

WASTEWATER TREATMENT SYSTEM INSTALLATION PLANS FOR CAROLINA RESEARCH CENTER

SMITHERS VISCIENT, INC.
2900 QUACKENBUSH ROAD
SNOW CAMP, ALAMANCE COUNTY, NORTH CAROLINA

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GENERAL

G.1.0 COVER SHEET

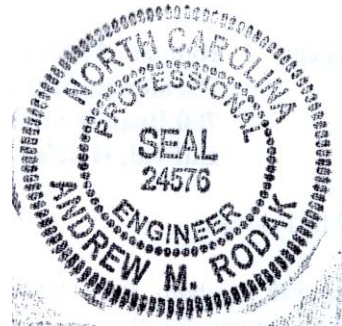
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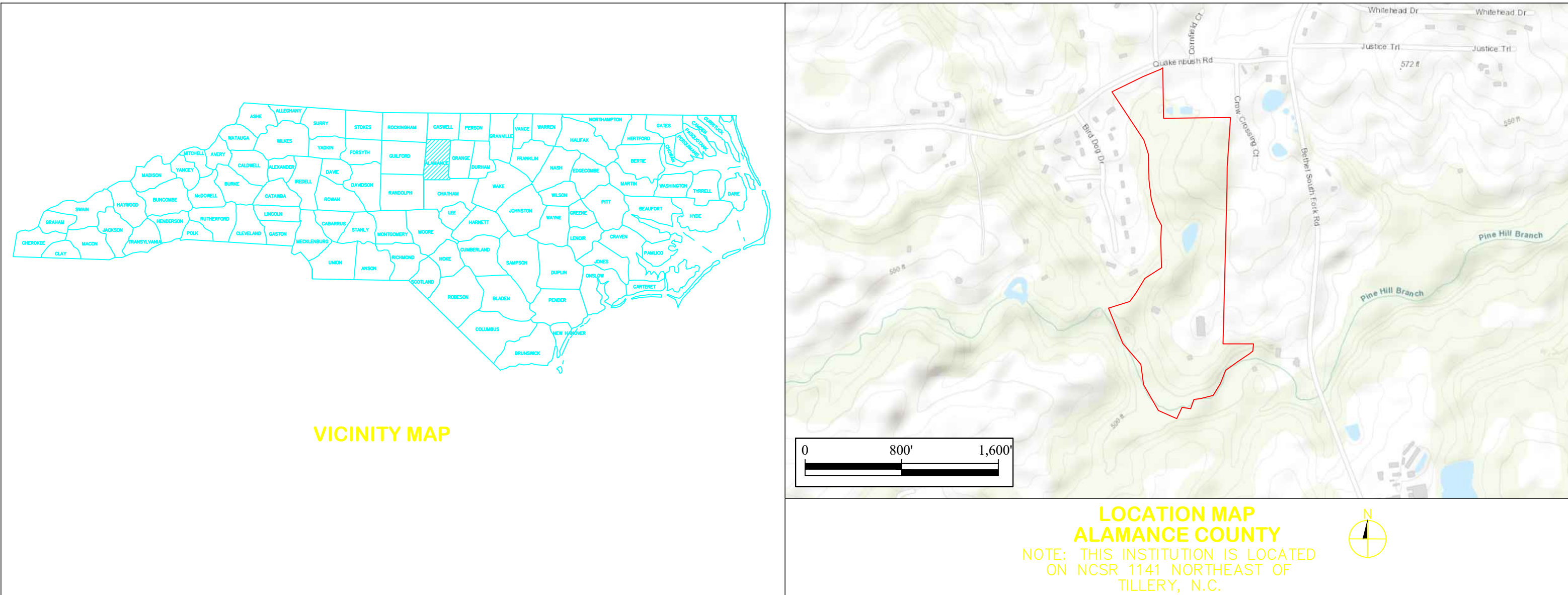
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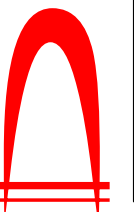


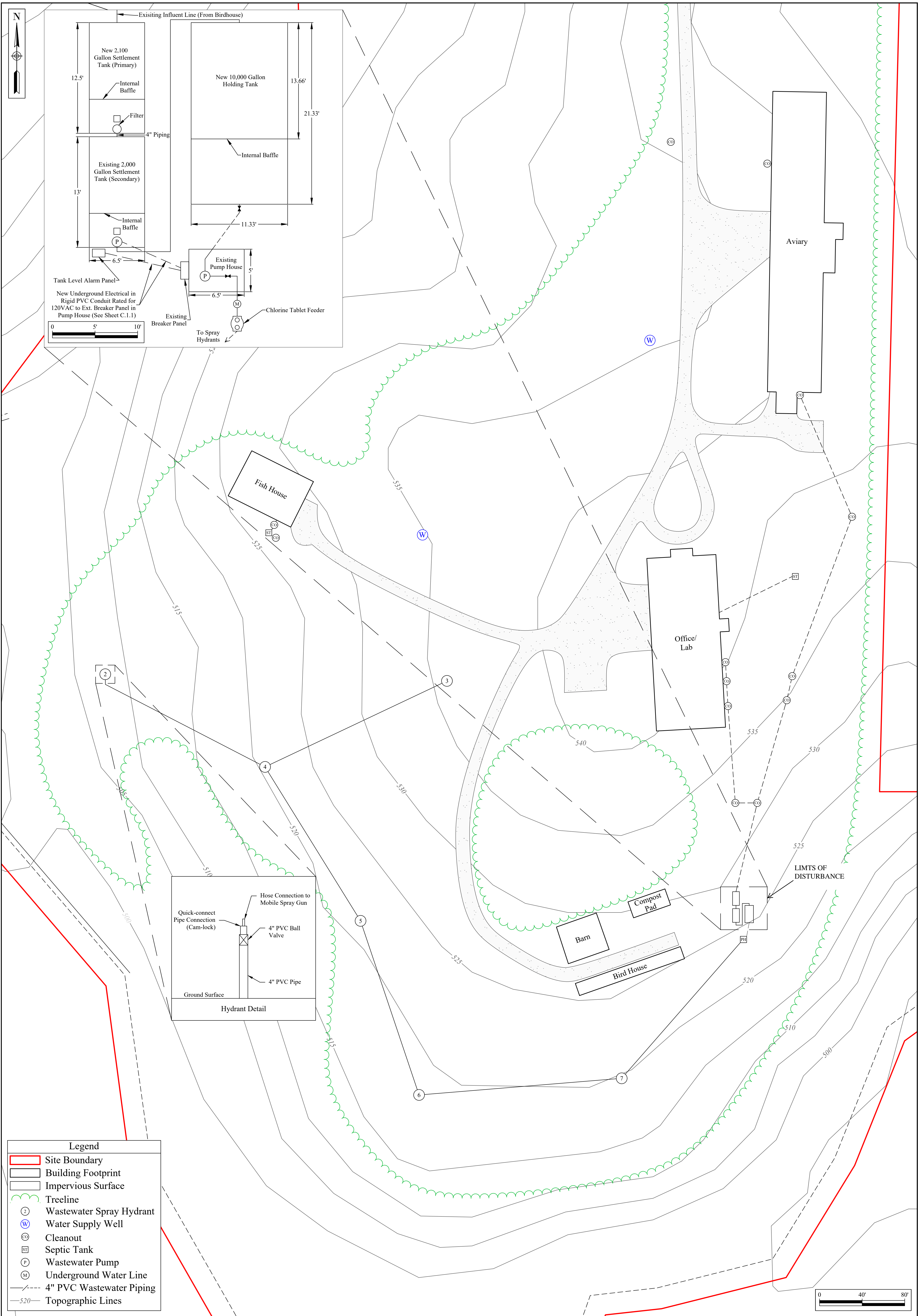
Andrew M. Rodak



PERMIT SET

Cover Sheet Smithers Viscient Snow Camp, North Carolina				
Drawn By:	Checked By:	Project Number:	Date:	References:
mrw		2017190	October 2018	Add reference drawings, documents or field notes (source and date)
			Scale:	Size:
			NTS	22" x 34"
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PIPING SPECIFICATIONS

PIPING:

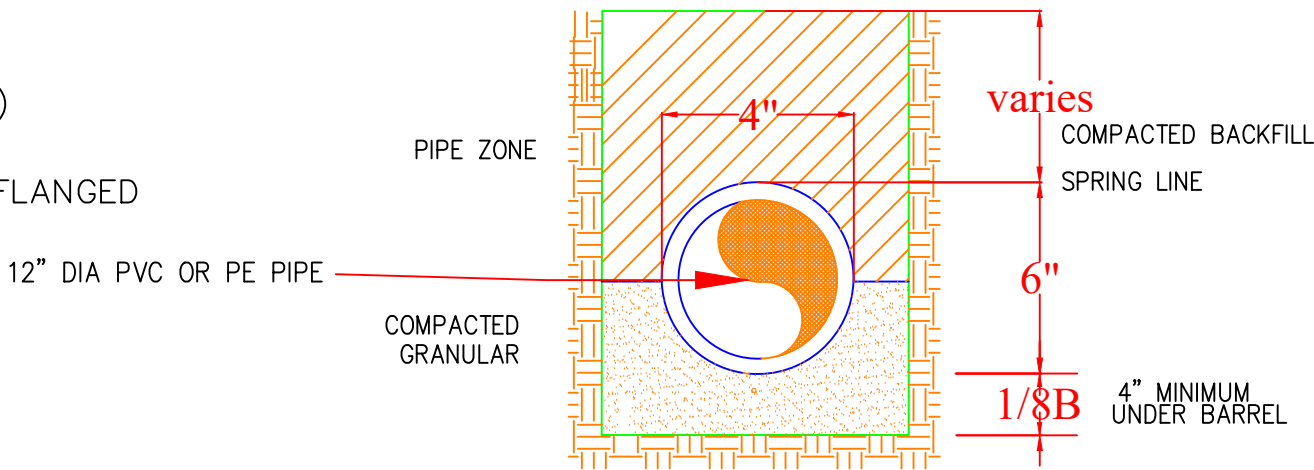
4" DIA PVC OR PE PIPE (C 900 DR 18 OR SDR 21)
PVC: TYPE PSM W/INTEGRAL BELL AND SPIGOT
RUBBER O-RING GASKET JOINTS, SDR 35 (ASTM D3034)
ALL PIPE JOINTS TO BE PUSH-ON OR MECHANICAL
(ANSI/AWWA C111/A21.11) EXCEPT WHERE SHOWN AS FLANGED

