TENNESSEE Wastewater
an Adenus Utility

851 Aviation Parkway
Smyrna, TN 37167

September 25, 2014

Mr. David Foster, Chief
Utilities Division
Tennessee Regulatory Authority
502 Deaderick Street, 4th Floor
Nashville, TN 37243

RE: Docket # 14-00062 – Clovercroft Acres - Data Response

Dear Mr. Foster:

Tennessee Wastewater Systems, Inc. provides the following information per your request dated September 23, 2014.

1. If CCN is granted today, when will the system be "up and running"? Will it be installed in phases or completely installed for all 120 lots?

Response: The system would be expected to be up and running approximately 120-180 days after all prerequisite approvals are received from the corresponding governmental agencies. The system will be completely installed up front for all phases.

2. What assurances are in place that the wastewater system at Clovercroft Acres will be within the time frame of the answer to number 1 above?

Response: TWSI cannot make any guarantees as to the timeframe of the system completion; however, we would like to reference our 20 year track record as a utility as evidence of the extremely high likelihood that the system completion will occur in this window.

3. Provide a copy of the Professional Services Agreement between Adenus Solutions Group, LLC and the developer.

Response: Not currently available.

4. Is the phone number listed for emergency contact 220-7200 answered 24/7?

Response: The main line for the Adenus building is 615-220-7200 (toll free 888-4-ADENUS also forwards to 615-220-7200). That line is answered by an attendant during regular business hours (7:30AM - 4:30PM M-F). After hours, an automated answering service gives the caller options for either leaving a voicemail for customer service or reporting a maintenance emergency. Those calls are forwarded to our Maintenance Hotline (877-669-0786, which is posted on all customer statements as well as the tennesseewastewater.com

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website). Callers who leave a message on the maintenance hotline after hours have their message pushed out to all key maintenance personnel via visual voicemail.

5. Will Adenus Operations be responsible for the maintenance of the STEP/STEG tank and pumps or grinder pumps. If so, provide written documentation.

Response: No. The nature of this question implies a fundamental misunderstanding by TRA staff of the collection system technologies outlined in our utility specifications. TWSI has never used grinder pumps for any of its systems. A recent reorganization of the Adenus companies caused certain maintenance personnel previously employed by Adenus Operations to now become full time employees of TWSI. For Clovercroft Acres all operation and maintenance duties will be performed by an employee of Tennessee Wastewater and not an affiliate company.

6. Provide the name of the construction company building the collection, treatment and dispersal system(s).

Response: The developer has not selected a construction contractor. That decision will be made once a sewer provider is granted the authority to provide service to the project.

7. Please provide a copy of the proposed Site Plan for the sewage treatment and/or disposal system used with the noted 36,000 gallon capacity and 120 lots that has been approved by the Williamson County Regional Planning Commission in preparation of submitting the Final Plat for Clovercroft Acres to Williamson County for the development.

Response: See Attachment “A”.

8. Provide a copy of any and all contracts for this wastewater system by and between the Develop, the Construction Company(s) building the wastewater system and the Utility.

Response: Not currently available.

9. Has the builder of the wastewater system provided a performance bond to and supporting security to Williamson County for completion of the system? Is so, please provide an explanation of what ensures that the funds are available for the wastewater system and that it will be built to completion, inclusive of treatment, collection and dispersal systems.

Response: Not currently available.

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10. Please provide a detailed breakdown of the $675,000 Contribution in Aid of Construction by cost of land, treatment system, collection and dispersal system, materials and installation. The estimate shall be calculated utilizing recent actual construction costs for similar systems. Alternatively, provide the total cost of construction of the Wastewater Treatment and Disposal System as prepared for Williamson County to be submitted as part of the DDR and an estimate of the land value that the Utility will potentially be acquiring. .

Response: A detailed breakdown is currently impossible because this project is still in the planning stages. Once plans have been approved by the regulatory authority, the project can then be broken down for pricing. Until then, pricing can only be speculative based on historical costs from previous TWSI serviced projects. The $675,000 number is indicative of what a typical RSF and dripfield system of this size has cost and is subject to change. It also does not include the cost of installing the collection system.

11. Please provide the certified operator that will be the contact for Clovercroft Acres.

Response: Jesse Hutcherson is expected to be TWSI's certified operator for the project.

If you have any further questions, or need any additional information, please feel free to contact me.

Sincerely,

Matt Pickney

Matt Pickney, Operations Manager
Tennessee Wastewater Systems, Inc.

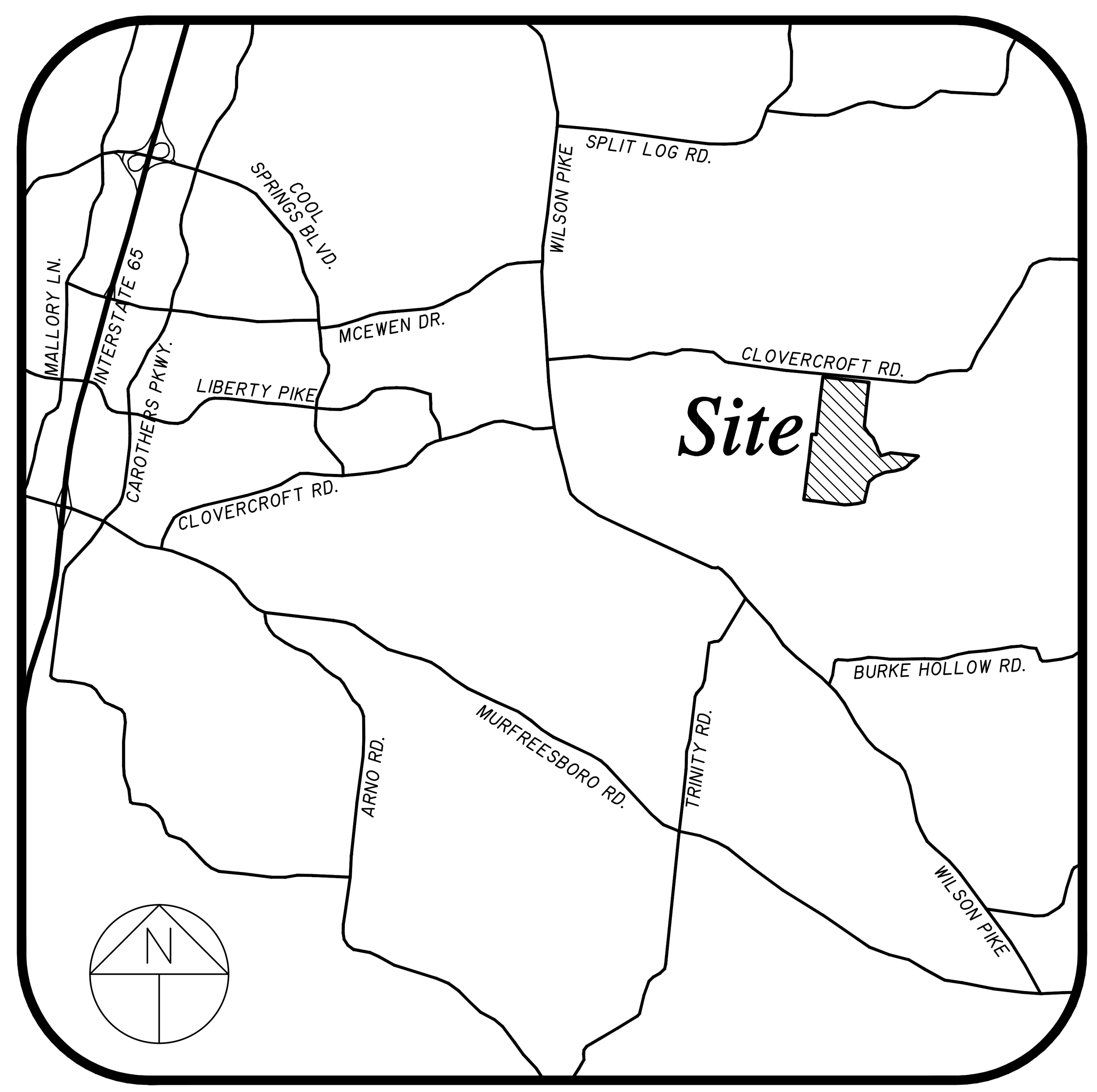
615.220.7202 www.tennesseewastewater.com Fax: 615.220.7207

Attachment "A"

Clovercroft Acres Subdivision
S.T.E.P. System Design
Wastewater Site Plan
Williamson County, Tennessee
SOP#: 13026
Construction Drawings

Drawing Index

Sheet No.	Title
1	Cover Sheet
2	Soils Map
3	Site Plan
4	Grading & Drainage Plan
5	Sanitary Sewer Profile
6	Notes & Details
7-11	S.T.E.P. Details



Site Location Map
Not To Scale

Owners/Developer:
Land Development.com
c/o Ardavan Afrakhteh
798 Old Hickory Blvd.
Brentwood, TN 37027

Consultant:
S.E.C., Inc.
850 Middle Tennessee Blvd.
Murfreesboro, TN 37129
Phone: (615) 890-7901

Floodplain Note:
A Portion of this site lies within a 100 Year Flood Hazard Area per F.E.M.A. Map No. 47187C0240F dated Sept. 29, 2006

Land Data:
Existing Zoning: RD-1
Proposed Zoning:
120 Lot on 193.77± Acres

Yard Requirements:
Front: 35'
Side: 5'
Rear: 30'

Deed Reference:
Map 81, Parcel 5.00, D.BK. 6090, PG. 637
19th. Civil District, Williamson County, Tennessee

S.T.E.P. System Data:
Design Flow = 36,000 gpd
Land Application Area Required: 4.13 Ac.
Land Reserve Area Required: 2.07 Ac.
Total Area Required = 6.20 Ac.±

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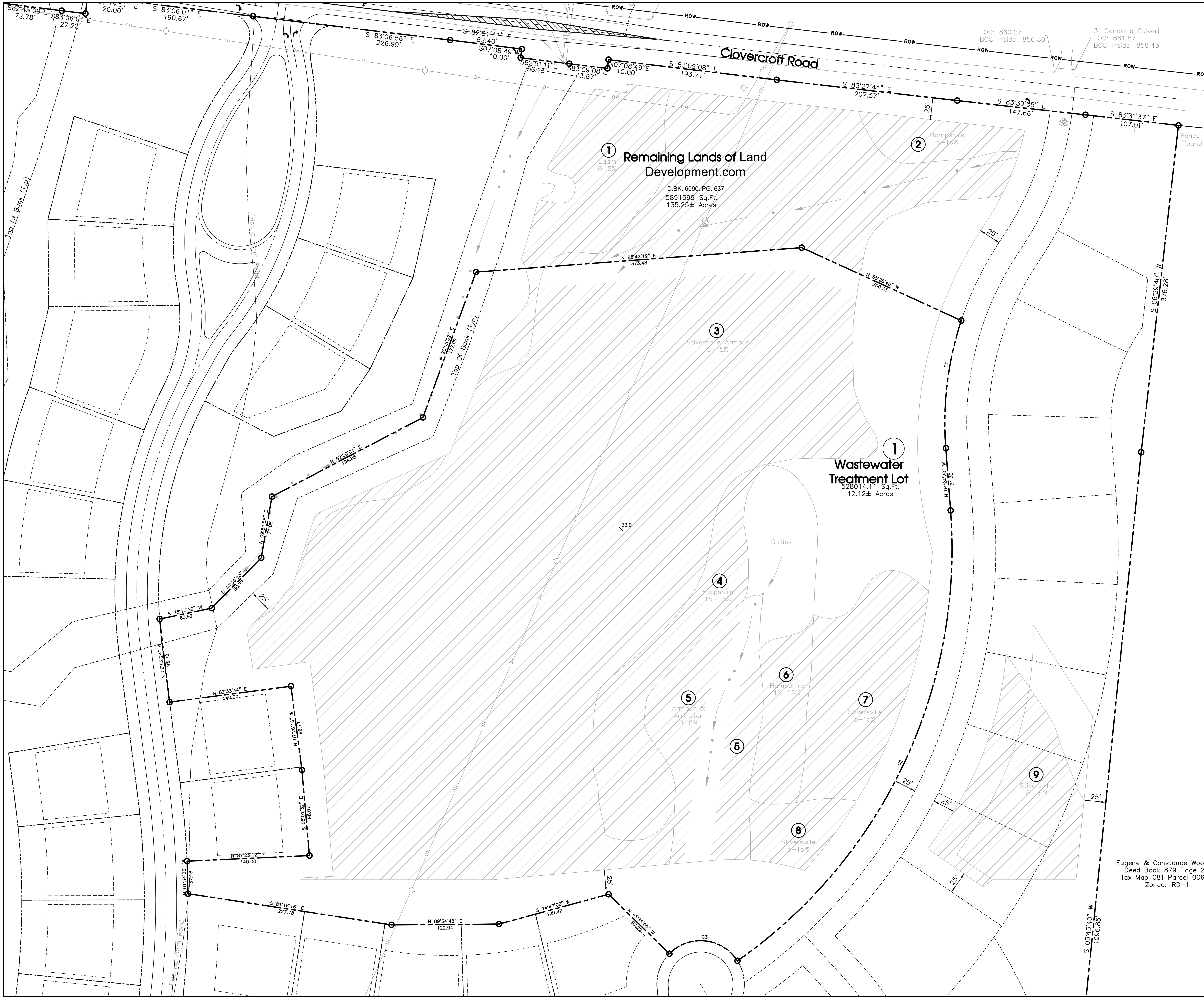
850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
PHONE: (615) 890-7901 E-MAIL: JREED@SEC-CIVIL.COM FAX: (615) 895-2567

REVIEW SET
(Not Intended For Construction)

JAMES F. REED III REGISTERED ENGINEER AGRICULTURE COMMERCE No. 109038 STATE OF TENNESSEE

By:________________________ Date:________________________
James F. Reed III, P.E. TN. Reg. #109038



Legend:

□	EXIST. CONCRETE MONUMENT	◇	EXIST. FIRE HYDRANT
●	IRON PIN SET (I.P.S.)	⊕	BENCHMARK
○	IRON PIN FOUND (I.P.F.)	◩	BLOW OFF VALVE
◇	EXIST. UTILITY POLE	⊗	SOLENOID VALVE
EXISTING ELECTRIC	— OH —		
BOUNDARY LINE	— - —		
EASEMENTS	— — —		
RIGHT OF WAY	— ROW —		
EXISTING TREELINE			
EXISTING FENCELINE	— X — X —		
MINIMUM BUILDING SETBACK LINE	— MBSL —		
EXISTING GAS LINE	— GAS — GAS —		
EXISTING STORM	— STM — STM —		
EXISTING CONTOUR LINES	— 601 —		
EXISTING WATER	— W — W —		

Soil Mapping Provided By:
John Gibi
2103 Donna Kaye Ct.
Mt. Juliet, TN 37122
(615) 351-4512
Date: 7-17-13

N

50' 0 50' 100'
SCALE: 1"= 50'

Soil Chart:

1. Egam 0–5%, 0.56±Acres
2. Hampshire 5–15%, 0.17± Acres
3. Stiversville–Armour 5–15%, 7.56±Acres
4. Hampshire 15–25%, 0.56±Acres
5. Armour–Arrington 0–5%, 0.43±Acres
6. Hampshire 15–25%, 0.25±Acres
7. Stiversville 5–15%, 0.58±Acres
8. Stiversville 5–15%, 0.16±Acres
9. Stiversville 5–15%, 0.59±Acres

Total Soils: 10.86± Acres

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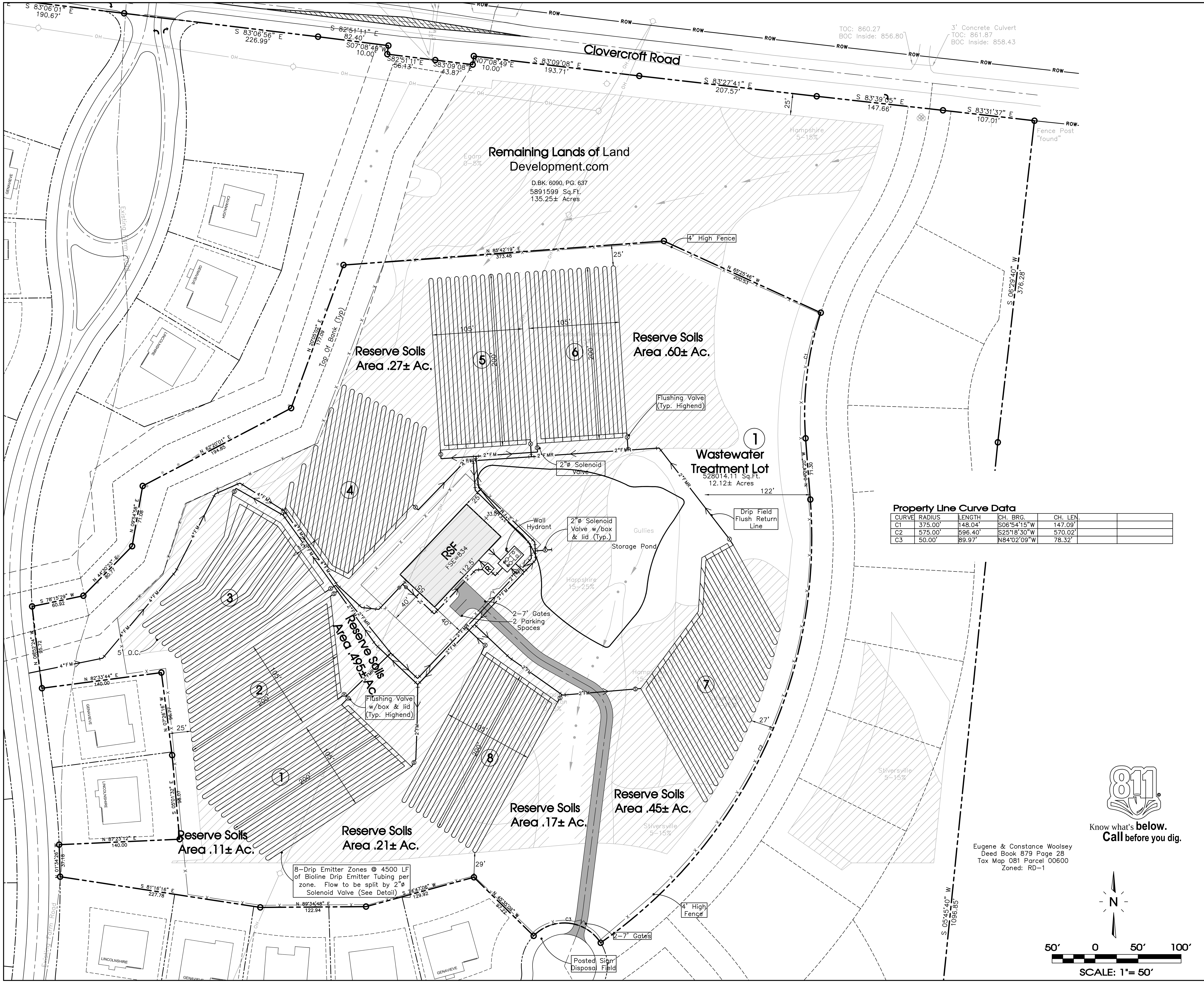
REVIEW SET
(Not Intended For Construction)

Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

Soils Map

REVISED:
DRAWN: SJA
DATE: 7-31-14
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040
SHEET:
2 of 11



Property Line Curve Data

CURVE	RADIUS	LENGTH	CH. BRG.	CH. LEN.		
C1	375.00'	148.04'	S06°54'15"W	147.09'		
C2	575.00'	596.40'	S25°18'30"W	570.02'		
C3	50.00'	89.97'	N84°02'09"W	78.32'		

Legend:

	EXIST. CONCRETE MONUMENT		INLET PROTECTION FILTER
	IRON PIN SET (I.P.S.)		HANDICAP PARKING SYMBOL
	IRON PIN FOUND (I.P.F.)		HC SIGN
	EXIST. SIGN POST		HEADWALL
	EXIST. SEWER CLEANOUT		WINGED HEADWALL
	EXIST. MANHOLE (SEWER & PHONE)		MANHOLE
	EXIST. CATCH BASIN (STORM SEWER)	63.25 ×	PROPOSED SPOT ELEVATION
	EXIST. WATER/GAS VALVE	(63.25) ×	EXIST. SPOT ELEVATION
T	EXIST. TELEPHONE RISER		POST INDICATOR VALVE
G	EXIST. GAS RISER		REDUCER
E	ELECTRICAL ENCLOSURE		REMOTE FIRE DEPT. CONNECTION
W	EXIST. WATER METER	1	REVISION NUMBER
	EXIST. UTILITY POLE		RIP RAP
	EXIST. FIRE HYDRANT		RUNOFF FLOW ARROW
	BENCHMARK	>	SEWER/STORM FLOW DIRECTION
	BLOW OFF VALVE		TRAFFIC ARROW
	CONCRETE BOLLARD		TURN LANE ARROWS
	CATCH BASIN	V.A.	VAN ACCESSIBLE HANDICAP DESIGNATION
	CURB INLET	W	WATER METER
	AREA DRAIN		WHEEL STOP
	CONCRETE THRUST BLOCK		GREASE TRAP
	DOUBLE DETECTOR CHECK VALVE	#1	DRAINAGE STRUCTURE DESIGNATION
S	SOLENOID VALVE	A	DRAINAGE PIPE DESIGNATION
	FIRE HYDRANT		CONCRETE SIDEWALK
G	GAS METER		EXTRUDED CURB
	GATE VALVE & BOX		CURB & GUTTER
	EXTERIOR CLEANOUT		CONCRETE SWALE

EXISTING PHONE	PH
EXISTING ELECTRIC	OH
BOUNDARY LINE	
EASEMENTS	
RIGHT OF WAY	ROW
EROSION CONTROL SILT FENCE	SF SF
EXISTING TREELINE	
EXISTING FENCELINE	X X
MINIMUM BUILDING SETBACK LINE	MBSL
PHASE BOUNDARY	
EXISTING GAS LINE	GAS GAS
PROPOSED GAS LINE	GAS GAS
EXISTING STORM	STM STM
PROPOSED STORM	STM STM
EXISTING CONTOUR LINES	601
PROPOSED CONTOUR LINES	601
EXISTING SANITARY SEWER	SS
PROPOSED SANITARY SEWER	SS
EXISTING WATER	W W
PROPOSED WATER	W W

S.T.E.P. LEGEND

- S — SEPTIC TANK
- D — DOSING TANK
- R — RECIRCULATING TANK (5000 GAL)
- T — TREATMENT TANK (5000 GAL)
- UV — ULTRAVIOLET DISINFECTION
- FM — FORCE MAIN
- FMR — FORCE MAIN RETURN (FLUSH LINE)
- SOLENOID VALVE
- CHECK/FLUSHING VALVE
- TL — TIGHT LINE
- ECO (EXTERIOR CLEAN OUT)

FLOOR AREA RATIO (F.A.R.)

FLOOR AREA (ALL FLOORS) / BASE SITE AREA = 0.29 Ac. / 20 Ac.

REQUIRED F.A.R. = 0.10
PROVIDED F.A.R. = 0.015

LANDSCAPE SURFACE RATIO (L.S.R.)

LANDSCAPE AREA / BASE AREA = 18 Ac. / 20 Ac.

