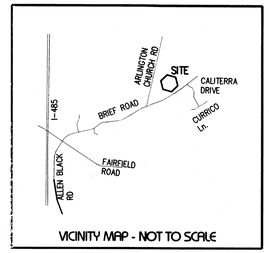
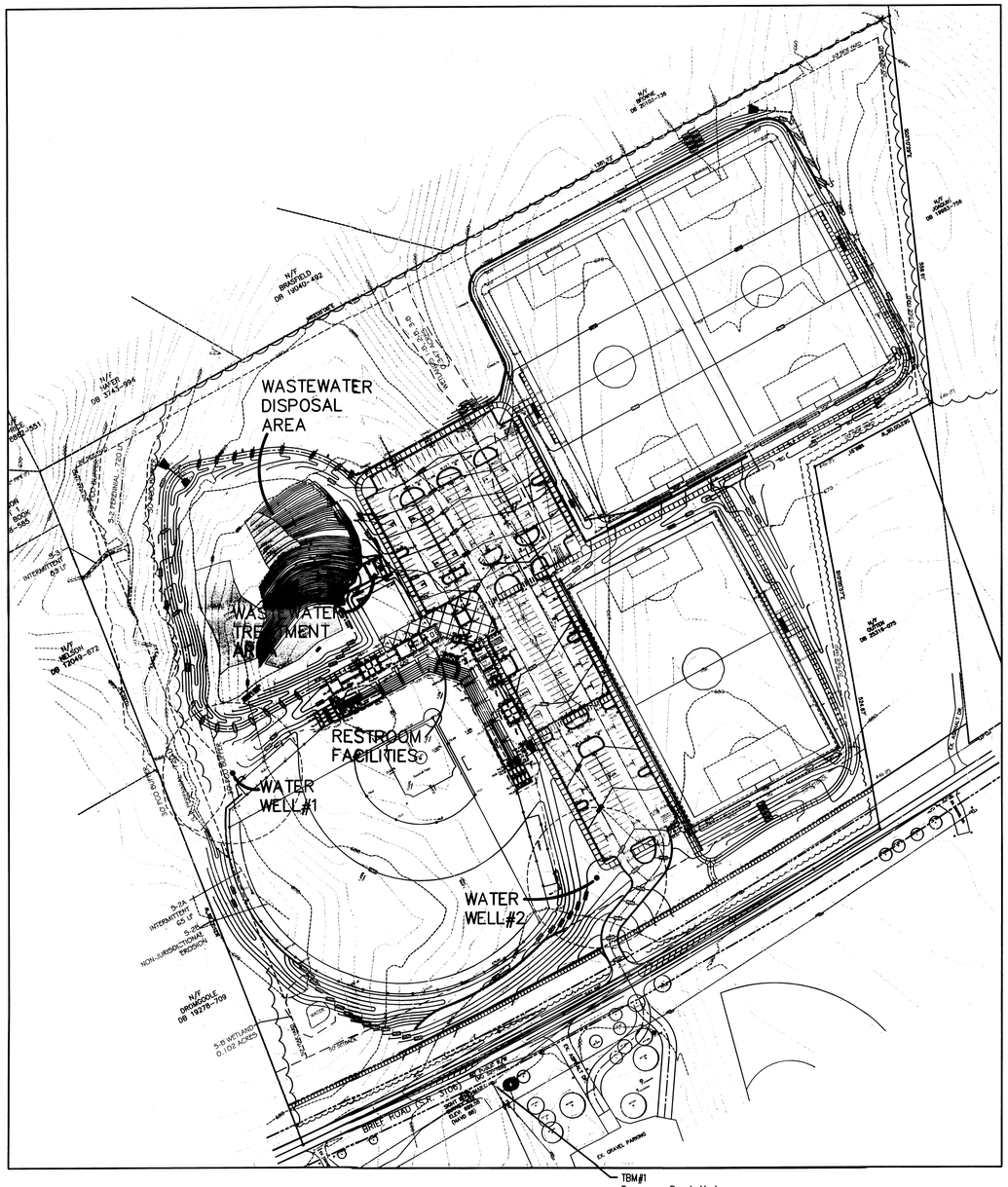
GENERAL NOTES:
1. CURRENT TAX RECORDS ARE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
2. THE PROPERTY SHOWN HEREON IS SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS, RESTRICTIONS, AND AGREEMENTS NOT SHOWN HEREON.
3. ALL DISTANCES ARE HORIZONTAL DISTANCES UNLESS OTHERWISE NOTED.
4. TOTAL AREA = . (AREA COMPUTED BY AUTOCAD COMPUTATION).
5. THE PROPERTY IS OWNED BY THE TOWN OF MINT HILL. PARCEL #13930215 (9801 BRIEF ROAD.
6. SUBJECT PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA AS DETERMINED BY FLOOD INSURANCE RATE PANEL NO. #3710552000L 02/19/2014.
7. TOPOGRAPHIC INFORMATION WAS TAKEN BY FIELD MEASUREMENTS BY LUCAS FOREMAN, INC.
8. BOUNDARY INFORMATION HAS BEEN REPRODUCED FROM THE FIELD MEASURED TOP OF CREEK BANK ALONG BOTH SIDES.
9. POTABLE WATER IS BEING SUPPLIED BY A WATER WELL. WELL IS ON-SITE AND SHOWN (THIS SHEET). WASTEWATER FACILITY IS A MINIMUM OF 100' AWAY.
10. EXISTING WATER WELL HAS BEEN PLUGGED AND ABANDONED.
11. YADKIN PC WATERSHED DISTRICT.
12. CLEAR CREEK WATERSHED.
13. APPROXIMATE CENTER OF WASTEWATER FACILITY:
Lat.: 35.18663
Long.: -80.60250

INDEX OF SHEETS

1. Overall Site Plan
2. WW Facility Site Plan
3. WW Treatment Facility Plan
4. WW Treatment Facility Details
5. WW Disposal Layout Plan
6. WW Disposal Layout Details

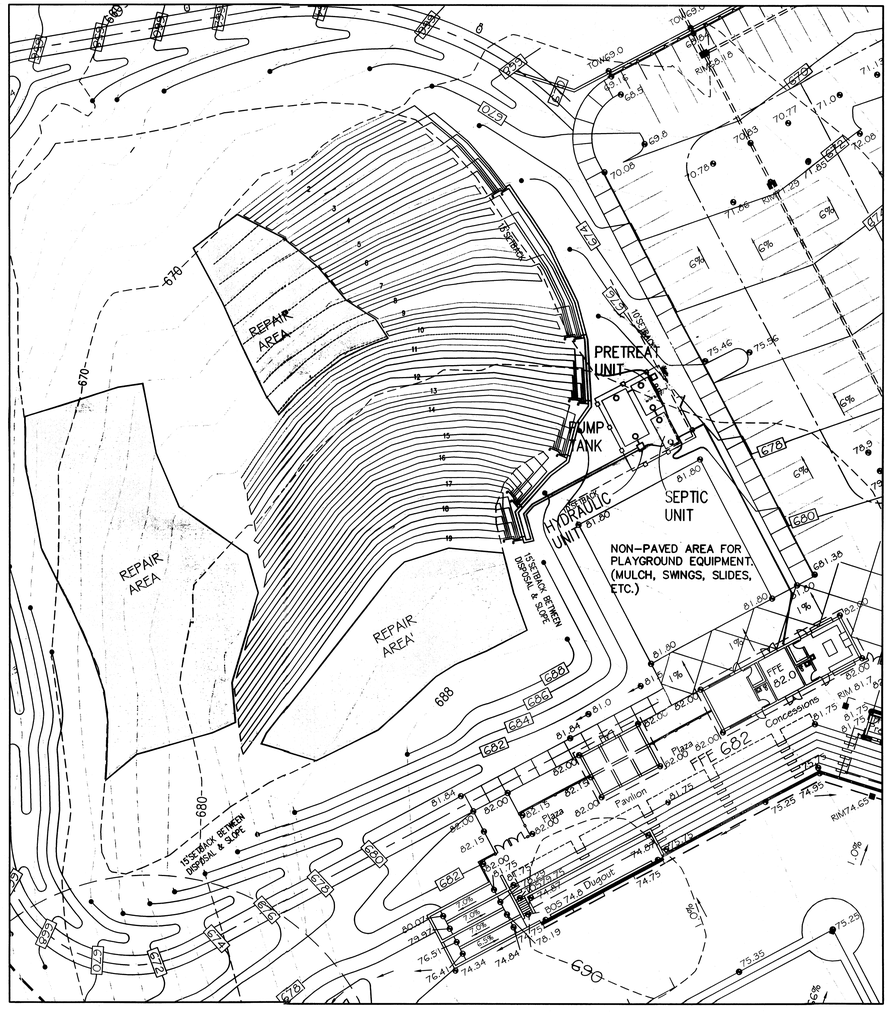


VICINITY MAP - NOT TO SCALE



OVERALL SITE PLAN OF PROPERTY.

Scale 1" = 100'



OVERALL SITE PLAN OF WASTEWATER FACILITY

Scale 1" = 30'

Approved By
ON-SITE WASTEWATER
Department of Health & Human Services
File No: 0017-19
Date: 6/9/17
By:

CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES, LOCATIONS AND ELEVATIONS BEFORE BEGINNING CONSTRUCTION. ANY DISCREPANCIES FOUND SHALL BE REPORTED

(3) DAYS BEFORE DIGGING IN NORTH CAROLINA CALL:
1.800.632.4949
NORTH CAROLINA 1 CALL CENTER

PREPARED FOR:
THE TOWN OF MINT HILL
4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:
MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:
Wirth & Associates
LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St. Suite 212
Charlotte, NC 28208
Phone: 704-375-1588 Fax: 704-375-3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14265 MICHAEL W. LASH 5/26/17

PROJECT ENGINEER:
MICHAEL LASH, P.E.

THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

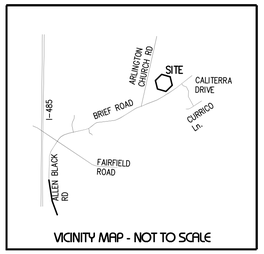
DRAWN BY: M.Lash
CHECKED BY: M.Lash
SCALE: As Shown
DATE: 5-26-2017
REVISIONS:
NO: DATE: DESCRIPTION:
1. 5-26-17 INCREASED PUMP TANK SIZE, ADJUSTED LAYOUT OF TANKS & GRADES; CHANGED 4"LATERAL TO 6".

RECEIVED
MAY 30 2017
DHHS
ON-SITE WASTEWATER

SHEET TITLE:
OVERALL SITE PLAN

SHEET NO.:
WW-1





VICINITY MAP - NOT TO SCALE

North

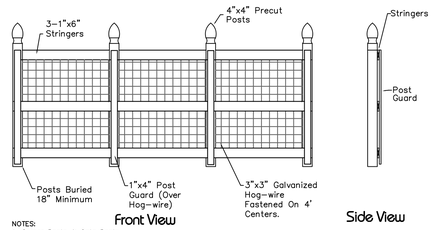
INDEX OF SOIL INVESTIGATION

Ksat Location

Pit

Auger

AREA CALCULATIONS:	
DISPOASAL AREA REQ'D:	14,270sf.
DISPOSAL AREA PROVIDED:	18,964sf.
REPAIR AREA REQUIRED:	14,270sf.
REPAIR AREA PROVIDED:	16,557sf.



NOTES:
1. Corner Posts & Gate Posts set 24" Deep
2. All Material To Be Black Vinyl Posts.

Disposal Field Restricted Access Fence

Other Fence Types can be considered. Submit Fence Cut-Sheets for Approval to Engineer and Owner.

CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES, LOCATIONS AND ELEVATIONS BEFORE BEGINNING CONSTRUCTION. ANY DISCREPANCIES FOUND SHALL BE REPORTED

(3) DAYS BEFORE DIGGING IN NORTH CAROLINA CALL:
1.800.632.4949
NORTH CAROLINA 1 CALL CENTER

20 0 20 40 60

Scale 1" = 20'

PREPARED FOR:

THE TOWN OF MINT HILL

4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:

MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:

Wirth & Associates
LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St. Suite 212
Charlotte, NC 28208
Phone: 704-375-1588 Fax: 704-375-3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL SEAL 14265 ENGINEER MICHAEL W. LASH

PROJECT ENGINEER:
MICHAEL LASH, P.E.

THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

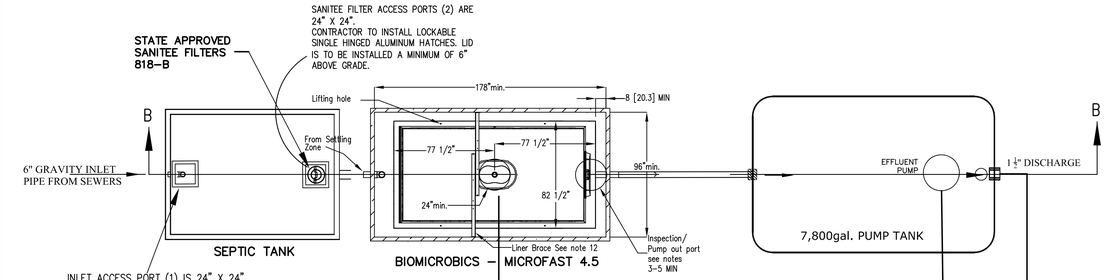
DRAWN BY:	M.Lash
CHECKED BY:	M.Lash
SCALE:	As Shown
DATE:	5-26-2017
REVISIONS:	

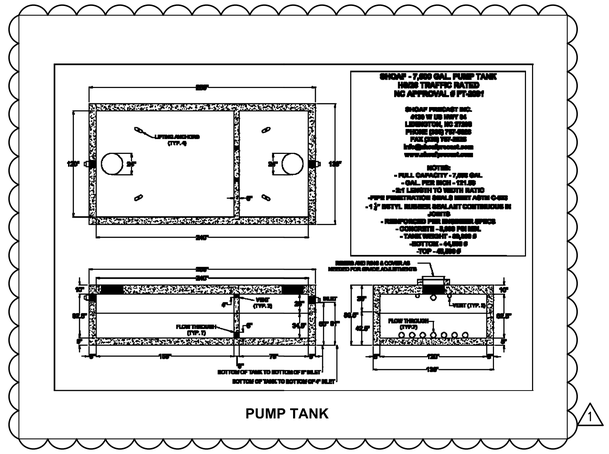
NO:	DATE:	DESCRIPTION:	BY:

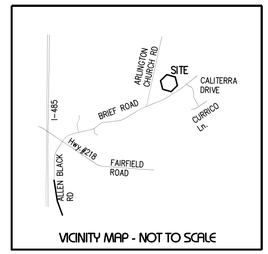
1, 5-26-17 INCREASED PUMP TANK SIZE FOR FLOW EQUALIZATION RESIDUAL VOLUME, ADJUSTED LAYOUT OF TANKS & GRADES; CHANGED FENCE LAYOUT.

SHEET TITLE:
WASTEWATER FACILITY SITE PLAN

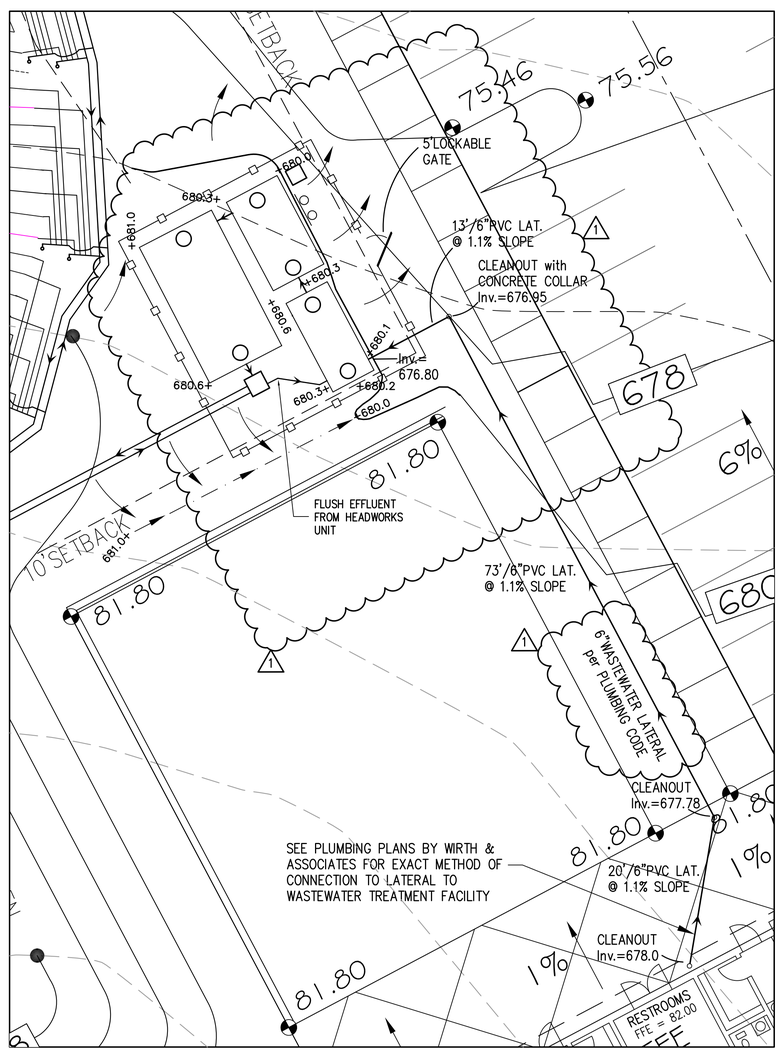
SHEET NO.:
WW-2











1BLOWER NOTES:
1. INSTALL BLOWER ON 3" THICK CONCRETE PAD.
2. PIPIONG FROM BLOWER TO DIFFUSER TO BE METAL (NOT PVC)
3. NO MORE THAN 4 ELBOWS.

TANK NOTES:
1. TANKS TO BE SET ON A 6" STONE BED.
2. TANKS SIZES IN CALCULATIONS ARE MINIMUM SIZES. LARGER TANKS OR OF DIFFERENT CONFIGURATIONS WILL BE ACCEPTABLE. SUBMIT CUT SHEETS TO ENGINEER FOR APPROVAL.
3. SOME TANKS OF THIS SIZE REQUIRE H20 LOADING CAPABILITY (adds additional costs). ALTERNATIVE TANKS OR PRODUCTS CAN BE EXPLORED FOR ACCEPTABILITY. SUBMIT CUT–SHEETS TO ENGINEER FOR APPROVAL.
4. TANK CONFIGURATION FOR BIOMICROBICS TANK WILL NEED TO BE APPROVED BY BIOMICROBICS PRIOR TO ORDERING ITS CONSTRUCTION. APPROPRIATE SCHEDULING WILL NEED TO BE COORDINATED BY CONTRACTOR.
5. ALL ACCESS PORTS SHALL BE LOCKABLE.

WASTEWATER SYSTEM NOTES:
PROPOSED WASTEWATER SYSTEM IS COMPOSED OF A SEPTIC TANK WHICH GRAVITY FEEDS INTO A BIO–MICROBICS FAST 4.5 SYSTEM. THIS GRAVITY FEEDS INTO A PUMP TANK THAT PUMPS THROUGH A HYDRAULIC UNIT TO A SUBSURFACE DRIP TUBING FIELD FOR DISPOSAL.
1. THE PRECAST TANKS AS SHOWN ARE PROVIDED BY SHOAF PRECAST IN LEXINGTON, NC. CONTACT IS: PHILLIP SHOAF AT 336–787–2026.
2. THE WASTEWATER TREATMENT SYSTEM IS SPECIFIED AS A BIO–MICROBICS, FAST 4.5S SYSTEM; PLANT IS IN KANSAS CITY, CONTACT IS: T&L RESOURCES, WASTEWATER PRODUCT DISTRIBUTOR; TIM BARBEE AT 704–589–0595.
3. THE DRIP TUBING IS SPECIFIED FROM AMERICAN MANUFACTURING; CONTACT IS: T & L RESOURCES, TIM BARBEE @ 704–589–0595.
4. THESE PRODUCTS ARE PART OF THE PERMIT AND REQUIRE CERTIFICATION FROM THE MANUFACTURER AS A SUPPLIER. CONTACT THE ENGINEER IF A DIFFERENT PRODUCT IS PROPOSED FOR THE SYSTEM. EXPECT A TIME DELAY SHOULD A PERMIT REVISION BE REQUESTED.

CONSTRUCTION SEQUENCE
(for Installation & Backfill of Tanks)
1. TANK TO BE INSTALLED 6"THICK PEA STONE BED. USE A DEWATERING PIT (IF REQUIRED)
2. USE NATIVE MATERIAL FOR BACKFILL WITH NO ORGANICS, PROPERLY PLACED AND COMPACTED. KEEP EXCAVATION FREE OF WATER AT ALL TIMES.
3. INSTALL FILL IN 6"LIFTS, MATERIAL MUST BE ABLE TO FILL–IN BETWEEN SIDES OF TANKS, FILL ON SIDES FIRST; THEN THE BULKHEADS.
4. USE A HAND TAMPER TO ACHIEVE SIDEWALL COMPACTION THROUGH THE COMPACTED BACKFILL.
5. SIDEWALL COMPRESSION IS ESSENTIAL FOR SIDEWALL RESTRAINT.
6. GRADE DRAINAGE AWAY FROM TANK.

REQUIRED FLOW CALCULATIONS:
288 Parking Spaces @ 10 gals/space
288 x 10 => 2,880 gals/day
Input 2,880 into Flow Equalization

FLOW EQUALIZATION CALCULATIONS 1

DAY	IN	OUT	Remainder
SUNDAY	2,880	2,141	1,641
SATURDAY	2,880	2,141	902
FRIDAY	2,304	2,141	163
THURSDAY	1,843	2,141	0
WEDNESDAY	1,475	2,141	295
TUESDAY	1,298	2,141	961
MONDAY	2,304	2,141	1,804 *
TOTAL GALLONS:	14,984	14,987	

FRIDAY – TUESDAY DECREASE BY 20% PER DAY.
MONDAY EQUALS FRIDAY @ 2,304 gpd
Flow Equalization => 14,984gpd/7days => 2,141gpd.
USE 2,141gpd for DISTRIBUTION SYSTEM

FLOW CALCULATIONS: per ZONE
DOSING FLOW CALCULATION PER ZONE:
NUMBER OF EMITTERS = DRIPPER LINE LENGTH / 2' EMITTER SPACING
= 1200'/2 = 600 EMITTERS
ABSORPTION FIELD DOSING RATE IN GPH = NUMBER OF EMITTERS X 0.61
= 600 X 0.61 = 366 GPH
ABSORPTION FIELD DOSING RATE IN GPM = GPH / 60 MINUTES
= 366 / 60 = 6.1 gpm
FLUSHING FLOW CALCULATION:
FLUSHING FLOW = NO. OF LATERALS PER ZONE X 1.6
= 4 X 1.6 = 6.4 gpm
TOTAL FLOW = FLUSHING FLOW + DOSING FLOW
= 6.4 + 6.1 = 12.5 gpm

HEADLOSS CALCULATIONS:

Length of Longest Lateral = 300'±	
Dose Flow = 3.11gpm; Flush Flow=3.2gpm	
Total Flow = 6.31gpm => Drip Tubing Flush Losses	58.0
Required Safety Factor= 23.1 ft	23.1'
Headloss through unit=7.5 ft	7.5'
Elevation Change = 4.5' (Pump Outlet to Hydraulic Unit)	13.0'
430'/1.5" Supply (31.7') & 1.5" Return (2.42'/100')=10.4'	=>42.1'
Headloss through laterals=	35'
TOTAL HEADLOSSES	124.9'

SEPTIC TANK SIZING CALCS
Septic Tank
Daily Flow = 2,880 gpd
(2,880 gpd * 1.17) = 3,369 gals
= 4,000 gal septic tank

PUMP TANK SIZING CALCS
Pump Tank Inside Dimensions:
Length=20'; Width=10'; Depth=5.2'
Storage=121.56 gals/in.
Pump Submergence=21"
or 21"x121.56g/in.= 2,553 gals.
Dose Volume = 100 gpd
Daily Flow = 2,880 gpd
Flow Remaining (max)= 1,804 gals
Total Storage for Tank=7,337 gals
Therefore: Use 7,500g Pump Tank

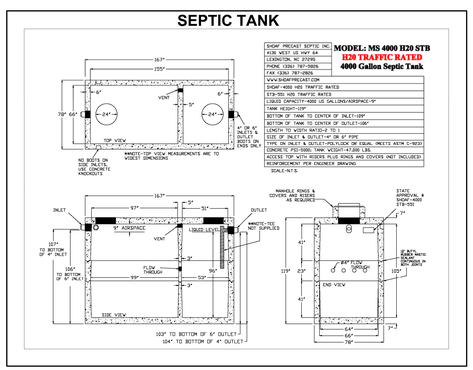
LENGTH OF RUN CALCULATIONS:
2141 GPD/0.15 LTAR = 14,270sf.
14,270/2 = 7135 ft.of tubing
Each Run = 150ft.
7135/150 = 48 runs
6 Zones–24Laterals–48 runs (typ.)
or 1,190'/Zone @ 75' or 150'/run

AREA CALCULATIONS:
DISPOSAL AREA REQ'D: 14,270sf.
DISPOSAL AREA PROVIDED: 18,964sf.
REPAIR AREA REQUIRED: 14,270sf.
REPAIR AREA PROVIDED: 16,557sf.

