

| LEGEND | |
|---------|-----------------------------------|
| SYMBOL | DESCRIPTION |
| --- | EXISTING CONTOUR 2' INTERVAL |
| --- | PROPOSED CONTOUR 2' INTERVAL |
| 362.5 | SPOT ELEVATION |
| -OF-OF- | DIVERSION FENCE |
| -SF-SF- | SUPER SILT FENCE |
| -SF-SF- | SILT FENCE |
| --- | EROSION CONTROL MATTING |
| --- | LIMITS OF DISTURBANCE |
| --- | SPECIMEN TREE |
| --- | TEMPORARY STONE OUTLET STRUCTURES |
| 1005 | FAILED PERC HOLE |
| 1001 | PASSED PERC HOLE |

VICINITY MAP
SCALE: 1" = 2000'
HO. CO. MD. ADC MAP 4934, GRID C3

- BAT NOTES**
- ANY CHANGE TO THE LOCATIONS OR DEPTHS TO ANY COMPONENTS MUST BE APPROVED BY THE ENGINEER AND THE HOWARD COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION. A REVISED SITE PLAN MAY BE REQUIRED.
 - SINCE COVER OVER THE BAT AND PUMP TANK EXCEEDS 3 FEET, TRAFFIC BEARING TANKS TO BE INSTALLED.
 - THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
 - THE BAT SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
 - WITHIN ONE MONTH OF INSTALLATION, A PERSON INSTALLING THE BAT SYSTEM SHALL REPORT TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) IN A MANNER ACCEPTABLE TO MDE, THE ADDRESS AND DATE OF COMPLETION OF THE BAT INSTALLATION AND THE TYPE OF BAT INSTALLED.
 - ANY ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN.
 - AN AGREEMENT AND EASEMENT HAS BEEN COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, LIBER 1, FOLIO 1.
 - THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
 - SURFACE RUNOFF SHALL BE DIRECTED AROUND THE BAT TANK.

SEPTIC SYSTEM ELEVATIONS

FFE = 418.79
BSE = 408.60
INV. OUT OF HOUSE = 405.4
PROP GROUND AT C/O = 407.9
INTO C/O = 405.3
INV. OUT OF C/O = 405.2
PROP GROUND AT BAT TANK = 406.9
TOP OF BAT TANK = 405.8
COVER OVER BAT TANK = 1.1 FT
INVERT INTO BAT TANK = 404.80
INVERT OUT OF BAT TANK = 404.4
PROP GROUND AT PUMP TANK = 406.9
TOP OF PUMP TANK = 405.7
COVER OVER PUMP TANK = 1.20 FEET
INVERT INTO PUMP TANK = 404.4
INVERT OUT OF PUMP TANK = 408.2

SEWAGE DISPOSAL SYSTEM DATA (INITIAL)
6 BEDROOMS
LOADING RATE = 6 BEDROOMS X 150 GPD/BEDROOM = 900 GPD
APPLICATION RATE = 1.2
EFFECTIVE SIDEWALL BEGINS AT 2 FEET
TRENCH DEPTH = 5 FEET
TRENCH WIDTH (W) = 3 FEET
EFFECTIVE DEPTH (D) = 3 FEET
SF OF DRAINFIELD = 900 GPD / 1.2 = 750 SF
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = $(W+2)/(W+1+2D) = (3+2)/(3+1+(2*3)) = 0.50$
TRENCH LENGTH = 750 SF X 0.50 / 3 = 125 FEET
TRENCH SPACING = 2D+W = ((2*3) + 3) = 9 USE 10'

SEWAGE DISPOSAL SYSTEM DATA (FIRST REPLACEMENT)
6 BEDROOMS
LOADING RATE = 6 BEDROOMS X 150 GPD/BEDROOM = 900 GPD
APPLICATION RATE = 1.2
EFFECTIVE SIDEWALL BEGINS AT 2.5 FEET
TRENCH DEPTH = 5 FEET
TRENCH WIDTH (W) = 3 FEET
EFFECTIVE DEPTH (D) = 2.5 FEET
SF OF DRAINFIELD = 900 GPD / 1.2 = 625 SF
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = $(W+2)/(W+1+2D) = (3+2)/(3+1+(2*2.5)) = 0.556$
TRENCH LENGTH = 750 SF X 0.556 / 3 = 139 FEET
TRENCH SPACING = 2D+W = ((2*2.5) + 3) = 8 USE 10'

SEWAGE DISPOSAL SYSTEM DATA (FIRST REPLACEMENT)
6 BEDROOMS
LOADING RATE = 6 BEDROOMS X 150 GPD/BEDROOM = 900 GPD
APPLICATION RATE = 1.2
EFFECTIVE SIDEWALL BEGINS AT 3 FEET
TRENCH DEPTH = 5 FEET
TRENCH WIDTH (W) = 3 FEET
EFFECTIVE DEPTH (D) = 2 FEET
SF OF DRAINFIELD = 900 GPD / 1.2 = 625 SF
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = $(W+2)/(W+1+2D) = (3+2)/(3+1+(2*2)) = 0.625$
TRENCH LENGTH = 750 SF X 0.625 / 3 = 156.25 FEET
TRENCH SPACING = 2D+W = ((2*2) + 3) = 7 USE 10'

Approved Septic System Plan
Howard County Health Department
Signature: [Signature] Date: 9/14/2020

BAT SITE PLAN
CHAPEL RISE, LOT 2
11540 CHAPEL RISE
ZONED RC-DEO PLAT NO. 22022
TAX MAP NO.: 29 GRID NO'S.: 8 & 14
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JUNE 30, 2020
SHEET 1 OF 2

TRENCH DESIGN

| TRENCH | GROUND ELEV. | TOP OF STONE ELEV. | PIPE INVERT ELEV. | DEPTH TO STONE FROM GROUND | DEPTH OF STONE | BOTTOM OF TRENCH ELEV. | EFFECTIVE DEPTH STARTS AT | EFFECTIVE DEPTH (D) | TRENCH DEPT. | WIDTH OF TRENCHES (W) | TRENCH SPACING |
|--------|--------------|--------------------|-------------------|----------------------------|----------------|------------------------|---------------------------|---------------------|--------------|-----------------------|----------------|
| 1A | 420.7 | 419.2 | 418.7 | 1.5' | 3.5' | 415.7 | 2' | 3' | 5' | 3.0' | 10' |
| 1B | 420.1 | 419.6 | 418.1 | 1.5' | 3.5' | 415.1 | 2' | 3' | 5' | 3.0' | 10' |

LOW PRESSURE DOSING SYSTEM - INITIAL INSTALLATION

| TRENCH | GROUND ELEV. | PIPE INVERT ELEV. | TRENCH LENGTH (FT) | LATERAL PIPE LENGTH (FT) | PERFORATION DIAMETER (IN) | HEAD (FT) | PERFORATION FLOW RATE (GPM) | PERFORATION SPACING (FT) | NUMBER OF ORIFICES | TRENCH FLOW RATE (GPM) |
|--------------------------------|--------------|-------------------|--------------------|--------------------------|---------------------------|-----------|-----------------------------|--------------------------|--------------------|------------------------|
| 1A | 420.7 | 418.7 | 62.5 | 59.66 | 5/16 | 2 | 1.63 | 5.68 | 11 | 17.93 |
| 1B | 420.1 | 418.1 | 62.5 | 59.36 | 5/16 | 2.6 | 1.85 | 6.25 | 10 | 18.50 |
| TOTAL TRENCH FLOW RATE: | | | | | | | | | | 36.43 |

FRICTION LOSS IN 2" PIPE FITTINGS:
 3 1/2" HB x 4 FEET PER FITTING = 12 EQUIVALENT FEET OF PIPE
 1 TE/CROSS x 11 FEET PER FITTING = 11 EQUIVALENT FEET OF PIPE
 1 UNION x 2 FEET PER FITTING = 2 EQUIVALENT FEET OF PIPE
 1 ELBOWS x 9 FEET PER FITTING = 9 EQUIVALENT FEET OF PIPE
TOTAL EQUIVALENT FEET OF PIPE = 34 FT

TOTAL LINEAR FEET OF 2" SCH. 40 PVC = 116.9 LF + 34 LF = 150.9 LF

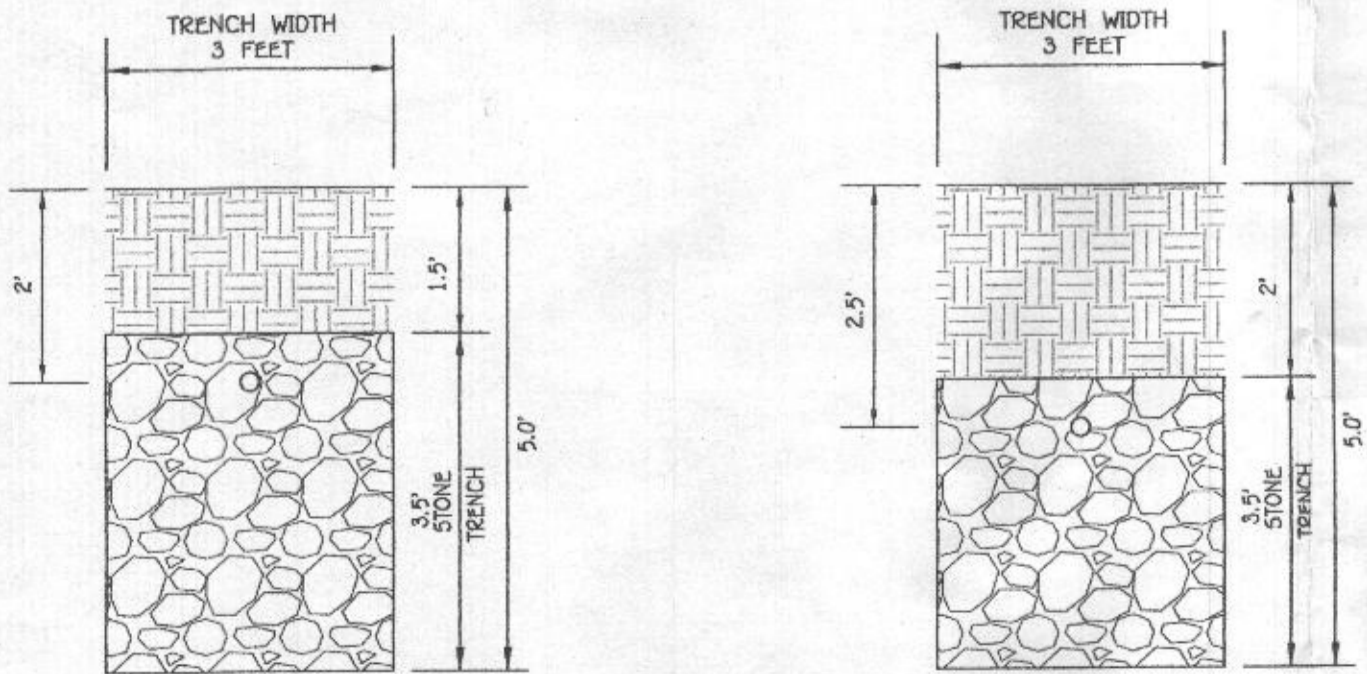
DYNAMIC HEAD
 150.9 LF X 1.5 FT PER 100 LF OF PIPE = 2.3 FT OF FRICTION HEAD
 VERTICAL FROM PUMP OFF TO DISCHARGE = 5.6 FT OF STATIC HEAD
 VERTICAL FROM DISCHARGE TO HIGHEST ELEV OF MAIN = 12.5 FT
TOTAL DYNAMIC HEAD = 22.4 FT

PIPE VOLUMES
 116.9 LF (2" SCH. 40 PIPE) X 17.4 GALLONS PER 100 LF = 20.3 GALLONS
 119 LF (1.5" SCH. 40 PIPE) X 10.6 GALLONS PER 100 LF = 12.6 GALLONS

MINIMUM DOSE
 MINIMUM DOSE = (5 X LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
 = (5 X 12.6) + (20.3)
 = 83.4 GALLONS

83.4 GALLONS IS LESS THAN 1/6 DESIGN FLOW (900/6=150)
 USE 182.2 GALLON DOSE (150 GALLON MINIMUM)
 (RUN TIME = 5 MIN (36.43 GPM X 5 = 182.2 GALLON DOSE))

PUMP NEEDS TO HANDLE 36.43 GPM AT 22.4 FT OF HEAD
 USE 0.4 HP (ZOELLER 152 PUMP)



PLAN VIEW
SCALE: 1" = 30'

PROFESSIONAL CERTIFICATION

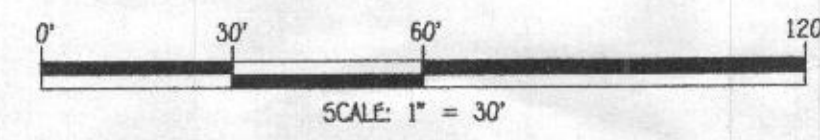
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38386, EXPIRATION DATE: 01/12/2022.

