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Innisfree Village Wastewater Management System Upgrades

Albemarle County, Virginia

STANDARD PROJECT LEGEND:

COMM

COMMUNICATIONS LINE

ELEC OH

OVERHEAD POWER

UE

UNDERGROUND POWER

FO

FIBER OPTIC LINE

GAS

GAS LINE

GEOTHERMAL

GEOTHERMAL LINE

SS

SANITARY SEWER LINE

SS FM

SANITARY SEWER FORCE MAIN

TELE OH

OVERHEAD TELEPHONE

TELE UG

UNDERGROUND TELEPHONE

W

WATER LINE

STORM SEWER

WATER GATE VALVE

ARV

AIR RELEASE VALVE

FIRE HYDRANT

PIPE PLUG OR CAP

CO

SANITARY SEWER CLEANOUT

UTILITY POLE

POST

1400

EXISTING CONTOURS

1400

PROPOSED CONTOURS

FENCE/GUARDRAIL

SIGN

C-C

CENTER TO CENTER

CL

CENTER LINE

CO

CLEAN OUT

CONC.

CONCRETE

DWV

DRAIN ,WASTE, VENT

ESMT

EASEMENT

ELEV

ELEVATION

EX.

EXISTING

FF

FINISH FLOOR

FM

FORCE MAIN

FNPT

FEMALE NATIONAL PIPE THREAD

MNPT

MALE NATIONAL PIPE THREAD

HDPPE

HIGH-DENSITY POLYETHYLENE

INV

INVERT

FT.

US FEET

IN.

US INCH

LF

LINEAR FEET

NTS

NOT TO SCALE

O-C

ON CENTER

EX.

EXISTING

PROP.

PROPOSED

PVC

POLYVINYL CHLORIDE

PVMT

PAVEMENT

R

RADIUS

ROW

RIGHT-OF-WAY

RSV

RECIRCULATING SPLITTER VALVE

RPZ

REDUCED PRESSURE ZONE (VALVE)

STEP

SEPTIC TANK EFFLUENT PUMP

STEG

SEPTIC TANK EFFLUENT GRAVITY

SOC

SOCKET (PIPE CONNECTION TYPE)

SCH

SCHEDULE

SS

SANITARY SEWER

SPD

SOIL PROFILE DESCRIPTION

Ksat

SATURATED SOIL HYDRAULIC CONDUCTIVITY

TYP.

TYPICAL

NOTE:
1. ANY SYMBOL NOT CALLED OUT IN LEGEND WILL BE LABELED ON PLAN.

2. NOT ALL SYMBOLS IN LEGEND APPLY TO THIS PLAN.

3. NUMBERS ON A UTILITY LINE INDICATES LINE SIZE.

SITE

765

Mountfair

Doylesville

810

668

672

N

PLANS PREPARED BY:
AQUA NOVA ENGINEERING, PLC
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David@AquaNovaEngineering.com

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Dig With G[®]OGG

CALL MISS UTILITY PRIOR TO EXCAVATION 811 OR 1.800.552.7001
SUBCONTRACTORS MAY NOT WORK UNDER ANOTHER COMPANY'S TICKET UNLESS THEY ARE UNDER THE DIRECT SUPERVISION OF THE COMPANY THAT PROVIDED THE NOTICE OF EXCAVATION. ALLOW REQUIRED TIME FOR MARKING AND BEGIN EXCAVATION ONLY AFTER CHECKING THE POSITIVE RESPONSE SYSTEM. EXCAVATION MAY BEGIN WHEN: ALL NOTIFIED UTILITIES HAVE EITHER MARKED THEIR LINES OR REPORTED THAT THEY HAVE NO FACILITIES IN THE AREA OF EXCAVATION OR THE MARKING PERIOD HAS EXPIRED (AFTER 7:00 AM ON THE THIRD WORKING DAY AFTER NOTICE TO THE CENTER.) OR MISS UTILITY INFORMS YOU THAT NO MEMBER OPERATORS NEED TO BE NOTIFIED OF THE EXCAVATION. YOU WILL STILL GET A TICKET NUMBER! RESPECT THE MARKS - PROTECT AND PRESERVE THE MARKINGS FROM THE TIME EXCAVATION BEGINS UNTIL THE WORK IS COMPLETED. CALL MISS UTILITY TO UPDATE THE TICKET IF WORK WILL CONTINUE PAST 15 DAYS OR IF THE MARKS BECOME ILLEGIBLE DUE TO TIME, WEATHER, CONSTRUCTION OR ANY OTHER CAUSE. EXCAVATE CAREFULLY - IF THE EXCAVATION IS WITHIN 2 FEET OF A MARKED UTILITY LINE, EXPOSE THE UTILITY LINE BY HAND DIGGING AND KEEP ALL MECHANIZED EQUIPMENT AT LEAST 2 FEET AWAY FROM THE EXTREMITIES OF THE UTILITY.

SHEET INDEX

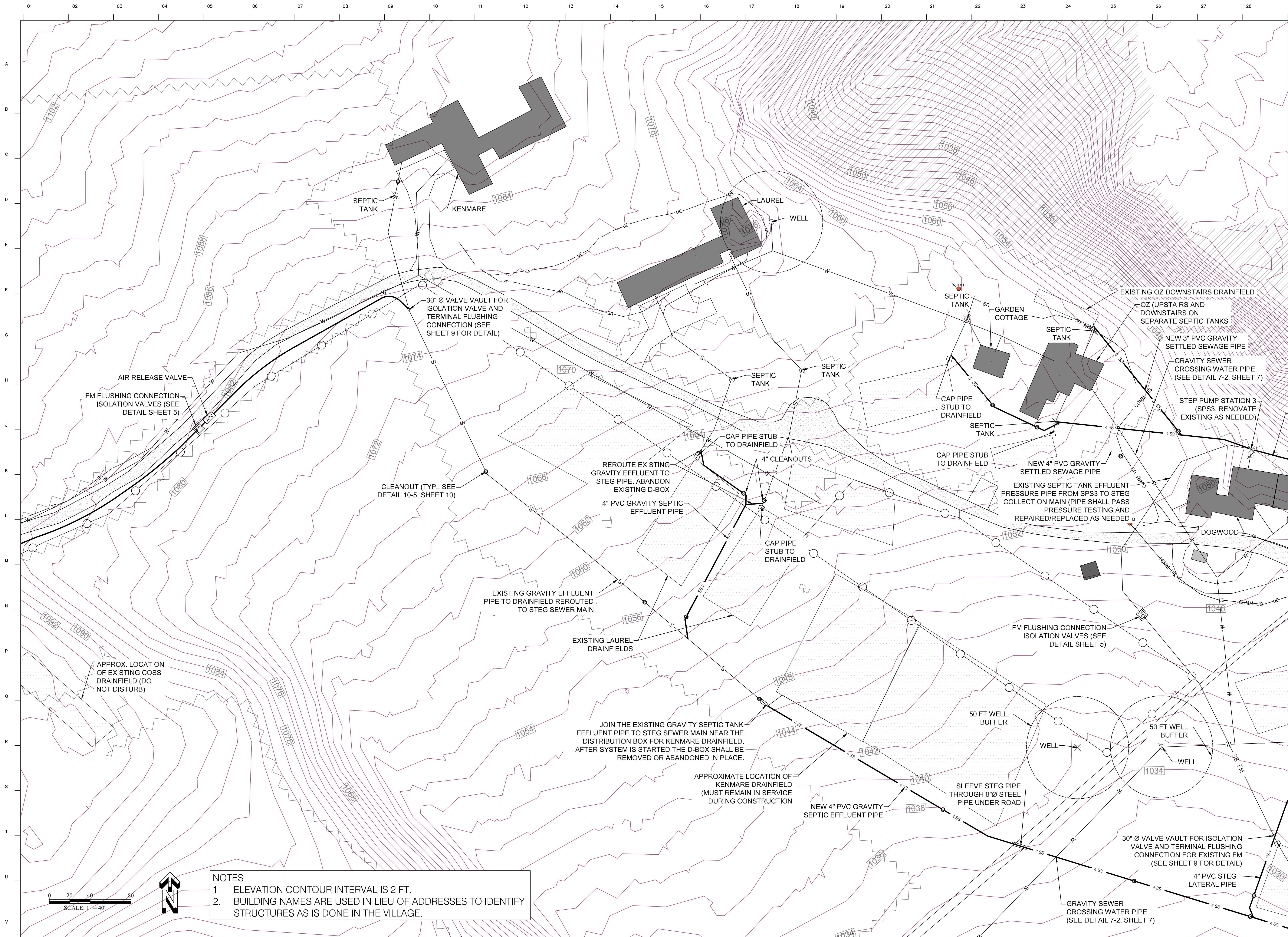
SHEET	DESCRIPTION
C	COVER
1	GENERAL NOTES
2A	SPECIFICATIONS
2B	SPECIFICATIONS CONTINUED
3A	OVERALL SITE PLAN
3B	SEWER SYSTEM EASEMENTS
4	COLLECTION SYSTEM SCHEMATIC
5	COLLECTION SYSTEM – TRILLIUM TO OAKWOOD
6	COLLECTION SYSTEM – KENMARE TO DOGWOOD
7	COLLECTION SYSTEM – DOGWOOD TO AMITY
8	COLLECTION SYSTEM – AMITY TO OFFICE
9	COLLECTION SYSTEM – BITTERSWEET TO TREATMENT
10	STEP/STEG COLLECTION SYSTEM DETAILS
11	TREATMENT SYSTEM PROCESS DIAGRAM
12	TREATMENT SYSTEM SCHEMATIC
13	TREATMENT AREA PLAN
14	TREATMENT SYSTEM LAYOUT
15	TREATMENT SYSTEM DETAILS
16	STAGE 1 ADVANTEX DETAILS
17	STAGE 2 ADVANTEX DETAILS
18	STAGE 3 TREATMENT DETAILS
19	MBBR AND EFFLUENT PUMP TANK DETAILS
20	FLOW METER & EQUIPMENT BUILDING DETAILS
21	DISPERSAL SYSTEM DETAILS
22	DRAINFIELD LAYOUT
23	NITROGEN DILUTION MANAGEMENT AREA
24	ELECTRICAL LAYOUT & DETAILS
25	ELECTRICAL SCHEMATIC & DEVICE LIST
26	TREATMENT SYSTEM HYDRAULIC PROFILE –ACROSS
27	TREATMENT SYSTEM HYDRAULIC PROFILE –SECTIONS
28	TREATMENT SYSTEM SITE FINISH

[illegible][illegible]

[illegible]

[illegible]





- NOTES
1. ELEVATION CONTOUR INTERVAL IS 2 FT.
 2. BUILDING NAMES ARE USED IN LIEU OF ADDRESSES TO IDENTIFY STRUCTURES AS IS DONE IN THE VILLAGE.

REV	DATE	DESCRIPTION OF REVISION	BY	APP



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ENGINEERING, PLC.

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PROJECT NAME:
**INNISFREE VILLAGE WASTEWATER
MANAGEMENT SYSTEM UPGRADES**

PROJECT LOCATION:
ALBEMARLE, VA

DATE: **11/26/2024**

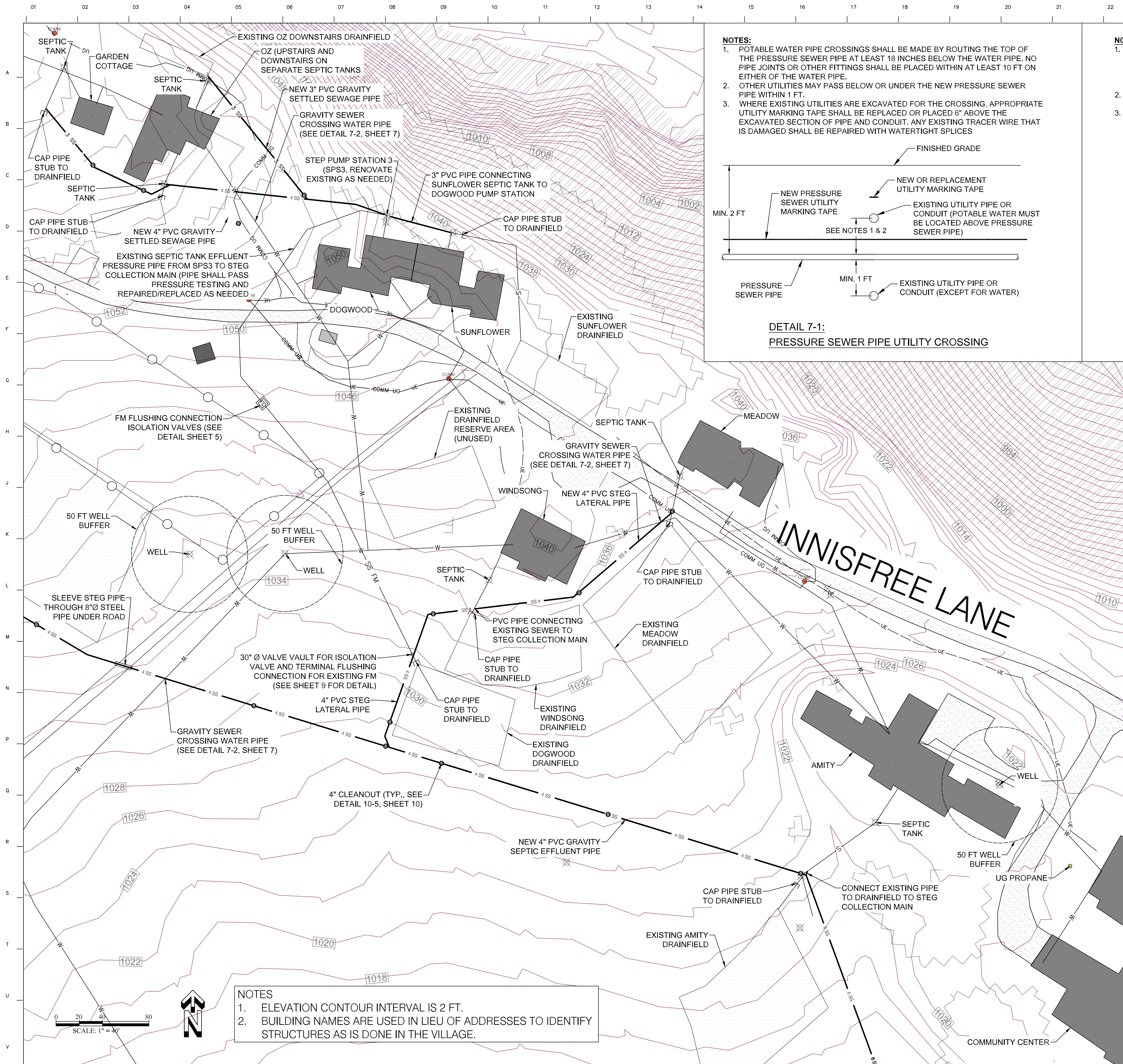
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DRAWN BY:
DESIGNED BY:
CHECKED BY:

