

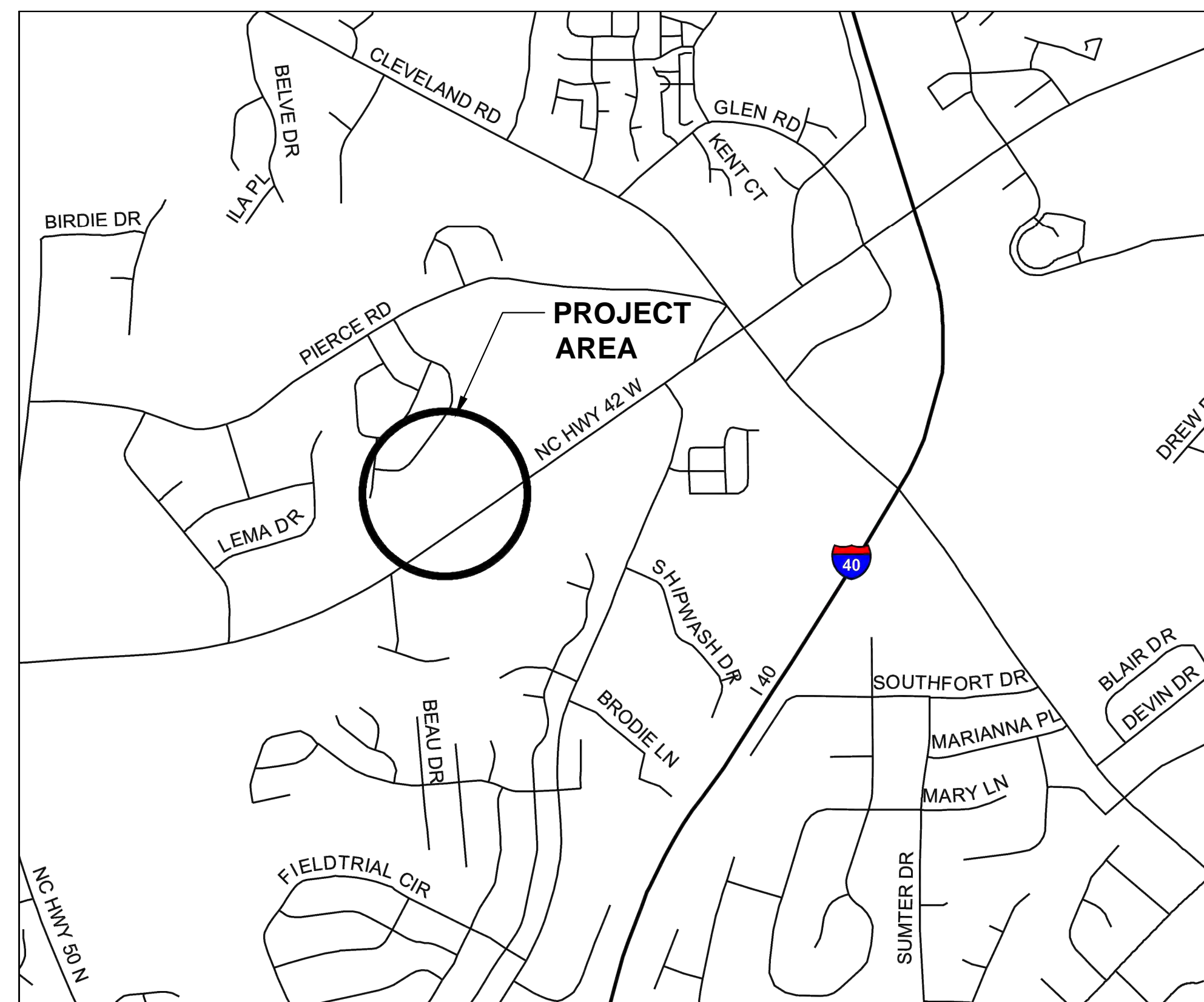
**JOHNSTON COUNTY
DEPARTMENT OF UTILITIES
DUCHESS DOWNS
FORCE MAIN IMPROVEMENTS
OCTOBER 2017**

Owner:
Johnston County

BOARD OF COMMISSIONERS

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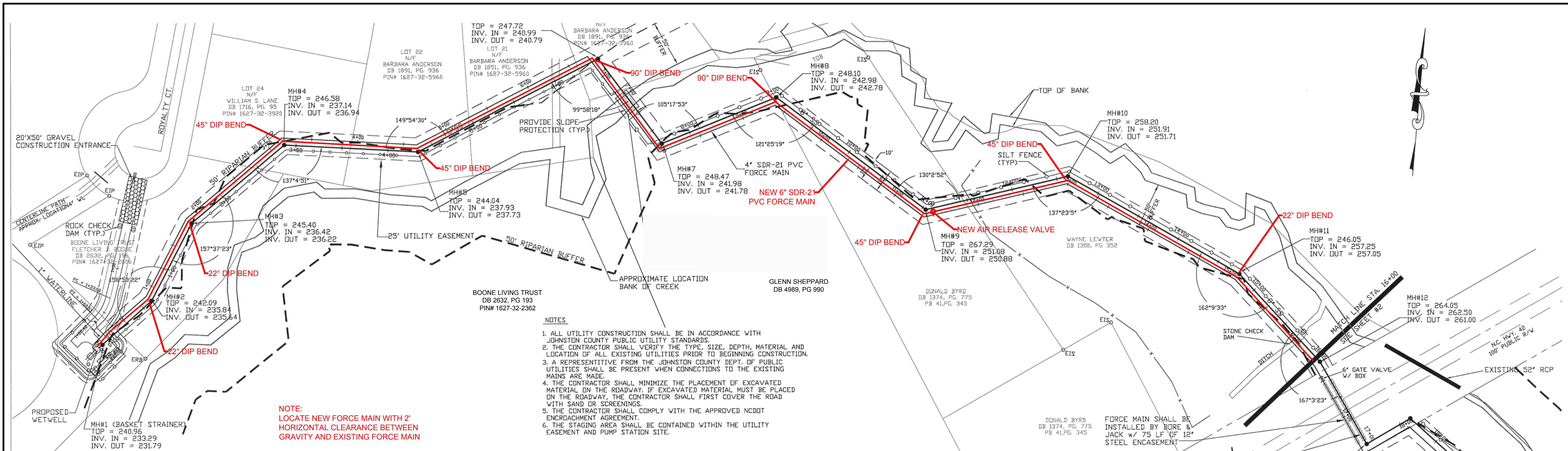


**VICINITY MAP
NOT TO SCALE**

PLAN INDEX

- 1 - COVER SHEET
- C1 - PLAN AND PROFILE
- C2 - PLAN AND PROFILE
- D1 - DETAIL SHEET
- D2 - PUMP STATION AND DETAIL SHEET

