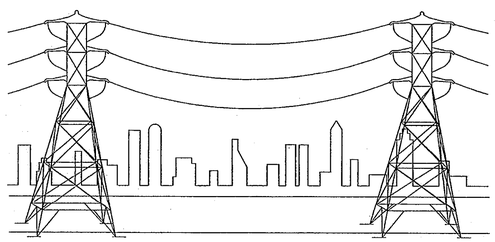
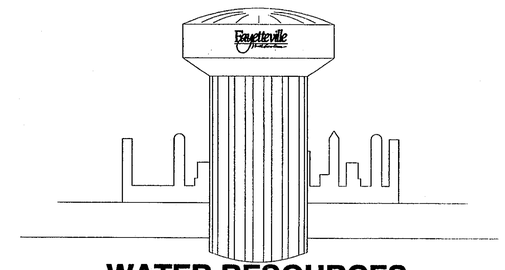
PUBLIC WORKS COMMISSION

FAYETTEVILLE, N.C.



ELECTRICAL

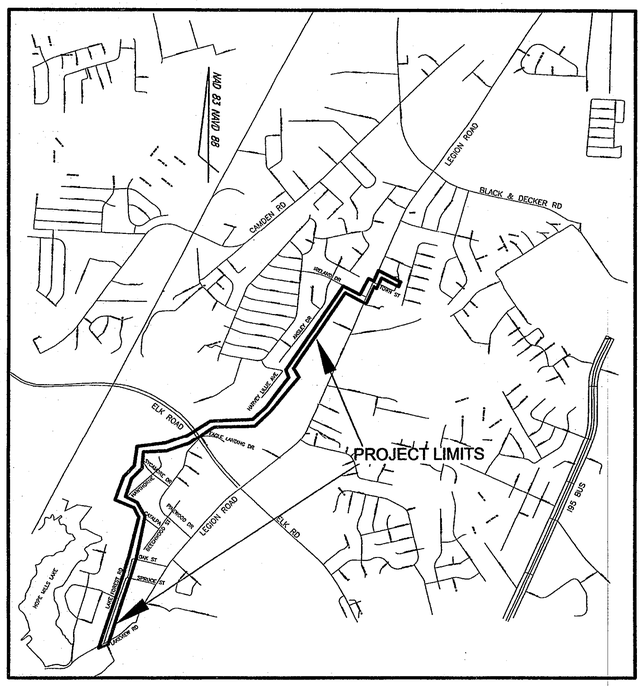
DAVID TREGO - CHIEF OPERATIONS OFFICER



WATER RESOURCES

M.J. NOLAND -W/R CHIEF OPER. OFFICER

JOSEPH E. GLASS-W/R ENGR. MANAGER



VICINITY MAP

N.T.S.

PWC COMMISSIONERS

Chairwoman:	**Evelyn O. Shaw**
Vice Chairman:	**Wade R. Fowler, Jr.**
Treasurer:	***Darsweil Rogers***
Secretary:	***Ralph D. Huff, III***
General Manager:	***David W. Trego***

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION

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UTIL-3	PARTIAL UTILITY PLAN
UTIL-4	PARTIAL UTILITY PLAN
UTIL-5	ALTERNATE BID UTILITY PLAN
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ECP-3	PARTIAL EROSION CONTROL PLAN
ECP-4	PARTIAL EROSION CONTROL PLAN
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D-1	TOWN LIFT STATION DEMO PLAN
D-2	LEGION HILLS LIFT STATION DEMO PLAN
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DET-2	EROSION CONTROL DETAILS
DET-3	SANITARY SEWER DETAILS
DET-4	SANITARY SEWER DETAILS
DET-5	FORCE MAIN/MISCELLANEOUS DETAILS
DET-6	FORCE MAIN/MISCELLANEOUS NOTES
DET-7	MISCELLANEOUS DETAILS

Drawn by David E Vaughn,PE,PLS
Checked David E. Vaughn,PE,PLS
Reviewed Jeffrey B Reitzel,PE,PLS
Date Jan 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION

COVER SHEET

Revision	By	Date

115 Broadfoot Avenue
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191
Firm No. F-0106

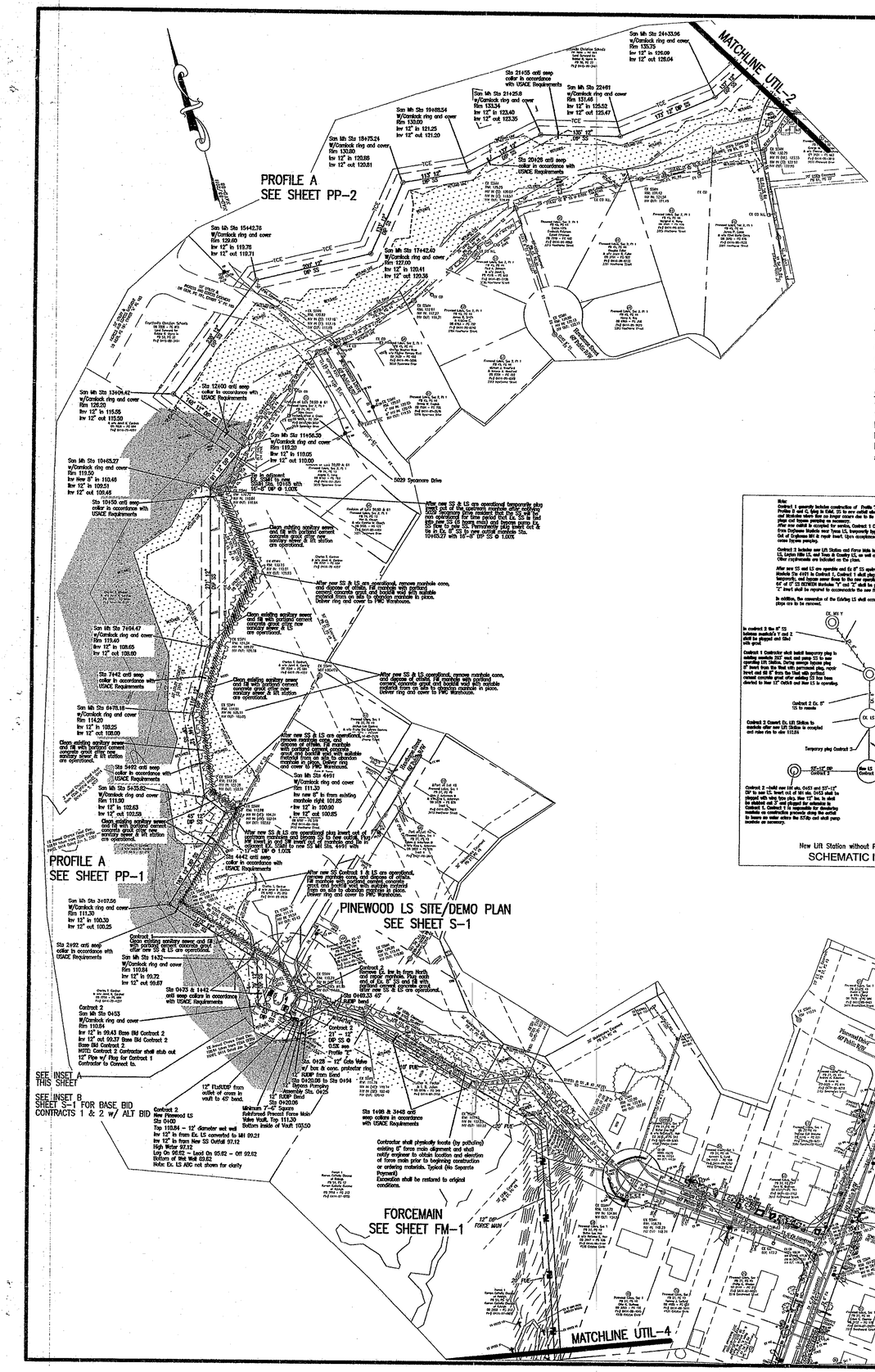
M&R
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

Scale

Book no.

Sheet C-1

JAN 26 2017



PWC
Water Resources Engineering
APPROVED FOR CONSTRUCTION
Project Name: Legion Road Outfall
Water Permit #: N/A
Sewer Permit#: PWC 2017- S005

Joseph E. Glass 2-6-17
Joseph E. Glass, PE Date
Engineering Manager

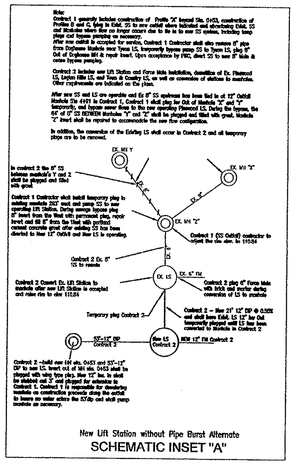
100' 0' 100' 200'

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

Contract Notes:

Contract 1 - Sanitary Sewer Outfall work begins at New Sanitary Sewer Manhole Sta. 0+53 at 12" stub out provided by Contract 2 Contractor and at existing sanitary sewer manhole "X" upstream of existing Pinewood Lift Station and includes any and all work north of these points.

Contract 2 - Lift Station and Force Main includes all work south of and including New Sanitary Sewer Manhole Sta. 0+53 and all work south of an including manhole upstream of existing Pinewood Lift Station and all work associated with the New Pinewood Lift Station, Force Main, site improvements, fencing, Existing Pinewood Lift Station conversion to manhole and abandonment of existing 6" Pinewood Force Main etc.



New Lift Station without Pipe Burst Alternate
SCHEMATIC INSET "A"

GENERAL NOTES (TYPICAL ALL SHEETS)

1. ACCESS TO SITES SHALL BE BY PUBLIC RIGHT-OF-WAYS AND UTILITY EASEMENTS. OTHER ACCESS LOCATIONS REQUIRED SHALL BE SECURED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. SUPPLEMENTAL EROSION CONTROL MEASURES SHALL BE REQUIRED TO INCLUDE CONSTRUCTION ENTRANCES, SILT FENCING, RESTORATION, ETC. ADDITIONAL MEASURES SHALL BE INCLUDED AS PART OF A SUPPLEMENTAL EROSION CONTROL PLAN PREPARED BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE CONSTRUCTION STAGING AREA AT HIS EXPENSE, INCLUDING ENVIRONMENTAL SURVEYS.
3. THE CONTRACTOR IS EXPECTED AND REQUIRED TO COOPERATE WITH THE PROPERTY OWNERS AFFECTED BY THE WORK. PRIVATE AGREEMENTS WITH PROPERTY OWNERS MUST BE IN WRITING ON A FORM APPROVED BY THE PROJECT ENGINEER AND A COPY SHALL BE PROVIDED TO THE PROJECT ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES AFFECTED BY SAID AGREEMENT. THE AGREEMENT MUST SPECIFY THAT PWC, THE CITY, AND THE PROJECT ENGINEER SHALL BE HELD HARMLESS AGAINST ALL CLAIMS ARISING FROM THE AGREEMENT. THE OWNER DISCOURAGES PRIVATE AGREEMENTS. BEFORE FINAL ACCEPTANCE, A RELEASE FROM EACH PROPERTY OWNER THAT THE CONTRACTOR HAS MADE AN AGREEMENT WITH SHALL BE REQUIRED. THE PROPERTY OWNER'S RELEASE IS A CONDITION OF FINAL ACCEPTANCE.
4. CONTRACTOR SHALL MAINTAIN A NEAT AND CLEAN JOB-SITE TO INCLUDE STAGING/STORAGE AREAS AS FOLLOWS:
   - PERFORM DUST CONTROL BY WATERING DAILY AS NEEDED OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
   - SWEEP STREETS A MINIMUM OF ONCE WEEKLY (FRIDAY) OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
   - BLADE, LEVEL AND RE-COMPACT ALL EXPOSED TRENCHES WEEKLY OR AS DIRECTED BY THE PROJECT ENGINEER, TO PRODUCE A SMOOTH "RIDE".
   - PERFORM DAILY CLEAN-UP OF ALL DIRT, DEBRIS AND SCRAP MATERIALS.
   - REMOVE EXCESS EQUIPMENT, MATERIALS, TOOLS, ETC. NOT NEEDED.
5. EXCESS SUITABLE SOIL EXCAVATED DURING CONSTRUCTION SHALL BE STOCKPILED FOR USE ON THE PROJECT OR DISPOSED OF OFF-SITE AS DIRECTED BY THE PROJECT ENGINEER. THE CONTRACTOR SHALL NOT BE ALLOWED TO STOCKPILE MATERIALS OR EXCESS MATERIALS IN THE STREET RIGHT-OF-WAYS AT ANY TIME. THE CONTRACTOR SHALL PROVIDE A SUFFICIENT AND SUITABLE STOCKPILE AREA AND LOCATION AT THE CONTRACTOR'S EXPENSE.
6. CONTRACTOR SHALL PROVIDE MEASURES DURING CONSTRUCTION TO SECURE THE SITE AND EXCAVATION FROM THE GENERAL PUBLIC AND COMPLY WITH ALL OSHA REGULATIONS. JOB SITE SAFETY IS THE EXCLUSIVE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. OPEN EXCAVATION LEFT UNATTENDED OR OVER NIGHT IS NOT ACCEPTABLE AND SHALL BE FILLED IMMEDIATELY.
7. CONTRACTOR SHALL REPAIR OR REPLACE DRIVES DISTURBED BY CONSTRUCTION TO EXISTING OR BETTER CONDITIONS. NO SEPARATE PAYMENT UNLESS OTHERWISE INDICATED.
8. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING WHERE FENCES ARE REMOVED FOR CONSTRUCTION. CONTRACTOR SHALL COORDINATE FENCE REMOVAL/REINSTALLATION WITH INDIVIDUAL PROPERTY OWNERS PRIOR TO REMOVAL. CONTRACTOR SHALL REINSTALL ALL SHEDS, ETC. TO AS GOOD OR BETTER THAN EXISTING CONDITIONS UNLESS OTHERWISE INDICATED. FENCE REINSTALLATION SHALL USE ALL NEW MATERIALS. (NO SEPARATE PAYMENT).
9. CONTRACTOR SHALL REPLACE ALL DISTURBED MAILBOXES, SIGNS, ETC. DISTURBED DURING CONSTRUCTION WITHIN 24 HOURS OF DISTURBANCE. PERMANENT ROAD SIGNAGE DISTURBED SHALL BE REPLACED IMMEDIATELY AND IF NECESSARY ROADWAY SIGNS SHALL BE TEMPORARILY INSTALLED IN A LOCATION CONSISTENT WITH THE NCMUTCD TO PROVIDE CONTINUOUS TRAFFIC AWARENESS OF ROADWAY CONDITIONS. (NO SEPARATE PAYMENT).
10. CONTRACTOR SHALL PROVIDE SECURITY FENCING, SECURITY GUARD, AND ANY AND ALL OTHER MEASURES CONTRACTOR DEEMS NECESSARY TO PROTECT EQUIPMENT AND MATERIALS STORED ON THE PROJECT. (NO SEPARATE PAYMENT).
11. WHERE CONTRACTOR CEASES WORK OPERATIONS FOR A 72 HOUR PERIOD OR LONGER, SUCH AS HOLIDAYS, ETC., THE FOLLOWING SHALL BE ACCOMPLISHED PRIOR TO THE WORK STOPPAGE.
   - CONTRACTOR SHALL STORE ALL EQUIPMENT IN THE CONTRACTOR STAGING AREA OR OFF SITE.
   - THE CONTRACTOR SHALL SWEEP ALL STREETS, PERFORM GENERAL CLEANUP AND SHALL PERFORM MAINTENANCE ON ALL EXPOSED PATCHES.
12. CONTRACTOR SHALL SCHEDULE WORK AND MATERIAL DELIVERIES SO THAT STORED MATERIAL QUANTITIES ON THE JOB SITE SHALL BE MINIMIZED.
13. CONTRACTOR SHALL STORE ALL MATERIALS IN THE CONTRACTOR STAGING AREA 72 HOURS PRIOR TO INCORPORATING INTO THE WORK TO REDUCE OBSTRUCTIONS TO TRAFFIC AND INCONVENIENCE TO RESIDENTS. WHERE UTILITIES ARE BEING CONSTRUCTED IN EASEMENTS OUT OF TRAFFIC AREAS CONTRACTOR MAY STORE MATERIALS AHEAD OF CONSTRUCTION FOR A DISTANCE NOT GREATER THAN 1800 FEET UNLESS APPROVED OTHERWISE BY THE CONSTRUCTION MANAGER.
14. AT THE PROPERTY OWNER'S REQUEST, THE CONTRACTOR SHALL DIG UP EXISTING SHRUBS AND BUSHES WITHIN UTILITY EASEMENT TO BE DISTURBED BY CONSTRUCTION AND SET OUTSIDE THE UTILITY EASEMENT AREA IN A LOCATION DETERMINED BY THE PROPERTY OWNER (NO SEPARATE PAYMENT). PROPERTY OWNER WILL BE RESPONSIBLE FOR REPLANTING SHRUBS AND BUSHES SO REMOVED, AND SHALL BE RESPONSIBLE FOR RE-ESTABLISHING GROWTH. IF NO REQUEST IS MADE BY THE PROPERTY OWNER, DISTURBED SHRUBS AND BUSHES SHALL BE REMOVED AND DISPOSED OF OFF-SITE UNLESS OTHERWISE INDICATED.
15. CLEARING AND GRUBBING SHALL BE RESTRICTED TO PERMANENT EASEMENTS ONLY. CONTRACTOR SHALL LIMIT TREE/BUSH CLEARING & GRUBBING IN THE TEMPORARY EASEMENTS, BETWEEN HOUSES AND ALONG PROPERTY LINES TO ONLY THAT WHICH IS ABSOLUTELY NECESSARY FOR CONSTRUCTION.
16. UPON COMPLETION OF CONSTRUCTION CONTRACTOR SHALL FLUSH AND CLEAN OUT STORM DRAINAGE SYSTEM TO INCLUDE DRIVEWAY PIPES, AND DISPOSE OF SPOIL MATERIAL OFFSITE. (NO SEPARATE PAYMENT)
17. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF FAYETTEVILLE, THE INSPECTION OF ALL STORM DRAINAGE TO BE IMPACTED BY CONSTRUCTION ACTIVITIES BEFORE AND AFTER ALL CONSTRUCTION ACTIVITIES HAVE TAKEN PLACE NEAR SUCH STORM DRAINAGE DEVICES (I.E. PIPE, CATCH BASINS, MANHOLES, ETC.). (NO SEPARATE PAYMENT)
18. AT LOCATIONS WHERE CONFLICTS MAY OCCUR, THE CONTRACTOR SHALL DIG UP STORM DRAINAGE PIPES PRIOR TO INSTALLING SANITARY SEWER AND ALLOW THE CITY OF FAYETTEVILLE REPRESENTATIVE TO VERIFY INVERT ELEVATIONS AND LOCATION TO ALLOW FOR ADJUSTMENT. NO SEPARATE PAYMENT
19. THE CONTRACTOR SHALL REPAIR STORM DRAINAGE DAMAGED DUE TO CONSTRUCTION TO CITY OF FAYETTEVILLE STANDARD. NO SEPARATE PAYMENT.
20. CONTRACTOR SHALL REPAIR DAMAGE TO SEPTIC SYSTEMS DUE TO CONSTRUCTION TO EXISTING OR BETTER CONDITIONS IMMEDIATELY UPON DAMAGE. CONTRACTOR SHALL PUMP AND HAUL SEPTIC TANK CONTENTS AS NECESSARY DURING THE INTERIM BETWEEN SEPTIC SYSTEM DAMAGE AND REPAIR. NO SEPARATE PAYMENT.

LEGEND

	EXISTING	NEW
POLE W/LIGHT		
POWER POLE		
UNDERGROUND ELECTRIC	UE	
OVERHEAD POWER LINE	OH	
POWER POLE GUY WIRE		
GAS LINE	G	
SANITARY SEWER W/MANHOLE		
RESTRAINED JOINT DIP THROUGH STEEL CASING		
SANITARY SEWER FORCEMAIN	FM	FM
STORM DRAINAGE PIPE		
STORM MANHOLE		
CATCH BASIN		
JUNCTION BOX		
HEADWALL		
DROP INLET		
OTCB		
TELEPHONE PEDESTAL	T	
UNDERGROUND TELEPHONE	UT	
TELEPHONE POLE		
FENCE	X	X
WATER PLUG		
CONTOUR	208	
WATER METER		
IRON PIPE	erb o eip	
WATER VALVE		
PROPERTY LINE (ACTIVE)		
WATER LINE (ACTIVE)	W W	
CABLE BOX		
CLEANOUT ON EX. SEWER LINE		
FIRE HYDRANT		
FLOW ARROW		
WOODS LINE		
SOIL BORING/HAND AUGER		
SOD		
HEDGE/BRUSH		
WETLANDS		

PWC WATER LATERAL REPAIR (TYP.)
CONTRACTOR SHALL REPAIR 1" WATER LATERALS DISTURBED BY CONSTRUCTION WITH 1" COPPER FROM MAIN TO METER. IF SVT WATER LATERAL IS DISTURBED DUE TO CONSTRUCTION CONTRACTOR SHALL REPLACE LATERAL WITH 1" COPPER FROM MAIN TO METER IN ACCORDANCE WITH PWC STANDARDS. NO SEPARATE PAYMENT.

AQUA AMERICA WATER LATERAL REPAIR (TYP.)
CONTRACTOR SHALL REPAIR WATER LATERALS DISTURBED BY CONSTRUCTION IN ACCORDANCE WITH AQUA AMERICA WATER LATERAL STANDARDS. NO SEPARATE PAYMENT.

ORDER OF PRECEDENCE GENERAL NOTES/TECHNICAL SPECIFICATIONS/ PHOTOS

1. THE NOTES CONTAINED HEREIN ARE INTENDED TO SUPPLEMENT THE TECHNICAL SPECIFICATIONS AND PROVIDE EASY REFERENCE FOR THE CONTRACTOR. IN NO CASE SHALL THESE NOTES VOID ANY PART, SECTION OR REQUIREMENT OUTLINED IN THE TECHNICAL SPECIFICATIONS CONTAINED IN THE CONTRACT DOCUMENTS. IF CONFLICTS OCCUR BETWEEN THE TECHNICAL SPECIFICATIONS AND THE NOTES CONTAINED HEREIN, THE TECHNICAL SPECIFICATIONS SHALL SUPERSEDE.

UTILITY OWNERS IN AREA:
WATER: CITY OF FAYETTEVILLE PWC
WATER: AQUA AMERICA – ENTIRE PROJECT

SANITARY SEWER: CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION
CABLE TELEVISION: TIME WARNER CABLE
TELEPHONE: CENTURY LINK
STORM DRAINAGE: CITY OF FAYETTEVILLE AND NCDOT
NATURAL GAS: PROGRESS ENERGY
ELECTRIC: CITY OF FAYETTEVILLE PWC

GENERAL NOTES FOR RESIDENT RELATIONS (MANDATORY)

PORTIONS OF THE PROPOSED WORK WILL BE CONSTRUCTED WITHIN A FULLY DEVELOPED SUBDIVISION. THE CONTRACTOR IS REQUIRED TO DEVELOP GOOD RELATIONS WITH THE RESIDENTS WHICH INCLUDES THE FOLLOWING MANDATORY MINIMUM REQUIREMENTS:

- NO SPEEDING WITH EQUIPMENT AND/OR VEHICLES (25 MPH MAX.)
- DO NOT BLOCK DRIVEWAYS AT ANY TIME
- DO NOT LITTER AT ANY TIME
- DO NOT USE RESIDENT'S WATER WITHOUT THEIR PERMISSION (SIGNED AGREEMENT REQUIRED)
- ALL REQUIREMENTS FOR BACKFLOW PREVENTION BY THE PLUMBING CODE WILL BE ADHERED TO. PWC BULK WATER POLICY SHALL BE ADHERED TO FOR THE USE OF PWC WATER FOR TESTING.
- RESPOND TO RESIDENT'S COMPLAINTS WITHIN 24 HOURS
- DO NOT USE ABUSIVE LANGUAGE, PROFANITY OR CAT-CALLING
- WEAR PROPER PROTECTIVE CLOTHING (HARD HATS, PROPER SHOES, SHIRTS, ETC.)
- MAINTAIN PROPER SAFETY MEASURES, PARTICULARLY ALONG OPEN TRENCHES IF CONSTRUCTION IS STOPPED AND THE OPEN TRENCH IS NOT MANNED.
- PERSONNEL MUST WEAR A CITY APPROVED SAFETY VEST AT ALL TIMES WHILE WORKING IN THE CITY AND/OR NCDOT RIGHT-OF-WAY.
- ALL TRAFFIC CONTROL FLAG PERSONS AND AT LEAST ONE PERSON ON EACH WORK CREW MUST BE FLUENT IN THE ENGLISH LANGUAGE. IF THE CONTRACTOR AND/OR SUBCONTRACTORS CANNOT ADEQUATELY PERFORM AND/OR COMPLY WITH THESE REQUIREMENTS, THE INDIVIDUAL, SUBCONTRACTOR, OR EMPLOYEES MAY BE DIRECTED TO LEAVE THE PROJECT PERMANENTLY. INCONSIDERATE, NON-COOPERATIVE ATTITUDES AND ACTIONS WILL NOT BE TOLERATED.
- CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS AT ALL TIMES.

