

- BAT NOTES**
1. 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.
 2. THE MAXIMUM COVER OVER THE BAT SHALL BE 3 FEET.
 3. THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
 4. THE BAT SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
 5. 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 THEM, THE ADDRESS AND DATE OF COMPLETION OF THE BAT INSTALLATION AND THE TYPE OF BAT INSTALLED.
 6. ANY ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICAL.
 7. AN AGREEMENT AND EASEMENT HAS BEEN COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, LIBER 19562, FOLIO 006.
 8. THE HEALTH DEPARTMENT OCCURS 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.
 10. AT HIGH WATER ALARM PROBE, PUMP WILL HAVE CONTINUOUS OPERATION UNTIL LEVEL GOES BENEATH PROBE.
 11. IF WATER LEVEL RISES ABOVE THE ALARM PROBE, AN AUDIBLE AND VISUAL ALARM WILL SOUND. SEE MANUFACTURER SPECS FOR ADDITIONAL INFORMATION.
 12. ALARM TO BE WIRED TO A CIRCUIT SEPARATE FROM THE PUMP CIRCUIT.

SEPTIC SYSTEM ELEVATIONS

FFE = 397.06
BSC = 399.07
INV. OUT OF HOUSE = 391.65
PROP. GROUND AT C/O = 393.60
INV. INTO C/O = 390.51
PROP. GROUND AT C/O = 392.20
INV. INTO C/O = 389.17
INV. OUT OF C/O = 389.07
PROP. GROUND AT 1,000 GAL. TANK = 392.25
TOP OF 1,000 GAL. TANK = 390.16
COVER OVER 1,000 GAL. TANK = 2.09 FT
INVERT INTO 1,000 GAL. TANK = 388.99
INVERT OUT OF 1,000 GAL. TANK = 388.74
PROP. GROUND AT BAT TANK (H1000) = 392.30
TOP OF BAT TANK = 389.60
COVER OVER BAT TANK = 2.7 FT
INVERT INTO BAT TANK = 388.64
INVERT OUT OF BAT TANK = 388.58
PROP. GROUND AT PUMP TANK = 392.25
TOP OF PUMP TANK = 389.25
INVERT INTO PUMP TANK = 388.42
INVERT OUT OF PUMP TANK = 389.42
BASEMENT SEWERAGE TO BE PUMPED

SEPTIC SYSTEM DESIGN

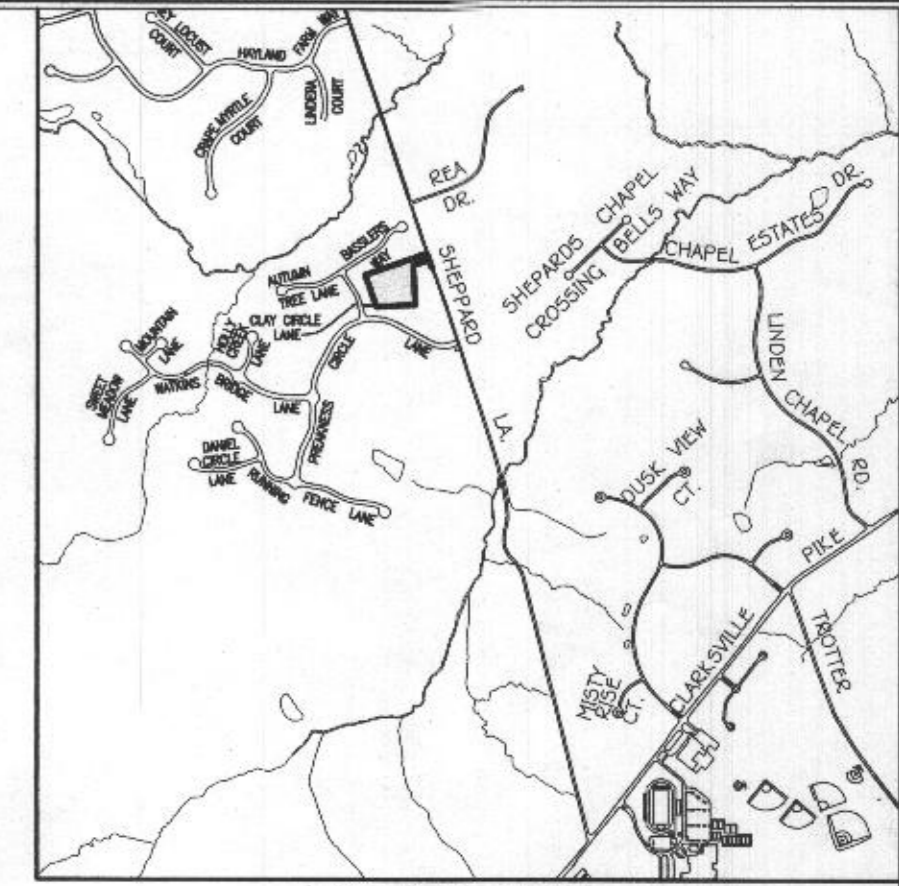
LOADING RATE = 1,350 GPD
APPLICATION RATE = 0.8
EFFECTIVE SIDEWALL BEGINS AT 3.0 FEET
TRENCH DEPTH = 6.5 FEET

INITIAL SYSTEM
TRENCH WIDTH (W) = 2 FEET
EFFECTIVE DEPTH (D) = 3.5 FEET
SF OF DRAINFIELD = 1,350 GPD / 0.8 = 1,687.5 SF
COEFFICIENT OF REDUCTION OF TRENCH LENGTH = (W+2)/(W+1+2D) = (2+2)/(2+1+2(3.5)) = 0.40
TRENCH LENGTH = 1,687.5 SF x 0.40 / 2 = 337.5 FEET (USE 339 FEET)

REPLACEMENT TRENCHES
TRENCH WIDTH (W) = 3 FEET
EFFECTIVE DEPTH (D) = 3.5 FEET
COEFFICIENT OF REDUCTION OF REPLACEMENT TRENCH LENGTH = (W+2)/(W+1+2D) = (3+2)/(3+1+2(3.5)) = 0.46
REPLACEMENT TRENCH WIDTH (W) = 3 FEET
REPLACEMENT TRENCH LENGTH = 1,687.5 SF x 0.46 / 3 = 298.75 FEET (USE 299 FEET)

REPLACEMENT SYSTEM (2) = 5 TRENCHES AT 43.2 LF EACH
REPLACEMENT SYSTEM (3) = 5 TRENCHES AT 51.8 LF EACH

- LEGEND**
- EXISTING 2' CONTOURS
 - EXISTING 10' CONTOURS
 - EXISTING TREE LINE
 - SOIL LINES AND TYPES
 - MAC
 - BEB
 - GGB
 - DENOTES PROPOSED WELL
 - DENOTES FAILED PERC
 - DENOTES PASSED PERC
 - DENOTES 1500 SQ.FT. ALTERNATE WELL SITE
 - ▨ DENOTES PROPOSED SEPTIC EASEMENT
 - ▨ DENOTES AN EXISTING SHARED SEPTIC AREA



- GENERAL NOTES**
1. SUBJECT PROPERTY ZONED: RC-DEO
 2. TOTAL AREA OF PROPERTY: 4.09 AC.
 3. SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT REVIEW.
 4. LENGTH OF TRENCH TO BE DETERMINED AT TIME OF SEPTIC PERMIT ISSUANCE.
 5. CONTRACTOR/BUILDER TO VERIFY ELEVATION IN THE FIELD BEFORE BEGINNING ANY CONSTRUCTION.
 6. BOUNDARY OF LOT BASED ON PLAT #22017.
 7. TOPOGRAPHY SHOWN HEREON TAKEN FROM F-07-072 WHICH IS BASED ON FIELD RUN TOPOGRAPHIC SURVEY CONDUCTED BY FISHER, COLLINS, & CARTER, INC.
 8. ALL ADJACENT WELLS ON THIS PLAN HAVE BEEN FIELD LOCATED BY FISHER, COLLINS, & CARTER, INC.
 9. NO WETLANDS EXIST ON THIS LOT.
 10. MICRO-BIORETENTION AREAS SHOWN ARE TO HAVE AN IMPERMEABLE LINER INSTALLED, PERMITTING THEM TO BE LOCATED LESS THAN 100 FEET FROM BUT NOT CLOSER THAN 50 FEET TO THE EXISTING WELL BOXES.

FRICITION LOSS IN 2" PIPE FITTINGS:

1 ELBOW x 12 FEET PER FITTING = 12 EQUIVALENT FEET OF PIPE
3 1/2 HB x 6 FEET PER FITTING = 18 EQUIVALENT FEET OF PIPE
2 1/16 HB x 6 FEET PER FITTING = 12 EQUIVALENT FEET OF PIPE
5 TEE/CROSS x 17 FEET PER FITTING = 85 EQUIVALENT FEET OF PIPE
1 UNION x 4 FEET PER FITTING = 4 EQUIVALENT FEET OF PIPE
TOTAL EQUIVALENT FEET OF PIPE = 131 FT

TOTAL LINEAR FEET OF 3" PVC = 202 LF + 131 LF = 333 LF

DYNAMIC HEAD
333 LF x 2.09 FT PER 100 LF OF PIPE = 6.96 FT OF FRICTION HEAD
DISTAL HEAD = 2.00 FT
VERTICAL FROM PUMP OFF TO DISCHARGE = 4.25 FT OF FRICTION HEAD
VERTICAL FROM DISCHARGE TO UPPER TRENCH = 7.68
TOTAL DYNAMIC HEAD = 20.89 FT (USE 21 FT)

PIPE VOLUMES
202 LF (3" PIPE) x 38.4 GALLONS PER 100 LF = 77.6 GALLONS
254 LF (1.5" PIPE) x 10.6 GALLONS PER 100 LF = 27.0 GALLONS

MINIMUM DOSE
MINIMUM DOSE = (5 x LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
= (5 x 26.7) + (77.6)
= 211.1 GALLONS

211.1 GALLONS IS LESS THAN 1/6 DESIGN FLOW (1,350/6=225)
USE 301.5 GALLON DOSE (3 MIN RUN TIME x 100.5 GPM FLOW)

PUMP NEEDS TO HANDLE 100.5 GPM AT 21 FT OF HEAD
PUMP HORSEPOWER ESTIMATED AT 1.6 HP BUT SELECTED PUMP MODEL HANDLES LOADING - USE 1 HP (GOULD MODEL WE15H PUMP)

LOW PRESSURE DOSING SYSTEM

TRENCH	GROUND ELEV.	PIPE INVERT ELEV.	TRENCH LENGTH (FT)	1.5" LATERAL PIPE LENGTH (FT)	PERFORATION DIAMETER (IN)	HEAD (FT)	PERFORATION FLOW RATE (GPM)	PERFORATION SPACING (FT)	NUMBER OF ORIFICES	TRENCH FLOW RATE (GPM)
1A1	400.1	397.1	56.5	50.85	5/16	2	1.63	5.65	10	16.3
1A2	400.1	397.1	56.5	50.85	5/16	2	1.63	5.65	10	16.3
1B1	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
1B2	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
1C1	397.1	394.1	56.5	50.85	1/4	5	1.85	5.65	10	16.5
1C2	397.1	394.1	56.5	50.85	1/4	5	1.85	5.65	10	16.5
TOTAL TRENCH FLOW RATE										100.5

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 BEGINS AT	EFFECTIVE DEPTH (D)	WIDTH OF TRENCHES (W)	TRENCH SPACING
1A1	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10
1A2	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10
1B1	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10
1B2	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10
1C1	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10
1C2	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10



Approved Septic System Plan
Howard County Health Department
Name: Osamu Date: 3/11/15

NOTE
THE EXISTING WELL FOR LOT 3 SHOWN ON THIS PLAN, TAG NO. HO #95-2097 HAS BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC., PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.

BAT SITE PLAN
MARILLEY PROPERTY
LOT 3
5102 CLAY CIRCLE LANE

SOILS LEGEND

SOIL	NAME	CLASS	K FACTOR
BeB	Benevola silt loam, 3 to 8 percent slopes	B	0.28
MaC	Manor loam, 8 to 15 percent slopes	B	0.24
GgB	Glenely loam, 3 to 8 percent slopes	B	0.20

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: 01/12/2016.

Arjun Kumar 3/11/15
Signature of Professional Engineer DATE



OWNER

SUDHIR RAO & PRIYA VENKATARAMAN-RAO
1021 MAIN STREET
GAITHERSBURG, MD 20878

PLAN

SCALE: 1" = 50'