DOSE CYCLE CHART
6 Zone dosing: 71.4 gal/cycle, 24 total average cycles per day. 30 total peak cycles per day. Pump will run for ~661 seconds per cycle. Pump will rest for 78 min in average mode and 47 min. in peak mode. Average mode shall be 1,284 GPD. Peak mode shall be 2,142 GPD.

FLUSH CYCLE CHART
IRRIGATION OF SYSTEM IS BY TIMED DOSE. EACH ZONE WILL FLUSH ONE AT A TIME. AVERAGE OF 24 DOSES PER DAY (or 1/hr.). ZONES ARE FIELD FLUSHED INDIVIDUALLY. FLUSH CYCLE TIMES AND INTERVALS MAY BE ADJUSTED BY OPERATOR.

SEPTIC TANK



CONTRACTOR TO FIELD VERIFY ALL EXISTING UTILITIES, LOCATIONS AND ELEVATIONS BEFORE BEGINNING CONSTRUCTION. ANY DISCREPANCIES FOUND SHALL BE REPORTED

(3) DAYS BEFORE DIGGING IN NORTH CAROLINA CALL:
1.800.632.4949
NORTH CAROLINA 1 CALL CENTER

PREPARED FOR:
THE TOWN OF MINT HILL
4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:
MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:
Wirth & Associates LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St. Suite 212
Charlotte, NC 28208
Phone: 704–375–1588 Fax: 704–375–3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14265 5/26/17 MICHAEL W. LASH

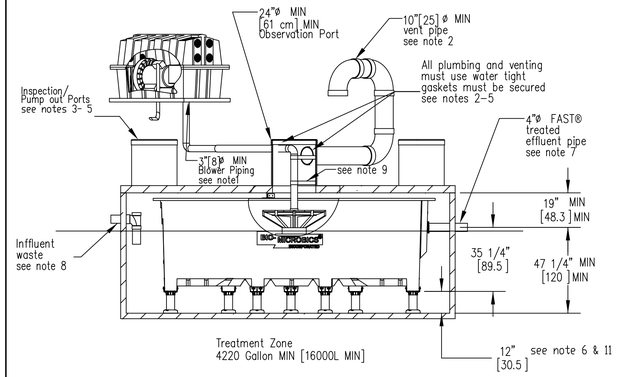
PROJECT ENGINEER:
MICHAEL LASH, P.E.

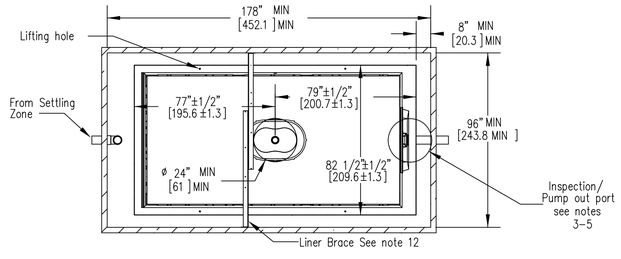
THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

DRAWN BY: M.Lash
CHECKED BY: M.Lash
SCALE: 1" = 10'
DATE: 5-26-2017
REVISIONS:
NO: DATE: DESCRIPTION:
1. 5–26–17 INCREASED PUMP TANK SIZE FOR FLOW EQUALIZATION RESIDUAL VOLUME, ADJUSTED LAYOUT OF TANKS & GRADES; CHANGED 4"LATERAL TO 6".

SHEET TITLE:
WASTEWATER TREATMENT FACILITY PLAN

SHEET NO.:
WW-3





NOTES

1. Airline piping to FAST? may not exceed 100 FT [30m] total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT [30m] consult factory. Blower must be located above flood levels on a concrete base 56.8" X 35.8" X 2.5" [144 X 91 X 6.35cm] minimum.
2. Vent to desired location and cover opening with a vent grate with at least 20 sq in.[125 sq. cm] open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 4 of 4).
3. All appurtenances to FAST? (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
4. All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
5. Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
6. If less than the specified minimums are considered necessary, consult factory for guidance.
7. All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
8. The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
9. The air supply line into the FAST? unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2' min [60 cm]. See alternate air supply option on sheet 3 of 3.
10. Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.
11. Refer to sheet 3 of 3 for leg extensions requirements.
12. Secure provided support braces to prevent movement.

DO NOT SCALE
UNLESS NOTED DIMENSIONS ARE IN INCHES
TOLERANCES ± 0.02 IN/IN

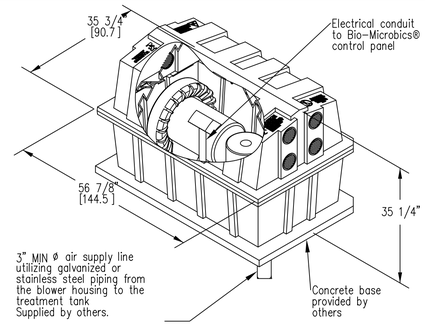
BIO MICROBICS
BETTER WATER. BETTER WORLD.

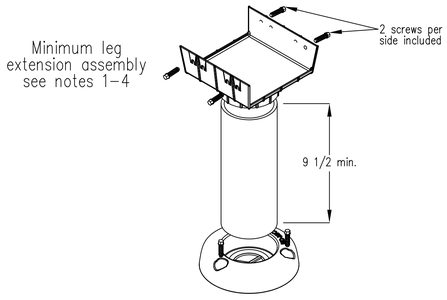
MicroFAST 4.5 FAST Unit

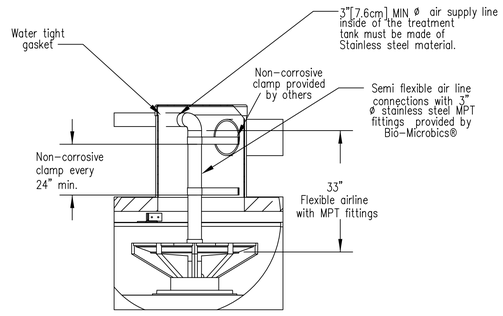
WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	MicroFAST 4.5 (feet)	1 OF 3
DRAWN CTC	5/10/2006			
CHECKED PF	4/16/2014	REVISED 4/16/2014	REV. INI-07-C	

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE.

BIO-MICROBICS 2014







DETAIL

Notes
1. Secure leg extension to the FAST® unit by placing two screws on each side of the leg extension (4 screws per foot are included).
2. Cut 4" Sch. 40 PVC pipe (not included) to obtain the desired height. Minimum pipe length of 11 3/4". For heights greater than 18" use schd. 80 PVC pipe (not included). Consult factory for extending leg beyond 36".
3. Anchor the leg extensions to the tank with non-corrosive hardware (not included) at the provided mounting points.
4. If less than the specified minimums are considered necessary, consult factory for guidance.
5. The air supply line into the FAST® unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2ft minimum. The unit is supplied with 3"ø semi-flexible airline connections with stainless steel MPT fittings and sample U-shape pipe clamps.
6. Tank, anchors, liner brace, piping conduit, blower, housing pad and vents are provided by others.

DO NOT SCALE
UNLESS NOTED DIMENSIONS ARE IN INCHES
TOLERANCES ± 0.02 IN/IN

BIO MICROBICS
BETTER WATER. BETTER WORLD.

MicroFAST 4.5 FAST Unit

WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	MicroFAST 4.5 Details	3 OF 3
DRAWN CTC	5/10/2006			
CHECKED PF	4/16/2014	REVISED 4/16/2014	REV. INI-07-C	

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE.

BIO-MICROBICS* 2014

Specifications for MicroFAST 4.5 Wastewater Treatment System

1. GENERAL
The contractor shall furnish and install (1) MicroFAST 4.5 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
The principal items of equipment shall include FAST System insert, leg extensions, blower assembly, blower controls and alarms. The MicroFAST 4.5 unit shall be situated within a 4,220 Gallon (16,000 L) minimum tank, as shown on the plans. Suggested maximum settling tank(s) equaling ½ to 1 x daily flow must be used prior to FAST. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall provide coordination between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit and delivery to the job site.

2. OPERATING CONDITIONS
The MicroFAST 4.5 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (18) eighteen to (63) sixty-three persons and not to exceed 4,500 US Gallons per day (17,000 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.

3. MEDIA
The FAST media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.

4. BLOWER
The MicroFAST 4.5 unit shall come equipped with a regenerative type blower capable of delivering 90-140 CFM [185-238m3/hr]. The blower assembly shall include an inlet filter with metal filter element. Blower piping to the tank shall use non-corrosive material (Galvanized, or Stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.

5. REMOTE MOUNTED BLOWER
The blower elevation must be higher than the normal flood level. A two-piece, rectangular housing shall be provided with tamper-proof screws. The discharge air line from the blower to the MicroFAST shall be provided and installed by the contractor.

6. ELECTRICAL
The electrical source should be within 150 feet [45 meters] of the blower. Consult local codes for longer wiring distances. All wiring must conform to code. Input power on 60Hz electrical systems 220/460VAC, 3ø, 6.4/3.3 FLA, on 50 Hz electrical systems 230/380VAC , 3ø, 6.1/3.5 FLA. Other voltages and phase are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.

7. ALARMS
The alarm system shall consist of a visual and audible alarm to indicate loss of power to the blower. A manual silence switch is included.

8. INSTALLATION AND OPERATING INSTRUCTIONS
All work must be done in accordance with local codes and regulations. Installation of the MicroFAST 4.50 shall be done in accordance with the written instructions provided by the manufacturer.
An operation and maintenance manual shall be furnished, which will include a description of system installation, operation, and maintenance procedures.

Treatement unit weighs approximately 1600 pounds [726kg]. Four holes for lifting the FAST liner are supplied. Spreader bars are to be used in lifting the unit. Place spreader bars between lifting holes.

9. FLOW & PIPE SIZING
Each FAST module is provided with a standard (4) four inch effluent pipe hole and gasket. An optional (6) six inch hole and gasket can be utilized consult factory for guidance.
FAST systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 15 gpm (57 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (450 gph (1700 LPH)).

10. WARRANTY
Bio-Microbics, Inc. warrants all new residential FAST® models (MicroFAST® 3.0, 4.5, and 9.0) against defects in materials and workmanship for a period of one year after installation or eighteen (18 months) from the date of shipment which ever occurs first. All other FAST® system models are warranted for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:

During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, aerator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the structure wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC., ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. Contact your local distributor for parts and service.