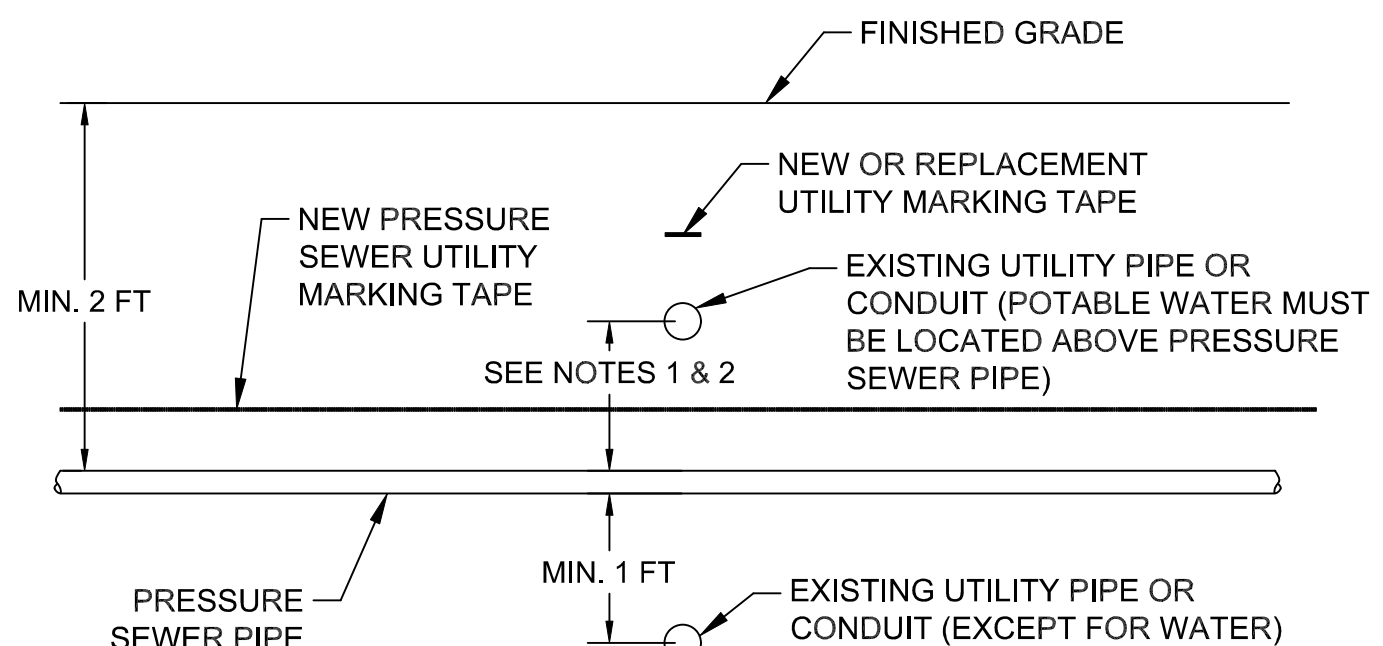
**CBH
DJM
DJM**

SHEET TITLE:
**COLLECTION
SYSTEM -
KENMARE TO
DOGWOOD**

6

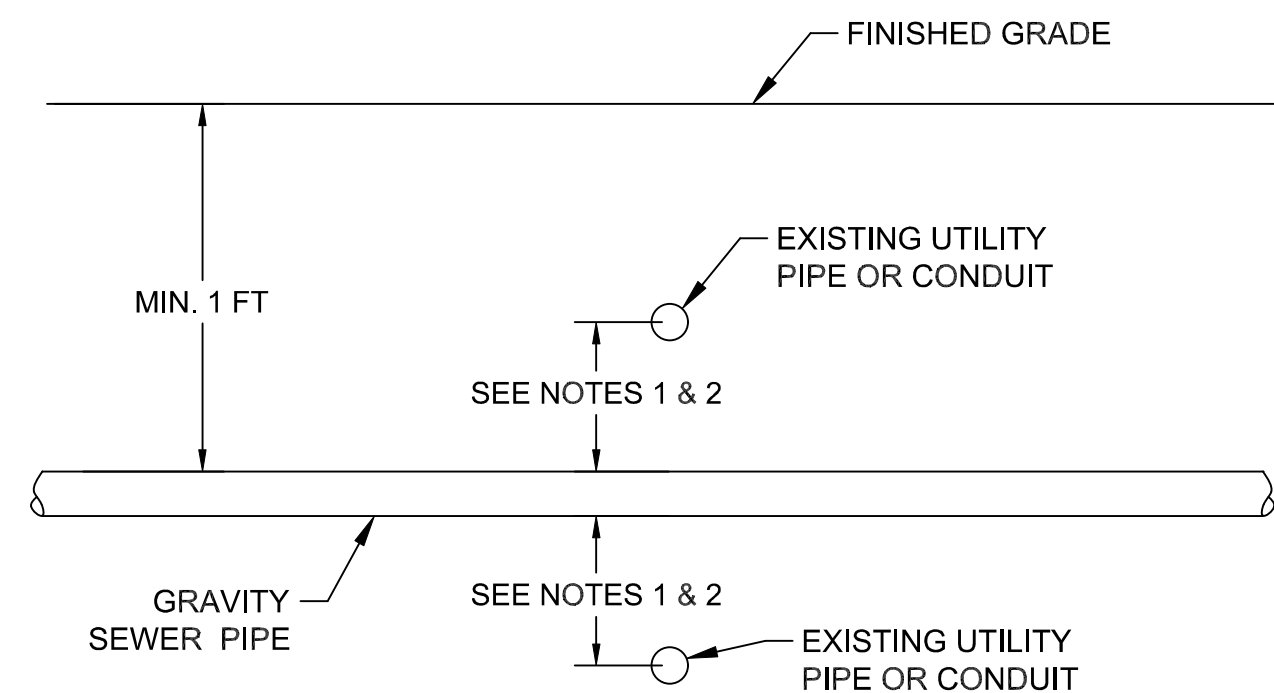


- NOTES:**
- POTABLE WATER PIPE CROSSINGS SHALL BE MADE BY ROUTING THE TOP OF THE PRESSURE SEWER PIPE AT LEAST 18 INCHES BELOW THE WATER PIPE. NO PIPE JOINTS OR OTHER FITTINGS SHALL BE PLACED WITHIN AT LEAST 10 FT ON EITHER OF THE WATER PIPE.
 - OTHER UTILITIES MAY PASS BELOW OR UNDER THE NEW PRESSURE SEWER PIPE WITHIN 1 FT.
 - WHERE EXISTING UTILITIES ARE EXCAVATED FOR THE CROSSING, APPROPRIATE UTILITY MARKING TAPE SHALL BE REPLACED OR PLACED 6" ABOVE THE EXCAVATED SECTION OF PIPE AND CONDUIT. ANY EXISTING TRACER WIRE THAT IS DAMAGED SHALL BE REPAIRED WITH WATERTIGHT SPLICES



DETAIL 7-1:
PRESSURE SEWER PIPE UTILITY CROSSING

- NOTES:**
- POTABLE WATER PIPE CROSSINGS SHALL BE MADE BY ROUTING THE GRAVITY SEWER AT LEAST 18 INCHES ABOVE OR BELOW THE WATER PIPE. NO PIPE JOINTS OR OTHER FITTINGS SHALL BE PLACED WITHIN AT LEAST 10 FT ON EITHER OF THE WATER PIPE. IF REQUIRED THE WATER PIPE MAY BE RE-ROUTED, IN COORDINATION WITH THE ENGINEER OF RECORD.
 - OTHER UTILITIES MAY PASS BELOW OR UNDER THE NEW PRESSURE SEWER PIPE WITHIN 1 FT.
 - WHERE EXISTING UTILITIES ARE EXCAVATED FOR THE CROSSING, APPROPRIATE UTILITY MARKING TAPE SHALL BE REPLACED OR PLACED 6" ABOVE THE EXCAVATED SECTION OF PIPE AND CONDUIT. ANY EXISTING TRACER WIRE THAT IS DAMAGED SHALL BE REPAIRED WITH WATERTIGHT SPLICES



DETAIL 7-2:
GRAVITY SEWER PIPE UTILITY CROSSING

- NOTES**
- ELEVATION CONTOUR INTERVAL IS 2 FT.
 - BUILDING NAMES ARE USED IN LIEU OF ADDRESSES TO IDENTIFY STRUCTURES AS IS DONE IN THE VILLAGE.



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PROJECT NAME:
**INNISFREE VILLAGE WASTEWATER
MANAGEMENT SYSTEM UPGRADES**

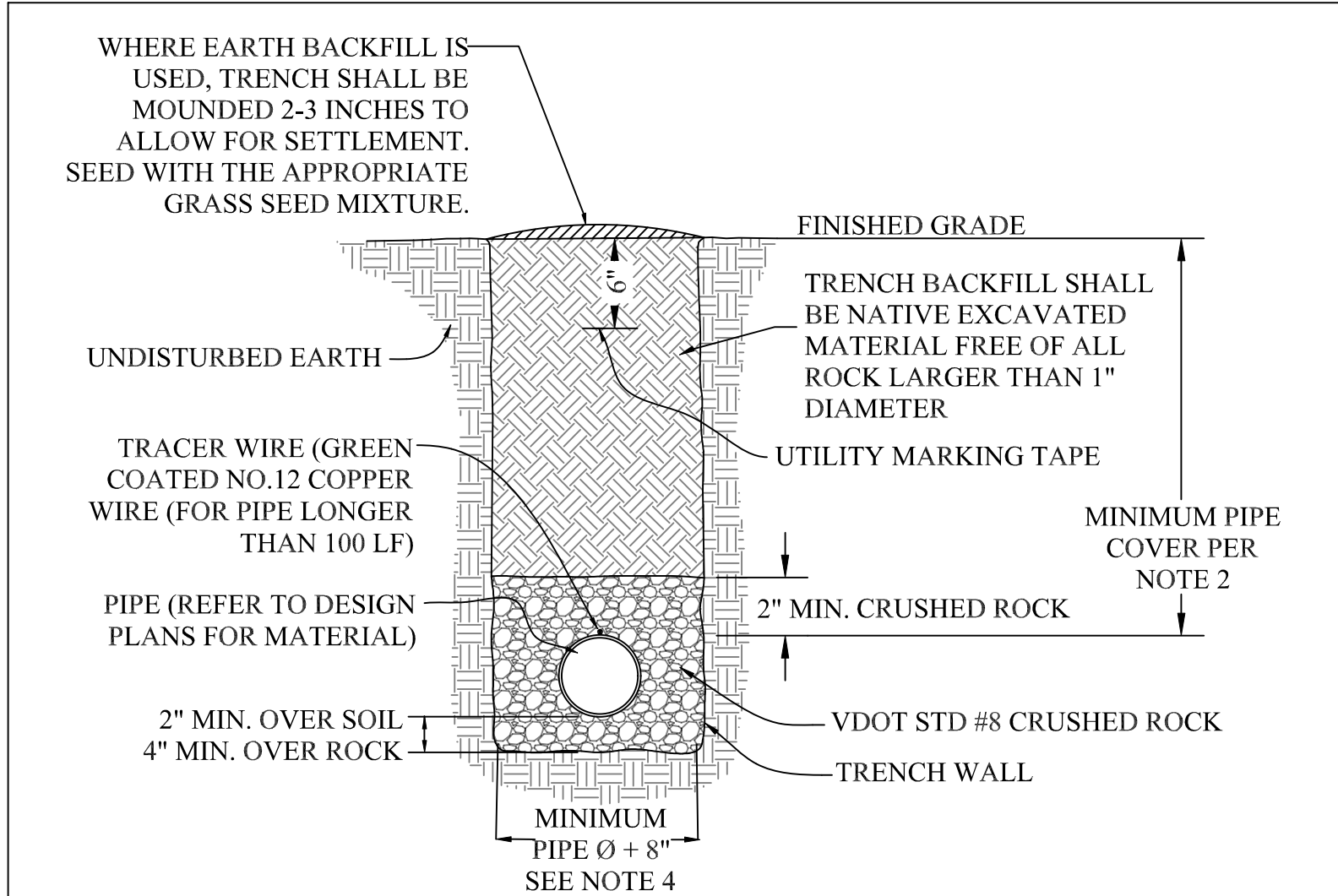
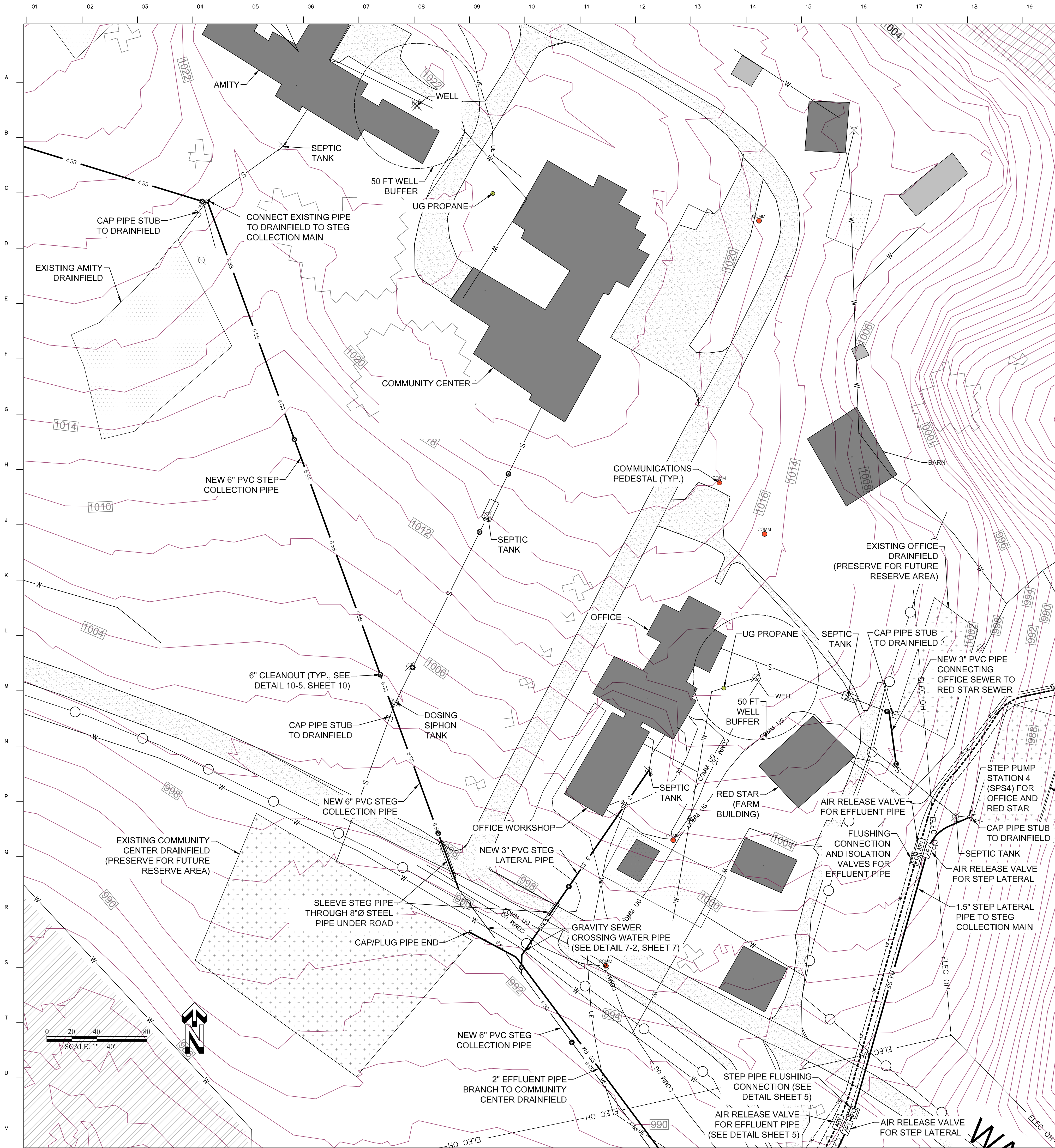
PROJECT LOCATION:
ALBEMARLE, VA

DATE: 11/26/2024

DRAWN BY:
DESIGNED BY:
CHECKED BY:

CBH
DJM
DJM

SHEET TITLE:
**COLLECTION
SYSTEM -
DOGWOOD TO
AMITY**



- BURIED PIPE INSTALLATION NOTES:**
1. THIS DETAIL APPLIES TO PRESSURE HDPE PIPE INSTALLATION FOR THE SEWER COLLECTION SYSTEM AND IN THE TREATMENT SYSTEM.
 2. PRESSURE SEWER PIPE SHALL BE INSTALLED WITH A MINIMUM 2 FT COVER OVER THE TOP OF PIPE.
 3. PRESSURE SEWER PIPE BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY POTABLE WATER PIPE. SEE DETAILS 7-1 & 7-2 ON SHEET 7 FOR WATER PIPE CROSSINGS.
 4. TRENCH WIDTH SHALL BE INCREASED BY THE PIPE DIAMETER PLUS 6 INCHES FOR EACH ADDITIONAL PIPE LAID PARALLEL IN THE SAME TRENCH WITH -6" SEPARATION BETWEEN EACH PIPE AND THE PIPE AND THE TRENCH WALL.

DETAIL 8-1: HDPE PIPE INSTALLATION DETAIL

- NOTES**
1. ELEVATION CONTOUR INTERVAL IS 2 FT.
 2. BUILDING NAMES ARE USED IN LIEU OF ADDRESSES TO IDENTIFY STRUCTURES AS IS DONE IN THE VILLAGE.

