

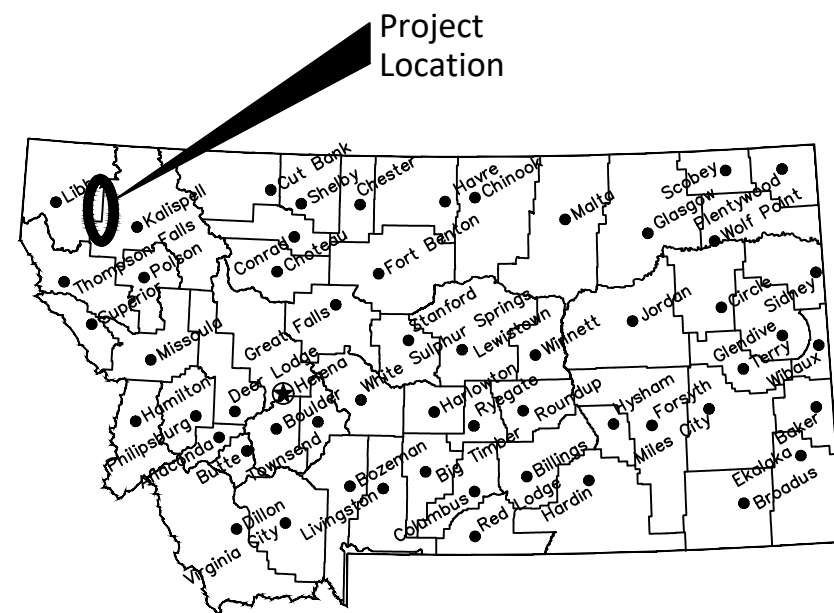
Montana Fish, Wildlife, and Parks

Updated 10/11/23

Logan State Park Septic Repairs/Improvements Project

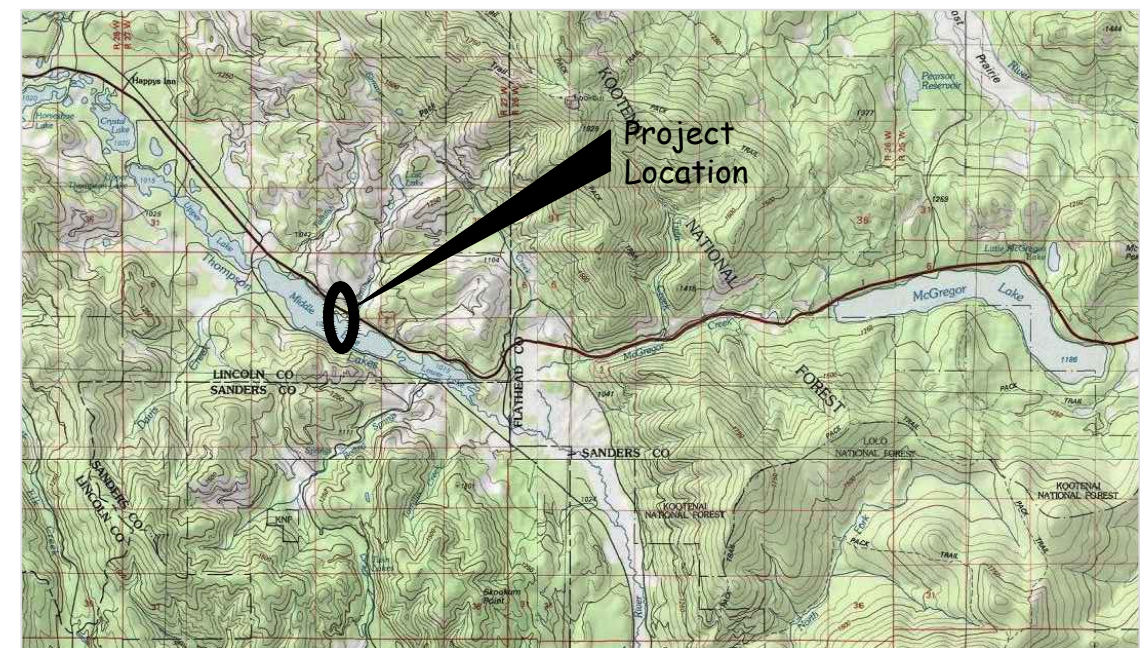
Near Happy's Inn, Lincoln County, Montana

FWP # 7176313



Location Map

No Scale



Vicinity Map

No Scale

MONTANA FISH, WILDLIFE AND PARKS
DESIGN AND CONSTRUCTION

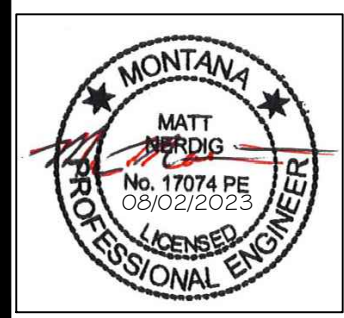
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M Nerdig, PE 08/02/2023
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R Smith, PE 08/02/2023
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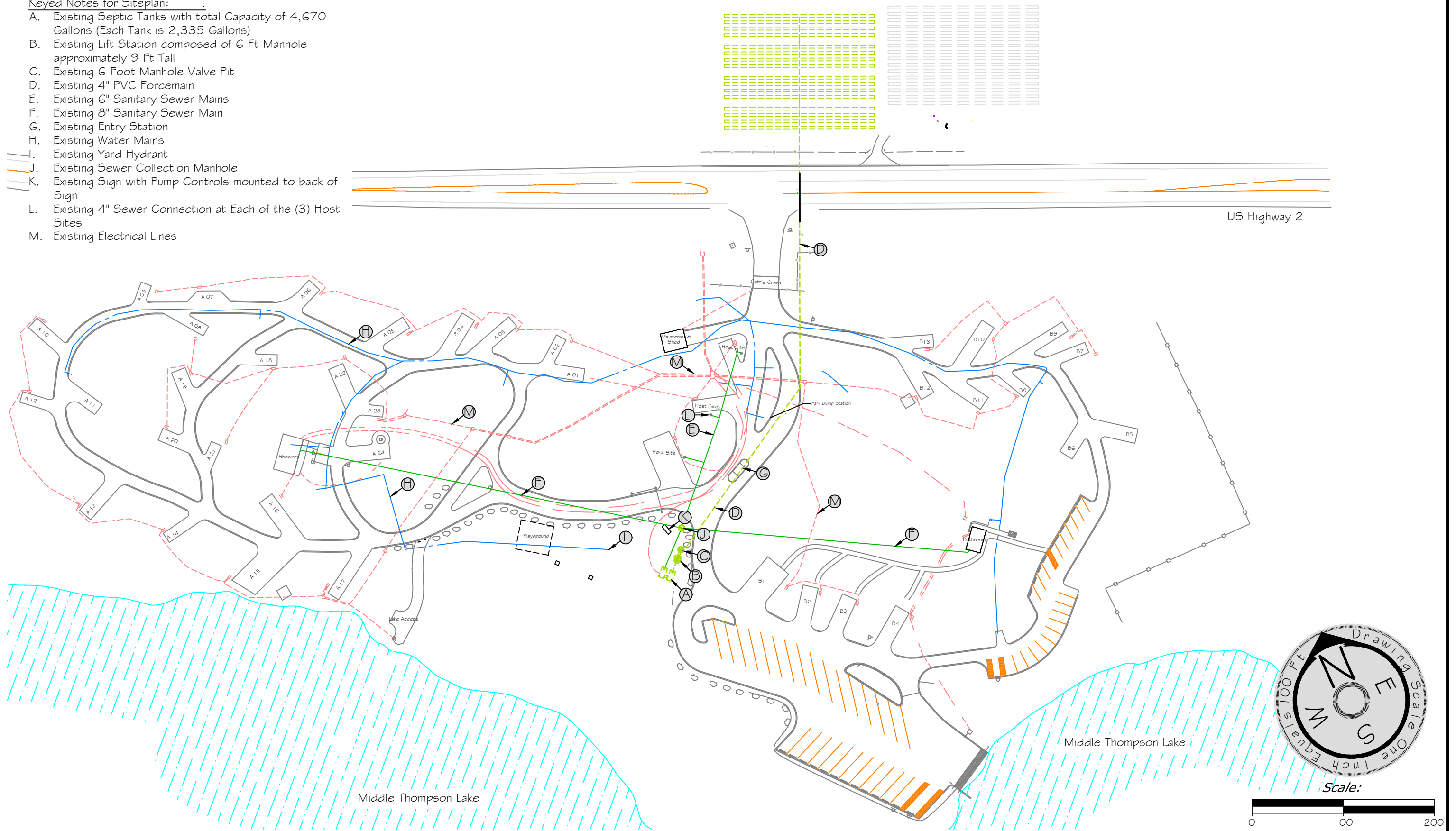
**MONTANA FISH,
WILDLIFE & PARKS**

Logan State Park Septic Repairs Project
Cover Sheet

SHEET: 1
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19

Keyed Notes for Siteplan:

- A. Existing Septic Tanks with total Capacity of 4,670 Gallons (Each Tank is 2,335 Gallons)
- B. Existing Lift Station composed of 6 Ft Manhole approximately 9 Ft Tall
- C. Existing 6 Foot Manhole Valve Pit
- D. Existing 4" PVC Forcemain
- E. Existing 6" Sanitary Sewer Mains
- F. Existing 8" Sanitary Sewer Main
- G. Existing Entry Station
- H. Existing Water Mains
- I. Existing Yard Hydrant
- J. Existing Sewer Collection Manhole
- K. Existing Sign with Pump Controls mounted to back of Sign
- L. Existing 4" Sewer Connection at Each of the (3) Host Sites
- M. Existing Electrical Lines



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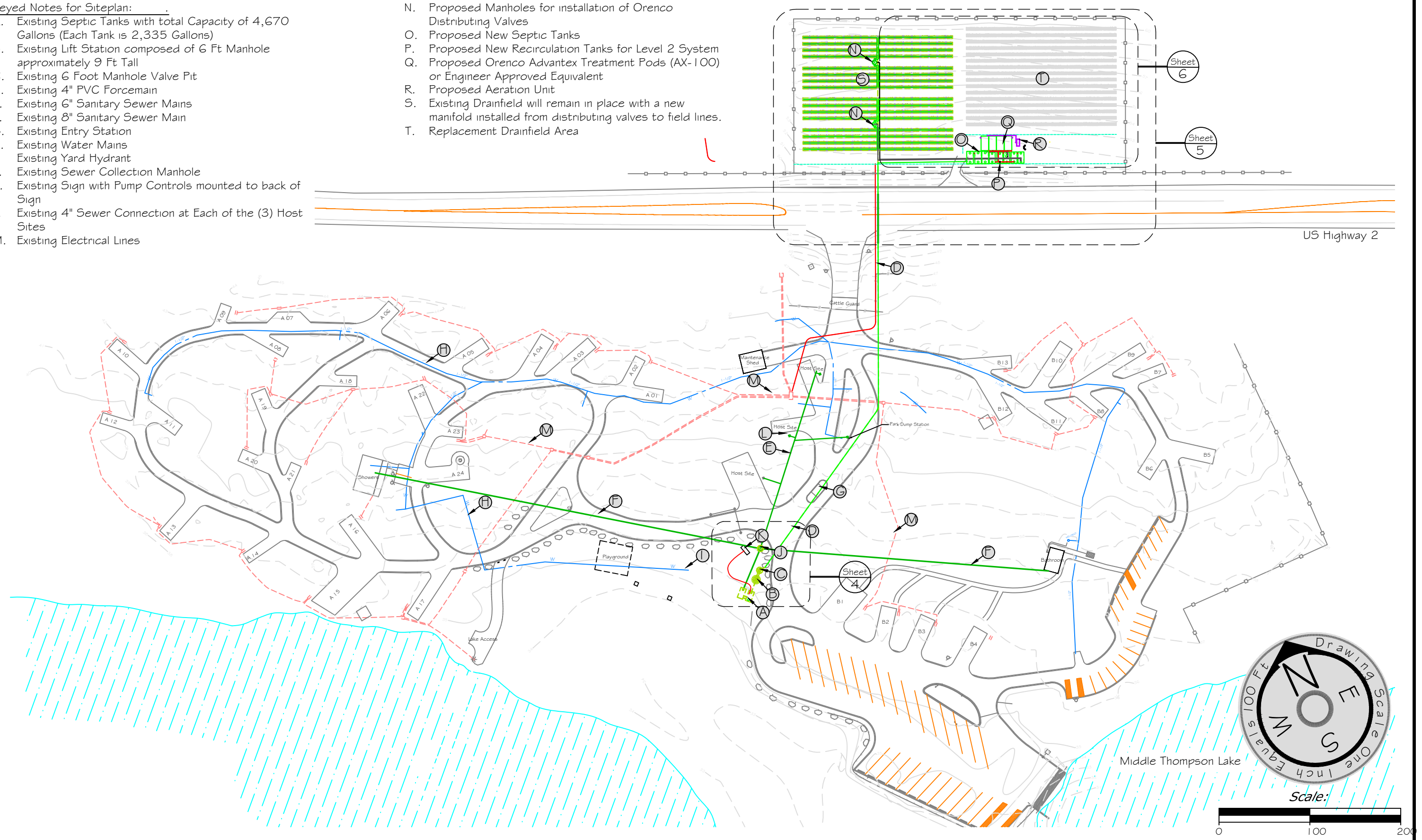
Overall Existing Conditions Siteplan
 Logan State Park Septic Repairs Project