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALDORNE NATIONAL PIKE
ELICHTY CITY, MARYLAND 21042
(410) 461 - 8995

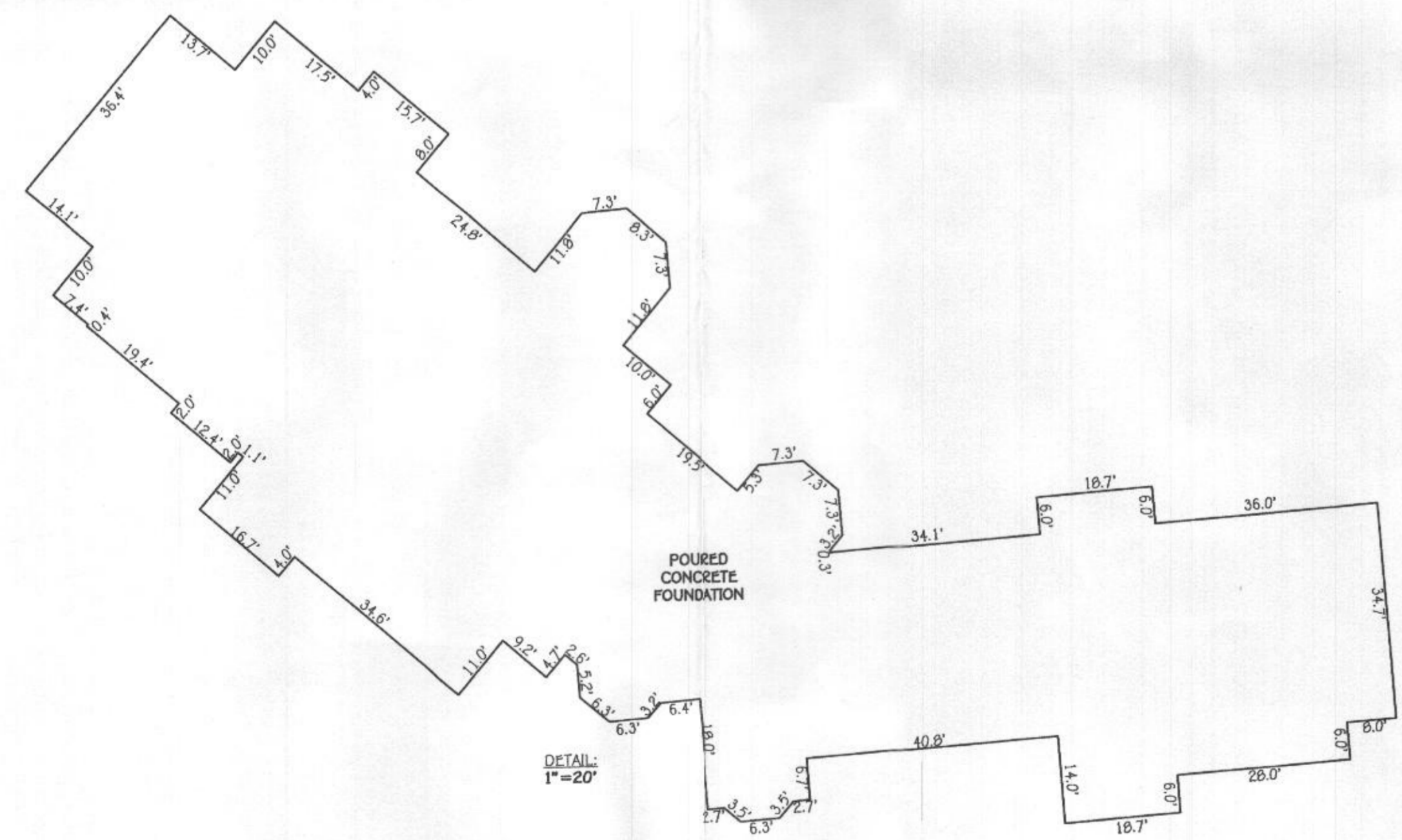
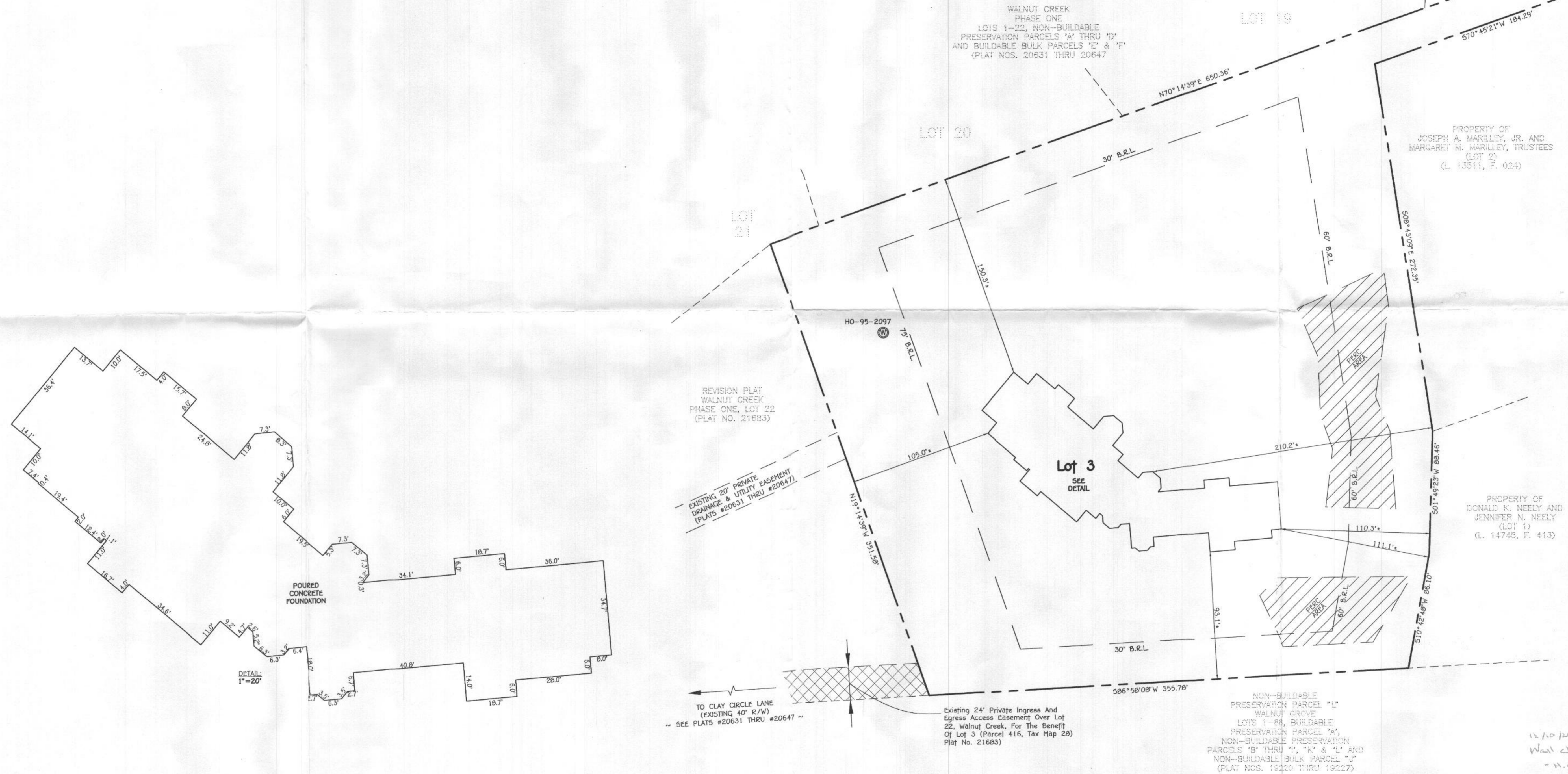
GENERAL NOTES:

- 1) THIS LOCATION DRAWING IS PREPARED FOR THE BENEFIT OF THE CLIENT SIGNING THE HOUSE LOCATION SURVEY APPROVAL FORM INsofar AS IT IS REQUIRED BY A LENDER OR TITLE INSURANCE COMPANY OR ITS AGENTS IN CONNECTION WITH THE CONTEMPLATED TRANSFER, FINANCING OR REFINANCING OF THE PROPERTY SHOWN HEREON. UNLESS INDICATED AS BEING A BOUNDARY SURVEY, THIS LOCATION DRAWING IS NOT INTENDED FOR USE IN THE ESTABLISHMENT OF PROPERTY LINES AND IS NOT TO BE RELIED UPON FOR THE ESTABLISHMENT OR LOCATIONS OF FENCES, GARAGES, BUILDINGS OR OTHER EXISTING OR FUTURE IMPROVEMENTS. AS A RESULT, THIS LOCATION DRAWING DOES NOT PROVIDE FOR ACCURATE IDENTIFICATION OF PROPERTY LINES, BUT SUCH IDENTIFICATION MAY NOT BE REQUIRED FOR THE TRANSFER OF TITLE OR SECURING FINANCING FOR RE-FINANCING.
- 2) SUBJECT PROPERTY IS SHOWN IN ZONE X₁ ON THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP OF HOWARD COUNTY, MARYLAND. COMMUNITY PANEL No. 24027C0136D EFFECTIVE NOV. 6, 2013.
- 3) THE OFFSETS FROM BUILDING LINE TO PROPERTY LINE AS SHOWN ON THE PLAT HEREON ARE TO AN ACCURACY OF PLUS OR MINUS 1".
- 4) NO TITLE REPORT FURNISHED. SUBJECT TO ALL EASEMENTS, RIGHTS OF WAY AND CONDITIONS OF RECORD.
- 5) PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED PROPERTY LINE SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 339, EXPIRATION DATE OCTOBER 4, 2016.
- 6) BUILDING PERMIT NUMBER: B-15000012
- 7) TOGETHER WITH A DECLARATION OF EASEMENT DATED AUGUST 6, 2009 & RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY, MARYLAND IN LIBER 11960, FOLIO 366.
- 8) TOGETHER WITH A DECLARATION OF TEMPORARY EASEMENT, DATED AUGUST 6, 2009 & RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY, MARYLAND IN LIBER 11960, FOLIO 370.
- 9) THE EXISTING WELL(S) SHOWN ON THIS PLAN (IDENTIFIED WITH THE ATTACHED WELL TAG NUMBER HO-95-2097) HAS BEEN FIELD LOCATED BY FISHER, COLLINS AND CARTER, INC. PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.
- 10) TOP OF FOUNDATION ELEVATION = 396.6'



POINT OF BEGINNING (POB) AT A REBAR & CAP MARKED "FCC 106" ON THE WESTERLY MARGIN OF SHEPPARD LANE ON & DISTANT 650.37 FEET FROM THE BEGINNING OF THE SIXTH OR N79°24'10"E ~ 680.54 FOOT LINE OF LIBER 1055, FOLIO 729 ~

Sheppard Lane
(Minor Collector - Scenic Road)



TO CLAY CIRCLE LANE (EXISTING 40' R/W) ~ SEE PLATS #20631 THRU #20647 ~

Existing 24' Private Ingress And Egress Access Easement Over Lot 22, Walnut Creek, For The Benefit Of Lot 3 (Parcel 416, Tax Map 28) Plat No. 21663

NON-BUILDABLE PRESERVATION PARCEL "I" WALNUT CREEK LOTS 1-22, BUILDABLE PRESERVATION PARCEL "A", NON-BUILDABLE PRESERVATION PARCELS "B" THRU "L", "K" & "L" AND NON-BUILDABLE BULK PARCEL "J" (PLAT NOS. 19220 THRU 19227)

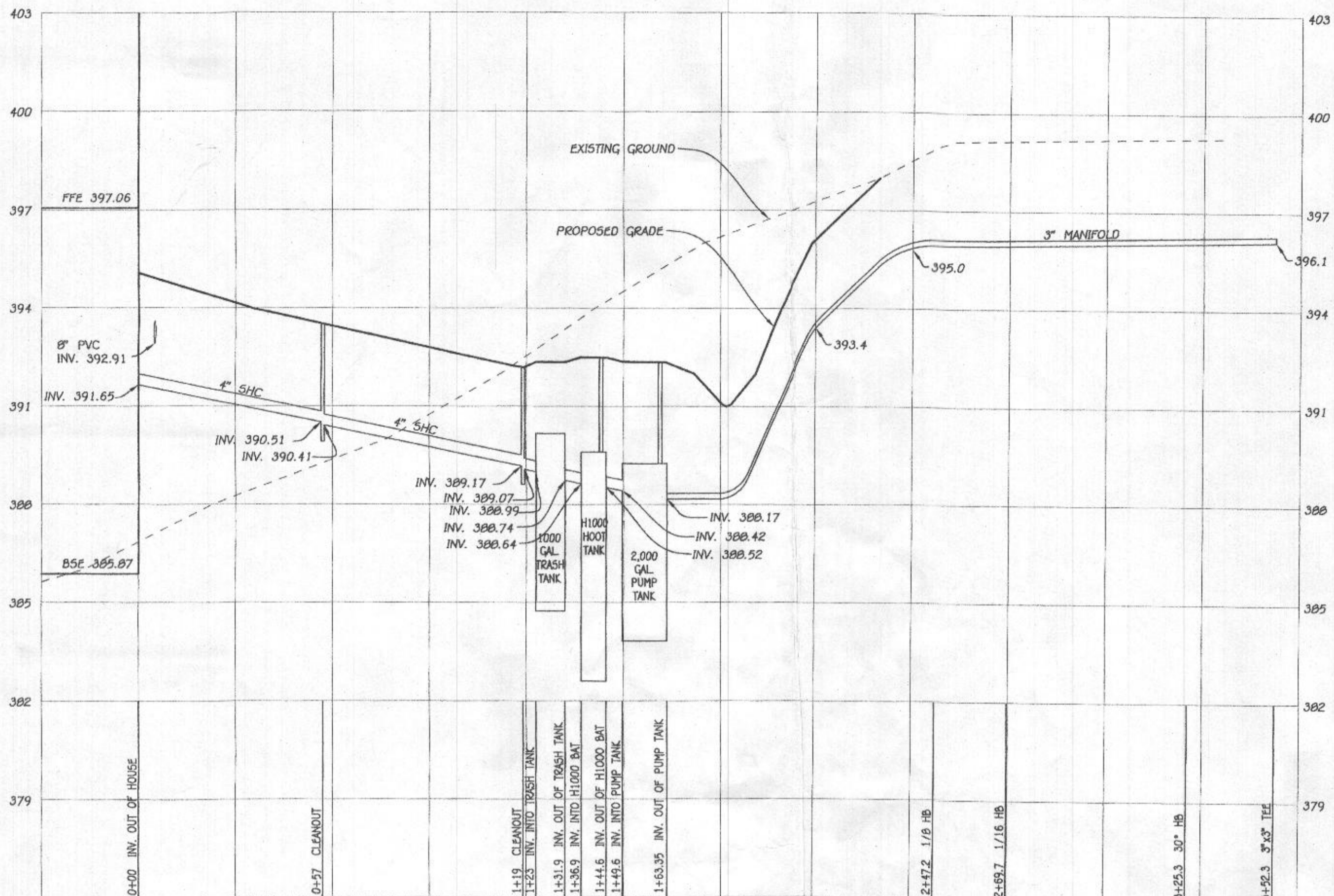
HOUSE LOCATION DRAWING

FOUNDATION LOCATION: 2/23/16
FINAL LOCATION:
BOUNDARY SURVEY:
SCALE: 1" = 40'
DATE: 2/23/16
DRAWN BY: GAO
CHECKED BY: HLC
PROJECT No. 08075-6004



Michael J. Fisher 2/03/16
PROPERTY LINE SURVEYOR DATE
REG. #339

#5102 CLAY CIRCLE LANE
TAX MAP #28 ~ GRID #18 ~ PARCEL #416
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
DEED REFERENCE: LIBER 15016, FOLIO 296



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 2. THE MAXIMUM COVER OVER THE BAT SHALL BE 3 FEET.
 3. THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
 4. THE BAT SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
 5. WITHIN ONE MONTH OF INSTALLATION, A PERSON INSTALLING THE BAT SYSTEM SHALL REPORT TO THE HOWARD COUNTY DEPARTMENT OF THE ENVIRONMENT (HDC) IN A MANNER ACCEPTABLE TO THE ADDRESS AND DATE OF COMPLETION OF THE BAT INSTALLATION AND THE TYPE OF BAT INSTALLED.
 6. ANY ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN. AN APPROVED AND SIGNED HAS BEEN COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, LIBER 1982, FOLIO 009.
 7. THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE START-UP CERTIFICATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
 8. SURFACE RUNOFF SHALL BE DIRECTED AROUND THE BAT TANK.
 9. AT HIGH WATER ALARM PROBE, PUMP WILL HAVE CONTINUOUS OPERATION UNTIL LEVEL GOES BENEATH PROBE.
 10. CONTRACTOR TO VERIFY REQUIRED FLOAT ELEVATIONS.
 11. IF WATER LEVEL RISES ABOVE THE ALARM PROBE, AN AUDIBLE AND VISUAL ALARM WILL SOUND. SEE MANUFACTURER SPECS FOR ADDITIONAL INFORMATION.
 12. ALARM TO BE WIRED TO A CIRCUIT SEPARATE FROM THE PUMP CIRCUIT.
 13. ALARM TO BE IN THE AREA OF SEPTIC FIELD WAS FIELD RUN BY FISHER, COLLINS AND CARTER, INC. ON APRIL 2021.