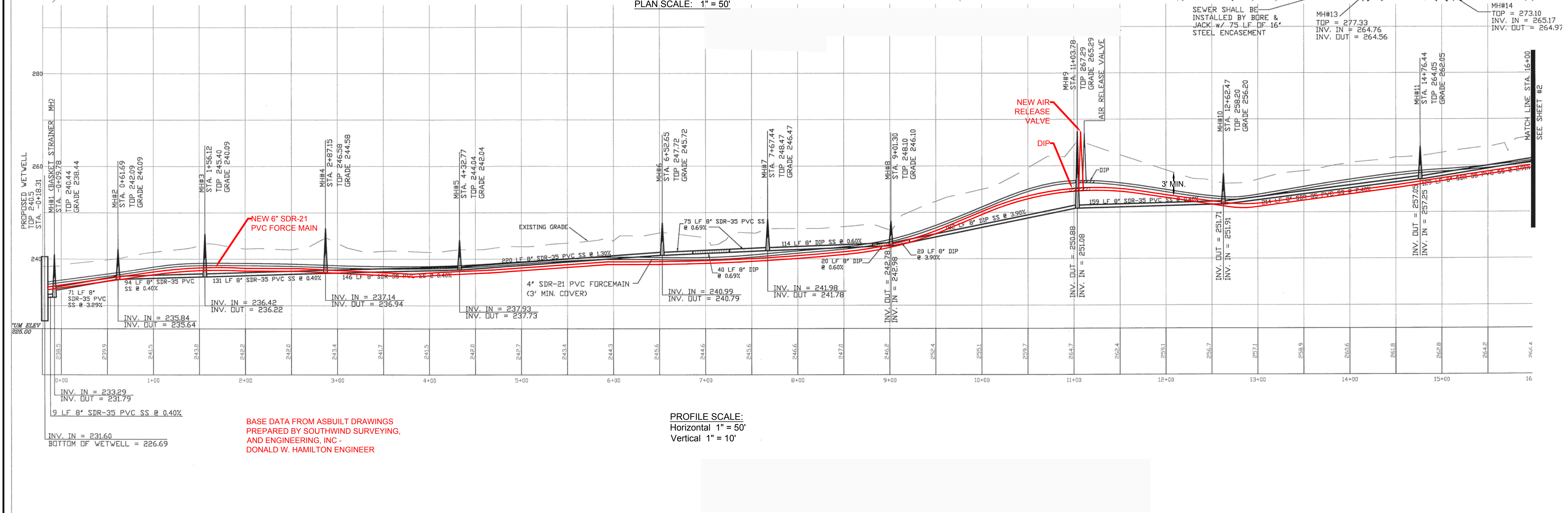




- NOTES**
1. ALL UTILITY CONSTRUCTION SHALL BE IN ACCORDANCE WITH JOHNSTON COUNTY PUBLIC UTILITY STANDARDS.
 2. THE CONTRACTOR SHALL VERIFY THE TYPE, SIZE, DEPTH, MATERIAL AND LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
 3. A REPRESENTATIVE FROM THE JOHNSTON COUNTY DEPT. OF PUBLIC UTILITIES SHALL BE PRESENT WHEN CONNECTIONS TO THE EXISTING MAINS ARE MADE.
 4. THE CONTRACTOR SHALL MINIMIZE THE PLACEMENT OF EXCAVATED MATERIAL ON THE ROADWAY. IF EXCAVATED MATERIAL MUST BE PLACED ON THE ROADWAY, THE CONTRACTOR SHALL FIRST COVER THE ROAD WITH SAND OR SCREENINGS.
 5. THE CONTRACTOR SHALL COMPLY WITH THE APPROVED NCDOT ENCROACHMENT AGREEMENT.
 6. THE STAGING AREA SHALL BE CONTAINED WITHIN THE UTILITY EASEMENT AND PUMP STATION SITE.

NOTE:
LOCATE NEW FORCE MAIN WITH 2' HORIZONTAL CLEARANCE BETWEEN GRAVITY AND EXISTING FORCE MAIN

PLAN SCALE: 1" = 50'



BASE DATA FROM ASBUILT DRAWINGS PREPARED BY SOUTHWIND SURVEYING, AND ENGINEERING, INC - DONALD W. HAMILTON ENGINEER

PROFILE SCALE:
Horizontal 1" = 50'
Vertical 1" = 10'

REVISION INFORMATION		
Num	Description	Date

DRAWING INFORMATION		
Init	Date	



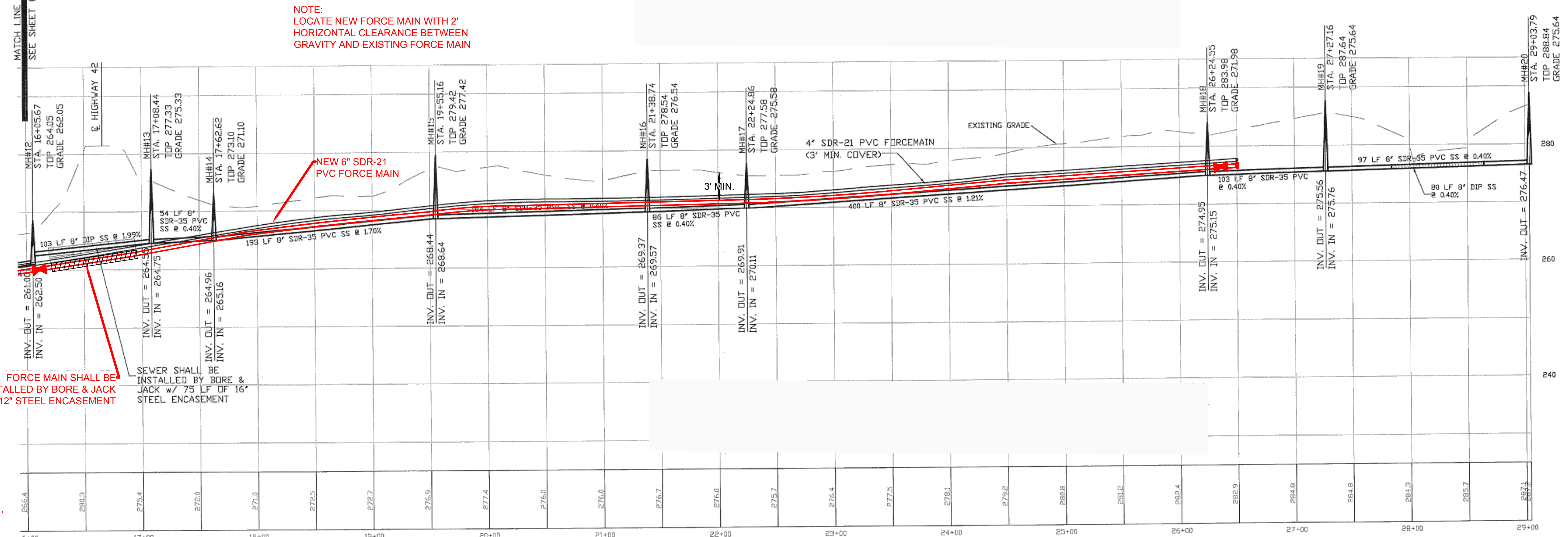
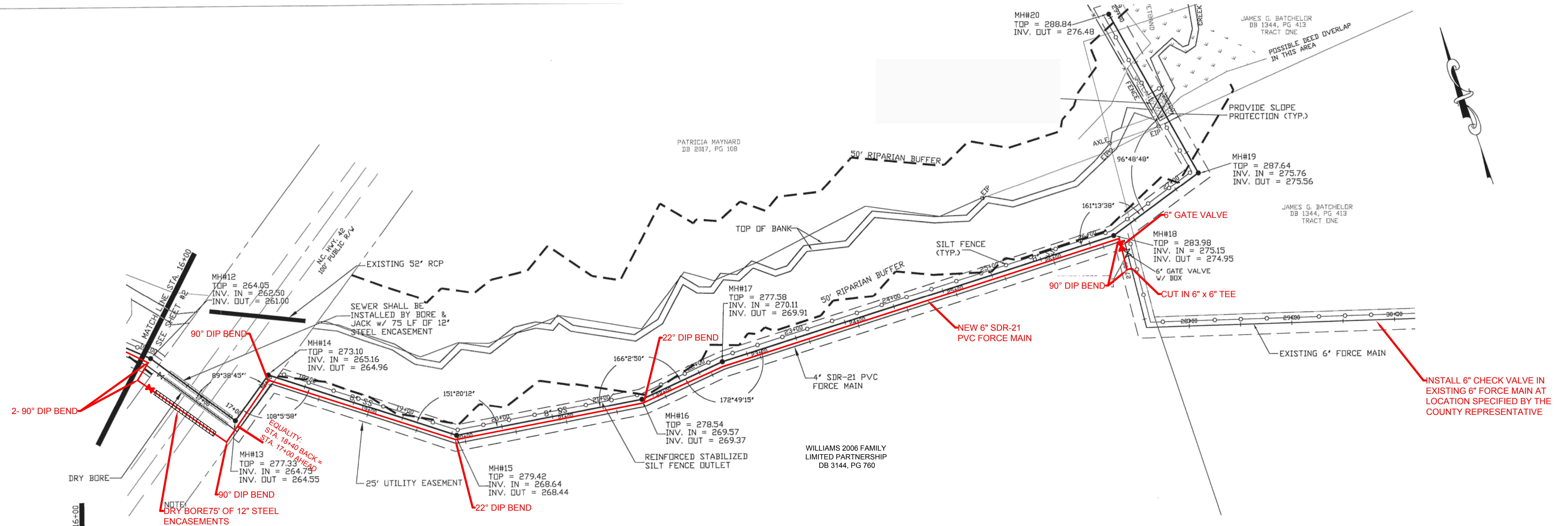
PLAN AND PROFILE SHEET

DUCHESS DOWNS FORCE MAIN IMPROVEMENTS

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2263
Smithfield, NC 27577



SHEET
C1
of



NOTE:
LOCATE NEW FORCE MAIN WITH 2'
HORIZONTAL CLEARANCE BETWEEN
GRAVITY AND EXISTING FORCE MAIN

FORCE MAIN SHALL BE
INSTALLED BY BORE & JACK
W/ 12\"/>

NOTE:
DRY BORE 75' OF 12\"/>

BASE DATA FROM ASBUILT DRAWINGS
PREPARED BY SOUTHWIND SURVEYING,
AND ENGINEERING, INC -
DONALD W. HAMILTON ENGINEER

PROFILE SCALE:
Horizontal 1" = 50'
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REVISION INFORMATION			
Num	Description	Date	Init


