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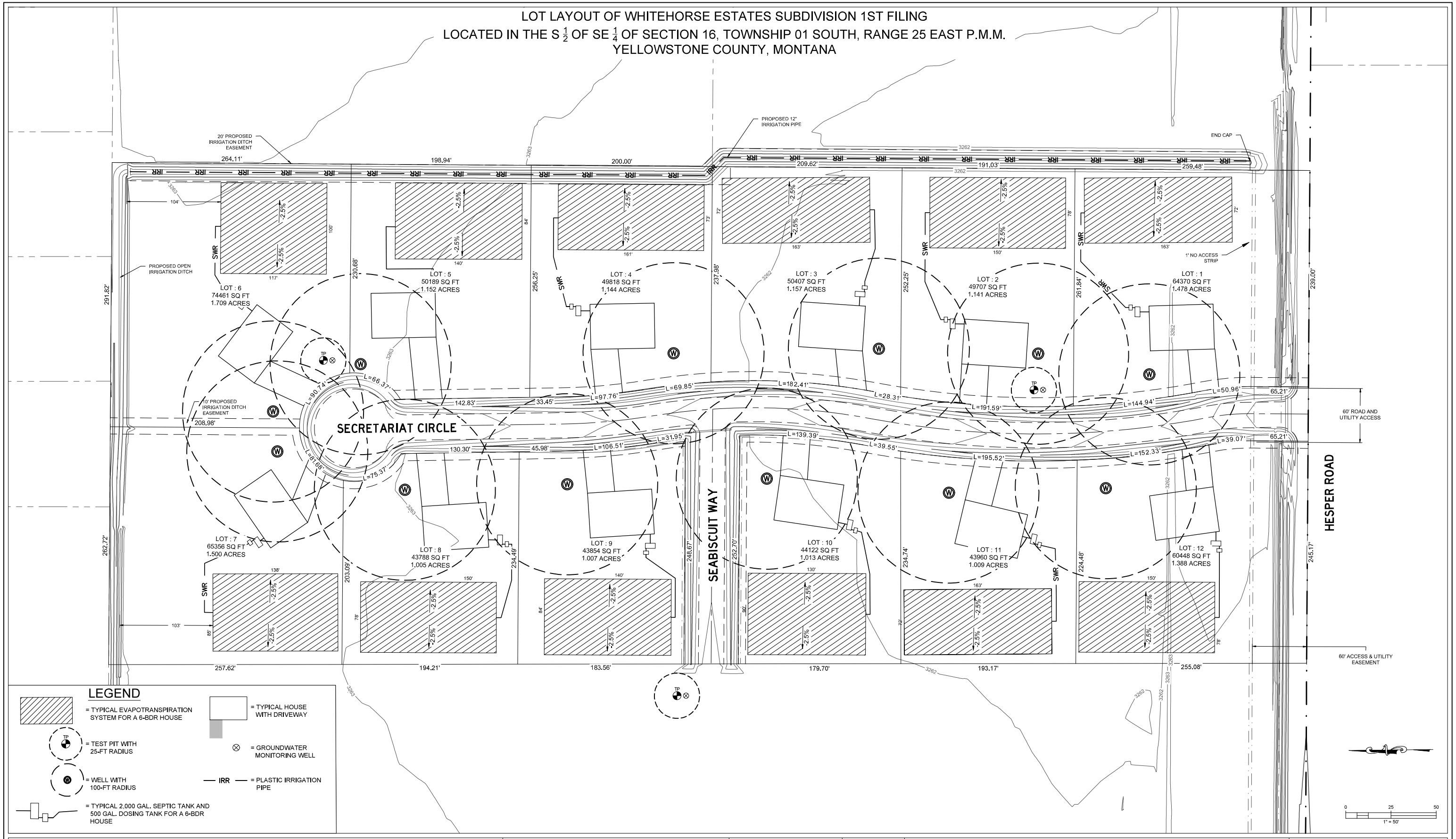
LOT LAYOUT OF WHITEHORSE ESTATES SUBDIVISION 1ST FILING
LOCATED IN THE S $\frac{1}{2}$ OF SE $\frac{1}{4}$ OF SECTION 16, TOWNSHIP 01 SOUTH, RANGE 25 EAST P.M.M.
YELLOWSTONE COUNTY, MONTANA



LEGEND

- = TYPICAL EVAPOTRANSPIRATION SYSTEM FOR A 6-BDR HOUSE
- = TYPICAL HOUSE WITH DRIVEWAY
- TP = TEST PIT WITH 25-FT RADIUS
- ⊗ = GROUNDWATER MONITORING WELL
- W = WELL WITH 100-FT RADIUS
- IRR = PLASTIC IRRIGATION PIPE
- = TYPICAL 2,000 GAL. SEPTIC TANK AND 500 GAL. DOSING TANK FOR A 6-BDR HOUSE

REVISIONS				
NO.	DESCRIPTION	DATE	BY	CHECKED BY
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2				
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PERFORMANCE ENGINEERING
608 NORTH 29TH STREET
BILLINGS, MT 59101
(406) 384-0080
performance-ec.com