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Keyed Notes for Siteplan:

- A. Existing Septic Tanks with total Capacity of 4,670 Gallons (Each Tank is 2,335 Gallons)
- B. Existing Lift Station composed of 6 Ft Manhole approximately 9 Ft Tall
- C. Existing 6 Foot Manhole Valve Pit
- D. Existing 4" PVC Forcemain
- E. Existing 6" Sanitary Sewer Mains
- F. Existing 8" Sanitary Sewer Main
- G. Existing Entry Station
- H. Existing Water Mains
- I. Existing Yard Hydrant
- J. Existing Sewer Collection Manhole
- K. Existing Sign with Pump Controls mounted to back of Sign
- L. Existing 4" Sewer Connection at Each of the (3) Host Sites
- M. Existing Electrical Lines

- N. Proposed Manholes for installation of Orenco Distributing Valves
- O. Proposed New Septic Tanks
- P. Proposed New Recirculation Tanks for Level 2 System
- Q. Proposed Orenco Advantex Treatment Pods (AX-100) or Engineer Approved Equivalent
- R. Proposed Aeration Unit
- S. Existing Drainfield will remain in place with a new manifold installed from distributing valves to field lines.
- T. Replacement Drainfield Area



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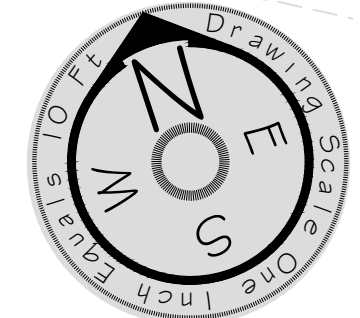
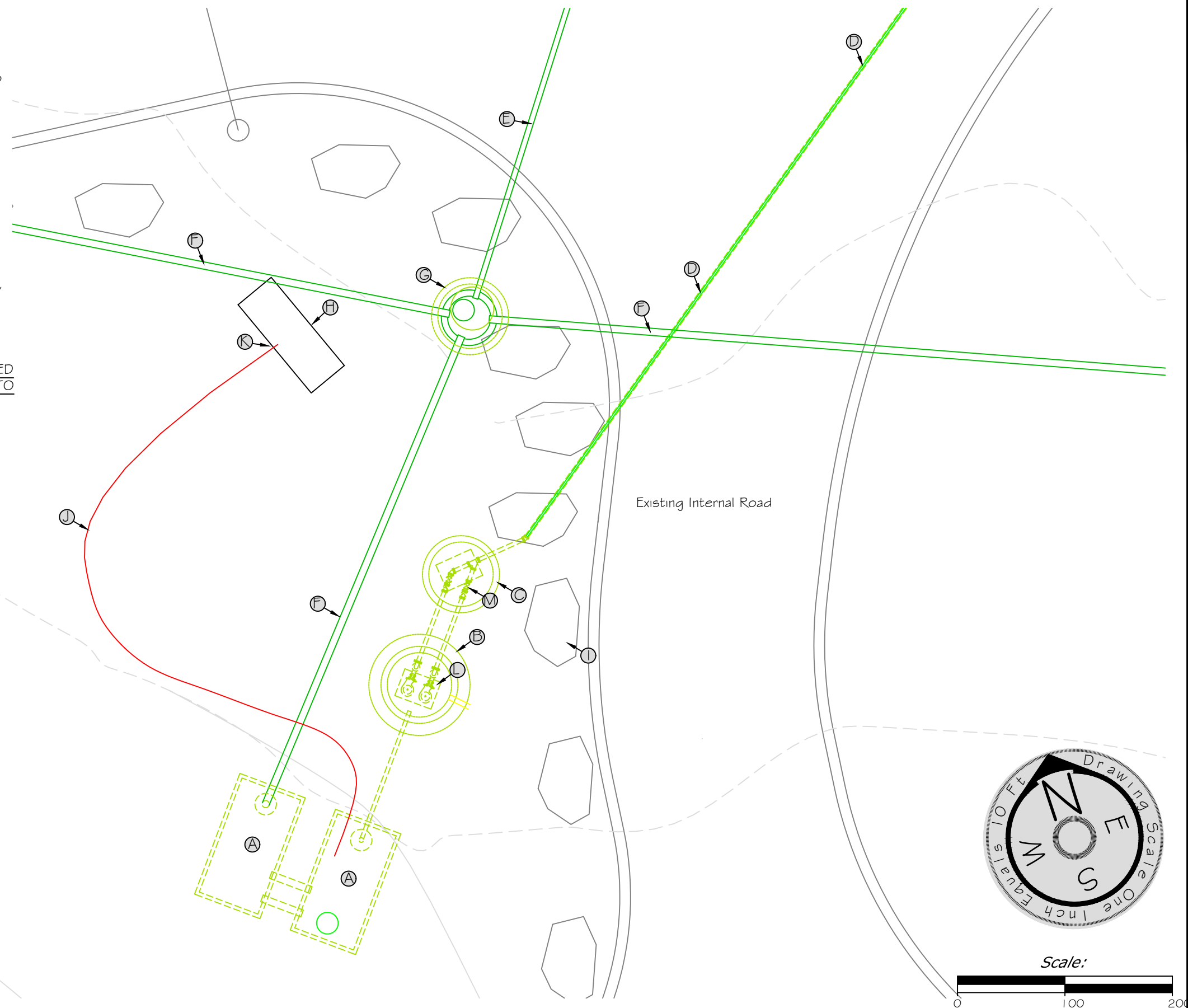
**Site Improvements
 Logan State Park Septic Repairs Project**

SHEET: **3**
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19

Keyed Notes for Siteplan:

- A. Existing Septic Tanks with total Capacity of 4,670 Gallons (Each Tank is 2,335 Gallons).
- B. Existing Lift Station composed of 6 Ft Manhole approximately 9 Ft Tall to Remain in Place
- C. Existing 6 Foot Manhole Valve Pit to Remain In Place
- D. Existing 4" PVC Forcemain
- E. Existing 6" Sanitary Sewer Mains
- F. Existing 8" Sanitary Sewer Main
- G. Existing 6' Sewer Collection Manhole to remain in place
- H. Existing Sign with Pump Controls mounted to back of Sign
- I. Existing Rocks to Protect Area
- J. Existing Electrical Lines
- K. Existing Control Panel to Remain in Place, contractor shall verify dosing volumes with float settings and proper operation of panel
- L. Existing Pumps, contractor shall verify existing pump operations after installation of new septic tanks and systems on drainfield side of highway
- M. Existing Valves in Manhole shall be inspected and verified for proper operation

CONTRACTOR SHALL ENSURE THAT ALL EXISTING SEPTIC TANKS BE PUMPED AND ALL PUMP OPERATIONS SHALL BE VERIFIED BY THE CONTRACTOR TO ENSURE PROPER CONTINUED OPERATION OF THE UPGRADED SYSTEM.



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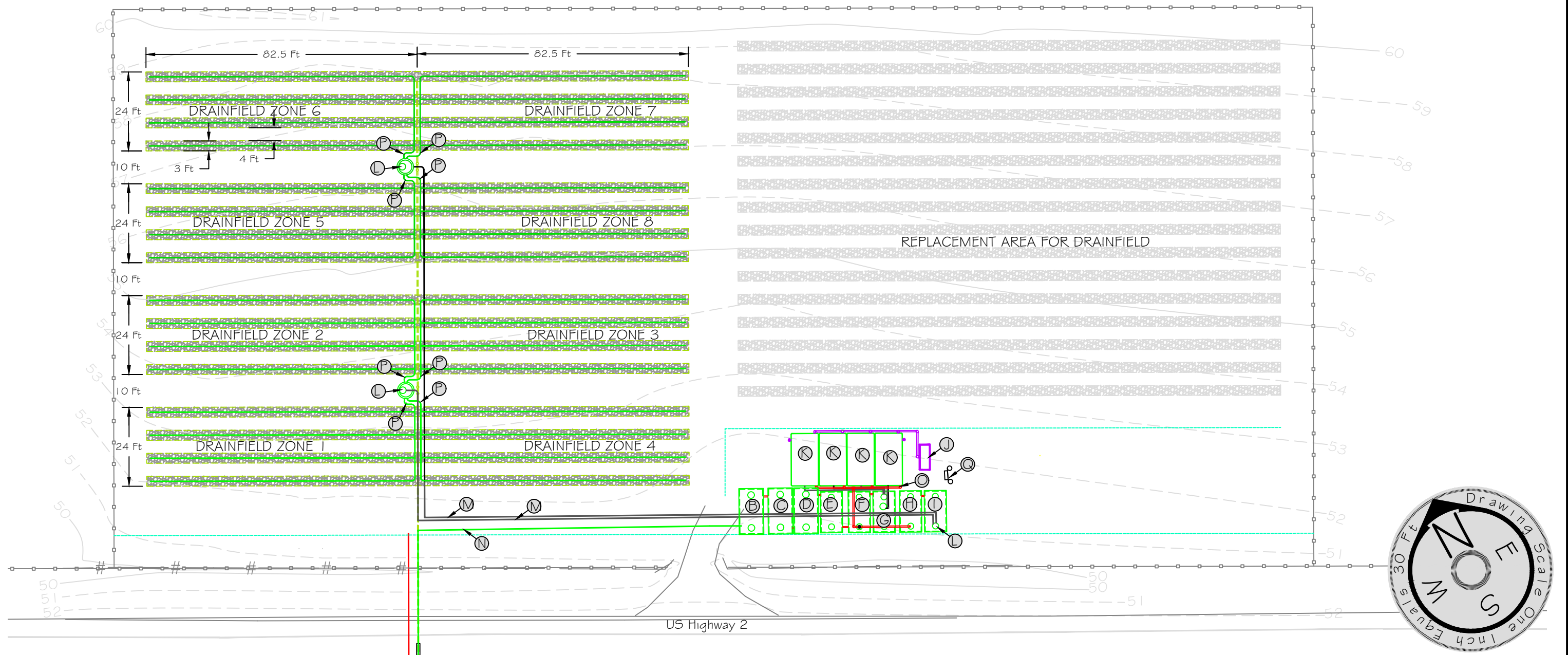
Existing/Proposed Lift Station Area
 Logan State Park Septic Repairs Project

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Keyed Notes for Siteplan:

- A. Existing Septic Tanks with total Capacity of 4,670 Gallons (Each Tank is 2,335 Gallons)
- B. Proposed 3,000 Gallon Precast Septic Tank #1
- C. Proposed 3,000 Gallon Precast Septic Tank #2
- D. Proposed 3,000 Gallon Precast Septic Tank #3
- E. Proposed 2,000 Gallon Precast Septic Tank #4
- F. Proposed 2,000 Gallon Recirculation Tank with no Pump #5
- G. Proposed 2,000 Gallon Recirculation Tank with (4) Pumps and (3) Risers as shown #6
- H. Proposed 2,000 Gallon Post Anoxic Tank #7
- I. Proposed 2,000 Gallon Post Anoxic Tank #8
- J. Proposed Air Ventilation Unit
- K. Proposed AX-100 Orenco Advantex Pods or Approved Equivalent
- L. Proposed 48" Manhole with 4 Way Distributing Valve (2 Locations)
- M. Proposed 2" Sch 40 Piping from Pump Chamber to Manhole with Distributing Valve (2 Pumps/Pipes)
- N. Connect to existing 4" Sch 40 Forcemain at edge of fencing/right of way and install new 4" sch 40 line to proposed septic tank #1

- O. Proposed 4" Sch 40 collection piping from Pods to Recirculation Valve in Recirculation Tank #5 and on to Post Anoxic Tank #7.
- P. 2" Sch 40 Line to Drainfield Zones
- Q. Control Panels for Level Two System and Electrical Panels (Electrical Panel shall be designed by Licensed Master Electrician) - Panels to be mounted on $\frac{3}{4}$ " Pressure Treated Plywood mounted to (2) 12" x 10' Posts with 4' embedded in 18" oversize concrete filled hole. All panels to be rated for exterior usage and installed per electrical code.



