

ONSITE WASTEWATER TREATMENT SYSTEM DESIGN
15760 HWY 83, COLORADO SPRINGS, CO 80921
EL PASO COUNTY, COLORADO

DESIGN CRITERIA

This design is for a proposed, small multi-home development. The design consists of four separate 1500 GPD OWTS with a combined flow of 6000 GPD.

In addition to the county and state OWTS Regulations, the Water Quality Site Application Policy 6 has been used as a reference for guidelines on placing multiple OWTS on a single parcel of land. In particular, the horizontal influence area described in Policy 6 has been used to determine applicable separation distances between OWTS.

The site has a moderately dense tree cover, and is underlain by poorly permeable soils. Thus, a Higher Level Treatment (HLT) System, followed by Drip Dispersal, is proposed. The HLT is to pretreat the wastewater prior to Drip Dispersal into the poorly permeable soil. The Drip Dispersal System is to allow the installation of a Dispersal System that does not require tree removal.

OBSERVATION REQUIREMENTS

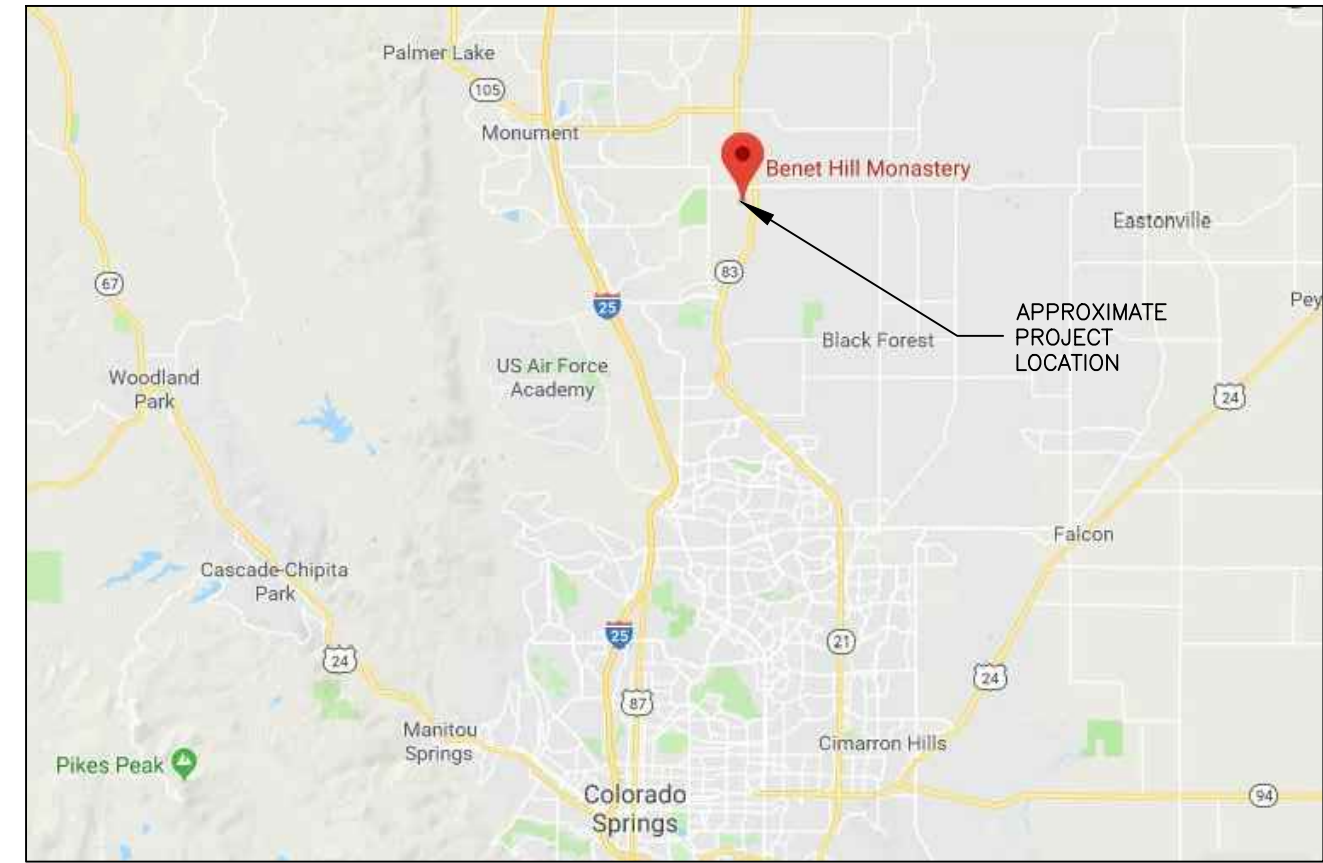
- This office is to observe the installation of the system at the following intervals:
- (1) Pre-construction meeting
 - (2) Prior to burial of any system components
 - (3) Post burial to observe final grading
 - (4) To observe system start-up and verify proper system operation.

WATER SUPPLY REQUIREMENTS

The development is to be served by a well in the location depicted on Sheet 2.

INDEX OF DRAWINGS

SHEET NO.	TITLE	SHEET NO.	TITLE
1.	Design Criteria	8.	Advantex System Plan Detail
2.	Project Site Plan	9.	Advantex System Profile
3.	Subsurface Conditions	10-13.	Drip Dispersal Plan View
4.	System #1 Site Plan	14.	Drip Dispersal Pump System
5.	System #2 Site Plan	15.	Drip Dispersal Detail
6.	System #3 Site Plan		
7.	System #4 Site Plan		



GENERAL NOTES LOCATION MAP

The locations of wells and fields shown on this site plan, and staked in the field are not the result of a property survey, and are to be considered approximate. It is the property owner's responsibility to ensure all construction is located within the property boundaries. All separation distances are to be verified prior to excavation.

Design criteria has been created based upon information submitted. If conditions differ from the information presented, this office should be contacted to verify and observe the conditions.

Locate all utilities prior to construction.

Contractor shall have one set of county approved plans, on the jobsite, at all times during the construction and observation period.

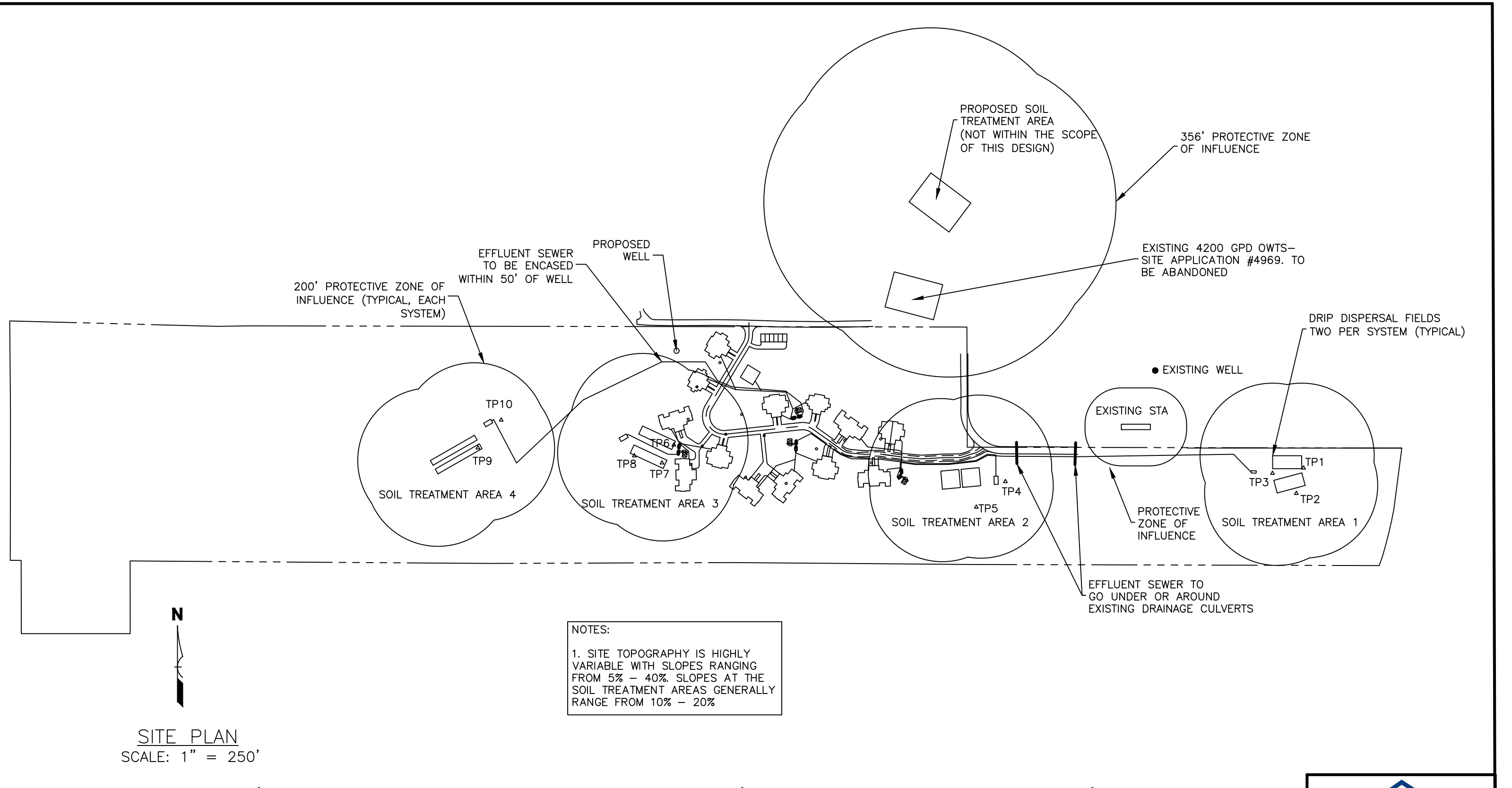
Deviation from these plans must be approved by the engineer.