SEPTIC SYSTEM ELEVATIONS

FFE	= 397.06
BSE	= 389.97
INV. OUT OF HOUSE	= 391.65
PROP. GROUND AT C/O	= 393.60
INV. INTO C/O	= 390.51
INV. OUT OF C/O	= 390.41
PROP. GROUND AT C/O	= 392.20
INV. INTO C/O	= 389.17
INV. OUT OF C/O	= 389.07
PROP. GROUND AT 1,000 GAL. TANK	= 392.25
TOP OF 1,000 GAL. TANK	= 390.16
COVER OVER 1,000 GAL. TANK	= 2.09 FT
INVERT INTO 1,000 GAL. TANK	= 388.99
INVERT OUT OF 1,000 GAL. TANK	= 388.74
PROP. GROUND AT BAT TANK (H1000)	= 392.30
TOP OF BAT TANK	= 389.60
COVER OVER BAT TANK	= 2.7 FT
INVERT INTO BAT TANK	= 388.54
INVERT OUT OF BAT TANK	= 388.52
PROP. GROUND AT PUMP TANK	= 392.25
TOP OF PUMP TANK	= 389.25
INVERT INTO PUMP TANK	= 388.42
INVERT OUT OF PUMP TANK	= 388.17

*BASEMENT SEWERAGE TO BE PUMPED

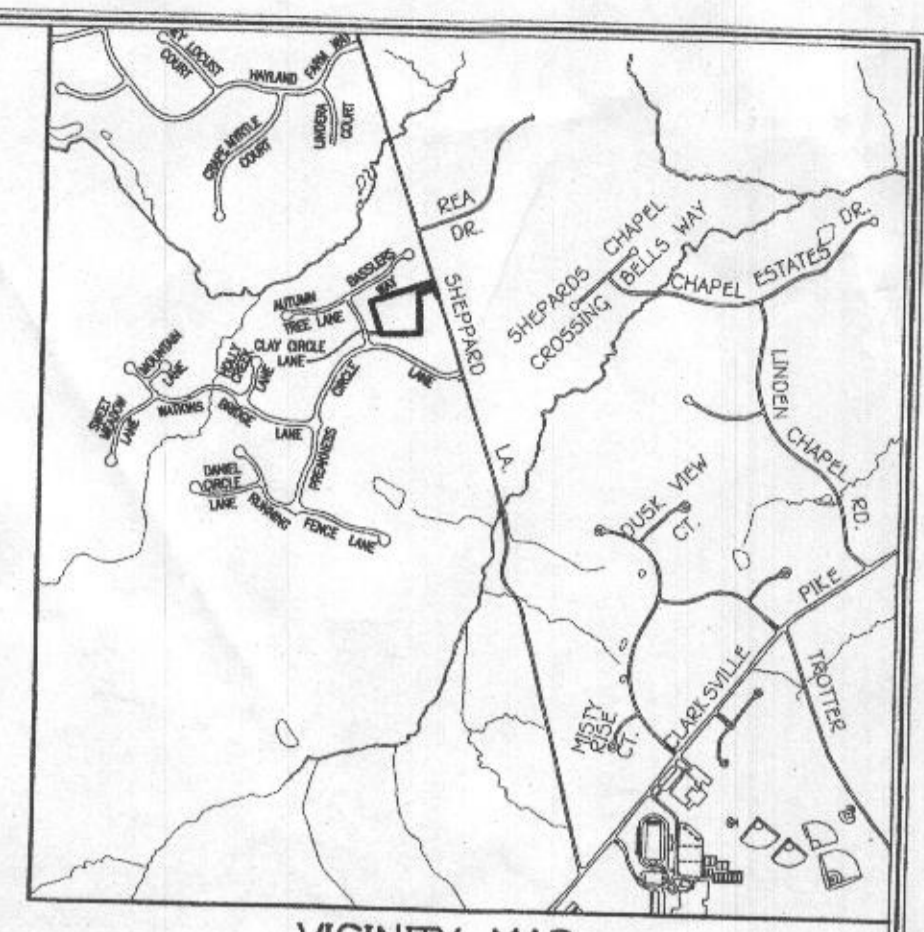
SEPTIC SYSTEM DESIGN
 9 BEDROOM HOUSE
 LOADING RATE = 1,350 GPD
 APPLICATION RATE = 0.8
 EFFECTIVE SIDEWALL BEGINS AT 3.0 FEET
 TRENCH DEPTH = 6.5 FEET

INITIAL SYSTEM
 TRENCH WIDTH (W) = 2 FEET
 EFFECTIVE DEPTH (D) = 3.5 FEET
 SF OF DRAINFIELD = 1,350 GPD / 0.8 = 1,687.5 SF
 COEFFICIENT OF REDUCTION OF TRENCH LENGTH = (W+2)/(W+1+2D) = 0.40
 TRENCH LENGTH = 1,687.5 SF x 0.40 / 2 = 337.5 FEET (USE 339 FEET)

REPLACEMENT TRENCHES
 TRENCH WIDTH (W) = 3 FEET
 EFFECTIVE DEPTH (D) = 3.5 FEET
 COEFFICIENT OF REDUCTION OF REPLACEMENT TRENCH LENGTH = (W+2)/(W+1+2D) = 0.46
 REPLACEMENT TRENCH WIDTH (W) = 3 FEET
 REPLACEMENT TRENCH LENGTH = 1,687.5 SF x 0.46 / 3 = 258.75 FEET (USE 259 FEET)

REPLACEMENT SYSTEM (2) - 6 TRENCHES AT 43.2 LF EACH
 REPLACEMENT SYSTEM (3) - 5 TRENCHES AT 51.8 LF EACH

- LEGEND**
- EXISTING 2' CONTOURS
 - EXISTING 10' CONTOURS
 - EXISTING TREE LINE
 - SOIL LINES AND TYPES
 - ⊙ DENOTES PROPOSED WELL
 - ⊙ DENOTES PASSED PERC
 - ⊙ DENOTES FAILED PERC
 - DENOTES 1500 SQ. FT. ALTERNATE WELL SITE
 - ▨ DENOTES PROPOSED SEPTIC CASSEMENT
 - ▨ DENOTES AN EXISTING SHARED SEPTIC AREA



- GENERAL NOTES**
1. SUBJECT PROPERTY ZONED: RC-DEO
 2. TOTAL AREA OF PROPERTY: 4.09 AC.
 3. SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT REVIEW.
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 5. CONTRACTOR/BUILDER TO VERIFY ELEVATION IN THE FIELD BEFORE BEGINNING ANY CONSTRUCTION.
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 8. ALL ADJACENT WELLS ON THIS PLAN HAVE BEEN FIELD LOCATED BY FISHER, COLLINS, & CARTER, INC.
 9. NO WETLANDS EXIST ON THIS LOT.
 10. MICRO-BIORETENTION AREAS SHOWN ARE TO HAVE AN IMPERMEABLE LINER INSTALLED, PERMITTING THEM TO BE LOCATED LESS THAN 100 FEET FROM BUT NOT CLOSER THAN 50 FEET TO THE EXISTING WELL BOXES.

FRICTION LOSS IN 3" PIPE FITTINGS:

1 ELBOW	x 12 FEET PER FITTING	= 12 EQUIVALENT FEET OF PIPE
3 1/8" HB	x 6 FEET PER FITTING	= 18 EQUIVALENT FEET OF PIPE
2 1/16" HB	x 6 FEET PER FITTING	= 12 EQUIVALENT FEET OF PIPE
5 Tee/CROSS	x 17 FEET PER FITTING	= 85 EQUIVALENT FEET OF PIPE
1 UNION	x 4 FEET PER FITTING	= 4 EQUIVALENT FEET OF PIPE

TOTAL EQUIVALENT FEET OF PIPE = 131 FT

TOTAL LINEAR FEET OF 3" PVC = 216 LF + 131 LF = 347 LF

DYNAMIC HEAD
 347 LF x 2.09 FT PER 100 LF OF PIPE = 7.25 FT OF FRICTION HEAD
 DISTAL HEAD = 2.00 FT
 VERTICAL FROM PUMP OFF TO DISCHARGE = 4.25 FT OF FRICTION HEAD
 VERTICAL FROM DISCHARGE TO UPPER TRENCH = 7.68
 TOTAL DYNAMIC HEAD = 21.10 FT (USE 21 FT)

PIPE VOLUMES
 216 LF (3" PIPE) x 38.4 GALLONS PER 100 LF = 79.3 GALLONS
 320.7 LF (1.5" PIPE) x 10.6 GALLONS PER 100 LF = 34.0 GALLONS

MINIMUM DOSE
 MINIMUM DOSE = (5 x LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
 = (5 x 34) + (79.3) @ 2.5
 = 249.3 GALLONS

1.53
 249.3 GALLONS IS LESS THAN 1/6 DESIGN FLOW (1,350/6=225)
 USE 250 GALLON DOSE (2.1 MIN RUN TIME X 120 GPM FLOW)

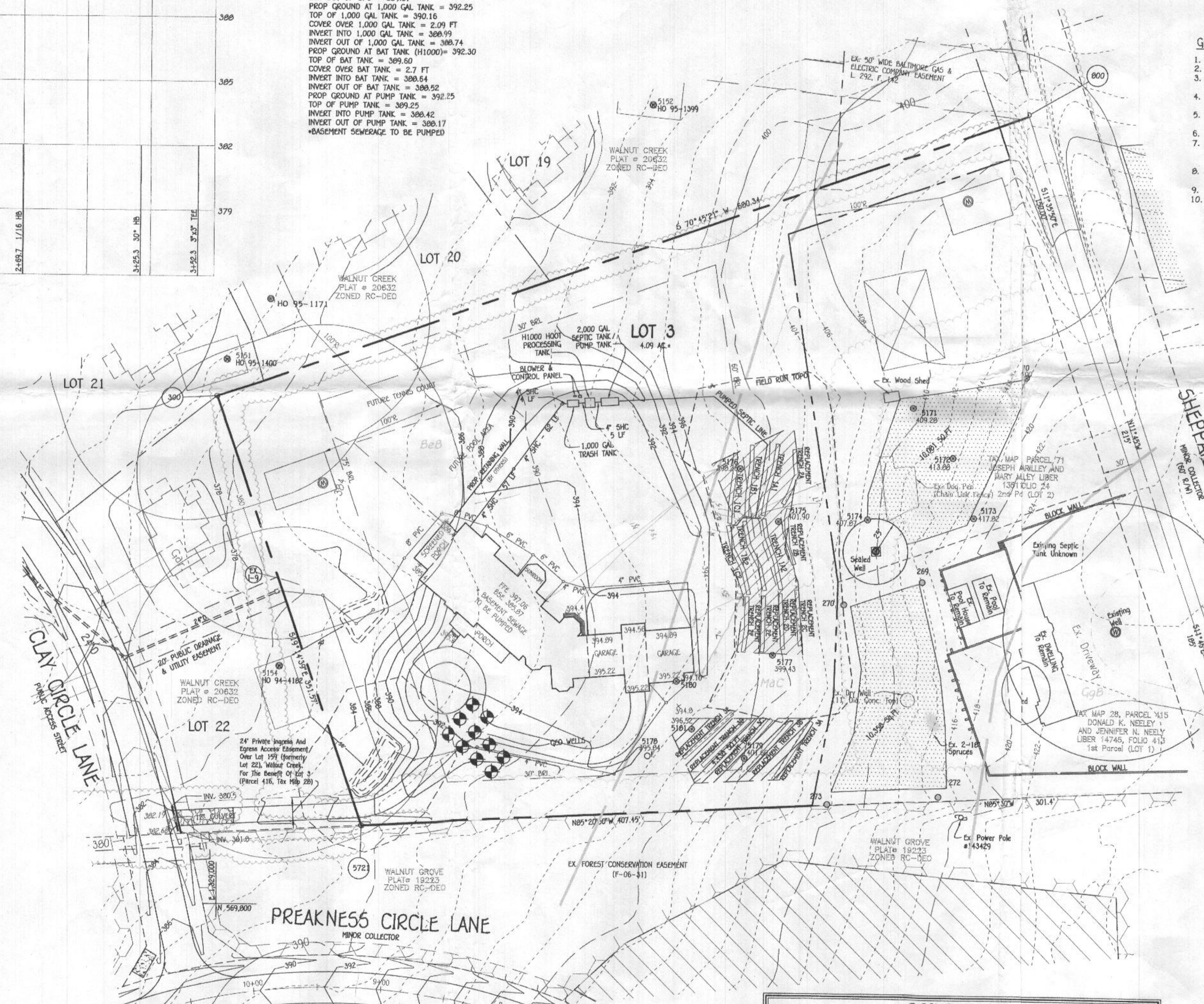
PUMP NEEDS TO HANDLE 120 GPM AT 21 FT OF HEAD
 LOADING - USE 1 HP (GOULD MODEL WE15H PUMP)

LOW PRESSURE DOSING SYSTEM

TRENCH	GROUND ELEV.	PIPE INVERT ELEV.	TRENCH LENGTH (FT)	1.5" LATERAL PIPE LENGTH (FT)	PERFORATION DIAMETER (IN)	HEAD (FT)	PERFORATION FLOW RATE (GPM)	PERFORATION SPACING (FT)	NUMBER OF ORIFICES	TRENCH FLOW RATE (GPM)
IA1	400.1	397.1	56.5	53.68	5/16	2	1.63	5.65	10	16.3
IA2	400.1	397.1	56.5	53.68	5/16	2	1.63	5.65	10	16.3
IB1	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
IB2	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
IC1	397.1	394.1	56.5	53.68	1/4	5	1.65	5.65	10	16.5
IC2	397.1	394.1	56.5	53.68	1/4	5	1.65	5.65	10	16.5
TOTAL TRENCH FLOW RATE										100.5

TRENCH DESIGN

TRENCH	GROUND ELEV.	TOP OF STONE ELEV.	PIPE INVERT ELEV.	DEPTH FROM GROUND	DEPTH TO STONE	DEPTH OF TRENCH	BOTTOM OF TRENCH ELEV.	EFFECTIVE DEPTH BEGINS AT	EFFECTIVE DEPTH (D)	WIDTH OF TRENCHES (W)	TRENCH ACING
IA1	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10	
IA2	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10	
IB1	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10	
IB2	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10	
IC1	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10	
IC2	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10	



Approved Septic System Plan
 Howard County Health Department
 Signature: *Howe Oswald* Date: 6/15/21

NOTE
 THE EXISTING WELL FOR LOT 3 SHOWN ON THIS PLAN, TAG NO. HO #95-2097 HAS BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC., PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.

