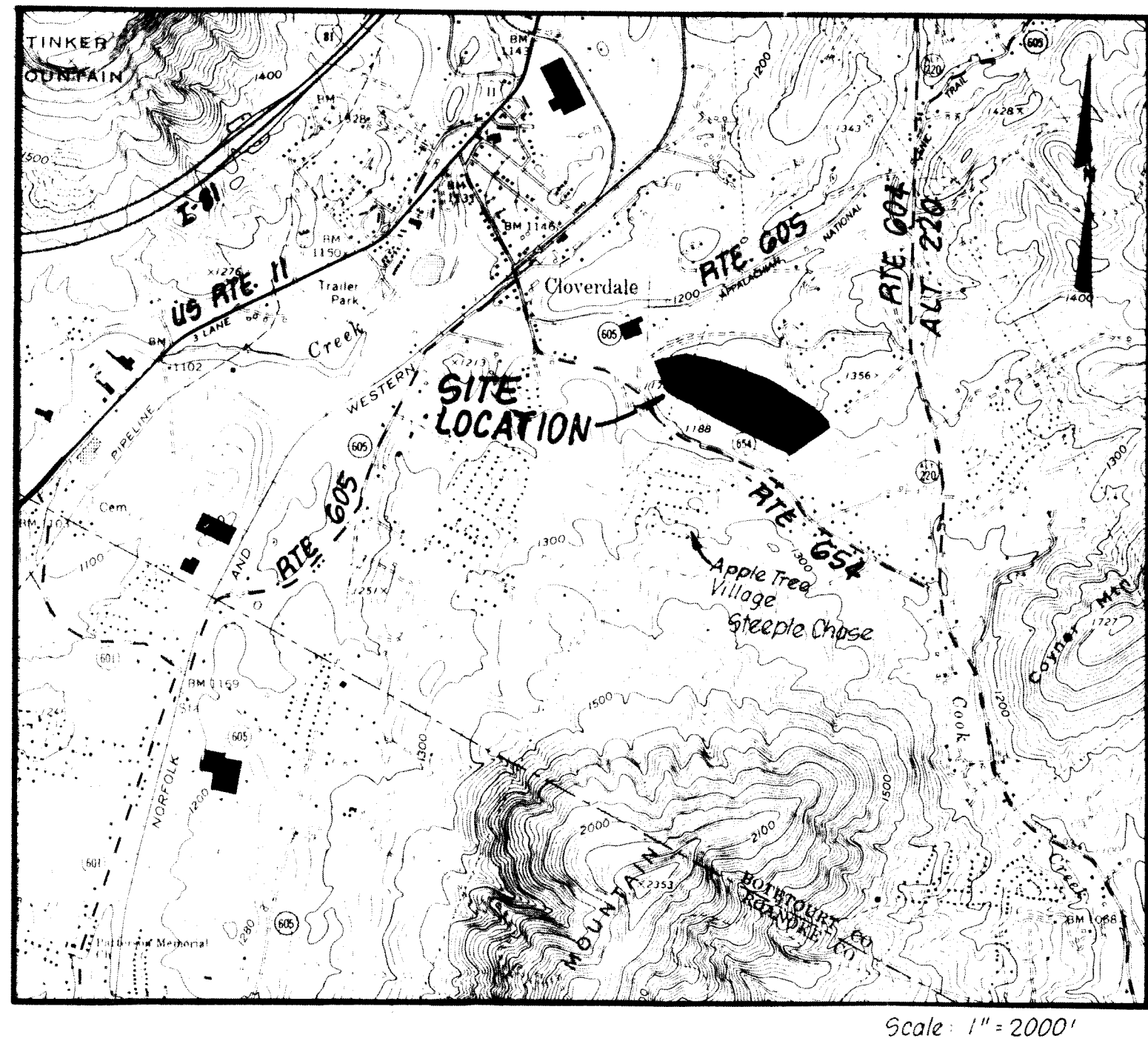


PROJECT NAME: Hunter's Green 2 Mylar
DATE: 2-93
TYPE: _____
LOCATION: _____
TOTAL # SHEETS: 13
A/E FIRM: L M W
OF SETS: 1

HUNTER'S GREEN

SECTION II

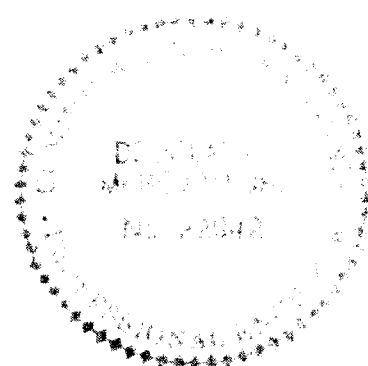


BOTETOURT COUNTY, VIRGINIA

owner
R. & R. JOINT VENTURE, INC.
C/O RON GEIGER
815 BLUE RIDGE BLVD.
BLUE RIDGE, VA. 24064

RECORD DRAWINGS

L.M.W., PC.
Engineering - Surveying
1401 2nd Street SW
Rumoke, Virginia 24016
Phone (703) 345-0675
Fax (703) 342-4456



SET NO. _____

ABBREVIATIONS

AB	ANCHOR BOLT	MAX	MAXIMUM
ABAM	ABANDON OR ABANDONED	MB	MAIL BOX
ABUT	ABUTMENT	MECH	MECHANICAL
ABY	ABOVE	MFR	MANUFACTURER
ACT	ACCELERATE	MH	MANHOLE, MOUNTING HEIGHT
ADD	ADDITIONAL	MIX	MIXING
ADJ	ADJACENT	MISC	MISCELLANEOUS
AFF	ABOVE FINISH FLOOR	NJ	MECHANICAL JOIST
AGOR	AGGREGATE	NOM	NOMINENT
AHOR	ARCHWET	NOT	NOTED
ALUM	ALUMINUM	OTO	OUTLET
ALT	ALTERNATE	HTL	METAL
ANC	ANCHOR	R & C	NAIL AND CAP
APPROX	APPROXIMATE	NIC	NOT IN CONTRACT
ARCH	ARCHITECTURAL	NO	NO
AWBA	AMERICAN WATER WORKS ASSOCIATION	NPV	NON PORTABLE WATER
B	BRICK	NTS	NOT TO SCALE
B1T	B1TUMINOUS	OC	ON CEATERS
B2	BELL JOINT	OD	OUTSIDE DIAMETER
BL	BASE LINE	OPER	OPERATOR
BEN	BEGIN OR BEGINNING	OPNG	OPENING
BLDG	BUILDING	OPP	OPPOSITE
BLKG	BLOCKING	PC	POINT OF CURVE
BR	BENCH MARK, BEAM	PCC	POINT OF COMPOUND CURVE
BSOT	BOTTOM	PER	PERIMETER
BT	BYPASS	PERF	PERFORATED
BRG	BEARING	PERP	PERPENDICULAR
BSMT	BASEMENT	PI	POINT OF INTERSECTION
BSF	BLACK STEEL PIPE	PIV	POINT INDICATOR VALVE
BULT	BUILT UP ROOF	PL	PLATE, PLUMBING LINE
BY	BUTTERFLY VALVE	PLYMD	PLYWOOD
C	CHANNEL, COLD	POL	POINT ON LINE
C/C, C TO C	CENTER TO CENTER	PT	POINT OF TANGENCY
CAB	CABINET	PST	POINT ON TANGENT
CAP	CAPACITY	PRC	POINT OF REVERSE CURVE
CB	CUBIC FEET	PSI	POUNDS PER SQUARE INCH
CG	CHARGE OF GRADE	PT	POINT OF TANGENT
C & G	CURB AND GUTTER	PVC	POLYVINYL CHLORIDE
CIR	CAST IRON	PVI	POINT OF VERTICAL INTERSECTION
CIRC	CIRCULAR	PVMT	PAVEMENT
CKT	CIRCUIT	PVT	PRIVATE
CL	CENTER LINE	R	RADIUS, RISER
CLR	CLEAR	RR	RAILROAD
CONBT	CONSTRUCTION	RCP	REINFORCED CONCRETE PIPE
CONC	COMPACTED METAL PIPE	RD	ROAD DRAIN, ROAD
CMP	CONCRETE MASONRY UNITS	REDU	REDUCER
CND	CONDUIT	RECTP	RECTANGLE
CO	CLEANOUT	RECT	RECTANGULAR
CONB	CONCRETE (PORTLAND CEMENT)	REIN	REINFORCE, REINFORCEMENT
CONC	CONCRETE (PORTLAND CEMENT)	REF	REPERED
CONN	CONNECT, CONNECTION	REL	RELUCATED
CONT	CONTINUOUS, CONTROL	REQD	REQUIRED
CONTR	CONTRACTOR	REV	REVISION
CONV	CONVEYOR	RTE	ROUTE
CR	CRUSHED STONE	R	RIGHT
CTR	CENTER	R/W	RIGHT OF WAY
CULV	CULVERT	S	SANITARY SEWER, SOUTH, STORT, SWITCH
CT	CUBIC YARD	SAH	SANITARY
D	DEPTH OR DEGREE OF CURVE	SDH	SCHEDULE
DEPT	DEPARTMENT	SD	STORY DRAIN
DF	DRINKING FOUNTAIN	SECT	SECTION
DI	DROP INLET, DUCTILE IRON	SER	SERVICE
DIA	DIAMETER	SH	SHEET
DIM	DIMENSION	SHG	SHEETING
DISC	DISCONNECT	SIM	SIMILAR
DWH	DROP MANHOLE	SPEC	SPECIFICATION
DN	DOWN	SPECS	SPECIFICATIONS
DR	DRIVE	SO	SQUARE
DR	DRAIN SPOUT	SS	STAINLESS STEEL
DTL	DETAIL	ST	STREET
DWL	DWELLING	STA	STATION
DWG	DRAWING	STD	STANDARD
E	EAST	STL	STEEL
EACH	EACH	STRUCT	STRUCTURAL
E.B.L.	EASTBOUND LANE	STY	STORY
EF	EACH FACE	SUR	SURVEY
EJ	EXPANSION JOINT	SURF	SURFACE
EL, ELEV	ELEVATION	SYMM	SYMMETRICAL
ELEC	ELECTRICAL	T	TREAD
EXT	ENGINEER	T & B	TOP AND BOTTOM
ENTR	ENTRANCE	TOC	TURNUED DOWN CURB
EOL	END OF LINE	TELE	TELEPHONE
EP	EDGE OF PAVEMENT	TEMP	TEMPORARY
EQ	EQUAL	THK	THICK
EQPT	EQUIPMENT	TRTD	TREATED
EW	EACH WAY, ENDWALL	TV	TELEVISION
EXIST	EXISTING	TW	TOP OF WALL
EXP	EXPANSION	TYP	TYPICAL
EXT	EXTERIOR	UG	UNDERGROUND
FB	FRAME	UGM	UNLESS OTHERWISE NOTED
FD	FLOOR DRAIN	US-C & A-S	UNITED STATES COAST AND
FDN	FOUNDATION		GEODETIC SURVEY
FES	FLARED END SECTION	V, VAL	VALVE, VEIT
FF	FINISH FLOOR	VAP BAR	VAPOR BARRIER
FFE	FINISHED FLOOR ELEVATION	VC	VERTICAL CURVE
FIG	FIGURE	VE	VERTICAL
FIN	FINISH	VOL	VOLUME
FIXT	FIXTURE	VDOT	VIRGINIA DEPARTMENT OF TRANSPORTATION
FL	FLOOR	V.S.D.	VERTICAL SIGHT DISTANCE
FLEX	FLEXIBLE	V.B.L.	VEHICULAR LANE
FLO	FLANGE	V	WIDE FLANGE, WIDE, WASTE, WATER
FT	FOOT	W	WITH
FTG	FOOTING	WOOD	WOOD
FUT	FUTURE	WL	WATER LINE
GALON	GALLON	W/O	WITHOUT
DALY	GALVANIZED	WS	WATER SURFACE
GAR	GARAGE	WT	WATERIGHT, WEIGHT
GND	GROUND	WYOM	WEST VIRGINIA DEPARTMENT
GR	GRAVEL		OF HIGHWAYS
GOVERNMENT	GOVERNMENT	WVF	WELDED WIRE FABRIC
GPM	GALLONS PER MINUTE	CONR	CORNER
GRTO	GRATING	DW/D4	DRIVENAT
GV	DATE VALVE	PP	POWER POLE
H	HOT	TP	TELEPHONE POLE
HC	HOSE BIBB	S/W	SIDEWALK
HE	HOOK		
HN	HOLLOW METAL		
HOR, HORIZ	HORIZONTAL		
HP	HORSE POWER		
HPT	HIGH POINT		
HYD	HYDRANT		
IO	INSIDE DIAMETER		
IN	INCH		
INSUL	INSULATION		

LEGEND

EXISTING

WV

H/T

NEW

GENERAL NOTES

GENERAL NOTES

1. THE LOCATION OF EXISTING UTILITIES, INCLUDING UNDERGROUND UTILITIES, IS INDICATED ON THE DRAWINGS INsofar AS THEIR EXISTENCE AND LOCATION WERE KNOWN AT THE TIME OF PREPARATION OF THE DRAWINGS. HOWEVER, NOTHING IN THESE CONTRACT DOCUMENTS SHALL BE CONSTRUED AS A GUARANTEE THAT SUCH UTILITIES ARE IN THE LOCATION INDICATED OR THAT THEY ACTUALLY EXIST, OR THAT OTHER UTILITIES ARE NOT WITHIN THE AREA OF OPERATIONS. THE CONTRACTOR SHALL MAKE ALL NECESSARY INVESTIGATIONS TO DETERMINE THE EXISTENCE AND LOCATIONS OF SUCH UTILITIES. THE CONTRACTOR SHALL PAY FOR ANY DAMAGE TO AND FOR MAINTENANCE AND PROTECTION OF EXISTING UTILITIES AND STRUCTURES.
2. EXISTING WATER LINE LOCATIONS, BOTH HORIZONTAL AND VERTICAL, ARE APPROXIMATE. THE LOCATIONS ARE NOT THE RESULTS OF FIELD SURVEYS.
3. THE CONTRACTOR IS DIRECTED TO DIG AND LOCATE ALL UTILITIES, IN ADVANCE OF THE PIPELAYING, TO ALLOW FOR ADJUSTMENTS. DUE TO CONFLICTS WITH THE UTILITIES, IN THE HORIZONTAL AND VERTICAL LOCATION OF THE PIPE LINE.
5. SURVEY INFORMATION OBTAINED FROM TOPOGRAPHIC SURVEY COMPLETED FEBRUARY, 1993, BY LMW, PC, ROANOKE, VIRGINIA
6. BENCHMARKS ARE AS NOTED ON DRAWINGS AND THEY ARE OF USGS DATUM.

①

TS

PS

CD

QP

← TS →

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→ → →

TEMPORARY SEEDING

PERMANENT SEEDING

ROCK CHECK DAMS

OUTLET PROTECTION

[illegible]

QUALITY CONTROL

Streets shall be graded, paved and all structural components erected in accordance with the Virginia Department of Transportation Road and Bridge Specifications and the latest edition of Road Design Standards. All materials used shall be tested in accordance with standard policies. The developer must contact the office of the Resident Engineer, prior to beginning any construction at which time an inspection and Testing Procedure Policy will be drawn. The developer will produce test reports from approved independent laboratories at the developer's expense.

The pavement designs shown are based on a subgrade rating of CBR 10 or greater. The subgrade soil is to be tested by an independent laboratory and the results submitted to the Virginia Department of Transportation prior to pavement construction. Should the subgrade CBR values be less than GBR 10, then additional base material shall be required in accordance with departmental specifications.

The subgrade must be approved by Virginia Department of Transportation prior to placement of the base. Base must be approved by Virginia Department of Transportation for depth, template and compaction before surface is applied.

UTILITIES

All necessary utility laterals shall be placed prior to pavement base and conduit provisions made for the same (i.e. water, sewer, gas, and telephone).

Gas or petroleum transmission lines will not be permitted within the pavement or shoulder element (back of curb to back of curb) of this development. Service laterals crossing and pipe lines located outside the pavement but inside the right of way will be in conformity with ASA B 31.8 Specifications and Safety Regulations. Distribution lines with pressures less than 120 lbs. are unaffected by the above.

Permits will be required for all utilities within street right of way prior to acceptance into the secondary highway system.

Any easements granted to a utility company for placement of power, telephone, etc. must be released prior to acceptance.

PRIVATE ENTRANCES

Standard CG-8 gutter will be provided at all entrances to private lots where standard CG-6 curb gutter is approved for use.

Permits will be required for all private entrances constructed on street rights of way prior to acceptance into the secondary highway system.

EROSION CONTROL AND LANDSCAPING

Care must be taken during construction to prevent erosion, dust and mud from damaging adjacent property, clogging ditches, tracking public streets and otherwise creating a public or private nuisance to surrounding areas.

The entire construction area back of curbs and or pavement shall be backfilled and seeded together with ditches and channels, at the earliest possible time after final grading.

Drainage easements must be defined by excavated ditches or channels for their full length to well defined existing natural watercourses.

This road will be reviewed during construction for the need of paved gutters. If erosion is encountered in any drainage easement, it will be the responsibility of the developer to sod, rip rap, grout, pave, or to do whatever is necessary to correct the problem.

All vegetation and overburden shall be removed from shoulder to shoulder prior to the conditioning (cutting and /or preparation) of the subgrade.

GENERAL

A minimum pavement radius of 25 feet is required at all street intersections.

While these plans have been approved, such approval does not exempt connections with existing state-maintained roads from critical review at the time permit applications are made. This is necessary in order that the prevailing conditions be taken into consideration regarding safety accompaniments such as turning lanes.

Standard guardrail with safety end sections may be required on fills as deemed necessary by the VDOT engineer. After completion of rough grading operations, the office of the Resident Engineer, Virginia Department of Transportation, shall be notified so that a field review may be made of the proposed locations.

Field review will be made during construction to determine the need and limits of paved gutter and/or ditch stabilization treatments, to determine the need and limits of additional drainage easements. All drainage easements must be cut and made to function to a natural watercourse. Any erosion problems encountered in an easement must be corrected by whatever means necessary prior to subdivision acceptance.

The Contractor shall obtain an entrance permit to existing Virginia Department of Transportation right of way from the Resident Engineer prior to road construction.

An inspector will not be furnished except for periodic progress inspection, the above mentioned field reviews, and checking 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.

The streets must be properly maintained until acceptance. At such time as all requirements have been met for acceptance, another inspection will be made to determine if the street has been properly maintained.

In order to meet public service requirements, all streets must serve a minimum of three occupied dwellings prior to acceptance.

The Contractor shall verify location and elevation of all underground utilities shown on the plans in areas of construction prior to starting work. Contact Engineer immediately if location or elevation is different from that shown on the plan. If there appears to be a conflict, and upon discovery of any utility not shown on this plan, 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.

CONSTRUCTION NOTES

- The Contractor shall secure all permits prior to commencing work.
- The County Engineer shall be notified by the contractor 48 hours prior to commencing work.
- The locations of all underground utilities are approximate and shall be verified prior to any construction.
- The Contractor shall be responsible for locating and uncovering all manholes and valve boxes after surface treatment of roads and to adjust them to final road grades.
- The minimum cover above water lines shall be 42 inches (3.5 feet).
- PVC plastic sewer pipe shall be ASTM D-3034 SDR 35(minimum).
- Ductile Iron sewer pipe shall be ANSI/AWWA C-151, Class 52 minimum.
- PVC plastic water line shall be AWWA C-900, Table 2, Class 150 (minimum).
- Ductile Iron water line shall be ANSI/AWWA C-151, Class 52 up to 12" and Class 51 for larger pipe.
- An Erosion and Sediment Control Plan has been approved and is hereby made part of these plans. The contractor shall be responsible for obtaining and adhering to the provisions therein, which shall include inspections and repairs, if necessary, periodically and after every significant rainfall.
- An approved Erosion and Sediment Control Plan may be amended by the plan approving authority if on-site inspection indicates that the approved control measures are not effective in controlling erosion and sedimentation, or if, because of changed circumstances, the approved plan cannot be carried out.
- All erosion and sediment control practices shall be in accordance with the "Virginia Erosion and Sediment Control Handbook, Latest Edition." (VESCH)

MINIMUM STANDARDS FOR CONTROLLING EROSION AND SEDIMENTATION

1. Stabilization of Denuded Areas

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 (undisturbed) for longer than 30 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.

Soil stabilization refers to measures which protect soil from the erosive forces of raindrop impact and flowing water. Applicable practices include vegetative establishment, mulching, and the early application of gravel base on areas to be paved.

2. Stabilization of Soil Stockpiles

During construction of the project, soil stock piles shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all stockpiles on site as well as soil intentionally transported from the project site.

3. Permanent Vegetation

A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that, in the opinion of the local program administrator or his designated agent, is uniform, mature enough to survive and will inhibit erosion.

4. Timing and Stabilization of Sediment Trapping Measures

Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.

5. Stabilization of Earthen Structures

Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

6. Sediment Basins

Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The sediment basin shall be constructed to accommodate the anticipated sediment loading from the land-disturbing activity.

7. Cut and Fill Slopes

Cut and fill slopes shall be constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

- A. Roughened soil surfaces are generally preferred to smooth surfaces on slopes (see SURFACE ROUGHENING, E & S Handbook).
- B. DIVERSIONS should be constructed at the top of long steep slopes which have significant drainage areas above the slopes. Diversions or terraces may also be used to reduce slope lengths.

