

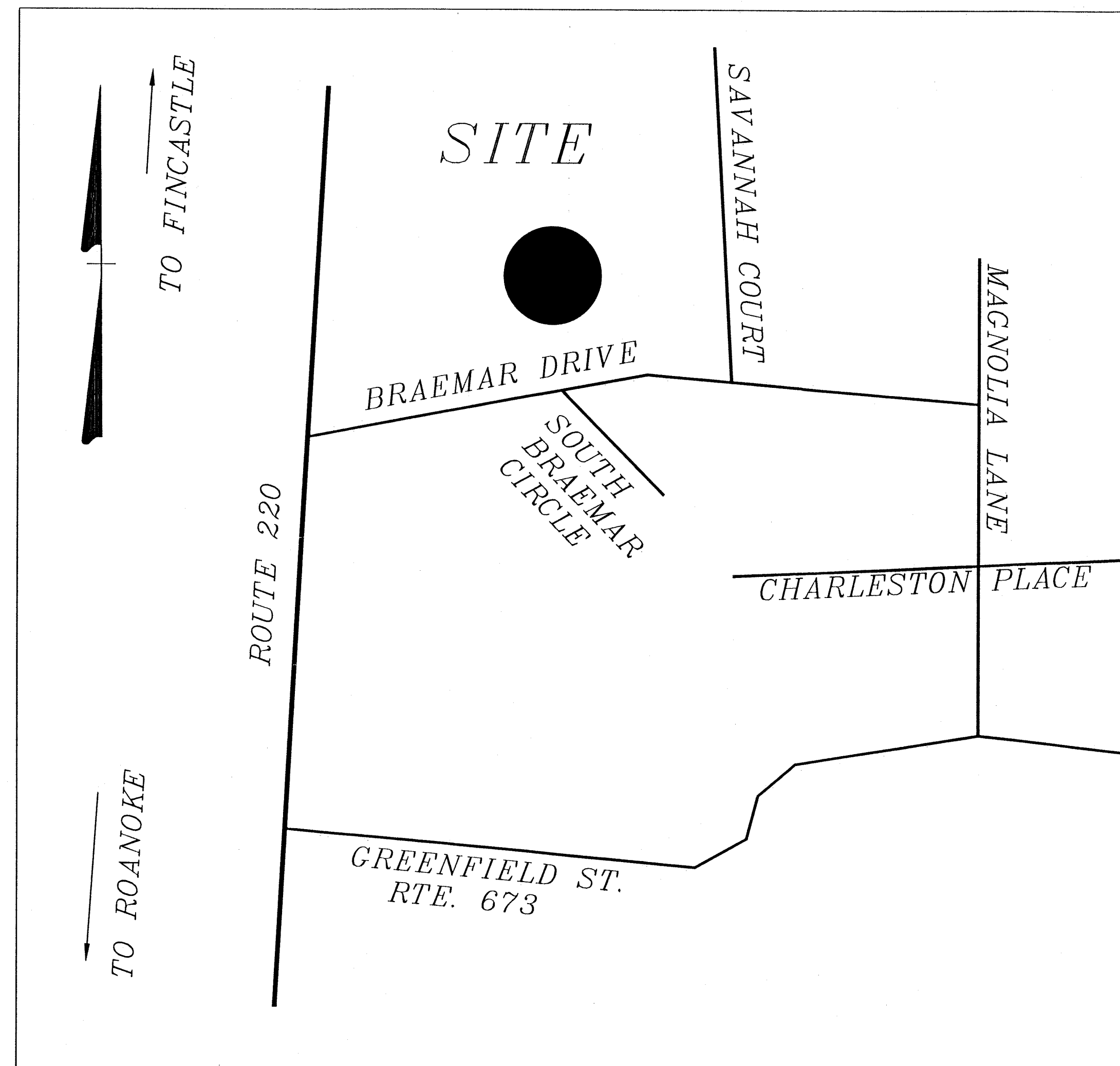
# DEVELOPMENT PLANS ASHLEY PLANTATION-SECTION IV AMSTERDAM MAGISTERIAL DISTRICT BOTETOURT COUNTY, VIRGINIA

DATE:	05-01-02
REVISIONS	Δ 12/02/02
	Δ 02/08/03
	Δ 06/05/03
	Δ

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1324 ROANOKE ROAD  
DALEVILLE, VA 24083

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(540) 966-5906 FAX  
e-mail: rpierson@rbnet.com



MR. A.R. OVERBAY  
3705 WINGSAP ROAD  
ROANOKE, VIRGINIA 24019  
PHONE: (540)992-6600

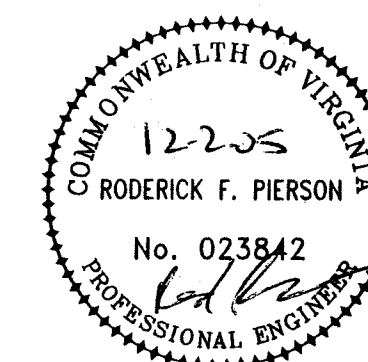
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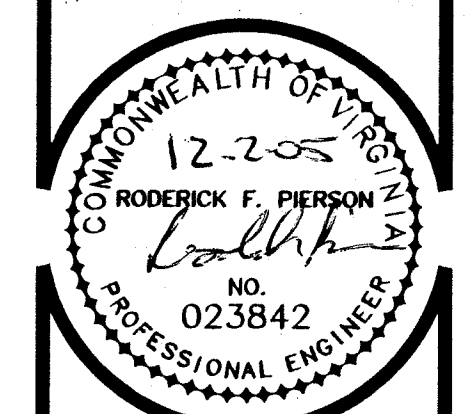
**AS-BUILT**

PIERSON ENGINEERING & SURVEYING  
RODERICK F. PIERSON, LLS, PE  
P.O. BOX 311  
DALEVILLE, VA 24083  
540.966.3027  
540.966.5906 fax



SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

COVER SHEET



COMMISSION  
R200124  
SHEET  
COVERIV

DATE: 05-01-02  
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 02/08/03

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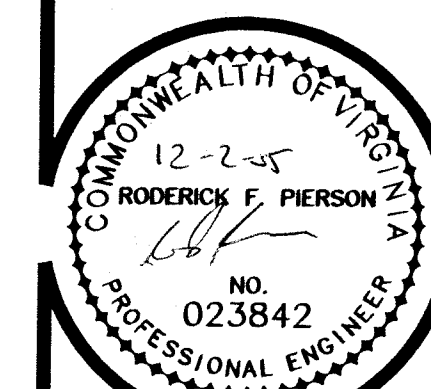
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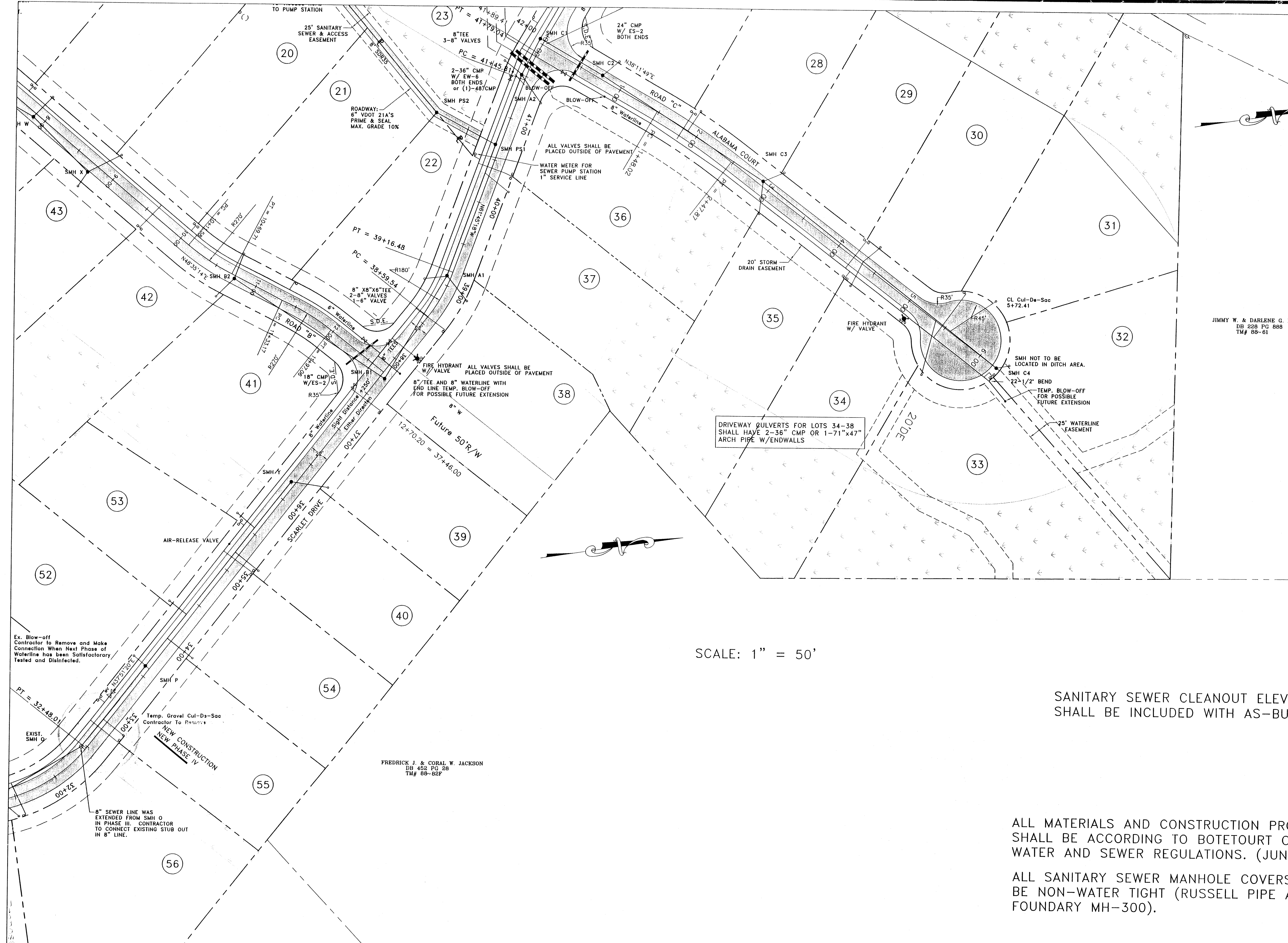
JIMMY W. & DARLENE G. FLESHMAN  
 DB 228 PG 888  
 TM# 88-01

SUBDIVISION PLAT  
 FOR  
 ASHLEY PLANTATION - SECTION IV  
 BOTETOURT COUNTY, VIRGINIA

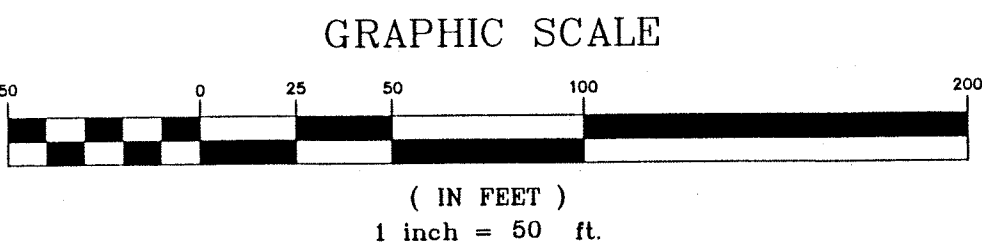
PLAN SHEET



COMMISSION  
 R200124  
 SHEET  
 1



ALL MATERIALS AND CONSTRUCTION PROCEDURES SHALL BE ACCORDING TO BOTETOURT COUNTY WATER AND SEWER REGULATIONS. (JUNE 2000)

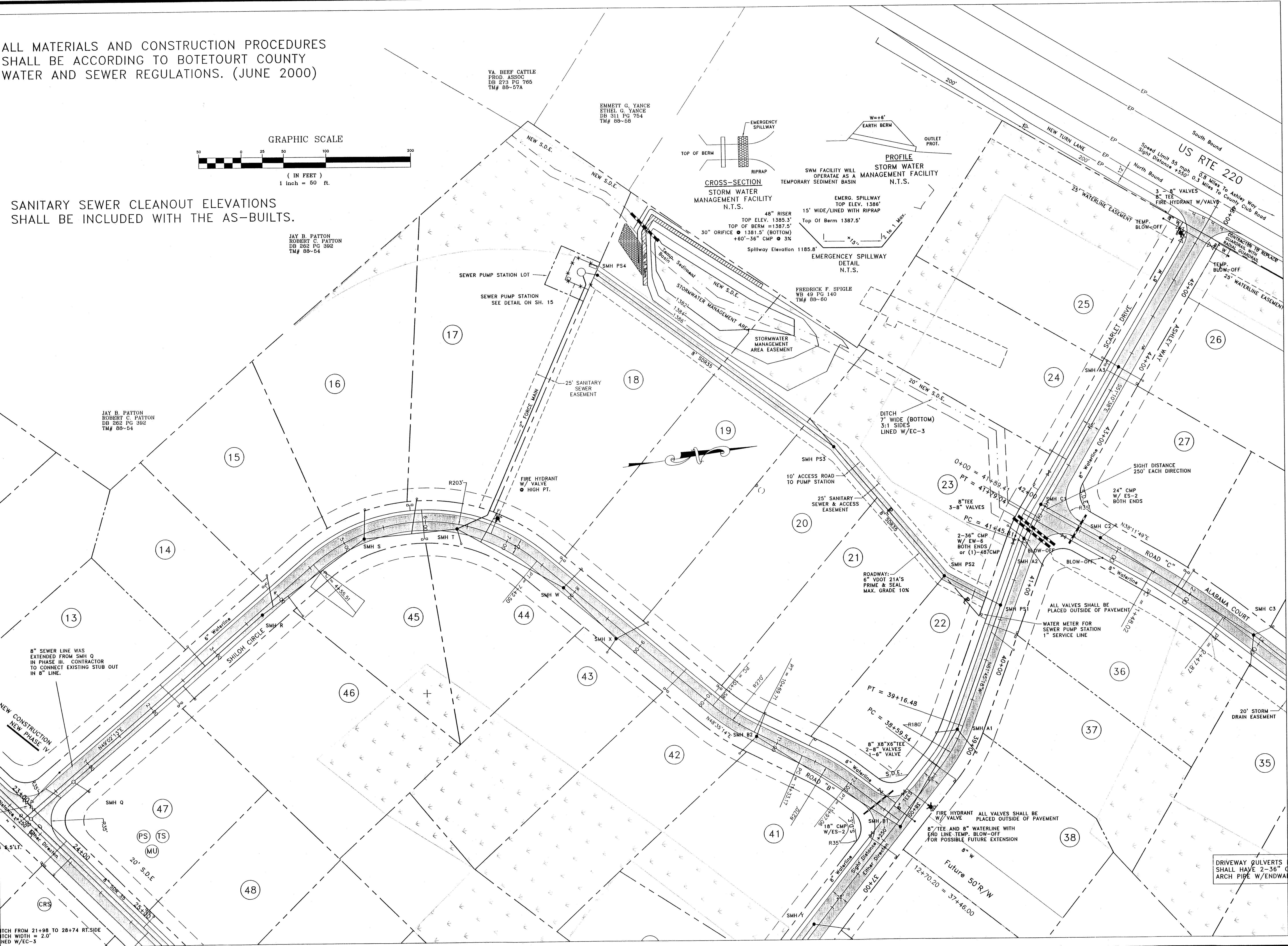


SANITARY SEWER CLEANOUT ELEVATIONS SHALL BE INCLUDED WITH THE AS-BUILTS.

JAY B. PATTON  
ROBERT C. PATTON  
DB 262 PG 382  
TM# 88-54

JAY B. PATTON  
ROBERT C. PATTON  
DB 262 PG 382  
TM# 88-54

ITCH FROM 21+98 TO 28+74 RT. SIDE  
ITCH WIDTH = 2.0'  
NED W/EC-3



DATE:	05-01-02
REVISIONS	12/02/02
	02/08/03

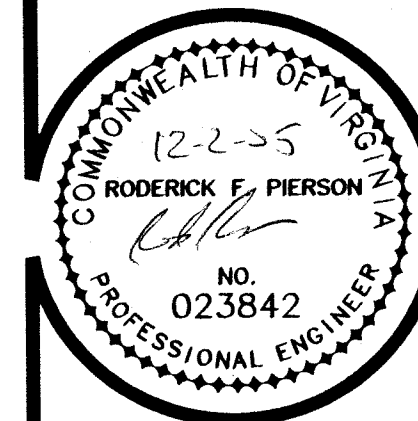
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SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

PLAN SHEET




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2

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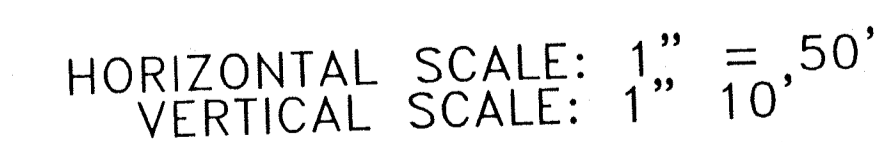
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(540) 966-5906 FAX  
e-mail: [rplerson@rbnet.com](mailto:rplerson@rbnet.com)

SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOFETIQUART COUNTY, VIRGINIA