FITTINGS:

90 DEG ELBOWS-
4" DIA, MECHANICAL JOINT TYPE W/SYNTHETIC
45 DEG ELBOWS-
4" DIA, MECHANICAL JOINT TYPE W/SYNTHETIC

VALVES:

4" BALL VALVES



TYPICAL BEDDING FOR PIPE

PIPE BEDDING DETAILS

NOT TO SCALE

TANK INLET/INVERT ELEVATIONS

TANK 1	528.60'
TANK 2	527.60'
TANK 3	N/A (PUMPED)

DESIGN OPERATING WATER LEVEL ELEVATIONS (AVERAGE FLOW)

LOCATION	AVERAGE FLOW	PEAK FLOW
INLET TO TANK 1	528.65'	528.70'
OUTLET FROM TANK 1	528.48'	528.53'
INLET TO TANK 2	527.89'	527.72'
OUTLET FROM TANK 2	N/A (PUMPED)	N/A (PUMPED)

NOTES:

- TRENCH BOTTOMS SHALL BE EXCAVATED TO PROVIDE UNIFORM AND CONTINUOUS BEARING FOR THE PIPE ALONG THE ENTIRE LENGTH. BELL HOLES SHALL BE PROVIDED FOR COMPLETION OF JOINTS.
- IF APPROVED BY THE ENGINEER, TRENCH MAY BE EXCAVATED A FEW INCHES BELOW THE ESTABLISHED SUBGRADE AND BACKFILLED TO SUBGRADE WITH SUITABLE MATERIAL COMPACTED AND GRADE TO PROVIDE UNIFORM AND CONTINUOUS BEARING.
- IF MATERIAL AT SUBGRADE IS UNSTABLE, OR INCAPABLE OF SUPPORTING THE PIPE, TRENCH MAY BE EXCAVATED BELOW SUBGRADE TO A SUITABLE DEPTH GIVEN SOIL CONDITIONS, AND BACKFILLED TO SUBGRADE WITH ANGULAR MATERIAL, COMPACTED AND GRADED TO PROVIDE A STABLE FOUNDATION AND UNIFORM BEARING FOR THE PIPE.
- DEBRIS ENCOUNTERED DURING TRENCH EXCAVATION SHALL BE REMOVED AT A DEPTH OF 6 INCHES BELOW THE BOTTOM OF THE PIPE.
- TRENCH TO BE KEPT FREE OF WATER DURING PIPE INSTALLATION.
- SHEETING AND BRACING SHALL BE USED WHERE NECESSARY TO COMPLY WITH OSHA REQUIREMENTS. SHEETING AND BRACING TO BE LEFT IN PLACE UNTIL THE TRENCH IS REFILLED TO A SAFE LEVEL, WHEREUPON THE TOP PORTION CAN BE REMOVED. TRENCH BOX MAY BE USED IN LIEU OF BRACING.

SEEDING NOTES

ALL DISTURBED AREAS SHALL BE STABILIZED WITH A PERMANENT VEGETATIVE COVER. THE CONTRACTOR MAY USED METHODS AND SCHEDULES SHOWN BELOW; HOWEVER, IT IS RECOMMENDED THAT A SPECIALIST BE CONSULTED WITH ATTENTION GIVEN TO SITE SPECIFIC CONDITIONS.

- A. CULTIVATE AREA TO A DEPTH OF 5".
B. APPLY AGRICULTURAL LIME AT THE RATE OF 400 LBS. PER ACRE.
C. APPLY 10-20-20 COMMERCIAL FERTILIZER AT THE RATE OF 500 LBS PER ACRE.
D. SOW GRASS SEEDS AT THE FOLLOWING RATES.

KINDS	RATE PER ACRE
PENSACOLA BAHIGRASS	50 LBS.
KOREAN LESPEDEZA	25 LBS.
TALL FESCUE	30 LBS.

- E. MULCH WITH STRAW AT THE RATE OF 3250 TO 4350 LBS. PER ACRE
F. ANCHOR STRAW WITH ASPHALT EMULSION TACK COAT APPLIED AT THE RATE OF 300 GALLONS PER ACRE IN LOCATIONS AS AUTHORIZED BY THE ENGINEER.

ELECTRICAL SPECIFICATIONS

SPECIFIC INSTALLATION NOTES:

- ALL ELECTRICAL CONNECTIONS TO LEVEL MONITORING SYSTEM EQUIPMENT TO BE PER MANUFACTURER INSTRUCTIONS
- CONNECT #10 BARE CONDUCTOR TO GROUND WIRE, PUMP MOTOR AND TWO GROUND RODS AS SHOWN.
- CONNECT LEVEL SENSOR RELAY WIRING TO ALARM RELAY SWITCH IN PUMP SYSTEM CONTROL PANEL PER MANUFACTURER INSTRUCTIONS.
- CONNECT WIRING FROM PUMP AND LEVEL SENSOR FEED SYSTEM TO EXT. 15A CIRCUIT BREAKER IN EXT. POWER PANEL BOARD (IF AVAILABLE). IF NECESSARY, PROVIDE 15A CIRCUIT BREAKER FOR PUMP. CURRENT DRAW OF NEW EQUIPMENT IS 9.8A.

GENERAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70).
- ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND LISTED BY A TESTING AGENCY APPROVED BY THE AUTHORITY HAVING JURISDICTION, WHERE SUCH LISTING EXISTS.
- ALL 20 AMPERE, 120 VOLT CIRCUITS LONGER THAN 55 FEET SHALL BE # 10 AWG MINIMUM.
- ALL CONDUCTORS SHALL BE SIZED PER THE 75 DEGREE CELSIUS TABLES IN THE NEC. RESIZE CONDUCTORS AS NECESSARY WHEN CIRCUIT BREAKERS OR OTHER EQUIPMENT RATED AT A LOWER TEMPERATURE ARE USED.
- ALL CONDUCTORS SHALL BE INSTALLED IN APPROVED RACEWAYS. MINIMUM CONDUIT SIZE SHALL BE 1/2 INCH.
- SIZE ALL CONDUITS AND RACEWAYS PER THE THHN/THWN INSULATION TABLES IN THE NEC. RESIZE CONDUITS WHERE THICKER CONDUCTOR INSULATION IS USED.
- PROVIDE AN NEC SIZED GROUND WIRE IN ALL POWER CIRCUITS.

- USE RIGID GALVANIZED OR PVC ENCASED IN CONCRETE FOR UNDERGROUND INSTALLATION.

- ALL CONDUCTORS SHALL BE COPPER UNLESS NOTED.
- INSTALL WARNING TAPE 6" BELOW GRADE FOR ALL UNDERGROUND CONDUIT.
- ALL PANEL BOARDS SHALL BE DEAD FRONT, SHALL HAVE COPPER BUSSING AND SHALL BE SIZED AS INDICATED ON THE DRAWINGS.
- ALL BREAKERS SHALL BE BOLT-IN TYPE AND SHALL BE THERMAL MAGNETIC AND BE QUICK-MAKE, QUICK BREAK FOR MANUAL AND AUTOMATIC OPERATION.
- ALL PANEL BOARDS SHALL HAVE A TYPED DIRECTORY.
- ALL SWITCH ASSEMBLIES SHALL BE NEMA KSI, TYPE HD (HEAVY DUTY) LOAD INTERRUPTER ENCLOSED KNIFE SWITCH WITH EXTERNALLY OPERABLE HANDLE INTERLOCKED (WITH DEFEAT MECHANISM) TO PREVENT OPENING FRONT COVER WITH SWITCH IN ON POSITION. HANDLE LOCKABLE IN ON OR OFF POSITION.
- ALL FUSES SHALL BE CLASS RK5 DUAL ELEMENT, TIME DELAY, CURRENT LIMITING UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- POWER PHASE CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

1 PHASE SYSTEMS
208/120 VOLT
PHASE A.....BLACK
PHASE B.....RED
PHASE C.....BLUE
NEUTRAL.....WHITE

- CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE NORTH CAROLINA DEPARTMENT OF INSURANCE TO SCHEDULE REQUIRED INSPECTIONS. A "CERTIFICATE OF APPROVAL" SHALL BE OBTAINED FROM THE STATE ELECTRICAL INSPECTOR AFTER ALL WORK IS COMPLETED.