NOTE: UTILITIES SHOWN ON PLAN PROFILE SHEETS

ALL SANITARY SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS & SPECIFICATIONS OF THE CITY OF FAYETTEVILLE PWC (TYP)

PROPOSED SANITARY SEWER MANHOLE RIM ELEVATIONS SHOWN ARE TO EXISTING PAVEMENT GRADES AND DO NOT REFLECT THE NEW RIM ELEVATIONS RESULTING FROM ASPHALT OVERLAY.

Key Symbol (00) Typical Notes Key

1. Clear and grub permanent easement dispose off site – clear only trees necessary in temporary easements and dispose offsite.
2. Temporary silt fence (Typical).
3. Do not disturb wetlands outside easements (Typical)
4. Remove existing fence as necessary for construction. Fence reinstallation shall use all new materials (No Separate Payment). Place temporary 4' tall chain-link fence at edge of easement or tie in opening of fence to secure contents previously secured by permanent fence removed for construction. (Typical)
5. Strip topsoil in areas to be disturbed, add amendments and re-spread topsoil prior to installation of sod. Sod shall be same species as existing and shall be placed by a Licensed Landscape Contractor in all disturbed areas not otherwise improved. No payment shall be made for sod required to restore areas disturbed outside of areas indicated to receive sod. (Typical).
6. Sewer lateral 4" diameter unless otherwise indicated (Typical).
7. Do not disturb structures etc. outside of easements (Typical).
8. Soil Boring, Hand Auger (Typical)
9. Repair Aqua America Water mains and laterals disturbed by construction to Aqua America Standards. No separate payment.
10. Contractor shall repair damage due to construction to septic tanks and/or drain field to existing or better conditions immediately upon occurrence of damage. Contractor shall obtain permits and pump and haul septic tank contents as necessary during the interim between septic system damage and repair. No separate payment (Typical).
11. Limits of construction are edge of easements and boundary of existing street right of way. (Typical).
12. Contact City Engineering Representative for inspection of storm drain prior to and after SD crossing (Typical).
13. Repair PWC water laterals disturbed by construction. Repair requires replacing lateral from, but not including, corporation at the main (adapter required) to the meter with 1" Type "K" soft copper pipe and includes installing a new lock valve and necessary fittings to transition from the new lock valve to the meter. All materials shall be submitted and approved by PWC prior to incorporation into the work. No separate payment. (Typical) See Details
14. Strip topsoil, stockpile, install lateral, or main, add amendments to topsoil seed disturbed turf area with seed mixture similar to existing lawn and place curled wood matting anchored to soil. Submit curled wood matting samples for approval to Water Resources.
15. Contractor shall mill with zipper type equipment existing pavement along sewer main (10' maximum payment width for depths up to and including 10'; 12' maximum payment width for depths greater than 10' as measured vertically from the sewer invert) and along sewer laterals (6' maximum payment width). Base Bid patch shall be permanent patch, Alt. Bid shall be temp patch in lieu of permanent patch (no overage allowed, Typical).
16. Storm Basin Inlet protection (Typical)
17. Maintain 10' minimum horizontal separation between sanitary sewer and water.
18. Cross underground electric in accordance with N.E.C.. Typical), no separate payment.
19. Contractor shall pay any and all cost/fees etc. necessary to support utility pole and shall be responsible for repair/payment to utility owner for damage due to construction (Typical).
20. Do not disturb driveways; repair damage due to construction to existing or better conditions with no separate payment (Typical).
21. Maintain min 18" separation between top of sanitary sewer and bottom of water (Typical).
22. Maintain min. 24" separation between top of sanitary sewer and bottom of storm drain (Typical).
23. Maintain min. 12" separation between top of sanitary sewer and bottom of gas (Typical).

PWC PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION

DRAWN BY: MKR	WO #: 130 0559		
ENG TECH: JEP	WO #: —		
APPROVED BY: VM	PERMIT #:		
DATE: 1-26-2017	PERMIT #:		
SCALE: 1"= 100'	DS-14918	1 of 38	

EXISTING UNDERGROUND UTILITIES WARNING
THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING, PROTECTING, AND COORDINATING WITH OR ROUTING AROUND ALL EXISTING UTILITIES. EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE, BASED UPON INFORMATION PROVIDED BY THE OWNER FROM PREVIOUS PROJECT DOCUMENTATION AND A PHYSICAL SURVEY OF VISIBLE OBJECTS AND SHOULD NOT BE CONSIDERED COMPLETE OR ACCURATE. THE CONTRACTOR MUST PROVIDE ALL NECESSARY LOCATING SERVICES AT CONTRACTOR'S EXPENSE PRIOR TO EXCAVATION AND NOTIFY ENGINEER OF SAME PRIOR TO BEGINNING CONSTRUCTION. THE USE OF CURRENT TECHNOLOGY, EXPLORATORY EXCAVATION, GROUND PENETRATING RADAR, VACUUM EXCAVATION AND SIGNIFICANT HAND EXCAVATION IS EXPECTED AND REQUIRED. ANY UNDERGROUND ITEMS DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.

Drawn by: Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION UTILITY PLAN - PARTIAL

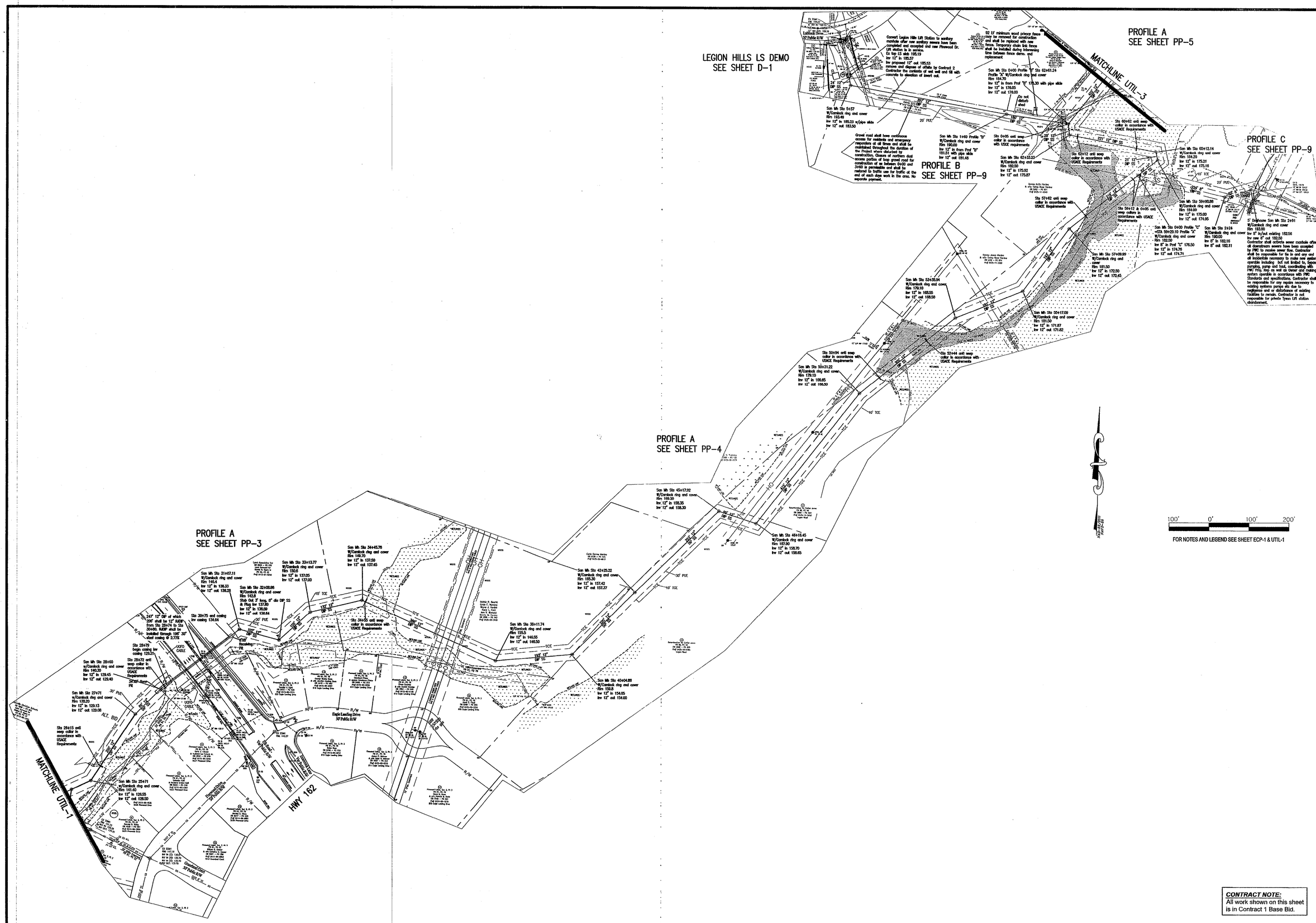
No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

M&R
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=100' HORI.
FIELD BOOK NO. 317

UTIL-1



CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION UTILITY PLAN - PARTIAL

No.	Revision	By	Date

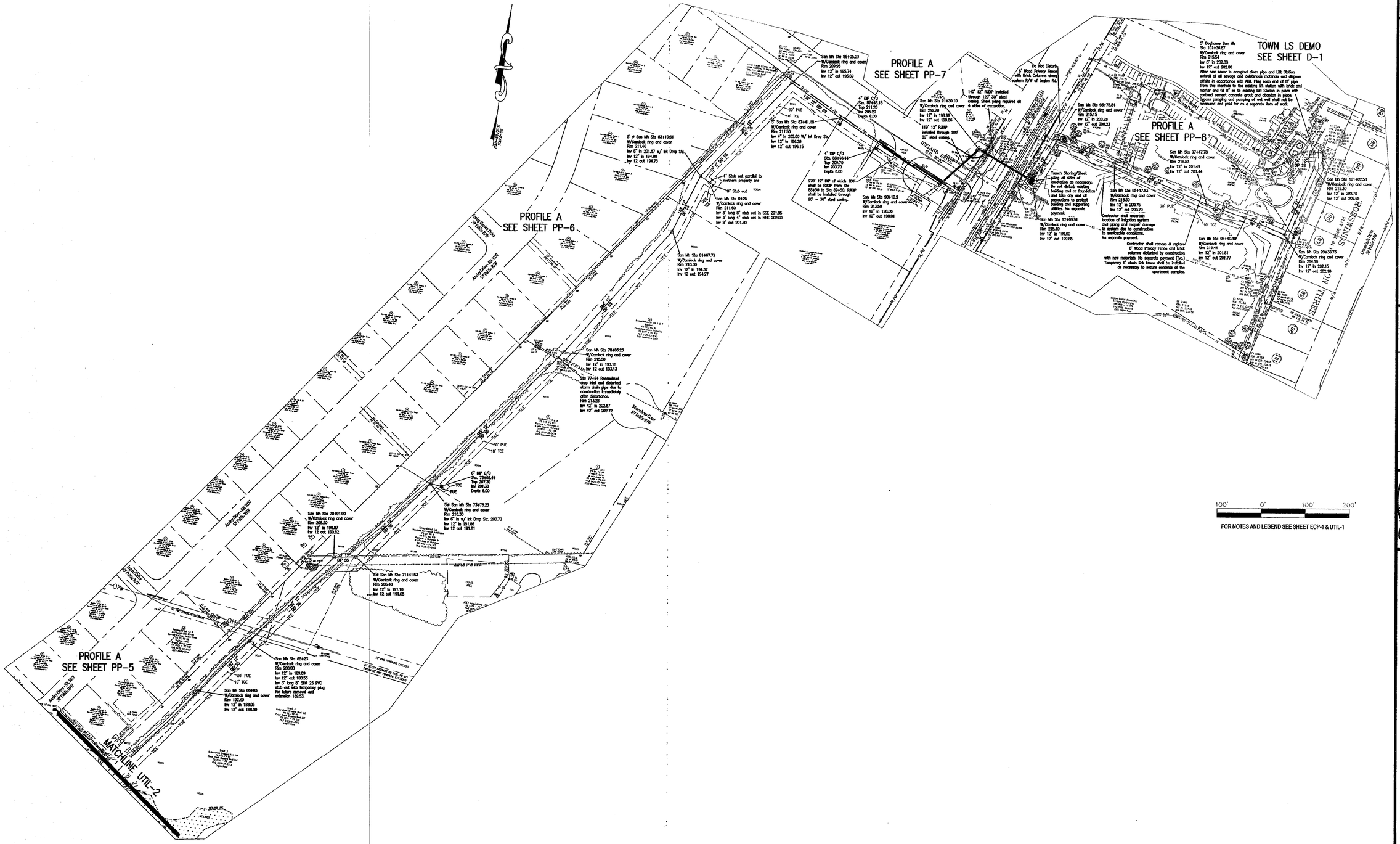
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

ENGINEERS PLANNERS SURVEYORS
M&R
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=100' HORL.

FIELD BOOK NO.

UTIL-2



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David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION UTILITY PLAN - PARTIAL

No.	Revision	By	Date

115 Broadfoot Avenue.
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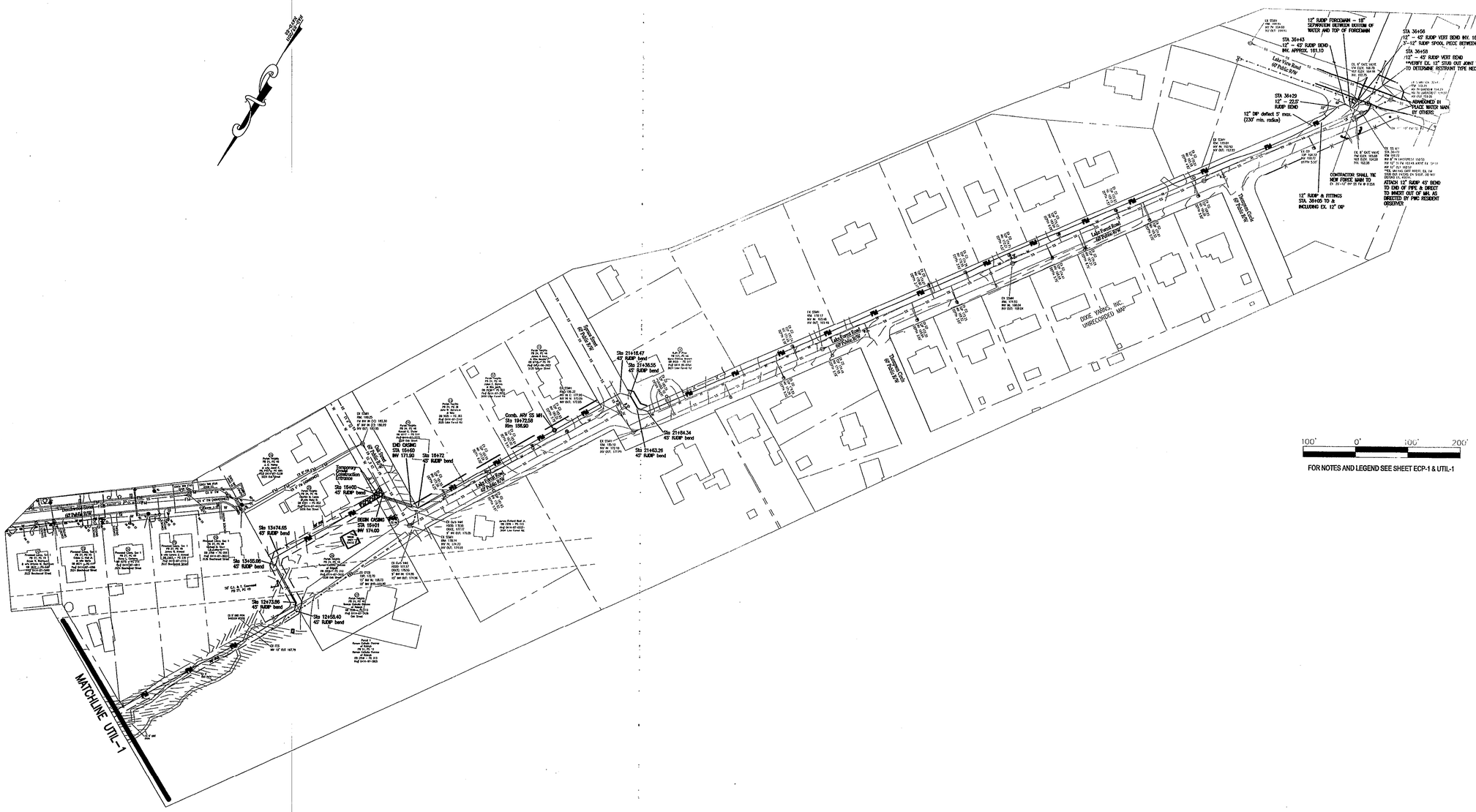
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=100' HORI.

FIELD BOOK NO.

UTIL-3



CONTRACT NOTE:
All work shown on this sheet is in Contract 2 Base Bid.

Drawn by : Dennis Gilbert David E Vaughn,PE,PLS	
Checked	
David E Vaughn,PE,PLS	
Reviewed	
J. REITZEL ,PE,PLS	
Date	JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
UTILITY PLAN - PARTIAL

No.	Revision	By	Date

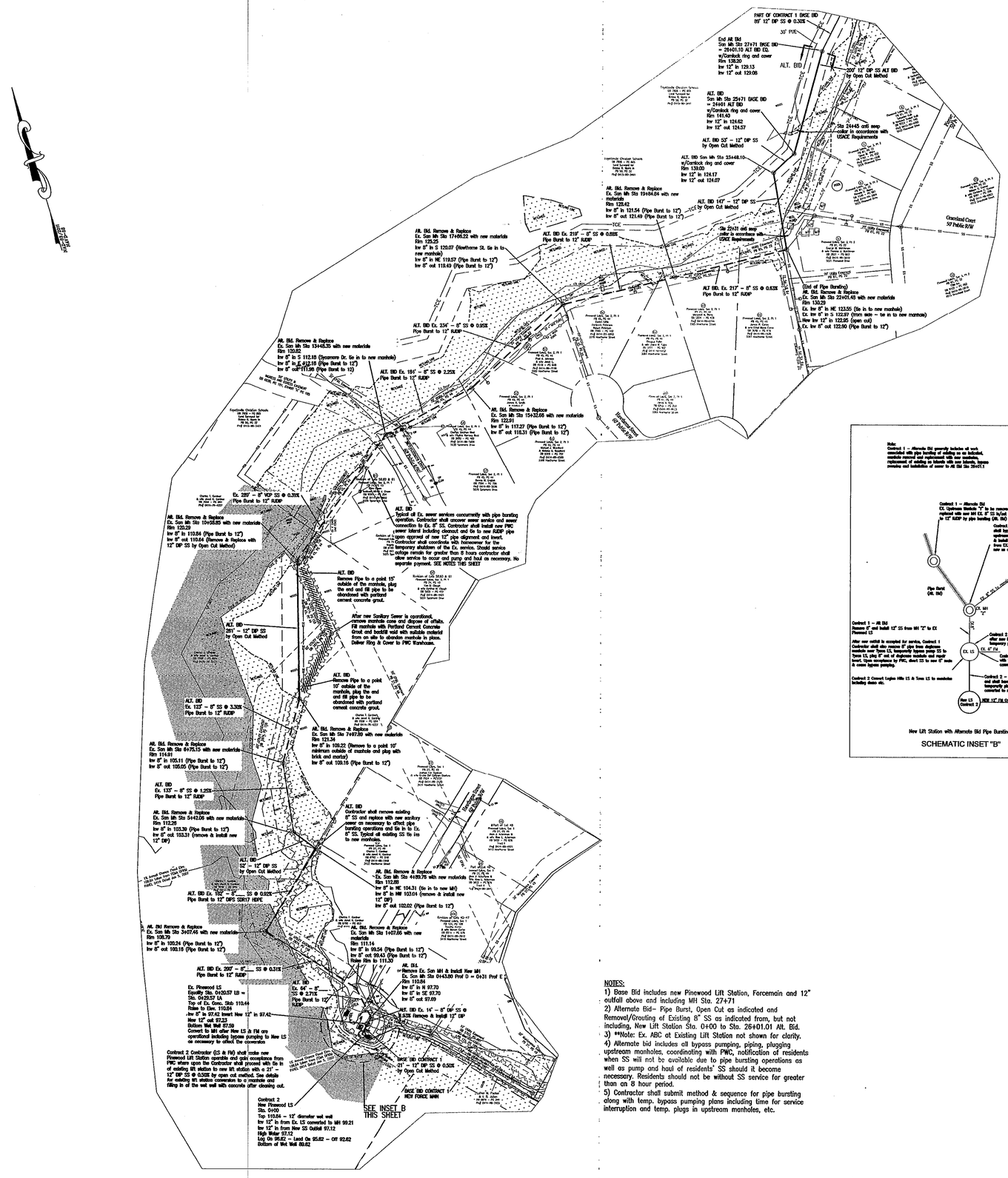
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

M&R
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=100' HORI.

FIELD BOOK NO.

UTIL-4



NOTES:

1) Base Bid includes new Pinewood Lift Station, Forcemain and 12" outfall above and including MH Sta. 27+71
2) Alternate Bid- Pipe Burst, Open Cut as indicated and Removal/Grouting of Existing 8" SS as indicated from, but not including, New Lift Station Sta. 0+00 to Sta. 26+01.01 Alt. Bid.
3) **Note: Ex. ABC at Existing Lift Station not shown for clarity.
4) Alternate bid includes all bypass pumping, piping, plugging upstream manholes, coordinating with PWC, notification of residents when SS will not be available due to pipe bursting operations as well as pump and haul of residents' SS should it become necessary. Residents should not be without SS service for greater than an 8 hour period.
5) Contractor shall submit method & sequence for pipe bursting along with temp. bypass pumping plans including time for service interruption and temp. plugs in upstream manholes, etc.

CONTRACT NOTE:
All work shown on this sheet above Sta. 0+20.57 (EX. Lift Station) is part of the Alternate Bid Pipe Bursting.

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION ALTERNATE BID UTILITY PLAN

No.	Revision	By	Date

ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.
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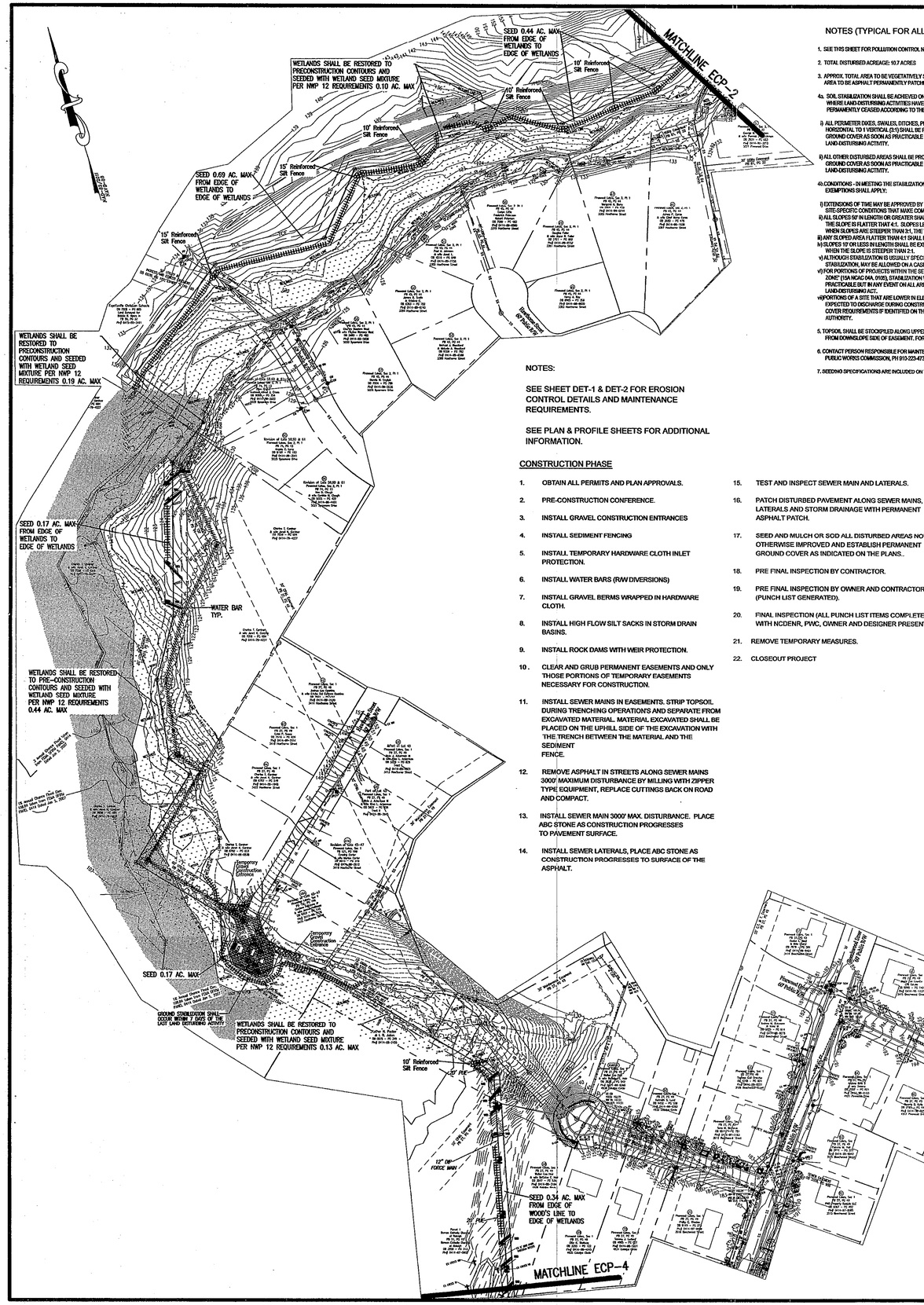
SCALE 1"=100' HORI.
FIELD BOOK NO.
SHEET
UTIL-5



NOTES:

SEE SHEET DET-1 & DET-2 FOR EROSION CONTROL DETAILS AND MAINTENANCE REQUIREMENTS.