DRAWING INFORMATION		
Init	Date	
Drawn By: HJS	10/18	
Checked By: MSK	10/18	
Approved By: KCR	10/18	
SCALE: AS SHOWN		



**PLAN AND
PROFILE SHEET**

**DUCHESS DOWNS
FORCE MAIN IMPROVEMENTS**

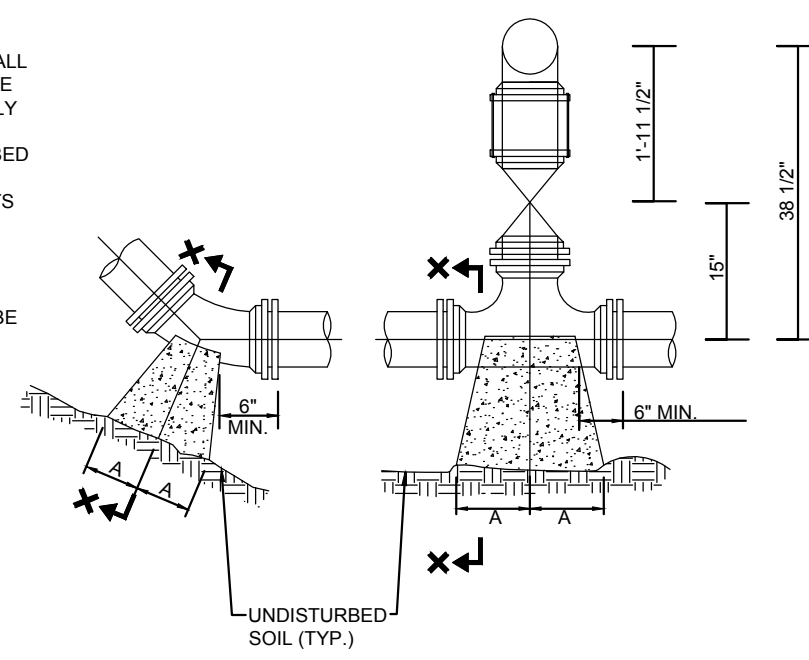
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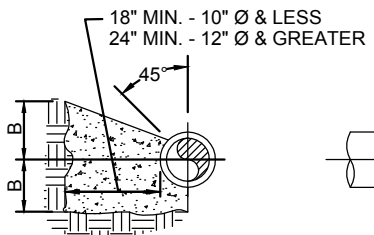
SHEET

of

- NOTES:
 1. CONCRETE SHALL BE 3,000 PSI MIN.
 2. CONCRETE FOR THRUST BLOCKING SHALL BE KEPT FAIRLY DRY, THUS MAKING THE CONCRETE WEDGE SHAPE MORE EASILY FORMED WITH THE WIDEST PART (BLOCKING AREA) AGAINST UNDISTURBED SOIL.
 3. NO CONCRETE SHALL COVER ANY BOLTS OR GLANDS.
 4. ALL FITTING AND ACCESSORIES TO BE WRAPPED WITH 10 MIL POLYETHYLENE PRIOR TO POURING BLOCKING.
 5. VOLUME OF THRUST BLOCKING SHALL BE AS SHOWN ON THE THRUST BLOCKING SCHEDULE.



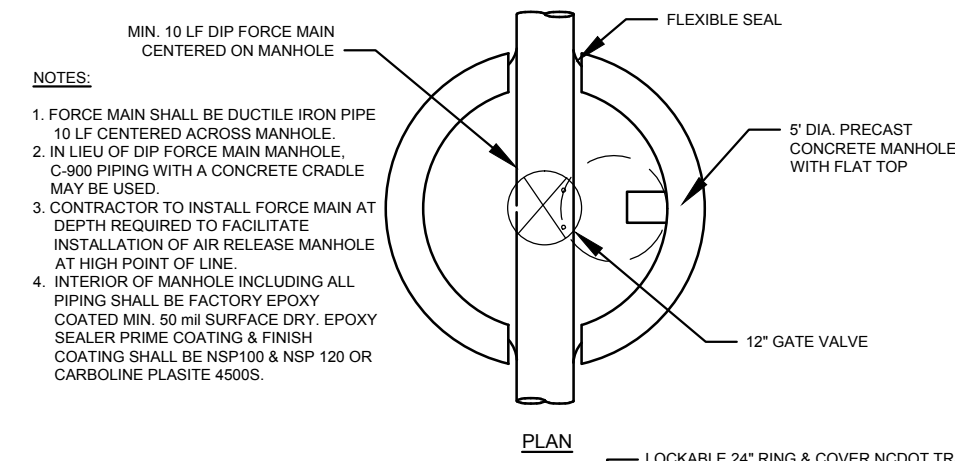
PLAN BENDS PLAN TEES



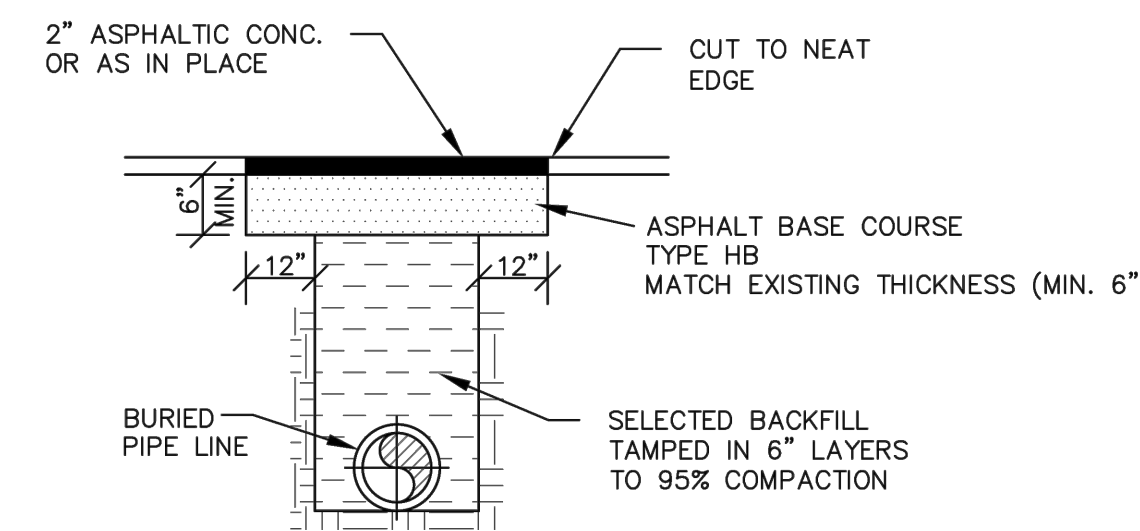
SECTION X-X BENDS & TEES PLAN & ELEV. PLUGS

PIPE SIZE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	6"	8"	8"	10"	16"
6"	10"	12"	8"	10"	8"	8"	8"	8"	10"	10"	12"	16"
8"	10"	12"	10"	10"	8"	8"	8"	8"	10"	10"	12"	24"
10"	10"	12"	10"	12"	8"	10"	8"	10"	11"	10"	14"	28"
12"	20"	18"	12"	14"	8"	12"	8"	12"	14"	10"	16"	30"
14"	22"	18"	14"	16"	10"	14"	10"	14"	16"	10"	18"	34"
16"	26"	20"	16"	18"	12"	16"	12"	16"	18"	20"	20"	38"
18"	30"	24"	18"	20"	14"	18"	14"	18"	20"	22"	24"	42"
24"	48"	30"	24"	28"	21"	24"	18"	21"	24"	28"	28"	56"