DO NOT SCALE
UNLESS NOTED DIMENSIONS ARE IN INCHES
TOLERANCES ± 0.02 IN/IN

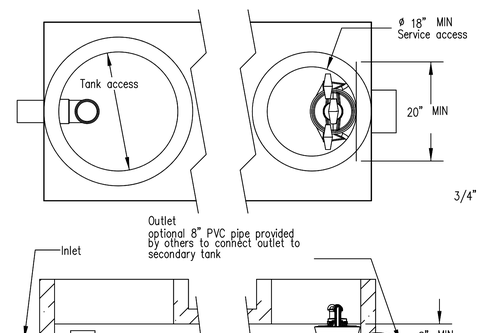
BIO MICROBICS
BETTER WATER. BETTER WORLD.

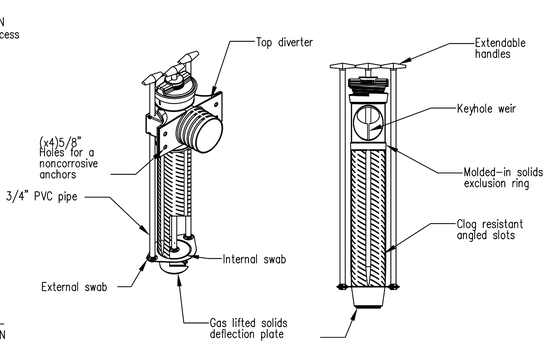
MicroFAST 4.5 FAST Unit

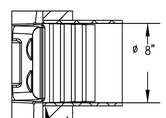
WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	MicroFAST 4.5 Specifications	2 OF 3
DRAWN	5/10/2006			
CHECKED PF	4/16/2014	REVISED 4/16/2014	REV.	

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE.

BIO-MICROBICS* 2014







DETAIL A
SCALE 1 : 10

If installed as shown in a single compartment tank the 8" PVC pipe must be water tight within the tank and flush against the inside to mount 8" SaniTEE top diverter

Notes:
- SNT 818-B is a 1/8" effluent screen capable of screening up to 3,000 GPD
- SNT 818 is a 1/8" effluent screen capable of screening up to 6,000 GPD
- SNT 838 is a 3/8" effluent screen capable of screening up to 10,000 GPD
- Outlet pipe not included.
- All appurtenances to SaniTEE (ie. septic tank, access risers, etc) must conform to all applicable codes.

DO NOT SCALE
UNLESS NOTED DIMENSIONS ARE IN INCHES
TOLERANCES ± 0.02 IN/IN

BIO MICROBICS
BETTER WATER. BETTER WORLD.

8 Inch SANITEE

WEIGHT	lb	SIZE	DRAWING NUMBER	SHEET
NAME	DATE	A	SaniTEE 818, 818-B, & 838	1 OF 1
DRAWN CTC	3/31/2005			
CHECKED PF	4/9/2014	REVISED 4/9/2014	REV. CAT-01	

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BIO-MICROBICS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF BIO-MICROBICS INC. IS PROHIBITED. DESIGN AND INVENTION RIGHTS ARE RESERVED. IN THE INTEREST OF TECHNOLOGICAL ADVANCEMENT, ALL PRODUCTS ARE SUBJECT TO DESIGN AND OR MATERIAL CHANGE WITHOUT NOTICE.

BIO-MICROBICS 2014

PREPARED FOR:
THE TOWN OF MINT HILL
4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:
MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:
Wirth & Associates
LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St. Suite 212
Charlotte, NC 28208
Phone: 704-375-1588 Fax: 704-375-3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL SEAL 14265 ENGINEER MICHAEL W. LASH 5/26/17

PROJECT ENGINEER:
MICHAEL LASH, P.E.

THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

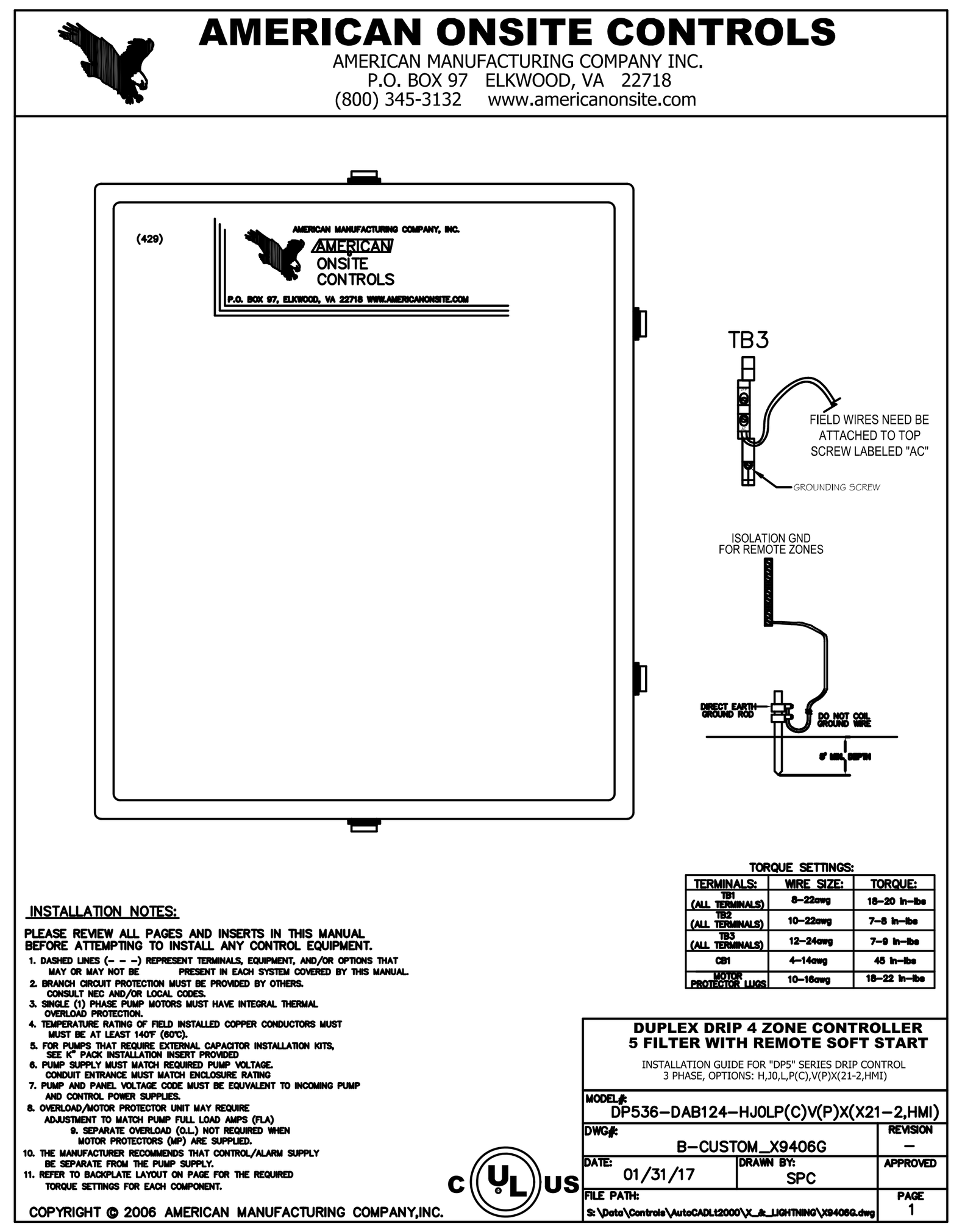
DRAWN BY:	M.Lash
CHECKED BY:	M.Lash
SCALE:	As Shown
DATE:	5-26-2017

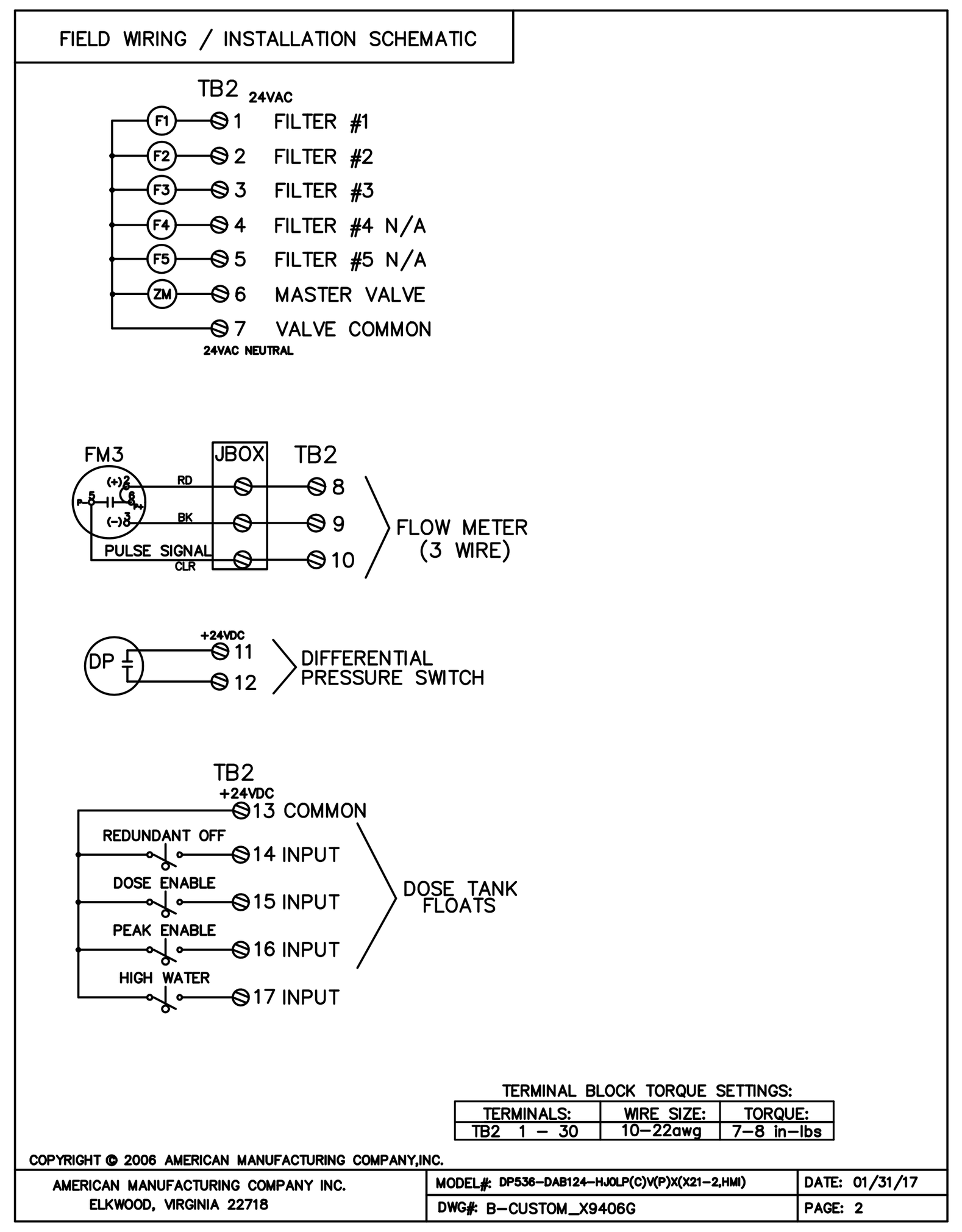
REVISIONS:

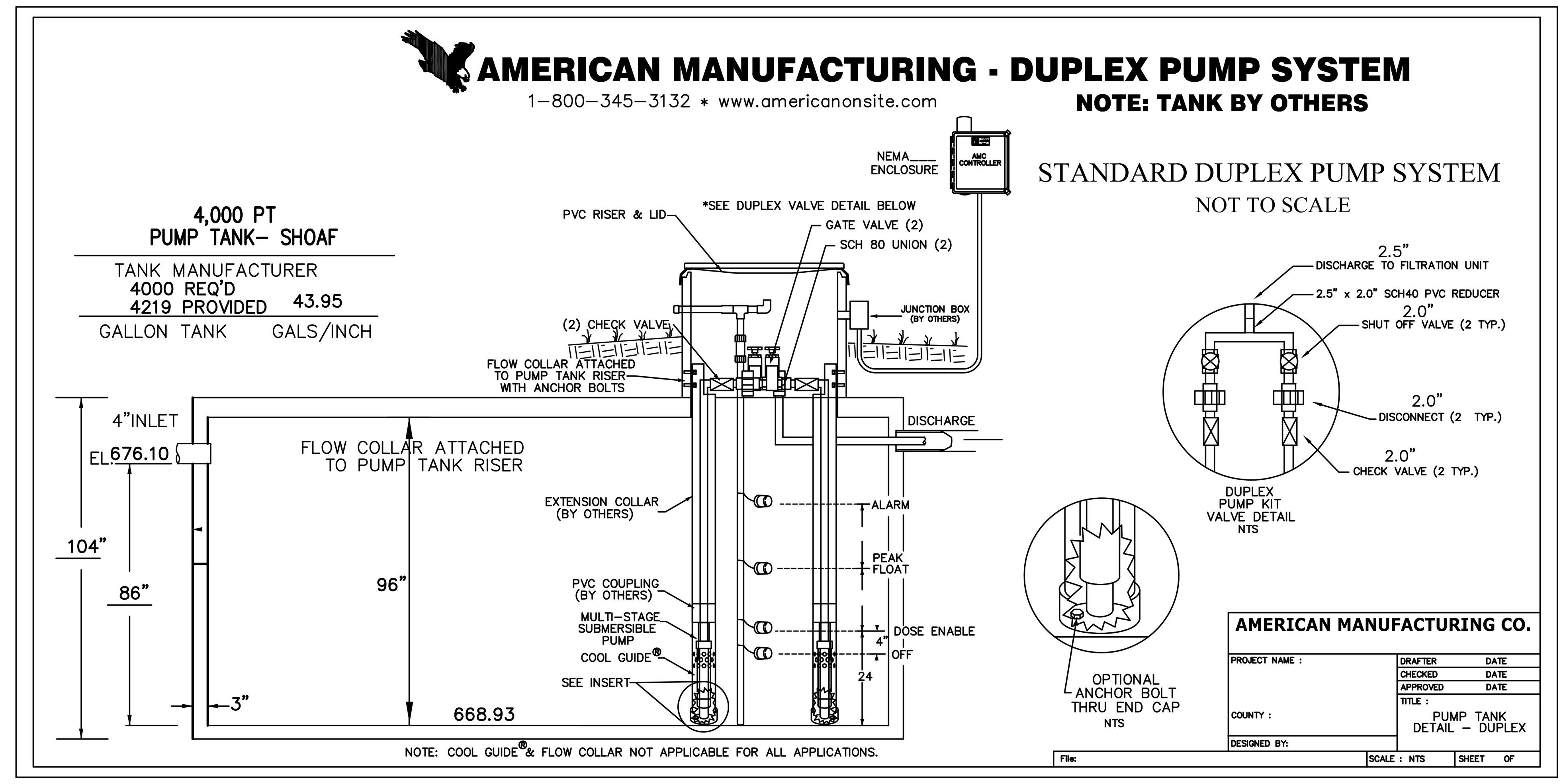
NO:	DATE:	DESCRIPTION:
1.	5-26-17	CHANGED DATE - NO REVISIONS