8. Concentrated Runoff Flow Down Cut or Fill Slopes

Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.

9. Water Seeps From a Slope Face

Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

10. Storm Sewer Inlet Protection

All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

11. Stabilization of Outlets

Before newly constructed stormwater conveyance channels are made operational, adequate outlet protection and any required temporary of permanent channel lining shall be installed in both the conveyance channel and receiving channel.

12. Work in Live Watercourses

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.

13. Crossing a Live Watercourse

When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary stream crossing constructed of nonerodible material shall be provided.

14. Applicable Regulations

All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met.

15. Stabilization of Bed and Banks

The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

16. Underground Utility Construction

Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

- No more than 500 linear feet of trench may be opened at one time.
- Excavated material shall be placed on the uphill side of trenches.
- 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.

17. Construction Access Routes

Where construction vehicle access routes intersect paved public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto a public road surface, the road 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. This provision shall apply to individual subdivision lots as well as to larger land-disturbing activities.

18. Temporary Erosion & Sediment Control Measure Removal

All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after temporary measures are no longer needed, unless otherwise authorized by the local program administrator.

19. Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff. Contractor shall be responsible for obtaining copy of approved Erosion and Sediment Control Plan and adhere to same. The Virginia Erosion and Sediment Control Handbook shall be used in addition to the approved narrative a plan.

SECTION 2F - INSPECTIONS AND TESTS

2F-01 SCOPE OF WORK

A. The work shall include providing all necessary equipment, material, labor and services required to properly test and inspect all work.

2F-02 GENERAL

A. The Engineer shall inspect the work in any part, or as a whole, and shall make or request all tests deemed necessary to insure that the work has been completed in accordance with the plans and specifications.

B. The Contractor shall repair or replace, at his expense, any length of pipe, pavement, and any material that is found or tested to be defective or deficient during the work or within one (1) year after the work has been completed and accepted by the Owner.

C. Any unsatisfactory or imperfect work that may be discovered before the final acceptance of the work shall be corrected immediately on the requirement of the Engineer, notwithstanding that it may have been overlooked or approved by the proper inspector. The inspection of the work shall not relieve the Contractor of any of his obligations to perform sound and reliable work as herein described. And, all the work, of whatever kind, which during its progress, and before it is finally accepted may become damaged for any cause, shall be properly taken up or removed so much of it as may be objectionable and be replaced by good and sound work satisfactory to the Engineer.

D. Pipe Tests

1. All pipe shall be tested by the Contractor in the presence of the Engineer before being incorporated into the work. When laid, pipe shall not be covered unless and until inspected by the Engineer and permission granted. The necessary facilities for proper inspection shall be provided by the Contractor when requested by the Engineer.

2. Manufacturer's certificates will be accepted in lieu of tests for materials. If independent laboratory tests are desired by the Engineer, they will be secured by the Contractor, but the Contractor will be reimbursed by the Owner for the actual costs of such tests.

2F-03 Not Used.

2F-04 TESTING OF WATER LINES

A. After placing all harnesting and all valve support concrete, sufficient backfill shall be placed prior to filling the pipe with water and field testing to prevent lifting of the pipe. When local conditions require that the trenches be backfilled immediately after the pipe has been laid, the testing shall be carried out after backfilling has been completed but prior to placement of the permanent surface. At least seven (7) days shall elapse after the 1st valve support or hydrant block has been cast (Type I Portland Cement) prior to testing, unless high early strength concrete (Type III) is used, in which case three (3) days shall elapse.

B. All testing will be performed in accordance with the AWWA C600-82 or current revision.

C. Pressure Test: After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing.

1. Test pressure restrictions. Test pressures shall:

- not be less than 1.25 times the working pressure at the highest point along the test section;
- not exceed pipe or thrust restraint design pressures;
- be of at least 2-hour duration;
- not vary by more than + 5 psi;
- not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants.
- not exceed the rated pressure of the valve.

2. Each valved section of pipe shall be filled with properly disinfected water slowly and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer.

3. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants.

4. All exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings, valves, or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the Engineer.

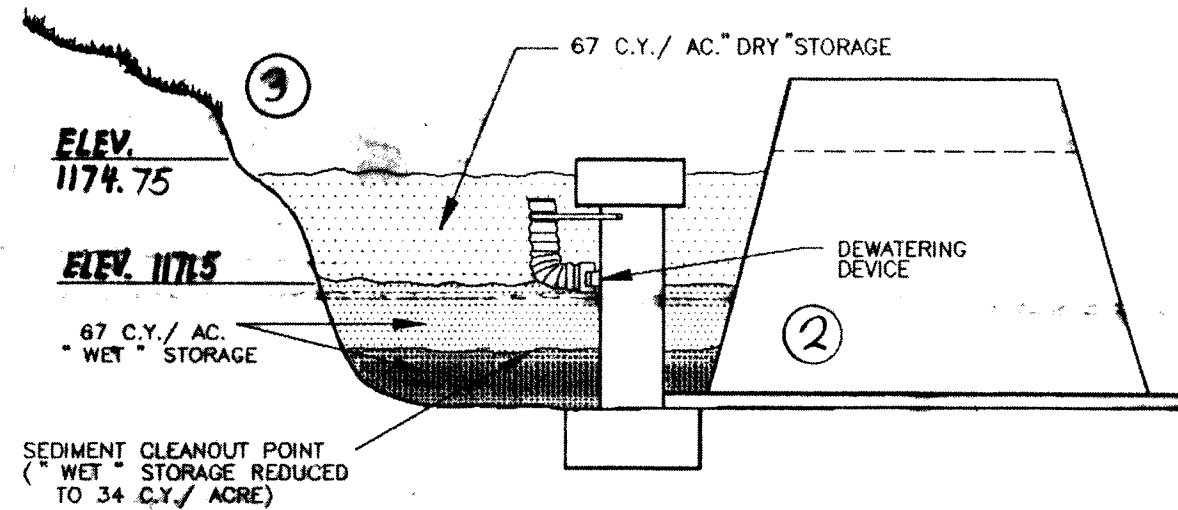
D. A leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SDPIL^2}{33,000}$$

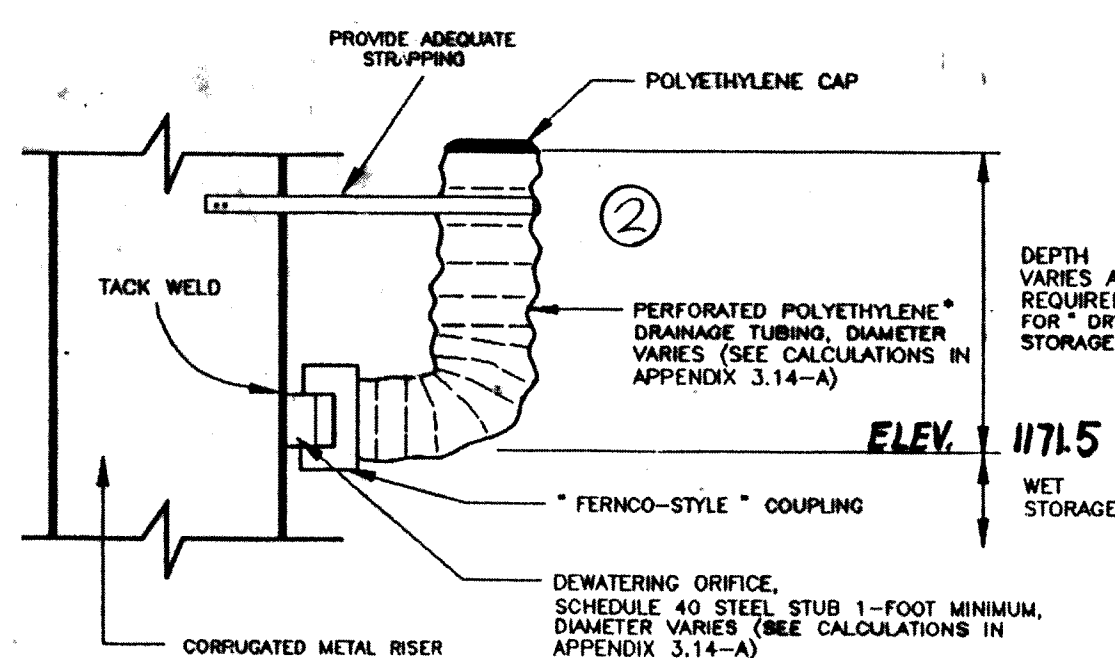
In which L is the allowable leakage, in gallons per hour; S is the length of pipeline tested in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge. When testing against closed metal-sected valves, an additional leakage per enclosed valve of 0.0078 gal/hr/in. of nominal valve size shall be allowed. When hydrants are in the test section, the test shall be made on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than the allowable amount, the Contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance. All visible leaks are to be repaired regardless of the amount of leakage.

②	4-27-93	VDH COMMENTS	HCW	DRM
REVISION	DATE	DESCRIPTION	BY	APP
DESIGNED	RCW	HUNTER'S GREEN- SECTION II GENERAL NOTES BOTETOURT COUNTY, VIRGINIA		
DRAWN	CLD			
CHECKED	DRM			
APPROVED				
SUBMITTED				
L.M.W., P.C.		SCALE: NONE	COMM. NO.	112
Engineering-Surveying		DATE: FEB. 1993	SHEET 3	
1401 2nd Street S.W. Roanoke, Virginia 24016		Phone (703) 345-0675 Fax (703) 342-4156		

MINIMUM STORAGE VOLUME AND SEDIMENT STORAGE

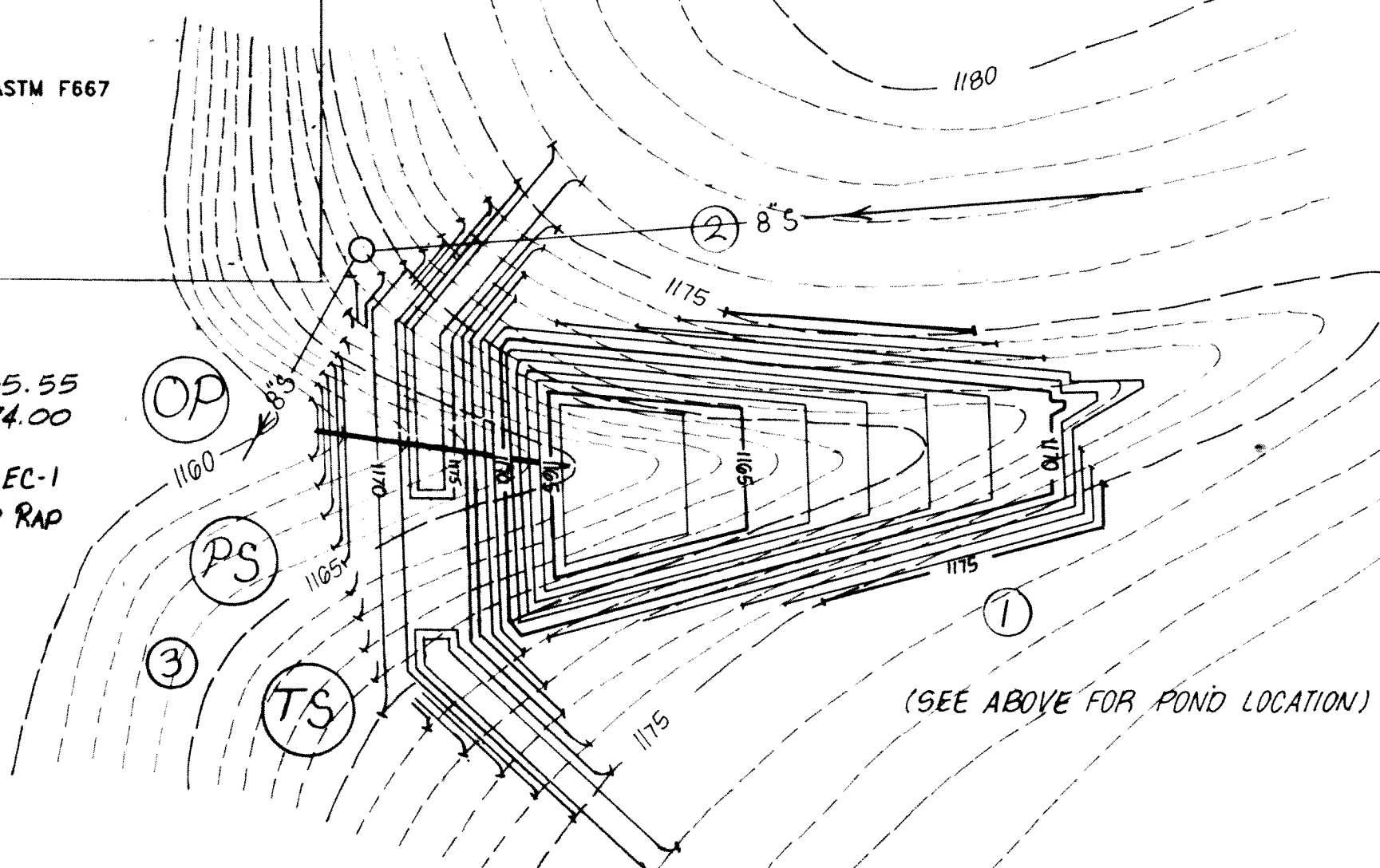


RECOMMENDED DEWATERING SYSTEM FOR SEDIMENT BASINS

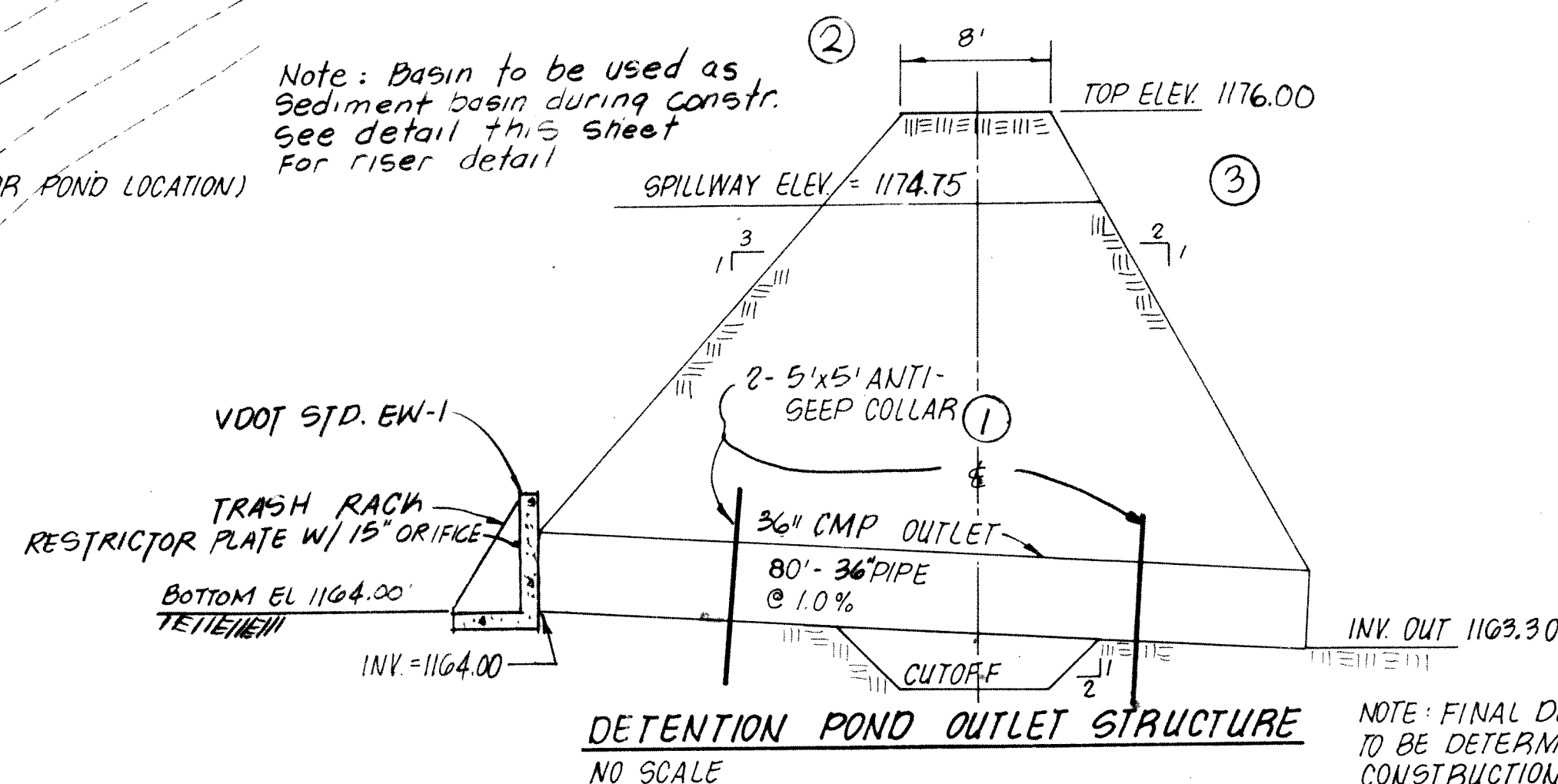


NOTE: WITH CONCRETE RISER, USE PVC SCHEDULE 40 STUB FOR DEWATERING ORIFICE

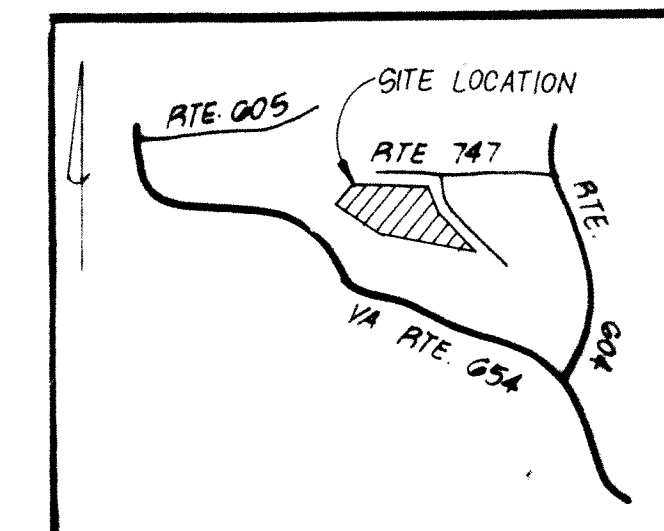
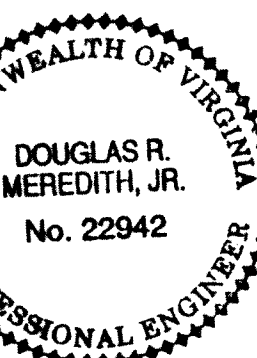
*DRAINAGE TUBING SHALL COMPLY WITH ASTM F667 AND AASHTO M294



DETENTION POND GRADING PLAN
SCALE: 1"=50'

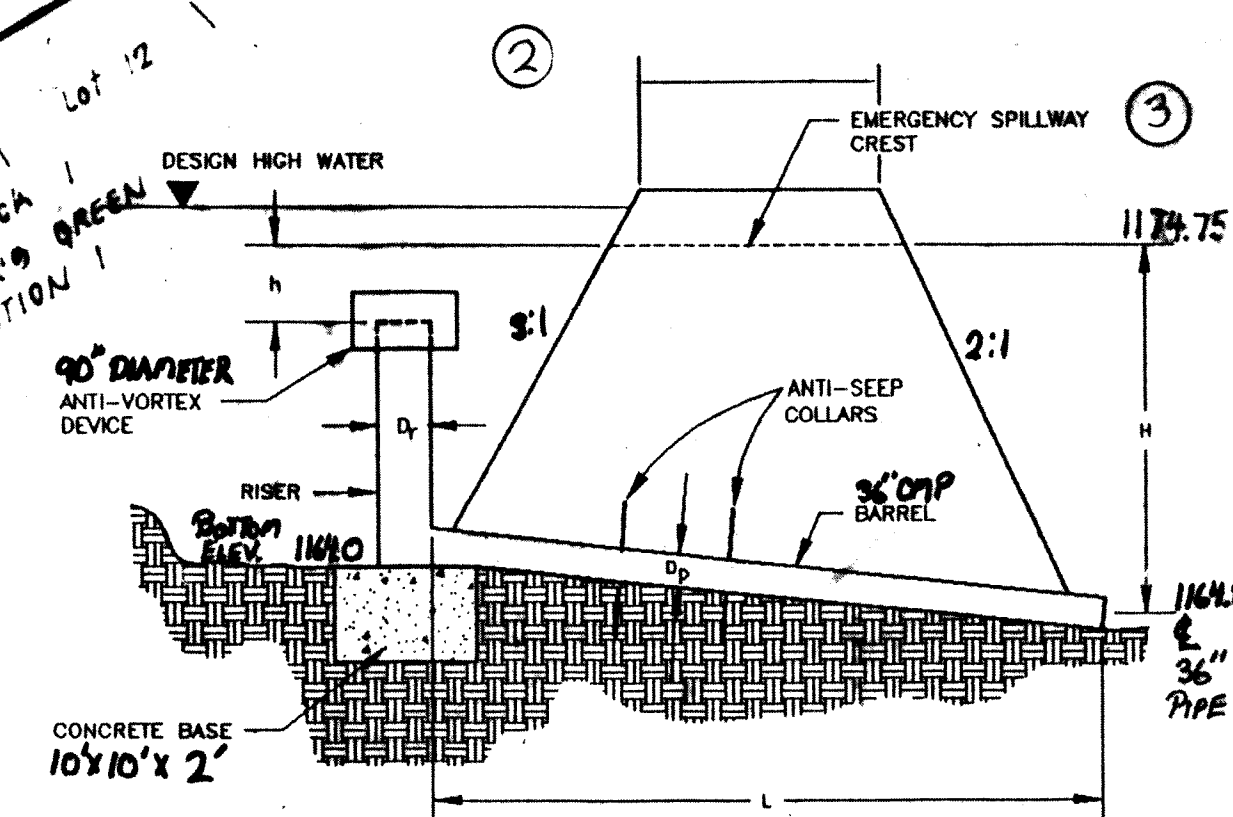


NOTE: FINAL DEPTH OF CUTOFF TO BE DETERMINED DURING CONSTRUCTION.