Signature: [Signature] DATE: 9/26/20
Signature Of Professional Engineer

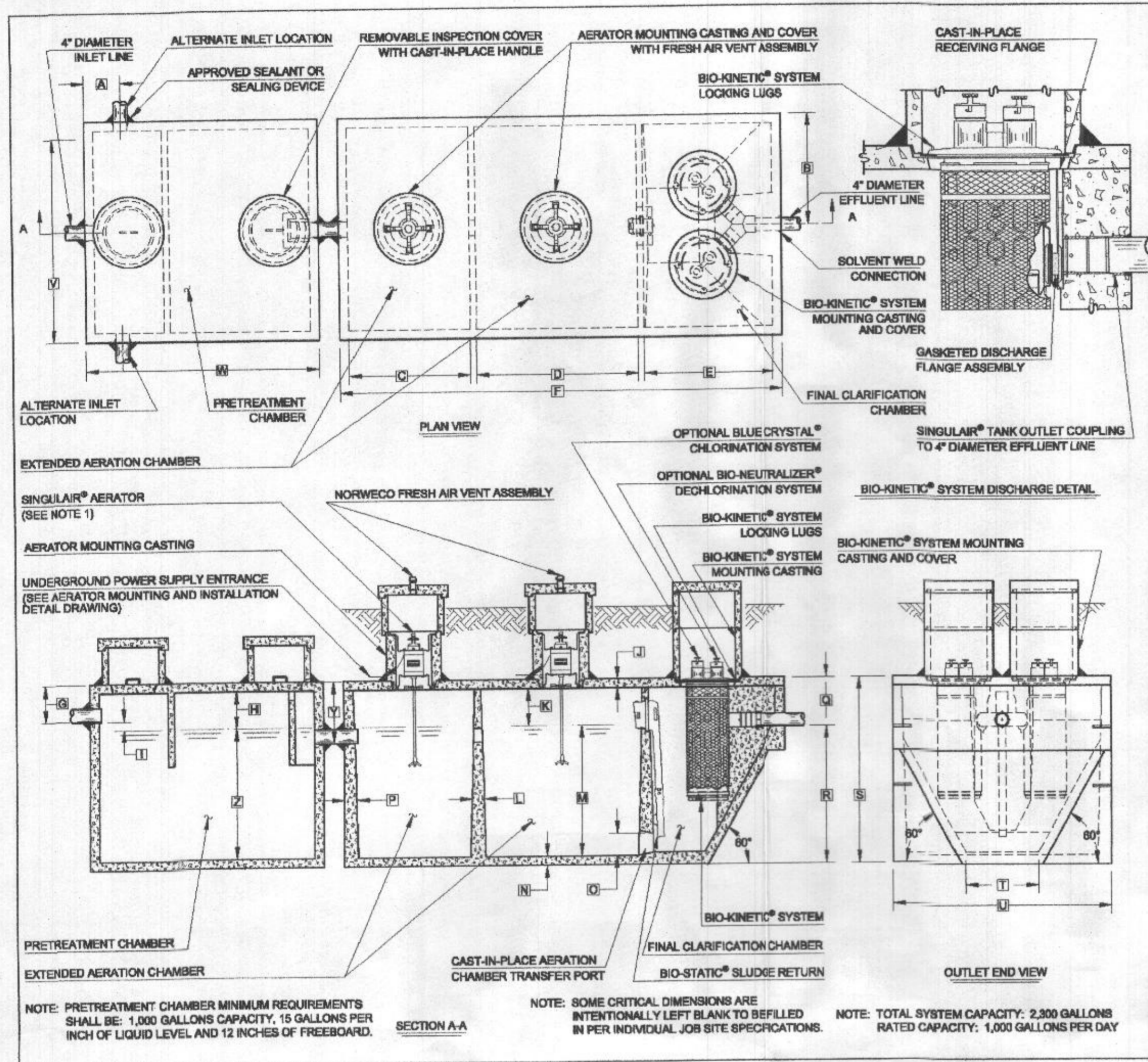


OWNER
 K-ONE CORPORATION
 209 RIVER BEND ROAD
 GREAT FALLS, VA 22066
 (703)-757-8757

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTRAL SQUARE OFFICE PARK - 10572 BALTIMORE NATIONAL PIKE
 ELETT CITY, MARYLAND 21142
 (410) 461-2295



E:\2021\212060\Engineering\Drawings\212060-6010 Chapel Rise Lot 2 12060-6008 Septic Initial Plan.dwg, BAK:SLI, 1:1



GENERAL NOTES:

- SINGULAR® AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 80 MINUTES ON / 80 MINUTES OFF.
- FALL THROUGH SINGULAR® PLANT FROM INLET INVERT TO OUTLET INVERT IS FOUR INCHES. INLET INVERT IS TWELVE INCHES BELOW TANK TOP.
- ON DEEPER INSTALLATIONS, PRECAST RISERS MUST BE USED TO EXTEND AERATOR MOUNTING CASTING AND BIO-KINETIC® SYSTEM MOUNTING CASTING TO GRADE. INSPECTION COVER ON PRETREATMENT CHAMBER MUST BE DEVELOPED TO WITHIN TWELVE INCHES OF GRADE.
- TANK REINFORCED PER ACI STD. 318.
- REMOVABLE COVERS ON RISERS WEIGH IN EXCESS OF SEVENTY-FIVE POUNDS EACH TO PREVENT UNAUTHORIZED ACCESS.
- CONTACT THE LOCAL LICENSED SINGULAR® DISTRIBUTOR FOR ELECTRICAL REQUIREMENTS.

PROJECT ENGINEER'S APPROVAL:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE: _____
NAME: _____

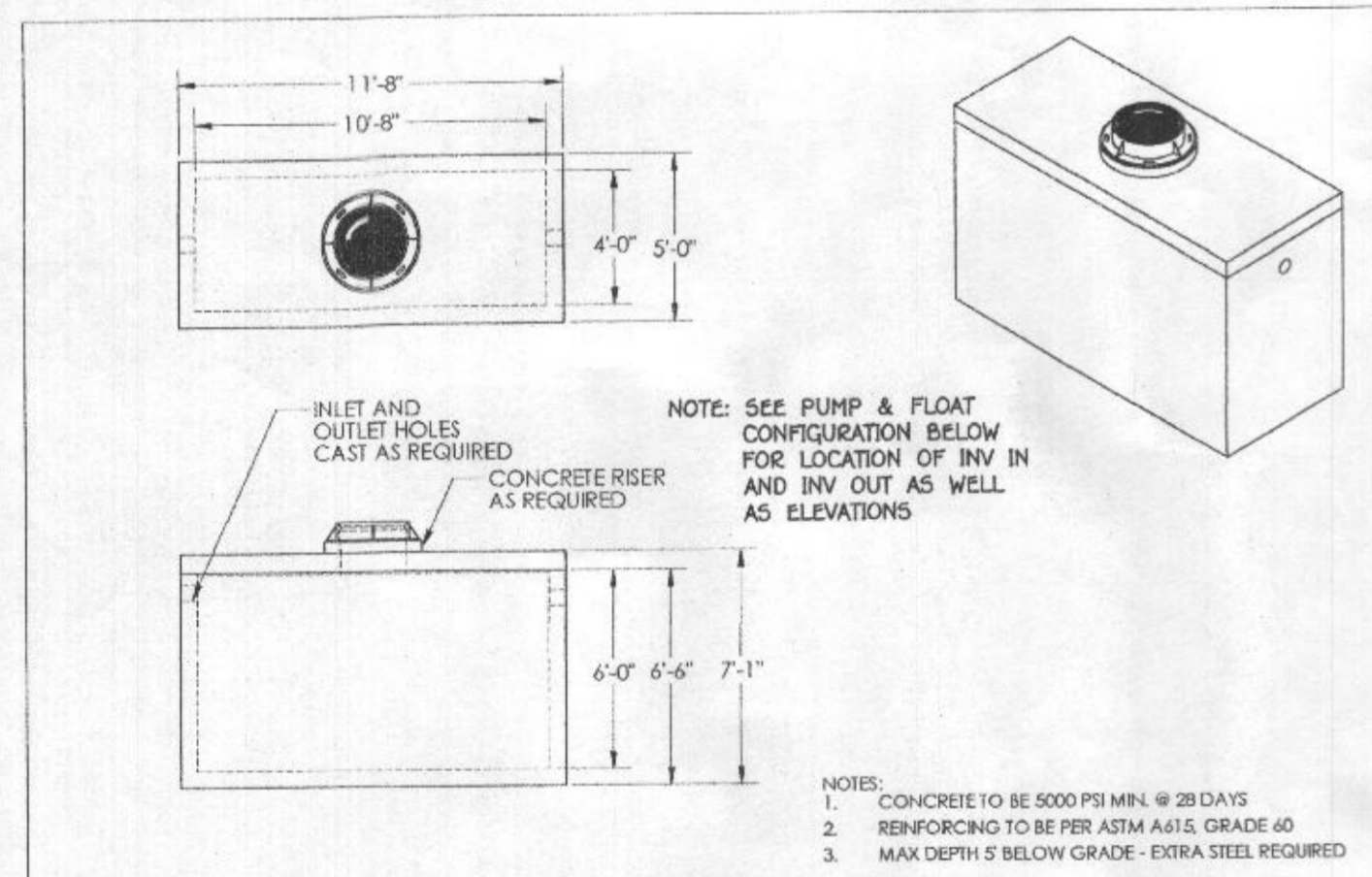
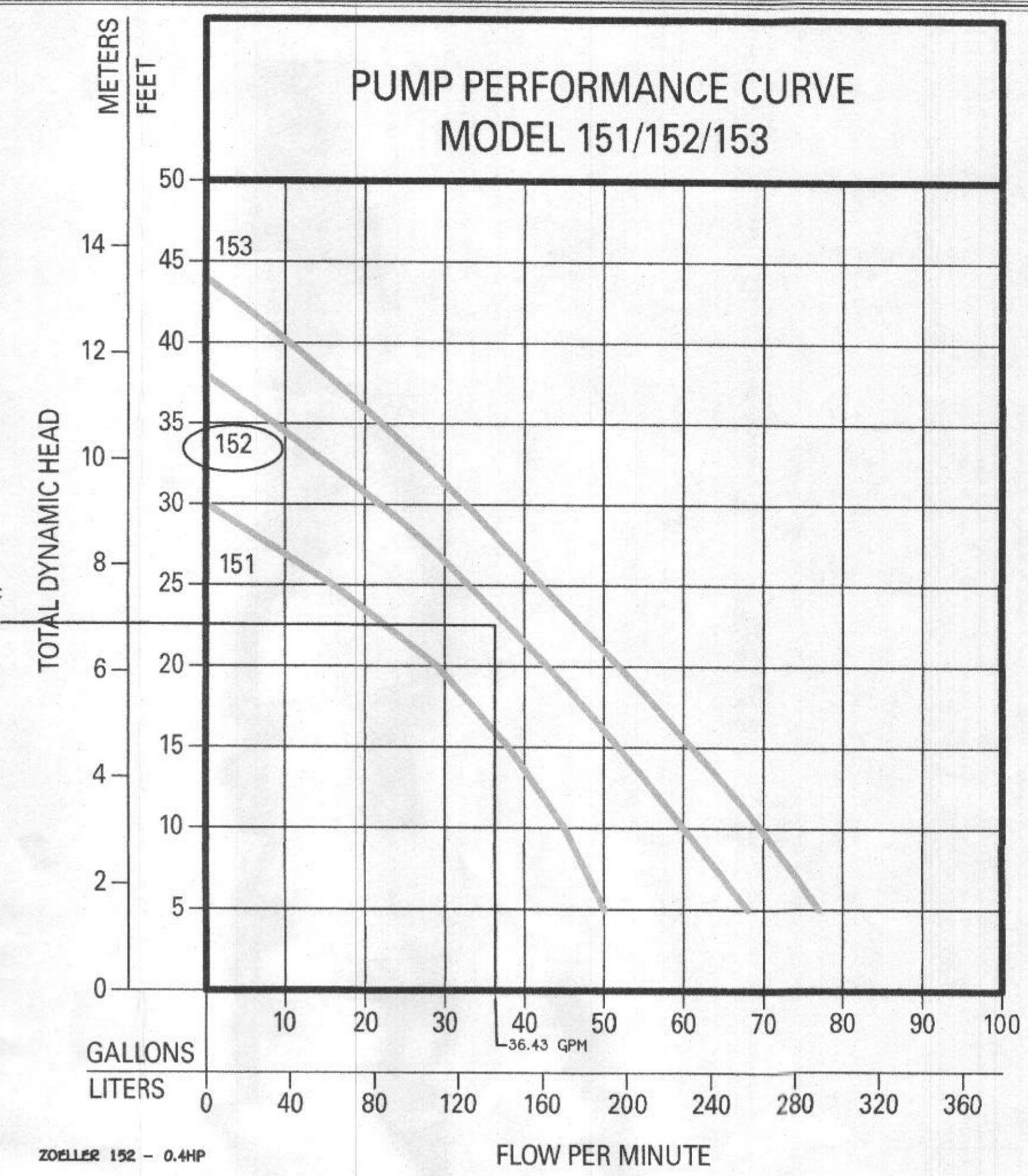
CONTRACTOR'S CERTIFICATION:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE: _____
NAME: _____

| CRITICAL DIMENSIONS | | | |
|---------------------|--------|---|-------|
| A | 1'-0" | N | 0'-3" |
| B | 2'-0" | O | 0'-3" |
| C | 4'-5" | Q | 1'-4" |
| D | 2'-7" | R | 3'-0" |
| E | 12'-2" | S | 5'-0" |
| F | 1'-0" | T | 2'-0" |
| G | 1'-0" | U | 0'-0" |
| H | 0'-3" | V | 0'-0" |
| I | 0'-3" | W | 0'-0" |
| J | 0'-3" | X | 0'-0" |
| K | 0'-2" | Y | 1'-0" |
| L | 2'-0" | Z | 0'-0" |

NOTE: PRETREATMENT CHAMBER MINIMUM REQUIREMENTS SHALL BE: 1,000 GALLONS CAPACITY, 15 GALLONS PER INCH OF LIQUID LEVEL AND 12 INCHES OF FREEBOARD.

