

SWAN POND SPORTS AND RECREATION COMPLEX

SITE TO BE CONSTRUCTED IN 3 PHASES

PHASE 1 AND 2 - 4 SOCCER FIELDS AND 1 GENERAL PURPOSE FIELD / NO CONSTRUCTED BLEACHERS

PHASE 1 - RESTROOM AND CONCESSION STAND

PHASE 2 - RESTROOM

PHASE 3 - 4 BASEBALL FIELDS W/ BLEACHERS, RESTROOMS AND CONCESSION STAND

SEWAGE DISPOSAL SYSTEM BUILD PHASES

PHASE 1 - INSTALLATION OF GREASE TRAP, SEPTIC TANK AND DOSING CHAMBER AT PHASE 1 RESTROOM. INSTALLATION OF SUPPLY LINE TO DISPOSAL FIELD. INSTALLATION OF 5-LINE HYDROSPPLITTER AND DRAINFIELD TO DISPOSAL OF EFFLUENT FROM PHASE 1 RESTROOMS/CONCESSION STAND AND PHASE 2 RESTROOMS.

PHASE 2 - INSTALLATION OF SEPTIC TANK AND DOSING TANK AT PHASE 2 RESTROOM. RELOCATION OF MAIN PUMPING SYSTEM FROM PHASE 1 DOSING TANK TO PHASE 2 DOSING TANK. INSTALLATION OF SMALLER PUMPING STATION IN PHASE 1 DOSING TANK TO MOVE EFFLUENT TO PHASE 2 DOSING TANK.

PHASE 3 - INSTALLATION OF GREASE TRAP, SEPTIC TANK AND DOSING TANK W/ EFFLUENT PUMPING SYSTEM AT BASEBALL FIELD RESTROOMS. TIE IN BASEBALL FIELD EFFLUENT LINE INTO MAIN SUPPLY LINE TO PHASE 2 DOSING TANK. INSTALL OSI HYDROTECK VALVE AND 2 ADDITIONAL HYDROSPPLITTERS AT DRAINFIELD AREA. INSTALL ADDITIONAL DRAINFIELD TO SERVE THE INCREASED FLOW FROM BASEBALL FIELD. RECALIBRATE FLOW FROM MAIN DOSING TANK TO HYDROTECK VALVE.

CALCULATIONS:

WATER USAGE CALCULATIONS
(BASED UPON COMPARABLE FIGURES)

PHASE 1 AND 2 - 4 SOCCER FIELDS AND 1 GENERAL PURPOSE FIELD @ 90 GPD/FIELD
90 GPD/FIELD X 5 FIELDS = 450 GPD
450 GPD X 2 (PEAK FACTOR) = 900 GPD DESIGN FLOW RATE

PHASE 3 - 4 BASEBALL FIELDS @ 90 GPD/FIELD
90 GPD/FIELD X 4 FIELDS = 360 GPD
360 GPD X 5 (PEAK FACTOR) = 1800 GPD DESIGN FLOW RATE

DRAINFIELD CALCULATIONS

SEE CHART ON SHEET ST-6 FOR LINE LENGTHS, SOIL RATES AND CAPACITIES.

DRAINFIELD TYPE - 36" WIDE INFILTRATOR Quick4 Plus Standard
PHASE 1 / 2 DRAINFIELD SIZING - 844 L.F. INITIAL DRAINFIELD CAPACITY - 925 GPD
PHASE 3 DRAINFIELD SIZING - 1784 L.F. INITIAL DRAINFIELD CAPACITY - 1836 GPD

SEPTIC TANK SIZING

RESTROOM 1 - 600 GPD @ 1.5 DAILY FLOW = 900 GALLON TANK / 1500 GALLON TO BE USED
RESTROOM 2 - 300 GPD @ 750 GALLON TANK MIN. / 1500 GALLON TO BE USED
BASEBALL FIELD RESTROOM - 1800 GPD @ 1125 + .75(1800) = 2475 GALLON TANK / 5000 TO BE USED

PUMP TANK SIZING

RESTROOM 1 - 600 GPD W/ DUPLEX PUMPING STATION = 1200 GALLON TANK TO BE USED
RESTROOM 2 (MAIN DOSING TANK) - 2700 GPD (RESTROOM 1 + RESTROOM 2 + BASEBALL FIELD RESTROOM)
DUPLEX PUMPS USED = 5000 GALLON TANK TO BE USED
BASEBALL FIELD RESTROOM - 1800 GPD W/ DUPLEX PUMPING STATION = 2500 GALLON TANK TO BE USED

PUMP SIZING

RESTROOM 1
GPM FLOW - 10 GPM
ELEVATION CHANGE - 15'
HEAD LOSS THROUGH 785' OF 2" SCH 40 PVC @ 10 GPM =
785' X 0.23/100' = 2'
FITTINGS LOSS 20% = 2' X 0.20 = 1'
TOTAL REQUIRED = 15' + 2' + 1' = 18'
PUMP SIZE - 18 FEET @ 10 GALLONS PER MINUTE
DESIGN PUMP O.S.I. MODEL PF1503, 60 Hz, 0.3 HP W/ ANTI-SIPHON VALVE

BASEBALL FIELD -
GPM FLOW - 10 GPM
ELEVATION CHANGE - 15'
HEAD LOSS THROUGH 715' OF 2" SCH 40 PVC @ 10 GPM =
715' X 0.23/100' = 2'
FITTINGS LOSS 20% = 2' X 0.20 = 1'
TOTAL REQUIRED = 15' + 2' + 1' = 18'
PUMP SIZE - 18 FEET @ 10 GALLONS PER MINUTE
DESIGN PUMP O.S.I. MODEL PF1503, 60 Hz, 0.3 HP W/ ANTI-SIPHON VALVE

RESTROOM 2 (MAIN DOSING TANK)
GPM FLOW - 15 GPM
ELEVATION CHANGE - 65'
HEAD LOSS THROUGH 6600' OF 2" SCH 40 PVC @ 15 GPM =
6600' X 0.49/100' = 33'
FITTINGS LOSS 20% = 33' X 0.20 = 7'
HEAD DESIRED AT HYDROSPPLITTER = 5'
HEAD LOST AT HYDROTECK VALVE @ 15 GPM FLOW = 10'
TOTAL REQUIRED = 65' + 33' + 7' + 5' + 10' = 120'
PUMP SIZE - 120 FEET @ 15 GALLONS PER MINUTE
DESIGN PUMP O.S.I. MODEL PF2010, 60 Hz, 1.0 HP