SEE PLAN & PROFILE SHEETS FOR ADDITIONAL INFORMATION.

CONSTRUCTION PHASE

1. OBTAIN ALL PERMITS AND PLAN APPROVALS.
2. PRE-CONSTRUCTION CONFERENCE.
3. INSTALL GRAVEL CONSTRUCTION ENTRANCES
4. INSTALL SEDIMENT FENCING
5. INSTALL TEMPORARY HARDWARE CLOTH INLET PROTECTION.
6. INSTALL WATER BARS (R/W DIVERSIONS)
7. INSTALL GRAVEL BERMS WRAPPED IN HARDWARE CLOTH.
8. INSTALL HIGH FLOW SILT SACKS IN STORM DRAIN BASINS.
9. INSTALL ROCK DAMS WITH WEIR PROTECTION.
10. CLEAR AND GRUB PERMANENT EASEMENTS AND ONLY THOSE PORTIONS OF TEMPORARY EASEMENTS NECESSARY FOR CONSTRUCTION.
11. INSTALL SEWER MAINS IN EASEMENTS. STRIP TOPSOIL DURING TRENCHING OPERATIONS AND SEPARATE FROM EXCAVATED MATERIAL. MATERIAL EXCAVATED SHALL BE PLACED ON THE UPHILL SIDE OF THE EXCAVATION WITH THE TRENCH BETWEEN THE MATERIAL AND THE SEDIMENT FENCE.
12. REMOVE ASPHALT IN STREETS ALONG SEWER MAINS 3000' MAXIMUM DISTURBANCE BY MILLING WITH ZIPPER TYPE EQUIPMENT, REPLACE CUTTINGS BACK ON ROAD AND COMPACT.
13. INSTALL SEWER MAIN 3000' MAX. DISTURBANCE. PLACE ABC STONE AS CONSTRUCTION PROGRESSES TO PAVEMENT SURFACE.
14. INSTALL SEWER LATERALS, PLACE ABC STONE AS CONSTRUCTION PROGRESSES TO SURFACE OF THE ASPHALT.
15. TEST AND INSPECT SEWER MAIN AND LATERALS.
16. PATCH DISTURBED PAVEMENT ALONG SEWER MAINS, LATERALS AND STORM DRAINAGE WITH PERMANENT ASPHALT PATCH.
17. SEED AND MULCH OR SOD ALL DISTURBED AREAS NOT OTHERWISE IMPROVED AND ESTABLISH PERMANENT GROUND COVER AS INDICATED ON THE PLANS..
18. PRE FINAL INSPECTION BY CONTRACTOR.
19. PRE FINAL INSPECTION BY OWNER AND CONTRACTOR (PUNCH LIST GENERATED).
20. FINAL INSPECTION (ALL PUNCH LIST ITEMS COMPLETED WITH NCDENR, PWC, OWNER AND DESIGNER PRESENT).
21. REMOVE TEMPORARY MEASURES.
22. CLOSEOUT PROJECT

NOTES (TYPICAL FOR ALL SHEETS)

1. SEE THIS SHEET FOR POLLUTION CONTROL NOTES
2. TOTAL DISTURBED ACREAGE: 10.7 ACRES
3. APPROX. TOTAL AREA TO BE VEGETATIVELY STABILIZED:10.69 ACRES
   AREA TO BE ASPHALT PERMANENTLY PATCHED:0.01 AC.

4a. SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE:

i) ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAT 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.

ii) ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.

4b. CONDITIONS - IN MEETING THE STABILIZATION REQUIREMENTS ABOVE, THE FOLLOWING CONDITIONS OR EXEMPTIONS SHALL APPLY:

i) EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE.
ii) ALL SLOPES 50' IN LENGTH OR GREATER SHALL APPLY THE GROUND COVER WITHIN 7 DAYS EXCEPT WHEN THE SLOPE IS FLATTER THAT 4:1. SLOPES LESS THAN 50' SHALL APPLY COVER WITHIN 14 DAYS EXCEPT WHEN SLOPES ARE STEEPER THAN 3:1, THE 7 DAY-REQUIREMENT APPLIES.
iii) ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT.
iv) SLOPES 10' OR LESS IN LENGTH SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT EXCEPT WHEN THE SLOPE IS STEEPER THAN 2:1.
v) ALTHOUGH STABILIZATION IS USUALLY SPECIFIED AS GROUND COVER, OTHER METHODS, SUCH AS CHEMICAL STABILIZATION, MAY BE ALLOWED ON A CASE-BY-CASE BASIS.
vi) FOR PORTIONS OF PROJECTS WITHIN THE SEDIMENT CONTROL COMMISSION-DEFINED "HIGH QUALITY WATER ZONE" (15A NCAC 04A .0105), STABILIZATION WITH GROUND COVER SHALL BE ACHIEVED AS SOON AS PRACTICABLE BUT IN ANY EVENT ON ALL AREAS OF THE SITE WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACT.
vii) PORTIONS OF A SITE THAT ARE LOWER IN ELEVATION THAN ADJACENT DISCHARGE LOCATIONS AND ARE NOT EXPECTED TO DISCHARGE DURING CONSTRUCTION MAY BE EXEMPT FROM THE TEMPORARY GROUND COVER REQUIREMENTS IF IDENTIFIED ON THE APPROVED EASC PLAN OR ADDED BY THE PERMITTING AUTHORITY.

5. TOPSOIL SHALL BE STOCKPILED ALONG UPPER SIDE OF TRENCH WITH TRENCH SEPARATING THE TOPSOIL FROM DOWNSLOPE SIDE OF EASEMENT. FOR ADDITIONAL INFORMATION SEE SPECIFICATIONS.

6. CONTACT PERSON RESPONSIBLE FOR MAINTENANCE IS JOHN ALLEN, PE OF THE CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION, PH 910-223-4724

7. SEEDING SPECIFICATIONS ARE INCLUDED ON THIS EROSION CONTROL DETAILS SHEET DET-2.

GENERAL NOTES SEDIMENT POLLUTION CONTROL ACT

SEE SHEETS DET-1 &DET-2 FOR EROSION CONTROL DETAILS

MINIMUM REQUIREMENTS FOR EROSION CONTROL ARE SHOWN ON THE DRAWINGS, BASED ON THE DESIGNER'S ANTICIPATED CONSTRUCTION METHODS AND SEQUENCES. INDIVIDUAL CONTRACTORS SHALL SUPPLEMENT, ADJUST OR PROVIDE ADDITIONAL MEASURES TO COMPLIMENT HIS/HER TYPE OF CONSTRUCTION AND/OR PHASING AND SEQUENCING TO PREVENT TRANSMITTAL OF SILT. INDIVIDUAL CONTRACTORS ARE REQUIRED TO MAINTAIN MINIMUM STANDARDS FOR EROSION CONTROL AS APPROVED OR REQUIRED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES. ALL FEES, PENALTIES, FINES FOR NONCOMPLIANCE AND ALL CIVIL ACTIONS RESULTING THERE FROM SHALL BE THE CONTRACTORS RESPONSIBILITY AND IN NO WAY INVOLVES THE OWNER OR DESIGNER. THE CONTRACTOR MAY BE REQUIRED TO MODIFY OR SUPPLEMENT MEASURES AT NO ADDITIONAL COST TO THE OWNER. ALL EROSION CONTROL MEASURES SHALL REMAIN SERVICEABLE UNTIL THE SITE IS RESTORED AND STABILIZED, UPON SUCH TIME THE MEASURES SHALL BE REMOVED BY THE CONTRACTOR. THE SITE MUST BE RESTORED, STABILIZED AND ANY OFF SITE SEDIMENTATION MUST HAVE BEEN REMOVED AND AREAS AFFECTED RESTORED PRIOR TO THE DESIGNER'S APPROVAL FOR FINAL REQUEST FOR PAYMENT.

THE CONTRACTOR SHALL BE REQUIRED TO PREPARE AND OBTAIN AN APPROVED EROSION CONTROL PLAN AMENDING THE ORIGINAL PERMITTED PLAN SUBMITTED BY THE OWNER. THE SUPPLEMENTAL PLAN SHALL ADDRESS STAGING/STORAGE AREAS, HAUL ROADS, BORROW PIT OPERATIONS AND/OR DISPOSAL/WASTE AREAS REGARDLESS OF THE SIZE OF DISTURBANCE. THE CONTRACTOR SHALL PAY ALL FEES ASSOCIATED WITH THE SUPPLEMENTAL PLAN AND A COPY OF THE NCDENR APPROVED PLAN SHALL BE FURNISHED TO THE DESIGNER. WORK CANNOT BEGIN UNTIL THE PLAN IS APPROVED. PERMANENT AND TEMPORARY EROSION CONTROL MEASURES PROPOSED BY THE CONTRACTOR FOR STAGING AREAS, HAUL ROADS, ETC. SHALL BE AT THE CONTRACTOR'S EXPENSE AND SHALL NOT CONSTITUTE ADDITIONAL COMPENSATION.

THE CONTRACTOR SHALL BE REQUIRED TO DISPLAY AT THE JOB-SITE OFFICE (OR READILY AVAILABLE ON THE PROJECT SITE), BOTH THE OWNER'S EROSION CONTROL PERMIT AND THE CONTRACTOR'S SUPPLEMENT EROSION CONTROL PERMIT. A COPY OF THE AMENDED PERMIT OR EVIDENCE OF AN APPROVAL SHALL BE FURNISHED TO THE DESIGNER PRIOR TO BEGINNING WORK.

NPDES STORM WATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES: REGULATIONS ADOPTED BY THE US ENVIRONMENTAL PROTECTION AGENCY (US EPA) AND BY THE NORTH CAROLINA DIVISION OF WATER QUALITY REQUIRE THAT A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT BE OBTAINED FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES WITH LAND DISTURBANCE OF 1 OR MORE ACRES. THIS PERMIT IS IN ADDITION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN APPROVAL. THE DIVISION OF WATER QUALITY IS DELEGATED BY THE US EPA TO ADMINISTER THE NPDES PERMIT PROGRAM IN NORTH CAROLINA. THIS PROJECT IS SUBJECT TO THESE NPDES GENERAL PERMITTING REQUIREMENTS. THE CONTRACTOR SHALL COMPLY WITH THE APPLICATION TERMS AND CONDITIONS OF THIS GENERAL PERMIT AND IS SUBJECT TO ENFORCEMENT BY THE DIVISION OF WATER QUALITY FOR ANY VIOLATIONS OF THE GENERAL PERMIT.

THE GENERAL PERMIT IS TIED TO AN APPROVED EROSION AND SEDIMENT CONTROL PLAN ISSUED BY THE NORTH CAROLINA DIVISION OF LAND RESOURCES. ADHERENCE TO THE EROSION AND SEDIMENTATION CONTROL PLAN IS AN ENFORCEABLE COMPONENT TO THE GENERAL PERMIT. THE GENERAL PERMIT NOT ONLY REQUIRES ADHERENCE TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN, BUT ALSO INCLUDES OTHER LIMITATIONS AND CONTROLS. SOME OF THE MAJOR ITEMS ARE OUTLINED BELOW.

* COVERAGE: THE PERMIT COVERS PROJECTS THAT DISTURB ONE OR MORE ACRE OF LAND.
* INSPECTIONS: THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENTATION CONTROL FACILITIES AND ALSO SHALL OBSERVE RUNOFF AT STORM WATER DISCHARGES IN ACCORDANCE WITH THE GENERAL PERMIT (SEE PART I BELOW FOR SPECIFIC FREQUENCIES, ETC.) DISCHARGES TO CERTAIN IMPAIRED WATERS REQUIRE MORE FREQUENT INSPECTIONS.
* RECORDS: RECORDS OF INSPECTIONS SHALL BE MAINTAINED BY THE CONTRACTOR WITH A COPY OF THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AT THE PROJECT SITE.
* THE GENERAL PERMIT HAS OTHER PROVISIONS THAT ADDRESS AREAS THAT COULD AFFECT STORM WATER RUNOFF FROM CONSTRUCTION ACTIVITY THAT ARE NOT A PART OF AN EROSION AND SEDIMENTATION CONTROL PLAN. THESE AREAS INCLUDE MATTERS SUCH AS DEMOLITION DEBRIS, CHEMICAL USAGE, AND OIL SPILLS THAT MAY CONTAMINATE STORM WATER RUNOFF ON A CONSTRUCTION SITE.

1. MINIMUM MONITORING AND REPORTING REQUIREMENTS

* ALL SEDIMENTATION AND EROSION CONTROL OF FACILITIES SHALL BE INSPECTED AND DOCUMENTED BY THE CONTRACTOR AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT OF GREATER THAN 0.5 INCHES OF RAIN PER 24 HOUR PERIOD. THE CONTRACTOR SHALL INSTALL AND MAINTAIN A RAIN GAUGE ON THE SITE AND A RECOND OF THE RAINFALL AMOUNTS AND DATES.

* STORM WATER RUNOFF DISCHARGES SHALL BE INSPECTED BY VISUAL OBSERVATION FOR COLOR, FOAM, OUTFALL, STAINING, VISIBLE SHEENS, DRY WEATHER FLOWS AND MUDDY WATER (AT THE FREQUENCY DESCRIBED ABOVE) TO EVALUATE THE EFFECTIVENESS OF THE POLLUTION CONTROL FACILITIES OR PRACTICES. IF ANY VISIBLE OFF-SITE SEDIMENTATION IS LEAVING THE SITE, CORRECTIVE ACTION SHALL BE TAKEN TO REDUCE THE DISCHARGE OF SEDIMENTS.

* THE CONTRACTOR SHALL SUBMIT WITH EACH REQUEST FOR PAYMENT, A WRITTEN REPORT OF WEEKLY INSPECTIONS. A SAMPLE REPORT LOG IS INCLUDED IN THE CONTRACT DOCUMENTS. VISIBLE SEDIMENTATION FOUND OFF THE SITE SHALL BE RECORDED WITH A BRIEF EXPLANATION AS TO THE MEASURES TAKEN TO PREVENT FUTURE RELEASES AS WELL AS ANY MEASURES TAKEN TO CLEAN UP THE SEDIMENT THAT HAS LEFT THE SITE. THESE RECORDS SHALL BE MADE AVAILABLE TO DEM OR AUTHORIZED AGENT UPON REQUEST.

2. MAINTENANCE AND INSPECTIONS

* THE CONTRACTOR SHALL PROVIDE THE NECESSARY OPERATION AND MAINTENANCE TO KEEP ALL EROSION CONTROL DEVICES AND MATERIALS IN GOOD REPAIR AND OPERATING AT OPTIMUM EFFICIENCY. THE OWNER RESERVES THE RIGHT, WITHIN 24 HOURS PRIOR NOTICE TO THE CONTRACTOR TO REPAIR ANY EROSION CONTROL MEASURES OR MATERIALS AS REQUIRED, AND DEDUCT THE COST OF THOSE REPAIRS FROM THE CONTRACTOR'S REQUEST FOR PAYMENT.

* THE OWNER. DESIGNER OR DEM REPRESENTATIVES MAY PERIODICALLY EVALUATE THE PROJECT FOR COMPLIANCE WITH THESE REQUIREMENTS.

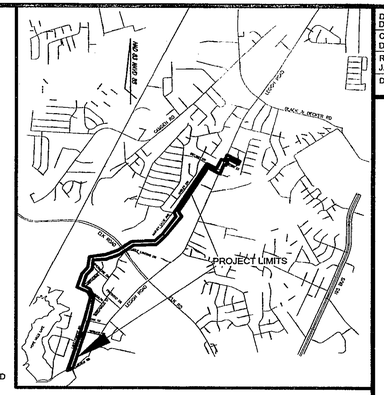
* THE CLEAN WATER ACT PROVIDES THAT ANY PERSON WHO KNOWINGLY MAKES ANY FALSE STATEMENT, REPRESENTATION, OR CERTIFICATION IN ANY RECORD OR OTHER DOCUMENT SUBMITTED OR REQUIRED TO BE MAINTAINED UNDER THIS GENERAL PERMIT, INCLUDING MONITORING REPORTS OR REPORTS OF COMPLIANCE OR NONCOMPLIANCE SHALL, UPON CONVICTION, BE PUNISHED BY A FINE OF NOT MORE THAT $10,000 PER VIOLATION, OR BY IMPRISONMENT FOR NOT MORE THAN TWO YEARS PER VIOLATION, OR BY BOTH.

THE CONTRACTOR SHALL INSURE THAT THE STREETS CONNECTING TO THE PROJECT ARE PROTECTED FROM MUD, SAND, STONE, LITTER OR DEBRIS IN ANY FORM. ALL MUD COLLECTED ON VEHICLE WHEELS SHALL BE REMOVED OR CLEANED OFF BEFORE LEAVING THE CONSTRUCTION SITE. SHOULD ANY MUD OR DEBRIS FROM THE PROJECT COLLECT ON THE STREETS THE MUD OR DEBRIS SHALL BE REMOVED IMMEDIATELY TO PREVENT ANY HAZARDS TO VEHICULAR OR PEDESTRIAN TRAFFIC AS WELL AS FROM ENTERING THE STORM DRAINAGE SYSTEM. THE CONTRACTOR IS REQUIRED TO CLEAN THE STREETS DAILY OF CONSTRUCTION RELATED DEBRIS, DUST AND MUD AND IS REQUIRED TO CLEAN THE STORM DRAINAGE SYSTEM (AND DOWNSTREAM SYSTEMS) AFFECTED BY CONSTRUCTION RUN OFF COMPLETELY PRIOR TO FINAL ACCEPTANCE AND PAYMENT. THE OWNER RESERVES THE RIGHT TO PROCEED WITH STREET CLEANING SHOULD THE CONTRACTOR FAIL TO COMPLY WITH THIS REQUIREMENT AND DEDUCT THE COSTS FROM THE CONTRACTOR'S REQUEST FOR PAYMENT.

GROUND STABILIZATION REQUIREMENTS

Site Area Description	Stabilization Time Frame	Stabilization Time Frame Exceptions
Perimeter dikes, swales, ditches and slopes	*7 days*	*None*
High Quality Water (HQW) Zones	*7 days*	*None*
Slopes steeper than 3:1	*7 days*	*If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.*
Slopes 3:1 or flatter	*14 days*	*7-days for slopes greater than 50 feet in length*
All other areas with slopes flatter than 4:1	*14 days*	*None (except for perimeters and HQW Zones)*

Permanent ground cover shall be established for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following completion of construction or development



VICINITY MAP

N.T.S.

POLLUTION PREVENTION

(TYPICAL FOR ALL SHEETS)

1. EQUIPMENT UTILIZED DURING THE CONSTRUCTION ACTIVITY ON A SITE MUST BE OPERATED AND MAINTAINED IN A MANNER AS TO PREVENT THE POTENTIAL OR ACTUAL POLLUTION OF THE SURFACE OR GROUND WATERS. FUELS, LUBRICANTS, COOLANTS, AND HYDRAULIC FLUIDS, OR ANY OTHER PETROLEUM PRODUCTS, SHALL NOT BE DISCHARGED ON THE GROUND OR INTO SURFACE WATERS. SPENT FLUIDS SHALL BE DISPOSED OF IN A MANNER SO AS NOT TO ENTER THE WATERS, SURFACE OR GROUND, AND IN ACCORDANCE WITH APPLICABLE AND FEDERAL DISPOSAL REGULATIONS. ANY SPILLED FLUIDS SHALL BE CLEANED UP TO THE EXTENT PRACTICABLE AND DISPOSED OF IN A MANNER SO AS NOT TO ALLOW THEIR ENTRY INTO THE WATERS, SURFACE OR GROUND, STORM SEWERS, OR DRAINS ON PRIVATE OR PUBLIC (STATE) PROPERTY. THE CONTRACTOR IS REQUIRED TO PROVIDE PRIMARY AND SECONDARY CONTAINMENT SYSTEM FOR FLUID STORAGE, FUELING AND SERVICING EQUIPMENT.

2. THE CONTRACTOR, HIS SUBCONTRACTORS AND MATERIAL SUPPLIERS ARE PROHIBITED FROM DISCHARGING ANY WASTE PRODUCTS FROM CONCRETE TRUCKS TO INCLUDE WASH DOWN WATER OR FROM CONCRETE CORING AND SAWING WORK OR ANY OTHER UNSUITABLE CONSTRUCTION MATERIALS OR PRODUCTS INTO THE STORM SEWER SYSTEM OR DISCHARGE ONTO THE OWNER'S PROPERTY.

3. THE CONTRACTOR SHALL CONTROL THE MANAGEMENT AND DISPOSAL OF LITTER AND SANITARY WASTE FROM THE SITE SUCH THAT NO ADVERSE IMPACTS TO WATER QUALITY OCCUR.

4. THE CONTRACTOR SHALL PAY ALL COSTS OF THE CLEAN UP AND REMOVAL OF ANY SUCH UNAUTHORIZED DISCHARGE AND PAY ANY AND ALL FINES, PENALTIES AND/OR DAMAGES.

100' 0' 100' 200'

FOR ADDITIONAL NOTES SEE SHEET ECP-2

LEGEND

- INSTALL TEMPORARY HIGH FLOW SILT SACK IN EXISTING BASIN. (TYPICAL)
- WETLANDS
- TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
- TEMPORARY SILT FENCE
- TEMPORARY REINFORCED SILT FENCE
- SOD SYMBOL
- LIMITS OF CONSTRUCTION (RIGHT OF WAY)
- LIMITS OF CONSTRUCTION (EASEMENTS)
- WB — RW DIVERSION (WATER BAR)
- SANITARY SEWER LATERAL
- SANITARY SEWER MANHOLE
- EXCAVATED DROP INLET PROTECTION
- RIP RAP DRAINAGE FEATURE

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION EROSION CONTROL PLAN - PARTIAL

No.	Revision	By	Date

M&R
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115 Broadfoot Avenue.
Fayetteville, N.C.
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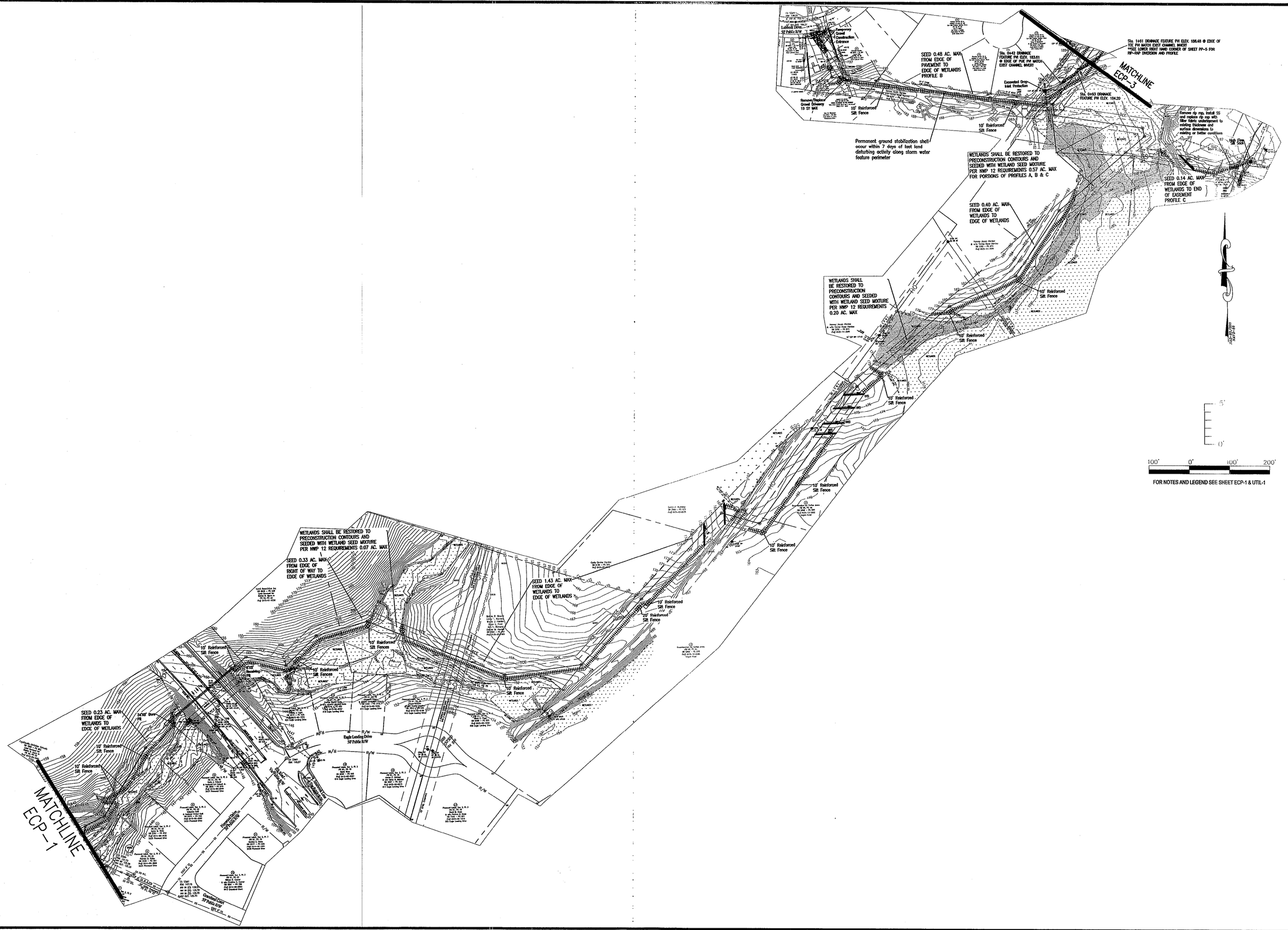
Phone 910-484-5191

SCALE 1"=100' HORI.