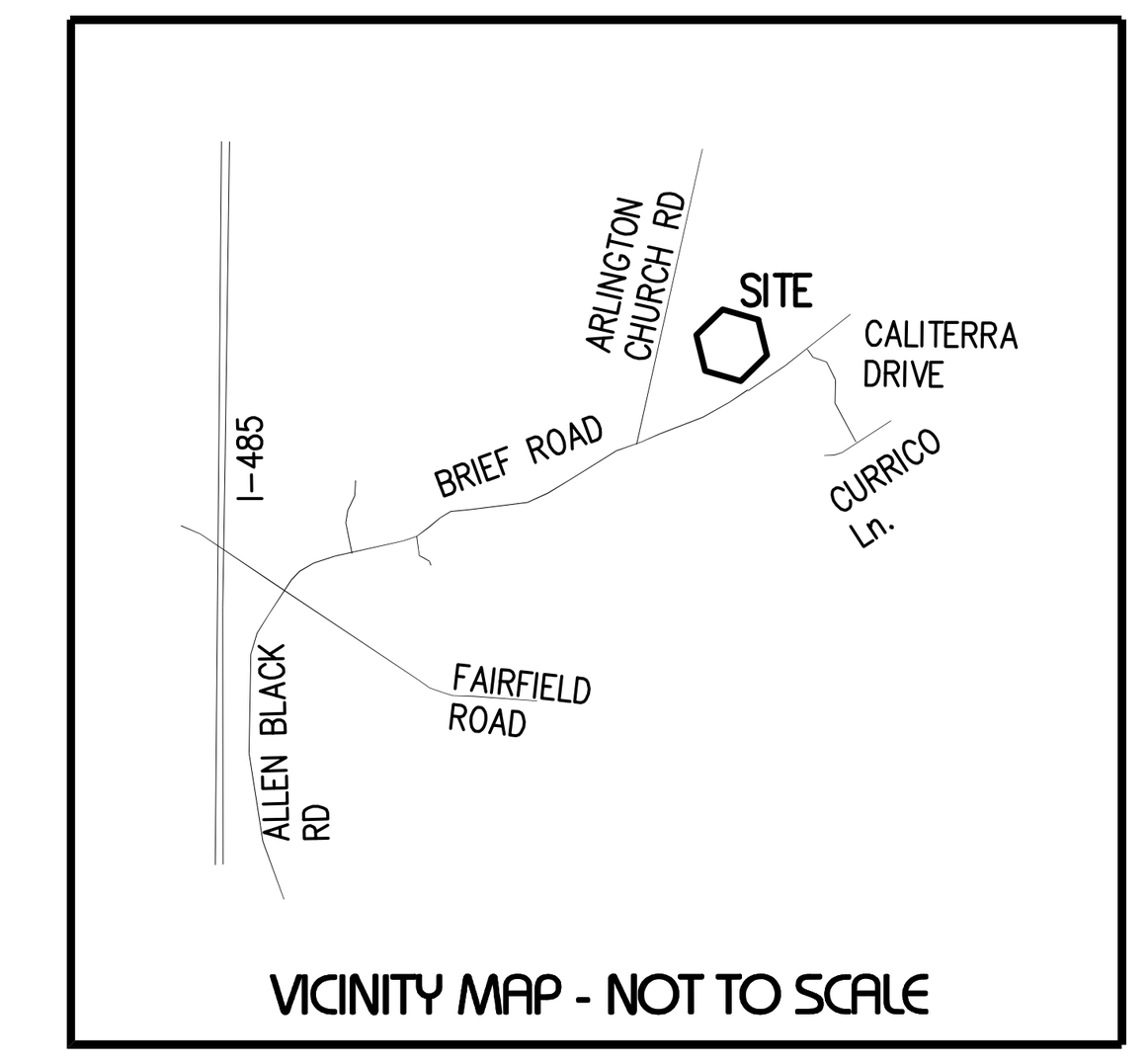
SHEET TITLE:
TREATMENT FACILITY DETAILS

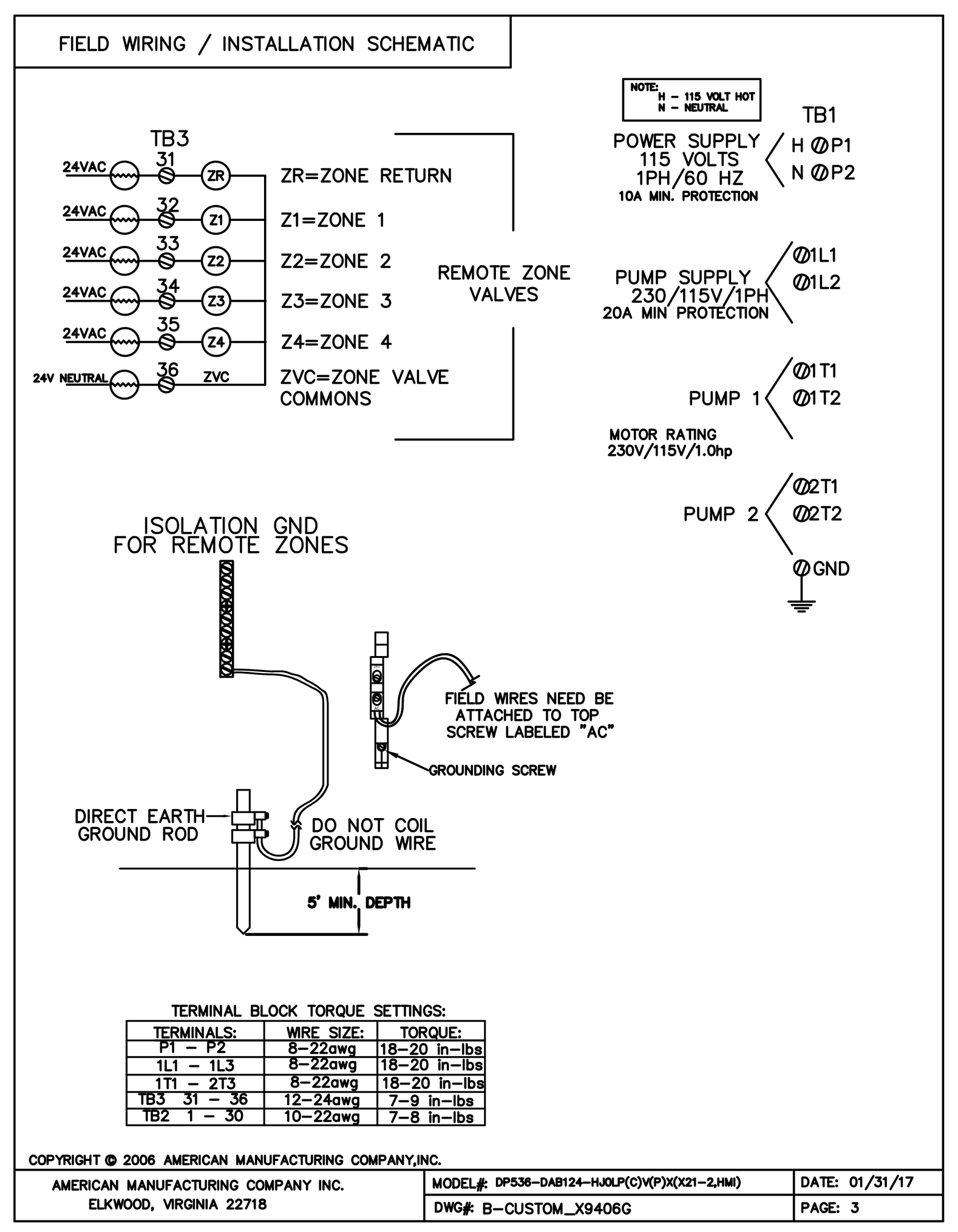
SHEET NO.:
WW-4

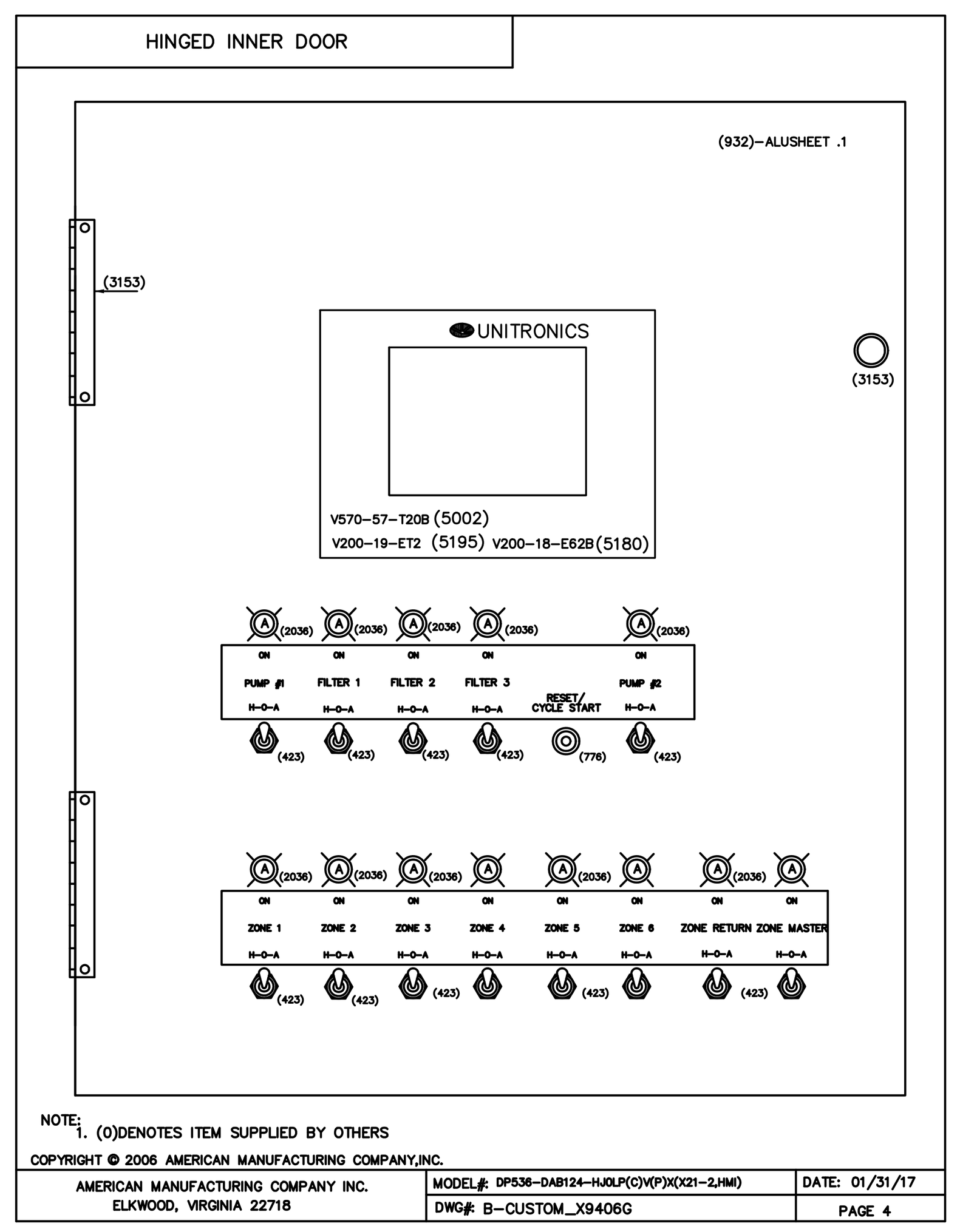




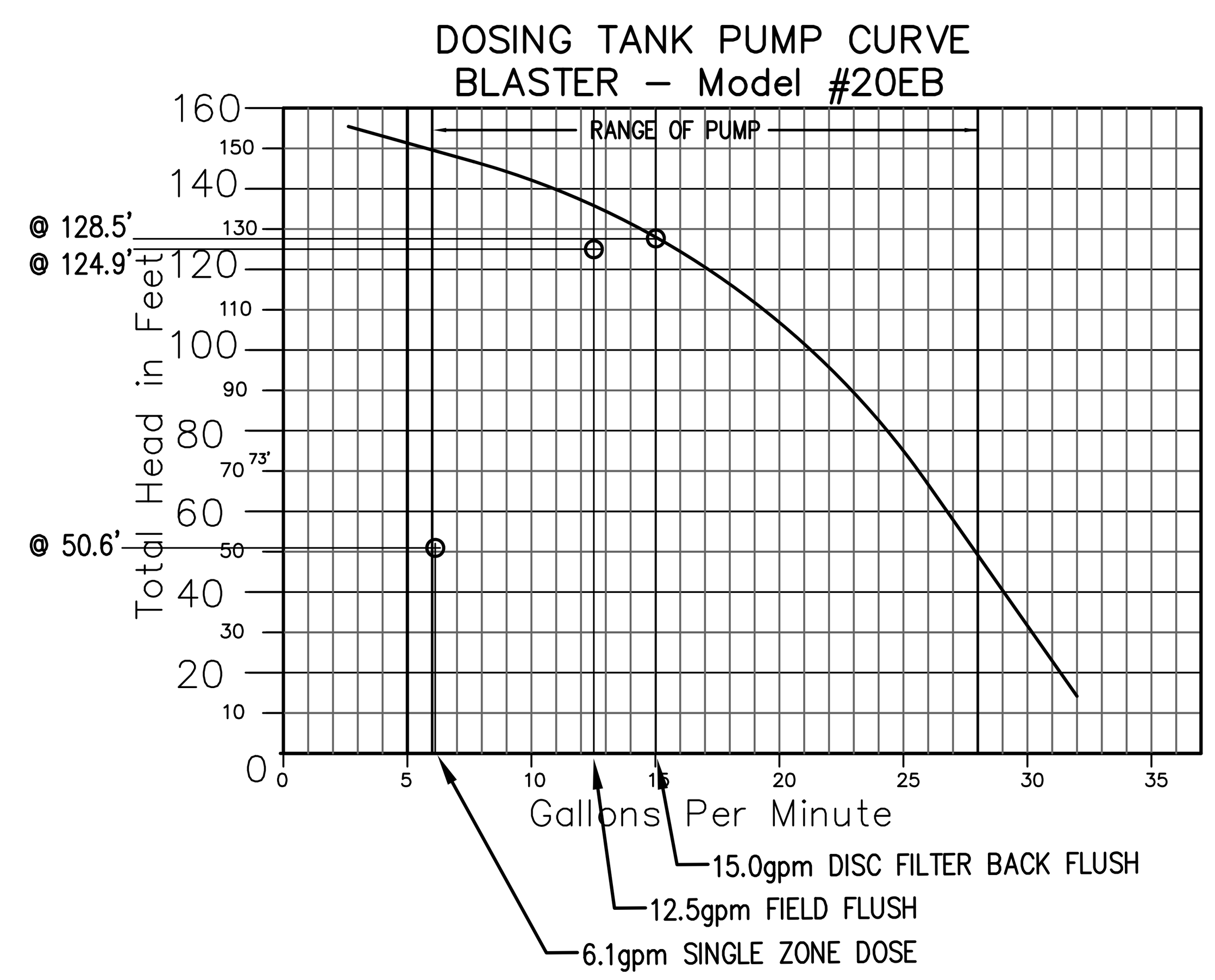


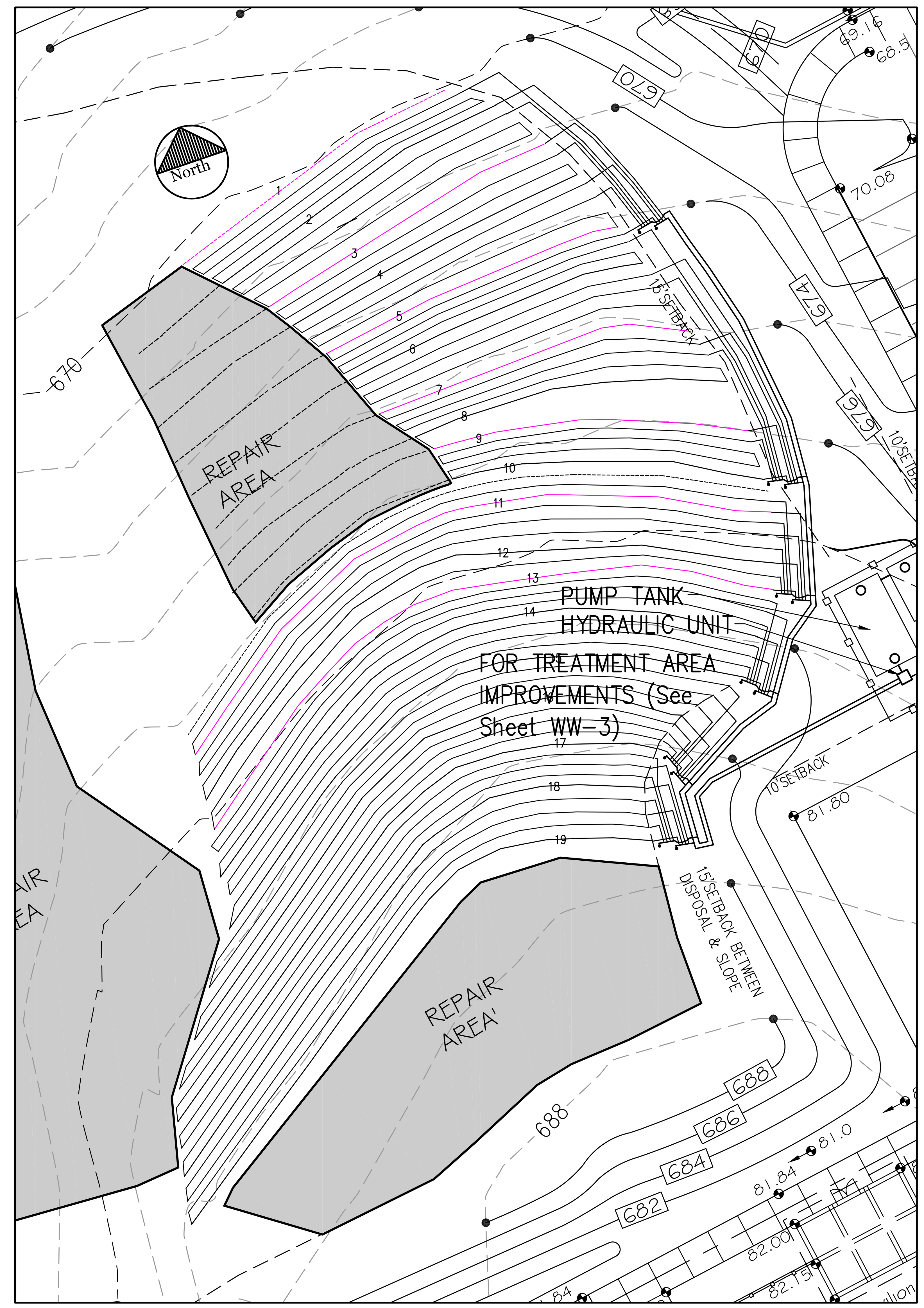


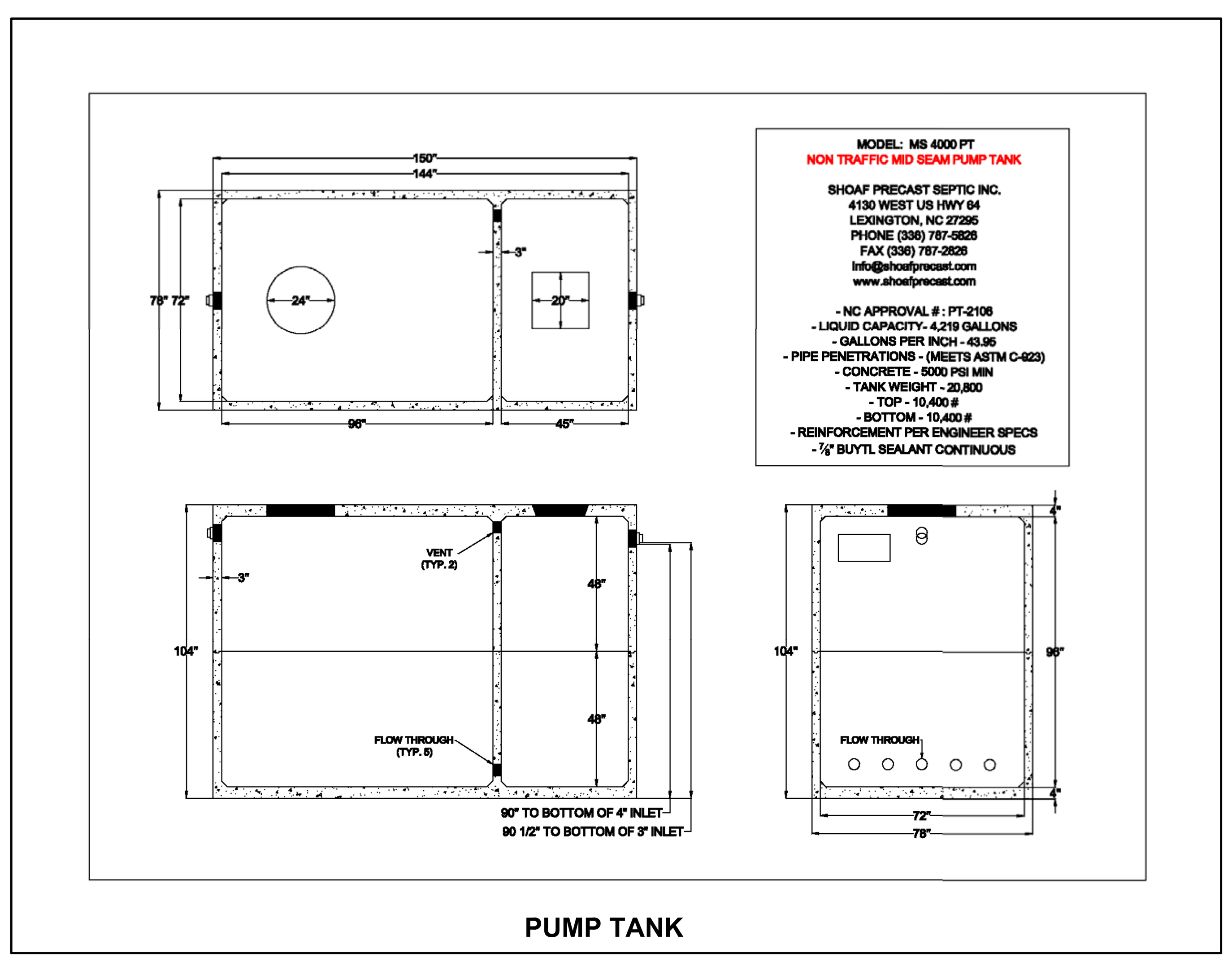




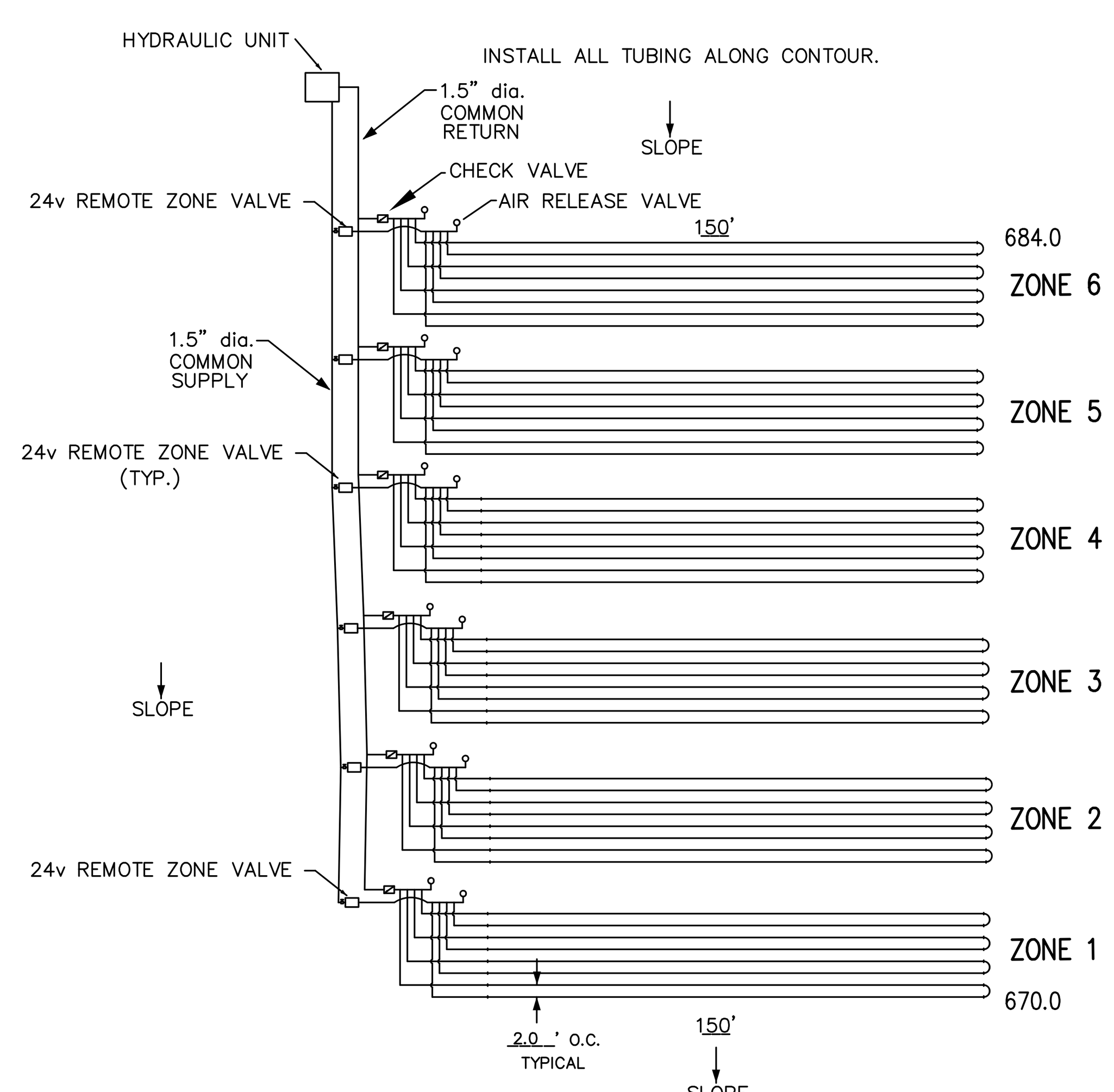
DRIP SYSTEM CONTROL PANEL – AMERICAN MANUFACTURING







PUMP TANK



PREPARED FOR:

THE TOWN OF MINT HILL

4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:

MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:

Wirth & Associates
LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St. Suite 212
Charlotte, NC 28208
Phone: 704–375–1588 Fax: 704–375–3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL SEAL 14265 ENGINEER MICHAEL W. LASH 5/26/17

PROJECT ENGINEER:
MICHAEL LASH, P.E.

THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

DRAWN BY: M.Lash
CHECKED BY: M.Lash
SCALE: 1" = 20'
DATE: 5-26-2017
REVISIONS:

NO: DATE: DESCRIPTION:

1. 5–11–17 RESHAPED DISPOSAL AREA PER SOILS.
2. 5–26–17 INCREASED PUMP TANK SIZE, AND ADJUSTED LAYOUT OF TANKS.

SHEET TITLE:

WASTEWATER DISPOSAL LAYOUT PLAN

SHEET NO.:

WW-5

COLD WEATHER INSTALLATION NOTES (Check all that apply)
Minimum construction techniques for all American "Perc-Rite" Drip systems in cold weather climates:
"Top feed" manifolds should be used on all sites with a discernible slope to allow for proper drainage of the manifolds and the 3/4" and 1/2" lateral connectors into the drip tubing.
The main supply and return lines shall be installed below the frost line and shall feed the shallow "top feed" manifolds with a single vertical section of insulated sch 40 PVC pipe. Insulation shall be minimum 1/2" thick foam insulation (or equivalent).
On flat sites where "top feed" manifolds will not drain therefore requiring the use of side feed manifolds, 12" cover is recommended between highest point of 1/2" black flexible PVC pipe (non loop connections) and final grade. On drip tubing installations less than 12" this would require additional cover over the header ditch area to create the 12" separation. Any additional cover is it to be graded and tapered into landscape. Please see note on loop connections below.
Dense vegetation turf cover to be established over supply trench, return trench and tubing prior to 1st exposure to cold weather. If vegetation cannot be established, then trenches and tubing to be covered with a thick layer (minimum 6") of mulch, straw/hay, etc. until such turf cover is established. Cover must be stabilized and maintained until dense vegetative turf is established. Amount of cover may need to be adjusted to account for settling.
All valve boxes that house "remote zone valves" shall be insulated by contractor. Insulation to consist of either blue board, bagged Styrofoam peanuts or equivalent. If fiberglass insulation is used it must be sealed to prevent it from becoming saturated. The "remote valves" shall be placed on a bed of gravel or screenings (4"-6"). Positive grade away from valve boxes is encouraged to reduce the volume of groundwater that may collect in valve box. Certain sites may require positive drains to daylight.
All loops connecting drip runs with 1/2" flexible PVC shall be slightly elevated (minimum 1"-2") so that they drain into the drip tubing after the pump shuts off. It is contractors responsibility to ensure these loops stay elevated during and after the loops are backfilled.
All main supply and return trenches to be installed below the local frost line. If this is not possible due to site restrictions then adequate soil must be added over the top of the trenches so that the effective depth remains below the frost line after settling occurs. The added soils must be prepared for turf cover and stabilized. If vegetation cannot be established then trenches are to be covered with an additional layer (minimum 6") of mulch, straw/hay, etc. until such turf cover is established.