SEPTIC TANK, DOSING TANK AND SUPPLY LINE NOTES:

- A. GREASE TRAPS, SEPTIC AND PUMP TANKS ARE TO BE SUPPLIED BY C.R. BARGER AND SONS, INC., HARRIMAN, TN
- B. PHASE 1 RESTROOM AND CONCESSION STAND PUMP MODEL - OSI PF-2010 (TO BE REPLACED W/ O.S.I. MODEL PF1503 IN PHASE 2 MODIFICATION SYSTEM)

PHASE 2 RESTROOM (MAIN PUMP TANK) PUMP MODEL - OSI PF-2010 FROM PHASE 1 RESTROOM SYSTEM
PHASE 3 BASEBALL FIELD PUMP MODEL - OSI PF-1503
- C. THE DOSING TANK ACCESS RISER SHALL HAVE A MINIMUM DIAMETER OF TWENTY-FOUR (24) INCHES AND EXTEND TO THE FINISHED GRADE OR ABOVE. THE ACCESS RISER SHALL BE LOCATED NEAR THE OUTLET END OF THE TANK, DIRECTLY ABOVE THE PUMP OR SIPHON, SUPPLY LINE, SWITCHES AND OTHER FIXTURES.
- D. ALL PIPE MATERIALS SHALL BE A MINIMUM OF SCHEDULE 40 PVC.
- E. ALL FITTINGS SHALL BE PRESSURE FITTINGS.
- F. ALL CONNECTIONS SHALL BE ADEQUATELY CLEANED WITH CLEANING SOLVENT AND GLUED WITH PVC SOLVENT CEMENT.
- G. THE HIGH WATER ALARM SHALL BE REQUIRED AND CONSIST OF AN AUDIBLE AND VISIBLE ALARM LOCATED IN A VISIBLE PLACE AND CLEARLY MARKED "WASTEWATER SYSTEM ALARM".
- H. THE ALARM AND ALARM SWITCHES SHALL BE PLACED ON A SEPARATE ELECTRICAL CIRCUIT FROM THE PUMP POWER LINE.
- I. THE ALARM FLOAT CONTROL SHALL BE PLACED SO AS TO BE ACTIVATED WHEN THE PUMP CHAMBER WATER LEVEL RISES ABOVE THE "PUMP ON" FLOAT CONTROL.
- J. THE PUMP OUTLET PIPE MUST BE CONNECTED TO THE SUPPLY MANIFOLD WITH A THREADED UNION OR SIMILAR DEVICE.
- K. ALL ELECTRICAL INSTALLATIONS SHALL BE INSTALLED TO MEET THE CURRENT WIRING METHODS OF THE CURRENT EDITION OF THE "NATIONAL ELECTRIC CODE" (NEC) ADOPTED BY THE STATE FIRE MARSHALL'S OFFICE.
- L. INSTALL A 4" CLEANOUT BETWEEN BUILDING AND SEPTIC TANK PER DETAIL 3/SHEET ST-7.
- M. AT TIME OF EACH PHASE INSTALLATION, THE ENGINEER SHALL DETERMINE THE DOSING VOLUME TO BE PUMPED AT EACH PUMP CYCLE AND AMOUNT NOTED ON AS-BUILT DRAWING.