CHLORINATION SYSTEM DETAILS (SEE MANUFACTURER'S SPECS FOR ADDITIONAL INFORMATION)	
MANUFACTURER/MODEL	NORWECO BIO-DYNAMIC IT2000
FLOW RATE	TYPICAL 200-20,000 GPD
REMOVAL EFFICIENCY	99.9%
CHEMICAL DELIVERY RATE	1-50 Mg/L
EQUIPMENT	CLEAN-CHECK FEED TUBES, INTERNAL SLOPED PIPE FOR SELF-DRAINAGE
CHEMICAL DELIVERY CONTROLS	AUTOMATIC, TABLET DISSOLUTION IN FLOW STREAM
TABLET STORAGE CAPACITY	25 POUNDS
MATERIALS OF CONSTRUCTION	HEAVY DUTY, UV RESISTANT, ROTATIONALLY MOLDED PE INLET AND OUTLET HUBS, INSTALLED IN-LINE WITH DISCHARGE PIPING, FIXED WEIR DESIGN
WEIGHT	50 POUNDS
DIMENSIONS	10"W X 24" H X 25.5" L

WASTEWATER TREATEMENT SYSTEM DESIGN SPECIFICATIONS	
DESIGN FLOW (MAX)	2,000 GPD
AVERAGE FLOW	1,500 GDD
TARGET REMOVAL EFFICIENCY	99.9%
CHLORINE	1-50 Mg/L
DOSAGE	0.6 LB/DAY (0.8 LB/DAY - PEAK)
DISINFECTION LIMIT	100 FC UNITS/100 mL

CONSTRUCTION SCHEDULE

- CONTRACTOR SHALL COORDINATE INSTALLATION OF THE WASTEWATER PRETREATMENT EQUIPMENT WITH THE OWNER TO SCHEDULE TEMPORARY INTERRUPTION OF WASTEWATER FLOW AS DESCRIBED IN THIS WORK SCHEDULE.
- CONTRACTOR SHALL IDENTIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION WORK.
- CONTRACTOR SHALL EVACUATE CONTENTS OF ALL TANKS PRIOR TO CONSTRUCTION WORK.
- CONTRACTOR SHALL TEMPORARILY SUSPEND FLOW FROM THE BIRDHOUSE AND LABORATORY BUILDINGS. MEASURES FOR TEMP. COLLECTION/STORAGE OF WASTEWATER SHALL BE PROVIDED AS NEEDED.
- CONTRACTOR SHALL EXCAVATE SOIL WHERE INDICATED TO EXPOSE EXISTING 8" PIPING FROM BIRD HOUSE TO EXT. TANK
- CONTRACTOR SHALL CUT AND CAP THE INLET FROM THE BIRDHOUSE/LABORATORY TO EXT. TANK AS SHOWN ON SHEET C.1.0
- CONTRACTOR SHALL REMOVE APPROX. 20 FEET OF PIPING SEGMENT FROM BIRDHOUSE/LABORATORY TO EXT. TANK AND LEAVE STUB OUT FOR CONNECTION TO NEW TANK AS SHOWN ON SHEET C.1.0.
- CONTRACTOR SHALL EXCAVATE A PIT APPROXIMATELY 16' X 10' AND 6' DEEP, SHORING AS NEEDED, FOR THE INSTALLATION OF THE 2,100 GALLON SETTLEMENT TANK.
- EXCAVATED SOIL NOT USED FOR BACKFILL AROUND TANK SHALL BE APPLIED TO EXISTING CONTAINMENT BERM AROUND TANKS.
- CONTRACTOR SHALL CUT PIPING INTO AND OUT OF EXT. 6,000 GALLON TANK AND REMOVE TANK FOR DISPOSAL
- CONTRACTOR SHALL CUT AND TEMPORARILY CAP THE TANK EFFLUENT PIPE (TEMP CAP #2) END FROM 6,000 GALLON TANK TO PREVENT DIRT FROM ENTERING SYSTEM.
- CONTRACTOR SHALL EXCAVATE A 24' X 12' x 9' DEEP PIT FOR THE NEW 10,000 GALLON EQ TANK. SIDEWALL SLOPES OF 3:1, TRENCHING AND SHORING AS NEEDED (EXCAVATION AREA INDICATED ON SITE PLAN C.1.0)
- CONTRACTOR SHALL DEWATER THE PITS AS REQUIRED UNTIL TANK PLACEMENT CAN BE COMPLETED.
- CONTRACTOR SHALL PLACE WASHED #57 STONE TO A MAXIMUM DEPTH OF 1 FT IN THE BOTTOM OF THE TANK PITS AS A BASE COURSE FOR THE TANKS.
- CONTRACTOR SHALL PLACE AND LEVEL ALL PRECAST TANKS IN THE PITS AT THE REQUIRED ELEVATIONS AND CONFIRM THE ELEVATIONS OF ALL INVERTS AS SPECIFIED IN THE CONSTRUCTION PLANS.
- CONTRACTOR SHALL BACKFILL THE PITS WITH NATIVE SOIL AND COMPACT IN 1 FOOT LIFTS TO AN ELEVATION THAT ALLOWS FOR AT LEAST 28" OF EXPOSED TANK WALL ABOVE THE SURFACE.
- CONTRACTOR SHALL INSTALL ALL NEW 4" PVC PIPING AND CONNECT INTO AND OUT OF NEW AND EXT. TANKS. CONTRACTOR SHALL LAY ALL PIPES INTO AND OUT OF TANKS AS SPECIFIED ON C.1.0 AND IN ACCORDANCE WITH DETAILS ON THIS SHEET USING APPROPRIATE FITTINGS. CONNECT PIPES INTO AND OUT OF TANKS.
- CONTRACTOR SHALL EXCAVATE A TRENCH 18" X 30", 12-18" DEEP FROM PLACEMENT OF THE CHLORINATION FEEDER. PLACE A 6" BASE COURSE OF WASHED #57 STONE OR COARSE GRAVEL FOR EQUIPMENT INSTALLATION AS INDICATED ON THE SITE MAP.
- CONTRACTOR SHALL PLACE AND INSTALL THE CHLORINATION SYSTEM FEED EQUIPMENT AS PER MANUFACTURERS SPECIFICATIONS ON SHEET C.1.2.
- CONTRACTOR SHALL LEAK TEST ALL PIPING AND CONNECTIONS AS PER AWWA STANDARDS AND MANUFACTURERS SPECIFICATIONS.
- CONTRACTOR SHALL CALL FOR INSPECTION BY ENGINEER ONCE ALL EQUIPMENT, PIPING AND APPURTENANCES ARE INSTALLED. CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING ALL WORK REGARDLESS OF INSPECTIONS BY OWNERS AND ENGINEER.
- CONTRACTOR SHALL REMOVE TEMP CAP 2 AND INSTALL A 2" DIAMETER PVC PIPE WITH APPROPRIATE FITTING TO MATE EXISTING METAL PIPE AND CONNECT TO EXISTING EFFLUENT PUMP AS SHOWN ON HYDRAULIC PROFILE SHEET C.1.3.

Wastewater System Equipment and Construction Specifications

Smithers Viscient
Snow Camp, North Carolina

References:
Add reference drawings, documents or field notes (source and date)

Date:
October 2018

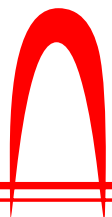
Project Number:
2017190

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mmw

Drawn By:
mmw

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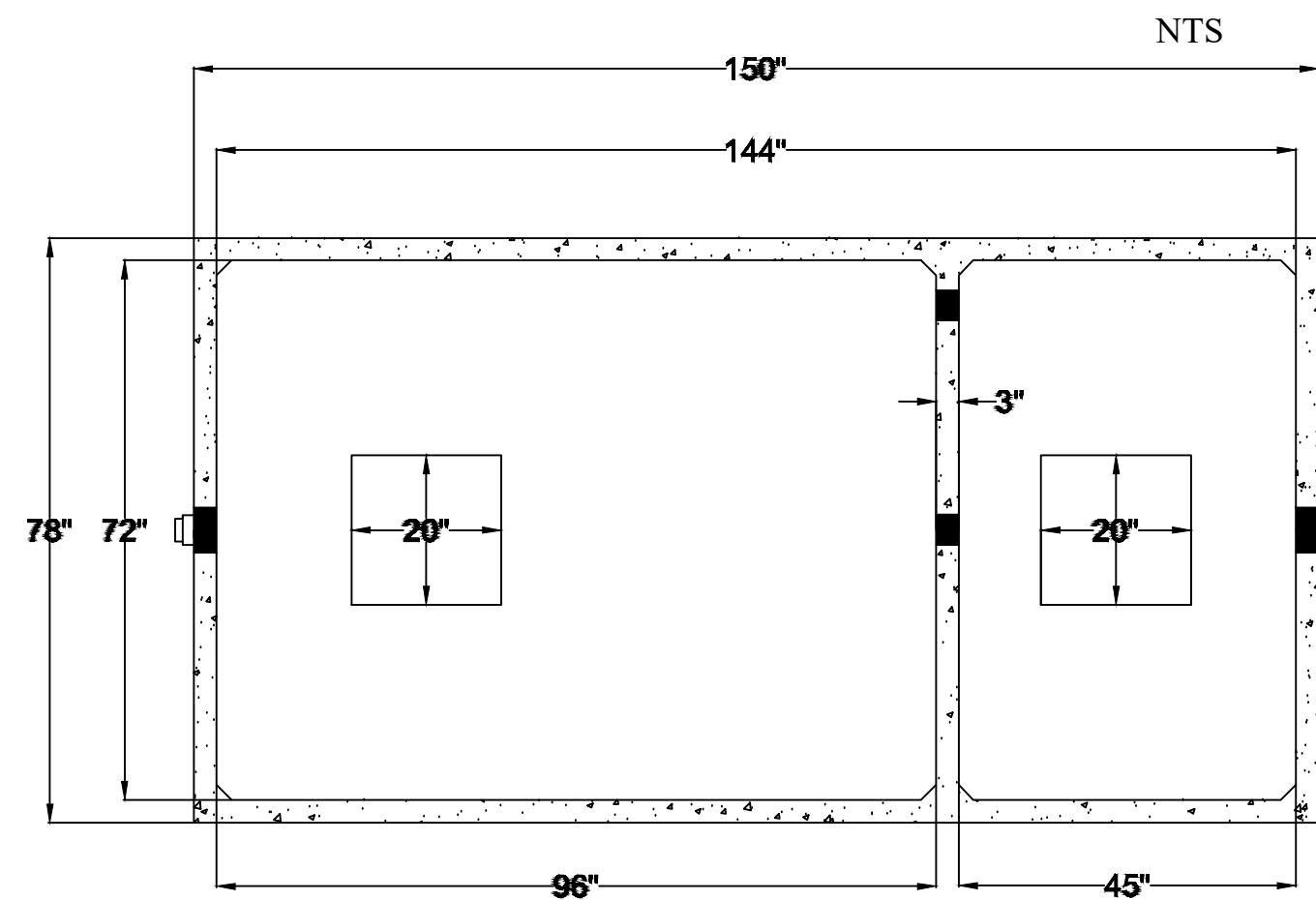
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Sheet