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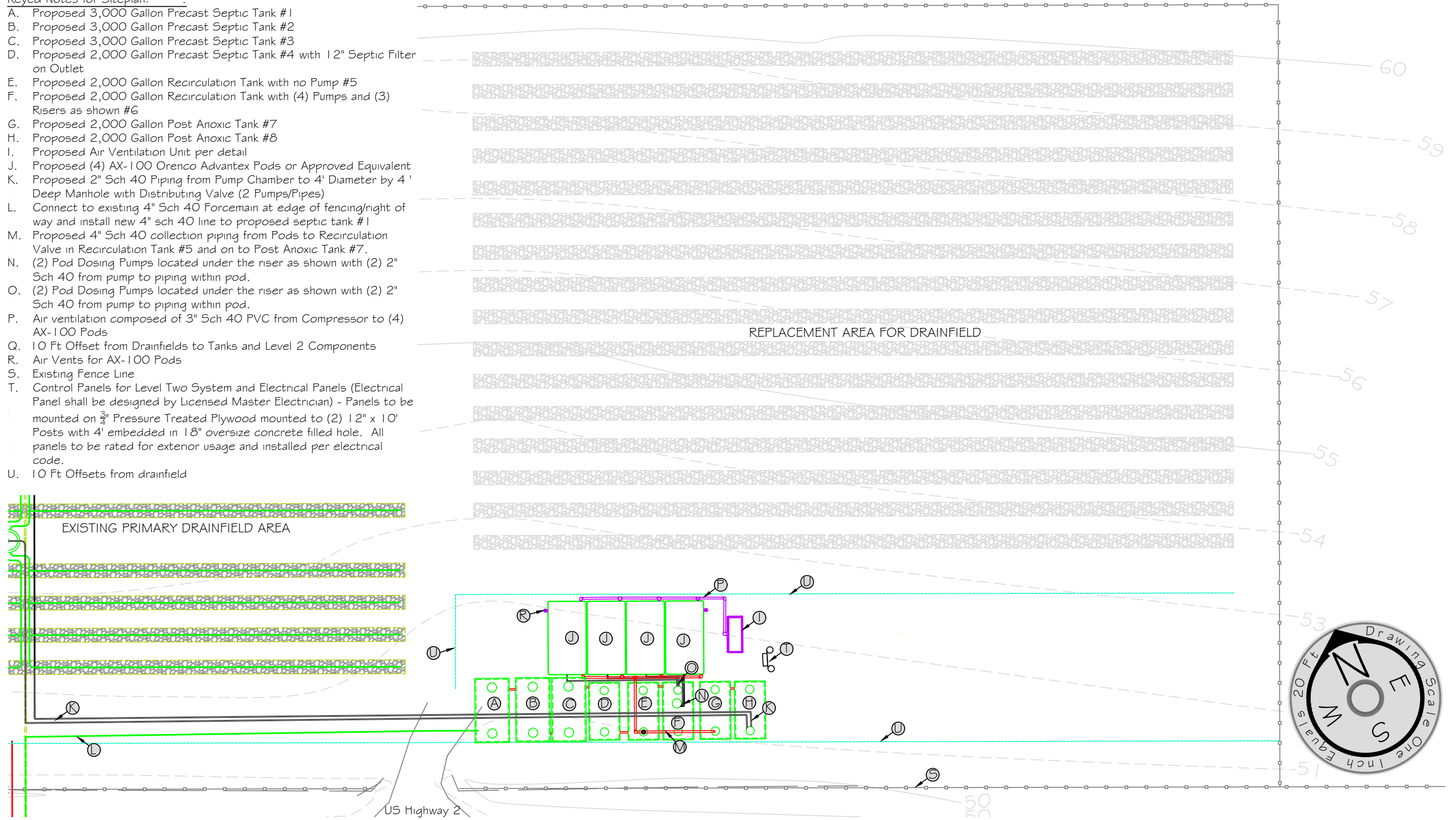
Drainfield and Level 2 Improvements

Logan State Park Septic Repairs Project

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19

Keyed Notes for Siteplan:

- A. Proposed 3,000 Gallon Precast Septic Tank #1
- B. Proposed 3,000 Gallon Precast Septic Tank #2
- C. Proposed 3,000 Gallon Precast Septic Tank #3
- D. Proposed 2,000 Gallon Precast Septic Tank #4 with 12" Septic Filter on Outlet
- E. Proposed 2,000 Gallon Recirculation Tank with no Pump #5
- F. Proposed 2,000 Gallon Recirculation Tank with (4) Pumps and (3) Risers as shown #6
- G. Proposed 2,000 Gallon Post Anoxic Tank #7
- H. Proposed 2,000 Gallon Post Anoxic Tank #8
- I. Proposed Air Ventilation Unit per detail
- J. Proposed (4) AX-100 Orenco Advantex Pods or Approved Equivalent
- K. Proposed 2" Sch 40 Piping from Pump Chamber to 4' Diameter by 4' Deep Manhole with Distributing Valve (2 Pumps/Pipes)
- L. Connect to existing 4" Sch 40 Forcemain at edge of fencing/right of way and install new 4" sch 40 line to proposed septic tank #1
- M. Proposed 4" Sch 40 collection piping from Pods to Recirculation Valve in Recirculation Tank #5 and on to Post Anoxic Tank #7.
- N. (2) Pod Dosing Pumps located under the riser as shown with (2) 2" Sch 40 from pump to piping within pod.
- O. (2) Pod Dosing Pumps located under the riser as shown with (2) 2" Sch 40 from pump to piping within pod.
- P. Air ventilation composed of 3" Sch 40 PVC from Compressor to (4) AX-100 Pods
- Q. 10 Ft Offset from Drainfields to Tanks and Level 2 Components
- R. Air Vents for AX-100 Pods
- S. Existing Fence Line
- T. Control Panels for Level Two System and Electrical Panels (Electrical Panel shall be designed by Licensed Master Electrician) - Panels to be mounted on $\frac{3}{4}$ " Pressure Treated Plywood mounted to (2) 12" x 10' Posts with 4" embedded in 18" oversize concrete filled hole. All panels to be rated for exterior usage and installed per electrical code.
- U. 10 Ft Offsets from drainfield



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**MONTANA FISH,
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Level 2 and Replacement Area
 Logan State Park Septic Repairs Project

SHEET: 6 of 19

OPERATION AND MAINTENANCE OF THE SYSTEM - SEPTIC TANKS

1. Inspect Filters every 3 months, clean and replace as needed
2. Clean and Pump Tank every 3 years
 - 2.1. Confirm baffles are in place
 - 2.2. Visual inspect Mechanical & Electrical
 - 2.3. observe and calibrate if necessary pump operation and tank draw down
 - 2.4. Observe and confirm discharge into bed

PIPE INSTALLATION

All pipes shall be bedded six (6) inches above and below the pipe in pipe bedding sand or other fine grained soil free of gravel over one (1) inch in size. Debris, frozen material, large clods, stones (greater than 8 inches in diameter), organic material or other unsuitable materials shall not be used for back fill within 24 inches of the top of the pipe. Compaction under and around the pipe shall be sufficient to prevent movement of the pipe due to settlement. All piping shall be buried a minimum of 4 feet in depth unless otherwise noted by the engineer.

MATERIAL SPECIFICATIONS

1. Pipe and fittings from the dwelling or structure to the septic tank and from the septic tank to the drainfield shall conform to or exceed ASTM D 1785 (schedule 40 or 80) and must be joined by an integral bell-and-spigot joint with rubber elastomeric gasket or solvent cement. PVC pipe shall have a minimum Standard Dimension Ratio of SDR 35, and the compound type shall meet or exceed ASTM D 1784.
2. Drain rock must be washed, must range in size from 1 inch to 2-1/2 inches, and must contain no more than 2 percent passing the #8 sieve. The material must be of sufficient competency to resist slaking or dissolution. Gravels of shale, sandstone, or limestone may degrade and may not be used.
3. Sand C-30 shall meet the following specifications:

Sieve	Particle Size (mm)	Percent Passing
0.375 inch	9.50	100
No. 4	4.75	95 to 100
No. 8	2.36	80 to 100
No. 16	1.18	45 to 85
No. 30	0.60	15 to 60
No. 50	0.30	3 to 10
No. 100	0.15	0 to 2

ABSORPTION TRENCH INSTALLATION (As Necessary)

When Trenches have been excavated the sides and bottom must be raked to scarify any smeared soil surfaces. Construction equipment not needed to construct the system should be kept off the area to be utilized for the absorption trench system to prevent undesirable compaction of soils. Construction must not be initiated when the soil moisture content is high.

The bottom of the drainfield trenches must be at least 12 inches and no more than 36 inches below the natural ground surface. There must be a minimum of 12 inches of fill or soil material above the drain rock. When the bottom of the trench is less than 24 inches below ground, a cap above the natural ground surface is required. The cap must be tapered from the edge of the outermost trench wall with a 3 horizontal to 1 vertical or flatter slope. The cap must be sloped to provide positive drainage away from the center of the drainfield.

Cleanouts must be provided at the end of each lateral. The cleanouts must be within 6 inches of finished grade and should be made with either a long sweep elbow or two 45 degree bends. A metal location marker must be provided for each cleanout. It is required that the cleanout be installed inside a 6" round irrigation box for ease of access. The irrigation box shall be installed with the top flush to the ground surface.

SEPTIC TANK INSTALLATION:

Where the top of the septic tank is located more than 18 inches below the finished grade of the ground surface, manhole risers shall be installed, extending to within eight inches of the finished grade, to facilitate inspection and cleaning of each compartment in the tank. The riser pipe shall be of sufficient size to provide access to each compartment for inspection and sludge removal. The septic tank filter shall be a minimum of 4" but it is recommended that a larger 8" filter be used. The filter handle shall extend to within 2" of the access lid per county regulations. Minimum cover for the septic tanks shall be 18" of depth.

Sealing material shall be placed around any pipe where it enters or exits the tank to assure that no leakage occurs. Hydraulic grout is preferred however oakum and tar, tar strips, or similar materials are acceptable if used properly. This sealing includes the filter pipe as it passes through the baffle wall inside the septic tank. If the filter is not sealed properly then solids may enter the pump chamber. It is typical that mastic is supplied with the tank for sealing all pipe penetrations.

The septic tank must be installed level and on a flat bedding material free of an organic material, debris, rocks, cobbles, stones or gravel greater than 1" in diameter.

SEPTIC TANK TESTING

1. All tanks must be watertight. Water tightness testing for a concrete tank maybe conducted using a water test. Water tightness testing for a polyethylene tank may be conducted using a water test, a vacuum test, or a pressure test.
2. Water testing must be conducted by sealing the outlets, filling the septic tank to its operational level, and allowing the tank to stand for at least 8 hours. If there is a measurable loss (2 inches or more), refill the tank and let stand for another 8 hours. If there is again a measurable loss, the tank must be rejected.
3. Vacuum testing must be conducted by sealing all inlets, outlets, and accesses, then introducing a vacuum of 4 inches of mercury. If the vacuum drops in the first 5 minutes, it must be brought back to 4 inches of mercury. If the septic tank fails to hold the vacuum at 4 inches of mercury or 5 minutes, the tank must be rejected.
4. For pressure testing a tank, all inlets, outlets, and access ports must be sealed and adequately secured. The tank must be charged with 3 PSIG, Allow tank pressure to stabilize. Disconnect the air supply. If there is any noticeable pressure drop in 1 hour, the tank must be rejected or repaired. Repeat the test after repair release air carefully through an appropriate mechanism.