12-2-05  
RODERICK F. PIERSON  
No.  
023842  
PROFESSIONAL ENGINEER

COMMISSION  
R200124  
SHEET  
SH3



DATE:	05-01-02
REVISIONS	12-02-02
	02-08-03

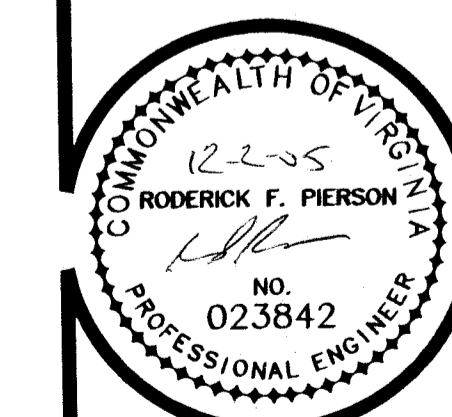
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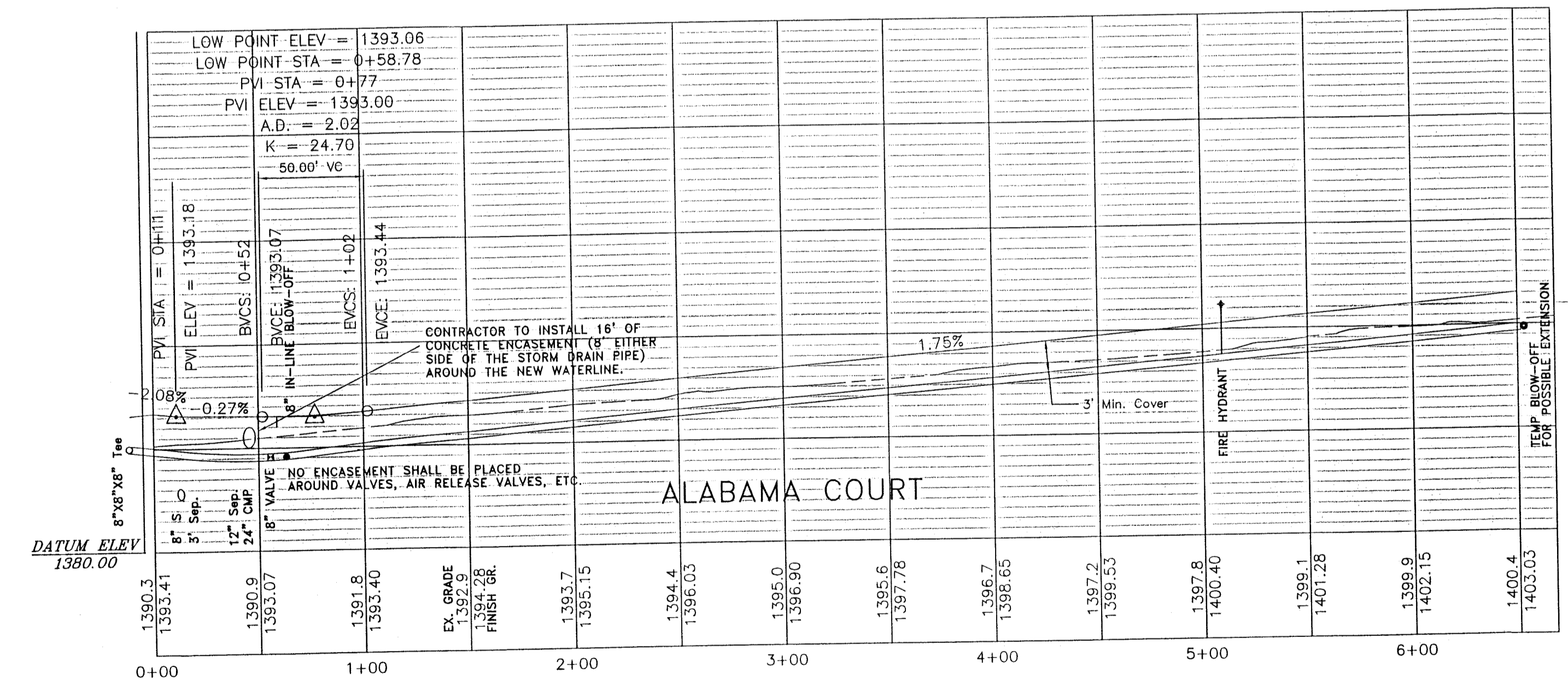
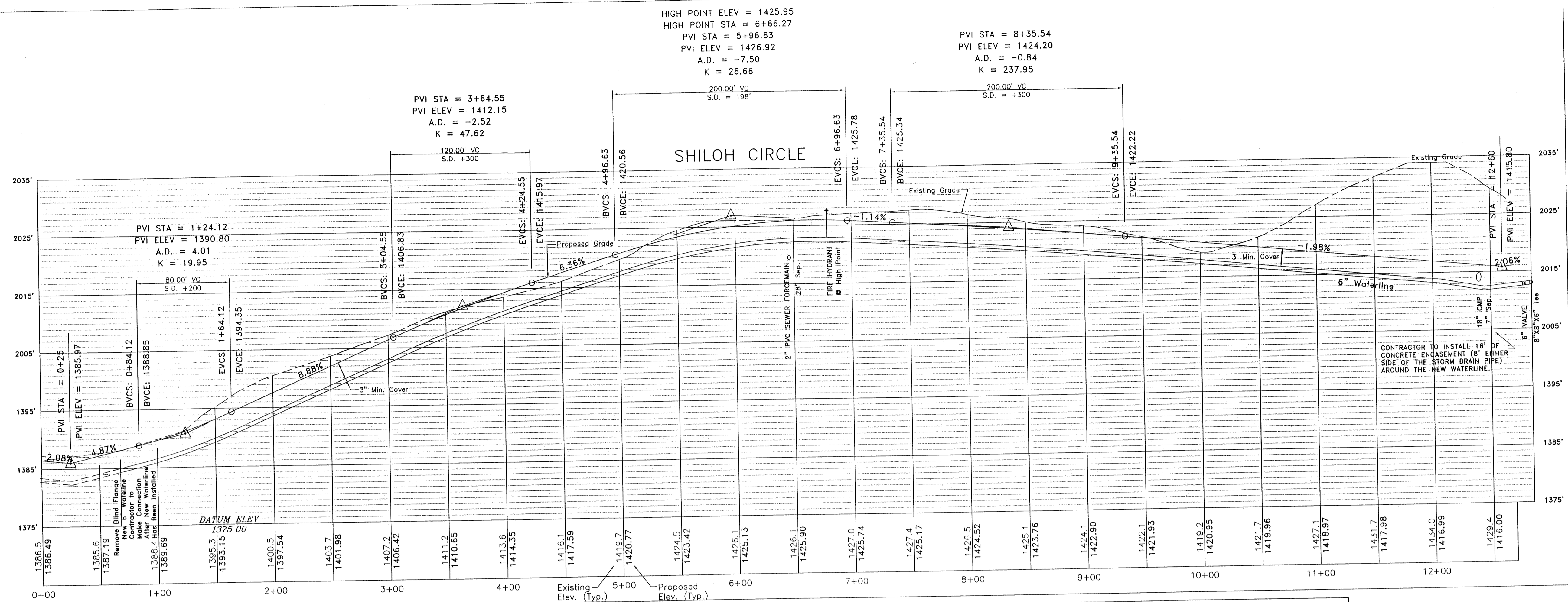
SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

PROFILES



COMMISSION  
R200124  
SHEET  
SH4

HORIZONTAL SCALE: 1" = 50'  
VERTICAL SCALE: 1" = 10'



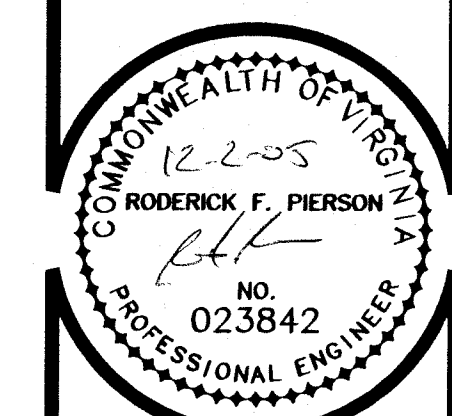
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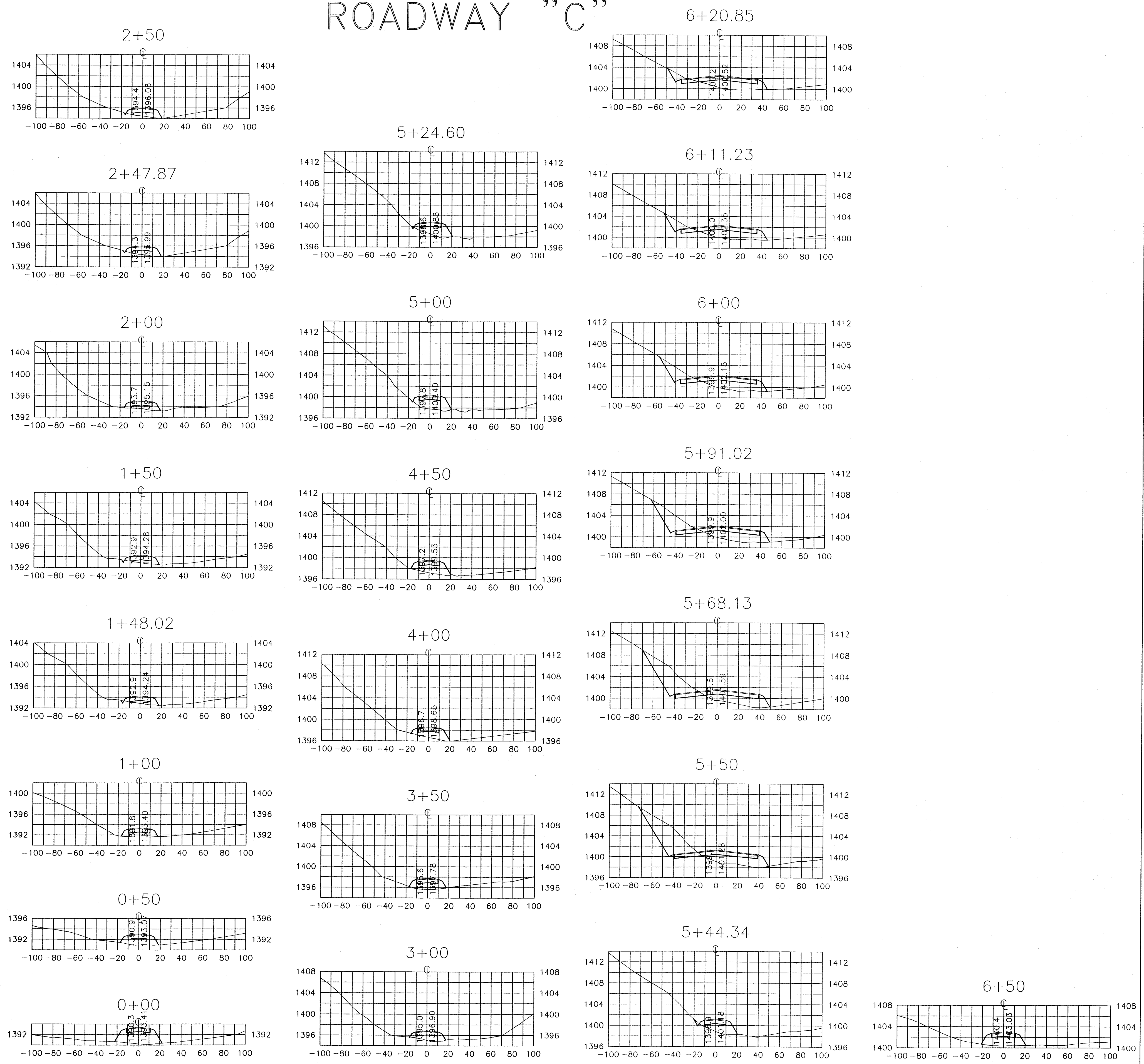
SUBDIVISION PLAT  
 FOR  
 ASHLEY PLANTATION - SECTION IV  
 BOTETOURT COUNTY, VIRGINIA

CROSS-SECTIONS



COMMISSION  
 R200124  
 SHEET  
 SH511

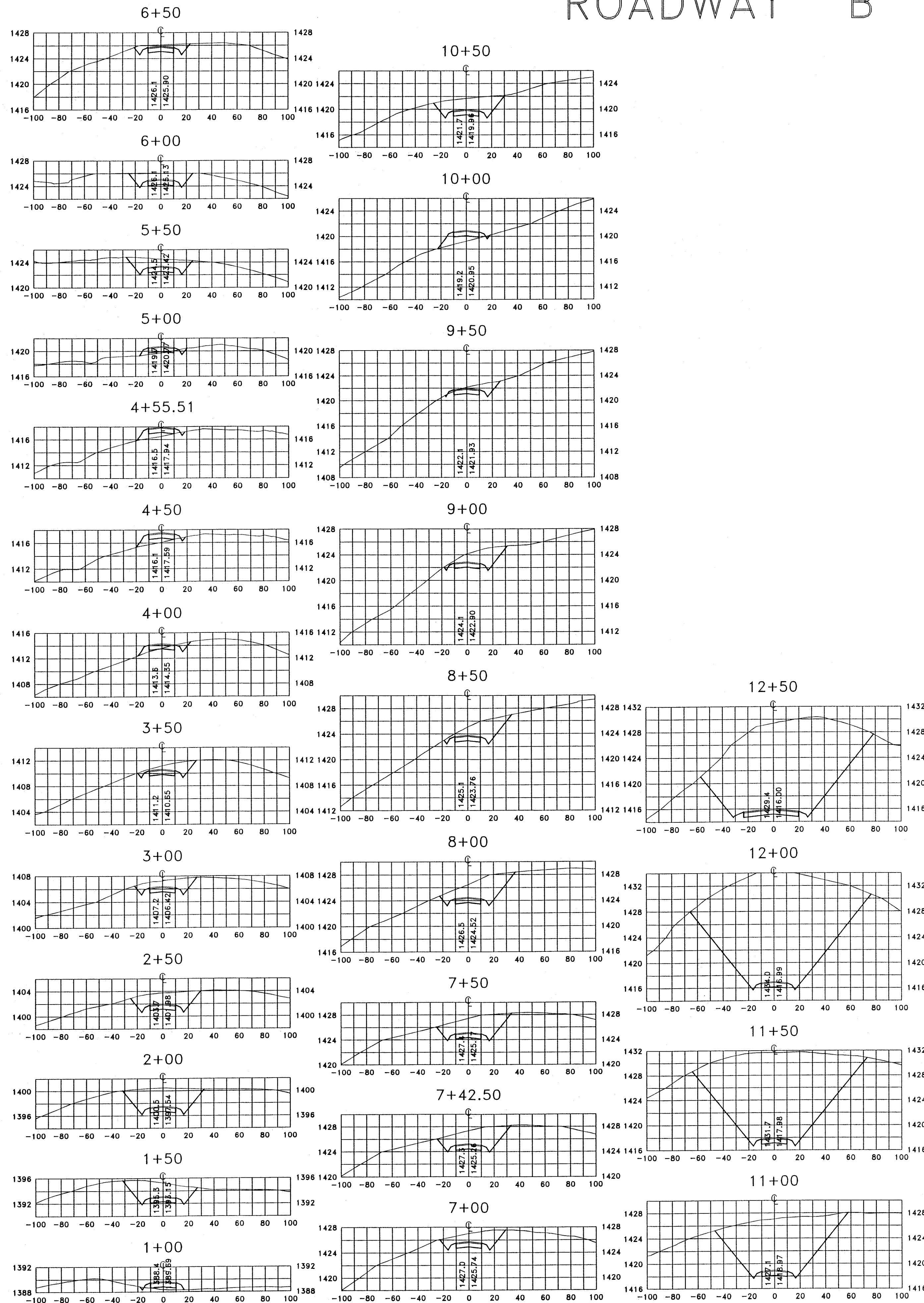
# ROADWAY "C"



HORIZONTAL SCALE: 1" = 50'  
 VERTICAL SCALE: 1" = 10'



# ROADWAY "B"



DATE: 05-01-02  
 REVISIONS  
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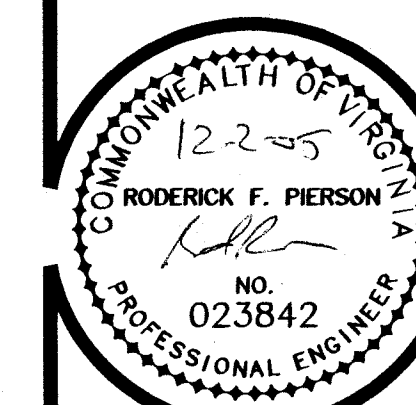
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SUBDIVISION PLAT  
 FOR  
 ASHLEY PLANTATION - SECTION IV  
 BOTETOURT COUNTY, VIRGINIA

CROSS-SECTIONS



COMMISSION  
 R200124  
 SHEET  
 SH7II

HORIZONTAL SCALE: 1" = 50'  
 VERTICAL SCALE: 1" = 10'

DATE: 05-01-02

1 02-08-03

2 02-08-03

REVISIONS

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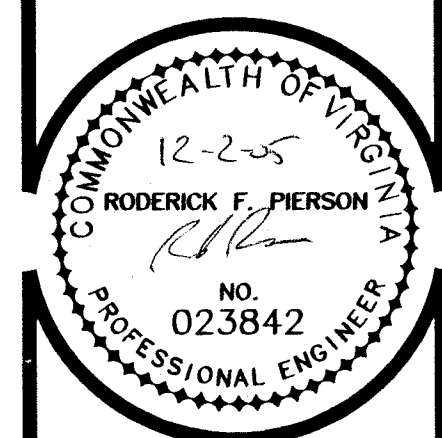
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SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION – SECTION IV  
BOTETOURT COUNTY, VIRGINIA

## ROADWAY SPECIFICATIONS



COMMISSION  
R200124  
SHEET  
SH811

## 8. Storm Drainage

Ditch slopes are to be four to one (4:1) for shoulder widths of six feet (6') or greater and three to one (3:1) for shoulder widths of four feet (4') or five feet (5'), unless otherwise specified in the plans.

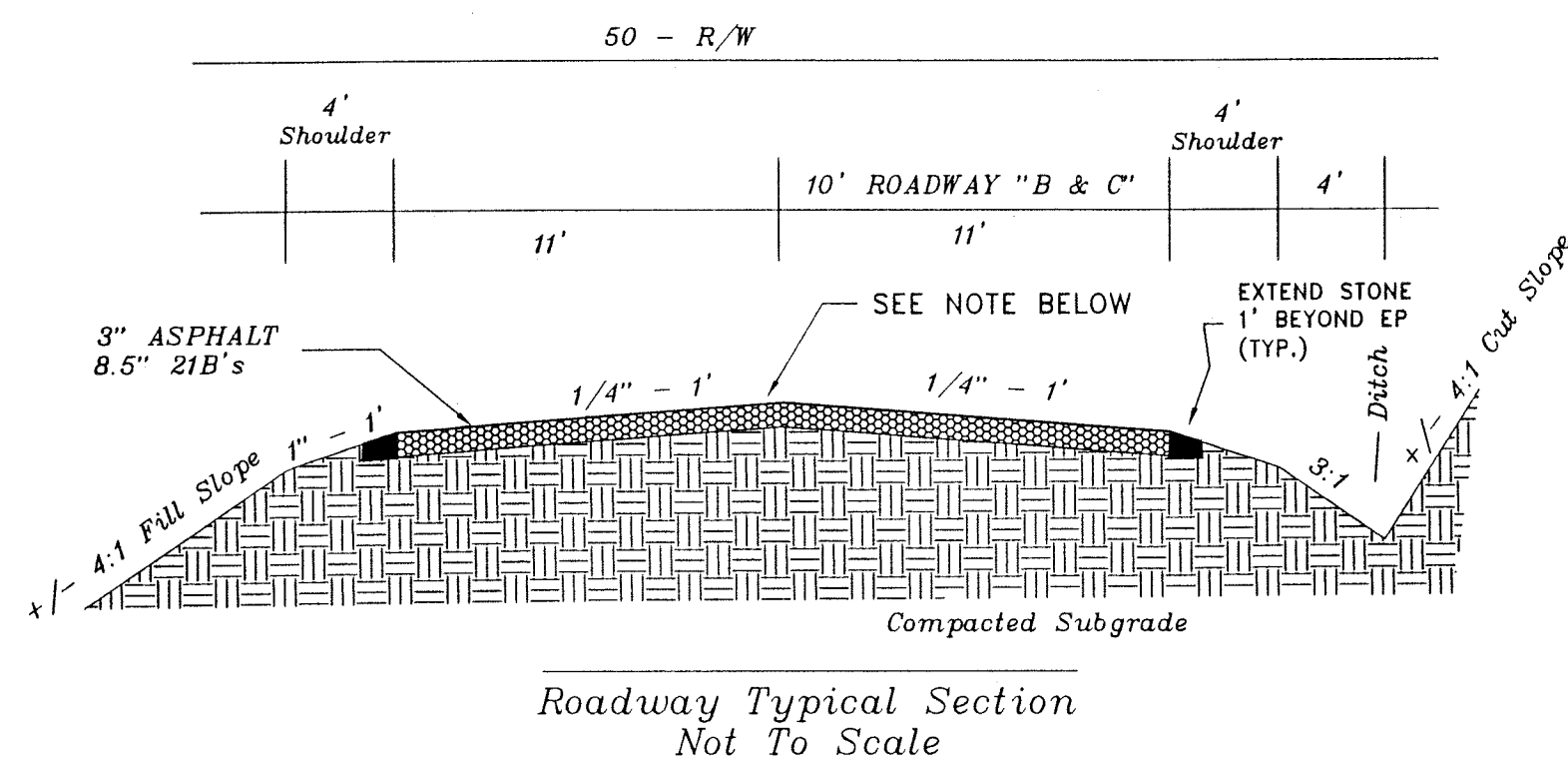
Contractor shall obtain entrance permit to the existing Virginia Department of Transportation Right of Way from Resident Engineer prior to road construction.

An inspector will not be furnished except for periodic progress inspection, the above mentioned field reviews and for required stone depths. The developer will be required to post a surety to guarantee the road free of defects for one year after acceptance by the Department of Transportation.

Contractor shall verify location and elevation of all underground utilities shown on the plans in areas of construction prior to starting work by contacting Miss Utility. Contact site engineer immediately if location or elevation is different from that shown on the plans. If there appears to be a conflict, and upon discovery of any utility not shown on the plans call "Miss Utility" of central Virginia at 1-800-552-7001.

Approval of these plans will be based on specifications and standards in effect at the time of approval and will be subject, until completion of the roadway and acceptance by the Department, to future revisions, of the Specifications and Standards.