SOILS LEGEND

SOIL	NAME	CLASS	E FACTOR
BeB	Benevolat silt loam, 3 to 8 percent slopes	B	0.28
M8C	M8nor loam, 8 to 15 percent slopes	B	0.24
GgB	Glennet loam, 3 to 8 percent slopes	B	0.20

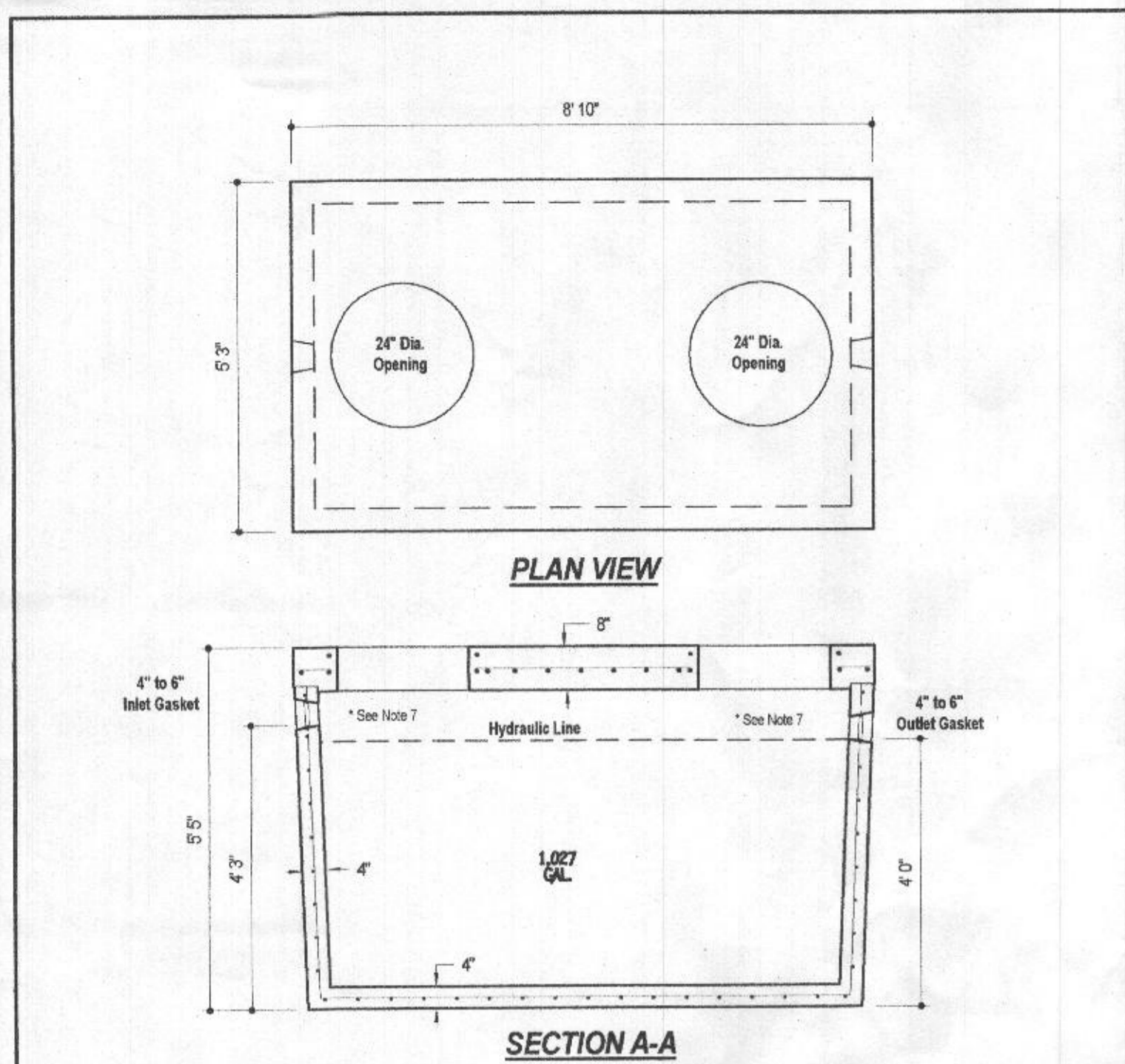
BAT SITE PLAN
MARILLEY PROPERTY
LOT 3
 5102 CLAY CIRCLE LANE
 ZONED: RC-DEO
 TAX MAP NO. 29 GRID NO. 18 PARCEL NO. 416
 FIFTH ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
 DATE: APRIL 21, 2021
 SHEET 1 OF 2

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTRAL SQUARE OFFICE PARK - 10772 BALDWIN NATIONAL PIKE
 ELICOTT CITY, MARYLAND 21142
 (410) 461-2899

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. 20748, EXPIRATION DATE: 02/22/2023.
 Signature: *Howe Oswald* DATE: 6/15/21

OWNER
 SUDHIR RAO & PRIYA VENKATARAMAN-RAO
 1021 MAIN STREET
 GAITHERSBURG, MD 20878

PLAN
 SCALE: 1" = 50'

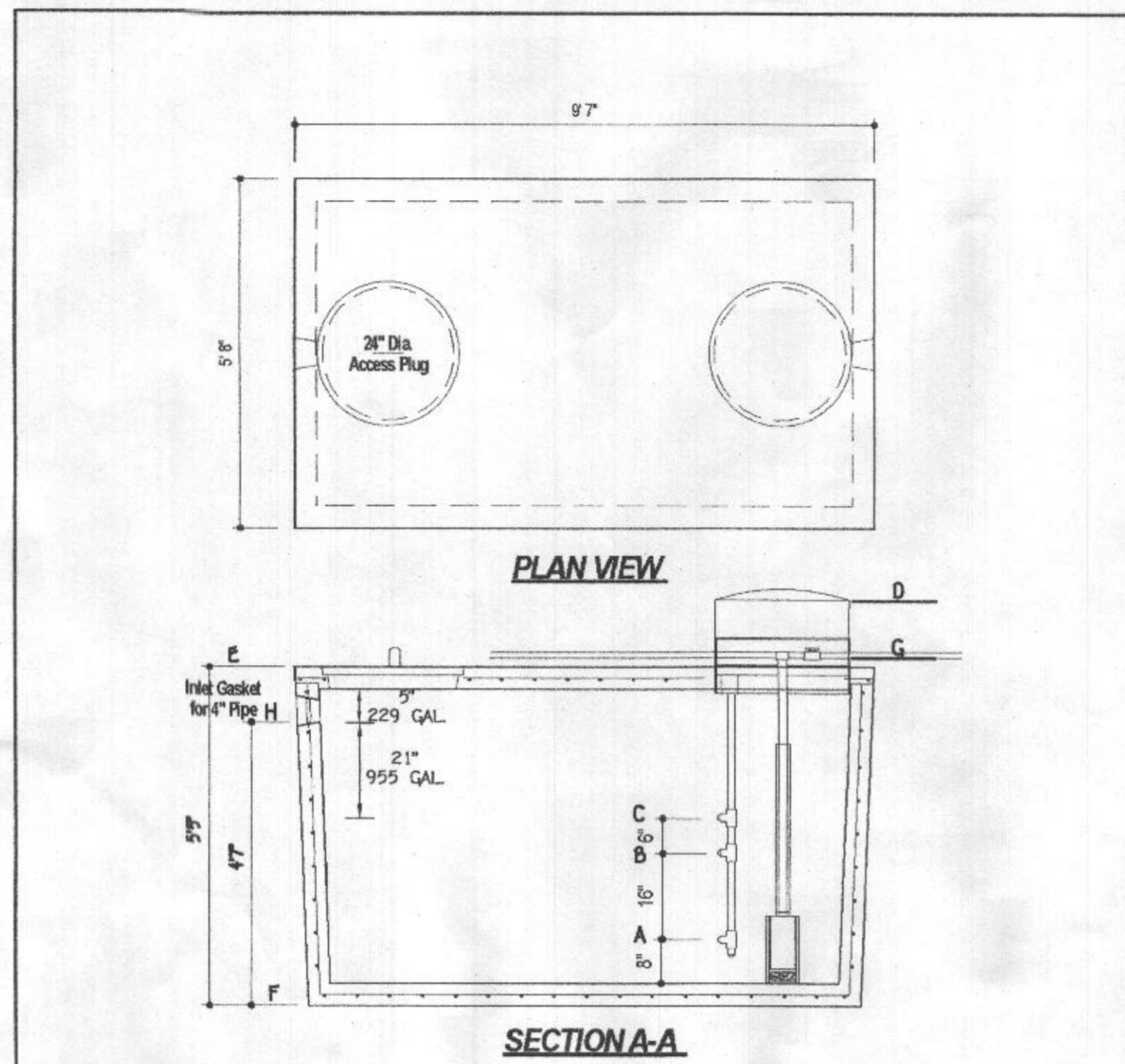


DESIGN DATA & GENERAL NOTES

- Concrete strength F_{cm} 4,000 p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type III per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
- Reinforcing per ASTM A108. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- Maximum 8-4" of earth cover over top slab.
- Depending on use of tank, Inlet & Outlet baffles may be required by code.

Mayer Bros., Inc.
 6364 Race Road
 Elridge, Maryland 21075
 Tel. 410.796.1434
 Fax. 410.796.1438
 www.mayerbrosprecast.com

1,000 GALLON TANK
 Heavy-Traffic Rated
 Stock Item [Approx. Wt. - 14,000 lbs.]
 Dwg. No. 1000TR1 No Scale Aug 11, 2008

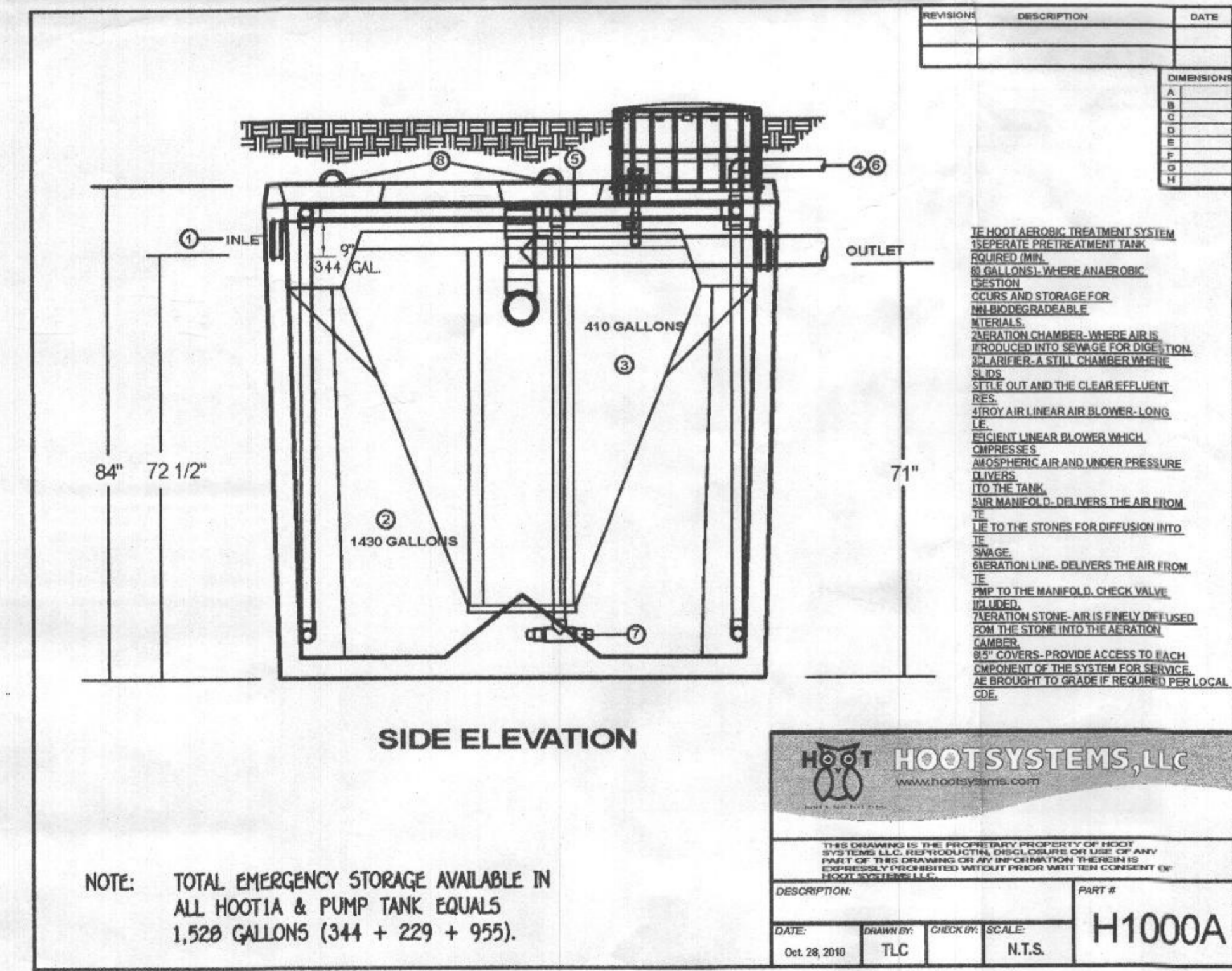


DESIGN DATA & GENERAL NOTES

- Concrete strength F_{cm} 4,000 p.s.i. @ 28 days. Density = 150 pcf.
- Cement - Portland Type III per ASTM C 150-92.
- Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
- Reinforcing per ASTM A108. Min. 1-1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 7" of cover.