PRE-INSTALLATION TASKS

1. Locate all existing drainfields, septic tanks, and gravity lines. Note location and provide to engineer of record. Call U dig per state law to verify all utilities. Contractor is responsible for locating and protecting all existing utilities.
2. Locate all existing dry and wet utilities.
3. Completely remove or crush and completely fill all existing septic tanks.

INSTALLATION SEQUENCE

The following installation sequence and sign offs shall be followed during the construction:

1. Excavate for new systems, install tanks and pumps.
2. Install bed piping and forcemains.
3. Squirt test systems.
4. Engineer and Lincoln County must observe and certify.
5. Test float operation by filling tanks and pump chambers with clear water for one pump cycle.
6. Disable Pump power and test alarm function.
7. Engineer and Lincoln County must observe and certify.
8. Finalize bed piping and cover.
9. Engineer to inspect before backfilling.

START UP PROCEDURE

The following start up procedure shall be followed.

1. Fill septic tank with clear water.
2. Check pump ready status.
3. Verify all alarms are operational and in a visible location.
4. Begin use.

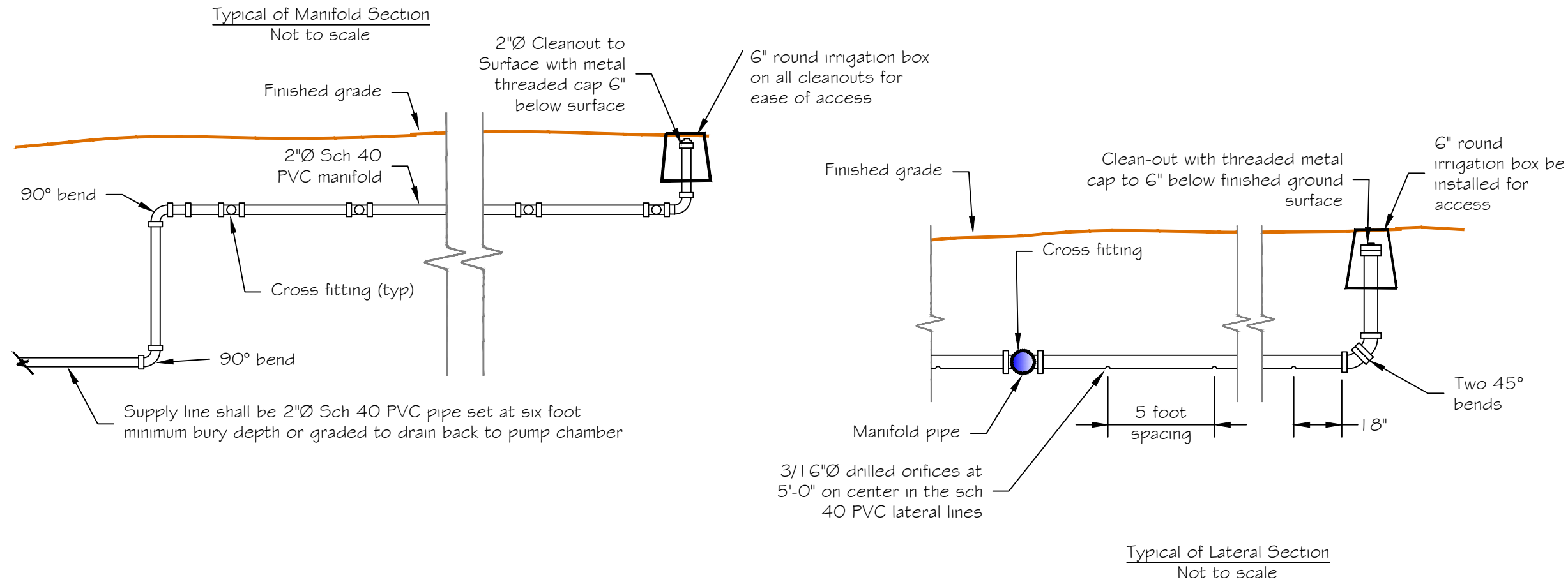
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MONTANA FISH, WILDLIFE & PARKS

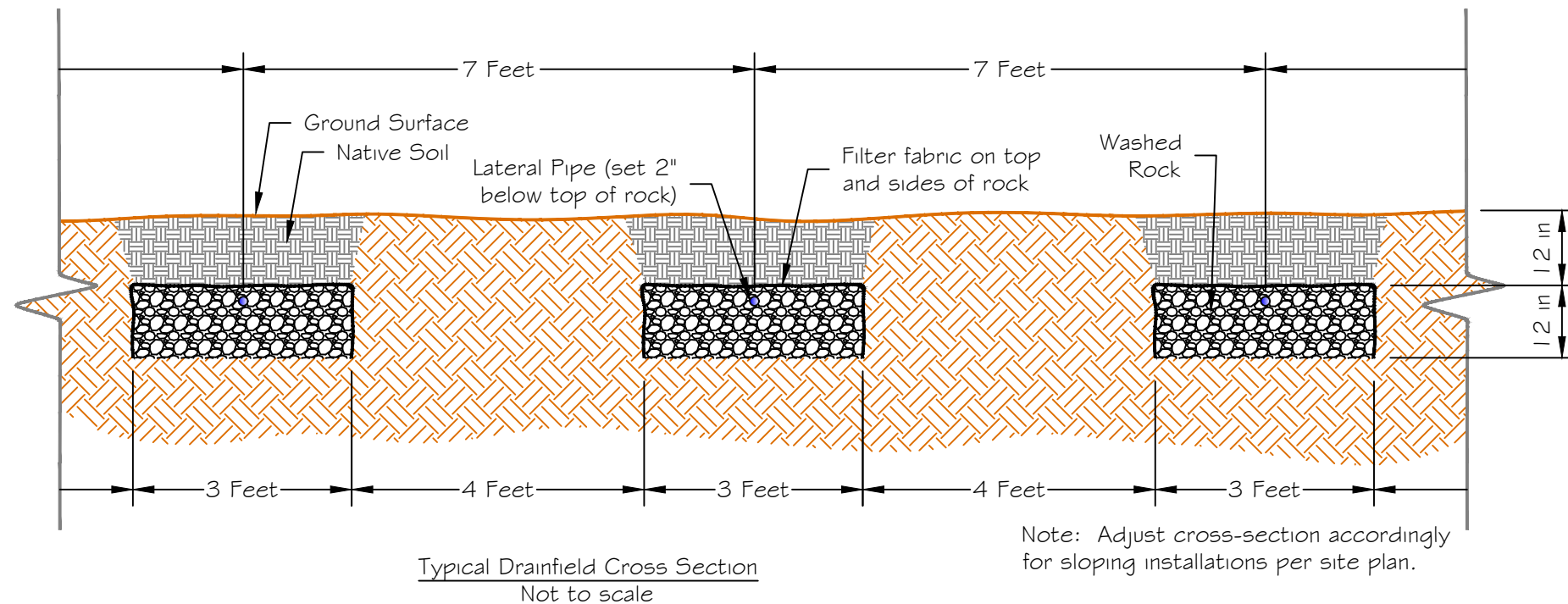
Septic General Notes
Logan State Park Septic Repairs Project

This project will require the contractor to provide installation of 6" round irrigation box on all existing cleanouts (32 Locations) for ease of access and maintenance. Contractor will also need to flush/jet all the existing drainfield laterals with a high pressure cleaning device.



Standard Trench Installation Notes:

1. Excavate and level installation areas.
2. Scarify surface to remove any smearing caused during excavation.
3. Place washed drain rock per F.C.C.H.D. standard drawing 3.
4. Install universal end cap and secure in place with backfill. Place washed drain rock per F.C.C.H.D. standard drawing 3 in each trench.
5. Using a light tracked machine, cover trenches to a minimum of 12 inches after consolidation for H-10 applications and with 18 inches minimum cover after consolidation for H-20 applications. Avoid large rocks or debris in cover material. A well graded, crushed gravel and careful compaction is recommended for H-20 installations.
6. See product specifications.
7. Strongly recommended that irrigation box be placed over cleanout to allow easy access and maintenance.



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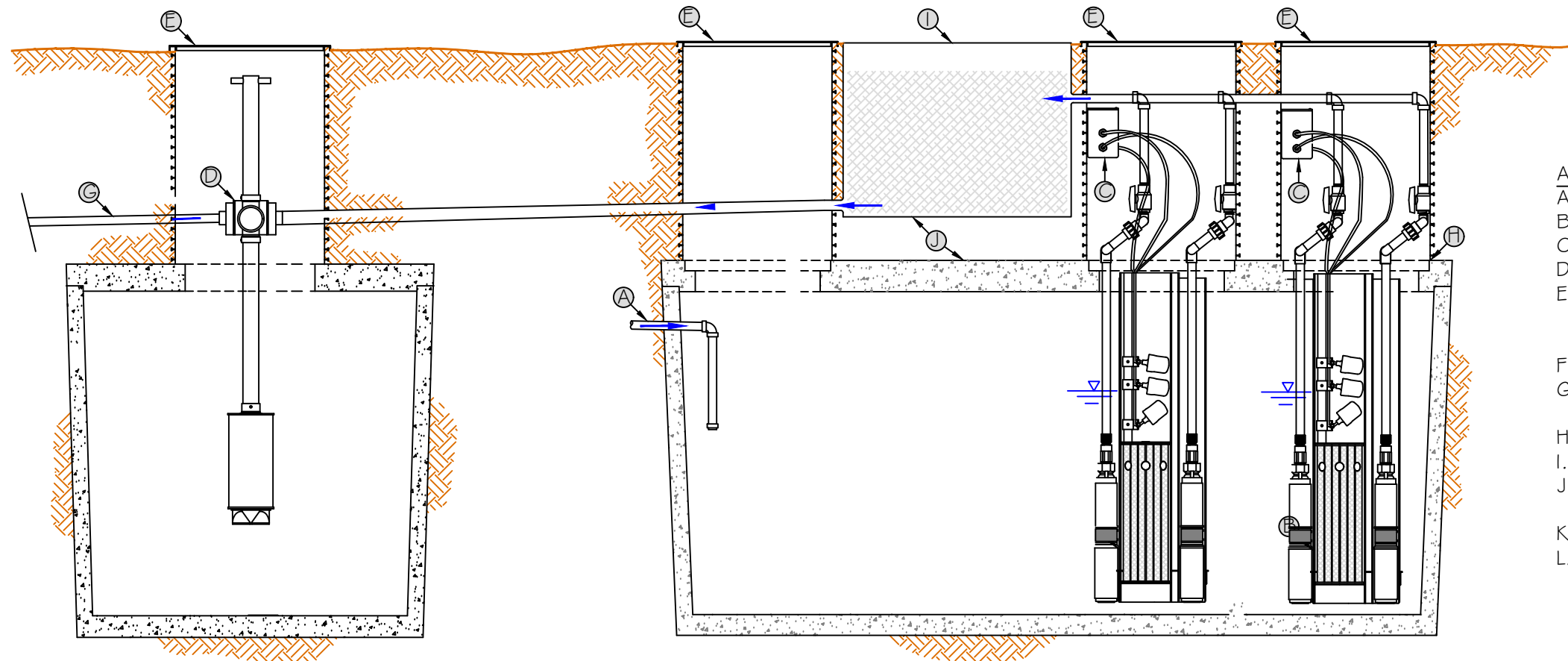


**MONTANA FISH,
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Drainfield Repair Details
Logan State Park Septic Repairs Project

Advantex Parts Specifications:
 System.....Orenco Advantex CW
 Orenco Pump Vault.....PVU571819
 Orenco Floats.....MF3A
 Orenco Hose & Vault Assembly.....HV100BCX
 Orenco Control Panel.....Custom
 Orenco Recirculation Pump.....P300511

- Notes:
1. Precast concrete tanks shall be designed and sealed by a State licensed professional engineer
 2. Final Details of Control Panel and all Advantex or Equal components shall be determined by the Level 2 Manufacturer.
 3. Contractor and manufacturer shall verify all model numbers listed above as well as any additional items needed.