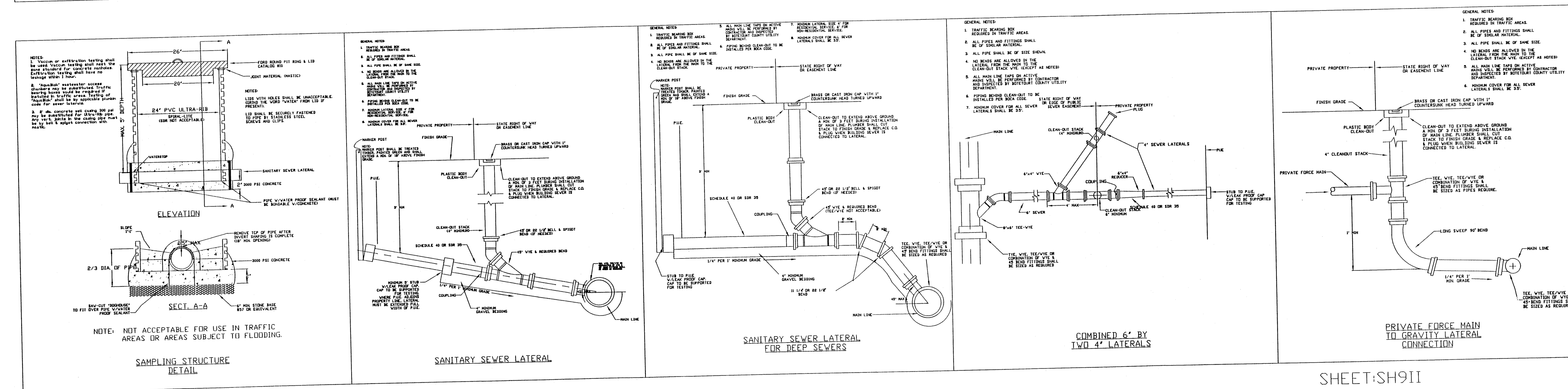
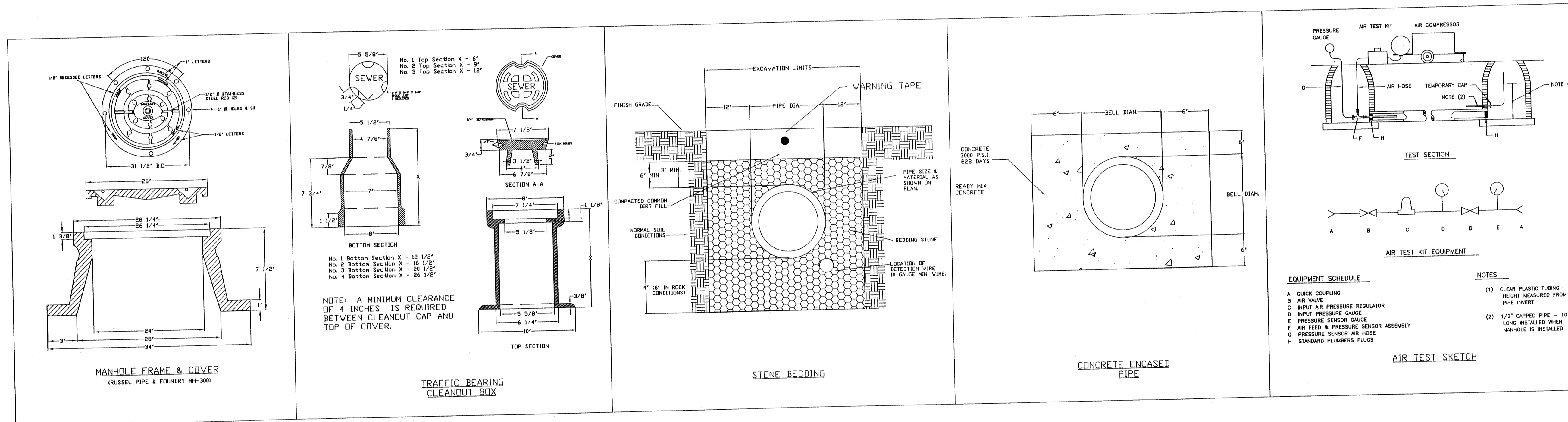
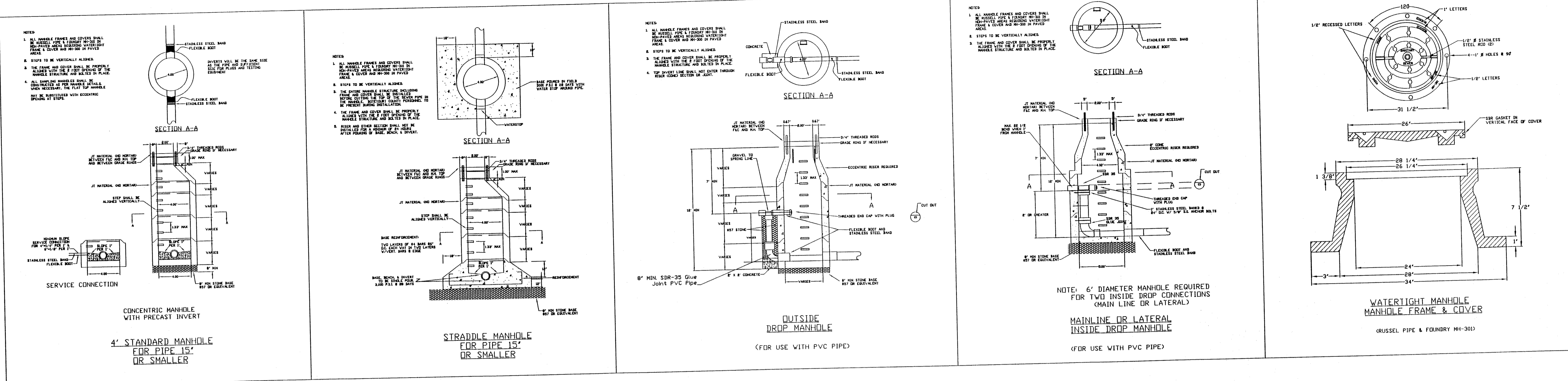
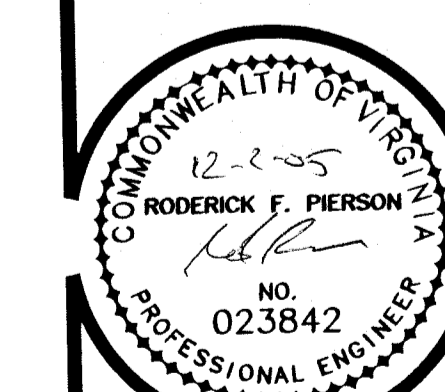
Where guardrails are to be installed the shoulder width shall be increased in accordance with VDOT Road and Bridge Standards.



A FIELD REVIEW WILL BE MADE OF THE DEVELOPMENT'S ROADWAY DITCH LINE DURING AND AFTER CONSTRUCTION TO ENSURE THAT NO CONCENTRATED RUNOFF IS BEING CONVEYED ACROSS FILL MATERIAL. IF IT IS FOUND THAT CONCENTRATED RUNOFF IS BEING CONVEYED ACROSS FILL MATERIAL, THE DITCH LINE MUST BE LINED WITH RIP RAP TO PREVENT FUTURE EROSION SCOUR PROBLEMS.

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**SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA**
**SEWER DETAILS**