NOTE: SOME CRITICAL DIMENSIONS ARE INTENTIONALLY LEFT BLANK TO BE FILLED IN PER INDIVIDUAL JOB SITE SPECIFICATIONS.

NOTE: TOTAL SYSTEM CAPACITY: 2,300 GALLONS RATED CAPACITY: 1,000 GALLONS PER DAY



MONARCH PRODUCTS COMPANY, INC.
YORK, PA. 17303
717-938-8303
www.MonarchProducts.net

| | | |
|------------------------|------------|--------------------|
| MAKE | DATE | TITLE |
| MONARCH | 10/22/2019 | 1500 GAL PUMP TANK |
| TOTAL STRUCTURE WEIGHT | JOB NAME | STRUCTURE NO. |
| 24020 lbs | PUMP TANK | |

PUMP ALARMS / INFORMATION

- A. PUMP OFF: 400.60
- B. PUMP ON: 401.17
- C. HIGH WATER ALARM: 401.74
- D. TOP OF ACCESS COVER: 406.9
- E. TOP OF TANK: 405.7
- F. BOTTOM OF TANK: 398.62
- G. DISCHARGE OUT OF TANK: 406.2
- H. INVERT INTO TANK: 404.43

NOTE: SEPTIC SYSTEM ALARM WILL BE ON A CIRCUIT SEPARATE FROM ANY OTHER SEPTIC SYSTEM COMPONENTS OR ALARMS.

NOTE: THIS DETAIL IS TO BE USED FOR FLOAT CONFIGURATION ONLY - SEE DETAIL ABOVE FOR TANK DIMENSIONS AND ACTUAL LOCATION OF ACCESS COVER.

OWNER:
K-ONE CORPORATION
209 RIVER BEND ROAD
GREAT FALLS, VA 22066
(703)-757-8757

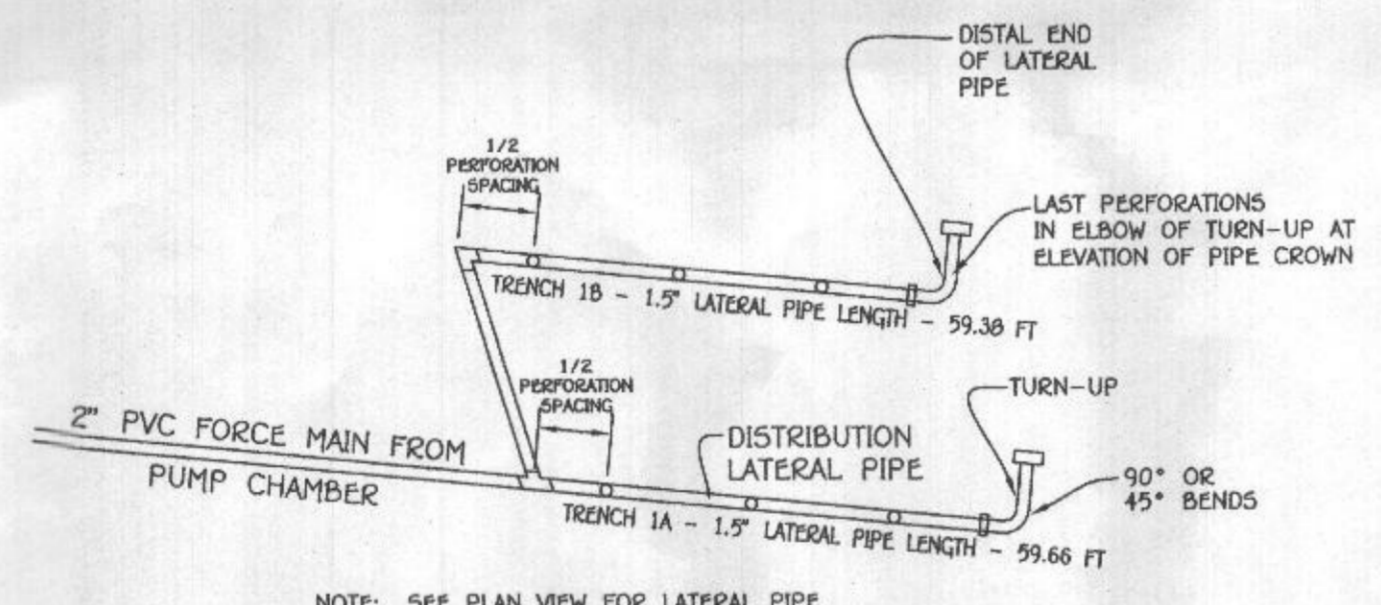


FIGURE 4.1 END FEED MANIFOLD DISTRIBUTION NETWORK

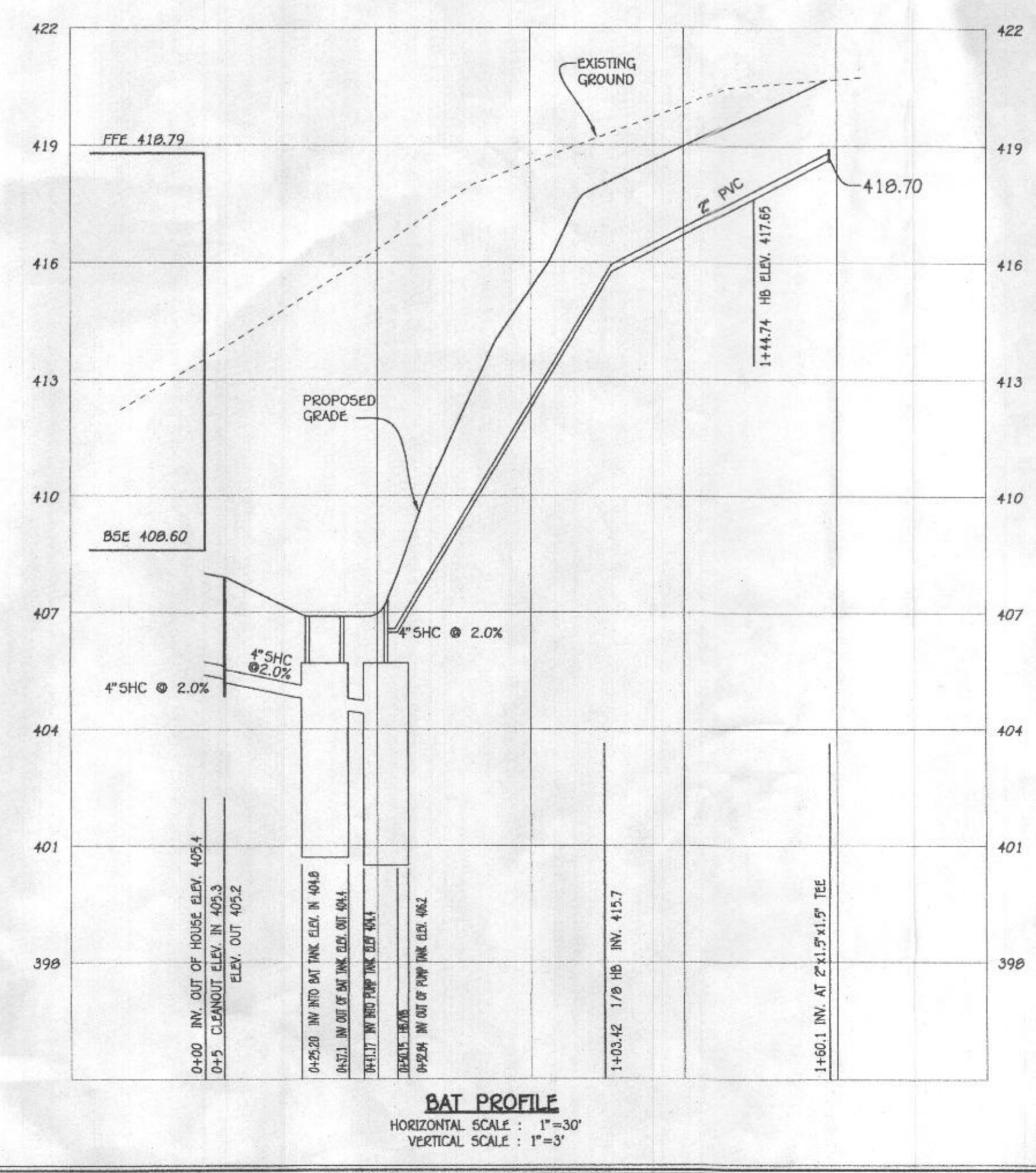
NOTE: SEE PLAN VIEW FOR LATERAL PIPE CONFIGURATION / HORIZONTAL BENDS. DETAIL TO SHOW SPACING AND TURN UPS ONLY.

PERFORATION SPACING / # OF PERFORATIONS

- TRENCH 1A - 2.66 FEET / 11 PERFORATIONS
- TRENCH 1B - 6.29 FEET / 10 PERFORATIONS

END FEED LAYOUT

TRENCH 1A - LATERAL PIPE LENGTH - 59.66 FEET
TRENCH 1B - LATERAL PIPE LENGTH - 59.36 FEET



Approved Septic System Plan
Howard County Health Department
Signature: _____ Date: 9/14/2020

NOTE: PLACE AN OBSERVATION PIPE IN THE GRAVEL BED AT THE DISTAL END OF EACH TRENCH SEGMENT.

PERFORATED SCH. 40 PVC LATERAL PIPE BLOWUP DETAIL
SCALE: 1"=1'

BAT SITE PLAN
CHAPEL RISE, LOT 2
11540 CHAPEL RISE
ZONED RC-DEO PLAT NO. 22022
TAX MAP NO.: 29 GRID NO'S.: 0 & 14
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JUNE 30, 2020
SHEET 2 OF 2

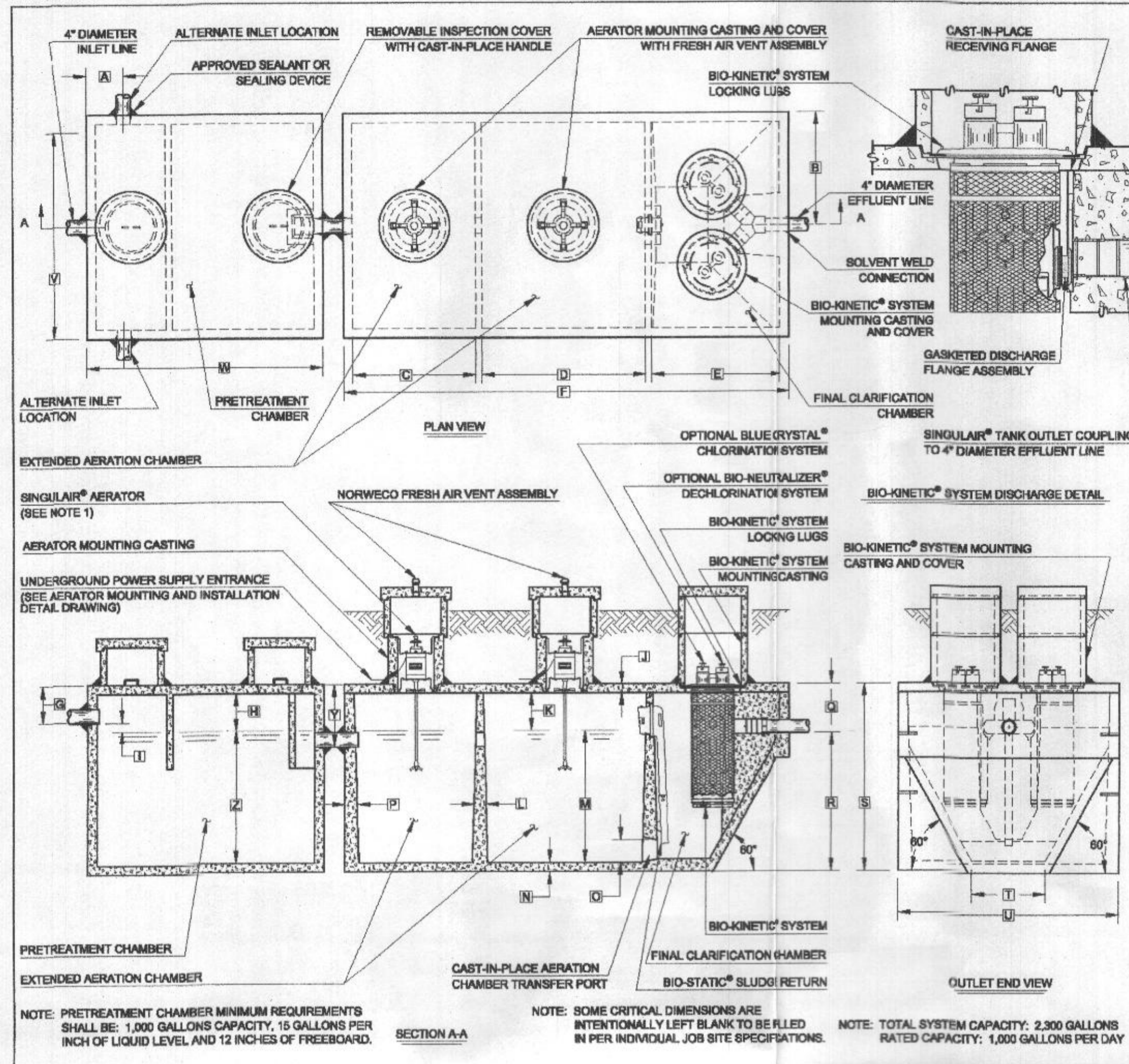
PROFESSIONAL CERTIFICATION

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Stephen Jint 8/26/20
Signature of Professional Engineer DATE