C.1.1

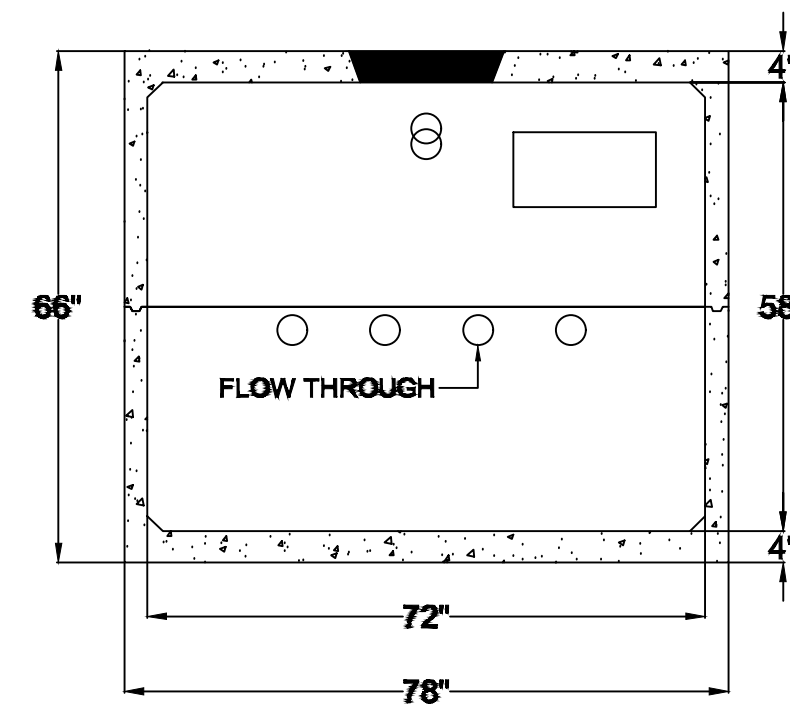
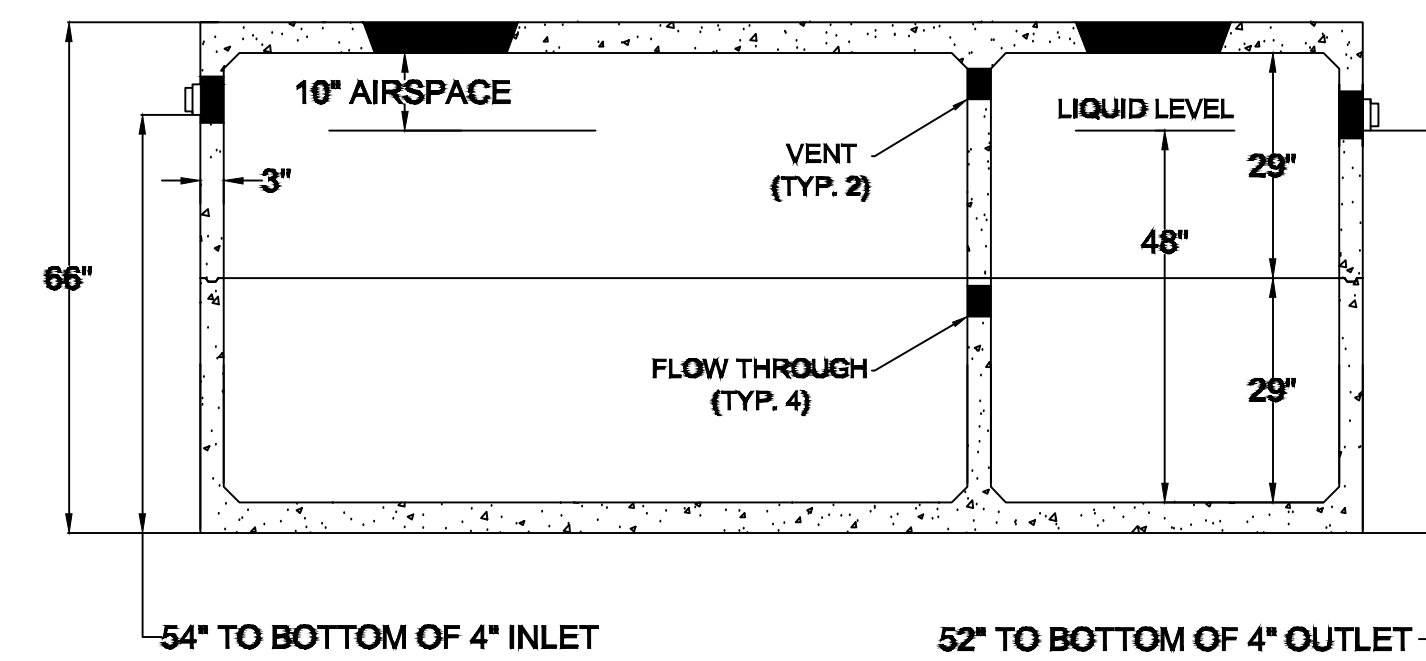
Primary Settling Tank (Tank 1)



MODEL: MS NON-TRAFFIC 2000 STB
NON TRAFFIC MID SEAM SEPTIC TANK

SHOAF PRECAST SEPTIC INC.
4130 WEST US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
info@shoafprecast.com
www.shoafprecast.com

- NC APPROVAL # : STB-2102
- LIQUID CAPACITY- 2,110 GALLONS
- GALLONS PER INCH-43.95
- PIPE PENETRATIONS - (MEETS ASTM C-923)
- CONCRETE - 5000 PSI MIN.
- TANK WEIGHT - 16,000 #
- TOP - 8,000 #
- BOTTOM - 8,000 #
- REINFORCEMENT PER ENGINEER SPECS
- 1 1/4" BUTYL SEALANT CONTINUOUS IN JOINTS



Effluent Holding Tank (Tank3)

NTS

TANK SPECIFICATIONS			
	TANK 1	TANK 2	TANK 3
DIMENSIONS	78" W X 18" L X 68" H	78" W X 150" L X 66" H	136" W X 256" L X 111" H
GROSS STORAGE VOLUME (GALLONS)	2,500	2,000	10,000
NUMBER OF BAFFLES/TANK	1	1	1
FLOW LENGTH (TOTAL)	12.5 FEET	13 FEET	13 FEET
VERTICAL WALL THICKNESS	3 INCHES	3 INCHES	8 INCHES
BASE THICKNESS	4 INCHES	3.5 INCHES	8 INCHES
WEIGHT	16,000 LB	16,000 LB	106,000 LB
NET STORAGE VOLUME	2,110 GALLONS	2,000 GALLONS	10,000 GALLONS

CONCRETE AND REINFORCING SPECIFICATIONS

PRECAST SPECIFICATIONS SHALL CONFORM TO LATEST ASTM C-913 SPEC FOR REINFORCED CONCRETE WASTE WATER STRUCTURES

CONCRETE COMPRESSIVE STRENGTH 4000 PSI (MINIMUM) FOR PRECAST TANK AND BAFFLES

RUBBER BOOT WITH STAINLESS STEEL EXPANSION BAND SET FOR 4" LINE AT INLET AND OUTLET OF TANKS

STEEL REINFORCING SHALL CONFORM TO LATEST ACI-318 SPECS FOR REINFORCED CONCRETE

REINFORCEMENT: NON-TRAFFIC LOADING

LENGTHWISE CAST IN #5 DOWEL BAR SPLICER ROD ENDS

FINAL DESIGN OF REBAR AS PER MANUFACTURER SPECIFICATIONS

TANK ELEVATIONS (FT ASL)				
TANK ID	TOP OF TANK	INLET ELEVATION	BOTTOM OF TANK	OUTLET ELEVATION
PRIMARY SETTLING TANK	528.9	527.9	523.4	527.7
SECONDARY SETTLING TANK	528.9	527.5	523.9	527.3
HOLDING TANK	532.5	531.3	523.4	524.0

Diagram illustrating the top view of a rectangular structure, likely a foundation or footing, with dimensions and notes.

Dimensions:

- Overall width: 156'
- Overall length: 150'
- Left side offset: 78' (total) and 72' (to the inner edge)
- Right side offset: 3' (to the inner edge)
- Top side offset: 3' (to the inner edge)
- Bottom side offset: 3' (to the inner edge)
- Inner square dimensions: 18" (width) and 20" (height)
- Inner square offset from right side: 20"

Notes:

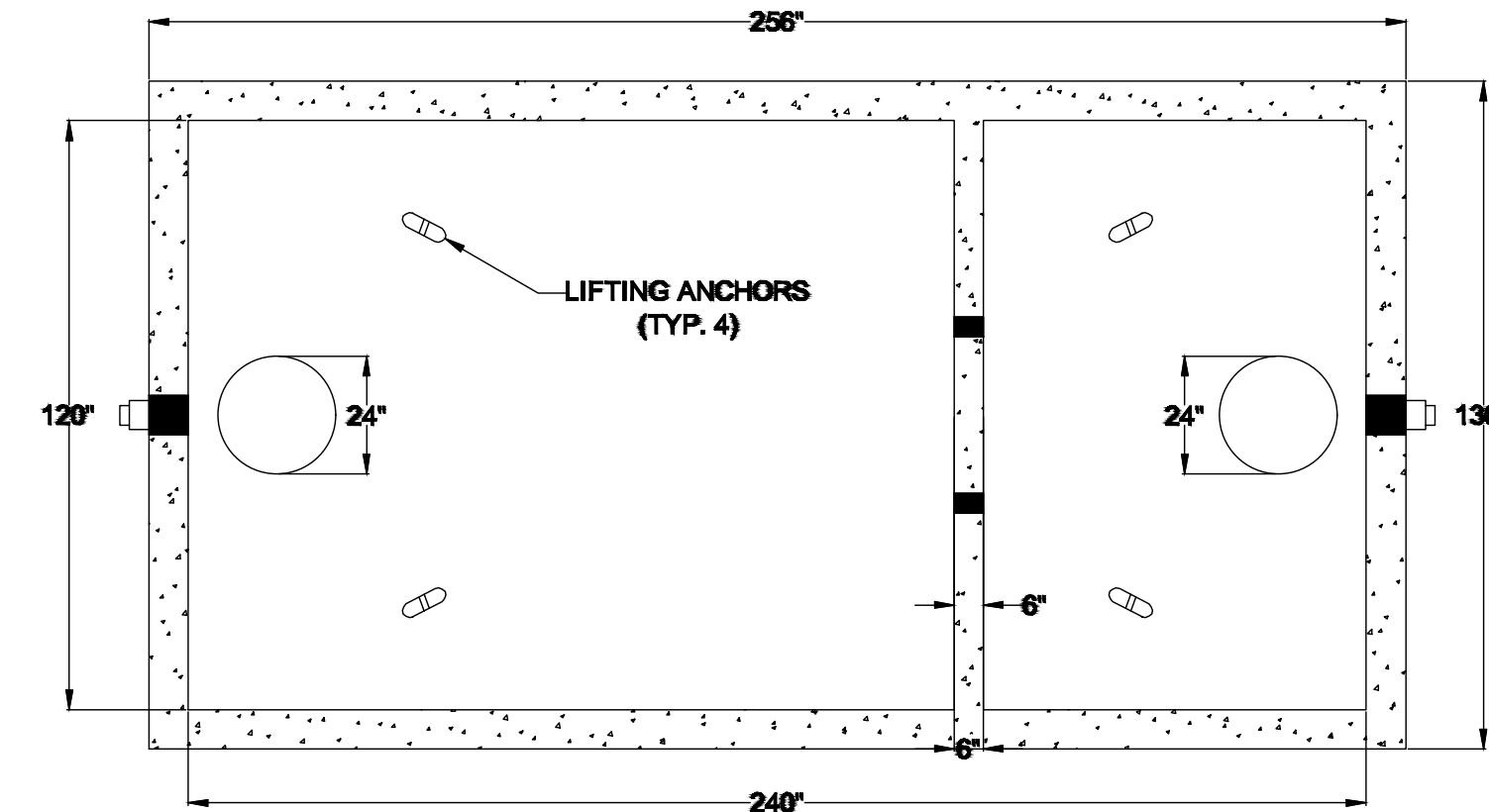
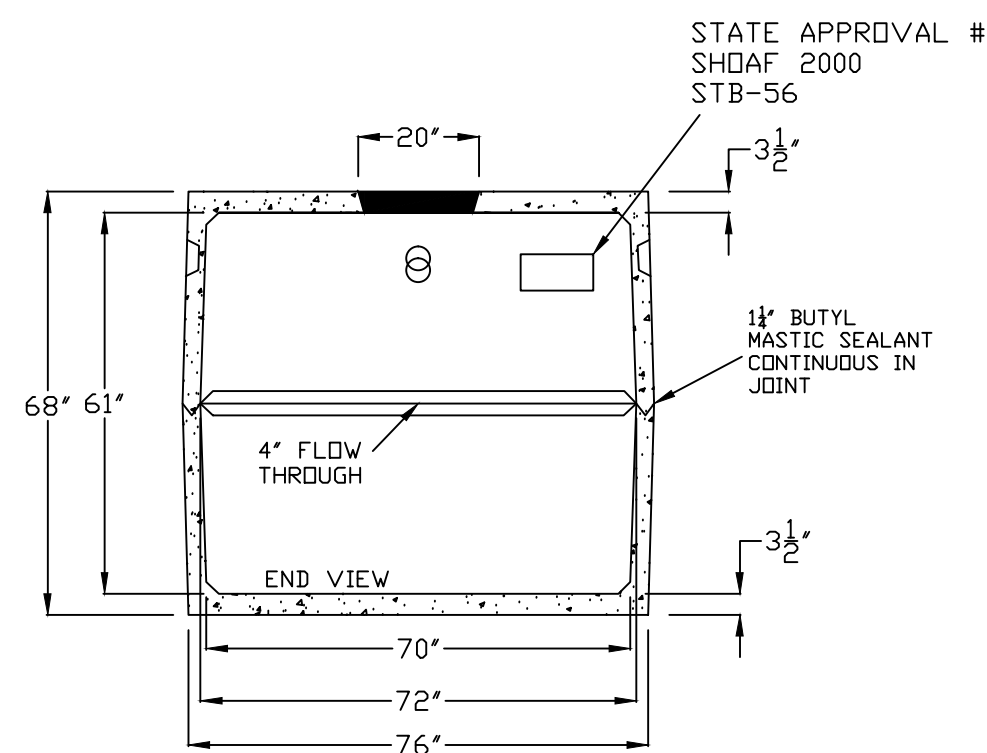
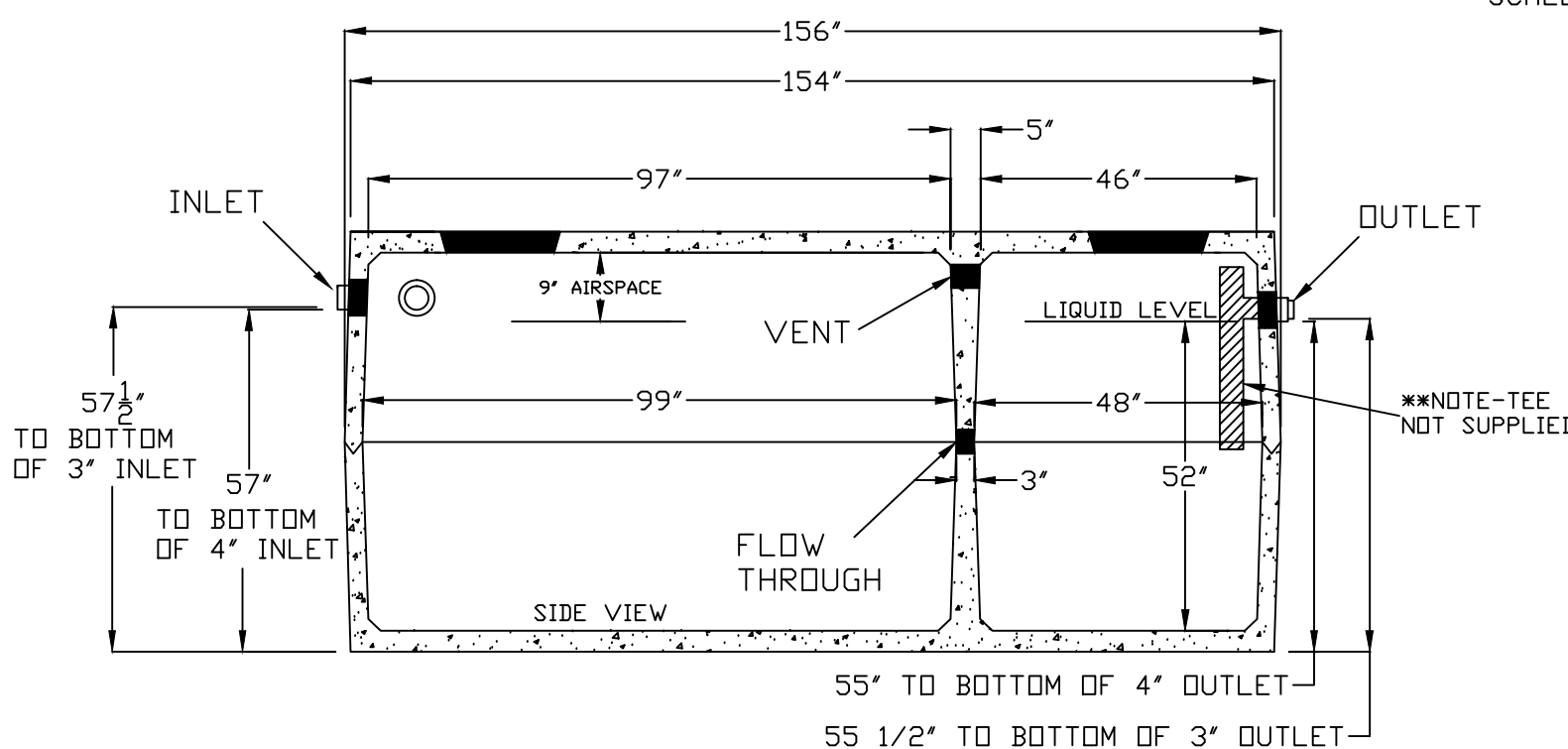
- NOTE - SQUARE ACCESS FOR CONCRETE RISER OR OPTIONAL PLASTIC 20" ROUND RISER CAST-IN
- VENT
- TOP VIEW
- NOTE - TOP VIEW MEASUREMENTS ARE TO WIDEST DIMENSION
- 3' TO 4' INLET OUTLET BOOTS ENDS ONLY
- NO BOOTS ON SIDE INLETS, USE CONCRETE KNOCKOUTS

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MODEL: MS 2000 STB
NON TRAFFIC
2000 Gallon Septic Tank

WWW.SHDAFPRECAST.COM
SHDAF-2000 NONTRAFFIC
STB-56 NONTRAFFIC
LIQUID CAPACITY-2000 US GALLONS/9' AIRSPACE
TANK HEIGHT-68"
BOTTOM OF TANK TO CENTER OF INLET-59"
BOTTOM OF TANK TO CENTER OF OUTLET-57"
LENGTH TO WIDTH RATIO-2 TO 1
SIZE OF INLET & OUTLET-3" OR 4"
TYPE OF INLET & OUTLET-POLYLOCK OR EQUAL (MEETS ASTM C-923)
CONCRETE PSI-4000; TANK WEIGHT-16,000 LBS.
REINFORCEMENT PER STATE CODE