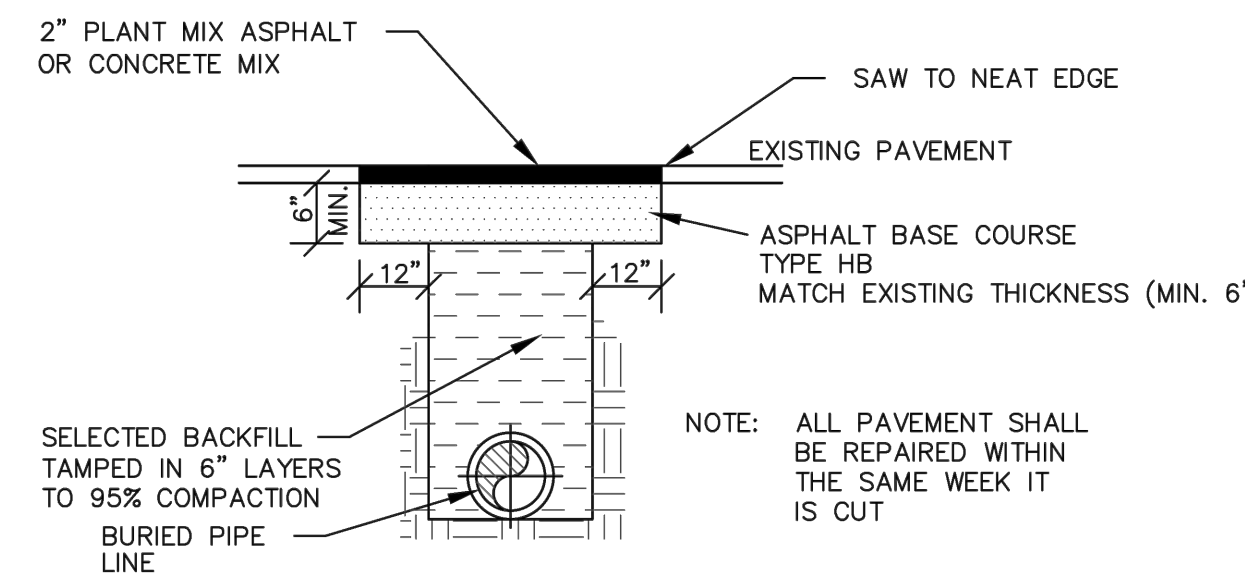
THRUST BLOCK DETAIL
NOT TO SCALE



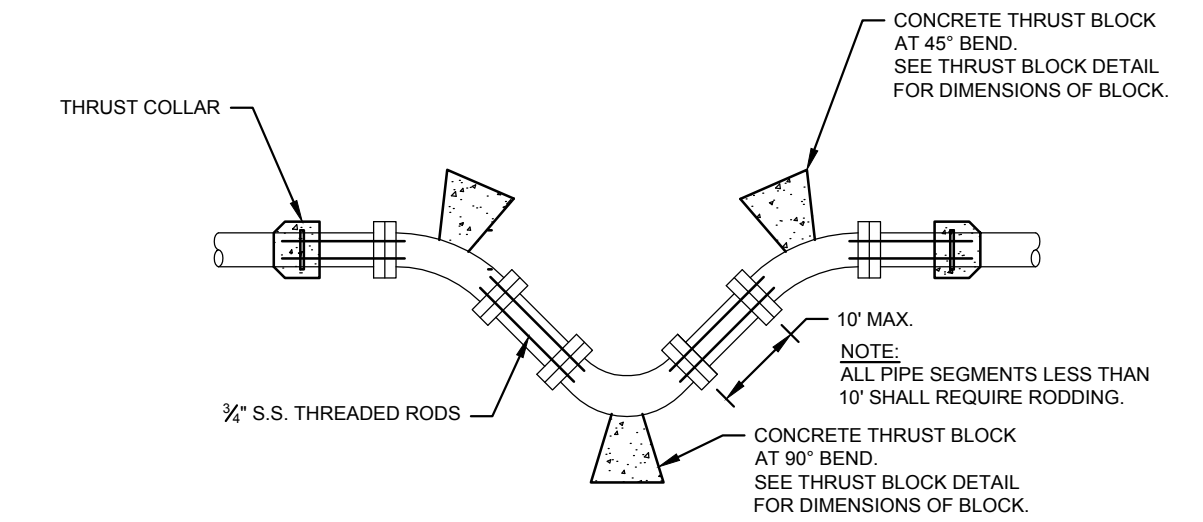
GATE VALVE MANHOLE FOR FORCE MAIN
NOT TO SCALE



SECONDARY HIGHWAYS



PRIMARY HIGHWAYS
DETAILS FOR CUTTING AND REPLACING PAVEMENT
NOT TO SCALE

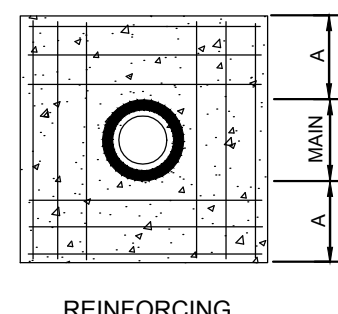


ROD REQUIREMENTS

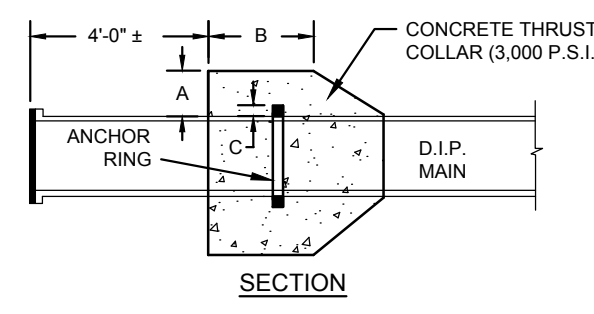
SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NUMBER OF RODS REQUIRED
6"	4,328	2
8"	7,694	2
12"	17,312	4
16"	30,779	6
20"	48,091	8
24"	69,252	10

- GENERAL NOTES:
 1. RODS AND NUTS SHALL BE OF TYPE 304 OR TYPE 316 STAINLESS STEEL.
 2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.

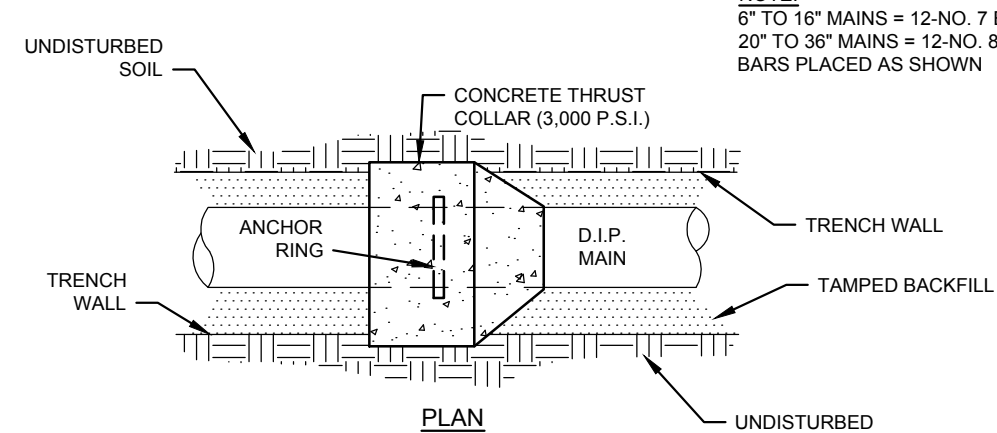
VERTICAL BEND RODDING AND BLOCKING DETAIL
NOT TO SCALE



REINFORCING



SECTION

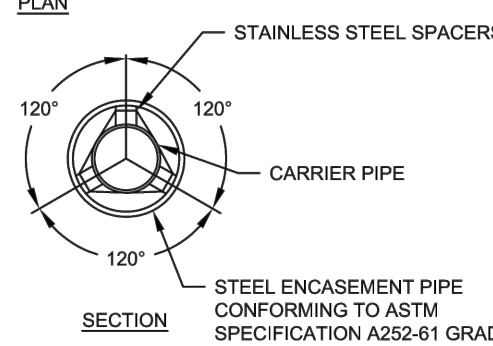
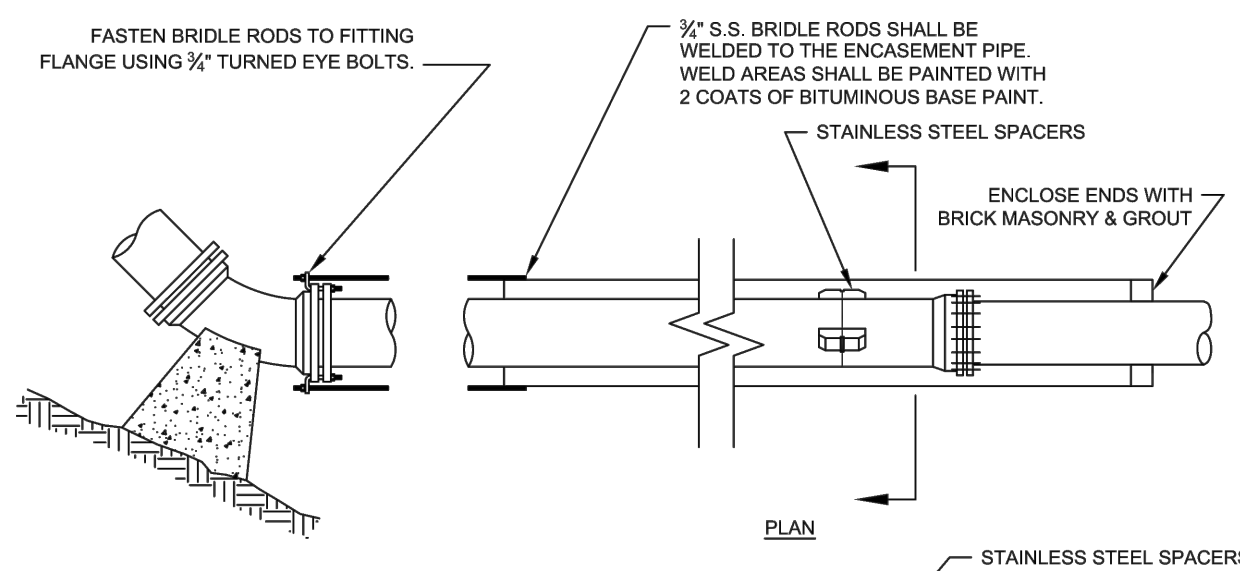