All onsite wastewater treatment system construction, and any requirements not specified within this design, must meet county requirements. The contractor should have documented, and demonstrated, knowledge of the requirements and regulation of the county in which they are working.

The system is designed and intended to be used only for the wastewater load specified.

The owner is to assume responsibility, and be aware of the ongoing maintenance, required for an onsite wastewater treatment system.

285 ENGINEERING P.O. BOX 1048 CONIFER, CO 80433 (720)-515-1781	PROJECT: 2018196	TITLE: DESIGN CRITERIA		SHEET: 1/15
	LOCATION: 3190 BENET LANE COLORADO SPRINGS, CO 80921	DATE: 06/18/2018	REVISIONS:	
	CLIENT: BENET HILL MONASTERY	SCALE: NONE	1	
			2	
			3	



285 ENGINEERING P.O. BOX 1048 CONIFER, CO 80433 (720)-515-1781	PROJECT: 2018196		TITLE: PROJECT SITE PLAN		SHEET: 2/15	
	LOCATION: 3190 BENET LANE COLORADO SPRINGS, CO 80921		DATE: 06/18/2018	REVISIONS: <div><div>1</div><div>2</div><div>3</div></div>		
			SCALE: SHOWN			
	CLIENT: BENET HILL MONASTERY					

SOILS INFORMATION

DATE TESTING COMPLETED: 06/19/2018
EQUIPMENT USED: EXCAVATOR
DEPTH TO BEDROCK REFUSAL: NOT PRESENT
DEPTH TO STANDING WATER: NOT PRESENT
REDOXIMORPHIC FEATURES: NOT PRESENT

SITE EVALUATOR

ROGER J. SHAFER, P.E.
P.O. BOX 1048
CONIFER, CO. 80433
719-839-1382
rshafer@285engineering.com

BS Civil Engineering
MS Environmental Engineering and Science

Credentials: CPOW Soils Characterization Class 2012

DIFFICULTIES
ENCOUNTERED DURING
SITE VISIT

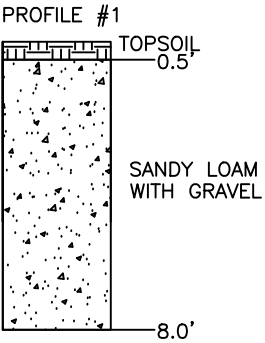
There were no difficulties encountered during the site visit that prevented a complete evaluation of the property.

POTENTIAL LAND USE
CHANGES

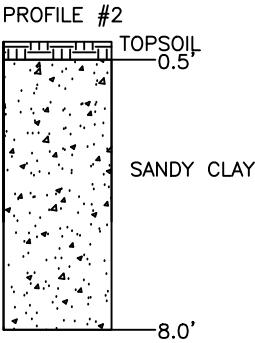
There are no known or foreseeable land use changes that would affect system performance.

ANTICIPATED CONSTRUCTION
RELATED ISSUES

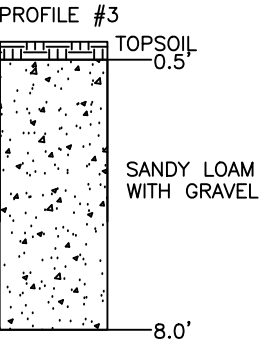
No construction related issues are expected for this site.



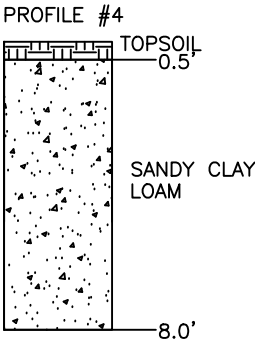
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
2A	SANDY LOAM	GR	1 (MASSIVE)



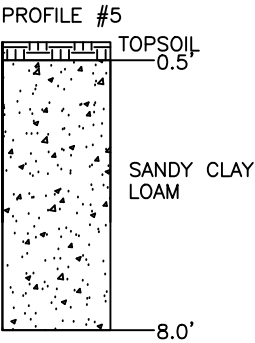
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
4	SANDY CLAY	GR	2 (MODERATE)



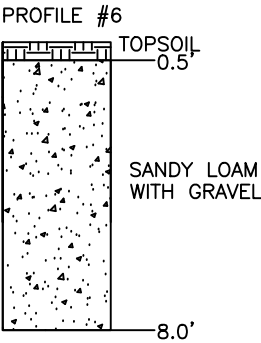
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
2A	SANDY LOAM	GR	1 (MASSIVE)



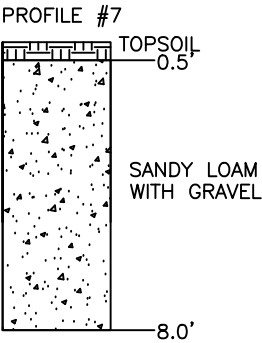
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
3A	SANDY CLAY LOAM	GR	1 (MASSIVE)



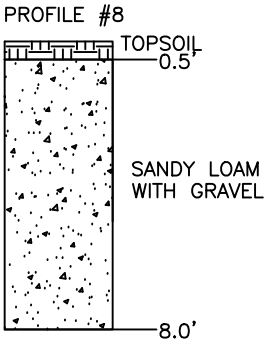
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
3A	SANDY CLAY LOAM	GR	1 (MASSIVE)



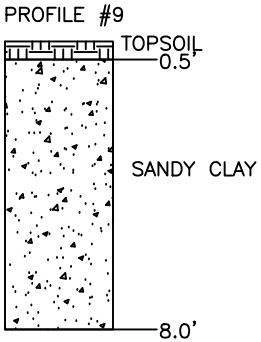
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
3A	SANDY CLAY LOAM	GR	1 (MASSIVE)



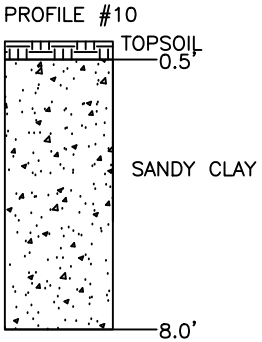
SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
2A	SANDY LOAM	GR	1 (MASSIVE)



SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
2A	SANDY LOAM	GR	1 (MASSIVE)



SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
4	SANDY CLAY	GR	2 (MODERATE)



SOIL TYPE, TEXTURE AND STRUCTURE			
SOIL TYPE	TEXTURE	STRUCTURE /SHAPE	STRUCTURE/ GRADE
4	SANDY CLAY	GR	2 (MODERATE)

SCALE: 3/16" = 1'

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: SUBSURFACE CONDITIONS
DATE: 06/18/2018
SCALE: SHOWN

REVISIONS:
1
2
3

SHEET:
3/15



DESIGN FLOWS:
 $(10 \text{ BR}) \times (150 \text{ GPD/BR}) = 1500 \text{ GPD}$

TREATMENT SYSTEM DESIGN CRITERIA:

SEPTIC TANK = 2 DAY RETENTION = $(2) \times (1500 \text{ GPD})$
= 3000 GAL MINIMUM CAPACITY.

RECIRCULATION TANK = 1 DAY RETENTION = $(1) \times 1500 \text{ GPD}$
= 1500 GAL MINIMUM CAPACITY.

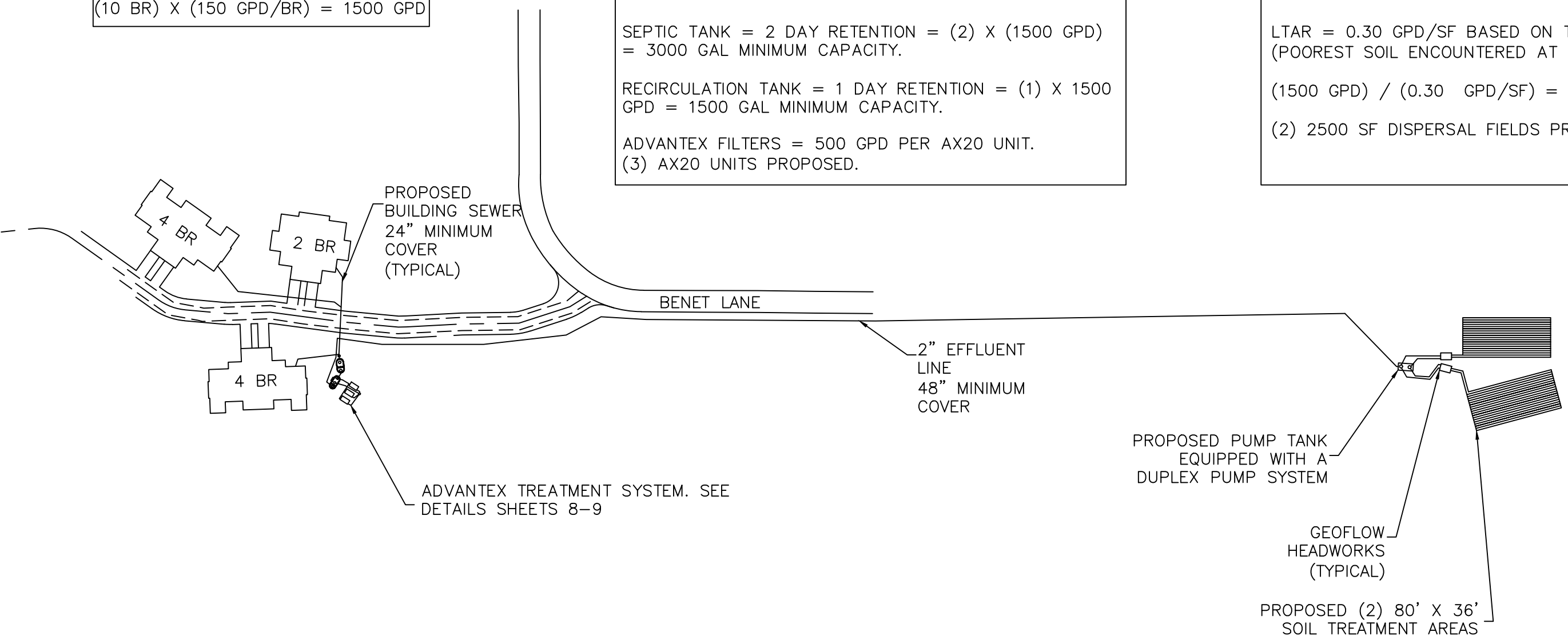
ADVANTECH FILTERS = 500 GPD PER AX20 UNIT.
(3) AX20 UNITS PROPOSED.