MONTANA SCOTT ASPENLIEDER No. 17310 PE LICENSED PROFESSIONAL ENGINEER

KQH DESIGNED BY
KQH DRAWN BY
5/14/2020 DATE
QUALITY ASSURANCE
SAA CHECKED BY
5/14/2020 DATE

WHITEHORSE ESTATES SUBDIVISION 1ST FILING

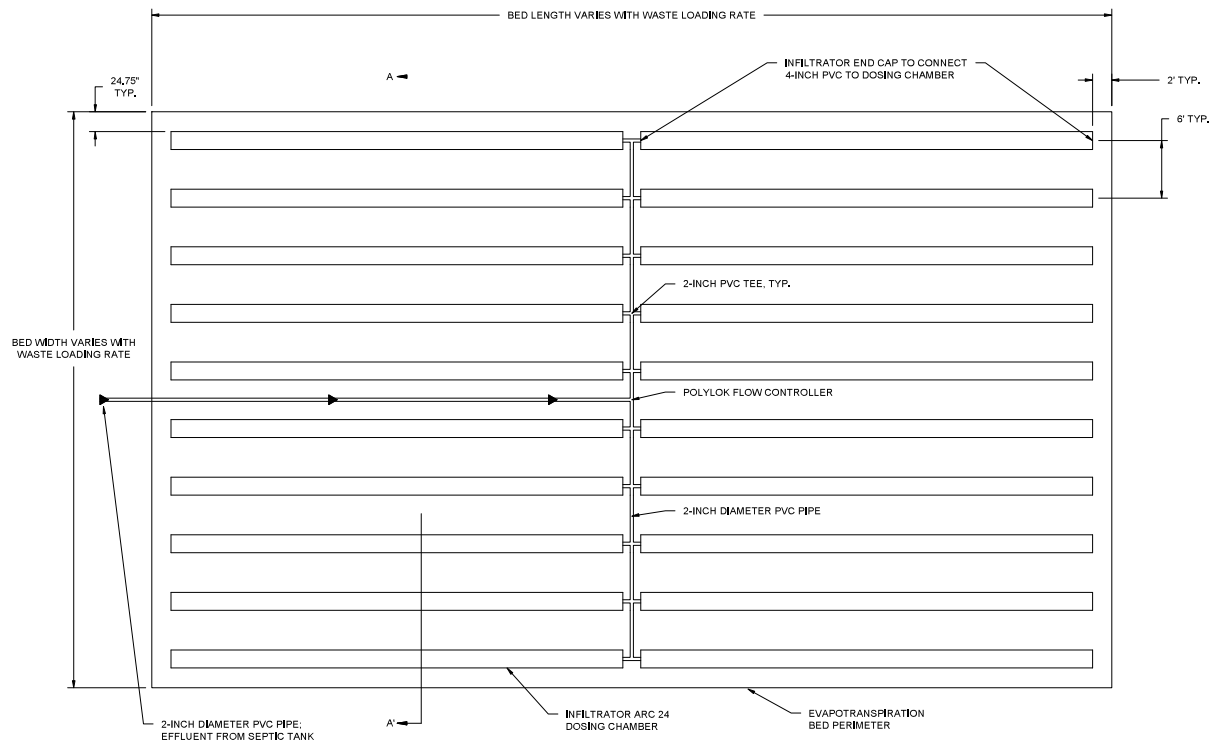
BILLINGS, MONTANA

LOT LAYOUT

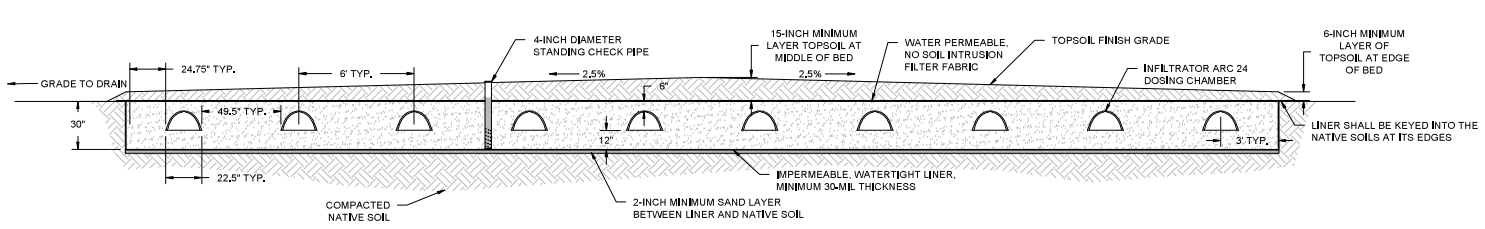
PROJECT NUMBER 2016-065

SHEET NUMBER 1 OF 3

DRAWING NUMBER C1.0



1 EVAPOTRANSPIRATION BED CONFIGURATION
SCALE: NTS



2 SECTION A-A' EVAPOTRANSPIRATION BED
SCALE: NTS

EVAPOTRANSPIRATION BED SIZE		
BEDROOMS	FLOW	AREA
(#)	(GPD)	(SF)
1	150	3900
2	225	6000
3	300	7800
4	350	9000
5	400	10500
6	450	11700

GENERAL NOTES:
1. CONTRACTOR AND/OR SUPPLIER SHALL SUBMIT SHOP DRAWINGS ON ALL PRESSURE-DOSED SYSTEM COMPONENTS FOR VERIFICATION AND APPROVAL.
2. PUMP SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER. SHOP DRAWINGS AND PUMP CURVES MUST BE SUBMITTED TO THE ENGINEER TO ENSURE ADEQUATE PUMP PERFORMANCE.
3. IF ELEVATIONS DIFFERENCES DIFFERS BY MORE THAN 5+ FEET, CONTACT ENGINEER TO ENSURE RECOMMENDED PUMP IS ADEQUATE. ELEVATION DIFFERENCE IS MEASURED FROM THE BOTTOM OF THE DOSING TANK TO THE BOTTOM OF THE ET SYSTEM.