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 6364 Race Road
 Elridge, Maryland 21075
 Tel. 410.796.1434
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2,000 GALLON SEPTIC/PUMP TANK
 1-Compartment
 Stock Item [Approx. 19,000 lbs.]
 Dwg. No. 2000-1C No Scale Aug. 11, 2008



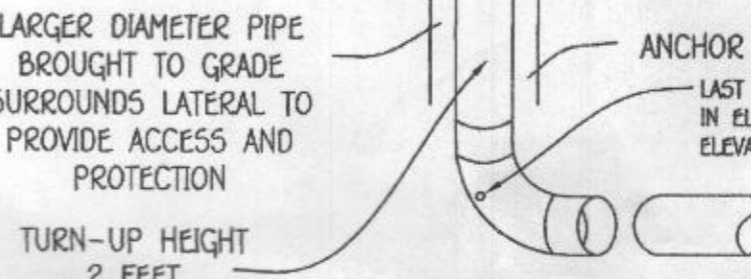
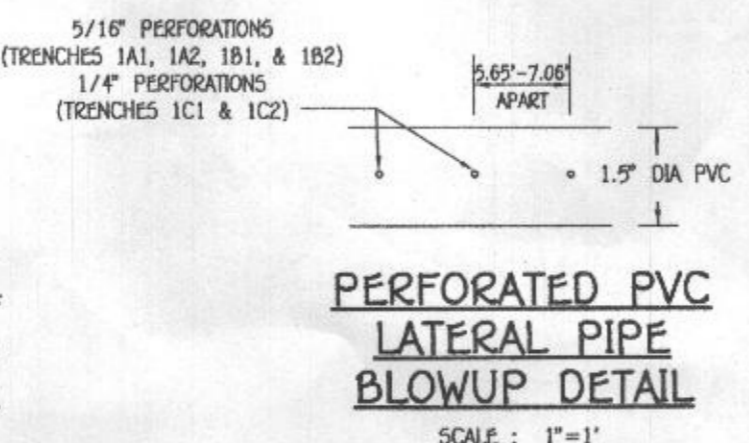
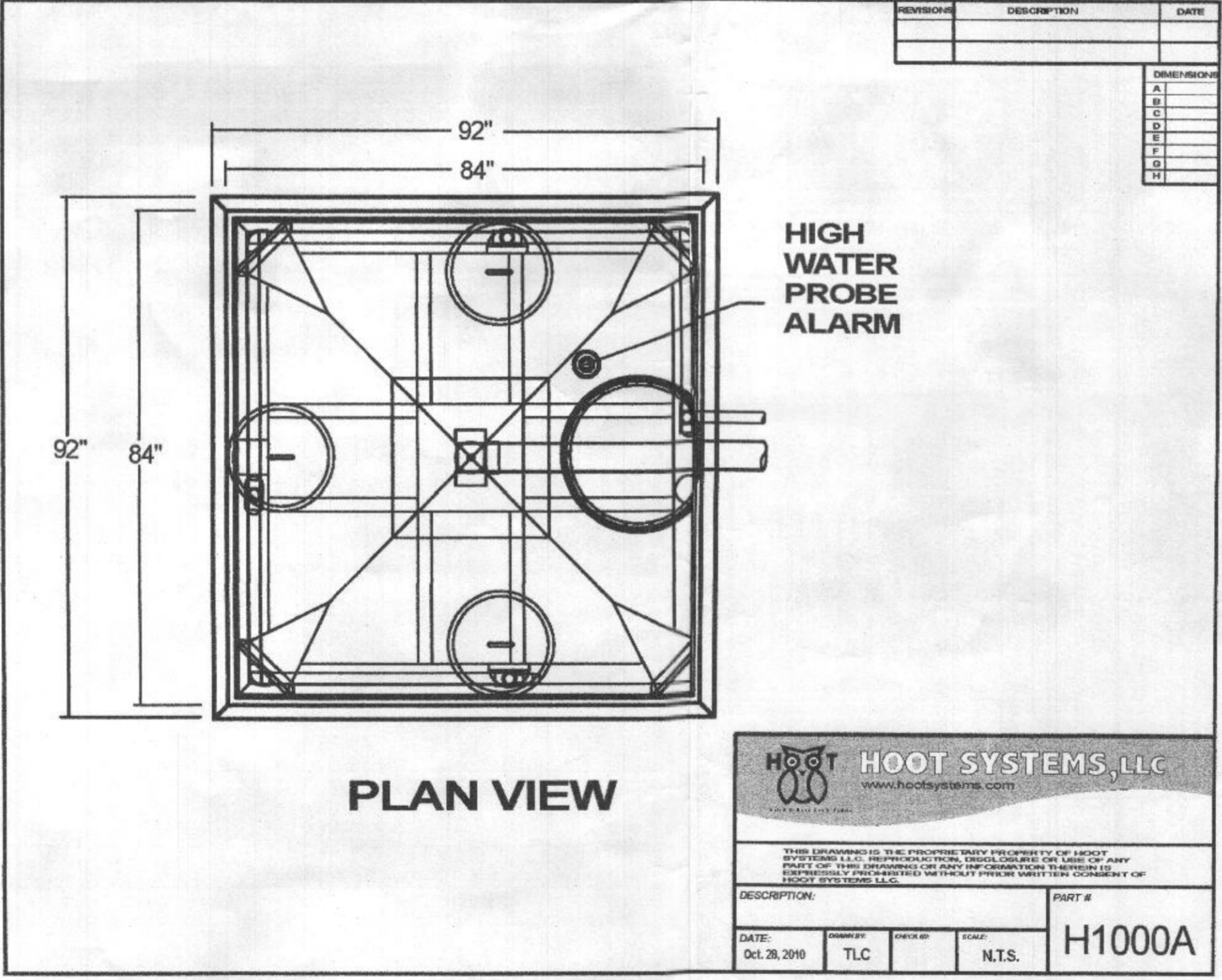
NOTE: TOTAL EMERGENCY STORAGE AVAILABLE IN ALL HOOTIA & PUMP TANK EQUALS 1,528 GALLONS (344 + 229 + 955).

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. 22746. EXPIRATION DATE: 02/22/2023.

Signature of Professional Engineer
 DATE



OWNER
 SUDHIR RAO &
 PRIYA VENKATARAMAN-RAO
 1021 MAIN STREET
 GANTHERSBURG, MD 20878



GOULDS PUMPS



Submersible Effluent Pump
MODEL 3885
 PROSECURE AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS
 Specifically designed for the following uses:
 • Homes
 • Farms
 • Trailer courts
 • Motels
 • Schools
 • Hospitals
 • Industry
 • Effluent systems

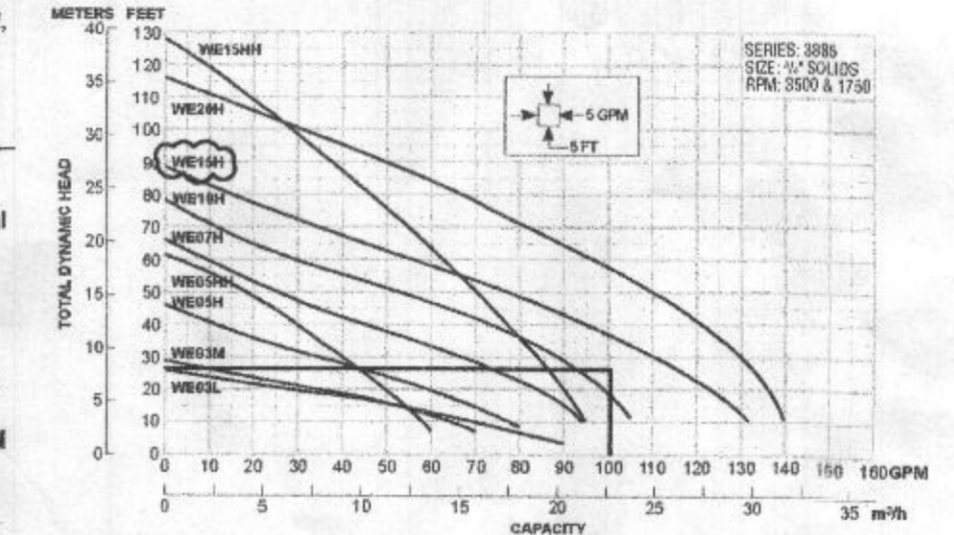
SPECIFICATIONS
 Pump
 • Solids handling capabilities: 3/4" maximum
 • Discharge size: 2" NPT
 • Capacities: up to 140 GPM
 • Total heads: up to 128 feet TDH
 • Temperature: 104°F (40°C) continuous, 140°F (50°C) intermittent
 • See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS
 • Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
 • Class B insulation.

Single phase:
 • Built-in overload with automatic reset
 • All single phase models feature capacitor start motors for maximum starting torque
 • 1/2 and 3/4 HP - 16/0 STOW with 115, 208 and 230 Volt three string plug
 • 1/2 HP - 14/3 STOW with bare leads
 • 3/4 HP - 14/3 STOW with bare leads
 • Overload protection must be provided in starter unit.
 • 1/2 HP - 14/4 STOW with bare leads
 • Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

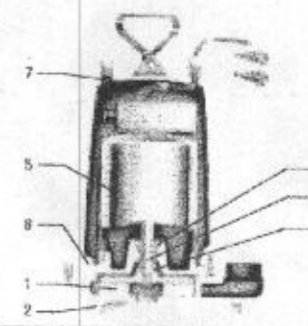
Three phase:
 • Bearings: Upper and lower heavy duty ball bearing construction
 • Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil leakage. 20 foot standard with optional lengths available.
 • O-Ring: Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS
 Goulds Pumps is ISO 9001 Registered.



© 2000 Goulds Pumps Effective February, 2000 3385

GOULDS PUMPS



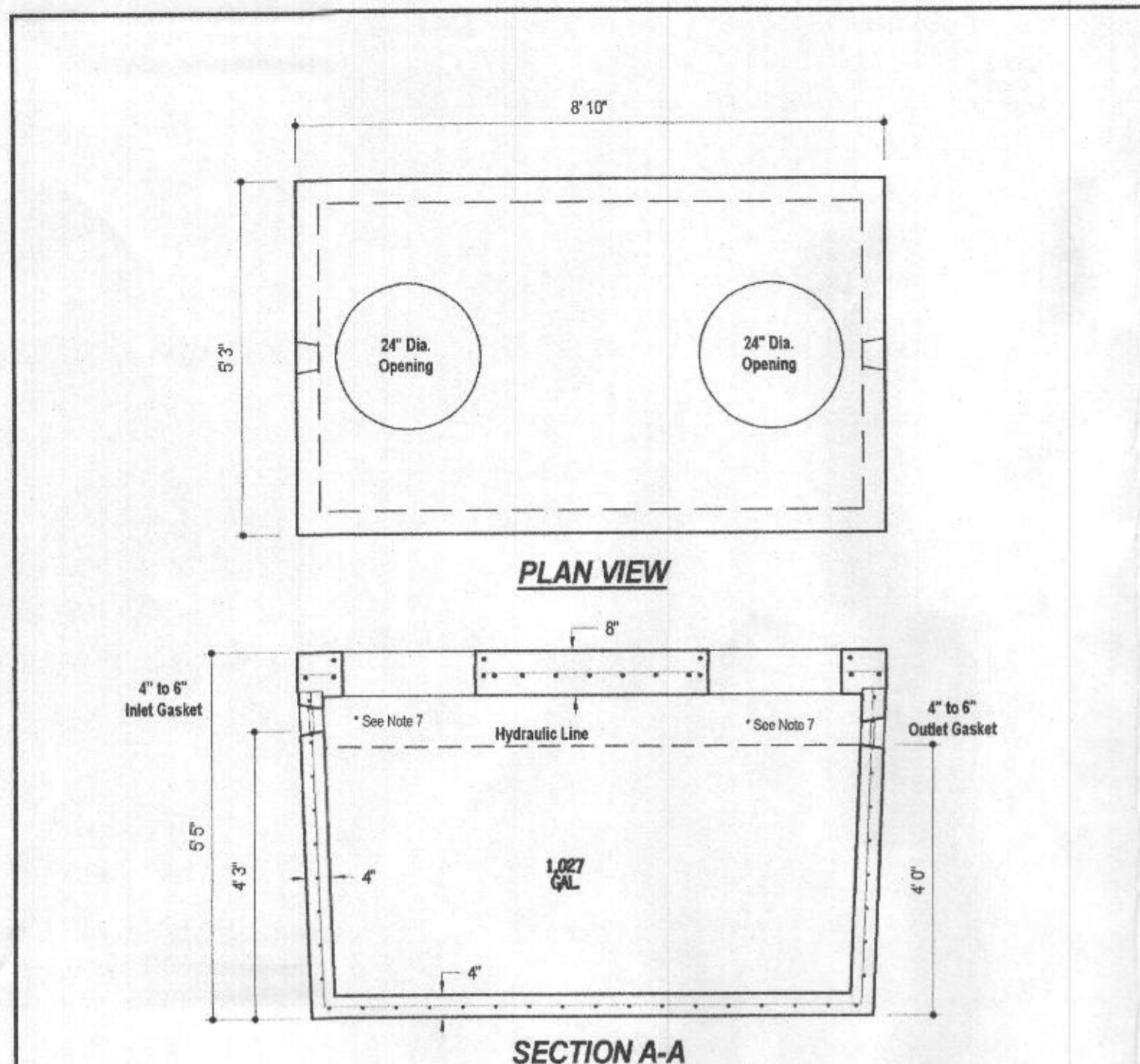
Submersible Effluent Pump
MODEL 3885

COMPONENTS

Item No.	Description
1	Casing
2	Shaft
3	Shaft Coupling vs. silicon carbide
4	Mechanical seal
5	Motor
6	All ball bearings heavy duty design
7	Power cable
8	O-ring