- Advantex Configuration Labels: .
- A. Inlet from septic tanks
 - B. Biotube Pump Package
 - C. SB4 Splice Box
 - D. Ball Valve (RSV)
 - E. FL24G12 Insulated Fiberglass Lids and Riser to Finished Grade (typ)
 - F. SB4 Splice Box
 - G. Supply line out to Pump Chamber for field
 - H. PRRTA24 Tank Flange (typ)
 - I. Four AX 100 Pods
 - J. 8 inch thick layer of sand below pods for bedding
 - K. 12" Effluent filter
 - L. Effluent Pump

2000 Gallon Recirculation Tank #5
 Section View - Not to Scale

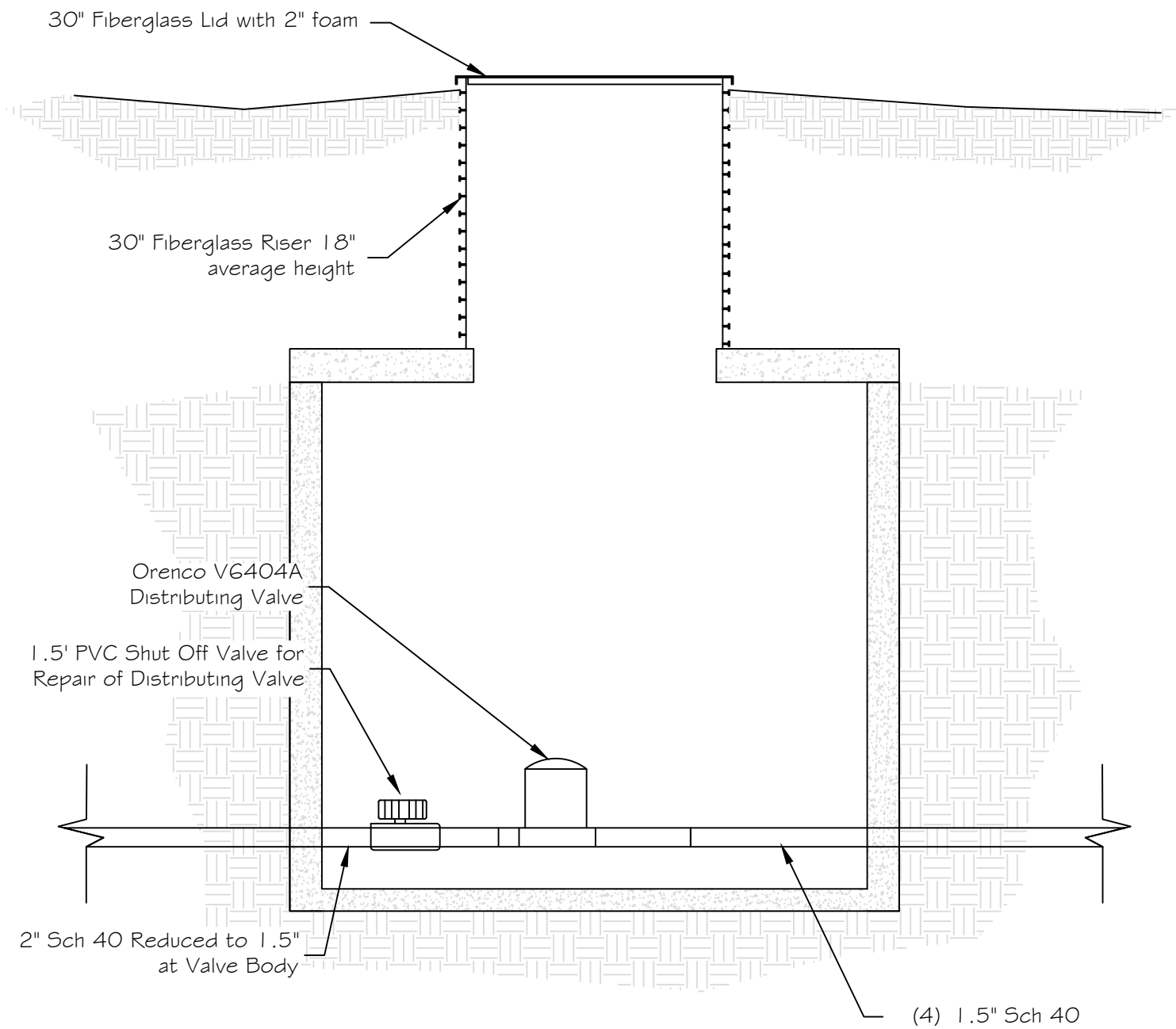
2000 Gallon Recirculation Tank #6
 Section View - Not to Scale

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**MONTANA FISH,
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Typical Level Two Pump Chamber/Recirc
 Logan State Park Septic Repairs Project



Distributing Valves

Applications

Automatic Distributing Valve Assemblies are used to pressurize multiple zone distribution systems including textile filters, sand filters and drainfields.

General

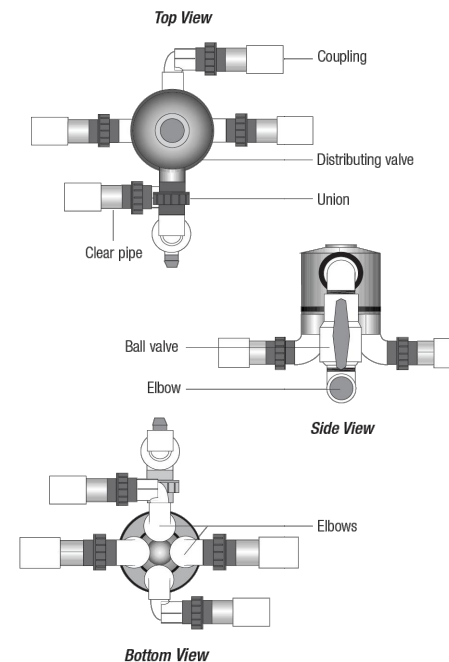
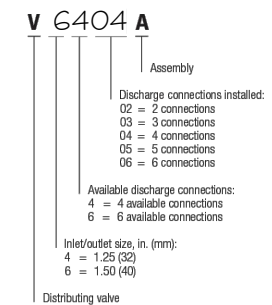
Orenco's Automatic Distributing Valve Assemblies are mechanically operated and sequentially redirect the pump's flow to multiple zones or cells in a distribution field. Valve actuation is accomplished by a combination of pressure and flow. They allow the use of smaller horsepower pumps on large sand filters and drainfields. For example, a large community drainfield requiring 300 gpm (18.90L/sec) can use a six-line valve assembly to reduce the pump flow rate requirement to only 50 gpm (3.14L/sec).

Orenco only warrants Automatic Distributing Valves when used in conjunction with High-Head Effluent Pumps with Biotube® pump vaults to provide pressure and flow requirements, and to prevent debris from fouling valve operation. An inlet ball valve, a section of clear pipe, and a union for each outlet are provided for a complete assembly that is easy to maintain and monitor. Ideal valve location is at the high point in the system. Refer to Automatic Distributing Valve Assemblies (NTP-VA-1) for more information.

Standard Models

V4402A, V4403A, V4404A, V4605A, V4606A, V6402A, V6403A, V6404A, V6605A, V6606A.

Product Code Diagram



Materials of Construction

All Fittings	Sch. 40 PVC per ASTM specification
Unions	Sch. 80 PVC per ASTM specification
Ball Valve	Sch. 40 PVC per ASTM specification
Clear Pipe	Sch. 40 PVC per ASTM specification

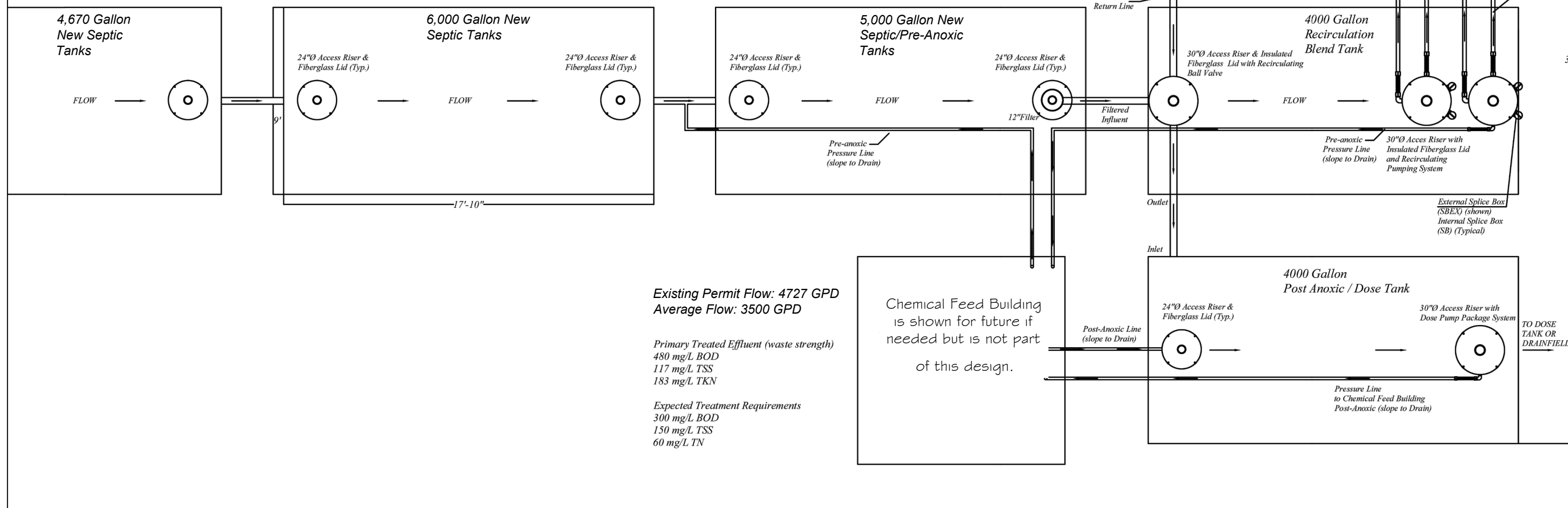
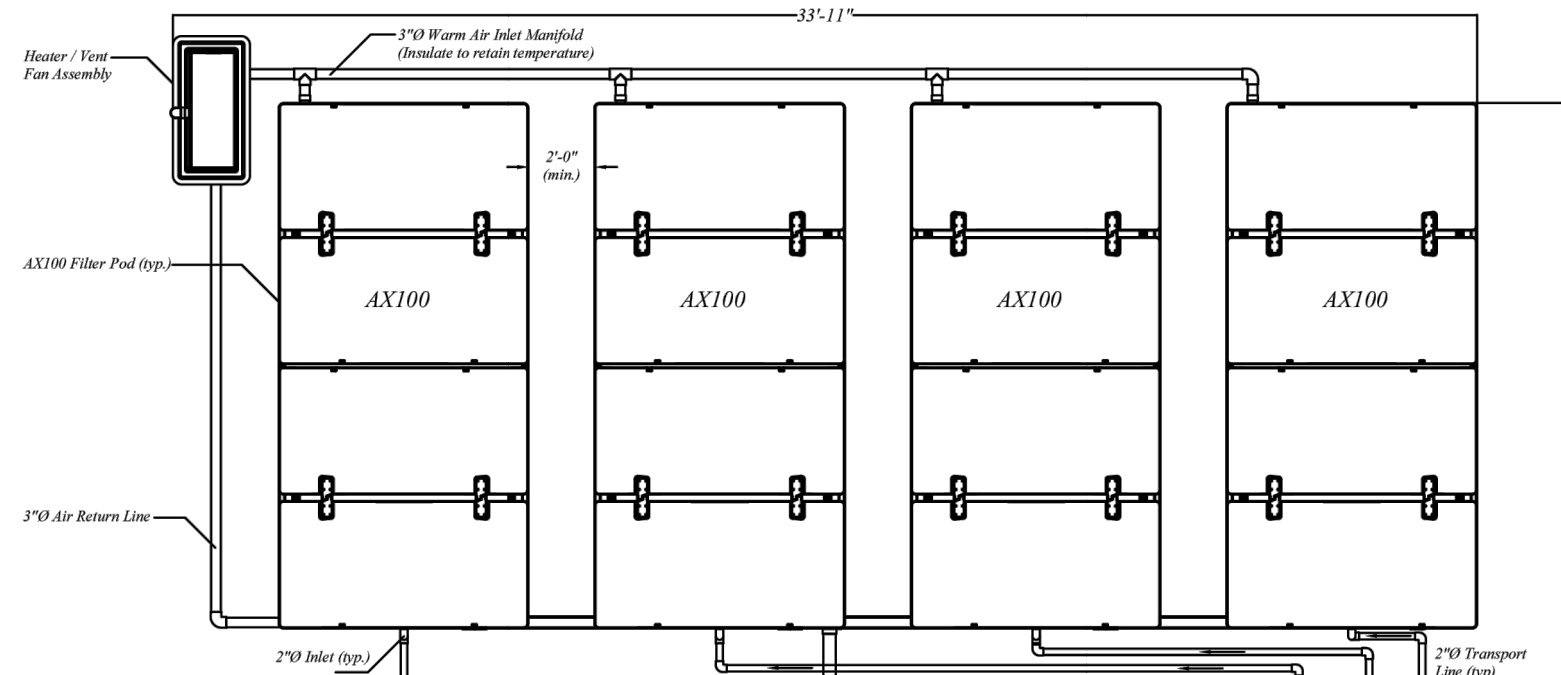
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**MONTANA FISH,
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Drainfield Distribution Valve Manhole
Logan State Park Septic Repairs Project