 COMMISSION  
R200124

 SHEET  
SH9

SHEET:SH9II



DATE: 03/14/03

REVISIONS  
 1  
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 3

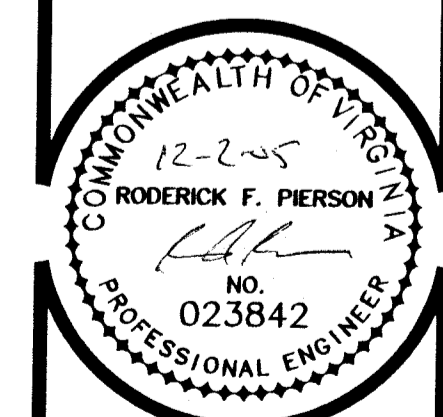
# PIERSON ENGINEERING & SURVEYING

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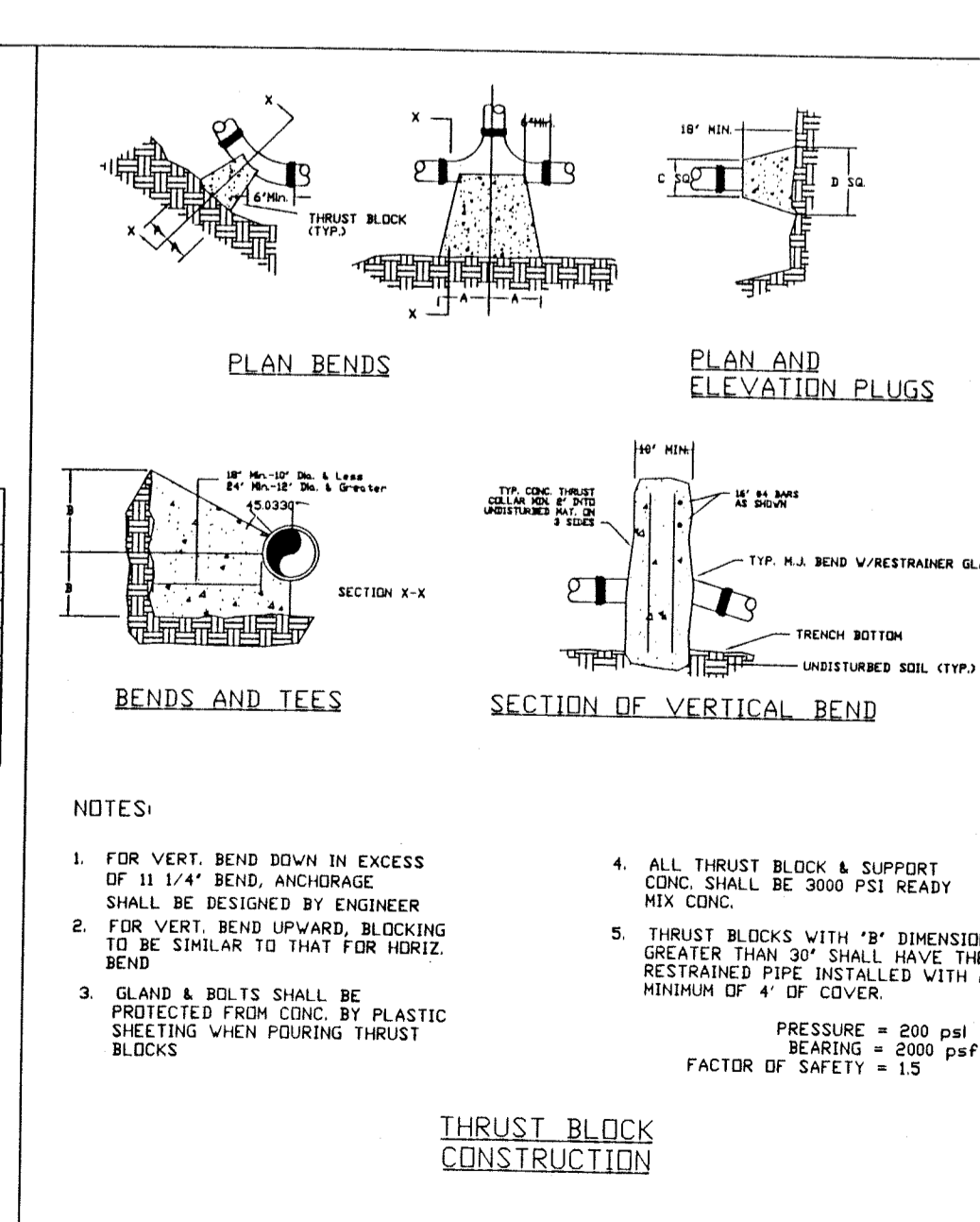
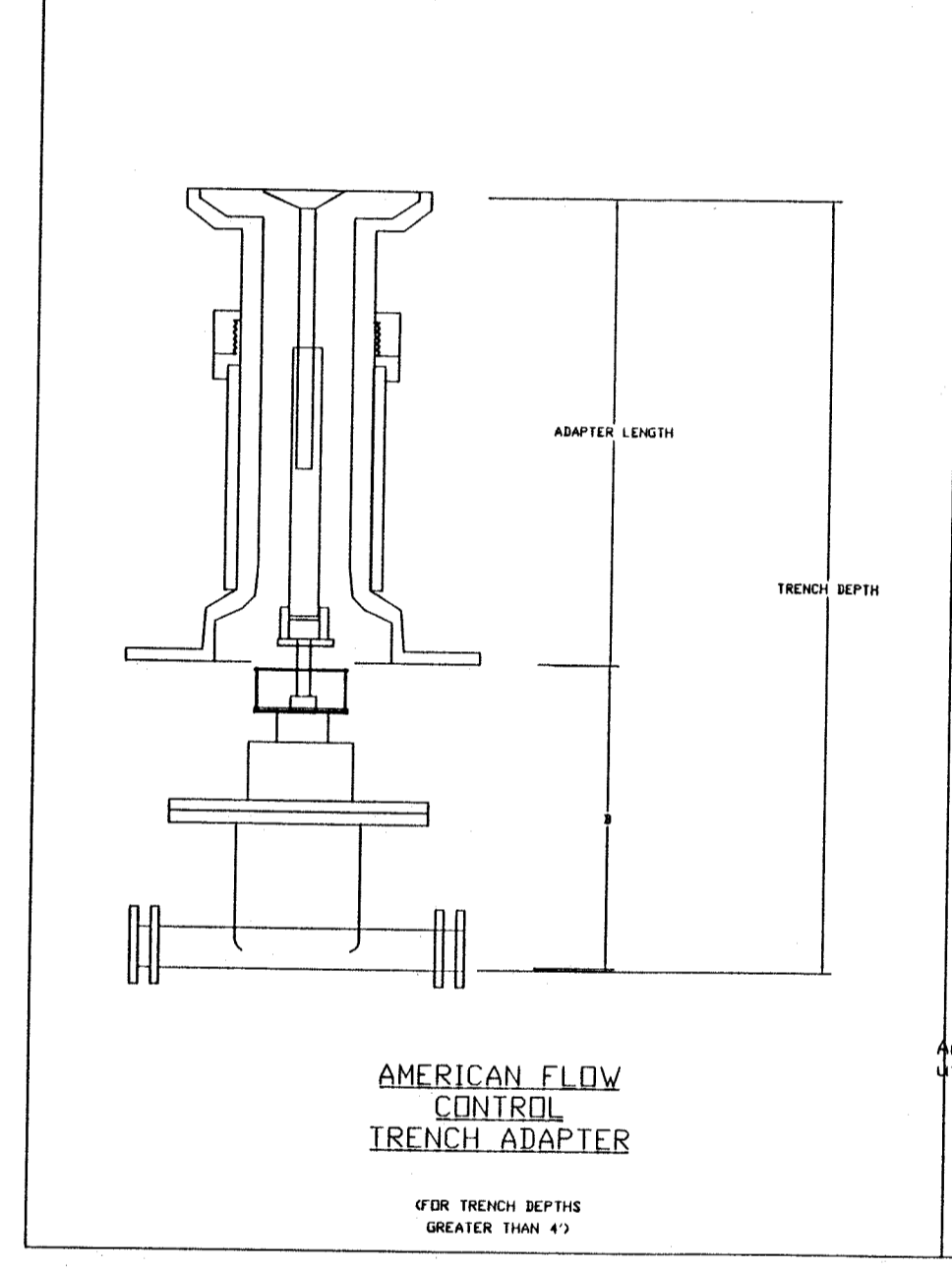
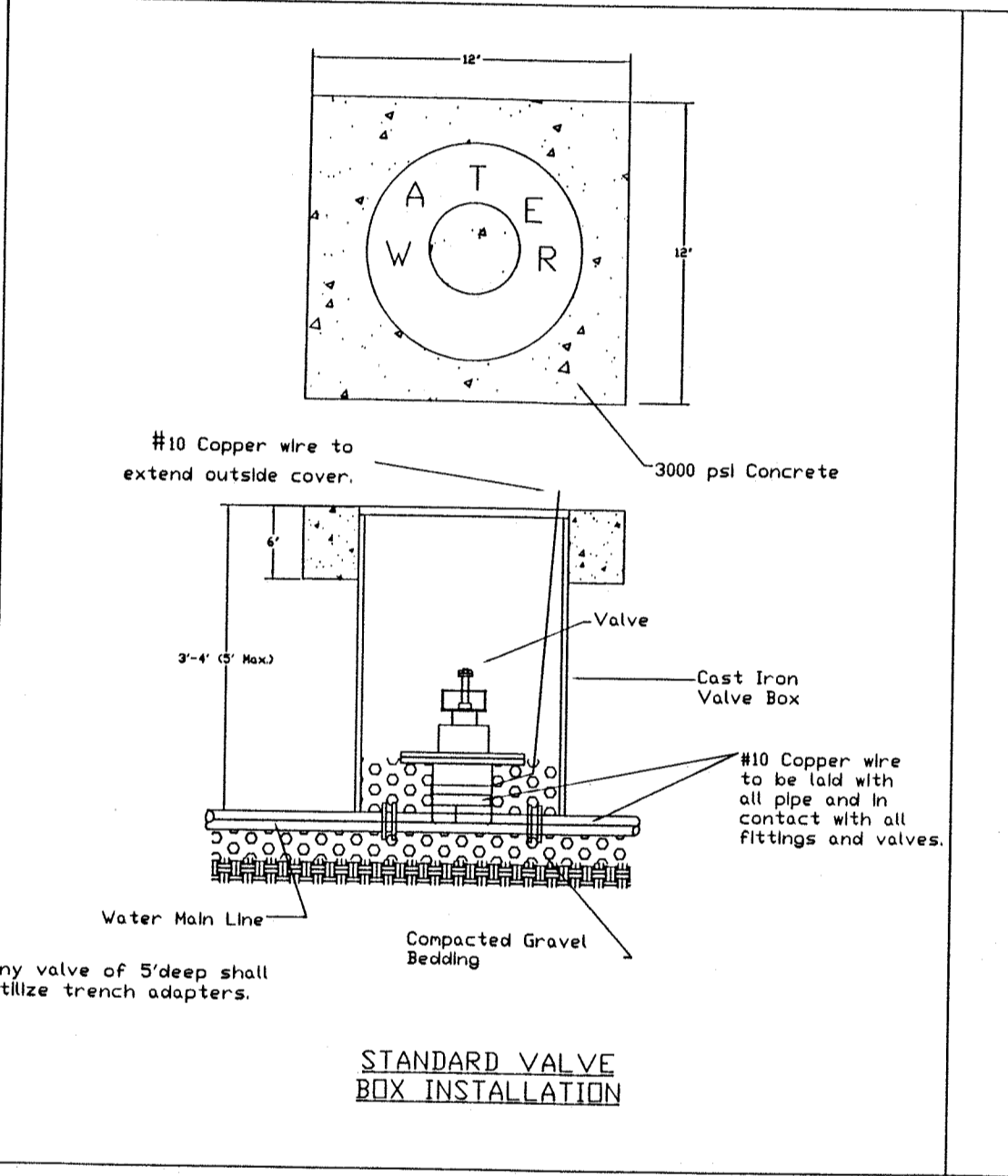
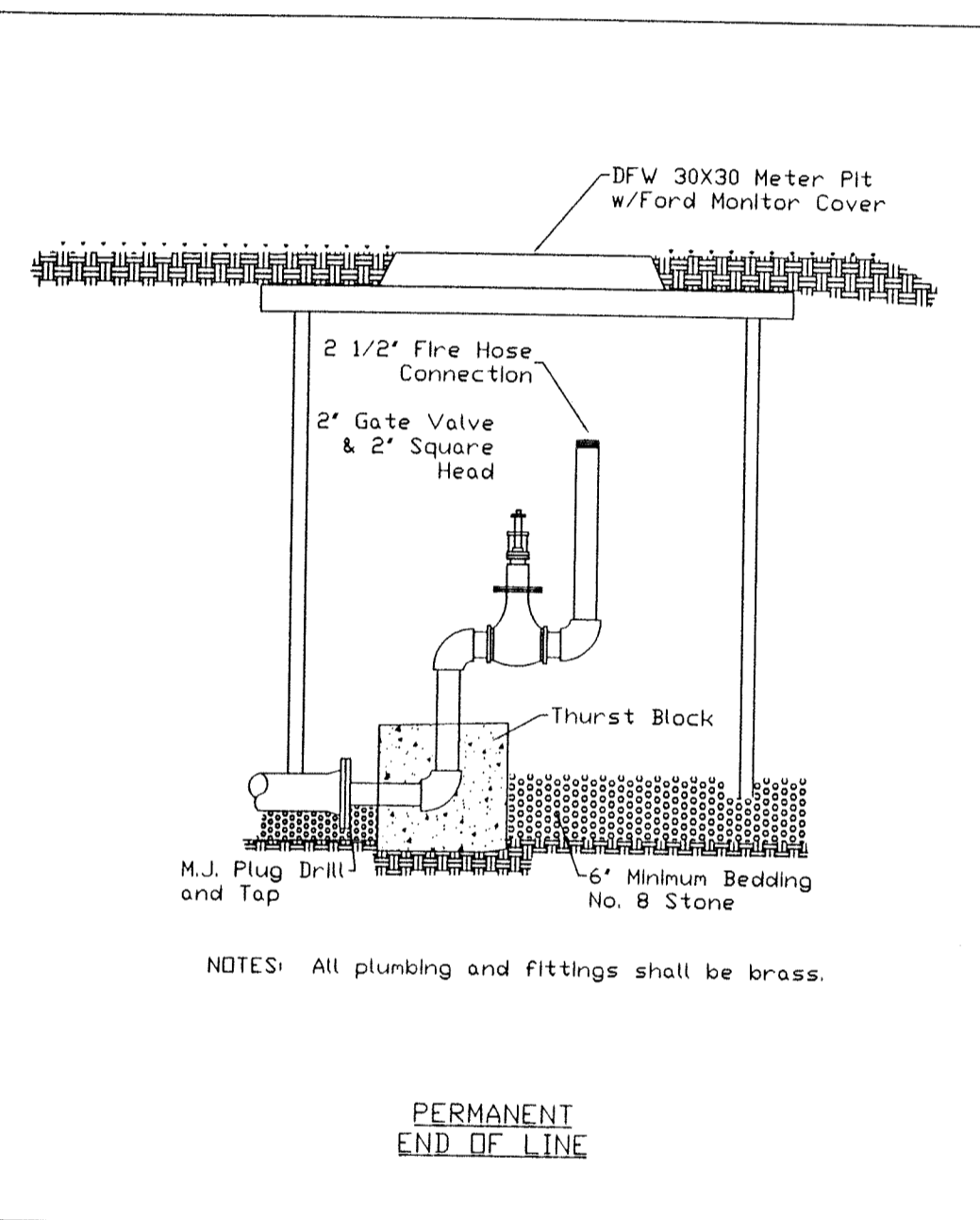
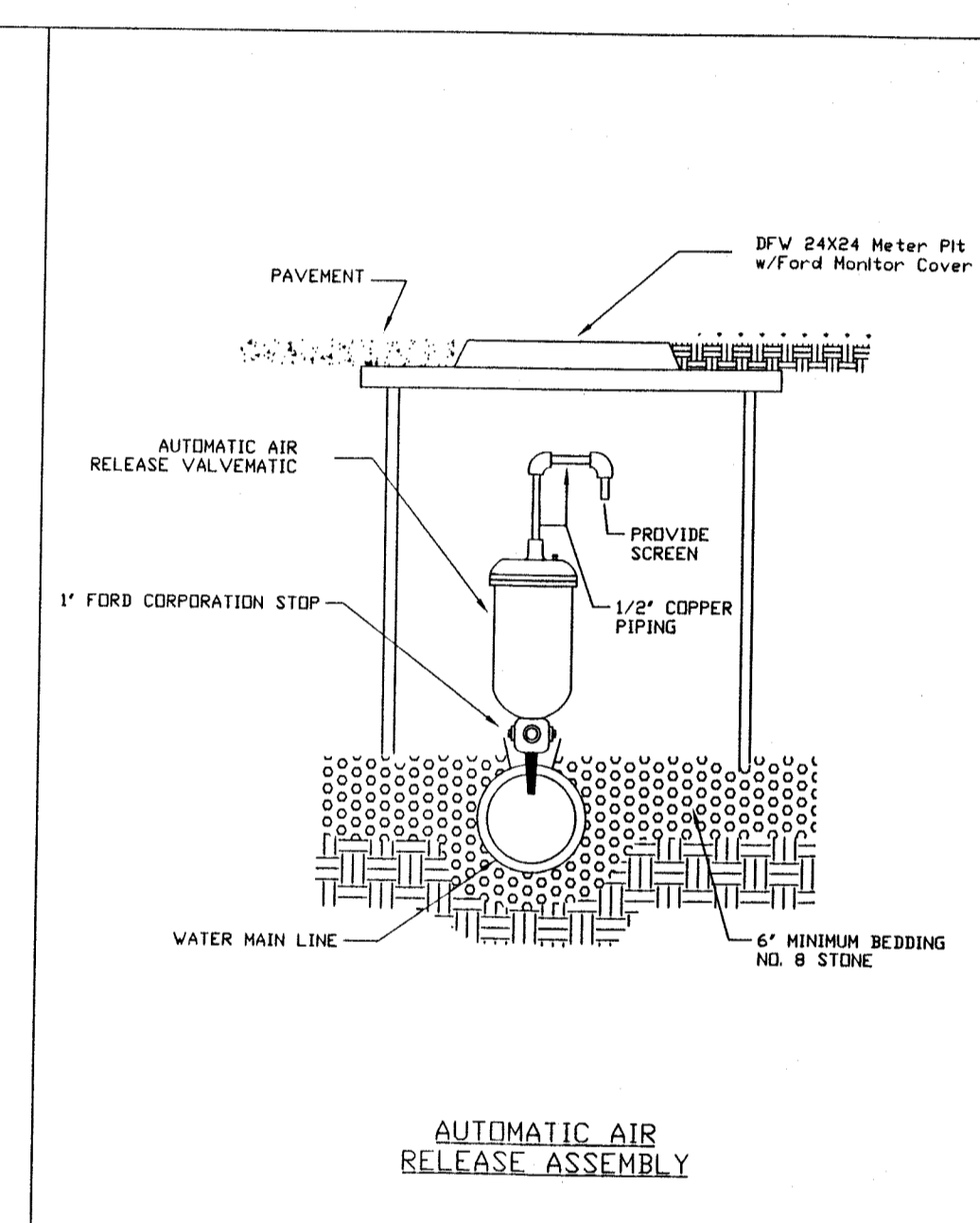
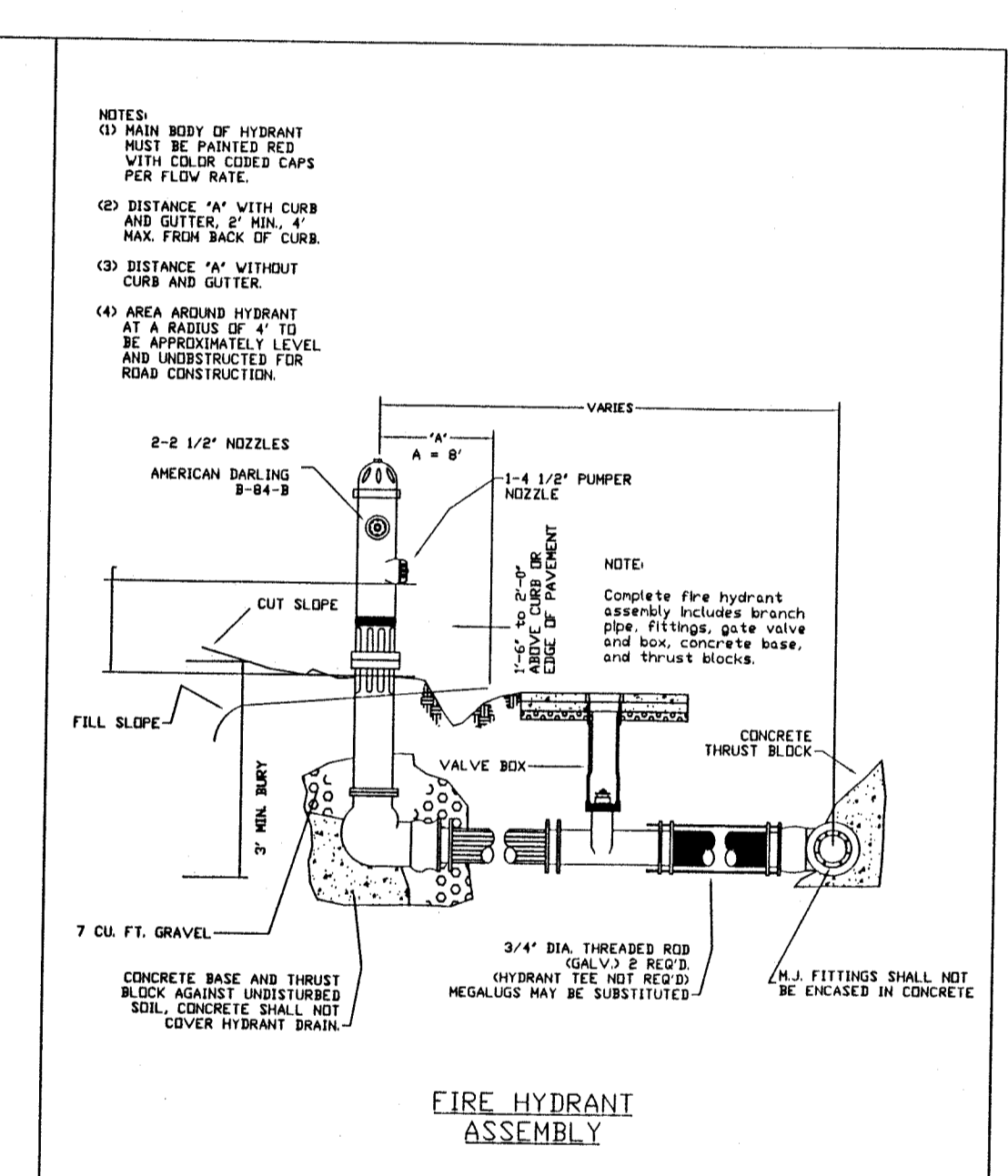
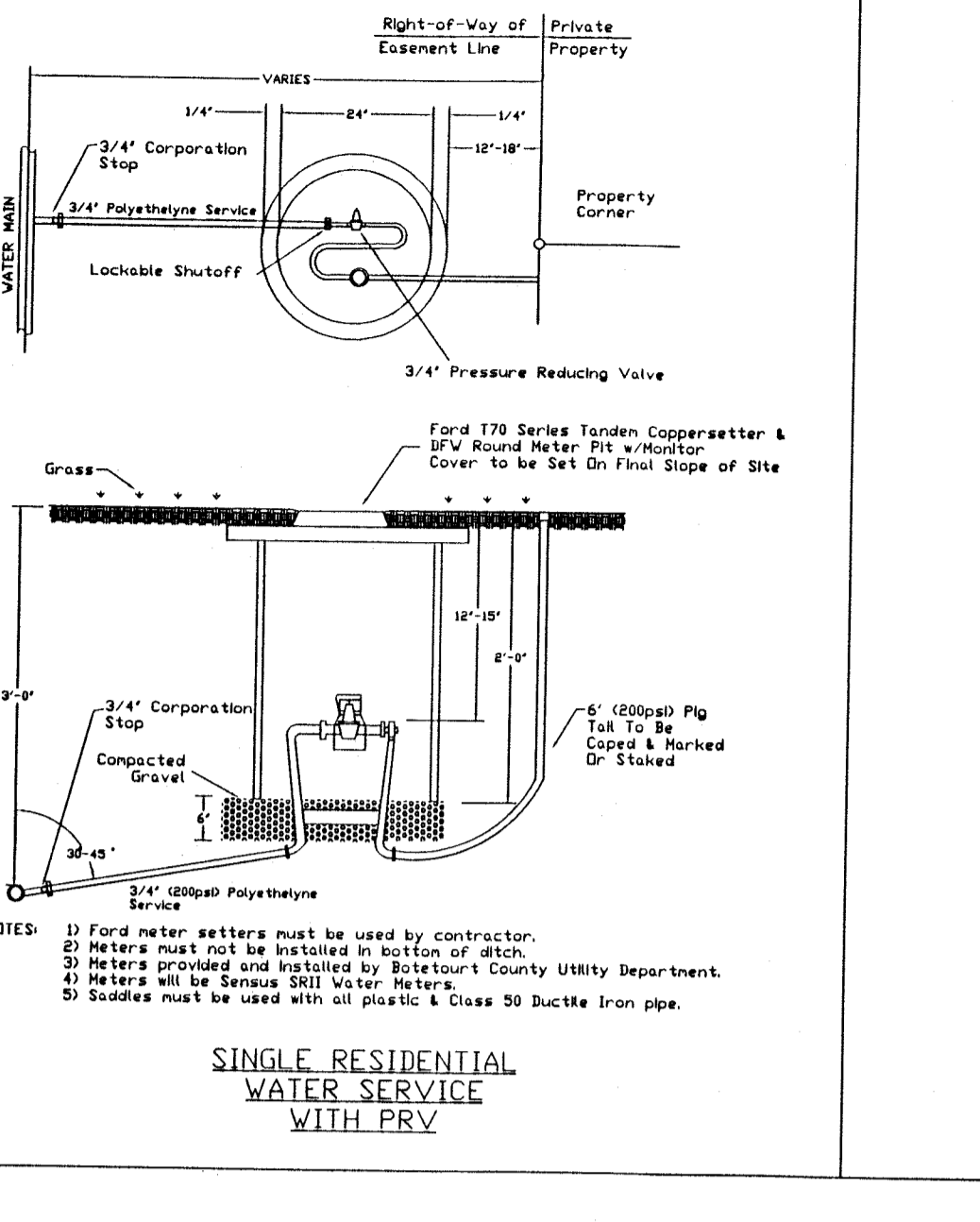
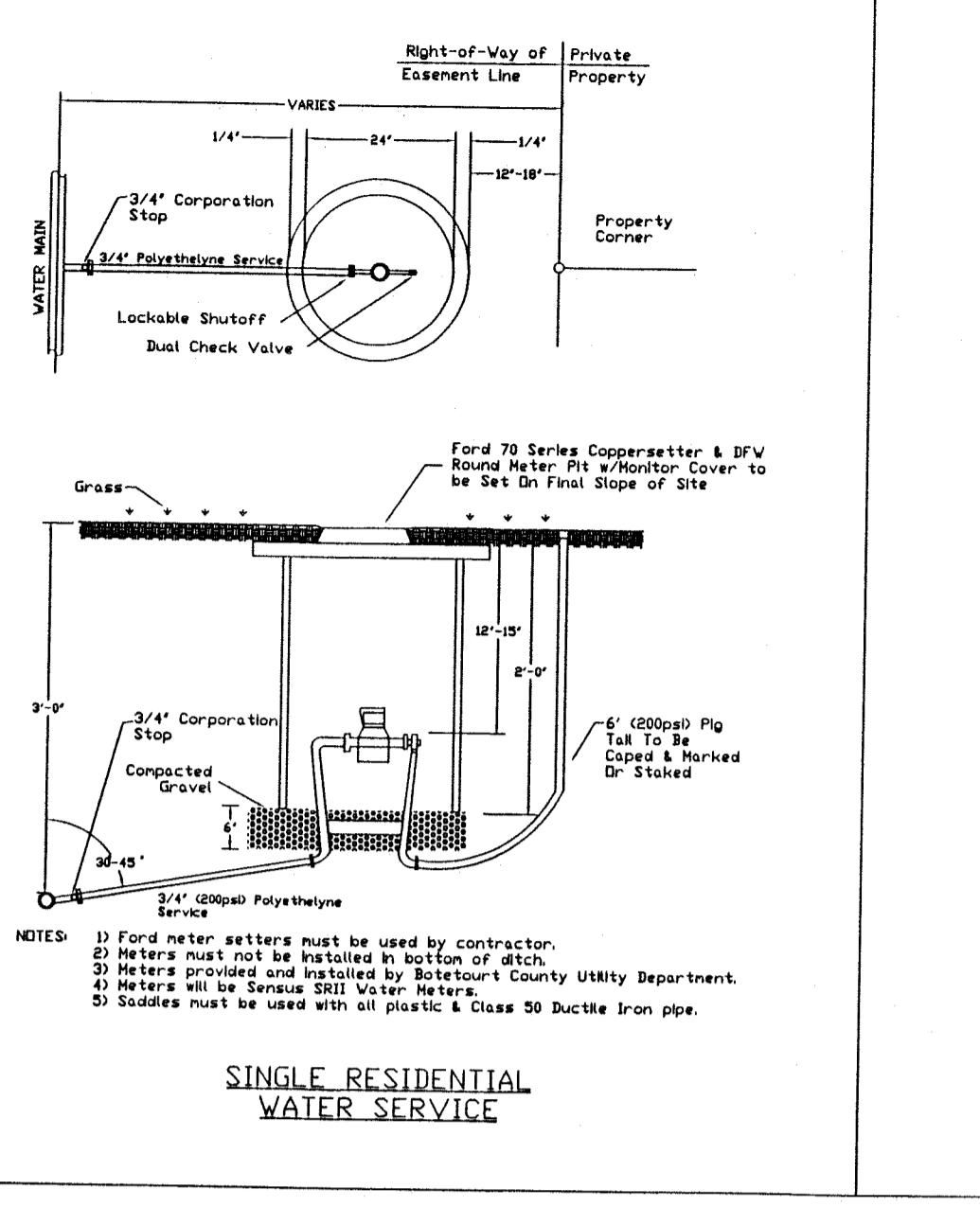
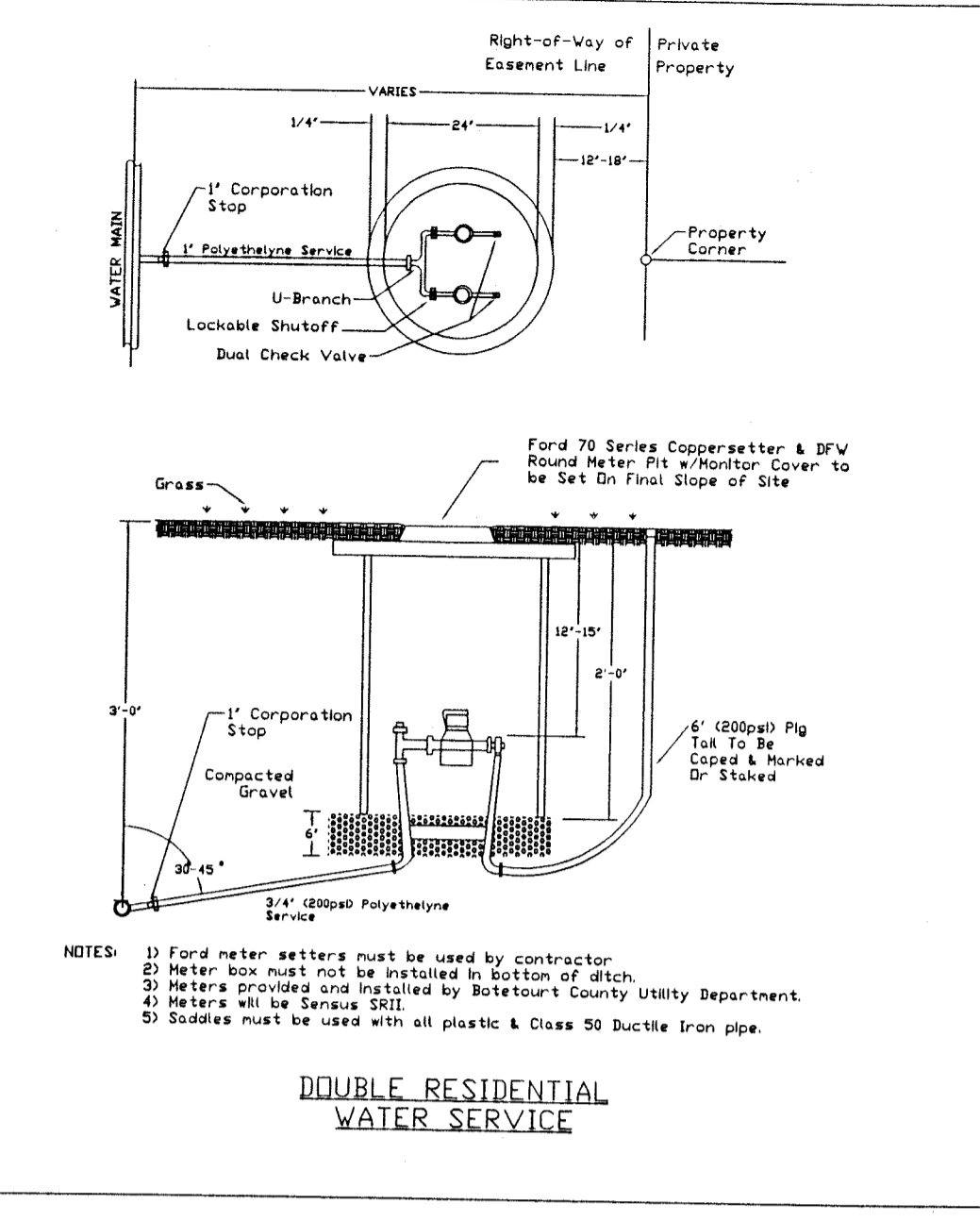
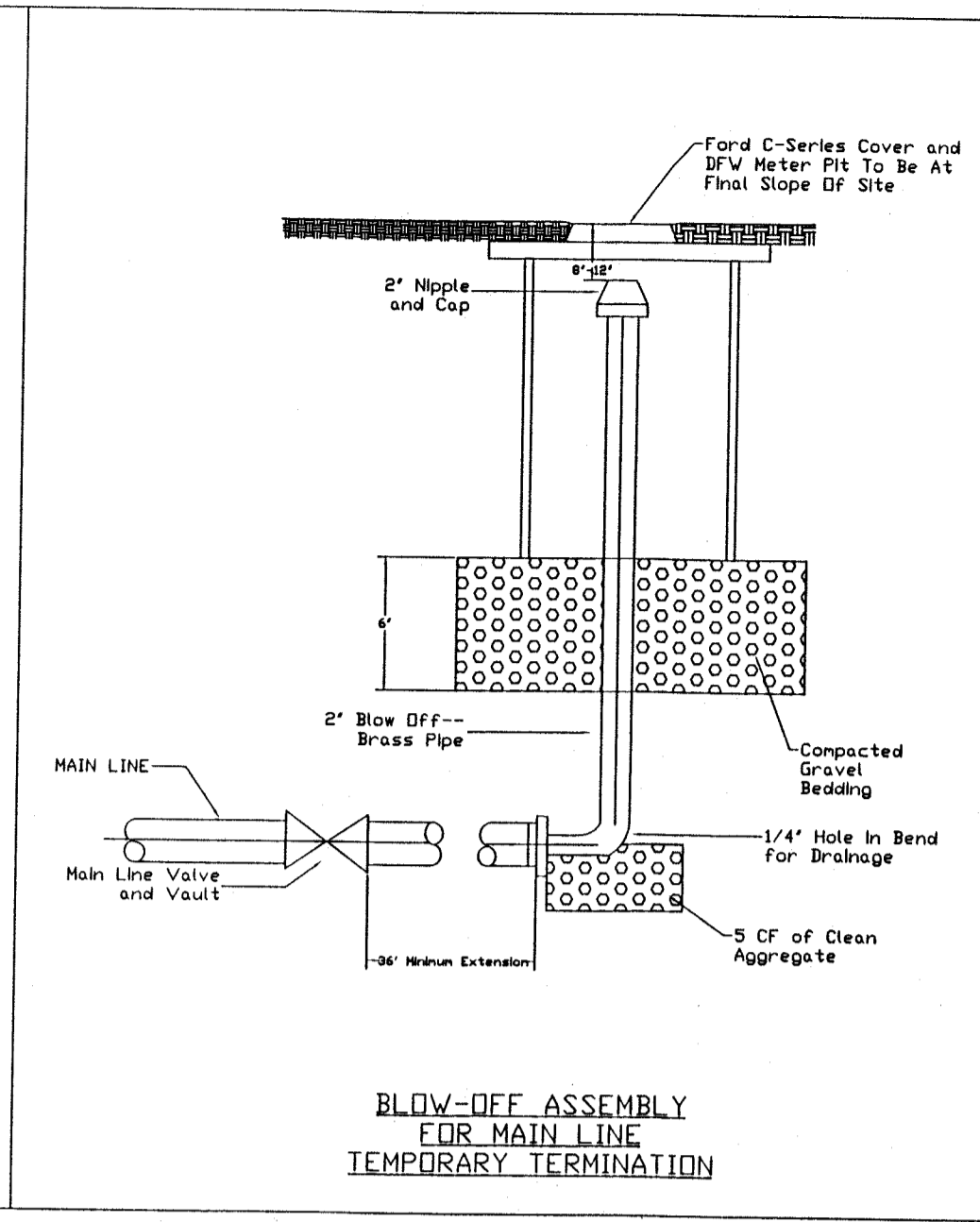
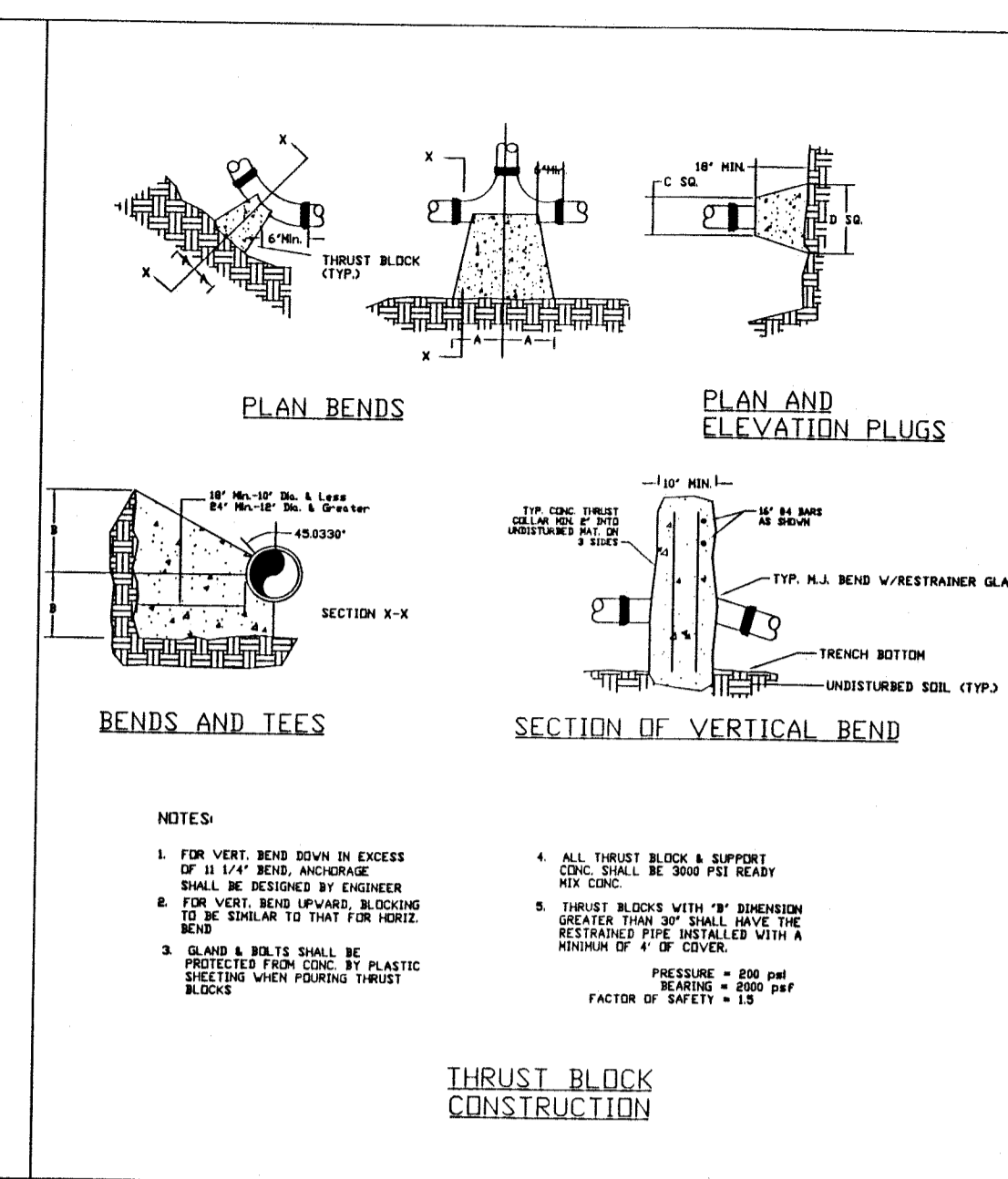
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## SUBDIVISION PLAT FOR ASHLEY PLANTATION - SECTION IV BOTETOURT COUNTY, VIRGINIA