DRIP DISPERSAL SYSTEM DESIGN CRITERIA:


LTAR = 0.30 GPD/SF BASED ON TL3 AND SOIL TYPE 4
(POOREST SOIL ENCOUNTERED AT THE SITE).

$(1500 \text{ GPD}) / (0.30 \text{ GPD/SF}) = 5000 \text{ SF REQUIRED.}$

(2) 2500 SF DISPERSAL FIELDS PROPOSED.



DETAIL SITE PLAN
SCALE: 1" = 100'

285 ENGINEERING P.O. BOX 1048 CONIFER, CO 80433 (720)-515-1781	PROJECT: 2018196		TITLE: SYSTEM 1 SITE PLAN		SHEET: 4/15	
	LOCATION: 3190 BENET LANE COLORADO SPRINGS, CO 80921		DATE: 06/18/2018	REVISIONS: <div>1</div> <div>2</div> <div>3</div>		
			SCALE: SHOWN			
	CLIENT: BENET HILL MONASTERY					

DESIGN FLOWS:
(10 BR) X (150 GPD/BR) = 1500 GPD

TREATMENT SYSTEM DESIGN CRITERIA:

SEPTIC TANK = 2 DAY RETENTION = (2) X (1500 GPD) = 3000 GAL MINIMUM CAPACITY.

RECIRCULATION TANK = 1 DAY RETENTION = (1) X 1500 GPD = 1500 GAL MINIMUM CAPACITY.

ADVANTECH FILTERS = 500 GPD PER AX20 UNIT.
(3) AX20 UNITS PROPOSED.

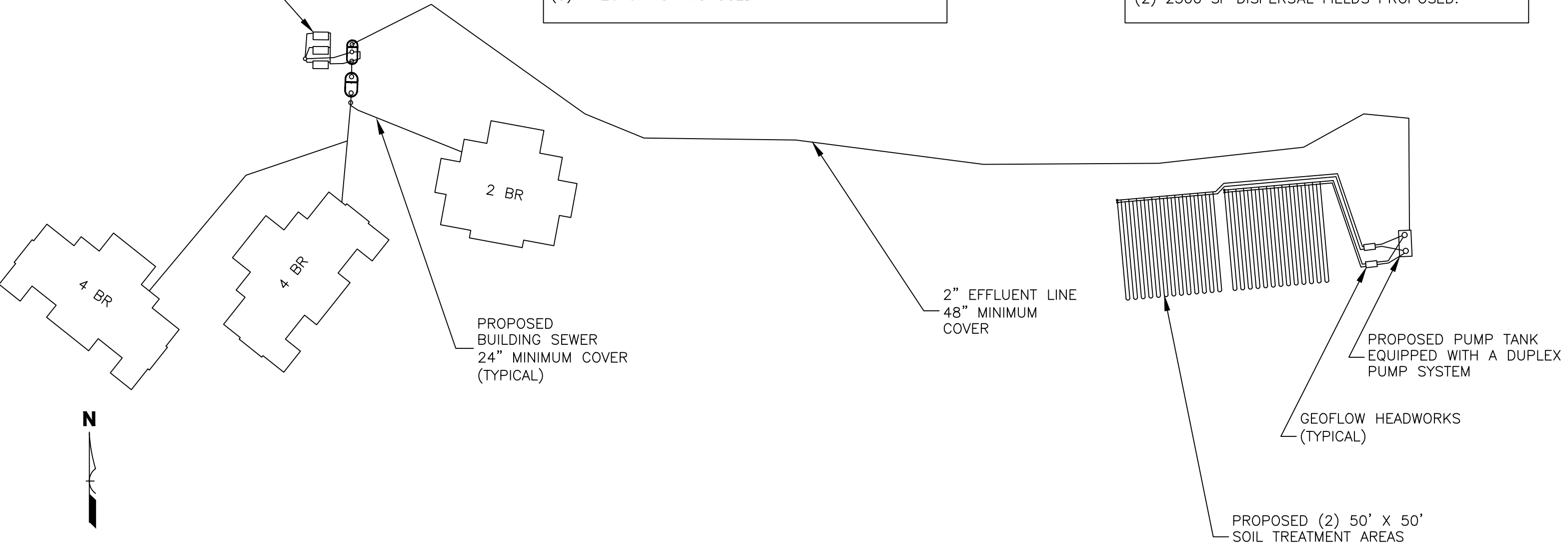
DRIP DISPERSAL SYSTEM DESIGN CRITERIA:

LTAR = 0.30 GPD/SF BASED ON TL3 AND SOIL TYPE 4 (POOREST SOIL ENCOUNTERED AT THE SITE).

(1500 GPD) / (0.30 GPD/SF) = 5000 SF REQUIRED.

(2) 2500 SF DISPERSAL FIELDS PROPOSED.

ADVANTECH TREATMENT SYSTEM.
SEE DETAILS SHEETS 8-9



DETAIL SITE PLAN
SCALE: 1" = 50'

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: SYSTEM 2 SITE PLAN

DATE: 06/18/2018	REVISIONS: ① ② ③
SCALE: SHOWN	

SHEET:
5/15



DESIGN FLOWS:
 $(10 \text{ BR}) \times (150 \text{ GPD/BR}) = 1500 \text{ GPD}$

TREATMENT SYSTEM DESIGN CRITERIA:

SEPTIC TANK = 2 DAY RETENTION = $(2) \times (1500 \text{ GPD}) = 3000 \text{ GAL}$ MINIMUM CAPACITY.

RECIRCULATION TANK = 1 DAY RETENTION = $(1) \times 1500 \text{ GPD} = 1500 \text{ GAL}$ MINIMUM CAPACITY.

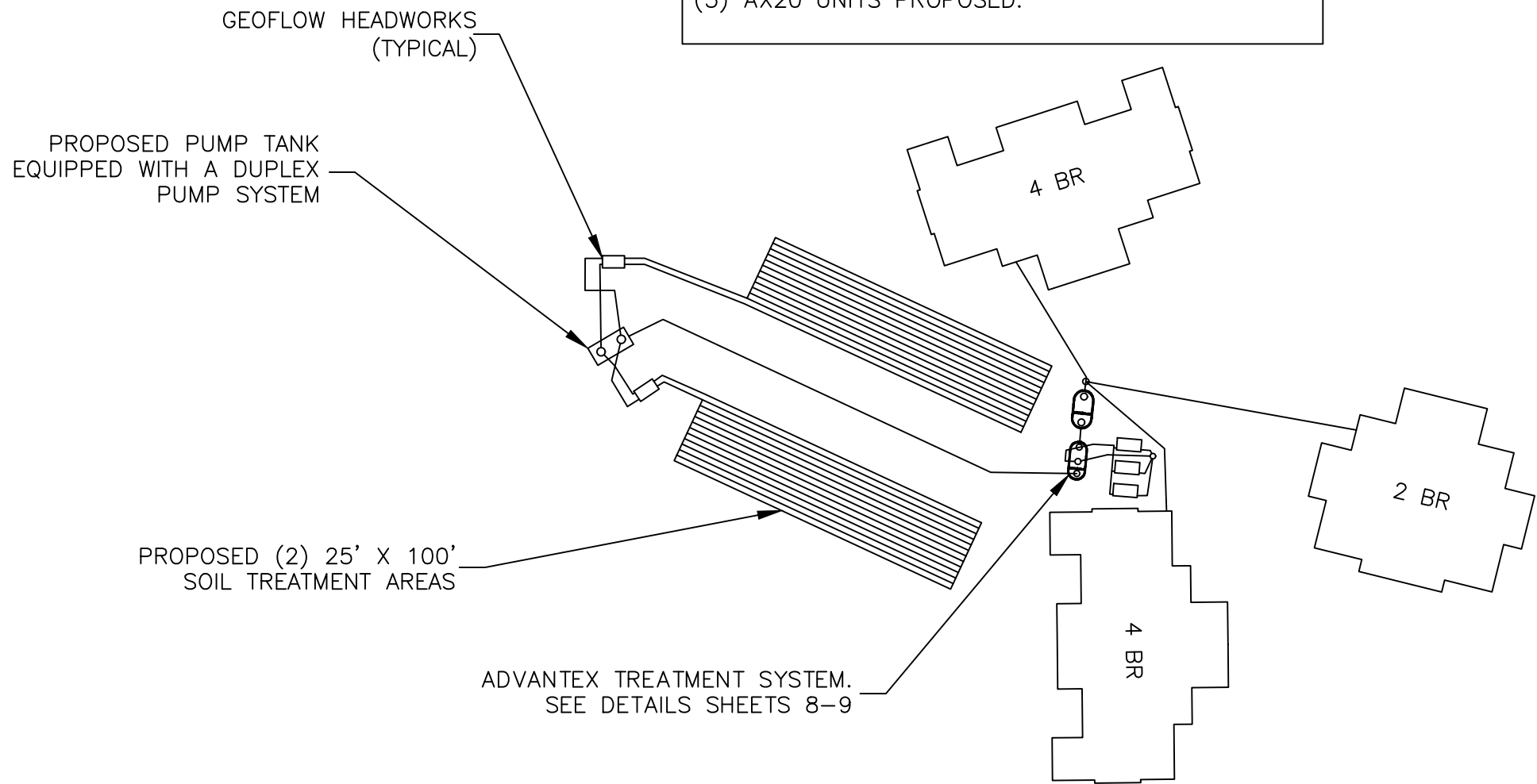
ADVANTECH FILTERS = 500 GPD PER AX20 UNIT.
 $(3) \text{ AX20 UNITS PROPOSED.}$