ET GRASS SEEDING NOTES:
1. BASIN WILDRYE IS THE RECOMMEND TURF FOR THE ROOT DEPTH AND GROWTH PERIOD. GRASS SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
2. RAKE AREA TO REMOVE CLODS, ROCKS, WEEDS, ROOTS, AND DEBRIS.
3. THOROUGHLY WATER SEEDED AREAS AND RE-SEED AREAS THAT DO NOT SHOW PROMPT GERMINATION AT 15-DAY INTERVALS UNTIL AN ACCEPTABLE STAND OF GRASS IS ASSURED.

EVAPOTRANSPIRATION SYSTEM DESIGN (DEQ CIRCULAR 4):

6.8.1. General
Evapotranspiration absorption (ETA) systems are used where slow percolation rates or soil conditions would preclude the use of a standard absorption system. Percolation tests conducted in accordance with Appendix A, with at least a 24-hour presoak of the hole prior to the test or a double-ring infiltrometer procedure outlined in ASTM D5093-02 must be conducted for all ETA systems, at the depth of the bottom of the bed.
Evapotranspiration systems (ET) are used where slow percolation rates or soil conditions would preclude the use of a soil absorption system or where discharge to the receiving soils is undesirable.
The primary difference between the ETA and ET system is the inclusion of a liner in ET systems.
ETA and ET systems should be used in conjunction with wastewater flow reduction strategies.

6.8.2. Location

6.8.2.1. ETA and ET systems must meet all minimum separation distances as stated in ARM Title 17, Chapter 36, subchapter 3 or 9, as applicable. Distances must be measured from the edge of the system.

6.8.2.2. ETA and ET systems must be level and must not be installed on land with a slope greater than 15 percent. Protective berms or drainage trenches must be installed to divert storm drainage and snow-melt run-off away from the system, if necessary.

6.8.3. Design

6.8.3.1. ETA and ET systems must not be deeper than 30 inches from the natural ground surface.

6.8.3.2. The fill material in the ETA and ET system must be washed coarse sand, drain rock meeting the requirements of Section 1,2,25, or other inert media approved by the reviewing authority. Information must be provided to document the void ratio used and, if available, the wicking characteristics of the material.

6.8.3.3. ETA and ET systems must be installed with the long dimension parallel to the land contour.

6.8.3.4. ET systems must include a watertight liner of at least 30-mil thickness to contain the effluent. Seams for a synthetic liner must be completely sealed in accordance with the manufacturer's recommendations and the liner must be keyed into the native soils at its edges.

6.8.3.5. A minimum of 2 inches of sand fill must be placed between the native soil surface and/or any projecting rocks and the liner.

6.8.3.6. Standard absorption trenches, gravelless trenches, other absorption systems, or distribution pipes may be used to distribute effluent in an ETA and ET system. Standard absorption trenches, gravelless trenches and other absorption systems must be constructed in accordance with Subchapters 6,1 or 6,6 and this chapter. No reduction in absorption area sizing will be allowed for the use of gravelless or other trench technology in ETA or ET systems. The spacing between standard absorption trenches, gravelless trenches, other trenches, or distribution pipes in an ETA or ET system must be a minimum of 6 feet and maximum of 8 feet measured on center. Gravel trenches or leaching chambers are required for ET and ETA systems constructed with a sand media. These methods of distribution may be used, but are not required, for ET and ETA systems constructed with a gravel medium.

EVAPOTRANSPIRATION SYSTEM DESIGN (DEQ CIRCULAR 4):

6.8.3.7. Soils with an initial percolation rate between 121 and 240 mpi, with a 24-hour presoak of the hole prior to the test, may use an ET or ETA system. All calculations must be submitted for review. Soils with an initial percolation rate of 241 mpi or slower may use an ETA system if the percolation rate, determined in the field, using the ASTM D5093-02 doublering infiltrometer procedure shows a rate between 121 and 240 mpi. All calculations must be submitted for review.

6.8.3.8. Calculated storage capacity must provide a factor of safety of at least 1.5 for storage loss over time caused by plugging of the voids due to evaporated salts and residuals wastewater flow rates.

6.8.3.9. Water balance sizing calculations for ETA and ET systems must be based on a one-year period. A water balance analysis may include pan evaporation data, precipitation for the wettest year in a 10-year period, soils absorption information from the site, transpiration, and other site-specific design information.
A. Pan evaporation information may be included in the water balance where it can be adequately demonstrated. Very few locations exist where data has been tabulated in Montana and calculations must address site-specific pan evaporation conditions.
The design must show that total water lost through evaporation and absorption equals or exceeds the total water gained through precipitation and effluent discharge. Precipitation information used must be for the wettest year in a 10-year period. Storage capacity must be built into the system to accommodate months with low evaporation.
C. Transpiration may be included in the water balance where it can be adequately demonstrated.
D. Other site-specific design information such as shade, area topography, or manmade structures must be considered.