STATE OF MARYLAND
STEPHANE J. JINT
PROFESSIONAL ENGINEER
No. 30386
EXPIRES 01/12/2022

I:\2021\2060\Engineering\2600-6010 Chapel Rise Lot 2\2060-6008 septic install Plan.dwg: RAY.SJ: 1:1



GENERAL NOTES:

- SINGULAR® AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 80 MINUTES ON / 160 MINUTES OFF.
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I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE: _____
NAME: _____

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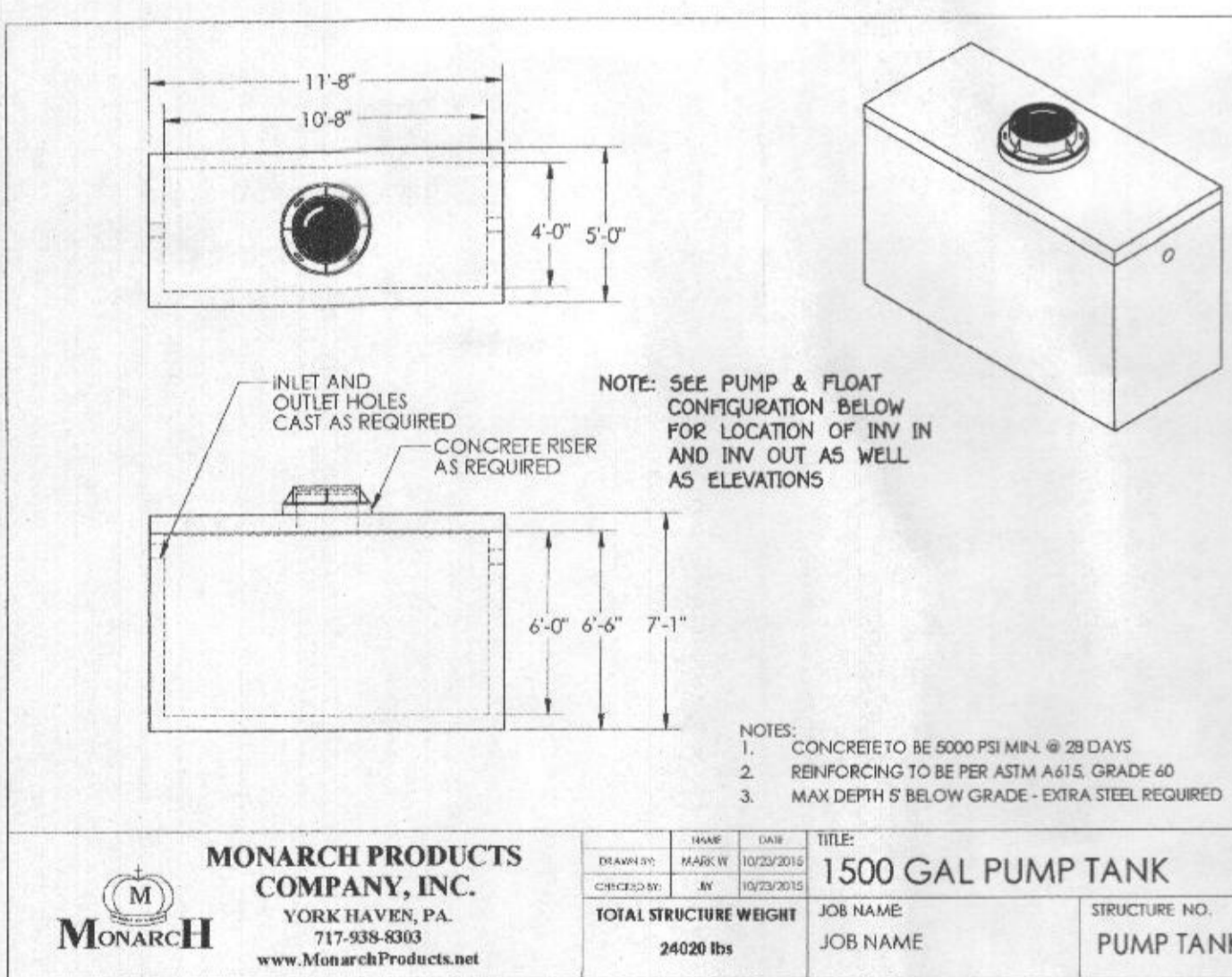
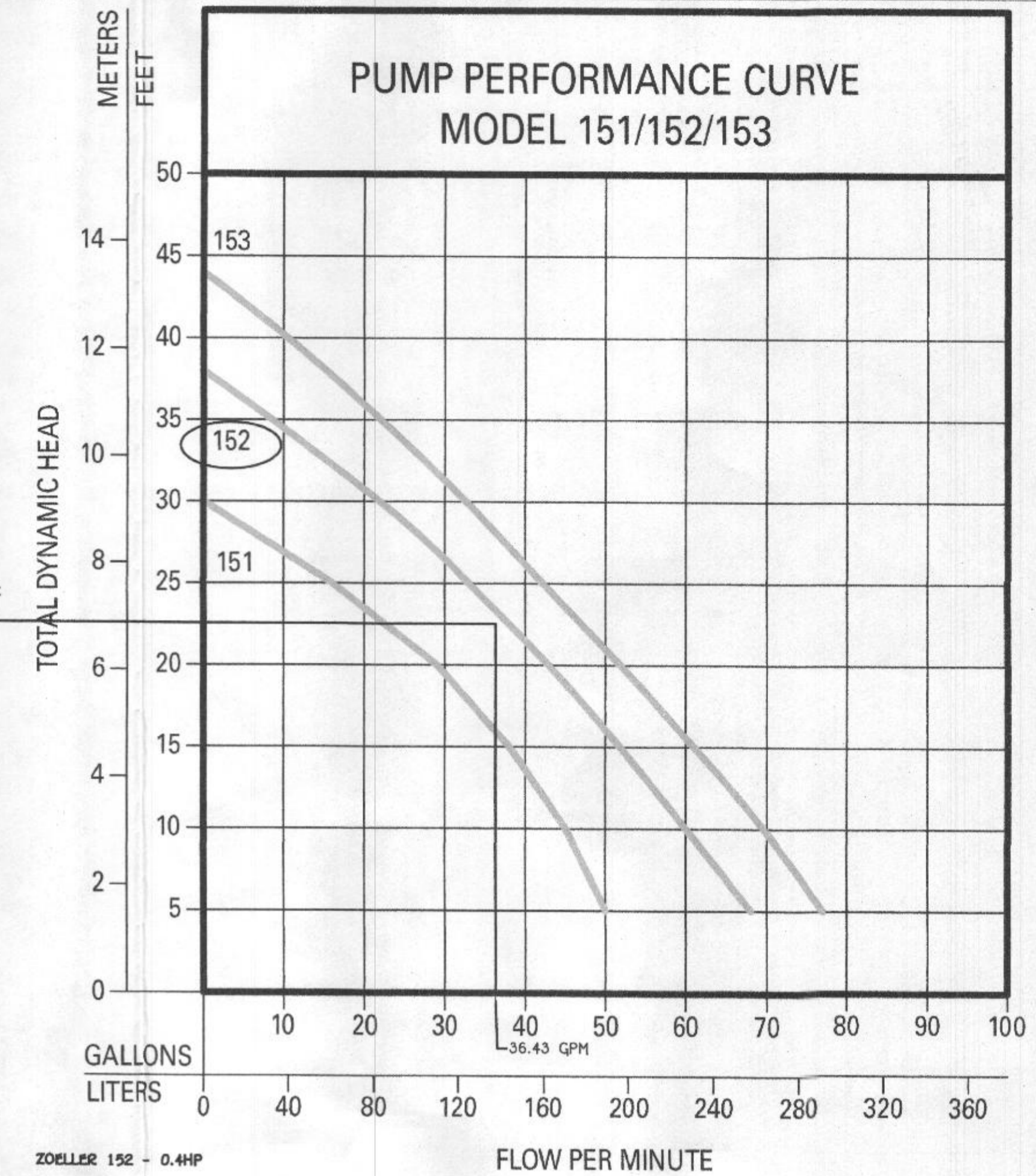
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| B | 3'-0" | O | 0'-0" |
| C | 3'-4" | P | 0'-3" |
| D | 4'-5" | Q | 1'-4" |
| E | 3'-7" | R | 3'-0" |
| F | 12'-2" | S | 8'-0" |
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| H | 1'-0" | U | 0'-0" |
| I | 0'-3" | V | |
| J | 0'-3" | W | |
| K | 1'-0" | X | |
| L | 0'-2" | Y | 1'-0" |
| M | 3'-0" | Z | |

norweco 7-10-07 1-C
U.S. PATENT # 6,810,400
LOW PROFILE SINGULAR® BIO-KINETIC WASTEWATER TREATMENT SYSTEM MODEL 151-152-153
© 2007
PC-2-2008

NOTE: PRETREATMENT CHAMBER MINIMUM REQUIREMENTS SHALL BE: 1,000 GALLONS CAPACITY, 15 GALLONS PER INCH OF LIQUID LEVEL AND 12 INCHES OF FREEBOARD.

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NOTE: TOTAL SYSTEM CAPACITY: 2,300 GALLONS RATED CAPACITY: 1,000 GALLONS PER DAY



MONARCH PRODUCTS COMPANY, INC.
YORK HAVEN, PA.
717-538-8303
www.MonarchProducts.net

| NO. | DATE | DESCRIPTION |
|-----|------------|--------------------|
| 1 | 10/22/2010 | ISSUED FOR PERMITS |
| 2 | 10/22/2010 | ISSUED FOR PERMITS |
| 3 | 10/22/2010 | ISSUED FOR PERMITS |