DRIP DISPERSAL SYSTEM DESIGN CRITERIA:

LTAR = 0.30 GPD/SF BASED ON TL3 AND SOIL TYPE 4 (POOREST SOIL ENCOUNTERED AT THE SITE).

$(1500 \text{ GPD}) / (0.30 \text{ GPD/SF}) = 5000 \text{ SF}$ REQUIRED.

$(2) \text{ 2500 SF DISPERSAL FIELDS PROPOSED.}$



DETAIL SITE PLAN
SCALE: 1" = 50'

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196

LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921

CLIENT: BENET HILL MONASTERY

TITLE: SYSTEM 3 SITE PLAN

DATE: 06/18/2018

SCALE: SHOWN

REVISIONS:



SHEET:
6/15



DESIGN FLOWS:

(8 BR) X (150 GPD/BR) = 1200 GPD
(4 ROOM GUEST HOUSE) X (75 GPD/ROOM) = 300 GPD
TOTAL DESIGN FLOW = 1500 GPD

NOTE – 75 GPD PER ROOM USED FOR THE GUEST HOUSE FROM "HOTELS AND MOTELS PER ROOM" FROM TABLE 6-2 OF THE OWTS REGULATION.

TREATMENT SYSTEM DESIGN CRITERIA:

SEPTIC TANK = 2 DAY RETENTION = (2) X (1500 GPD) = 3000 GAL MINIMUM CAPACITY.

RECIRCULATION TANK = 1 DAY RETENTION = (1) X 1500 GPD = 1500 GAL MINIMUM CAPACITY.

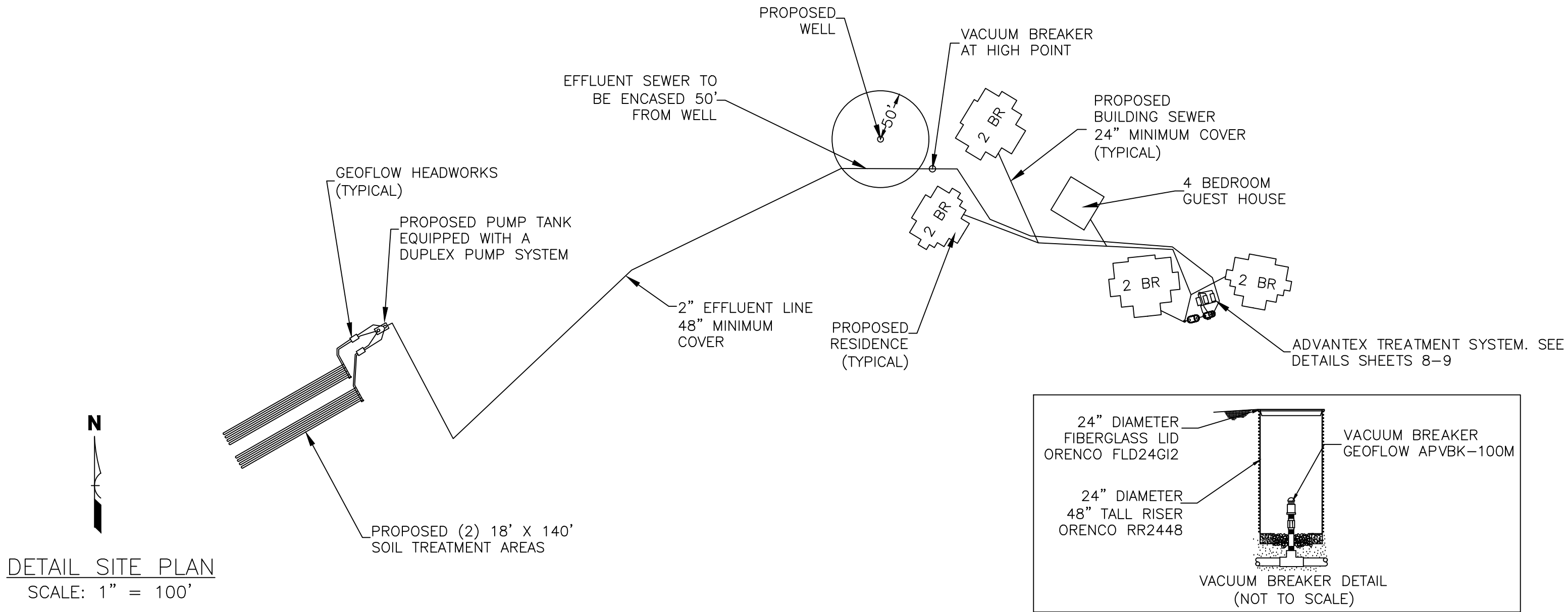
ADVANTEK FILTERS = 500 GPD PER AX20 UNIT.
(3) AX20 UNITS PROPOSED.

DRIP DISPERSAL SYSTEM DESIGN CRITERIA:

LTAR = 0.30 GPD/SF BASED ON TL3 AND SOIL TYPE 4 (POOREST SOIL ENCOUNTERED AT THE SITE).

(1500 GPD) / (0.30 GPD/SF) = 5000 SF REQUIRED.

(2) 2500 SF DISPERSAL FIELDS PROPOSED.



DETAIL SITE PLAN
SCALE: 1" = 100'

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

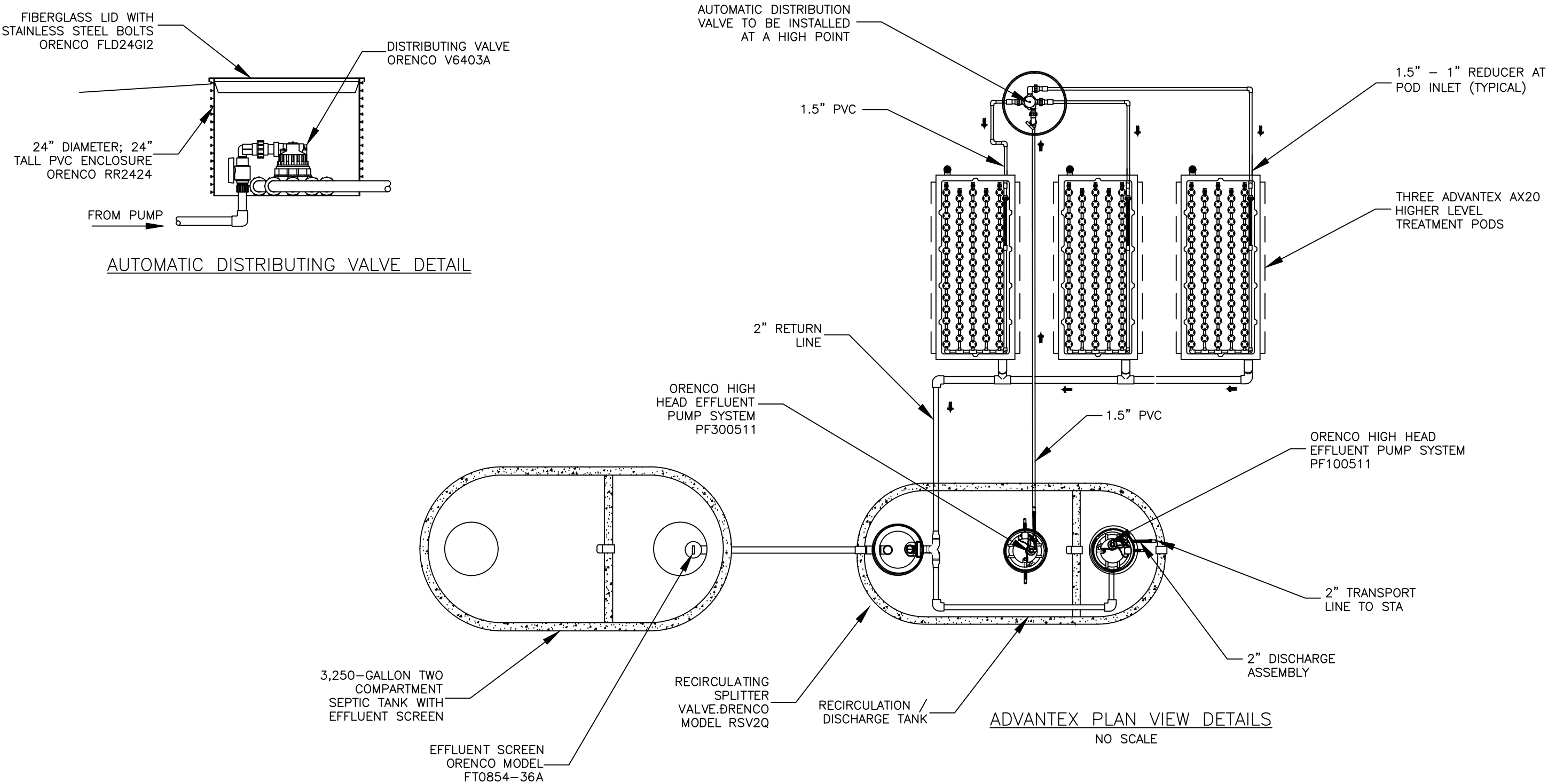
PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: SYSTEM 4 SITE PLAN