MODELS

Order No.	HP	Phase	Min. Amps	TDH	Vol. (Lit. / Stroke)
WE15H	1/2	1	1.2	128	96
WE15H	3/4	1	1.8	128	96
WE15H	1	1	2.4	128	96
WE15H	1 1/2	1	3.6	128	96
WE15H	2	1	4.8	128	96
WE15H	3	1	7.2	128	96
WE15H	4	1	9.6	128	96
WE15H	5	1	12.0	128	96
WE15H	6	1	14.4	128	96
WE15H	8	1	19.2	128	96
WE15H	10	1	24.0	128	96
WE15H	15	1	36.0	128	96
WE15H	20	1	48.0	128	96
WE15H	30	1	72.0	128	96
WE15H	40	1	96.0	128	96
WE15H	50	1	120.0	128	96
WE15H	60	1	144.0	128	96
WE15H	75	1	180.0	128	96
WE15H	100	1	240.0	128	96
WE15H	150	1	360.0	128	96
WE15H	200	1	480.0	128	96
WE15H	300	1	720.0	128	96
WE15H	400	1	960.0	128	96
WE15H	500	1	1200.0	128	96
WE15H	600	1	1440.0	128	96
WE15H	800	1	1920.0	128	96
WE15H	1000	1	2400.0	128	96
WE15H	1500	1	3600.0	128	96
WE15H	2000	1	4800.0	128	96
WE15H	3000	1	7200.0	128	96
WE15H	4000	1	9600.0	128	96
WE15H	5000	1	12000.0	128	96
WE15H	6000	1	14400.0	128	96
WE15H	8000	1	19200.0	128	96
WE15H	10000	1	24000.0	128	96
WE15H	15000	1	36000.0	128	96
WE15H	20000	1	48000.0	128	96
WE15H	30000	1	72000.0	128	96
WE15H	40000	1	96000.0	128	96
WE15H	50000	1	120000.0	128	96
WE15H	60000	1	144000.0	128	96
WE15H	80000	1	192000.0	128	96
WE15H	100000	1	240000.0	128	96
WE15H	150000	1	360000.0	128	96
WE15H	200000	1	480000.0	128	96
WE15H	300000	1	720000.0	128	96
WE15H	400000	1	960000.0	128	96
WE15H	500000	1	1200000.0	128	96
WE15H	600000	1	1440000.0	128	96
WE15H	800000	1	1920000.0	128	96
WE15H	1000000	1	2400000.0	128	96
WE15H	1500000	1	3600000.0	128	96
WE15H	2000000	1	4800000.0	128	96
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WE15H	4000000	1	9600000.0	128	96
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WE15H	50000000	1	120000000.0	128	96
WE15H	60000000	1	144000000.0	128	96
WE15H	80000000	1	192000000.0	128	96
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WE15H	8000000000	1	19200000000.0	128	96
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WE15H	30000000000	1	72000000000.0	128	96
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WE15H	300000000000	1	720000000000.0	128	96
WE15H	400000000000	1	960000000000.0	128	96
WE15H	500000000000	1	1200000000000.0	128	96
WE15H	600000000000	1	1440000000000.0	128	96
WE15H	800000000000	1	1920000000000.0	128	96
WE15H	1000000000000	1	2400000000000.0	128	96
WE15H	1500000000000	1	3600000000000.0	128	96
WE15H	2000000000000	1	4800000000000.0	128	96
WE15H	3000000000000	1	7200000000000.0	128	96
WE15H	4000000000000	1	9600000000000.0	128	96
WE15H	5000000000000	1	12000000000000.0	128	96
WE15H	6000000000000	1	14400000000000.0	128	96
WE15H	8000000000000	1	19200000000000.0	128	96
WE15H	10000000000000	1	24000000000000.0	128	96
WE15H	15000000000000	1	36000000000000.0	128	96
WE15H	20000000000000	1	48000000000000.0	128	96
WE15H	30000000000000	1	72000000000000.0	128	96
WE15H	40000000000000	1	96000000000000.0	128	96
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WE15H	8000000000000000	1	19200000000000000.0	128	96
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WE15H	40000000000000000	1	96000000000000000.0	128	96
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WE15H	60000000000000000	1	144000000000000000.0	128	96
WE15H	80000000000000000	1	192000000000000000.0		

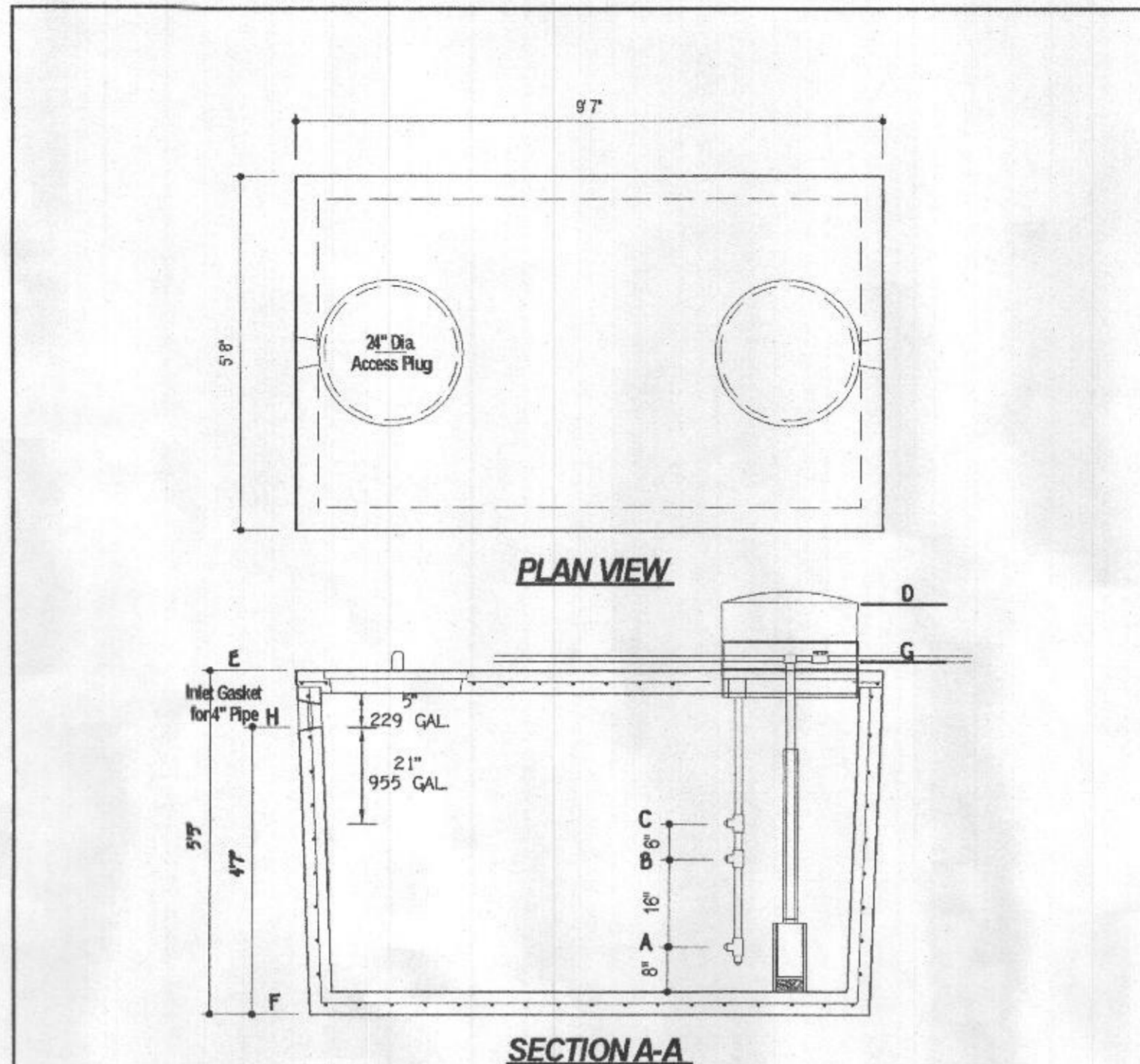


DESIGN DATA & GENERAL NOTES

- Concrete strength $F'_{cm} = 3,000$ p.s.i. @ 28 days. Density = 150 pcf.
- Concrete - Portland Type III per ASTM C 150-05.
- Admixtures & plasticizers per ASTM C 266-06 & C 494-02.
- Reinforcing per ASTM A193, Min. 1/2" cover.
- Top slab sealed with butyl rope mastic.
- Maximum 8" of earth cover top slab.
- Depending on use of tank, Inlet & Outlet baffles may be required by code.

1,000 GALLON TANK
Heavy-Traffic Rated
Stock Item [Approx. Wt. - 14,000 lbs.]
Dwg. No. 1000TR1 No Scale Aug 11, 2008

Mayer Bros., Inc.
6764 Race Road
Elkridge, Maryland 21075
Tel. 410.786.1434
Fax. 410.786.1438
www.mayerbrosprecast.com

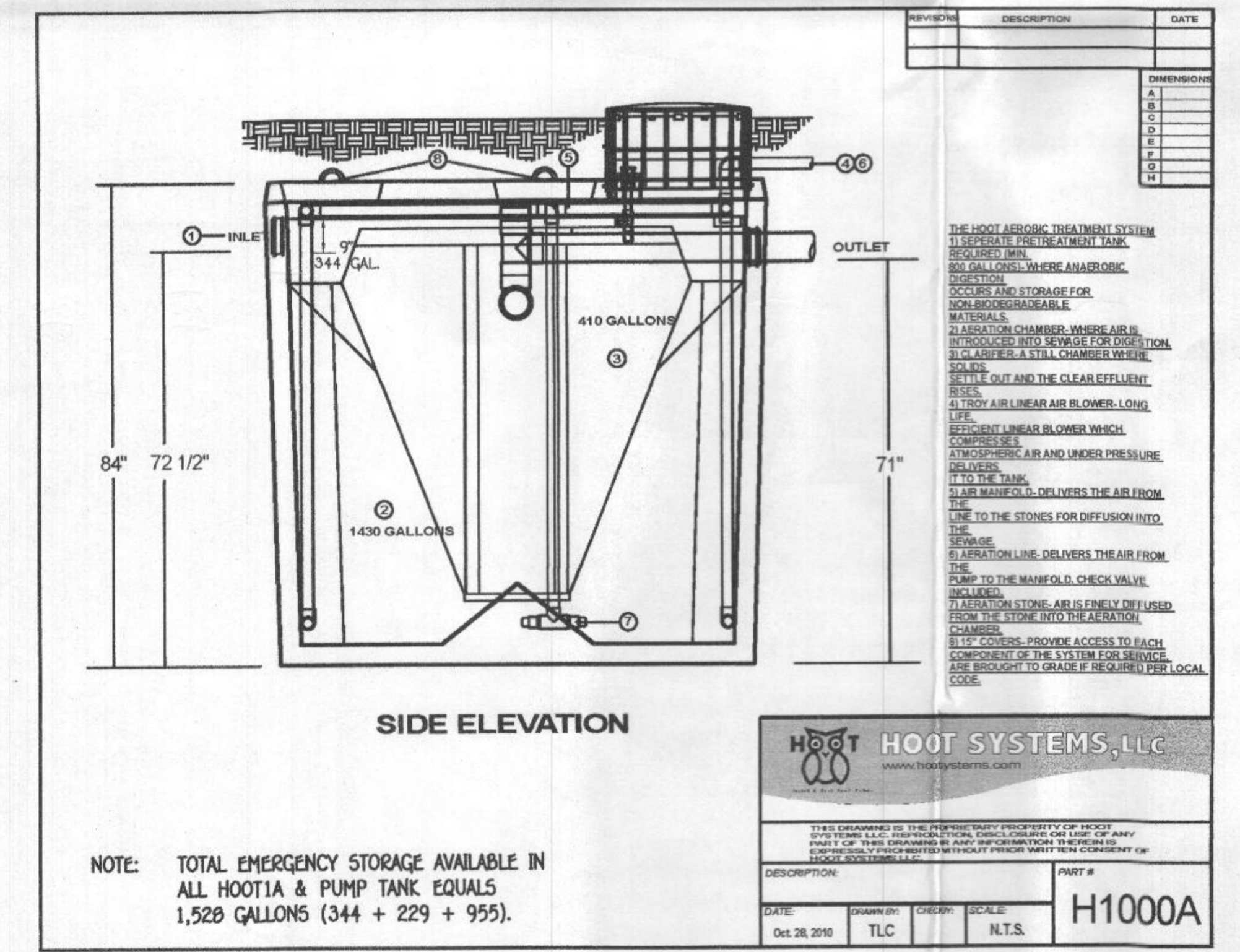


DESIGN DATA & GENERAL NOTES

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- Reinforcing per ASTM A193, Min. 1/2" cover.
- Top slab sealed with butyl rope mastic.
- 4" wall, base, & top thickness.
- Max 7' of cover.

2,000 GALLON SEPTIC/PUMP TANK
1-Compartment
Stock Item [Approx. 19,000 lbs.]
Dwg. No. 2000-1C No Scale Aug 11, 2008

Mayer Bros., Inc.
6764 Race Road
Elkridge, Maryland 21075
Tel. 410.786.1434
Fax. 410.786.1438
www.mayerbrosprecast.com



NOTE: TOTAL EMERGENCY STORAGE AVAILABLE IN ALL HOOTIA & PUMP TANK EQUALS 1,520 GALLONS (344 + 229 + 955).

HOOT HOOT SYSTEMS, LLC
www.hoothootsystems.com
THIS DRAWING IS THE PROPERTY OF HOOT HOOT SYSTEMS, LLC. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. ANY REUSE OR MODIFICATION OF THIS DRAWING WITHOUT THE WRITTEN CONSENT OF HOOT HOOT SYSTEMS, LLC IS STRICTLY PROHIBITED.
DATE: Oct. 28, 2010 DRAWN BY: TLC CHECKED BY: N.T.S. SCALE: N.T.S. PART # H1000A

NOTE: THE MANUFACTURER HAS CERTIFIED THAT THIS UNIT IS ADEQUATE FOR THIS PARTIAL DESIGN AT 9 BEDROOMS.

PROFESSIONAL CERTIFICATION

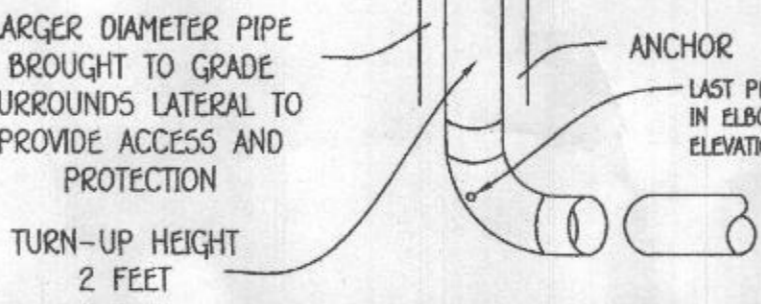
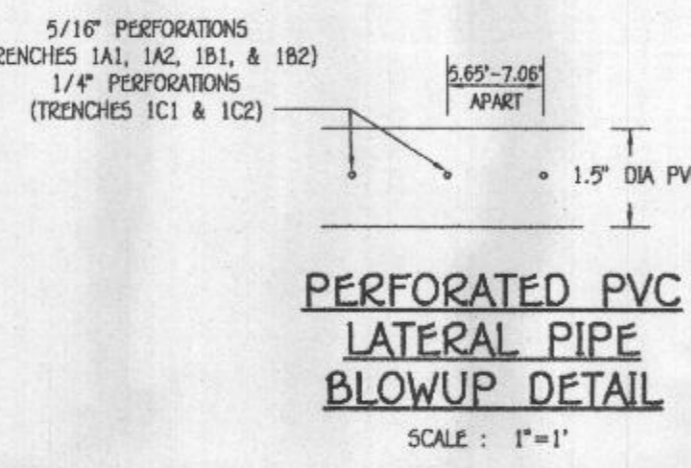
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAW OF THE STATE OF MARYLAND, LICENSE NO. 227148, EXPIRATION DATE: 02/22/2015.