REV	DATE	DESCRIPTION OF REVISION	BY	APP
3	11/18/24	DETAIL 8-1 ADDED, MISC. CORRECTIONS		

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COMMONWEALTH OF VIRGINIA
27 Nov 2024
DAVID J. MACIOLEK
Lic No. 043224
PROFESSIONAL ENGINEER

PROJECT NAME: IINNISFREE VILLAGE WASTEWATER MANAGEMENT SYSTEM UPGRADES

PROJECT LOCATION: ALBEMARLE, VA

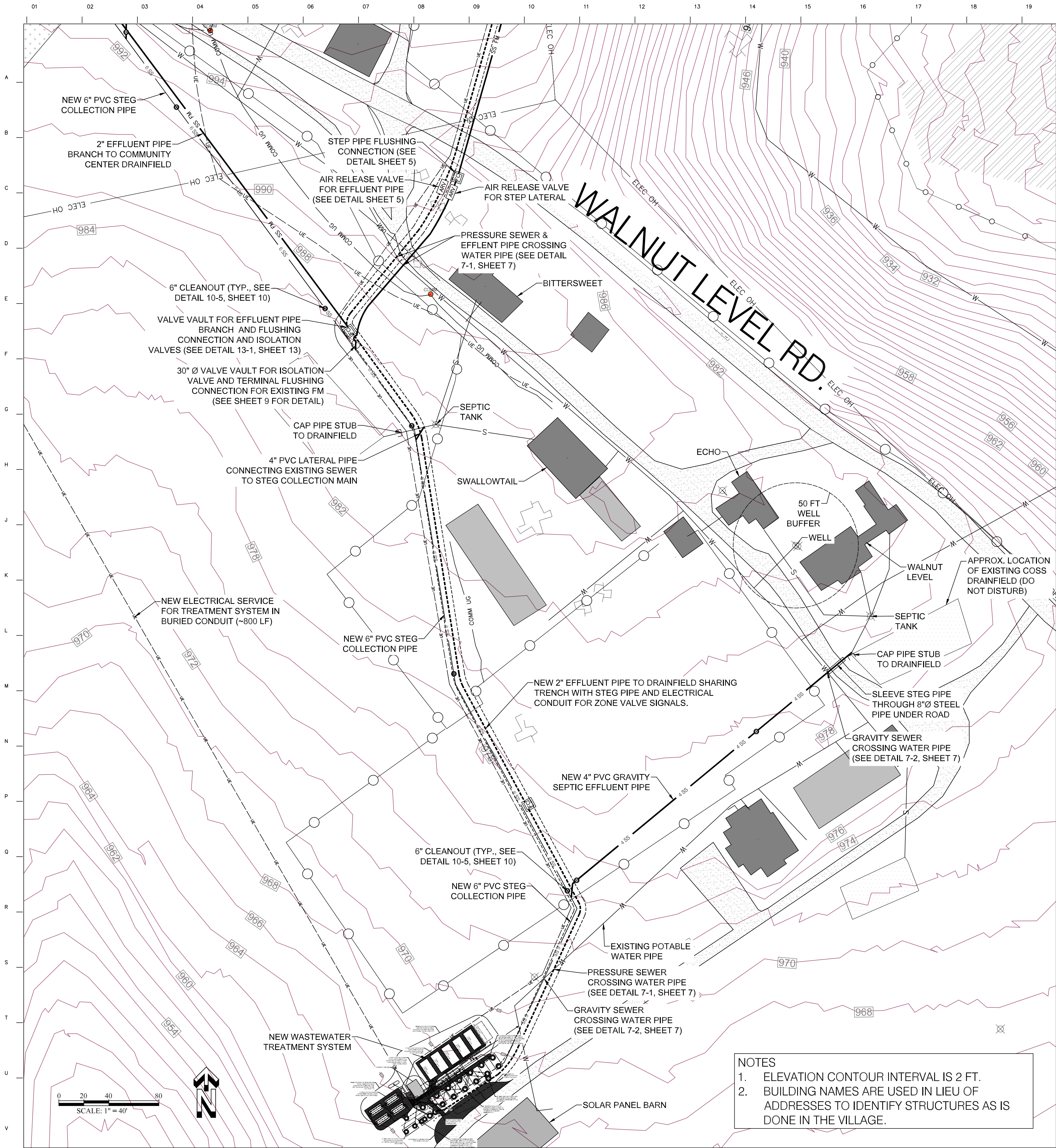
DATE: 11/26/2024

DRAWING SCALE: AS NOTED

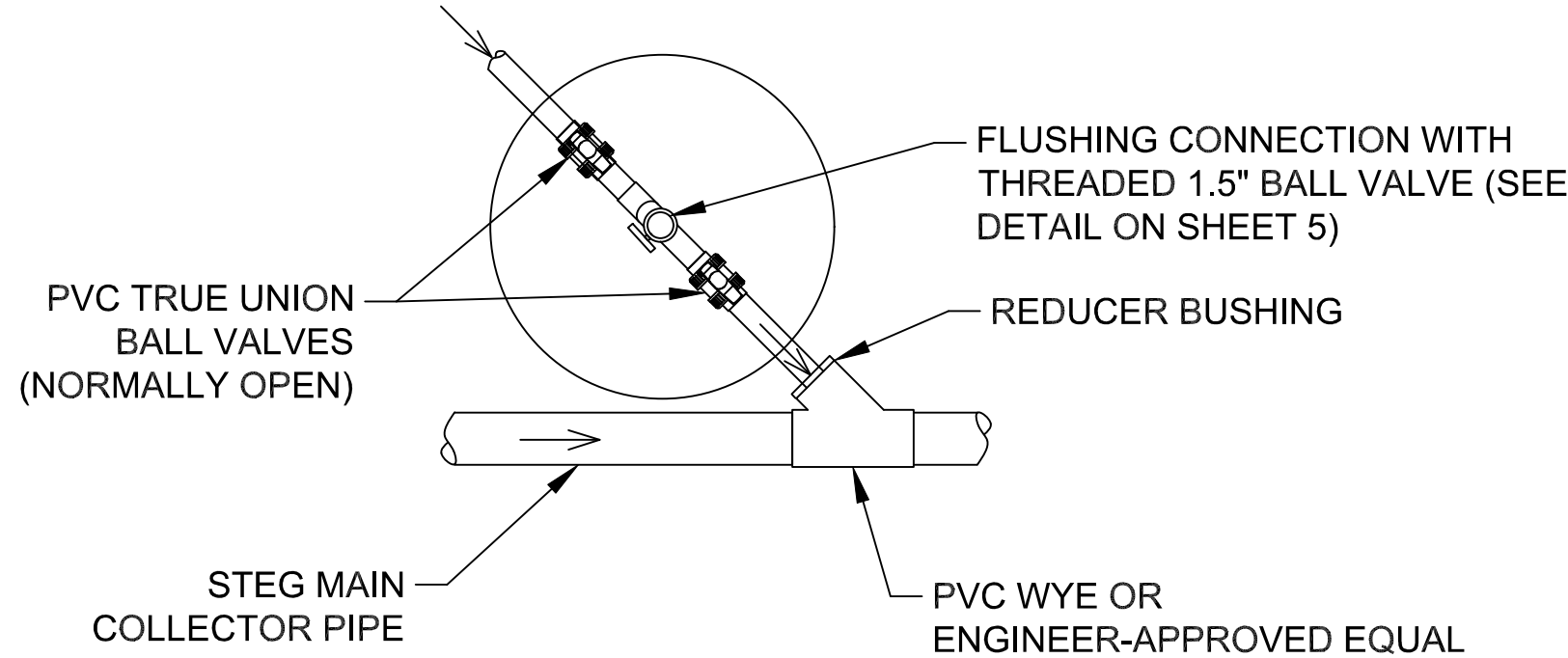
DRAWN BY: CBH
DESIGNED BY: DJM
CHECKED BY: DJM

SHEET TITLE: **COLLECTION SYSTEM - AMITY TO OFFICE**

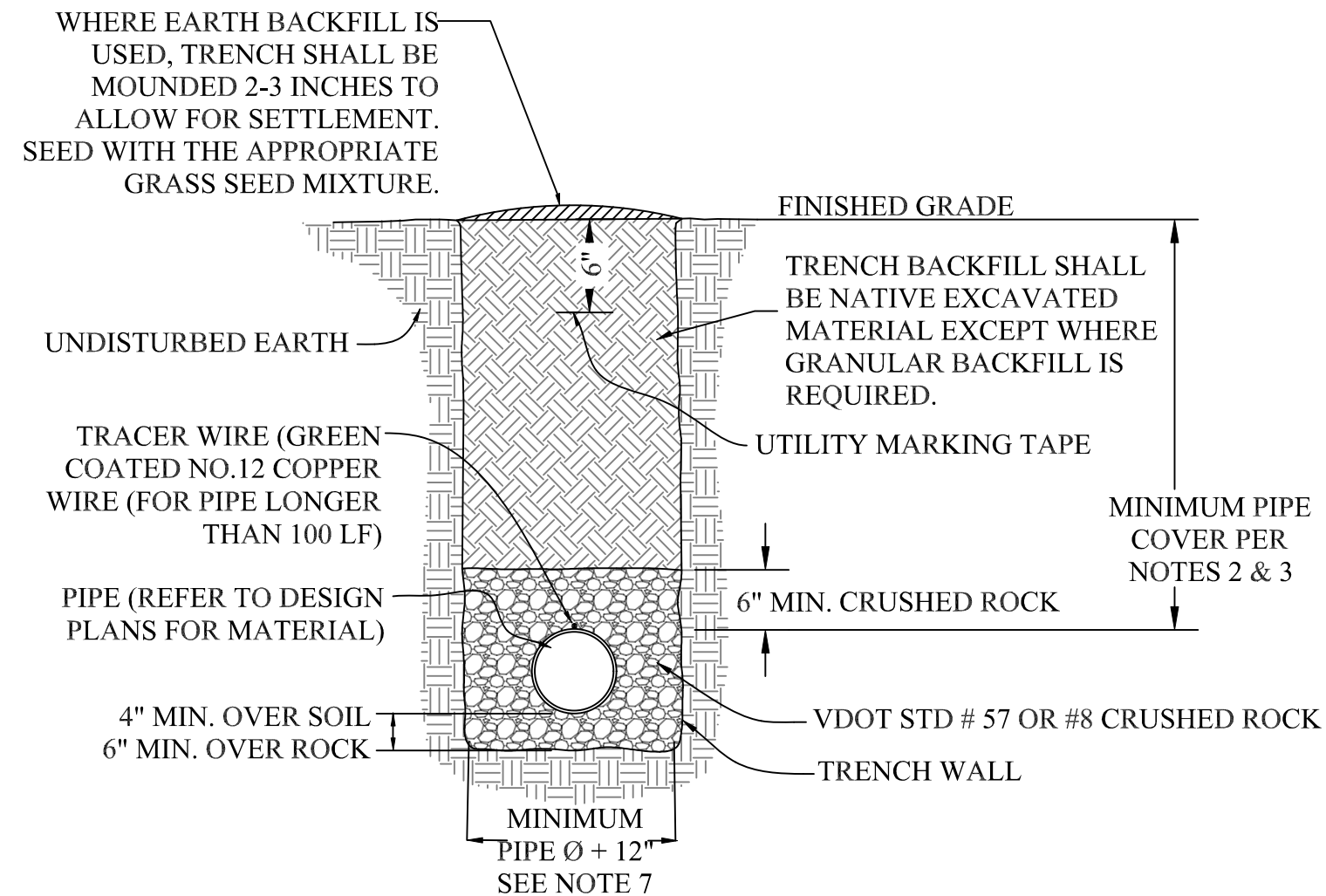
8



- NOTES
- ELEVATION CONTOUR INTERVAL IS 2 FT.
 - BUILDING NAMES ARE USED IN LIEU OF ADDRESSES TO IDENTIFY STRUCTURES AS IS DONE IN THE VILLAGE.



DETAIL 9-1:
TERMINAL FLUSHING CONNECTION & STEP PRESSURE
PIPE CONNECTION INTO A STEG PIPE MAIN



- BURIED PIPE INSTALLATION NOTES:**
- THIS DETAIL APPLIES TO PVC PIPE INSTALLATION FOR THE SEWER COLLECTION SYSTEM AND IN THE TREATMENT SYSTEM.
 - GRAVITY SEWER PIPES SHALL BE INSTALLED WITH A MINIMUM 1 FT COVER OVER THE TOP OF PIPE.
 - PRESSURE SEWER PIPE SHALL BE INSTALLED WITH A MINIMUM 2 FT COVER OVER THE TOP OF PIPE.
 - GRAVITY PIPE SHALL BE INSTALLED AT A CONSTANT SLOPE SO AS TO AVOID ANY DIPS AND HUMPS IN THE LINE THAT COULD TRAP SEDIMENT. PRESSURE PIPE SHALL BE INSTALLED TO AVOID DIPS AND HUMPS AND FLUSHING CONNECTIONS AND AIR RELEASE VALVES SHALL BE INSTALLED WHERE REQUIRED.
 - GRAVITY SEWER PIPE CLEANOUTS SHALL BE INSTALLED PER DETAIL 10-5, SHEET 10.
 - PRESSURE SEWER PIPE BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY POTABLE WATER PIPE. SEE DETAILS 7-1 & 7-2 ON SHEET 7 FOR WATER PIPE CROSSINGS.
 - TRENCH WIDTH SHALL BE INCREASED BY THE PIPE DIAMETER PLUS 6 INCHES FOR EACH ADDITIONAL PIPE LAID PARALLEL IN THE SAME TRENCH WITH ~6" SEPARATION BETWEEN EACH PIPE AND THE PIPE AND THE TRENCH WALL.

DETAIL 9-2: RIGID PVC PIPE INSTALLATION DETAIL

BY	APP	DESCRIPTION OF REVISION	DATE	REV
		DETAIL 8-1 ADDED, MISC. CORRECTIONS	11/18/24	3

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27 Nov 2024
DAVID J. MACCOLEK
Lic No. 043224
PROFESSIONAL ENGINEER

PROJECT NAME:
**IINISFREE VILLAGE WASTEWATER
MANAGEMENT SYSTEM UPGRADES**

PROJECT LOCATION:
ALBEMARLE, VA

DATE: 11/26/2024

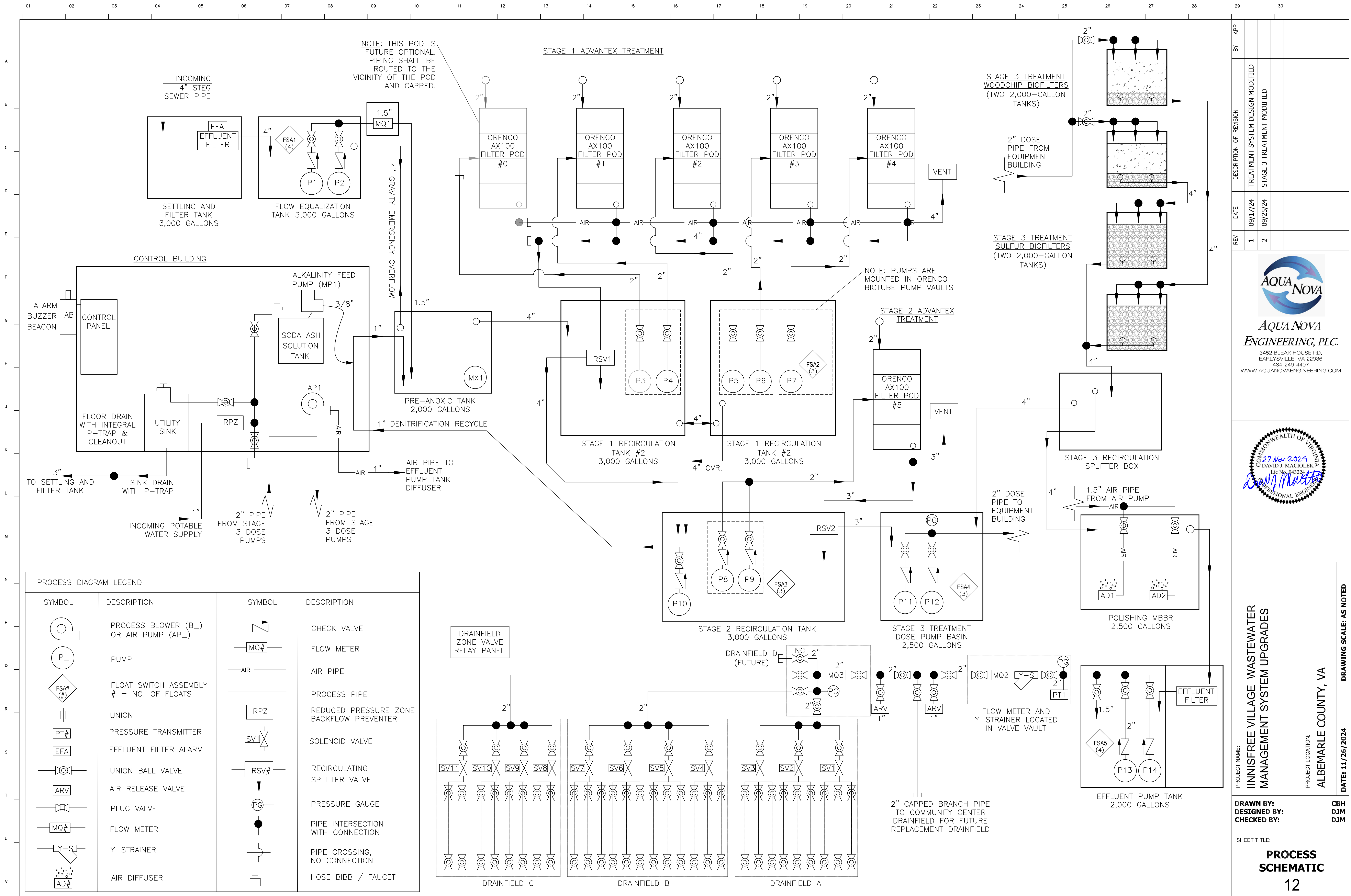
DRAWING SCALE: AS NOTED

DRAWN BY:
DESIGNED BY:
CHECKED BY:

CBH
DJM
DJM

SHEET TITLE:
**COLLECTION
SYSTEM -
BITTERSWEET TO
TREATMENT**

9

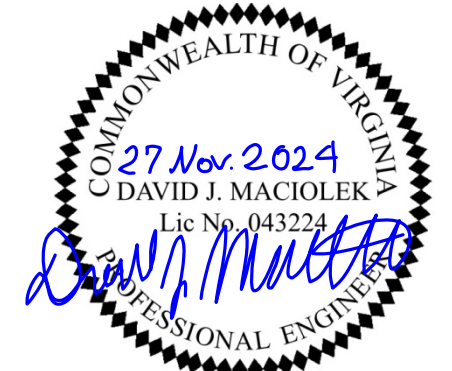


REV	DATE	DESCRIPTION OF REVISION
1	09/17/24	TREATMENT SYSTEM DESIGN MODIFIED
2	09/25/24	STAGE 3 TREATMENT MODIFIED



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PROJECT NAME:
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MANAGEMENT SYSTEM UPGRADES**

PROJECT LOCATION:
ALBEMARLE COUNTY, VA

DATE: 11/26/2024

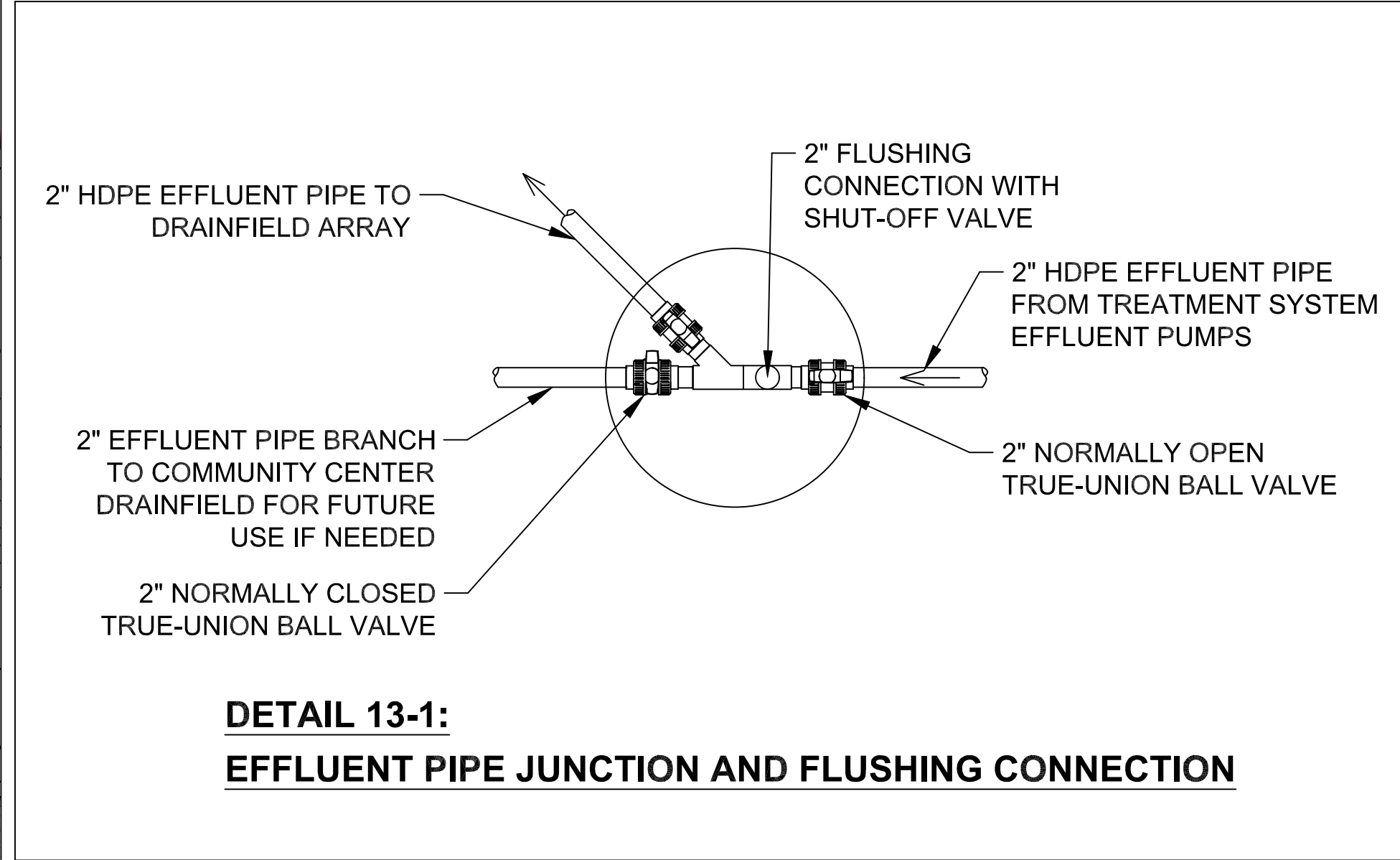
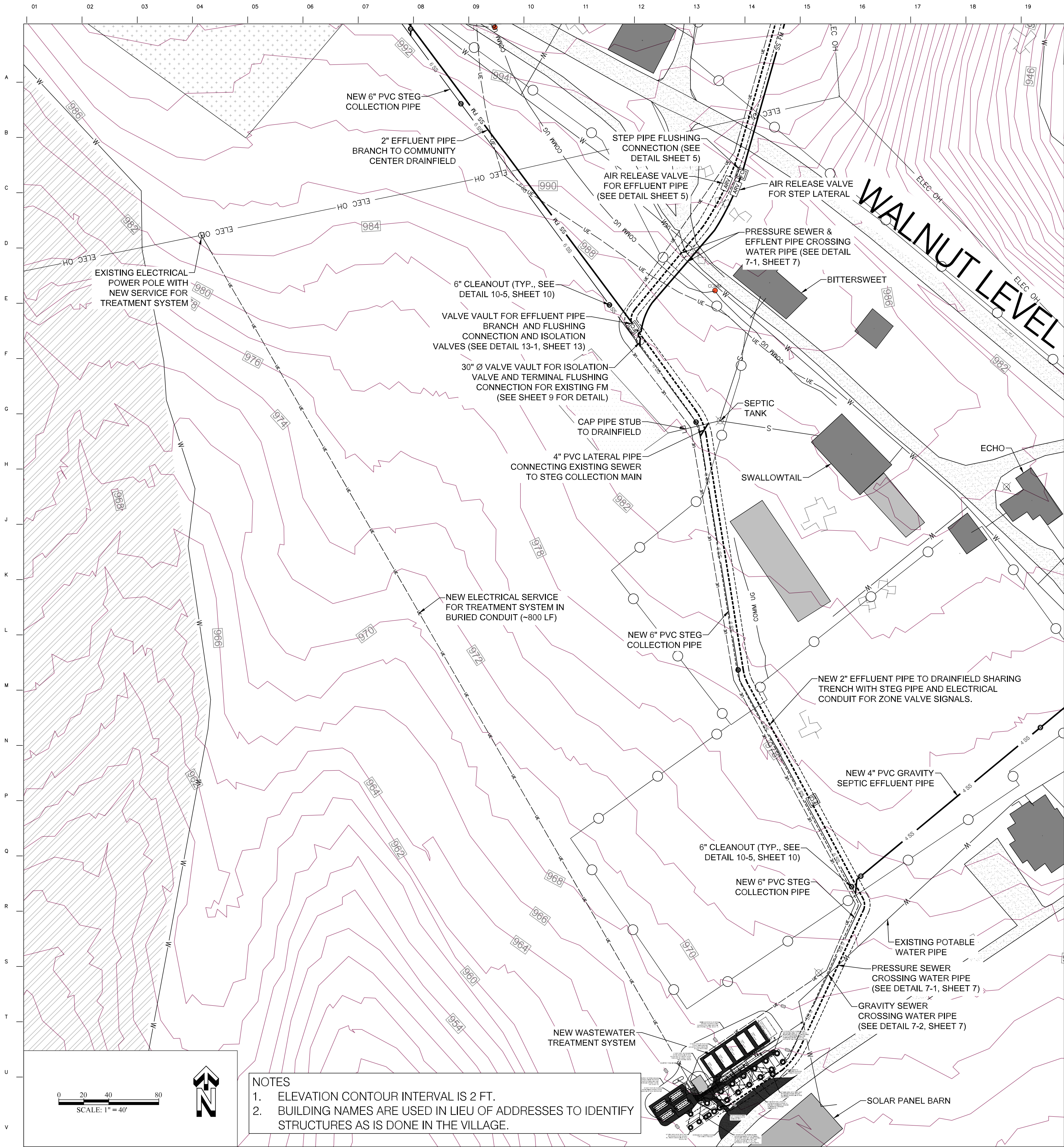
DRAWING SCALE: AS NOTED

DRAWN BY:
DESIGNED BY:
CHECKED BY:

**CBH
DJM
DJM**

SHEET TITLE:
**PROCESS
SCHEMATIC**

12



REV	DATE	DESCRIPTION OF REVISION	BY	APP
1	09/17/24	TREATMENT SYSTEM DESIGN MODIFIED		

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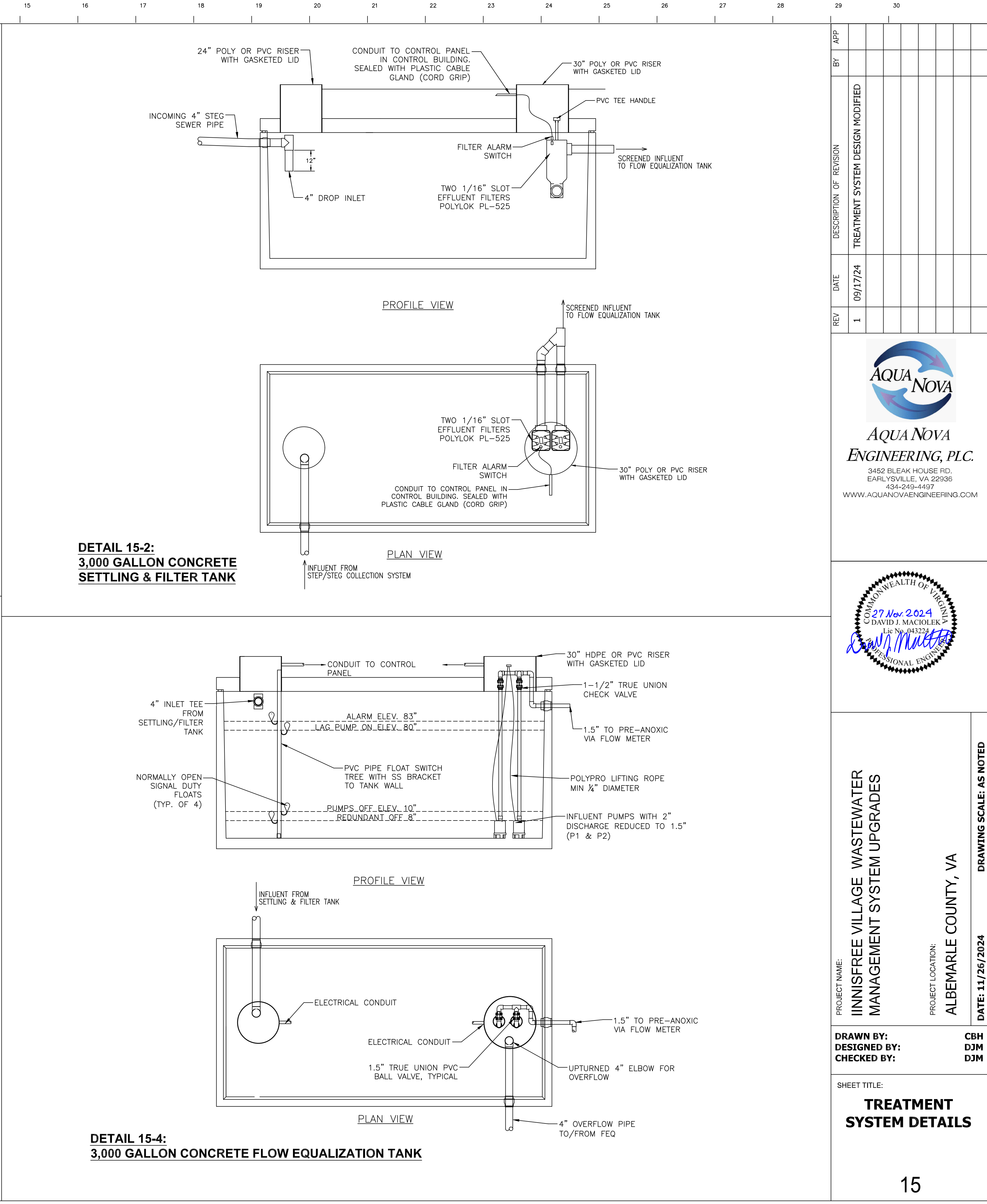
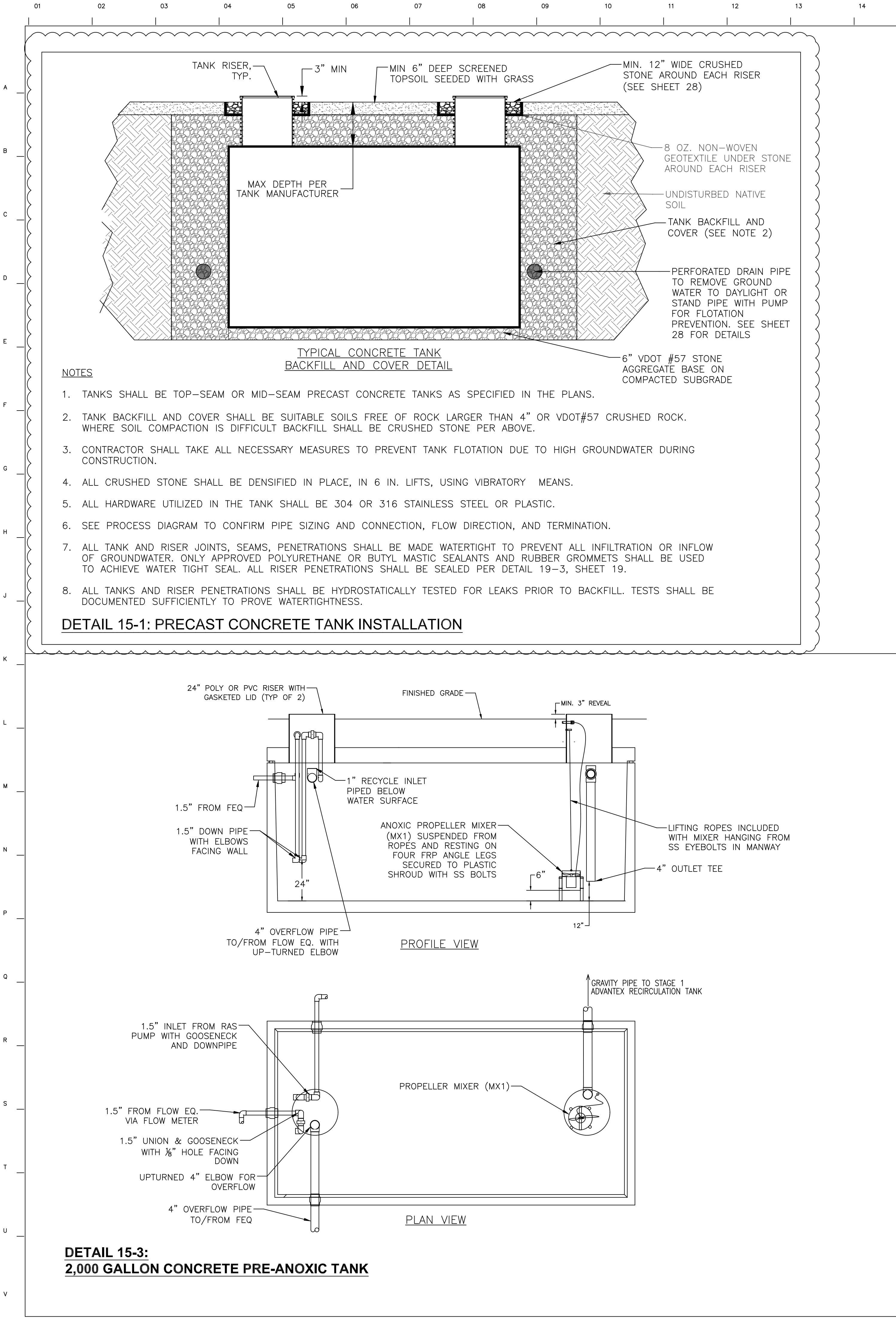
PROJECT NAME: IINISFREE VILLAGE WASTEWATER MANAGEMENT SYSTEM UPGRADES	PROJECT LOCATION: ALBEMARLE COUNTY, VA	DATE: 11/26/2024 DRAWING SCALE: AS NOTED