6.8.4. Construction

6.8.4.1. Construction of an ET system must be initiated immediately after preparation of the liner.

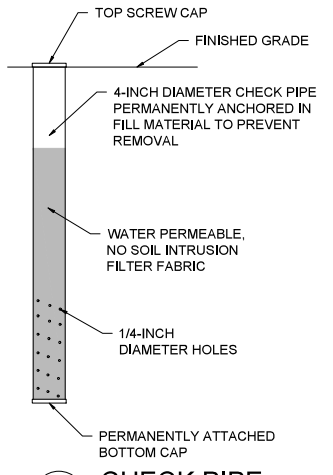
6.8.4.2. Excavation for ETA systems may proceed only when the moisture content is below the soil's plastic limit. If a sample of soil taken at the depth of the proposed bottom of the system forms a ribbon, instead of crumbling, when one attempts to roll it between the hands, the soil is too wet to excavate.

6.8.4.3. ETA construction must be completed in such a manner to prevent compaction. The fill material must be covered completely with an appropriate geotextile fabric, untreated building paper, or 2 inches of straw to prevent the soil cover from entering the media.

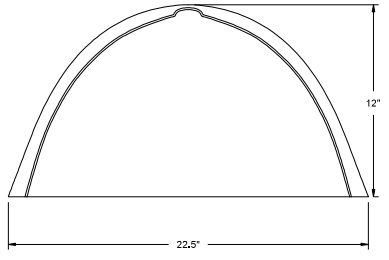
6.8.4.4. A 4-inch diameter standing check pipe with both ends capped (only the bottom cap should be glued) must be installed. Several 1/8-inch to 1/4-inch diameter holes should be drilled in the bottom half of the pipe and covered with a filter cloth sock. The check pipe should be anchored in fill material to prevent the pipe from being pulled out of the system.

6.8.4.5. The ETA and ET system must be covered with a minimum of 12 inches at the center of the system and 6 inches at the edge of the system of a suitable medium, such as sandy loam, loamy sand, or silt loam to provide drainage and aeration. These depths are measured after settling. The topsoil cap must be immediately vegetated after construction with sod or other appropriate method.

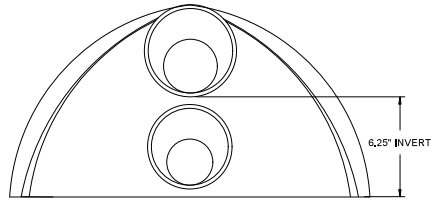
6.8.5. Operation and Maintenance, Certification, and As-builts
A detailed set of plans, specifications, and an operation and maintenance plan are required. The operation and maintenance plan must meet the requirements in Appendix D. Certification and as-built plans are required in accordance with Appendix D.



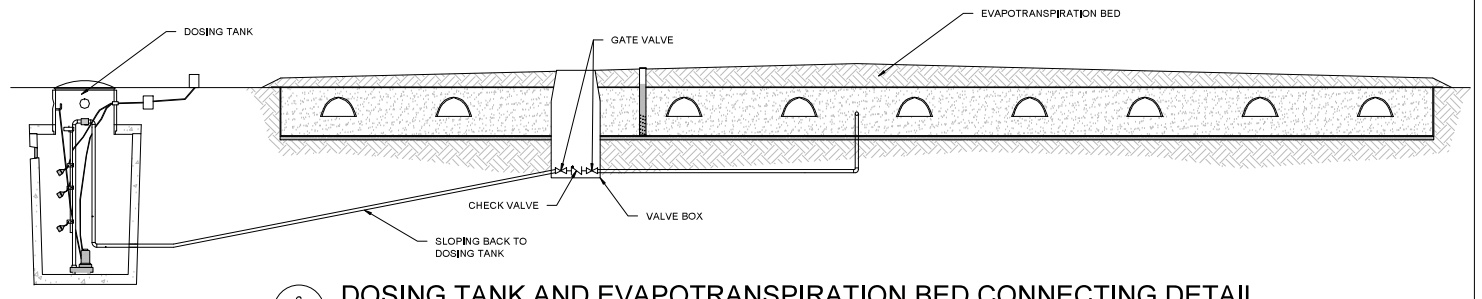
3 CHECK PIPE
SCALE: NTS



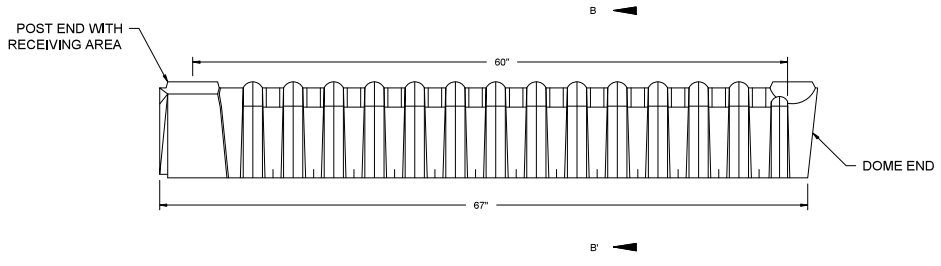
4 SECTION B-B' DOSING PIPE
SCALE: NTS



5 END SECTION OF DOSING PIPE
SCALE: NTS



6 DOSING TANK AND EVAPOTRANSPIRATION BED CONNECTING DETAIL
SCALE: NTS



7 DOSING PIPE SIDE VIEW
SCALE: NTS

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PERFORMANCE ENGINEERING
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MONTANA SCOTT ASPENLIEDER No. 17310 PE LICENSED PROFESSIONAL ENGINEER