REQUIRED L.S.R. = 0.70
PROVIDED L.S.R. = 0.90

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JAMES F. REED III · REGISTERED ENGINEER · No. 109038 · STATE OF TENNESSEE

REVIEW SET
(Not Intended for Construction)

Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

REVISED:
DRAWN: SJA
DATE: 7-31-14
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040

Site Plan

SHEET:

Legend:

	EXIST. CONCRETE MONUMENT		INLET PROTECTION FILTER	EXISTING PHONE	PH
	IRON PIN SET (I.P.S.)		HANDICAP PARKING SYMBOL	EXISTING ELECTRIC	OH
	IRON PIN FOUND (I.P.F.)		HC SIGN	BOUNDARY LINE	
	EXIST. SIGN POST		HEADWALL	EASEMENTS	
	EXIST. SEWER CLEANOUT		WINGED HEADWALL	RIGHT OF WAY	ROW
	EXIST. MANHOLE (SEWER & PHONE)		MANHOLE	EROSION CONTROL SILT FENCE	SF SF
	EXIST. CATCH BASIN (STORM SEWER)	63.25 ×	PROPOSED SPOT ELEVATION	EXISTING TREELINE	
	EXIST. WATER/GAS VALVE	(63.25) ×	EXIST. SPOT ELEVATION	EXISTING FENCELINE	X X
T	EXIST. TELEPHONE RISER		POST INDICATOR VALVE	MINIMUM BUILDING SETBACK LINE	MBSL
G	EXIST. GAS RISER		REDUCER	PHASE BOUNDARY	
E	ELECTRICAL ENCLOSURE		REMOTE FIRE DEPT. CONNECTION	EXISTING GAS LINE	GAS GAS
W	EXIST. WATER METER	1	REVISION NUMBER	PROPOSED GAS LINE	GAS GAS
	EXIST. UTILITY POLE		RIP RAP	EXISTING STORM	STM STM
	EXIST. FIRE HYDRANT		RUNOFF FLOW ARROW	PROPOSED STORM	STM STM
	BENCHMARK	>	SEWER/STORM FLOW DIRECTION	EXISTING CONTOUR LINES	601
	BLOW OFF VALVE		TRAFFIC ARROW	PROPOSED CONTOUR LINES	601
	CONCRETE BOLLARD		TURN LANE ARROWS	EXISTING SANITARY SEWER	SS
	CATCH BASIN	V.A.	VAN ACCESSIBLE HANDICAP DESIGNATION	PROPOSED SANITARY SEWER	SS
	CURB INLET	W	WATER METER	EXISTING WATER	W W
	AREA DRAIN		WHEEL STOP	PROPOSED WATER	W W
	CONCRETE THRUST BLOCK		GREASE TRAP		
	DOUBLE DETECTOR CHECK VALVE	#1	DRAINAGE STRUCTURE DESIGNATION		
S	SOLENOID VALVE	A	DRAINAGE PIPE DESIGNATION		
	FIRE HYDRANT		CONCRETE SIDEWALK		
G	GAS METER		EXTRUDED CURB		
	GATE VALVE & BOX		CURB & GUTTER		
	EXTERIOR CLEANOUT		CONCRETE SWALE		

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Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

REVISED:
DRAWN: SJA
DATE: 7-31-14
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040
SHEET: 4 of 11

Grading & Drainage Plan

Grading and Drainage Notes:

1. The site work contractor shall coordinate the installation of all underground utilities with his work. All underground utilities (water, sanitary sewer, storm sewer, electrical conduit, irrigation sleeves, and any other miscellaneous underground utilities, devices, or structures), shall be in–place prior to the placement of base course material.

2. The contractor shall cut existing pavement as necessary to assure a smooth fit and continuous grade.

3. The contractor shall verify horizontal and vertical location of all existing storm sewer structures, pipes and all utilities prior to construction.

4. Clearing and grubbing limits shall include all areas disturbed by grading operation.

5. Any graded or disturbed areas shall have 4 inches of topsoil, seed, mulch, fertilizer and water applied until a healthy stand of grass is obtained. The restoration shall closely follow construction.

6. A Portion of this site lies within Zone AE, in a 100 Year Flood Hazard Area per F.E.M.A. Map No. 47187C0240F dated September 29, 2006.

7. All cut/fill slopes and drainage swales shall be stabilized to the satisfaction of the Williamson County Engineering Department. If stabilization is not achieved by seeding or sodding, then more stringent measures such as erosion control fabric, permanent turf reinforcement matting or concrete lining shall be used.

8. Contact the Williamson County Engineering Department at 615–790–5809 to request permits to perform work within the public right–of–way.

9. Any improvements or modifications within the public right–of–way require the approval of the Williamson County Highway Department.

Erosion Control Notes:

1. The site contractor is responsible for establishing and maintaining suitable erosion and sediment control devices on–site during construction as required to prevent silt from leaving site. Silt will not be allowed beyond construction limits.

2. The contractor is responsible for removing silt from site if not reusable on–site and assuring plan alignment and grade in all ditches at completion of construction.

3. The contractor is responsible for cleaning out all storm drainage structures, including flumes, pipes, etc., prior to completion of this project.

4. Erosion control shall be provided for all cut and fill operations within the limits of the construction site, throughout the construction period to provide the site with maximum protection from erosion at all times.

5. Erosion control measures are to be installed prior to any grading on–site and are to be maintained in place until stabilization of erodable soils has been accomplished.

General Utility Notes:

1. Existing utility lines shown are approximate locations only. The contractor shall field verify all existing utility line locations prior to any construction. Any deviations from the design locations shall be reported to the owner or engineer prior to beginning construction.

2. The contractor will provide all necessary protective measures to safeguard existing utilities from damage during construction of this project. In the event that special equipment is required to work over and around the utilities, the contractor will be required to furnish such equipment. The cost of protecting utilities from damage and furnishing special equipment will be included in the price bid for other items of construction.

3. The contractor shall notify each individual utility owner of his plan of operation in the area of the utilities, prior to commencing work, the contractor shall contact the utility owners and request them to properly locate their respective utility on the ground. This notification shall be given at least three (3) business days prior to commencement of operations around the utility.

4. The contractor shall refer to engineer's plans and specifications for actual location of all utility entrances to include sanitary sewer laterals, domestic water, and electrical service. This contractor shall coordinate installation of utilities in such a manner as to avoid conflicts and assure proper depths are achieved as well as coordinating with the regulatory agency as to location and scheduling of tie–ins/connections to their facilities.

5. All underground utilities (water, sewer, storm sewer, electrical conduit, irrigation sleeves, and any other miscellaneous), shall be in–place prior to the placement of base course material.

6. Location of site utilities shall be verified with proper utility company providing service.

7. In Tennessee it is a requirement per "the underground utility damage prevention act" that anyone who engages in excavation must notify all known utility owners, no less than three nor more than ten working days, prior to their intended excavation. A list of these utility owners may be obtained from the county register of deeds those utility owners who participate in the Tennessee one call system can be notified toll free at 1–800–351–1111.

S.T.E.P. System General Notes:

1. The location of treatment system components as shown are general in nature. Minor field adjustments may be necessary. The contractor may request to modify the location of the components through the owner and the Tennessee Division of Water Pollution Control.

2. This design is for the treatment and disposal of wastewater collected from Clovercroft Acres, design flow 36,000 gpd.

3. All flows for this system shall be controlled and monitored by the MVD (Smart) Panel. This monitoring shall be considered the flow meter for this system.

4. The minimum horizontal separation between the closest two points of the water and sewer line is ten (10) feet. The minimum vertical separation between the closest two points of the water and sewer line shall be 18 inches, with waterlines being above sewerlines.

5. Contractor shall comply with the most current requirements, specifications, and detail drawings for the installation of STEP system collection lines as outlined in the WPC Design Criteria Section 2.4.1.

6. All trenches, pipe laying, and backfilling shall be in accordance with federal O.S.H.A. regulations.

7. Utility contractor shall have approval of all governing agencies having jurisdiction over this system prior to installation.

8. All tanks shall be one–piece, structurally sound, watertight tanks as manufactured by Jarrett Concrete Products, or approved equal.

9. Testing procedure for water tightness is as follows. Fill tank 2" into the riser. After a period of 24 hours, the water level should have lowered no more than ½".

10. Collection forcemain shall be 2"ø, 3"ø, & 4"ø SDR21 purple PVC pipe (color to be coordinated with IRM Utility Co.). Forcemain shall be tested and rated for a 150 PSI working pressure.

Site Notes:

1. Contractor shall immediately notify the engineer of any discrepancies found between these plans, and/or field conditions prior to construction.

2. Apparent errors, discrepancies, or omissions on the drawing shall be brought to the attention of the owner prior to bid submittal. The contractor may not use apparent errors, discrepancies, or omissions present on the drawings presented for bidding for additional charges after bids have been submitted. The architect shall be permitted to make corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the contract documents.

3. The contractor shall stake all improvements using the geometric data provided in the drawings. It is the sole responsibility of the contractor to completely stake and check all improvements to ensure adequate positioning, both horizontal and vertical, prior to the installation of any improvements. No digital file will be provided.

4. The notes and plans shown call attention to certain required features of the construction but do not claim to cover all details of design and construction. The contractor shall furnish and install the work complete and ready for operation.

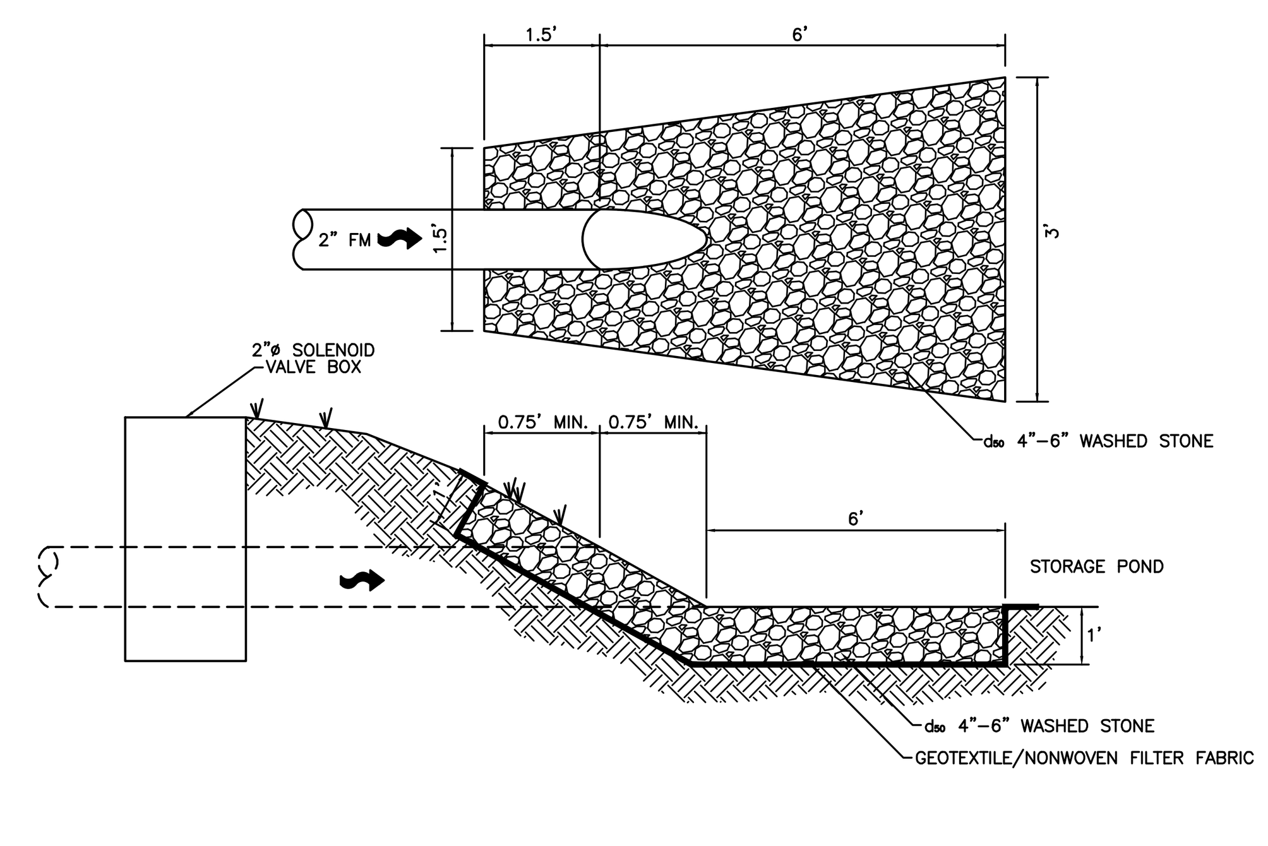
5. After completion of construction, the contractor shall perform site cleanup to remove all trash, debris, excess materials, equipment, and other deleterious materials associated with construction. The contractor is expressly responsible for ensuring the site is clean and in operable condition at the time of final acceptance.

6. The contractor is responsible for the protection and replacement of all property pins on this site.

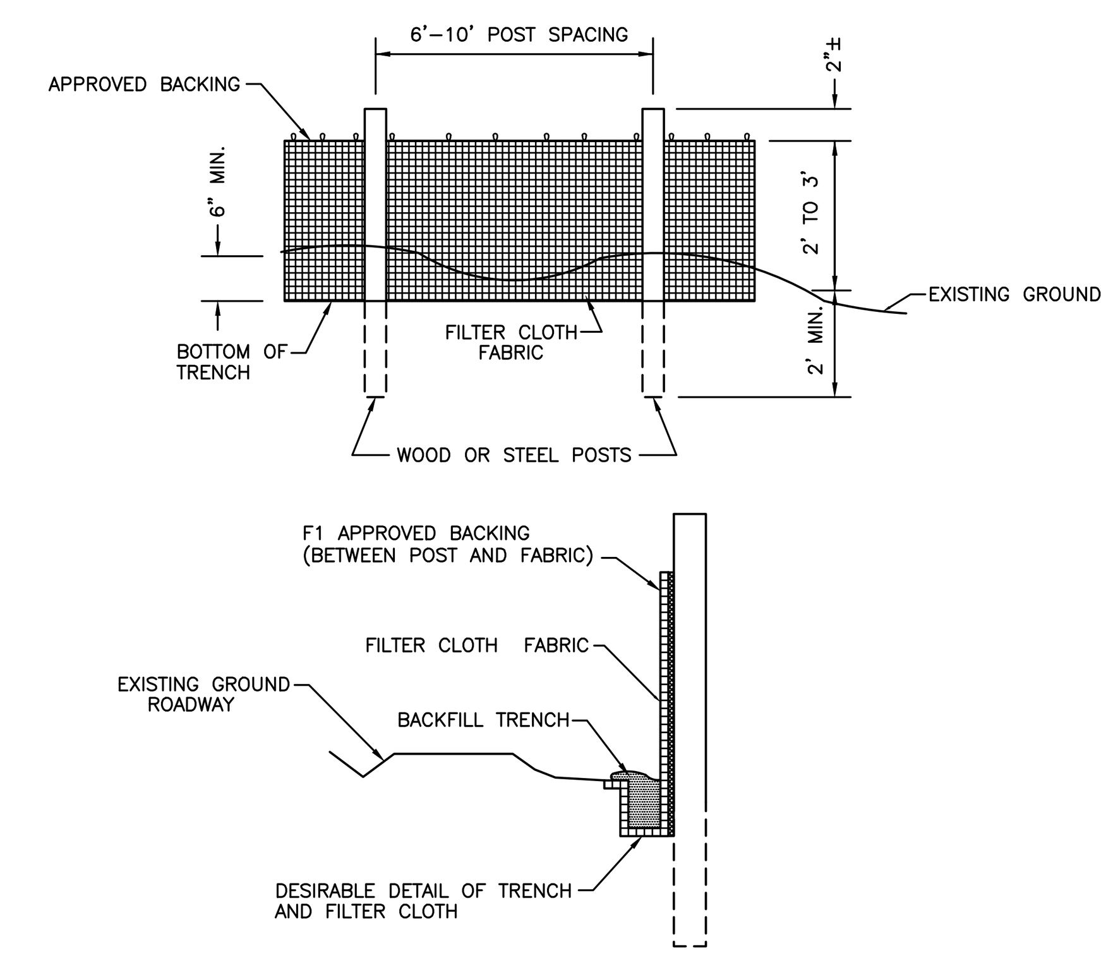
7. These drawings are intended for use on this site only and as an integrated set for this specific project. These drawings may not be used in whole or in part on any other project under the professional engineer's seal, The owner shall hold harmless and indemnify the architect and engineer from and against any and all claims of any nature whatsoever arising from such use.

8. Existing conditions and topo shown herein are taken from a field–run survey by S.E.C., Inc.

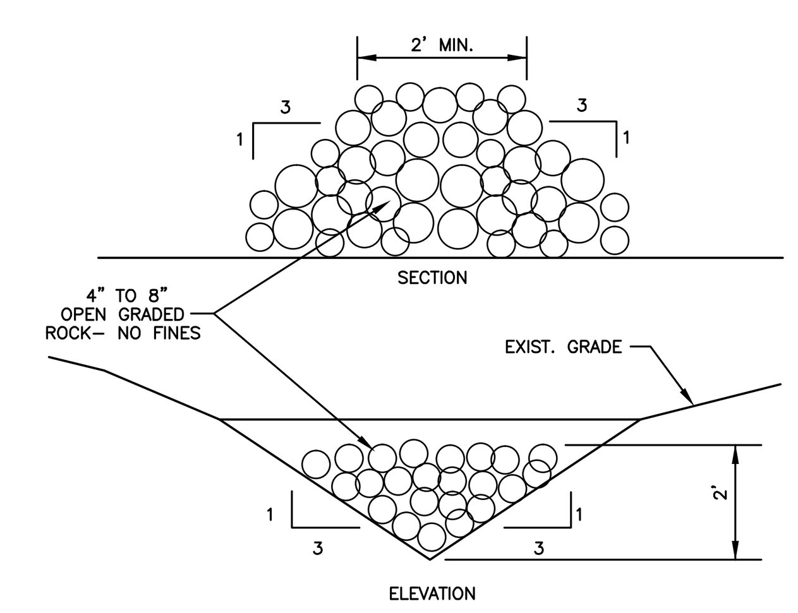
9. A separate R.O.W. Excavation Permit issued from Williamson County shall be required for any excavation or constuction in the public R.O.W.



UNDER DRAIN OUTLET
SCALE——NONE



SILT FENCE DETAIL
SCALE——NONE



TEMPORARY ROCK FILTER DAM
SCALE——NONE

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(Not Intended for Construction)

Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

REVISED:
DRAWN: SJA
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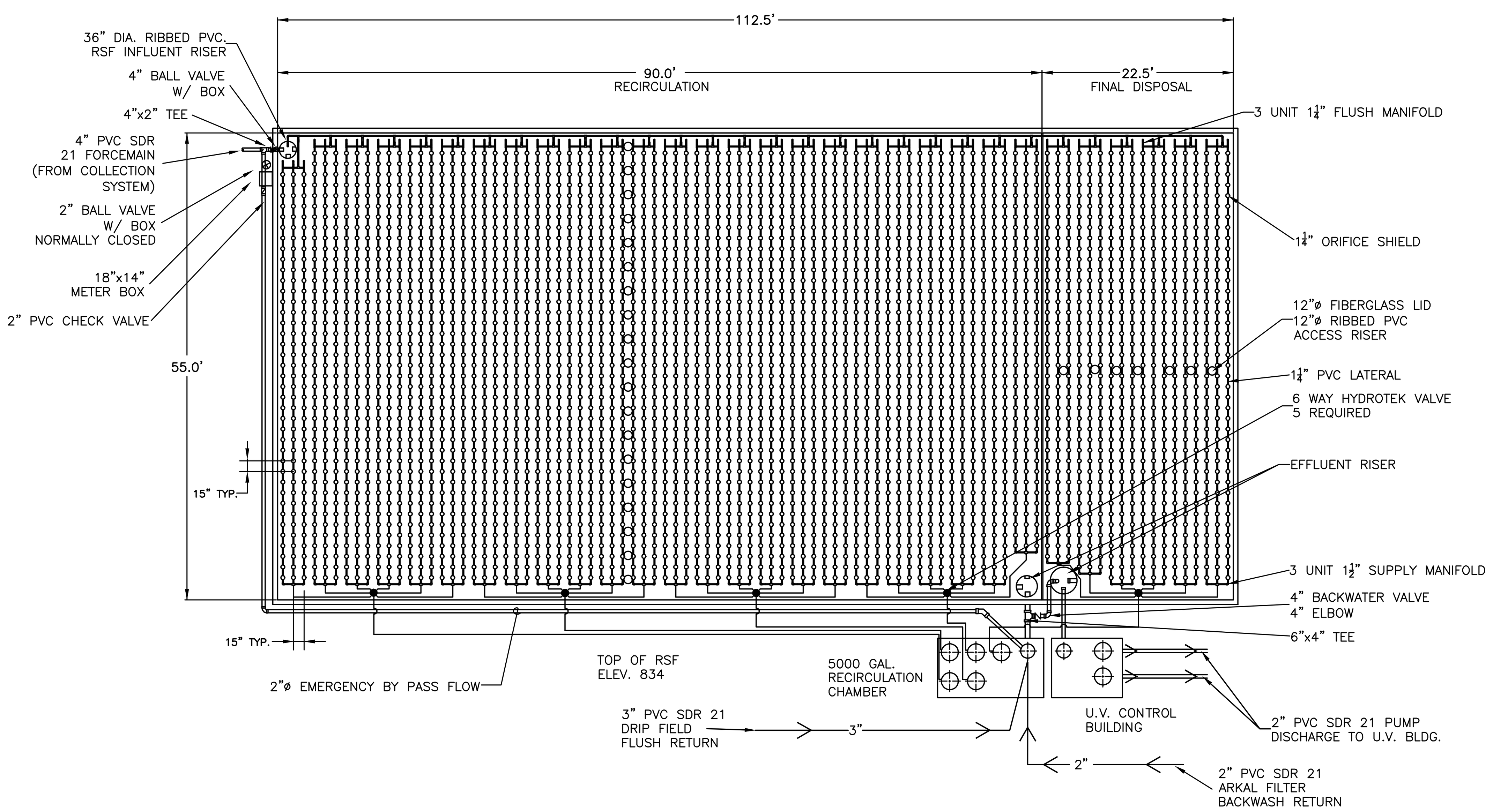
JOB NO. 12040

Notes & Details

SHEET:



RECIRCULATING SAND FILTER - PLAN

SCALE——NONE

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2. This design is for the treatment and disposal of wastewater collected from Clovercroft Acres, design flow 36,000 gpd.

3. All flows for this system shall be controlled and monitored by the MVD (Smart) Panel. This monitoring shall be considered the flow meter for this system.

4. The minimum horizontal separation between the closest two points of the water and sewer line is ten (10) feet. The minimum vertical separation between the closest two points of the water and sewer line shall be 18 inches, with waterlines being above sewerlines.

5. Contractor shall comply with the most current requirements, specifications, and detail drawings for the installation of STEP system collection lines as outlined in the WPC Design Criteria Section 2.4.1.

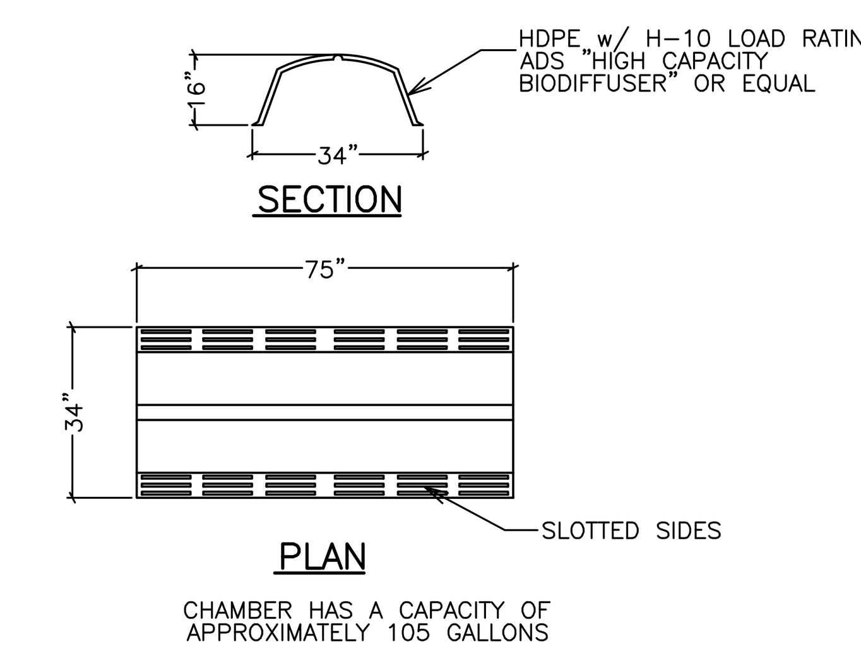
6. All trenches, pipe laying, and backfilling shall be in accordance with federal O.S.H.A. regulations.

7. Utility contractor shall have approval of all governing agencies having jurisdiction over this system prior to installation.

8. All tanks shall be one-piece, structurally sound, watertight tanks as manufactured by Jarrett Concrete Products, or approved equal.