DATE: 06/18/2018	REVISIONS: ① ② ③
SCALE: SHOWN	

SHEET:
7/15





285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: ADVANTEX SYSTEM PLAN DETAIL
DATE: 06/18/2018
SCALE: SHOWN

REVISIONS:
1
2
3

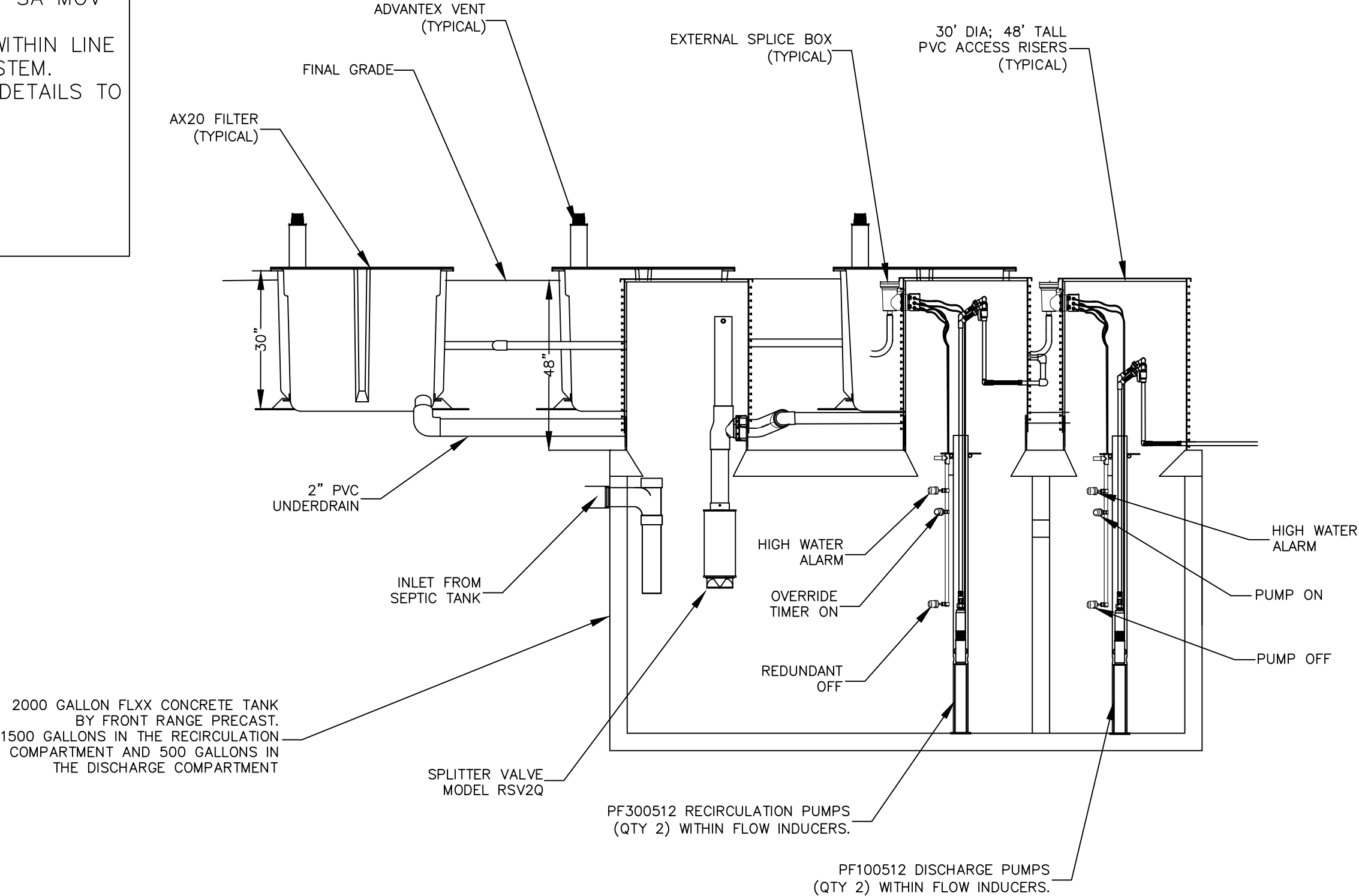
SHEET:
8/15



ORENCO CONTROL PANEL
MODEL MVP-DAX/DAX2 PT RO HT SA MOV

CONTROL PANEL TO BE PLACED WITHIN LINE
OF SIGHT OF THE TREATMENT SYSTEM.
PANEL LOCATION AND MOUNTING DETAILS TO
BE DETERMINED AT THE TIME OF
CONSTRUCTION.

ELECTRICAL REQUIREMENTS:
ONE 230V, 40 AMP CIRCUIT
ONE 115V, 10 AMP CIRCUIT.



FLOATS TO BE SET BY ADVANTECH
SERVICE PROVIDER AT TIME OF
START-UP.

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196

LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921

CLIENT: BENET HILL MONASTERY

TITLE: ADVANTECH SYSTEM PROFILE

DATE: 06/18/2018

SCALE: SHOWN

REVISIONS:

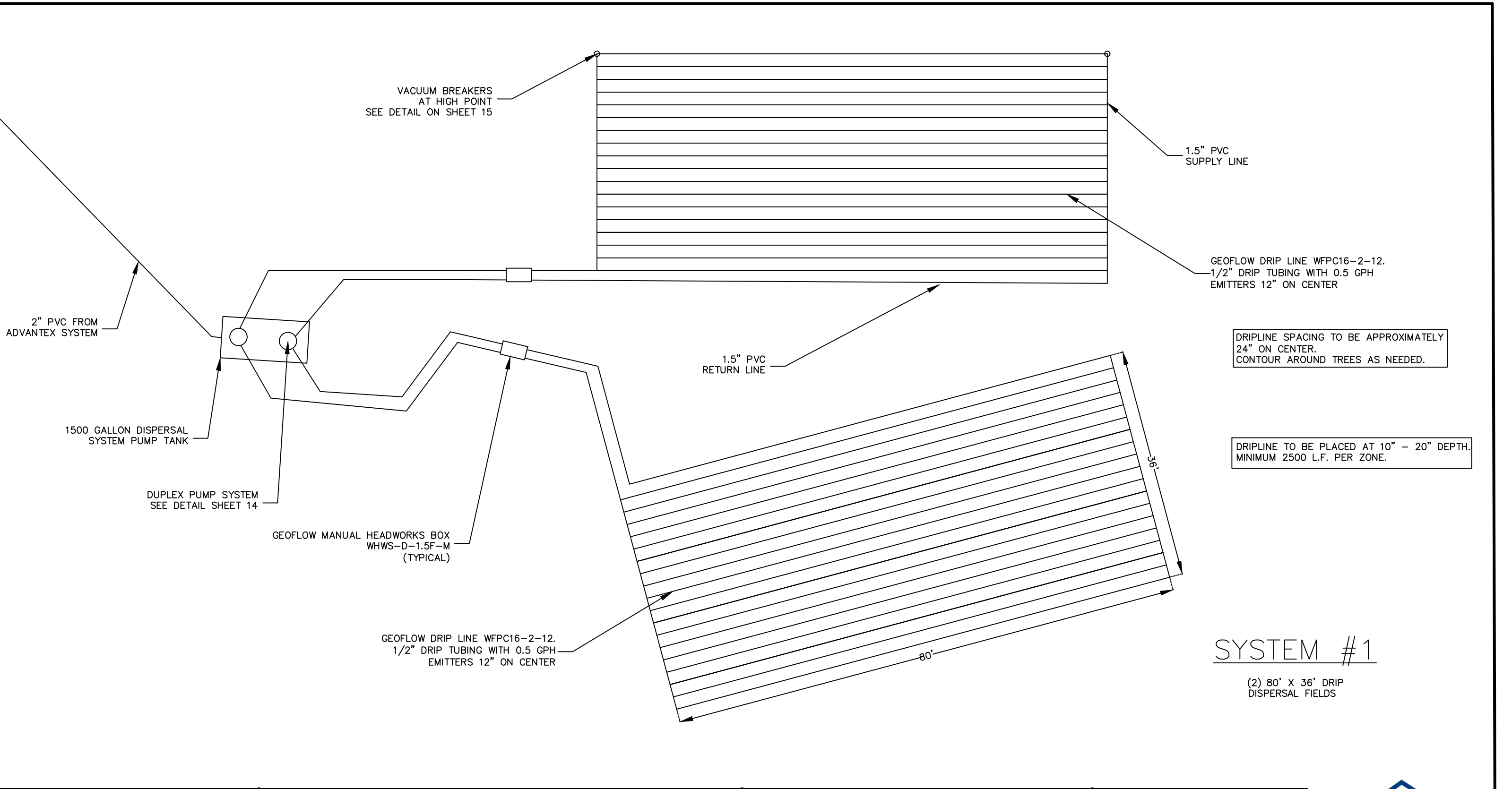
1

2

3

SHEET:
9/15



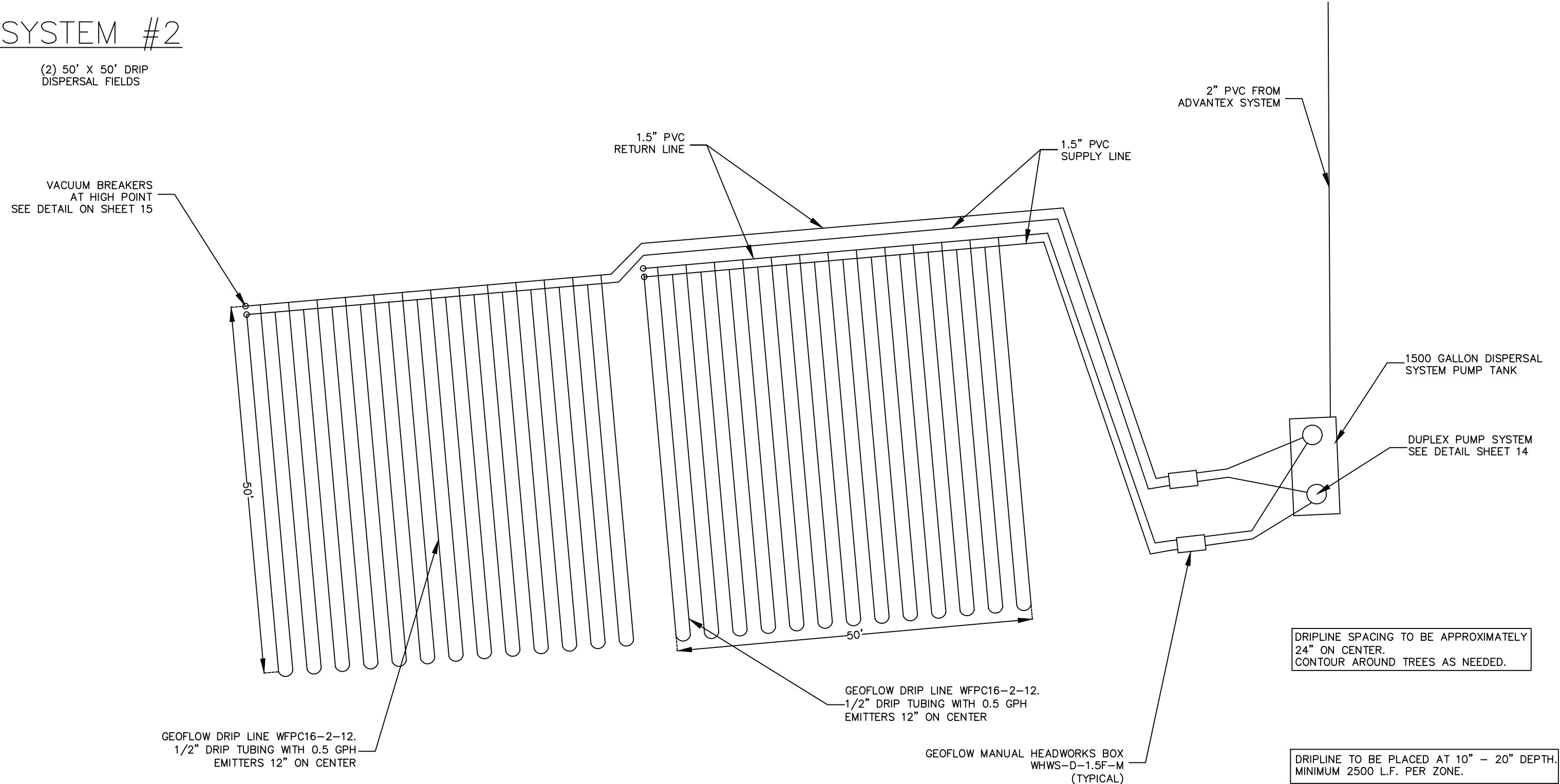


285 ENGINEERING P.O. BOX 1048 CONIFER, CO 80433 (720)-515-1781	PROJECT: 2018196		TITLE: DRIP DISPERSAL PLAN DETAIL		SHEET: 10/15
	LOCATION: 3190 BENET LANE COLORADO SPRINGS, CO 80921	DATE: 06/18/2018		REVISIONS: <div>1</div> <div>2</div> <div>3</div>	
		SCALE: SHOWN			
	CLIENT: BENET HILL MONASTERY				



SYSTEM #2

(2) 50' X 50' DRIP
DISPERSAL FIELDS



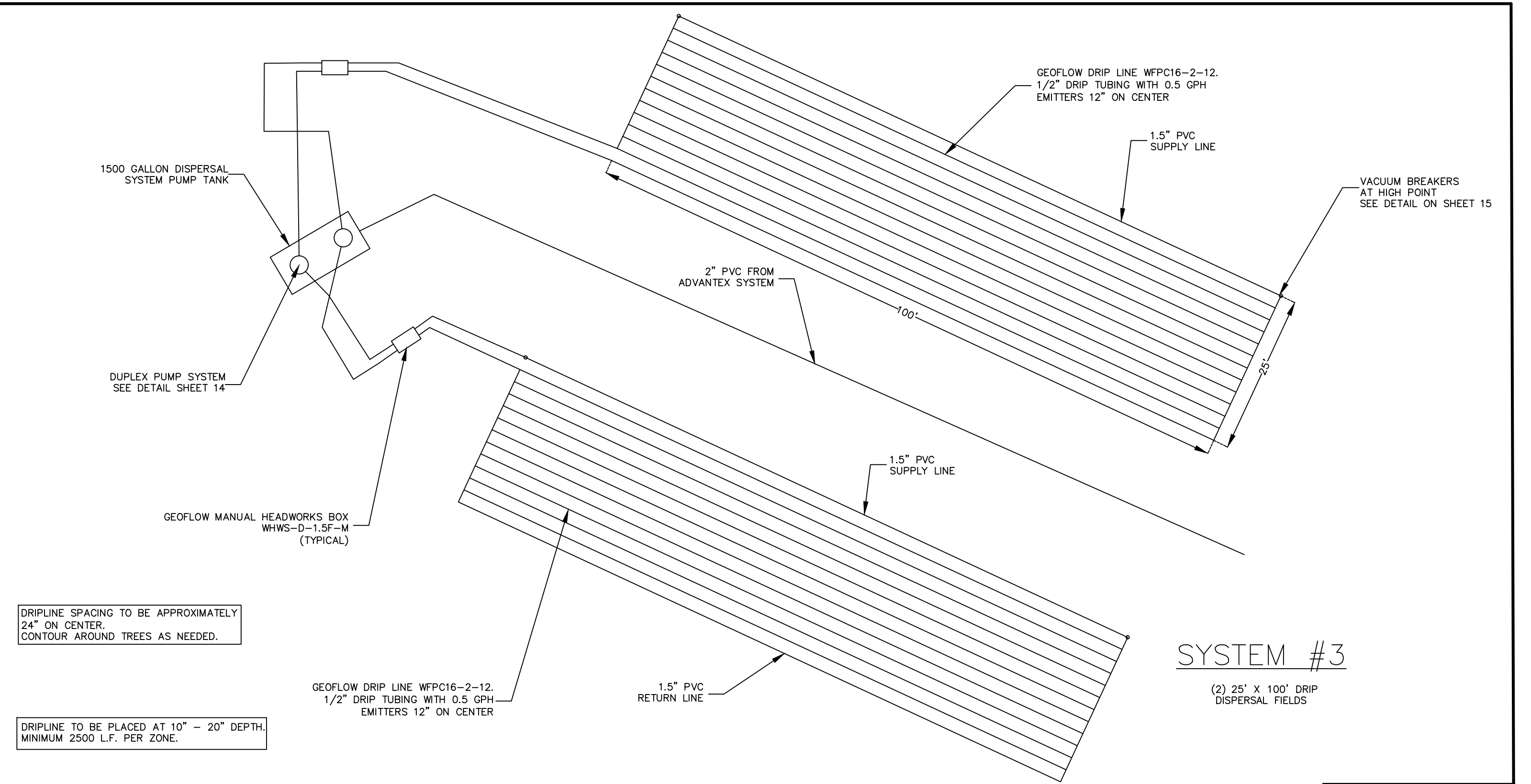
285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: DRIP DISPERSAL PLAN VIEW
DATE: 06/18/2018
SCALE: SHOWN
REVISIONS:
1
2
3