1500 GAL PUMP TANK

TOTAL STRUCTURE WEIGHT: 24020 lbs

JOB NAME: _____
JOB NO.: _____

PUMP TANK

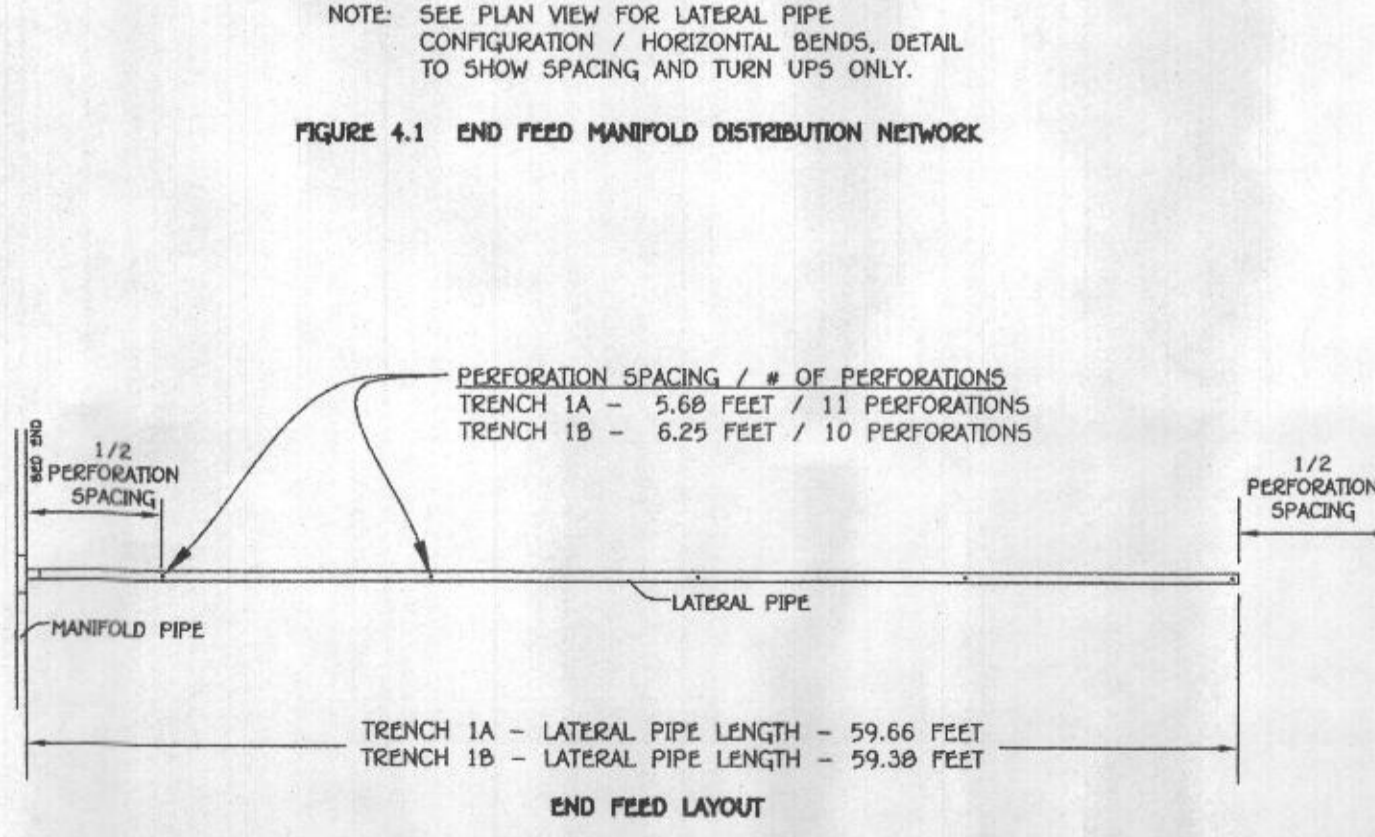
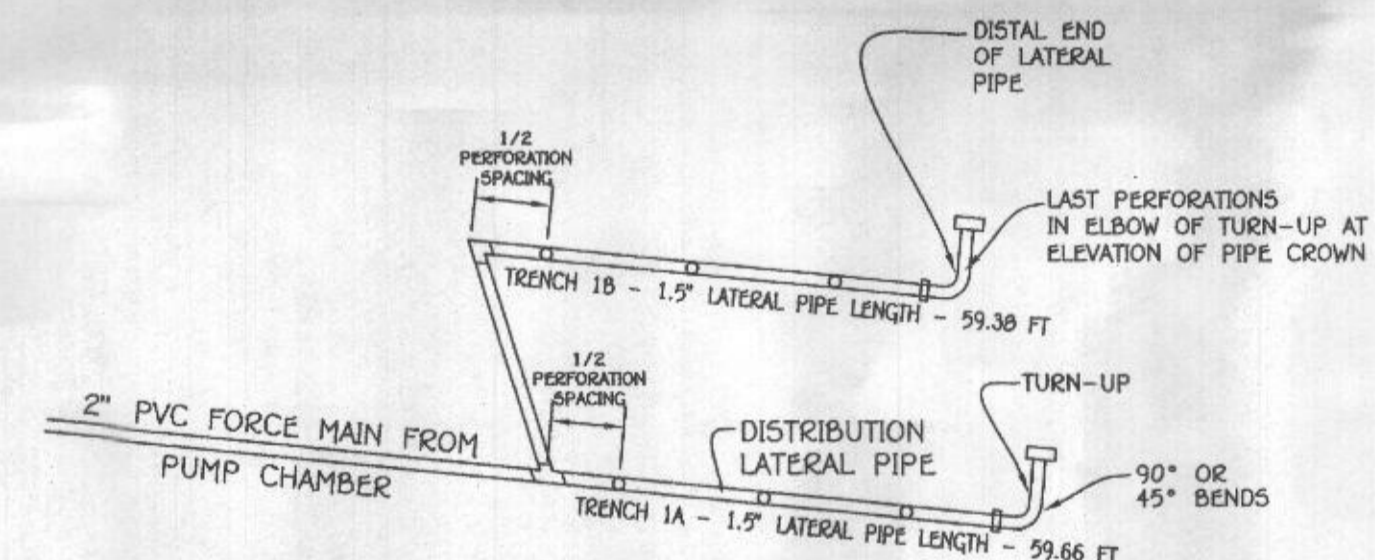
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- H INVERT INTO TANK: 404.43

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TOTAL EMERGENCY STORAGE = 858.8 + 220.3 = 1,079.1 GAL

NOTE: THIS DETAIL IS TO BE USED FOR FLOAT CONFIGURATION ONLY - SEE DETAIL ABOVE FOR TANK DIMENSIONS AND ACTUAL LOCATION OF ACCESS COVER.

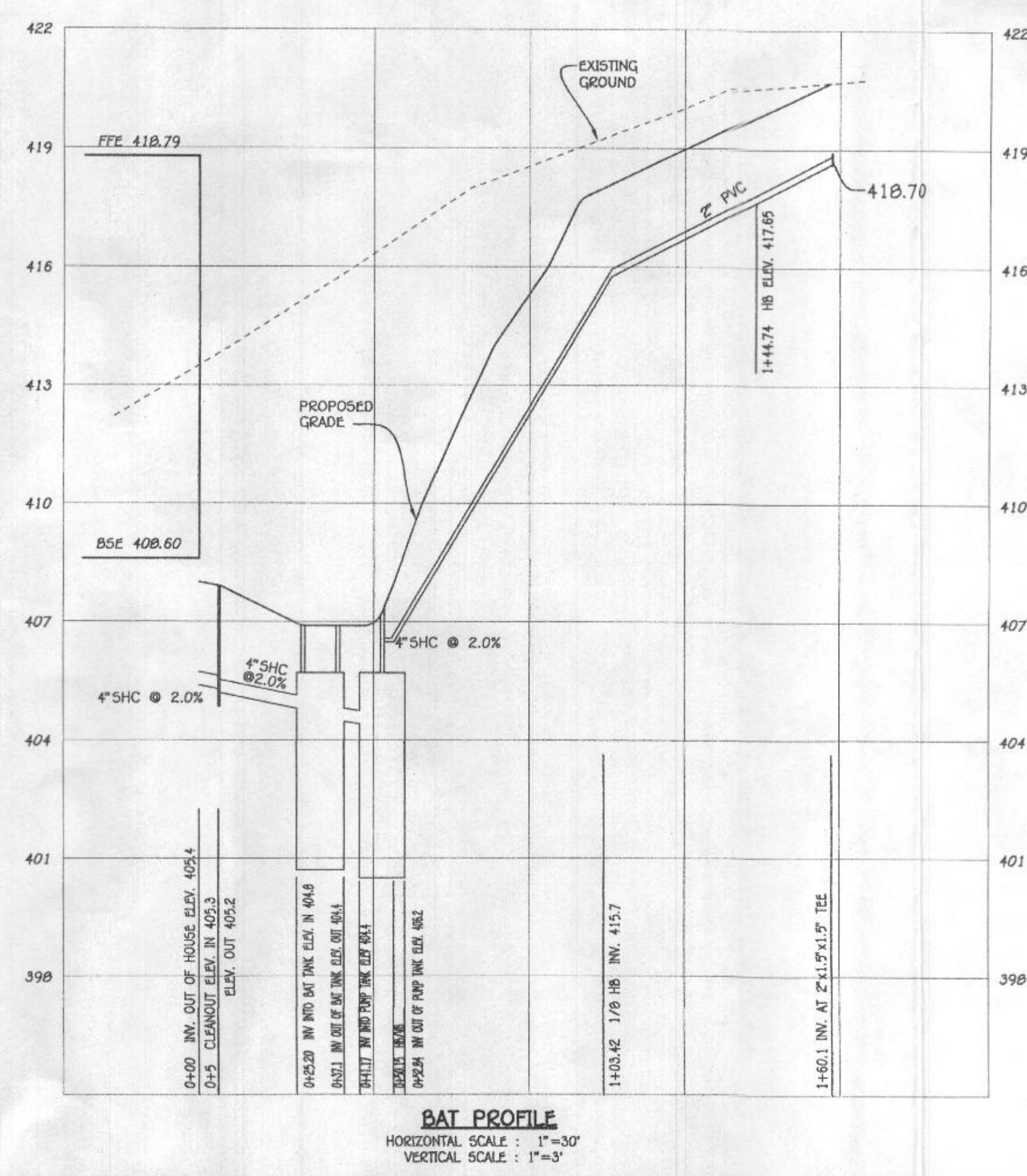


PROFESSIONAL CERTIFICATION

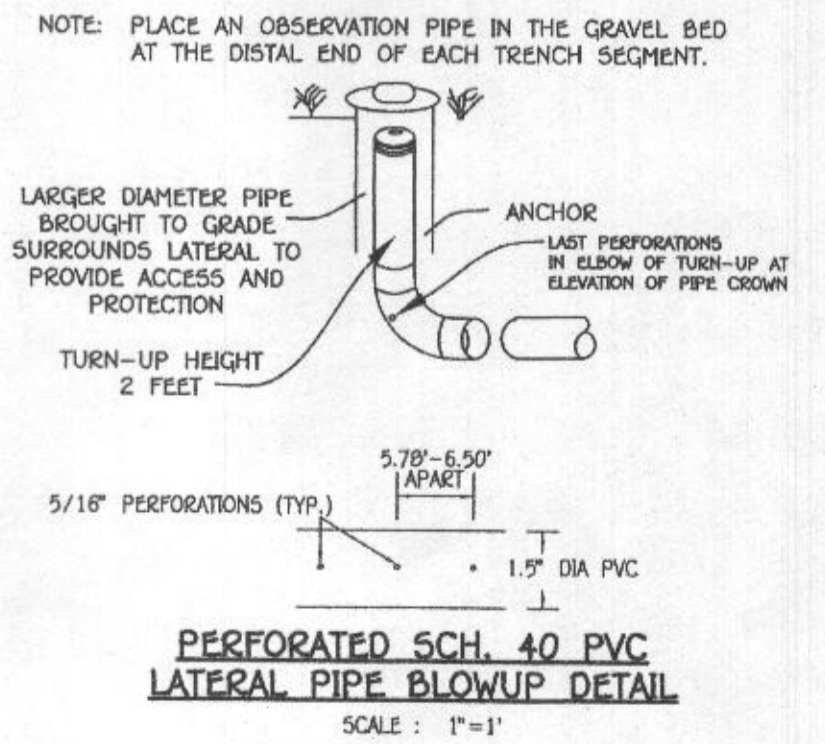
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Stephen J. Int... 8/26/20
Signature of Professional Engineer DATE

STATE OF MARYLAND
STEPHANIE J. LUTE
No. 28386
PROFESSIONAL ENGINEER



Approved Septic System Plan
Howard County Health Department
[Signature] 9/14/2020
Signature Date



BAT SITE PLAN
CHAPEL RISE, LOT 2
11540 CHAPEL RISE
ZONED RC-DEO PLAT NO. 22022
TAX MAP NO.: 29 GRID NO'S.: 8 & 14
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JUNE 30, 2020
SHEET 2 OF 2

CHapel Estate Drive
 (EXISTING PUBLIC CORNER BY 80.00')
 50' R.W. P.N. 536.8' BY 123.86'
 N37°23'33"E
 394.1'

562°37'39"E 261.94'
 N62°37'39"W 264.13'

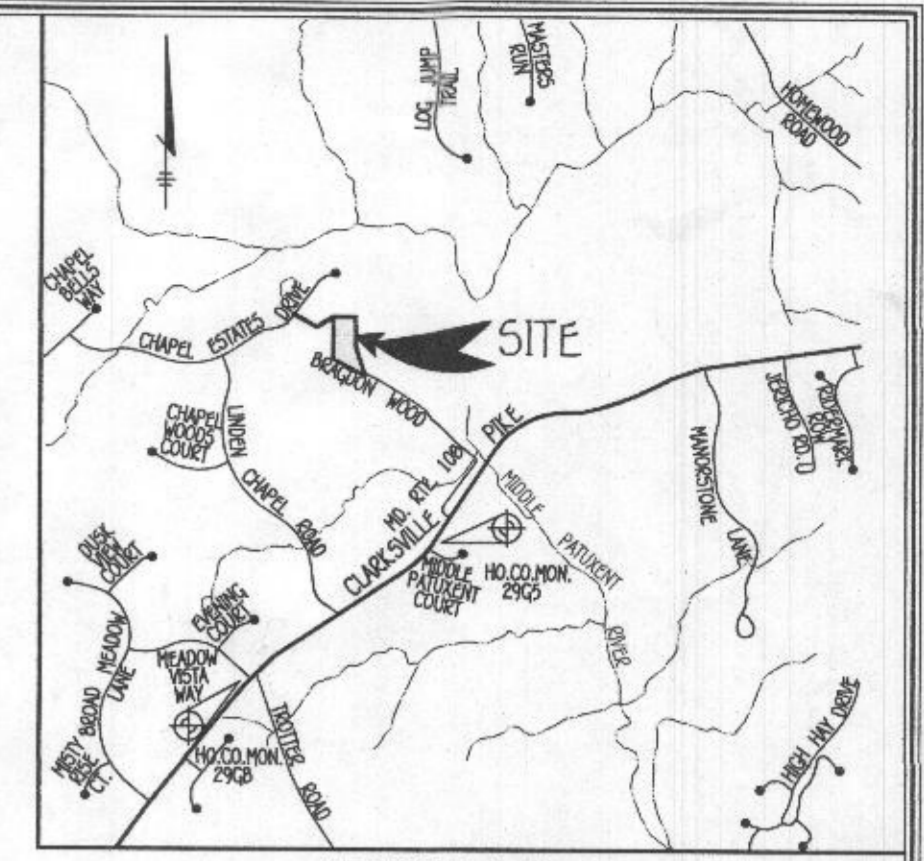
304 306 308 400 402 404 406 408 410 412 414 416 418 420 422 424 426

N90°00'00"E 239.92'

