

**GENERAL NOTES**

**PART I - GENERAL**

1. Subject property Zoned "RR-DEO" per 02/02/04 Comprehensive Zoning Plan and per the "Comp. Lite" Zoning Regulation Amendments effective 7/28/06.
2. Private water and shared septic to be utilized for lots 2, 3, and 13, and private water and private septic to be utilized for the other lots in this subdivision.
3. Topography and Boundary is based on a field run survey prepared by FSH Associates, Inc. in July and October, 2006 respectively.
4. The coordinates shown herein are based upon the Howard County Geodetic Control which is based on the Maryland State Plane Coordinate system. Howard County monument numbers 341A and 341B were used for this project. All vertical controls are based on NAVD'83. (See Vicinity Map)
5. All pipe elevations shown are invert elevations unless otherwise noted on the plans.
6. Clear all utilities by a minimum of 12 inches. Clear all poles by 5'-0" minimum or tunnel as required unless otherwise noted. The owner has contacted the utility companies and has made arrangements for bracing of poles as shown on the drawings. In the event the Contractor's work requires the bracing of additional poles, any cost incurred by the owner for the bracing of additional poles or damages shall be deducted from monies owned by the Contractor. The Contractor shall coordinate with the utility companies to schedule the bracing of the poles.
7. For details not shown on the drawing, and for materials and construction methods, use Howard County Design Manual, Volume IV, Standard Specifications and Details for Construction (latest Edition). The Contractor shall have a copy of Volume IV on the job.
8. The Contractor shall notify the following utility companies or agencies at least five working days before starting work shown on these plans:
 

A & T	1,800,252,1133
BGE(Construction Services)	410,850,4620
BGE(Emergency)	410,685,1400
Bureau of Utilities	410,313,4900
Colonial Pipeline Company	410,735,1900
Miss Utility	1,800,257,7777
Verizon	1,800,745,0033/410,224,9210
SHA District Utility Engineer	301-624-8115 or 1-800-695-5119 ext. 8115
Howard County, Bureau of Environmental Health	410,313,1771
MDE Onsite Systems Division	410,537,3680

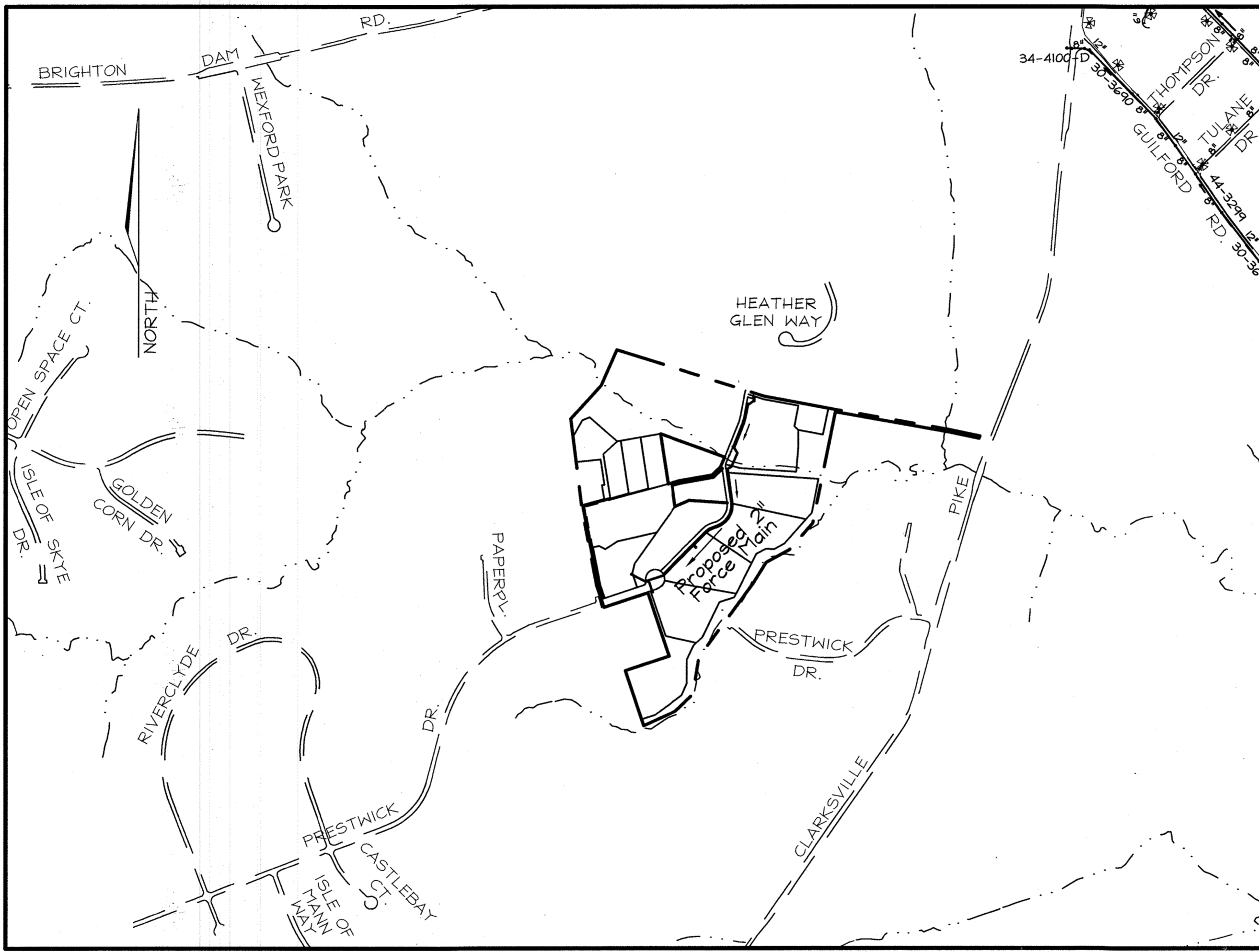
9. Trees and shrubs are to be protected from damage to the maximum extent. Trees and shrubs located within the construction strip are not to be removed or damaged by the Contractor.
10. The Contractor shall remove trees, stumps and roots along line of excavation. Payment for such removal shall be included in the unit price bid for the construction of the main.
11. Previous Howard County file numbers: SP-07-11, SP-09-03, F-10-106.
12. No clearing, grading or construction is permitted within wetlands, streams or their required buffers.
13. MDE has approved a Variance to allow wells down grade of the shared septic system. A low pressure dosing system has been designed for the shared septic system and the wells for lots 1 through 4, 6 and 7 must be constructed using a steel well casing which must be installed at a minimum depth of fifty feet below ground surface or ten feet into competent bedrock, whichever is deeper.
14. Building permits for homes served by the shared septic system will not be issued until the system installation is complete.

**PART II - SEWER**

1. Private sewage systems and a shared septic system will be used within this site. Shared septic system for Lots 2, 3, and 13, and private sewage for remaining lots.
2. All sewer mains shall be D.I.P. or P.V.C. unless otherwise noted.
3. All manholes shall be 4'-0" inside diameter unless otherwise noted.
4. Force mains shall be SDR-II HDPE
5. Basement sewer service on lots 6-9 shall be provided by private on-site pump.
6. See sheet 9 for design parameters for shared septic system.
7. Grinder pumps and their installation/startup are the responsibility of developer.
8. The Builder shall install a backflow preventer and relief vent on the sewer service at the house at the time of the house connection or as required by the plumbing inspector.
9. Septic Tanks shall be vacuum tested on-site by the manufacturer. Septic tank shop drawings from the manufacturer shall be submitted to the Howard County Environmental Health Department prior to installation of the septic tanks.
10. All pressure sewer is to be pressure tested according to the Howard County Department of Public Works Standards and Specifications.
11. The contractor shall notify the Howard County Health Department at 410,313,2640, at least five (5) working days before any pressure test of pressure sewers, and any septic tanks vacuum or water testing is performed.
12. Monitoring wells shall be installed after trench installation is completed.
13. Portions of sewer lines closer than 50 feet to any well shall be encased in concrete, constructed of welded steel, or use fused HDPE as required by COMAR 26.04.04.05.B(2)(a)(vii).
14. A spare effluent filter, grinder pump, and effluent pump will be provided.
15. For design details not shown on the drawing, the shared septic system shall include all design and construction standards of Howard County design manual Volume 2: Water & Sewer.
16. The electric panel shall be placed on the same side of the house as the grinder pump control panel.

# FINAL SHARED SEPTIC PLANS WILLOW POND

## LOTS 1 THROUGH 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C' & 'D' AND PARCEL 'E' HOWARD COUNTY, MARYLAND CONTRACT NO. 50-4491-D



**LOCATION PLAN**  
SCALE: 1"=600'

TYPE OF BUILDING:	RESIDENTIAL
NO. OF LOTS/PARCELS:	13 *
NO. OF WATER HOUSE CONNECTIONS:	0
NO. OF SEWER HOUSE CONNECTIONS:	3
* PRIVATE WATER FOR LOTS 1-13	
* PRIVATE SEPTIC FOR LOTS 1 & 4 THRU 12	
* SHARED SEPTIC FOR LOTS 2, 3, AND 13.	

**AS-BUILT  
FOR SHARED SEPTIC:**



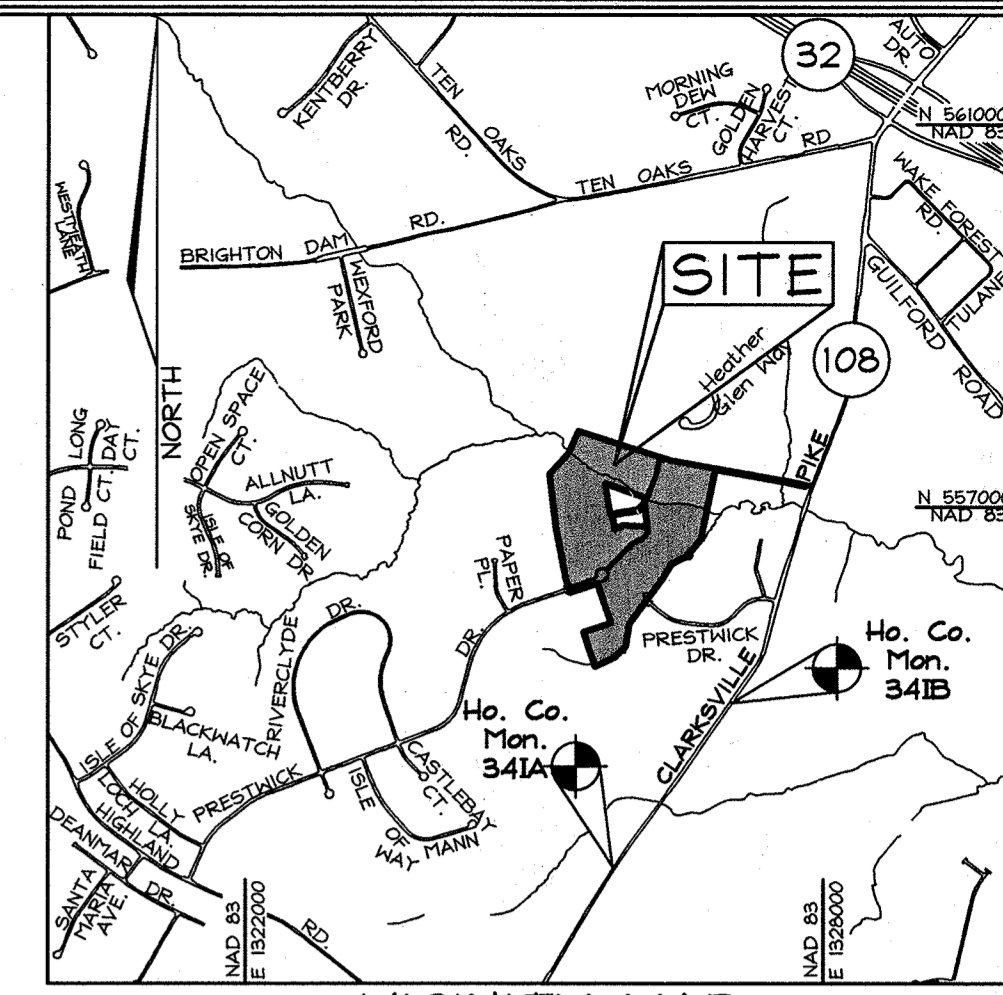
**AS-BUILT**

by *[Signature]* Date *9/4/19*

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. #22418, Expiration Date: 07/29/2011.

**LEGEND**

- Existing Contour
- Proposed Contour
- Existing Spot Elevation
- Existing Trees to Remain
- Wetlands
- Perc Test (Passed)
- Existing Perc Test (Failed)
- Existing Dry Well
- Utility Poles
- Proposed House
- Proposed Split Rail Fence
- Wetlands
- Wetlands Buffer
- Stream Buffer
- Existing Well
- Proposed Well Area
- Public Shared Septic Easement
- Private Septic Easement
- Existing Septic Easement



**VICINITY MAP**  
SCALE: 1"=2000'

**BENCHMARKS**

The coordinates shown herein are based upon the Howard County geodetic control which is based on the Maryland state Plane coordinate system. Howard Co. Monument No. 341A and 341B were used for this project.  
Sta. 341A N 553,271.9126 E 1,325,838.7481 El.: 471.945 (ft)  
Sta. 341B N 554,975.5265 E 1,327,076.7729 El.: 442.801 (ft)

**BUILDABLE LOTS FRONTAGE CHART**

Lot #	Total frontage along Public R/W
2	120.59'
3	495.26'
13	20.10'

Note: Lot 1 and 4 thru 12 have private Septic System.

**SHEET INDEX**

DESCRIPTION	SHEET No.
Cover Sheet	1 of 11
Final Shared Septic Plan	2 of 11
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Shared Septic Miscellaneous Details	7 of 11
Septic Design Details (by Benchmark Engineering)	8 of 11
Septic Design Details (by Benchmark Engineering)	9 of 11
Septic Design Details (by Benchmark Engineering)	10 of 11
Septic Design Details (by Benchmark Engineering)	11 of 11

**QUANTITIES**

ITEMS	QUANTITIES ESTIMATED	AS-BUILT			
		QUANTITIES	TYPE	MANUFACTURER/SUPPLIER	REMARKS
2,000 Gallon Septic Tank	4	4	Precast	Mayer Brothers Inc. Precast	
Isolation Valve	1	1	Bronze	Smith - Cooper International	
Transition Manhole	1	1	Precast	East Jordan Iron Works/Atlantic Concrete	
Gravity Sewer Cleanouts	3	3	Sch-40 PVC	Crestline	
Monitoring Wells	3	3	PVC	Crestline	
Terminal Flushing Connection w/ Valve	1	1	Servair-Combo	Danfoss Flomatic	
Control Box	1	1		SJE - Rhombus Controls	
Split Rail Fence	954 LF	954 L.F.			
Entrance Gate	1	1			
Simplex Grinder Pump	3	3		Goulds Pumps	
2" Force Main, SDR II PVC	1,600 L.F.	1,600 L.F.	PVC	Crestline Pumps	
4" PVC	632 L.F.	632 L.F.	PVC	Crestline Pumps	
6" PVC	5 L.F.	5 L.F.	PVC	Crestline Pumps	
2" PVC	701 L.F.	701 L.F.	PVC	Crestline Pumps	
Effluent Pump & Filter	3	3	Model 3886	Goulds Pumps/Zabel Aido Filter	
Utility Shed	1	1			
Spare: effluent pump, filter, and grinder pump	1 each	1	Model 3886	Goulds Pumps/Zabel Aido Filter	
Turf boxes	24	24	HDP	Carson Industries	
Detection Vaults	9	9	HDP	Carson Industries	
1-1/2" Pressure Sewer	155 L.F.	155	PVC Sch40	Crestline	
1-1/4" x 1-1/2" Reducer	2	2	PVC Sch40	Spears Manufacturing	
1 1/2" - 45" Bend	4	4	PVC Sch40	Spears Manufacturing	
2" x 1-1/2" Wye Connection	3	3	PVC Sch 40	Spears Manufacturing	
1 1/2" Ball Valve & Vault Box	3	3	Bronze	Smith-Cooper/Nupi/East Jordan Works	
Union Ball Valve	1	1	Bronze	Smith-Cooper/Nupi	
Distribution Box	1	1	Concrete	Mayer Bros. Inc. Precast	

SEDIMENT CONTROL MEASURES WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 214 OF THE STANDARD SPECIFICATIONS AND WITH ROAD CONSTRUCTION PLANS, F-10-106.

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.  
*[Signature]* DATE *12/10/10*

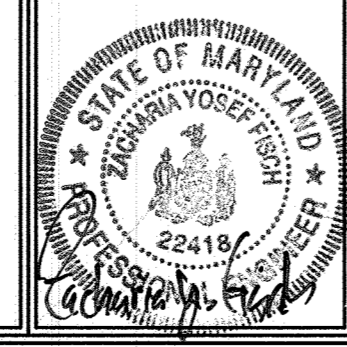
Howard County Health Department  
APPROVED: For private water and public shared sewerage systems for lots 2, 3 & 13 and for private water and private sewerage systems for Buildable Preservation Parcel 'A' and lots 1 & 4 thru 12 in accordance with the Master Plan of Howard County  
*[Signature]* DATE *12/10/10*

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE #11043, EXPIRATION: 2/10/21.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*[Signature]* DATE *11/10/10*

DEPARTMENT OF PLANNING & ZONING  
HOWARD COUNTY, MARYLAND  
*[Signature]* DATE *11/10/10*

**FSH Associates**  
Engineers Planners Surveyors  
6339 Howard Lane, Elkridge, MD 21075  
Tel: 410-567-5200 Fax: 410-796-1562  
E-mail: info@fshet.com



DESIGN BY: MTKCRH2  
DRAWN BY: AY&CRH2  
CHECKED BY: ZYF  
DATE: Oct. 29, 2010

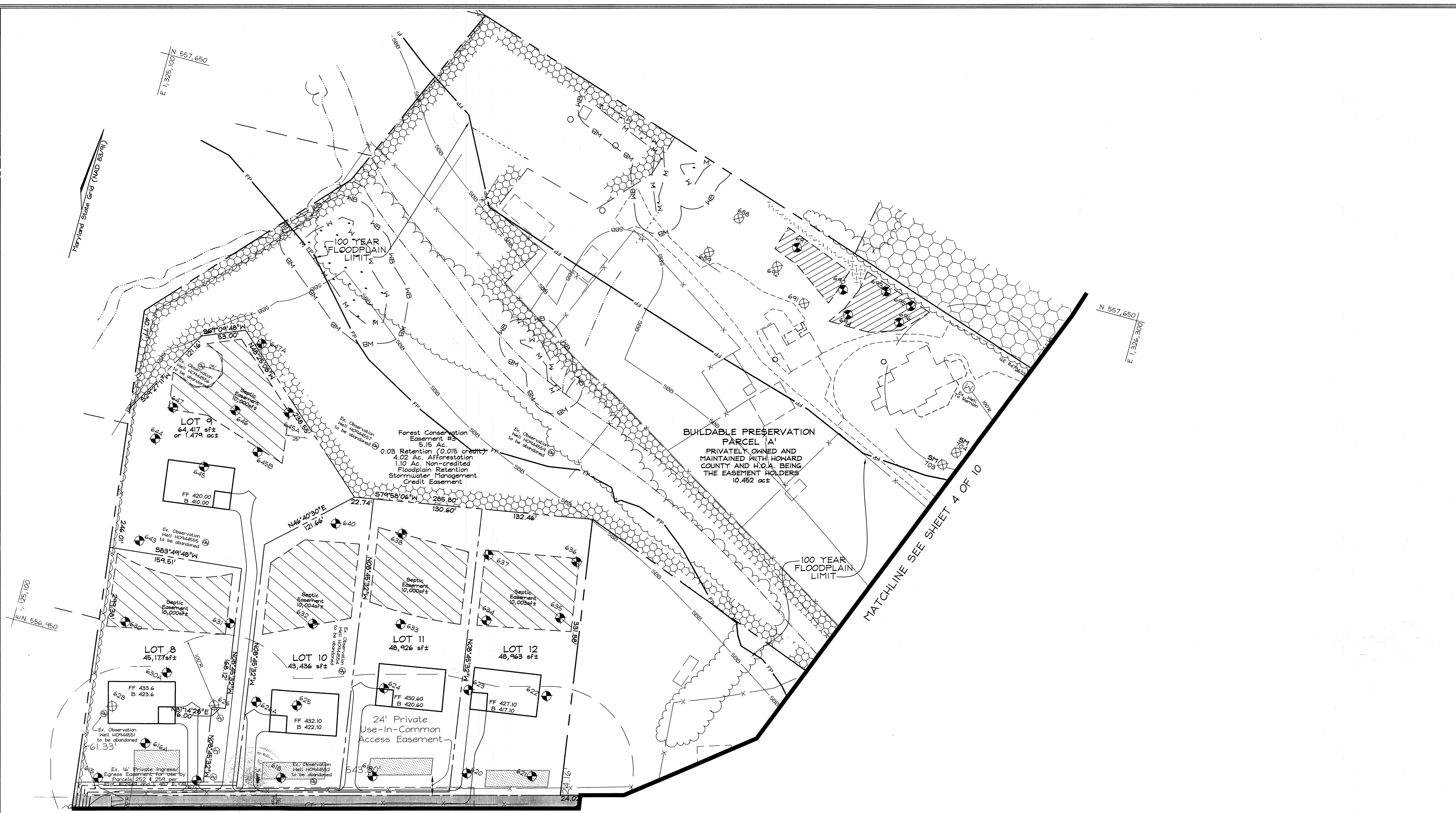
BY NO.	REVISION	DATE

COVER SHEET  
600' SCALE MAP NO.: 34 BLOCK NO.: 17

**WILLOW POND**  
LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' AND PARCEL 'E'  
ZONED RR-DEO  
CONTRACT NO. 50-4491-D  
TAX MAP 34 GRID 17 PARCELS 382  
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE  
As Shown  
SHEET NO.  
1 OF 11





Howard County Health Department  
 APPROVED: For private water and public shared sewerage systems for lots 2, 3 & 13 and for private water and private sewerage systems for Buildable Preservation Parcel 'A' and lots 1 & 4 thru 12 in accordance with the Master Plan of Howard County.  
 [Signature] 12/10/10  
 County Health Officer  
 Howard County Health Department

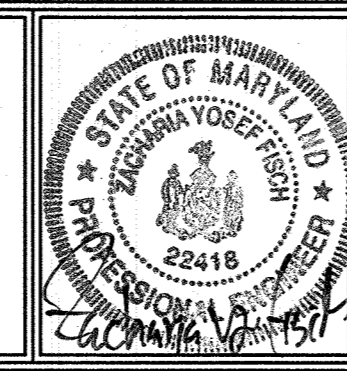
MATCHLINE SEE SHEET 2 OF 10

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. #22418, Expiration Date: 07/24/2011.