FIELD BOOK NO.

ECP-1



FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
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LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION EROSION CONTROL PLAN - PARTIAL

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FIELD BOOK NO.

ECP-2

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

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ENGINEERS PLANNERS SURVEYORS
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SCALE 1"=100' HORI.

FIELD BOOK NO.

ECP-3

Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
EROSION CONTROL PLAN - PARTIAL

No.	Revision	By	Date

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SCALE 1"=100' HORI.

FIELD BOOK NO.

ECP-4

100' 0' 100' 200'

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

Drawn by : Dennis Gibert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION ALTERNATE BID EROSION CONTROL PLAN

No.	Revision	By	Date

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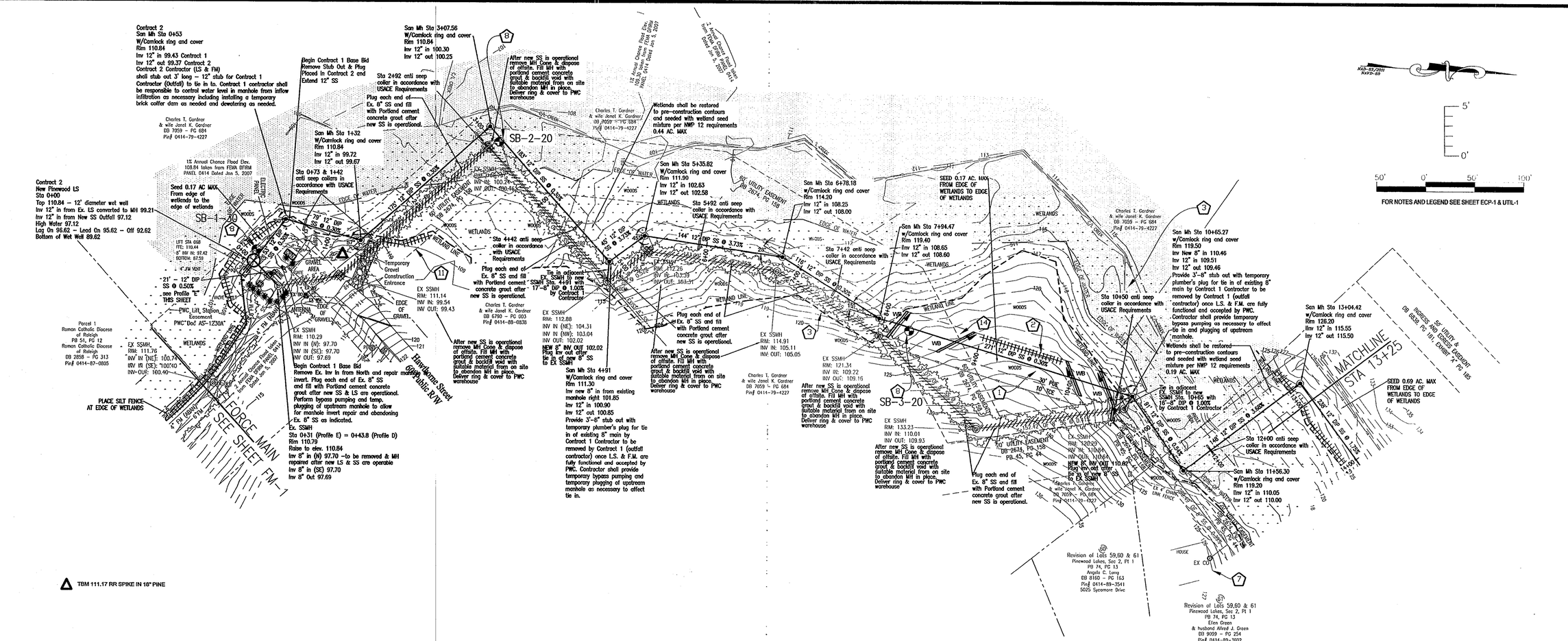
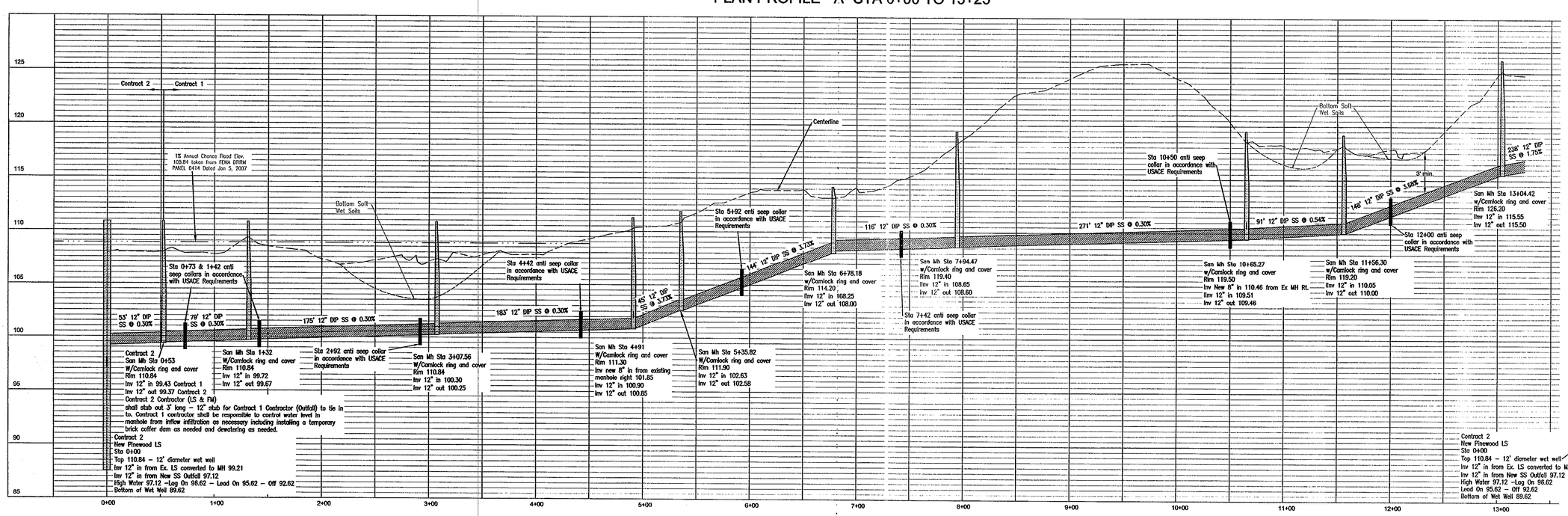
FIELD BOOK NO.

ECP-5

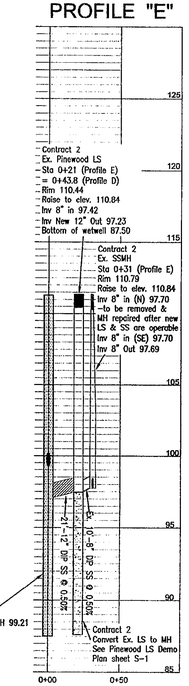


TBM 111.17 RR SPIKE IN 16" PINE

PLAN PROFILE "A" STA 0+00 TO 13+25



PROFILE "E"



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LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION

PLAN PROFILE "A" STA 0+00 TO STA 13+25

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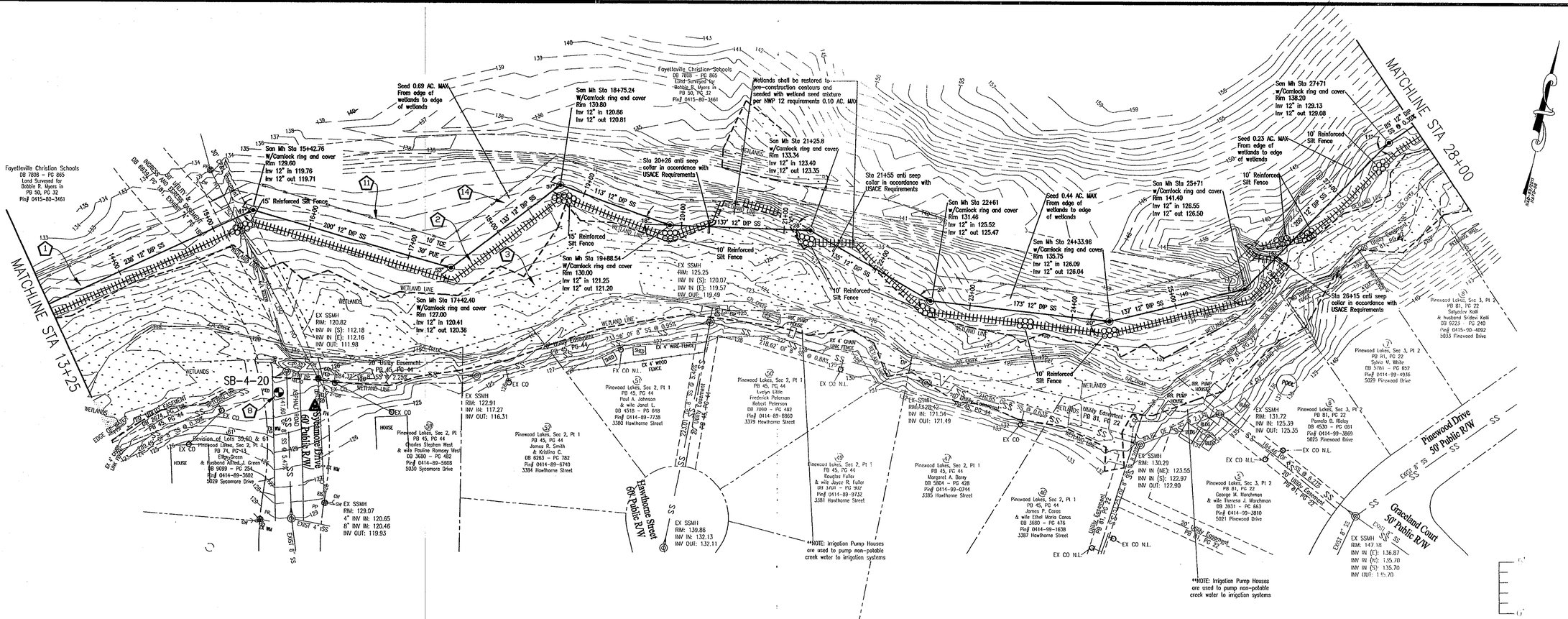
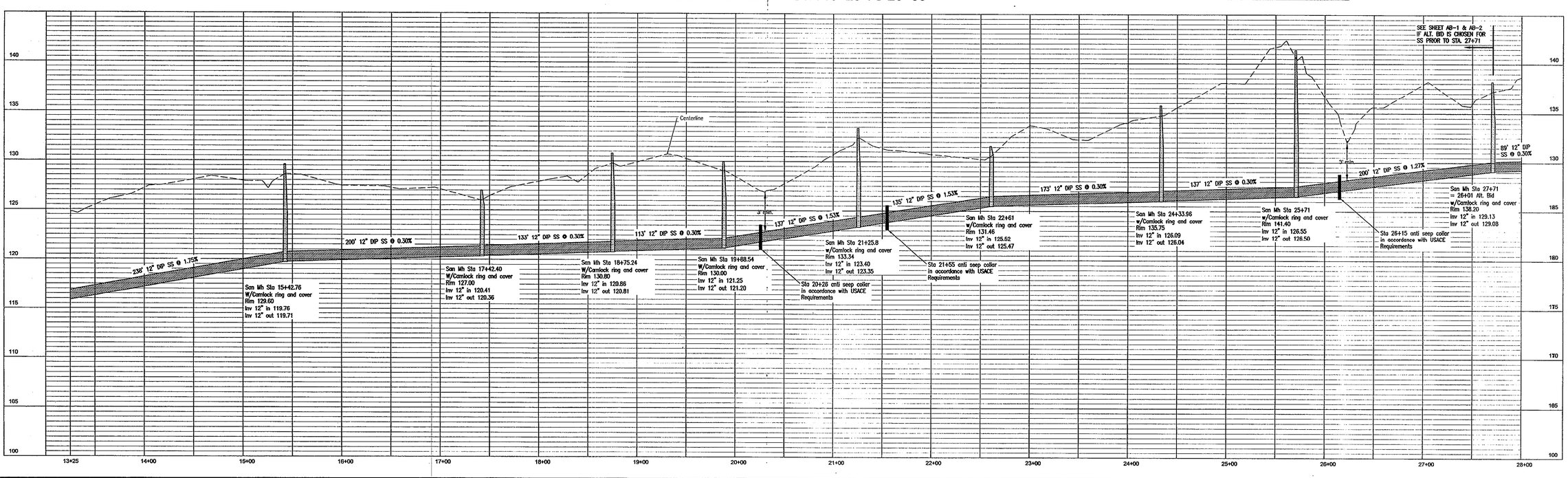
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
PP-1



CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

PLAN PROFILE "A" STA 13+25 TO 28+00



Drawn by Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 13+25 TO 28+00

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

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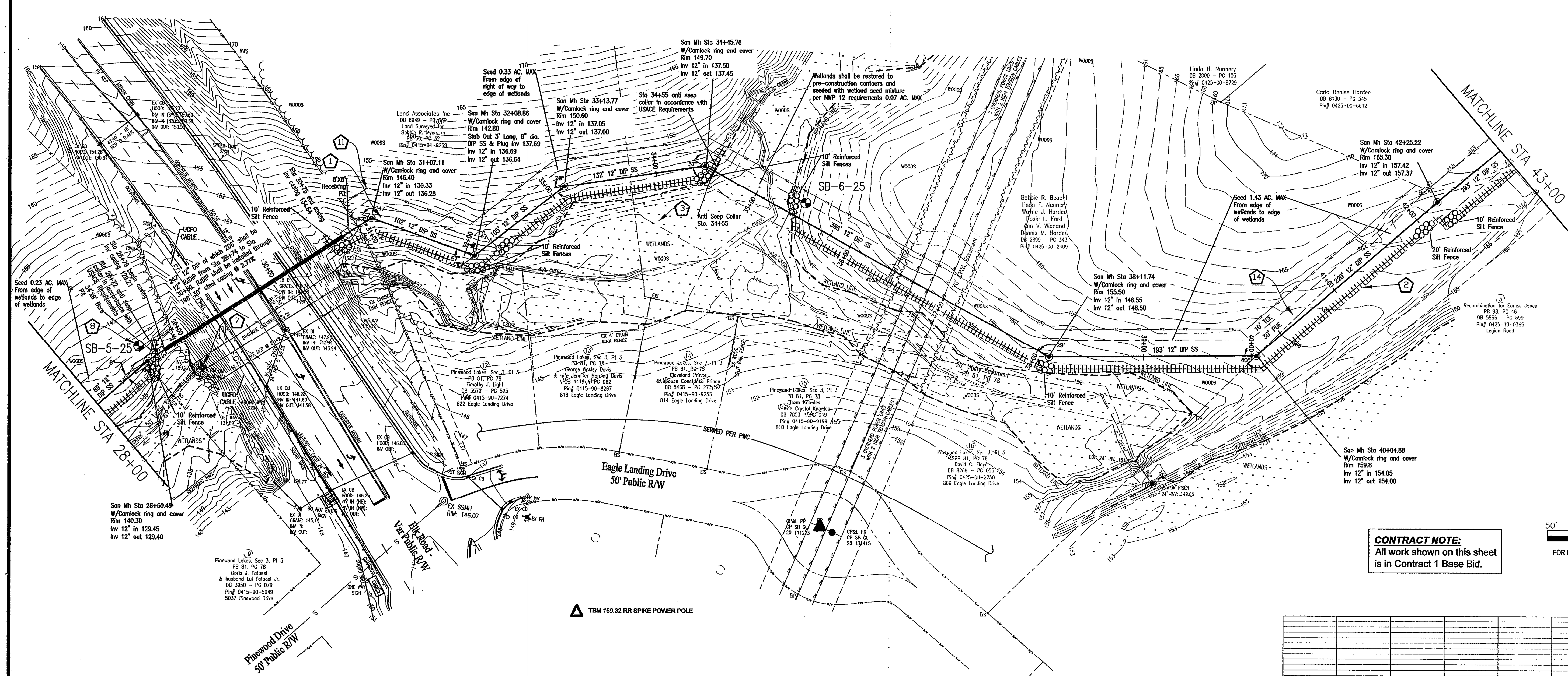
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

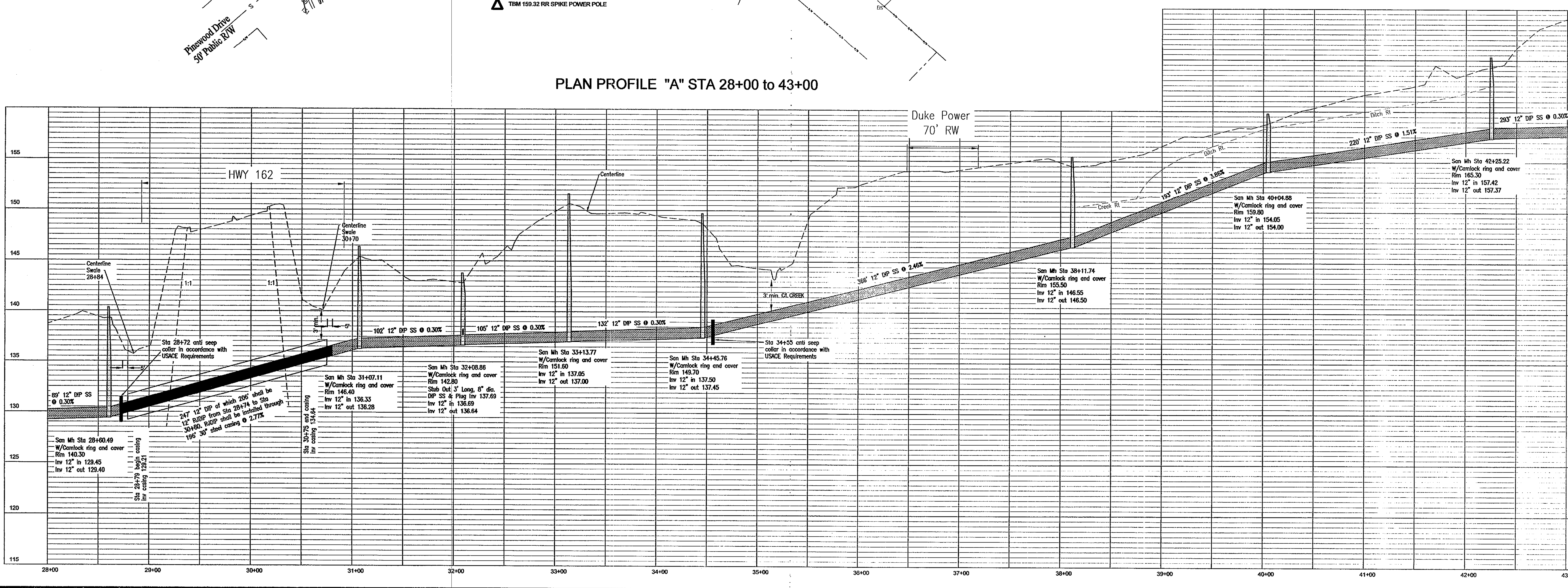
SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
PP-2



CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

PLAN PROFILE "A" STA 28+00 to 43+00



Drawn by: Dennis. Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 28+00 to 43+00

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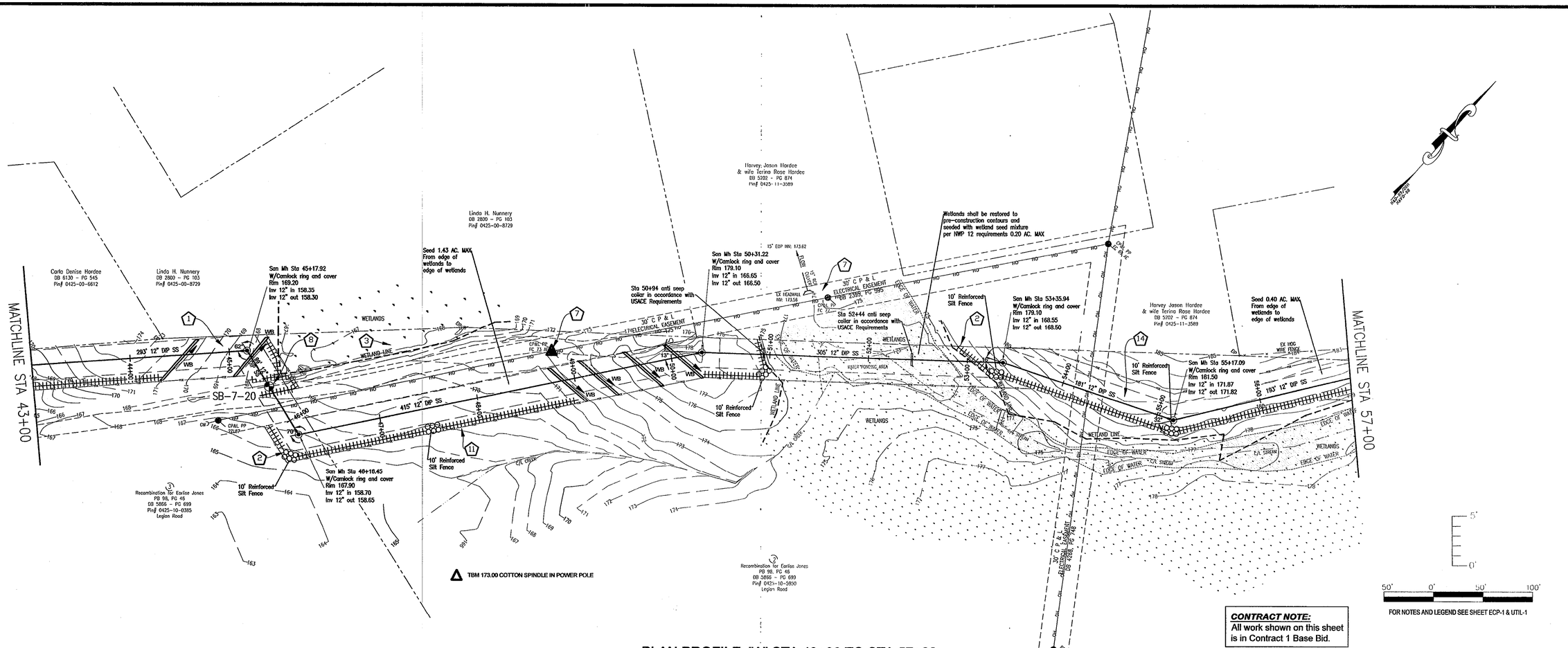
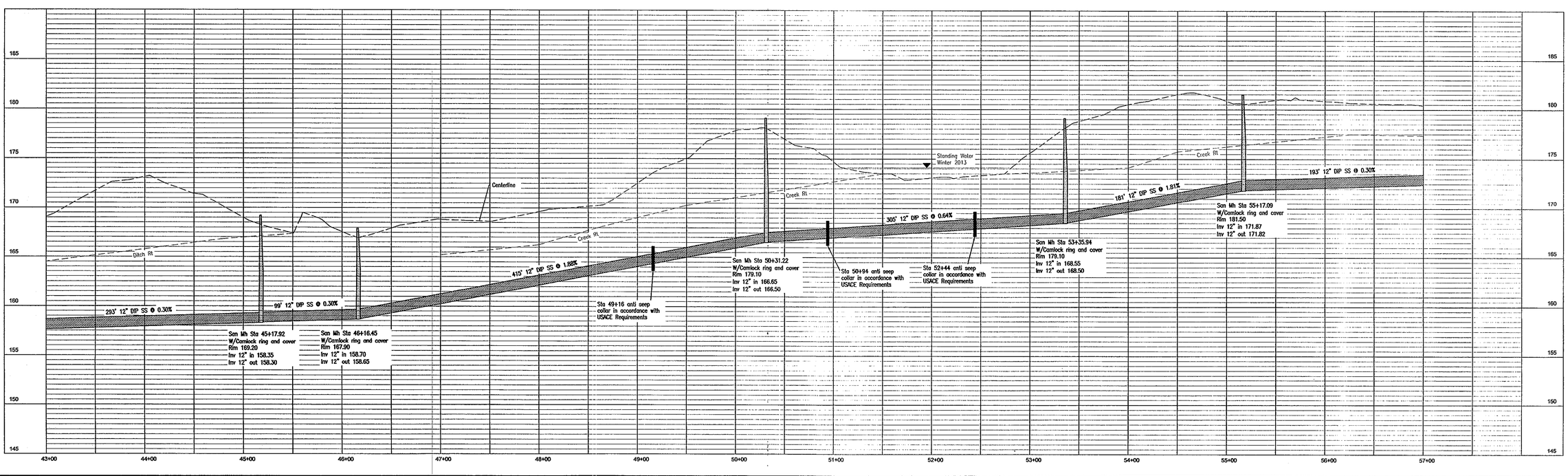
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
PP-3



CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

PLAN PROFILE "A" STA 43+00 TO STA 57+00



Drawn by: D Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 43+00 TO STA 57+00

No.	Revision	By	Date

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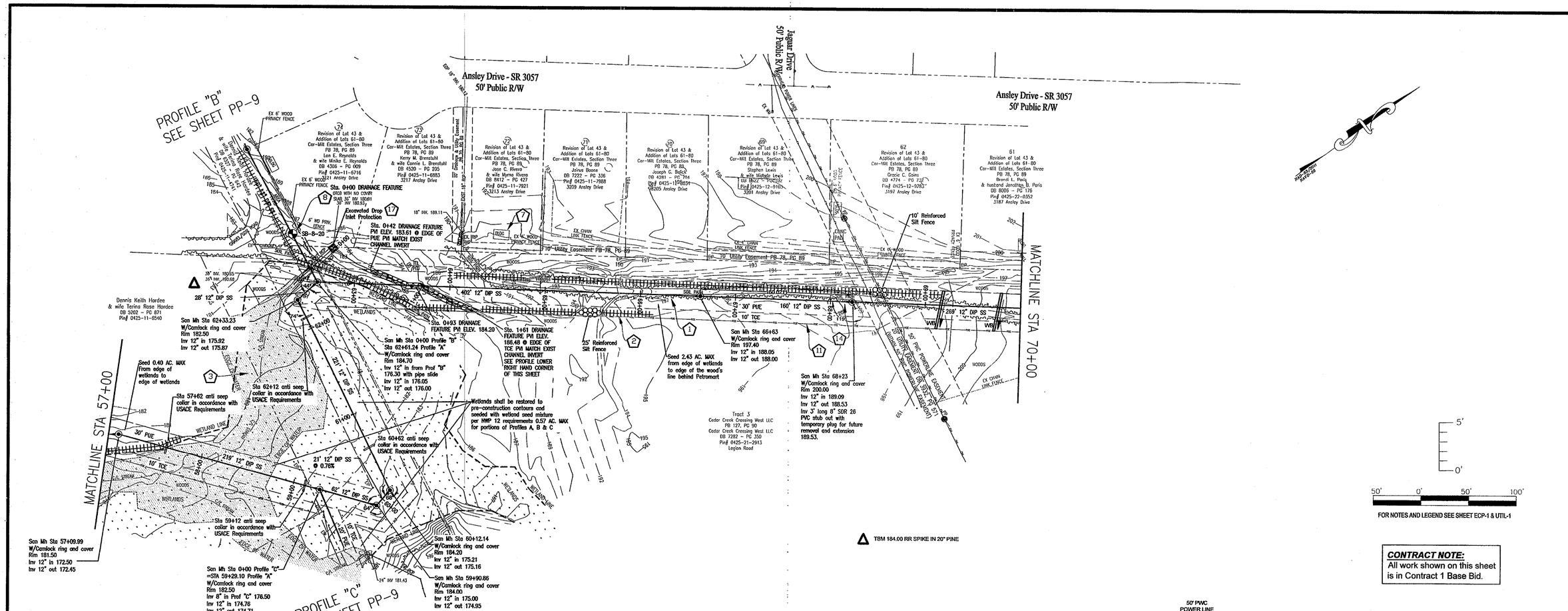
ENGINEERS
PLANNERS
SURVEYORS

SCALE 1"=50' HORI.
1"=5' VERT.

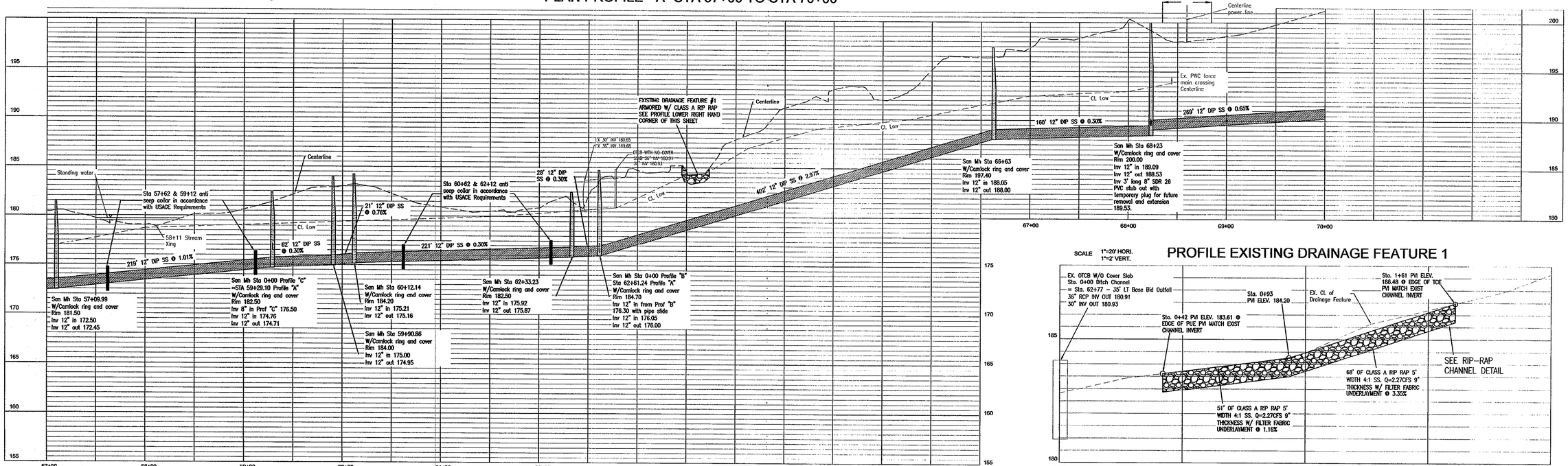
BOOK NO.

SHEET
PP-4



CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

PLAN PROFILE "A" STA 57+00 TO STA 70+00



PROFILE EXISTING DRAINAGE FEATURE 1

SCALE 1"=20' HORI. 1"=2' VERT.

Drawn by: D. Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 57+00 TO STA 70+00

No.	Revision	By	Date

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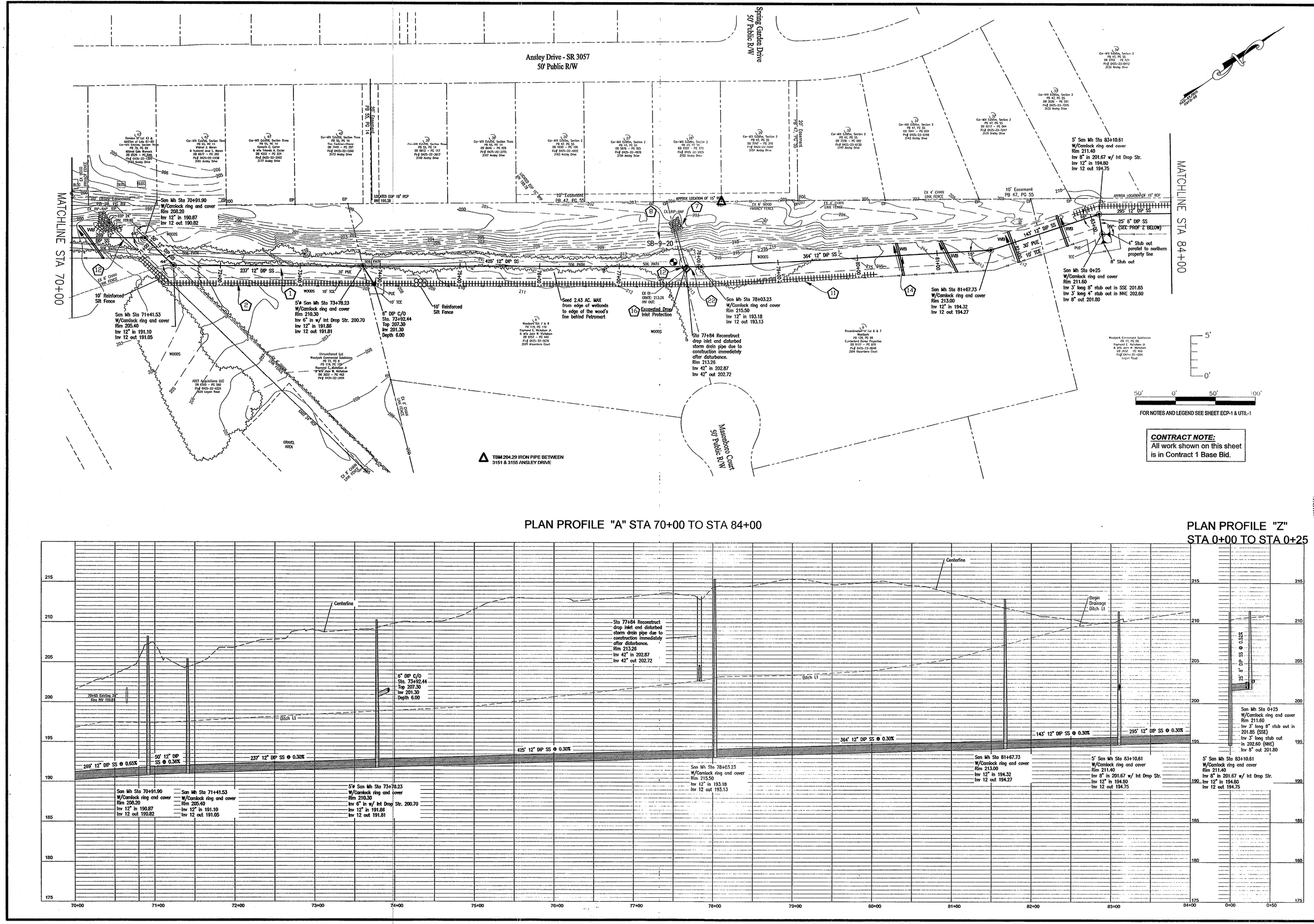
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
PP-5



Drawn by:D. Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION

PLAN PROFILE "A" STA 70+00 TO STA 84+00

No.	Revision	By	Date

CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

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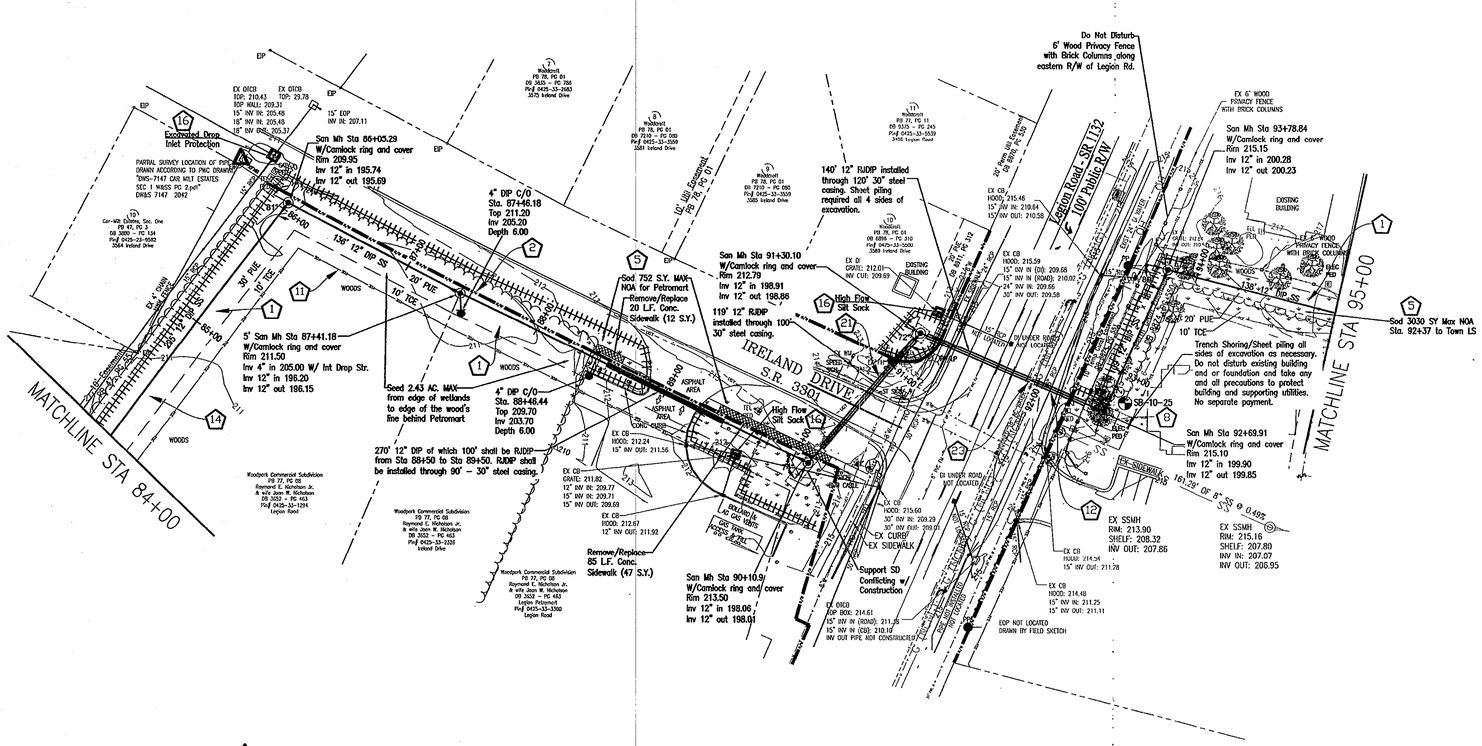
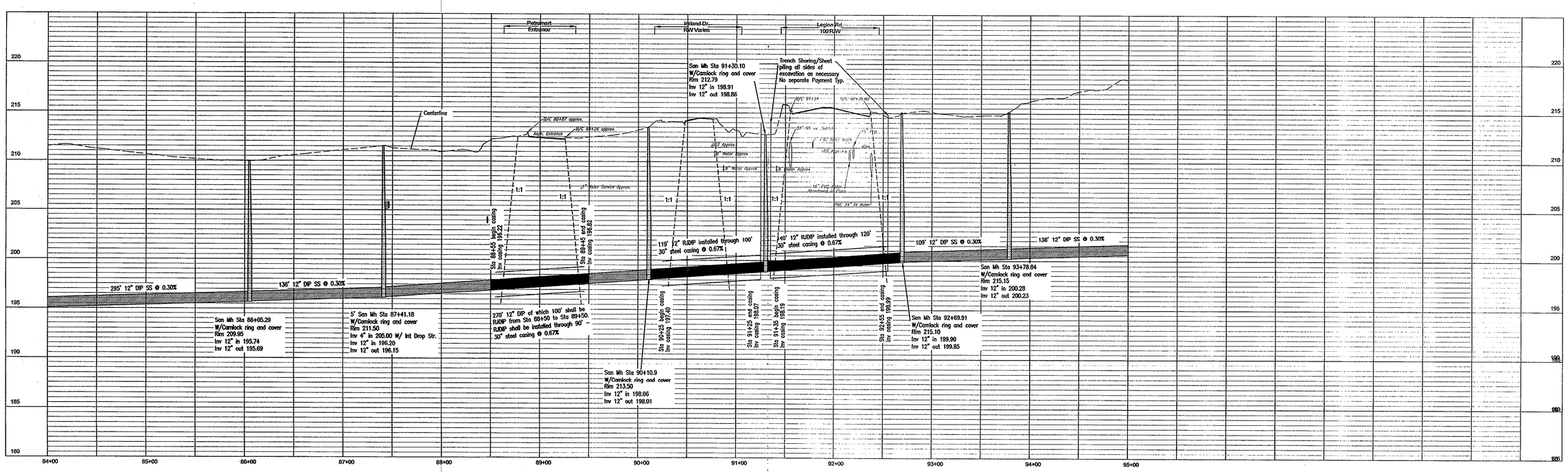
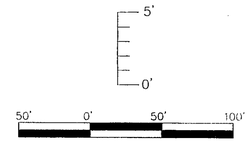
ENGINEERS PLANNERS SURVEYORS
115 Broadfoot Avenue
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
PP-6



PLAN PROFILE "A" STA 84+00 TO STA 95+00





FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

Drawn by:	D. Gilbert David E Vaughn,PE,PLS
Checked	David E Vaughn,PE,PLS
Reviewed	J. REITZEL ,PE,PLS
Date	JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 84+00 TO STA 95+00

No.	Revision	By	Date

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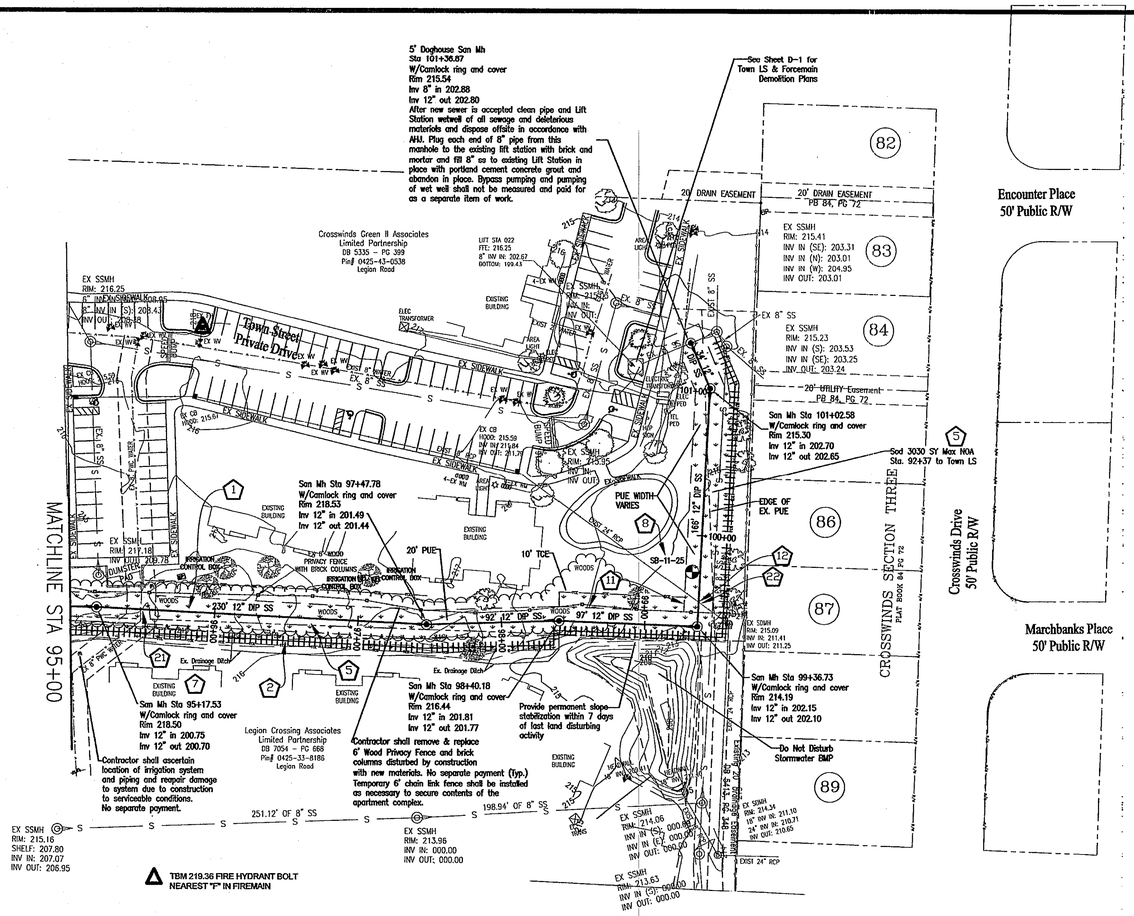
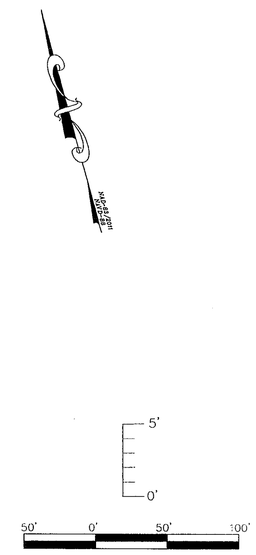
SCALE 1"=50' HORI. 1"=5' VERT.

BOOK NO.

SHEET PP-7

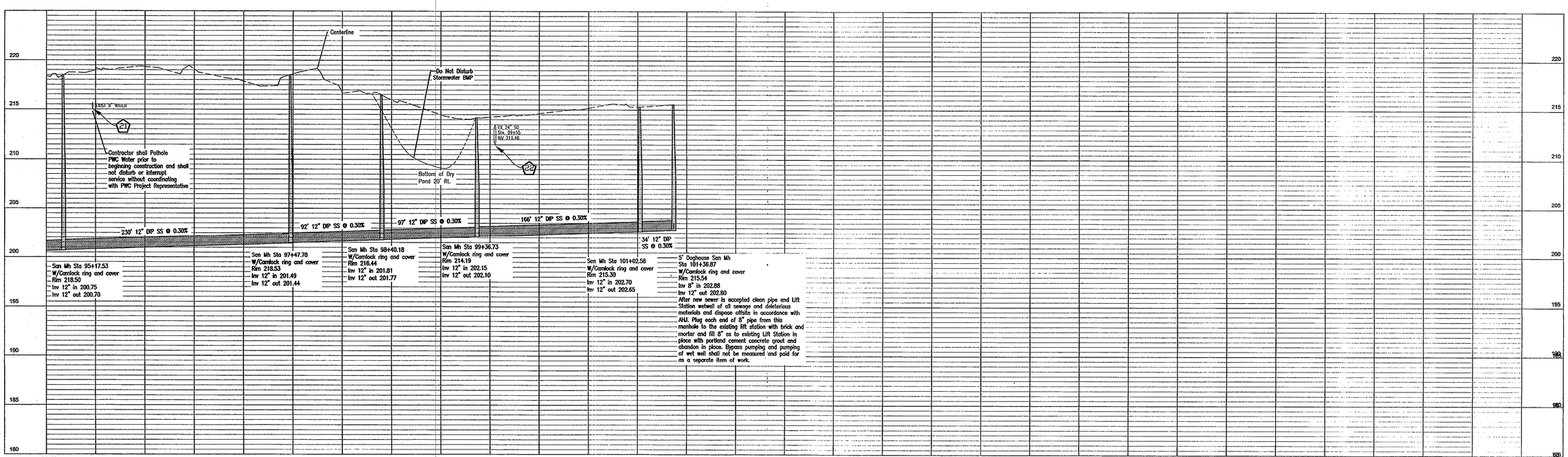




FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

PLAN PROFILE "A" STA 95+00 TO END PROJ.



Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE "A" STA 95+00 TO END PROJ.