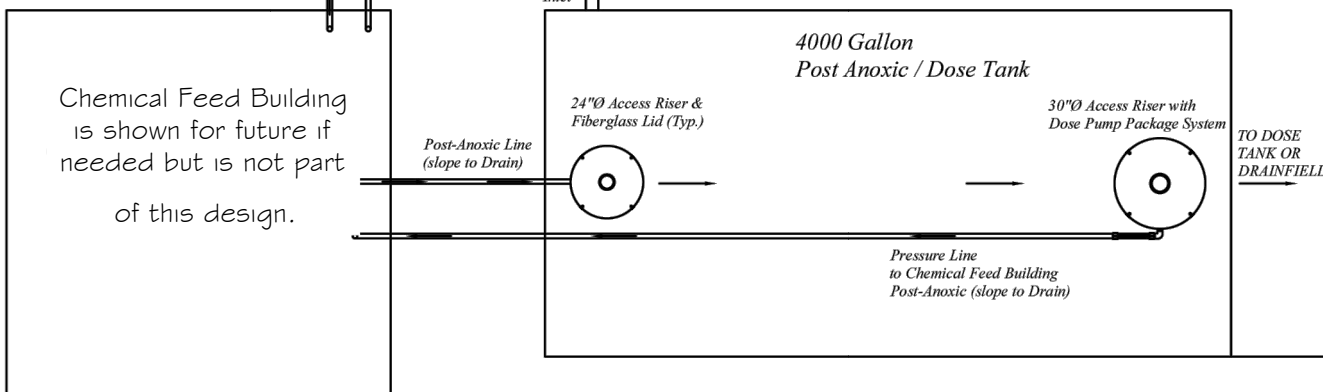
NOTE
 Treatment schematic is shown to illustrate process volumes and treatment processes and is provided by Orenco and Glacier Precast. Refer to remaining design for exact tank volumes and layout as some of these tanks volumes are made up of multiple tanks on site.



Existing Permit Flow: 4727 GPD
 Average Flow: 3500 GPD

Primary Treated Effluent (waste strength)
 480 mg/L BOD
 117 mg/L TSS
 183 mg/L TKN

Expected Treatment Requirements
 300 mg/L BOD
 150 mg/L TSS
 60 mg/L TN



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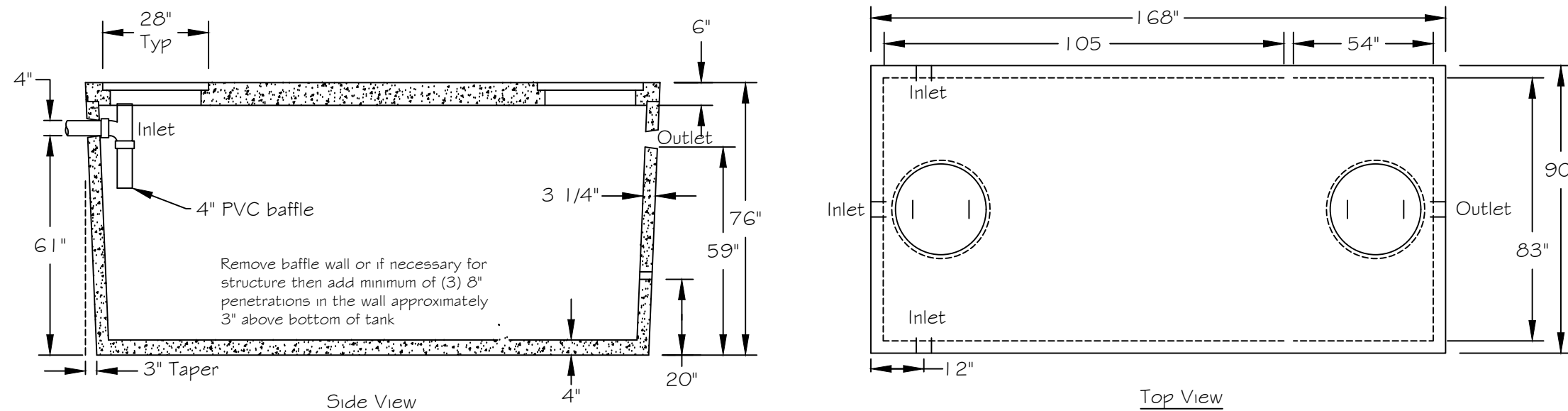


Level 2 Treatment Schematic

Logan State Park Septic Repairs Project

Septic Tank Notes:

- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
- * Tank sizes per plan, with 4" discharge.
- * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
- * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
- * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
- * If access lids are concrete they must be at least 2" thick.
- * Tank top must be reinforced concrete at least 3" thick.
- * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.



3000 Gallon Septic Tank Detail
Not to Scale

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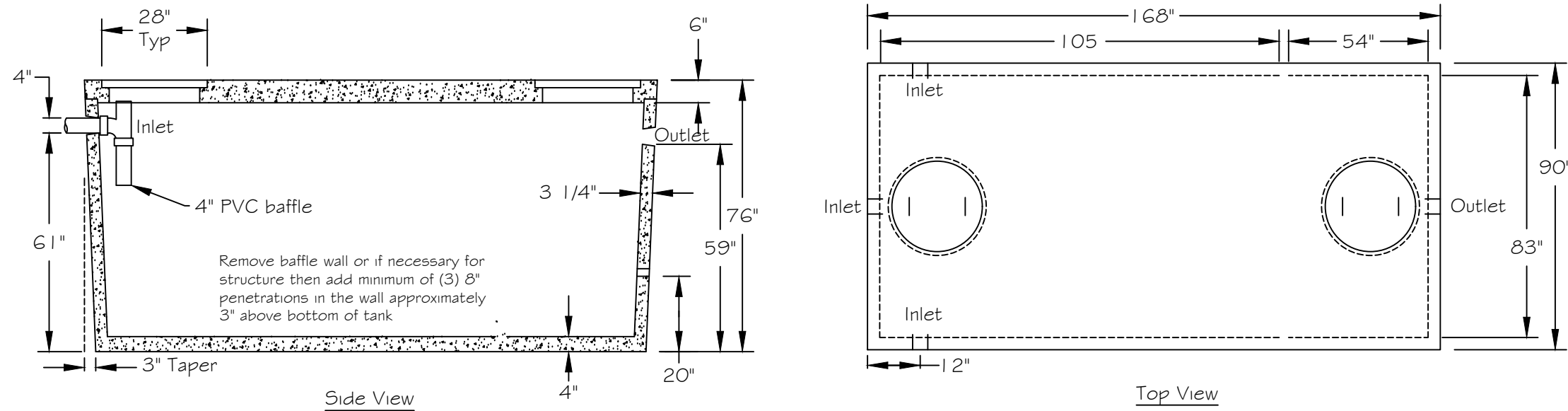


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2,000 Gallon Septic Tank #4
Logan State Park Septic Repairs Project

Septic Tank Notes:

- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
- * Tank sizes per plan, with 4" discharge.
- * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
- * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
- * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
- * If access lids are concrete they must be at least 2" thick.
- * Tank top must be reinforced concrete at least 3" thick.
- * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.



3000 Gallon Septic Tank Detail
Not to Scale

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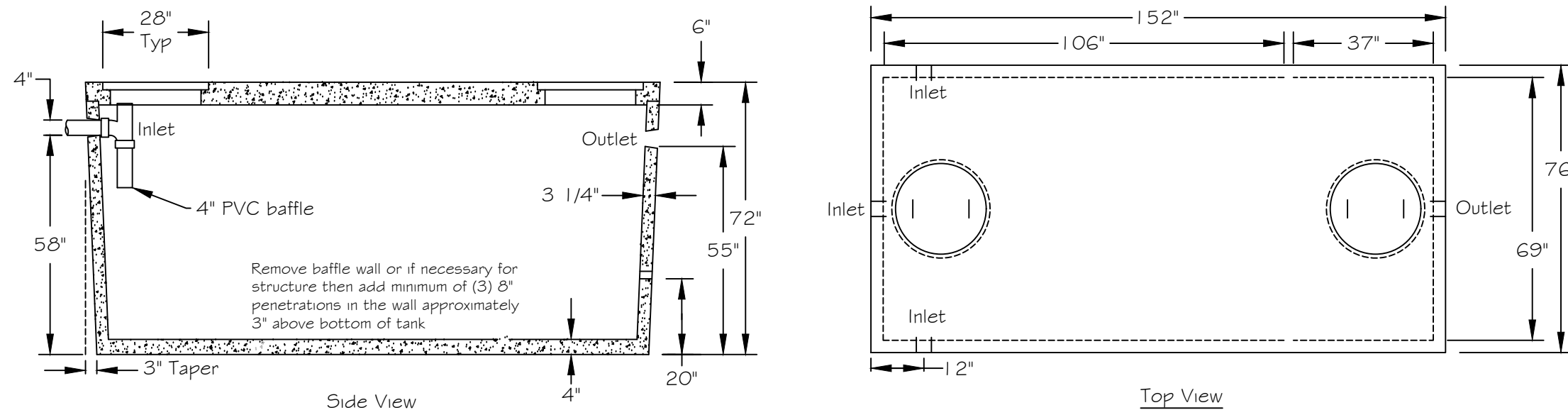
**MONTANA FISH,
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3,000 Gallon Septic Tank #1, #2, and #3
Logan State Park Septic Repairs Project

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Septic Tank Notes:

- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
- * Tank sizes per plan, with 4" discharge.
- * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
- * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
- * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
- * If access lids are concrete they must be at least 2" thick.
- * Tank top must be reinforced concrete at least 3" thick.
- * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.



2000 Gallon Recirculation Tank #5 Detail
Not to Scale

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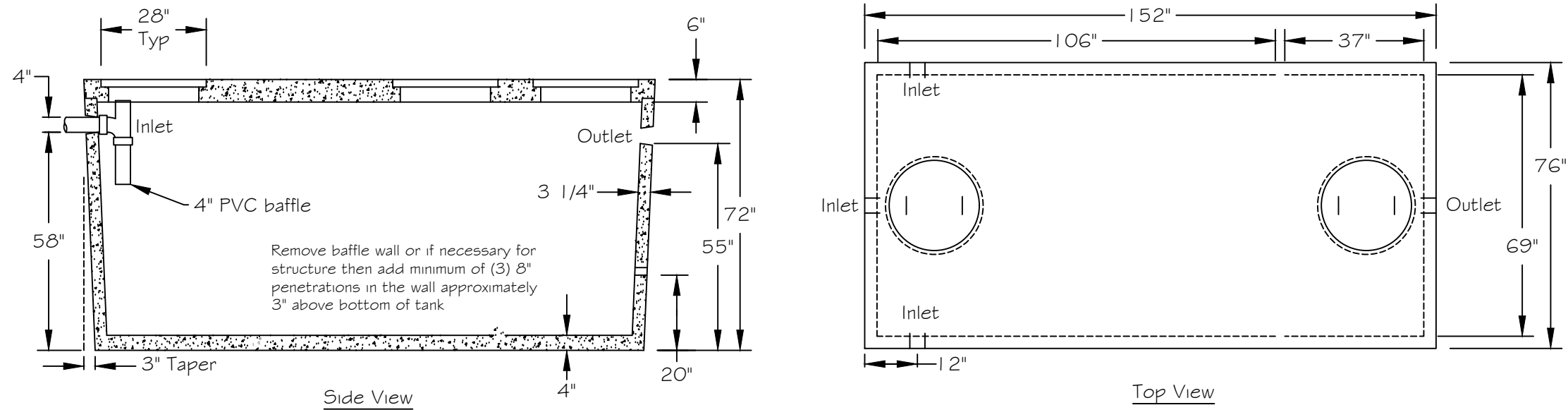
**MONTANA FISH,
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2,000 Gal. Recirculation Tank #5
Logan State Park Septic Repairs Project

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Septic Tank Notes:

- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
- * Tank sizes per plan, with 4" discharge.
- * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
- * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
- * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
- * If access lids are concrete they must be at least 2" thick.
- * Tank top must be reinforced concrete at least 3" thick.
- * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.