SHEET:
11/15





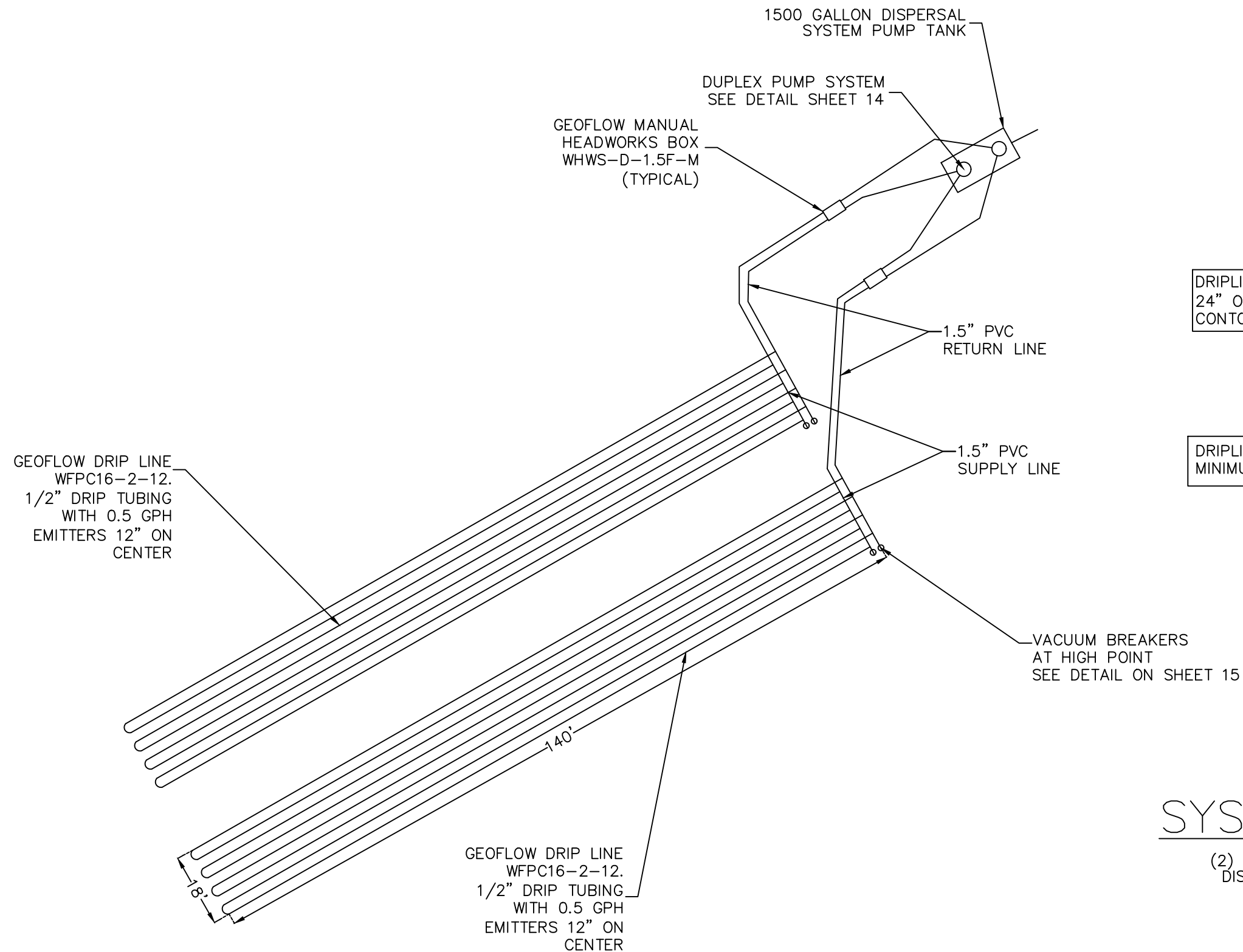
285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: DRIP DISPERSAL PLAN VIEW		
DATE: 06/18/2018 SCALE: SHOWN	REVISIONS:	
	1	
	2	
	3	

SHEET:
12/15





SYSTEM #4

(2) 18' X 140' DRIP
DISPERSAL FIELDS

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196

LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921

CLIENT: BENET HILL MONASTERY

TITLE: DRIP DISPERSAL PLAN VIEW

DATE: 06/18/2018

SCALE: SHOWN

REVISIONS:



SHEET:

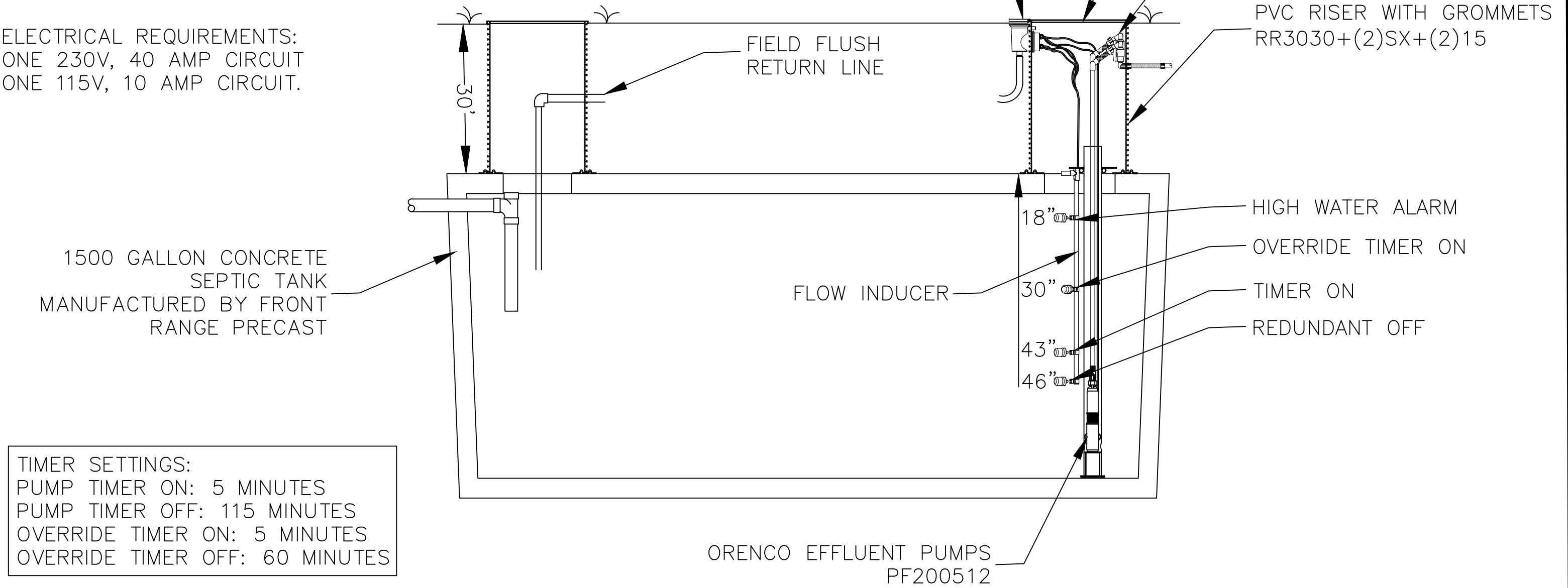
13/15



ORENCO CONTROL PANEL
MODEL MVP-DAX/DAX2 PT RO HT SA MOV.

CONTROL PANEL TO BE PLACED WITHIN
LINE OF SIGHT OF THE TREATMENT SYSTEM.
PANEL LOCATION AND MOUNTING DETAILS
TO BE DETERMINED AT THE TIME OF
CONSTRUCTION.

ELECTRICAL REQUIREMENTS:
ONE 230V, 40 AMP CIRCUIT
ONE 115V, 10 AMP CIRCUIT.



TIMER SETTINGS:
PUMP TIMER ON: 5 MINUTES
PUMP TIMER OFF: 115 MINUTES
OVERRIDE TIMER ON: 5 MINUTES
OVERRIDE TIMER OFF: 60 MINUTES