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 [Signature] 11/30/10  
 CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING & ZONING  
 HOWARD COUNTY, MARYLAND  
 [Signature] 11/10/10  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

**FSH Associates**  
 Engineers Planners Surveyors  
 6339 Howard Lane, Elkridge, MD 21075  
 Tel: 410-567-5200 Fax: 410-796-1562  
 E-mail: info@fisher.com

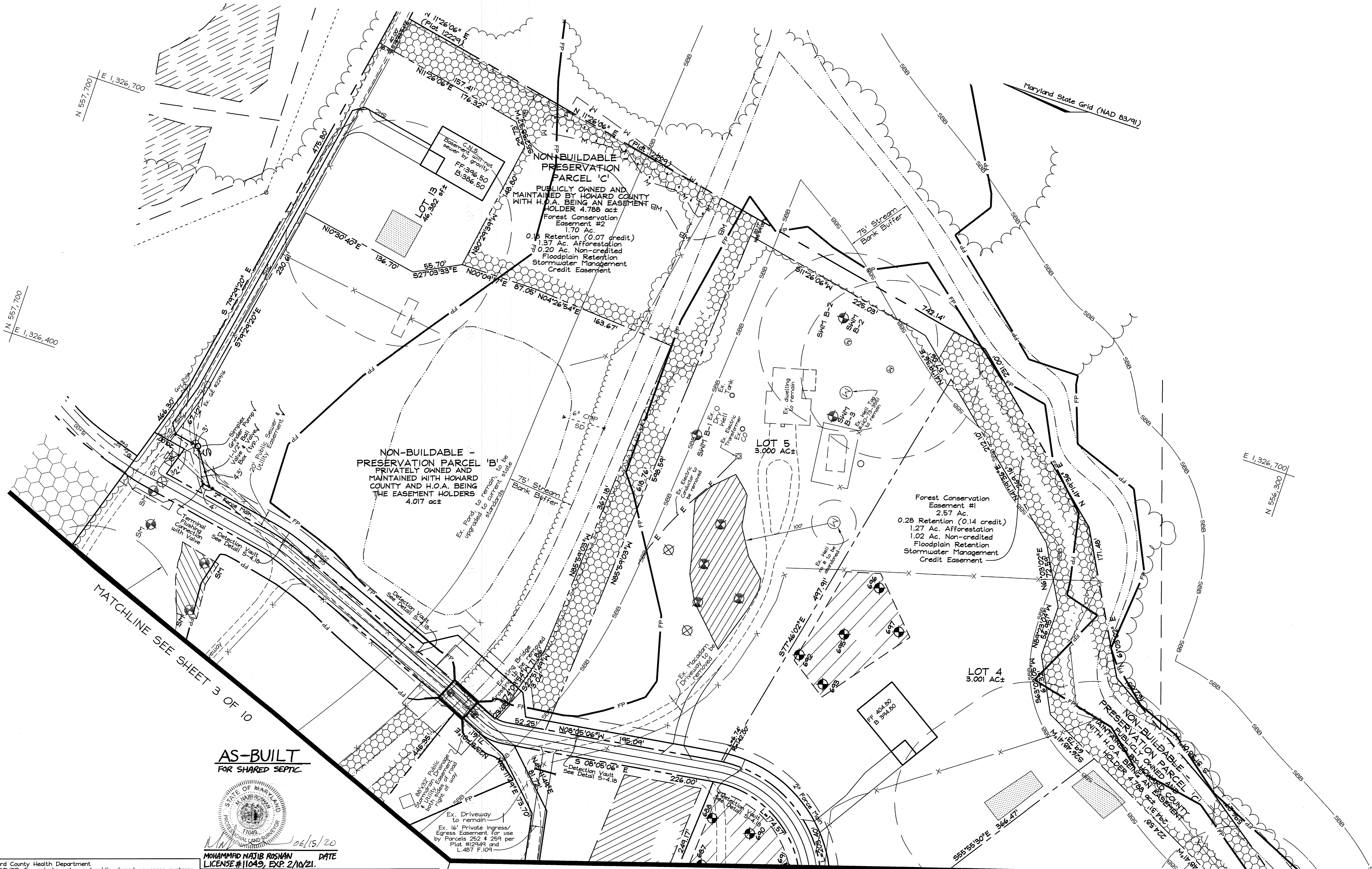


DESIGN BY: MIT&RHZ			
DRAWN BY: AY&RHZ			
CHECKED BY: ZYF			
DATE: Oct. 29, 2010	BY NO.	REVISION	DATE

FINAL SHARED  
 SEPTIC PLAN  
 600' SCALE MAP NO.: 34 BLOCK NO.: 17

**WILLOW POND**  
 LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C' & 'D' AND PARCEL 'E'  
 ZONED RR-DEO  
**CONTRACT NO. 50-4491-D**  
 TAX MAP 34 GRID 17 PARCELS 382  
 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE  
 1"=50'  
 SHEET NO.  
 3 OF 11



**AS-BUILT**

*Jan 9/4/19*

OWNER/  
(NAECKER PROPERTY  
Plat #7288 Lot 4)

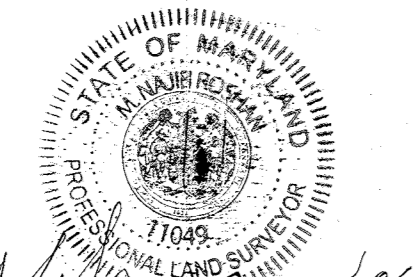
Robert L. Naecker  
12740 Route 108  
ClarksVile MD 21029-1531  
443.864.6445

OWNER/  
(NAECKER PROPERTY  
Plat #20373-20375 Lot 6)

GREENFIELD HOMES, Inc.  
6656 Luster Drive  
Highland, Maryland 20777  
410.781.6782

DEVELOPER  
GREENFIELD HOMES, Inc.  
6656 Luster Drive  
Highland, Maryland 20777  
410.781.6782

**AS-BUILT**  
FOR SHARED SEPTIC



MOHAMMAD NAJIB ROSNAN DATE  
LICENSE #11049, EXP. 2/10/21.

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY  
ME OR UNDER ME OR MY RESPONSIBLE CHARGE, AND THAT  
I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF  
THE STATE OF MARYLAND. LICENSE #11049, EXPIRATION: 2/10/21.

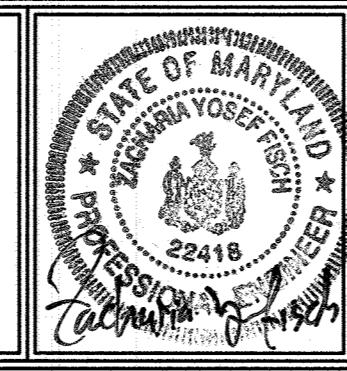
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that I am a duly licensed professional engineer under the laws of the State of  
Maryland, License No. #22418, Expiration Date: 07/24/2011.

Howard County Health Department  
APPROVED: For private water and public shared sewerage systems for  
Buildable Preservation Parcel 'A' and lots 1 & 4 thru  
12 in accordance with the Master Plan of Howard County.

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING & ZONING  
HOWARD COUNTY, MARYLAND

**FSH Associates**  
Engineers Planners Surveyors  
6339 Howard Lane, Elkridge, MD 21075  
Tel: 410-567-5200 Fax: 410-796-1562  
E-mail: info@fshnet.com



DESIGN BY: MTKR42  
DRAWN BY: AYCR42  
CHECKED BY: ZYF  
DATE: Oct. 29, 2010

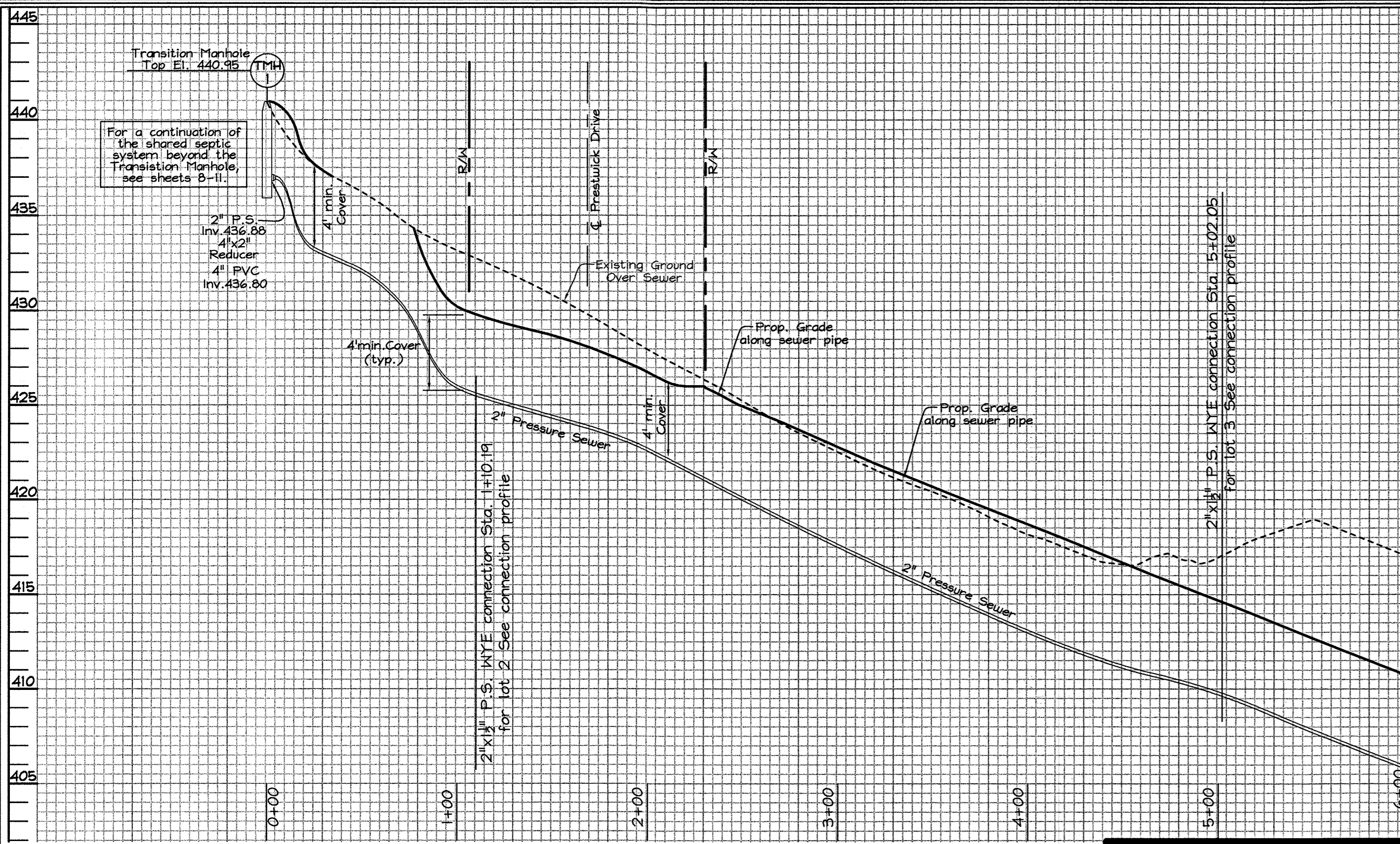
BY NO.	REVISION	DATE

**FINAL SHARED SEPTIC PLAN**

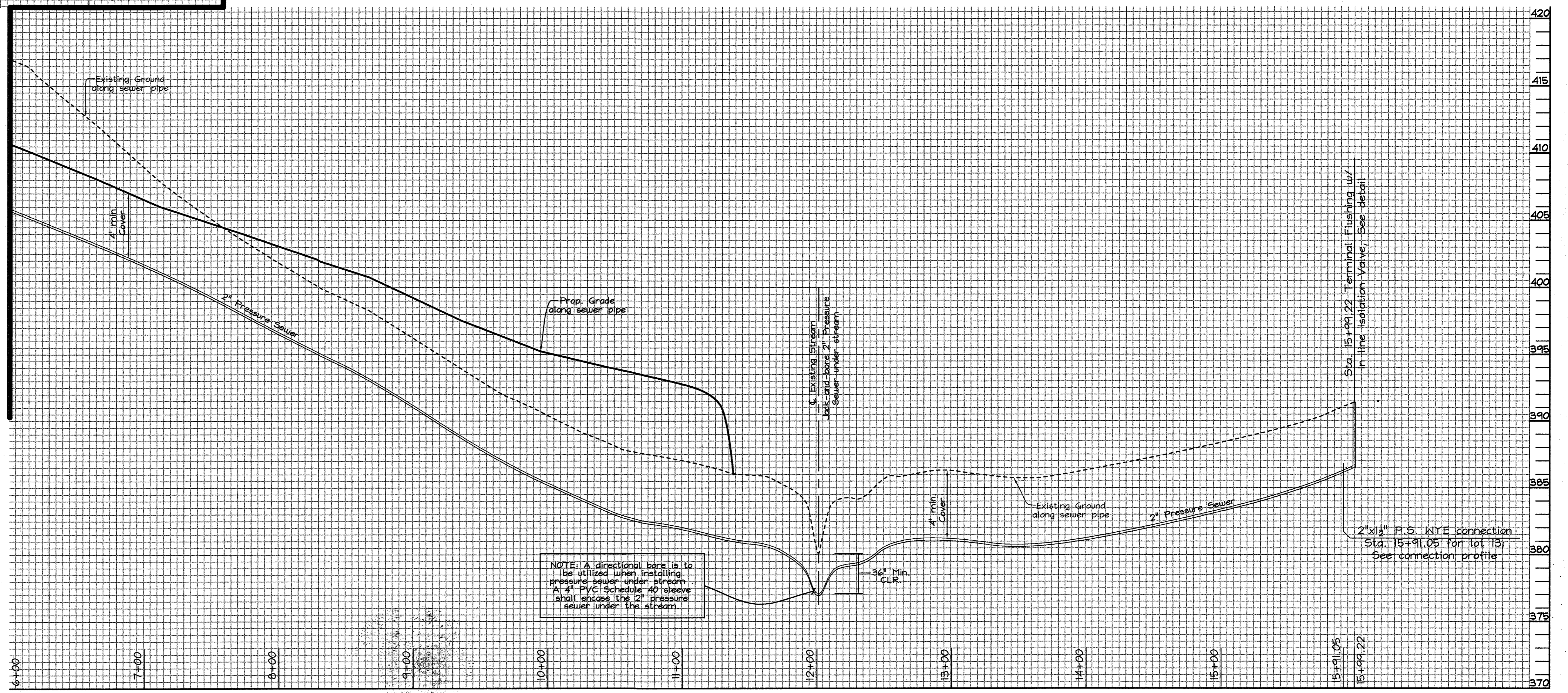
600' SCALE MAP NO.: 34 BLOCK NO.: 17

**WILLOW POND**  
LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE  
PRESERVATION PARCELS 'B', 'C' & 'D' AND PARCEL 'E'  
ZONED RR-DEO  
CONTRACT NO. 50-4491-D  
TAX MAP 34 GRID 17 PARCELS 382  
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE  
1"=50'  
SHEET NO.  
4 OF 11



MATCHLINE  
SEE BELOW



**PRESSURE SEWER PROFILE**  
Scale: Horizontal- 1"=50'  
Vertical- 1"=5'

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APPROVED: For private water and public shared sewerage systems for lots 2, 3 & 13 and for private water and private sewerage systems for Buildable Preservation Parcel 'A' and lots 1 & 4 thru 12 in accordance with the Master Plan of Howard County  
*Robert L. Naecker*  
County Health Officer  
Howard County Health Department

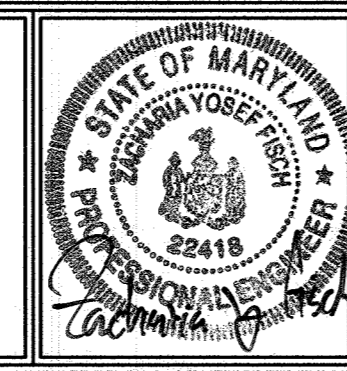
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I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. #22418, Expiration Date: 07/29/2011.  
Robert L. Naecker  
12740 Route 108  
Clarksville MD 21029-1531  
443.864.6445

**OWNER/**  
(NAECKER PROPERTY Plat #7288 Lot 4)  
**OWNER/**  
(NAECKER PROPERTY Plat #7288 Lot 6)  
**DEVELOPER**  
GREENFIELD HOMES, Inc.  
6656 Luster Drive  
Highland, Maryland 20777  
410.781.6782

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND  
*Steve Clark*  
CHIEF, BUREAU OF UTILITIES

DEPARTMENT OF PLANNING & ZONING  
HOWARD COUNTY, MARYLAND  
*Michael J. Davis*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

**FSH Associates**  
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6339 Howard Lane, Elkridge, MD 21075  
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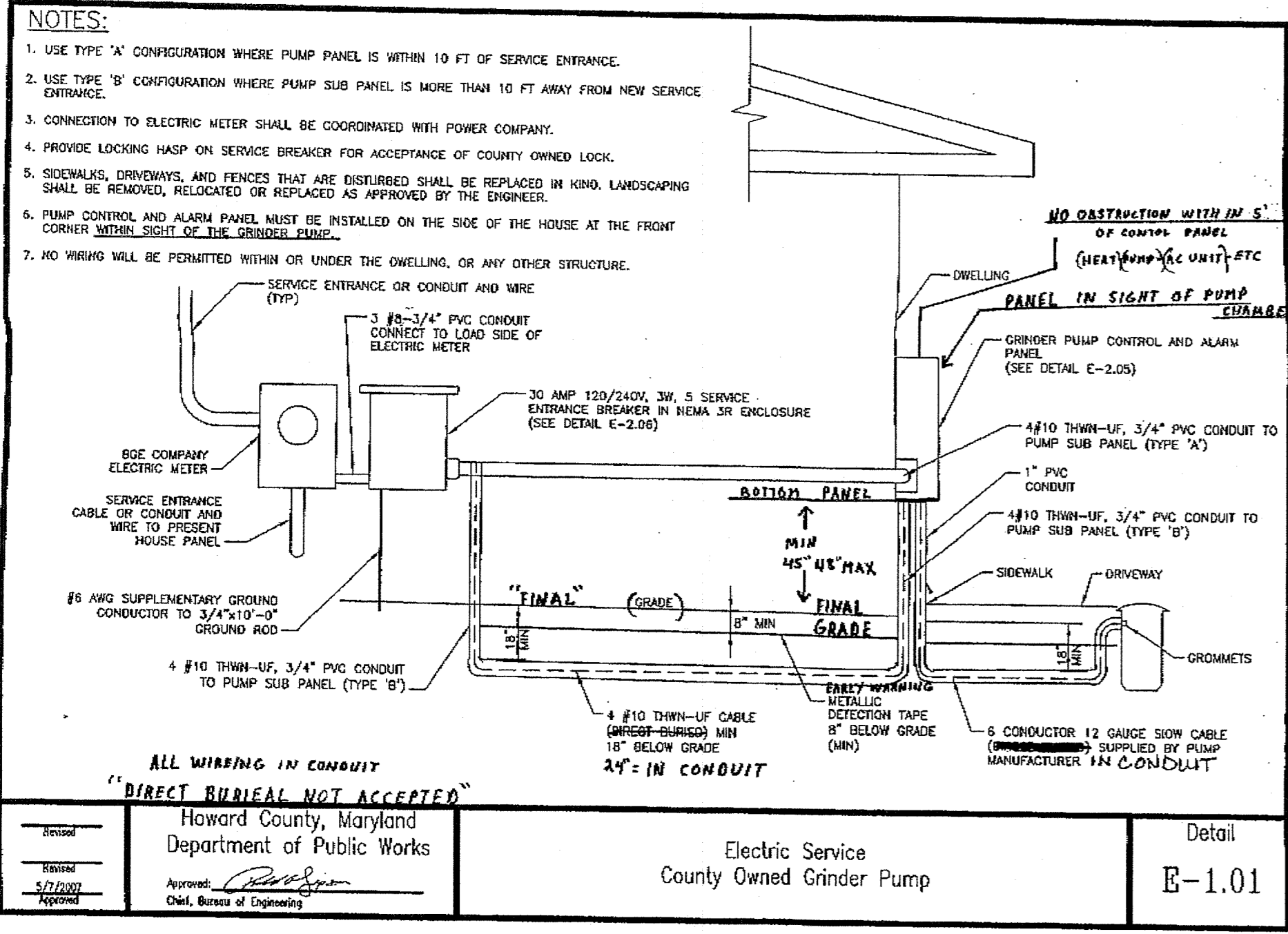