### WATER DETAILS



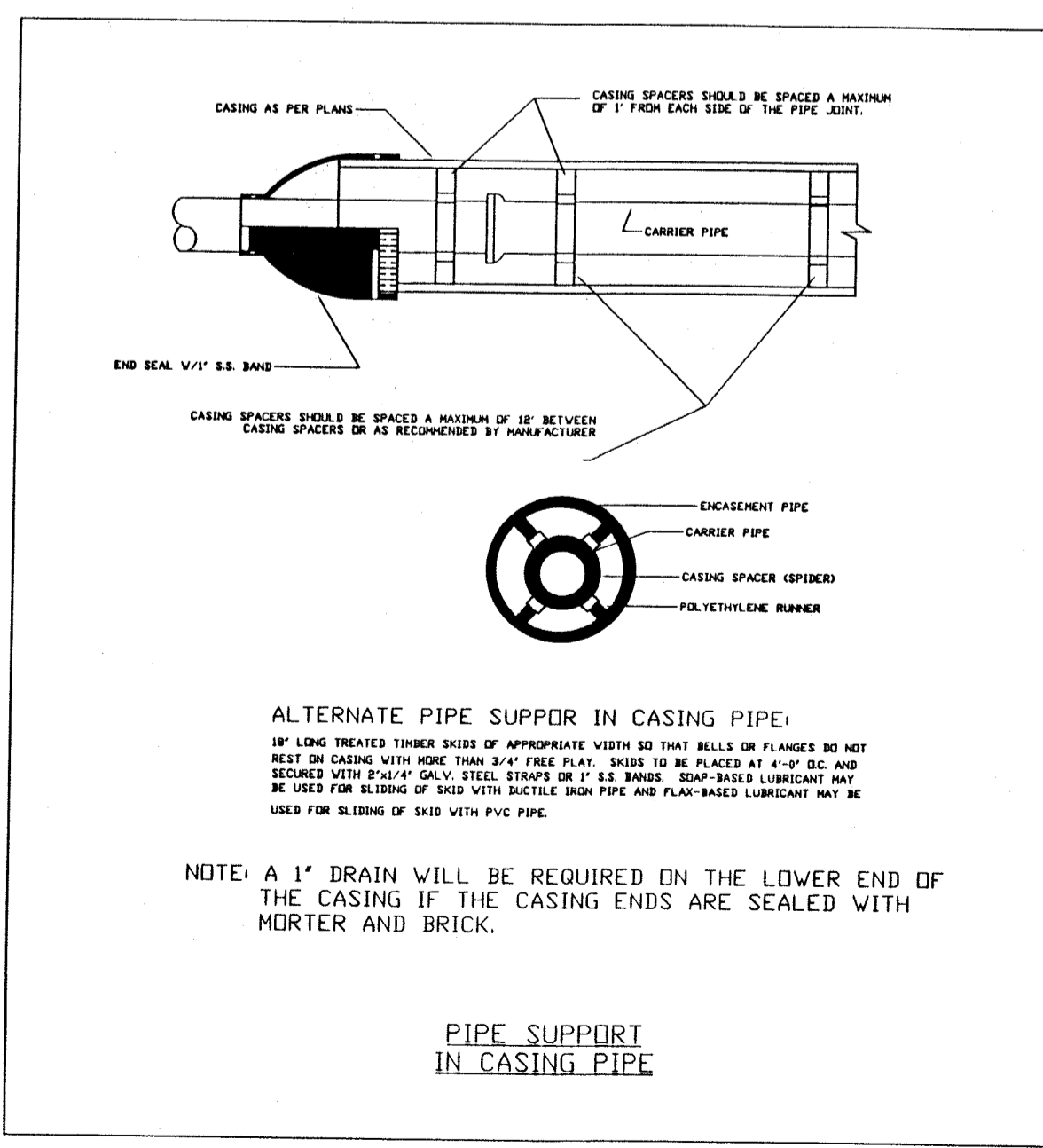
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SHEET  
11

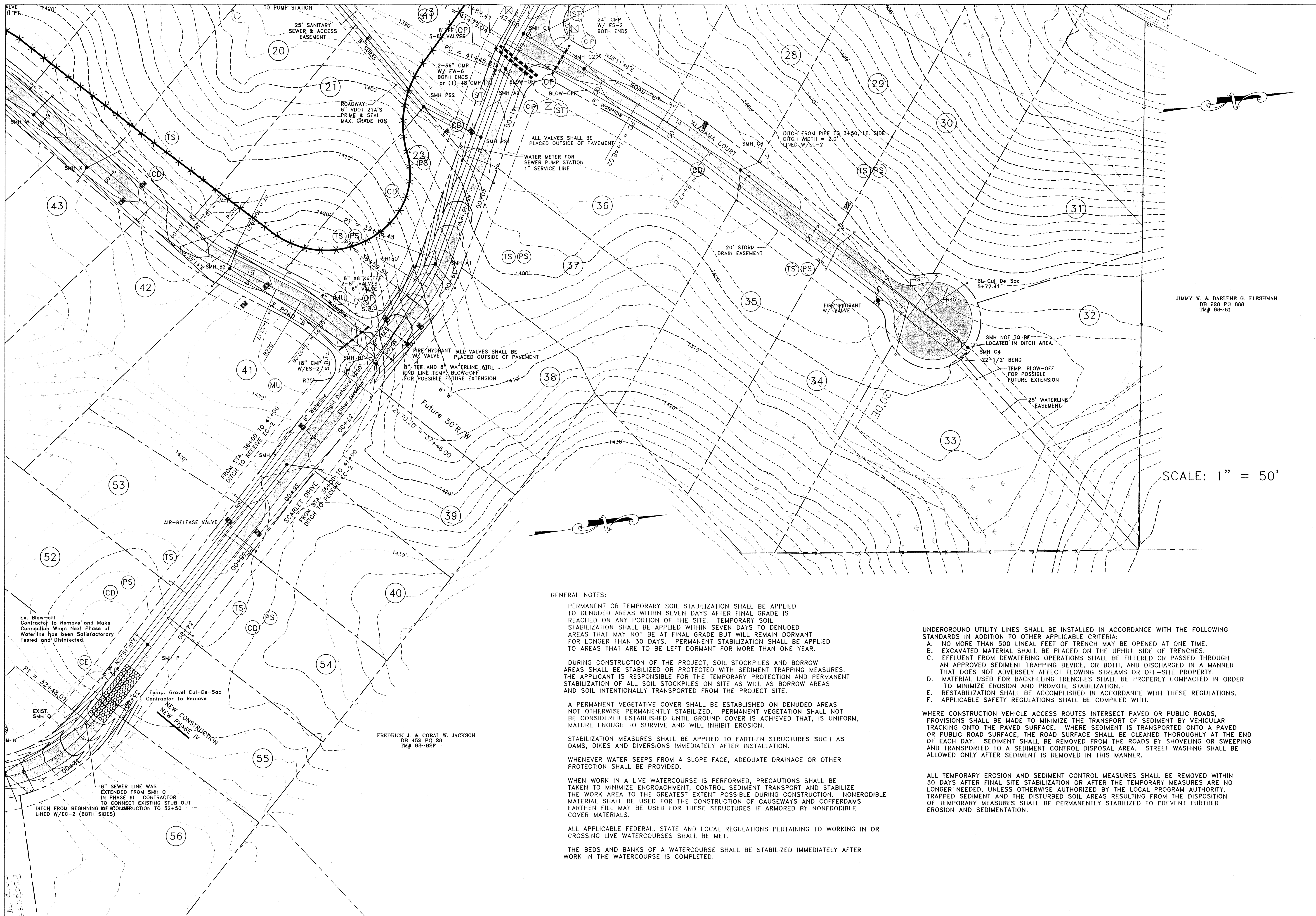


PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	VALVE	TEE	REDUCER	VERT. PLUG	VERT. BRANCH	VERT. (NOTE 2)	VERT. 22 1/2°	VERT. 11 1/4°
6"	D.I.	28'	12'	6'	3'	36'	34'	20'	23'	11'	5'		
8"	D.I.	37'	15'	7'	4'	51'	47'	21'	30'	15'	7'		
10"	D.I.	45'	19'	9'	4'	61'	57'	20'	37'	18'	9'		
12"	D.I.	53'	22'	11'	5'	73'	69'	38'	43'	21'	10'		
6"	PVC	30'	12'	6'	3'	56'	38'	29'	35'	17'	8'		
8"	PVC	40'	16'	8'	4'	74'	56'	31'	46'	22'	11'		
10"	PVC	47'	20'	9'	5'	89'	82'	30'	56'	27'	13'		
12"	PVC	56'	23'	11'	6'	108'	88'	56'	66'	32'	16'		

FACTOR OF SAFETY = 1.5

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.  
 2. REDUCER IS ONE SIZE SMALLER THAN PIPE LISTED. RESTRAINED LENGTH IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.





DATE:	05-01-02
REVISIONS	12/02/02
	02/08/03

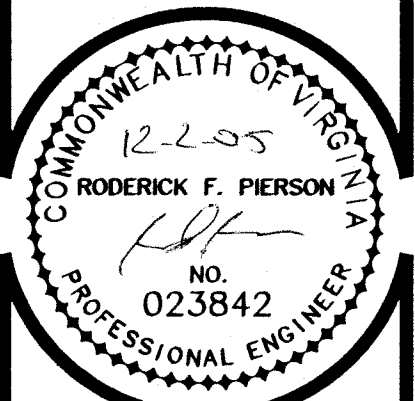
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SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

EROSION &  
SEDIMENT  
CONTROL PLAN



COMMISSION  
R200124  
SHEET  
12

GENERAL NOTES:

PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.

A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.

STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.

WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.

WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.

ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.

THE BEDS AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.

UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

A. NO MORE THAN 500 LINEAL FEET OF TRENCH MAY BE OPENED AT ONE TIME.

B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.

C. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.

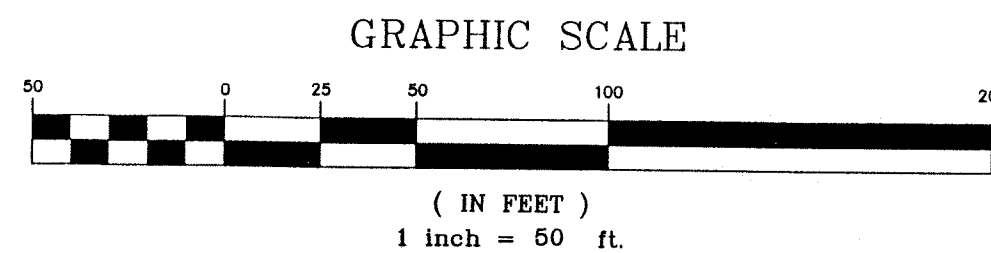
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.

E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.

F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPILED WITH.

WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

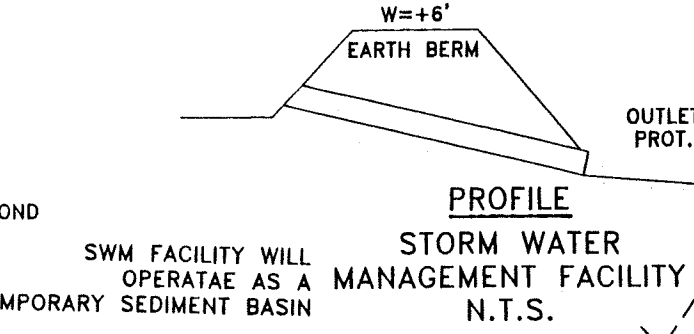
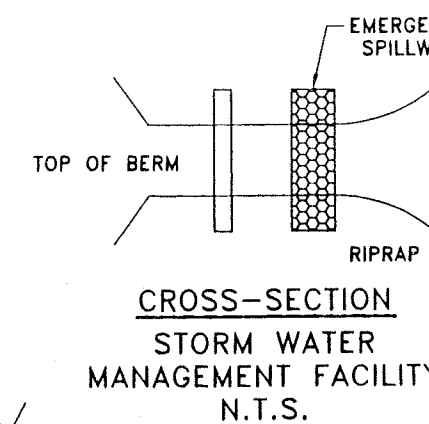
ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE LOCAL PROGRAM AUTHORITY. TRAPPED SEDIMENT AND THE DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.