VICINITY MAP
Not To Scale

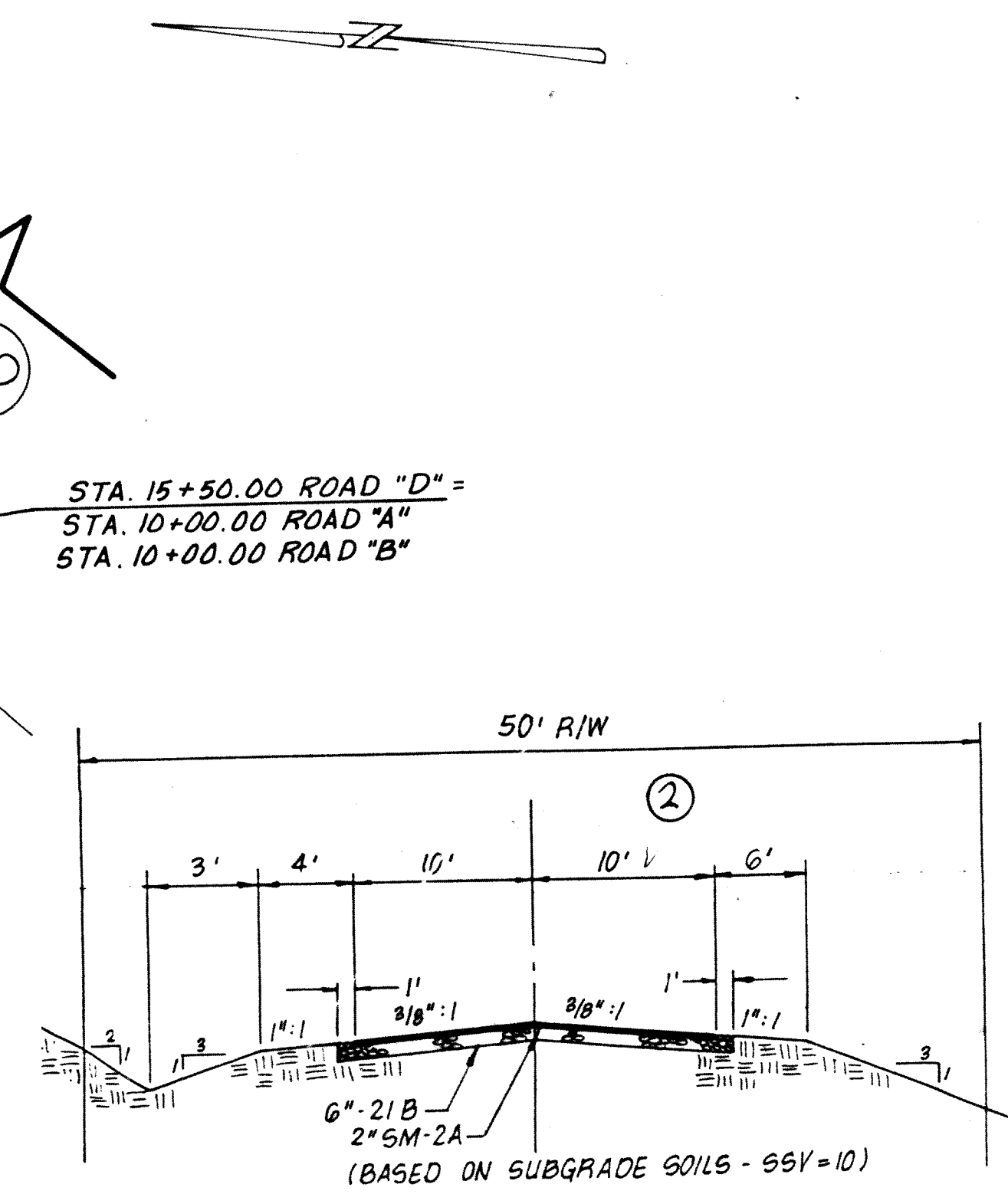
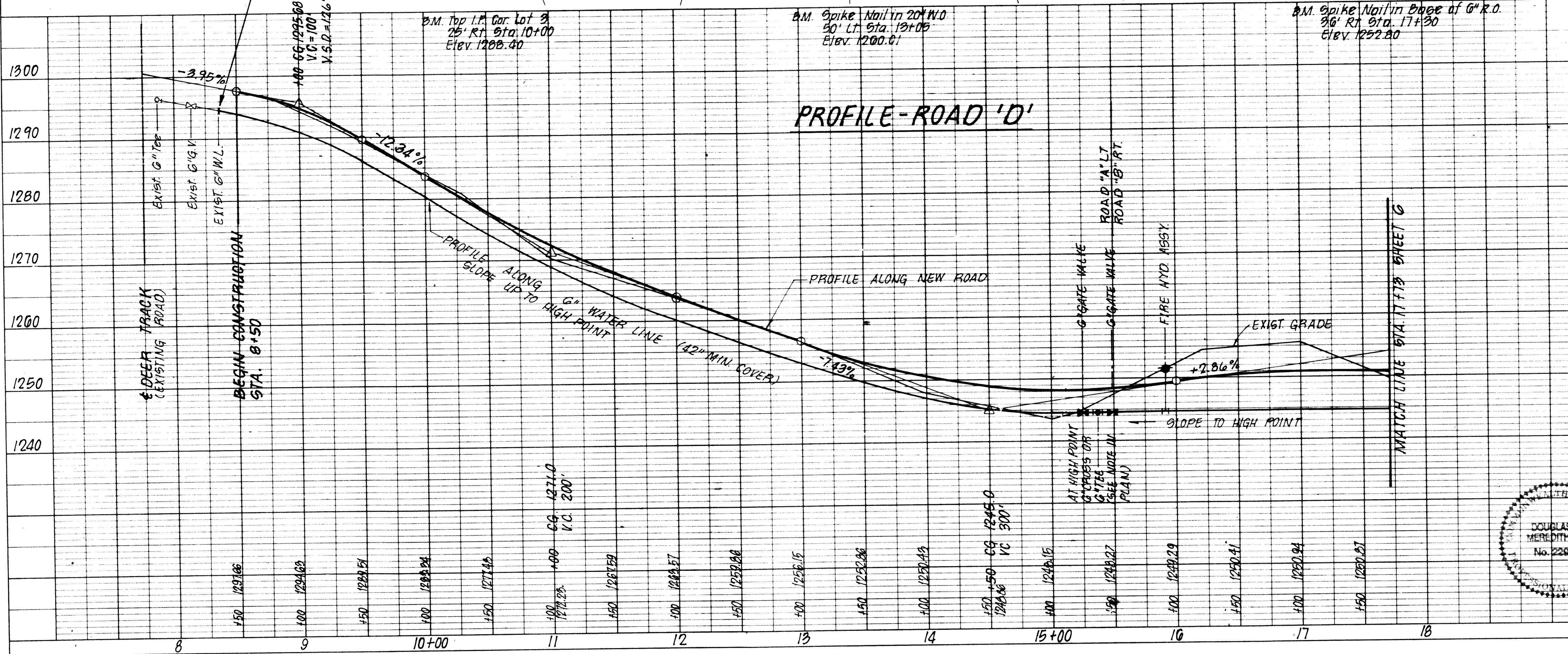
PRINCIPAL SPILLWAY DESIGN



H = HEAD ON PIPE THROUGH EMBANKMENT = 9.9'
h = HEAD OVER RISER CREST = 1'
L = LENGTH OF PIPE THROUGH EMBANKMENT = 80'
D_p = DIAMETER OF PIPE THROUGH EMBANKMENT = 36"
D_r = DIAMETER OF RISER = 60"

DESIGNED	RCW	HUNTER'S GREEN-SECTION II	SCALE: NONE	COMM. NO. 112
DRAWN	CLD	INDEX SHEET	DATE: MARCH 1993	SHEET 4
CHECKED	DRM			
APPROVED				
SUBMITTED				

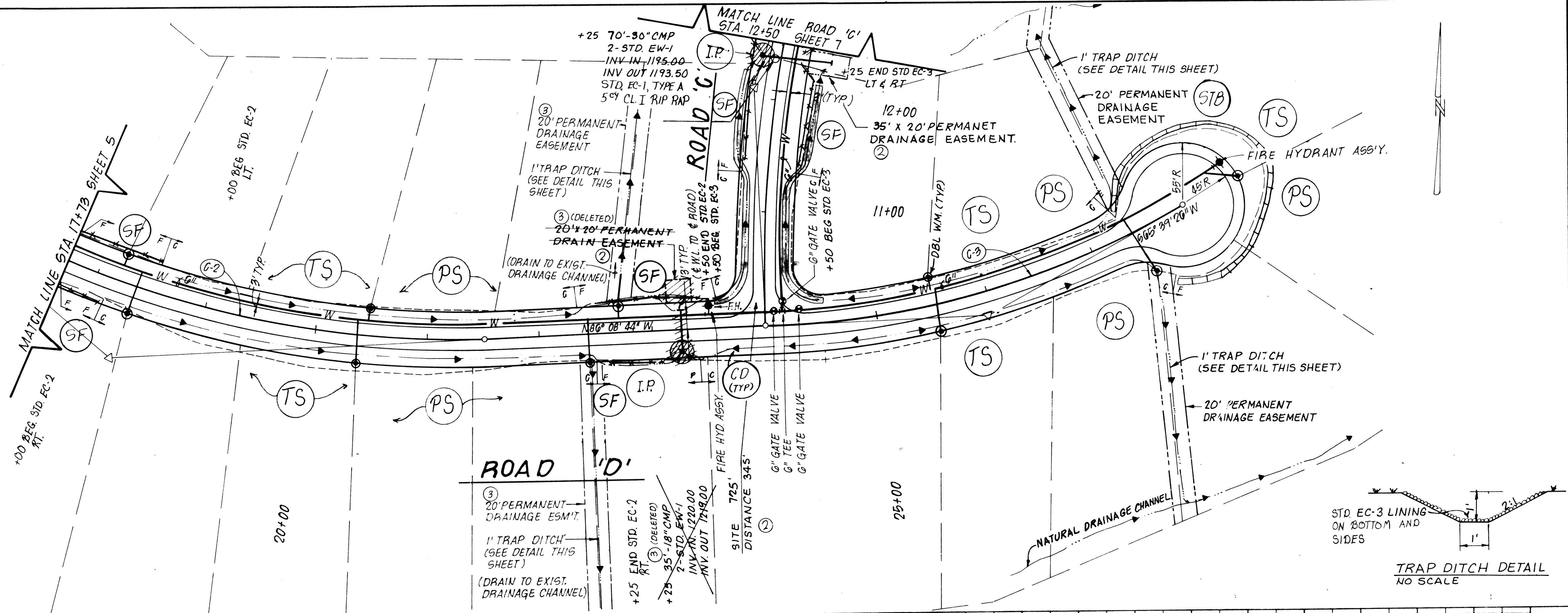
PROFILE	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
	GRADES CHECKED		
	B. M.'s NOTED		



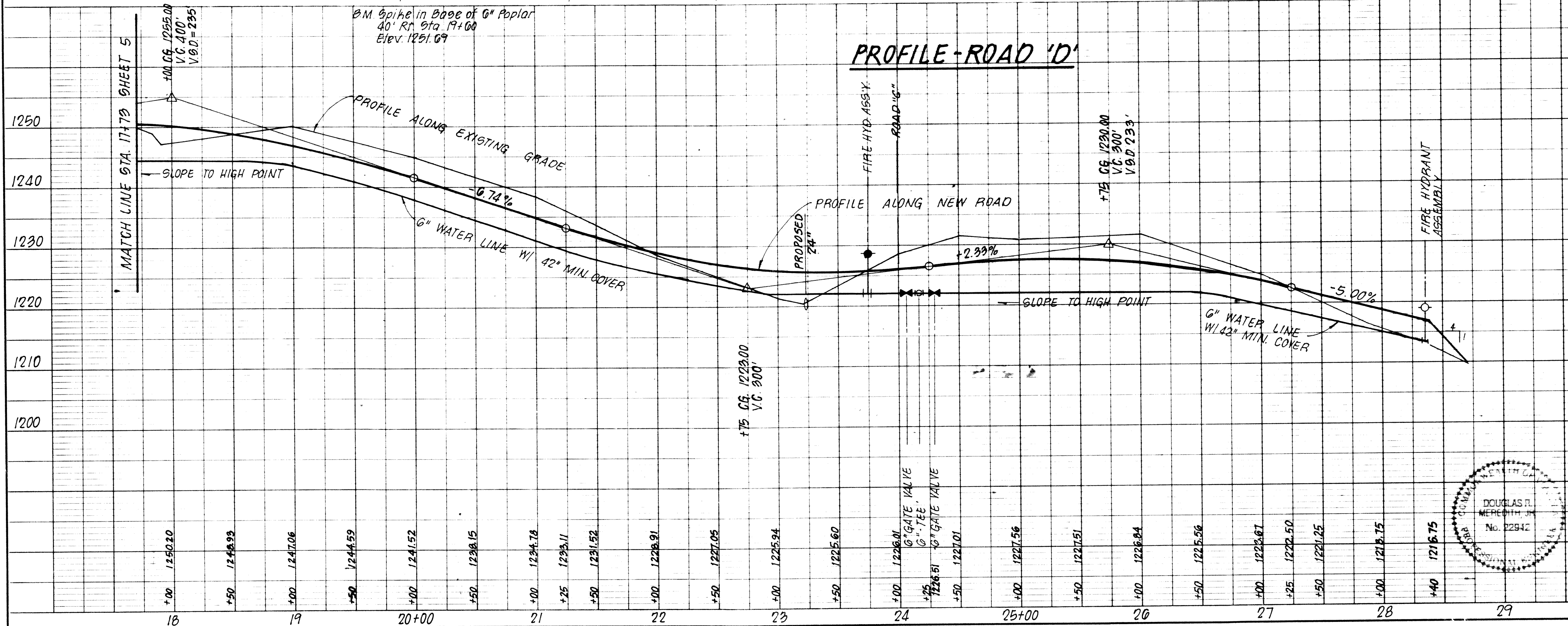
(2)	4-26-93	VDOT COMMENTS	REV	DR
	4-13-93	SCS COMMENTS - ADD SILT FENCE	REV	DR
REVISION	DATE	DESCRIPTION	BY	APP.
DESIGNED	RCW	<p align="center"> HUNTER'S GREEN - SECTION II <u>PLAN AND PROFILE OF</u> <u>ROAD AND UTILITIES</u> BOTETOURT COUNTY, VIRGINIA </p>		
DRAWN	CLD			
CHECKED	DRM			
APPROVED				
SUBMITTED				
L.M.W., PC. Engineering - Surveying 1401 2nd Street S.W. Roanoke, Virginia 24016		SCALE: 1" = 50' Horiz. 10' Vert.		COMM NO. 112
Phone (703) 345-0675 Fax (703) 342-4456		DATE: MAR. 1993	SHEET 5	

C-2
 $\Delta = 43^\circ 10' 04''$ LT
 $D = 663'$
 $R = 863.04'$
 $T = 341.00'$
 $L = 650.08'$
 $PC = 15+00.00$
 $PI = 18+41.00$
 $PT = 21+50.09$

C-3
 $\Delta = 28^\circ 11' 50''$ LT
 $D = 7.28'$
 $R = 787.34'$
 $T = 197.75'$
 $L = 387.48'$
 $PC = 24+00.15$
 $PI = 25+97.90$
 $PT = 27+87.50$



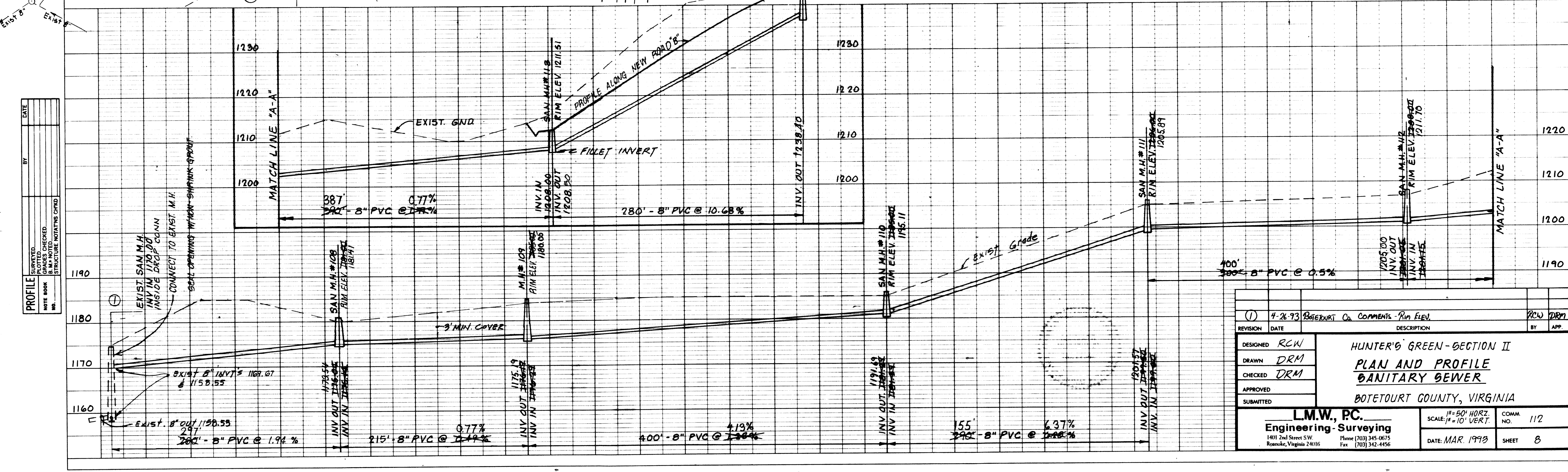
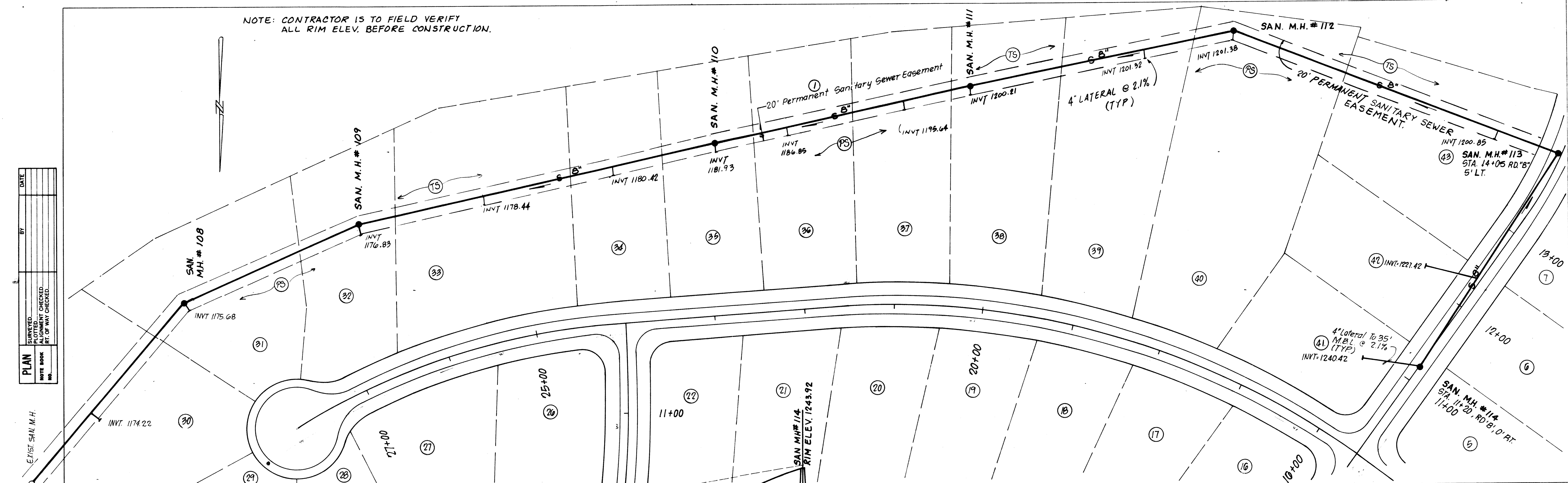
PROFILE - ROAD 'D'



DESIGNED	RCW	ROW	DRM
DRAWN	CLD	ROW	DRM
CHECKED	DRM	ROW	DRM
APPROVED			
SUBMITTED			

HUNTER'S GREEN - SECTION II PLAN AND PROFILE OF ROAD AND UTILITIES BOTETOURT COUNTY, VIRGINIA	
L.M.W., P.C. Engineering - Surveying 1401 2nd Street SW Roanoke, Virginia 24016 Phone (703) 345-0635 Fax (703) 342-4456	SCALE: 1" = 50' Horiz. 10' Vert. DATE: MARCH 1993 SHEET: 6