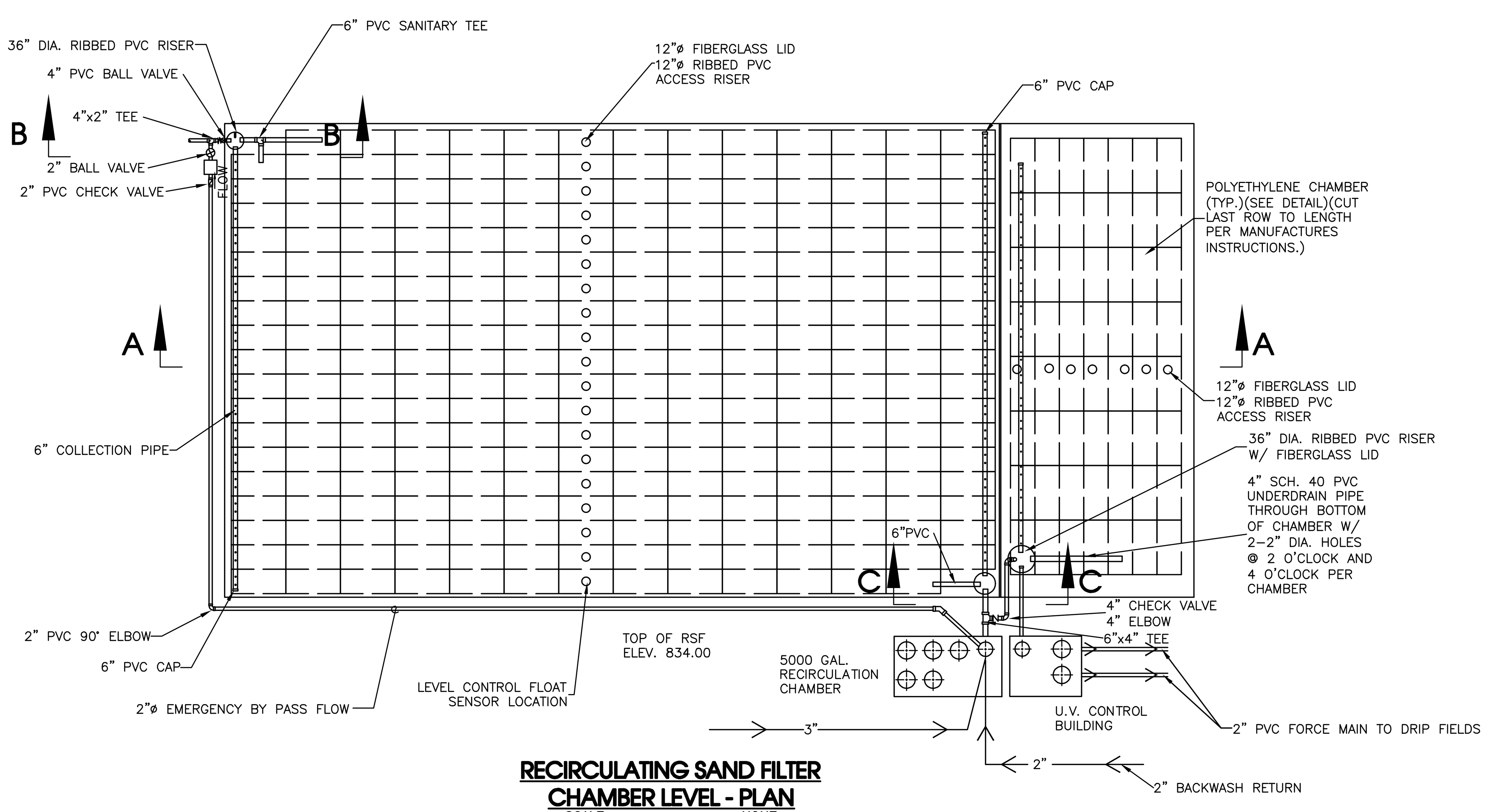
9. Testing procedure for water tightness is as follows. Fill tank 2" into the riser. After a period of 24 hours, the water level should have lowered no more than ½".

10. Collection forcemain shall be 2"ø, 3"ø, & 4"ø SDR21 purple PVC pipe (color to be coordinated with IRM Utility Co.). Forcemain shall be tested and rated for a 150 PSI working pressure.



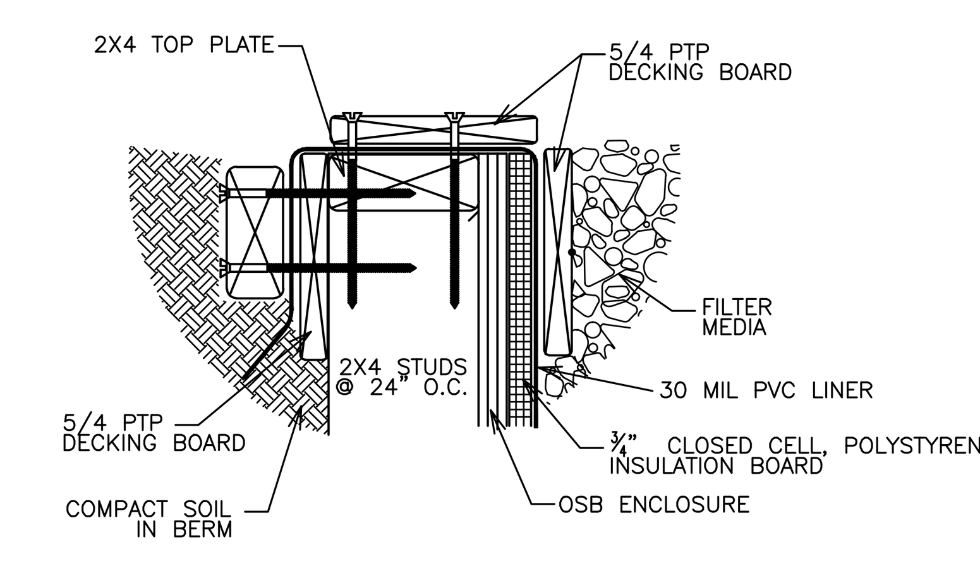
CHAMBER DETAIL

SCALE——NONE



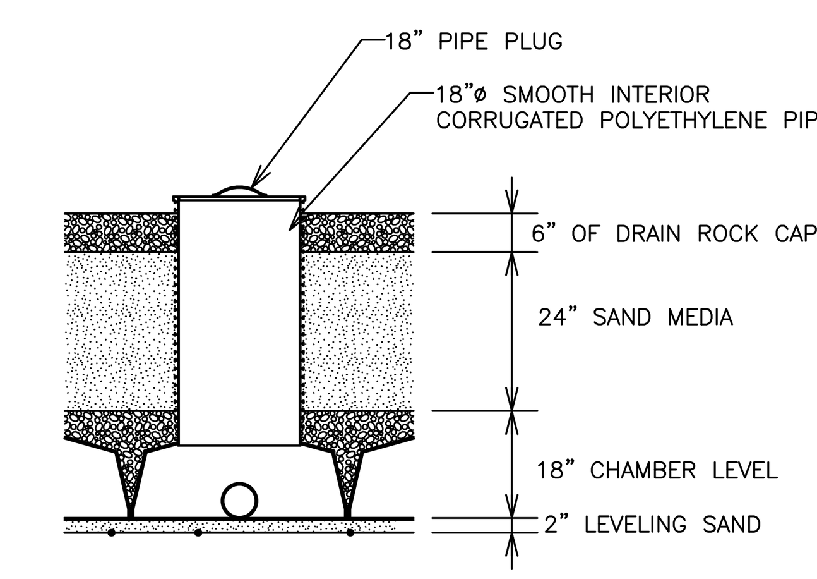
RECIRCULATING SAND FILTER CHAMBER LEVEL - PLAN

SCALE——NONE



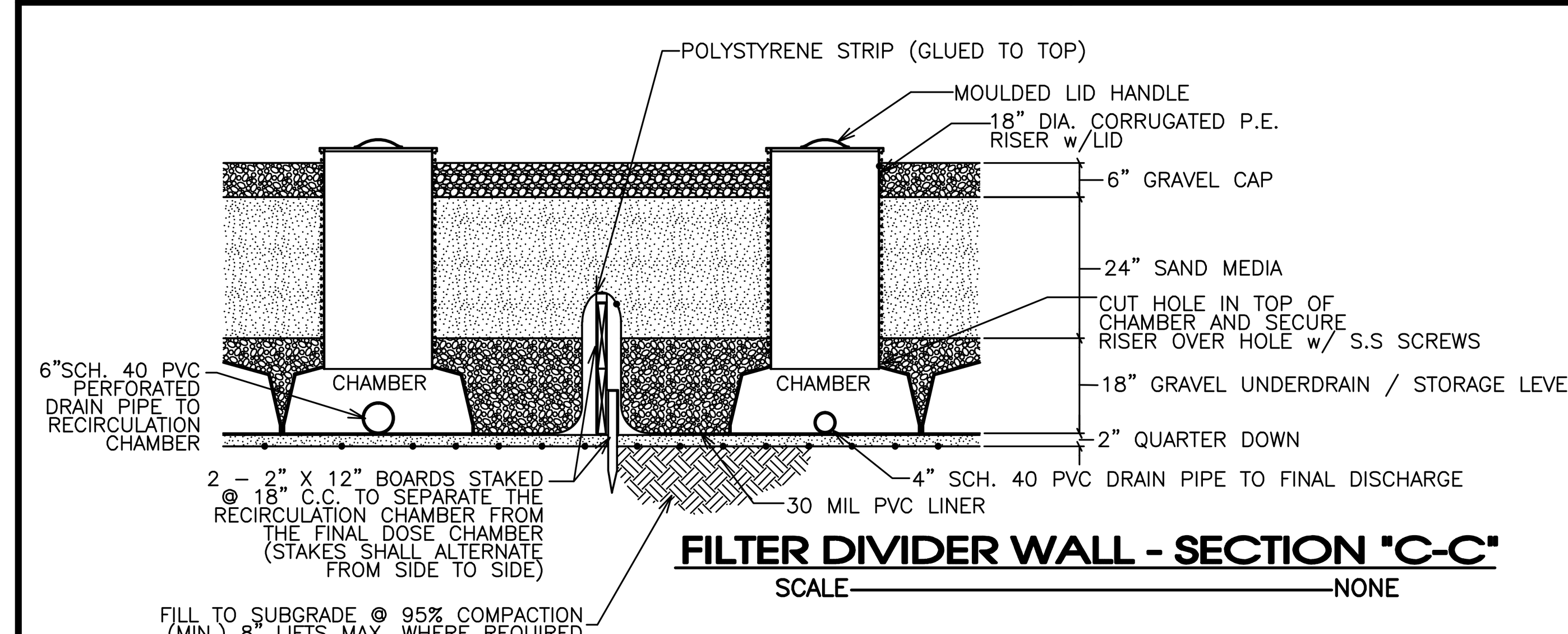
LINER ANCHOR DETAIL

SCALE——NONE



SECTION VIEW

SCALE——NONE



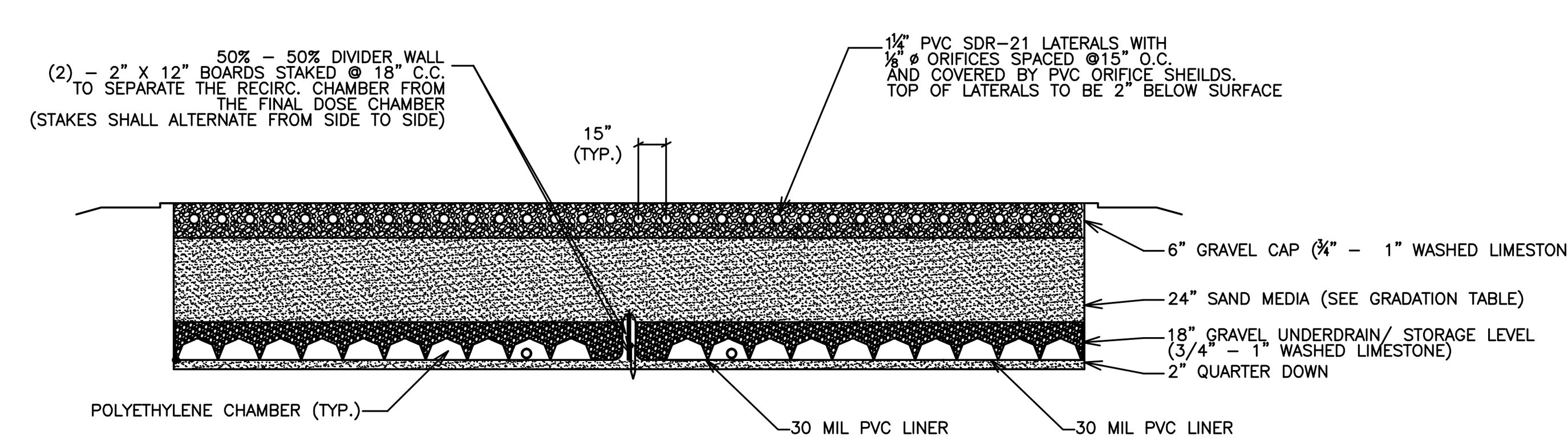
FILTER DIVIDER WALL - SECTION "C-C"

SCALE——NONE

SAND GRADATION FOR FILTER SAND

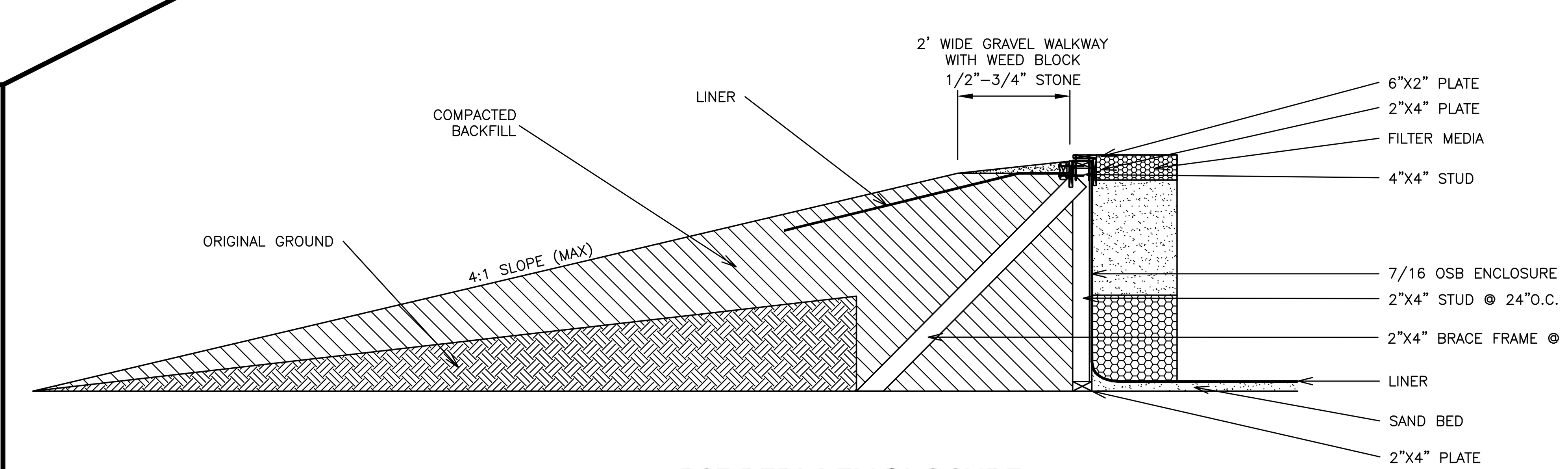
SIEVE SIZE	PERCENT PASSING
3/8	100
4	60 - 100
8	7 - 75
16	0 - 5
30	0 - 3
50	0 - 2

Cu = 1.5 TO 2.5
EFFECTIVE SIZE: D_{10} = 1.5 TO 2.5 mm
SAND MUST BE WELL WASHED



SAND FILTER SECTION A-A

SCALE——NONE



RSF BERM ENCLOSURE

SCALE——NONE

SEC, Inc.
SITE ENGINEERING CONSULTANTS
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850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
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E-MAIL: JREED@SEC-CIVIL.COM

The site as shown on these construction drawings is intended to achieve specific engineering design criteria and objectives. It is the sole responsibility of the owner/developer to ensure that the construction of the site shown on these construction drawings is in total accordance with the design as noted, described, and illustrated. The engineer assumes no administrative liability or responsibility in the assurance that the site is constructed in accordance with the construction plans.

JAMES F. REED III — STATE OF TENNESSEE — REGISTERED ENGINEER

REVIEW SET
(Not Intended for Construction)

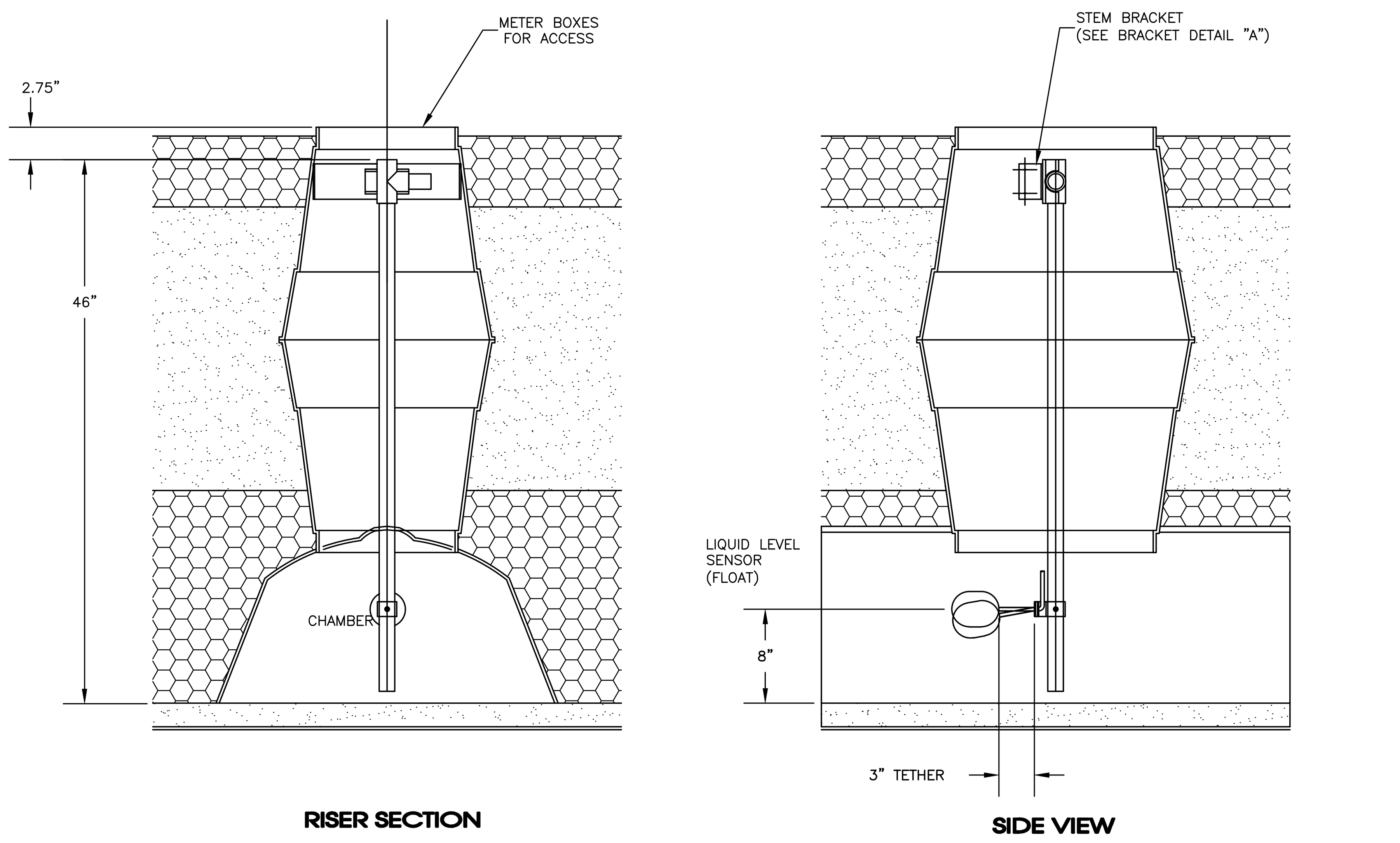
Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

REVISED:

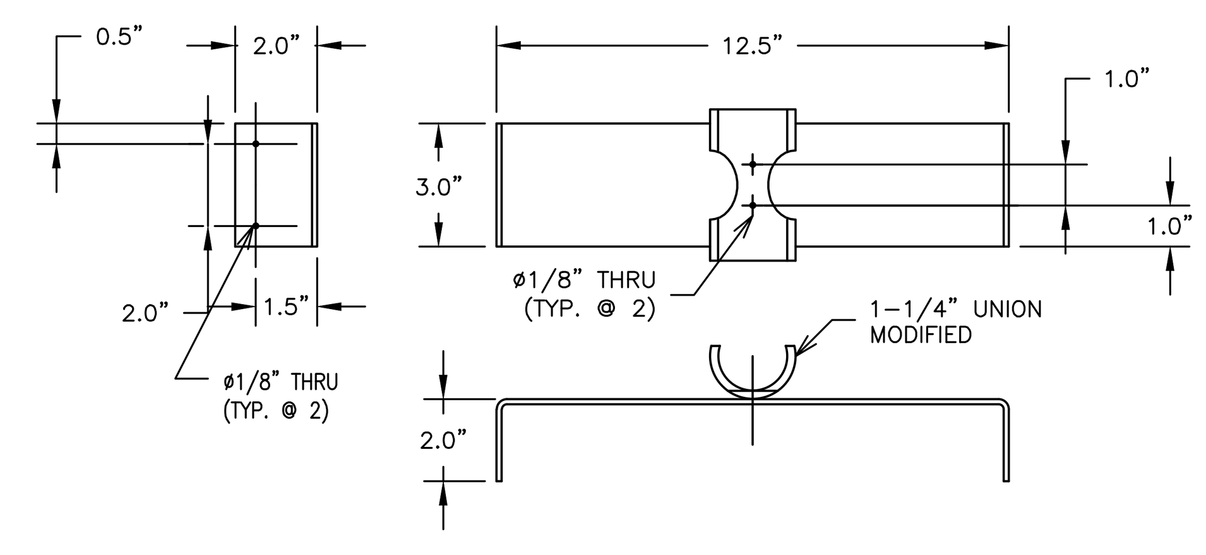
DRAWN: SJA
DATE: 7-31-14
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040