LOT 2
 AREA = 3.0378 AC
 ZONE: RC-DEO

PRIVATE STORMWATER MANAGEMENT, DRAIN, ENTRANCE SIGN, MAINTENANCE, USE-IN-COMMON DRIVEWAY ACCESS, & UTILITY EASEMENT

| LEGEND | |
|-----------|-----------------------------------|
| SYMBOL | DESCRIPTION |
| --- | EXISTING CONTOUR 2' INTERVAL |
| --- | PROPOSED CONTOUR 2' INTERVAL |
| X062.5 | SPOT ELEVATION |
| -DF-DF- | DIVERSION FENCE |
| -SSF-SSF- | SUPER SILT FENCE |
| -SF-SF- | SILT FENCE |
| --- | EROSION CONTROL MATTING |
| LOO | LIMITS OF DISTURBANCE |
| ○ | SPECIMEN TREE |
| □ | TEMPORARY STONE OUTLET STRUCTURES |
| ○ | FAILED PERC HOLE |
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8. THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
9. SURFACE RUNOFF SHALL BE DIRECTED AROUND THE BAT TANK.

| TRENCH DESIGN | | | | | | | | | | | |
|---------------|--------------|--------------------|-------------------|----------------------------|---------------------|------------------------|---------------------------|---------------------|--------------|------------------|----------------|
| TRENCH | GROUND ELEV. | TOP OF STONE ELEV. | PIPE INVERT ELEV. | DEPTH TO STONE FROM GROUND | DEPTH OF STONE (FT) | BOTTOM OF TRENCH ELEV. | EFFECTIVE DEPTH STARTS AT | EFFECTIVE DEPTH (D) | TRENCH DEPTH | TRENCH WIDTH (W) | TRENCH SPACING |
| 1A | 420.7 | 419.2 | 418.7 | 1.5' | 3.5' | 415.7 | 2' | 3' | 5 | 3.0' | 10' |
| 1B | 420.1 | 419.6 | 418.1 | 1.5' | 3.5' | 415.1 | 2' | 3' | 5 | 3.0' | 10' |

| LOW PRESSURE DOSING SYSTEM - INITIAL INSTALLATION | | | | | | | | | | |
|---|--------------|-------------------|--------------------|--------------------------|---------------------------|-----------|-----------------------------|--------------------------|--------------------|------------------------|
| TRENCH | GROUND ELEV. | PIPE INVERT ELEV. | TRENCH LENGTH (FT) | LATERAL PIPE LENGTH (FT) | PERFORATION DIAMETER (IN) | HEAD (FT) | PERFORATION FLOW RATE (GPM) | PERFORATION SPACING (FT) | NUMBER OF RIFICLES | TRENCH FLOW RATE (GPM) |
| 1A | 420.7 | 418.7 | 52 | 49.11 | 5/16 | 2 | 1.63 | 5.78 | 9 | 14.67 |
| 1B | 420.1 | 418.1 | 52 | 48.75 | 5/16 | 2.6 | 1.85 | 6.50 | 8 | 14.80 |
| TOTAL TRENCH FLOW RATE | | | | | | | | | | 29.47 |

FRICITION LOSS IN 2" PIPE FITTINGS:
 1/8" HD x 4 FEET PER FITTING = 4 EQUIVALENT FEET OF PIPE
 1 TEE/CROSS x 11 FEET PER FITTING = 11 EQUIVALENT FEET OF PIPE
 1 UNION x 2 FEET PER FITTING = 2 EQUIVALENT FEET OF PIPE
 1 ELBOWS x 9 FEET PER FITTING = 9 EQUIVALENT FEET OF PIPE
 TOTAL EQUIVALENT FEET OF PIPE = 26 FT

TOTAL LINEAR FEET OF 2" SCH. 40 PVC = 48.3 LF + 26 LF = 74.3 LF

DYNAMIC HEAD
 74.3 LF X 1.5 FT PER 100 LF OF PIPE = 1.1 FT OF FRICTION HEAD
 DISTAL HEAD = 2.0 FT
 VERTICAL FROM PUMP OFF TO DISCHARGE = 7.1 FT OF STATIC HEAD
 VERTICAL FROM DISCHARGE TO HIGHEST ELEV. OF MAIN = 3.7 FT
 TOTAL DYNAMIC HEAD = 13.9 FT

PIPE VOLUMES
 48.3 LF (2" SCH. 40 PIPE) X 17.4 GALLONS PER 100 LF = 8.4 GALLONS
 97.86 LF (1.5" SCH. 40 PIPE) X 10.6 GALLONS PER 100 LF = 10.4 GALLONS

MINIMUM DOSE
 MINIMUM DOSE = (5 X LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
 = (5 X 10.4) + (8.4)
 = 60.4 GALLONS

60.4 GALLONS IS LESS THAN 1/6 DESIGN FLOW (750/6=125)
 USE 147.5 GALLON DOSE (125 GALLON MINIMUM)
 (RUN TIME = 5 MIN (29.5 GPM X 5 = 147.5 GALLON DOSE))

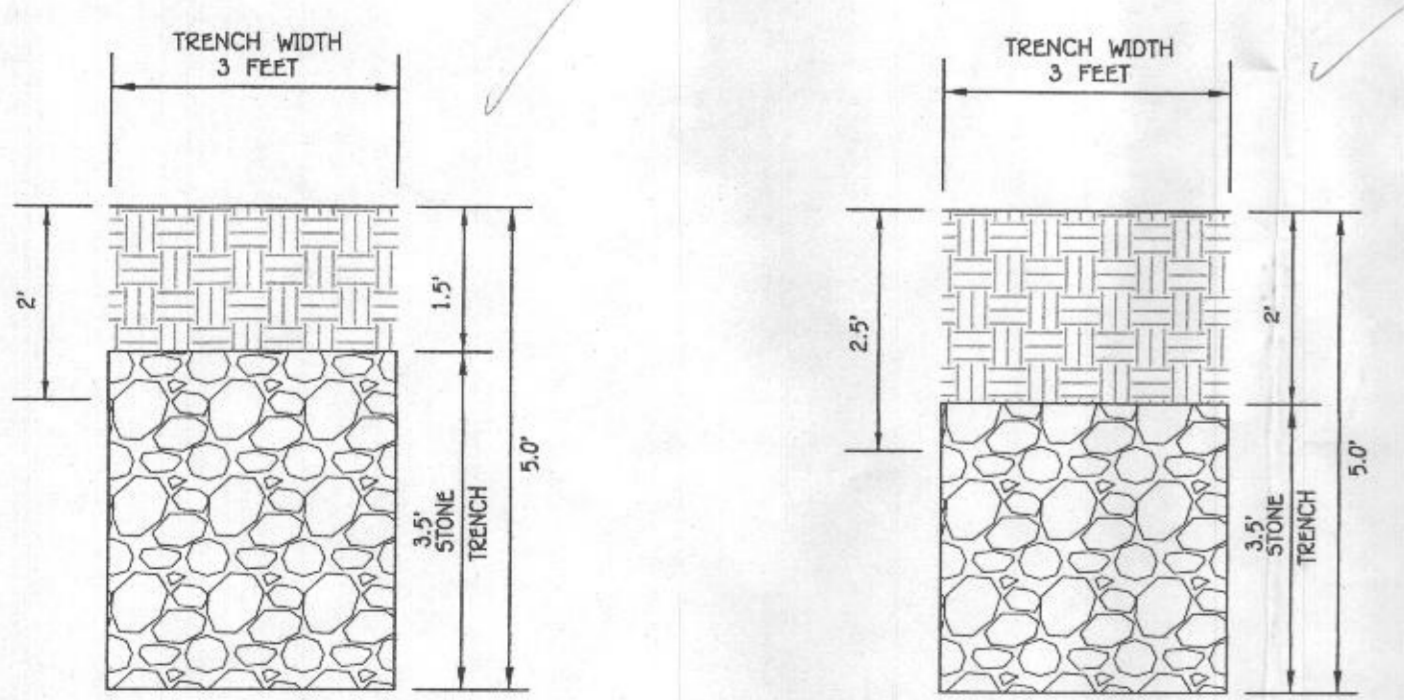
PUMP NEEDS TO HANDLE 29.5 GPM AT 14.4 FT OF HEAD
 USE 0.4 HP (MYERS SRM4 PUMP)

SEPTIC SYSTEM ELEVATIONS

FFE = 418.00
 BSE = 407.50
 INV. OUT OF HOUSE = 412.8
 PROP. GROUND AT C/O = 416.5
 INTO C/O = 412.10
 INV. OUT OF C/O = 412.00
 PROP. GROUND AT BAT TANK = 417.0
 TOP OF BAT TANK = 412.70
 COVER OVER BAT TANK = 4.3 FT
 INVERT INTO BAT TANK = 411.70
 INVERT OUT OF BAT TANK = 411.37
 PROP. GROUND AT PUMP TANK = 417.0
 TOP OF PUMP TANK = 412.56
 COVER OVER PUMP TANK = 4.44 FEET
 INVERT INTO PUMP TANK = 411.31
 INVERT OUT OF PUMP TANK = 415.00

SEWAGE DISPOSAL SYSTEM DATA (INITIAL)
 2 BEDROOMS
 LOADING RATE = 5 BEDROOMS X 150 GPD/BEDROOM = 750 GPD
 APPLICATION RATE = 1.2
 EFFECTIVE SIDEWALL BEGINS AT 2 FEET
 TRENCH DEPTH = 5 FEET
 TRENCH WIDTH (W) = 3 FEET
 EFFECTIVE DEPTH (D) = 3 FEET
 SF OF DRAINFIELD = 750 GPD / 1.2 = 625 SF
 COEFFICIENT OF REDUCTION OF TRENCH LENGTH =
 (W+2)/(W+1+2D) = (3+2)/(3+1+(2x3)) = 0.50
 TRENCH LENGTH = 625 SF x 0.50 / 3 = 104.2 FEET
 TRENCH SPACING = 2D+W = ((2x3) + 3) = 9 USE 10'

SEWAGE DISPOSAL SYSTEM DATA (FIRST REPLACEMENT)
 2 BEDROOMS
 LOADING RATE = 5 BEDROOMS X 150 GPD/BEDROOM = 750 GPD
 APPLICATION RATE = 1.2
 EFFECTIVE SIDEWALL BEGINS AT 2.5 FEET
 TRENCH DEPTH = 5 FEET
 TRENCH WIDTH (W) = 3 FEET
 EFFECTIVE DEPTH (D) = 2.5 FEET
 SF OF DRAINFIELD = 750 GPD / 1.2 = 625 SF
 COEFFICIENT OF REDUCTION OF TRENCH LENGTH =
 (W+2)/(W+1+2D) = (3+2)/(3+1+(2x2.5)) = 0.556
 TRENCH LENGTH = 625 SF x 0.556 / 3 = 115.8 FEET
 TRENCH SPACING = 2D+W = ((2x2.5) + 3) = 8 USE 10'



INITIAL TRENCH DETAIL
 SCALE: 1"=2'

1ST REPLACEMENT TRENCH DETAIL
 SCALE: 1"=2'

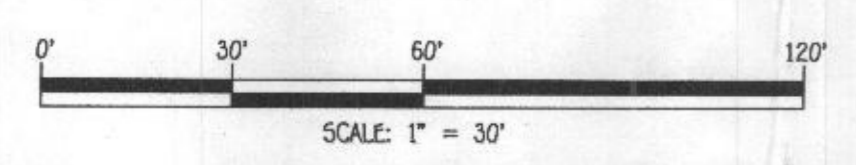
PLAN VIEW
 SCALE: 1"=30'

PROFESSIONAL CERTIFICATION
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38386, EXPIRATION DATE: 01/12/2018.