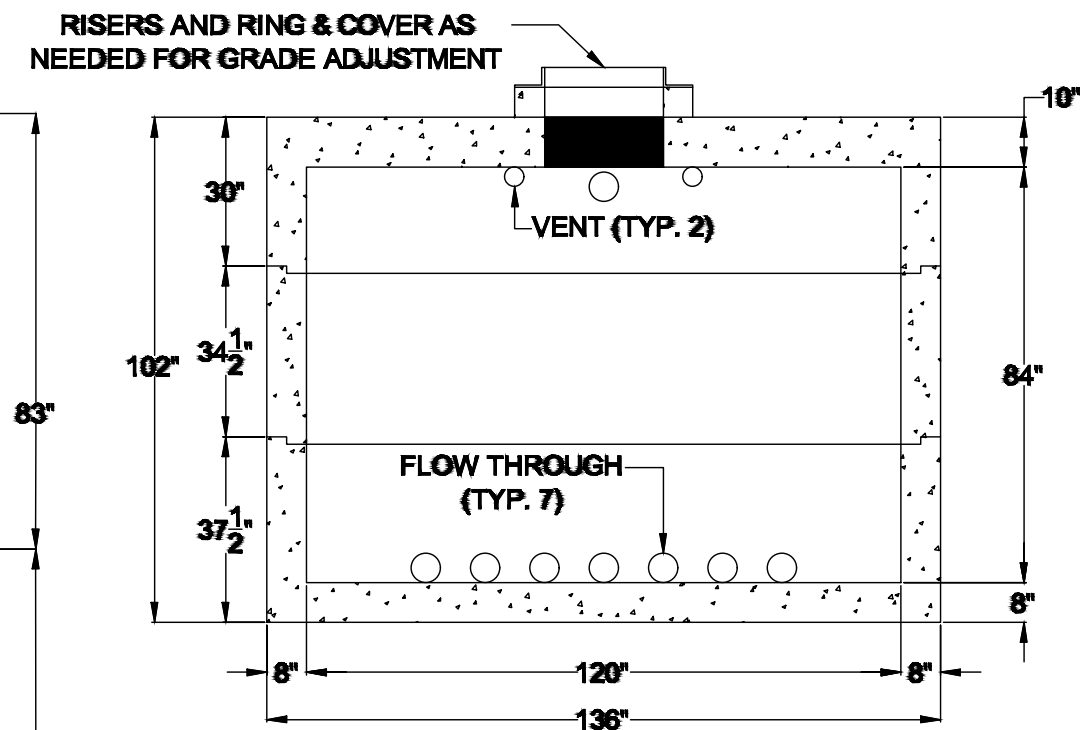
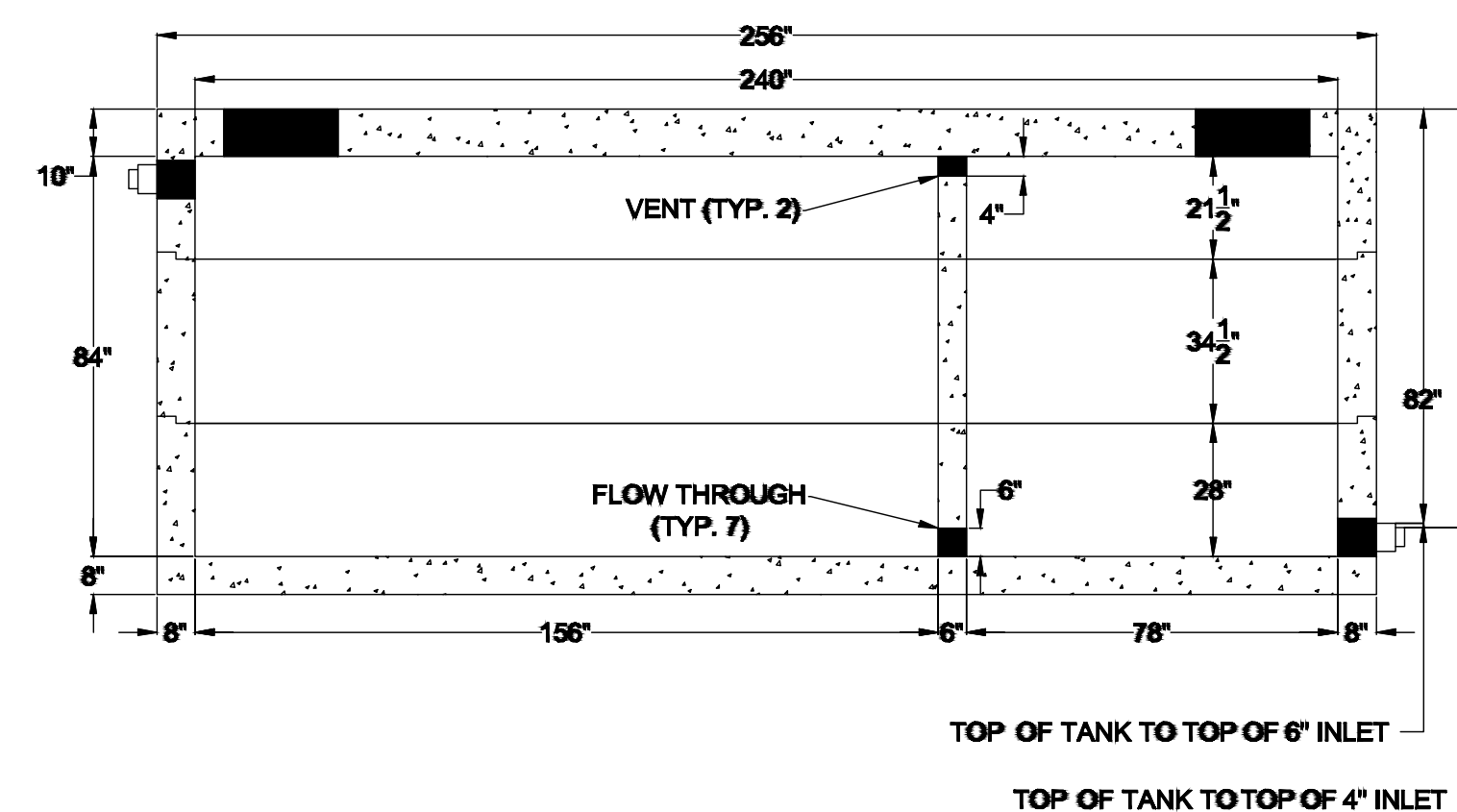
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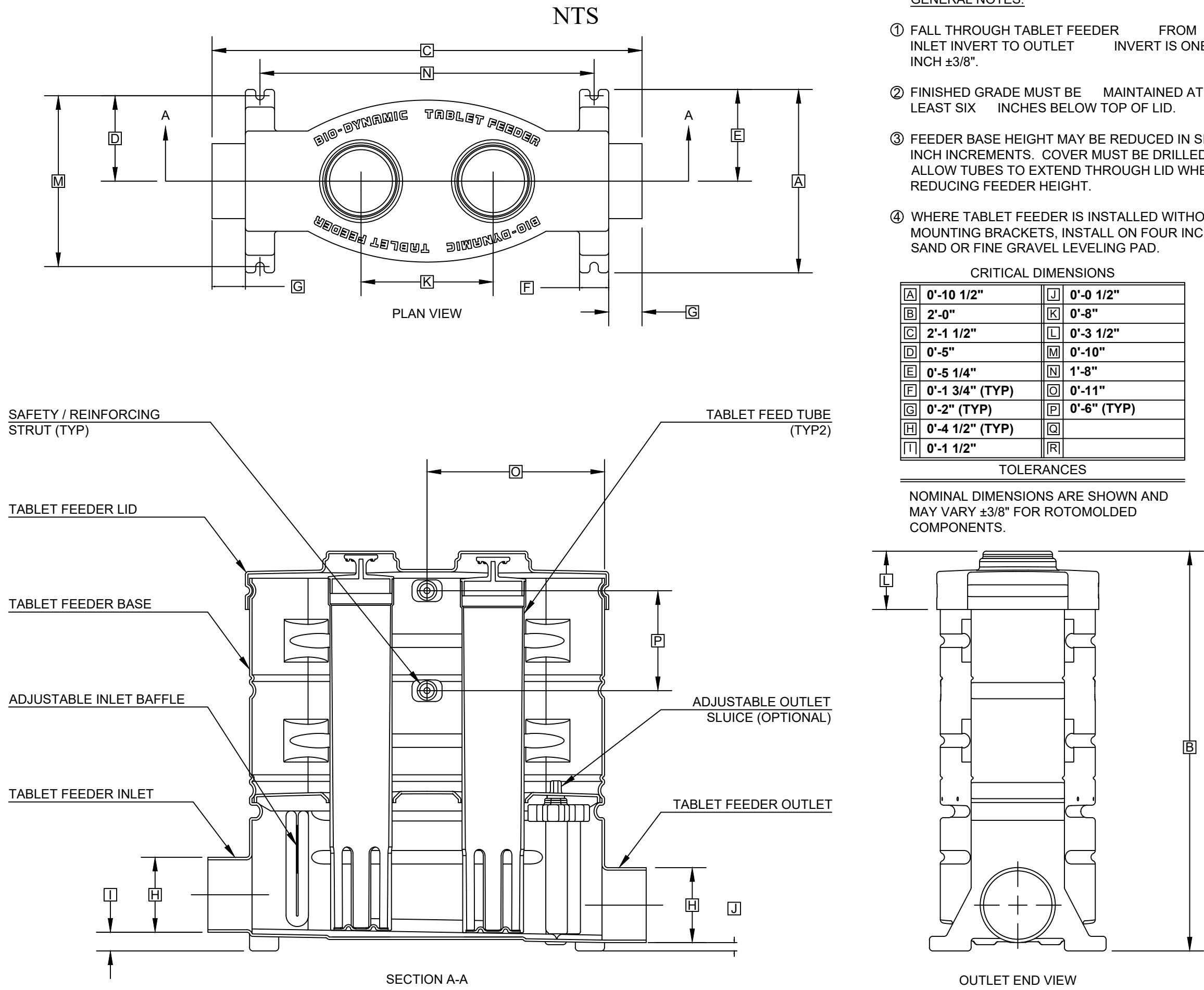
**SHOAF - 10,000 GAL. PUMP TANK
HS/20 TRAFFIC RATED
NC APPROVAL # PT-2092**

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4130 W US HWY 64
LEXINGTON, NC 27295
PHONE (336) 787-5826
FAX (336) 787-2826
info@shoafprecast.com
www.shoafprecast.com

- NOTES:**
- FULL CAPACITY - 10,211 GAL
 - GAL. PER INCH - 121.56
 - 2:1 LENGTH TO WIDTH RATIO
 - PIPE PENETRATION SEALS MEET ASTM C-923
 - 1 1/4" BUTYL RUBBER SEALANT CONTINUOUS IN JOINTS
 - REINFORCED PER ENGINEER SPECS
 - CONCRETE - 5,000 PSI MIN.
 - TANK WEIGHT - 102,350 #
 - TOP - 42,150 #
 - BOTTOM - 40,100 #
 - RISER SECTION - 20,000 #



Tablet Feeder Diagram



GENERAL SPECIFICATIONS

The contractor shall furnish and install one Bio-Dynamic tablet feeder with all applicable equipment as described in the following specifications. It shall be a flow rated proportional feeder that allows for long-term unattended operation while providing a stable, adjustable chemical dose. Treatment of the water or wastewater flow shall be accomplished by immersion of feed tubes containing vertically stacked chemical tablets. Chemical agents shall be released as the liquid erodes the tablets. The tablet feeder shall be equipped with a self-draining flow channel to allow complete dry down of the chemical tablets during low and/or no flow conditions and to insure long-term tablet integrity.