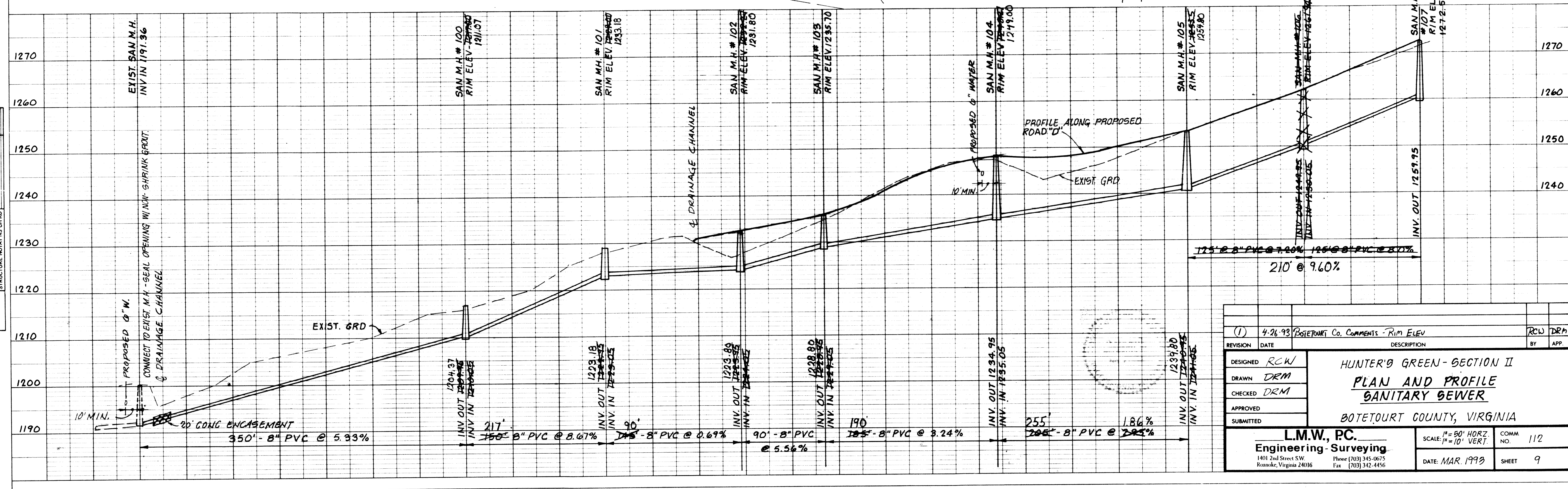
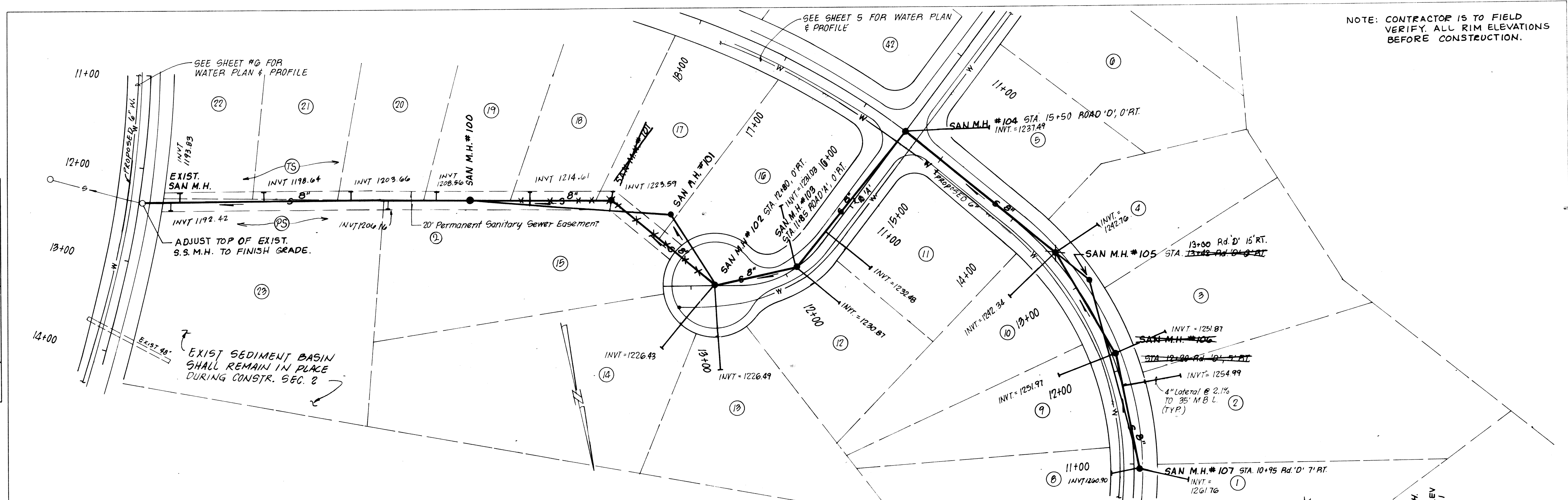
NOTE: CONTRACTOR IS TO FIELD VERIFY ALL RIM ELEV. BEFORE CONSTRUCTION.



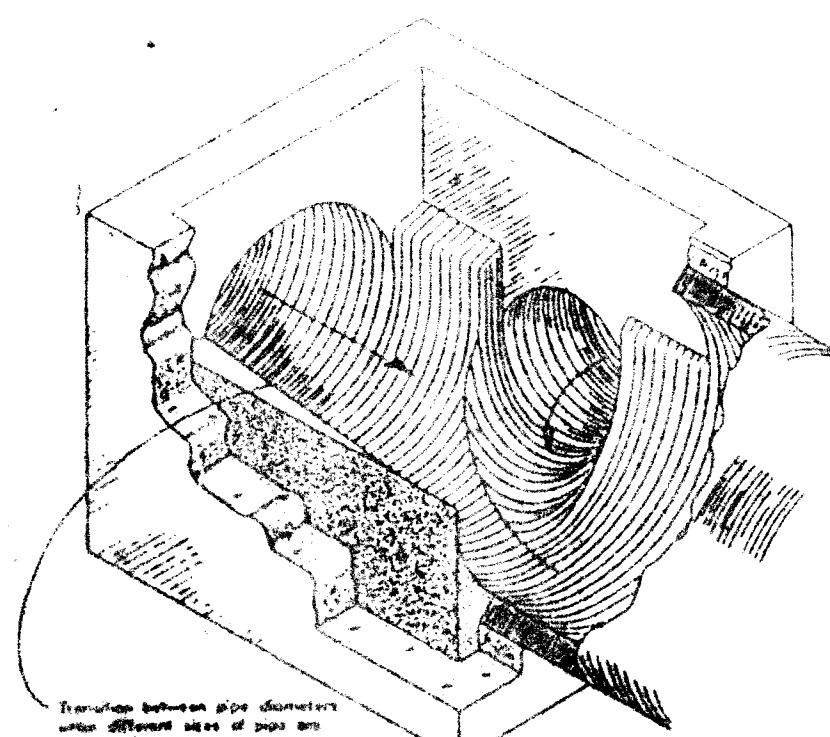
DESIGNED	RCW	DATE	4-26-93	REVISION	1	BY	RCW	APP.	DRM
DRAWN	DRM	HUNTER'S GREEN - SECTION II							
CHECKED	DRM	PLAN AND PROFILE							
APPROVED		SANITARY SEWER							
SUBMITTED		BOTETOURT COUNTY, VIRGINIA							
L.M.W., P.C.		1401 2nd Street SW		Phone (703) 345-0675		Fax (703) 342-4456		COMM. NO. 112	
Engineer - Surveying		Roanoke, Virginia 24016		DATE: MAR. 1993		SHEET 8			

PLAN	DATE	BY
SURVEYED		
NOTED		
ALIGNED		
CHECKED		
RT. OF WAY CHECKED		
NO.		

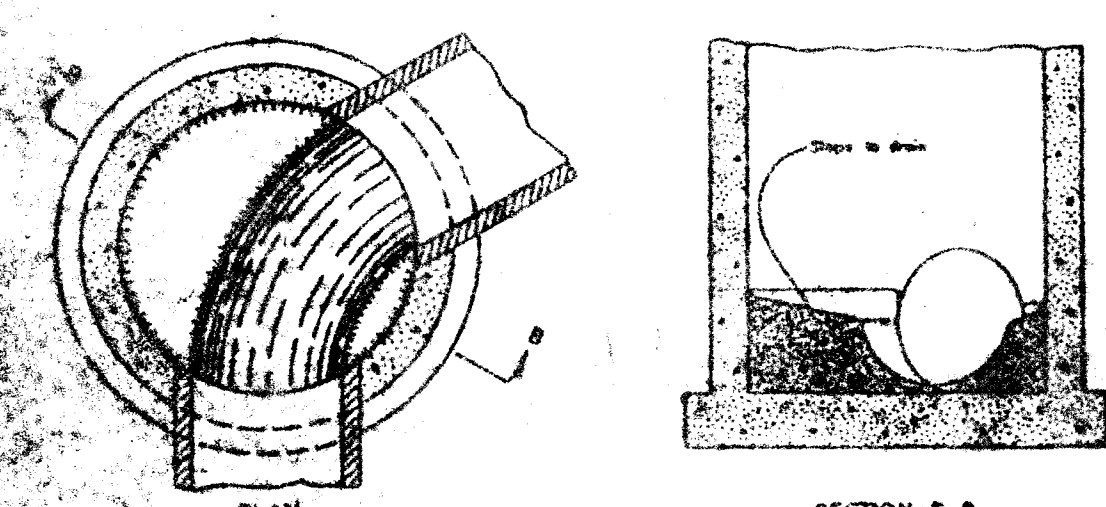
PROFILE	DATE	BY
SURVEYED		
NOTED		
GRADED		
CHECKED		
STRUCTURE NOTATIONS CHKD		
NO.		



(1) 4-26-93 BOTETOURT Co. COMMENTS - RIM ELEV		RCW	DRM
DESIGNED	RCW		
DRAWN	DRM		
CHECKED	DRM		
APPROVED			
SUBMITTED			
HUNTER'S GREEN - SECTION II PLAN AND PROFILE SANITARY SEWER BOTETOURT COUNTY, VIRGINIA			
L.M.W., PC. Engineering - Surveying 1401 2nd Street S.W. Roanoke, Virginia 24016 Phone (703) 345-0675 Fax (703) 342-4456		SCALE: 1" = 50' HORIZ. 1" = 10' VERT. DATE: MAR. 1993	COMM. NO. 112 SHEET 9



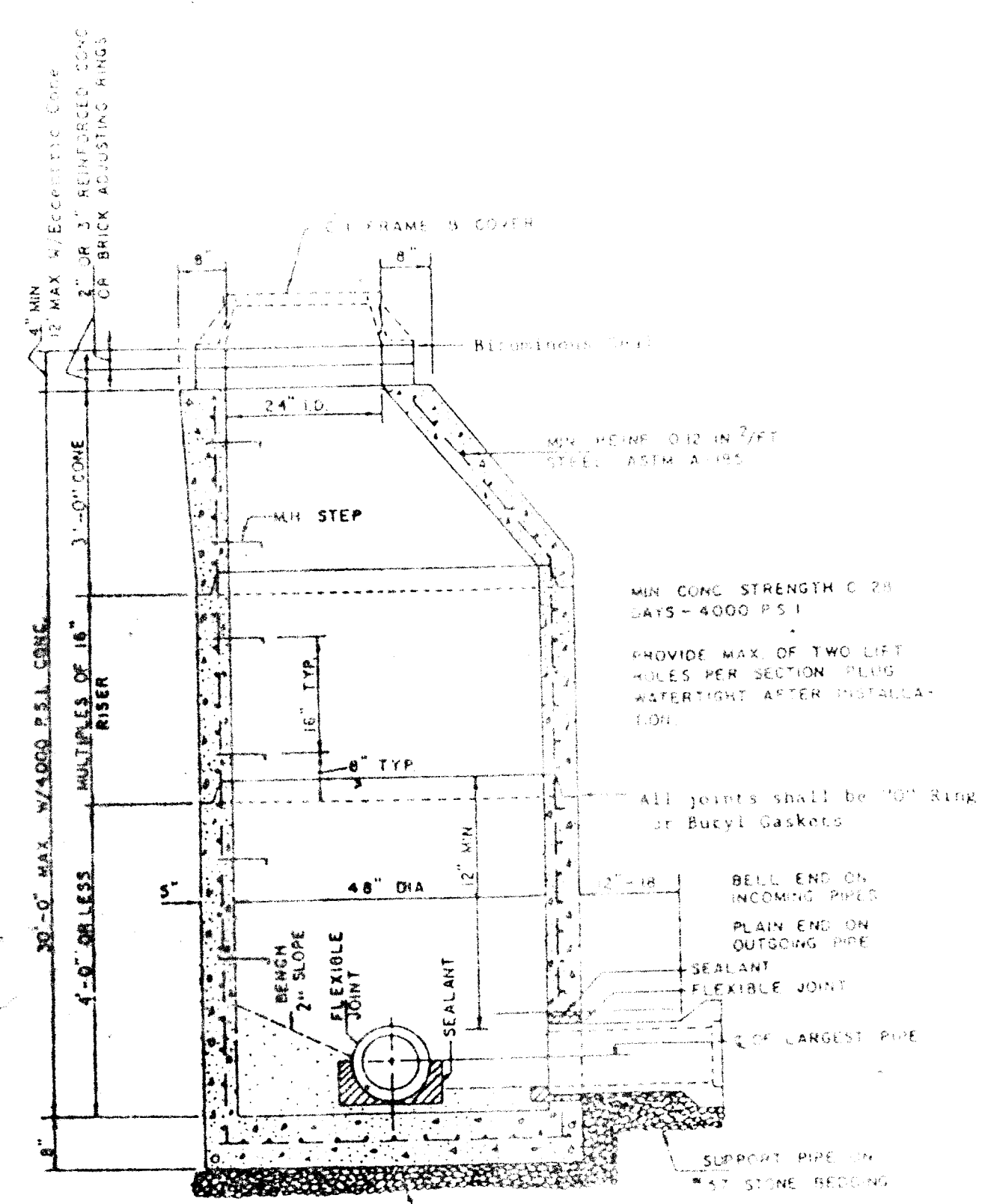
METHOD OF TREATMENT IN MANHOLES



INVERT SHAPING DETAIL
NO SCALE

The invert shaping as detailed herein is to consist of a Portland Cement Concrete or Class A1 or Class C1, except that 25% of coarse aggregate may be up to 3/4" in diameter and consist of stone, broken brick, broken concrete, or broken concrete block. The surface shall be left smooth by means of hand troweling. None of the coarse aggregate shall remain exposed.

Details of invert shaping as shown herein are for example purposes only. Each manhole is to be shaped individually to best fit the particular inlet and outlet configuration and flow lines.

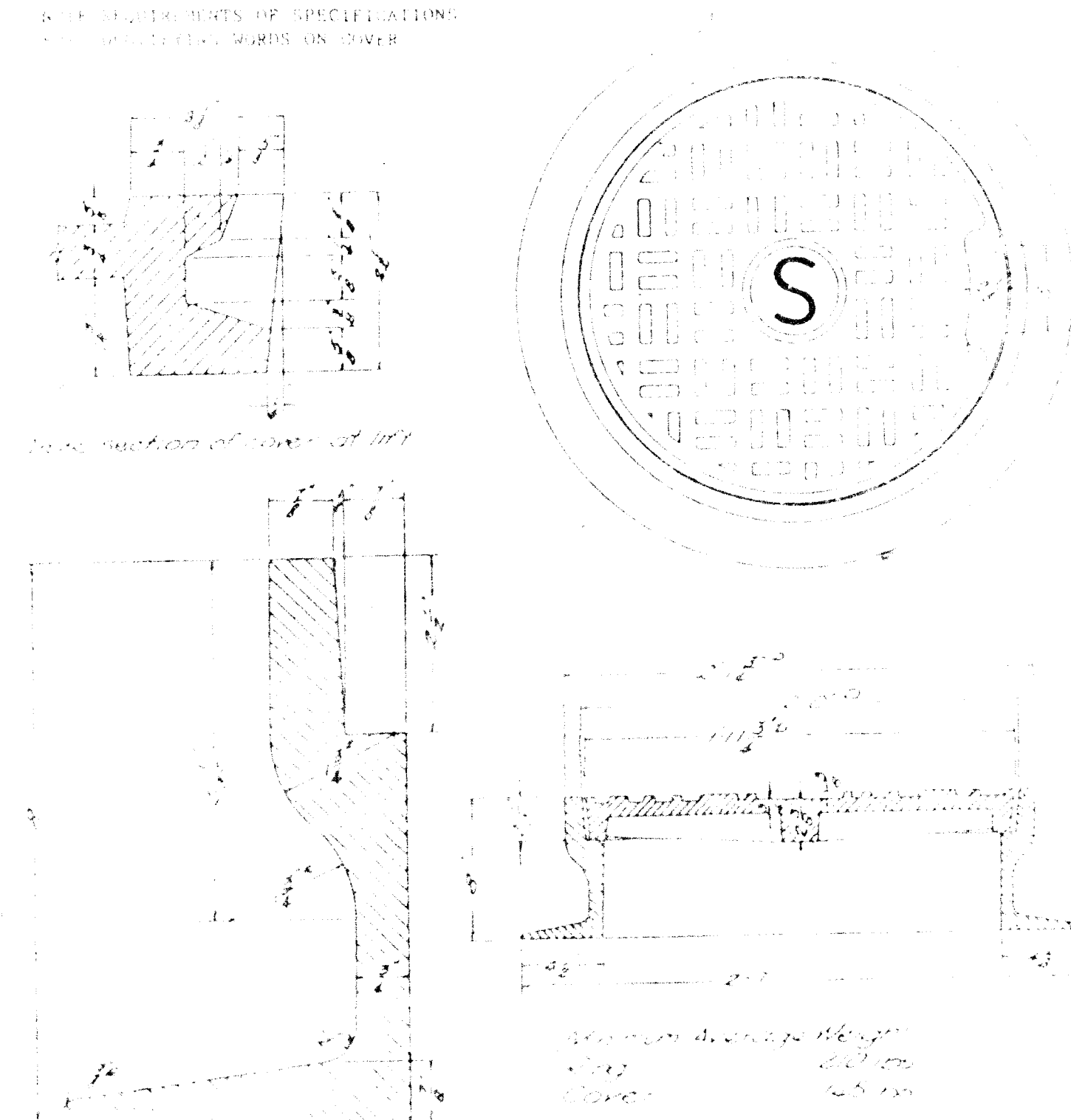


STANDARD PRECAST MANHOLE
NO SCALE

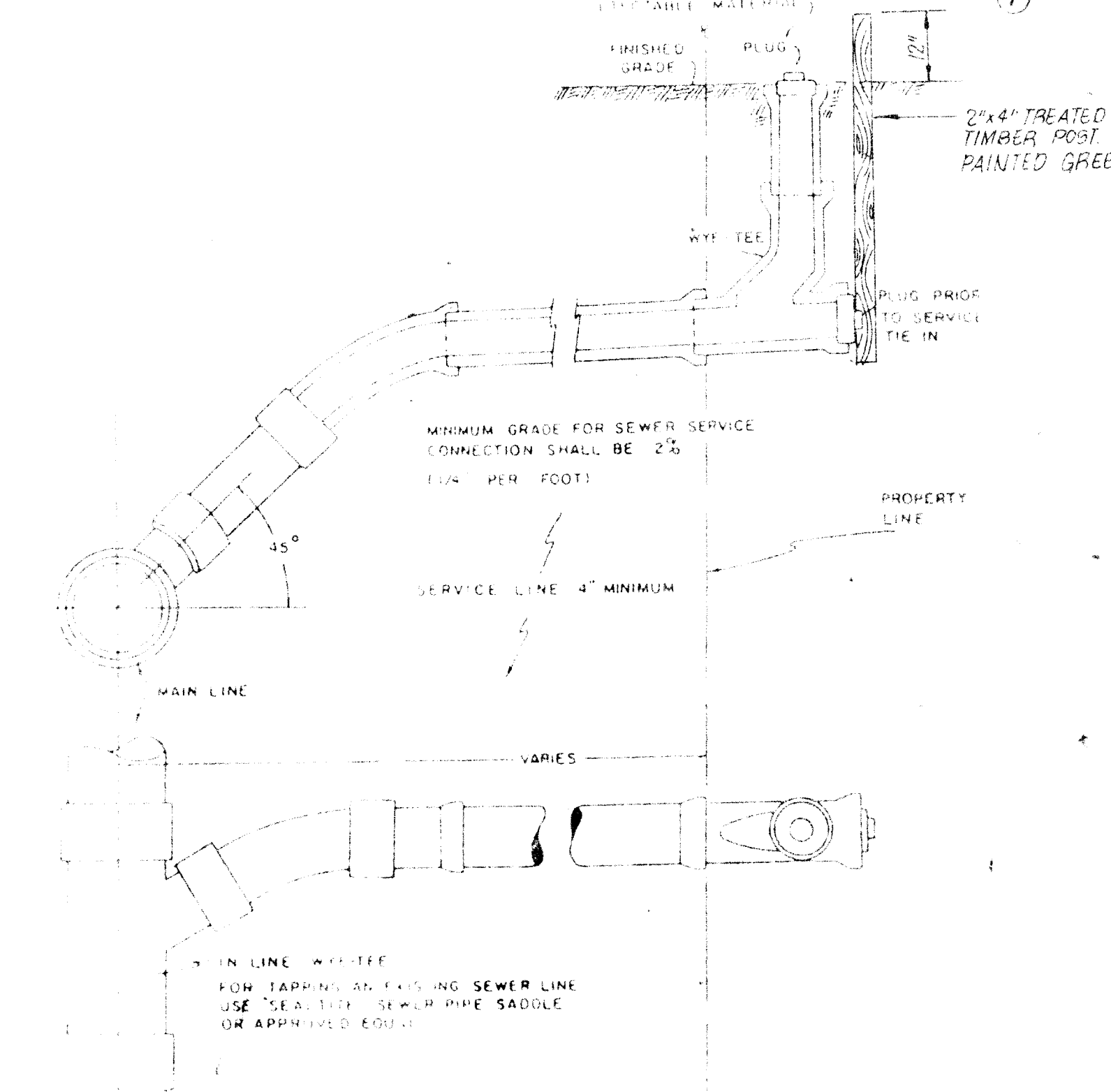
NOTE: BENCH MAY BE CONC OR BRICK AND MORTAR.