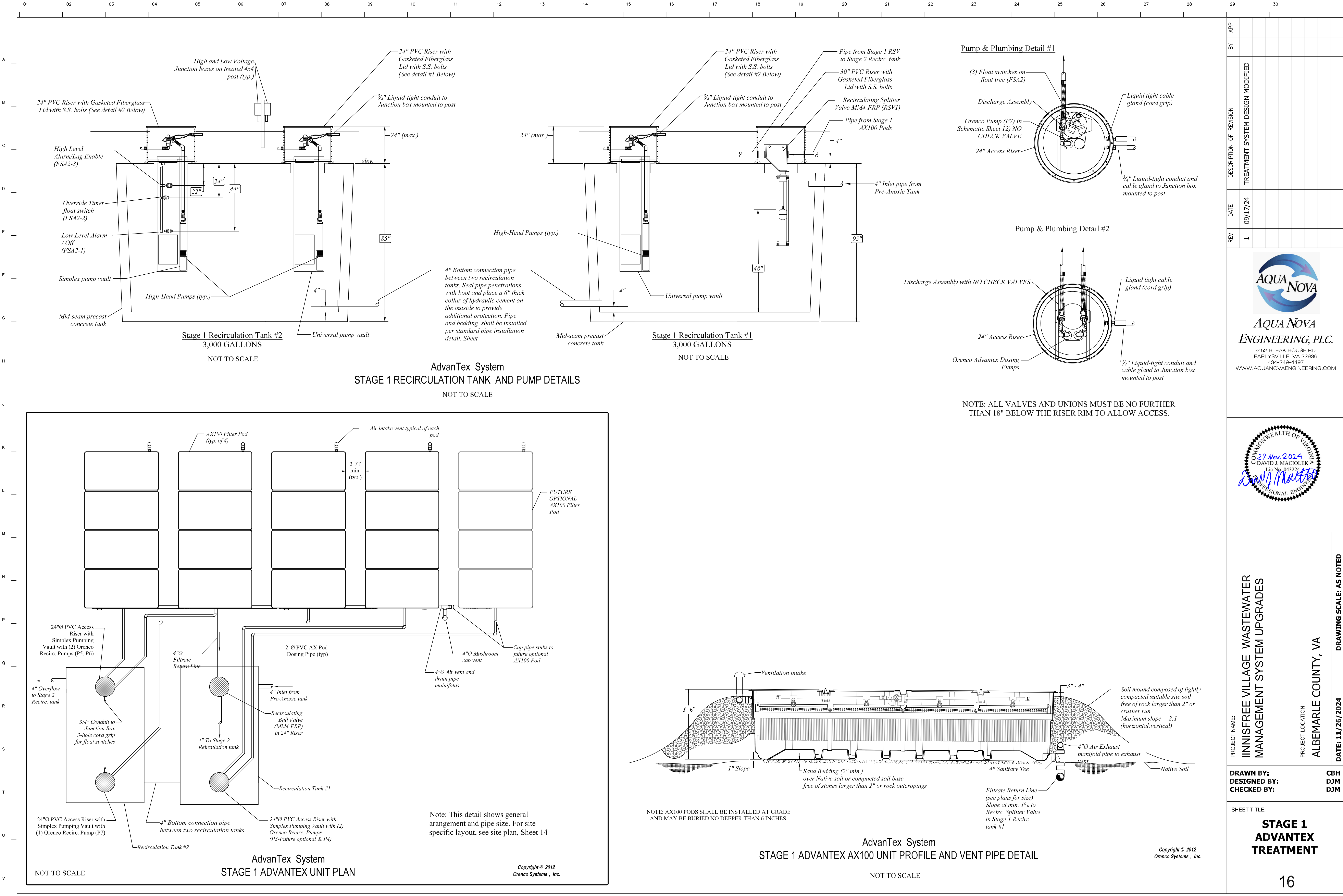
DRAWN BY: DJM	CBH DJM DJM
DESIGNED BY: DJM	
CHECKED BY:	

SHEET TITLE:

**TREATMENT
SYSTEM AREA PLAN**

13





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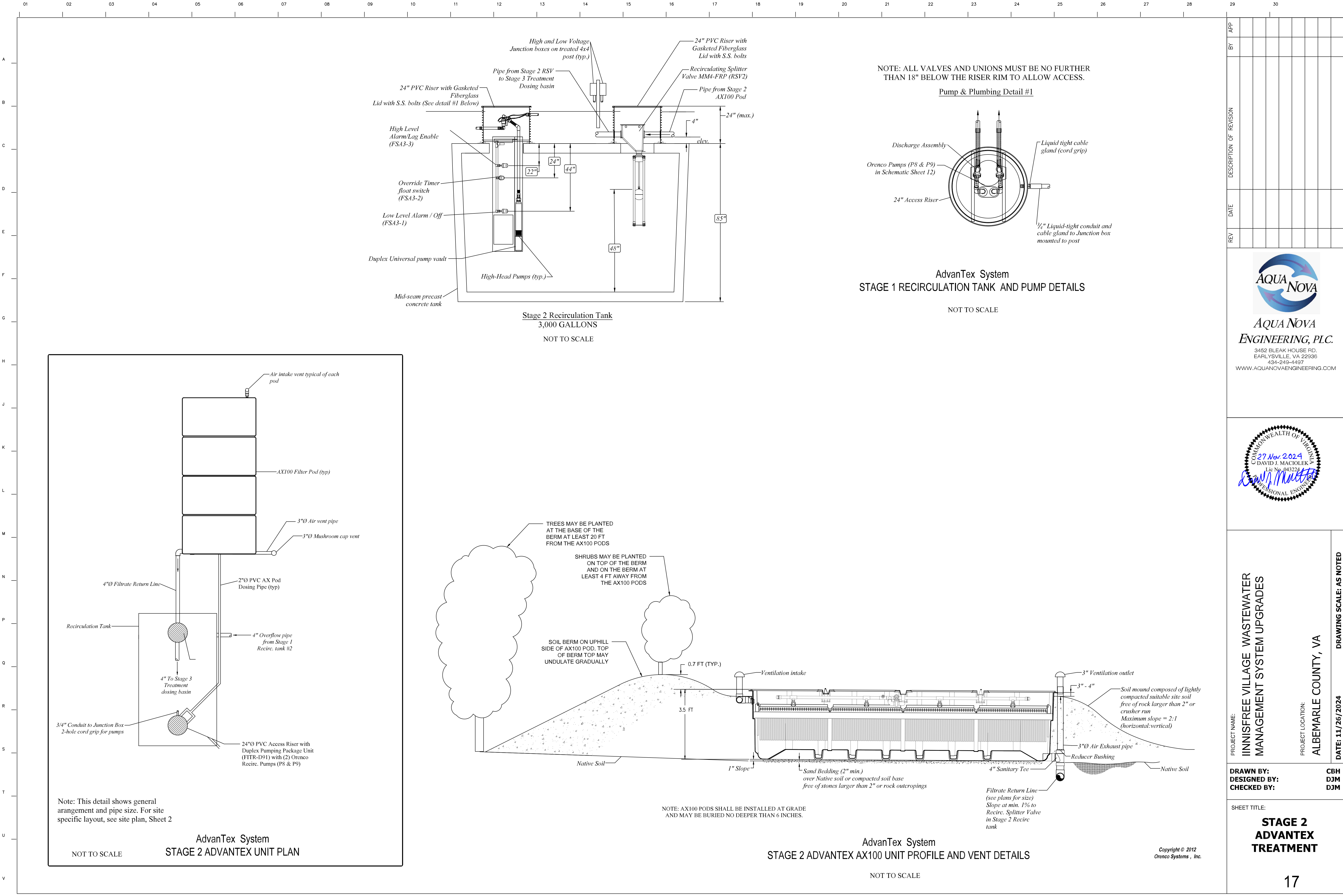
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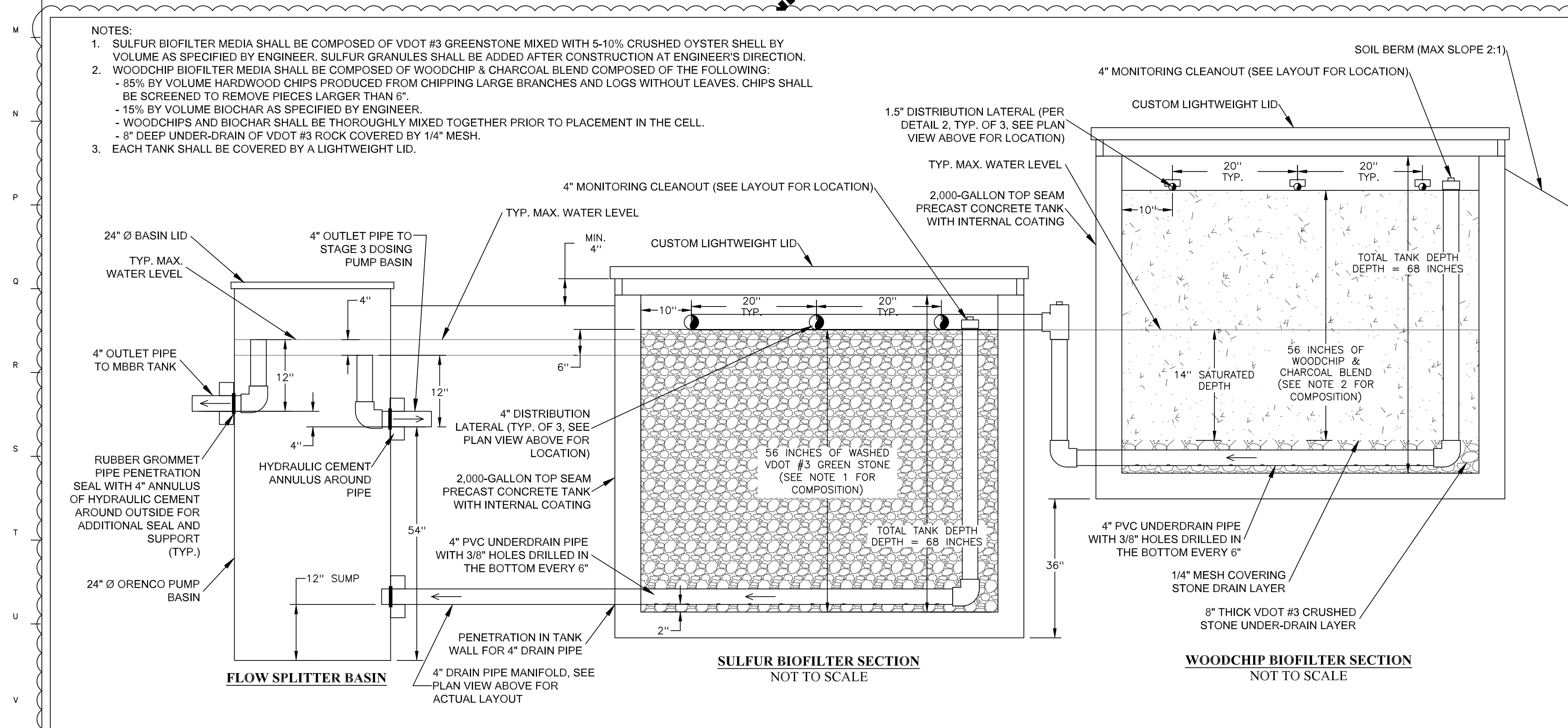
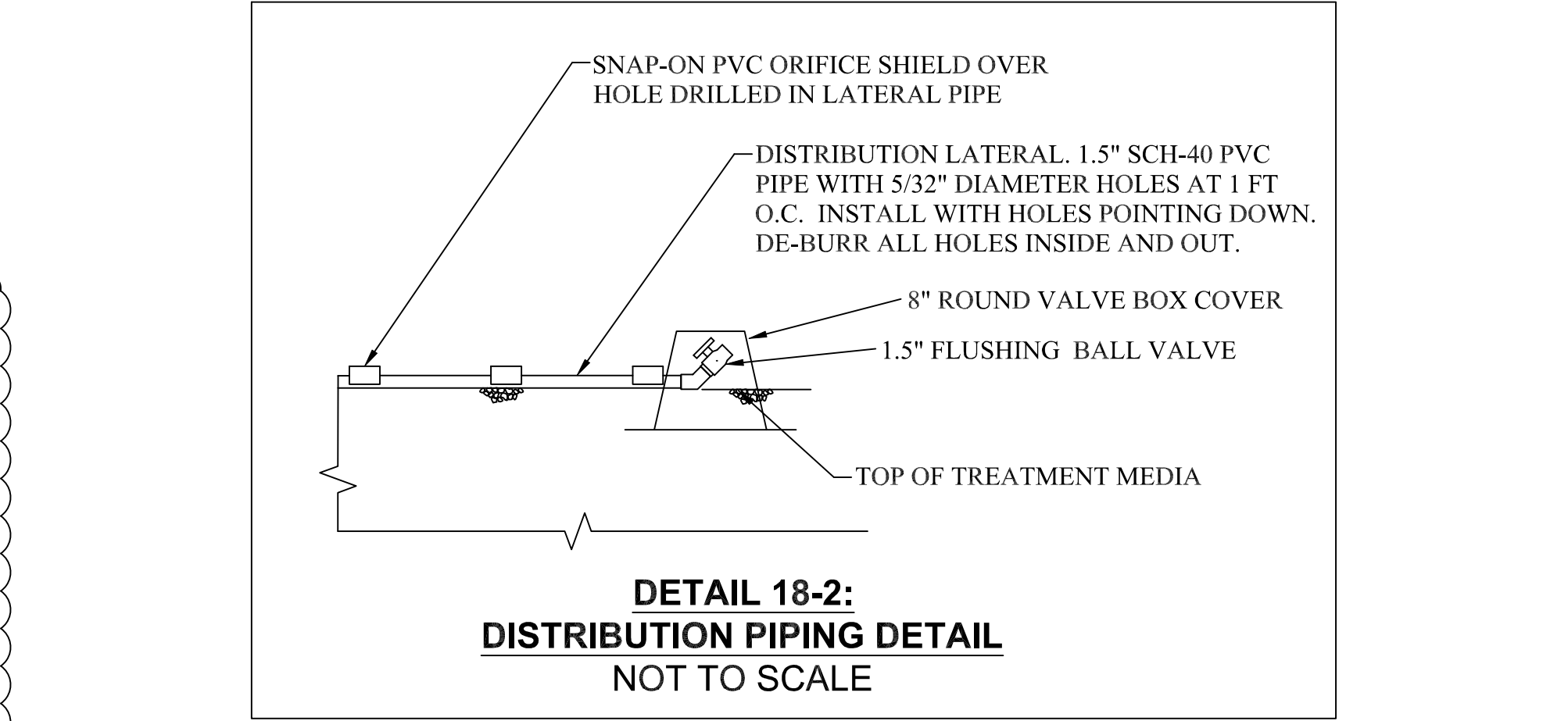
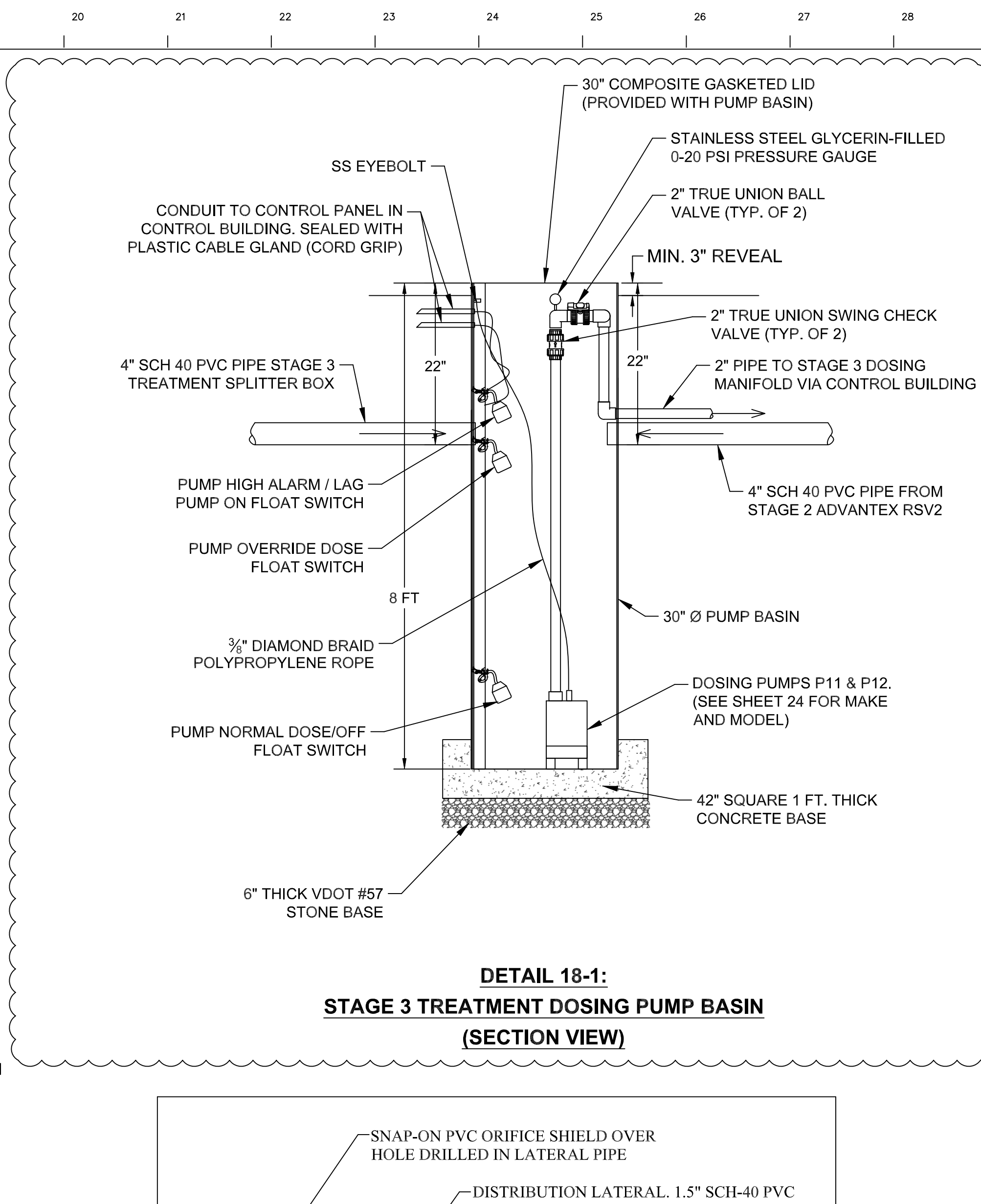
PROJECT LOCATION:
ALBEMARLE COUNTY, VA