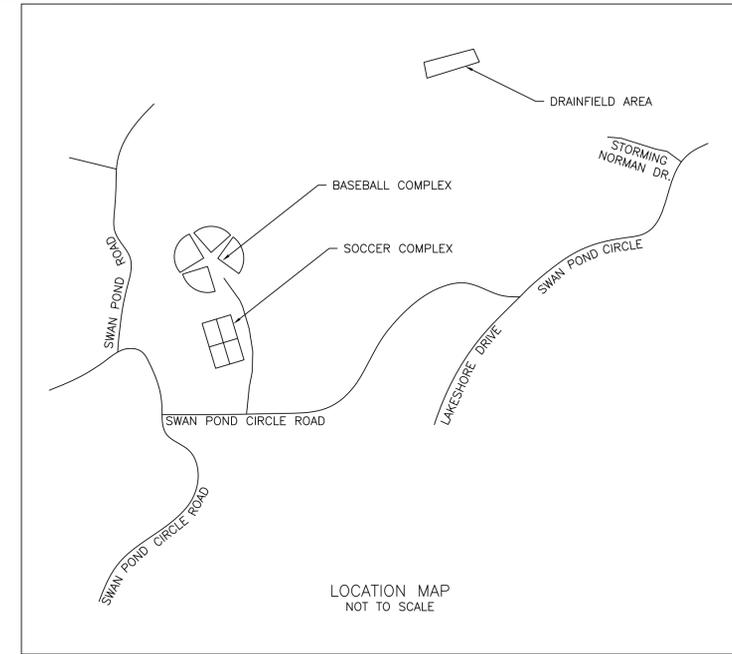
COLLECTION AND SUPPLY LINE SYSTEM NOTES

- A. GRAVITY COLLECTION SYSTEM LINES ARE TO BE 3" SCH. 40 PVC INSTALLED TO A MINIMUM DEPTH OF 24" TO TOP OF PIPE. MAINTAIN A MINIMUM OF 1% SLOPE.
- B. ALL PIPES UNDER EXISTING AND OR FUTURE PAVED AREAS SHALL BE SCH. 80 PVC AND BACKFILLED TO TO OF SUBGRADE WITH CRUSHED STONE.
- C. ANY DAMAGE TO EXISTING ASPHALT SURFACE (TO REMAIN) RESULTING FROM NEW CONSTRUCTION SHALL BE REPLACED IN LIKE KIND AT THE CONTRACTORS EXPENSE.
- D. IN THE EVENT OF ANY DISCREPANCIES AND/OR ERRORS FOUND IN THE DRAWINGS, OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. IF ENGINEER IS NOT NOTIFIED, THE CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE COST OF THE REVISION.
- E. EXERCISE EXTREME CAUTION WHEN EXCAVATING NEAR EXISTING UTILITIES.
- F. CONTRACTOR SHALL COORDINATE THE LOCATION OF THE PROPOSED UTILITIES SHOWN HEREON WITH OTHER FEATURES OF THE SITE, EITHER PROPOSED OR EXISTING TO REMAIN, AND NOTIFY THE ARCHITECT/ENGINEER OF ANY CONFLICTS PRIOR TO INSTALLATION OF UTILITIES.
- G. CONTRACTOR SHALL COORDINATE THE SERVICE LINES WITH THE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR LOCATION OF ENTRY INTO BUILDING.
- H. SEE PLUMBING DRAWINGS FOR INTERIOR WATER AND SEWER DETAILS AND SPECIFICATIONS.
- I. SEPTIC TANKS, EFFLUENT FILTERS, PUMPING SYSTEMS, ETC. ARE TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS
- J. WATER LINES SHALL NOT CROSS, PASS THROUGH, OR GO UNDER THE SUBSURFACE SEWAGE DISPOSAL FIELD. WATER LINES MAY CROSS, BUT NOT BE LOCATED IN THE SAME TRENCH WITH, A TIGHT LINE LEADING FROM A SEPTIC TANK OR DOSING TANK TO A DISPOSAL FIELD PROVIDED THE WATER LINE IS SLEAVED IN A CONTINUOUS TWENTY (20) FEET SECTION OF SCHEDULE 40 PVC PIPE OR EQUIVALENT (A MINIMUM OF TEN (10) FEET ON EITHER SIDE OF THE TIGHT LINE) AND THE WATER LINE IS A MINIMUM OF ONE (1) FOOT VERTICALLY ABOVE THE TIGHT LINE.

DRAINFIELD TRENCH NOTES:

- A. CHAMBER TYPE - INFILTRATOR QUICK4 STANDARD CHAMBER
- B. TRENCHES SHALL NOT BE EXCAVATED WHEN THE SOIL IS WET ENOUGH TO SMEAR OR COMPACT EASILY.
- C. THE LATERAL LINES SHALL BE PLACED ON CONTOUR.

THE TRENCH BOTTOM OF EACH LATERAL SHALL HAVE A GRADE FROM LEVEL TO NO GREATER THAN TWO (2) INCHES PER LATERAL LINE.
- D. A MINIMUM OF SIX (6) FEET OF UNDISTURBED EARTH BETWEEN ADJACENT TRENCH WALLS SHALL BE REQUIRED.
- E. TRENCH WIDTH SHALL BE NO MORE THAN SIX (6) INCHES WIDER THAN THE PRODUCT WIDTH, WITH THE MAXIMUM TRENCH WIDTH BEING THIRTY-SIX (36) INCHES.
- F. TRENCH DEPTH SHALL RANGE FROM TWENTY-FOUR (24) TO THIRTY-SIX (36) INCHES.
- G. SOIL MATERIAL EXCAVATED FROM TRENCHES SHOULD BE USED IN BACKFILLING AND SHOULD BE LEFT MOUNDED OVER THE TRENCHES UNTIL INITIAL SETTLING HAS TAKEN PLACE.
- H. EACH CHAMBER MUST BE DESIGNED TO INTERLOCK WITH ADJACENT CHAMBERS, INLET PLATE OR END PLATE FORMING A COMPLETE DISPOSAL TRENCH THAT CONSISTS OF AN INLET PLATE AND A SOLID END PLATE TO BE LOCATED AT THE DISTAL END OF EACH TERMINAL TRENCH.
- I. THE CHAMBER SIDEWALL MUST BE DESIGNED TO ALLOW EFFLUENT TO PASS Laterally INTO THE SOIL.
- L. CHAMBERS SHALL BE CONSTRUCTED OF MATERIALS MEETING THE MATERIAL PROPERTY REQUIREMENTS OF THE INTERNATIONAL PLUMBING AND MECHANICAL OFFICIALS (IAPMO) PROPERTY STANDARD 63-2005.



ENGINEER AGREES TO MONITOR THE INSTALLATION AND CONSTRUCTION OF THE SYSTEM AND UPON COMPLETION, PROVIDE A FINAL SET OF AS-BUILT PLANS ENCOMPASSING ALL COMPONENTS OF THE SYSTEM AND CERTIFICATION THAT THE INSTALLATION IS IN ACCORDANCE WITH DESIGN SPECIFICATIONS.