2000 Gallon Recirculation Tank #6 Detail
Not to Scale

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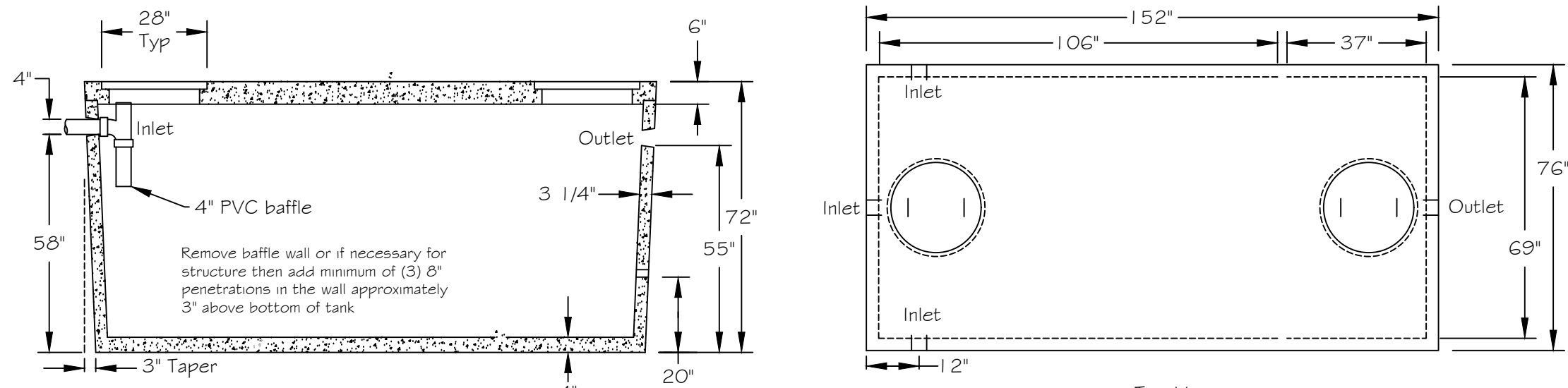
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2,000 Gal. Recirculation Tank #6
Logan State Park Septic Repairs Project

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Septic Tank Notes:

- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
- * Tank sizes per plan, with 4" discharge.
- * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
- * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
- * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
- * If access lids are concrete they must be at least 2" thick.
- * Tank top must be reinforced concrete at least 3" thick.
- * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.



2000 Gallon Post Anoxic Tank Detail
Not to Scale

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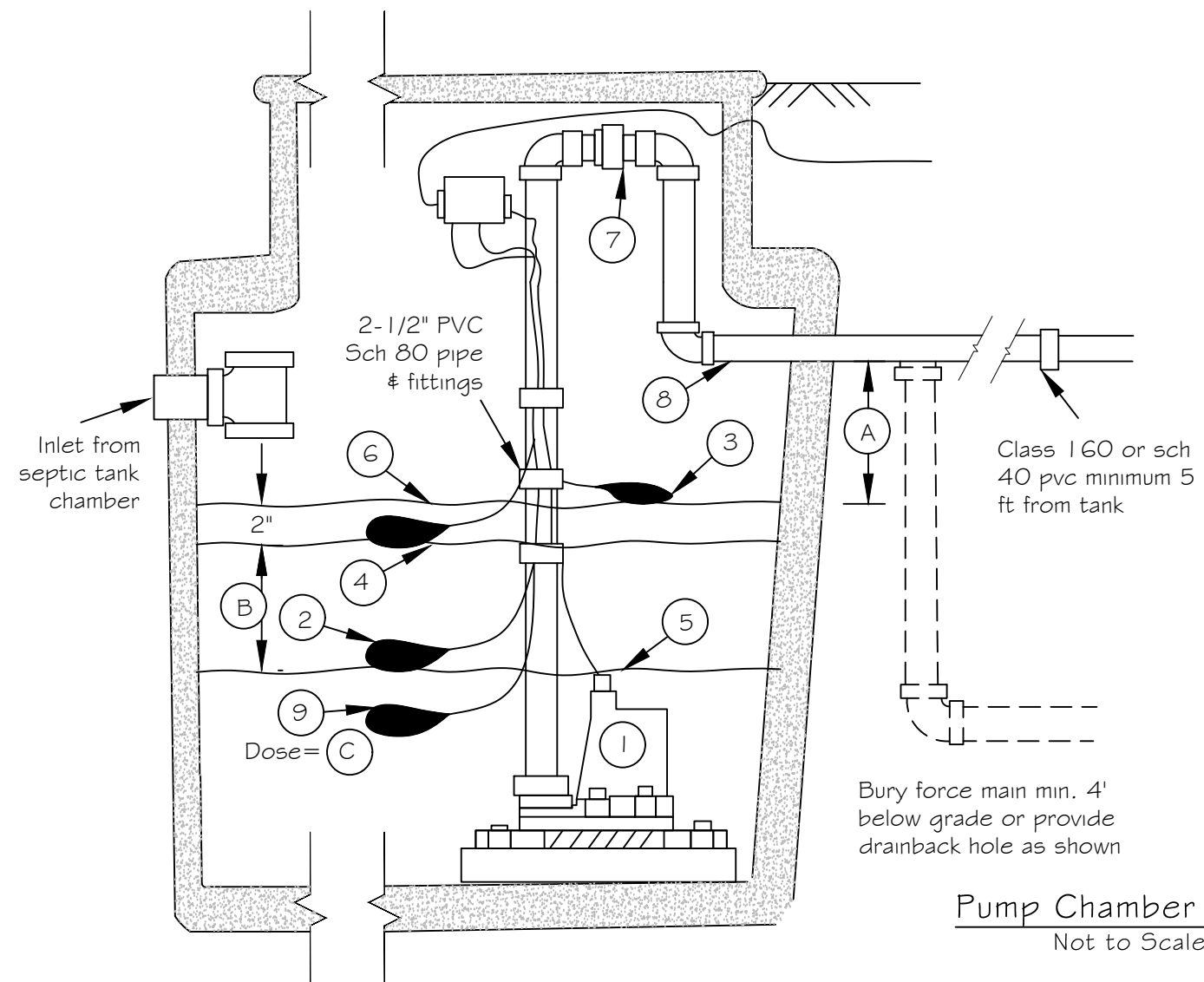
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2,000 Gal. Post Anoxic Tank #7
Logan State Park Septic Repairs Project

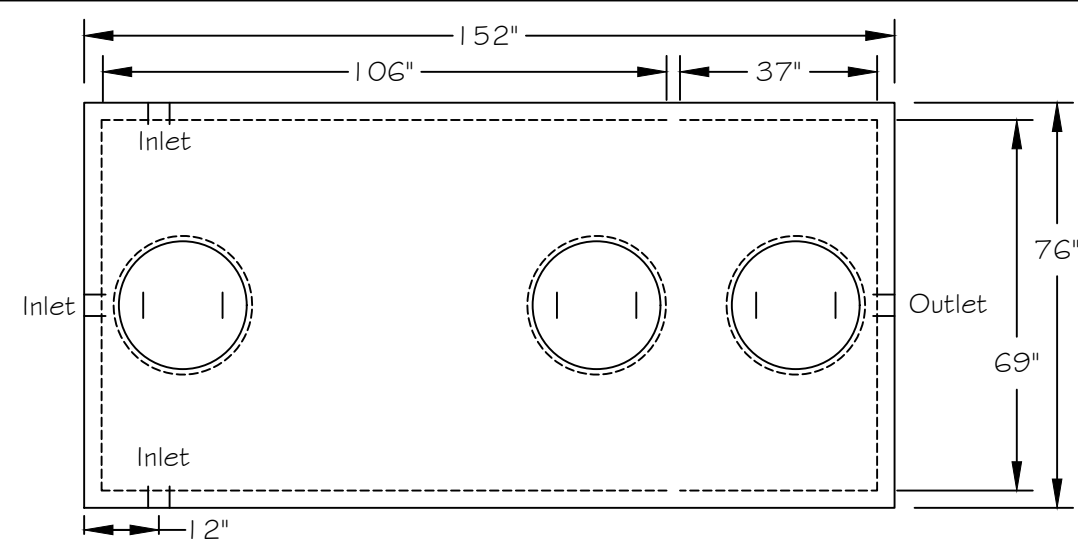
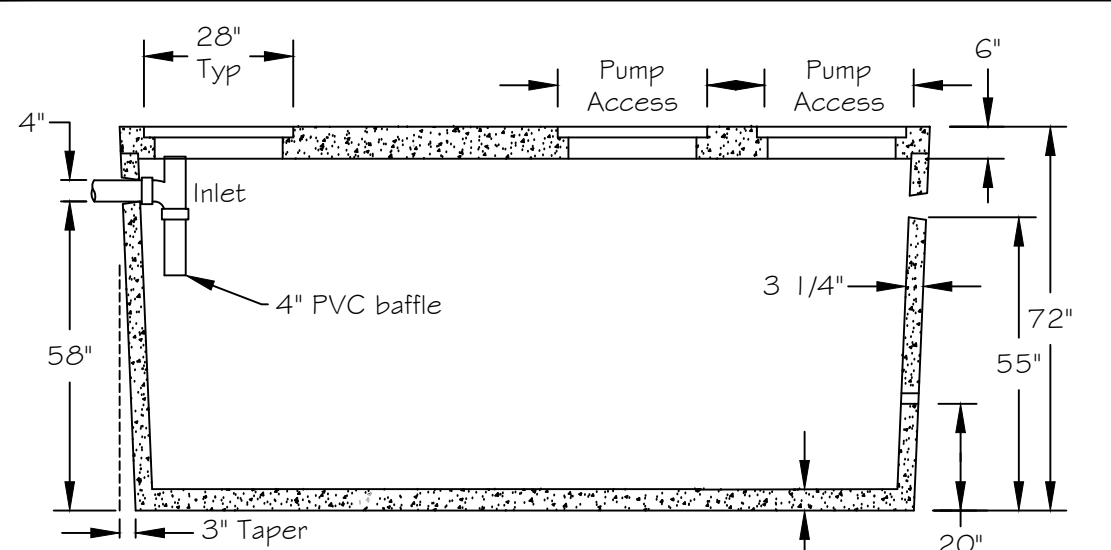
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Dimensions:
 A - 6 inches
 B - 24 inches
 C - 40 gallons / inch

- Legend:**
- 1 - (2) Sets of (2) Duplex Ashland EP75 pumps
 - 2 - pump control float (1 or 2 can be used)
 - 3 - alarm float
 - 4 - pump "on" level
 - 5 - pump "off" level
 - 6 - alarm level
 - 7 - quick-connect union
 - 8 - drainback hole, see notes
 - 9 - Low Level Alarm Float

- Pump Chamber Notes:**
- * The tank below is not representative of the actual size or dimensions of the pump chamber. This detail provides a plumbing/wiring schematic and float elevations only. Reference other detail for actual tank size.
 - * Tank and pump sizes per plan, with 2" discharge. These pump chambers are attached to a septic tank where primary treatment is accomplished
 - * All the piping in and within 5 feet of the septic tank shall be schedule 80 pvc pipe.
 - * Access to the pump must be large enough for maintenance and the top of the riser shall be not more than 8 inches below the ground surface.
 - * Riser over the filter must extend to the finished ground surface and filter handle shall be 2" below top of riser.
 - * All pipe penetrations shall be sealed with hydraulic grout or acceptable equivalent, this also applies to the filter installation in the baffle wall.
 - * If access lids are concrete they must be at least 2" thick.
 - * Tank top must be reinforced concrete at least 3" thick.
 - * Tank walls & bottom must be at least 3" thick reinforced or 6" thick unreinforced concrete.
 - * Low Level Alarm shall be positioned so that pump will be shut off prior to running dry. This is designed to avoid burning out a pump in the case of float failure.