DESIGN BY: MITCRH2			
DRAWN BY: AYKCRH2			
CHECKED BY: ZYF			
DATE: Oct. 29, 2010	BY NO.	REVISION	DATE

**PRESSURE SEWER PROFILES**  
600' SCALE MAP NO.: 34 BLOCK NO.: 17

**WILLOW POND**  
LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D' AND PARCEL 'E'  
ZONED RR-DEO  
**CONTRACT NO. 50-4491-D**  
TAX MAP 34 GRID 17 PARCELS 382  
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE  
As Shown  
SHEET NO.  
5 OF 11

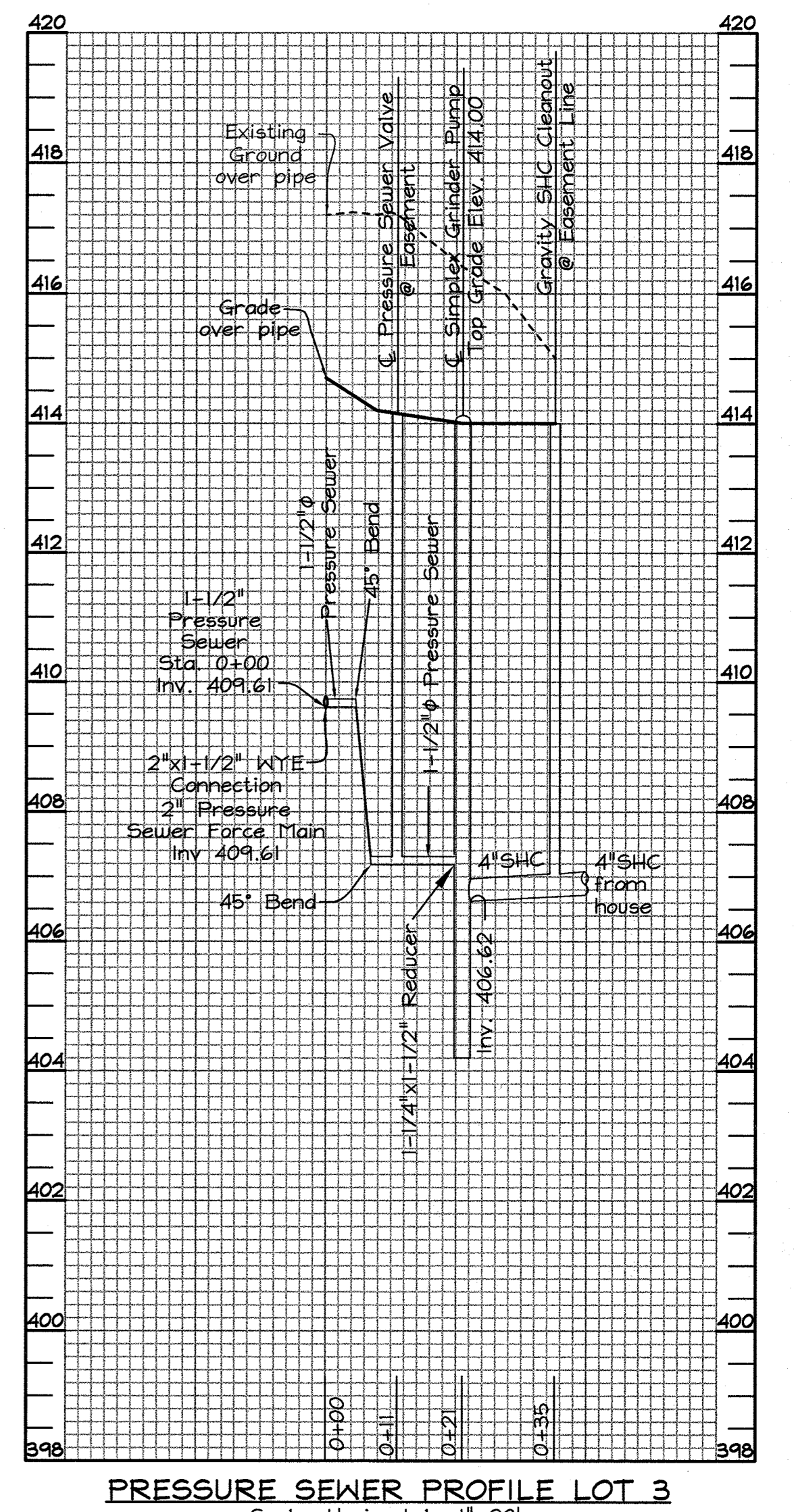
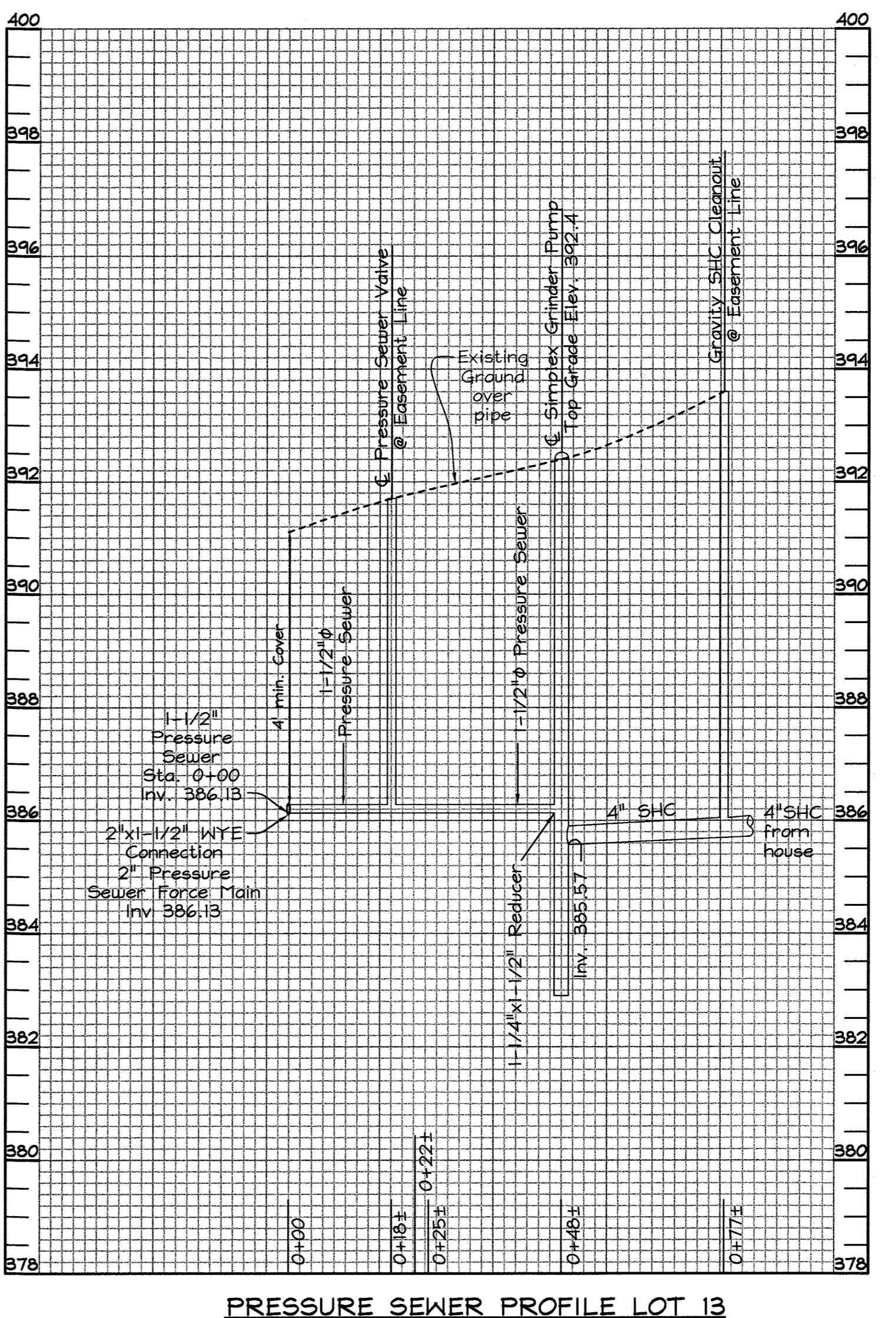
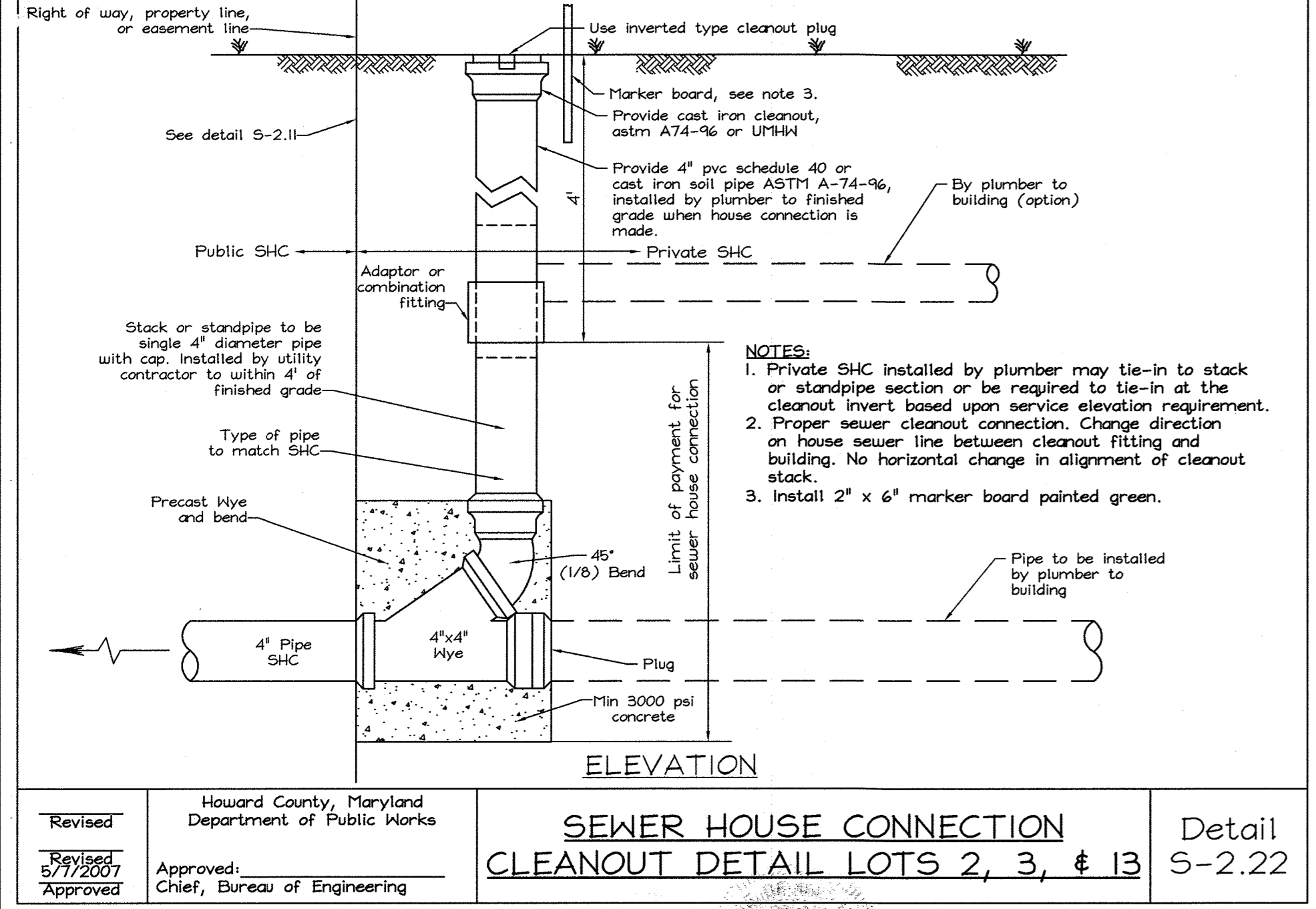
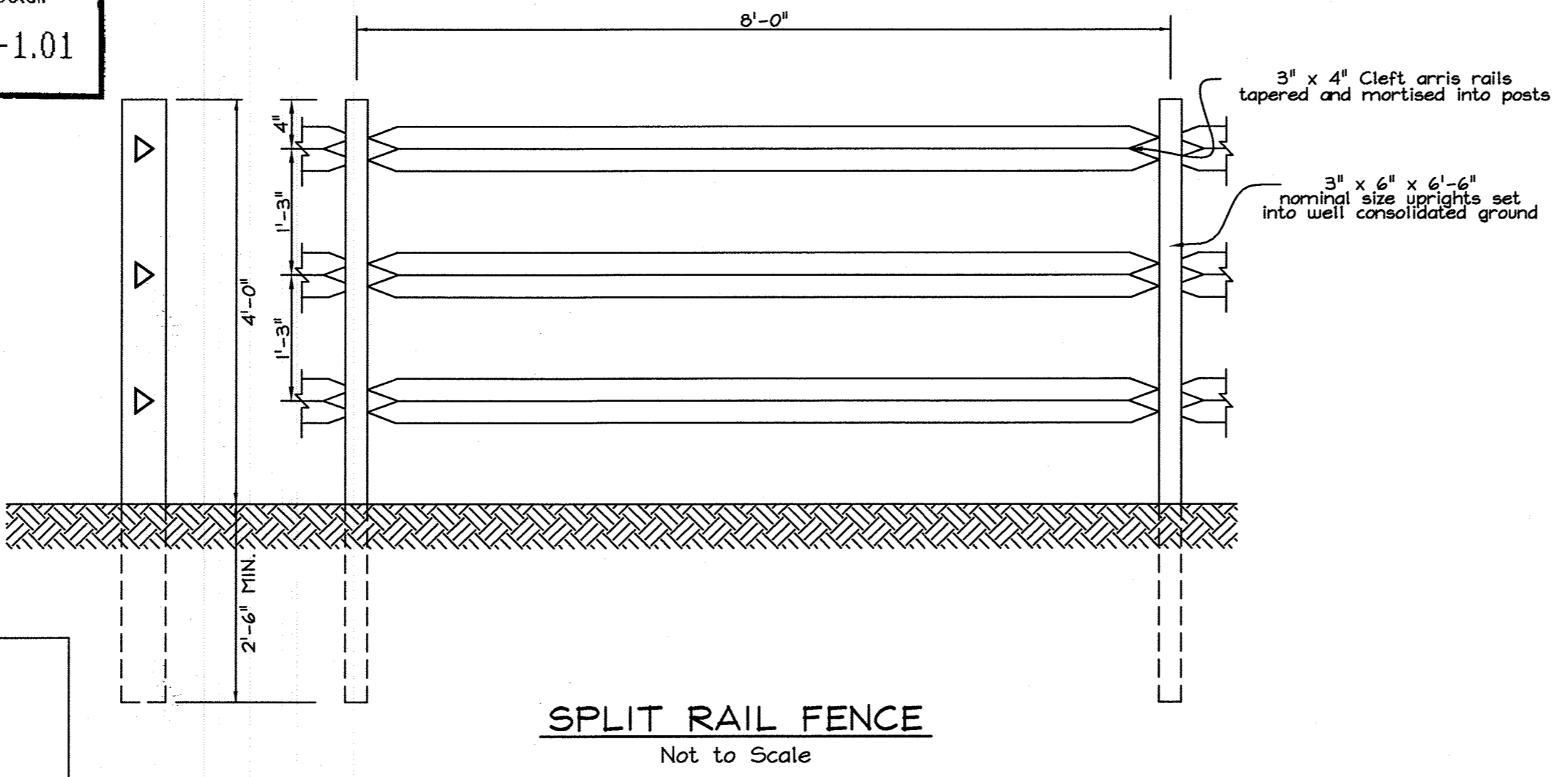
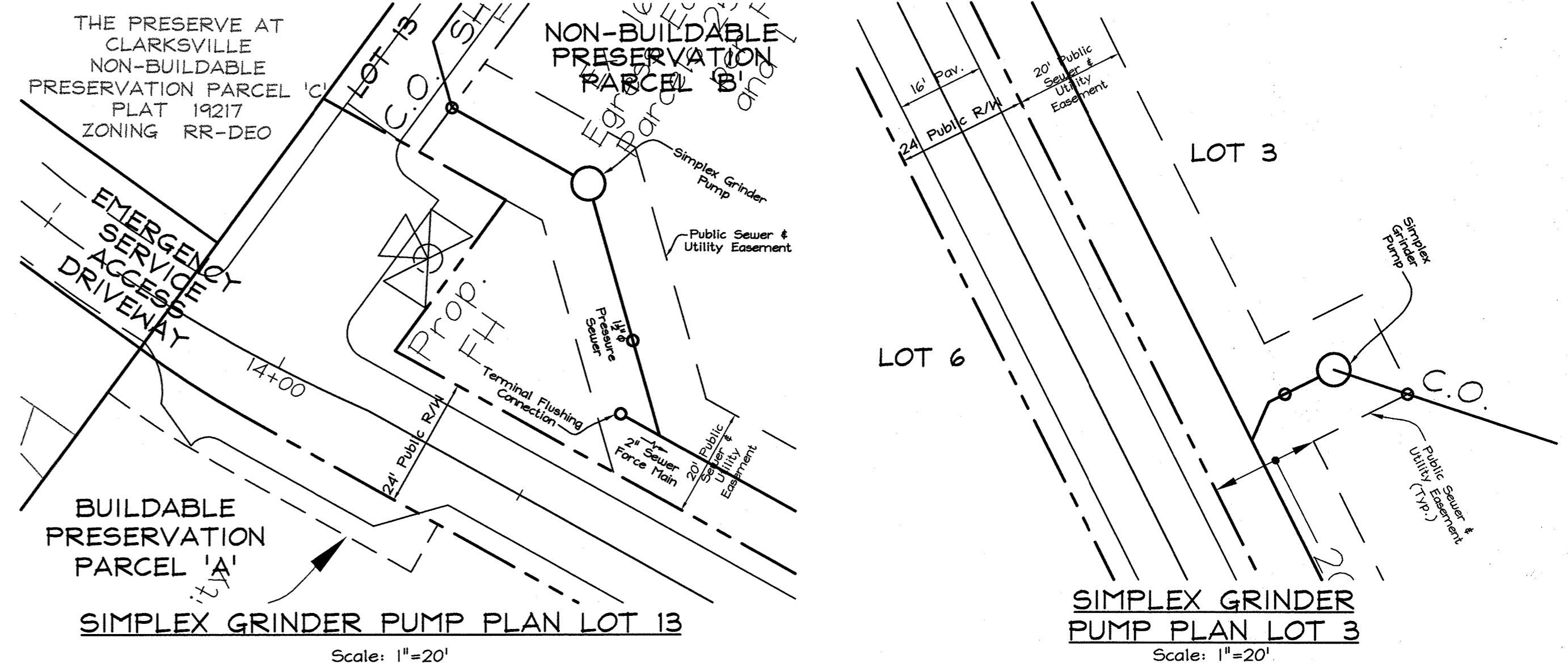


**GRINDER PUMP NOTES:**

- See Howard County Standard Detail E-1.01 for Grinder Pump Electric Service Connection.
- Unless otherwise noted, all PVC Pipe shall have Solvent Cement Joints and HDPE will have Butt Fused Joints.
- See Howard County Standard Detail E-1.03 for Terminal Flushing Connection. For Pipe Bedding, see Howard County Standard Detail G-2.12.
- See Howard County Standard Detail E-2.01 for Anti Flotation Collar.
- See Howard County Standard Detail E-2.05 for Pump Control and Alarm Wiring.
- See Howard County Standard Detail E-2.02 for backfilling Grinder Pumps.
- See Howard County Standard Detail E-2.03 for simplex Grinder Pumps.

**GRINDER PUMP ELEVATION CHART**

DESCRIPTION	ELEVATION		
	LOT 2	LOT 3	LOT 13
Grinder Pump Grade Elevation	427.96	414.07	382.4
PVC INV. @ PUMP	420.17	406.62	385.57
PUMP CASE BOTTOM ELEVATION	417.5	404.2	382.9



**AS-BUILT**  
FOR SHARED SEPTIC

STATE OF MARYLAND  
PROFESSIONAL LAND SURVEYOR  
MOHAMMAD NAJIB ROSHAN  
LICENSE #11043, EXP. 2/10/21.