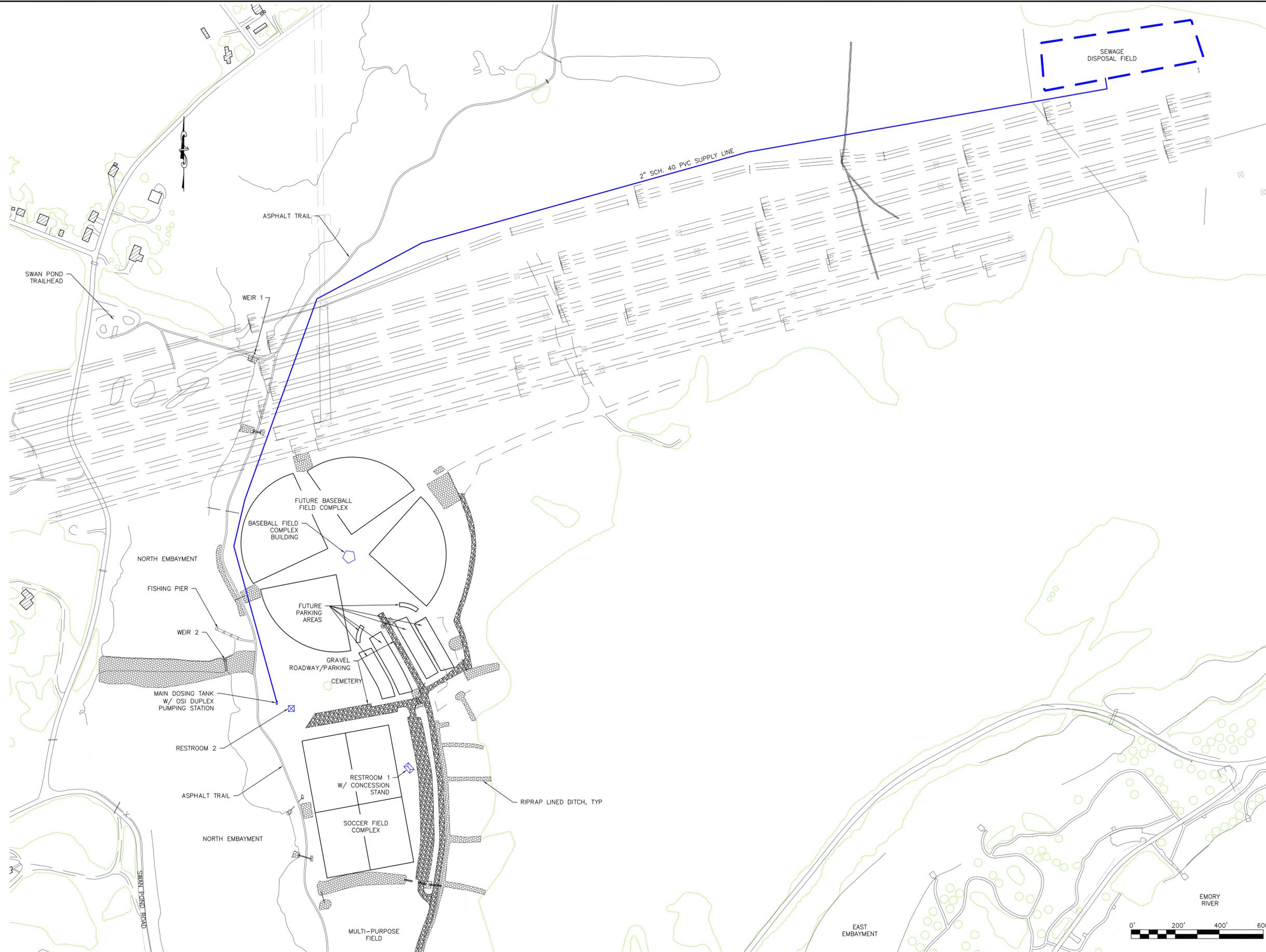
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REVISIONS
DRAWN BY: JRV
CHECKED BY: KJP



SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE
NOTES

DRAWING NUMBER
ST-1



SITE PLAN

1" = 200'-0"

**SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE**

SITE PLAN

DRAWING NUMBER
ST-2



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423.663.7400

2" SCH. 40 PVC TO DISPOSAL FIELD AIR-RELEASE VALVE TO BE INSTALLED AT HIGH POINTS SEE DET. 6/ST-7



- 1200 GALLON DOSING TANK W/ OSI PF-2010 DUPLEX PUMPING STATION
- 1500 GALLON SEPTIC TANK W/ EFFLUENT FILTER
- 1000 GALLON GREASE TRAP
- RESTROOM 1 W/ CONCESSION STAND

ALL LINES FROM BUILDINGS TO TANKS AND GREASE TRAP TO SEPTIC TANK TO BE 4" SCH. 40 PVC

PHASE 1 TANK AND LINE PLAN



**SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE
PHASE 1 TANK & LINE PLAN**

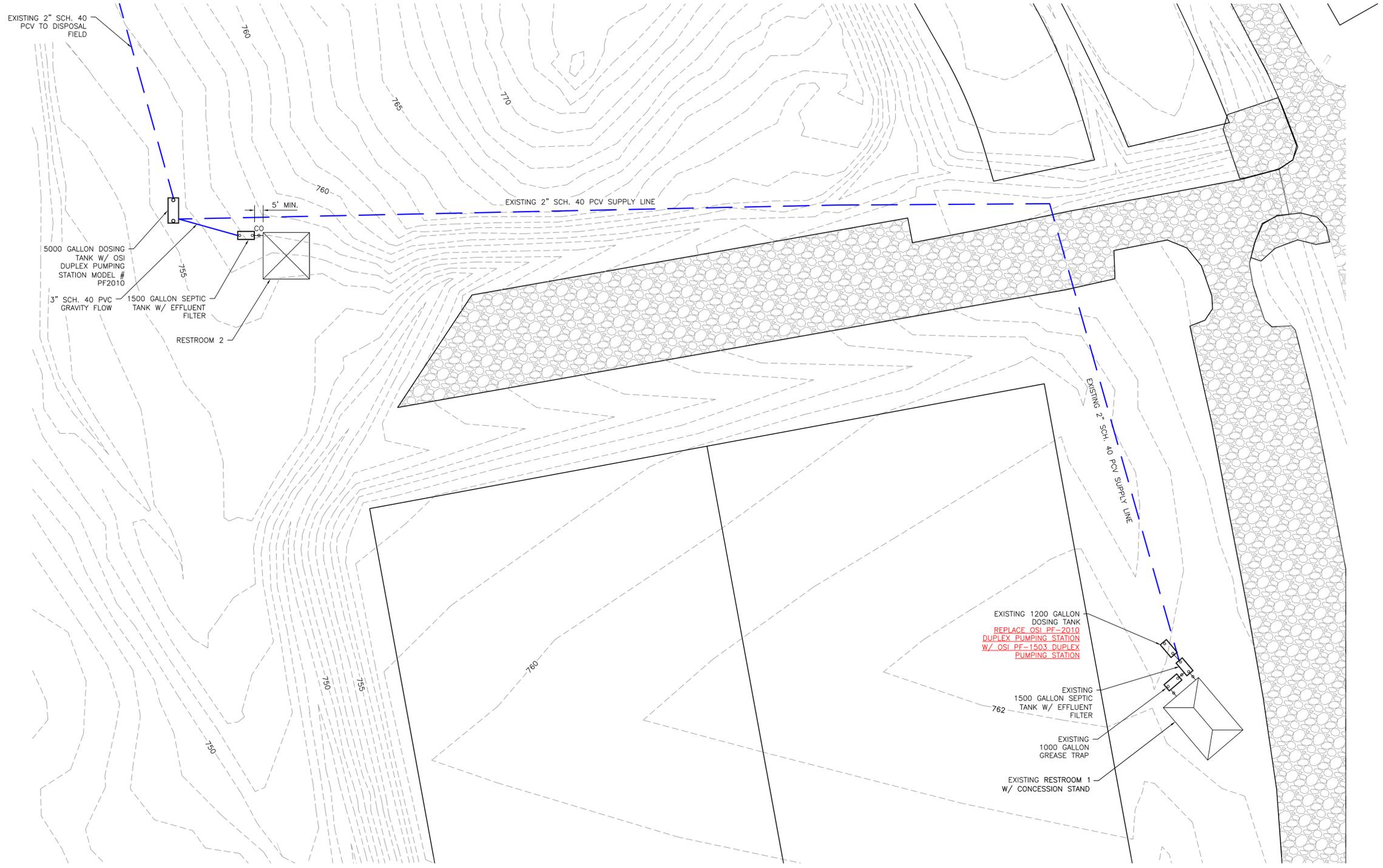
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ST-3