MANHOLE CONSTRUCTION SHALL CONFORM TO ASTM SPEC. C-478.

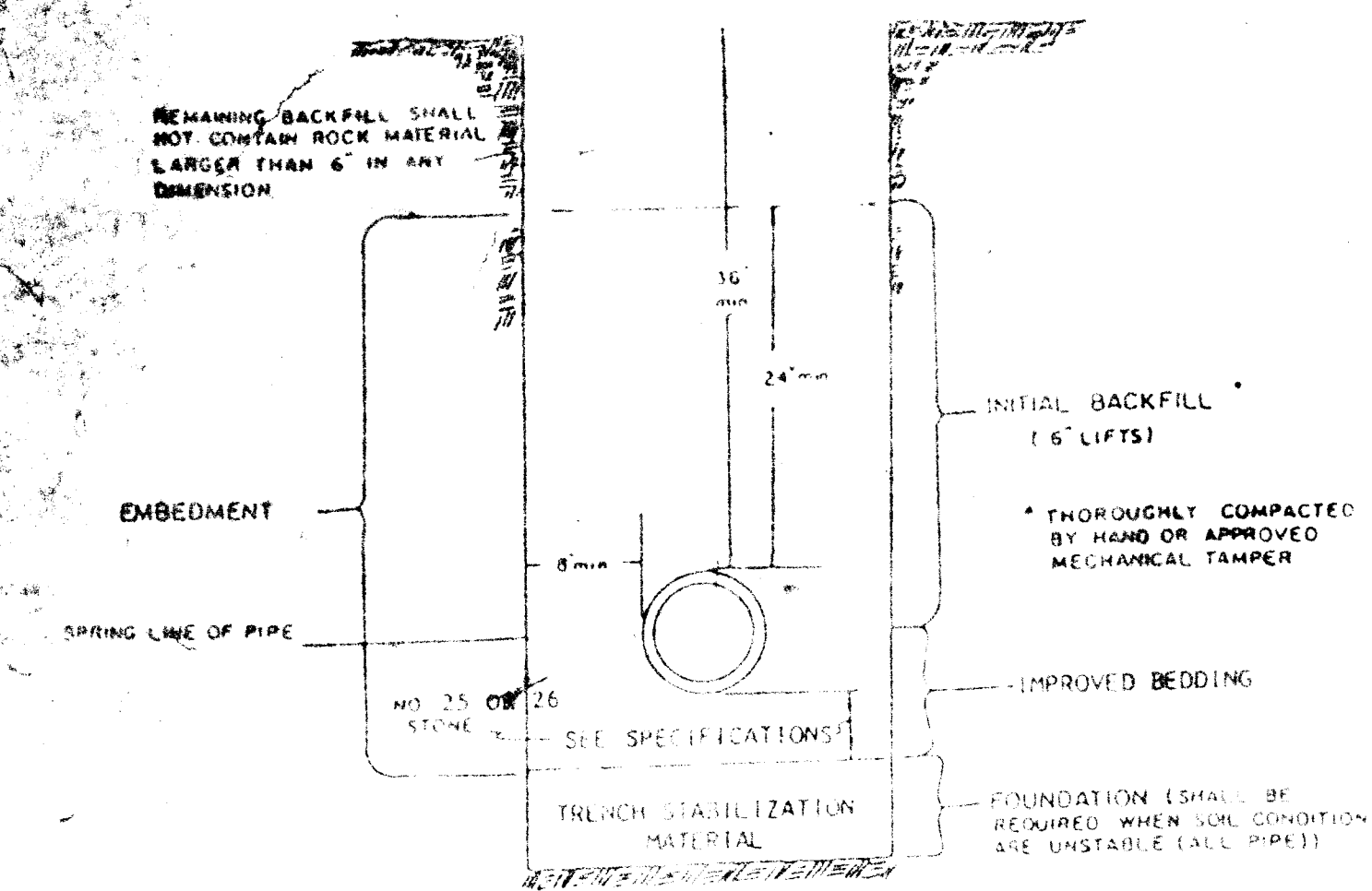
WHERE STOPS OR ANCHORS ARE REQUIRED FOR FUTURE CONNECTIONS, THEY SHALL BE SO SHOWN.



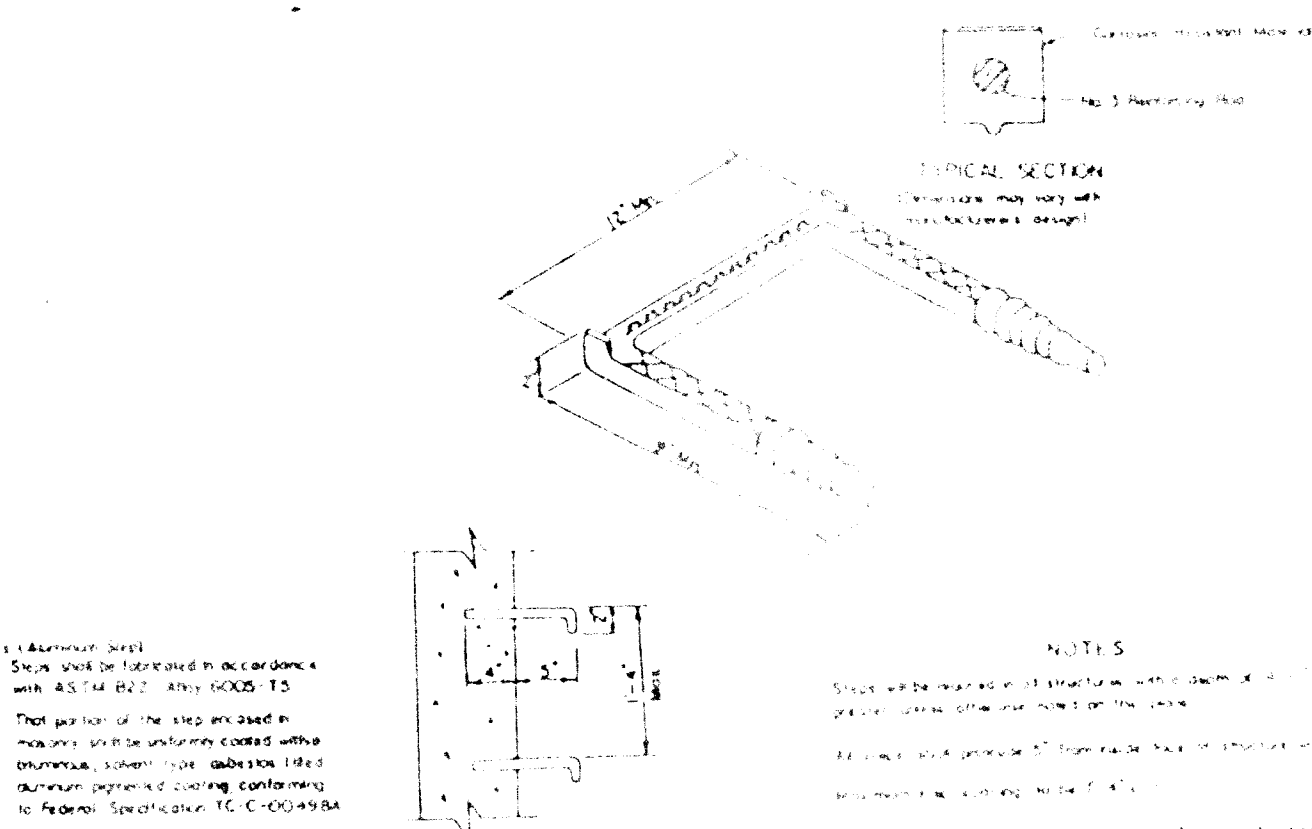
MANHOLE FRAME & COVER DETAIL
NO SCALE



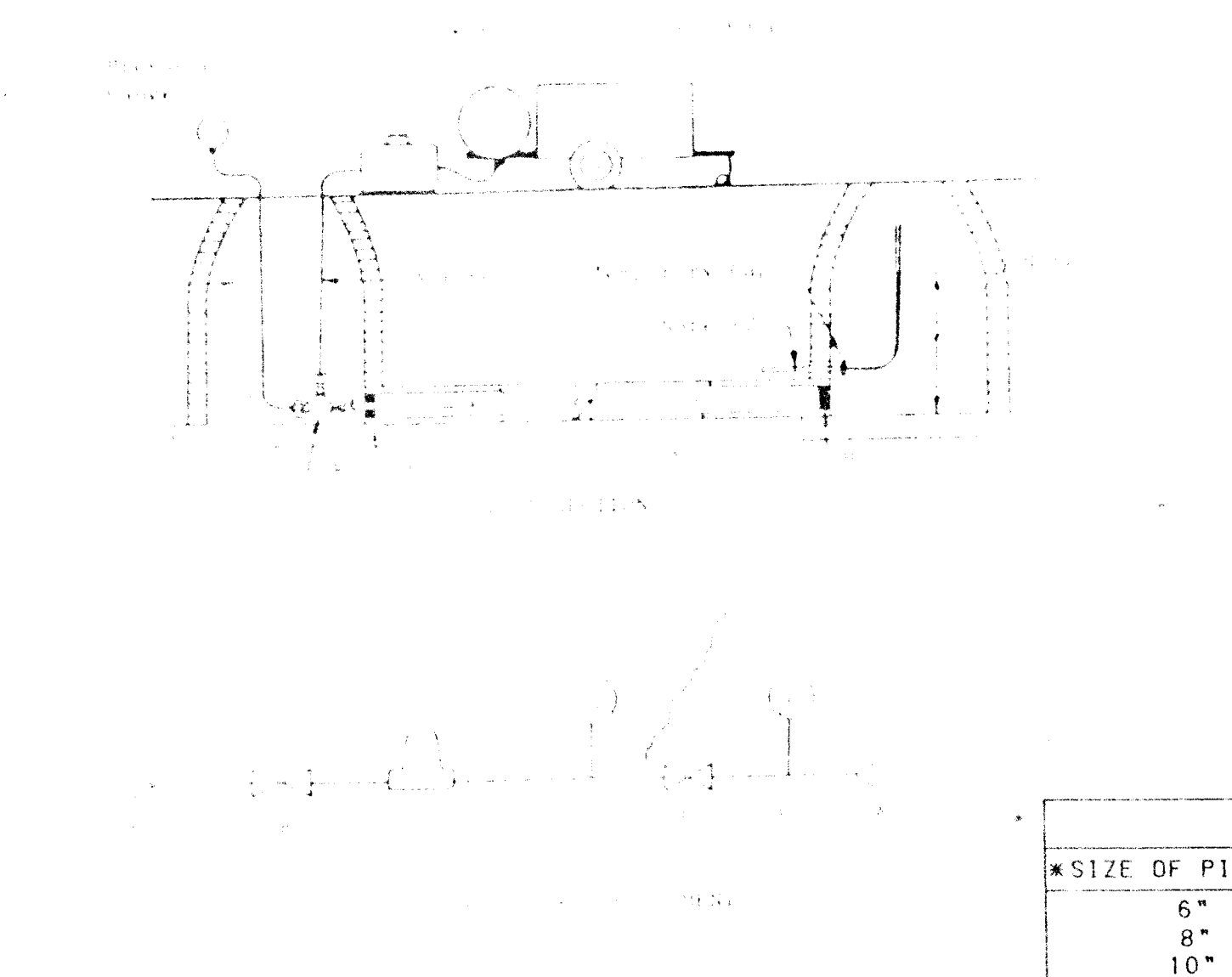
SANITARY SEWER SERVICE CONNECTION
NO SCALE



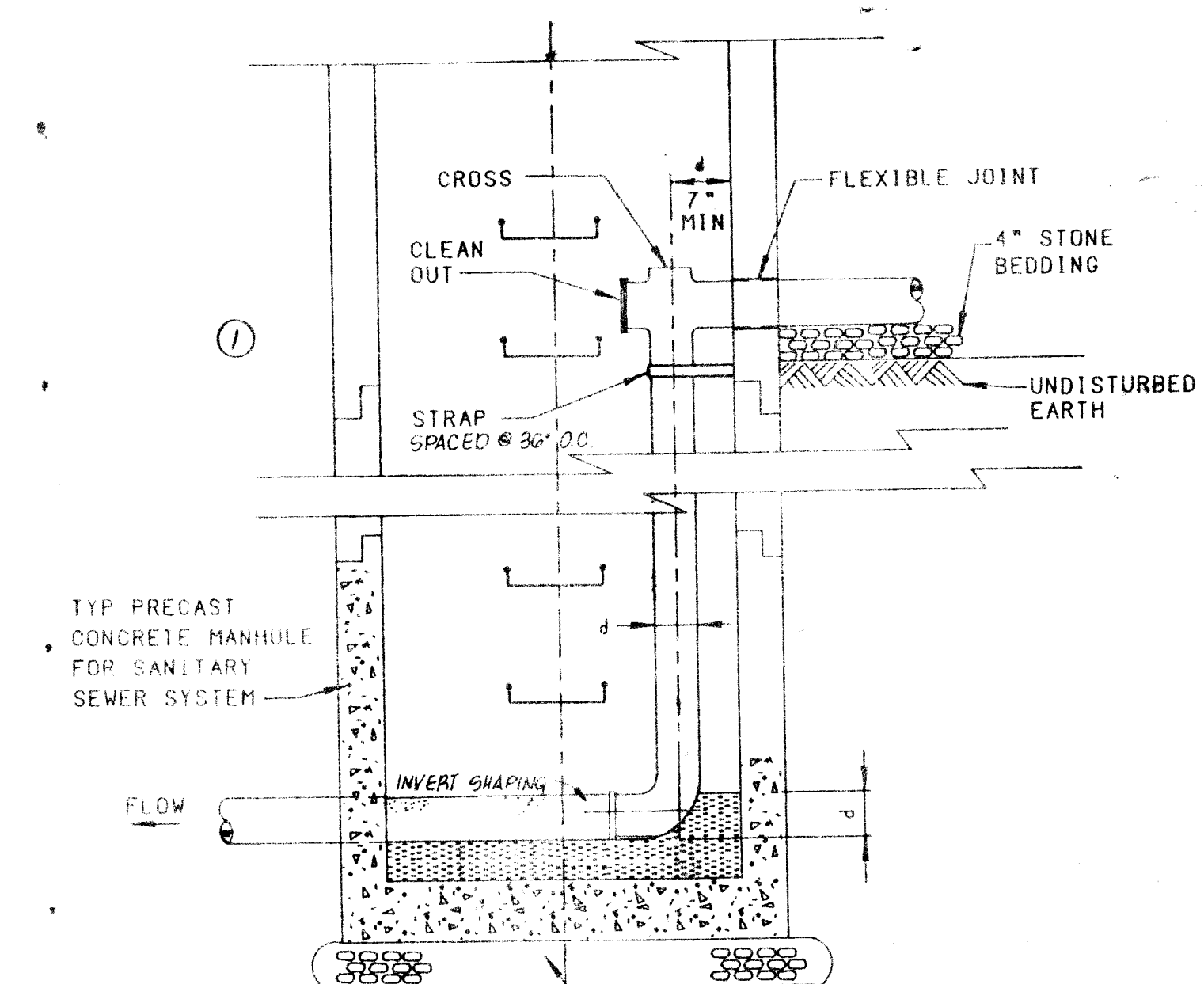
GRAVITY TRENCH DETAIL
NO SCALE



MANHOLE STEP DETAIL
NO SCALE



AIR TEST SKETCH
NO SCALE

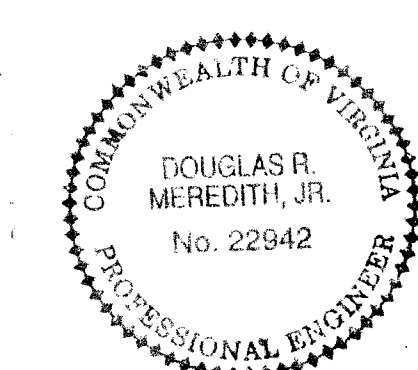


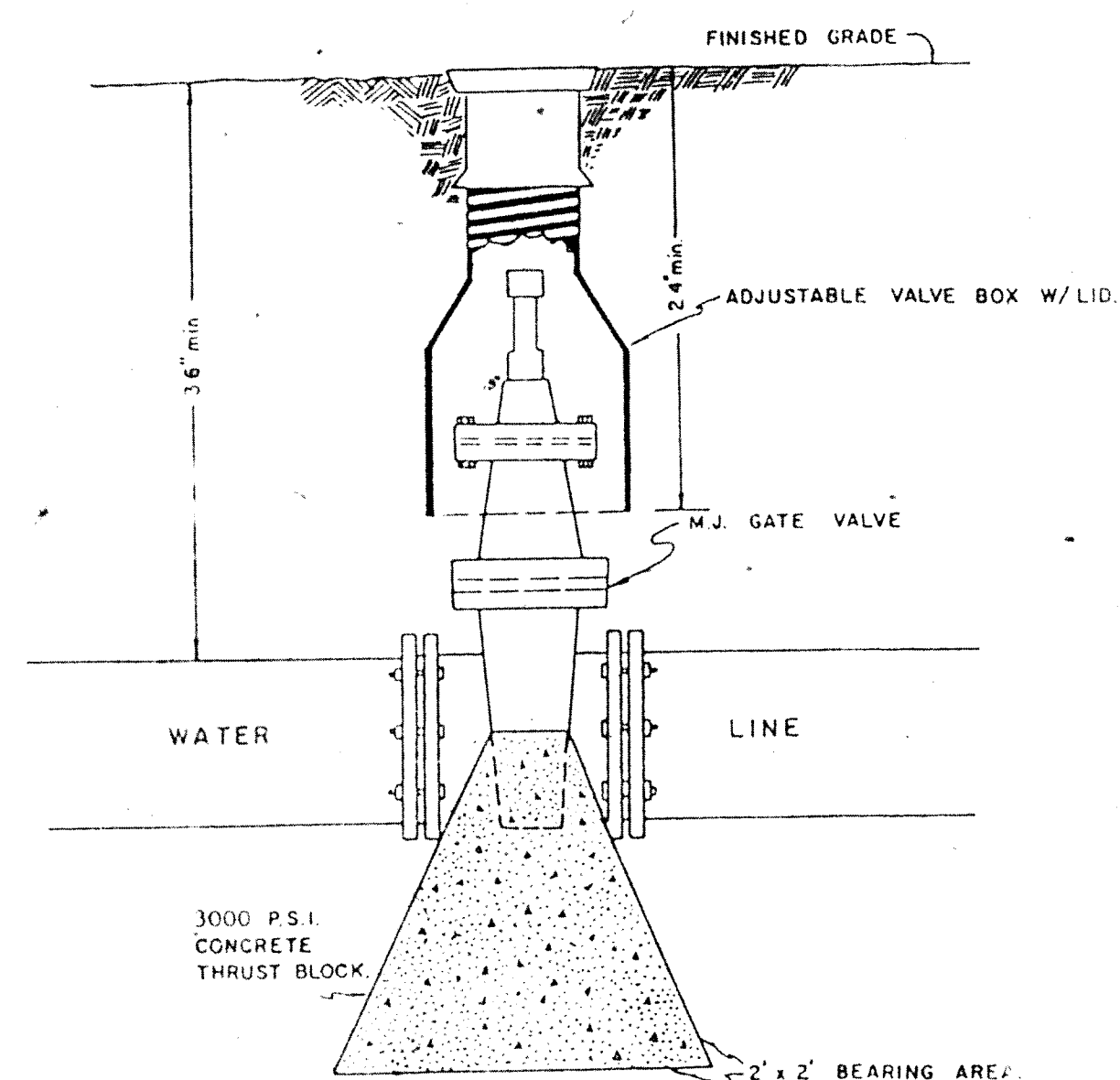
DROP CONNECTIONS		
SIZE OF PIPE (4)	MIN. MH. DIA.	MIN. DROP
6"	5'	2'-0"
8"	5'	2'-2"
10"	5'	2'-4"
12"	6'	2'-6"

* NOTE: (SEE SPECIFICATIONS) FOR PIPES GREATER THAN 12" IN DIAMETER, AN EXTERIOR DROP CONNECTION IS REQUIRED.