06/15/20  
DATE

**PROFESSIONAL CERTIFICATION**  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE #11043, EXPIRATION: 2/10/21.

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**OWNER/ (NAECKER PROPERTY (NAECKER PROPERTY**  
Plat #7288 Lot 4)  
Robert L. Naecker  
12740 Route 108  
ClarksVillage MD 21029-1531  
443.364.6445

**OWNER/ (NAECKER PROPERTY**  
Plat #7288 Lot 6)  
GREENFIELD HOMES, Inc.  
6656 Luster Drive  
Highland, Maryland 20777  
410.781.6782

**DEVELOPER**  
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Highland, Maryland 20777  
410.781.6782

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF UTILITIES  
DATE

DEPARTMENT OF PLANNING & ZONING  
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE

**FSH Associates**  
Engineers Planners Surveyors  
6339 Howard Lane, Elkridge, MD 21075  
Tel: 410-567-5200 Fax: 410-796-1562  
E-mail: info@fisher.com

DESIGN BY: MTKCRH2  
DRAWN BY: AYKCRH2  
CHECKED BY: ZYF  
DATE: Oct. 29, 2010

BY NO. REVISION DATE

**PRESSURE SEWER**  
PROFILES AND GRINDER  
PUMP PLANS & DETAILS

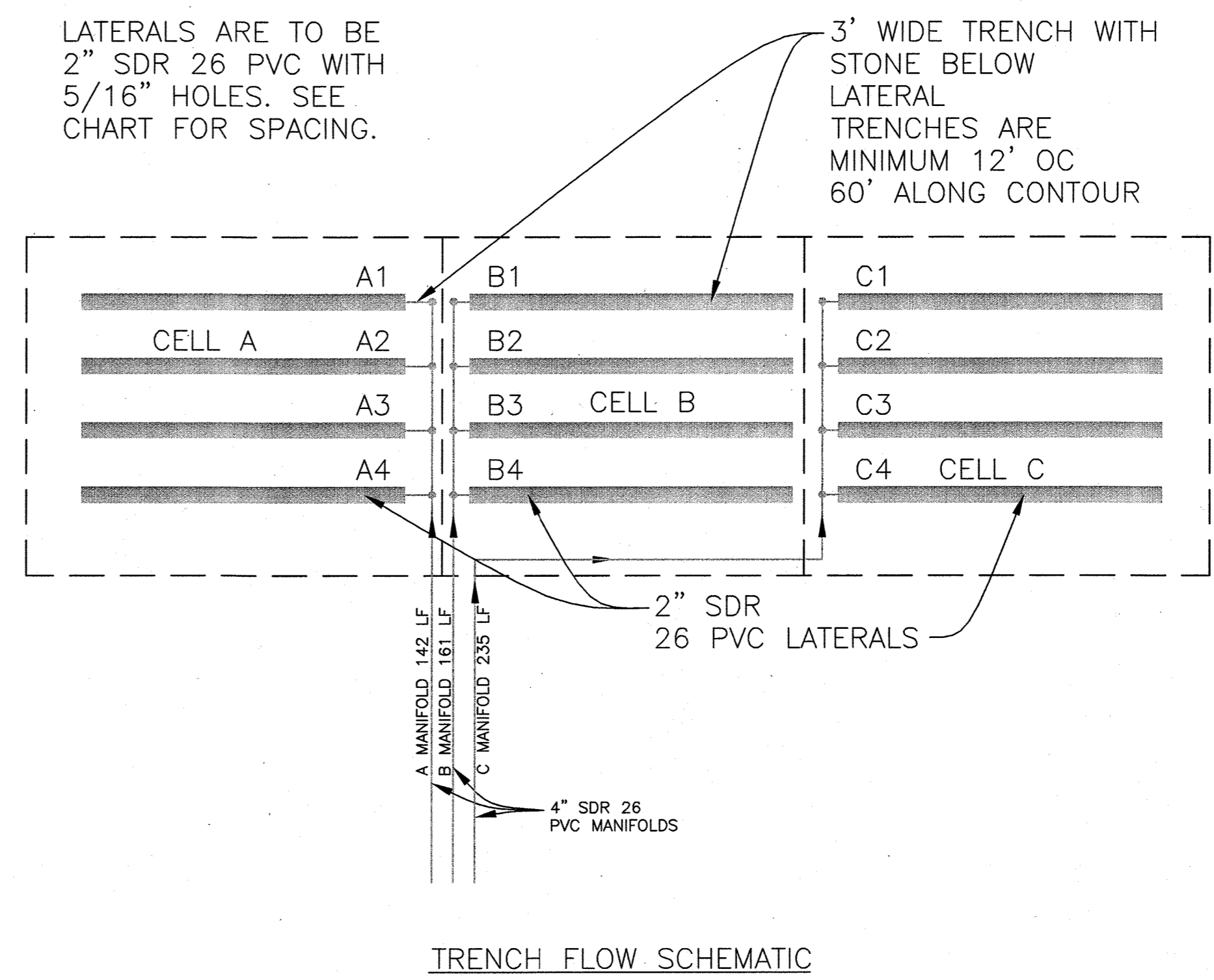
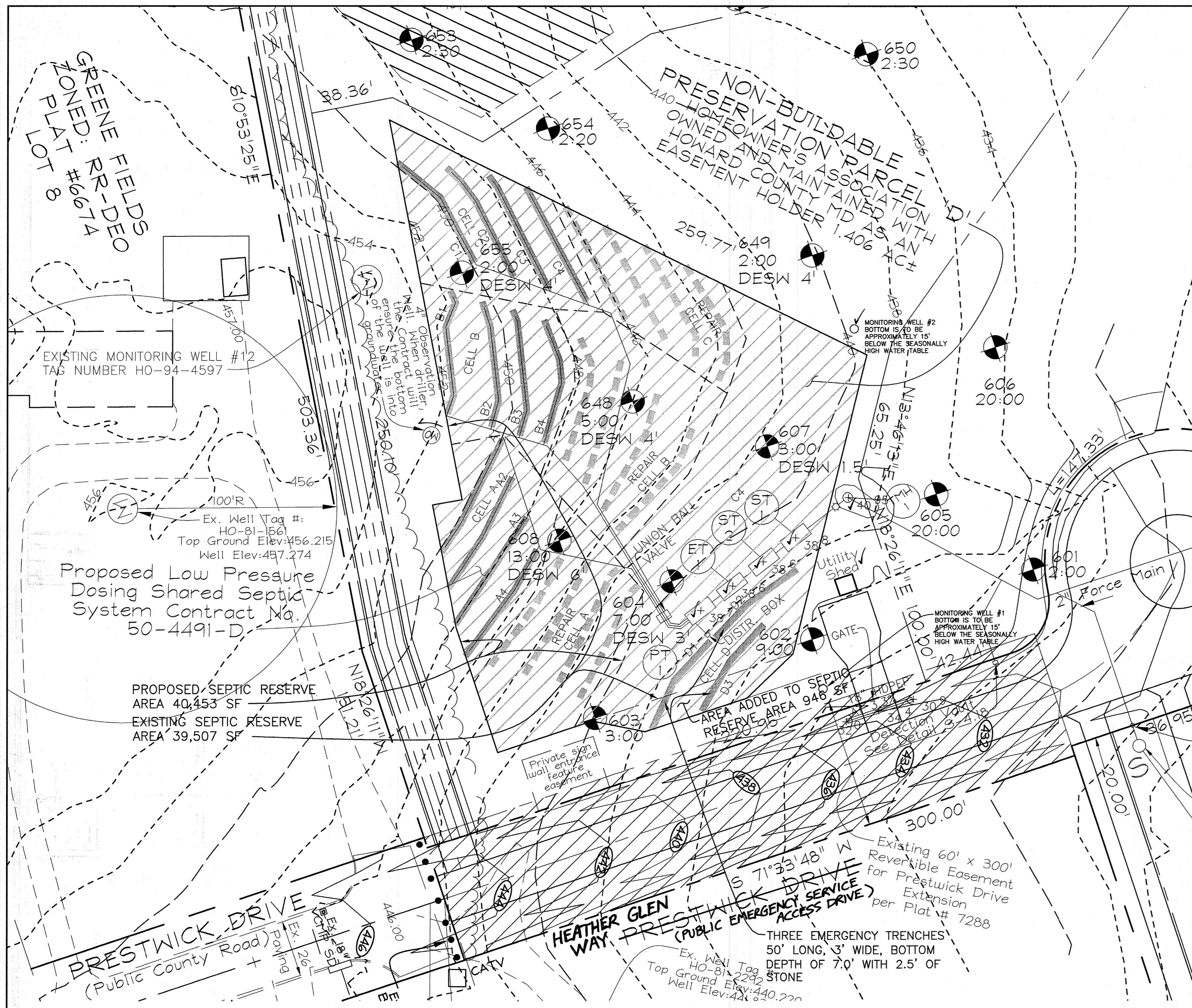
600' SCALE MAP NO.: 34 BLOCK NO.: 17

**WILLOW POND**  
LOTS 1 THRU 13, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C' & 'D' AND PARCEL 'E'  
ZONED RR-DEO  
CONTRACT NO. 50-4491-D  
TAX MAP 34 GRID 17 PARCELS 382  
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SCALE  
As Shown

SHEET NO.  
6 OF 11





NOTE: LATERALS ARE TO BE AS FOLLOWS:  
 2" SDR 26 PVC WITH 5/16" HOLES LOCATED IN ACCORDANCE WITH THE LATERAL AND PERFORMANCE CHART. HOLES ARE TO BE ON THE BOTTOM OF THE LATERAL WITH THE EXCEPTION OF THE LAST HOLE THAT IS TO BE DRILLED ON THE CROWN OF THE LATERAL.

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. 28559, Expiration Date: 7-22-2011.

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE # 11043, EXPIRATION DATE: 2/10/21.

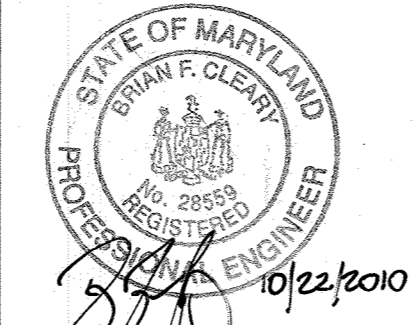
AS-BUILT  
 FOR SHARED SEPTIC  
 MOHAMMAD NATIB ROSHAN  
 LICENSE # 11043, EXP. 2/10/21

APPROVED:  
 APPROVED: FOR PRIVATE WATER AND A SHARED SEPTIC SYSTEM FOR LOTS 2, 3, & 13 AND PRIVATE WATER AND PRIVATE SEWAGE FOR LOTS 1, 4 THROUGH 12, AND BUILDABLE PRESERVATION PARCEL 'A'.  
 COUNTY HEALTH OFFICER  
 DATE 12/10/10

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 CHIEF, BUREAU OF UTILITIES  
 DATE 11/10/10

DEPARTMENT OF PLANNING AND ZONING  
 HOWARD COUNTY, MARYLAND  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE 11/10/10

BENCHMARK  
 ENGINEERS • LAND SURVEYORS • PLANNERS  
 ENGINEERING, INC.  
 8480 BALTIMORE NATIONAL PIKE • SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-8105 FAX: 410-465-8644



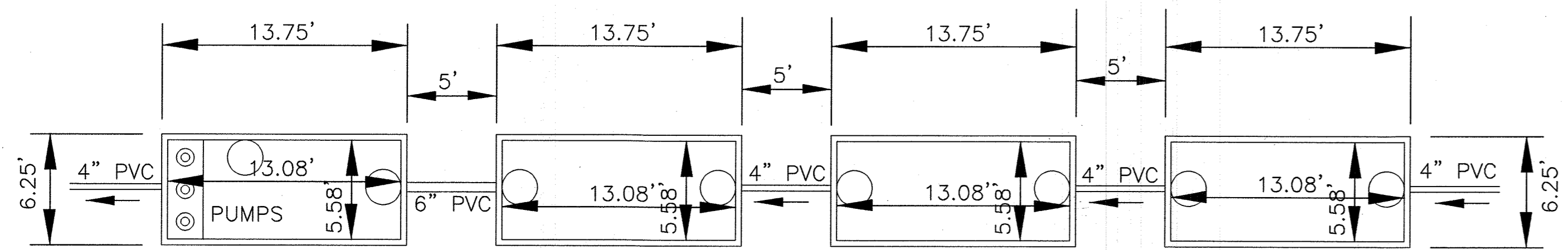
DESIGN:	JC				
DRAFT:	JC				
CHK:	-				
DATE:	3-23-10	1			
BY:		NO.		REVISIONS	DATE

DETAILS  
 600 SCALE MAP NO. 34  
 BLOCK 17

WILLOW POND  
 LOTS 2, 3 AND 13  
 LOW PRESSURE DOSING SHARED SEPTIC SYSTEM  
 FIFTH ELECTION DISTRICT  
 CONTRACT NO. 50-4491-D