Sufficient ground cover around the hydraulic unit is required to insulate the unit. All pipes entering and leaving the hydraulic unit shall elbow vertically down 90 degrees to a depth below the frost line prior to extending away from the unit horizontally. Additional insulation inside the hydraulic unit is encouraged. Insulation to consist of either blue board, bagged Styrofoam peanuts or equivalent. If fiberglass insulation is used it must be sealed to prevent it from becoming saturated.
All conduit entering into the control panel shall be sealed to prevent condensation inside the panel.
Established vegetation height shall be minimum 4"-6" throughout winter months.
Air release valves shall be placed below the ground surface inside a valve box but at an elevation above the highest drip line in that particular zone.

GENERAL CONSTRUCTION NOTES
AMERICAN MANUFACTURING "Perc-Rite® Drip

1. All installation and construction techniques shall conform to state and county codes pertaining to on site sewage systems and the permit for this site.
2. The installation of this system shall be in accordance with specifications and procedures as supplied by the Manufacturer of the equipment.
3. The drip tubing shall be installed using a vibratory plow, trencher, or by hand.
4. All tubing to be installed along contour.
5. All PVC pipe and fittings shall be PVC SCH 40 Type 1 rated for pressure applications. All glued joints shall be cleaned and primed with purple (dyed) PVC primer prior to being glued.
6. All cutting of PVC pipe, flexible PVC and dripper tubing of size 1 1/2" or smaller shall be accomplished with pipe cutters approved by American Manufacturing Company, Inc. No sawing of PVC, flexible PVC or dripper tubing of size 1 1/2" or smaller allowed.
7. All PVC pipe, flexible PVC and dripper tubing in the work area shall have the ends covered with duct tape to prevent construction debris from entering the pipe. Prior to gluing, all joints shall be inspected for and cleared of any construction debris.
8. All automatic valves (zone valves & field flush return valves) shall be installed with isolation valves, bypass valves, and disconnects (i.e. unions, flanges) for manual field operation during field maintenance events. All valves must be provided with at-grade access.
9. Drain field supply and return lines and manifolds to be installed at adequate depth to prevent freezing. Horizontal spacing between the dripper lines and the installation depth to be as specified.
10. No activity on drain field area other than minimum required to install system. Do not park equipment, drive large equipment over or store materials on drain field area.
11. No wet weather installation is permitted.
12. The contractor shall be certified by American Manufacturing Company, Inc. to install this type of system and shall hold a pre-construction meeting with the individuals responsible for soil evaluation, permitting and inspections prior to site work beginning to insure protection of the site conditions and to ensure the system is installed according to design.
13. If site conditions are determined to require the installation of the system to deviate from these plans, all work shall stop immediately and the designer shall be notified. Any ongoing work shall be at the sole responsibility of the contractor.
14. All force mains shall be tested for leaks prior to drip tubing installation and prior to system startup. Uncovered force mains shall be visibly inspected for leaks. If a leak is suspected in covered force mains then the force main shall be re-tested at a minimum pressure of at least percent above the design operating pressure, for at least 30 minutes. There shall be no discernible leakage.
15. ASD15 & 25 Hydraulic units to be placed on a bed of gravel for drainage.
16. If standing groundwater is a problem a screened drain to daylight is required.