KQH DESIGNED BY
KQH DRAWN BY
JULY 2019 DATE
QUALITY ASSURANCE
SAA CHECKED BY
JULY 2019 DATE

WHITEHORSE ESTATES SUBDIVISION 1ST FILING
BILLINGS, MONTANA

EVAPOTRANSPIRATION BED DETAILS

PROJECT NUMBER 2016-065
SHEET NUMBER 2 OF 3
DRAWING NUMBER C1.1

SEPTIC TANK DESIGN (DEQ CIRCULAR 4):

5.1.2.1. Liquid connection between compartments must consist of a single opening completely across the compartment wall or two or more openings equally spaced across the wall. The total area of openings must be at least three times the area of the inlet pipe.

5.1.2.2. A septic tank must provide an air space above the liquid level, which must be equal to, or greater than, 15 percent of its liquid capacity. Dose tanks do not need to meet the 15 percent air space requirement. Each compartment of the septic tank must be vented back to the inlet pipe.

5.1.2.3. Inspection ports measuring at least 8 inches in diameter must be provided above each inlet and outlet and marked with rebar. An access of at least 1.75 square feet in size must be provided for each compartment. Each access must be extended to within 12 inches of the finished ground surface. Access to the effluent filter must be large enough to maintain the filter and must be extended to the finished ground surface.

5.1.2.4. The nominal length of the septic tank must be at least twice the width (or diameter) of the tank. Dose tanks are excluded from these length, width, and depth requirements.

5.1.2.5. Septic tanks that have less than, or equal to, a 5,000-gallon liquid capacity must not use depths greater than 78 inches in computing tank capacity.

5.1.2.6. Septic tanks that have a greater than 5,000-gallon liquid capacity must calculate the maximum liquid depth by dividing the liquid length by a factor of 2.5.

5.1.3. Inlets
5.1.3.1. The inlet into the tank must be at least 4 inches in diameter and enter the tank 3 inches above the liquid level. The inlet connection must be watertight.

5.1.3.2. The inlet of the septic tank and each compartment must be submerged by means of a vented tee or baffle. Tees and baffles must extend below the liquid level to a depth where at least 10 percent of the tank's liquid volume is above the bottom of the tee or baffle.

5.1.3.3. Vented tees or baffles must extend above the liquid level a minimum of 7 inches.

5.1.3.4. Baffle tees must extend horizontally into the tank to the nearest edge of the riser access to facilitate baffle maintenance.

5.1.4. Outlets
5.1.4.1. Outlets must include an effluent filter complying with Section 5.1.5. A combination septic/dosing tank outlet is considered to be in the wall dividing the septic compartment(s) and the dosing compartment. Septic tanks aligned in series require an effluent filter only on the final outlet.

5.1.4.2. The outlet of the tank must be at least 4 inches in diameter. The outlet connection must be watertight.

5.1.4.3. Each compartment of the septic tank must be vented to the atmosphere.

5.1.5. Effluent Filters
5.1.5.1. Effluent filters must be used in all systems, unless the reviewing authority approves another filtering device such as a screened pump vault.

5.1.5.2. All septic tank effluent must pass through the effluent filter. No by-pass capability may be designed into the effluent filter. A high-water alarm should be installed to signal that the filter has clogged and needs maintenance.

5.1.5.3. Effluent filter inlets must be located below the liquid level at a depth where 30 to 40 percent of the tank's liquid volume is above the intake of the filter.

5.1.5.4. The effluent filter must be secured so that inadvertent movement does not take place during operation or maintenance. Filters must be readily accessible to the ground surface and the handle must extend to within 2 inches of the access riser lid to facilitate maintenance.

5.1.5.5. The effluent filter manufacturer must provide documentation that the filter meets the design standard for effluent filters in ANSI/NSF Standard 46.

5.1.5.6. The effluent filter manufacturer must provide installation and maintenance instructions with each filter. The installer must follow the manufacturer's instructions when installing the filter and must use the manufacturer's recommendations for sizing and application. The installer must provide the owner of the system with a copy of the maintenance instructions.

5.1.6 Sizing of Septic Tanks
5.1.6.1 Minimum Size Requirements: Multiple single compartment tanks may be connected in series to meet minimum capacity requirements. Dose tank or other tank volumes included in the design may not be included in the required septic tank minimum capacity. The reviewing authority may have additional maintenance requirements for tanks connected in series or those systems utilizing grinder pumps.

5.1.6.2 For Residential Flows:

A. Residential septic tank capacity must be sized in accordance with the number of bedrooms as described below:
   1. For 1 to 3 bedrooms, the minimum capacity is 1,000 gallons per living unit;
   2. For 4 to 5 bedrooms, the minimum capacity is 1,500 gallons per living unit;
   3. For 6 to 7 bedrooms, the minimum capacity is 2,000 gallons per living unit;
B. When the number of living units on a single or common septic tank is between 2 and 9, the minimum capacity will be based on the number of living units and corresponding bedrooms as described in Subsection 5.1.6.2.A.
C. When the number of living units on a single or common septic tank is 10 or greater, the septic tank must have a capacity of at least 2.5 times the design flow.