SCALE:  
 AS SHOWN  
 SHEET NO.  
 8 OF 11





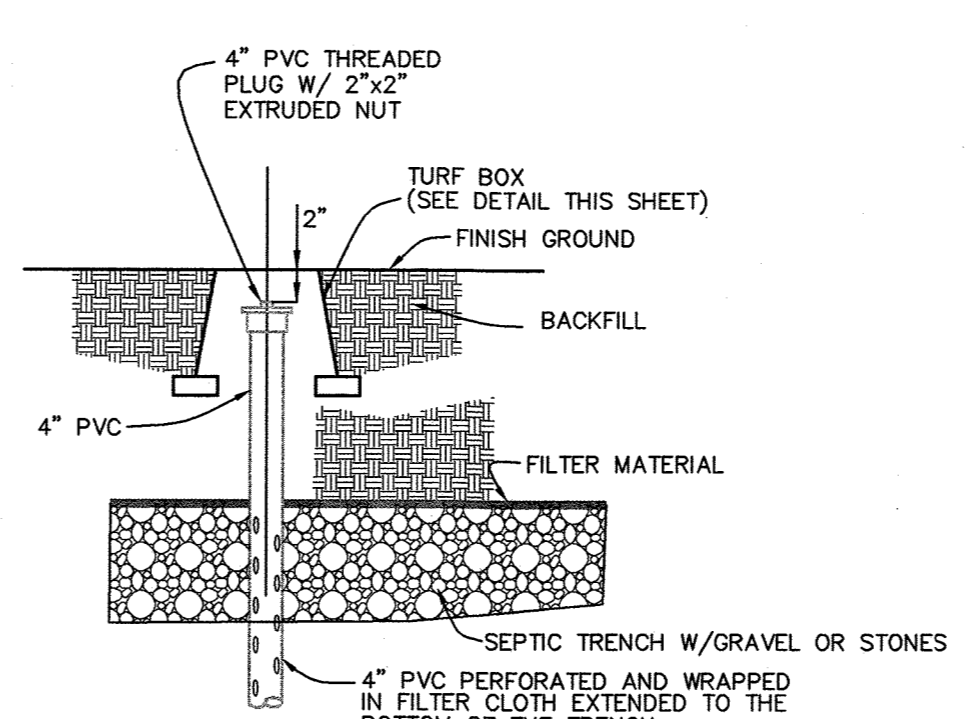
PUMP TANK  
2,000 GALLONS

EQUALIZATION TANK  
2,000 GALLONS

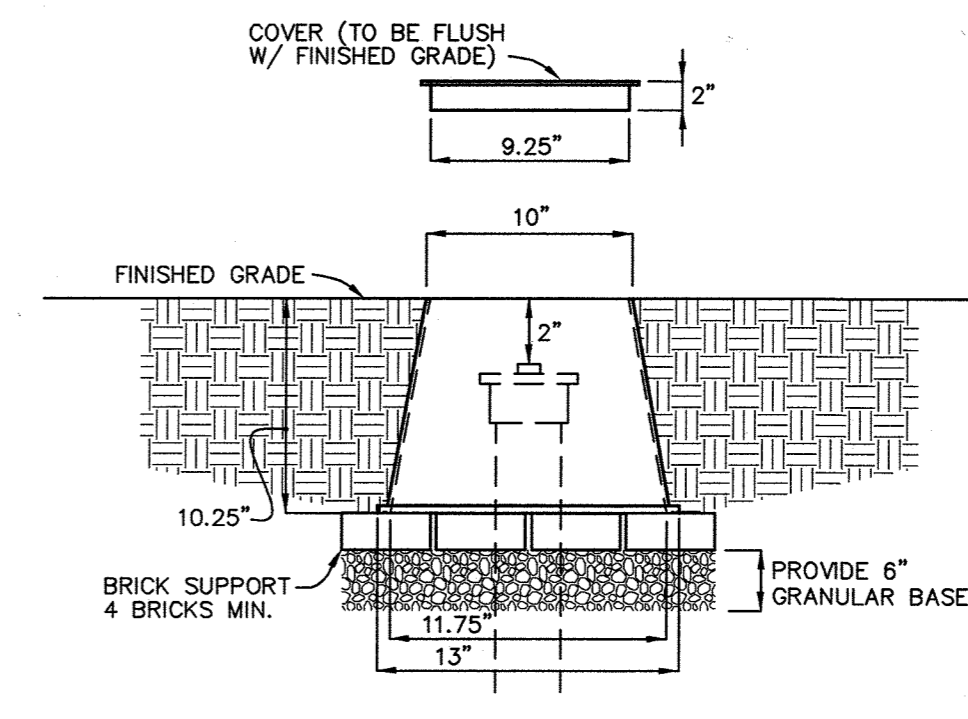
SETTLING TANK #2  
2,000 GALLONS

SETTLING TANK #1  
2,000 GALLONS

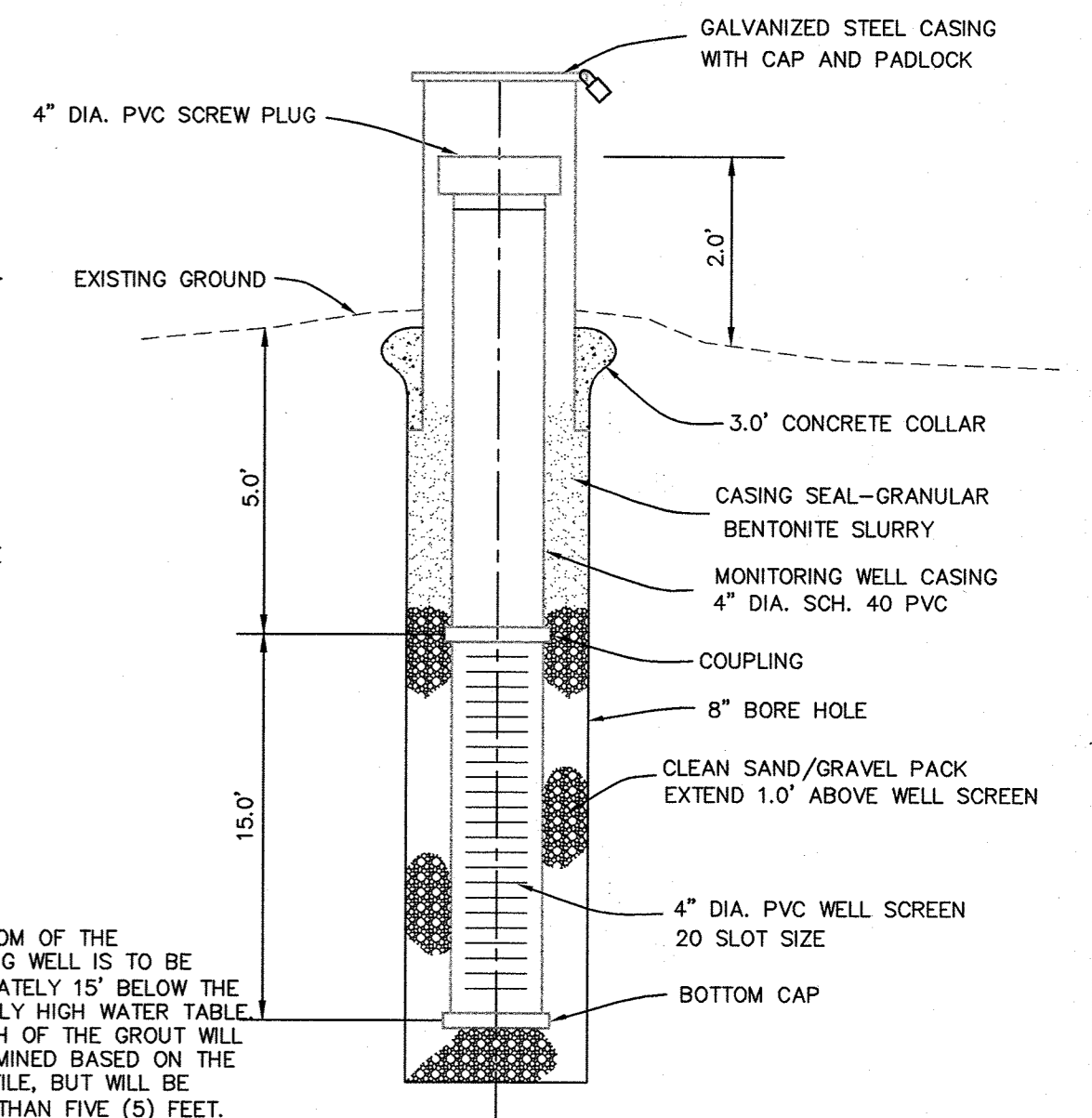
PLAN VIEW



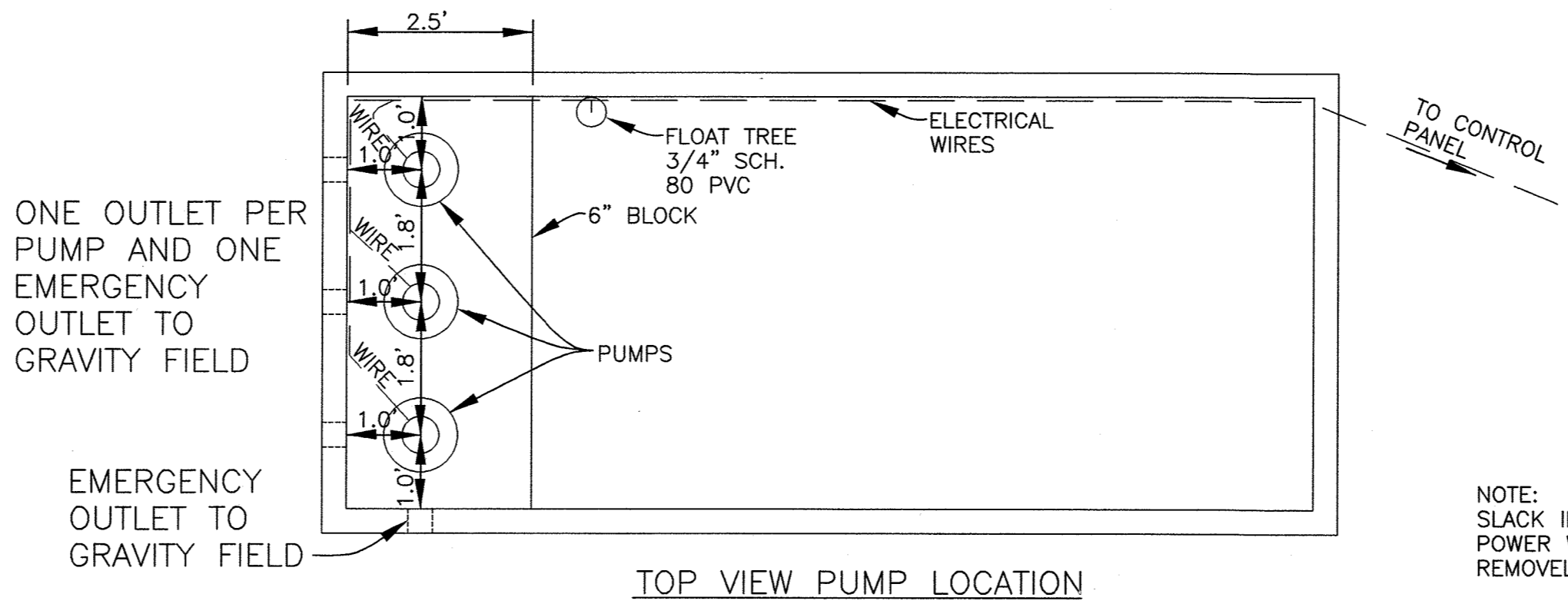
OBSERVATION PIPE DETAIL  
NOT TO SCALE



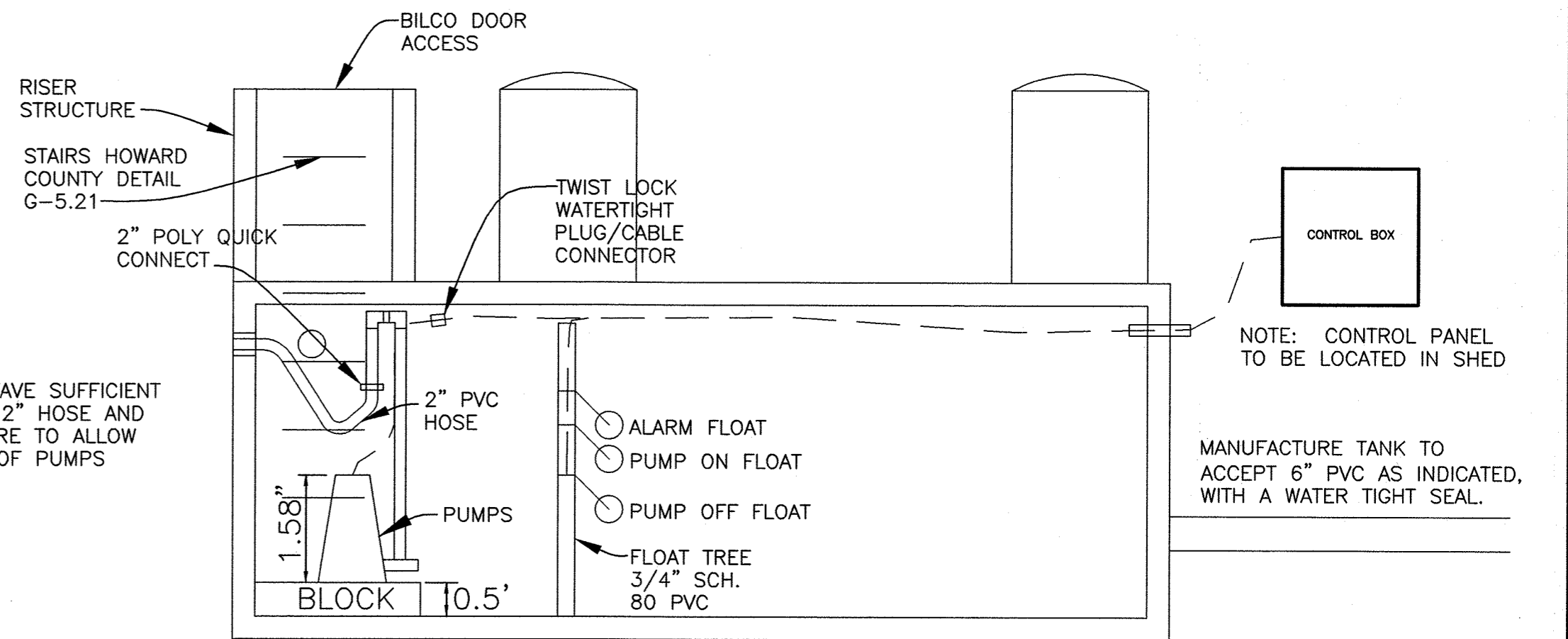
TURF BOX DETAIL  
NOT TO SCALE



MONITORING WELL DETAIL  
NOT TO SCALE



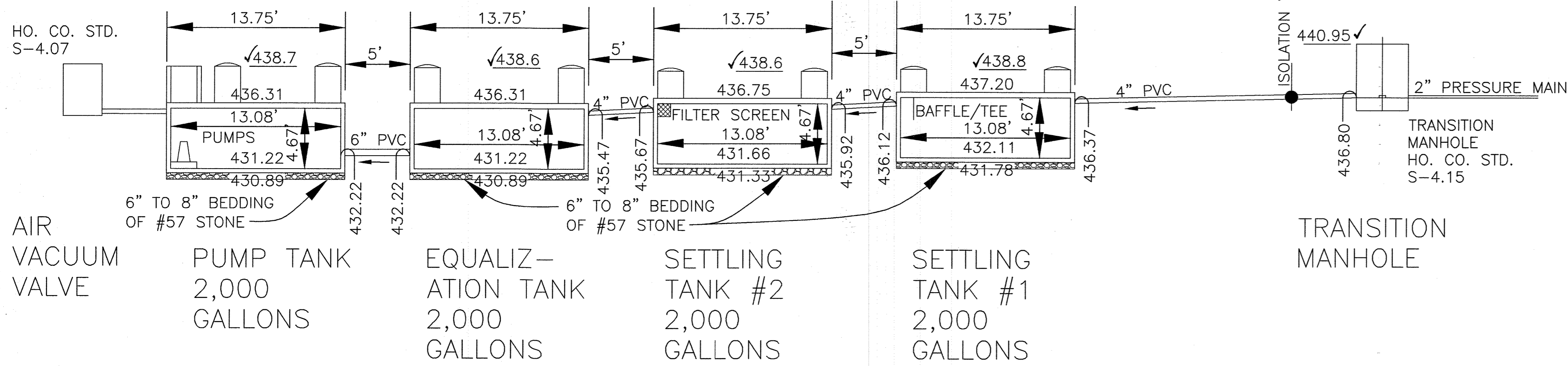
TOP VIEW PUMP LOCATION



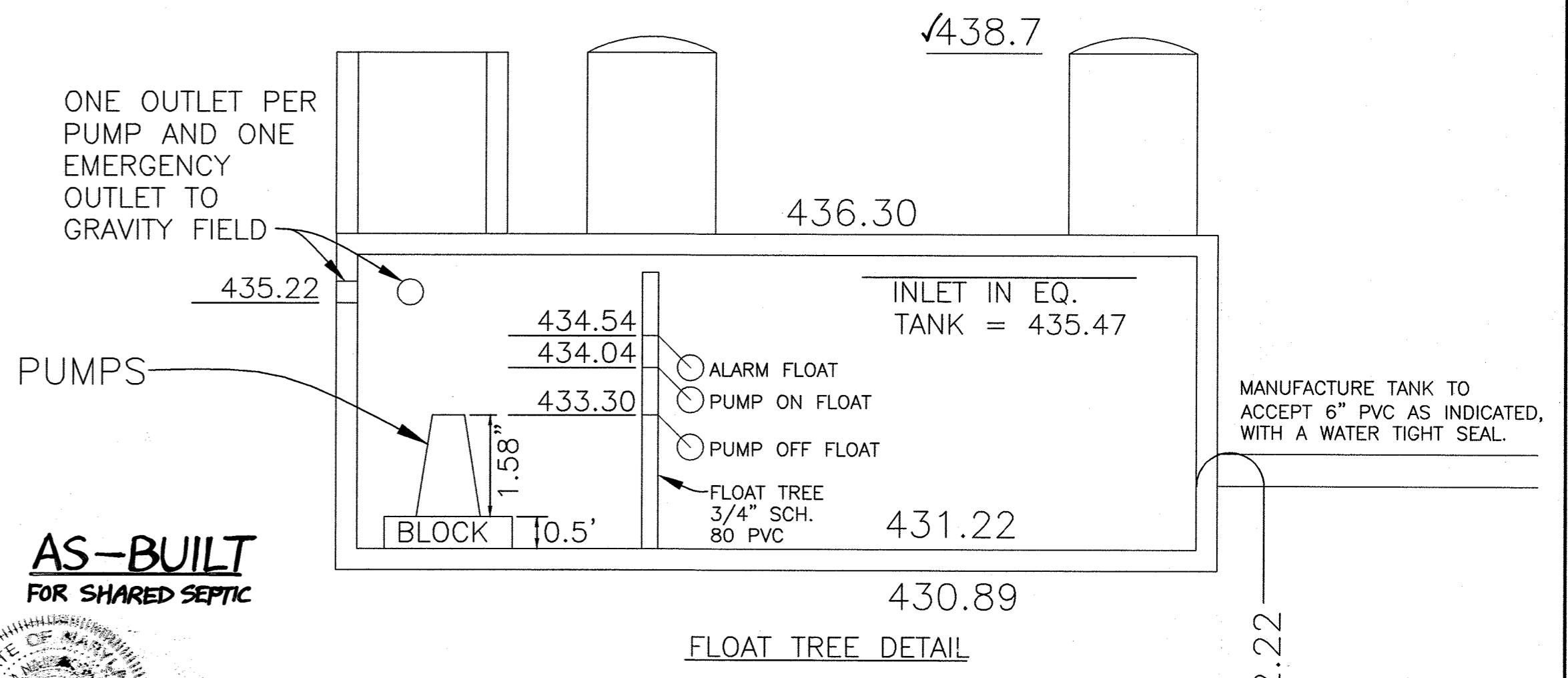
PUMP BLOCK, WIRING AND HOSE SECTION

TANKS AND VACUUM VALVE TO BE PLACED ON A LEVEL SOLID BASE OF 6 TO 8 INCHES OF #57 STONE.

LOW PRESSURE SANITARY SEWER  
3 LOTS, 5 BEDROOMS PER LOT  
2,250 GALLONS MDF  
1,125 GALLONS ADF



TANK FLOW DIAGRAM



FLOAT TREE DETAIL

CONTRACTOR TO MAKE ALL CONNECTIONS WATERTIGHT SEALS.

AS-BUILT FOR SHARED SEPTIC

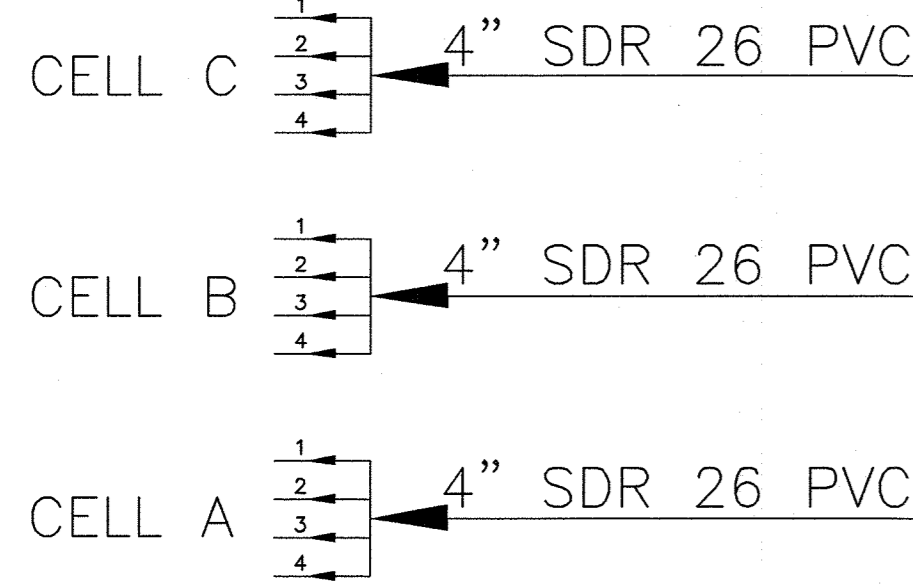
PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE #11049, EXPIRATION: 2/10/21.

MOHAMMAD NAJIB ROSMAN  
DATE 06/15/20  
LICENSE # 11049, EXP. 2/10/21

APPROVED:  
FOR PRIVATE WATER AND A SHARED SEPTIC SYSTEM FOR LOTS 2, 3, & 13 AND PRIVATE WATER AND PRIVATE SEWAGE FOR LOTS 1, 4 THROUGH 12, AND BUILDABLE PRESERVATION PARCEL 'A'.

DATE 11/10/10

LATERALS TO BE  
2" SDR 26 PVC



EMERGENCY GRAVITY  
OVERFLOW SYSTEM

LOW  
PRESSURE  
PIPING  
SYSTEM

PROCESS FLOW DIAGRAM

EQUALIZATION/PUMP  
TANKS  
2,000 GALLONS EACH  
TOTAL CAPACITY  
4,000 GALLONS

4" PVC GRAVITY SANITARY SEWER  
FROM TRANSITION MANHOLE #1  
3 LOTS, 5 BEDROOMS PER LOT  
2,250 GALLONS MDF  
1,125 GALLONS ADF

SETTLING TANKS  
2,000 GALLONS EACH  
TOTAL CAPACITY  
4,000 GALLONS



Goolds Pumps

WS\_BF Series Model 3887BF  
Submersible Sewage Pump  
Extended Warranty available for residential applications.



FEATURES

- Impeller: Cast iron, semi-open, non-clog, dynamically balanced with pump cut vanes for mechanical seal protection.
- Casing: Cast iron flanged volute type for maximum efficiency. Designed for easy installation on A10-25 slide rail on base elbow rail systems.
- Mechanical Seal: Silicon Carbide vs. Silicon Carbide sealing faces for superior abrasion resistance. Stainless steel metal parts, BUNA-N elastomers.
- Shaft: Corrosion resistant, 300 series stainless steel. Threaded design. Locknut on all 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.



Goolds Pumps is a brand of ITT Corporation.  
www.goolds.com

Engineered for life



Goolds Pumps

Wastewater

APPLICATIONS

- Specifically designed for the following uses:
  - Homes
  - Emergency systems
  - Decontaminating Effluent
  - Anywhere waste or drainage must be disposed of quickly, quietly and efficiently.

SPECIFICATIONS

- Pumps:
  - Solids handling capabilities: 2" maximum.
  - Capacities: up to 185 GPM.
  - Total heads: up to 35 feet TDH.
  - Discharge size: 2" NPT threaded companion flange as standard. 2" option available but must be ordered separately. (Order no. A1-2)
  - Temperature: 104°F (40°C) continuous.
  - Motor: 1/2 HP (370W) continuous.

MOTORS

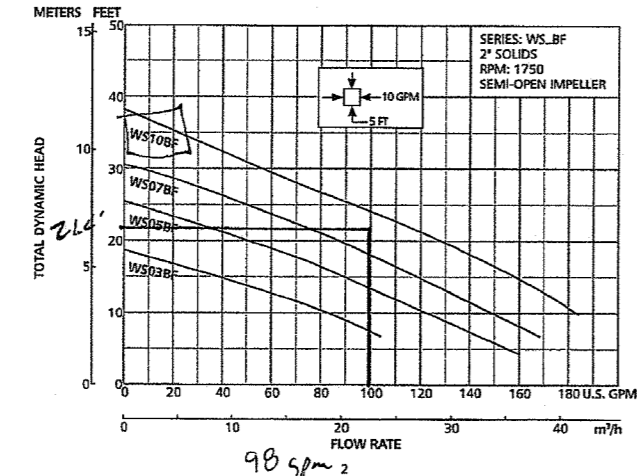
- Highly engineered in high grade cast iron for lubrication and oil proof front cover. All castings are within the working limits of the motor.
- Class 8 insulation.

Single phase 90 WSP:

- Capacitor start motor for maximum starting torque.
- Built-in overload with automatic reset.
- 120V or 277V covers duty oil and water resistant power cords.
- 1/2 - 1 HP models have NEMA three prong grounding plugs.

Three phase 90 WSP:

- Class 10 overload protection must be provided in separately ordered starter unit.
- 277V power cords all have three lead cord ends.
- Designed for Continuous Operation: Pump castings 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 Cables: Severe duty rated, oil and water resistant. Every unit on motor and generator secondary resistance barrier in case of outer jacket damage and to prevent all wiring. Standard cables to 37' optional lengths are available.
- Motor Cover Gasket: Seams positive sealing against contaminants and oil leakage.

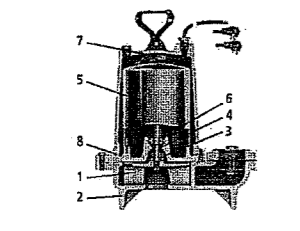


PERFORMANCE RATINGS (gallons per minute)

Code No.	HP	WSP	WSP	WSP	WSP
90WSP	1/2	115	115	115	115
90WSP	3/4	115	115	115	115
90WSP	1	115	115	115	115
90WSP	1 1/2	115	115	115	115
90WSP	2	115	115	115	115
90WSP	3	115	115	115	115
90WSP	4	115	115	115	115
90WSP	5	115	115	115	115
90WSP	6	115	115	115	115
90WSP	8	115	115	115	115
90WSP	10	115	115	115	115
90WSP	15	115	115	115	115
90WSP	20	115	115	115	115
90WSP	30	115	115	115	115
90WSP	40	115	115	115	115
90WSP	50	115	115	115	115
90WSP	75	115	115	115	115

COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearing
7	Power Cord
8	Motor Cover
9	Motor Gasket



THE PUMPS ARE NOT BE  
PLACED ON SLIDE RAILS



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83887BF June, 2009  
© 2007 ITT Corporation  
Engineered for life



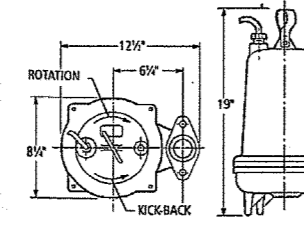
Goolds Pumps

Wastewater

MOTOR AND MODEL INFORMATION

ORDER NUMBER	HP	WSP	WSP	WSP	WSP	MAX. AMPS	LOCKED ROTOR AMPS	WINDING CODE	LOAD MOTOR EFF. %	RESISTANCE START	WEIGHT (LBS)
90WSP115	1/2	115	115	115	115	1.5	2.5	115	75	115	11
90WSP115	3/4	115	115	115	115	2.0	3.5	115	75	115	13
90WSP115	1	115	115	115	115	2.5	4.5	115	75	115	15
90WSP115	1 1/2	115	115	115	115	3.0	5.5	115	75	115	17
90WSP115	2	115	115	115	115	3.5	6.5	115	75	115	19
90WSP115	3	115	115	115	115	4.0	7.5	115	75	115	21
90WSP115	4	115	115	115	115	4.5	8.5	115	75	115	23
90WSP115	5	115	115	115	115	5.0	9.5	115	75	115	25
90WSP115	6	115	115	115	115	5.5	10.5	115	75	115	27
90WSP115	8	115	115	115	115	6.5	12.5	115	75	115	31
90WSP115	10	115	115	115	115	7.5	14.5	115	75	115	35
90WSP115	15	115	115	115	115	10.0	19.5	115	75	115	45
90WSP115	20	115	115	115	115	13.0	25.5	115	75	115	55
90WSP115	30	115	115	115	115	18.0	35.5	115	75	115	75
90WSP115	40	115	115	115	115	24.0	47.5	115	75	115	95
90WSP115	50	115	115	115	115	30.0	59.5	115	75	115	115
90WSP115	75	115	115	115	115	45.0	89.5	115	75	115	175
90WSP115	100	115	115	115	115	60.0	119.5	115	75	115	235