PLAN

SCHEDULE

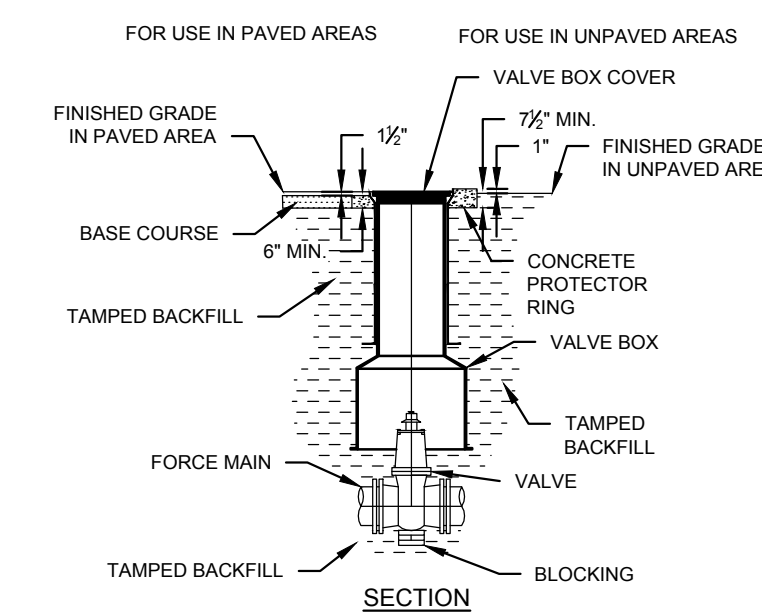
PIPE DIAMETER	CONCRETE THRUST COLLAR			RINGS REQUIRED
	A	B	C	
6", 8", 12"	1'-0"	1'-0"	2"	ONE
16"	1'-4"	1'-0"	2"	ONE
20"	1'-4"	1'-0"	3"	TWO
24"	1'-4"	1'-0"	3"	TWO
30"	1'-4"	1'-2"	4"	TWO
36"	1'-4"	1'-4"	4"	TWO

THRUST COLLAR INSTALLATION
NOT TO SCALE



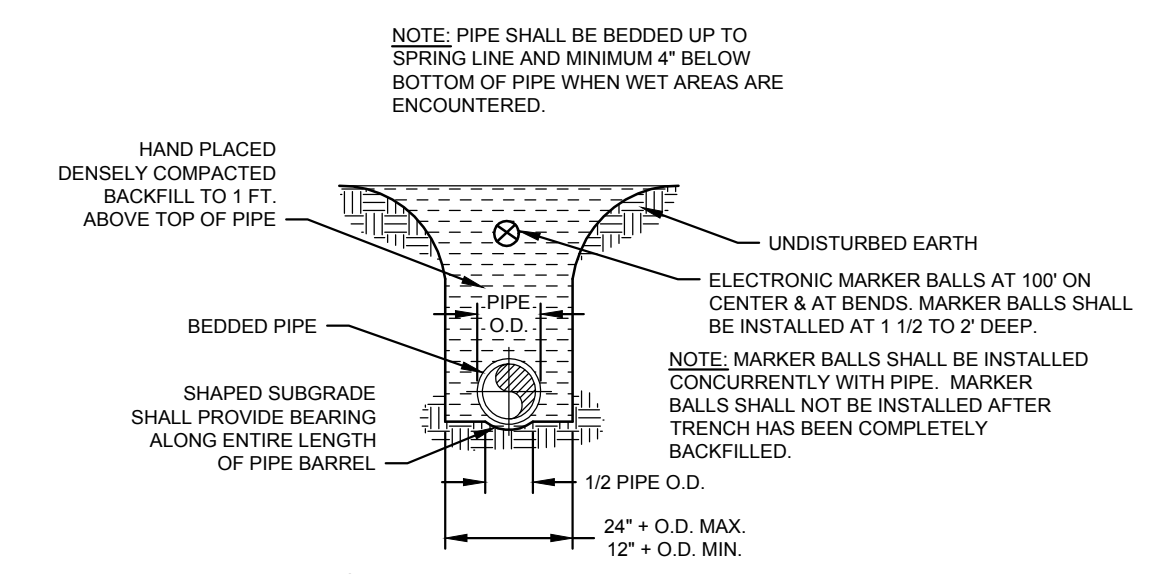
- NOTES:
 1. CARRIER PIPE SHALL BE D.I.P. UNLESS EXPRESSLY APPROVED BY THE COUNTY.
 2. STAINLESS STEEL SPACERS SHALL BE USED. NO TIMBER SKIDS ARE ALLOWED.
 3. TWO SPACERS PER JOINT SHALL BE USED FOR D.I.P. CARRIER PIPE.
 4. THREE SPACERS PER JOINT SHALL BE USED FOR PVC CARRIER PIPE.
 5. ENCASED BORES ALONG GRAVITY COLLECTION SYSTEMS SHALL NOT REQUIRE BRIDLE RODS.
 6. 2 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 8"Ø AND SMALLER. 4 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 10"Ø AND LARGER.
 7. CARRIER PIPE SHALL BE INSTALLED USING 'FIELD LOK' GASKETS OR APPROVED EQUAL.

STANDARD BORE ENCASEMENT
NOT TO SCALE



- NOTES:
 1. D.I.P. MAY BE USED FOR VALVE BOX EXTENSIONS.
 2. VALVE BOX SHOULD NOT CONTACT WATER MAIN OR VALVE.
 3. CONCRETE PROTECTOR RING SHALL BE USED IN ALL UNPAVED AREAS.

VALVE AND VALVE BOX INSTALLATION
NOT TO SCALE



- NOTE:
 FORCE MAINS 8"Ø AND SMALLER SHALL HAVE MINIMUM OF 3' COVER. FORCE MAINS LARGER THAN 8"Ø SHALL HAVE A MINIMUM OF 3'-6" COVER.

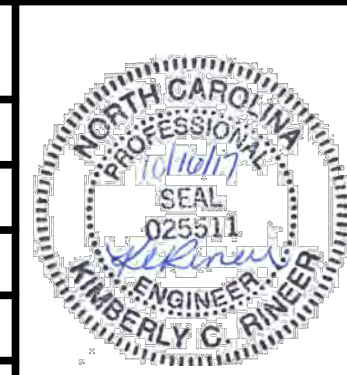
PIPE LAYING CONDITION
NOT TO SCALE

REVISION INFORMATION

Num	Description	Date	Init

DRAWING INFORMATION

Init	Date
Drawn By: HJS	10/18
Checked By: MSK	10/18
Approved By: KCR	10/18
SCALE: AS SHOWN	