DRAWING SCALE: AS NOTED
DATE: 11/26/2024

DRAWN BY: **CBH**
DESIGNED BY: **DJM**
CHECKED BY: **DJM**

SHEET TITLE:
**STAGE 1
ADVANTEX
TREATMENT**





REV	DATE	DESCRIPTION OF REVISION	BY	APP
1	09/17/24	TREATMENT SYSTEM DESIGN MODIFIED		
2	09/25/24	STAGE 3 TREATMENT MODIFIED		
4	11/21/24	SHEETS 26, 27 & 28, GENERATOR ADDED		



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COMMONWEALTH OF VIRGINIA
27 Nov 2024
DAVID J. MACIOLEK
Lic No. 043224
PROFESSIONAL ENGINEER

PROJECT NAME:

**INNISFREE VILLAGE WASTEWATER
MANAGEMENT SYSTEM UPGRADES**

PROJECT LOCATION:

ALBEMARLE COUNTY, VA

DRAWN BY:

DESIGNED BY:

CHECKED BY:

CBH

DJM

DJM

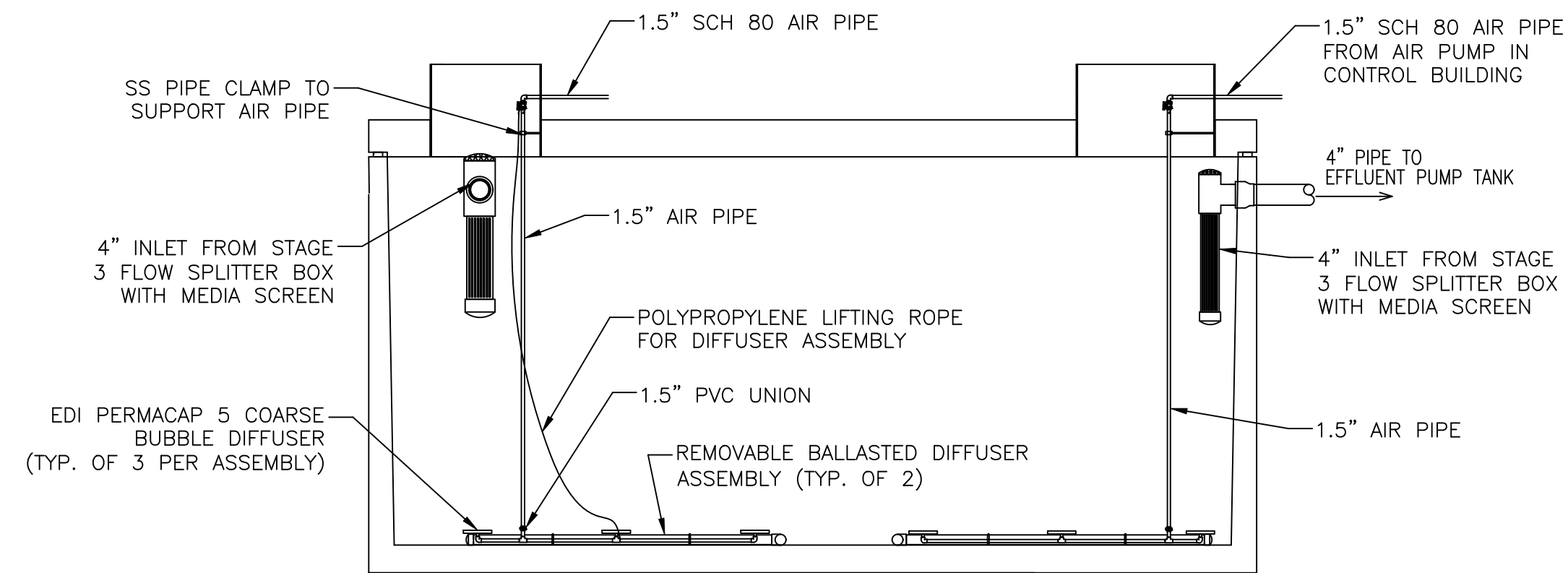
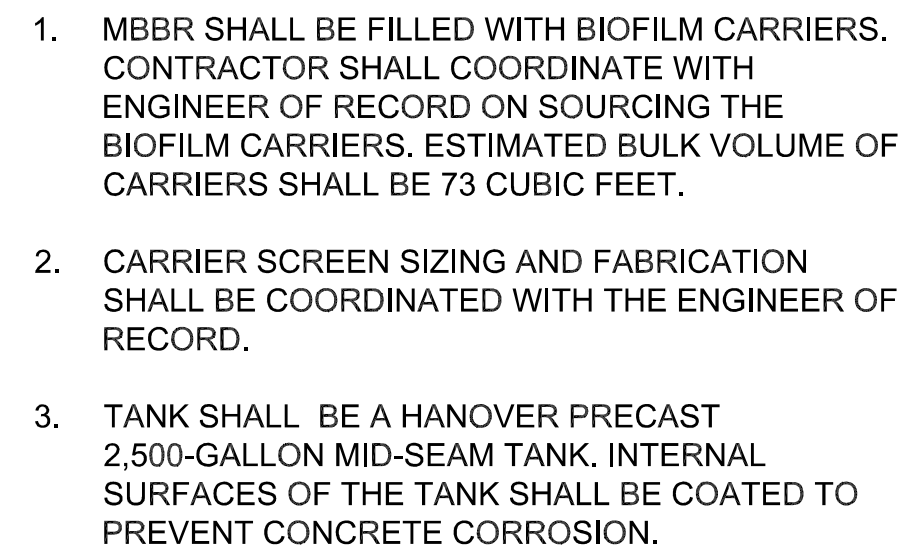
SHEET TITLE:

**STAGE 3
TREATMENT
DETAILS**

DRAWING SCALE: AS NOTED

DATE: 11/26/2024

18



PROFILE VIEW

INFLUENT FROM STAGE 3 TREATMENT

1.5" AIR PIPE FROM AIR PUMP IN CONTROL BUILDING

1.5" TRUE UNION BALL VALVE

30"

30"

30"

30"

24" RISERS

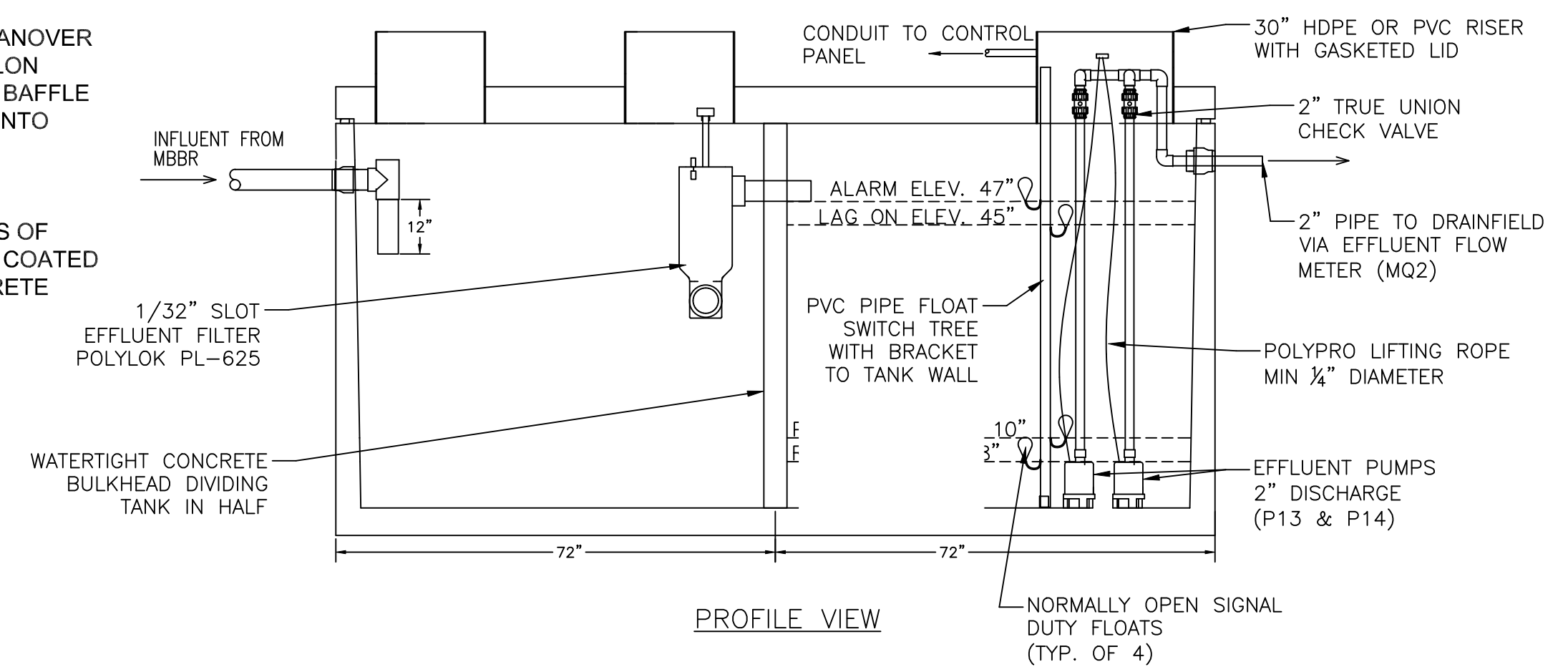
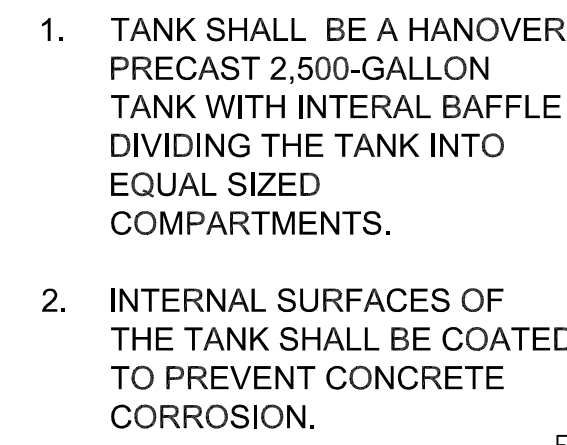
REMOVABLE BALLASTED DIFFUSER ASSEMBLY

4" PIPE TO EFFLUENT PUMP TANK

EDI PERMACAP 5 COARSE BUBBLE DIFFUSER (TYP. OF 3 PER ASSEMBLY)

PLAN VIEW

DETAIL 19-1
2,500 GALLON CONCRETE MOVING BED BIOREACTOR (MBBR) TANK

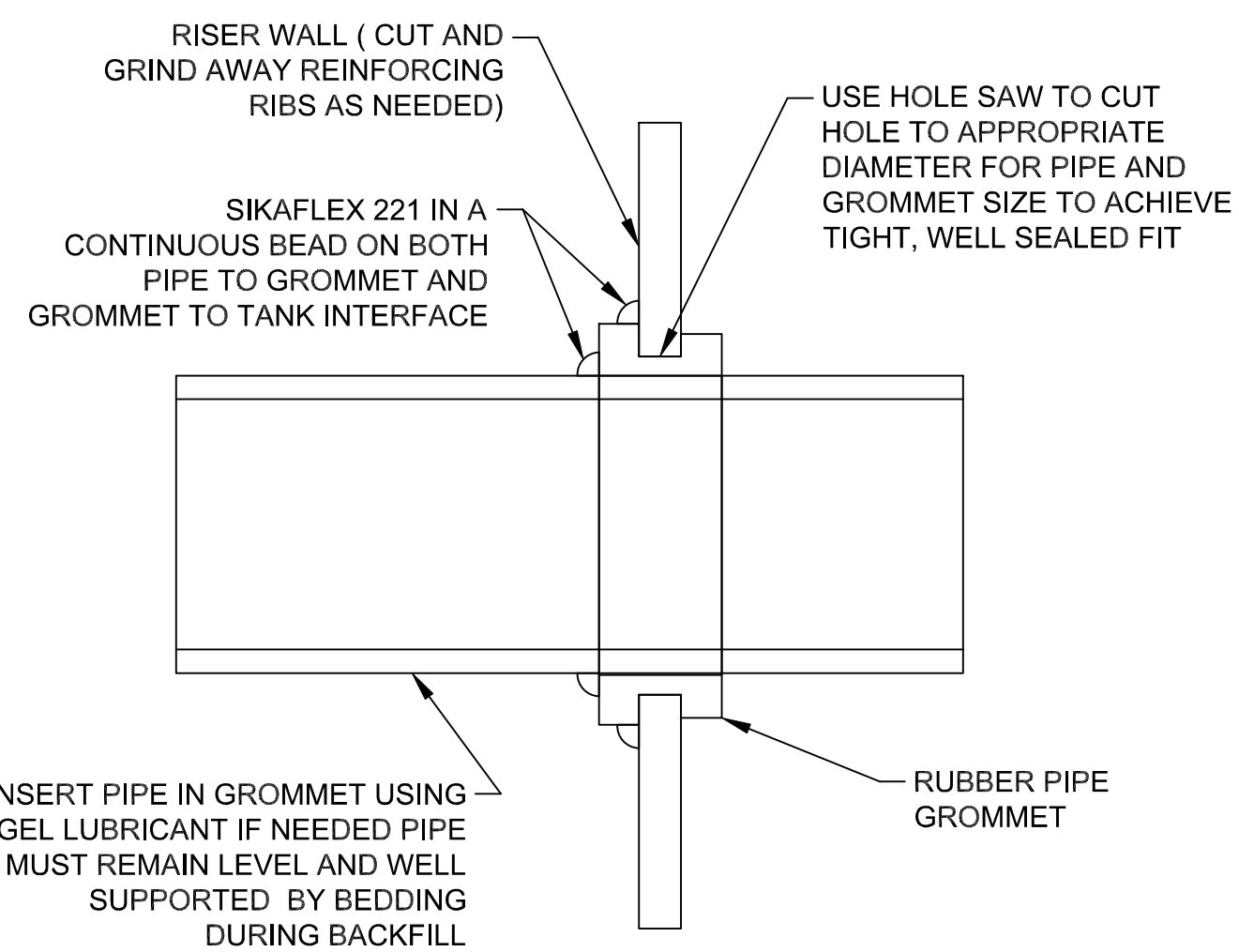


The diagram illustrates a float valve assembly installed in a tank. Key components and labels include:

- INFLUENT FROM SETTLING & FILTER TANK**: Indicated by an arrow pointing into the left side of the tank.
- 1/32" SLOT EFFLUENT FILTER POLYLOK PL-625**: A circular filter component located in the center of the tank.
- WATERTIGHT CONCRETE BULKHEAD DIVIDING TANK IN HALF**: A vertical line representing the divider.
- 2" TRUE UNION PVC BALL VALVE, TYPICAL**: A valve component located on the right side of the tank.
- ELECTRICAL CONDUIT**: A line connecting the valve assembly to the right side of the tank.
- NORMALLY OPEN SIGNAL DUTY FLOATS (TYP. OF 4)**: Four small circular components located near the valve assembly.
- 2" PIPE TO DRAINFIELD VIA EFFLUENT FLOW METER (MQ2)**: A pipe extending from the right side of the tank.