DRIP TUBING SHALL BE:
1. AMERICAN PERC-RITE SUBSURFACE DRIP SYSTEM by American Manufacturing Company in accordance with Innovative Wastewater System Approval No. IWWS-93-R6B
2. NETAFIM PC DRIPLINE with pressure compensating emitters spaced uniformly in the tubing at 24" o.c.
3. Each run of tubing must be installed dead level. Lateral/Run locations may need to be spread out further to keep lines more on contour. The location of the field lines must be field-staked (at least every 4 lateral "runs" along contour), and field verified to be acceptable, and acceptable depth range kept within field-specified tolerances.

SITE CLEARING GUIDELINES (Check all that apply)
General guidelines for preparing/clearing a site for installation of an American Mfg. "Perc-Rite®" Drip System:

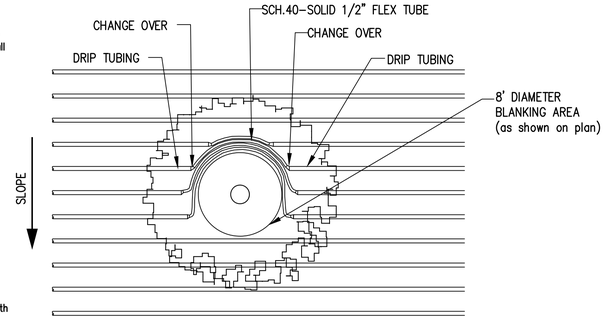
* **GENERAL REQUIREMENTS:**
The preservation of the original structure of the soil in the absorption area is essential to maintaining the percolative capacity of the soil. No activity other than the construction of the system is permitted within the absorption area. On sites where a majority of the vegetation needs to be removed, care must be taken to minimize the impact on the soils natural permeability. There shall be no cutting, filling, or storage of material on or within 20' of the adsorption area. Site clearing and preparation shall be performed by the installation contractor for the wastewater dispersal system.
The absorption system is not to be constructed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. The plastic limit is exceeded when the soil can be rolled between the palms of the hands to produce threads 1/8 inch in diameter without breaking and crumbling.
After installation of the dispersal system, or if after clearing installation is not to be performed for 60 days, seed the area liberally with native grasses. The standard Department Of Transportation specification is acceptable consisting of perennial rye and fescue. At all times protect the installation area from erosion. Local codes shall apply for best management practices to control runoff.

* **SHALLOW INSTALLATIONS (surface to 8"):**
Clearing and removal should be by hand with minimal machine assistance and under optimum soil moisture conditions. Track machines are preferred to those with rubber tires and should only be used around edges of installation. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

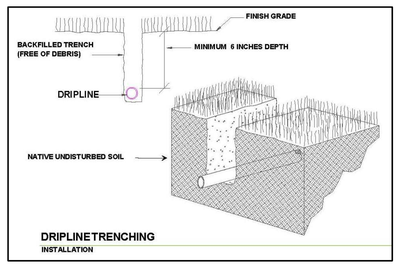
MID RANGE INSTALLATIONS (12" TO 24"):
All trees and brush, as necessary, should be "pulled out" (grubbed out) or cut flush with the ground surface. Stumps may be ground to two inches below the installation depth and the hole backfilled with sandy material to 6" above installation depth and the remainder with natural soil. When the soil is disturbed at the installation depth by pulling a stump, backfill the hole with sandy material to 6" above installation depth and the remainder with natural soil. Digging and pushing over trees may be more detrimental to the soils infiltrative characteristics. Track machines are preferred to those with rubber tires and should only be used during optimal soil moisture conditions. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

DEEP INSTALLATIONS (30" and deeper):
All trees and brush, as necessary, should be removed. When the soil is disturbed at the installation depth, backfill the hole with sandy material to 6" above installation depth and the remainder with natural soil. Stumps may be ground to two inches below the installation depth and the hole backfilled with sandy material to 6" above installation depth and the remainder with natural soil. Digging and pushing over trees may be more detrimental to the soils infiltrative characteristics than "pulling" and are not recommended. Track machines are preferred to those with rubber tires and should only be used during optimal soil moisture conditions. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

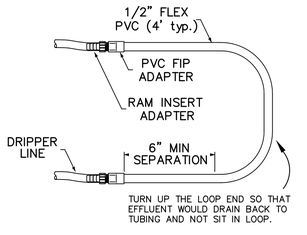
* **LARGE SCALE INSTALLATION TESTING:**
Larger systems typically do not have water available for zone installation testing on a timely manner. It is desirable to water test an installed zone while the supply and return manifold header ditches are exposed to better inspect for leaks. In order to facilitate site and equipment protection and erosion control, the installation contractor shall provide sufficient water and the means to deliver and monitor the water to both flush and leak test each zone or subzone prior to backfill. The flushing volume shall be five times the volume of the piping network being flushed. The flushing velocity shall be in excess of 2-1/2 feet per second. The leak testing volume shall be at least 3 times the volume of the pipe. The leak test shall continue until steady state flow is achieved and the flow rate is within 6% of the design flow rate or as approved by the manufacturer or engineer. After successful testing and inspection the supply and return pipe connection points shall be sealed and protected from dirt and debris from entering prior to final connection.



Disposal Field Tree Blanking Detail

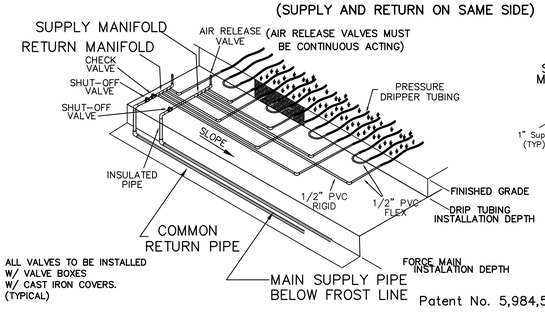


DRIPLINE TRENCHING
INSTALLATION



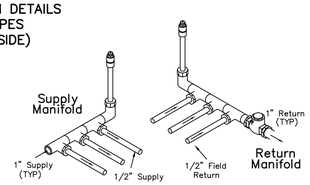
BURIED DRIP LOOP CONNECTION NTS

STANDARD RESIDENTIAL DRIP SYSTEM DETAILS
FOR SITES WITH DISCERNIBLE SLOPES
(SUPPLY AND RETURN ON SAME SIDE)



ALL VALVES TO BE INSTALLED
W/ VALVE BOXES
W/ CAST IRON COVERS.
(TYPICAL)

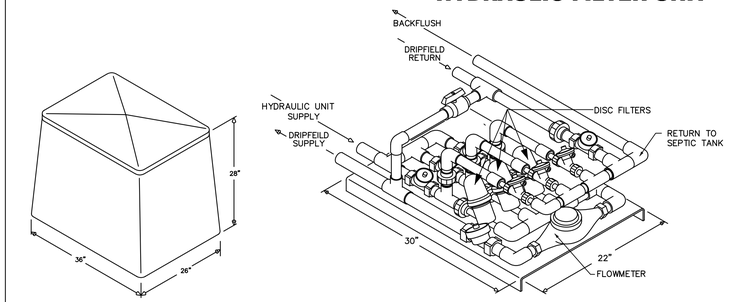
Patent No. 5,984,574



TOP FEED SUPPLY MANIFOLD AND 1/2" LATERAL SUPPLIES TO BE PLACED ABOVE DRIP TUBING AND MUST DRAIN INTO THE DRIP TUBING AFTER EACH DOSE.

DUE TO NECESSARY LINE DEPTH VARIATIONS (in order to "fit" site constraints and to keep each lateral dead level), THE MINIMUM INSTALLATION DEPTH COULD BE REDUCED TO 3" (requiring cover to be added over any areas where the drip tubing depth is less than 6"deep).

AMERICAN MANUFACTURING - PERC RITE DRIP MODEL ASD25 HYDRAULIC FILTER UNIT
1-800-345-3132 * www.americanonsite.com

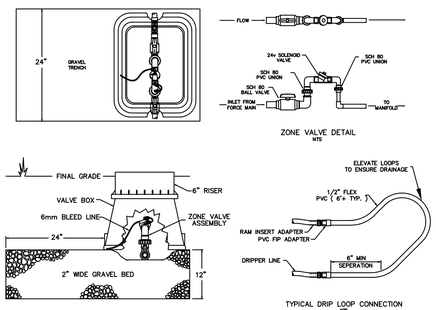


ASD25-HYDRAULIC FILTER UNIT
w/ FIBERGLASS ENCLOSURE
NOT TO SCALE

AMERICAN MANUFACTURING CO.

PROJECT NAME :	DRAFTER DATE
	CHECKED DATE
	APPROVED DATE
COUNTY :	TITLE : Hyd. Unit Detail
DESIGNED BY:	
File:	SCALE : NTS SHEET OF

AMERICAN MANUFACTURING - DRIP SYSTEM DETAILS
1-800-345-3132 * www.americanonsite.com



NOT TO SCALE

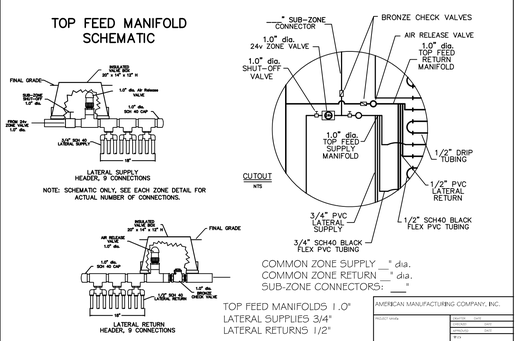
STANDARD REMOTE ZONE VALVE &
MANIFOLD CONNECTION DETAILS

AMERICAN MANUFACTURING CO.

PROJECT NAME :	DRAFTER DATE
	CHECKED DATE
	APPROVED DATE
COUNTY :	TITLE : PUMP TANK DETAIL - DUPLEX
DESIGNED BY:	
File:	SCALE : NTS SHEET OF

SCHEMATIC - NOT TO SCALE

TOP FEED MANIFOLD SCHEMATIC



AMERICAN MANUFACTURING COMPANY, INC.	
PROJECT NAME :	DRAWN BY:
	CHECKED BY:
	APPROVED BY:
COUNTY :	TITLE : ZONE DETAIL
DESIGNED BY:	
File:	SCALE: SHEET:

PREPARED FOR:
THE TOWN OF MINT HILL
4430 Mint Hill Village Lane
Mint Hill, NC 28227

PROJECT:
MINT HILL ATHLETIC PARK
9801 Brief Road
Charlotte, NC 28227

PREPARED BY:
Wirth & Associates
LANDSCAPE ARCHITECTS AND LAND PLANNERS
1230 W. Morehead St, Suite 212
Charlotte, NC 28208
Phone: 704-375-1588 Fax: 704-375-3844
Email: gwirth@wirthassociates.com

LASH ENGINEERING
Consulting Civil Engineer/Planner
1104 Cindy Carr Drive
Matthews, N.C. 28105
Phone: 704/847-3031
email: mikel@lashengineering.com
Firm License #C-2433

NORTH CAROLINA PROFESSIONAL SEAL 14265 ENGINEER MICHAEL W. LASH 5/26/17

PROJECT ENGINEER:
MICHAEL LASH, P.E.

THESE DRAWINGS AND THE DESIGN SHOWN THEREON ARE INSTRUMENTS OF LASH ENGINEERING, INC. THE REPRODUCTION OR UNAUTHORIZED USE OF THE DOCUMENTS WITHOUT THE CONSENT OF LASH ENGINEERING, INC. IS PROHIBITED.

DRAWN BY: M.Lash
CHECKED BY: M.Lash
SCALE: As Shown
DATE: 5-26-17
REVISIONS:
NO: DATE: DESCRIPTION:
1. 5-26-17 CHANGED DATE - NO REVISIONS.

SHEET TITLE:
DISPOSAL LAYOUT DETAILS

SHEET NO.:
WW-6