Signature DATE: 11/8/17
 Signature of Professional Engineer DATE

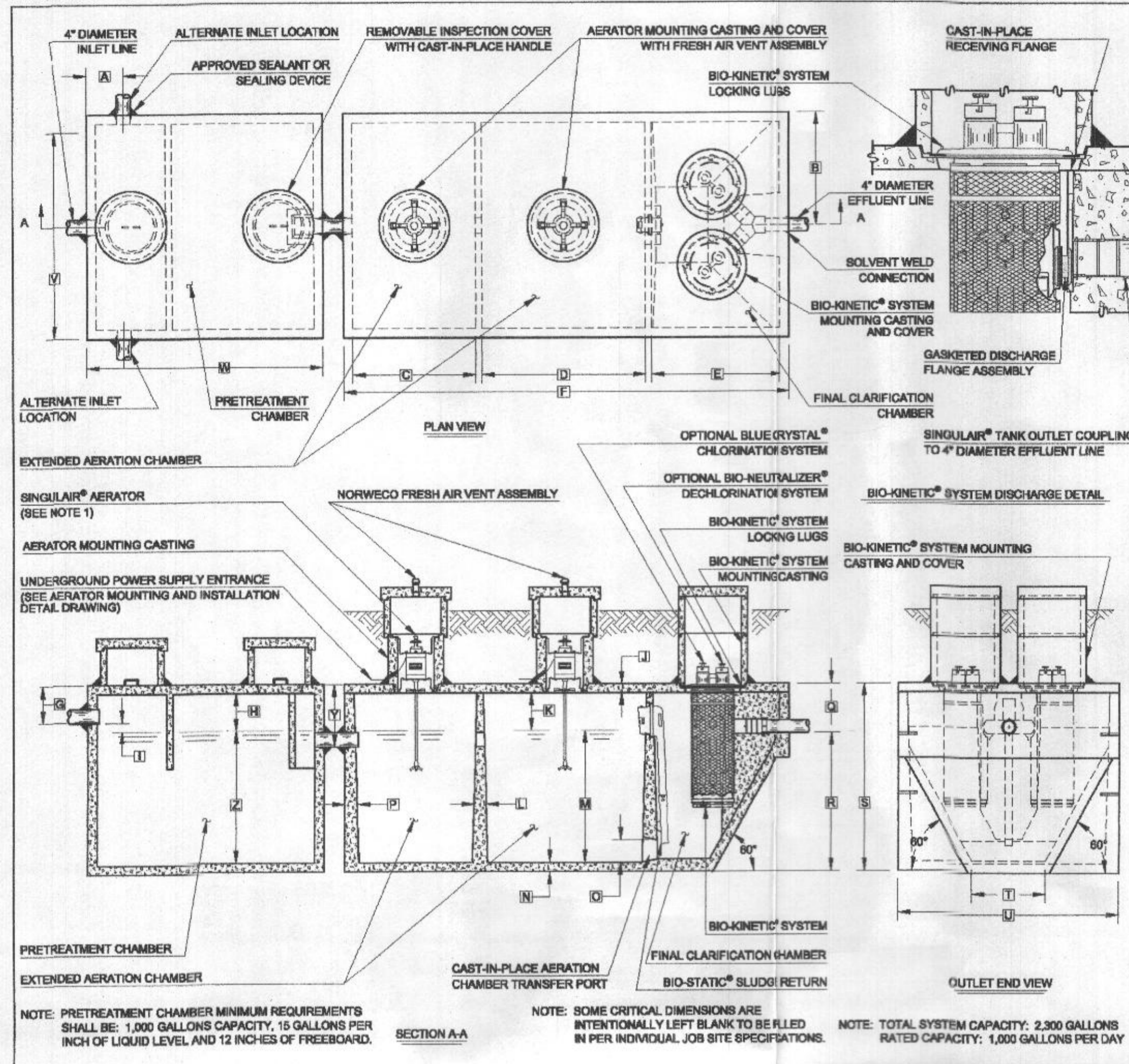


OWNER
 K-ONE CORPORATION
 209 RIVER BEND ROAD
 GREAT FALLS, VA 22066
 (703)-757-8757



Approved Septic System Plan
 Howard County Health Department
Signature 11/17/17
 Date

BAT SITE PLAN
CHAPEL RISE, LOT 2
 11540 CHAPEL RISE
 ZONED RC-DEO PLAT NO. 22022
 TAX MAP NO.: 29 GRID NO'S.: 8 & 14
 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: NOVEMBER, 2017
 SHEET 1 OF 2



GENERAL NOTES:

- SINGULAR® AERATOR, AS TESTED AND ACCEPTED BY NSF, OPERATING 80 MINUTES ON / 160 MINUTES OFF.
- FALL THROUGH SINGULAR® PLANT FROM INLET INVERT TO OUTLET INVERT IS FOUR INCHES. INLET INVERT IS TWELVE INCHES BELOW TANK TOP.
- ON DEEPER INSTALLATIONS, PRECAST RISERS MUST BE USED TO EXTEND AERATOR MOUNTING CASTING AND BIO-KINETIC® SYSTEM MOUNTING CASTING TO GRADE. INSPECTION COVER ON PRETREATMENT CHAMBER MUST BE DEVELOPED TO WITHIN TWELVE INCHES OF GRADE.
- TANK REINFORCED PER ACI STD. 318.
- REMOVABLE COVERS ON RISERS WEIGH IN EXCESS OF SEVENTY-FIVE POUNDS EACH TO PREVENT UNAUTHORIZED ACCESS.
- CONTACT THE LOCAL LICENSED SINGULAR® DISTRIBUTOR FOR ELECTRICAL REQUIREMENTS.

PROJECT ENGINEER'S APPROVAL:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE: _____
NAME: _____

CONTRACTOR'S CERTIFICATION:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.
DATE: _____
NAME: _____

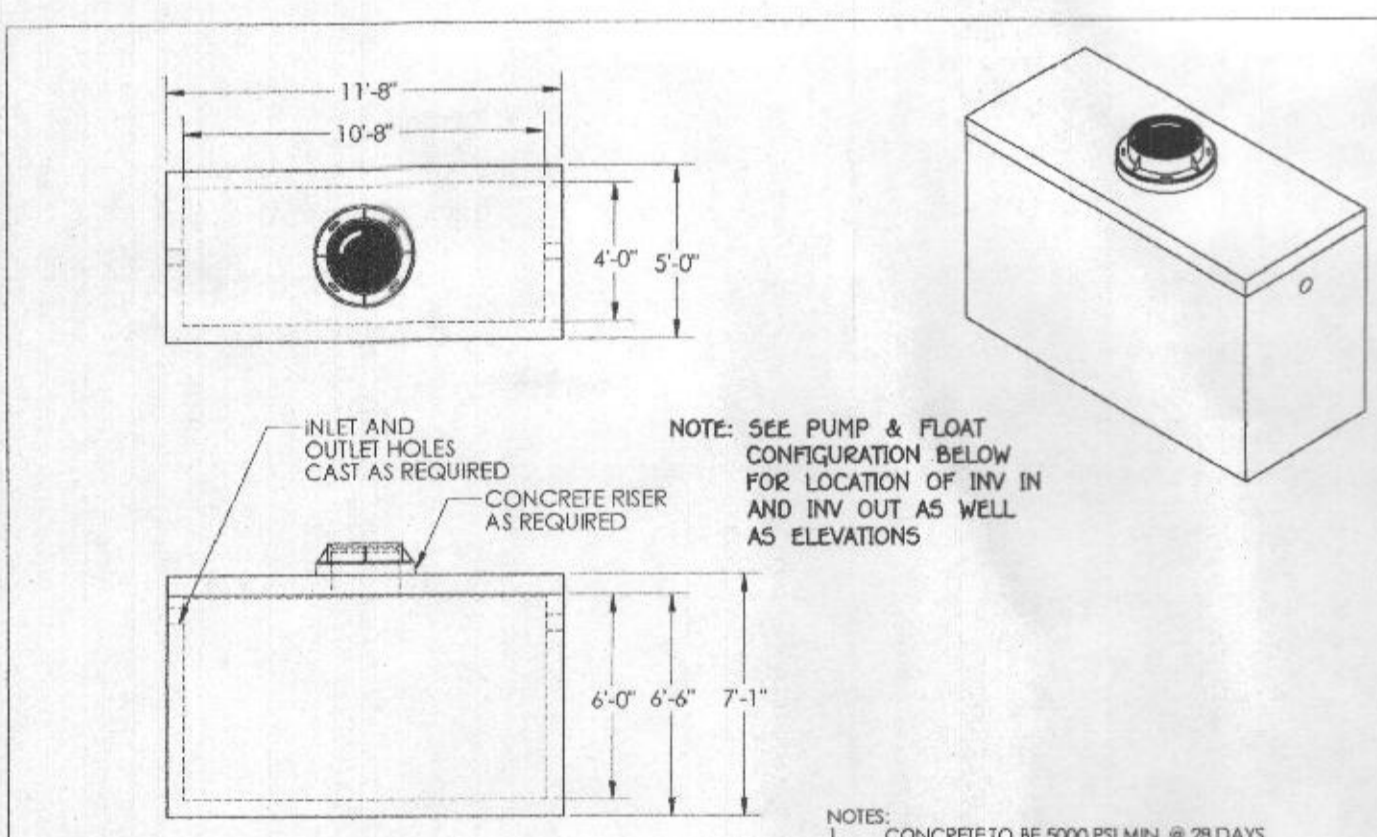
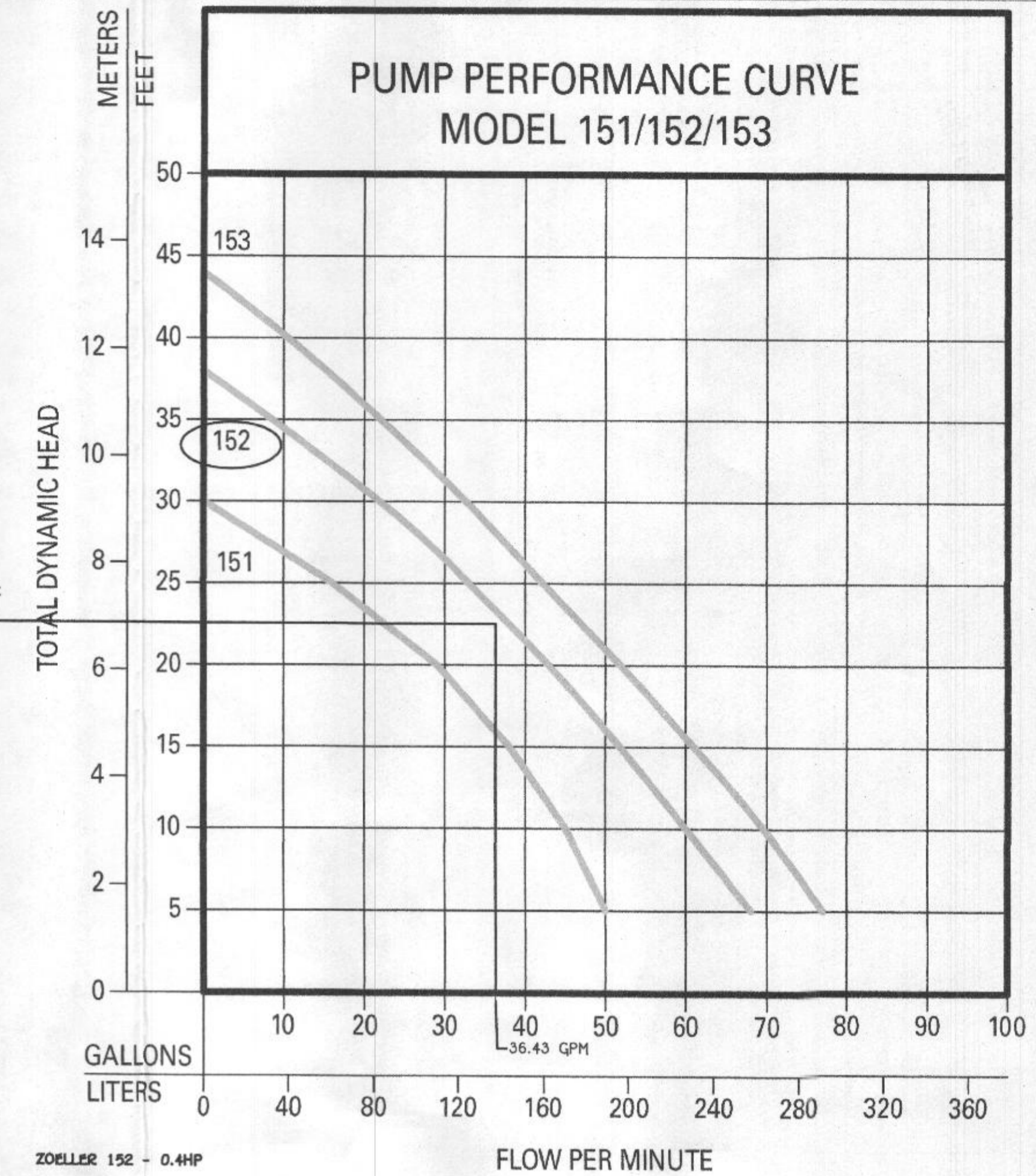
| CRITICAL DIMENSIONS | | | |
|---------------------|--------|---|-------|
| A | 1'-0" | N | 4'-3" |
| B | 3'-0" | O | 0'-0" |
| C | 3'-4" | P | 0'-3" |
| D | 4'-5" | Q | 1'-4" |
| E | 3'-7" | R | 3'-0" |
| F | 12'-2" | S | 8'-0" |
| G | 1'-0" | T | 2'-0" |
| H | 1'-0" | U | 0'-0" |
| I | 0'-3" | V | |
| J | 0'-3" | W | |
| K | 1'-0" | X | |
| L | 0'-2" | Y | 1'-0" |
| M | 3'-0" | Z | |

norweco 7-10-07 1-C
U.S. PATENT AND TRADEMARK OFFICE
LOW PROFILE SINGULAR® BIO-KINETIC WASTEWATER TREATMENT SYSTEM MODEL 151-152-153
© 2007
PC-2-2005

NOTE: PRETREATMENT CHAMBER MINIMUM REQUIREMENTS SHALL BE: 1,000 GALLONS CAPACITY, 15 GALLONS PER INCH OF LIQUID LEVEL AND 12 INCHES OF FREEBOARD.

NOTE: SOME CRITICAL DIMENSIONS ARE INTENTIONALLY LEFT BLANK TO BE FILLED IN PER INDIVIDUAL JOB SITE SPECIFICATIONS.