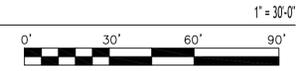
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PHASE 2 TANK AND LINE PLAN



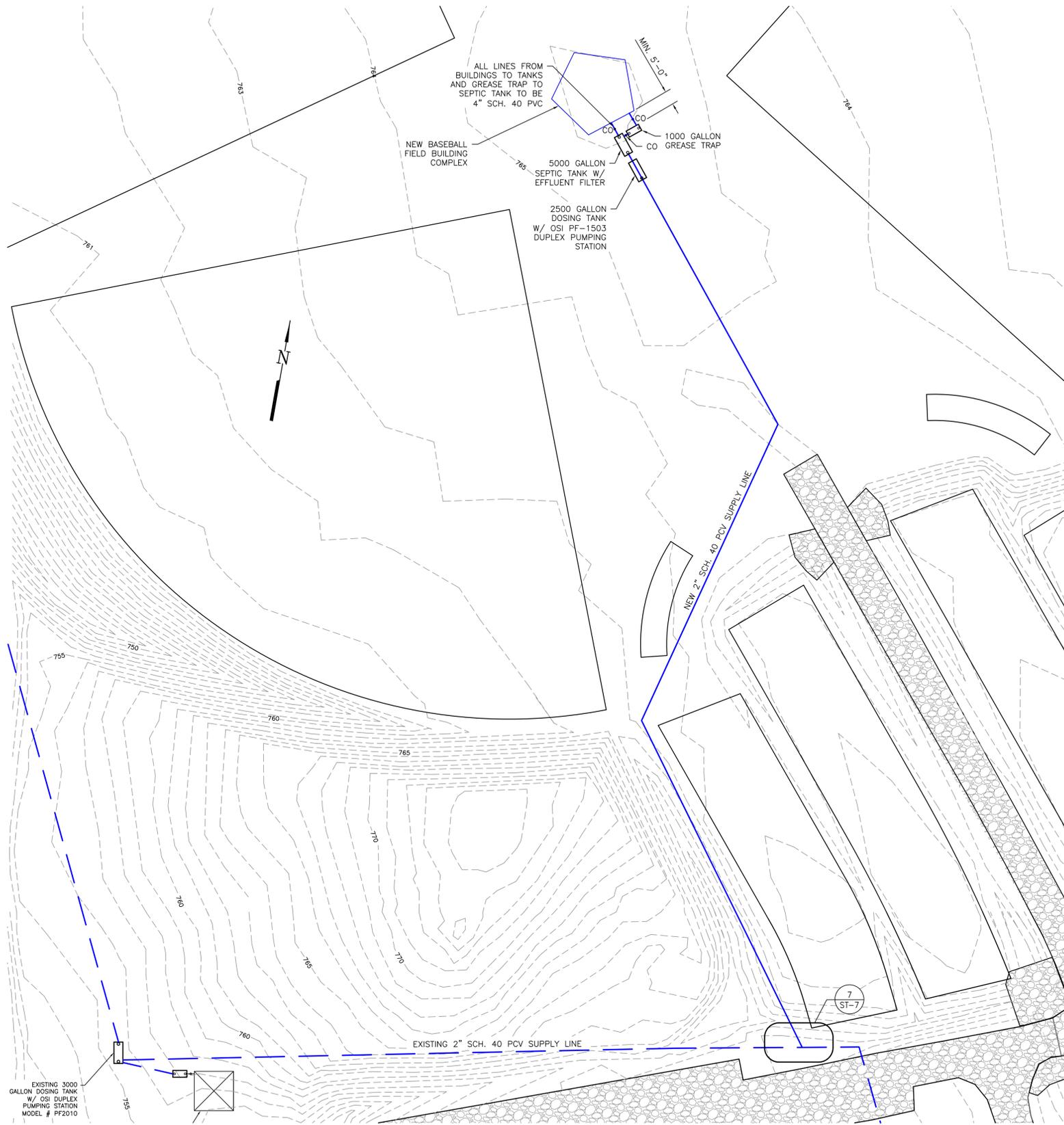
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SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE
PHASE 2 TANK & LINE PLAN



PHASE 3 TANK AND LINE PLAN

1" = 40'-0"



SUBSURFACE SEWAGE DISPOSAL SYSTEM
 SWAN POND SPORTS AND RECREATION COMPLEX
 PHASE 1, 2 & 3
 HARRIMAN, TENNESSEE
 PHASE 3 TANK & LINE PLAN