No.	Revision	By	Date

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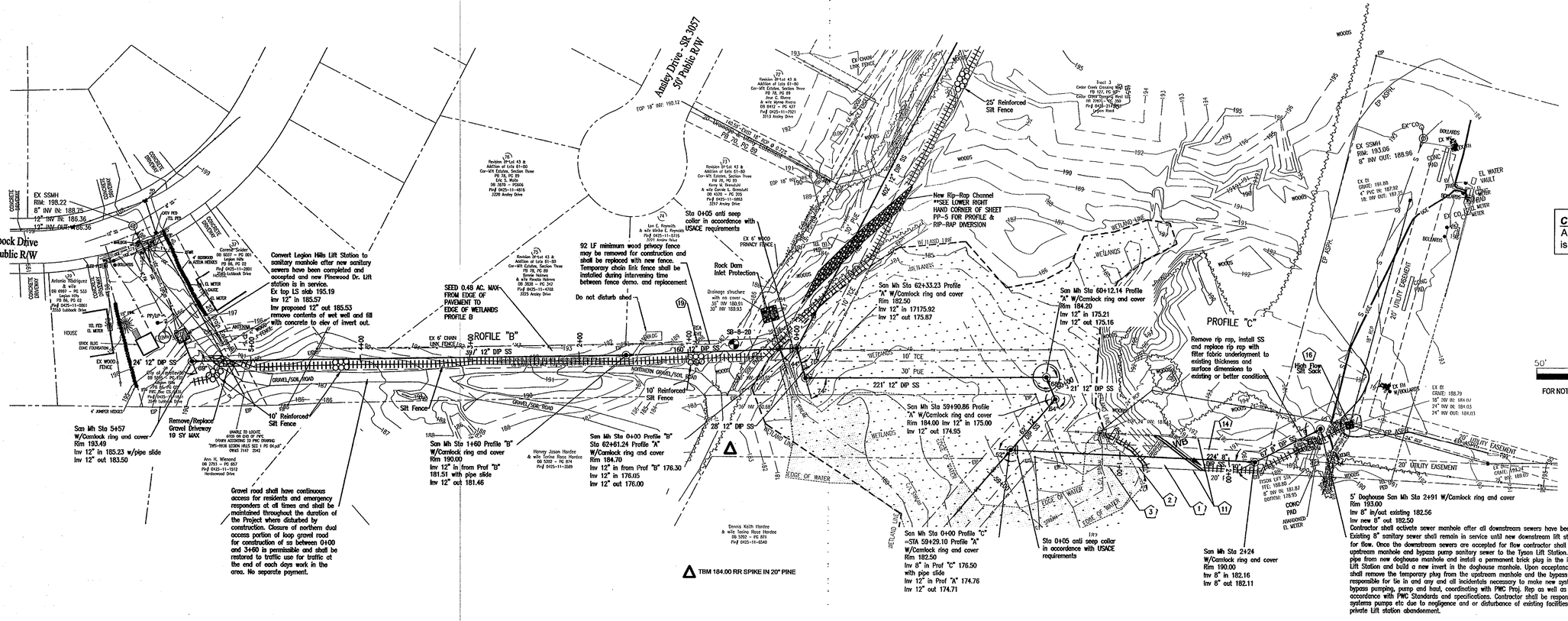
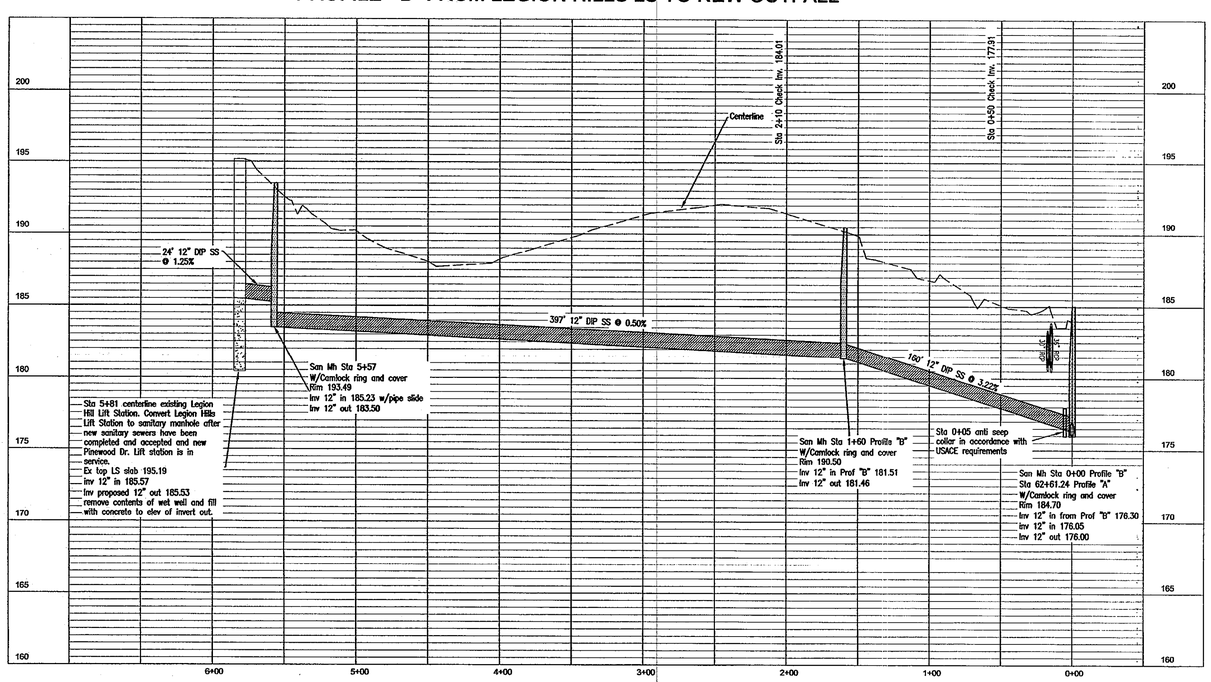
MOORMAN, KIZER & REITZEL, INC.
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

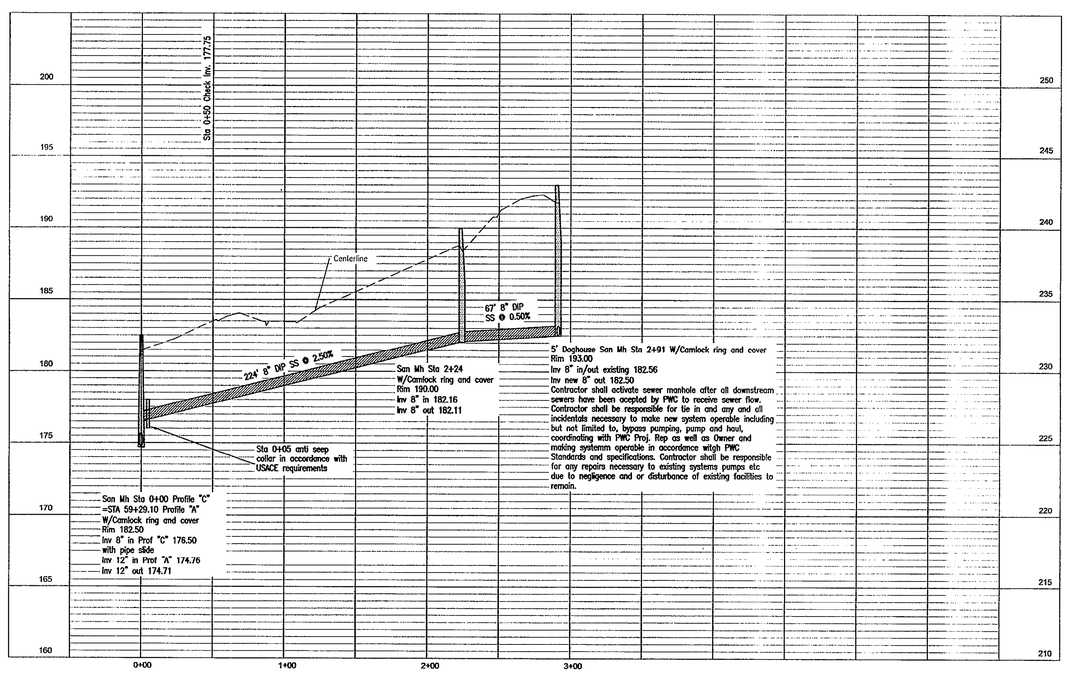
SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET PP-8



PROFILE "B" FROM LEGION HILLS LS TO NEW OUTFALL



PROFILE "C" FROM TYSON LS TO NEW OUTFALL



Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PLAN PROFILE'S "B" & "C"

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
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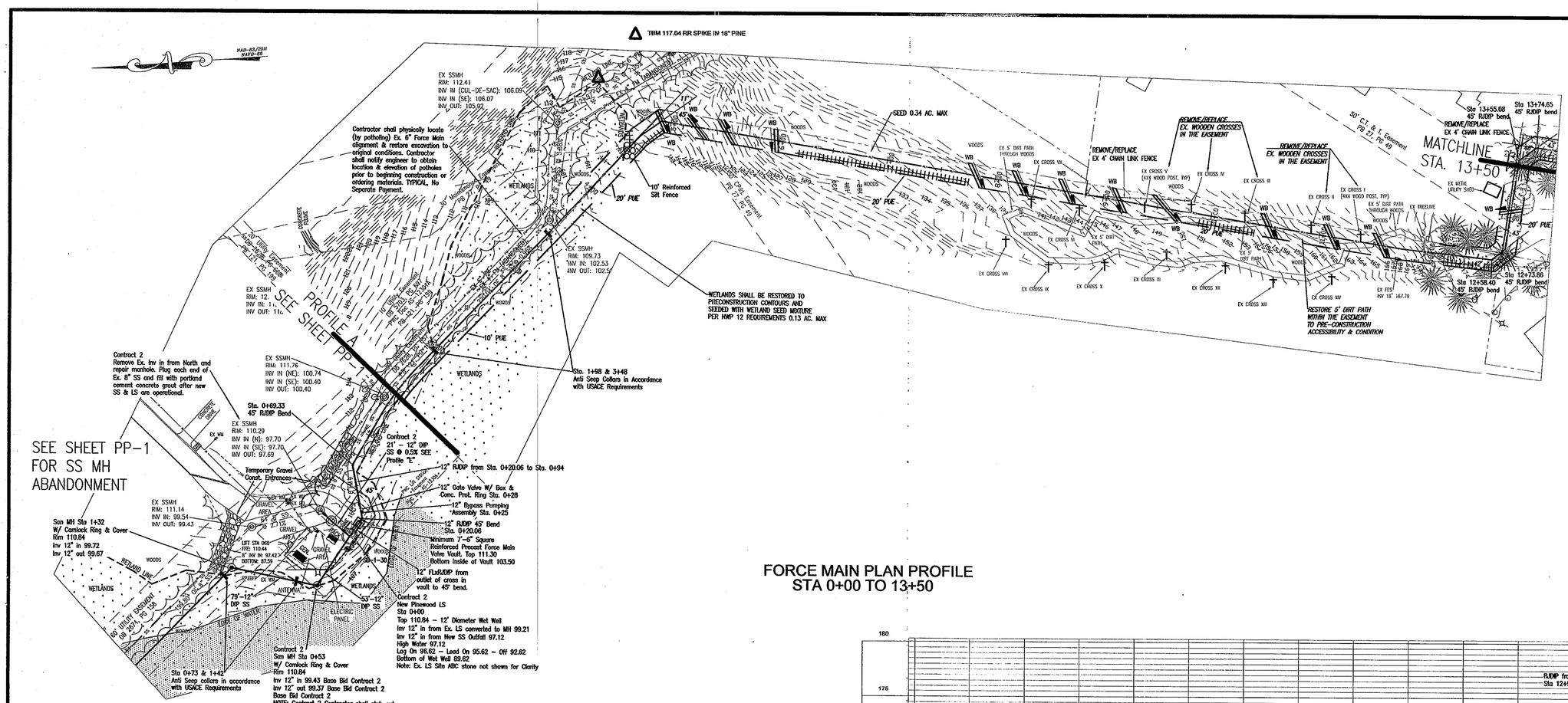
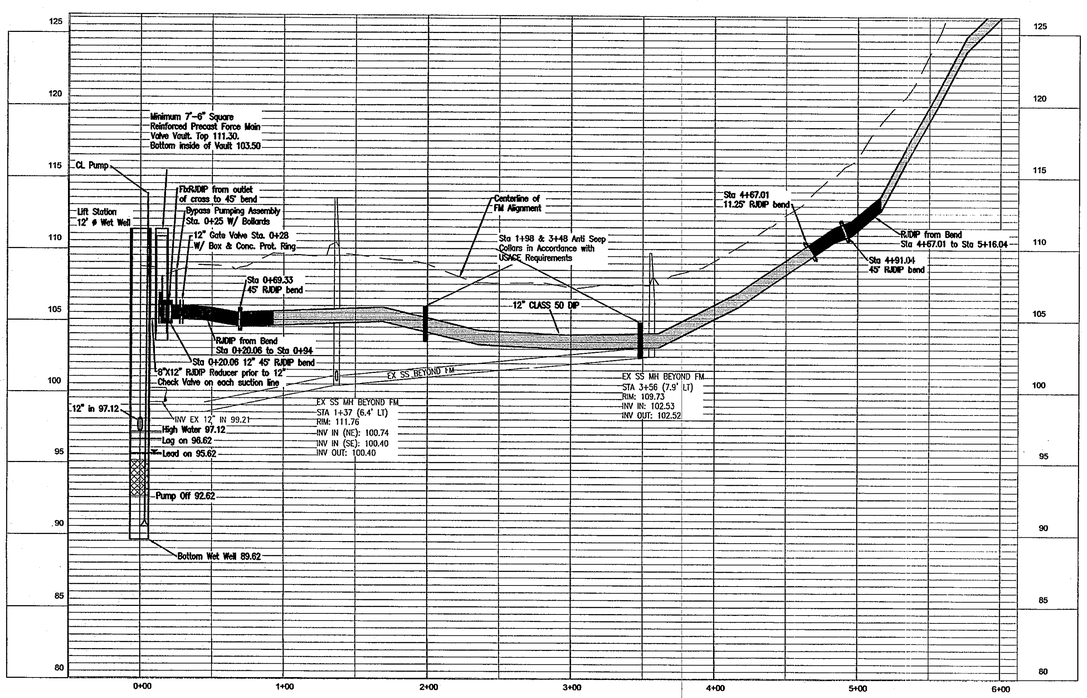
Phone 910-484-5191

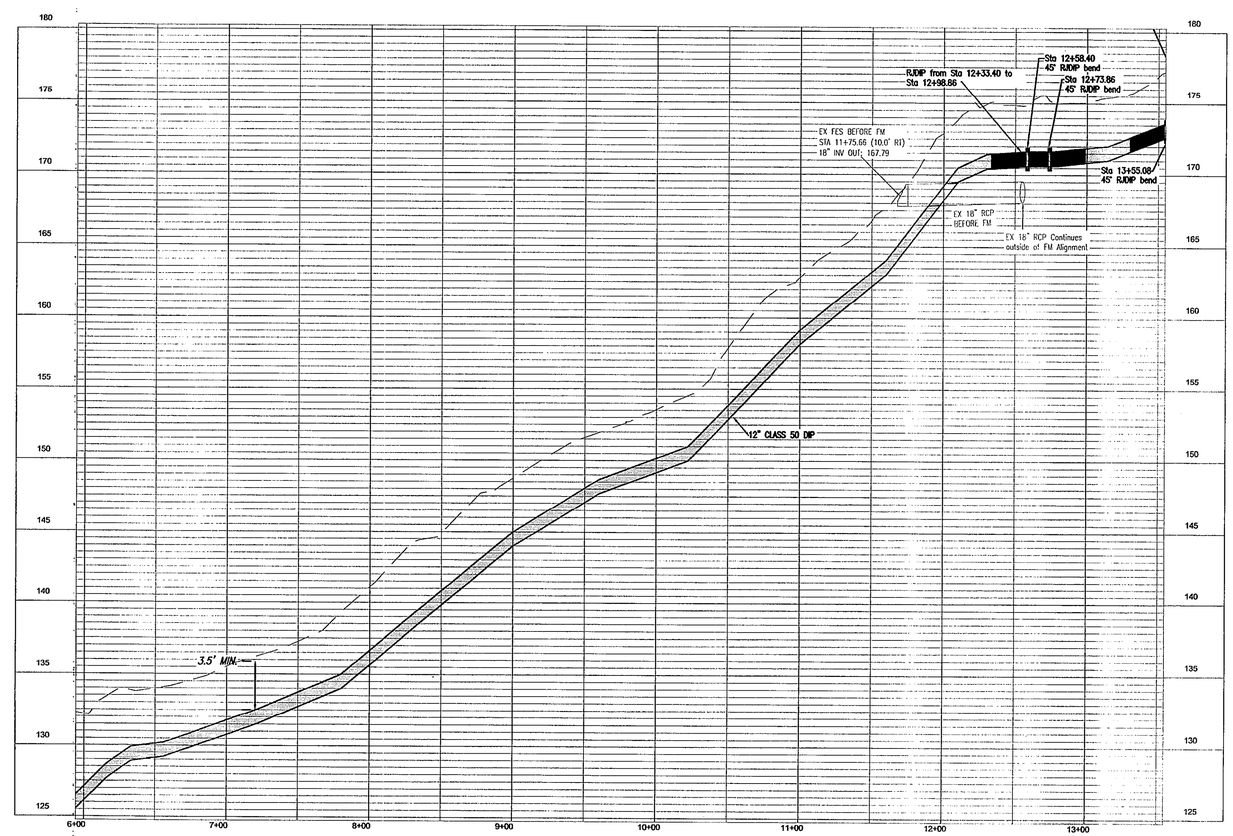
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET PP-9



FORCE MAIN PLAN PROFILE
STA 0+00 TO 13+50





5'
0'
50' 0' 50' 100'

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 2

Drawn by: D Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION FORCE MAIN PLAN PROFILE STA 0+00 TO 13+50

No.	Revision	By	Date

MOORMAN, KIZER & REITZEL, INC.
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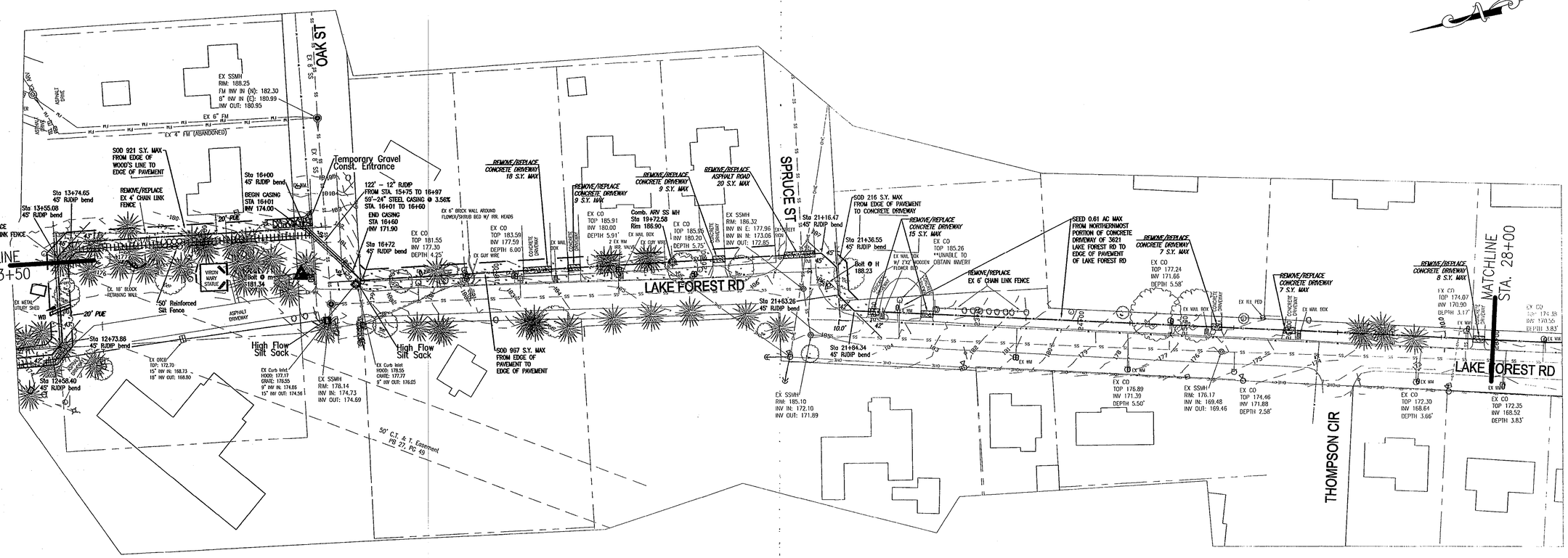
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
FM-1



TBM 181.34 BOLT NEAREST THE "M" IN MUELLER ON FIRE HYDRANT AT INTERSECTION OF LAKEFOREST RD. AND OAK ST.

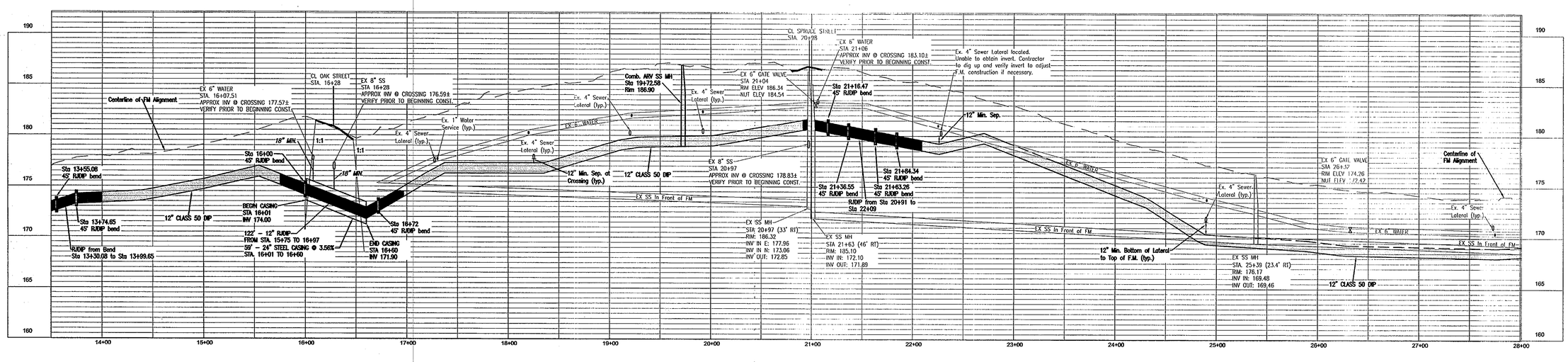
5' 0'

50' 0' 50' 100'

FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 2

FORCE MAIN PLAN PROFILE
STA 13+50 TO 28+00



Drawn by: D Gilbert David E Vaughn,PE,PLS			
Checked David E Vaughn,PE,PLS			
Reviewed J. REITZEL ,PE,PLS			
Date JAN 2017			
No.	Revision	By	Date

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION FORCE MAIN PLAN PROFILE STA 13+50 TO 28+00

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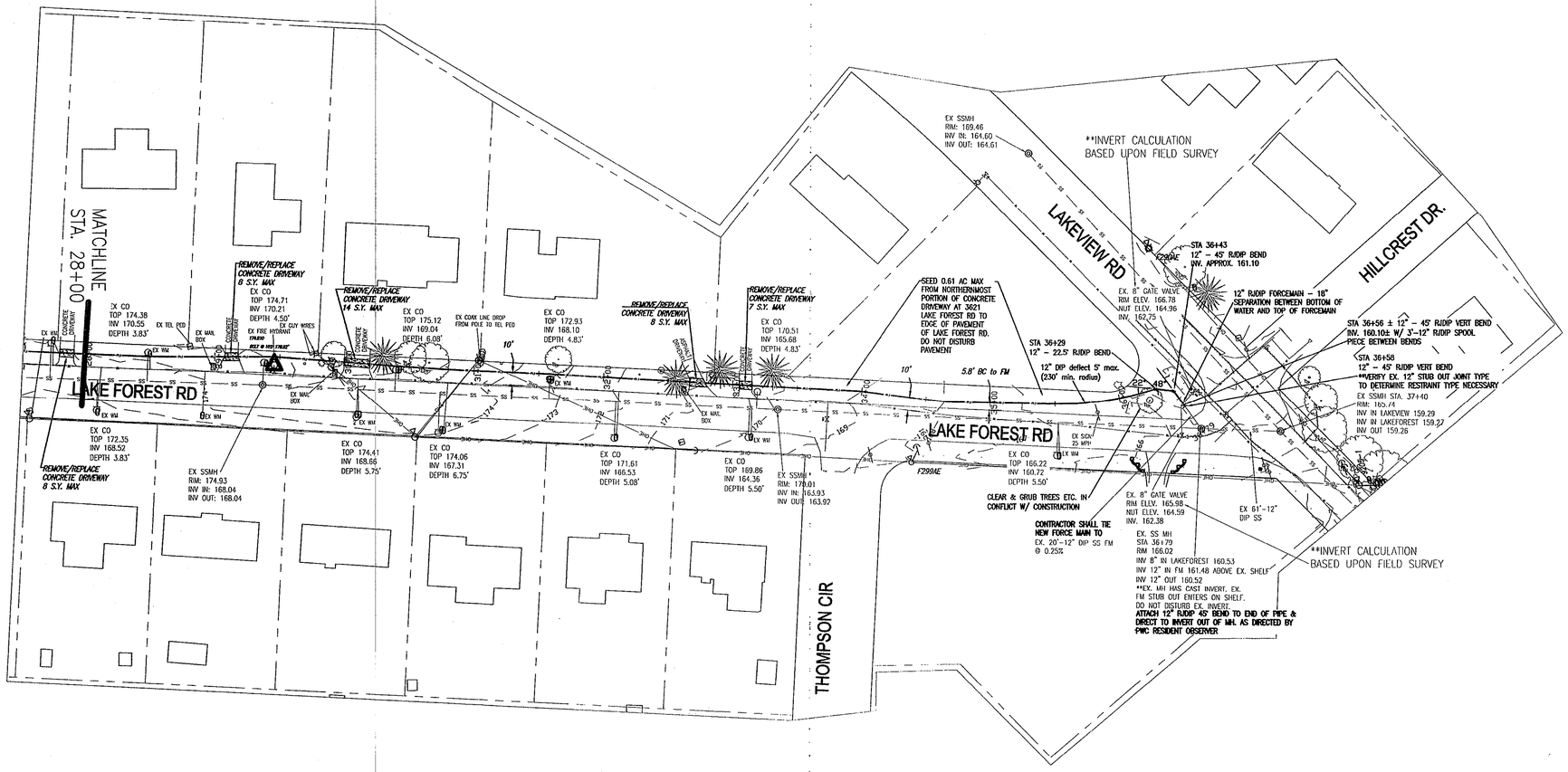
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.