INSIDE DROP CONNECTION - NO SCALE

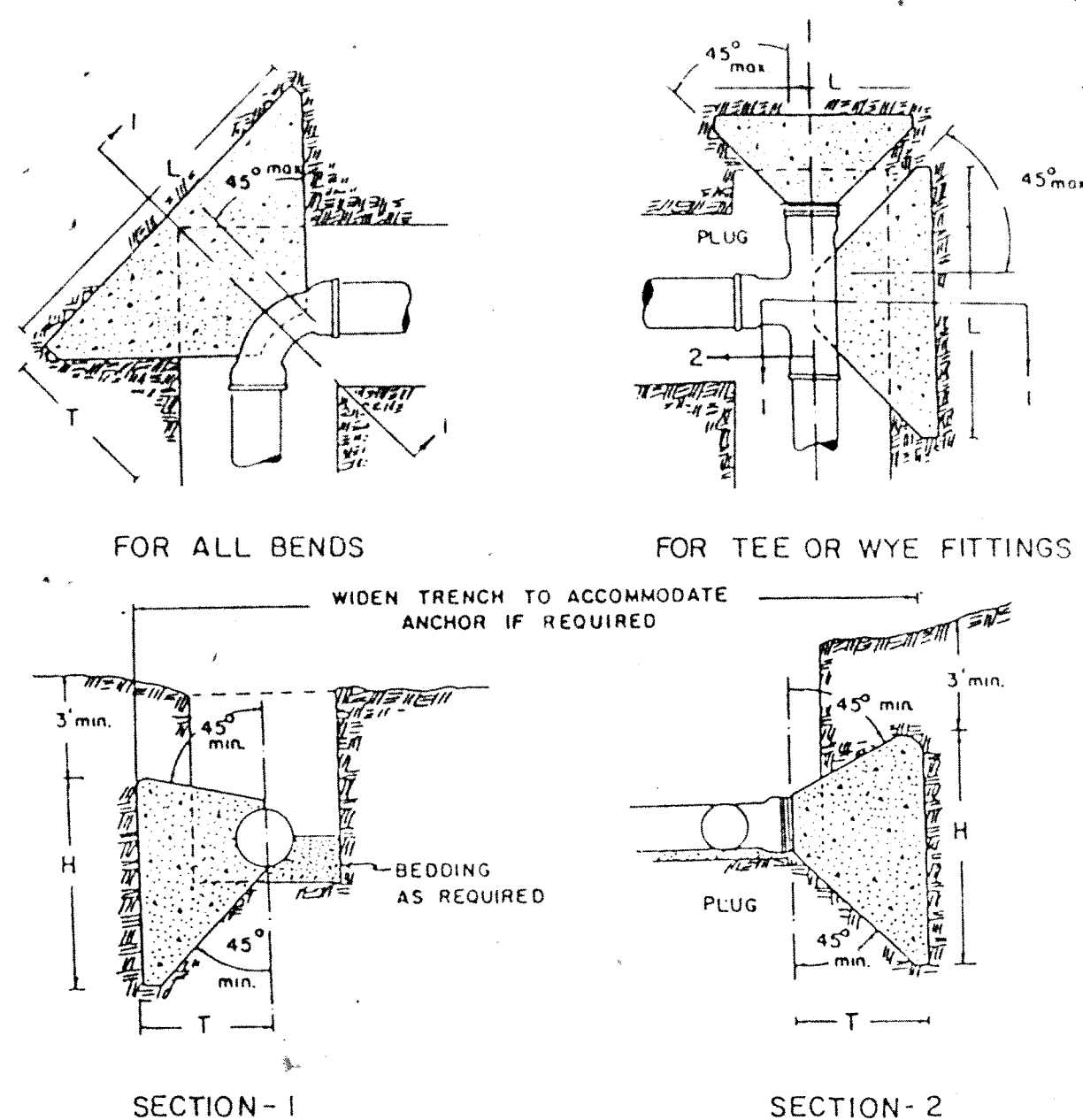
REVISION		DATE	DESCRIPTION	BY	APP.
①		4/26/93	FOR THE 100 COMPENS	RCW	DRM
DESIGNED		RCW			
DRAWN		CLD			
CHECKED		DRM			
APPROVED					
SUBMITTED					
HUNTER'S GREEN-SECTION II					
SANITARY SEWER DETAILS					
BOTETOURT COUNTY, VIRGINIA					
L.M.W., P.C.		SCALE NOTED		COMM NO.	112
Engineering Surveying		DATE MARCH 1993		SHEET	11
Phone (703) 515-1875		1401 2nd Street SW		Roanoke, Virginia 24016	
Fax (703) 515-4456					





NOTE: IN REMOTE AREAS, VALVE BOXES SHALL EXTEND SIX (6) INCHES ABOVE GRADE.

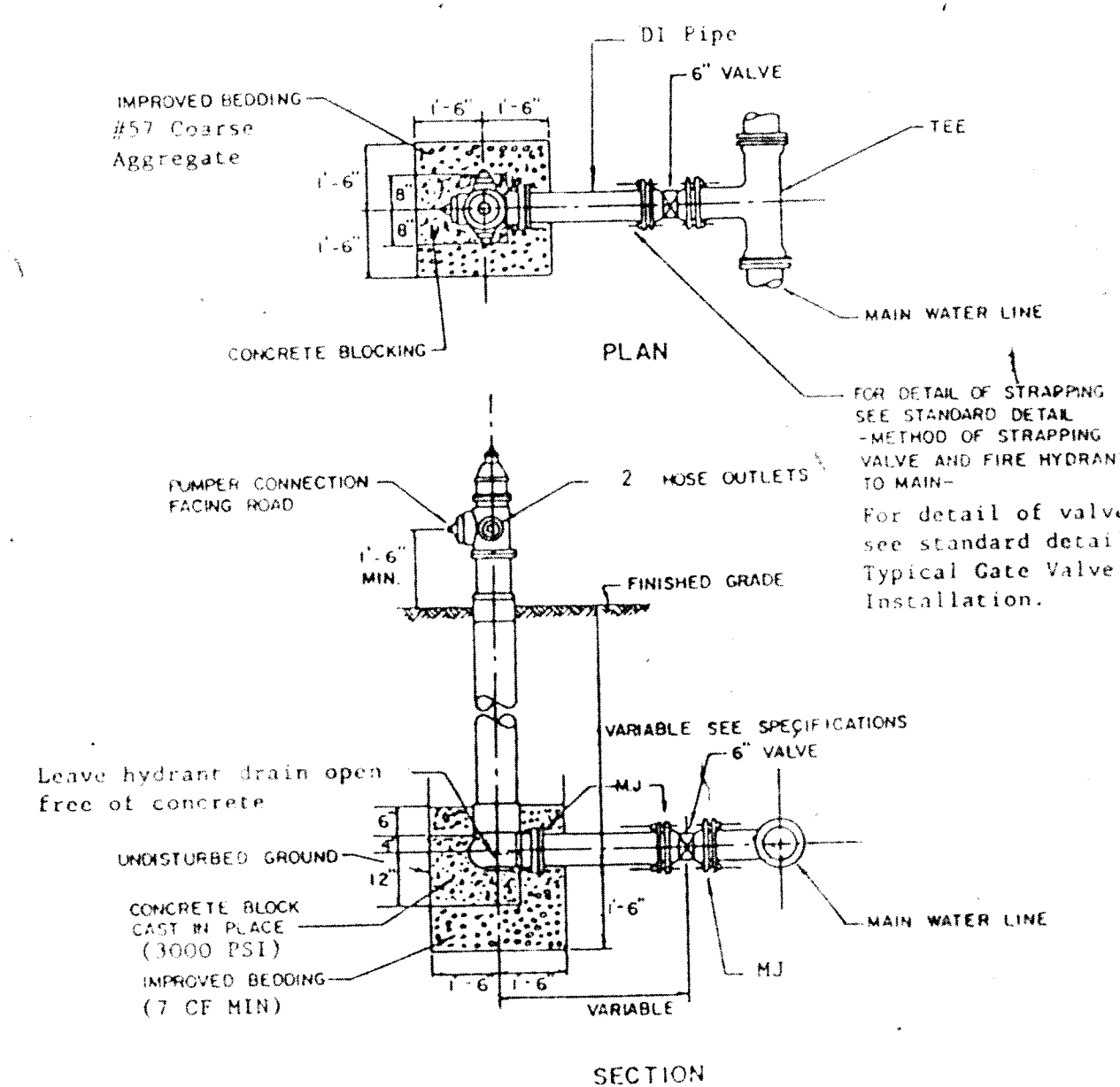
TYPICAL GATE VALVE
NO SCALE



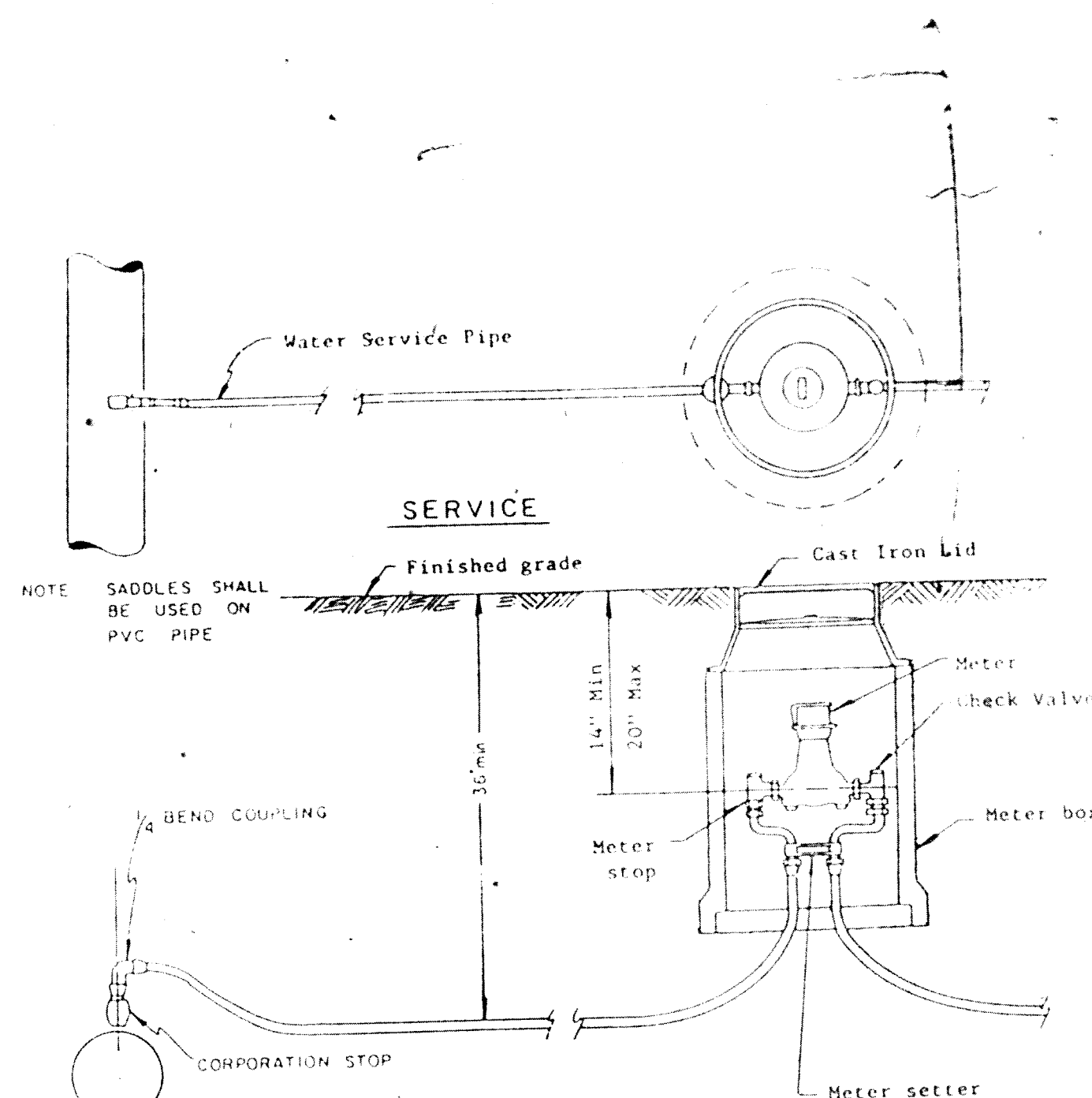
PIPE SIZE	DEGREE OF BEND	BEND DIMENSIONS (FEET)			VOL. CU. YD.	TEE AND PLUGS (FEET)			VOL. CU. YD.
		L	H	T		L	H	T	
4" & 6"	90	2.50	2.50	3.00	0.74	2.00	2.25	2.50	0.15
	45	1.50	1.50	1.80	0.15				
	22 1/2	1.00	1.00	1.20	0.10				
8"	90	2.66	2.66	3.20	0.80	3.16	2.91	2.66	0.32
	45	1.66	1.66	2.00	0.26				
	22 1/2	1.11	1.11	1.33	0.17				
10" & 12"	90	2.83	2.83	3.40	0.87	3.83	4.00	2.83	0.52
	45	1.83	1.83	2.20	0.28				
	22 1/2	1.22	1.22	1.48	0.18				

1. THRUST BLOCKS ARE REQUIRED WHENEVER THE PIPELINE: CHANGES DIRECTION; CHANGES SIZE; DEAD ENDS AND AT VALVES.
2. USE 3000 P.S.I. CONCRETE.
3. NO CONCRETE SHALL BE POURED ON ANY PART OF THE JOINT.

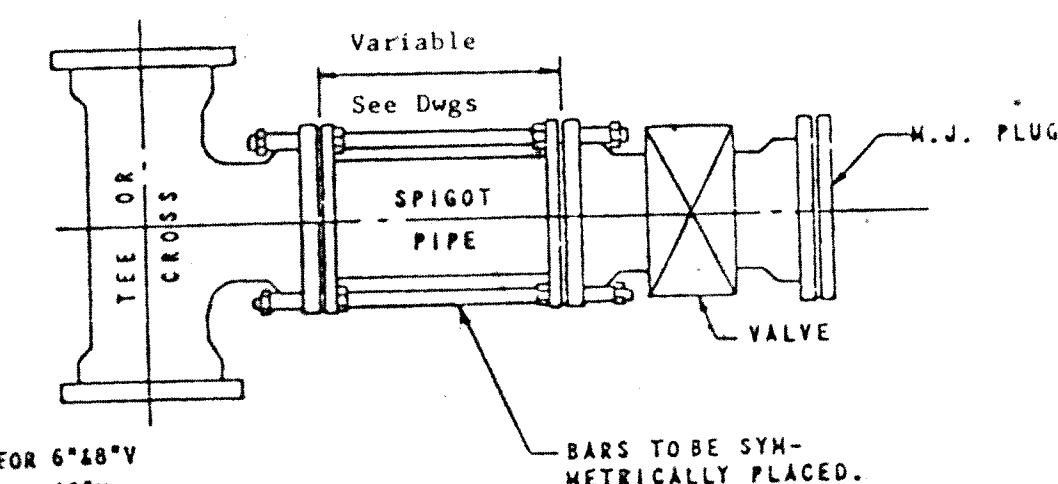
THRUST BLOCK DETAILS
NO SCALE



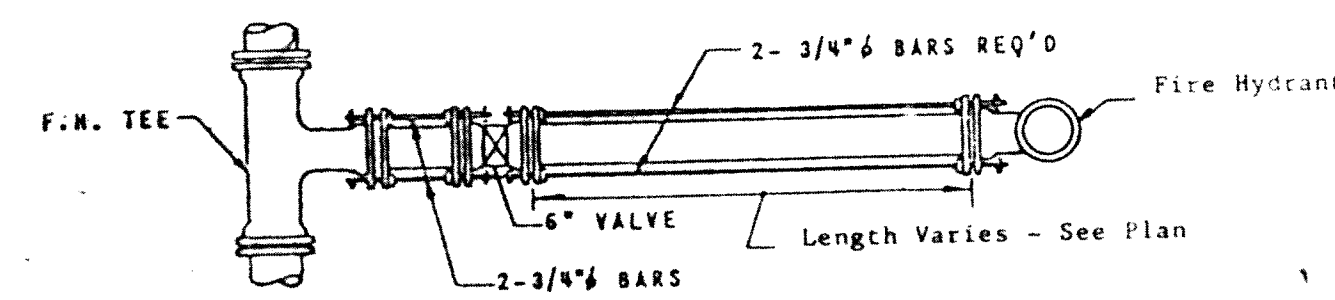
TYPICAL FIRE HYDRANT INSTALLATION
NO SCALE