PLAN VIEW

DETAIL 19-2:
2,500 GALLON CONCRETE SETTLING & EFFLUENT PUMP TANK



DETAIL 19-3
RISER PENETRATION DETAIL (NOT TO SCALE)

[illegible]

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ENGINEERING, PLC.*

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PROJECT LOCATION:
ALBEMARLE COUNTY, VA

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DRAWING SCALE: AS NOTED

DRAWN BY:
DESIGNED BY:
CHECKED BY:

CBH
DJM
DJM

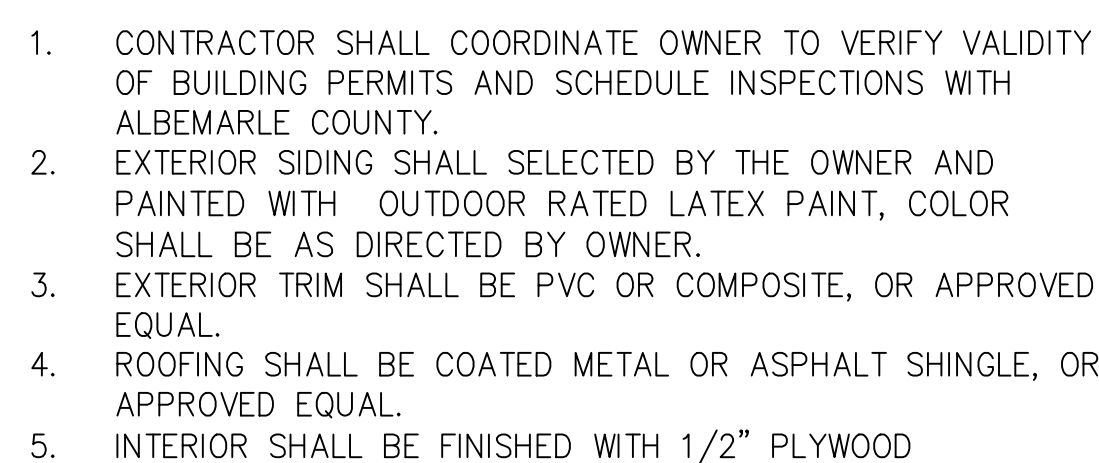
SHEET TITLE:

MBBR AND EFFLUENT PUMP TANK DETAILS

1. VAULT SHALL BE CONSTRUCTED FROM 30" DIAMETER PVC ULTRA-RIB PIPE.
2. LID SHALL BE HINGED HATCH.
3. BOTTOM OF VAULT AND ALL PIPE PENETRATIONS SHALL BE WRAPPED IN NON-WOVEN GEOTEXTILE TO PREVENT SOIL INTRUSION. GEOTEXTILE HELD IN PLACE WITH GORILLA-BRAND DUCT TAPE.



1. FLOW METER SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS INCLUDING MINIMUM PIPE RUNS BEFORE AND AFTER THE FLOW METER.
2. VAULT SHALL BE CONSTRUCTED FROM 30" DIAMETER PVC ULTRA-RIB PIPE.
3. LID SHALL BE HINGED ALUMINUM HATCH.
4. ALL PIPE AND FITTING SIZES AS SHOWN IN SCHEMATIC ON SHEET 12.



DETAIL 20-3: BUILDING CONSTRUCTION



DETAIL 20-4: CONTROL BUILDING LAYOUTS



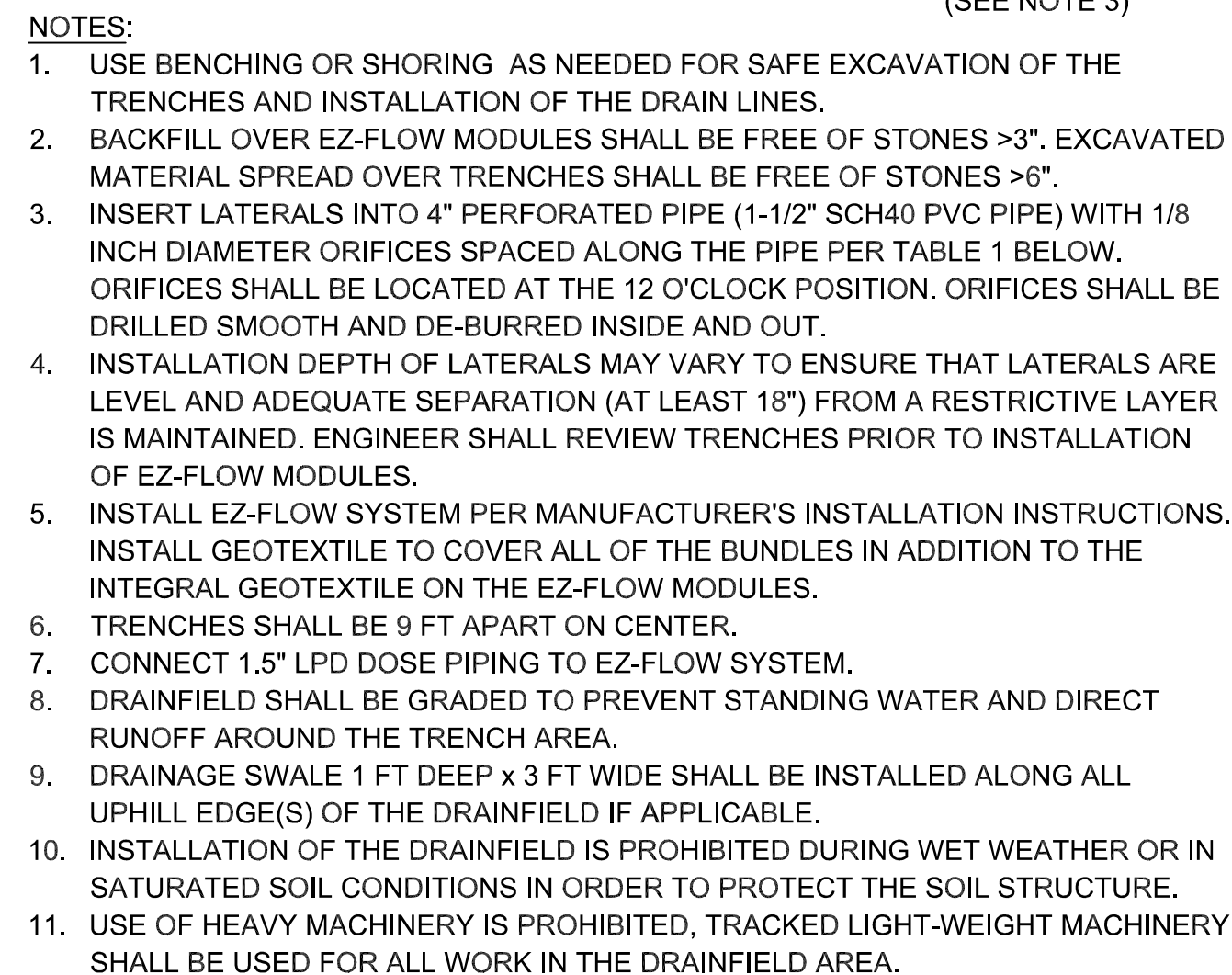
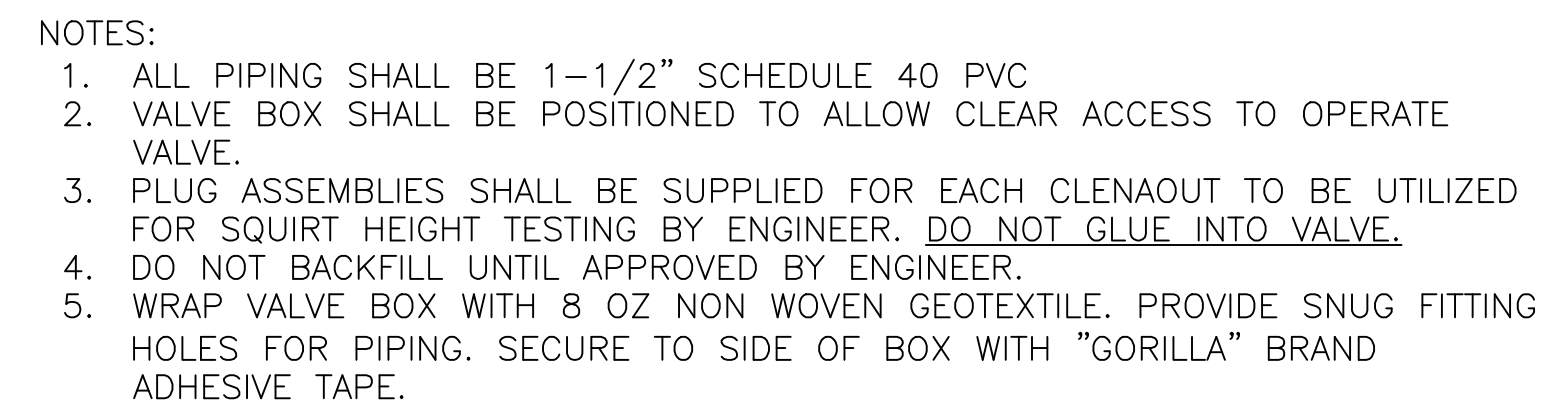
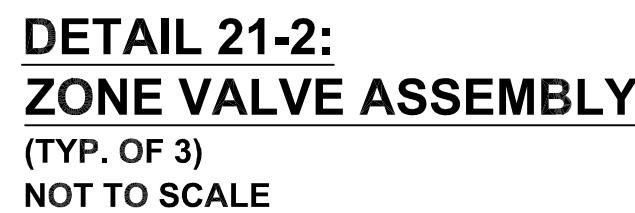
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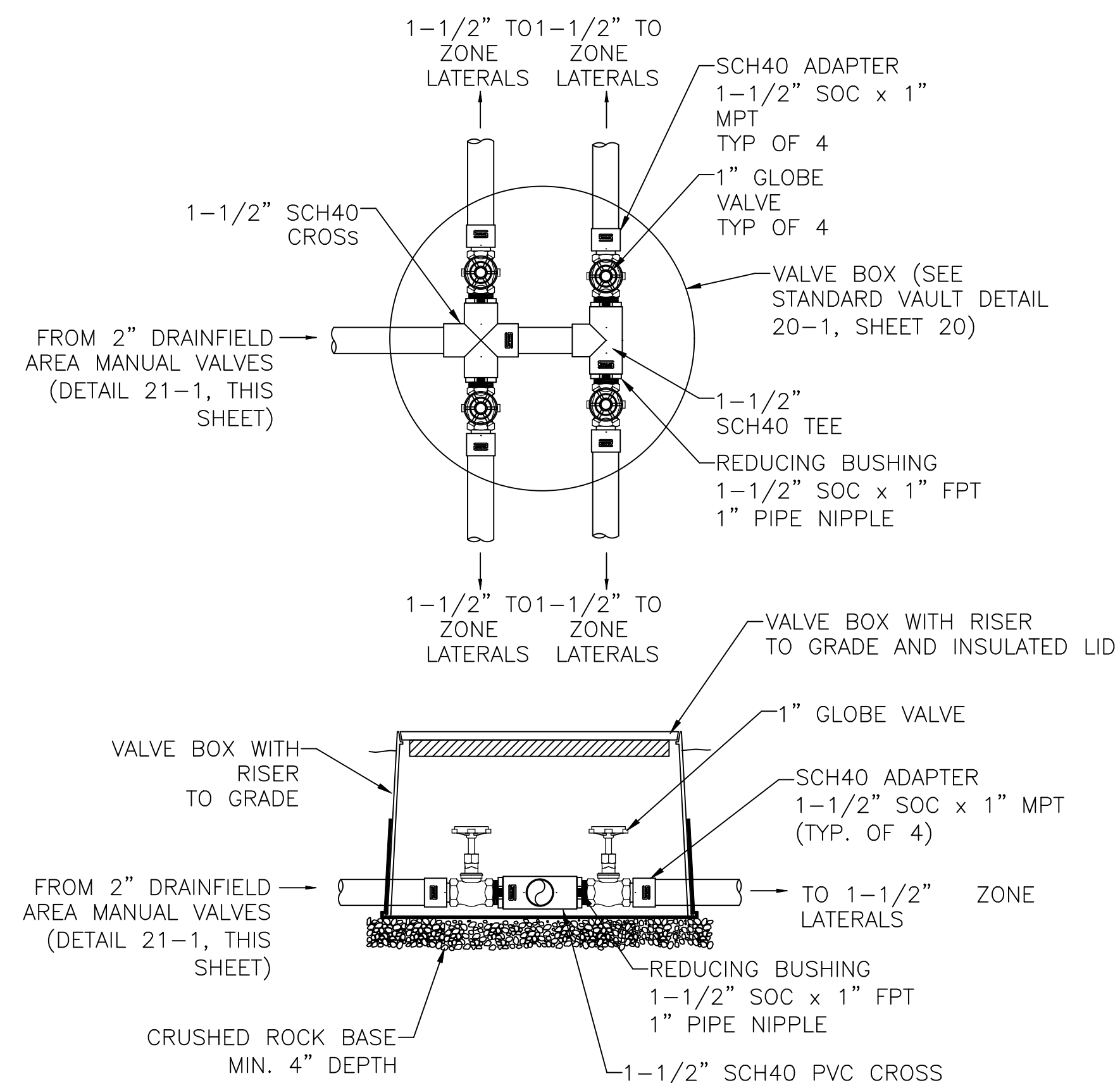
DATE: 11/26/2024

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FLOW METER & EQUIPMENT BUILDING DETAILS



PARAMETER	DRAINFIELD A	DRAINFIELD B	DRAINFIELD C
NUMBER OF LATERALS	9	12	8
NUMBER OF ZONES	3	4	4
MINIMUM LATERAL LENGTH	75 Ft	85 Ft	100 Ft
ORIFICE DIAMETER	1/8"		
ORIFICE SPACING	2'-3"	2'-6"	2'-0"
PERCOLATION RATE	65 MPI	90 MPI	60 MPI
HYDRAULIC LOADING RATE	0.94 GPD/SQ.FT.	0.56 GPD/SQ.FT.	0.83 GPD/SQ.FT.
TOTAL TRENCH BOTTOM AREA	2,025 SQ.FT.	3,060 SQ.FT.	2,400 SQ.FT.
ABSORPTION CAPACITY	1,904 GPD	1,714 GPD	1,992 GPD

[illegible]

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PROJECT NAME: INNISFREE VILLAGE WASTEWATER MANAGEMENT SYSTEM UPGRADES