JAY B. PATTON  
ROBERT C. PATTON  
DB 262 PG 392  
TM# 88-54

JAY B. PATTON  
ROBERT C. PATTON  
DB 262 PG 392  
TM# 88-54

ETHEL G. YANCE  
DB 311 PG 754  
TM# 88-58



DATE:	05-01-02
REVISIONS	12/02/02
	02/08/03

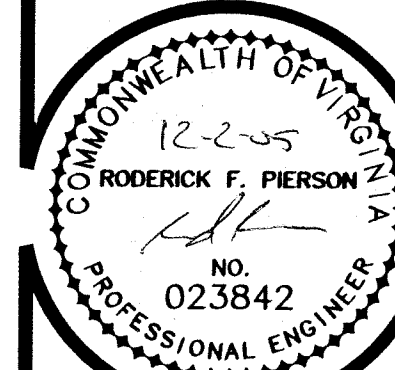
PIERSON  
ENGINEERING  
&  
SURVEYING

P.O. BOX 311  
1324 RANDOLPH ROAD  
DALEVILLE, VA 24083

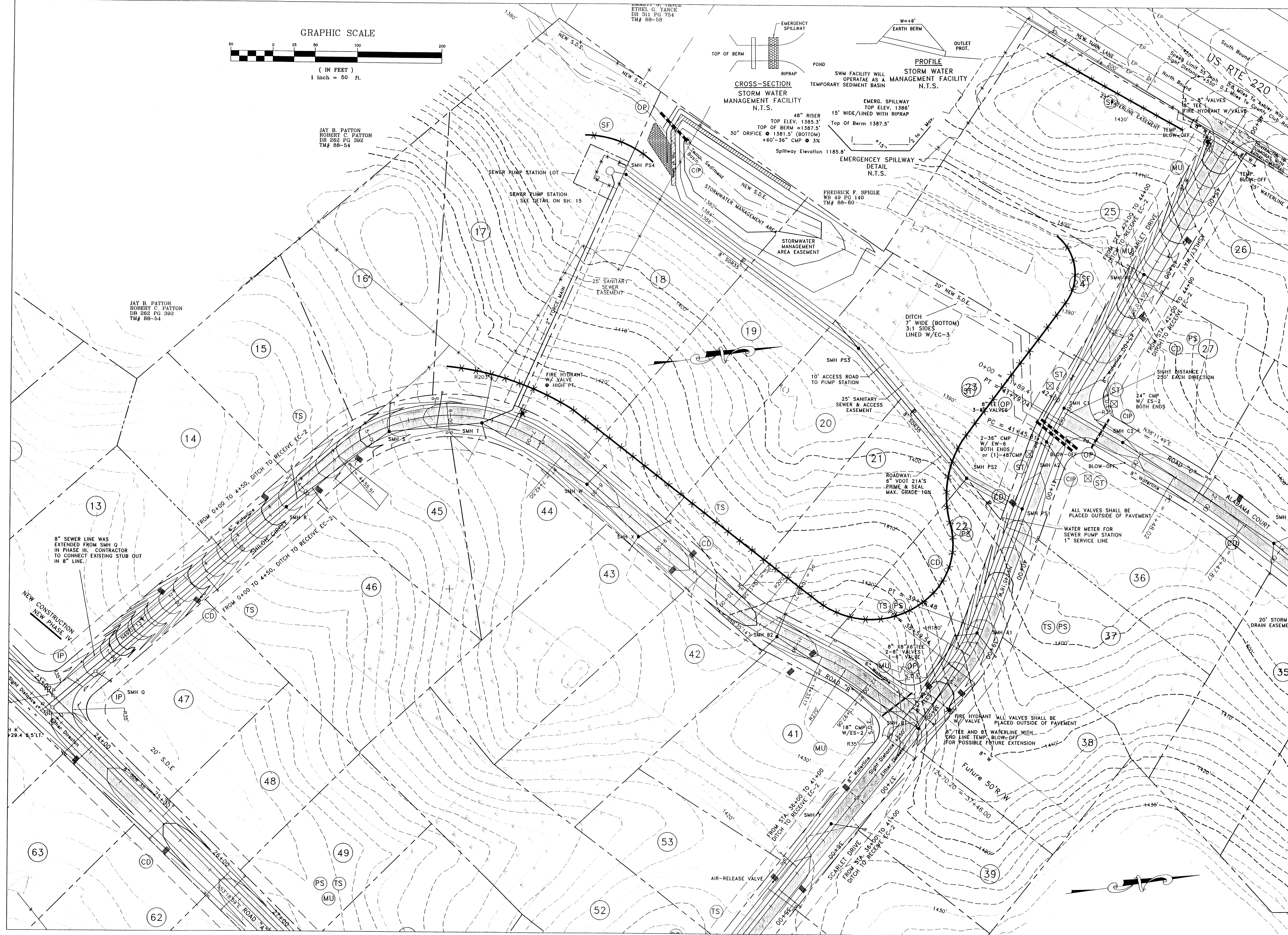
(540) 966-3027 TEL  
(540) 966-5906 FAX  
e-mail: rpierson@bnet.com

SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

EROSION &  
SEDIMENT  
CONTROL PLAN

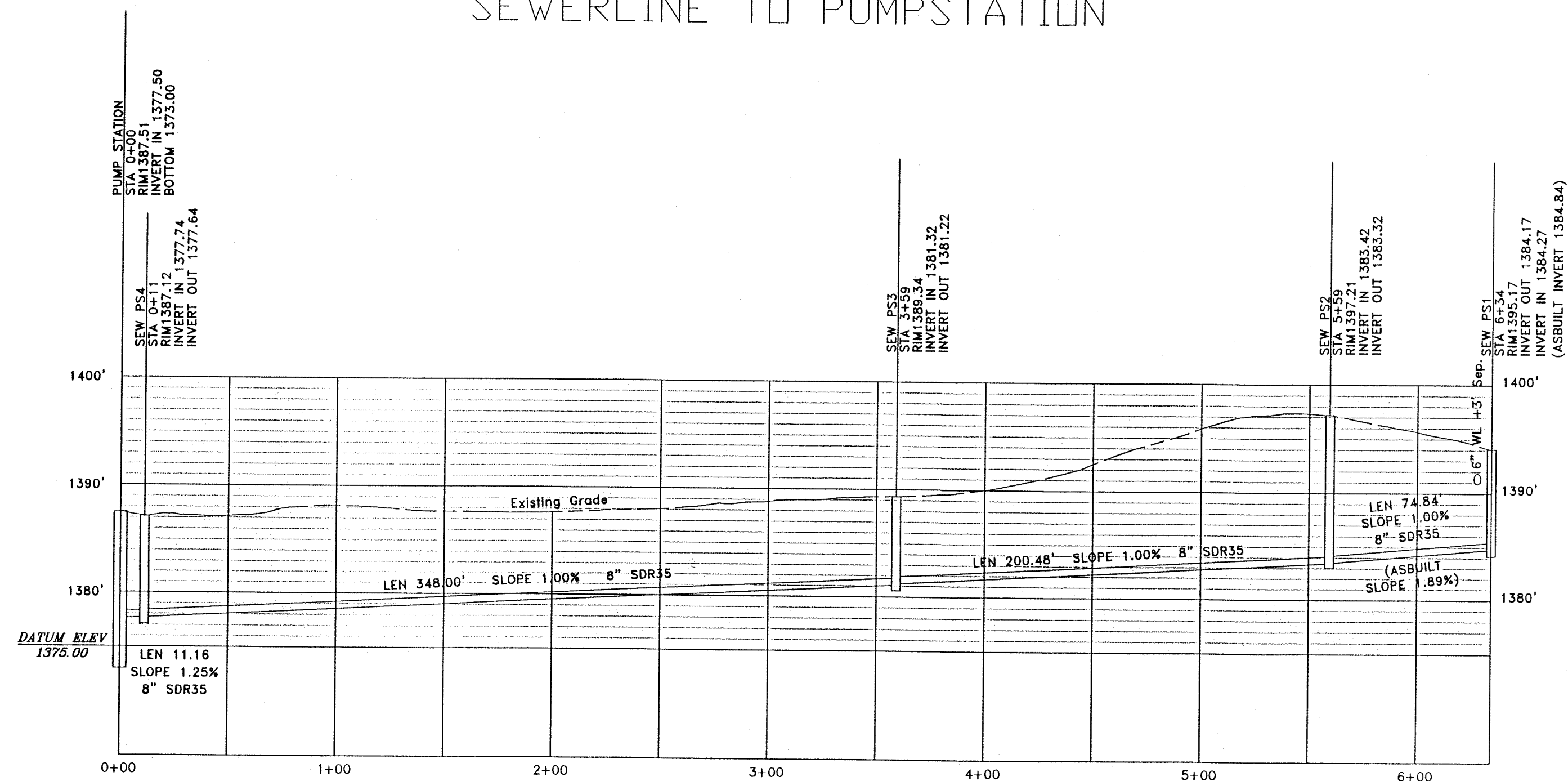


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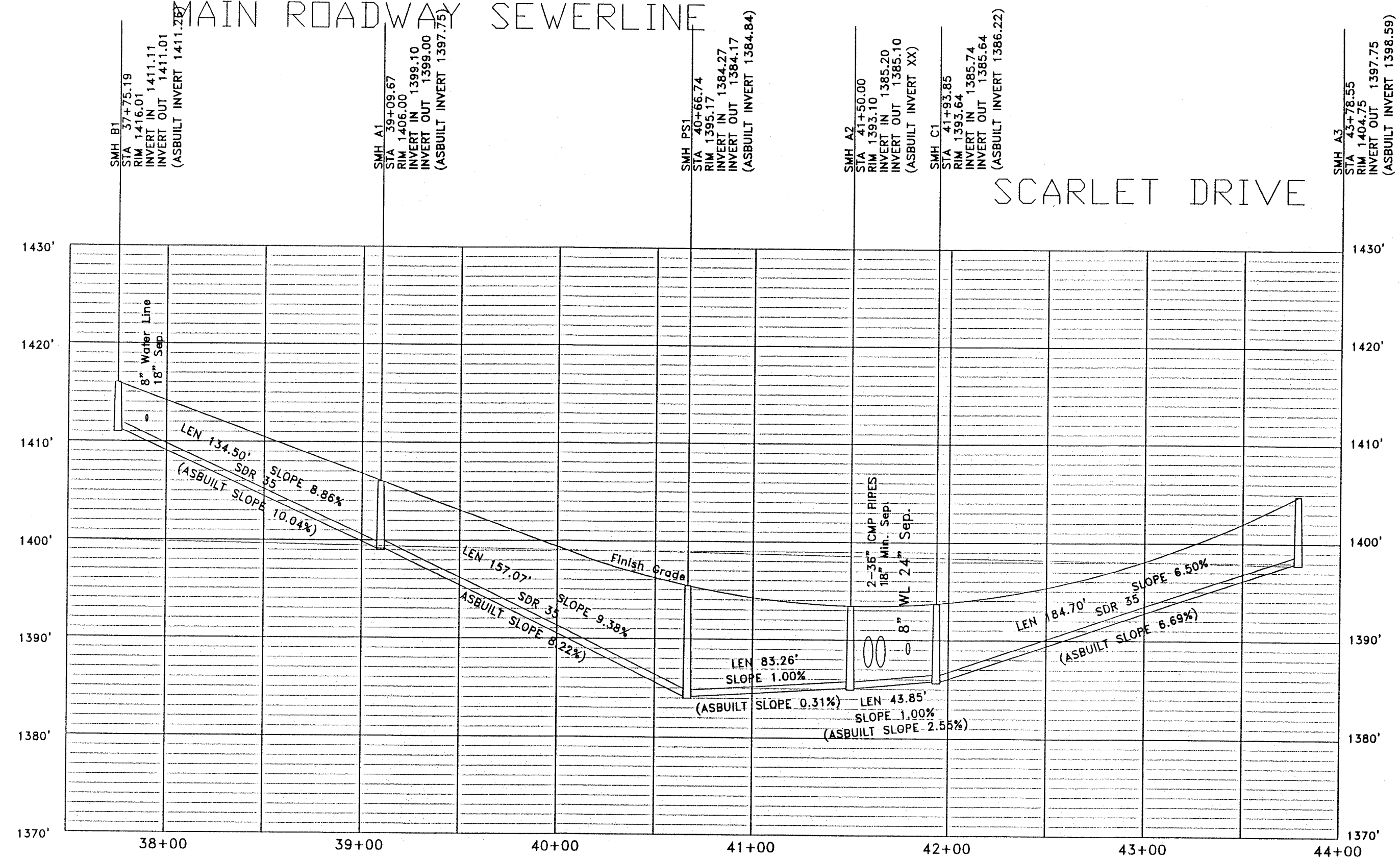




# SEWERLINE TO PUMPSTATION

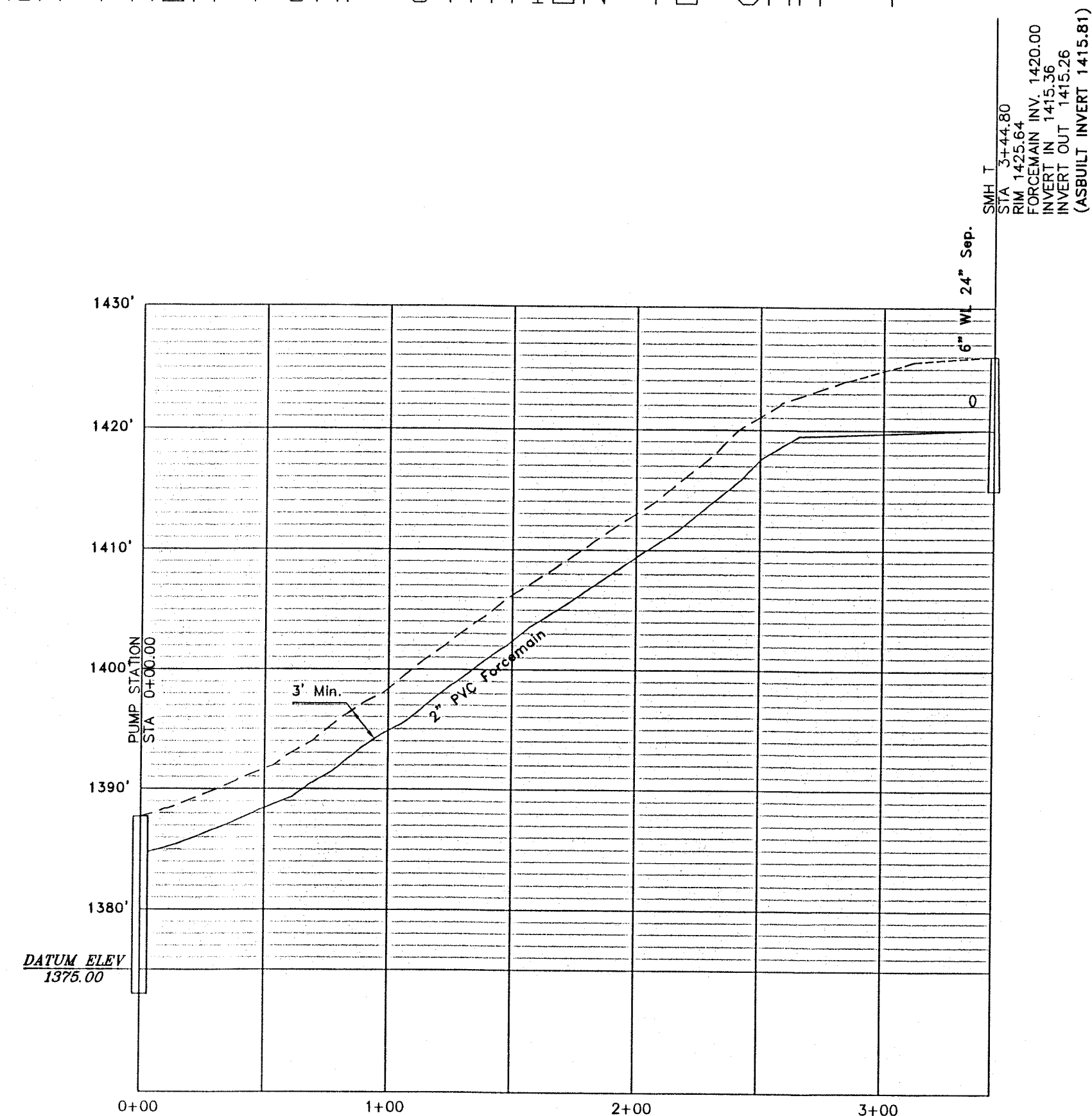


# MAIN ROADWAY SEWERLINE



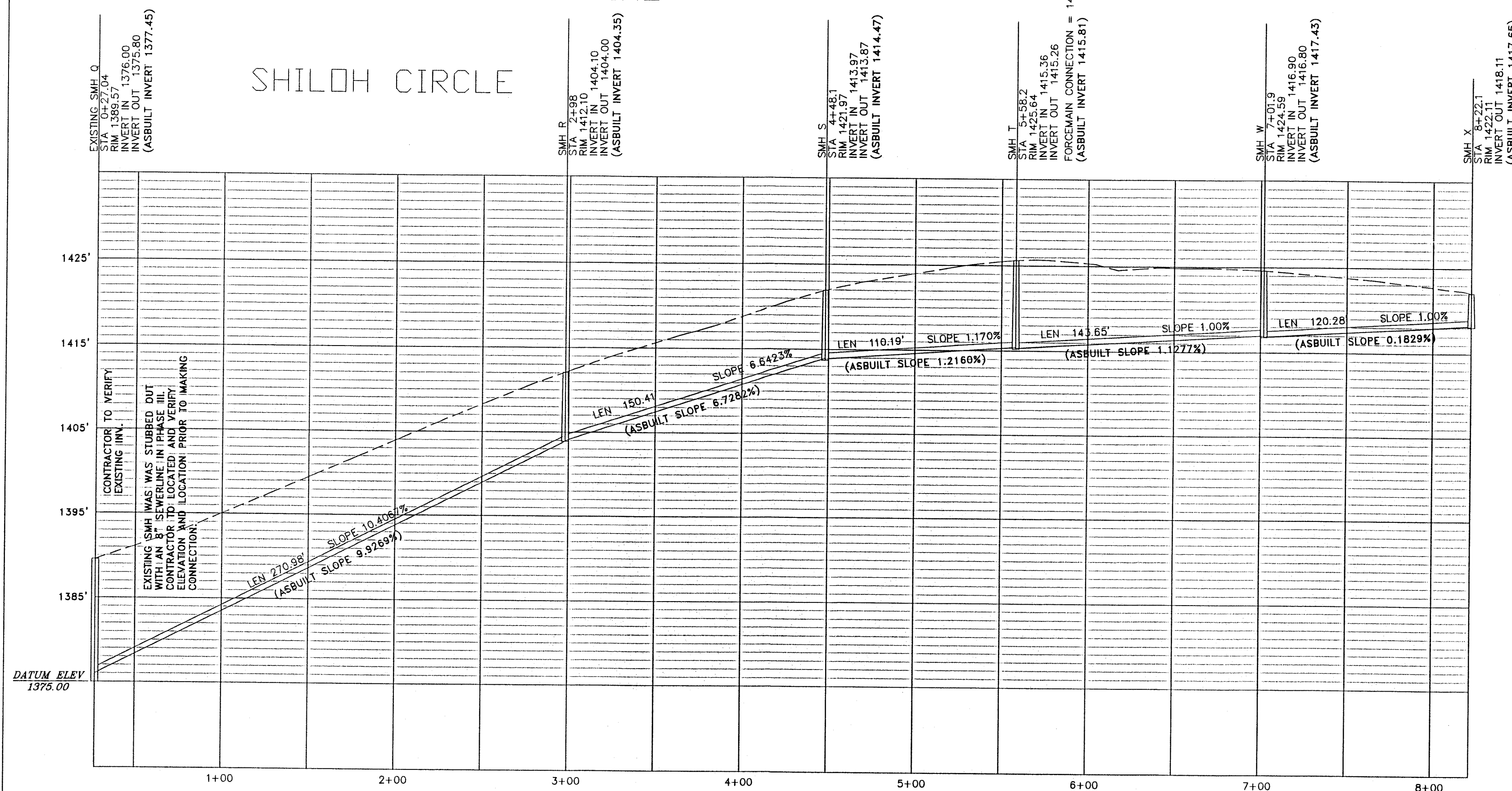
# SCARLET DRIVE

# FORCEMAIN FROM PUMP STATION TO SMH "T"



# ROADWAY "B" SEWERLINE

# SHILOH CIRCLE



AS-BUILT

HORIZONTAL SCALE: 1" = 50'  
VERTICAL SCALE: 1" = 10'

DATE:	05-01-02
REVISIONS	12-02-02
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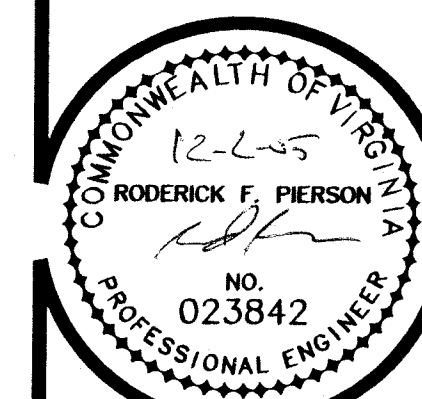
**PIERSON**  
ENGINEERING  
&  
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SUBDIVISION PLAT  
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SEWER  
PROFILES



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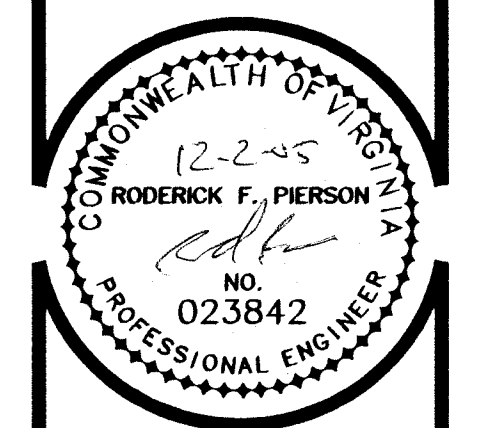
# PIERSON ENGINEERING & SURVEYING