TYPICAL SERVICE CONNECTION DETAIL
NO SCALE



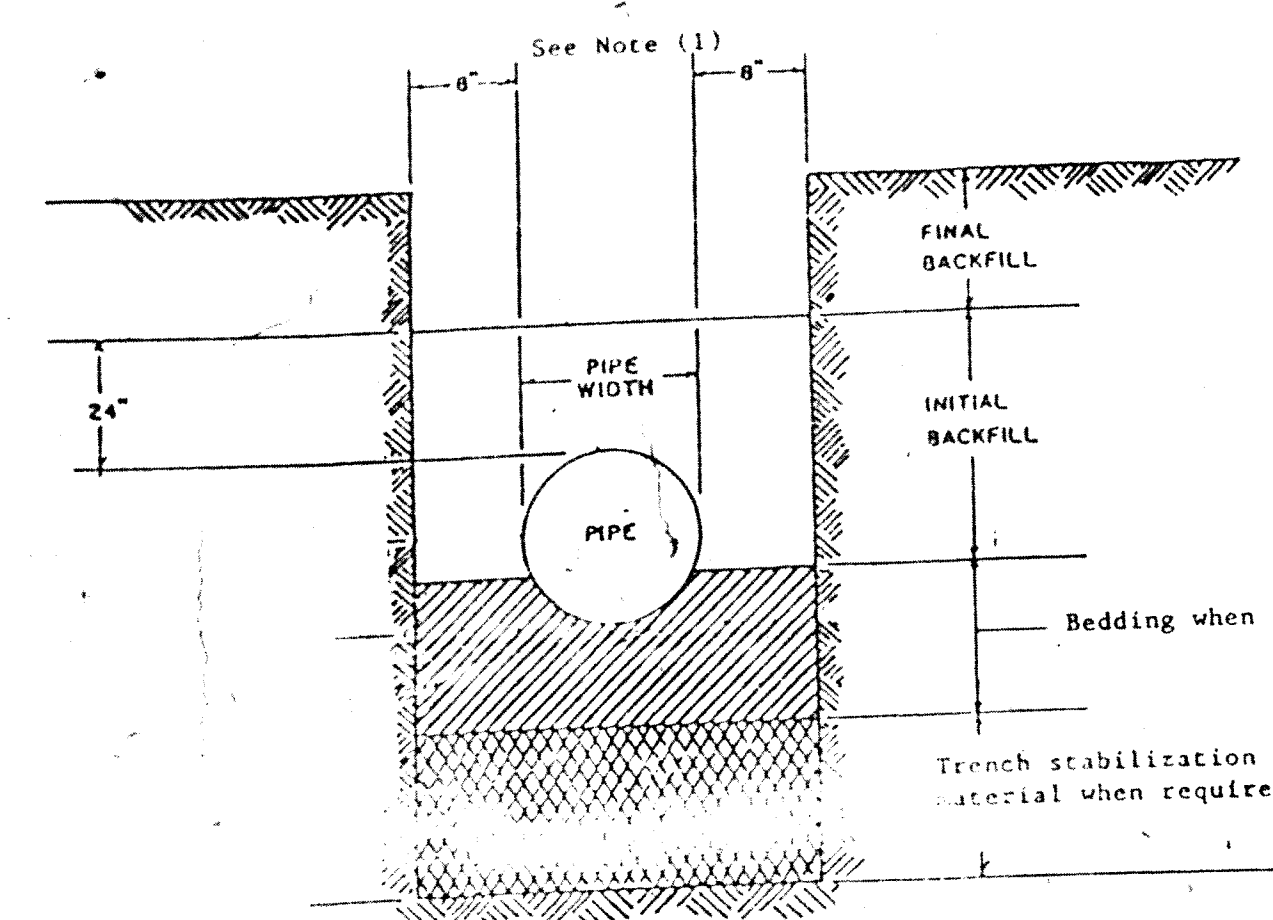
DETAIL STRAPPING VALVE TO MAIN



DETAIL STRAPPING FIRE HYDRANT TO MAIN

Note: See Specifications For Harnessing Requirements

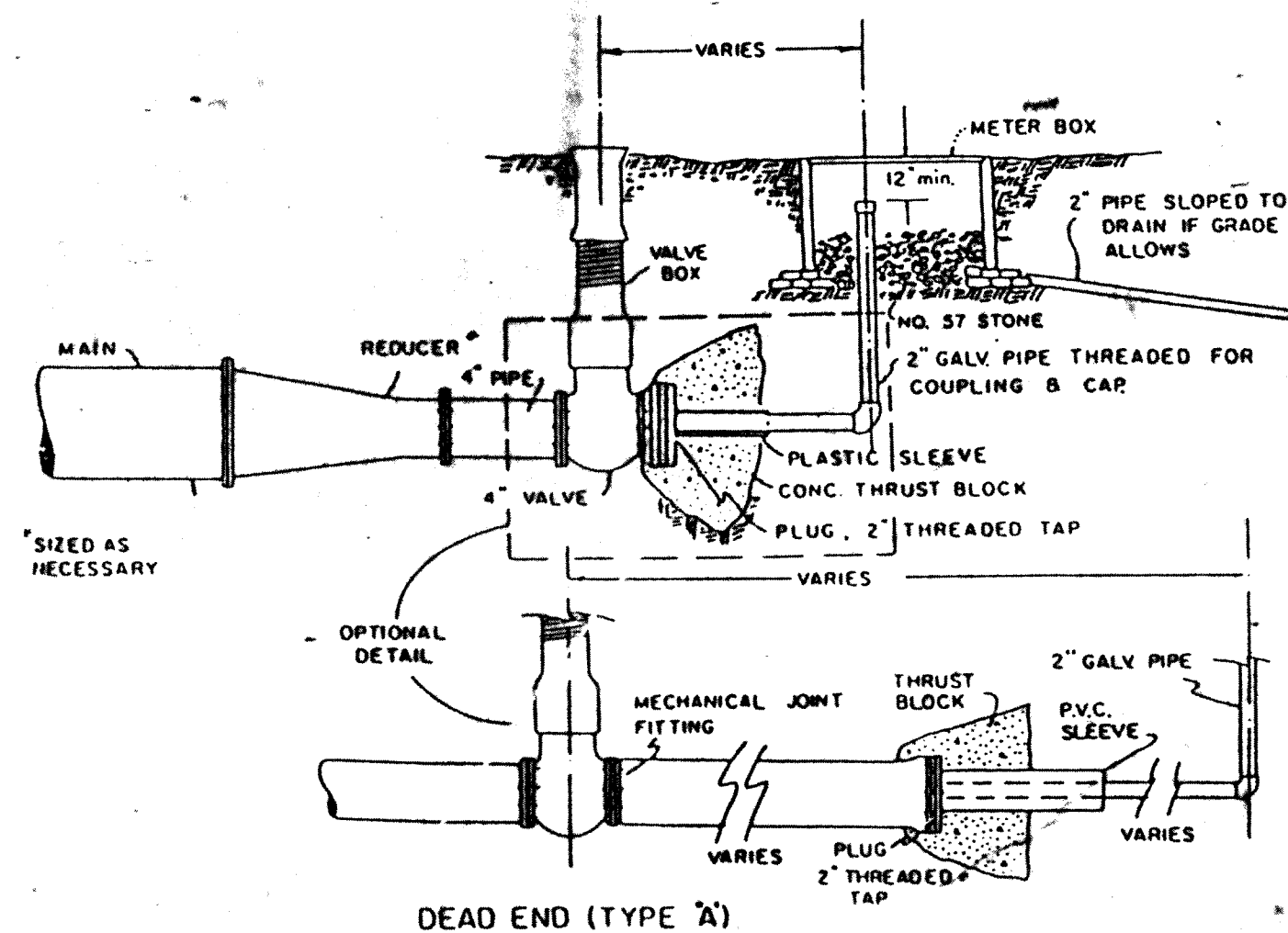
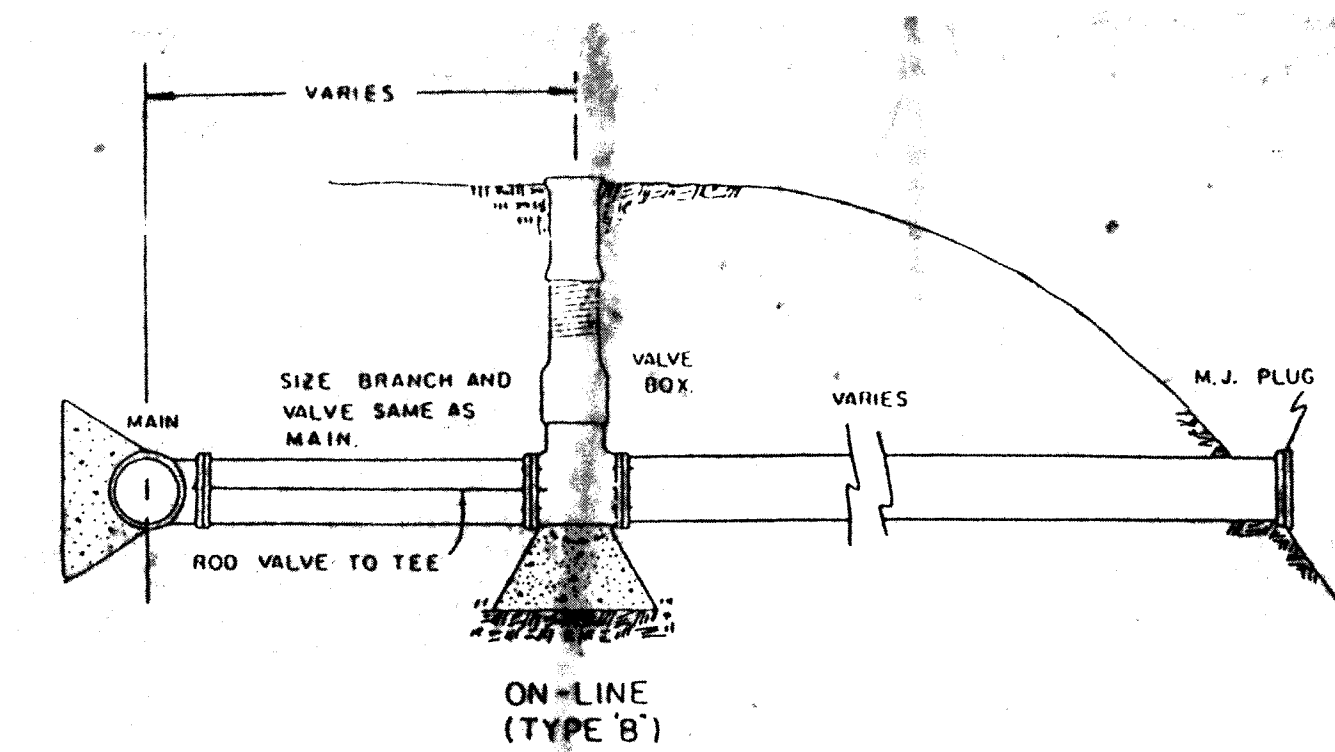
HARNESSING VALVE & FIRE HYDRANT TO MAIN
NO SCALE



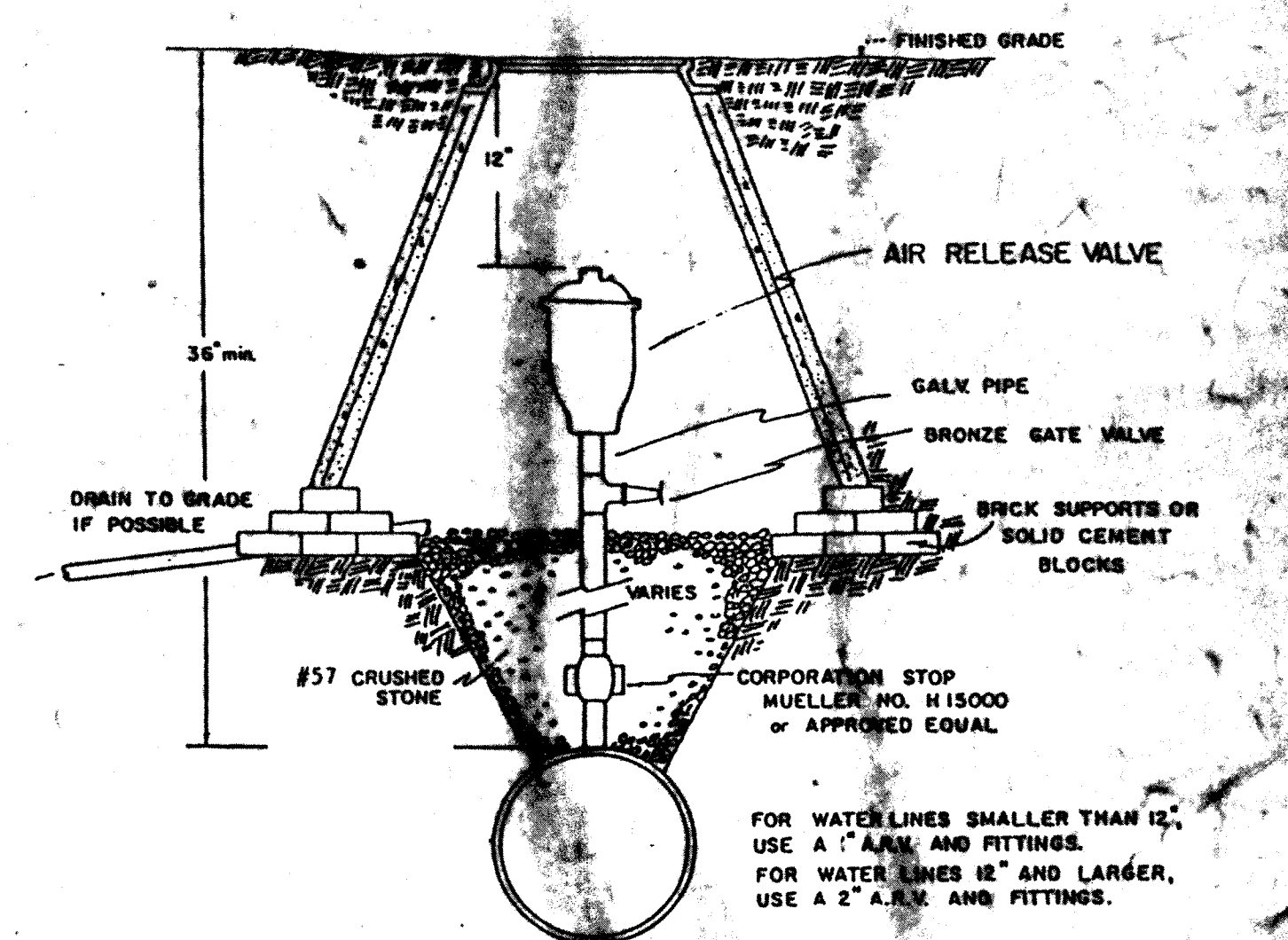
Note:

- FOR SERVICE CONNECTIONS, TOTAL TRENCH WIDTH SHALL NOT EXCEED 4".

TRENCH INSTALLATION FOR PRESSURE PIPE
NO SCALE



① TYPICAL BLOW-OFF INSTALLATION
NO SCALE

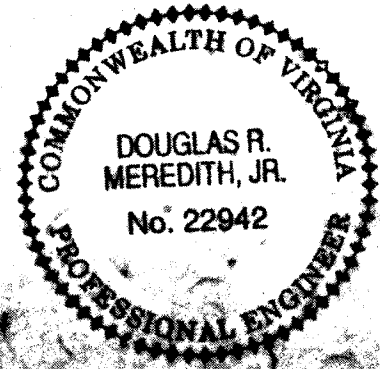


A precast manhole cone and cover with "water" cast on the lid shall be used. An adequate foundation shall be installed so the water line doesn't support the manhole cone.

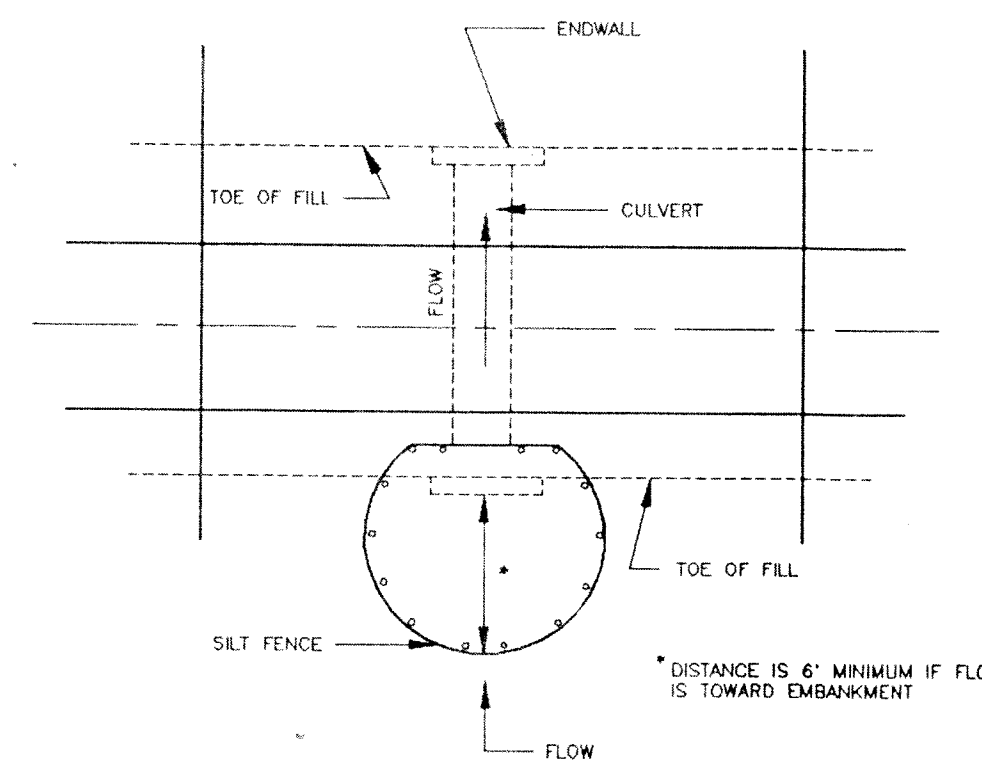
NOTE: DURING CONSTRUCTION IF FIELD CONDITIONS NECESSITATE, THE CONTRACTOR WILL BE DIRECTED TO INSTALL AN A.R.V. AS REQUIRED BY THE ENGINEER.

① AIR RELEASE VALVE
NO SCALE

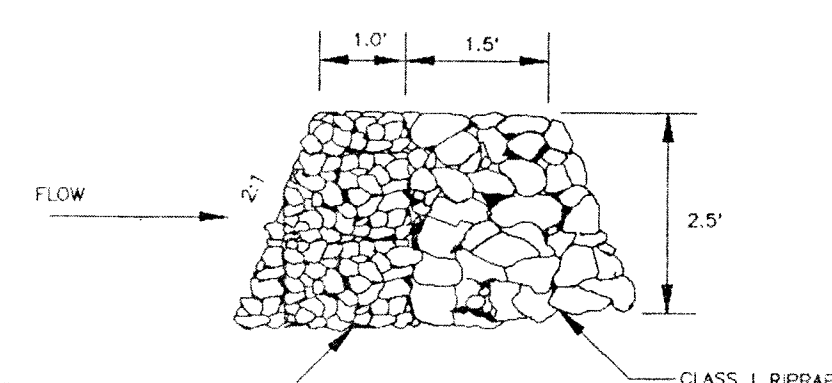
① 4-26-93 VDH COMMENTS		DESIGNED	RCW	HUNTER'S GREEN - SECTION II	
REVISION	DATE	DRAWN	CLD	WATER SYSTEM DETAILS	
		CHECKED	DRM	BOTETOURT COUNTY, VIRGINIA	
		APPROVED			
		SUBMITTED			
L.M.W., P.C. Engineering - Surveying			SCALE: NOTED	COMM. NO.	112
Phone: (703) 343-0675 Fax: (703) 342-4156			DATE: MARCH 1990	SHEET	12