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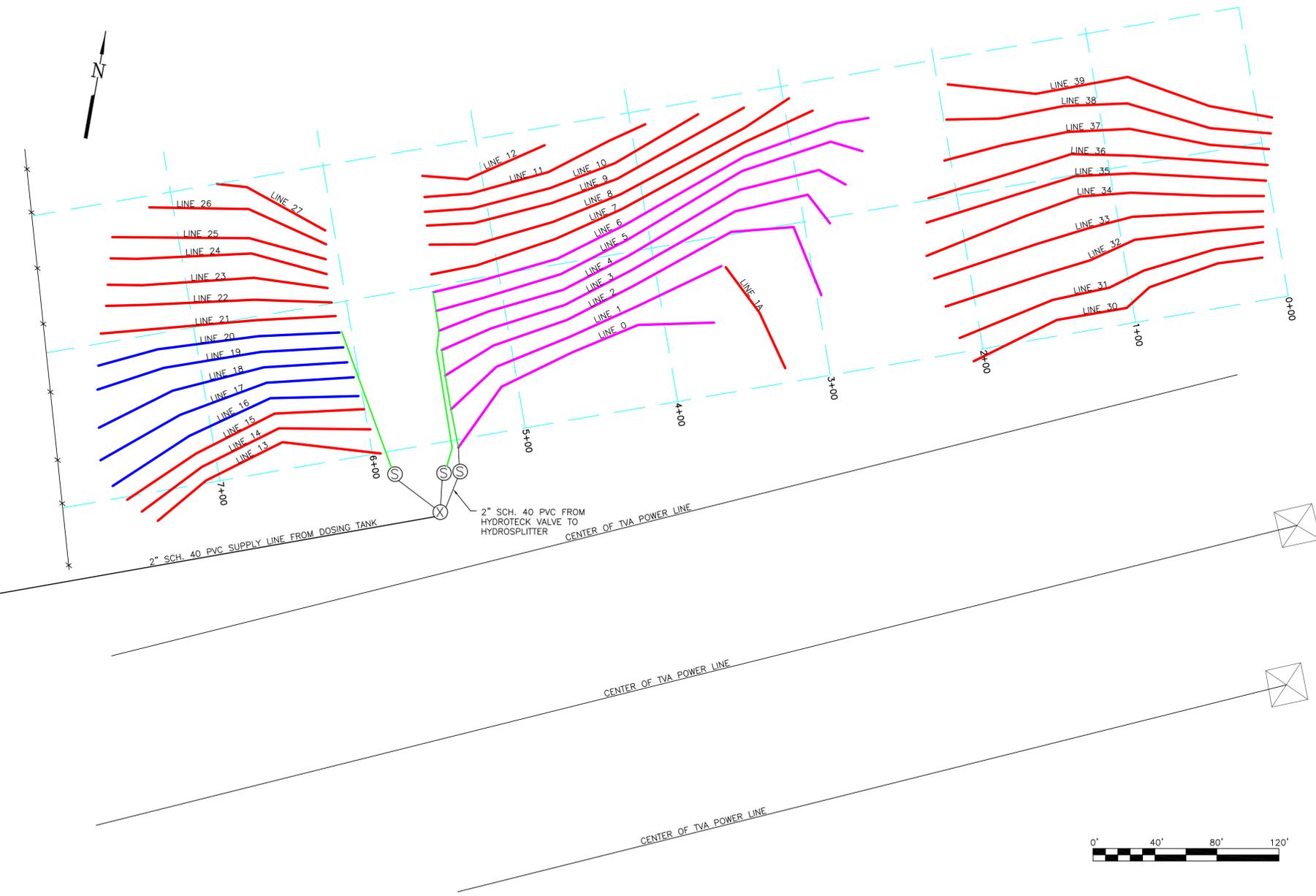
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DRAWING NUMBER
ST-5



- LEGEND**
- PHASE 1/2 DRAINFIELD LINE
 - PHASE 3 DRAINFIELD LINE
 - DUPLICATE DRAINFIELD LINE
 - S OS1 HYDROSPPLITER IN 30" RISER
 - X OS1 3 WAY HYDROTECK VALVE IN 30" RISER
 - COMMON TRENCH CONTAINING INDIVIDUAL 1" LINES FROM HYDROSPPLITER SEE DET. 1/ST-6



TOTAL LINE FLAGGING

LINE	LENGTH	SOIL MPI	GPD
0	193	60	198.79
1A	148	60	152.44
1	125	60	128.75
2	294	60	302.82
3	281	60	289.43
4	287	60	295.61
5	300	60	309
6	304	60	313.12
7	286	60	294.58
8	253	60	260.59
9	221	45	264.095
10	189	45	225.855
11	151	45	180.445
12	83	45	99.185
13	159	60	163.77
14	162	60	166.86
15	168	60	173.04
16	173	60	178.19
17	174	60	179.22
18	167	60	172.01
19	161	45	192.395
20	157	45	187.615
21	152	45	181.64
22	145	45	173.275
23	142	45	169.69
24	141	45	168.495
25	139	45	166.105
26	139	45	166.105
27	119	45	142.205
30	201	45	240.195
31	206	45	246.17
32	212	45	253.34
33	218	45	260.51
34	225	45	268.875
35	223	45	266.485
36	223	45	266.485
37	212	45	253.34
38	212	45	253.34
39	214	45	255.73
TOTAL	7559	45	8459.795

PHASE 1/2 SYSTEM LINE FLAGGING

LINE	LENGTH	SOIL MPI	GPD
16	173	60	178.19
17	174	60	179.22
18	167	60	172.01
19	161	45	192.395
20	157	45	187.615
TOTAL	832	45	909.43

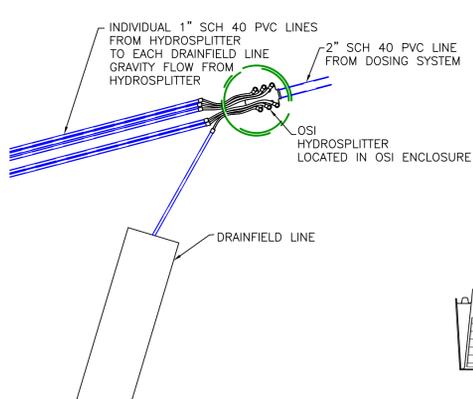
PHASE 3 SYSTEM LINE FLAGGING

LINE	LENGTH	SOIL MPI	GPD
4	287	60	295.61
5	300	60	309
6	304	60	313.12
TOTAL	891	60	917.73

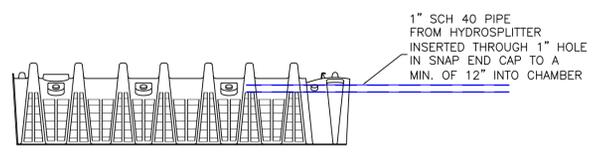
HYDROSPPLITER C

LINE	LENGTH	SOIL MPI	GPD
0	193	60	198.79
1	125	60	128.75
2	294	60	302.82
3	281	60	289.43
TOTAL	893	60	919.79

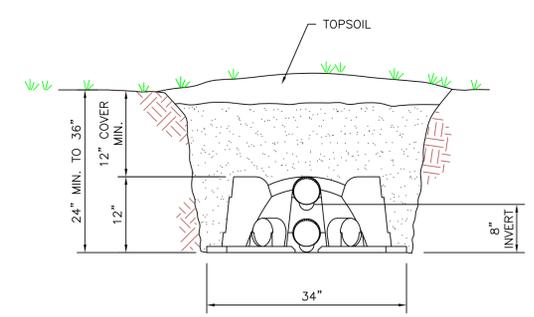
DRAINFIELD PLAN 1" = 40'-0"