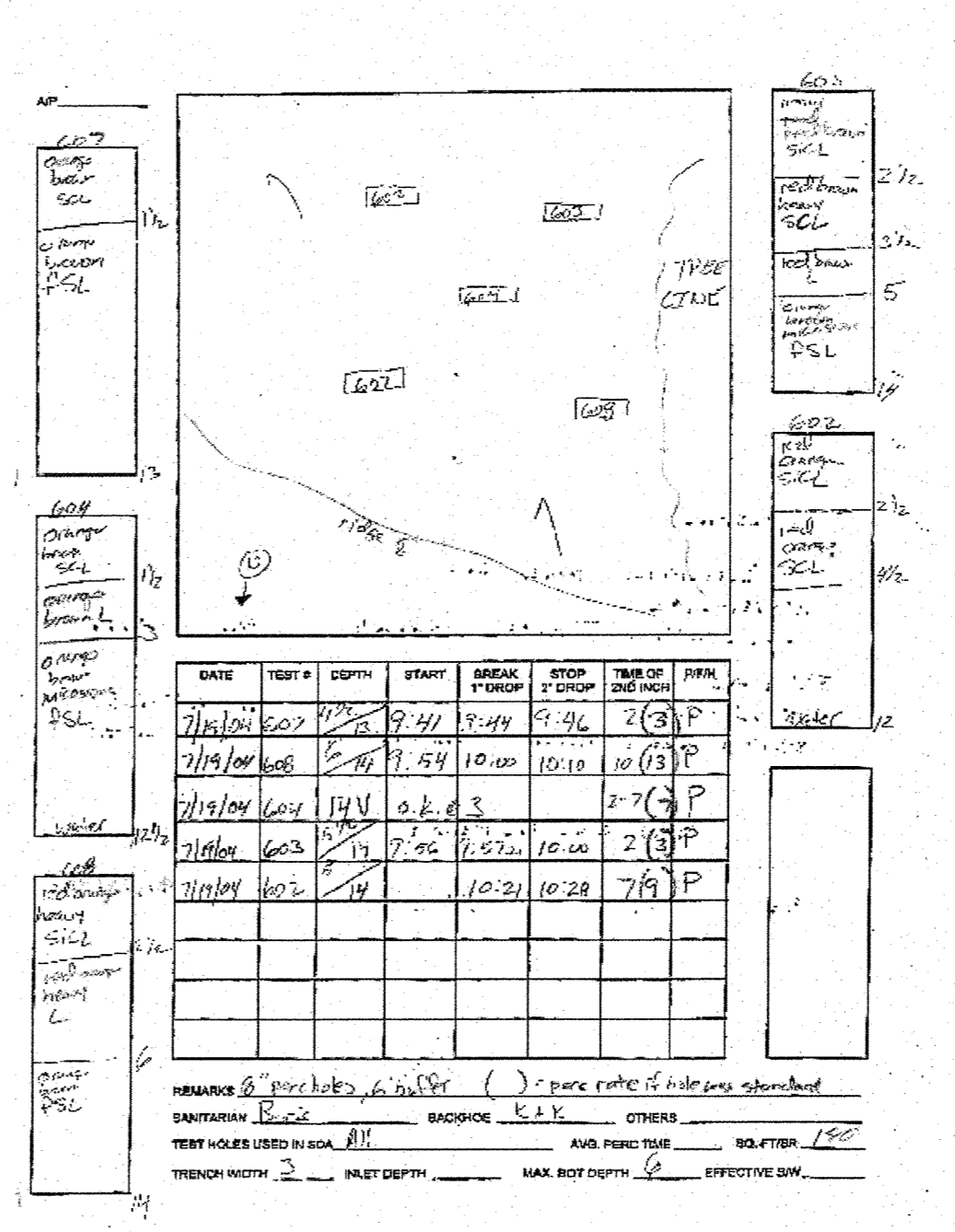
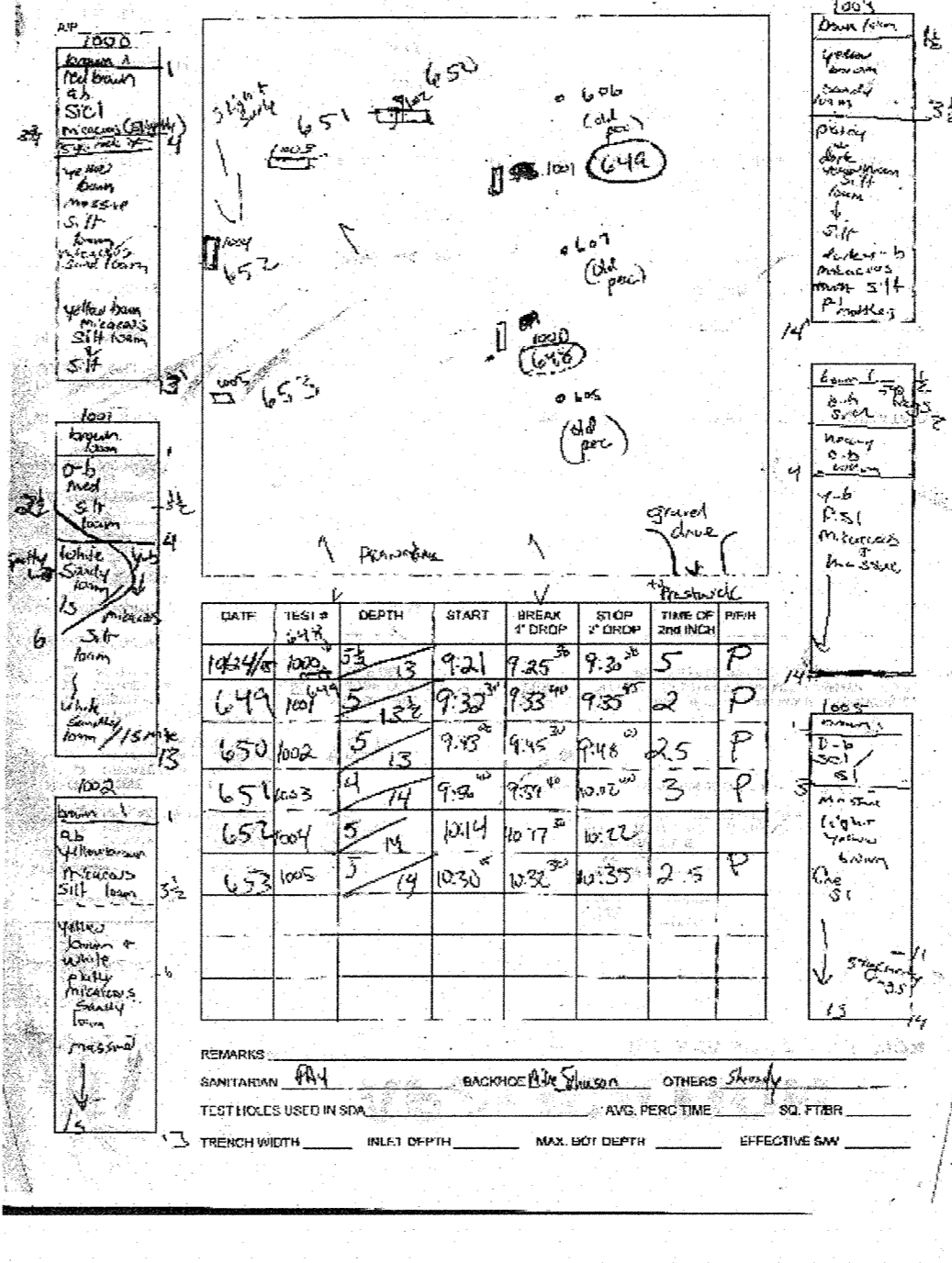
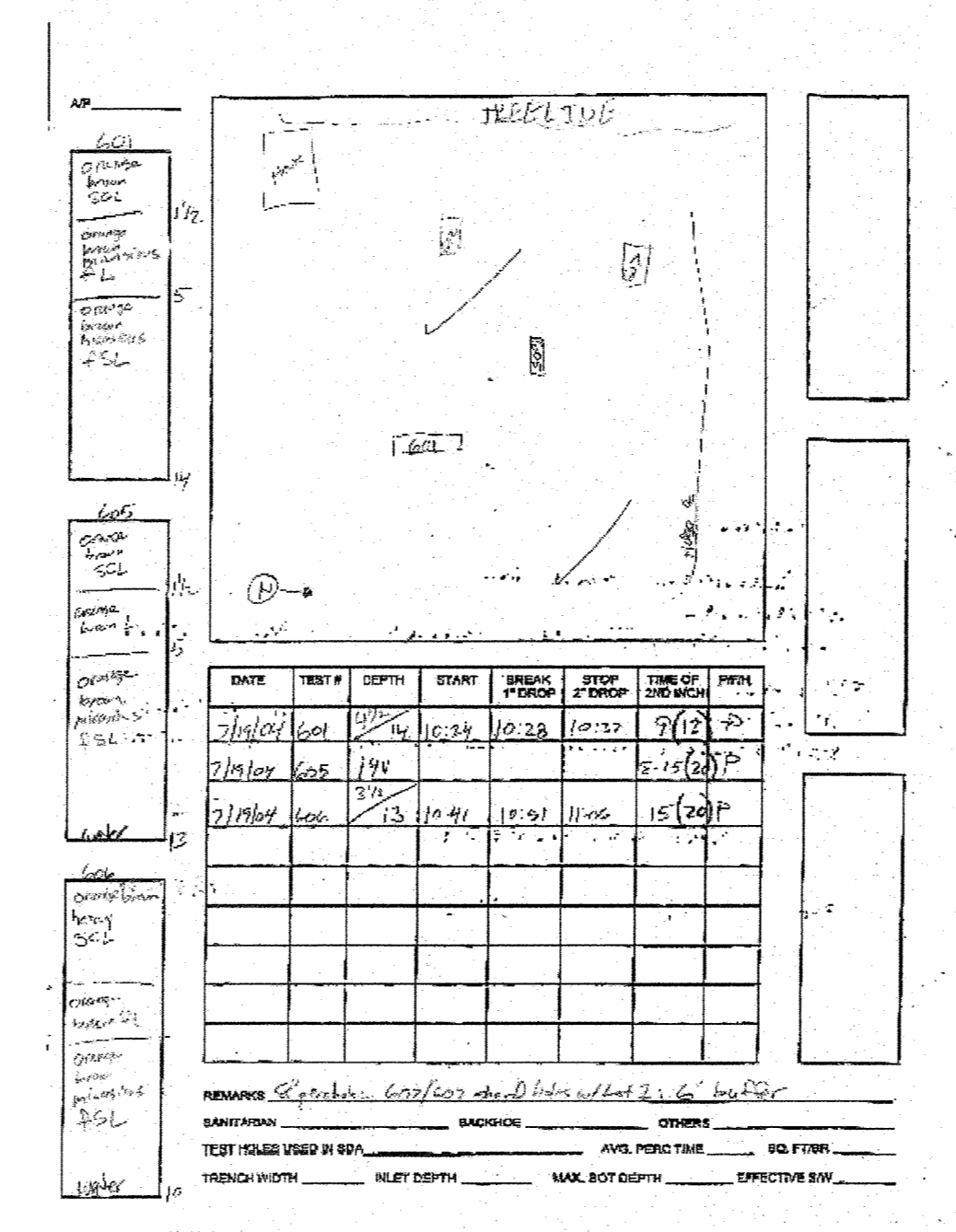
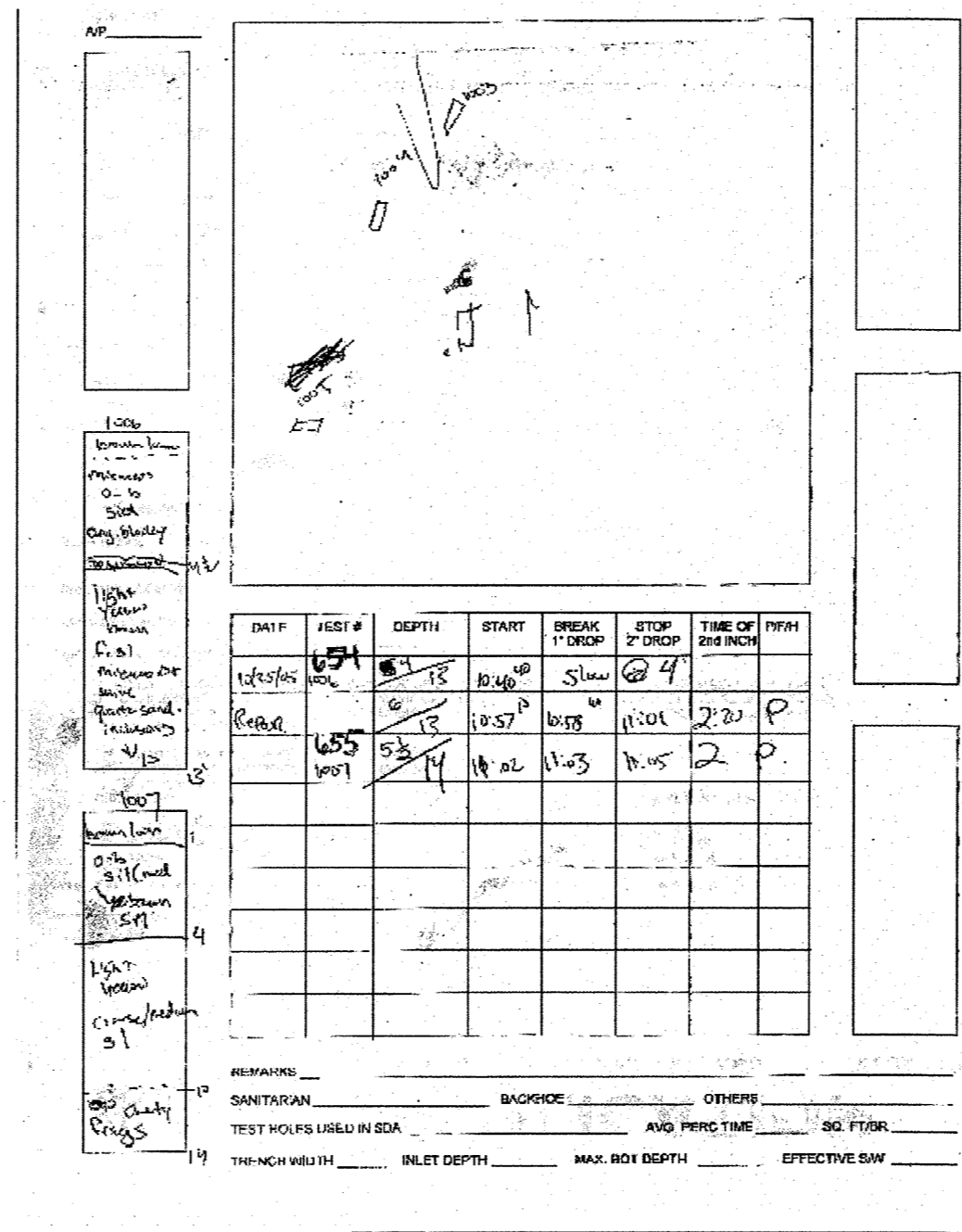
DIMENSIONS



Dimensions are in inches. Do not use for construction purposes.  
Minimum Filter: 8" WSP standard  
8" WSP optional order no. A1-3

ZABEL A100 Filter 1/16" Filtration  
8" and 12" Diameter  
This filter is ideal for larger homes, multi-family homes or light commercial settings where increased flows or higher quality effluent is required. The A100-8 Series is sized to handle flow rates from 1200 to 2400 GPD and is available in three different lengths. The A100-12 Series, installed in more locations than any other filter on the market, is sized to handle flow rates from 3000 to 6000 GPD. The A100-12 Series can be used in almost any application. Independent research has shown the A100-12 decreases TSS by 50-90% and CBOD5 by 20-40%. With 1/16" filtration, the A100-8 Series filter is available in 18", 26" and 32" lengths. The A100-12 Series filter is available in 20", 28" and 36" lengths.

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. 28559, Expiration Date: 7-23-2011.



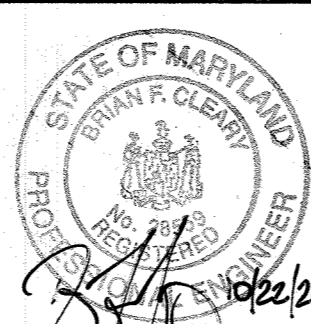
Design Calculations		Calculations:	
<b>Capacity requirements</b>			
number of lots	3	Max. Daily Flow	2250 gpd
bedrooms per lot	5	Average Daily Flow	1125 gpd
use rate per bedroom	150 gpd	Maximum Daily Flow	1.56 gpm
		Average Daily Flow	0.78 gpm
<b>Drainfield Requirements</b>			
Application Rate	0.8 gpd/sq ft	Standard Trench Length	937.5 ft
trench width	3 ft	Deep Trench Conversion Factor	50.00 %
trench gravel depth	3 ft	Deep Trench Length for MDF	468.75 ft
number of trenches	12	total trench length for 150% capacity	703.125 ft
trench spacing center-center	12 ft	individual trench length	60 ft
<b>Tanks and Capacities</b>			
1st settling tank	2,000 gallons	minimum req. area	8437.5 sq ft
2nd settling tank	2,000 gallons	req. capacity (1125+(0.75*MDF))	2812.5 gal.
Equalization Tank	2,000 gallons	design settling capacity	3000 gal.
pump tank size	2,000 gallons	min. pump tank capacity (ADF)	1526 gal.
<b>Distribution system</b>			
number of cells 50/50/50 ops	3	Total Number of Pumps	3
trenches per pump set	4	laterals served by each pump	4
lateral length per pump set	240 ft	Vol./100 ft 2" SDR 26	19.6 gal.
ID 2" SDR 26 PVC	2.193 inches	Vol. of laterals served	47.0 gal.
Max. Manifold length	438.30 ft	Vol./100 ft 4" SDR 26	70.4 gal.
ID 4" SDR 26 PVC	4.154 inches	Max. Main volume	165.4 gal.
<b>Static Hydraulic Profile</b>			
Ground Elev. at tank #1	438.30 ft	Tank #1 effluent elev.	436.12 ft
Tank #1 invert in	436.37 ft	Tank #2 effluent elev.	435.07 ft
Tank #1 top	437.20 ft	Eq. Tank effluent elev.	432.22 ft
Fall in tanks	0.25 ft	Pump Tank effluent elev.	ft
Fall between tanks	0.20 ft	Bottom of pump tank	430.89 ft
Ground Elev. at tank #2	438.50 ft		
Tank #2 invert in	438.92 ft		
Tank #2 top	436.75 ft	okay	
Ground Elev. at Eq. tank	438.30 ft		
Equalization Tank invert in	435.47 ft	okay	
Equalization Tank top	438.30 ft		
Inv. in inv. of Eq. tank	4.25 ft		
Outlet above tank inv.	1.00 ft		
Invert of pump tank	431.22 ft		
Ground Elev. at pump tank	438.70 ft		
Pump Tank invert in	431.22 ft		
inv. pump tank to top	5.08 ft	Pump Elevation	431.72 ft
Pump Tank top	436.30 ft	okay	pump intake elev.
Pump Block Height	0.50 ft		
Height of riser	0.27 ft		
Highest lateral	449.60 ft		
<b>Perforation Design:</b>			
Size of Perforation	5/16 inches	Distal Pressure =	2 ft
Design Separation	4.00 ft	Flow	1.63 gpm
Use Perforations	15	Perforations per Lateral	15.00
Perforations per field	60	Perforation Actual Spacing	4.00 ft
		Flow rate	97.70 gpm
<b>Dosing volume, flow rates and Pressures</b>			
lateral flow rate per pump	97.70 gpm	Static Head	16.30 ft
Friction (C) for PVC	150	Friction Head	3.09 ft
Miscellaneous Losses	0 ft	Distal Head	2 ft
Estimated Run Time	3.00 Min.	Max. Total Dynamic Head	21.39 ft
Cells in simultaneous use	2	min. Dose (5xLateral+1xMain) Vol.	400.64 gal.
Pump tank Volume	45.53 Gal/in	Min. Runtime	4.10 min.
		Total Dose Volume	801.28 gal.
		Average Doses	1.40 per day
<b>Tank and Float Design:</b>			
Ground over Tank =	438.70 ft	Inside Tank Dimensions	
Top of Tank =	436.30 ft	Height =	4.75 ft
Invert of Tank =	431.22 ft	Width =	5.58 ft
6" Riser =	0.50 ft	Length =	13.69 ft
18" Pump =	1.58 ft	Number of Tanks =	2
minimum Pump off =	433.30 ft		
Pump Off Float =	433.30 ft		
Dose =	107.12 cf		
Area of Pit	146.10 sf	Use 2,000 gallon pump tanks	
Pump on dist. =	0.73 ft		
Pump on Elev. =	434.04 ft		
Distance between Pump on and Highwater Alarm =		0.5 ft	
Highwater Alarm Elevation =		434.54 ft	
High Water Alarm to Inlet =	0.93		
Volume Above Alarm Float to Inlet =	136.37 cf or 2550.00 gallons	1020.07 gallons	not okay
One Day Flow =	1125 gpd		
We have provided 150' of 3.0' wide trench as a gravity flow option in case of pump failure.			