SILT FENCE CULVERT INLET PROTECTION

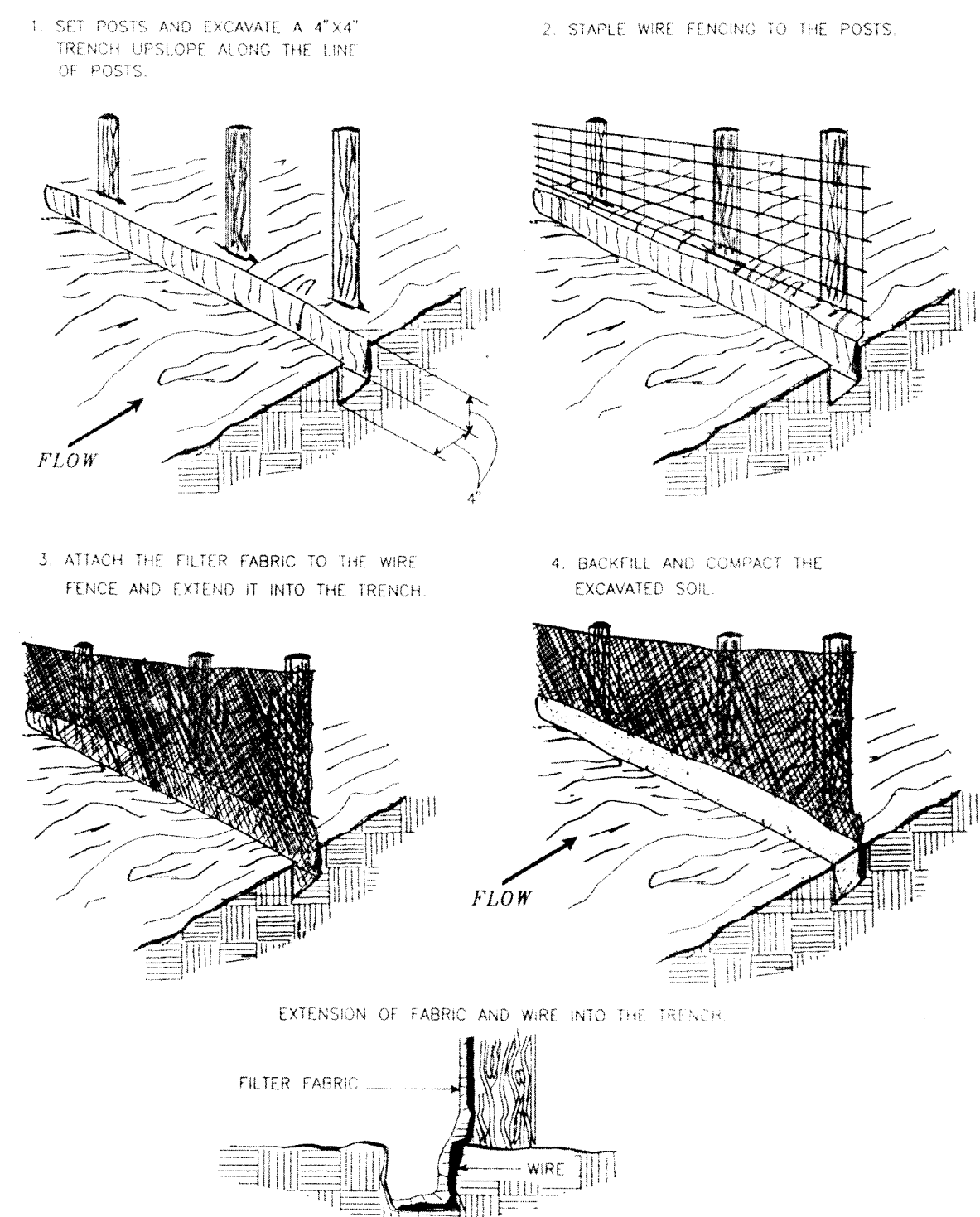


OPTIONAL STONE COMBINATION**

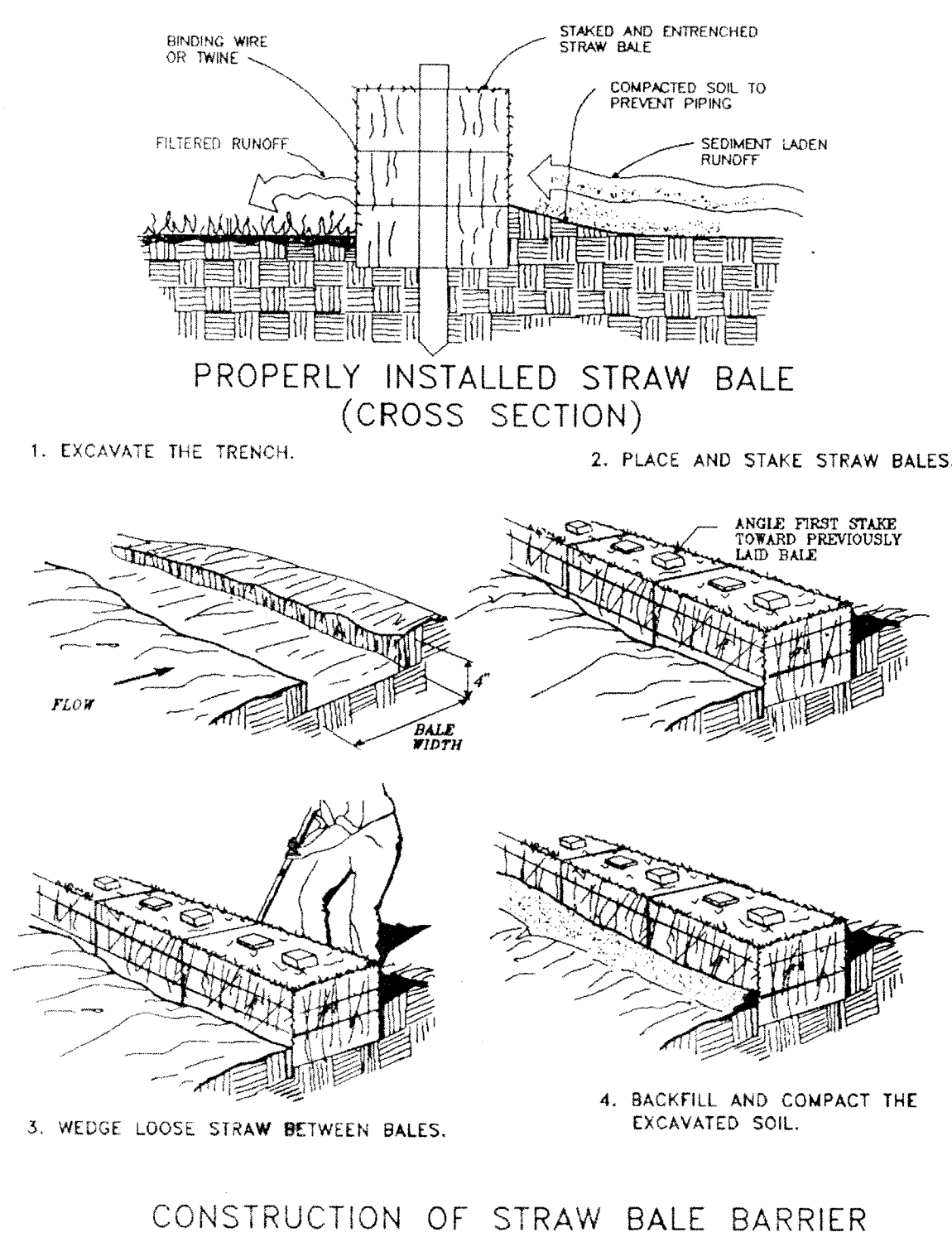


** VDOT #3, #507 OR #5 COARSE AGGREGATE TO REPLACE SILT FENCE IN "HORSESHOE" WHEN HIGH VELOCITY OF FLOW IS EXPECTED

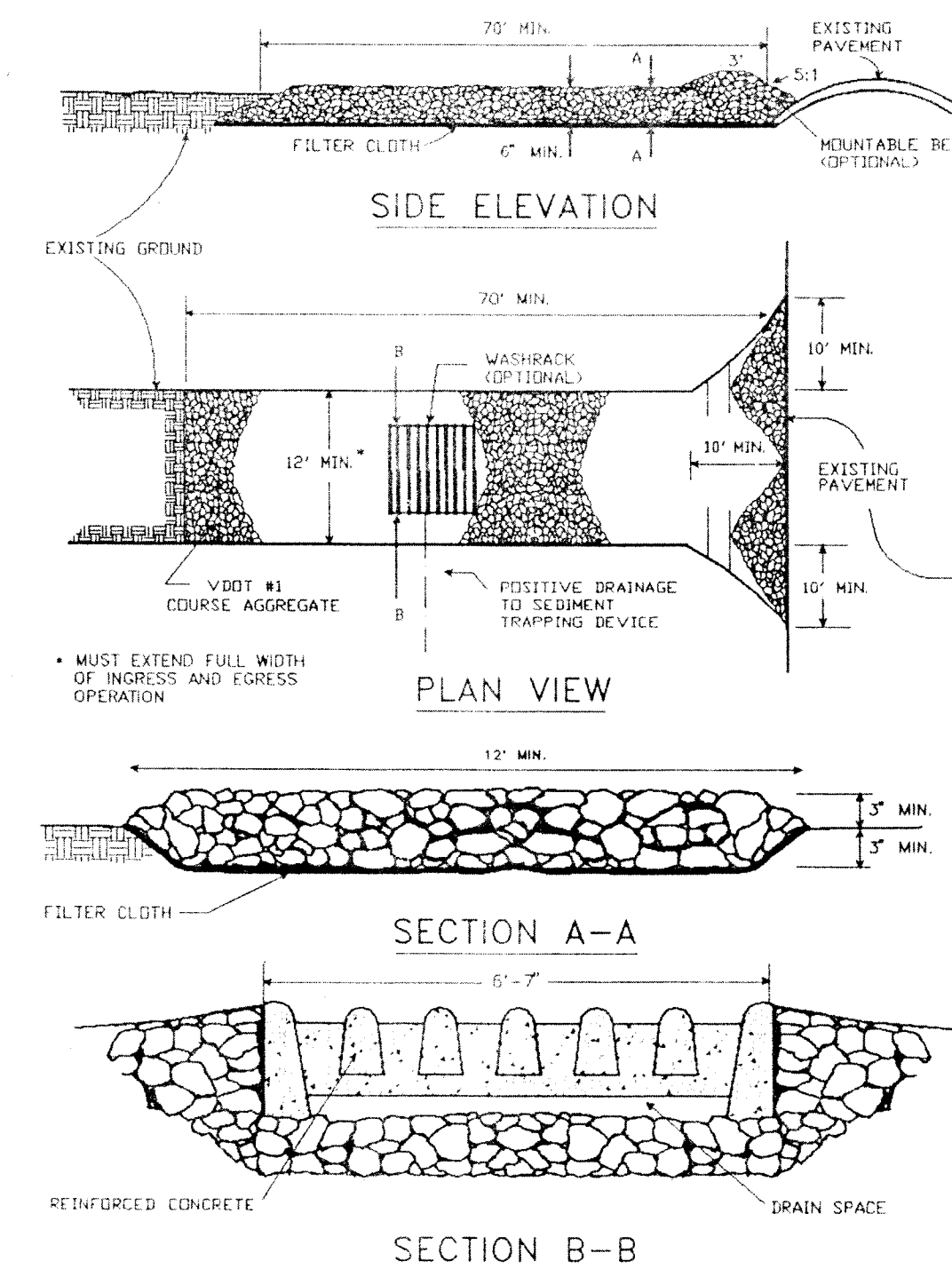
CONSTRUCTION OF A SILT FENCE (WITH WIRE SUPPORT)



STRAW BALE BARRIER

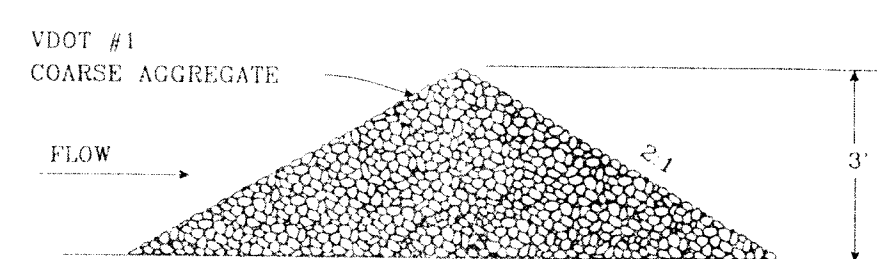
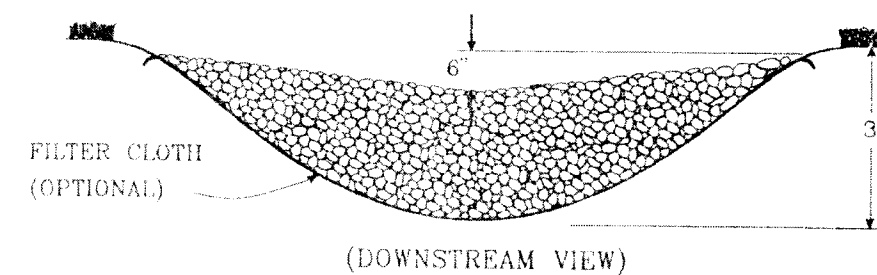


STONE CONSTRUCTION ENTRANCE

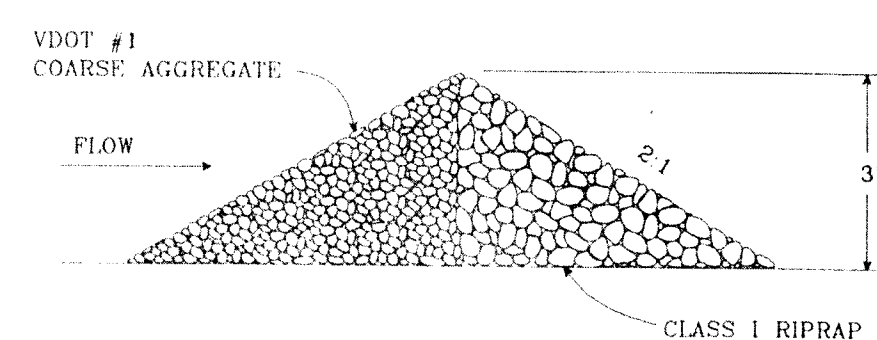
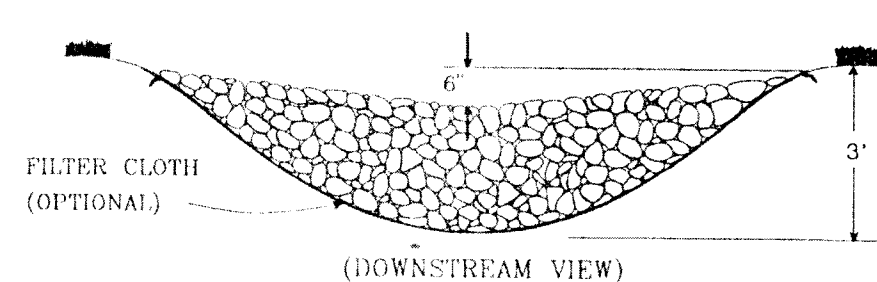


ROCK CHECK DAM

2 ACRES OR LESS OF DRAINAGE AREA:

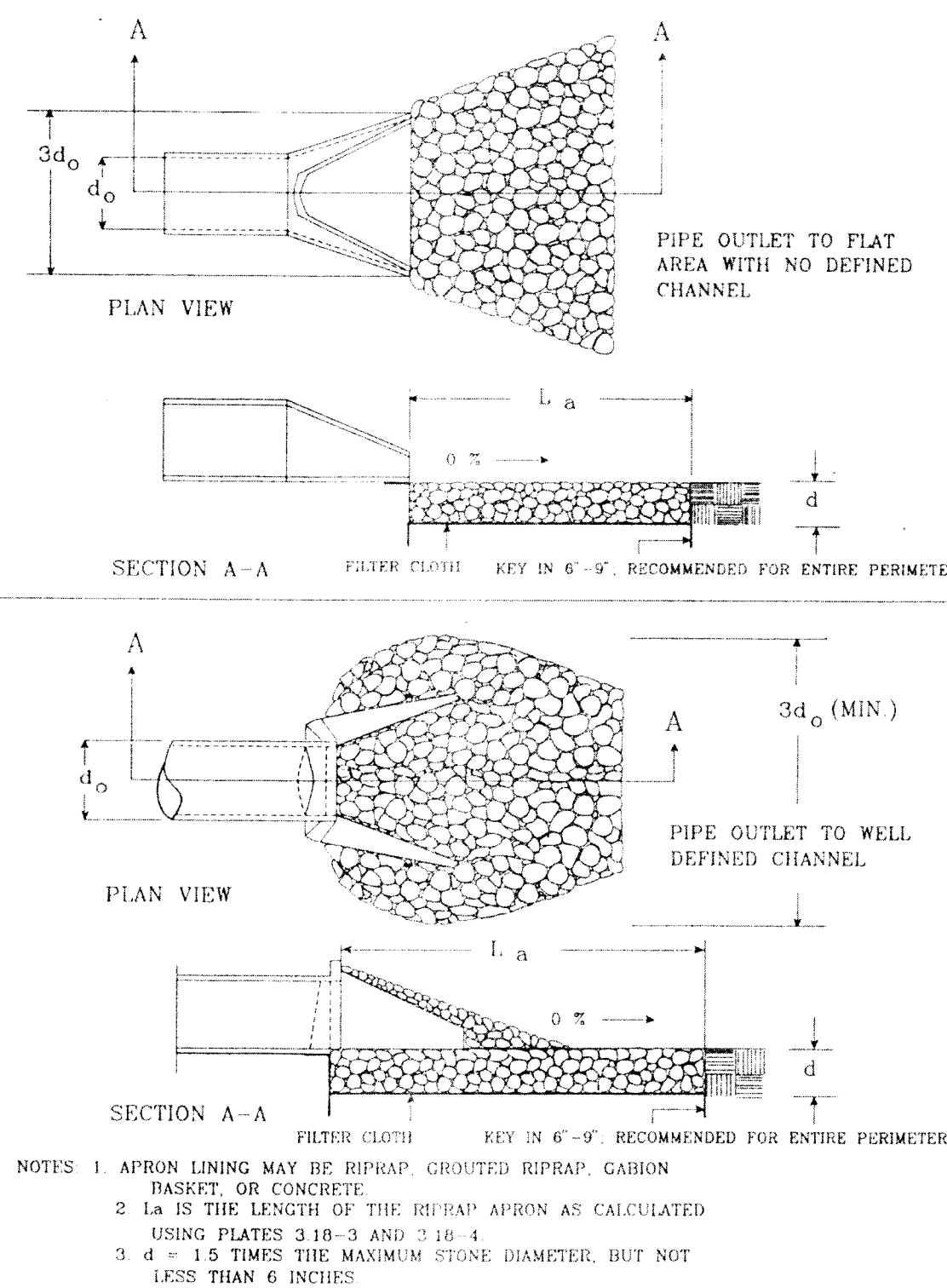


2-10 ACRES OF DRAINAGE AREA:

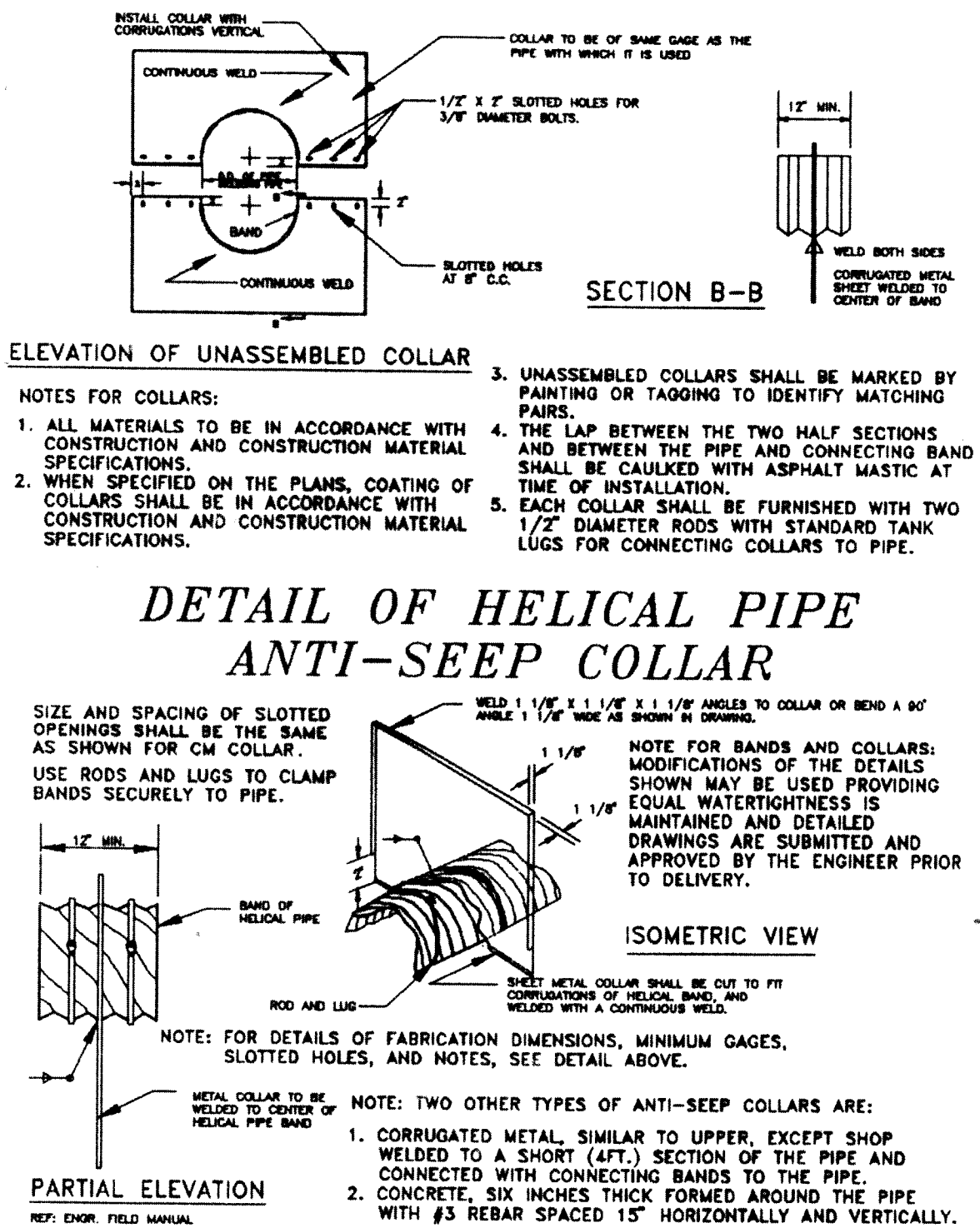


CLASS 1 RIPRAP

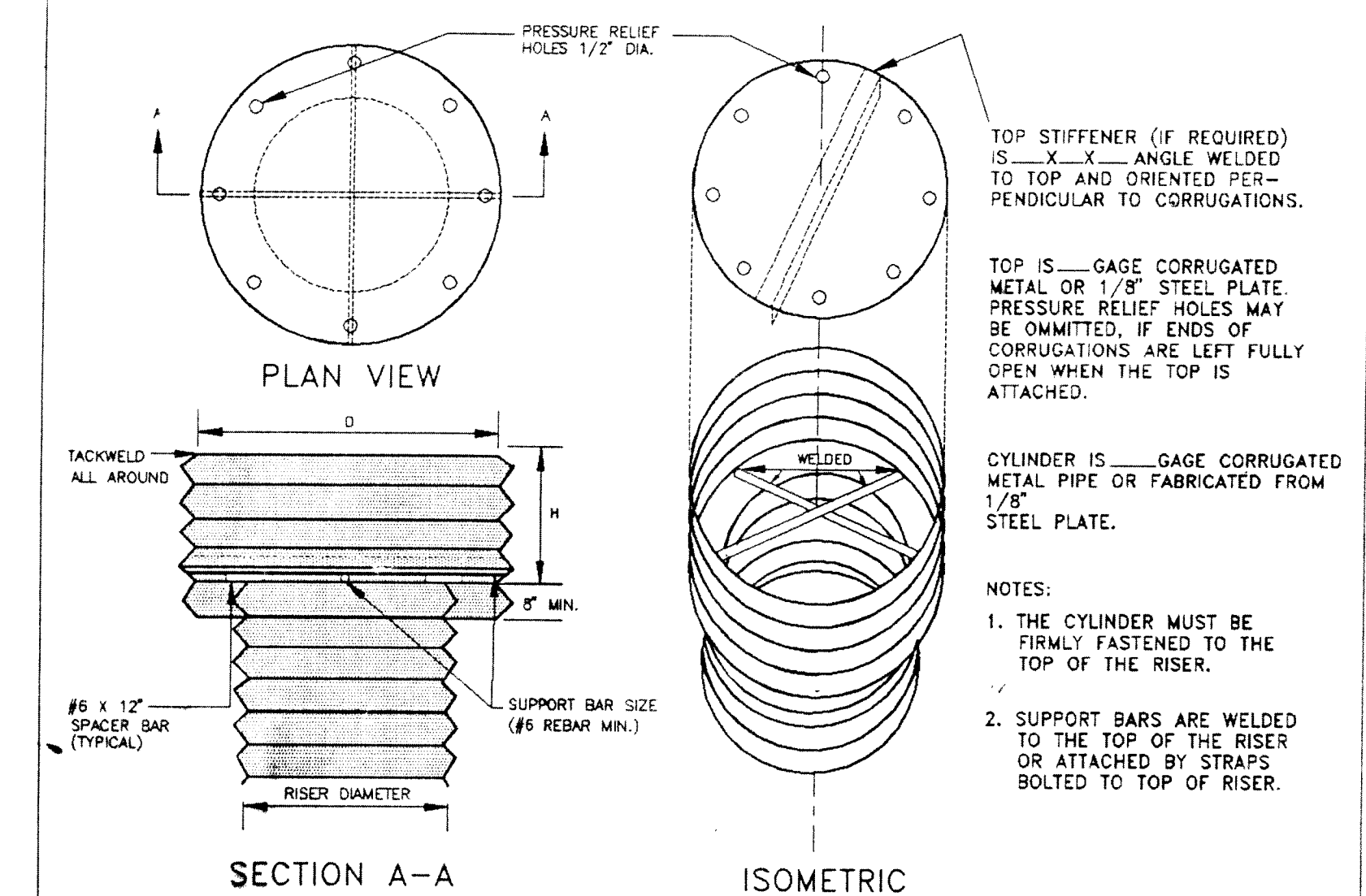
PIPE OUTLET CONDITIONS



DETAILS OF CORRUGATED METAL ANTI-SEEP COLLAR



ANTI-VORTEX DEVICE DESIGN



REVISION	DATE	DESCRIPTION	BY	APP.
①	5-7-93	SCS COMMENTS - DETAILS		
DESIGNED	RCW	HUNTER'S GREEN - SECTION II		
DRAWN	CLD	EROSION & SEDIMENT CONTROL DETAILS		
CHECKED	DRM			
APPROVED				
SUBMITTED				
BOTETOURT COUNTY, VIRGINIA				
LM.W, PC. Engineering - Surveying				
1814 2nd Street SW Roanoke, Virginia 24016				
Phone (703) 345-0675 Fax (703) 342-4456				
SCALE:		COMM. NO.	112	
DATE:	MARCH 1993	SHEET	13	