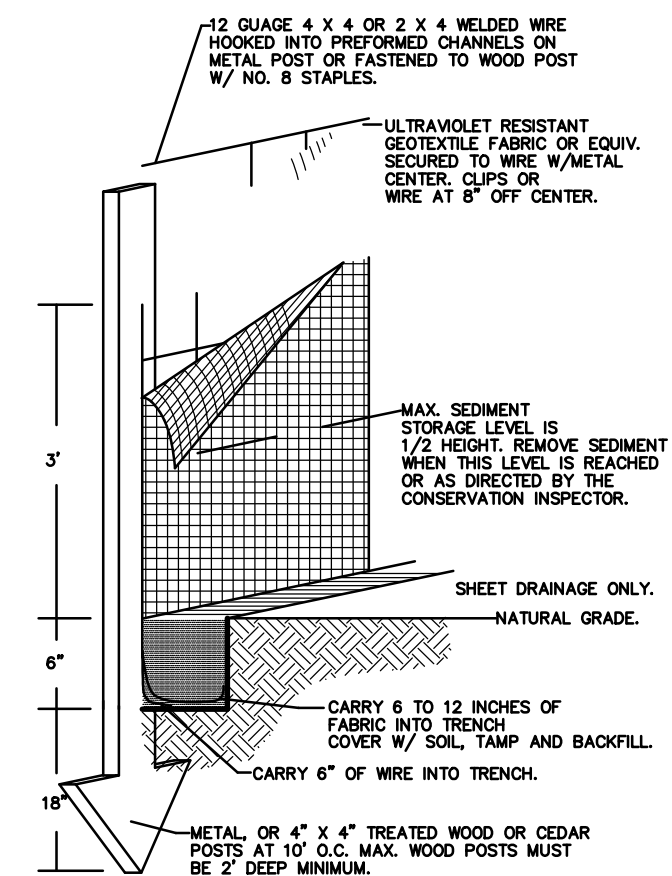


DETAIL SHEET

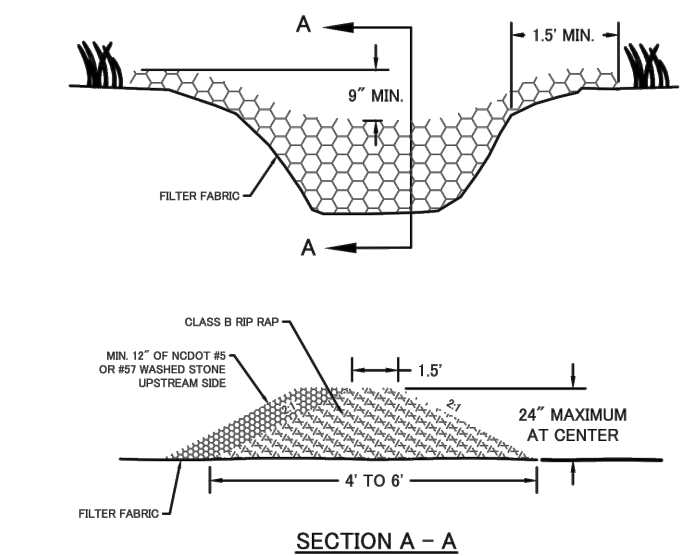
DUCHESS DOWNS
FORCE MAIN IMPROVEMENTS

JOHNSTON COUNTY
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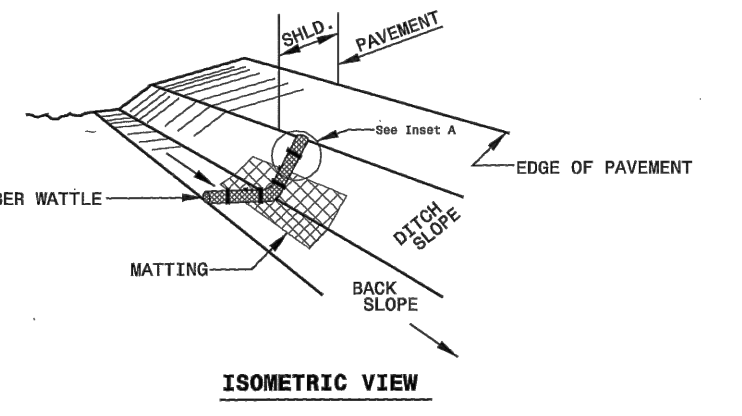


SILT FENCE DETAIL
NOT TO SCALE

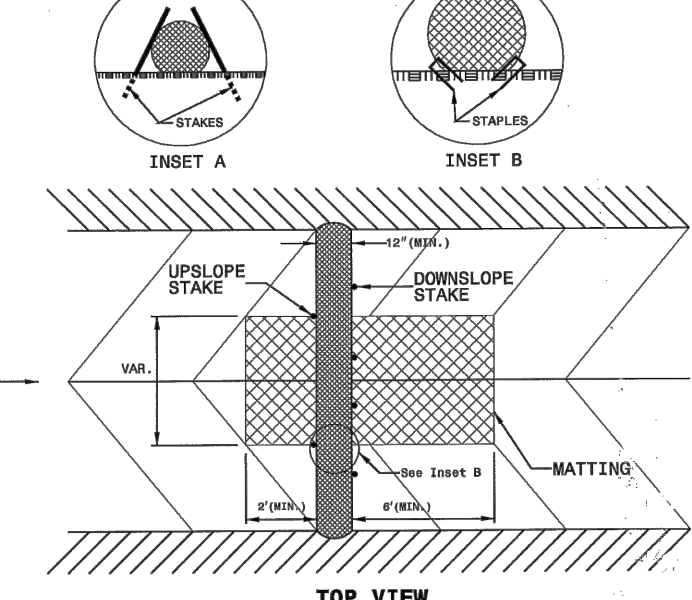


STONE CHECK DAM DETAIL
NOT TO SCALE

COIR FIBER WATTLE DETAIL



- NOTES:**
1. USE MINIMUM 1.5 IN. DIAMETER COIR FIBER (COCOANUT FIBER) WATTLE.
 2. USE 2 IN. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
 3. ONLY INSTALL WATTLE TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SIDES AS DIRECTED.
 4. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
 5. PAPER STAPLES MADE OF 12.5 IN. DIAMETER STEEL WIRE FORMED INTO A SHAPE NOT LESS THAN 12 IN. LENGTH.
 6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
 7. INSTALL MATTING IN ACCORDANCE WITH SECTION 311 OF THE NCUTD STANDARD SPECIFICATIONS.

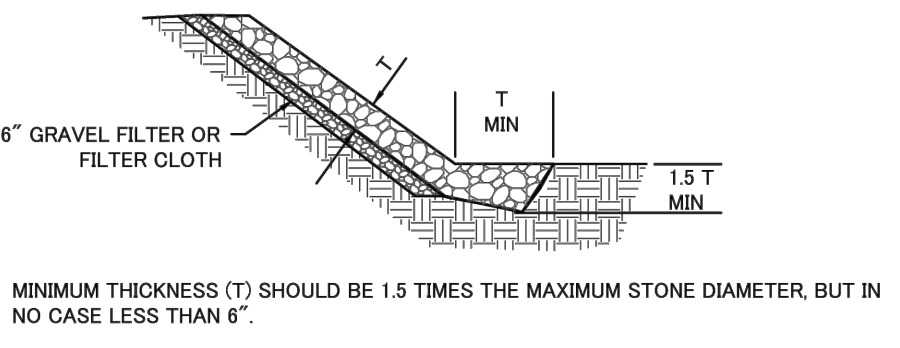


SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
 2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
 3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
 4. APPLY AGRICULTURAL LIME, FERTILIZER AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE BELOW).
 5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
 6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
 7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
 8. INSPECT ALL SEEDBED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDING WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 80% DAMAGED REESTABLISHED FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
 9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE, TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.
- *APPLY:**
AGRICULTURAL LIMESTONE - 2 TONS/ACRE OR 3 TONS/ACRE IN CLAY SOILS
FERTILIZER - 100 LBS/ACRE (10-10-10)
SUPERPHOSPHATE - 500 LBS/ACRE (20%)
MULCH - 2 TONS/ACRE (SMALL GRASS STRAW)
ANCHOR - ASPHALT EMULSION AT 450 GAL./ACRE

- Construction Sequence**
1. Obtain all necessary permits.
 2. Call Thad Valentine, NCDENR Land Quality at (919) 791-4200 for on-site inspection by inspector.
 3. Install gravel construction entrance, temporary diversions, silt fencing, sediment basins or other measures as shown on the approved plan. Clear only as necessary to install these devices.
 4. Begin clearing and grubbing. Maintain devices as needed. Rough grade site. All disturbed ditches shall be stabilized immediately with matting.
 5. Install storm sewer (if shown) and protect inlets with silt fencing, sediment traps or other approved measures as shown on the plan.
 6. Begin construction on pipelines.
 7. Stabilize site as areas are brought up to finish grade with vegetation, paving, ditch linings, etc. Install stabilization, temporary or permanent, at maximum intervals of every 5,000 LF or 15 working days, whichever is sooner.
 8. Trenches shall be backfilled and check dams shall be installed in ditches adjacent to work area daily.
 9. All areas shall have positive drainage following final grading. When construction is complete and all areas are stabilized completely, call for inspection by inspector.
 10. If site is approved, remove construction entrance, temporary diversions, silt fences, sediment basins, etc. and seed out or pave any resulting bare areas. All remaining permanent erosion control devices (such as velocity dissipaters) should be installed now.
 11. When vegetation has become established, call NCDENR at (919) 791-4200 for final site inspection by inspector.
 12. When vegetation has become established, call NCDENR at (919) 791-4200 for final site inspection by inspector.
- NOTE: All sediment and erosion control devices shall be checked and maintained weekly or after any runoff producing rainfall event.**