PROJECT LOCATION:
ALBEMARLE COUNTY, VA

DRAWING SCALE: AS NOTED

DATE: 11/26/2024

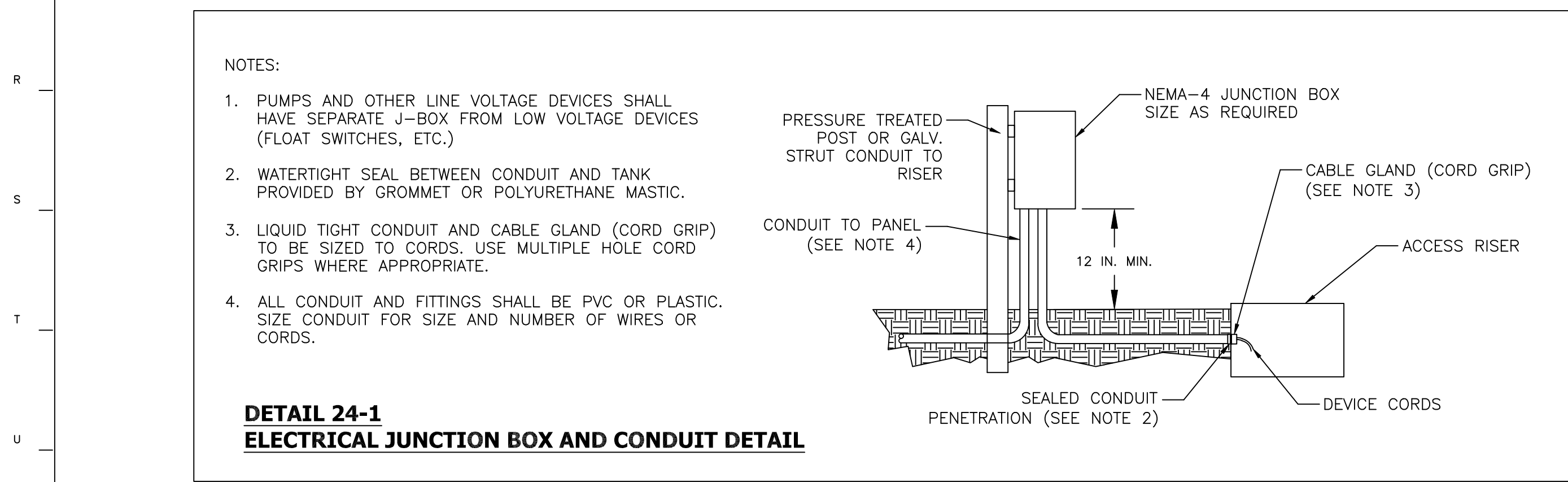
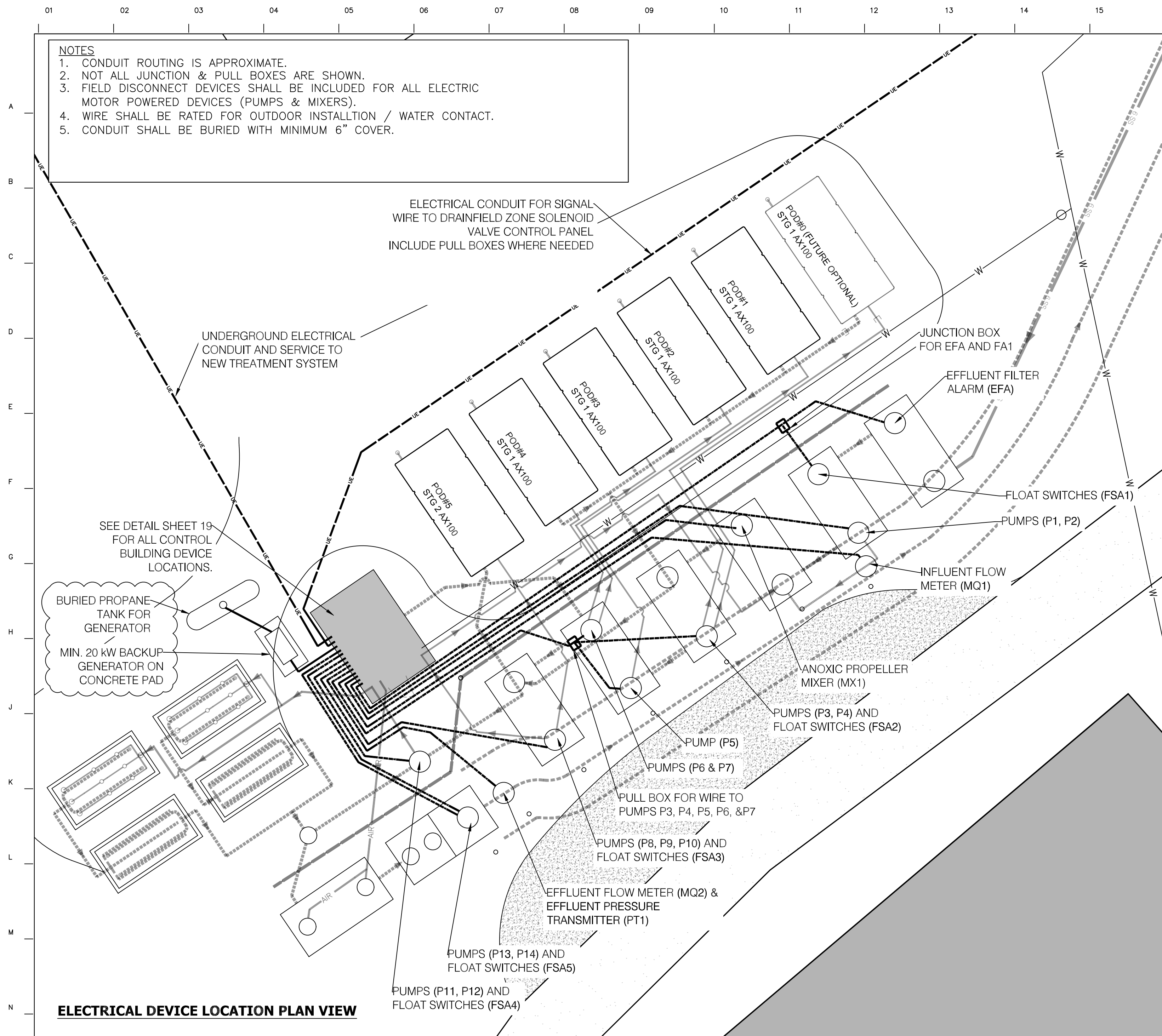
DRAWN BY:
DESIGNED BY:
CHECKED BY:

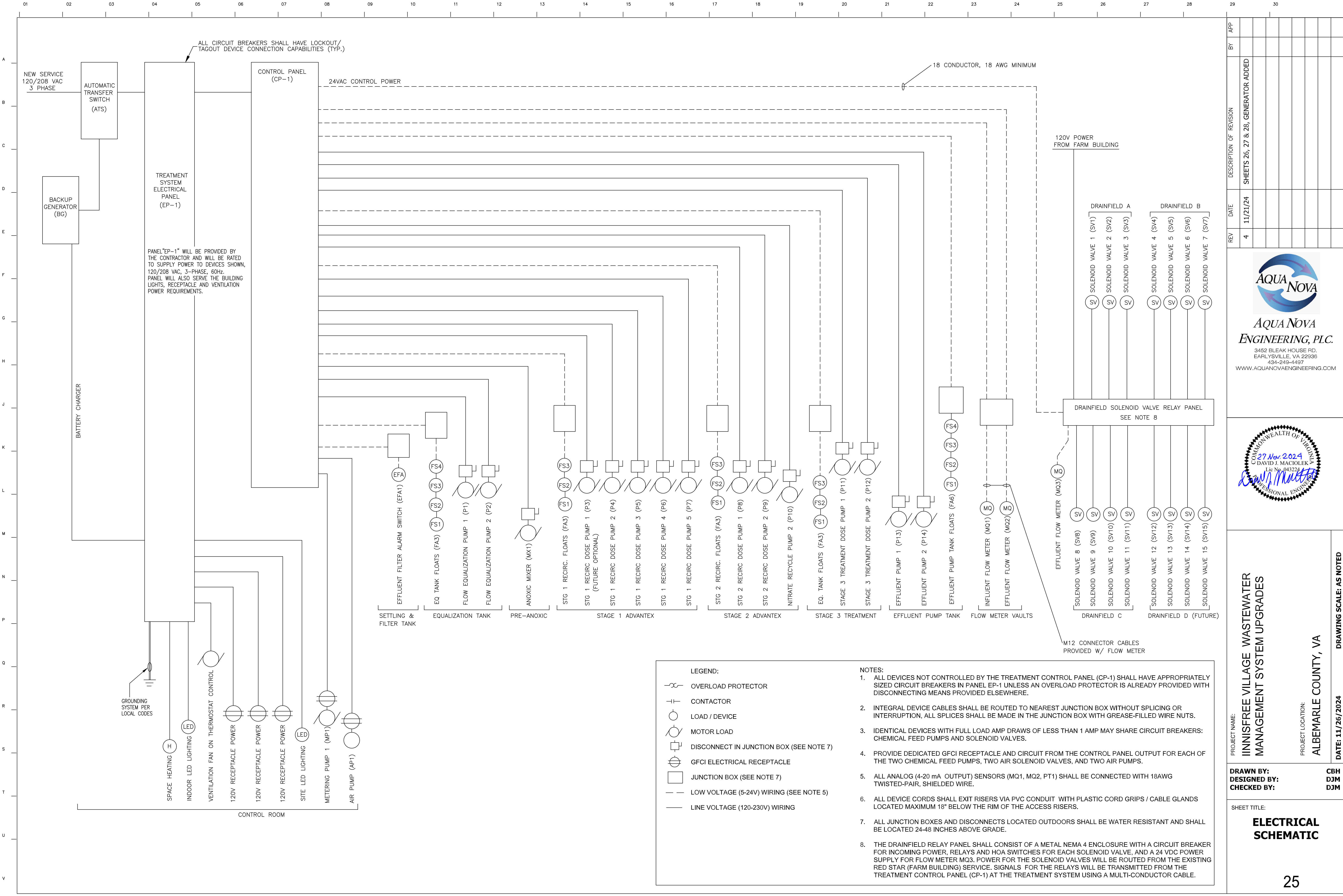
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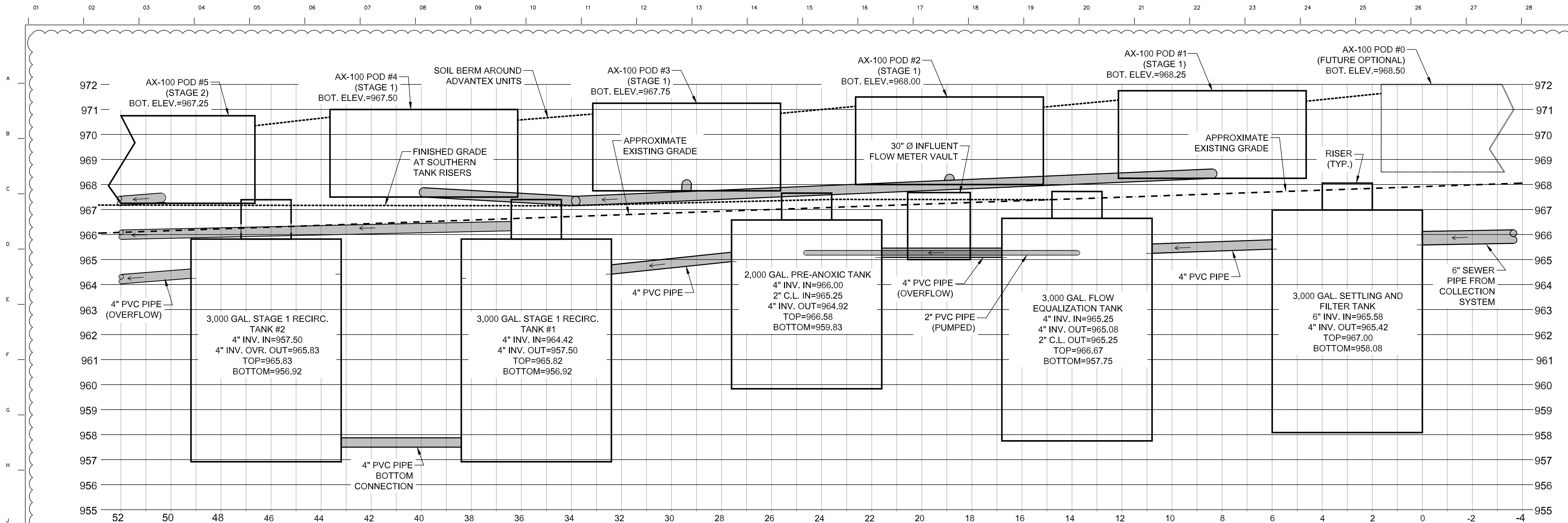
SHEET TITLE:

DISPERSAL SYSTEM DETAILS

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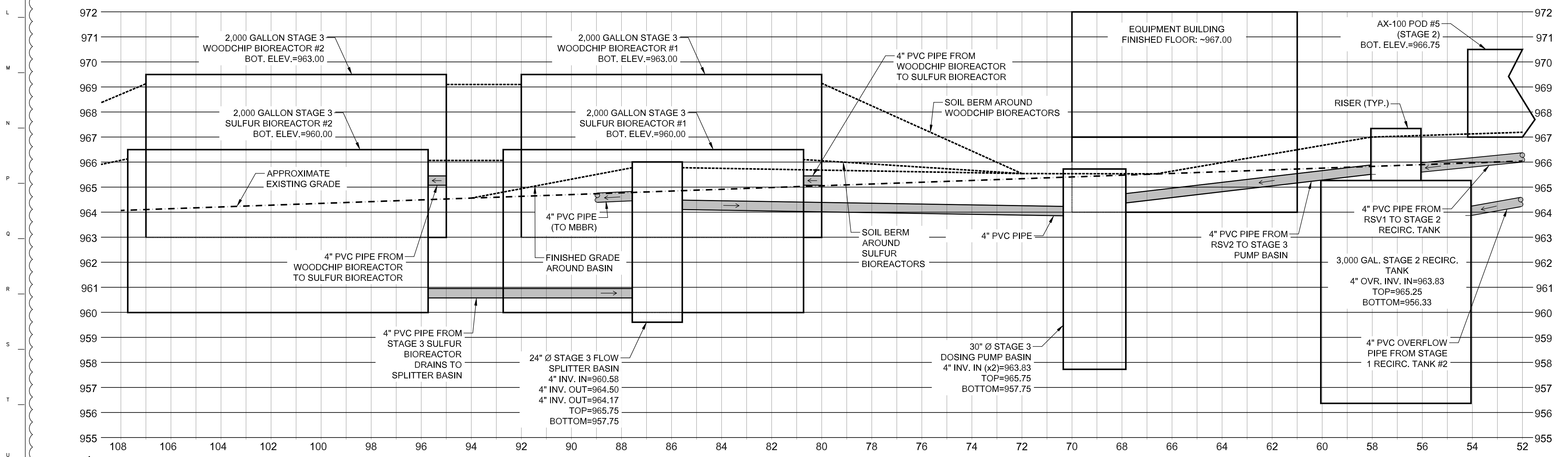




DETAIL 26-1: SYSTEM HYDRAULIC PROFILE - ACROSS THE TANKS - PART 1

HORIZONTAL SCALE: 1 INCH = 2 FT

NOTE: FOR CLARITY, NOT ALL PIPING AND PENETRATIONS ARE SHOWN. REFER TO PROCESS SCHEMATIC ON SHEET 12 AND LAYOUT ON SHEET 14 FOR DETAILS. ELEVATIONS VALUES ARE APPROXIMATE AND INTENDED TO ILLUSTRATE RELATIVE SLOPE AND POSITION OF PIPING AND TANKS. FIELD VERIFY.



DETAIL 26-2: SYSTEM HYDRAULIC PROFILE - ACROSS THE TANKS - PART 2

HORIZONTAL SCALE: 1 INCH = 2 FT



PROJECT NAME: IINNISFREE VILLAGE WASTEWATER MANAGEMENT SYSTEM UPGRADES		PROJECT LOCATION: ALBEMARLE COUNTY, VA		DATE: 11/26/2024	DRAWING SCALE: AS NOTED
DRAWN BY: DESIGNED BY: CHECKED BY:			CBH DJM DJM		
SHEET TITLE: TREATMENT SYSTEM HYDRAULIC PROFILE -ACROSS 26					