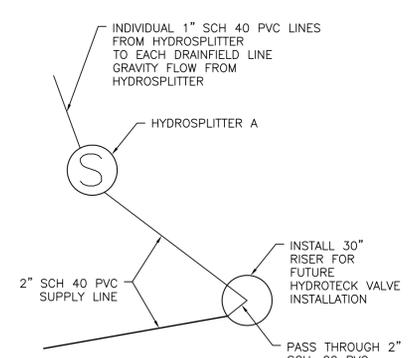
1 TYP. HYDROSPPLITER DETAIL
ST-6 SCALE: NONE



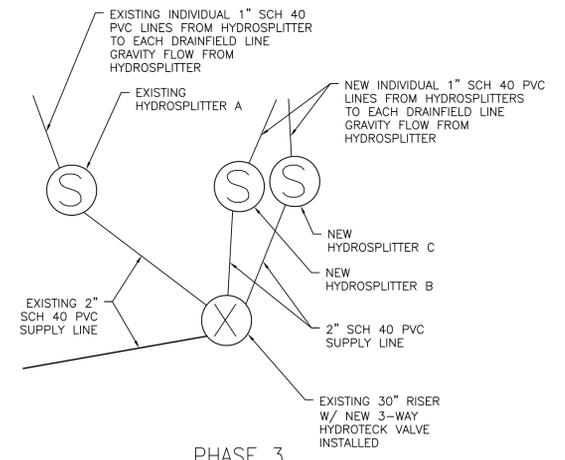
2 HYDROSPPLITER TO PERFORATED PIPE DETAIL
ST-6 SCALE: NONE



3 TYPICAL QUICK4 STANDARD CHAMBER DETAIL
ST-6 SCALE: NONE



PHASE 1/2
4 SUPPLY LINE TO HYDROSPPLITER DETAIL
ST-6 SCALE: NONE



REVISIONS

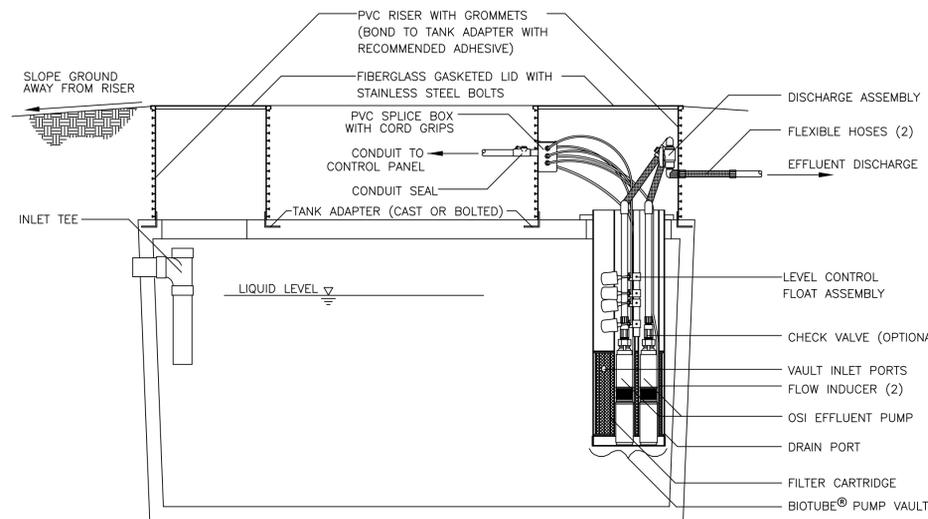
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SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE
DRAINFIELD PLAN & DETAILS

DRAWING NUMBER
ST-6

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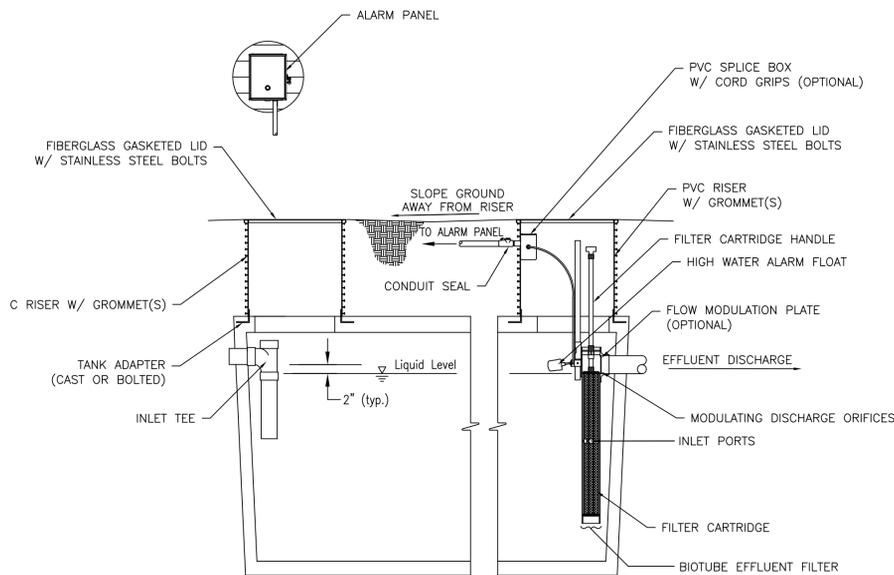
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EDW-TD-6
Rev. 1.0 (2/98)

Patents # 4,439,323 & 5,492,635
Foreign Patents Pending
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1 DUPLEX EFFLUENT PUMPING STATION
ST-7 SCALE: NONE