S.T.E.P. Details

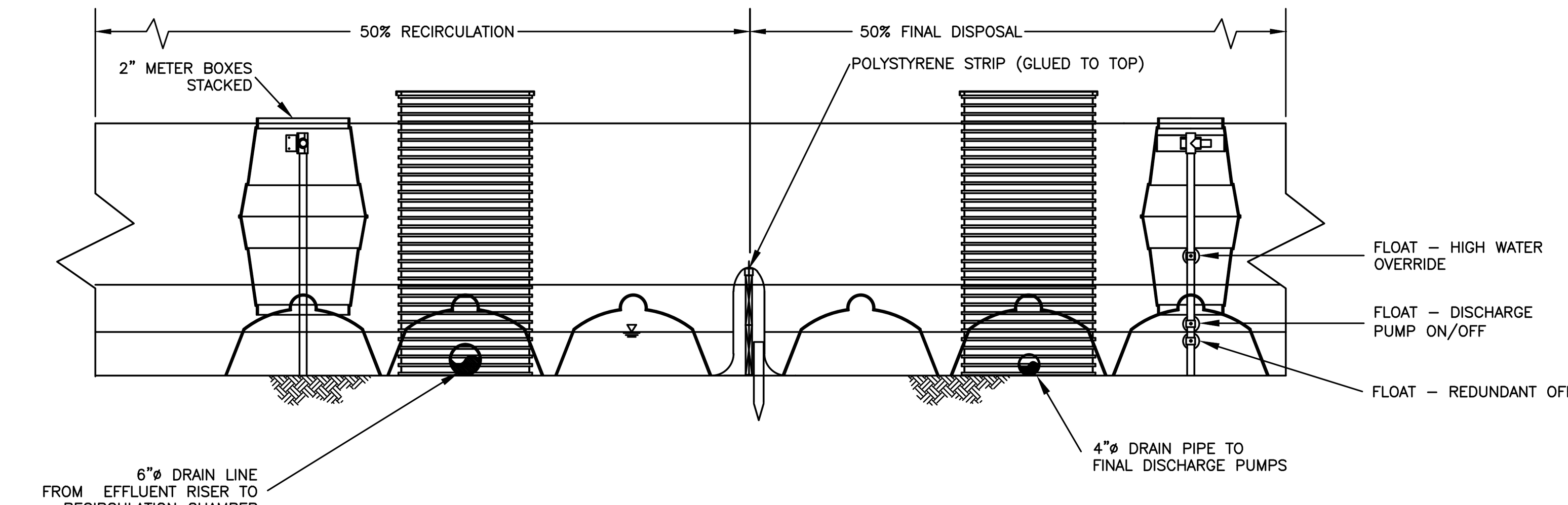
SHEET: 7 of 11



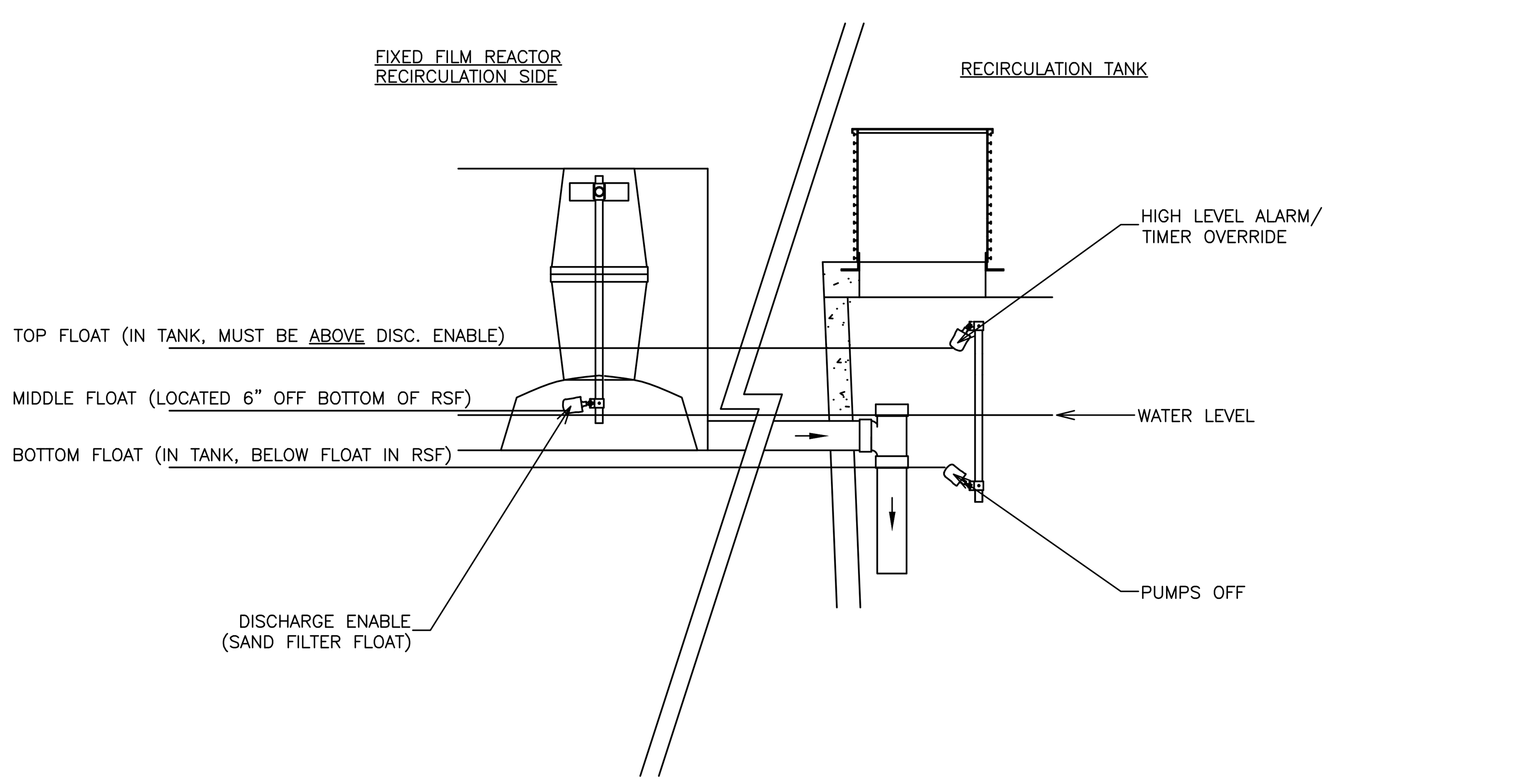
ADENUS TECHNOLOGIES
FFR FLOAT ASSEMBLY
SCALE—NONE



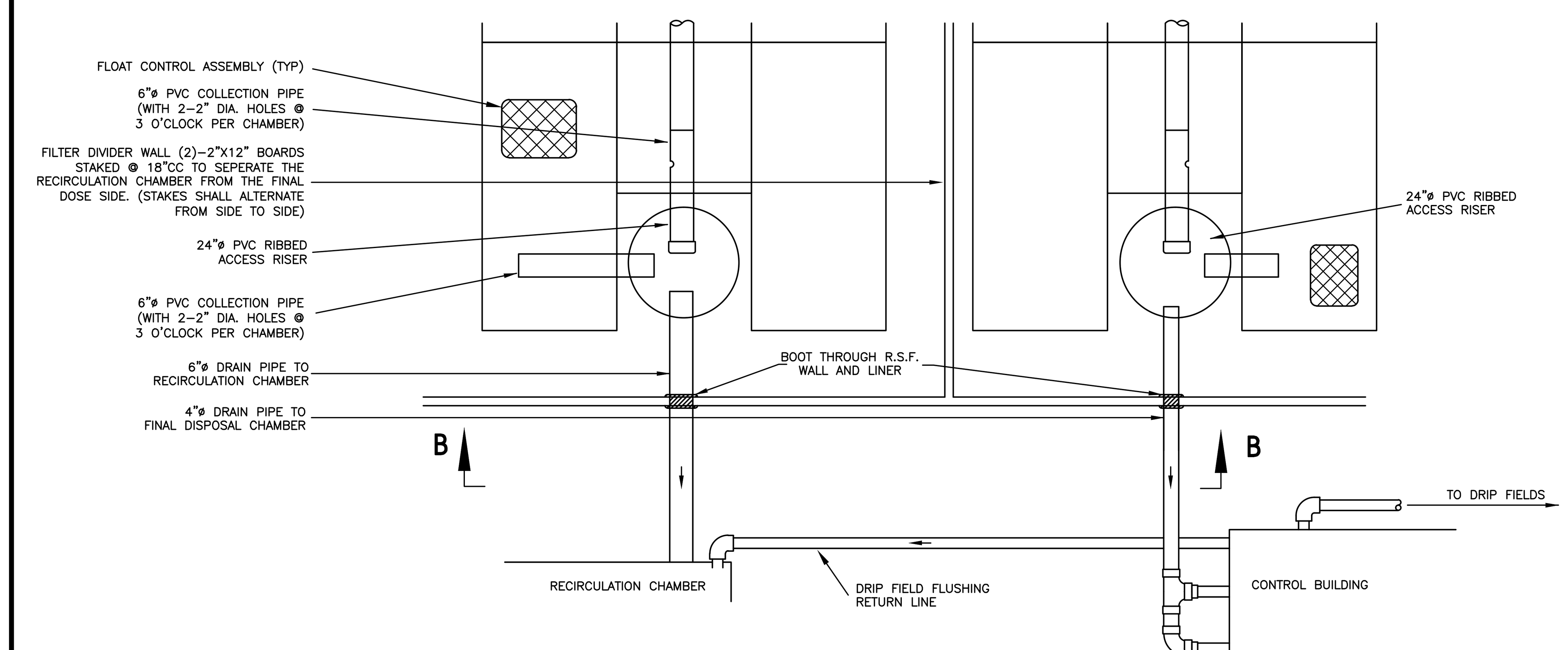
BRACKET DETAIL "A"
SCALE—NONE
A FLOAT BRACKET MAT: ALUMINUM 1/8" PL



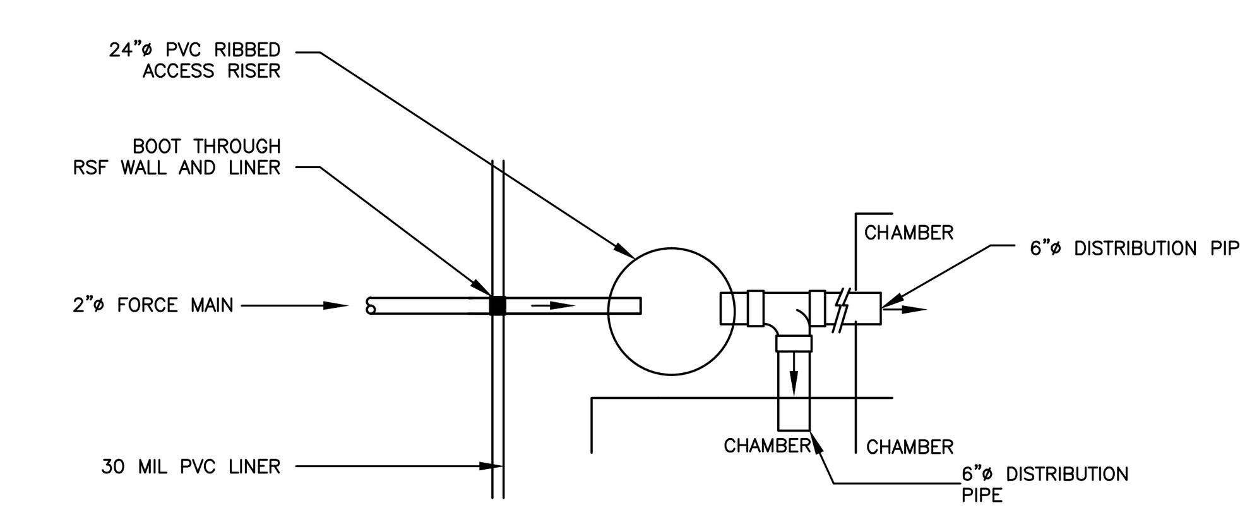
SECTION B-B



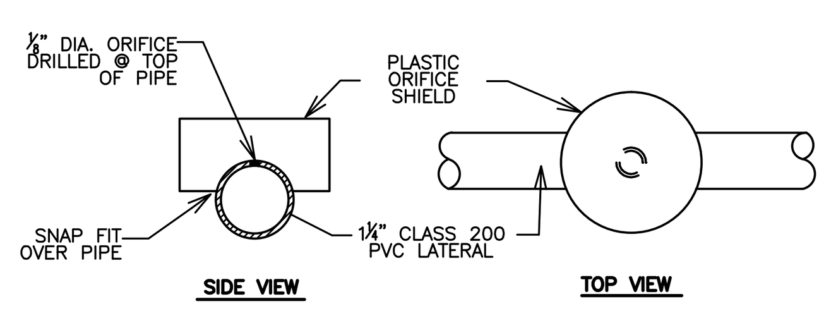
RELATIVE FLOAT ELEVATIONS FOR THE RECIRCULATION SIDE OF A SAND FILTER
SCALE—NONE



EFFLUENT RISER - PLAN

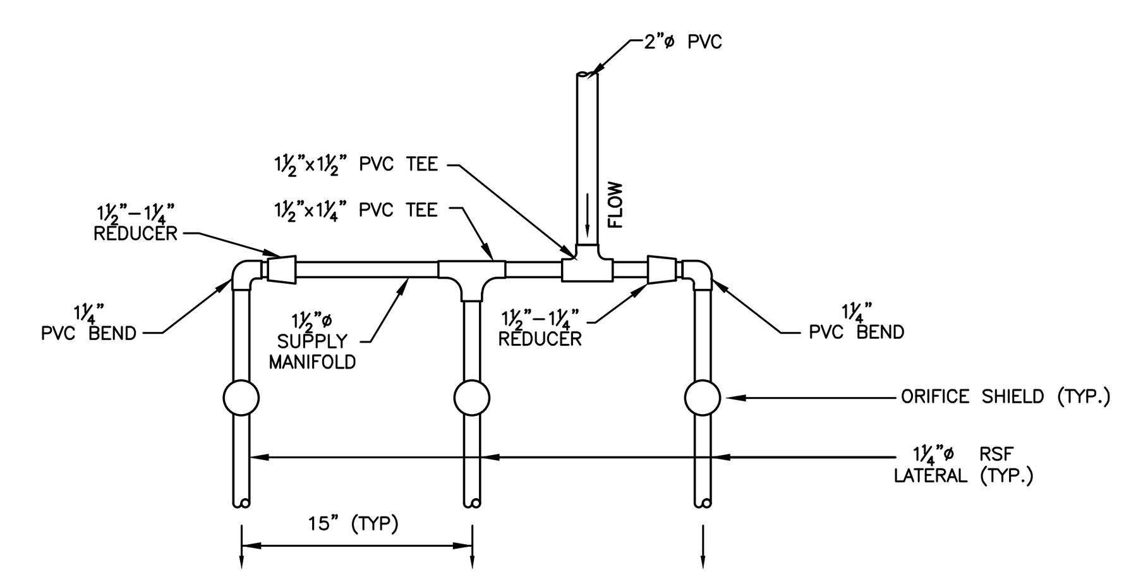


INFLUENT RISER - PLAN

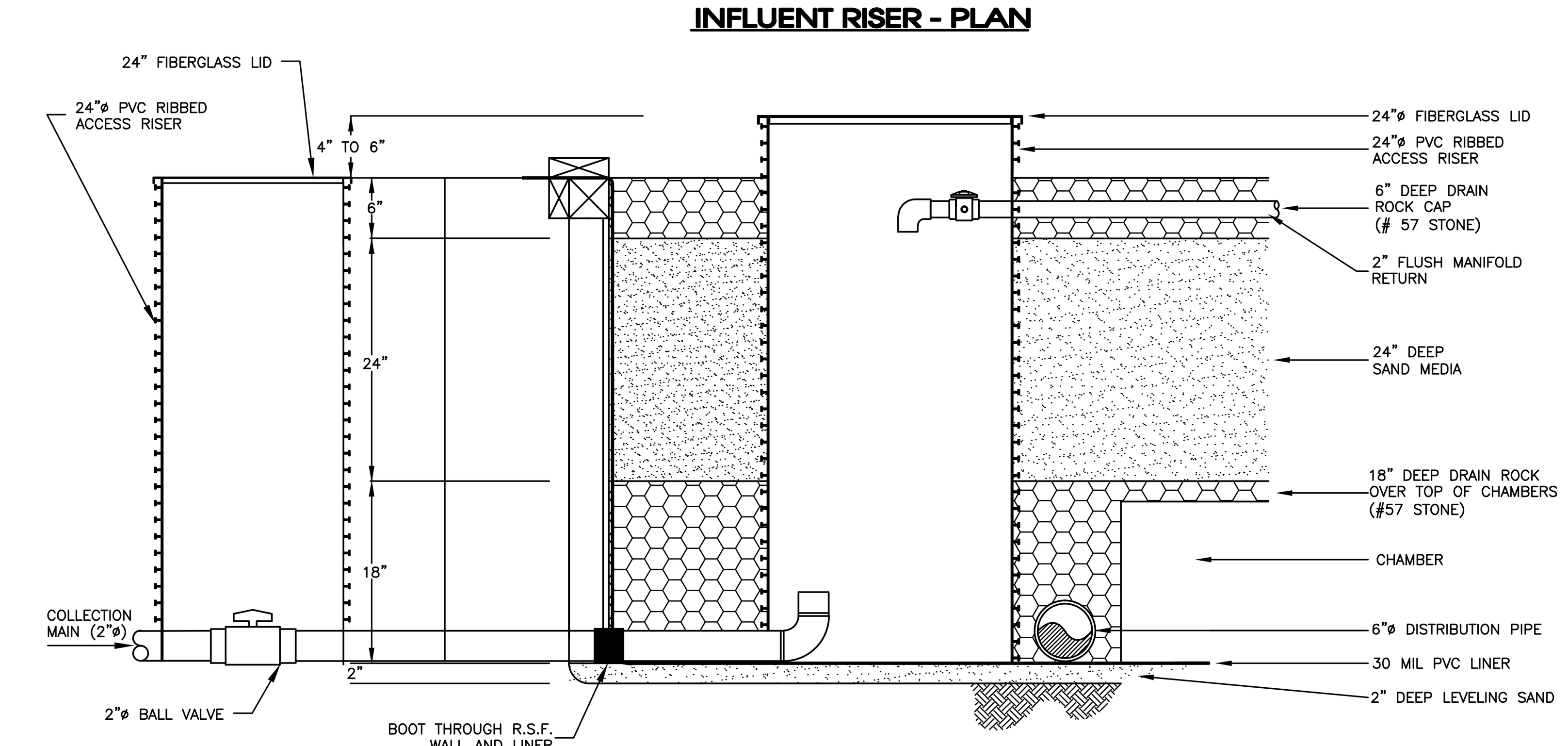


NOTES
1. ALL RESIDUE FROM PIPE BORING TO BE REMOVED BEFORE PIPE INSTALLATION.

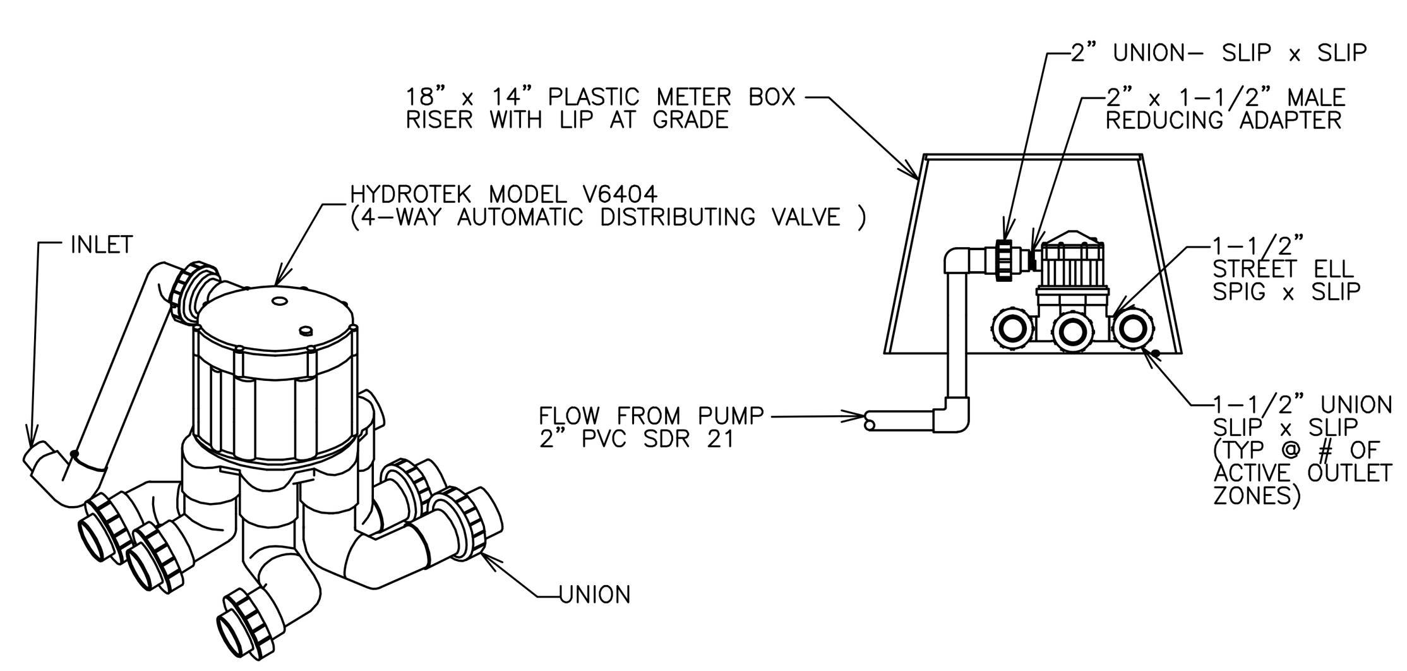
LATERAL ORIFICE SHIELD DETAIL
SCALE—NONE



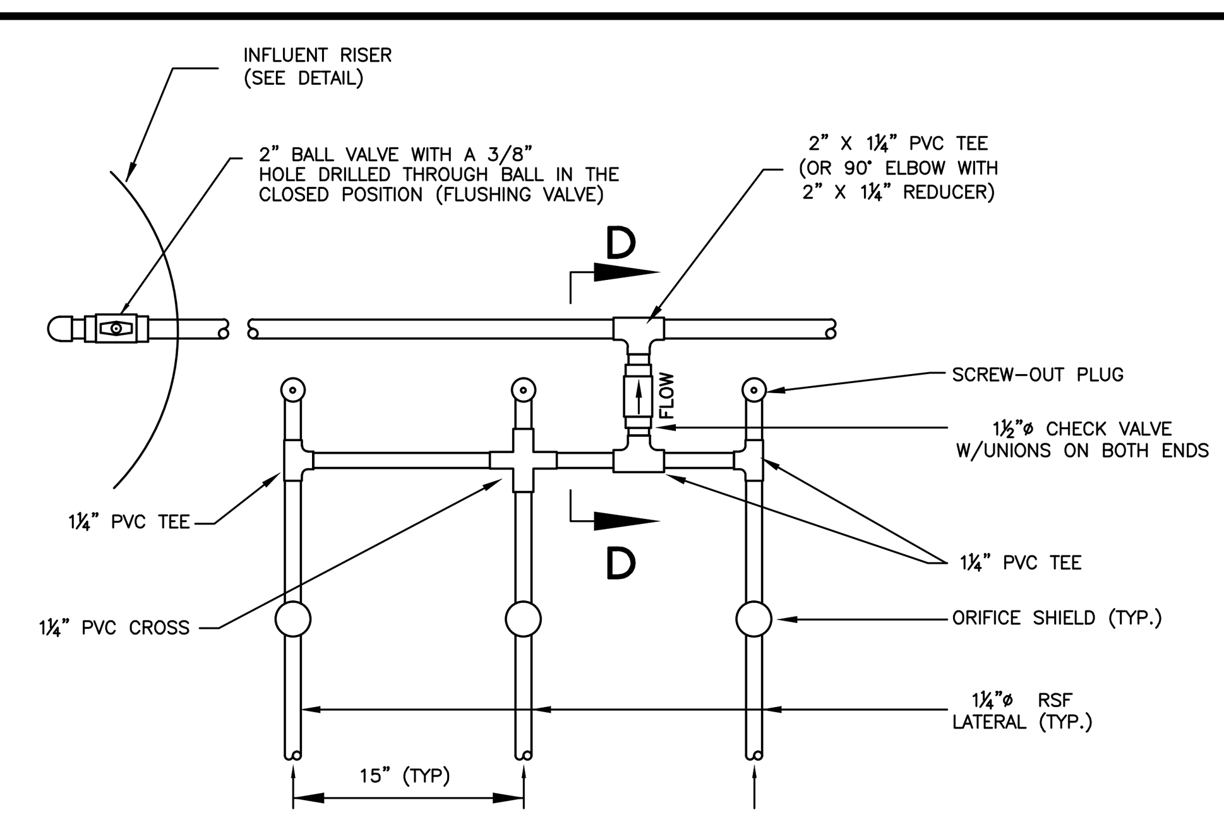
3 UNIT SUPPLY MANIFOLD
SCALE—NONE



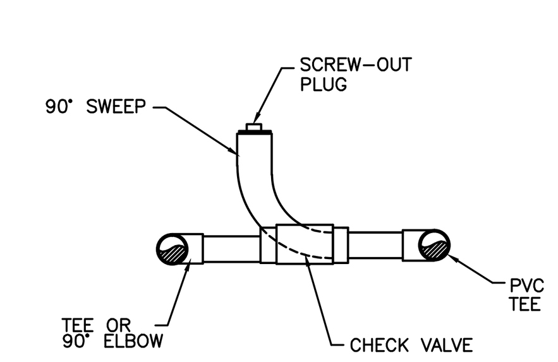
INFLUENT RISER
SCALE—NONE



DISTRIBUTING VALVE ASSEMBLY
SCALE—NONE



3 UNIT FLUSH MANIFOLD
SCALE—NONE



SECTION D-D

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850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
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JAMES F. REED III REGISTERED ENGINEER AGRICULTURE COMMERCE No. 109038 STATE OF TENNESSEE

REVIEW SET
(Not Intended For Construction)