APPROVED:  
APPROVED FOR PRIVATE WATER AND A SHARED SEPTIC SYSTEM FOR LOTS 2, 3, & 13 AND PRIVATE WATER AND PRIVATE SEWAGE FOR LOTS 1, 4 THROUGH 12, AND BUILDABLE PRESERVATION PARCEL 'A'.  
*Mark J. Davis*  
COUNTY HEALTH OFFICER  
12/10/10  
DATE

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PLANNING AND ZONING  
HOWARD COUNTY, MARYLAND

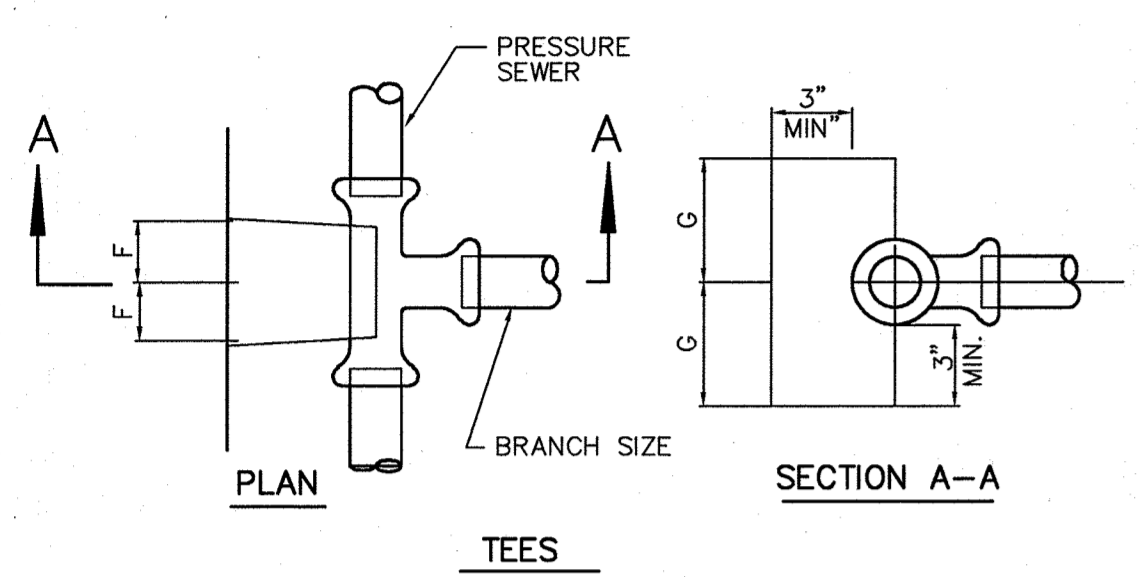
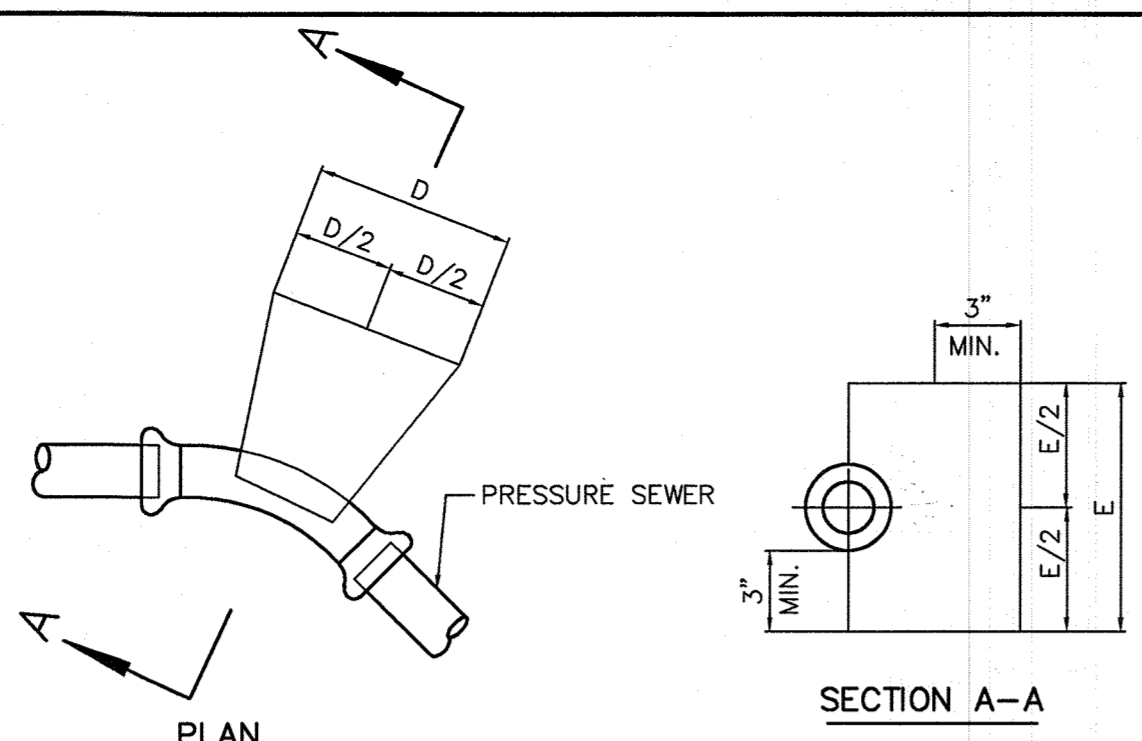
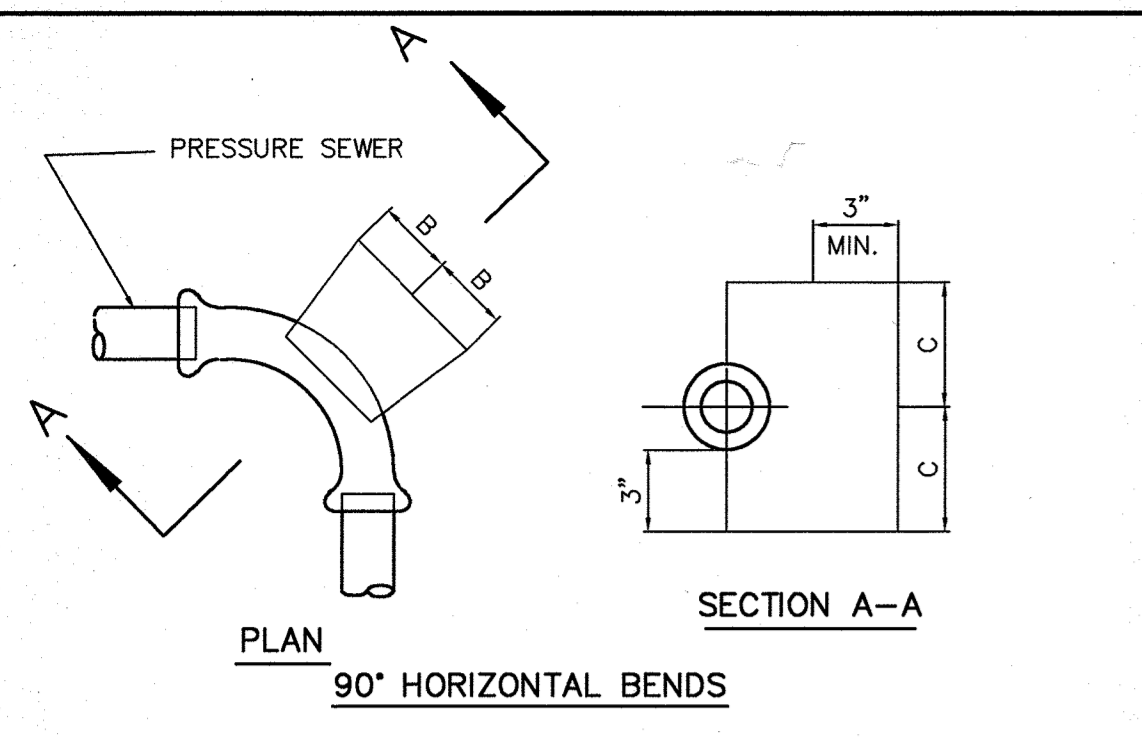
BENCHMARK  
ENGINEERS • LAND SURVEYORS • PLANNERS  
ENGINEERING, INC.  
8480 BALTIMORE NATIONAL PIKE • SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-485-8105 FAX: 410-485-6644



DESIGN: JC					
DRAFT: JC					
CHK: -					
DATE: 3-23-10					
BY	NO.	REVISIONS	DATE		

DETAILS  
600 SCALE MAP NO. 34  
BLOCK 17

WILLOW POND  
LOTS 2, 3 AND 13  
LOW PRESSURE DOSING SHARED SEPTIC SYSTEM  
FIFTH ELECTION DISTRICT  
CONTRACT NO. 50-4491-D  
SCALE:  
AS SHOWN  
SHEET NO.  
10 OF 11

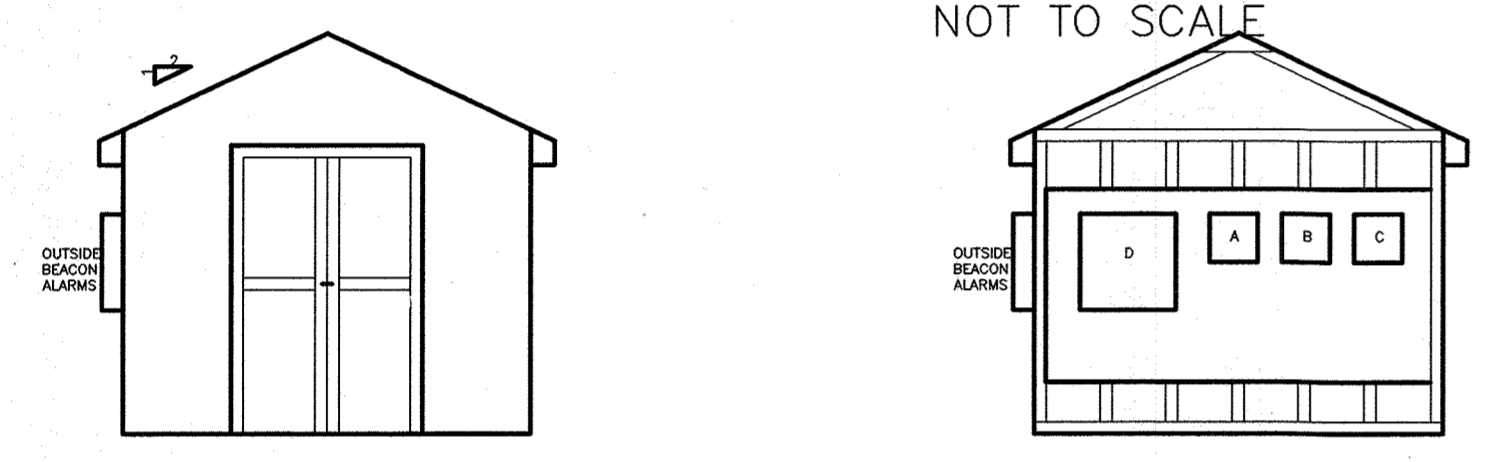


11-1/4, 22-1/2, 45° HORIZONTAL & LOWER VERTICAL BENDS

PIPE SIZE	B	C	D	E	F	G
1-1/4" & 1-1/2"	4"	4"	5"	5"	5"	3"
2"	5"	5"	7"	7"	5"	5"

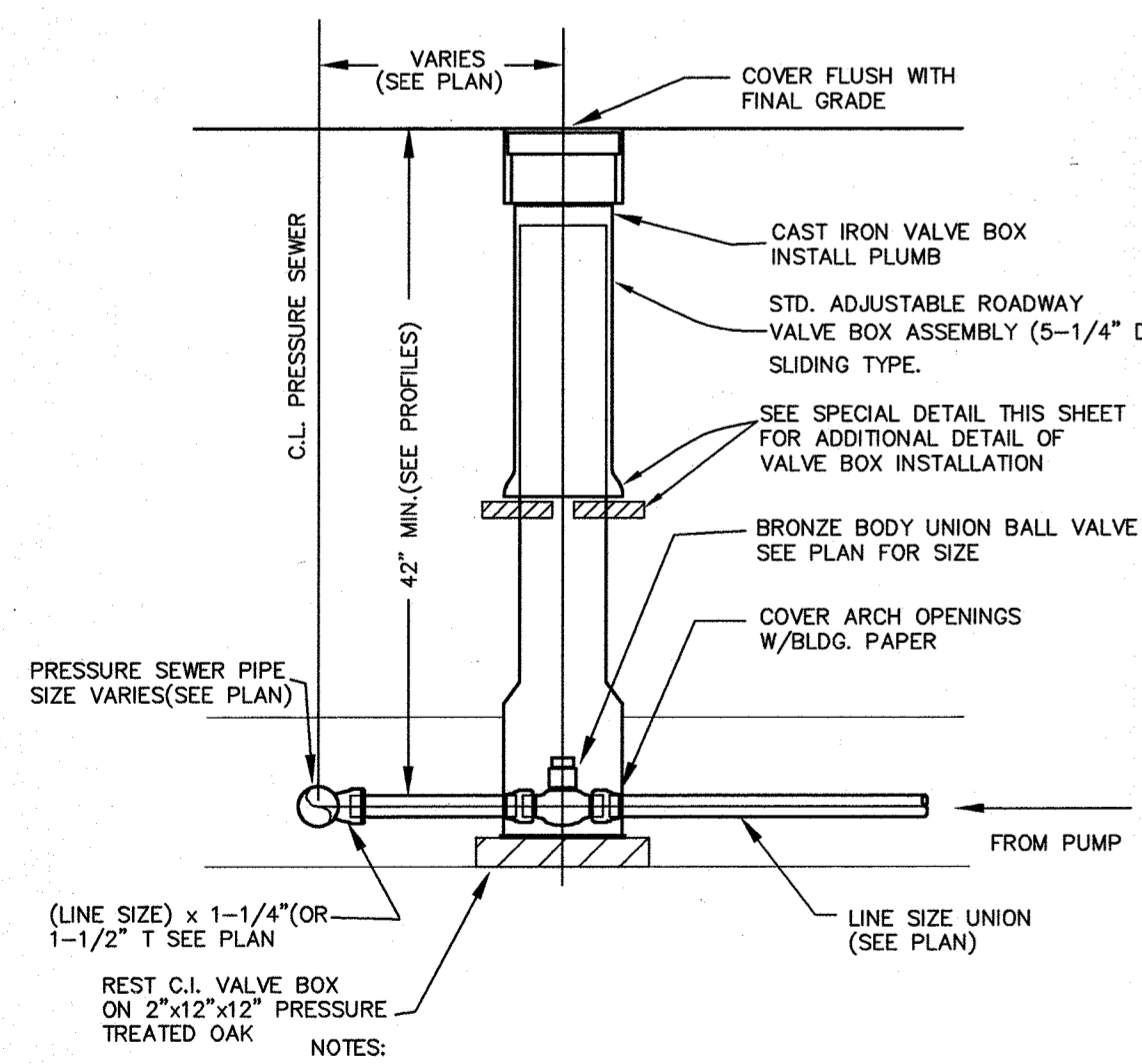
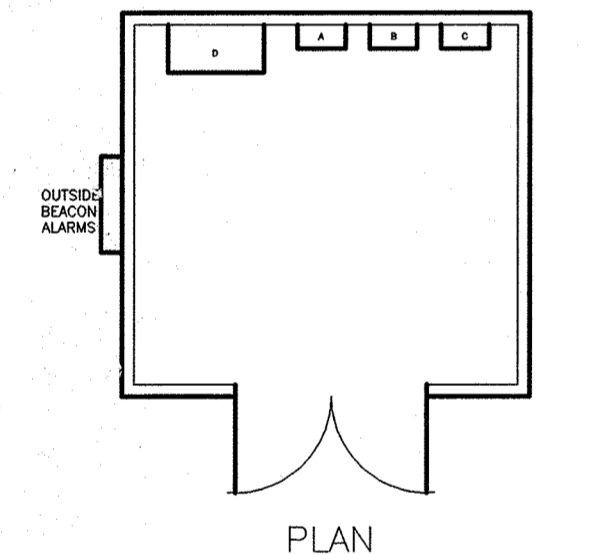
NOTES:  
 1. f'c = 3000 psi @ 28 DAYS.  
 2. CARRY ALL BEARING SURFACE TO UNDISTURBED GROUND OR FIRM SUBGRADE.  
 3. BUTTRESS TAP FOR 150 PSI.  
 5. DO NOT ENCASE JOINTS.

**PRESSURE SEWER BLOCKING DETAILS**



- LEGEND  
 A - CELL A CONTROL PANEL WITH RED ALARM BEACON  
 B - CELL B CONTROL PANEL WITH RED ALARM BEACON  
 C - CELL C CONTROL PANEL WITH RED ALARM BEACON  
 D - SLIDING DESIGNED MAIN PANEL BOARD AND BREAKERS

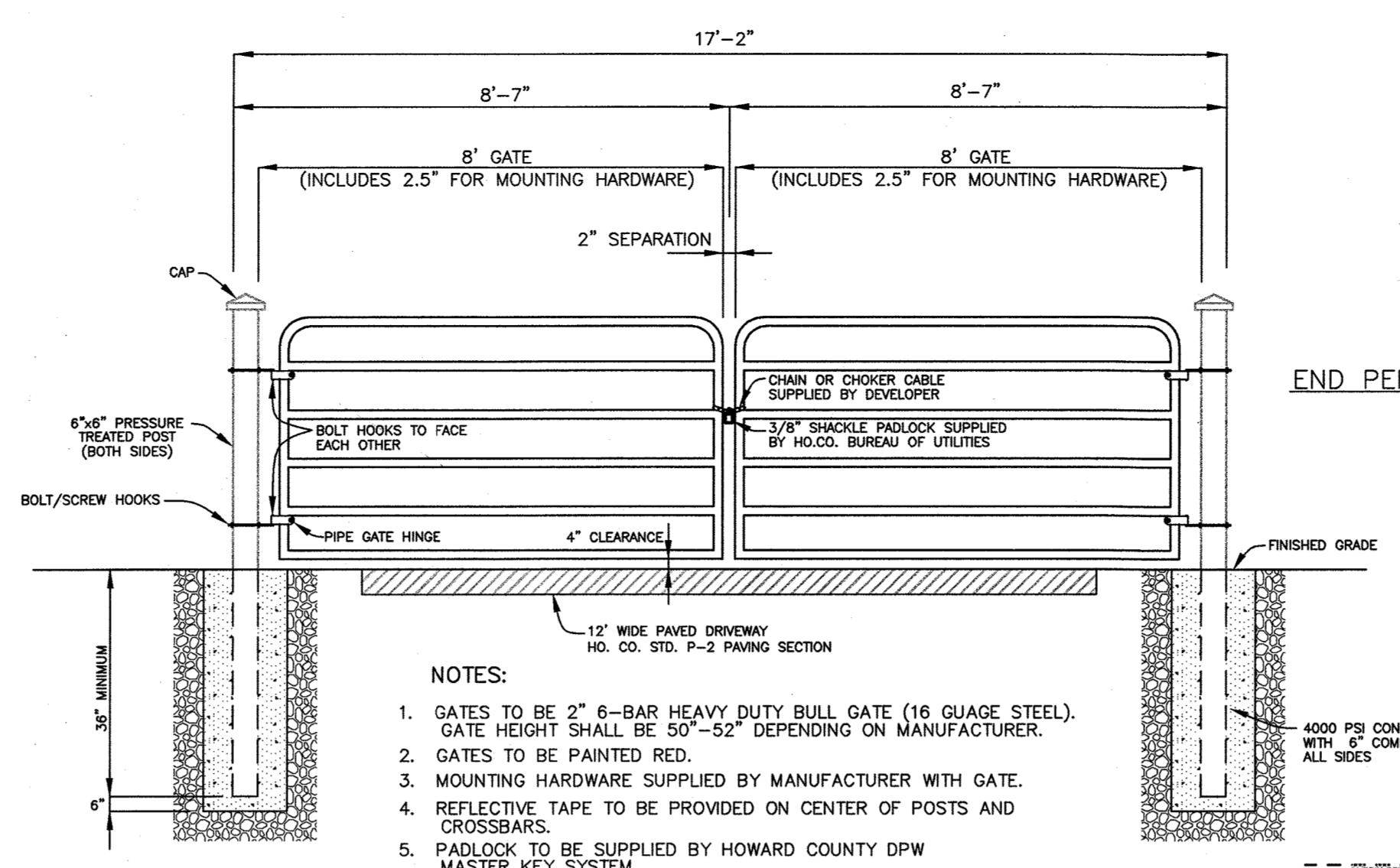
**SHED**



**UNION BALL VALVE ASSEMBLY**

NOT TO SCALE

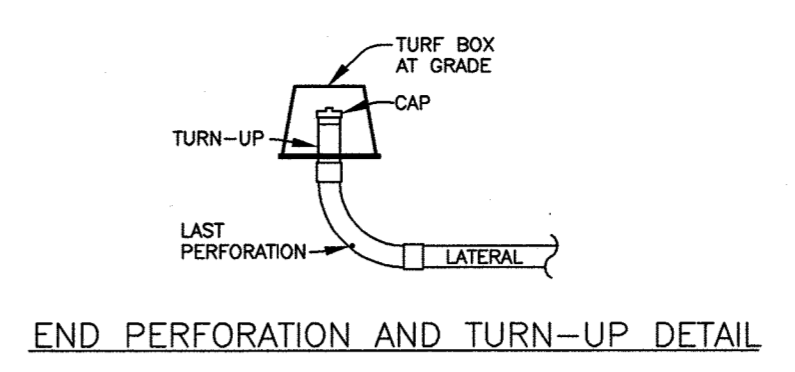
- NOTES:  
 1. MAINTAIN 42" MINIMUM COVER OVER PRESSURE SEWER.  
 2. OAK BOARDS TO REST ON UNDISTURBED EARTH OR FIRM SUBGRADE.  
 3. ALL CONNECTIONS SHALL BE SOLUTION WELDED.  
 4. INSURE CHECK VALVE IS PROPERLY ORIENTED IN DIRECTION OF FLOW & RIGHT SIDE UP.