Principal items of equipment and components of the tablet feeder shall include an integral one-piece molded inlet hub, inlet baffle, tiered flow deck including inert drainage tier, intermediate flow tier and upper flow tier, stationary feed tube insert, feed tubes (2 or 4), outlet weir with optional sluice, hydrodynamic mixing chamber and integral one-piece molded outlet hub. Liquid or gaseous systems requiring extensive handling and safety procedures or dry chemical feeders requiring separate drop boxes, or manholes for in-line mounting shall not be considered for this application.

CONSTRUCTION AND OPERATING CONDITIONS

The Bio-Dynamic tablet feeder shall be constructed of heavy duty, UV rated, rotationally molded polyethylene for maximum strength and durability. The feeder shall be a complete dry chemical dosing system that allows dosage capability ranging from 1 to 50 mg/L, according to the operational flow rating (GPD) of the system. A peak flow factor of four shall be used for non-flow equalized wastewater applications to insure proper dosage. The tablet feeder shall be elliptical in shape to utilize the velocity and energy of the liquid for consistent chemical application. The system shall be supplied as a self-enclosed unit suitable for direct burial without the need for a secondary manhole or enclosure.

The integral one-piece molded inlet and outlet hubs shall allow direct in-line connection to standard treatment system piping without the need for special adapters or mounting fixtures. Four reinforced mounting feet shall be molded into the body of the tablet feeder to allow the unit to be directly bolted to tankage or mounting brackets. All feeders shall be equipped with molded in place trim lines located at six inch vertical increments. The trim lines shall accommodate installation of the feeder and risers at the proper operational depth and yet allow field adjustment of the lid location to accommodate landscaping or other functional considerations.

Each translucent ClearCheck feed tube shall contain a vertical stack of tablets which dispense chemical agents into the liquid flow as the tablets are eroded. The chemical feed tubes shall be secured by retaining rings molded into the bottom of the flow deck and with a stationary insert. The retaining rings and stationary insert shall be designed to eliminate the possibility of tube displacement during high flow periods. Direct burial systems utilizing one or more 24" riser assembly shall include extension handles permanently installed on each feed tube. The tablet feeder shall be designed with an internal slope for self-drainage during low and/or no flow conditions to allow complete dry down of chemical tablets. Fall through the tablet feeder from inlet to outlet shall be one inch.

INLET HUB AND BAFFLE

All flow entering the tablet feeder shall pass through the integral one-piece molded inlet hub and be channeled under an adjustable inlet baffle. The molded inlet hub shall allow direct acceptance of (4" or 6") Schedule 40 PVC piping. The inlet baffle shall be located so that the bottom of the baffle is positioned below the mean liquid level. The baffle shall be configured to minimize the effect of periodic flow surges and optimize the dissolution pattern of the chemical tablets. It shall be held in place by molded slots in the feeder sidewall. The baffle shall maintain chemical dosage during low flow periods, while regulating chemical dosage during high flow periods.

FLOW DECK

The feeder shall contain a multi-tiered flow deck molded into the bottom of the system and configured to control liquid velocity within the unit. The configuration shall result in a stable chemical dose throughout the operating range of the unit and eliminate the potential for tablet degradation. The flow deck shall consist of three separate tiers designed to optimize the intrinsic energy of the liquid. The lowest tier functions as the inert drainage tier and shall encompass all chemical feed tubes and traverse the length of the feeder. This tier shall be employed during extremely low or no flow conditions to form a drainage channel for inert particles and eliminate tablet swelling. Feed tube retaining rings shall be molded into the inert drainage tier and shall securely locate each feed tube in position. When the flow rate increases up to three gallons per minute, the liquid level shall rise to the intermediate tier. This tier is hyperbolic in shape and traverses the length of the feeder. The intermediate channel shall increase flow velocity to insure accurate and consistent chemical delivery and to reduce or eliminate tablet wicking. At flow rates greater than three gallons per minute, the liquid level shall rise to the upper tier of the unit. This tier shall result in uniform flow velocity and provide adjustable tablet dissolution and consistent chemical dosage throughout the anticipated operating range.

STATIONARY INSERT

Retaining ribs shall be molded into the system housing to support a stationary insert. The insert shall be installed above the solids drainage tier of the tablet feeder and traverse the area of the flow deck. Feed tubes and internal components shall be held in proper position by the insert. Tapered locating holes shall be incorporated into the insert for ease of feed tube installation and removal. For direct burial applications, drill points shall be provided in the feeder body and the stationary insert shall be permanently affixed to the feeder body with synthetic drive rivets.

CHEMICAL FEED TUBES

The tablet feeder shall be equipped with one-piece translucent ClearCheck feed tubes. Each feed tube shall be equipped with a twist lock cap for safety. Notches molded into the feed tube body shall prevent accidental cap removal. The feed tubes shall utilize tablets with the nominal weight and dimensions of 5 ounces, 2 5/8" diameter and 1 3/4" height. The bottom of each feed tube shall be integrally molded with the tube body and contain two drainage ribs to allow the flow stream to purge inert particles and accomplish dry down of chemical tablets during no flow periods. The liquid shall flow through six equally spaced openings in each feed tube for contact with the chemical tablets.

FIXED WEIR

The tablet feeder shall have a fixed weir with interchangeable 1", 2" and 3" plates. The weir plates shall induce a static head within the feeder which regulates the quantity of tablets exposed to the liquid. The fixed weir plates shall be secured by molded slots located within the feeder that allow plates to be removed and exchanged without the need to take the system off-line or the need to make contact with the liquid stream. The molded slots facilitate interchangeability of weir plates and eliminate the need for adhesives or external fasteners. Alternating the fixed weir plates shall allow adjustment of the chemical feed dose in three separate 20% fixed adjustment increments.

BIO-DYNAMIC® TABLET FEEDER DATA CHART

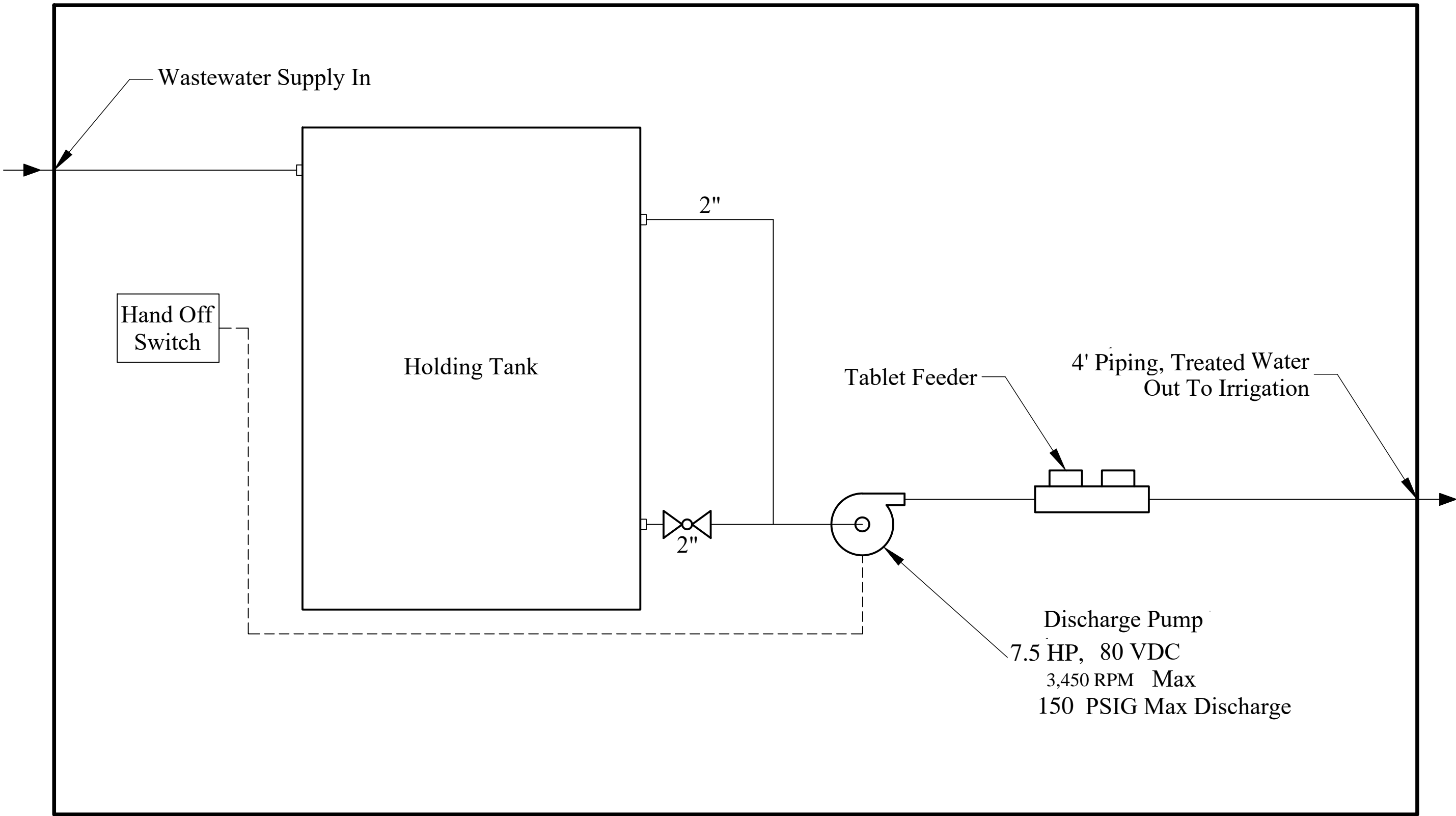
Model	Inlet/Outlet Diameter	Minimum Flow (GPD)	Design Flow (GPD)	Maximum Flow (GPD)	Number of Tubes	Fixed Weir	Adjustable Sluice	Drawing Number
IT 2000 (S)	4"	200	20,000	100,000	2	Standard	Optional	PC-5-9500

