRY CONTACTS 14 - #12	2" PVC	

*NOTE 1 THIS SHEET SHALL APPLY TO ALL ELECTRICAL CONDUIT INSTALLATIONS.

NOTE:
INSTALL SEALS ON ALL CONDUITS BETWEEN TERMINAL BOXES AND CONTROL PANELS (TYPICAL). ALL CONDUITS NOTE SHOWN.

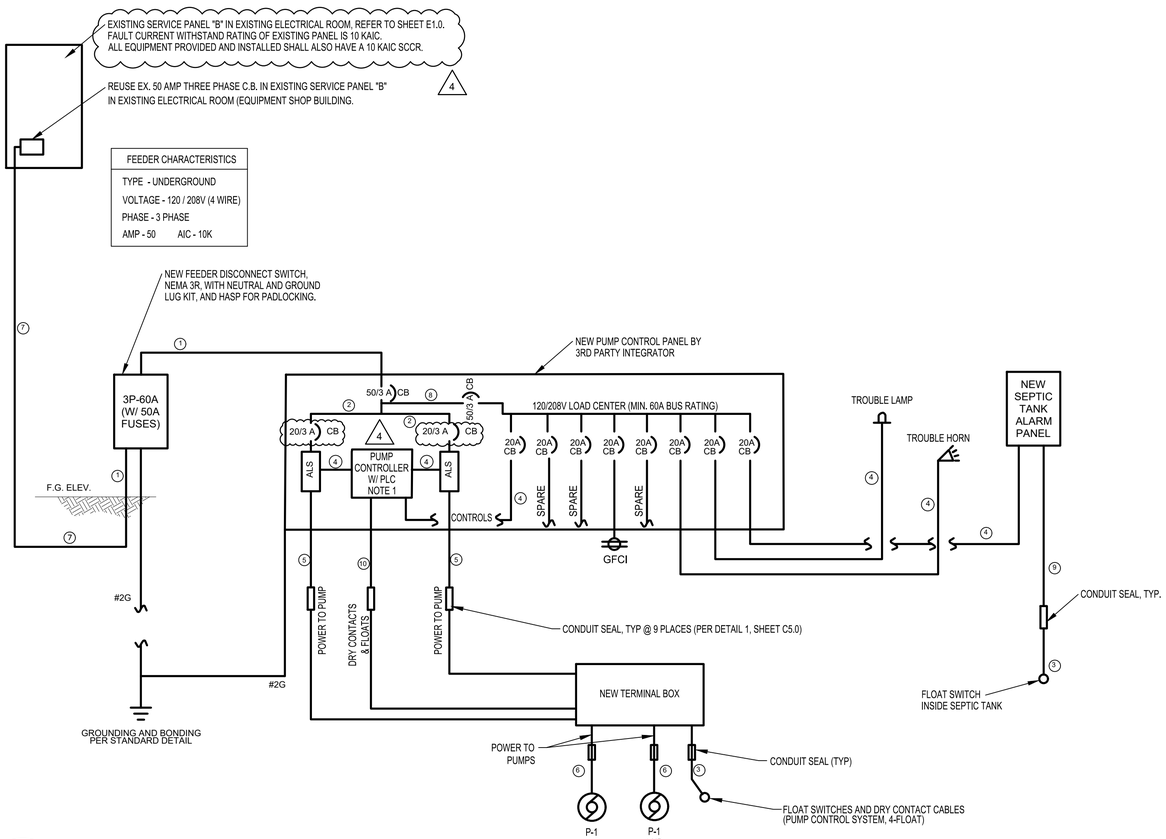


4 E2.0 JUNCTION BOX DETAIL
NOT TO SCALE



2 E2.0 GROUNDING DETAIL
NOT TO SCALE

NOTES:
1. PROVIDE TEST WELL AT THE DRIVEN GROUND ROD(S).
2. ALL GROUND CONNECTIONS SHALL BE ACCESSIBLE.
3. PERFORM GROUND RESISTANCE TEST AND PROVIDE ADDITIONAL GROUND RODS AS REQUIRED TO ACHIEVE A GROUND RESISTANCE OF 25 OHMS OR LESS.

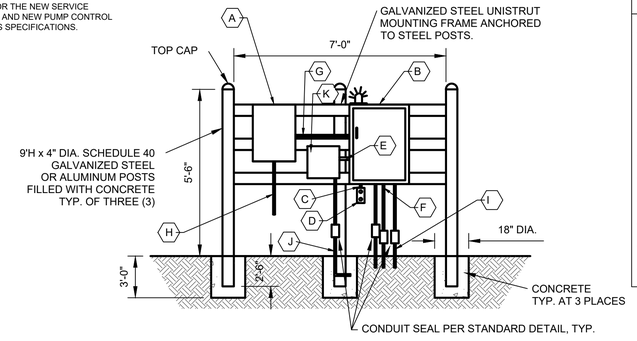


1 E2.0 SINGLE LINE DIAGRAM
NOT TO SCALE

NOTE:
1. PLC CONTROLLER SHALL HAVE BATTERY BACKUP INTEGRAL TO CONTROLLER CABINET. CONTRACTOR TO INSTRUCT OWNER ON BATTERY TESTING AND REPLACEMENT REQUIREMENTS.

NOTES:

1. INSTALL RMC CONDUIT IN EXPOSED AREAS AND FOR ALL UNDERGROUND ELBOWS THAT TRANSITION TO PVC. USE PVC CONDUIT BELOW GROUND AND INSIDE PRE-CAST TANKS.
2. SEAL GAS-TIGHT ALL ELECTRICAL CONDUIT OPENINGS INSIDE A WET-WELL/TANK.
3. ALL AREAS INSIDE THE WET/WELL/TANKS IS CLASSIFIED ACCORDING TO NEC TO CLASS I, DIVISION 1, GROUP D. ALL PROPOSED CONSTRUCTION SHALL COMPLY WITH APPLICABLE CODE REQUIREMENTS.
4. CONTRACTOR TO PROVIDE PADLOCKS FOR THE NEW SERVICE ENTRANCE DISCONNECT, JUNCTION BOX, AND NEW PUMP CONTROL PANEL. PADLOCKS SHALL MEET OWNER'S SPECIFICATIONS.



ELEVATION - FRONT

3 E2.0 ELECTRICAL AND PUMP CONTROL PANEL MOUNTING DETAIL
NOT TO SCALE

TANK SITE - DRAWING NOTES

A SERVICE DISCONNECT. LABEL WITH ARC FLASH POTENTIAL, 10 KAIC FAULT CURRENT WITHSTAND RATING AND AS THE SERVICE DISCONNECT FOR SEPTIC TANK SYSTEM.
B PUMP CONTROL PANEL WITH PADLOCKING HASP. LABEL WITH ARC FLASH POTENTIAL AND 10 KAIC RATING.
C 3/4" C. RMC FOR RECEPTACLE
D 120V, 20A GFCI DUPLEX RECEPTACLE. PROVIDE CAST ALUMINUM IN-USE COVERPLATE, HUBBELL OR EQUAL.
E RMC FEEDER FOR SEPTIC ALARM PANEL
F CONDUITS FOR POWER TO PUMPS, RMC
G RMC FEEDER FOR CONTROL PANEL
H INCOMING SERVICE CONDUIT AND CONDUCTORS, RMC
I CONDUIT FLOAT SWITCHES, RMC
J RMC CONDUIT TO SEPTIC TANK FLOAT SWITCH
K SEPTIC TANK ALARM PANEL

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