1. EACH RIP-RAP PLACEMENT SHALL BE BEDDED IN EITHER A 6 INCH LAYER OF STABILIZATION STONE OR A NON-BIODEGRADABLE FILTER FABRIC. PLACEMENT OF RIP-RAP SHALL IMMEDIATELY FOLLOW THE PLACEMENT OF THIS LAYER. KEEP VOIDS TO A MINIMUM AND FORM A DENSE WELL GRADED MASS OF STONE. DO NOT DISLODGE THE UNDERLYING BASE OF FILTER WHEN PLACING STONE. COST OF THE STONE BASE OR FILTER SHALL BE INCLUDED IN THE COST OF THE PLACING OF RIP-RAP.
2. THE DIAMETER OF THE LARGEST STONE SHALL NOT EXCEED 1.5 TIMES THE SIZE OF THE RIP-RAP. MAXIMUM STONE SIZE WHEN USING 8 INCH OSO WILL BE 12 INCHES AND THE MINIMUM THICKNESS OF THE RIP-RAP LAYER SHALL BE 18 INCHES.
3. MAXIMUM SLOPE OF THE CHANNEL BANK SHALL NOT EXCEED 2.0 HORIZONTAL TO 1.0 VERTICAL. FINISHED GRADE OF THE RIP-RAP IS TO BLEND WITH THE SURROUNDING AREA.
4. INSPECT RIP-RAP PERIODICALLY FOR SCOUR OR DISLODGED STONES (ESPECIALLY AFTER SEVERE STORMS) AND WEED BRUSH GROWTH.



RIP-RAP PLACEMENT DETAIL
NOT TO SCALE

JOHNSTON COUNTY SEEDING SPECIFICATIONS
(Updated 05/19/14)

TEMPORARY SEEDING SCHEDULE		
Date	Type	Planting Rate (lbs/acre)
Sept 1 - April 30	Tall Fescue and Abruzzi Rye	150
May 1 - Aug 31	Tall Fescue and Browntop or German Millet or Sorghum-Sudan Hybrids	40

SHOULDERS, SIDE DITCHES, SLOPES (For Slopes between 2:1 and 3:1)		
Date	Type	Planting Rate (lbs/acre)
Mar 1 - June 1	Sericea Lespedeza (scarified) and Add Tall Fescue	50
Mar 1 - Apr 15	Add Weeping Lovegrass or Add Hulled Common Bermuda grass	10
Mar 1 - June 30	Add Hulled Common Bermuda grass	25
June 1 - Sept 1	***Tall Fescue and ***Browntop or German Millet or ***Sorghum-Sudan Hybrids	120
Sept 1 - Mar 1	Sericea Lespedeza (unhulled/unscarified) and Tall Fescue	35
Nov 1 - Mar 1	Tall Fescue	70
Nov 1 - Mar 1	Add Abruzzi Rye	120

SHOULDERS, SIDE DITCHES, SLOPES (For Slopes between 3:1 and Flatter)		
Date	Type	Planting Rate (lbs/acre)
Aug 15 - Nov 1	Tall Fescue	300
Nov 1 - Mar 1	Tall Fescue and Abruzzi Rye	300
Mar 1 - Apr 15	Tall Fescue	300
Apr 15 - June 30	Hulled Common Bermuda grass	25
July 15 - Aug 15	Tall Fescue and ***Browntop or German Millet or ***Sorghum-Sudan Hybrids	120
July 15 - Aug 15	Tall Fescue	35
July 15 - Aug 15	***Sorghum-Sudan Hybrids	30

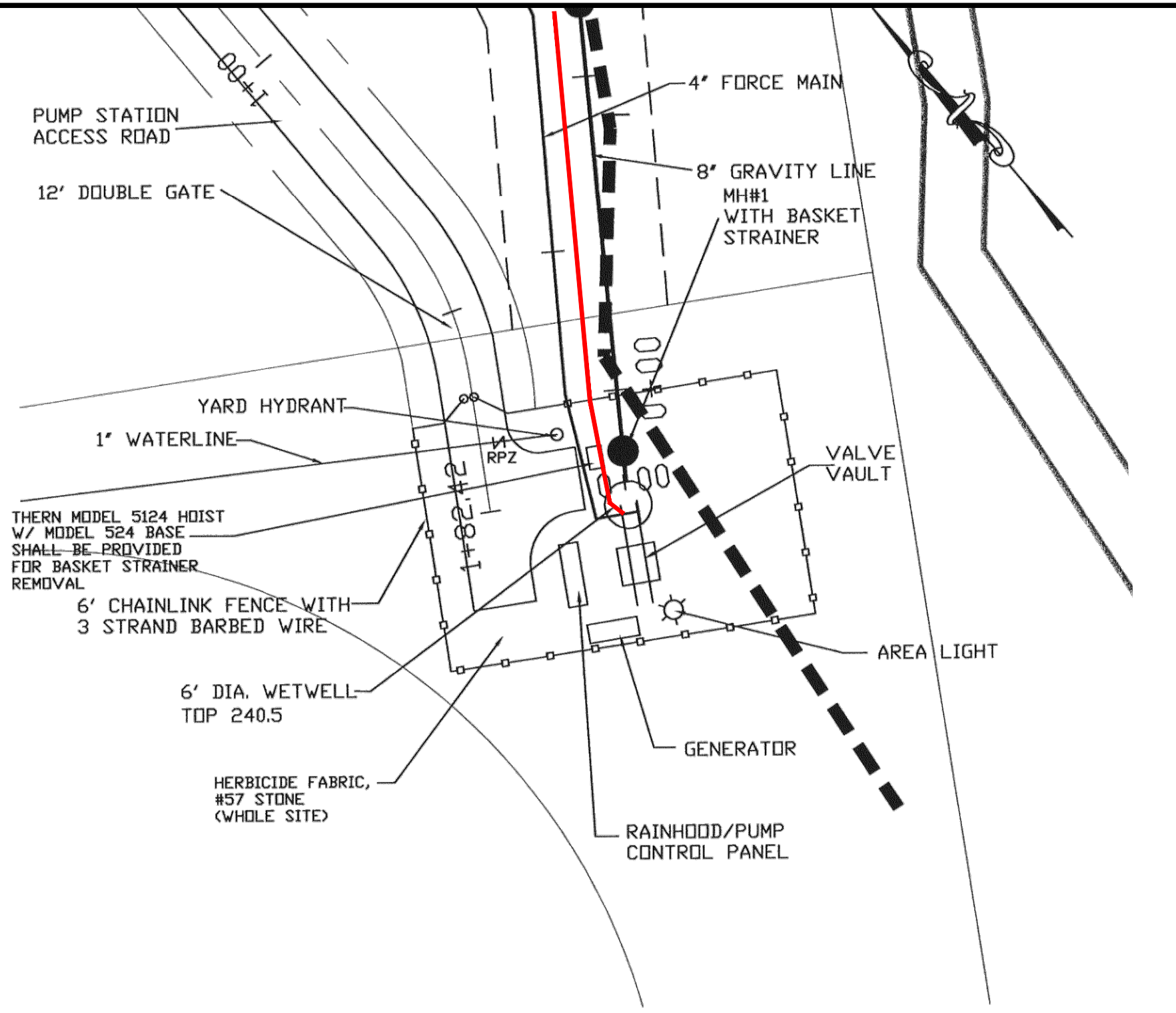
Notes:
Consult Johnston County Environmental and Stormwater Manager, the Johnston County Soil and Water Conservation Service, or the Cooperative Extension Service for additional information concerning other alternatives for vegetation of denuded areas. The above vegetation rates are those which do well under local conditions; other seeding rate combinations may be possible, but must be approved by the Environmental and Stormwater Manager.

***Temporary - Reseed according to optimum season for desired permanent vegetation. Do not allow temporary cover to grow over 12 inches in height before mowing to keep fescue from being shaded out.