BOOK NO.

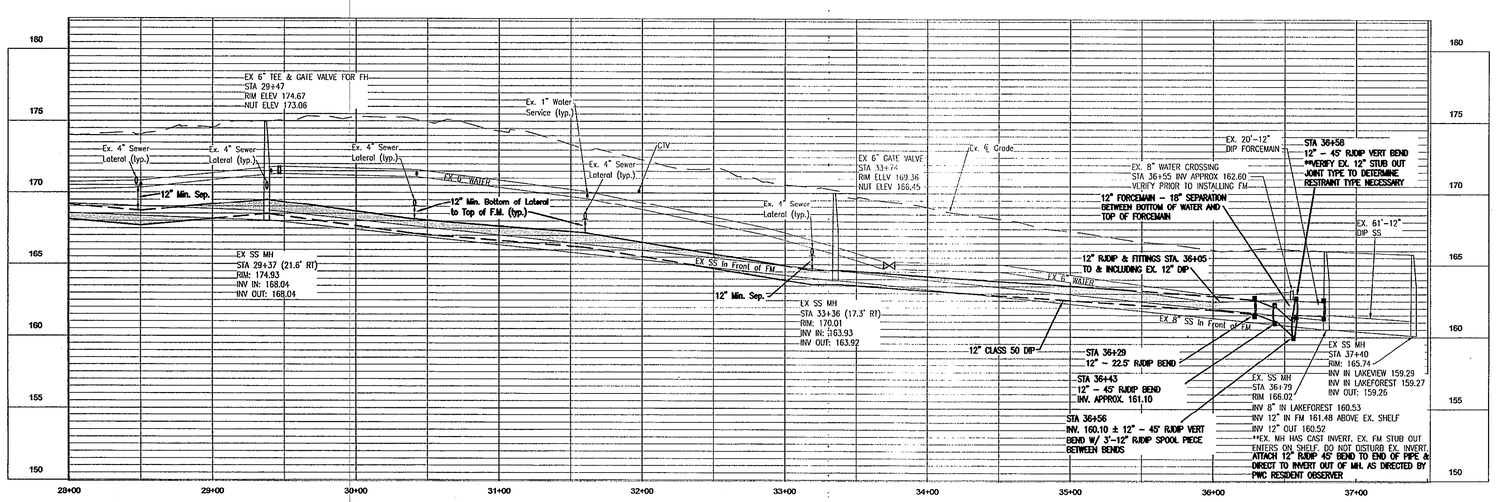
SHEET FM-2



FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 2

FORCE MAIN PLAN PROFILE
STA 28+00 TO END



Drawn by: D Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION FORCE MAIN PLAN PROFILE STA 28+00 TO END

No.	Revision	By	Date

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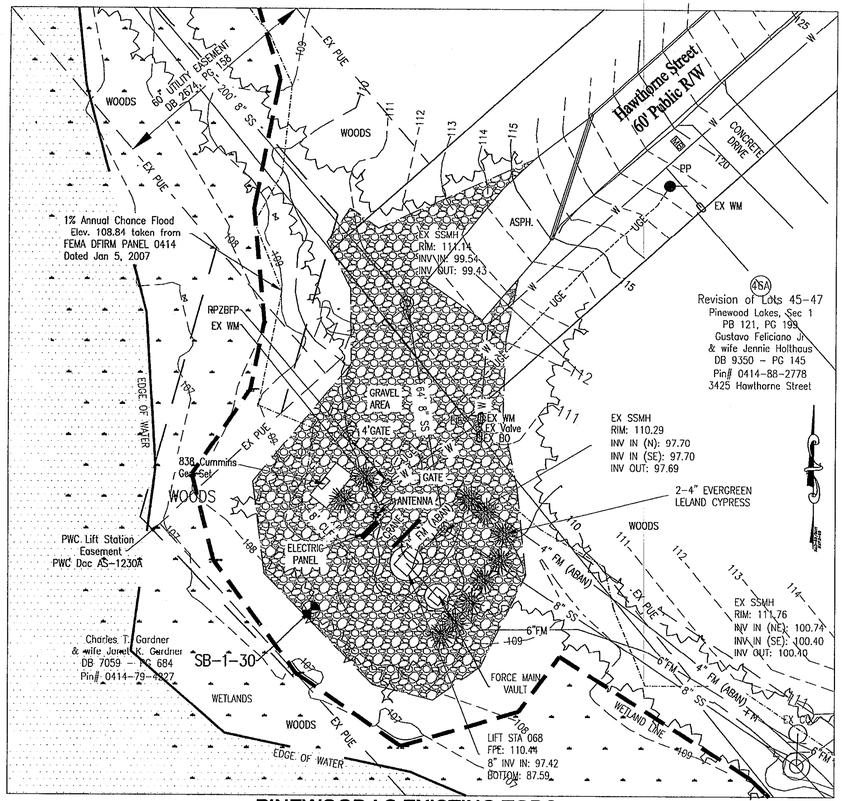
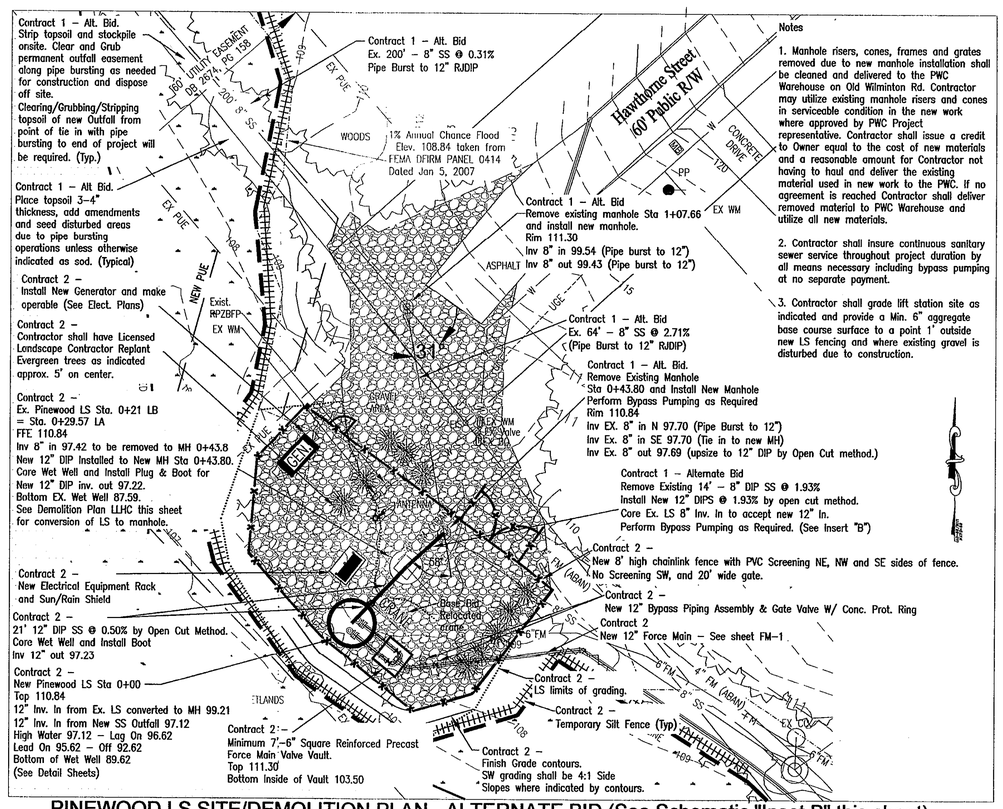
ENGINEERING PLANNING SURVEYING
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET FM-3



PINEWOOD LS EXISTING TOPO



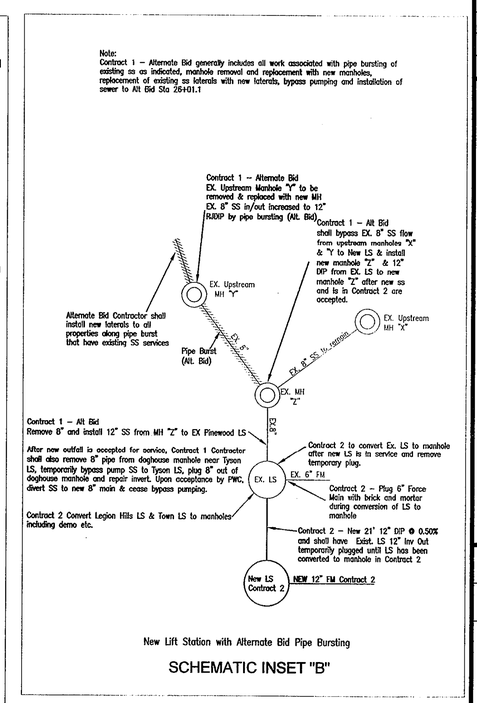
PINEWOOD LS SITE/DEMOLITION PLAN - ALTERNATE BID (See Schematic "Inset B" this sheet)

Notes

1. Manhole risers, cones, frames and grates removed due to new manhole installation shall be cleaned and delivered to the PWC Warehouse on Old Wilminton Rd. Contractor may utilize existing manhole risers and cones in serviceable condition in the new work where approved by PWC Project representative. Contractor shall issue a credit to Owner equal to the cost of new materials and a reasonable amount for Contractor not having to haul and deliver the existing material used in new work to the PWC. If no agreement is reached Contractor shall deliver removed material to PWC Warehouse and utilize all new materials.

2. Contractor shall insure continuous sanitary sewer service throughout project duration by all means necessary including bypass pumping at no separate payment.

3. Contractor shall grade lift station site as indicated and provide a Min. 6" aggregate base course surface to a point 1' outside new LS fencing and where existing gravel is disturbed due to construction.



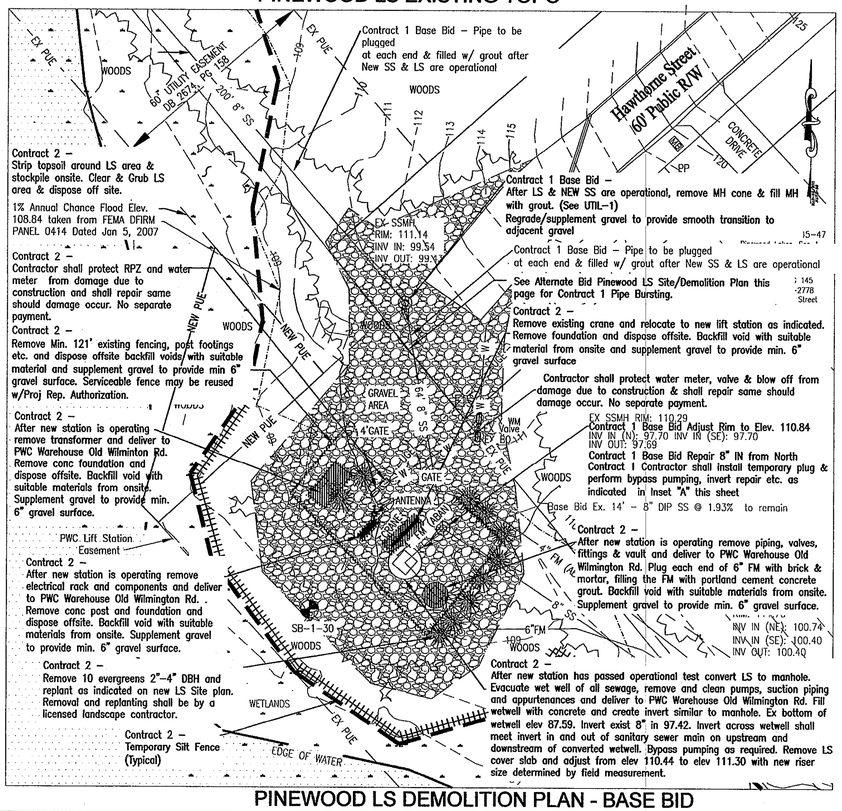
New Lift Station with Alternate Bid Pipe Bursting

SCHEMATIC INSET "B"

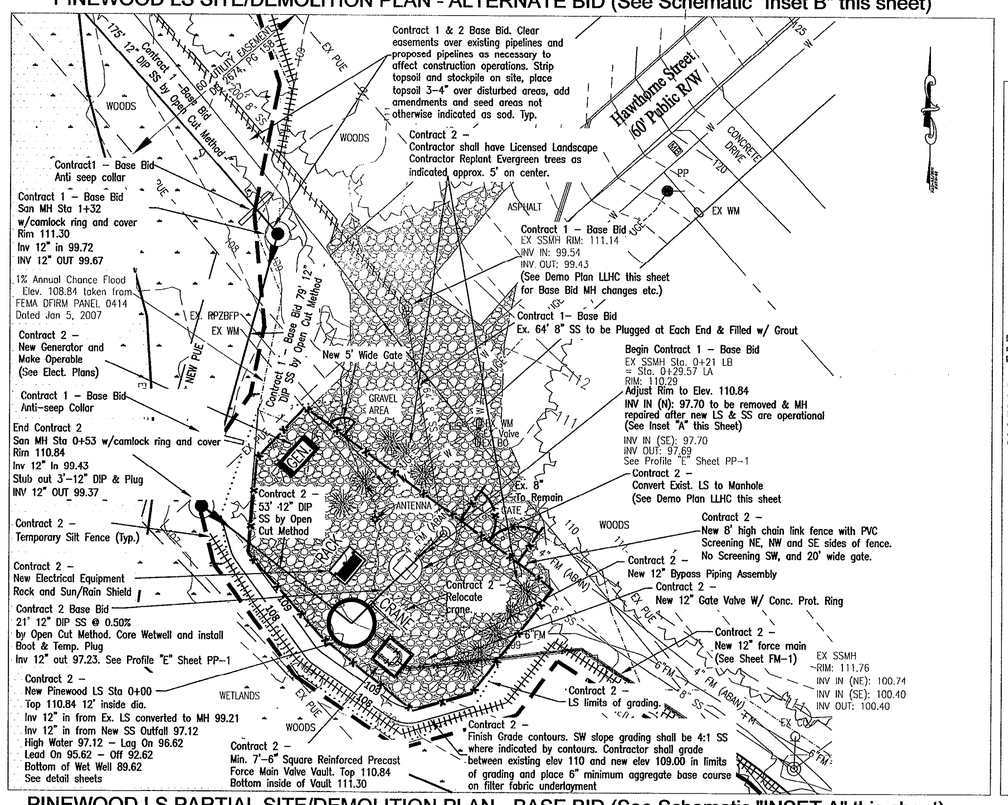
5' 0'

20' 0' 20' 40'

FOR NOTES AND LEGEND SEE SHEET ECP-4 & UTIL-1



PINEWOOD LS DEMOLITION PLAN - BASE BID



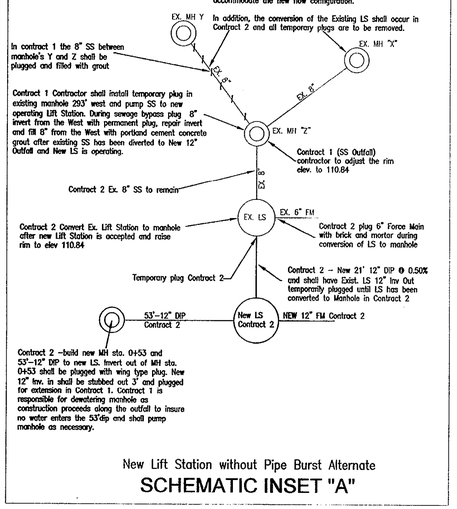
PINEWOOD LS PARTIAL SITE/DEMOLITION PLAN - BASE BID (See Schematic "INSET A" this sheet)

Note:
Contract 1 generally includes construction of Profile "A" beyond Sta. 0+53, construction of Profiles B and C, tying in Exist. SS to new outfall where indicated and abandoning Exist. SS and Manholes where flow no longer occurs due to tie in to new SS system, including temp plugs and bypass pumping as necessary.
After new outfall is accepted for service, Contract 1 Contractor shall also remove 8" pipe from Doghouse Manhole near Tyson LS, temporarily bypass pump SS to Tyson LS, plug 8" Out of Doghouse MH & repair invert. Upon acceptance by PWC, divert SS to new 8" Main & cease bypass pumping.

Contract 2 includes new Lift Station and Force Main installation, demolition of Ex. Pinewood LS, Legion Hills LS, and Town & Country LS, as well as conversion of stations to manholes. Other requirements are indicated on the plans.

After new SS and LS are operable and Ex 8" SS upstream has been tied in at 12" Outfall Manhole Sta 4+91 in Contract 1, Contract 1 shall plug Inv Out of Manhole "X" and "Y" temporarily, and bypass sewer flows to the new operating Pinewood LS. During the bypass, the 64' of 8" SS BETWEEN Manholes "Y" and "Z" shall be plugged and filled with grout. Manhole "Z" invert shall be repaired to accommodate the new flow configuration.

In addition, the conversion of the Existing LS shall occur in Contract 2 and all temporary plugs are to be removed.



New Lift Station without Pipe Burst Alternate

SCHEMATIC INSET "A"

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
PINEWOOD LS SITE & DEMO PLANS

No.	Revision	By	Date

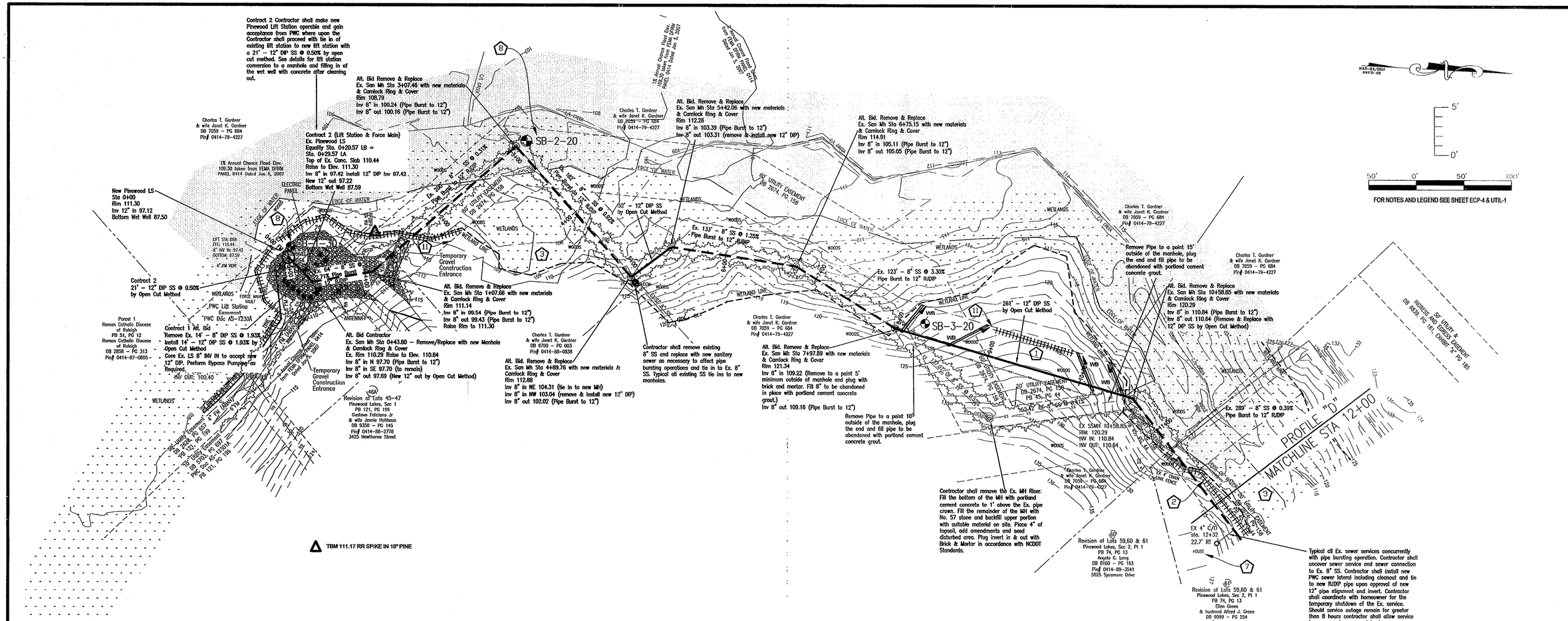
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

MOORMAN, KIZER & REITZEL, INC.
ENGINEERS PLANNERS SURVEYORS

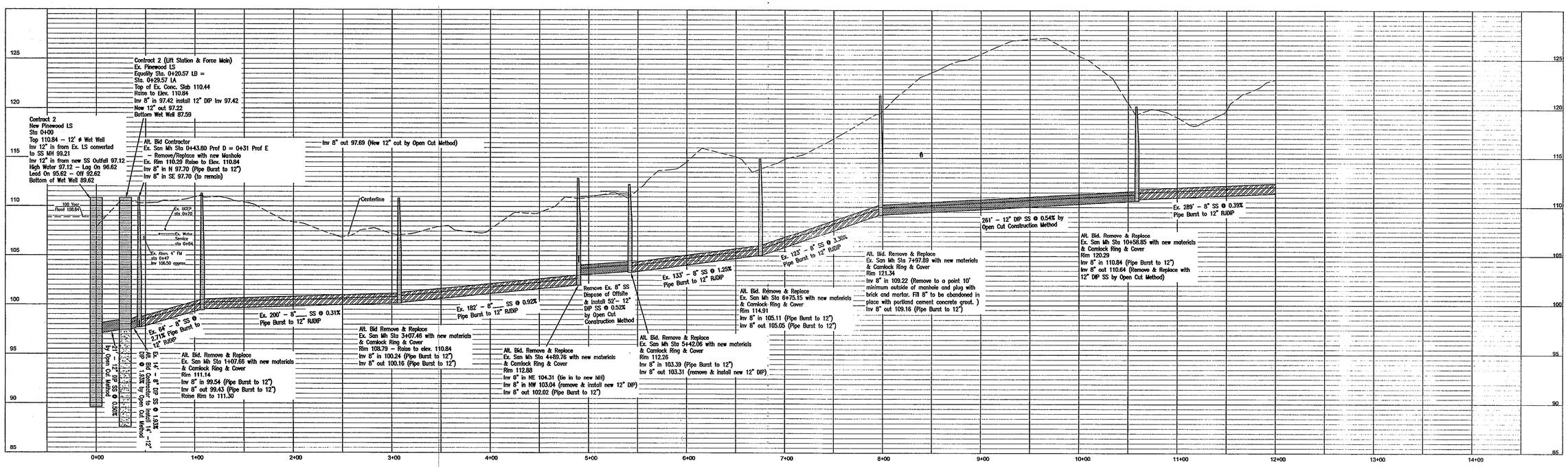
SCALE 1"=20' HORIZ.

BOOK NO.