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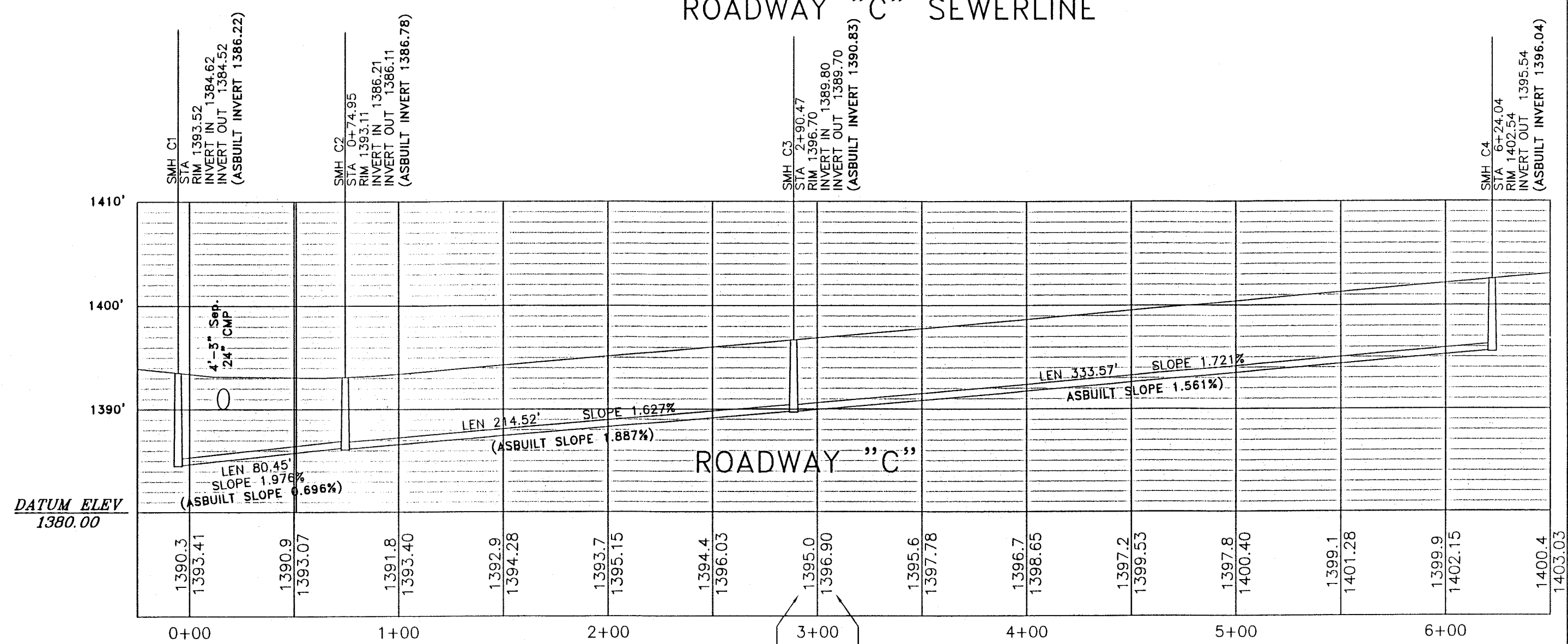
SUBDIVISION PLAT  
FOR  
ASHLEY PLANTATION - SECTION IV  
BOTETOURT COUNTY, VIRGINIA

SEWER  
PROFILES

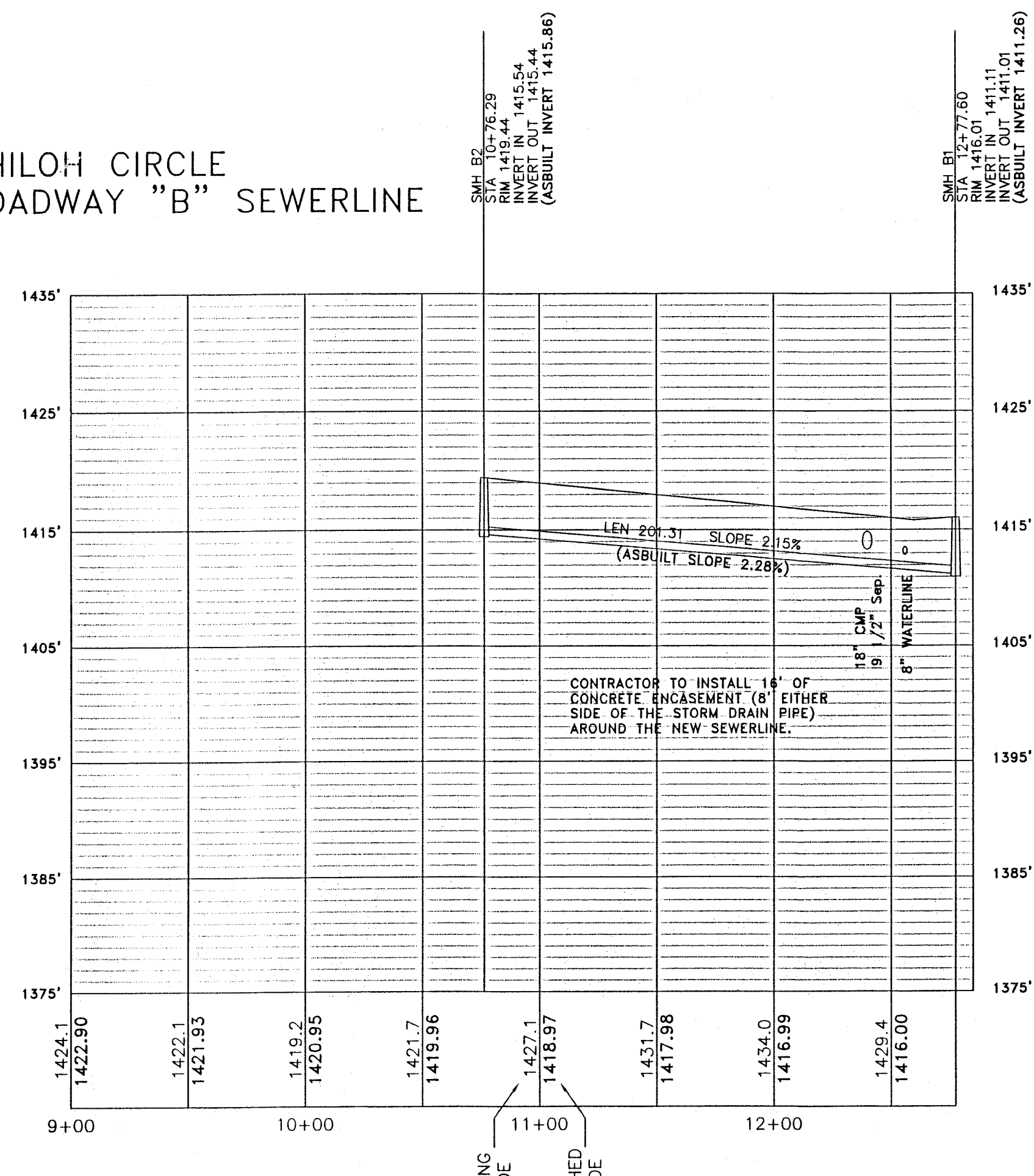


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## ALABAMA COURT ROADWAY "C" SEWERLINE



## SHILOH CIRCLE ROADWAY "B" SEWERLINE



HORIZONTAL SCALE: 1" = 50'  
VERTICAL SCALE: 1" = 10'

### SANITARY SEWER TESTING

#### Manhole Acceptance Tests (Vacuum Testing)

Manholes, including frame, shall be tested by vacuum testing from the top of the frame. Inflatable stoppers shall be used to plug all lines into and out of the manhole being tested including any vent line. The stoppers shall be positioned in the lines far enough from the manhole to insure testing to those portions of the lines not air tested. Vacuum tests shall be made with a vacuum of 10" Hg. The time for the vacuum to drop from 10" to 9" of Hg must be greater than 60 seconds.

Contractor shall furnish weirs, stand pipes, pipe plugs, water, pressure gauges, stop watches, air compressor, vacuum pump, hose and such materials and assistance as required to perform these tests. All acceptance tests shall be conducted by Contractor in the presence of a County Inspector.

Acceptance tests shall not be made until sanitary sewer, manholes and proposed sewer service connections, as shown on the approved sewer plans, have been installed, the sewer trenches (including manholes and cleanout stacks) backfilled and compacted to finish sub-grade.

Contractor shall schedule all acceptance tests with the project Inspector at least forty-eight (48) hours in advance. Each section of completed sewer shall be tested from manhole to manhole. No sewers or sewer service connections are to be excluded from this testing procedure.

#### Sewer Pipe Testing Procedure

Whenever it is necessary to construct underdrains or place gravel under pipe lines in order to dewater trench during construction of sewers, acceptance test will not be made until any pumps, which have been used in dewatering process, have been disconnected of drains have been taken out of service.

Contractor shall schedule all acceptance tests with the Engineering/Utility Department at least forty-eight (48) hours in advance. Each section of completed sewer shall be tested. Generally, sewers will be tested from manhole to manhole. No sewer or sewer service connection is to be excluded from this testing procedure.

Low Pressure Air Testing Procedure - The test procedure shall be conducted in the following manner: (Vacuum test of manholes is generally inverse of low pressure air test of sewer lines)

- Contractor shall thoroughly clean and remove all debris, silt, earth or other materials from the sewer prior to acceptance testing.
- Proper test plugs shall be supplied and installed by Contractor. Test gauges used in air test procedure shall have a range of 0-10 psi and shall be calibrated in divisions of 0.10 psi with an accuracy of +/- one percent. Test gauges shall be calibrated at least once a year and the date and results displayed on the equipment including date of calibration. Calibrations shall be certified by an independent testing lab. Test gauges shall be located outside of manhole during testing.
- If pipe to be tested is expected to be below ground water table, Contractor shall either:
  - Install a small diameter perforated vertical pipe from invert elevation of the sewer to the surface prior to backfilling; or
  - Insert a pipe probe by boring or driving into the backfilling material adjacent to the invert elevation of the pipe, and determine the depth of the ground water level above the pipe invert immediately prior to acceptance testing the sewer.
  - All gauge pressures for test shall be increased by the amount of this back pressure due to ground water over the invert of the pipe.
  - In lieu of the above water depth determination, Contractor may add three (3) psi to the gauge pressure in the test.
- Contractor shall add air slowly to the portion of the pipe under test until the internal air pressure is raised to 4.0 psi gauge plus the ground water pressure.
- As a safety precaution, no one shall be allowed in manhole after air pressure is increased in the sewer line. If the Inspector suspects that the test plug may be leaking, pressure shall first be relieved before any adjustments are made to eliminate air leakage at the plug.
- Contractor shall allow air temperature to stabilize for at least two (2) minutes with the pipe subjected to an internal pressure of 4.0 psi by adding only the amount of air required to maintain the pressure.
- After temperature stabilization, the test will begin. If the internal air pressure decreases, the time required for the pressure to drop from 3.5 to 2.5 psi gauge will be observed and recorded. The time interval shall be compared with the standards in accordance with the DD-30 or DD-31 for time and length of test section for various diameters of the sewer. All pipes 15 inches or less shall be tested for a pressure drop of 1.0 psi gauge.
- Pipe which fails to maintain the stipulated pressure for a period equal to or greater than the holding time shown in Table I shall be deemed to have failed the low pressure air test and is unsatisfactory for acceptance by the County. Any sewer that fails to pass this test shall be replaced by the Contractor at his expense.

Sewer Force Main Testing Procedure - Sewer force mains shall be hydrostatically tested at 150% of the design operating pressure of (60 psi) for 30 minutes. Allowable leakage shall be the same as established for water pipe lines in the Botetourt County Water and Sewer Standard and Specifications.

### Mandrel Testing

The Contractor shall deflection test the entire length of pipe by means of a go-no-go mandrel to assure that a 5.0% deflection has not been exceeded. The testing shall be performed completely at the expense of the Contractor and shall be performed in the presence of Engineer. Mandrel and proving ring details shall be approved by the Engineer and shall be sized at 5% less than ASTM dimensions for the sewer pipe (in accordance with ASTM D-3034 and F-679). The mandrel test shall be performed no sooner than three (3) months after backfill of the pipe is completed. All pipe that fails the deflection test shall be removed and replaced at the Contractor's expense. The "rerounder" technique shall not be allowed. The Contractor shall use approved nine (9) arm mandrels and proving rings for each size of mainline pipe. The contract length "L" of the mandrel arms and the actual mandrel diameter "D" (ID of the ring) shall equal the dimensions in Table I below. Critical mandrel dimensions shall carry a tolerance of +/- .01.

Nom. Dia.	(MIN)	ASTM D3034 SDR 35	ASTM D2751 (6" only)* ASTM D2680
6"	6"	5.65"	5.65" (SDR 35) 5.49" (SDR 23.5)
8"	8"	7.56"	7.40"
10"	10"	9.45"	9.31"
12"	12"	11.26"	11.22"
15"	15"	13.78"	14.09"
18"	18"	16.69"	
21"	18"	19.67"	
24"	18"	22.13"	
27"	18"	24.95"	

Mandrel and proving ring may be obtained from Wartco, Inc., 220 High Street, Franklin, Ohio 45005 (1-513-746-6439), or Hurco Enterprises (1-800-843-1300), or Cerne Industries (1-800-843-7584).

All tests are to be performed in the presence of the design engineer and properly documented by the design engineer for submittal with record drawings to Botetourt County prior to conveyance to Botetourt County. Tests submittals documented by anyone other than the design engineer (i.e. the contractor) will not be acceptable as proof of compliance.

Developer to provide video camera inspection documentation prior to conclusion 1-year warranty period. Video camera inspection work to be performed no sooner than 6 months after the date of system acceptance by Botetourt County and no later than 8 months after the date of system acceptance by Botetourt County. One (1) copy of the videotape to be provided to Botetourt County. Video camera inspection work to be coordinated with Botetourt County such that County personnel can be present during video inspection operations.

The contractor shall schedule a pre-construction meeting to be attended by no less than the following: Botetourt County representatives, contractor representative including the proposed sewer contractor site superintendent, design engineer, any material suppliers or subcontractors that the sewer contractor feels necessary to attend.

All sewer and water pipes (mains and service lines) shall have both magnetically locatable detection wire and or tape AND warning tape. Magnetically locatable detection wire and or tape shall be installed at same elevation of spring line of pipe. Warning tape (Caution! Buried Sewer / Water Pipe Below) to be installed no more than 18 inches above top of the pipe.

All water and sewer shop drawings / cut sheets shall be submitted by the contractor to both the design engineer and Botetourt County for approval prior to installation. Botetourt County will require three (3) complete sets of shop drawings for review.

### Waterline Testing

All new water mains shall be tested, after backfilling to a hydrostatic pressure of not less than 100 psi above design water pressure for the system or 150 psi, whichever is greater. Allowable leakage shall be calculated by the following formula:

$$L = \frac{SDP^{1/2}}{133,200}$$

Where: L = allowable leakage in gallons per hour  
S = length of pipe tested in feet.  
D = nominal diameter of pipe in inches.  
P = average test pressure during leakage test in psi.

No water line shall be placed in service until the leakage is less than the allowable leakage as indicated above. Testing of water mains shall only be done after installation of all valves, taps and service laterals are complete. All portions of the water system, including hydrants and service lines, shall be subject to the hydrostatic pressure during the leakage test. Testing of water mains shall be observed and documented by a County Utility or Engineering Inspector.

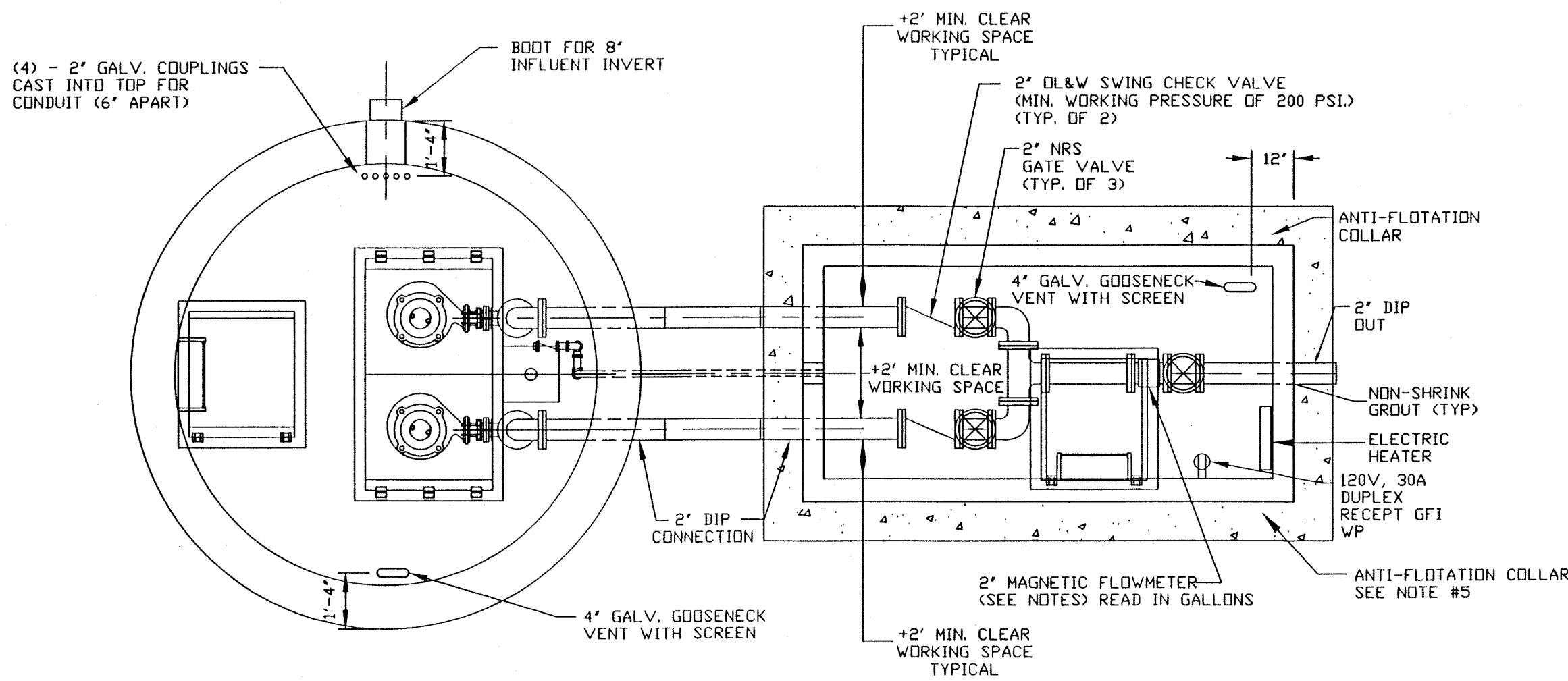
All high points and service lines in the portion of the system under test shall be vented and all air shall be expelled from the system prior to beginning the test.

All fittings and hydrants shall be properly braced or blocked before applying pressure. Where concrete thrust blocks are used, they shall have attained their set prior to testing.

After the portion of the system under the test has reached the required pressure as stated herein, said pressure shall be maintained for two (2) hours. At the conclusion of the pressure test, the volume of makeup water required to refill the pipeline shall be determined by measurement with a displacement meter or by pumping from a vessel of known volume.

All joints or fittings at which leakage occurs shall be re-worked to insure tightness. All visible leaks shall be repaired regardless of amount of leakage. If the measured amount of leakage exceeds the values for the appropriate size as found in AWWA Specifications C600, Hydrostatic Testing (Table 6), the pipe-line shall be repaired prior to re-testing will be done the Utility or Engineering Departments approval and inspection. Repairs of new construction will be by adjustment or replacement or replacement of material only. The use of repairs clamps or bell clamps will not be acceptable.