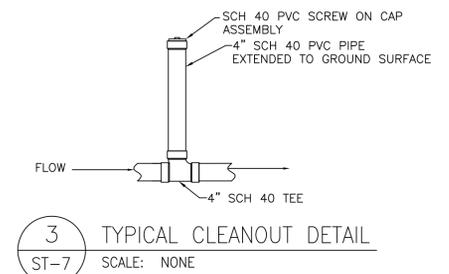
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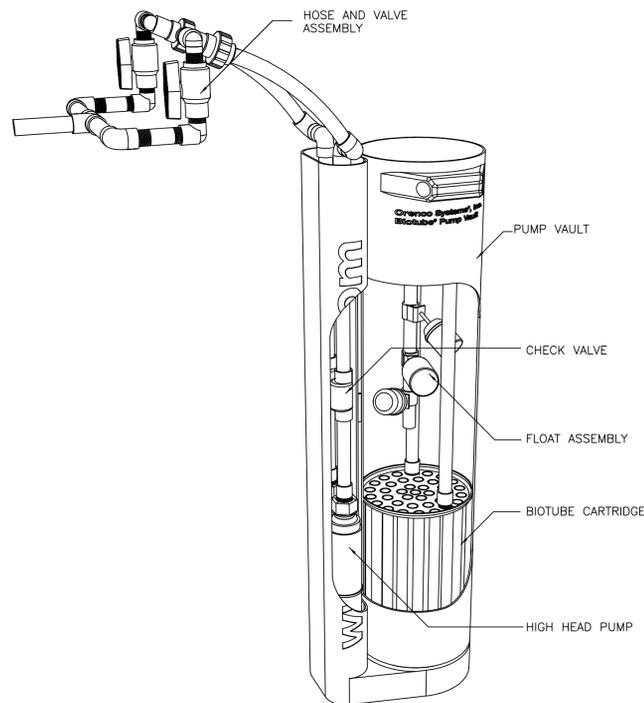
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Foreign Patents May Apply
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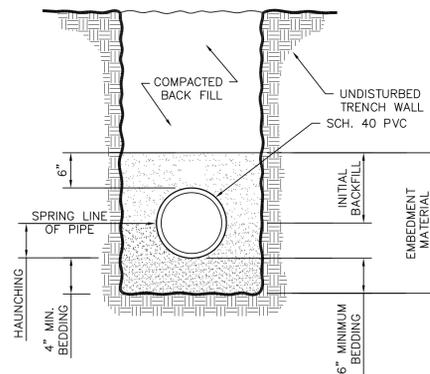
2 4" DIA. EFFLUENT FILTER DETAIL
ST-7 SCALE: NTS



3 TYPICAL CLEANOUT DETAIL
ST-7 SCALE: NONE

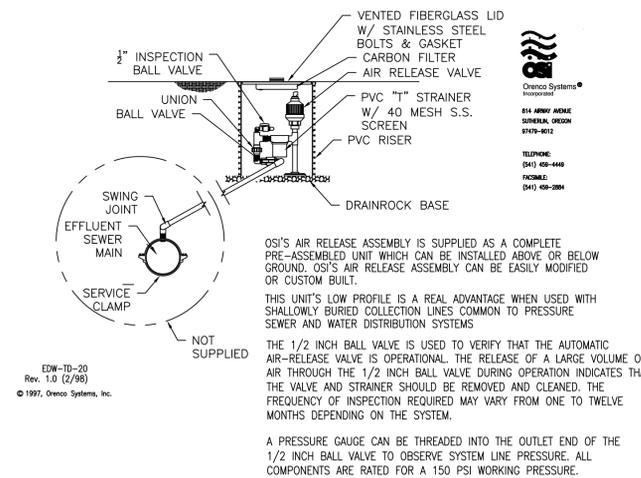


4 DUPLEX PUMP VAULT DETAIL
ST-7 SCALE: NONE



NOTES:
1. EMBEDMENT MATERIAL MUST BE CLASS I (#67 OR #78M WASHED STONE IS TYPICALLY USED).
2. EMBEDMENT MATERIAL SHALL BE COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY FOR CLASS I MATERIAL.

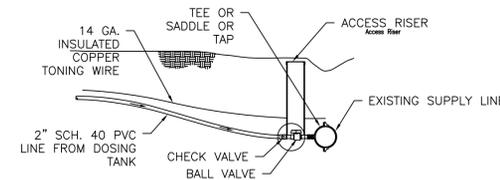
5 COLLECTION PIPE BEDDING DETAIL
ST-7 SCALE: NTS



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OSI'S AIR RELEASE ASSEMBLY IS SUPPLIED AS A COMPLETE PRE-ASSEMBLED UNIT WHICH CAN BE INSTALLED ABOVE OR BELOW GROUND. OSI'S AIR RELEASE ASSEMBLY CAN BE EASILY MODIFIED OR CUSTOM BUILT.
THIS UNIT'S LOW PROFILE IS A REAL ADVANTAGE WHEN USED WITH SHALLOWLY BURIED COLLECTION LINES COMMON TO PRESSURE SEWER AND WATER DISTRIBUTION SYSTEMS.
THE 1/2 INCH BALL VALVE IS USED TO VERIFY THAT THE AUTOMATIC AIR-RELEASE VALVE IS OPERATIONAL. THE RELEASE OF A LARGE VOLUME OF AIR THROUGH THE 1/2 INCH BALL VALVE DURING OPERATION INDICATES THAT THE VALVE AND STRAINER SHOULD BE REMOVED AND CLEANED. THE FREQUENCY OF INSPECTION REQUIRED MAY VARY FROM ONE TO TWELVE MONTHS DEPENDING ON THE SYSTEM.
A PRESSURE GAUGE CAN BE THREADED INTO THE OUTLET END OF THE 1/2 INCH BALL VALVE TO OBSERVE SYSTEM LINE PRESSURE. ALL COMPONENTS ARE RATED FOR A 150 PSI WORKING PRESSURE.

6 AIR RELEASE ASSEMBLY DETAIL
ST-7 SCALE: NTS



ALL SERVICE LINE CONNECTIONS SHALL BE SOLVENT WELDED. THE ONLY ACCEPTABLE SOLVENTS AND CEMENTS ARE THOSE THAT ARE RECOMMENDED BY THE PIPE MANUFACTURER.
ALL LINES SHALL BE PRESSURE TESTED PRIOR TO ANY BACKFILLING.

7 CONNECTION DETAIL
ST-7 SCALE: NTS



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	REVISIONS		CHECKED BY: KCB



SUBSURFACE SEWAGE DISPOSAL SYSTEM
SWAN POND SPORTS AND RECREATION COMPLEX
PHASE 1, 2 & 3
HARRIMAN, TENNESSEE
DETAILS

DRAWING NUMBER
ST-7