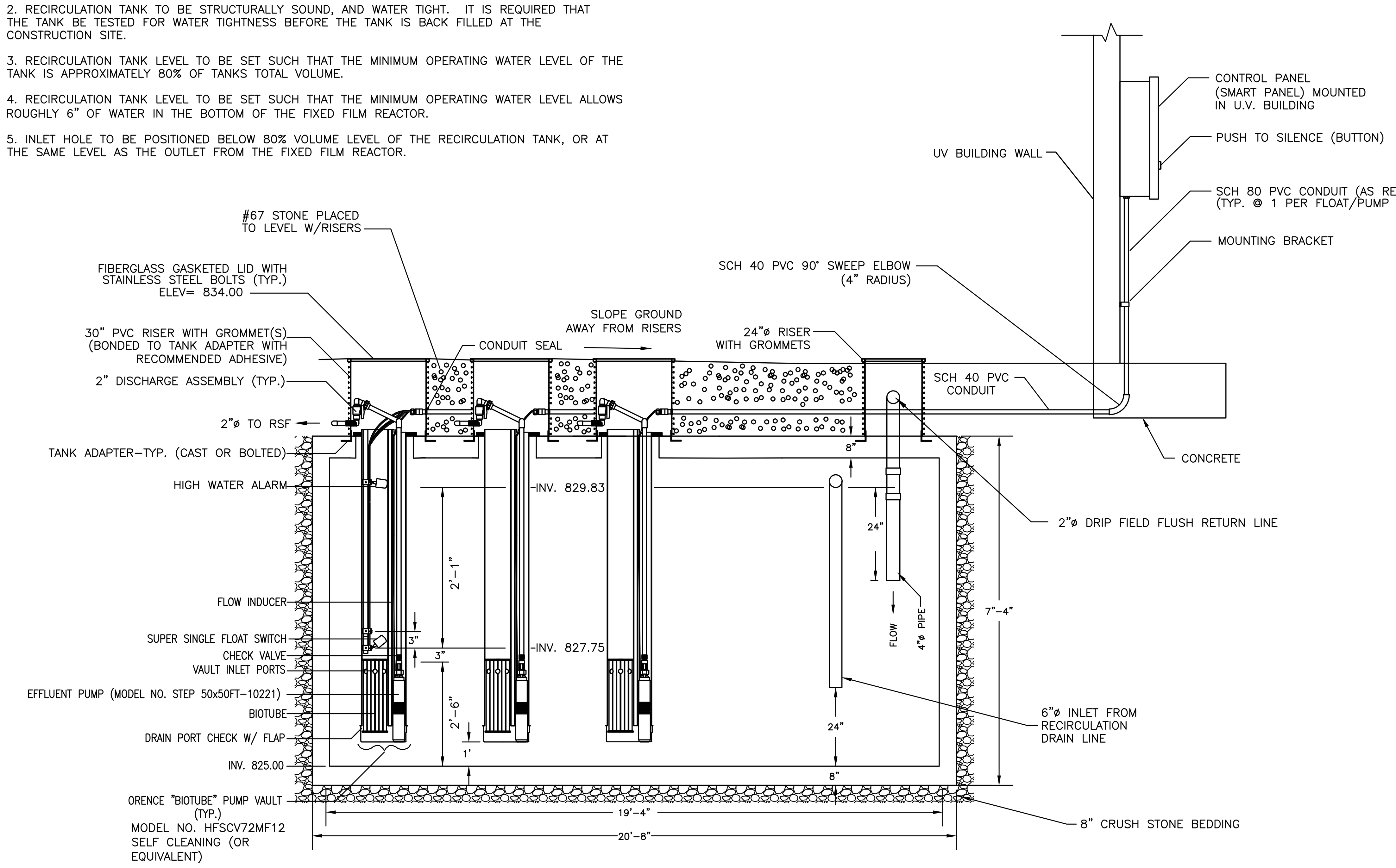
Clovercroft Acres Subdivision
STEP System Design
Williamson County, Tennessee

REVISED:
DRAWN: SJA
DATE: 7-31-14
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040

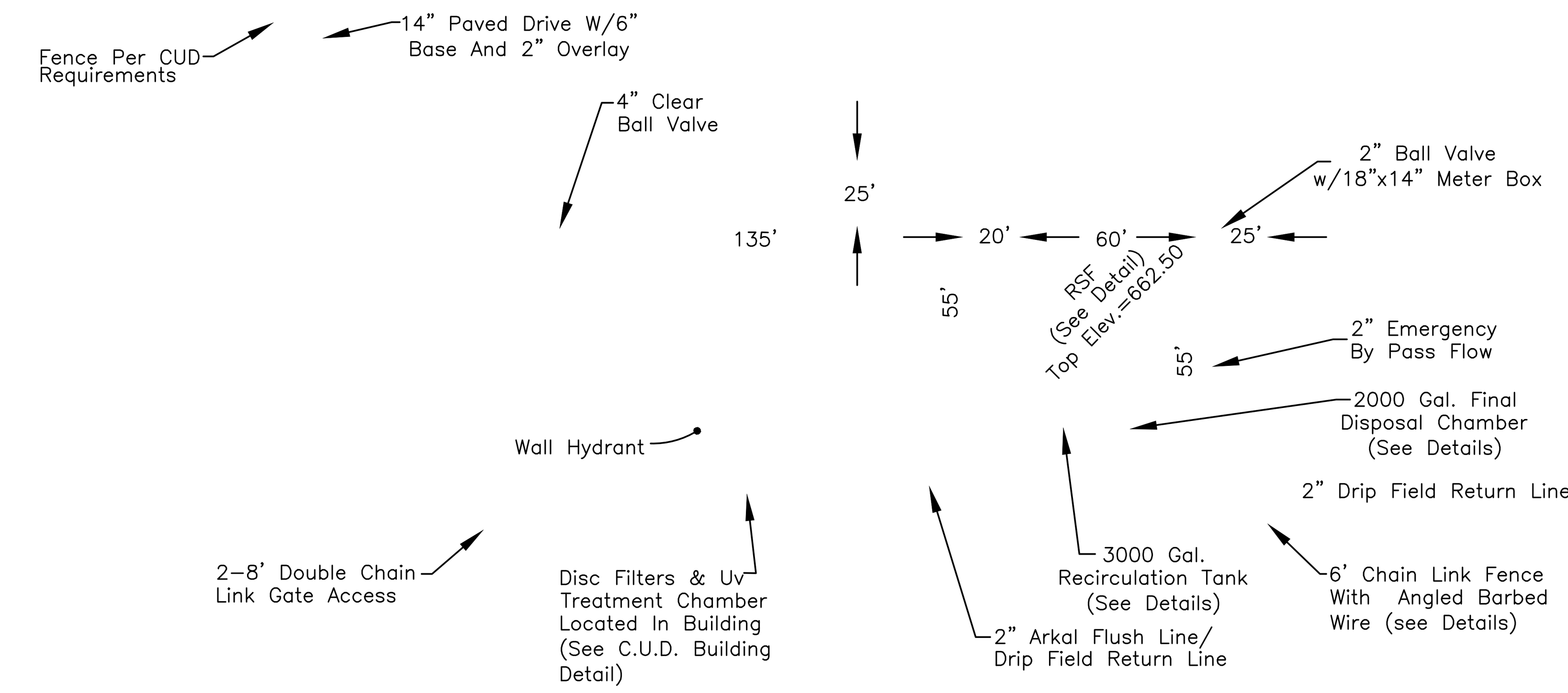
S.T.E.P. Details

INSTALLATION NOTES:

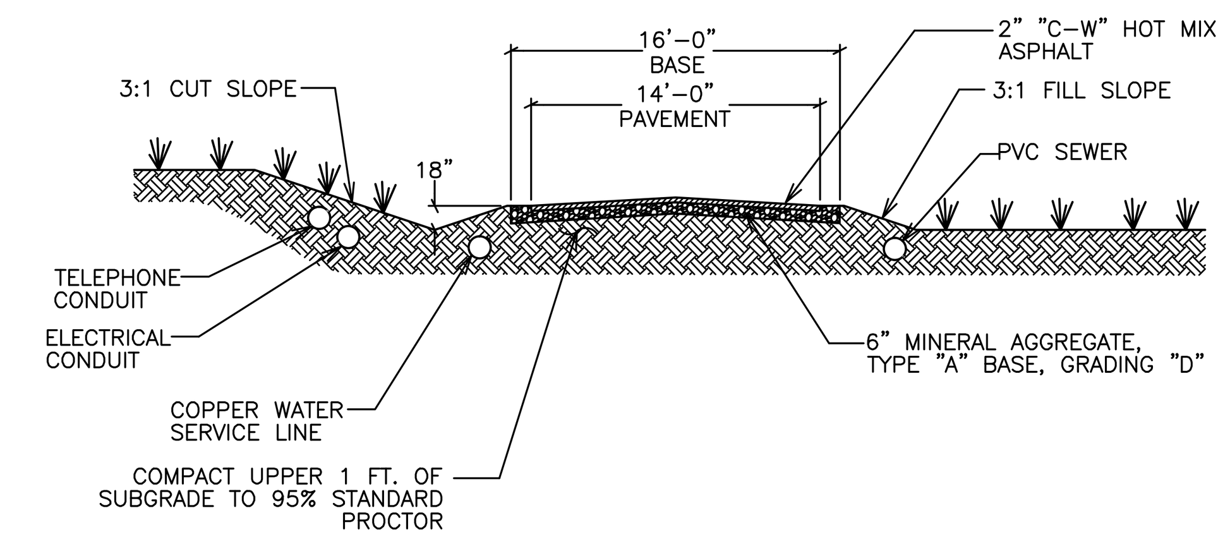
1. THE NUMBER OF 20" TANK OPENING TO EQUAL THE NUMBER OF HYDROTEKS REQUIRED FOR THE FIXED FILM REACTOR.
2. RECIRCULATION TANK TO BE STRUCTURALLY SOUND, AND WATER TIGHT. IT IS REQUIRED THAT THE TANK BE TESTED FOR WATER TIGHTNESS BEFORE THE TANK IS BACK FILLED AT THE CONSTRUCTION SITE.
3. RECIRCULATION TANK LEVEL TO BE SET SUCH THAT THE MINIMUM OPERATING WATER LEVEL OF THE TANK IS APPROXIMATELY 80% OF TANKS TOTAL VOLUME.
4. RECIRCULATION TANK LEVEL TO BE SET SUCH THAT THE MINIMUM OPERATING WATER LEVEL ALLOWS ROUGHLY 6" OF WATER IN THE BOTTOM OF THE FIXED FILM REACTOR.
5. INLET HOLE TO BE POSITIONED BELOW 80% VOLUME LEVEL OF THE RECIRCULATION TANK, OR AT THE SAME LEVEL AS THE OUTLET FROM THE FIXED FILM REACTOR.



5000 GALLON RECIRCULATION CHAMBER-SECTION
SCALE—NONE

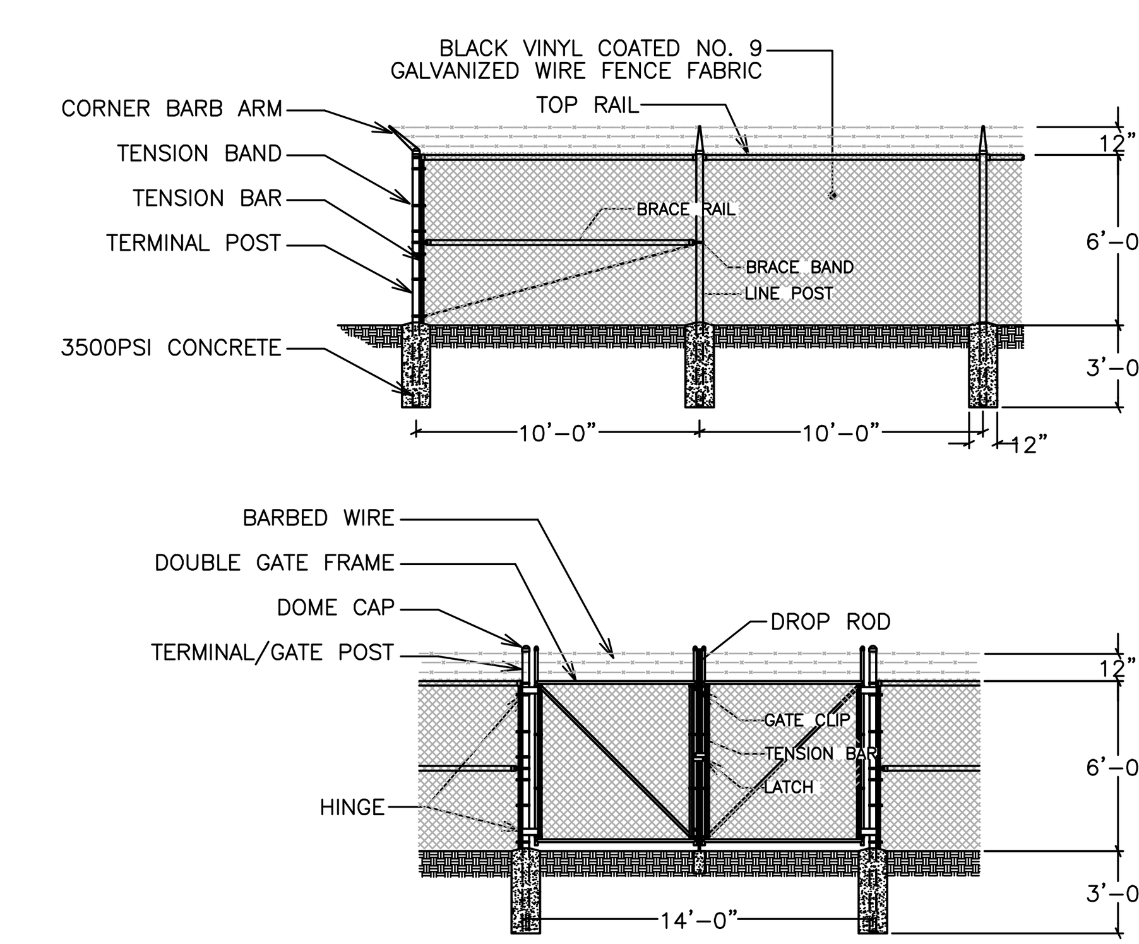


RECIRCULATING SAND FILTER PLAN DIAGRAM
SCALE—NONE

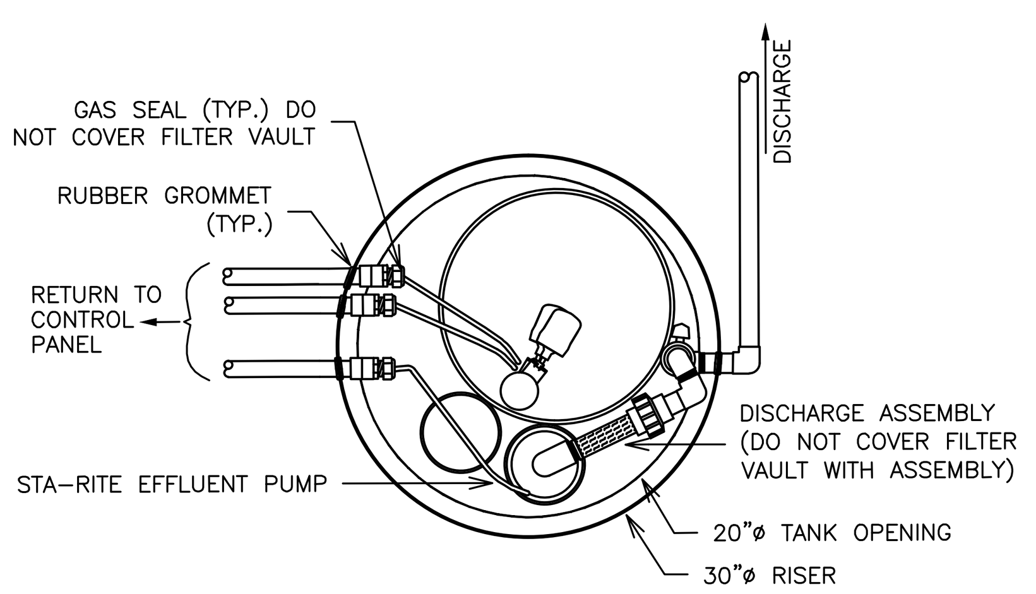


NOTE:
ACCESS DRIVE MATERIALS AND CONSTRUCTION PER STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, LATEST EDITION

PAVED ACCESS DRIVE
SCALE—NONE

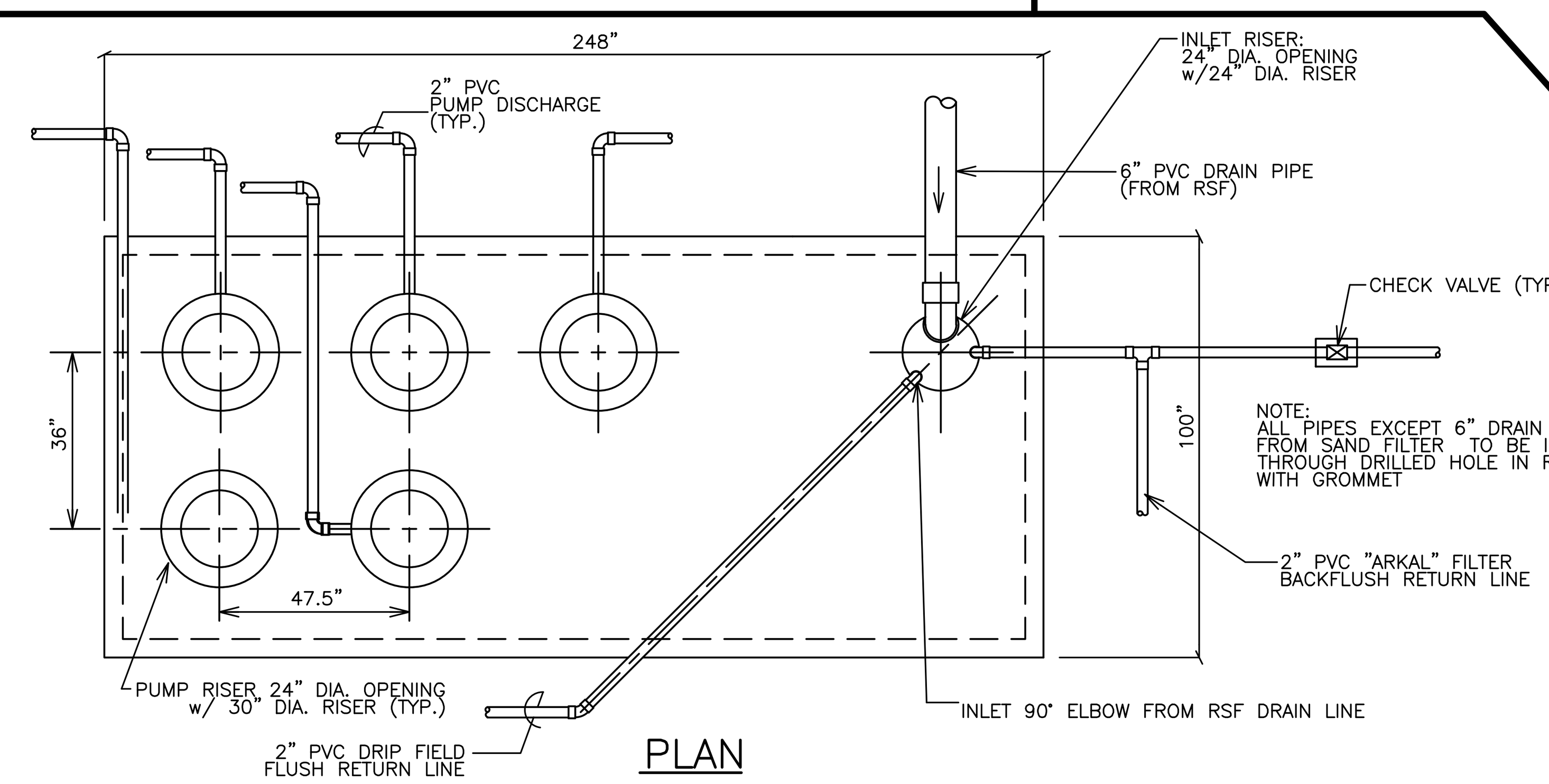


TYPICAL SECURITY FENCE DETAILS
SCALE—NONE

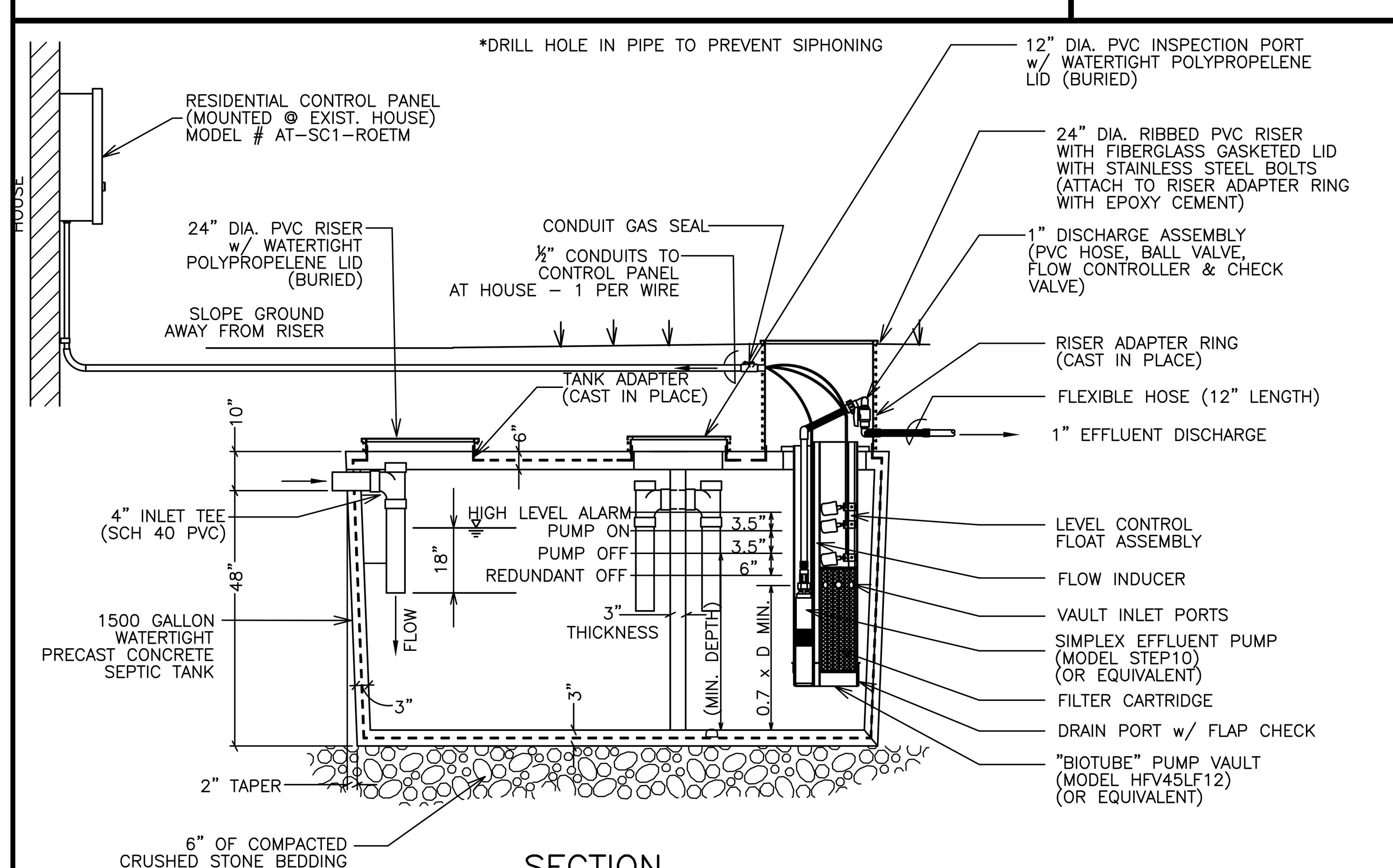


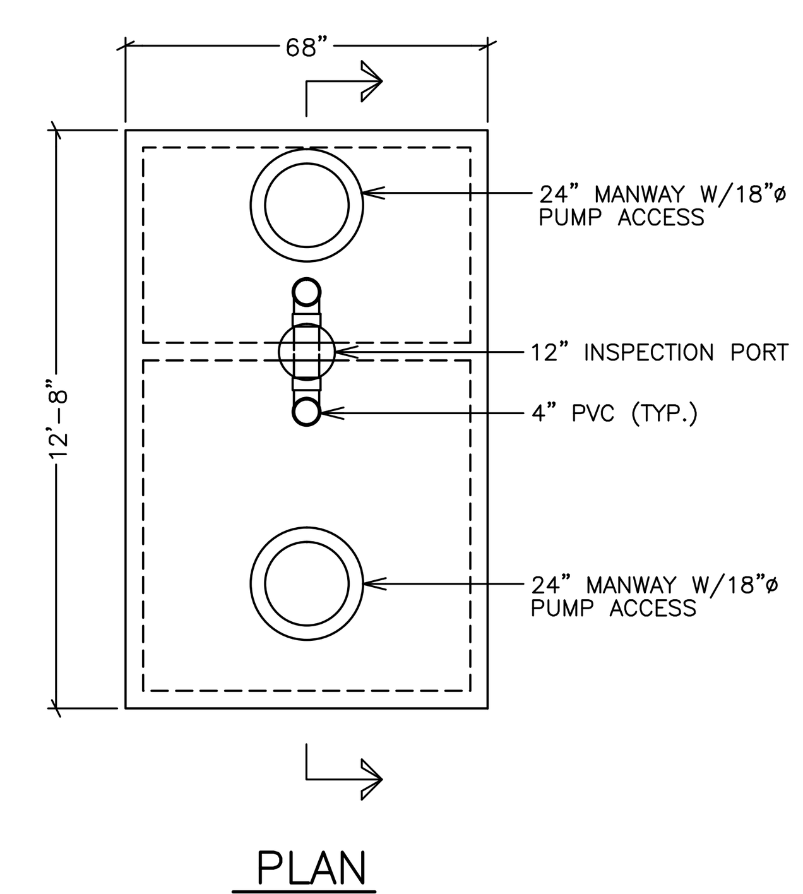
CONTROL PUMP VAULT - PLAN
SCALE—NONE

SPECIAL NOTE:
ONLY ONE PUMP VAULT SHALL CONTAIN FLOAT SWITCHES. THIS VAULT SHALL CONTAIN THE HIGH WATER ALARM FLOAT AND THE LOW LEVEL OFF FLOAT. ALL PUMP UNITS SHALL BE CONTROLLED BY THE TELEMETRY PANEL