5.1.7.1. Concrete Tanks (cast-in-place tanks and pre-cast tanks)
A. General Requirements:
All concrete tanks must comply with Sections 1, 2, 3, 5, and 6 of ASTM C 1227-12 with the following additional requirements:

1. All concrete tanks must be manufactured with ASTM C 150-12 Type I, Type I-II or Type V cement and must be made with sulfate-resistant cement (tricalcium aluminates content of less than 8 percent).

2. All concrete tanks must be watertight. Tanks used for commercial facilities, multiple-user systems, public systems or those with a design flow of 700 gallons per day, or greater, must be tested in place for water tightness using a vacuum test or water pressure test. The reviewing authority or designer may require tanks intended for other uses to be tested. Tanks must be tested using one of the following methods:
   a. Vacuum testing: Seal the empty tank and apply a vacuum to 4 inches (100 mm) mercury. The tank is approved if 90 percent of vacuum is held for 2 minutes; or
   b. Water pressure testing: Seal the tank, fill with water, and let stand for at least 24 hours. Refill the tank. The tank is approvable if it holds water.
3. Repairs of all concrete tanks, when required, must be performed by the manufacturer in a manner ensuring that the repaired structure will conform to the requirements of this Circular.
4. All concrete tank sealants must be flexible, appropriate for use in septic tanks, and must conform to ASTM C 990-09.

B. Pre-cast Concrete Tank Requirements:
A set of complete plans stamped by a professional engineer to certify compliance with this Circular must be on file with the tank manufacturer and made available to the reviewing authority upon request. These plans must show maximum depth of bury, all dimensions, capacities, reinforcing, structural calculations, and other such pertinent data for each tank model. The pre-cast concrete tank manufacturer shall develop manufacturer's recommended installation instructions for each tank model. The manufacturer shall provide a copy of the stamped drawings along with the installation instructions to each tank purchaser. All pre-cast concrete tanks must be clearly marked within 2 feet of the outlet with the name of the tank manufacturer, tank model, number of gallons, date of manufacture, and maximum depth of bury.

PUMPING SYSTEM (DEQ CIRCULAR 4):

4.2. PUMPING SYSTEMS

4.2.1 General
This subchapter describes pumping systems and appurtenances for both raw wastewater and effluent. Buoyancy must be considered and flotation of pumping systems prevented with appropriate construction where high ground water conditions are anticipated. Pumping systems must maintain the setback distances required in ARM Title 17, Chapter 37, subchapters 3 or 9, as applicable.

4.2.3 Effluent Pumping Stations
Effluent pumping stations process partially treated wastewater from a primary, advanced, or other treatment facility. The intent of effluent pumping stations is the distribution of effluent to a receiving component. Pressure dosing or pumping stations used to dose subsurface treatment or absorption systems include both gravity dosing to a distribution box or a drop box and delivery of effluent to a manifold for pressure distribution to a subsurface treatment or absorption system.

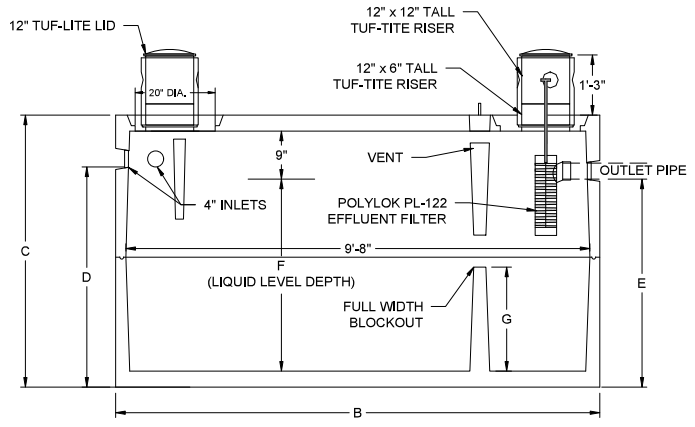
4.2.3.1 Wastewater pumping stations must be provided with effluent pumps, controls, and wiring that are corrosion-resistant and listed by Underwriters Laboratories, Canadian Standards Association, or other approved testing and/or accrediting agency as meeting the requirements for National Electric Code (NEC) Class I, Division 2 locations. An audible or visible alarm must be provided to indicate high water levels. In lieu of meeting the requirements for NEC Class 1, Division 2 locations, pumping stations receiving effluent from 5 or less living units, those stations vented in accordance with the requirements of Chapter 40 of Department Circular DEQ-2, or advanced treatment effluent pumping units that are preceded by a septic tank, may use submersible pumps and motors designed specifically for totally submerged operation with controls and wiring that are corrosion-resistant.

4.2.3.2 Effluent pumping stations for alternative collection systems must be designed in accordance with the requirements of Department Circular DEQ-2.