2000 Gallon Pump Chamber Detail
Not to Scale

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Future Plan for Drainfield Replacement Installation

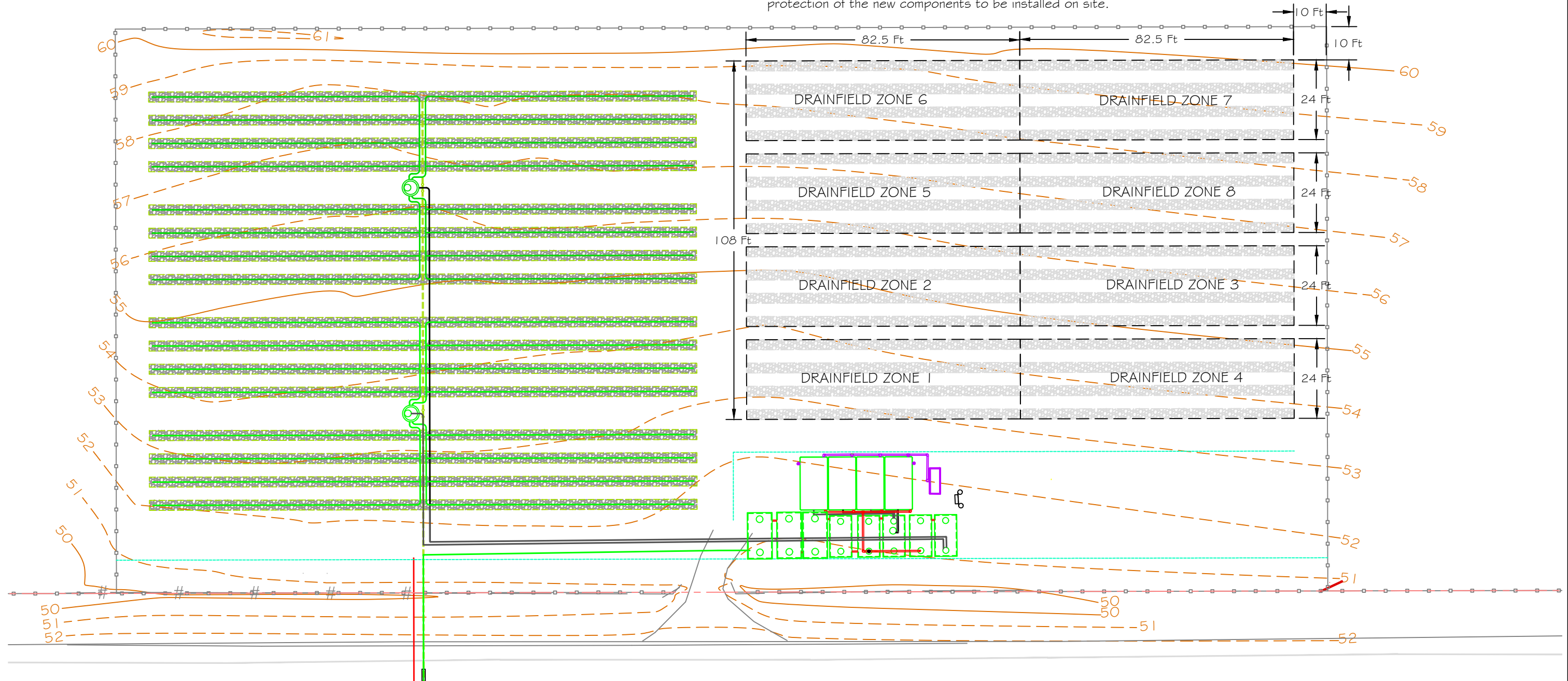
The following steps are not part of this project but are simply outlined for a future time if drainfield replacement is required. If in the future the existing drainfield fails then the following steps shall be followed for replacement.

1. The replacement drainfield will require a county septic permit but will not require any MDEQ review or approval.
2. The replacement field if needed will require the installation of a new 2" Sch 40 PVC line from the distributing valve locations that will be installed in this project to the replacement area. The replacement area shall have all the same zones as the current field.
3. The replacement drainfield trenches shall be installed per the details found in this plan set.
4. The replacement field will need to be squirt tested prior to final backfill if the installation is required in the future.

Contractor Tasks for Replacement Area Shown Below

Replacement Drainfield Area shown below is a timbered forest area at this time and the following items will be required to prepare the area for use if needed in the future. The following improvements are part of this project.

1. The trees in the replacement area shown will need to be felled and branches removed. They shall then be stacked in preparation for sale as marketable timber. It shall be the contractors responsibility to haul all of the logging debris off site. The FWP will coordinate for the sale of the timber.
2. The stumps of all the trees shall be removed with an excavator and hauled off site. When stumps are removed the digging around them shall be minimal to protect the drainfield area as much as possible.
3. The contractor shall perform finish grading on the area once the logging is complete. The finish grading shall be limited to no more than 10" of cut or fill. This limitation will allow all this work to be considered minor leveling to the site. The finish grading shall conform to the contours shown on this plan as much as possible and any deviations from this shall be approved by the engineer.
4. The work in this area shall not disturb the existing drainfield and no material shall be placed or stockpiled on the existing drainfield area. The contractor is responsible to repair any damage to the existing field due to construction on site.
5. This work on the drainfield area shall be performed prior to installation of the new tanks or the level two system to ensure protection of the new components to be installed on site.



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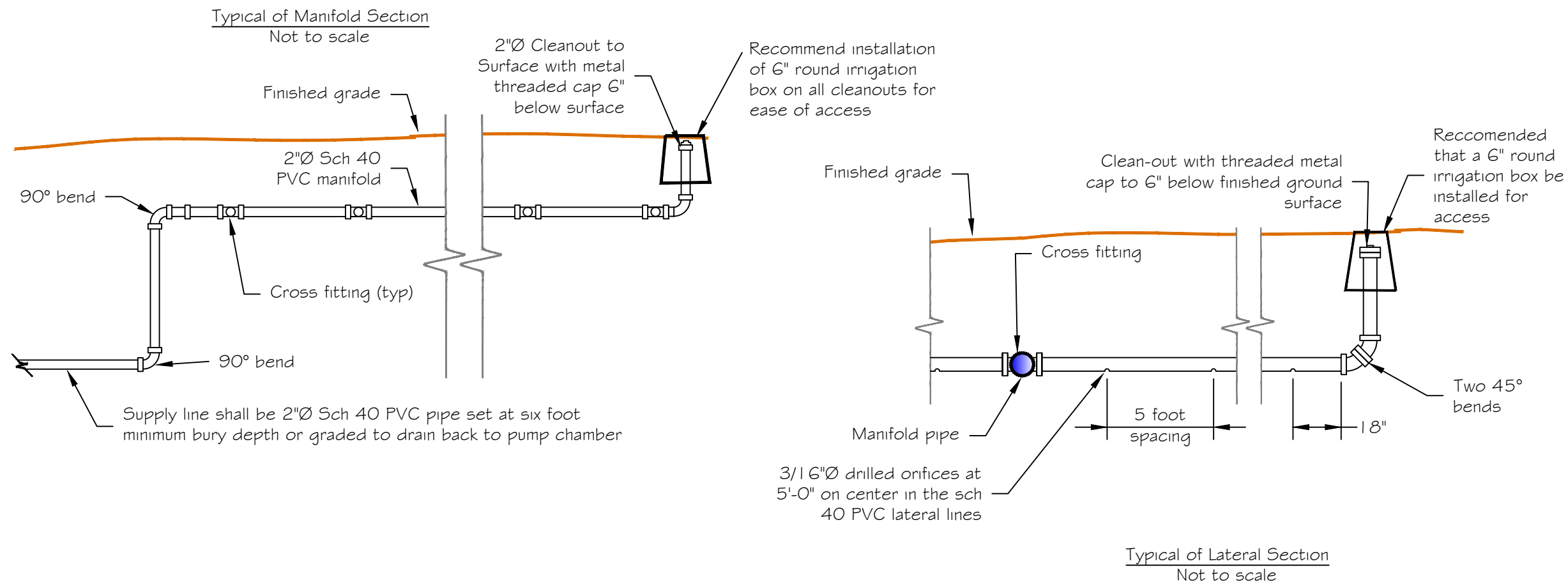


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Replacement Drainfield Area
 Logan State Park Septic Repairs Project

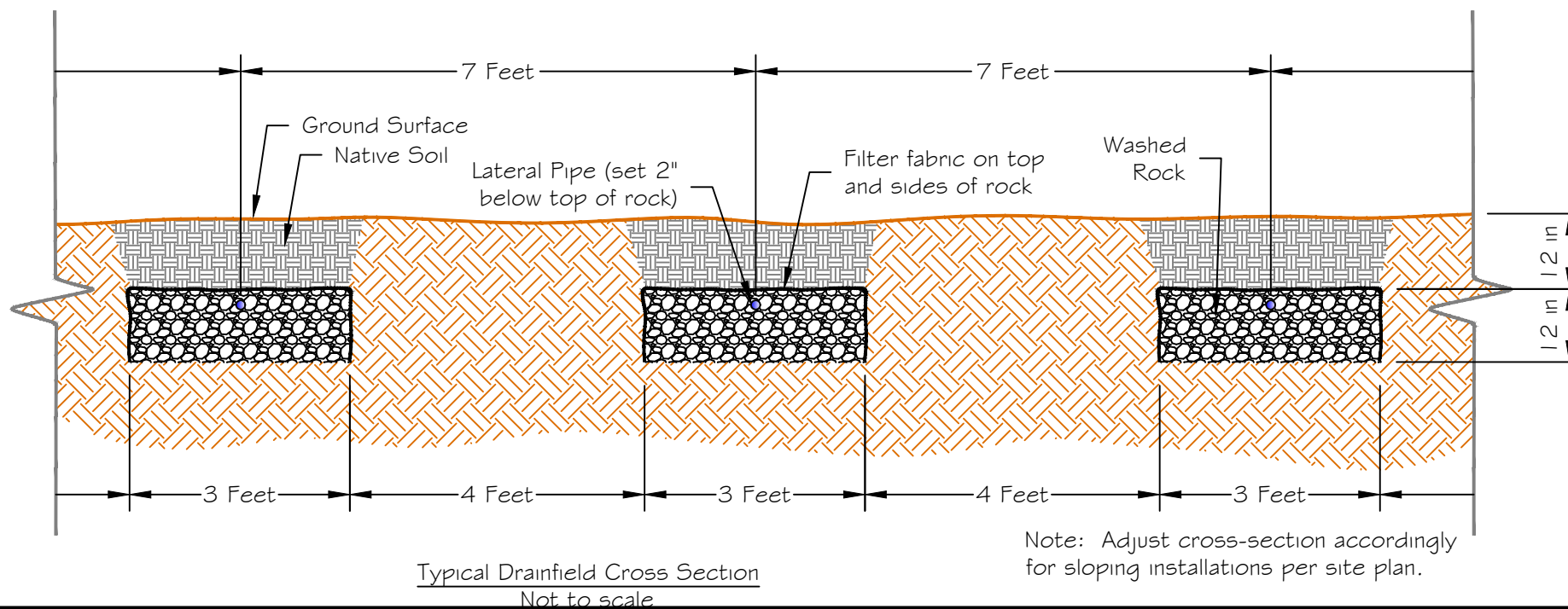
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Recommend installation of 6" round irrigation box on all cleanouts for ease of access



Standard Trench Installation Notes:

1. Excavate and level installation areas.
2. Scarify surface to remove any smearing caused during excavation.
3. Place washed drain rock per F.C.C.H.D. standard drawing 3.
4. Install universal end cap and secure in place with backfill. Place washed drain rock per F.C.C.H.D. standard drawing 3 in each trench.
5. Using a light tracked machine, cover trenches to a minimum of 12 inches after consolidation for H-10 applications and with 18 inches minimum cover after consolidation for H-20 applications. Avoid large rocks or debris in cover material. A well graded, crushed gravel and careful compaction is recommended for H-20 installations.
6. See product specifications.
7. Strongly recommended that irrigation box be placed over cleanout to allow easy access and maintenance.



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(Future) Replacement Drainfield Details
Logan State Park Septic Repairs Project

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