285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

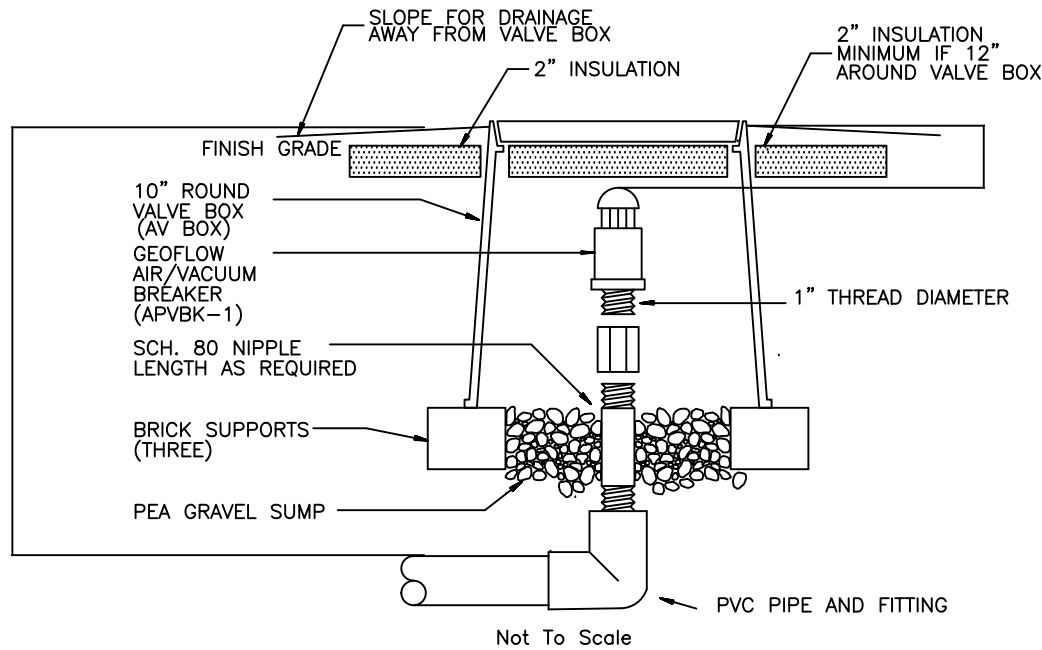
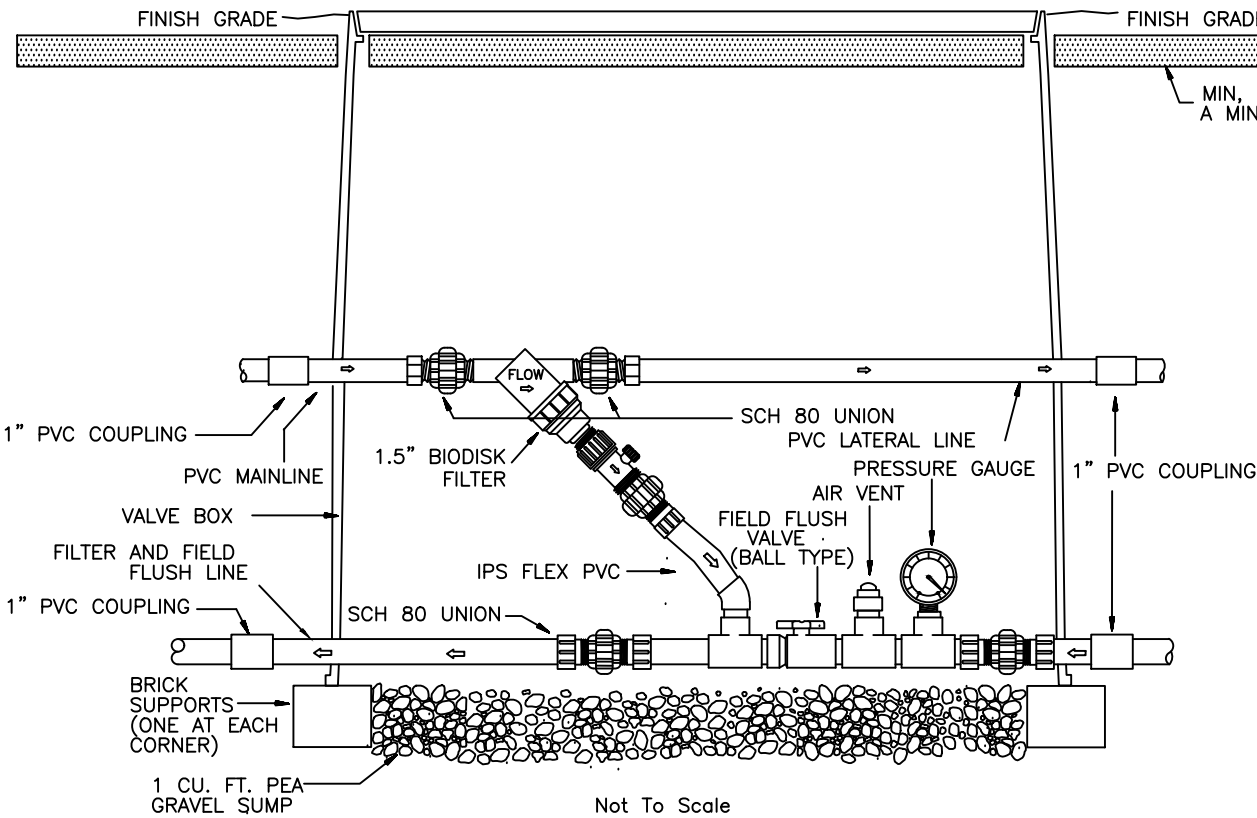
TITLE: DRIP DISPERSAL PUMP SYSTEM
DATE: 06/18/2018
SCALE: SHOWN

REVISIONS:
1
2
3

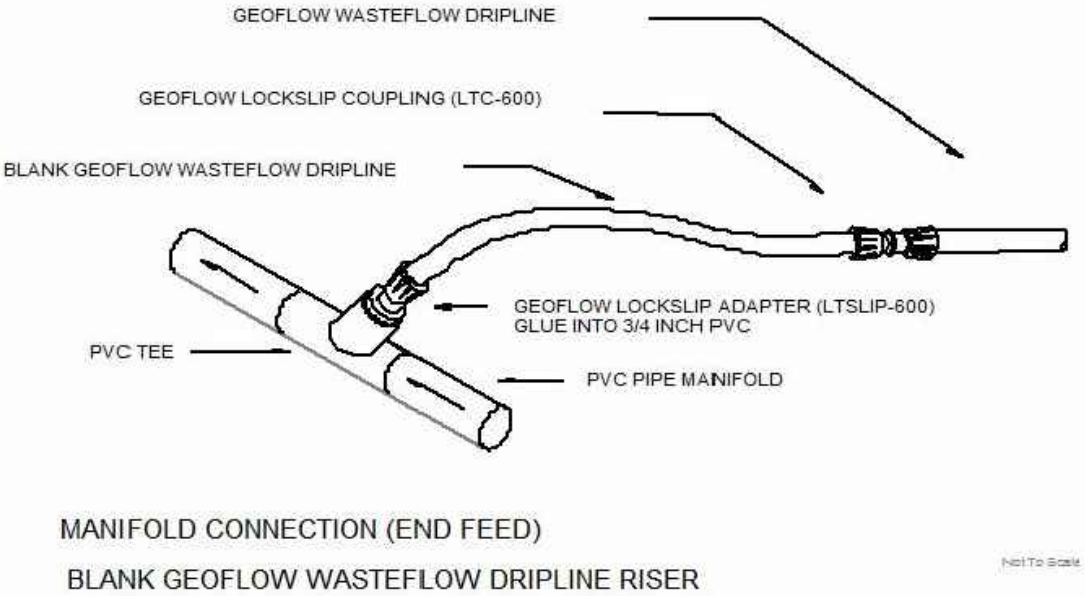
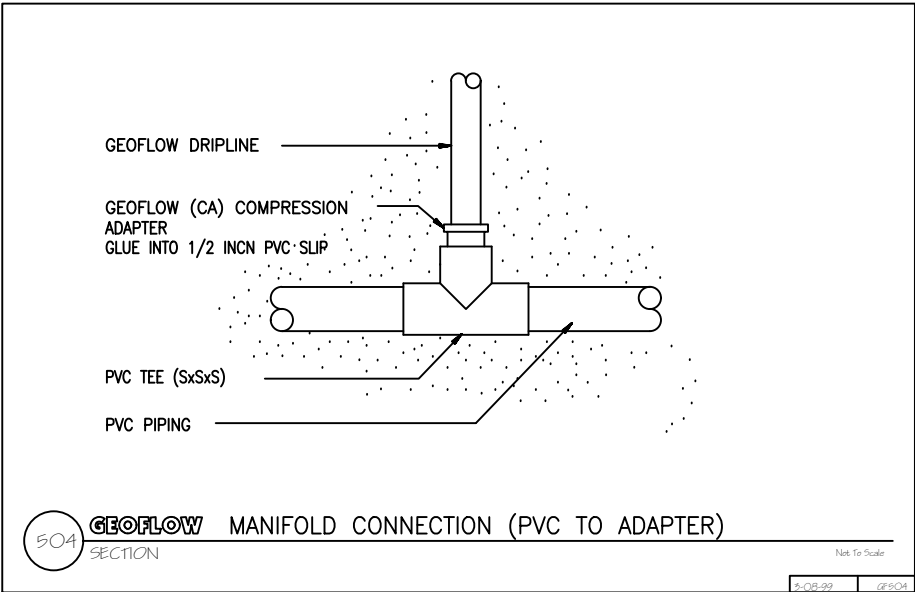
SHEET:
14/15



GEOFLOW HEADWORKS WHWS-D-1.5F-M



1. ALL INSULATION TO BE HI-DENSITY POLYSTYRENE, BURIAL TYPE RIGID INSULATION.
2. SUPPLY AND RETURN MANIFOLDS ARE TO BE INSTALLED SUCH THAT THEY DRAIN TO THE PUMP SYSTEM AFTER EACH DOSE.
3. INSTALL SUPPLY AND RETURN MANIFOLDS A MINIMUM OF 18" DEEP, OR INSULATE. SLOPE TO DRAIN BACK TO HEADWORKS BOX.
4. FOLLOW ALL OTHER "WINTERIZATION" RECOMMENDATIONS IN THE GEOFLOW DESIGN, INSTALLATION AND MAINTENANCE GUIDELINES.
5. THE GEOFLOW DRIP TUBING IS TO BE INSTALLED AT A DEPTH OF 12-18 INCHES BELOW FINAL GRADE.
6. INSTALLATIONS IN THE SPRING AND SUMMER ARE PREFERABLE TO ALLOW FOR REVEGETATION PRIOR TO WINTER. VEGETATIVE COVER AIDS IN THE INSULATION OF THE DRIP SYSTEM. FOR SYSTEMS INSTALLED IN THE FALL OR WINTER, THE DRIP FIELD AREA SHOULD BE COVERED WITH A 4-6 INCH LAYER OF MULCH MATERIAL.



285 ENGINEERING
P.O. BOX 1048
CONIFER, CO
80433
(720)-515-1781

PROJECT: 2018196
LOCATION:
3190 BENET LANE
COLORADO SPRINGS, CO 80921
CLIENT: BENET HILL MONASTERY

TITLE: DRIP DISPERSAL DETAIL
DATE: 06/18/2018
SCALE: SHOWN
REVISIONS:
1
2
3

SHEET:
15/15