4.2.3.3 Dosing and Pressure Distribution - Pumping Stations Used with Subsurface Absorption Systems
A. The intent of dosing is the uniform distribution of effluent to a receiving component. Dosing includes both gravity dosing to a distribution box or a drop box and delivery of effluent to a manifold for pressure distribution to a subsurface wastewater treatment system.
B. Pressure distribution to a subsurface wastewater treatment system should be utilized whenever practical, but must be utilized when the design wastewater flow requires an effective length of more than 500 lineal feet or 1,000 square feet of distribution lines, calculated before applying any reductions. The effective length of the absorption area is the actual length of the trench or bed, calculated prior to any applied reductions. The effective length cannot exceed the length of the pipe by more than one-half the orifice spacing.
C. Dosing may be accomplished with either pumps or siphons, which must be sized for the distribution system. Justification for the pump or siphon model selected must be included for review.
D. The dose volume of a pressure distribution system must be equal to the drained volume of the transport pipe and manifold, plus a volume that should be 5 to 10 times the net volume of the distribution pipe. Where the system is designed to operate on a timer, more frequent, smaller doses may be used. The minimum dose volume must be equal to the drained volume of the transport pipe and manifold, plus a volume equal to at least 2 times the distribution pipe volume. Where timers are used, additional controls are necessary to prevent pump operation at low-water level. For gravity dosed systems, the volume of each dose must be at least equal to 75 percent of the internal volume of the distribution lines being dosed.
E. The pressure distribution pipe must be at least Class 200 or Schedule 40 PVC or high density polyethylene (HDPE) with a minimum pressure rating of 160 psi. All fittings must be pressure rated to the pipe. The pipe must have a single row of orifices 1/8-inch diameter or larger in a straight line. Design must include orifices to allow for drainage of the pipe and to allow air to be expelled from the pipe. Maximum orifice spacing must be 5 feet. The size of the dosing pumps and siphons must be selected to provide a minimum pressure of 1 psi (2.3 feet of head) at the end of each distribution For orifices smaller than 3/16-inch, the minimum pressure must be 2.16 psi (5 feet of head) at the end of each distribution pipe.
F. A hydraulic analysis demonstrating uniform distribution must be provided for all pressure distribution systems. The analysis must show no greater than 10 percent variation in distribution of dose across the entire distribution system. Pressure-dosed systems installed on a sloping site must include means for controlling pressure differences caused by varying distribution pipe elevations across the entire distribution area.
G. Cleanouts must be provided at the end of every lateral. The cleanouts must be within 6 inches of finished grade and should be made with either a long-sweep elbow or 2 45-degree bends. A pressure distribution system designer may specify the use of capped ends that are replaced after flushing if, in the designer's opinion, this is a more feasible option than long sweep cleanouts. A metal location marker or plastic valve cover must be provided for each cleanout.
H. Dosing tanks
   1. Dose tank volumes are not to be included in primary, advanced, or other required tank volumes.
   2. The reserve storage volume of the dosing tank must be at least equivalent to 25 percent of the subsurface distribution system design flow. If a duplex pump station is used, where each pump doses the entire distribution system, then the reserve storage volume of the dosing tank may be reduced. The reserve storage volume is computed from the high-level alarm. If the specified pump requires submergence, the tank must also include adequate liquid capacity for pump submergence and the dose volume.
   3. The dosing tank must be separated from the septic tank by an air gap to eliminate the possibility of siphoning from the septic tank. Dosing tanks must be provided with access ports sufficiently large enough to maintain the tank and pumps. Pumps, valves, and other apparatus requiring maintenance must be accessible from the surface without entering the tank or be located in a dry tank adjacent to the wet chamber. Adequate provision must be made to effectively protect maintenance personnel from hazards.
   4. Dosing tanks must meet the construction requirements for septic tanks listed in Section 5.1.7. High-water alarms must be provided for all dosing chambers that utilize pumps. Dosed systems using a siphon should have a dose counter installed to check for continued function of the siphon.
I. Pressure distribution systems must be field-tested to verify that the pressure across the entire absorption field does not vary by greater than 10 percent.

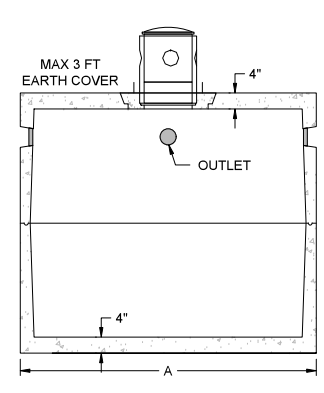
SEPTIC TANK SIZING

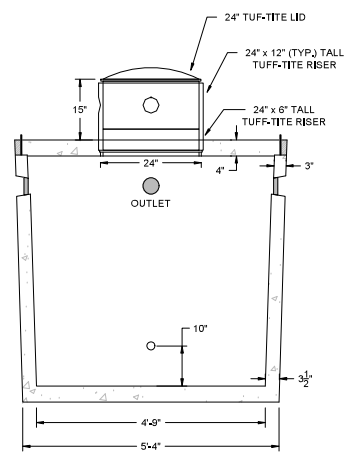
BEDROOMS	FLOW	SEPTIC TANK SIZE	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION E	DIMENSION F	DIMENSION G
(#)	(GPD)	(GAL. PER UNIT)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
1-3 BEDROOMS	150 - 300	1000	58	102	65	55	52	48	26
4-5 BEDROOMS	350 - 400	1500	68	126	65	55	52	48	26
6+ BEDROOMS	450+	2000	84	156	62	51	48	43	22