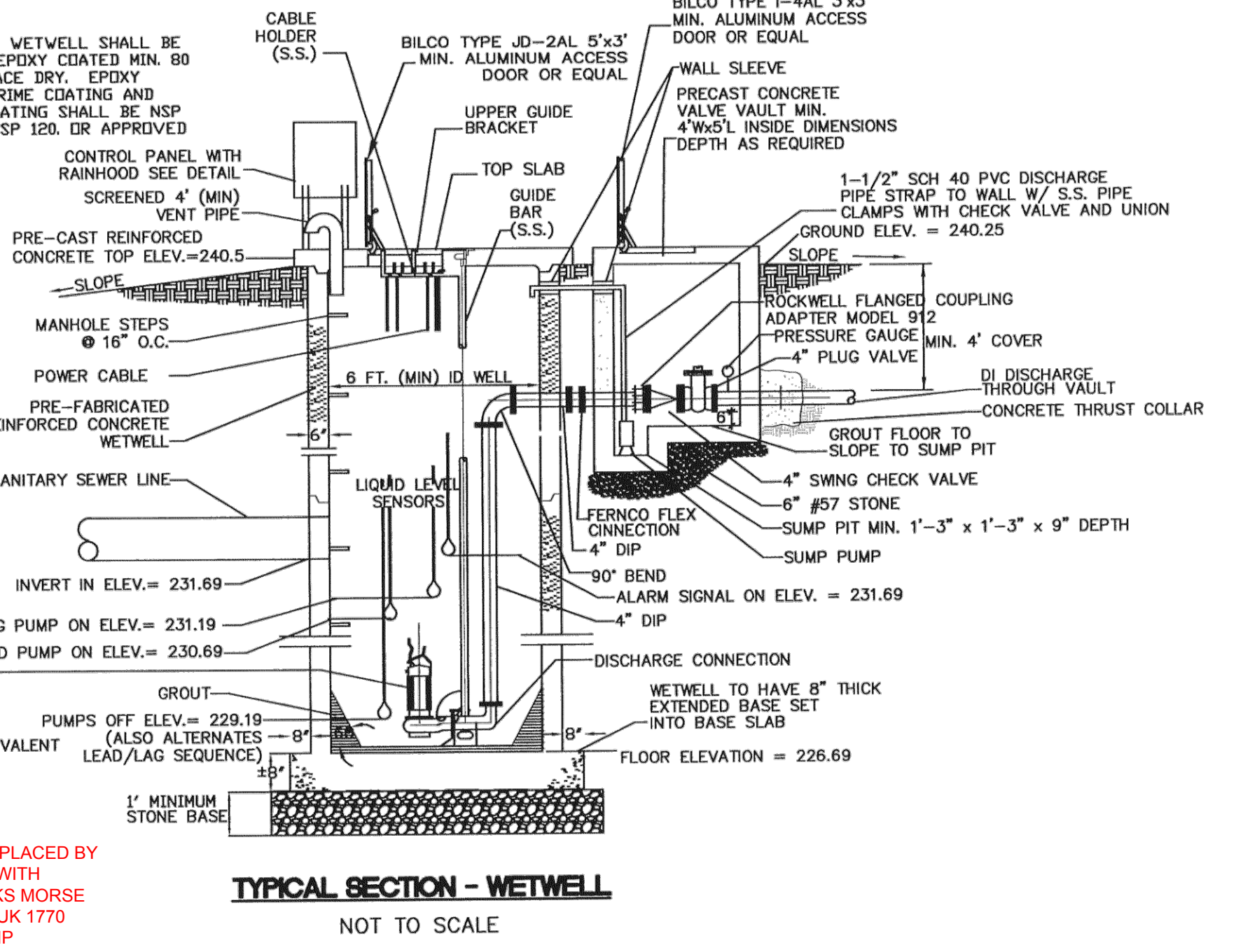
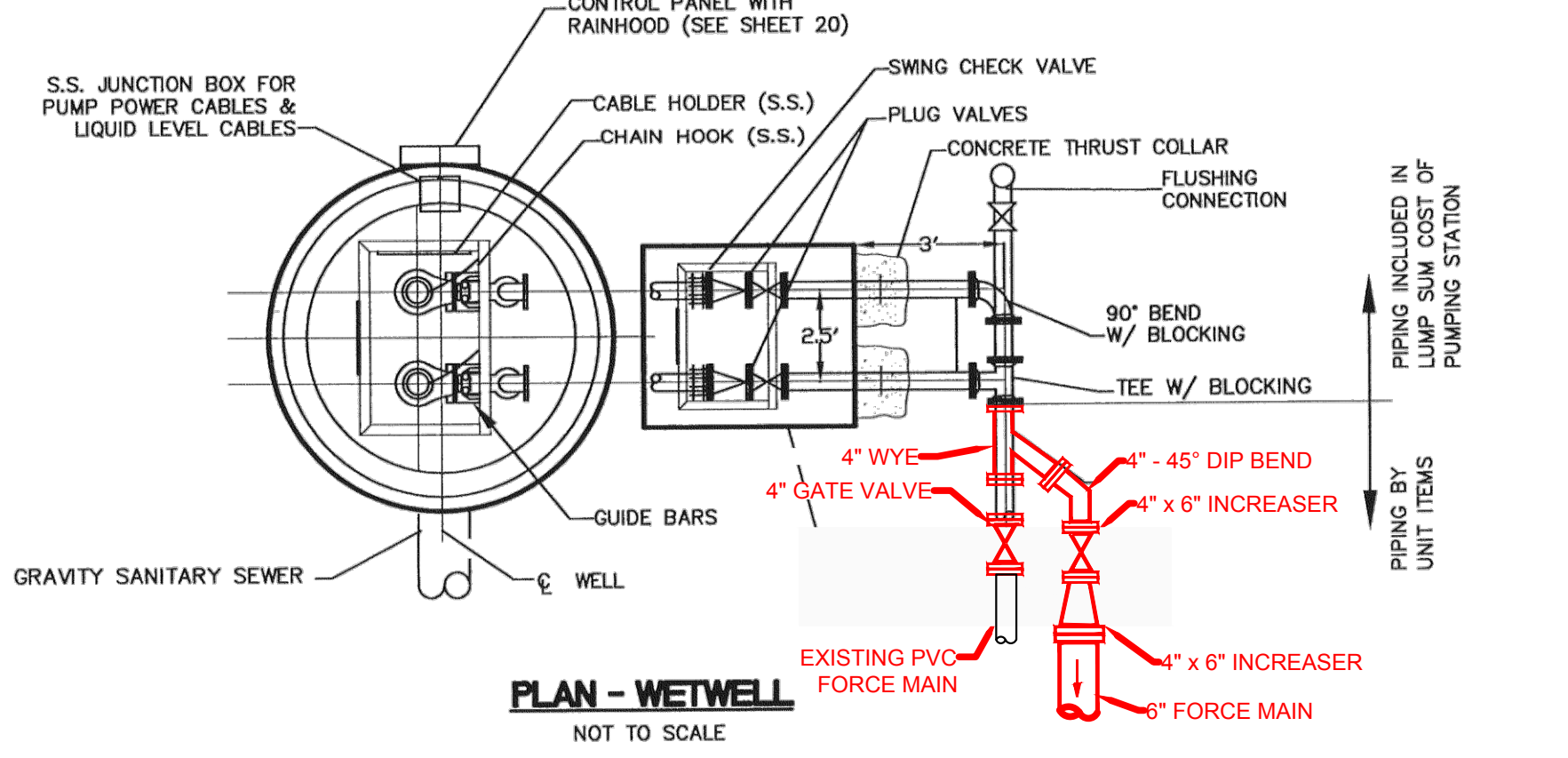
Fertilize - Apply lime and fertilizer according to soil tests, or apply 2,000 lb/acre ground agriculture limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch - Apply 4,000 lb/acre grain straw or equivalent cover of another suitable mulch. Anchor straw by tacking with asphalt. Apply asphalt at 0.10 gallons per square yard (10 Gal / 10,000 SF).

Maintenance - If growth is less than fully adequate, re-fertilize in the second year, according to soil tests or topdress with 500 lb/acre 10-10-10 fertilizer. Reseed, fertilize, and mulch damaged areas immediately.



PUMP STATION SITE PLAN
SCALE 1"=20'



TYPICAL SECTION - WETWELL
NOT TO SCALE

REVISION INFORMATION			DRAWING INFORMATION		
Num	Description	Date	Init	Init	Date
				Drawn By:	HJS 10/18
				Checked By:	MSK 10/18
				Approved By:	KCR 10/18
			SCALE: AS SHOWN		



**PUMP STATION AND
DETAIL SHEET**

**DUCHESS DOWNS
FORCE MAIN IMPROVEMENTS**

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2263
Smithfield, NC 27577

**SHEET
D2
of**