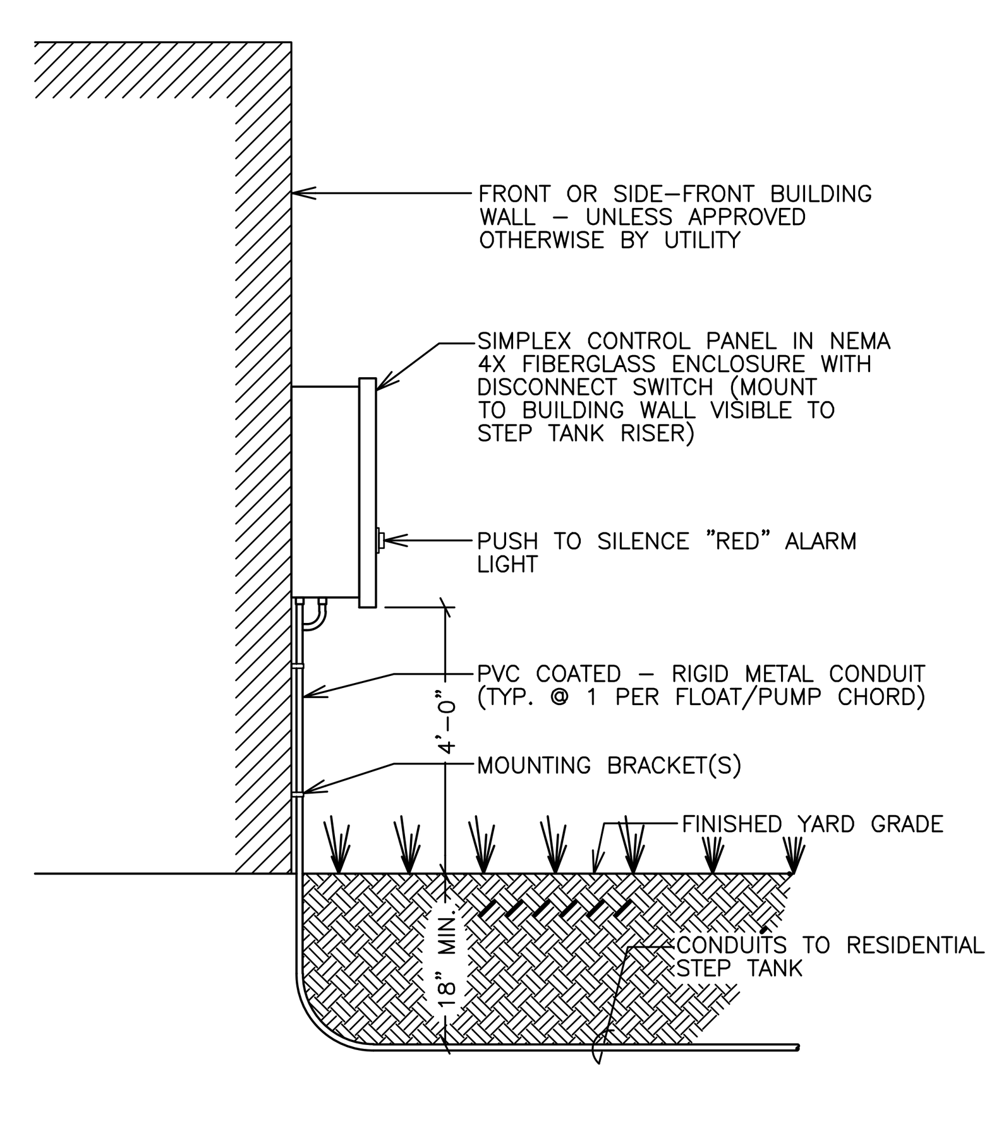


5000 GAL. RECIRCULATION TANK - PLAN
SCALE—NONE

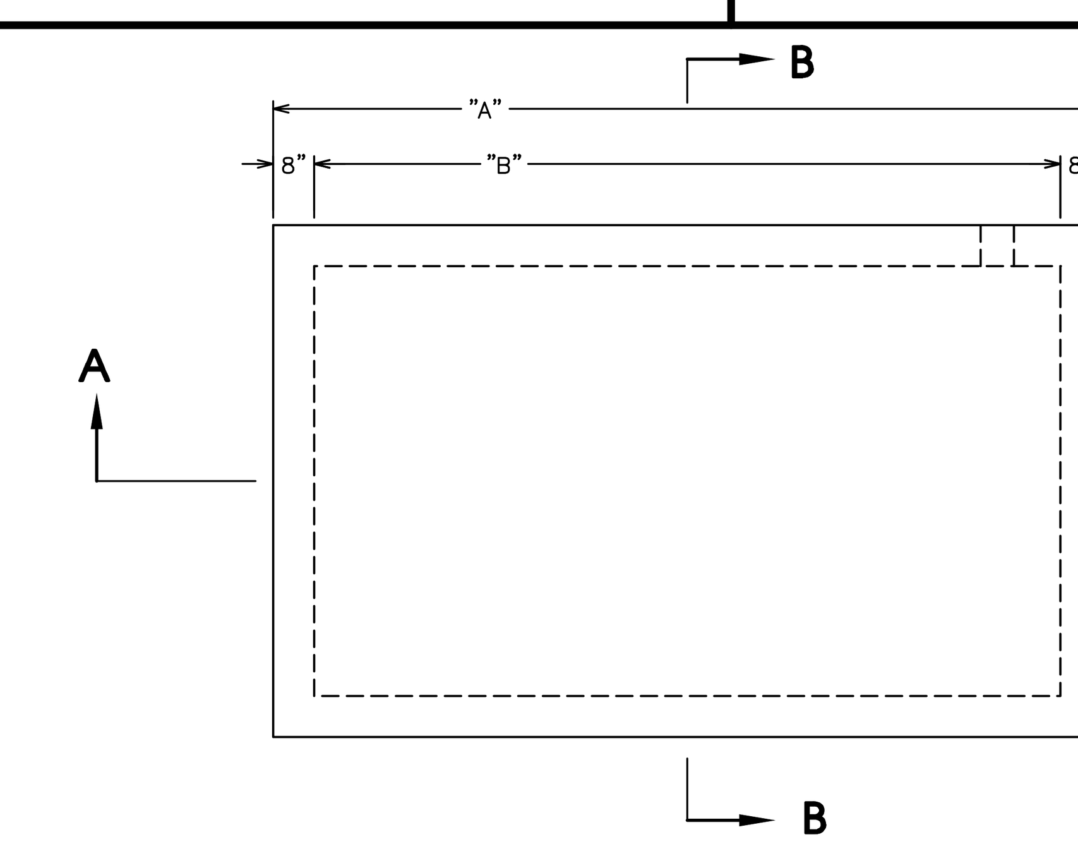




1,500 GALLON RESIDENTIAL STEP TANK
SCALE—NONE

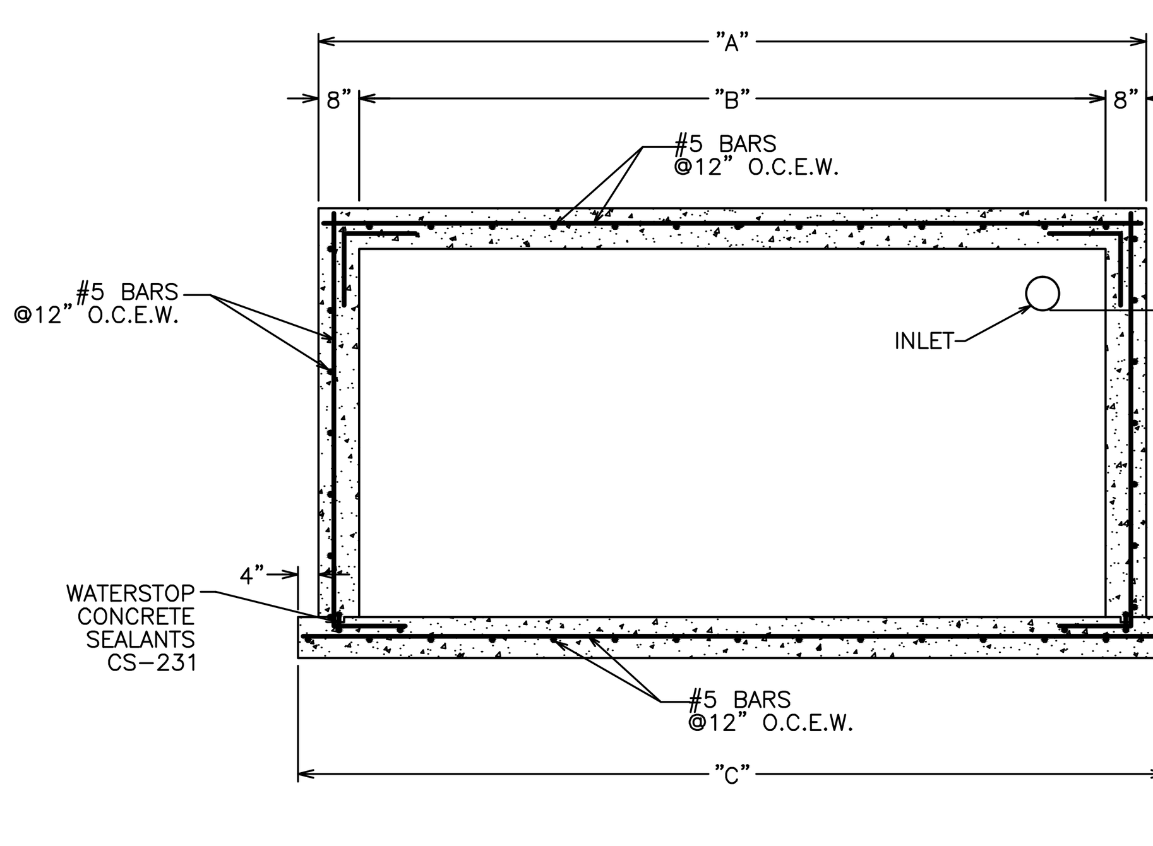


RESIDENTIAL CONTROL PANEL
SCALE—NONE

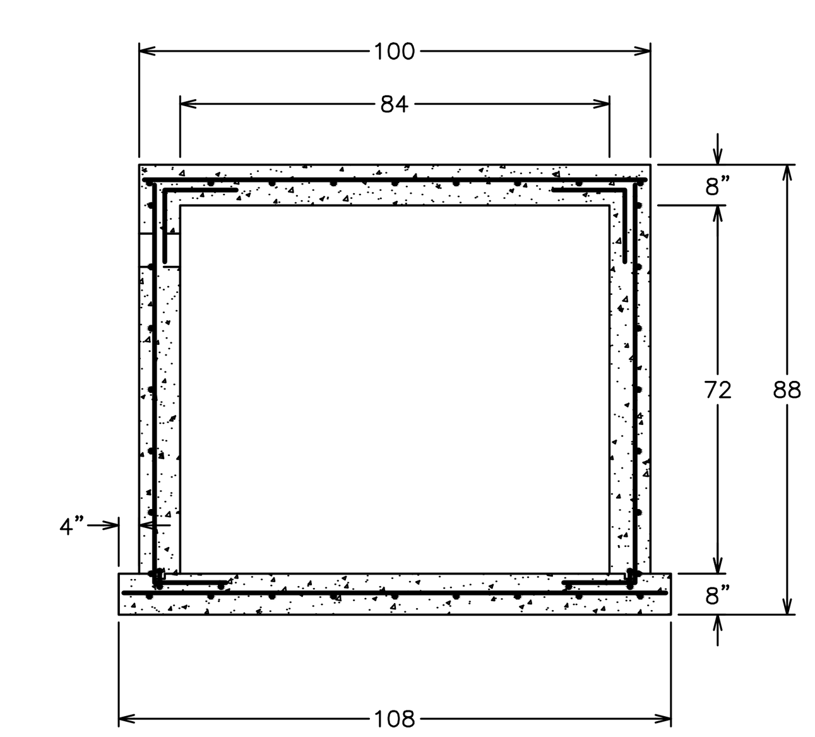


PLAN

SIZE	DIM "A"	DIM "B"	DIM "C"
2000 GAL	112"	96"	120"
3000 GAL	160"	144"	168"
4000 GAL	202"	186"	210"
5000 GAL	248"	232"	260"



SECTION A-A



SECTION B-B

RECIRCULATION TANK
SCALE—NONE

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E-MAIL: JREED@SEC-CIVIL.COM

JAMES F. REED III — STATE OF TENNESSEE

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Clovercroft Acres Subdivision
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Williamson County, Tennessee

S.T.E.P. Details

REVISED:
DRAWN: SJA
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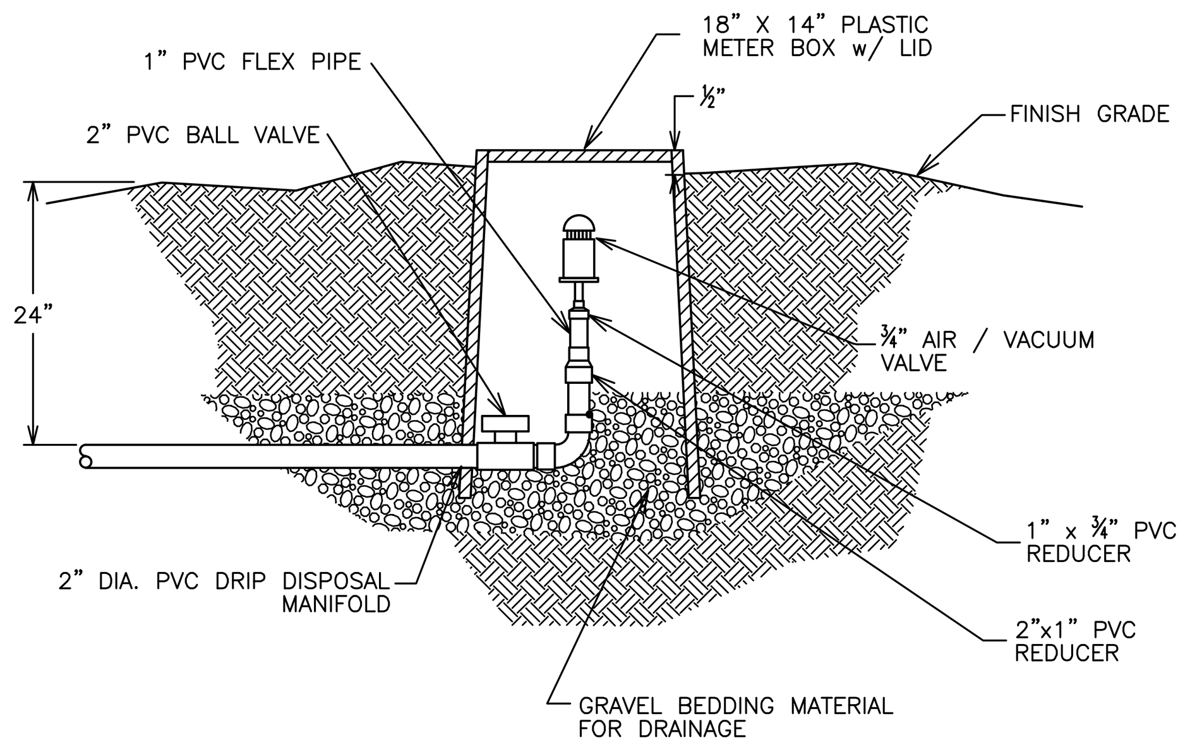
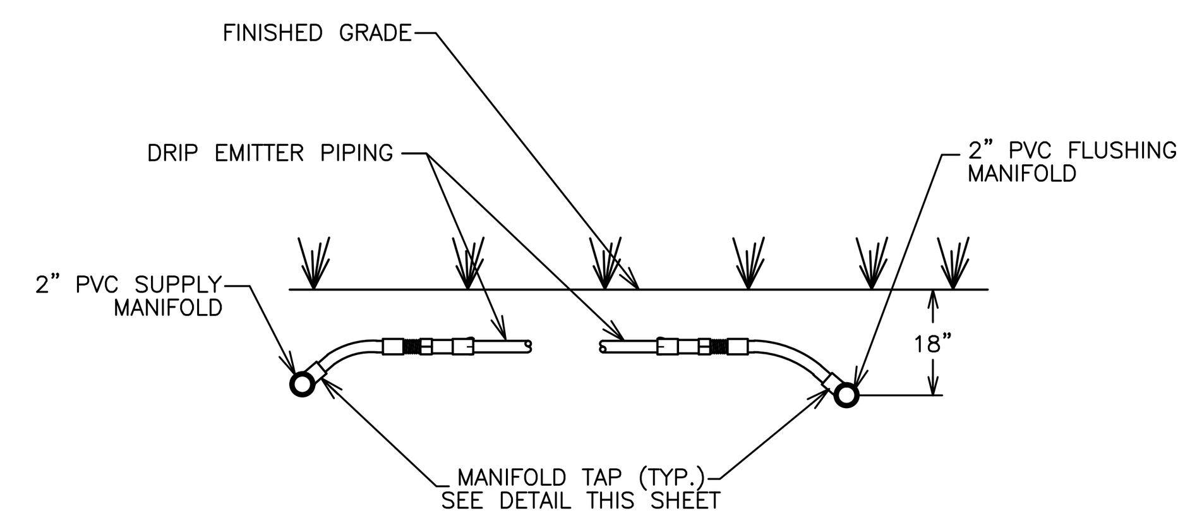
SCALE: 1"=50'
JOB NO. 12040
SHEET:



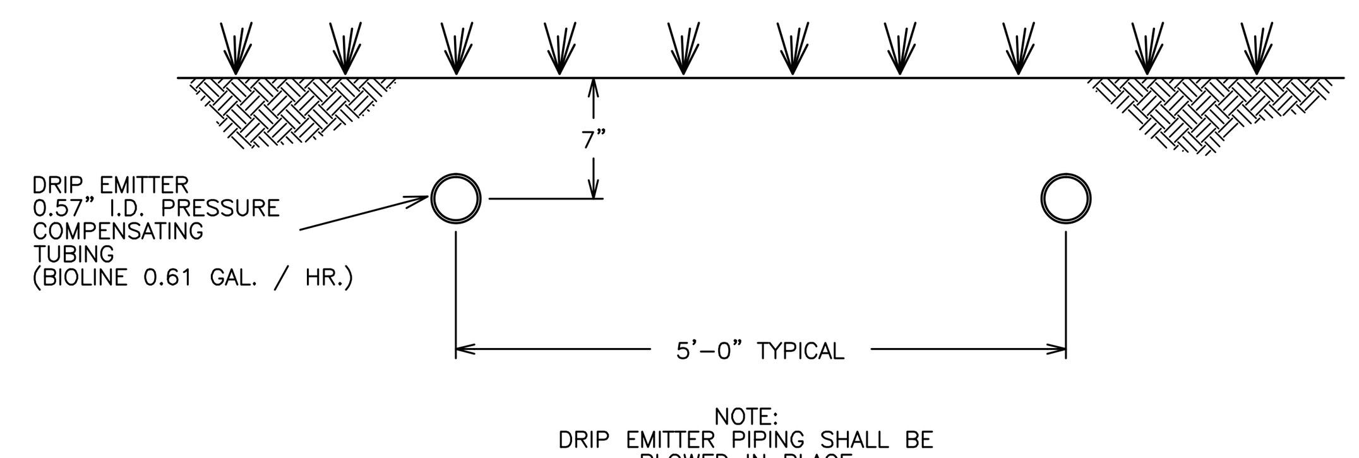
DRIP DISPOSAL AUTOMATIC AIR RELEASE VALVE ASSEMBLY

SCALE——NONE



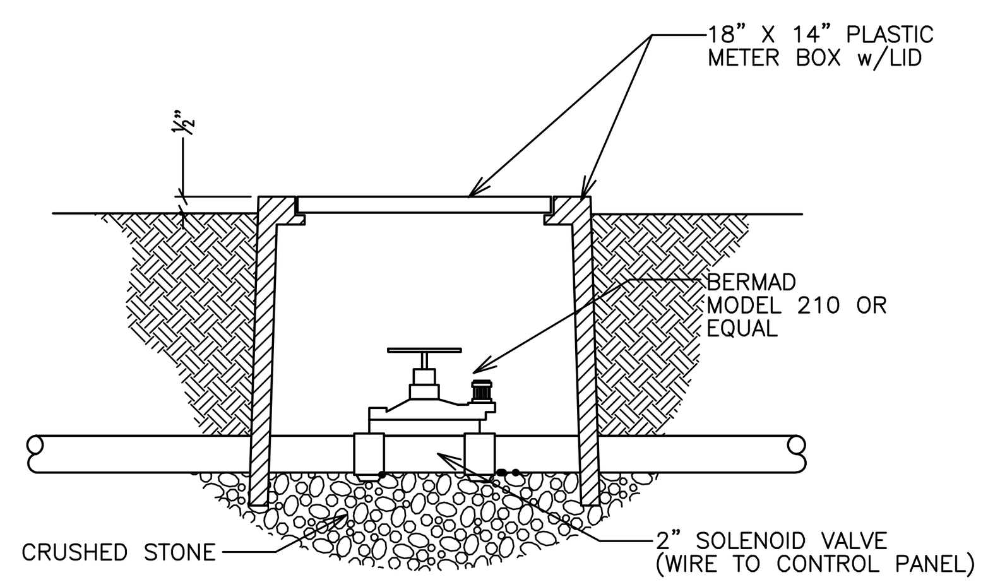
DRIP DISPOSAL PIPING END MANIFOLD ELEVATION