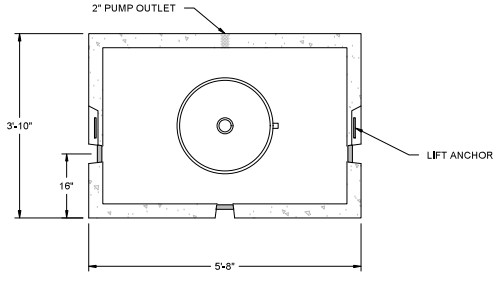


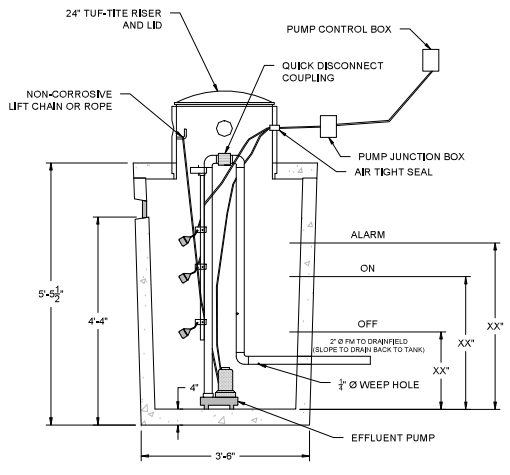
NOTES:
1. SEPTIC SYSTEM AND APPURTENANCES SHALL MEET THE STANDARDS SET FORTH IN MT DEQ CIRCULAR 4.
2. TANK SHALL BE BILLINGS PRECAST DUAL CHAMBER 1,000, 1,500, OR 2,000 GALLON SEPTIC TANK OR APPROVED EQUAL.
3. THE INLET OF THE SEPTIC TANK MUST BE SUBMERGED BY MEANS OF A VENTED TEE OR BAFFLE. THE VENTED TEE OR BAFFLE MUST EXTEND A MINIMUM OF 12" BELOW THE INLET.
4. EACH COMPARTMENT OF THE SEPTIC TANK MUST BE VENTED TO THE ATMOSPHERE.
5. THE EFFLUENT FILTER INLET MUST BE LOCATED A MINIMUM OF 17" BELOW THE OUTLET.
6. EFFLUENT FILTER MUST BE READILY ACCESSIBLE TO THE GROUND SURFACE AND THE HANDLE MUST EXTEND TO WITHIN 2 INCHES OF THE ACCESS RISER LID.
7. THE EFFLUENT FILTER SHALL BE A POLYLOK PL-122 FILTER OR ENGINEERED APPROVED EQUAL.
8. THE EFFLUENT FILTER MANUFACTURER MUST PROVIDE DOCUMENTATION THAT THE FILTER MEETS THE DESIGN STANDARD FOR EFFLUENT FILTERS IN ANSI/NSF STANDARD 46.
9. SEPTIC TANK SHALL BE WATERTIGHT.
10. TANK ACCESS RISERS SHALL EXTEND TO THE SURFACE.
11. TANK DIMENSIONS SHOWN ARE FOR A MAXIMUM BURY DEPTH OF 3'. CONSULT TANK MANUFACTURER FOR BURY DEPTHS GREATER THAN 3'.
12. ALL PIPE SHALL BE SCH 40 PVC.
13. CONTRACTOR TO VERIFY INVERT ELEVATION.

1000, 1500, 2000 GALLON DUAL CHAMBER SEPTIC TANK
SCALE: NTS









NOTES:
1. SEPTIC SYSTEM AND APPURTENANCES SHALL MEET THE STANDARDS SET FORTH IN MT DEQ CIRCULAR 4.
2. TANK SHALL BE BILLINGS PRECAST 500 GALLON DOSING TANK OR APPROVED EQUAL.
3. TANK ACCESS RISERS SHALL EXTEND TO THE SURFACE.
4. TANK DIMENSIONS SHOWN ARE FOR A MAXIMUM BURY DEPTH OF 3'. CONSULT TANK MANUFACTURER FOR BURY DEPTHS GREATER THAN 3'.
5. VERIFY MINIMUM SUBMERGENCE DEPTH FROM PUMP MANUFACTURER.
6. ALL PIPE SHALL BE SCH 40 PVC WITH WATERTIGHT FITTING AND JOINTS.
7. ALARM TO BE ON ITS OWN CIRCUIT. NOT SHARED WITH PUMP CONTROLS.
8. THE DOSING VOLUME, ALARM SWITCH, AND ON/OFF SWITCH WILL BE DETERMINED BASED OFF OF THE NUMBER OF BEDROOMS AND THE HEIGHT DIFFERENCE BETWEEN THE DOSING TANK OUTLET AND THE EVAPOTRANSPIRATION BED SYSTEM.

500 GALLON DOSING TANK
SCALE: NTS

REVISIONS

NO.	DESCRIPTION	DATE	BY	CHECKED BY
1				
2				
3				
4				
5				
6				

PERFORMANCE ENGINEERING
608 NORTH 29TH STREET
BILLINGS, MT 59101
(406) 384-0080
performance-ec.com

MONTANA SCOTT ASPENLIEDER No. 17310 PE LICENSED PROFESSIONAL ENGINEER

KQH DESIGNED BY
KQH DRAWN BY
JULY 2019 DATE
QUALITY ASSURANCE
SAA CHECKED BY
JULY 2019 DATE

WHITEHORSE ESTATES SUBDIVISION 1ST FILING

BILLINGS, MONTANA

SEPTIC AND DOSING TANK DETAILS

PROJECT NUMBER 2016-065
SHEET NUMBER 3 OF 3
DRAWING NUMBER C1.2