Signature of Professional Engineer
DATE



OWNER

SUHIR RAO & PRIYA VENKATARAMAN-RAO
1021 MAIN STREET
GATHERSBURG, MD 20878



GOULDS PUMPS



Submersible Effluent Pump

MODEL 3885

PROFURANCE AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS

Specifically designed for the following uses:
• Homes
• Farms
• Trailer courts
• Motels
• Schools
• Hospitals
• Industry
• Effluent systems

SPECIFICATIONS

Pump
• Solids handling capabilities: 3/4" maximum
• Discharge size: 2" NPT
• Capacities: up to 140 GPM
• Total heads: up to 125 feet TDH
• Temperature: 100°F (40°C) continuous, 140°F (60°C) intermittent
• See order numbers on reverse side for specific HP, voltage, phase and RPM's available

FEATURES

• Impeller: Cast iron, serrated, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.
• Casting: Cast iron volute type for maximum efficiency. 2" NPT discharge.
• Mechanical Seal: SILICON CARBIDE vs. SILICON CARBIDE wetting faces. Stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, stainless steel. Threaded design. Locknut on three phase models to guard against component damage on accidental reverse rotation.

• Fasteners: 300 series stainless steel
• Capable of running dry without damage to components.
• Designed for continuous operation when fully submerged.

MOTORS

• Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
• Class B insulation.

Single phase:

• Built-in overload with automatic reset.
• All single phase models feature capacitor start motors for maximum starting torque.
• 1/2 and 3/4 HP - 115V S.T.O.W. with 115, 208 and 230 Volt three prong plug.
• 1/2 HP - 143 S.T.O.W. with bare leads.

Three phase:

• Overload protection must be provided in starter unit.
• 1/2-2 HP - 143 S.T.O.W. with bare leads.

Designed for Continuous Operation:

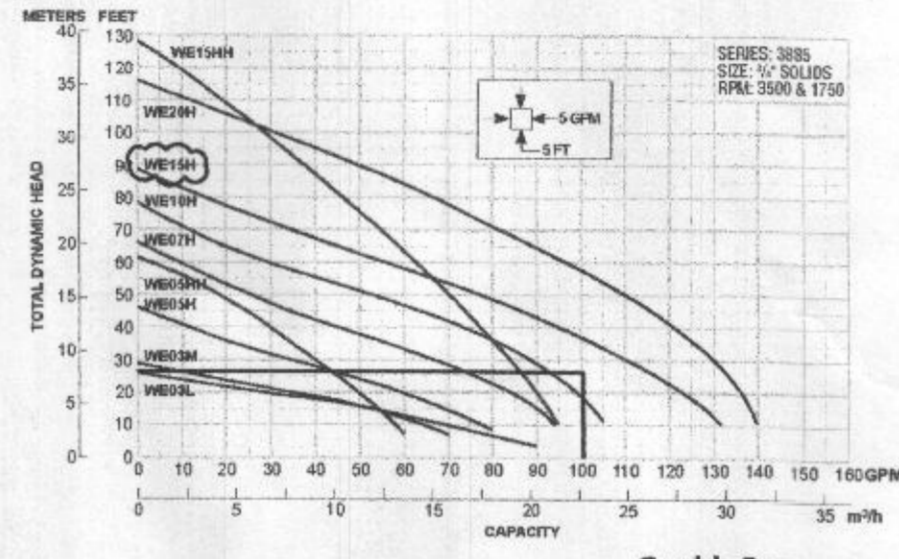
Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

Bearings: Upper and lower heavy duty ball bearing construction.

• Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. 20 foot standard with optional lengths available.
• O-ring: Assures positive sealing against contaminants and oil leakage.

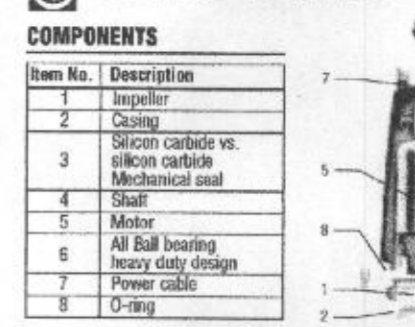
AGENCY LISTINGS

• Total in U.S. 718 and CANADA 158 Resellers By Canadian Standards Association
• ISO 9001 Registered
• ISO 14001 Registered
• Goulds Pumps is ISO 9001 Registered.



Goulds Pumps
ITT Industries

GOULDS PUMPS



Submersible Effluent Pump

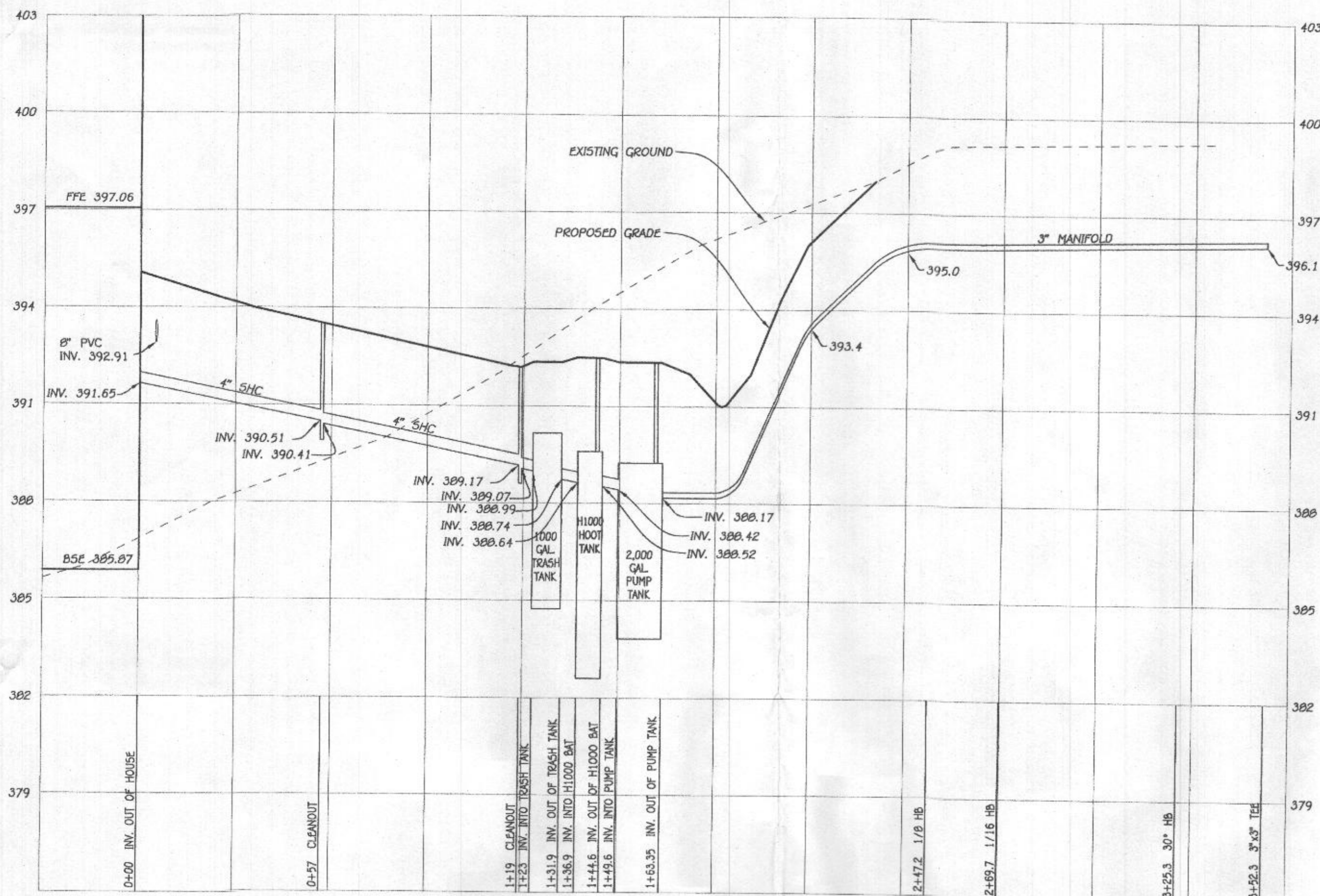
MODEL 3885

COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Silicon carbide vs. silicon carbide Mechanical seal
4	Motor
5	All Ball bearing heavy duty design Power cable
6	O-ring

MODELS

Model	HP	Volts	Phase	Max. Amps	RPM	Weight (lb.)	Height (in.)
WE15H	1/2	115	1	1.5	1750	18	110
WE15H	3/4	115	1	2.2	1750	18	110
WE15H	1	115	1	3.0	1750	18	110
WE15H	1 1/2	115	1	4.0	1750	18	110
WE15H	2	115	1	5.5	1750	18	110
WE15H	3	115	1	7.5	1750	18	110
WE15H	4	115	1	10.0	1750	18	110
WE15H	5	115	1	13.0	1750	18	110
WE15H	6	115	1	16.0	1750	18	110
WE15H	7 1/2	115	1	20.0	1750	18	110
WE15H	10	115	1	26.0	1750	18	110
WE15H	15	115	1	40.0	1750	18	110
WE15H	20	115	1	55.0	1750	18	110
WE15H	25	115	1	70.0	1750	18	110
WE15H	30	115	1	85.0	1750	18	110
WE15H	35	115	1	100.0	1750	18	110
WE15H	40	115	1	115.0	1750	18	110
WE15H	45	115	1	130.0	1750	18	110
WE15H	50	115	1	145.0	1750	18	110
WE15H	55	115	1	160.0	1750	18	110
WE15H	60	115	1	175.0	1750	18	110
WE15H	65	115	1	190.0	1750	18	110
WE15H	70	115	1	205.0	1750	18	110
WE15H	75	115	1	220.0	1750	18	110
WE15H	80	115	1	235.0	1750	18	110
WE15H	85	115	1	250.0	1750	18	110
WE15H	90	115	1	265.0	1750	18	110
WE15H	95	115	1	280.0	1750	18	110
WE15H	100	115	1	295.0	1750	18	110
WE15H	110	115	1	325.0	1750	18	110
WE15H	120	115	1	355.0	1750	18	110
WE15H	130	115	1	385.0	1750	18	110
WE15H	140	115	1	415.0	1750	18	110
WE15H	150	115	1	445.0	1750	18	110
WE15H	160	115	1	475.0	1750	18	110
WE15H	170	115	1	505.0	1750	18	110
WE15H	180	115	1	535.0	1750	18	110
WE15H	190	115	1	565.0	1750	18	110
WE15H	200	115	1	595.0	1750	18	110
WE15H	210	115	1	625.0	1750	18	110
WE15H	220	115	1	655.0	1750	18	110
WE15H	230	115	1	685.0	1750	18	110
WE15H	240	115	1	715.0	1750	18	110
WE15H	250	115	1	745.0	1750	18	110
WE15H	260	115	1	775.0	1750	18	110
WE15H	270	115	1	805.0	1750	18	110
WE15H	280	115	1	835.0	1750	18	110
WE15H	290	115	1	865.0	1750	18	110
WE15H	300	115	1	895.0	1750	18	110
WE15H	310	115	1	925.0	1750	18	110
WE15H	320	115	1	955.0	1750	18	110
WE15H	330	115	1	985.0	1750	18	110
WE15H	340	115	1	1015.0	1750	18	110
WE15H	350	115	1	1045.0	1750	18	110
WE15H	360	115	1	1075.0	1750	18	110
WE15H	370	115	1	1105.0	1750	18	110
WE15H	380	115	1	1135.0	1750	18	110
WE15H	390	115	1	1165.0	1750	18	110
WE15H	400	115	1	1195.0	1750	18	110
WE15H	410	115	1	1225.0	1750	18	110
WE15H	420	115	1	1255.0	1750	18	110
WE15H	430	115	1	1285.0	1750	18	110
WE15H	440	115	1	1315.0	1750	18	110
WE15H	450	115	1	1345.0	1750	18	110
WE15H	460	115	1	1375.0	1750	18	110
WE15H	470	115	1	1405.0	1750	18	110
WE15H	480	115	1	1435.0	1750	18	110
WE15H	490	115	1	1465.0	1750	18	110
WE15H	500	115	1	1495.0	1750	18	110
WE15H	510	115	1	1525.0	1750	18	110
WE15H	520	115	1	1555.0	1750	18	110
WE15H	530	115	1	1585.0	1750	18	110
WE15H	540	115	1	1615.0	1750	18	110
WE15H	550	115	1	1645.0	1750	18	110
WE15H	560	115	1	1675.0	1750	18	110
WE15H	570	115	1	1705.0	1750	18	110
WE15H	580	115	1	1735.0	1750	18	110
WE15H	590	115	1	1765.0	1750	18	110
WE15H	600	115	1	1795.0	1750	18	110
WE15H	610	115	1	1825.0	1750	18	110
WE15H	620	115	1	1855.0	1750	18	110
WE15H	630	115	1	1885.0	1750	18	110
WE15H	640	115	1	1915.0	1750	18	110
WE15H	650	115	1	1945.0	1750	18	110
WE15H	660	115	1	1975.0	1750	18	110
WE15H	670	115	1	2005.0	1750	18	110
WE15H	680	115	1	2035.0	1750	18	110
WE15H	690	115	1	2065.0	1750	18	110
WE15H	700	115	1	2095.0	1750	18	110
WE15H	710	115	1	2125.0	1750	18	110
WE15H	720	115	1	2155.0	1750	18	110
WE15H	730	115	1	2185.0	1750	18	110
WE15H	740	115	1	2215.0	1750	18	110
WE15H	750	115	1	2245.0	1750	18	110
WE15H	760	115	1	2275.0	1750	18	110
WE15H	770	115	1	2305.0	1750	18	110
WE15H	780	115	1	2335.0	1750	18	110
WE15H	790	115	1	2365.0	1750	18	110
WE15H	800	115	1				