SCALE——NONE



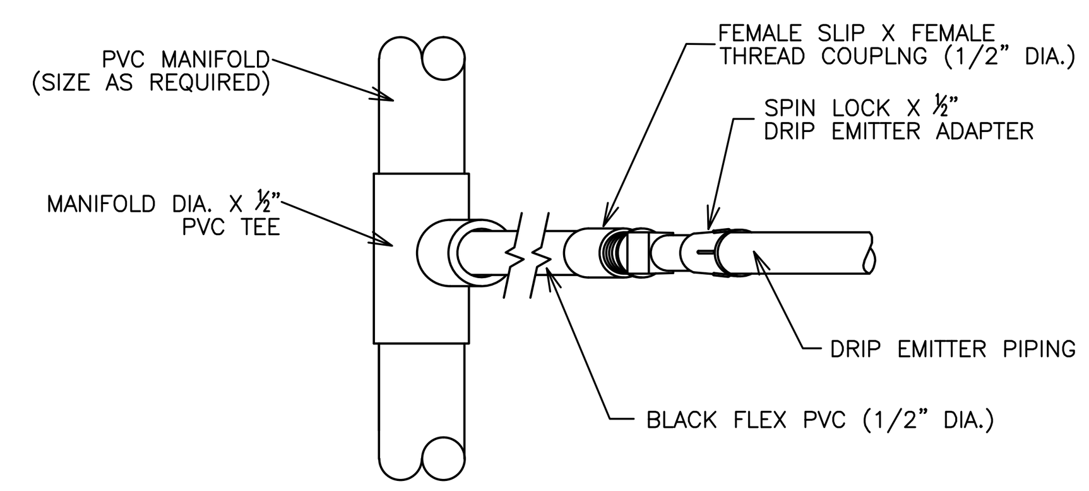
DRIP EMITTER PIPING

SCALE——NONE



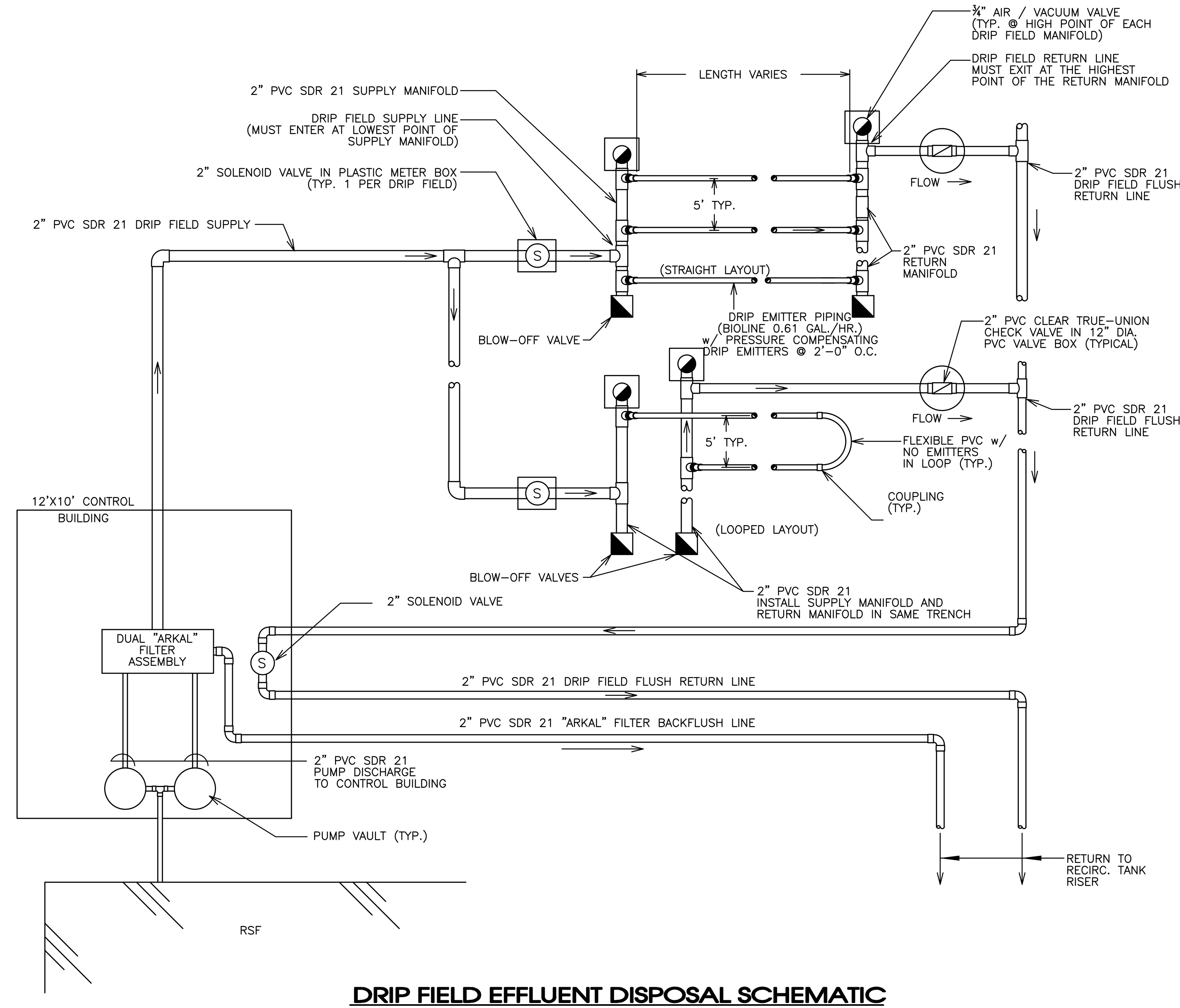
ELECTRIC SOLENOID VALVE

SCALE——NONE



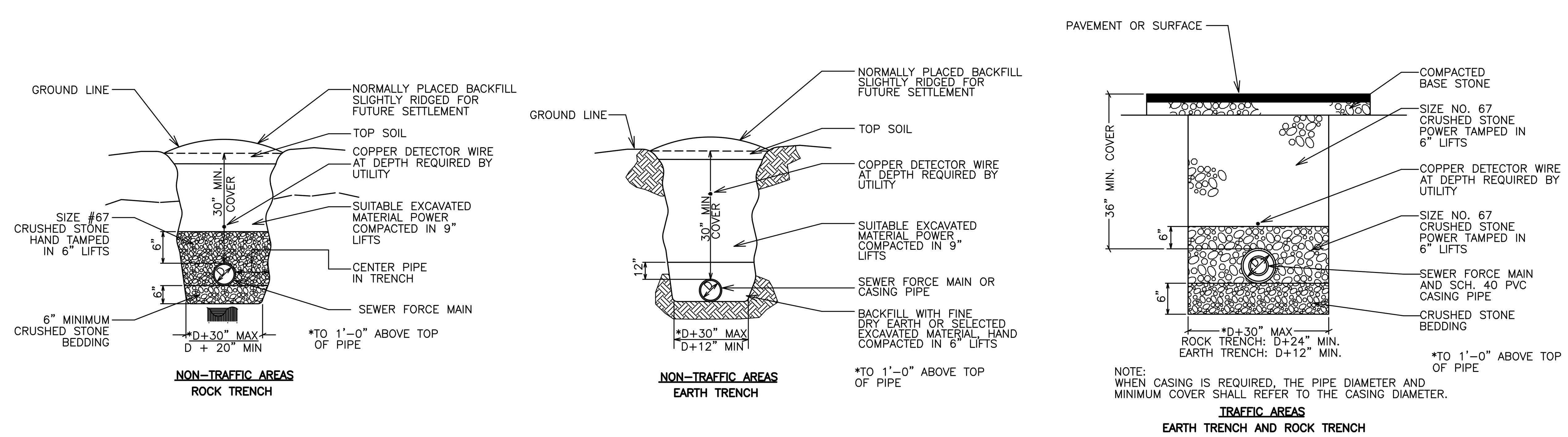
DRIP PIPING MANIFOLD TAP

SCALE——NONE



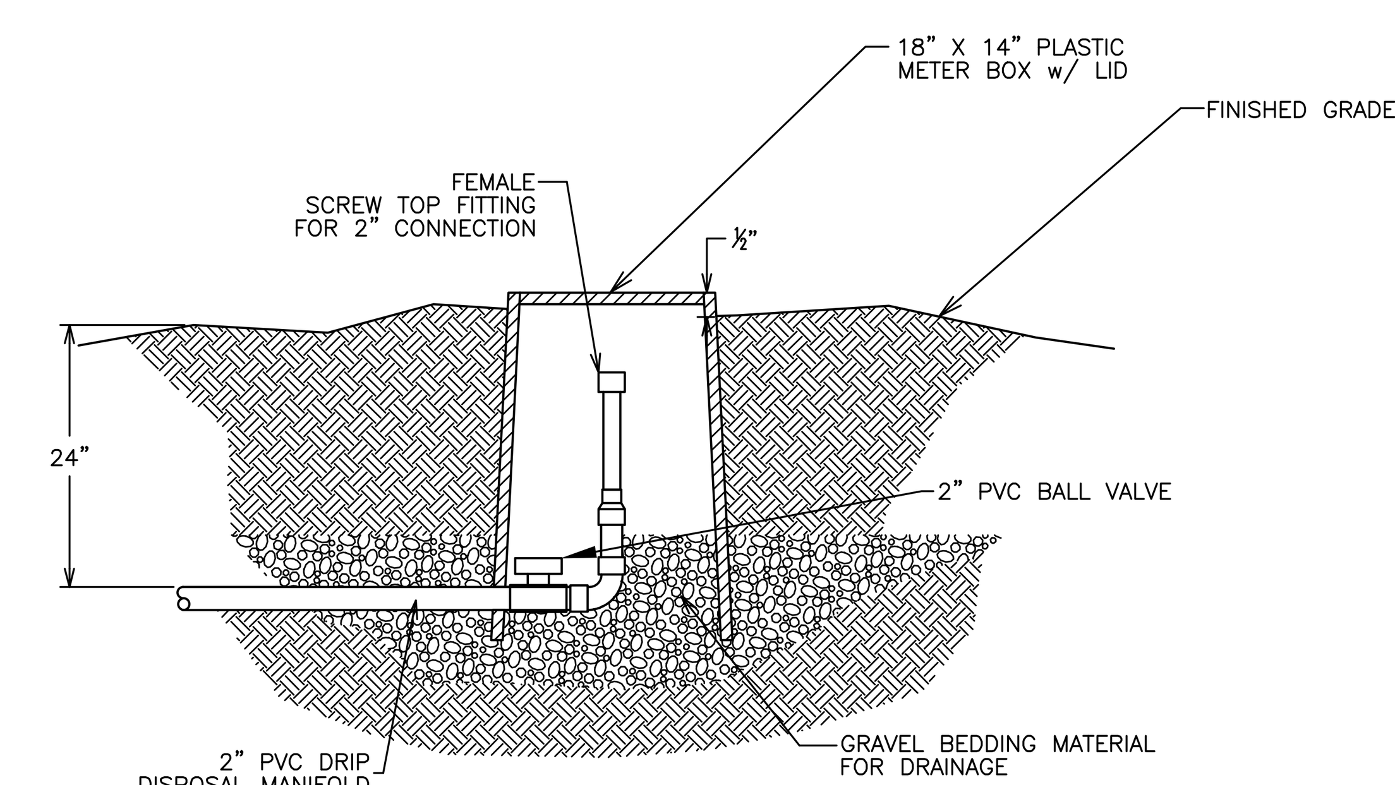
DRIP FIELD EFFLUENT DISPOSAL SCHEMATIC

SCALE——NONE



PIPING TRENCH DETAILS

SCALE——NONE



END-OF-LINE BLOW-OFF ASSEMBLY

SCALE——NONE

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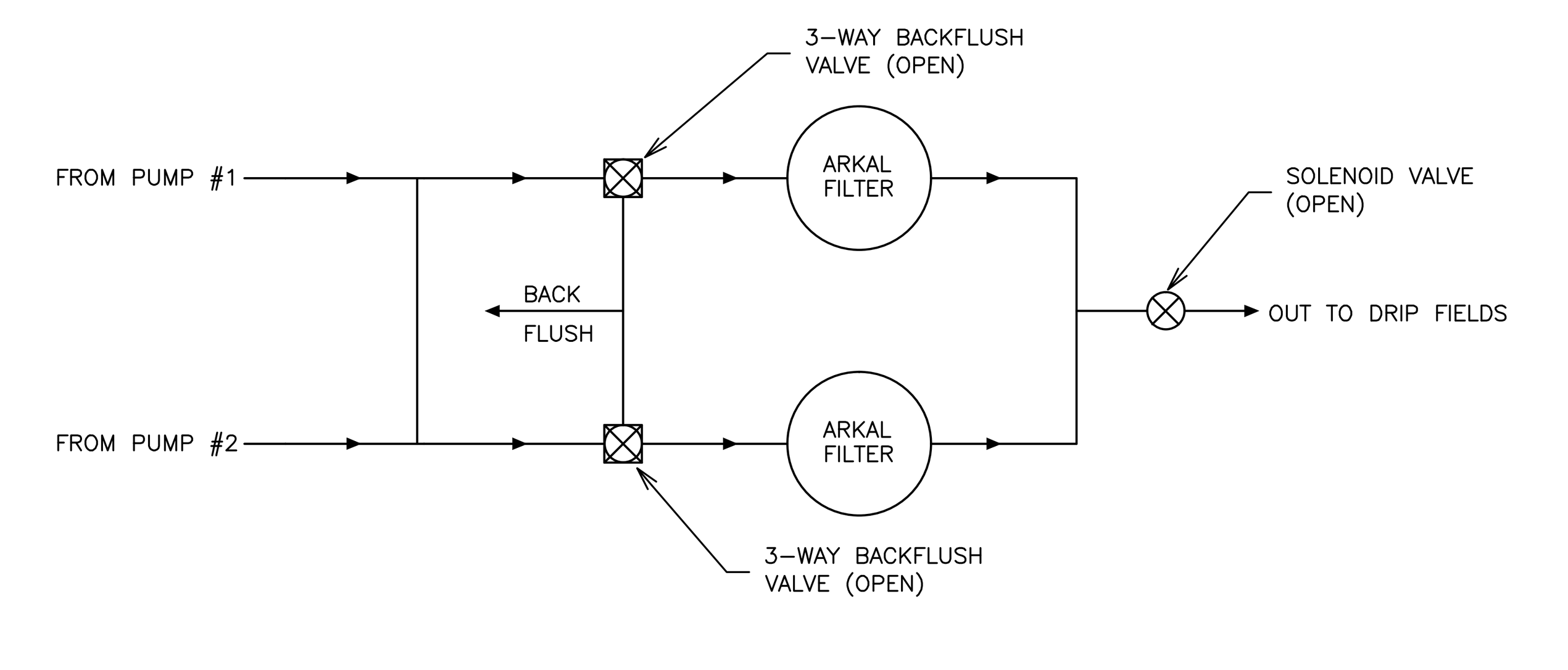
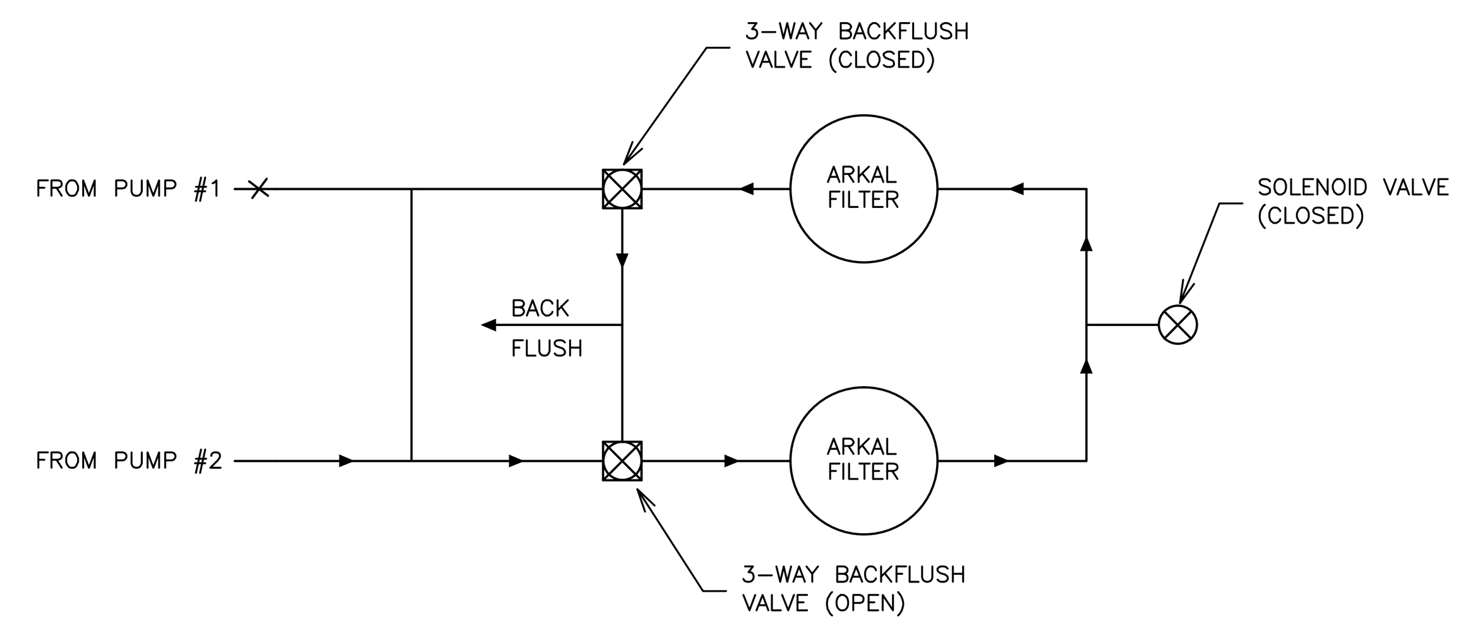
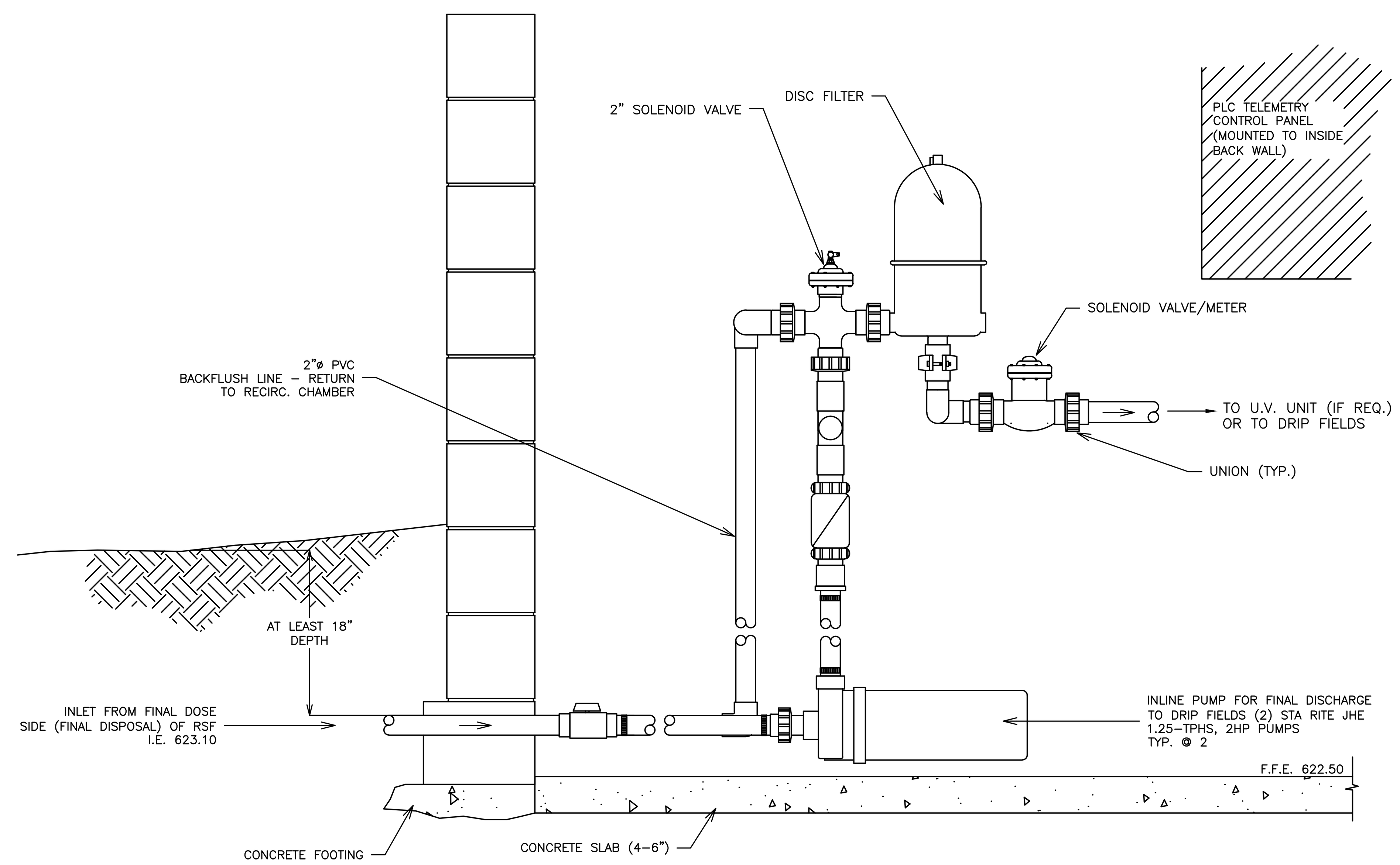


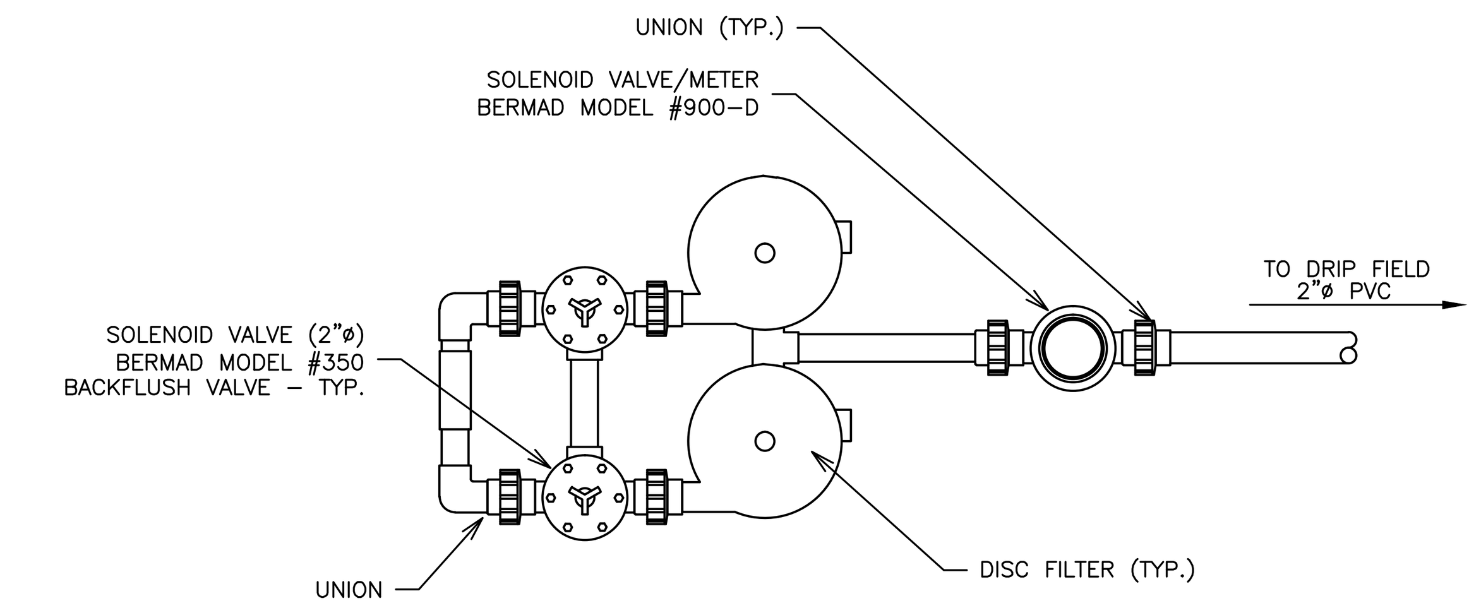
FLOW SCHEMATIC DUAL ARKAL FILTER - NORMAL
SCALE—NONE



FLOW SCHEMATIC DUAL ARKAL FILTER - FLUSHING
SCALE—NONE

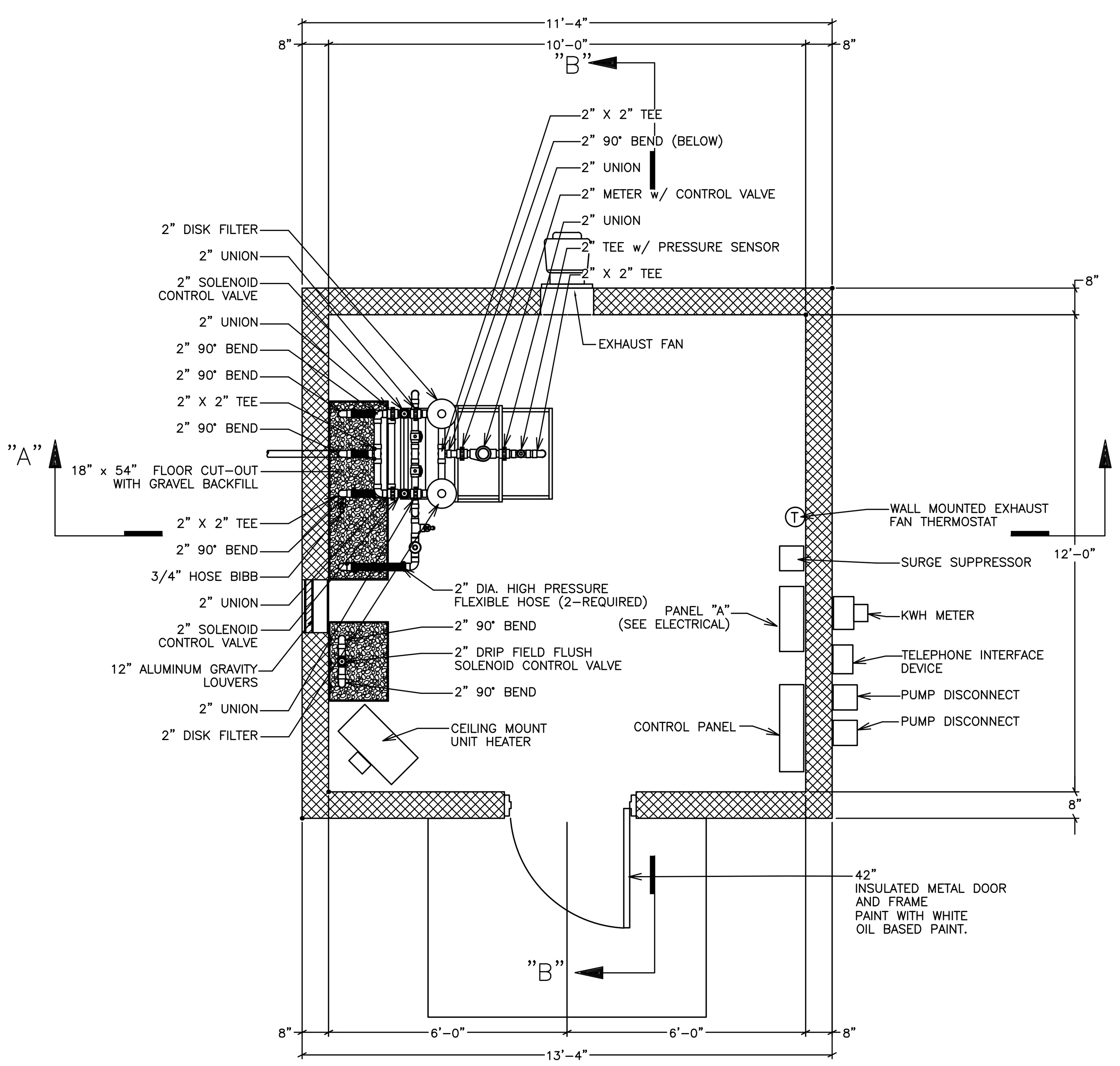


DISC FILTER ASSEMBLY SECTION VIEW
SCALE—NONE
ECS PART # ECSDUALSK-P



1. ENTIRE ASSEMBLY IS MOUNTED TO 2" ANGLE IRON FRAME (NOT SHOWN TO ALLOW FOR DETAILS)
2. ENTIRE ASSEMBLY IS DELIVERED PRE-ASSEMBLED AND MOUNTED TO FRAME
3. ALL PLUMBING CONNECTIONS (SUPPLY AND FLUSHING LINES) TO THE ASSEMBLY WILL BE MADE INSIDE OF THE TREATMENT FACILITY BUILDING

FINAL DISCHARGE PUMPS AND DUAL ARKAL FILTER WITH FLUSHING - PLAN
SCALE—NONE
ECS PART # ECSDUALSK-P



PLAN.