BIO-SANITIZER® CHLORINATION TABLETS

The Bio-Dynamic tablet feeder shall be furnished complete with a (10 lb., 25 lb., 45 lb. or 100 lb.) supply of Bio-Sanitizer disinfecting tablets. Bio-Sanitizer disinfecting tablets shall be manufactured and tested to insure efficient and dependable disinfection for wastewater treatment system effluent and other applications where a predictable long-term source of chlorine is desirable. The dissolve rate of the tablets shall generally lower overall chemical use and provide for consistent control of chlorine residual. The tablets shall be manufactured from pure calcium hypochlorite and contain at least 70% available chlorine. The tablets shall incorporate beveled edges to enhance the chemical dissolution pattern and minimize wicking and jamming. Each tablet within the feed tube shall be 2 5/8" diameter, compressed to a 1 3/4" thickness, weigh approximately 5 ounces and be white in color for easy identification. All flow through the system shall contact the Bio-Sanitizer tablets. The tablets shall dissolve slowly, releasing controlled amounts of chlorine for water or wastewater disinfection. The chlorine dosage rate shall be automatic and flow dependent. Periods of high flow shall expose more tablets to the liquid passing through the system and during periods of low flow, fewer tablets shall be exposed. The chemical application rate of the tablets shall remain consistent at peak flow factors as high as four.

System Piping & Instrument Diagram

NTS



CHLORINATION SYSTEM DETAILS <SEE MANUFACTURER'S SPECS FOR ADDITIONAL INFORMATION>	
MANUFACTURER/MODEL	NORWECO BIO-DYNAMIC IT2000
FLOW RATE	TYPICAL 200-20,000 GPD
REMOVAL EFFICIENCY	99.9%
CHEMICAL DELIVERY RATE	1-50 Mg/L
EQUIPMENT	CLEAN-CHECK FEED TUBES, INTERNAL SLOPED PIPE FOR SELF-DRAINAGE
CHEMICAL DELIVERY CONTROLS	AUTOMATIC, TABLET DISSOLUTION IN FLOW STREAM
TABLET STORAGE CAPACITY	25 POUNDS
MATERIALS OF CONSTRUCTION	HEAVY DUTY, UV RESISTANT, ROTATIONALLY MOLDED PE INLET AND OUTLET HUBS, INSTALLED IN-LINE WITH DISCHARGE PIPING, FIXED WEIR DESIGN
WEIGHT	50 POUNDS
DIMENSIONS	10"W X 24" H X 25.5" L

WASTEWATER TREATEMENT SYSTEM DESIGN SPECIFICATIONS	
DESIGN FLOW (MAX)	2,000 GPD
AVERAGE FLOW	1,500 GDD
TARGET REMOVAL EFFICIENCY	99.9%
CHLORINE	1-50 Mg/L
DOSAGE	0.6 LB/DAY <0.8 LB/DAY - PEAK>
DISINFECTION LIMIT	100 FC UNITS/100 mL

Chlorination Specifications

Smithers Viscent
Snow Camp, North Carolina

References:
Add reference drawings, documents or field notes (source and date)

Date:
October 2018

Project Number:
2017190

Checked By:
mrw

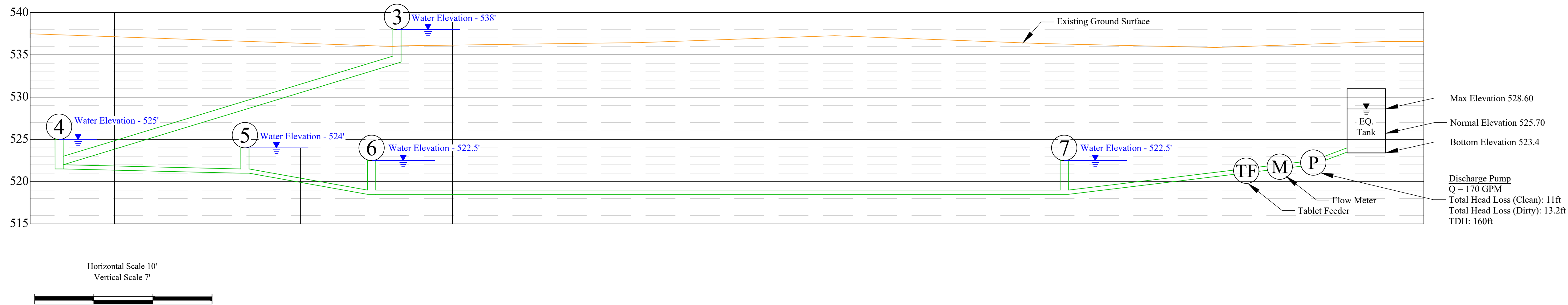
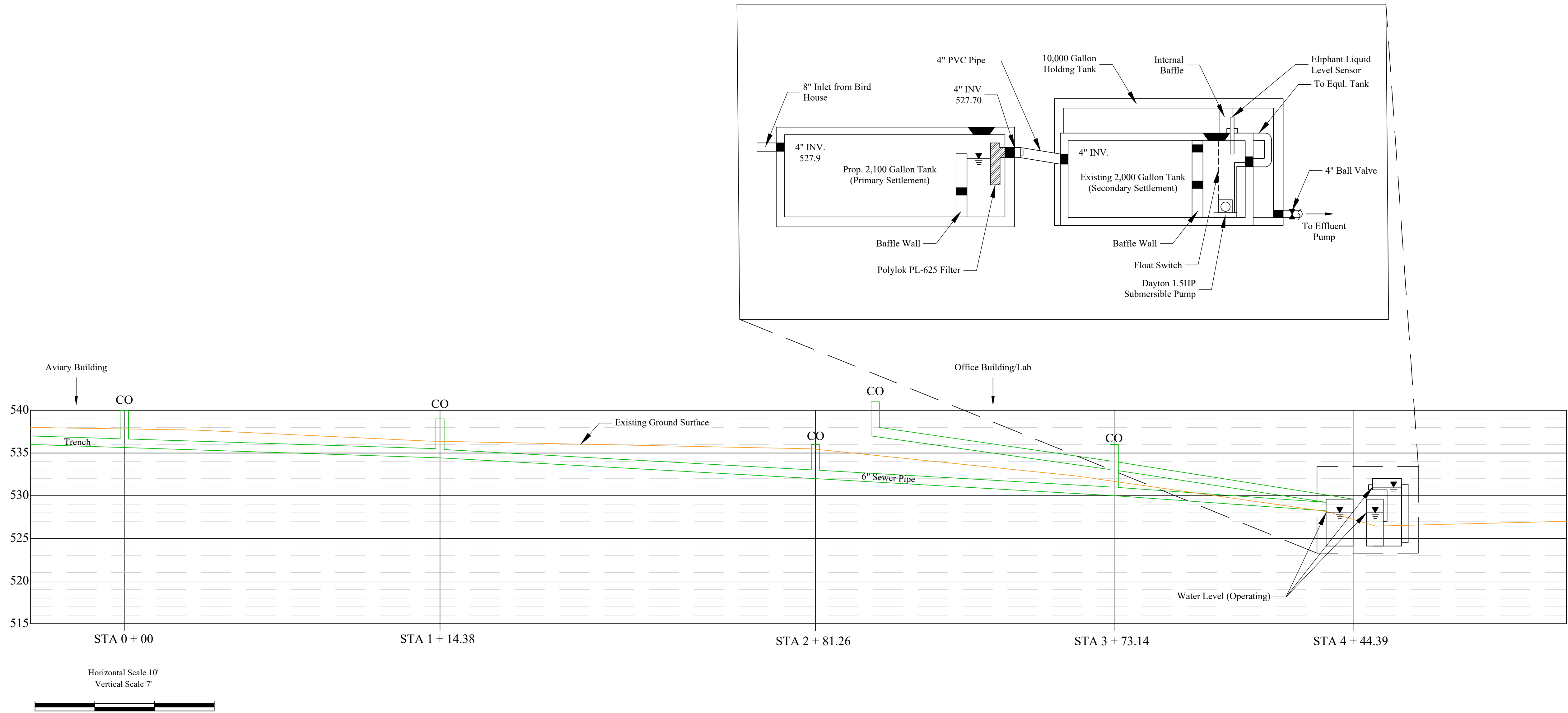
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mrw

System Installation Plans.dwg
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System Hydraulic Profile

Smithers Viscient Snow Camp, North Carolina							
Drawn By:	Checked By:	Project Number:	Date:	References:	Scale:	Size:	Layers:
mrw		2017190	October 2018	Add reference drawings, documents or field notes (source and date)	NTS	22" x 34"	0,1
P:\Progress Env\Smithers Viscient-2017190\CAD\Wastewater Treatment System Installation Plans.dwg							



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