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

FRICION LOSS IN 3" PIPE FITTINGS:
 1 ELBOW x 12 FEET PER FITTING = 12 EQUIVALENT FEET OF PIPE
 3 1/8 HB x 6 FEET PER FITTING = 18 EQUIVALENT FEET OF PIPE
 2 1/16 HB x 6 FEET PER FITTING = 12 EQUIVALENT FEET OF PIPE
 5 TEE/CROSS x 17 FEET PER FITTING = 85 EQUIVALENT FEET OF PIPE
 1 UNION x 4 FEET PER FITTING = 4 EQUIVALENT FEET OF PIPE
 TOTAL EQUIVALENT FEET OF PIPE = 131 FT

TOTAL LINEAR FEET OF 3" PVC = 216 LF + 131 LF = 347 LF

DYNAMIC HEAD
 347 LF x 2.09 FT PER 100 LF OF PIPE = 7.25 FT OF FRICTION HEAD
 DISTAL HEAD = 2.00 FT
 VERTICAL FROM PUMP OFF TO DISCHARGE = 4.25 FT OF FRICTION HEAD
 VERTICAL FROM DISCHARGE TO UPPER TRENCH = 7.60 FT
 TOTAL DYNAMIC HEAD = 21.10 FT (USE 21 FT)

PIPE VOLUMES
 216 LF (3" PIPE) x 38.4 GALLONS PER 100 LF = 79.5 GALLONS
 320.7 LF (1.5" PIPE) x 10.6 GALLONS PER 100 LF = 34.0 GALLONS

MINIMUM DOSE
 MINIMUM DOSE = (5 x LATERAL PIPE VOLUME) + (FORCE MAIN & MANIFOLD)
 = 249.5 GALLONS

249.5 GALLONS IS 148% THAN 1/6 DESIGN FLOW (1,350/6=225)
 USE 250 GALLON DOSE (2.1 MIN RUN TIME X 120 GPM FLOW)

PUMP NEEDS TO HANDLE 120 GPM AT 21 FT OF HEAD
 LOADING - USE 1 HP (GOULD MODEL WE15H PUMP)

TRENCH	GROUND ELEV.	PIPE INVERT ELEV.	TRENCH LENGTH (FT)	1.5" LATERAL PIPE LENGTH (FT)	PERFORATION DIAMETER (IN)	HEAD (FT)	PERFORATION FLOW RATE (GPM)	PERFORATION SPACING (FT)	NUMBER OF ORIFICES	TRENCH FLOW RATE (GPM)
IA1	400.1	397.1	56.5	53.60	5/16	2	1.63	5.65	10	16.3
IA2	400.1	397.1	56.5	53.60	5/16	2	1.63	5.65	10	16.3
IB1	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
IB2	398.5	395.5	56.5	52.97	5/16	3.6	2.18	7.06	8	17.4
IC1	397.1	394.1	56.5	53.60	1/4	5	1.85	5.65	10	16.5
IC2	397.1	394.1	56.5	53.60	1/4	5	1.85	5.65	10	16.5
TOTAL TRENCH FLOW RATE										100.5

TRENCH	GROUND ELEV.	TOP OF STONE ELEV.	PIPE INVERT ELEV.	DEPTH TO STONE FROM GROUND (FT)	DEPTH OF TRENCH (FT)	BOTTOM OF TRENCH ELEV.	EFFECTIVE DEPTH BEGINS AT (FT)	EFFECTIVE DEPTH (D) (FT)	WIDTH OF TRENCH (W) (FT)	TRENCH SPACING (FT)
IA1	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10
IA2	400.1	397.6	397.1	2.5'	4.0'	393.6	3.0'	3.5'	2.0'	10
IB1	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10
IB2	398.5	396.0	395.5	2.5'	4.0'	392.0	3.0'	3.5'	2.0'	10
IC1	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10
IC2	397.1	394.6	394.1	2.5'	4.0'	390.6	3.0'	3.5'	2.0'	10

BAT NOTES

1. 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 RECORDED SITE PLAN MAY BE REQUIRED.
2. THE MANIFOLD COVER OVER THE BAT SHALL BE 3 FEET.
3. THE BAT SYSTEM SHALL BE MAINTAINED AND OPERATED FOR THE LIFE OF THE SYSTEM.
4. THE BAT SHALL BE OPERATED BY AND MAINTAINED BY A CERTIFIED SERVICE PROVIDER.
5. ANY ELECTRICAL WORK FOR THE BAT INSTALLATION MUST BE PERFORMED BY A LICENSED ELECTRICIAN. AN ASSESSMENT AND EASEMENT HAS BEEN COMPLETED AND SIGNED BY ALL APPLICABLE PARTIES, AND RECORDED IN THE LAND RECORDS OF HOWARD COUNTY, LIBER 19962, FOLIO 009.
6. THE HEALTH DEPARTMENT REQUIRES DOCUMENTATION FOR THE SET-UP/CELEBRATION FROM THE MANUFACTURER PRIOR TO FINAL APPROVAL OF THE INSTALLATION.
7. SURFACE RUNOFF SHALL BE DIRECTED AWAY FROM THE BAT TANK.
8. AT HIGH WATER ALARM PROBE, PUMP WILL HAVE CONTINUOUS OPERATION UNTIL LEVEL GOES BENEATH PROBE.
9. CONTRACTOR TO VERIFY REQUIRED FLOAT ELEVATIONS.
10. IF WATER LEVEL RISES ABOVE THE ALARM PROBE, AN AUDIBLE AND VISUAL ALARM WILL SOUND. SEE MANUFACTURER SPECS FOR ADDITIONAL INFORMATION.
11. ALARM TO BE WIRED TO A CIRCUIT SEPARATE FROM THE PUMP CIRCUIT.
12. TOPO IN THE AREA OF SEPTIC FIELD WAS FIELD RUN BY FISHER, COLLINS AND CARTER, INC. ON APRIL 2021.

SEPTIC SYSTEM ELEVATIONS

FFE = 397.06
 BSE = 385.87
 INV. OUT OF HOUSE = 391.65
 PROP. GROUND AT C/O = 393.60
 INV. INTO C/O = 390.51
 INV. OUT OF C/O = 390.41
 PROP. GROUND AT C/O = 392.20
 INV. INTO C/O = 389.17
 INV. OUT OF C/O = 389.07
 PROP. GROUND AT 1,000 GAL TANK = 392.25
 TOP OF 1,000 GAL TANK = 390.15
 COVER OVER 1,000 GAL TANK = 2.09 FT
 INVERT INTO 1,000 GAL TANK = 388.99
 INVERT OUT OF 1,000 GAL TANK = 388.74
 PROP. GROUND AT BAT TANK (H1000) = 392.30
 TOP OF BAT TANK = 389.50
 COVER OVER BAT TANK = 2.7 FT
 INVERT INTO BAT TANK = 388.64
 INVERT OUT OF BAT TANK = 388.52
 PROP. GROUND AT PUMP TANK = 392.25
 TOP OF PUMP TANK = 389.25
 INVERT INTO PUMP TANK = 388.42
 INVERT OUT OF PUMP TANK = 388.17
 EASEMENT SCHEDULE TO BE PUMPED

SEPTIC SYSTEM DESIGN

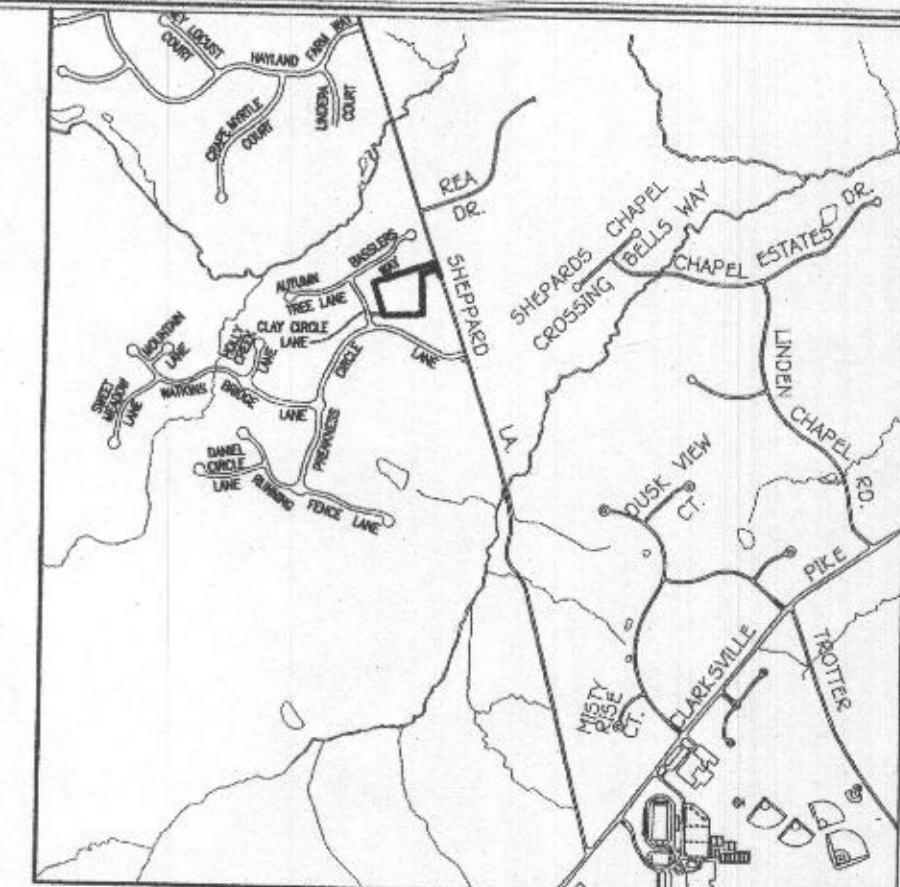
9 BEDROOM HOUSE
 LOADING RATE = 1,350 GPD
 APPLICATION RATE = 0.8
 EFFECTIVE SIDEWALL BEGINS AT 3.0 FEET
 TRENCH DEPTH = 6.5 FEET
 INITIAL SYSTEM
 TRENCH WIDTH (W) = 2 FEET
 EFFECTIVE DEPTH (D) = 3.5 FEET
 SF OF DRAINFIELD = 1,350 GPD / 0.8 = 1,687.5 SF
 COEFFICIENT OF REDUCTION OF TRENCH LENGTH = (W+2)/(W+1+2D) = (2+2)/(2+1+2*3.5) = 0.40
 TRENCH LENGTH = 1,687.5 SF x 0.40 / 2 = 337.5 FEET (USE 339 FEET)

REPLACEMENT TRENCHES

TRENCH WIDTH (W) = 3 FEET
 EFFECTIVE DEPTH (D) = 3.5 FEET
 COEFFICIENT OF REDUCTION OF REPLACEMENT TRENCH LENGTH = (W+2)/(W+1+2D) = (3+2)/(3+1+2*3.5) = 0.46
 REPLACEMENT TRENCH WIDTH (W) = 3 FEET
 REPLACEMENT TRENCH LENGTH = 1,687.5 SF x 0.46 / 3 = 298.75 FEET (USE 299 FEET)
 REPLACEMENT SYSTEM (2) = 6 TRENCHES AT 43.2 LF EACH
 REPLACEMENT SYSTEM (3) = 5 TRENCHES AT 51.8 LF EACH

LEGEND

- - - EXISTING 2' CONTOURS
- - - EXISTING 10' CONTOURS
- - - EXISTING TREE LINE
- SOIL LINES AND TYPES
- DENOTES PROPOSED WELL
- DENOTES EXISTING WELL
- DENOTES PASSED PERC
- DENOTES 1500 Sq.Ft. ALTERNATE WELL SITE
- ▨ DENOTES PROPOSED SEPTIC EASEMENT
- ▨ DENOTES AN EXISTING SHARED SEPTIC AREA



VICINITY MAP
SCALE: 1" = 2000'

GENERAL NOTES

1. SUBJECT PROPERTY ZONED: RC-DEO
2. TOTAL AREA OF PROPERTY: 4.09 AC.
3. SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT REVIEW.
4. LENGTH OF TRENCH TO BE DETERMINED AT TIME OF SEPTIC PERMIT ISSUANCE.
5. CONTRACTOR/BUILDER TO VERIFY ELEVATION IN THE FIELD BEFORE BEGINNING ANY CONSTRUCTION.
6. BOUNDARY OF LOT BASED ON PLAT #22017.
7. TOPOGRAPHY SHOWN HEREON TAKEN FROM F-07-072 WHICH IS BASED ON FIELD RUN TOPOGRAPHIC SURVEY CONDUCTED BY FISHER, COLLINS, & CARTER, INC.
8. ALL ADJACENT WELLS ON THIS PLAN HAVE BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC.
9. NO WETLANDS EXIST ON THIS LOT.
10. MICRO-BIORETENTION AREAS SHOWN ARE TO HAVE AN IMPERMEABLE LINER INSTALLED, PERMITTING THEM TO BE LOCATED LESS THAN 100 FEET FROM BUT NOT CLOSER THAN 50 FEET TO THE EXISTING WELL BOXES.



Approved Septic System Plan
 Howard County Health Department
 Henry Oswell
 Signature Date

NOTE
 THE EXISTING WELL FOR LOT 3 SHOWN ON THIS PLAN, TAG NO. HO 495-22971 HAS BEEN FIELD LOCATED BY FISHER, COLLINS & CARTER, INC., PROFESSIONAL LAND SURVEYORS AND IS ACCURATELY SHOWN.

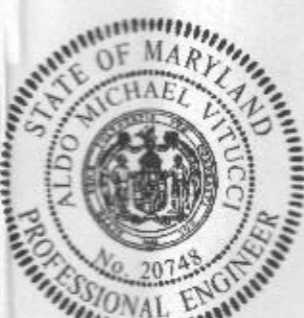
SOIL	NAME	CLASS	K FACTOR
BeB	Benevolat silt loam, 3 to 8 percent slopes	B	0.28
MaC	Minor loam, 8 to 15 percent slopes	B	0.24
GgB	Glenelg loam, 3 to 8 percent slopes	B	0.20

BAT SITE PLAN
MARILLEY PROPERTY
LOT 3
5102 CLAY CIRCLE LANE
 ZONED: RC-DEO
 TAX MAP No. 28 GRID No. 18 PARCEL No. 416
 FIFTH ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
 DATE: APRIL 21, 2021
 SHEET 1 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. 20746, EXPIRATION DATE: 02/22/2023.

Michael J. Winters
 Signature of Professional Engineer
 DATE: 6/15/21



OWNER

SUDHIR RAO &
 PRIYA VENKATARAMAN-RAO
 1021 MAIN STREET
 GAITHERSBURG, MD 20878

PLAN

SCALE: 1" = 50'

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTRAL SQUARE OFFICE PARK - 10772 BALTHORE NATIONAL PIKE
 ELKROFT CITY, MARYLAND 21046
 (410) 461-2099