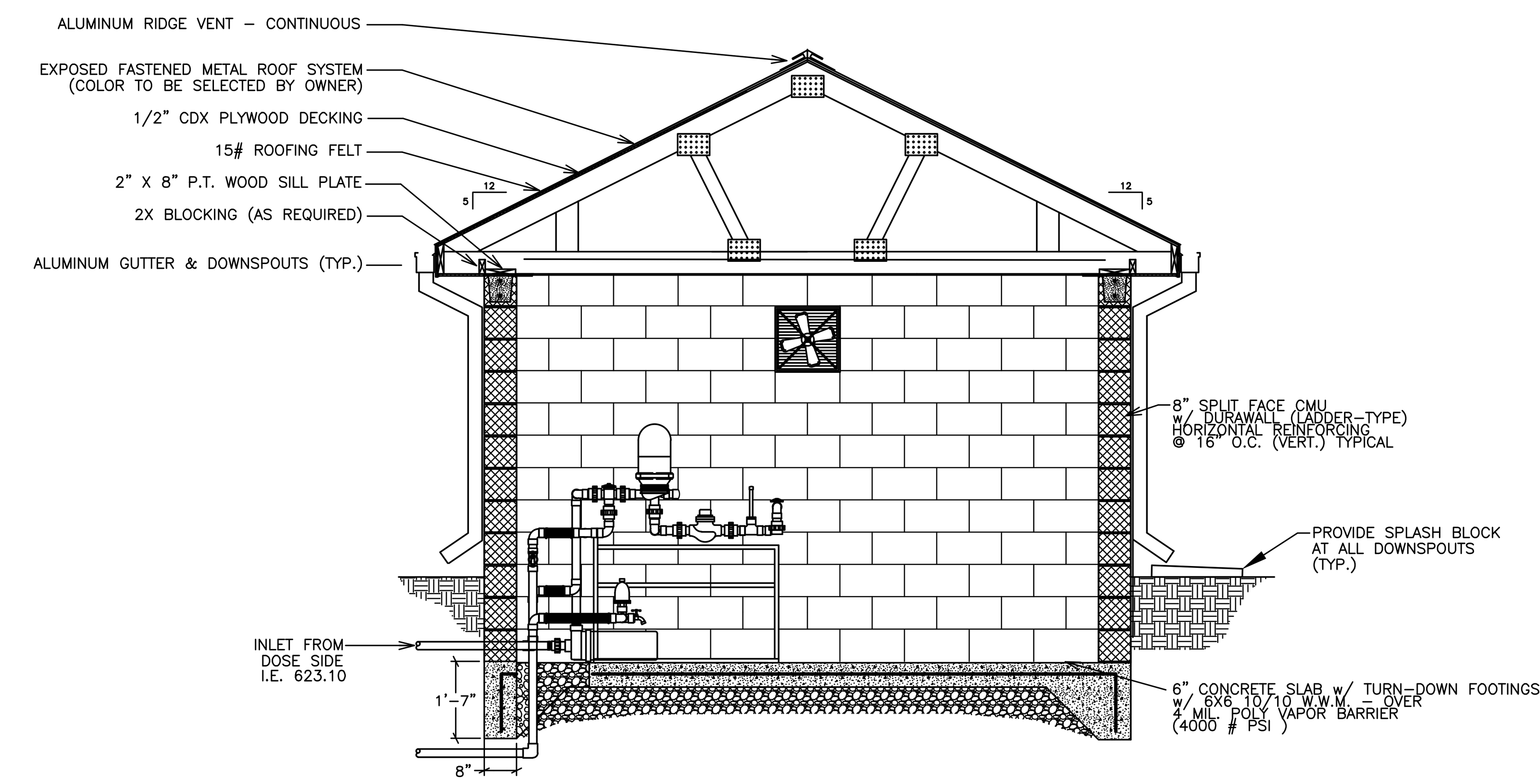
GENERAL NOTES:

1.) PIPING SHOWN IS FOR TWO PIPE INLET LAYOUT AND COMPONENTS FOR ADDITIONAL UNITS SHALL BE SIMILAR.

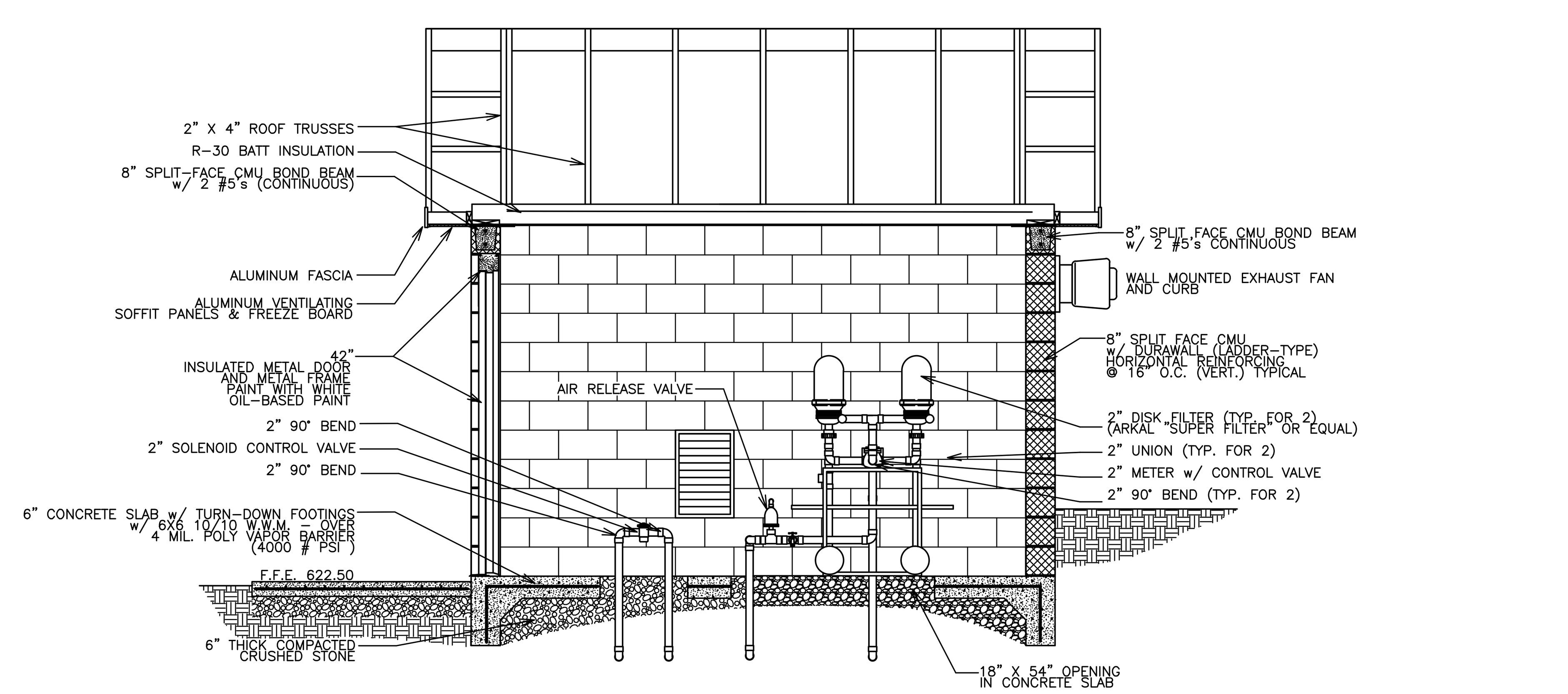
2.) ALL BUILDING PIPING AND VALVES SHALL BE 2" SCHEDULE 80 PVC.

3.) CONTRACTOR SHALL LEAVE PIPE STUB-OUTS IN BUILDING IF FUTURE U.V. DISINFECTION UNITS ARE PLANNED.

4.) FILTER UNITS TO BE SUPPORTED BY CUSTOM-MADE WELDED ANGLE IRON FRAME. FRAME TO BE PAINTED WITH TWO COATS BLACK ENAMEL. FRAME TO BE STURDY AND LEVEL.



SECTION "A"–"A"



SECTION "B"–"B"

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Williamson County, Tennessee

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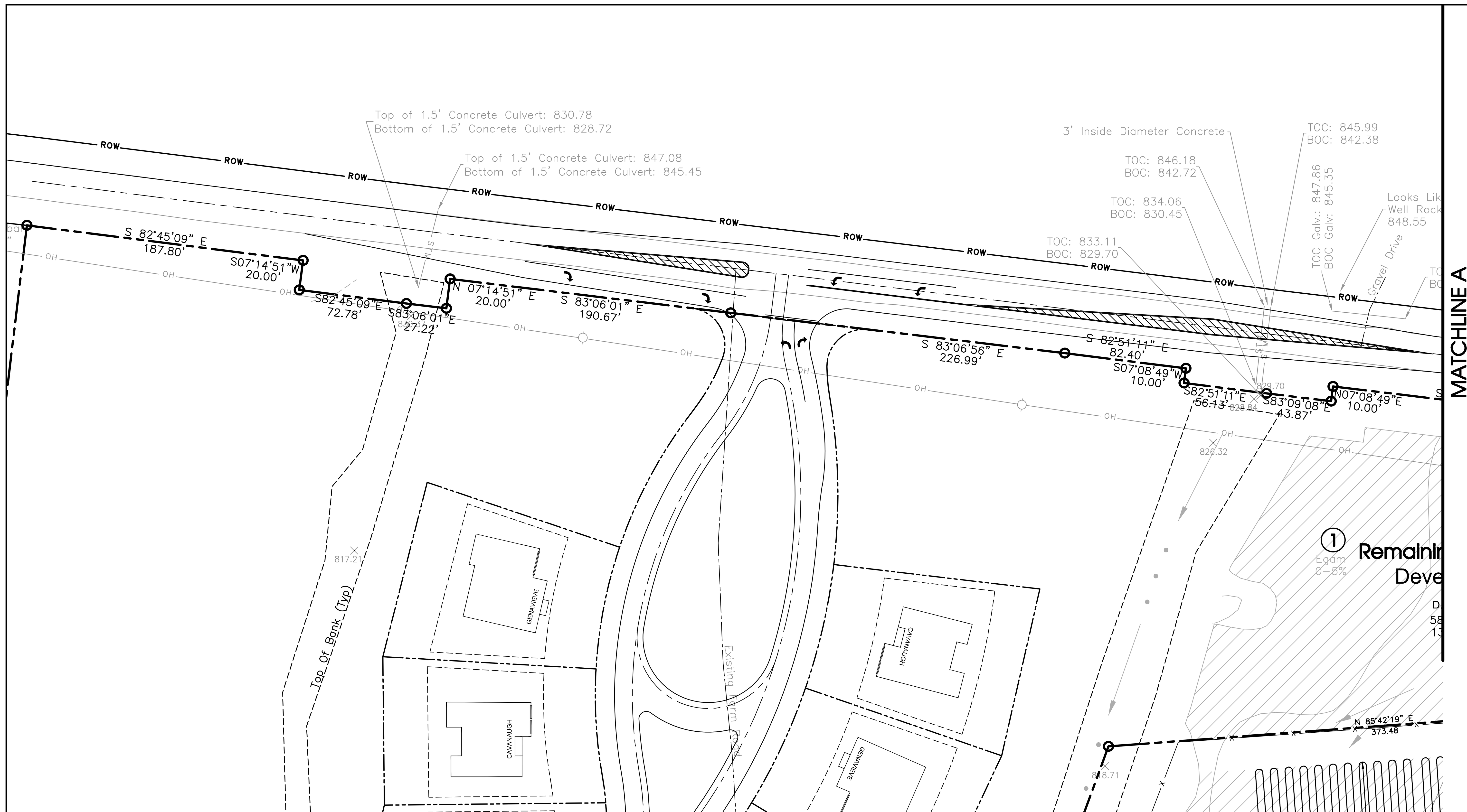
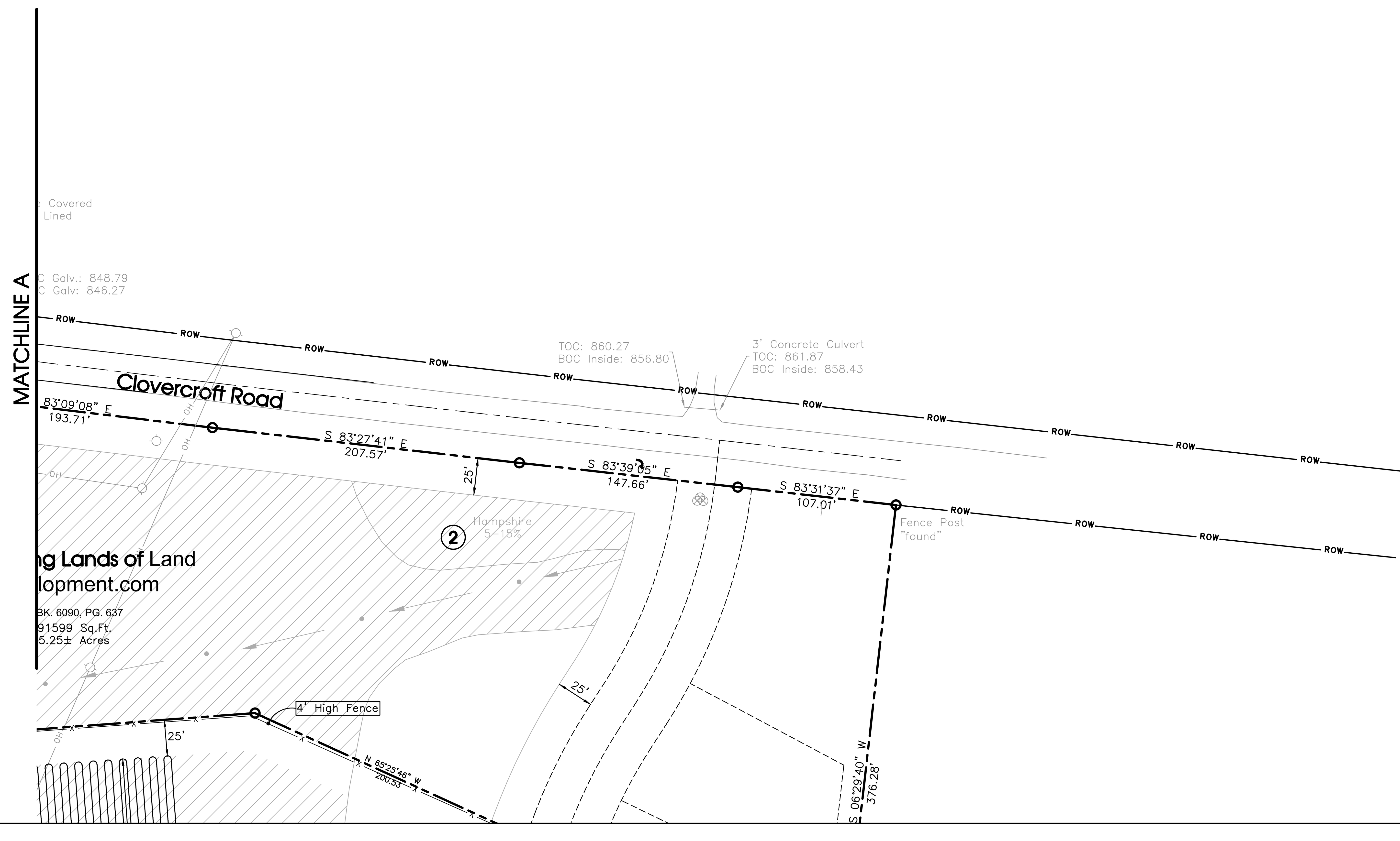
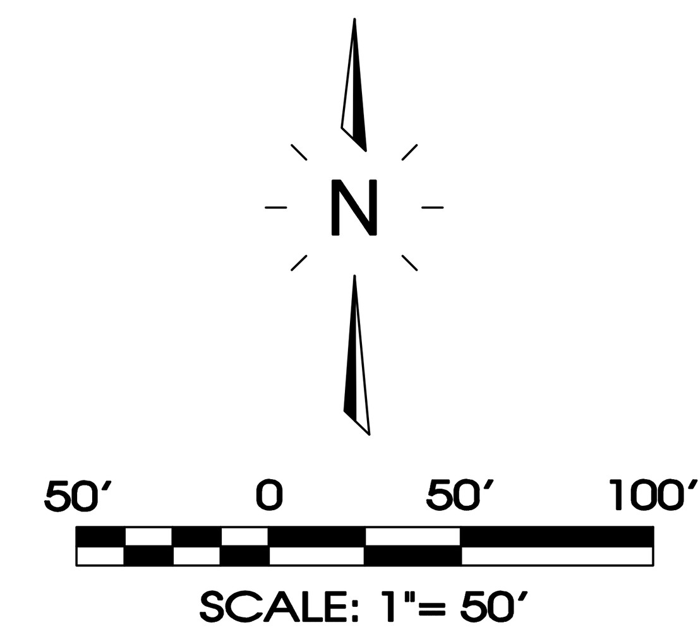
S.T.E.P. Details

SHEET:







General Notes:

1. Bituminous surface: (1" per sq. Yd.=106 lbs.) T.D.O.T. 411-01.01 - mineral aggregate (asc) grading "d" T.D.O.T. 411-01.02 - asphaltic cement (asc) grading "d"

2. All necessary permits and approvals from agencies governing this work shall be secured prior to commencing construction.

3. The locations of utilities shown within these plans are approximate only. Exact locations shall be determined in the field by contacting the utility companies.

4. The contractor shall notify each individual owner of his plan of operation in the area of the utilities prior to construction. The contractor shall contact the utility owners and request them to properly locate their respective utilities on the site. This notification must be given three(3) business days prior to construction operations. Some utilities can be located by calling Tennessee one call at 1-800-351-111.

5. The contractor will provide all necessary protective measures to safeguard existing utilities from damage during construction of this project. In the event that special equipment is required to work over and around the utilities, the contractor will be required to furnished such equipment. The cost of protecting utilities from damage and furnishing special equipment will be included in the bid price under other items of considerations.

6. Any lane closures shall be signed in accordance with part 6 of M.U.T.C.D.

7. The contractor shall comply with section 712 regarding "temporary traffic control" and "T.D.O.T.-standard specifications for road and bridge construction" (dated March 1, 2006) in the implementation of a traffic control plan.

8. All channelization, striping and pavement marking shall conform with part 3 of the manual on uniform traffic control devices (M.U.T.C.D.) and TN Dept. Of Transportation Standard Roadway Drawings No. T-M-1, T-M-3, and T-M-4.

9. All signs, barricades and warning lights shall conform with part 6 of M.U.T.C.D.

10. Cone and/or drums which meet requirements of part 6 of M.U.T.C.D. shall be provided as required for channelization of thru traffic.

11. All traffic control devices shall be removed immediately upon completion of this portion of the project. During construction, contractor shall follow T.D.O.T.'s "guidelines for handling differences in elevation between adjacent roadway elements".

Grading and Drainage Notes:

1. The contractor shall cut existing pavement as necessary to assure a smooth fit and continuous grade.

2. The contractor shall verify horizontal and vertical location of all existing storm sewer structures, pipes and all utilities prior to construction.

3. Clearing and grubbing limits shall include all areas disturbed by grading operation.

4. Any graded or disturbed areas shall have 4 inches of topsoil, seed, mulch, fertilizer and water applied until a healthy stand of grass is obtained. The restoration shall closely follow construction.

5. Existing structures to be relocated (headwalls, culverts, fire hydrants, blow-offs, guy wires/telephone poles, etc.) May be reinstalled only if undamaged and approved by the Williamson County Highway Department prior to backfill of trench.

6. Existing roadside culverts shall be replaced in-kind and size where not reusable. If reusable, relocate to new ditch location. However if final grade is to be less than 1.0 ft. over culvert, RCP shall be used.

Erosion Control Notes:

1. The site contractor is responsible for establishing and maintaining suitable erosion and sediment control devices on-site during construction as required to prevent silt from leaving site. Silt will not be allowed beyond construction limits.

2. The contractor is responsible for removing silt from site if not reusable on-site and assuring plan alignment and grade in all ditches at completion of construction.

3. The contractor is responsible for cleaning out all storm drainage structures, including flumes, pipes, etc, prior to completion of this project.

4. Erosion control shall be provided for all cut and fill operations within the limits of the construction site, throughout the construction period to provide the site with maximum protection from erosion at all times.

5. Erosion control measures are to be installed prior to any grading on-site and are to be maintained in place until stabilization of erodable soils has been accomplished.

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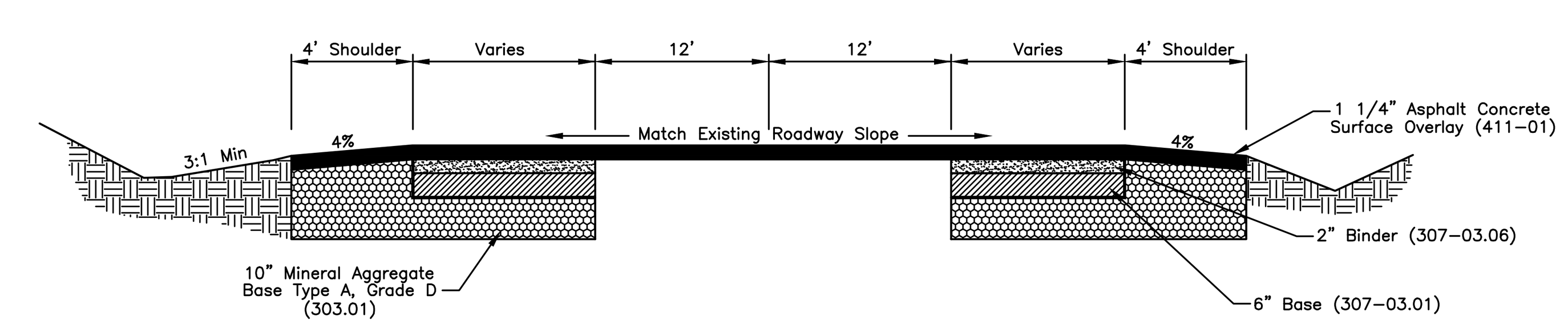
MPH



CLOVERCROFT ROAD Typical Section

SCALE — NONE

SEC, Inc.
SITE ENGINEERING CONSULTANTS
ENGINEERING • SURVEYING • LAND PLANNING
850 MIDDLE TENNESSEE BOULEVARD MURFREESBORO, TENNESSEE 37129
PHONE: (615) 890-7901 FAX: (615) 895-2567
E-MAIL: JREED@SEC-CIVIL.COM

REVIEW SET (Not Intended for Construction)

Clovercroft Acres Subdivision

Williamson County, Tennessee

Off-Site Turn Lane

REVISED:
DRAWN: SJA
DATE: 8-6-13
CHECKED: JFR
FILE NAME: 12040project.dwg
SCALE: 1"=50'
JOB NO. 12040
SHEET: 1 of 1