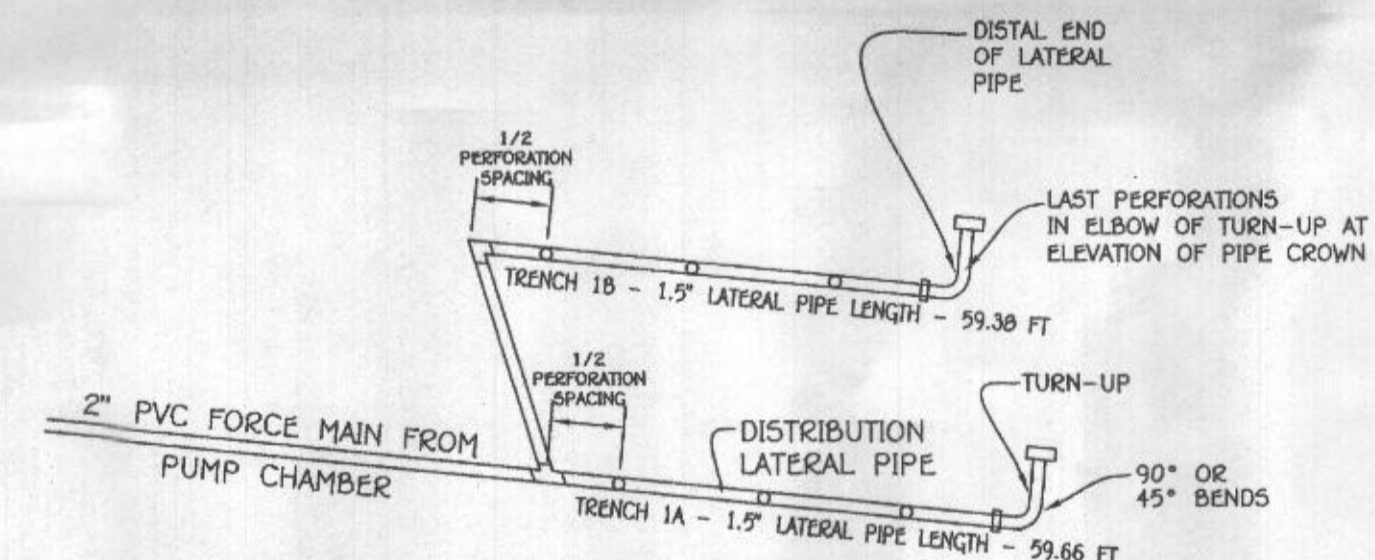
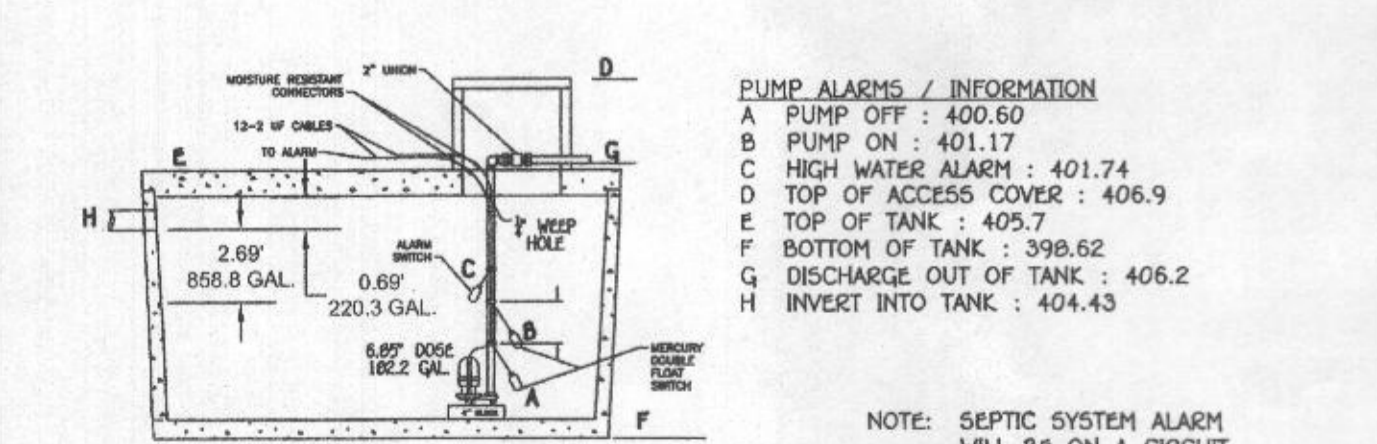
NOTE: TOTAL SYSTEM CAPACITY: 2,300 GALLONS RATED CAPACITY: 1,000 GALLONS PER DAY



MONARCH PRODUCTS COMPANY, INC.
YORK HAVEN, PA. 17358-8303
www.MonarchProducts.net

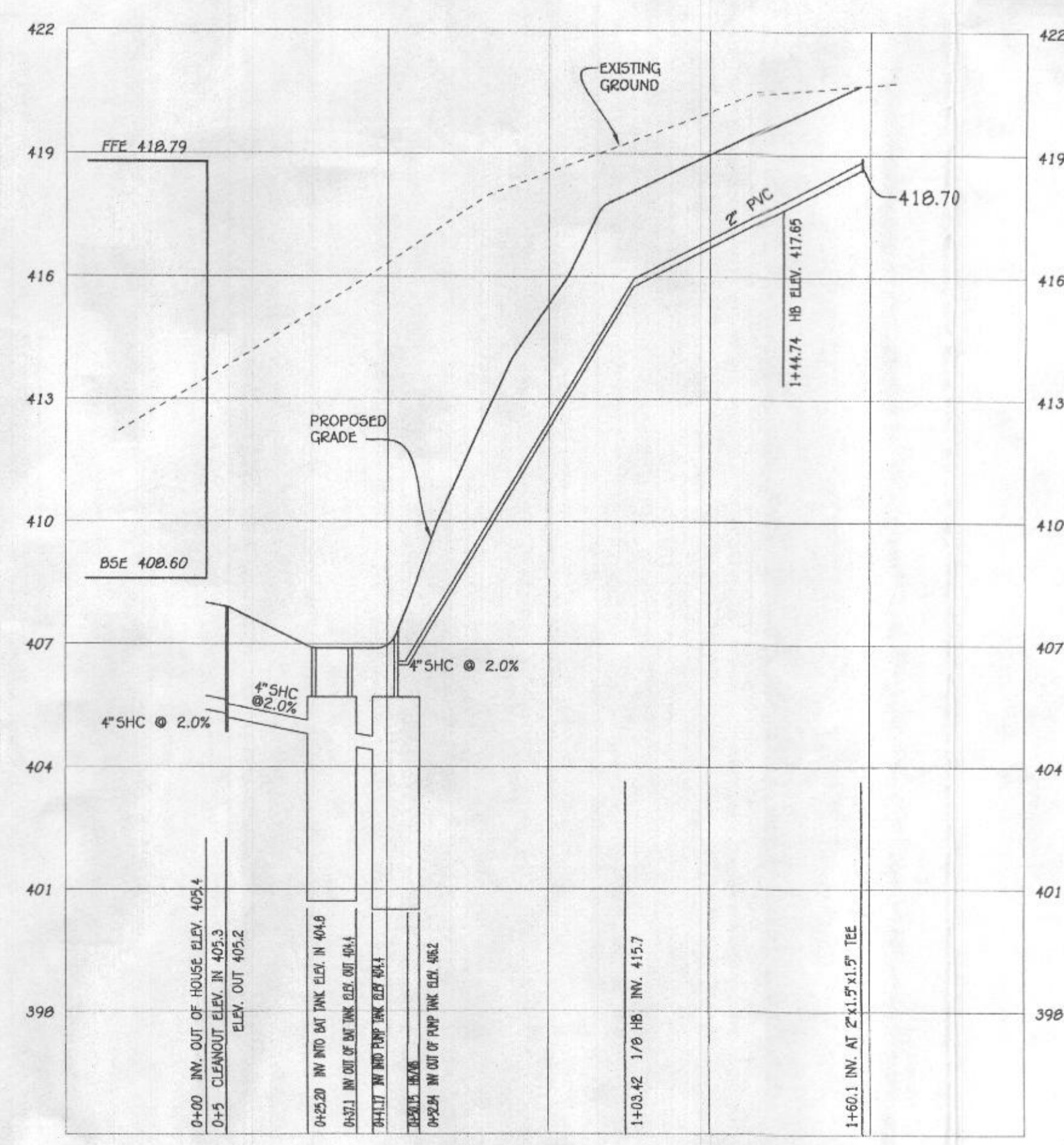
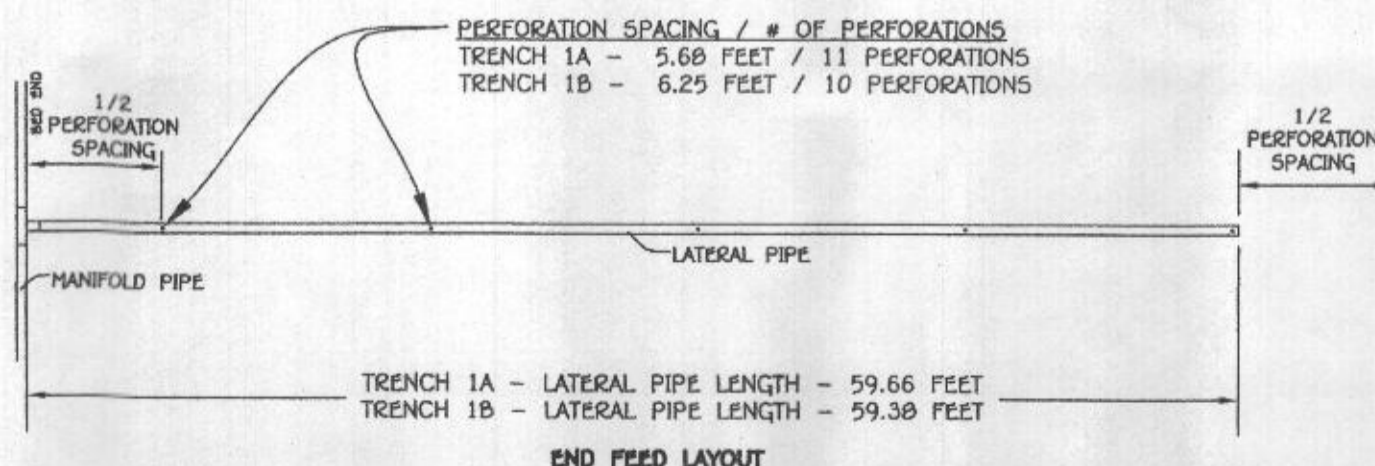
1500 GAL PUMP TANK

| | |
|-----------------------------------|--------------------|
| DATE: 10/22/2010 | TITLE: |
| DESIGNED BY: AY | 1500 GAL PUMP TANK |
| CHECKED BY: AY | JOB NAME: |
| TOTAL STRUCTURE WEIGHT: 24020 lbs | JOB NAME: |
| STRUCTURE NO.: | PUMP TANK |



NOTE: SEE PLAN VIEW FOR LATERAL PIPE CONFIGURATION / HORIZONTAL BENDS. DETAIL TO SHOW SPACING AND TURN UPS ONLY.

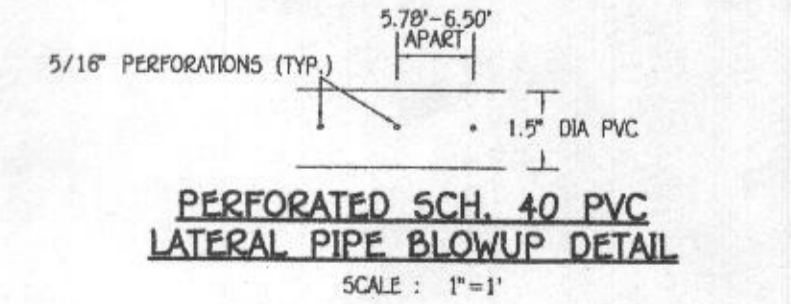
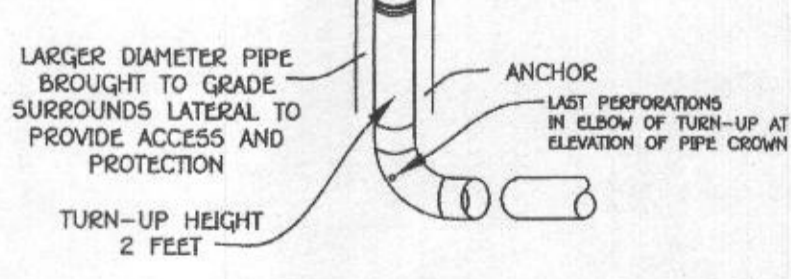
FIGURE 4.1 END FEED MANIFOLD DISTRIBUTION NETWORK



BAT PROFILE
HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=3'

Approved Septic System Plan
Howard County Health Department
Signature: [Signature] 9/14/2020 Date

NOTE: PLACE AN OBSERVATION PIPE IN THE GRAVEL BED AT THE DISTAL END OF EACH TRENCH SEGMENT.



BAT SITE PLAN
CHAPEL RISE, LOT 2
11540 CHAPEL RISE
ZONED RC-DEO PLAT NO. 22022
TAX MAP NO.: 29 GRID NO'S.: 8 & 14
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JUNE 30, 2020
SHEET 2 OF 2

PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36386, EXPIRATION DATE: 01/12/2022.

Signature: Stephen Int Date: 8/26/20
Signature of Professional Engineer



FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10275 BALTIMORE NATIONAL PIKE
BLUDDITT CITY, MARYLAND 21046
(410) 461 - 2899

OWNER
K-ONE CORPORATION
209 GUYVER BEND ROAD
GREAT FALLS, VA 22066
(703)-757-8757

I:\2010\210606\Engineering\Drawings\21060-6010 Chapel Rise Lot 2\21060-6008 Septic Install Plan.dwg, B.A.T. 5/2, 1:1