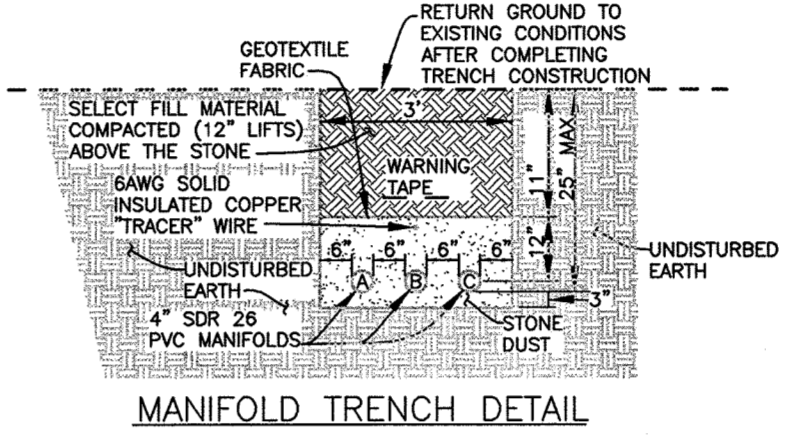
**GATE DETAIL**

NOT TO SCALE

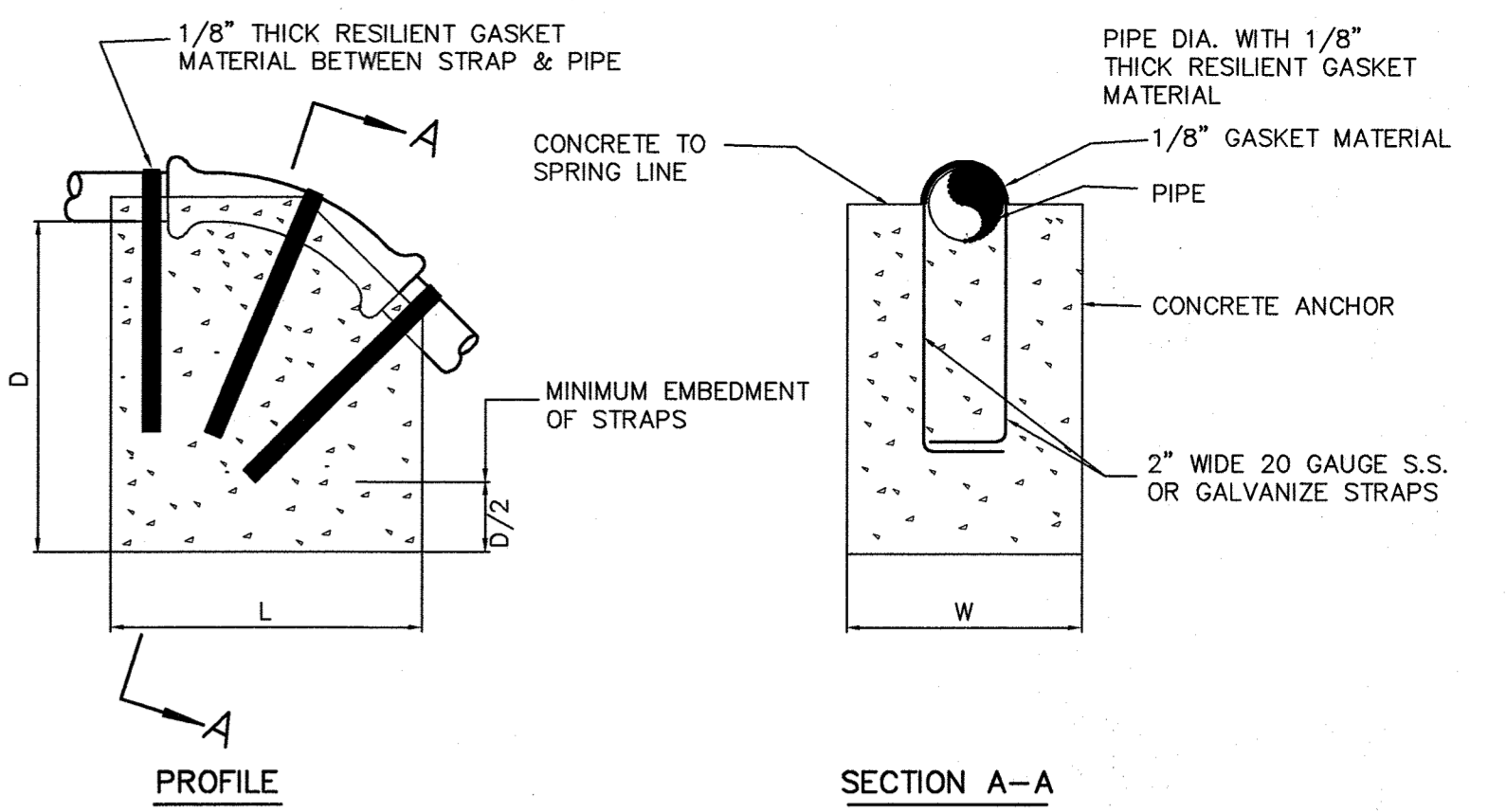
- NOTES:  
 1. GATES TO BE 2" 6-BAR HEAVY DUTY BULL GATE (16 GAUGE STEEL). GATE HEIGHT SHALL BE 50"-52" DEPENDING ON MANUFACTURER.  
 2. GATES TO BE PAINTED RED.  
 3. MOUNTING HARDWARE SUPPLIED BY MANUFACTURER WITH GATE.  
 4. REFLECTIVE TAPE TO BE PROVIDED ON CENTER OF POSTS AND CROSSBARS.  
 5. PADLOCK TO BE SUPPLIED BY HOWARD COUNTY DPW MASTER KEY SYSTEM.



END PERFORATION AND TURN-UP DETAIL



MANIFOLD TRENCH DETAIL



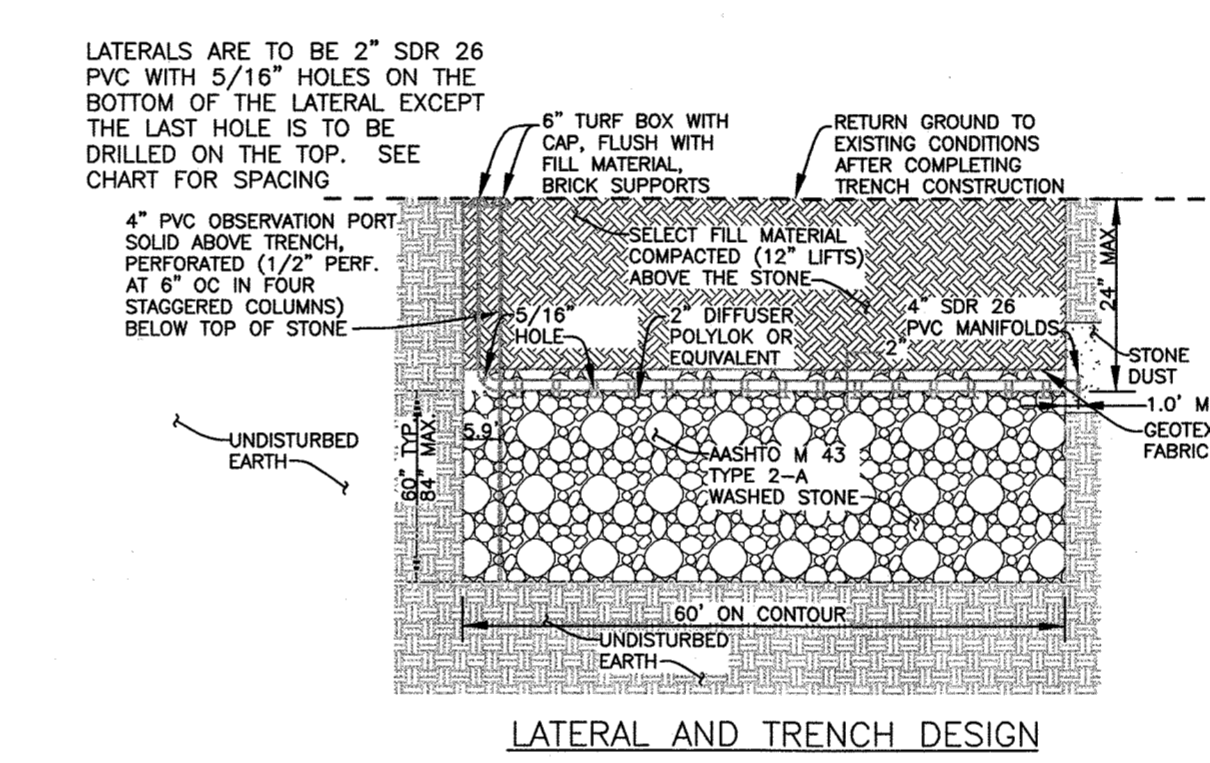
**ANCHORING PRESSURE SEWERS**

(UPPER VERTICAL BENDS)  
NOT TO SCALE

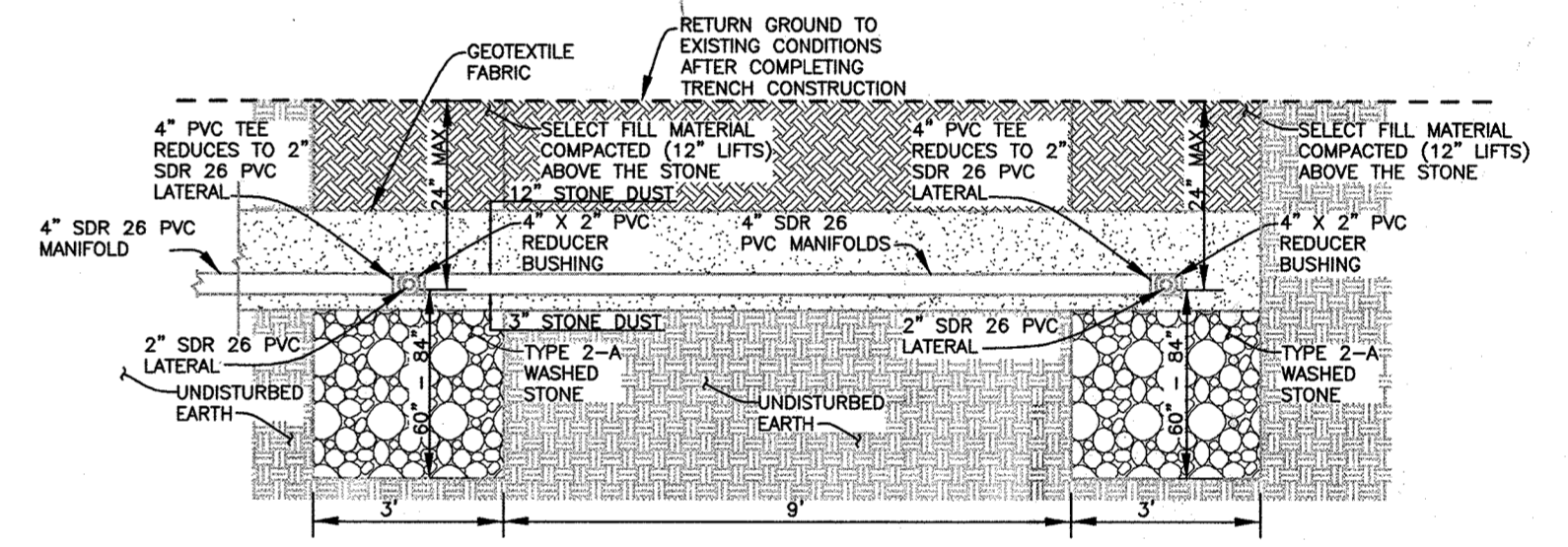
BEND		1-1/4"	1-1/2"
11-1/4"	L	12"	12"
	W	10"	10"
22-1/2"	L	15"	15"
	W	15"	15"
45°	L	20"	20"
	W	20"	20"

- NOTES:  
 1. PAINT EXPOSED GALVANIZE STRAPS WITH TWO(2) COATS OF BITUMINOUS PAINT.  
 2. f'c = 3000 psi AT 28 DAYS.  
 3. CARRY ALL BEARING SURFACE TO UNDISTURBED EARTH OR FIRM SUBGRADE.  
 4. CONCRETE ANCHORAGE DIMENSIONS ARE BASED ON TOTAL PRESSURE OF 150 PSI.

UTILITY STORAGE BUILDING  
 SHARED SEPTIC SYSTEMS  
 8' x 12' VINYL SIDED STORAGE BUILDING  
 HIGH WALL BARN STYLE WITH 6' SIDE WALLS  
 NO WINDOWS  
 ONE DOUBLE DOOR ON END OF BUILDING  
 10' RIDGE VENT  
 4 x 4 PRESSURE TREATED SKIDS  
 2 x 4 FLOOR JOIST, 16" OC  
 5/8" PLYWOOD FLOOR SHEATHING  
 2 x 4 STUDS 16" OC  
 ALL WALLS TO BE PLATED AT THE BOTTOM  
 ALL WALLS TO BE DOUBLE PLATED AT THE TOP  
 1/2" ROOF SHEATHING  
 240 POUND ASPHALT 20 YEAR SHINGLES  
 DOORS AND FRAMED TO BE REINFORCED  
 DOOR HINGES ARE TO BE "T" TYPE OR STRAP TYPE  
 THREE HINGES PER DOOR SIDE  
 PIANO HINGES ARE NOT ACCEPTABLE  
 LOCKS ARE TO BE KEYED ALIKE  
 LOCKS ARE TO BE BAUER CH 751 LOCK  
 VINYL SIDING AND TRIM COLOR IS ALMOND  
 SHINGLE COLOR IS BROWN



LATERAL AND TRENCH DESIGN



TRENCH SECTION

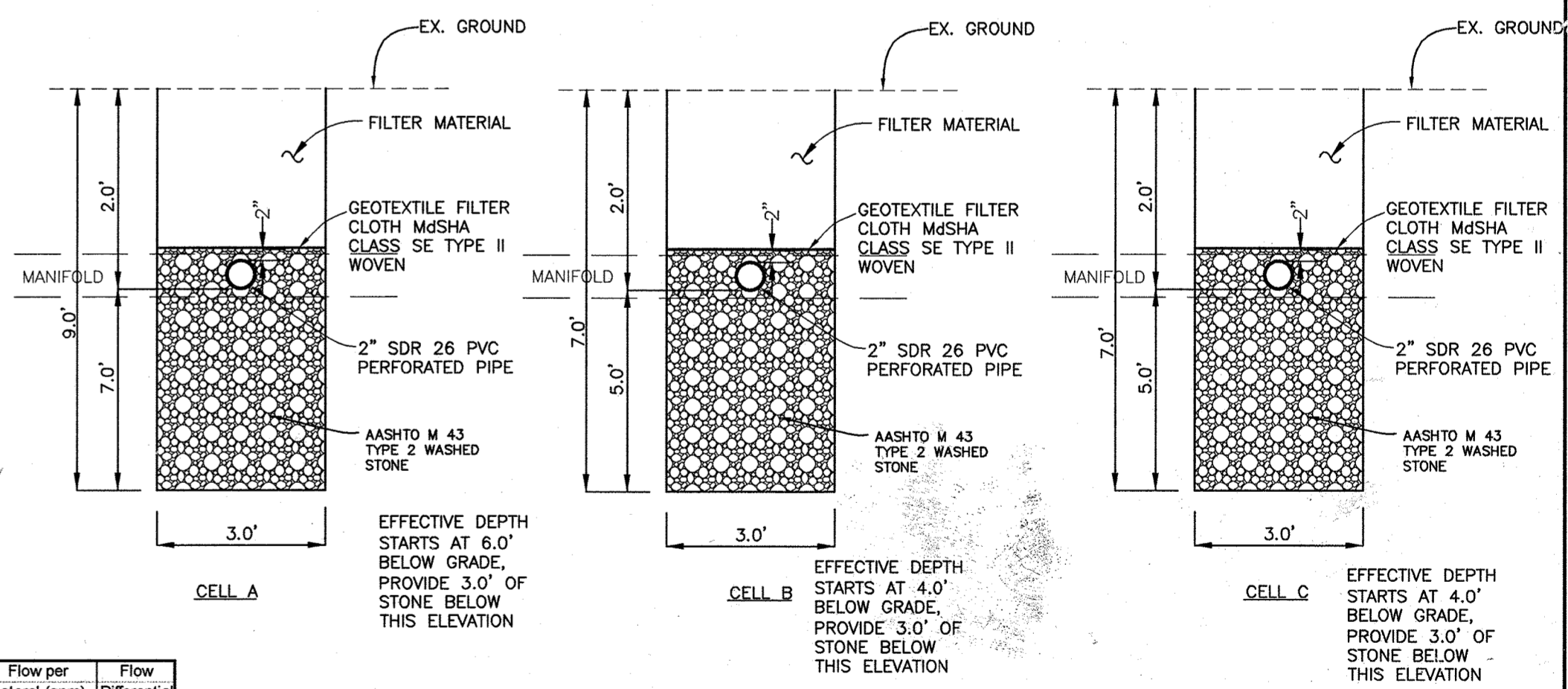
LATERALS ARE TO BE 2" SDR 26 PVC WITH 5/16" HOLES ON THE BOTTOM OF THE LATERAL EXCEPT THE LAST HOLE IS TO BE DRILLED ON THE TOP. SEE CHART FOR SPACING.

Cell	Trench	Number of Perforations	Manifold to Trench (ft)	Trench Length (ft)	Perforation Spacing (ft)	Dist. Manifold to First Perf. (ft)	Dist. Last Perf. to Trench Edge (ft)	Lateral Length (ft)
A	1	11	1.0	90	5.45	3.73	2.73	58.27
	2	9	2.6	90	6.67	5.93	3.33	58.27
	3	9	1.8	90	6.67	5.13	3.33	58.47
	4	8	2.1	90	7.50	5.85	3.75	58.35
B	1	15	1.0	90	4.00	3.00	2.00	58.00
	2	11	1.0	90	5.45	3.73	2.73	58.27
	3	10	1.0	90	6.00	4.00	3.00	58.00
	4	9	1.0	90	6.67	4.33	3.33	57.67
C	1	12	1.0	90	5.00	3.50	2.50	58.50
	2	11	1.0	90	5.45	3.73	2.73	58.27
	3	10	1.0	90	6.00	4.00	3.00	58.00
	4	9	2.2	90	6.67	5.53	3.33	58.67

**LATERAL AND PERFORATION CHART**

Cell	Trench	Pipe Elev.	Bottom Elev.	Highest Over	Lowest Over	Design Head (ft)	Approx. Lateral Length (ft)	Number of Perforations	Flow per Perforation (gpm)	Flow per Lateral (gpm)	Flow Differential
A	1	447.9	441.0	450.0	449.9	3.85	57	11	2.25	24.78	1.5%
	2	447.0	440.0	449.0	449.0	4.7	58.6	9	2.50	22.53	7.7%
	3	445.9	438.0	448.0	447.9	5.8	57.8	9	2.78	25.02	2.4%
	4	444.5	437.8	446.6	446.5	7.2	58.1	8	3.10	24.76	1.4%
B	1	448.5	444.8	451.8	451.6	2	57	15	1.63	24.68	Target
	2	448.0	443.4	450.4	450.0	3.6	57	11	2.18	24.03	1.6%
	3	447.4	442.4	449.4	449.4	4.2	57	10	2.36	23.60	3.4%
	4	446.4	441.5	448.5	448.4	5.2	57	9	2.63	23.63	3.3%
C	1	447.8	442.7	449.7	449.6	2.95	57	12	1.96	23.72	2.9%
	2	446.7	441.6	448.6	448.7	3.6	57	11	2.26	24.84	1.7%
	3	445.8	440.8	447.8	447.8	4.7	57	10	2.51	25.09	2.7%
	4	444.8	439.9	446.8	446.8	5.7	58.2	9	2.76	24.84	1.7%

**SEPTIC TRENCH CHART**



**SEPTIC TRENCH DETAILS**

NOT TO SCALE

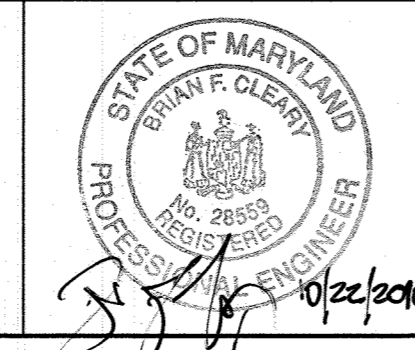
APPROVED: FOR PRIVATE WATER AND A SHARED SEPTIC SYSTEM FOR LOTS 2, 3, & 13 AND PRIVATE WATER AND PRIVATE SEWAGE FOR LOTS 1, 4 THROUGH 12, & BUILDABLE PRESERVATION PARCEL 'A'.

*Michael J. Davis*  
 COUNTY HEALTH OFFICER  
 DATE: 11/10/10

DEPARTMENT OF PUBLIC WORKS  
 HOWARD COUNTY, MARYLAND  
 Chief, Bureau of Utilities  
 DATE: 11/10/10

DEPARTMENT OF PLANNING AND ZONING  
 HOWARD COUNTY, MARYLAND  
 Chief, Development Engineering Division  
 DATE: 11/10/10

**BENCHMARK ENGINEERING, INC.**  
 8480 BALTIMORE NATIONAL PIKE A SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6644



DESIGN: JC					
DRAFT: JC					
CHK: -					
DATE: 3-23-10					
BY NO.	1	REVISIONS		DATE	

600 SCALE MAP NO. 34  
 BLOCK 17

**WILLOW POND**  
 LOTS 2, 3 AND 13  
 LOW PRESSURE DOSING SHARED SEPTIC SYSTEM  
 FIFTH ELECTION DISTRICT  
**CONTRACT NO. 50-4491-D**

SCALE: AS SHOWN  
 SHEET NO. 11 OF 11