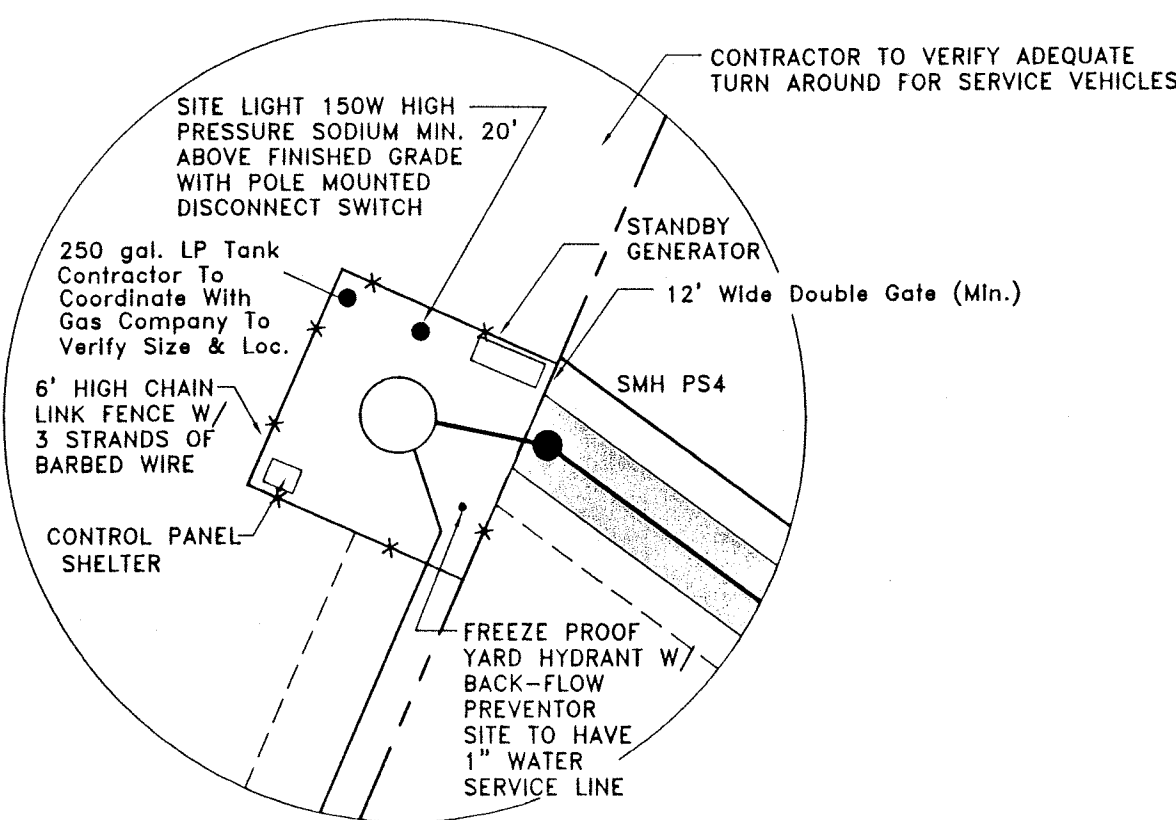
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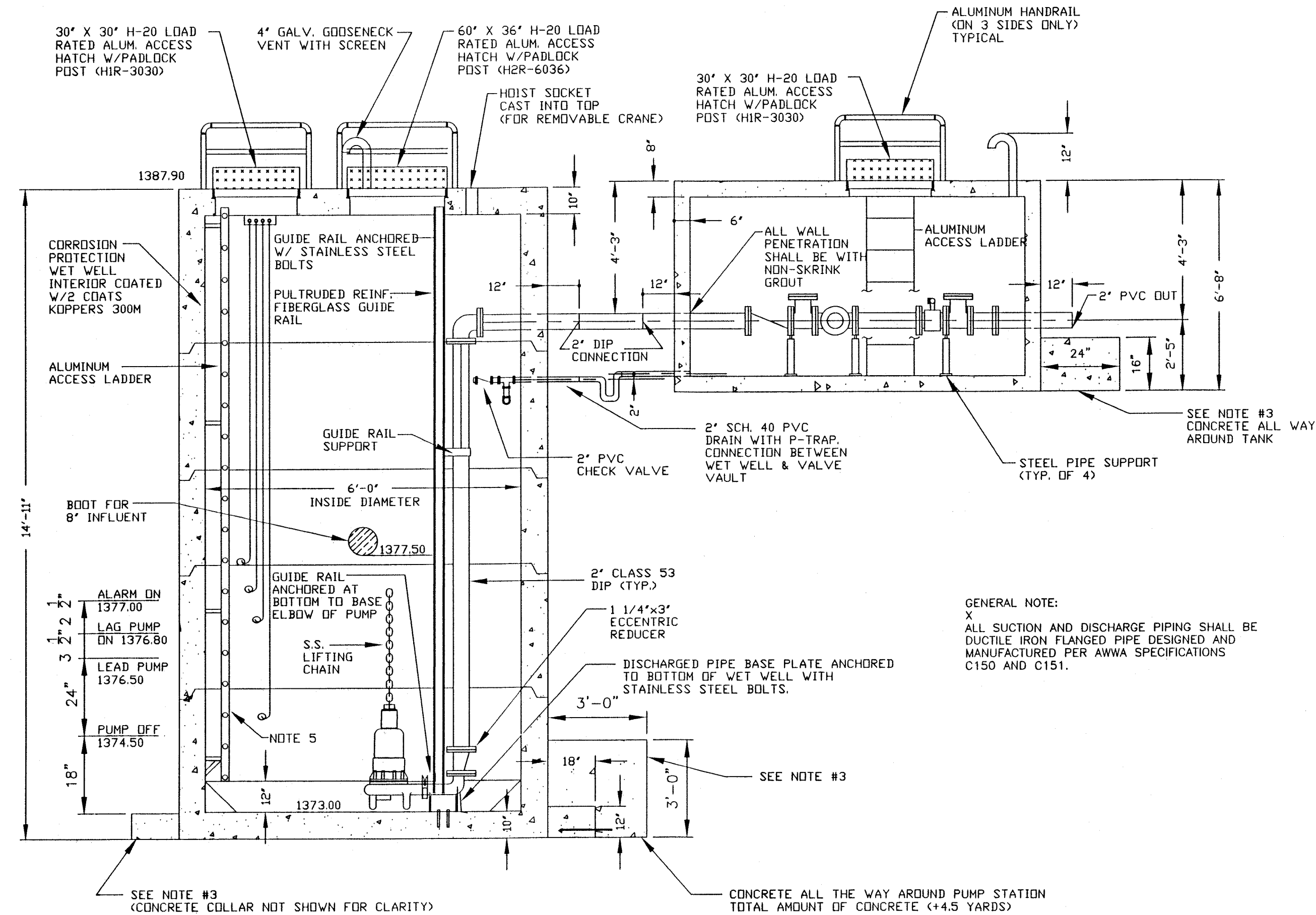
PLAN VIEW  
N.T.S.

### DESIGN CRITERIA

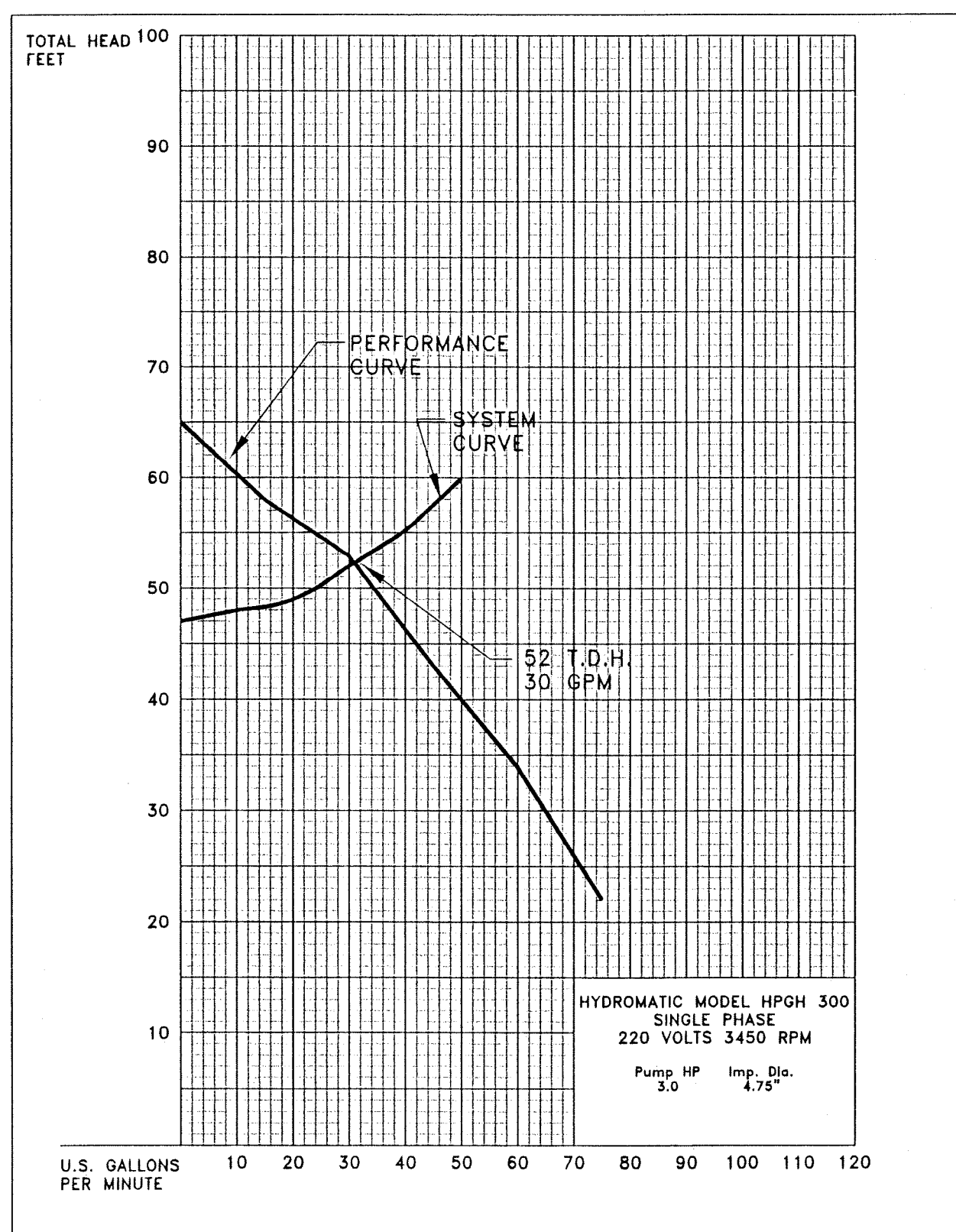
- APPROX. # OF LOTS TO BE SERVED — 20
- AVERAGE DAILY FLOW — 8.3 GPM
- PEAK DAILY FLOW — 33 GPM
- PUMP RATED CAPACITY — 30 GPM @ 55' TDH
- 25YR STORM ELEVATION — 1347.42
- 100YR STORM ELEVATION — 1347.84



PUMP STATION SITE DETAIL  
N.T.S.



SECTION VIEW  
N.T.S.



### Electrical Controls:

- (1) Control Sequence — On rising liquid level in the wet well, a mercury type float switch shall initiate operation of the lead pump at the elevation indicated on the DRAWINGS. Should the liquid level continue to rise, a second mercury float switch would initiate operation of the Lag Pump. The pump(s) would continue to operate until the liquid level recedes to the point where a third (bottom) mercury float switch would stop the pumps.

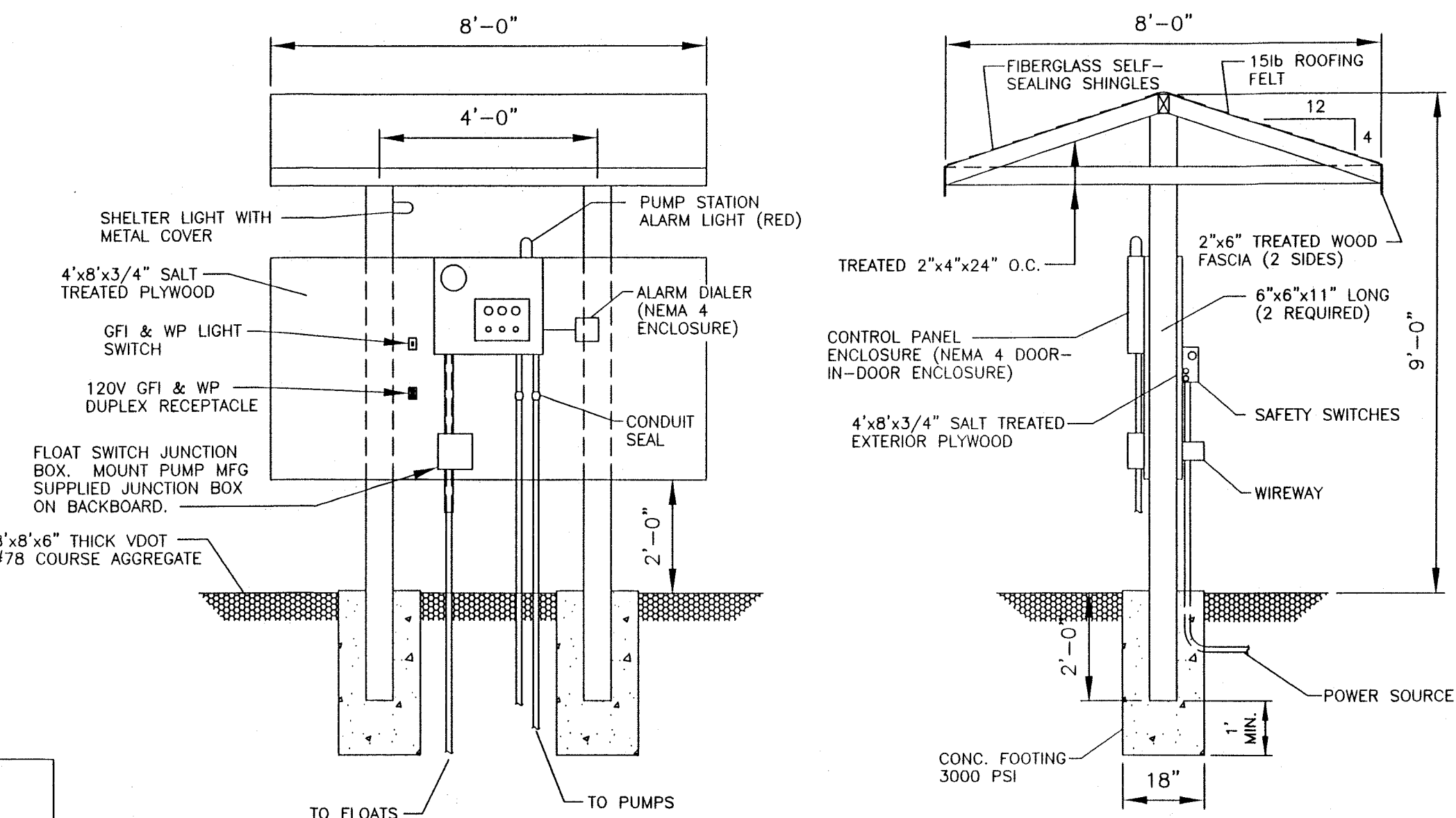
The two (2) pumps shall automatically alternate between the "lead" and "lag" positions by means of an electric alternator in the panel.

Should the liquid level continue to rise above the "Lag Pump On" level, a fourth mercury float switch would activate the alarm circuit.

- (2) Control Panel — The duplex pump control panel shall be furnished by the pump Manufacturer, completely pre-wired, factory assembled, tested and ready for service. Where possible, pump controls shall be housed in a single panel. For outside installations at submersible stations, the panel shall be NEMA 3 door-in-door enclosure, fully gasketed with drip cap. The panel shall be suitable for mounting on the panel board as indicated on the DRAWINGS. The panel shall contain the following elements.

- Separate Manual Disconnect for each pump with 2-pole adjustable overload protection for each phase
- Magnetic starter for each pump motor with all leg quick trip ambient compensated overload protection for each motor. Overloads are to have an auxiliary contract for automatic dialer.
- Hand-Off-Auto selector switch for each pump.
- Automatic Electric Alternator.

- Circuit Breaker for Control Circuit.
- Motor thermal protection — Motor control circuit is to shut down if high temperature occurs. Manual resets to be provided.
- 4-Float control system for duplex pumps and alarm system.
- Control Disconnect.
- Seal failure light for each pump and contact closure for automatic dialer (submersible installations only).
- High temperature light for each pump and contact closure for automatic dialer (submersible installations only).
- Running light for each pump.
- Non-resettable, elapsed time meter for each pump, reading in tenths of hours. Capacity — 100,000 hours.
- High level alarm light with Red Globe and contact closure for automatic dialer. (Remote mounting for "package" pump station where panel is inside pump compartment).
- Audible alarm.
- Back-up battery (12v) for alarm.
- All necessary internal wiring, relays, etc. to provide the operation as described.



CONTROL PANEL SHELTER  
N.T.S.

### NOTES:

1. DUPLEX EXPLOSION-PROOF HYDRAMATIC MODEL HPGH 300 (SINGLE PHASE, 220 VOLTS, 3450 RPM)
2. 2" SIEMENS MAGNETIC FLOWMETER WITH TRIM OR EQUAL. METER TO HAVE A RANGE FROM 0 TO 60 GALLONS MINIMUM. DISPLAY SHALL BE LOCATED ON TOP OF METER IN DIRECTION OF ACCESS HATCH. FLOWMETER SHALL HAVE PROVISIONS FOR READING BY SENSUS TOUCH READ REMOTE READING METER. READ IN GALLONS. FLOW METER TO RECORD INSTANTANEOUS FLOW AND TOTAL FLOW IN GALLONS.
3. CONCRETE ANTI-FLOTATION COLLAR SHALL BE DOWELED TO BOTTOM OF PUMP STATION.
4. CONTRACTOR TO VERIFY ELEVATIONS PRIOR TO CONSTRUCTION.
5. ALUMINUM LADDER BRACKET @ 6' CENTER SECURED TO WET WELL WALL WITH STAINLESS STEEL ANCHORS. BITUMINUS COATING SHALL BE APPLIED AT ALL AREAS WHERE BRACKETS CONTACT CONCRETE SURFACE.
6. CONSTRUCTION SHALL BE IN ACCORDANCE TO BOTETOURT COUNTY SPECIFICATIONS FOR WASTEWATER PUMPING STATIONS AND FORCE MAINS.
7. ALL PIPING COUPLINGS, FITTINGS, VALVES, ETC. SHALL BE CLASS 125 FLANGED MEETING ANSI B16.1 SPECIFICATIONS.
8. WET WELL STRUCTURES SHALL BE PRECAST CONCRETE CONSTRUCTION AND CONFIRM TO ASTM C478, WITH WATERTIGHT JOINTS PER ASTM C443.
9. WET WELL CORROSION PROTECTION SHALL BE TWO (2) COATS KOPPERS "BITUMASTIC" NO. 300M PER CORPS OF ENGINEERS SPECIFICATION C-200.
10. THE TWO (2) PUMPS SHALL AUTOMATICALLY ALTERNATE BETWEEN THE "LEAD" AND "LAG" POSITION BY MEANS OF AN ELECTRIC ALTERNATOR IN THE CONTROL PANEL.
11. AUTOMATIC DIALER SHALL BE AMERICAN MANUFACTURING CO. INC., MODEL #A4-AFLX WITH A SENAPHONE MODEL 1104 MONITORING SYSTEM.
12. AUTOMATIC STANDBY POWER GENERATOR SHALL BE INSTALLED PER BOTETOURT COUNTY SPECIFICATIONS FOR WASTEWATER PUMPING STATION AND FORCE MAINS. ONE (1) CATERPILLAR — OLYMPIAN L.P. GAS-ELECTRIC SET MODEL G25F33 WITH BRUSHLESS GENERATOR, 25KW STANDBY AT 1.0 P.F., 120/240 VOLTS, 1 PHASE, 60 HERTZ AT 1800 rpm. 6" CONCRETE PAD TO BE PROVIDED FOR GENERATOR TO SET ON.
13. CONTRACTOR TO SUBMIT INFORMATION ON PROPOSED ALARM DIALER SYSTEM TO BOTETOURT COUNTY AND ENGINEER PRIOR TO ORDERING EQUIPMENT.
14. CONTRACTOR TO SUBMIT INFORMATION ON PROPOSED STANDBY POWER GENERATOR TO BOTETOURT COUNTY AND ENGINEER PRIOR TO ORDERING EQUIPMENT.
15. THE CONTRACTOR SHALL PROVIDE AND INSTALL ONE (1) HOIST AND EMBEDDED HOIST SOCKET (HALLIDAY D2B36B & D2E).
16. CONTRACTOR TO PROVIDE TELEPHONE LINE FOR AUTOMATIC DIALER SYSTEM.

DATE	05-01-02
REVISIONS	03-03-03

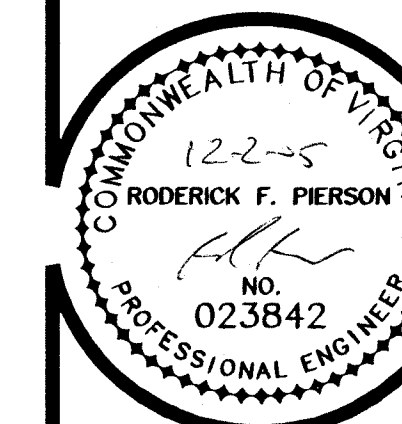
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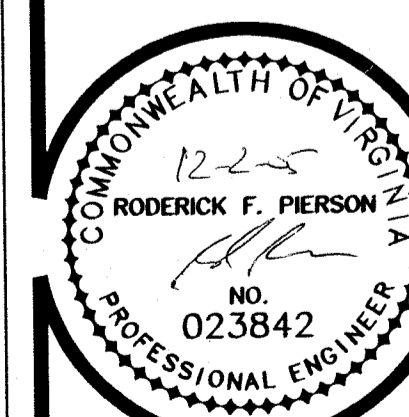
PUMP STATION



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FOR  
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### ROAD SCHEMATIC



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