SHEET S-1



ALTERNATE BID PLAN PROFILE "D" STA 0+00 TO 12+00



Drawn by : Dennis Gilbert
David E Vaughn,PE,PLS
Checked
David E Vaughn,PE,PLS
Reviewed
J. REITZEL ,PE,PLS
Date
JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
ALTERNATE BID UPSIZE EX SS PLAN PROFILE "D" STA 0+00 TO STA 12+00

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
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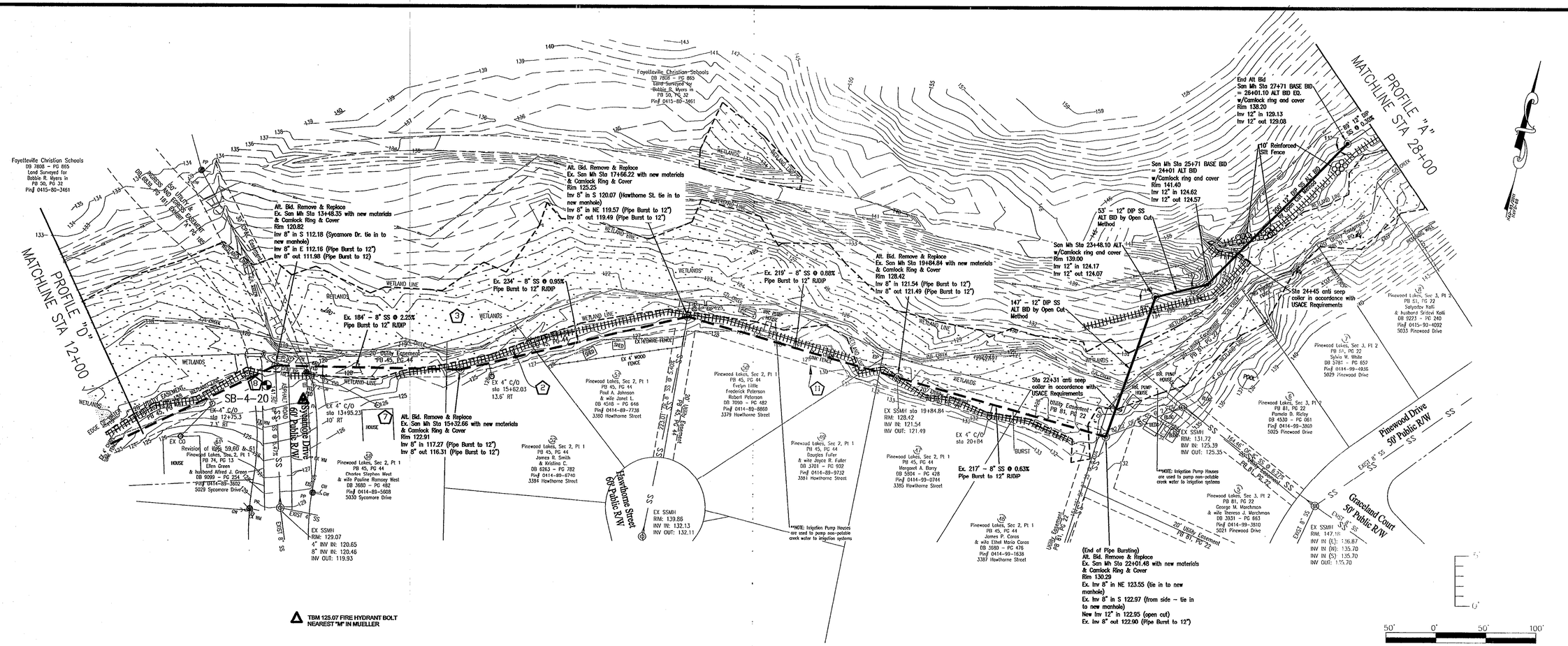
Phone 910-484-5191

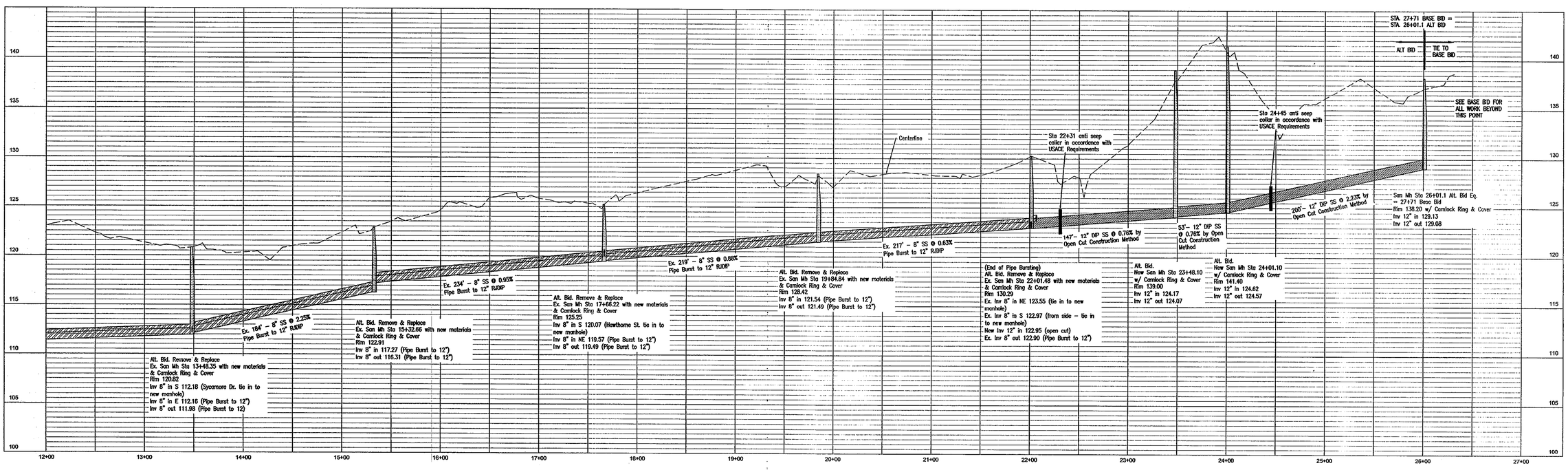
M&K ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE 1"=50' HORI. 1"=5' VERT.
BOOK NO.
SHEET
AB-1



FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

ALTERNATE BID PLAN PROFILE "D" STA 12+00 TO 26+01.10



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LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
ALTERNATE BID UPSIZE EX SS
PLAN PROFILE "D" STA 12+00 TO 26+01.10

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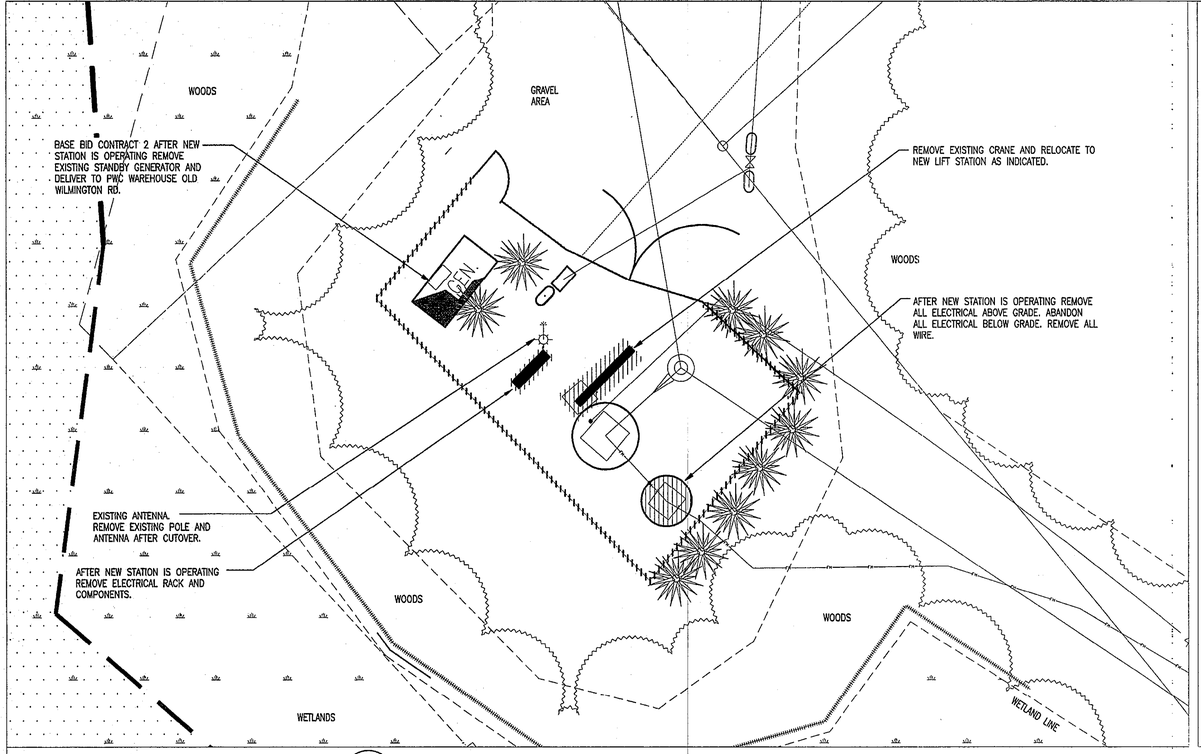
SCALE 1"=50' HORI. 1"=5' VERT.

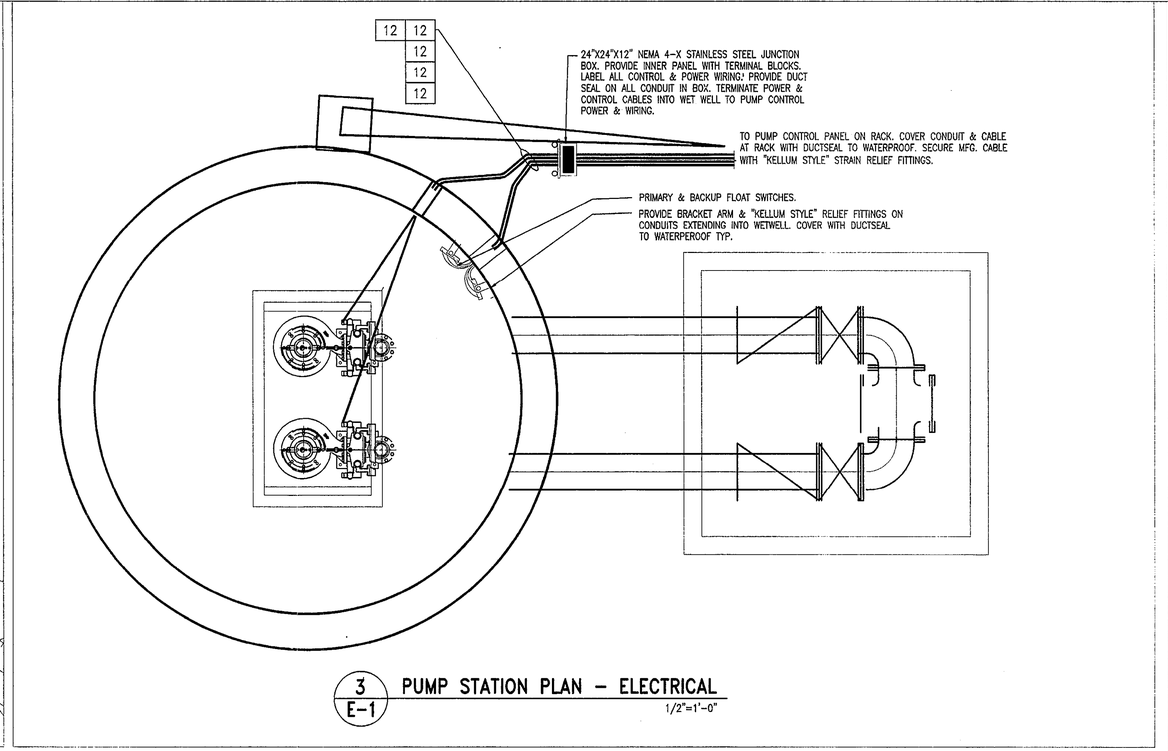
BOOK NO.

SHEET AB-2



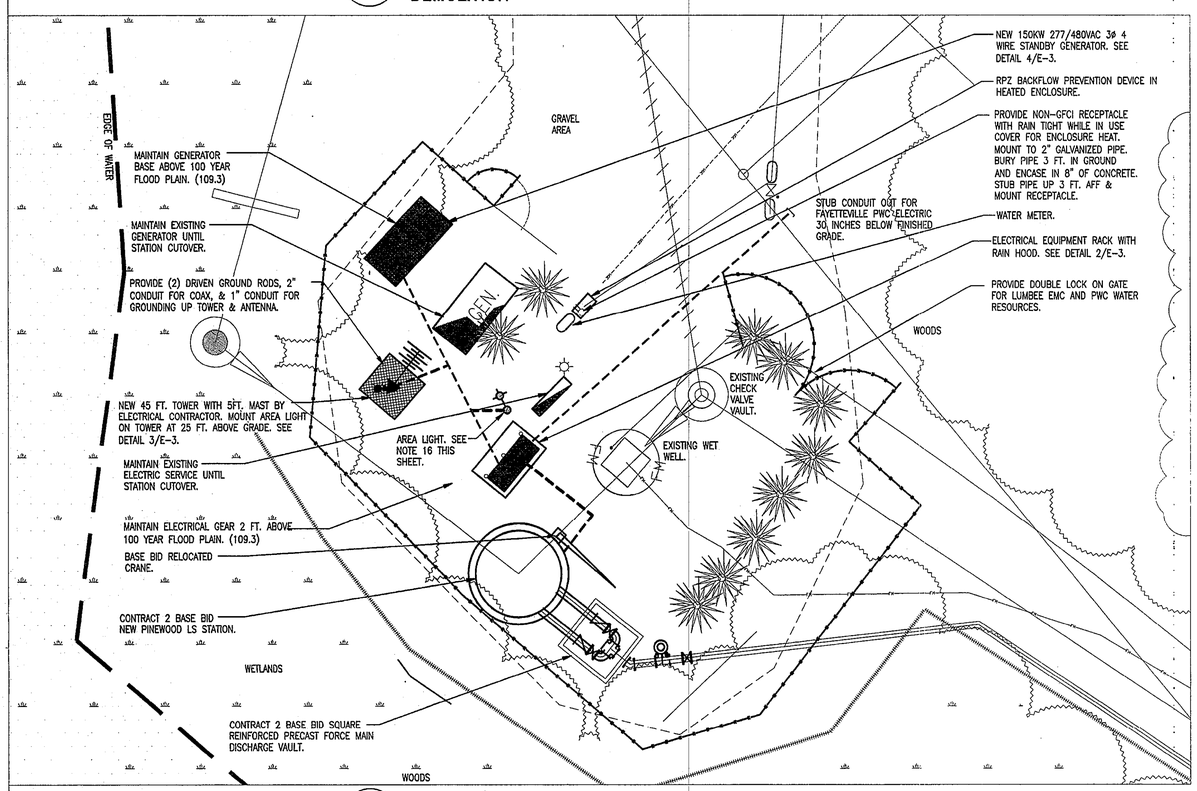
1 / E-1 PUMP STATION SITE PLAN – ELECTRICAL DEMOLITION

1"=10'-0"



3 / E-1 PUMP STATION PLAN – ELECTRICAL

1/2"=1'-0"



2 / E-1 PUMP STATION SITE PLAN – ELECTRICAL INSTALLATION

1"=10'-0"

GENERAL ELECTRICAL NOTES

1. ALL CONDUIT ABOVE GRADE SHALL BE RIGID GALVANIZED STEEL WITH PREMOLDED PVC JACKET.
2. COORDINATE ALL ELECTRICAL UTILITY REQUIREMENTS WITH FAYETTEVILLE PWC. REFER TO ELECTRICAL UTILITY ALLOWANCE. PAY ALL FAYETTEVILLE PWC COST. PROVIDE DOUBLE GATE LOCK FOR FAYETTEVILLE PWC.
3. REFER TO SPECIFICATIONS FOR EQUIPMENT DETAILS.
4. NUMBER & SIZE OF CONDUITS INTO VAULT SHALL BE AS REQUIRED BY EQUIPMENT MANUFACTURER AND THE NATIONAL ELECTRIC CODE. BUT NO SMALLER THAN CALLED FOR IN THE PLANS & SPECIFICATIONS.
5. ARRANGEMENT OF CONDUIT EXITING RACK & CONTROL CENTER IS SHOWN AS A SCHEMATIC ONLY. ARRANGE CONDUITS DURING INSTALLATION AS REQUIRED.
6. ALL ELECTRICAL WORK SHALL CONFORM TO THE MOST CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRIC SAFETY CODE, OSHA, AND ALL APPLICABLE LOCAL AND STATE CODES.
7. ELECTRICAL WORK SHALL BEGIN AT THE NEW ELECTRICAL UTILITIES METER. COORDINATE WITH ELECTRICAL UTILITIES SUPPLIER.
8. ALL CONDUIT BELOW GRADE SHALL BE PVC TYPE SCHEDULE 40 DESIGNED FOR DIRECT BURIAL 30 INCH MINIMUM DEPTH PROPER TRANSITION TO RIGID GALVANIZED PRIOR TO TURNING UP ABOVE GRADE. ALL EXTERIOR CONDUIT ABOVE GRADE SHALL BE RIGID GALVANIZED CONDUIT WITH PVC JACKET.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT NATIONAL ELECTRIC CODE INCLUDING AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUIT RUNS.
10. REFER TO CIVIL DRAWINGS FOR ACTUAL STRUCTURE SIZES, DIMENSIONS, AND LAYOUTS.
11. REFER TO CIVIL DRAWINGS FOR UNDERGROUND PIPING LAYOUT. AVOID CROSSINGS OR CONFLICTS AS MUCH AS POSSIBLE. WHERE UNAVOIDABLE, ROUTE DUCT BANK UNDER PIPING PROVIDING PROPER SEPARATION AND BACKFILL.
12. ALL EXTERIOR MOUNTING HARDWARE SHALL BE 304 STAINLESS STEEL OR CAST METAL CORROSION RESISTANT. ALL BRACKETS, CHANNELS, OR PIPE TO BE STAINLESS STEEL. ROUND ALL CORNERS
13. VOLTAGE AT SITE IS 277/480 VAC 3 PHASE 4 WIRE WYE.
14. REVISE AND COORDINATE SPACE REQUIREMENTS AS NECESSARY TO SUIT EQUIMPENT ACTUALLY USED.
15. CIRCUIT BREAKER INTERRUPTING RATINGS SHALL BE AS FOLLOWS:
    1. UP TO 70 AMPERES – 18,000 AIC – 480 VAC
    2. 70 TO 100 AMPERES – 18,000 AIC – 480 VAC
    3. 125 – 225 AMPERES – 18,000 AIC – 480 VAC
    4. UP TO 100 AMPERES – 10,000 AIC – 240 VAC
16. AREA LIGHT FIXTURE, METAL HALIDE ROADWAY ARM LUMINAIRE WITH PA OPTICAL ASSEMBLY IEC TYPE V LIGHT DISTRIBUTION. PROVIDE FOR 250 WATT METAL HALIDE LAMP AND HPF LAG TYPE (NPF) BALLAST FOR COLD WEATHER OPERATOR, 120 VAC INPUT. PROVIDE FOR PE CONTROL USE CLEAR 250 WATT MH LAMPS. USE LUMEX #250MH-MC3-120-HPF-PAL, GENERAL ELECTRIC, EMCO OR APPROVED EQUAL. PROVIDE ONE FIXTURE TO MOUNT ON SEPARATE 35/5 POLE AS INDICATED.
17. ALL ELECTRICAL ENCLOSURES SHALL USE CORROSION RESISTANCE SPACERS TO KEEP EQUIPMENT FROM DIRECT CONTACT WITH MOUNTING PLATES.
18. PROVIDE FOR TELEMETRY SYSTEM INSTALLATION IN THIS CONTRACT. PROVIDE RACKS, CONDUIT, & WIRE AS INDICATED.
19. VISUAL HIGH WATER ALARM LIGHT. VAPOR TIGHT, CAST METAL, WALL BRACKET MOUNTING WITH BACK BOX. PROVIDE POLYCARBONATE LENS, GLOBE & GUARD USE CROUSE HINDS V1759 OR EQUAL. MOUNT ON TOP OF RACK HOOD.
20. PROVIDE WEATHERPROOF HORN 80db @ 10'. MOUNT TO DUPLEX PANEL HOOD. INTERCONNECT TO ALARM LIGHT.
21. PROVIDE 4 FT. VANDAL RESISTANT VAPORLUME FLUORESCENT FIXTURE. 4FT. LONG 2-32 WATT T-8 LAMPS & ELECTRONIC BALLAST. PROVIDE H.E. WILLIAMS 91-4-232.
22. PROVIDE NEMA 4-X RATED HUBS FOR EQUALLY RATED DEVICE TOP, BOTTOM, OR SIDE ENTRY.
23. PROVIDE SELECTOR SWITCH ON PUMP CONTROL PANEL TO MANUALLY SWITCH BETWEEN FLOAT CONTROL SYSTEM #1 AND FLOAT CONTROL SYSTEM #2.
24. PROVIDE DUCT SEAL ON CONDUITS INTO WET WELL & INTO PUMP CONTROL PANEL.

ELECTRICAL SYMBOL SCHEDULE

	NEW EXTERIOR LIGHTING FIXTURE & POLE	A-20	HOMERUN AND CIRCUIT NUMBER
	UNDERGROUND CONDUIT DUCT BANK		LIGHT
	EXISTING POLE MOUNTED TRANSFORMER		MOTOR
	RECEPTACLE		GROUND
WP RTWIUC GFCI	RECEPTACLE – WEATHERPROOF GROUND FAULT INTERRUPTING & RAIN TIGHT WHILE IN USE COVER		SAFETY SWITCH
		20	CIRCUIT BREAKER AND AMPERAGE
1	CONDUIT IDENTIFICATION	G.C.	GENERAL CONTRACTOR
A	LIGHTING FIXTURE IDENTIFICATION	E.C.	ELECTRICAL CONTRACTOR
	NEW CONDUIT AND WIRE	PE	PHOTOTELECTRIC CONTROL
	UNDERGROUND CONDUIT AND WIRE		PROPOSED MOTOR
	NEW EQUIPMENT	NTS	NOT TO SCALE
			RELOCATED EQUIPMENT

Ronald E. Pledger

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-0416 DIBBLE & PLEDGER P.A. CORPORATION

NORTH CAROLINA PROFESSIONAL SEAL 11654 ENGINEER RONALD E. PLEDGER

5/3/2015

DP

MECH. / ELECT. PLUMB. DESIGN BY:
DIBBLE & PLEDGER, P.A.
222 WEST MAIN STREET, WASHINGTON N.C. 27889
PHONE : (252) 946-3320 FAX. (252) 946-5160
E-MAIL: rpledger@dibbleandpledger.com

Drawn by	David E Vaughn,PE,PLS
Checked	David E Vaughn,PE,PLS
Reviewed	J. REITZEL ,PE,PLS
Date	JULY 2, 2014

PINEWOOD LIFT STATION ELECTRICAL SITE PLAN

No.	Revision	By	Date

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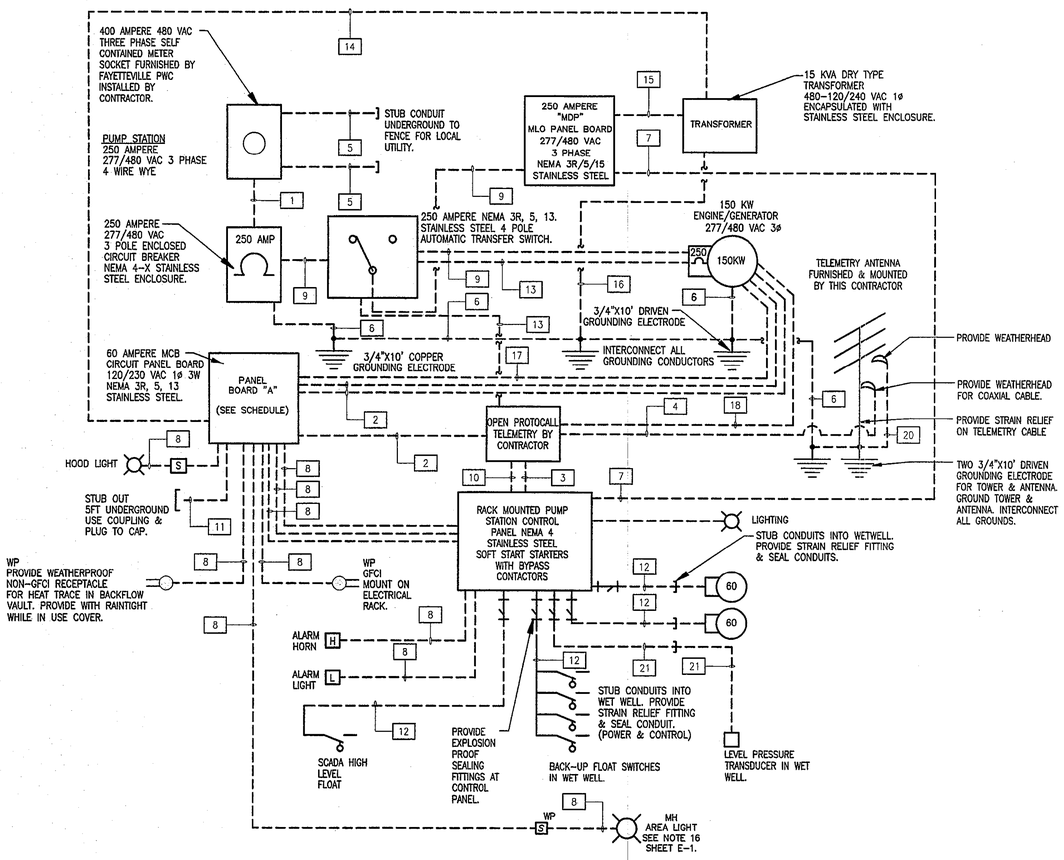
BOOK NO. #1283 L06104

SHEET E-1



1 / E-2 ELECTRICAL ONE LINE - PUMP STATION

NTS

CONDUIT AND CABLE SCHEDULE

1. 3-250 MCM CU. THHN/THWN UNGROUNDED CONDUCTORS
   1-250 MCM CU. THHN/THWN NEUTRAL CONDUCTOR
   3" CONDUIT
2. 1 #12 AWG CU. THHN/THWN UNGROUNDED CONDUCTOR
   1 #12 AWG CU. THHN/THWN NEUTRAL CONDUCTOR
   1 #12 AWG CU. THHN/THWN GROUNDING CONDUCTOR
   3/4" CONDUIT
3. 2 - 2 PAIR (4 CONDUCTOR) TWISTED SHIELDED INSTRUMENTATION CABLE W/ TAPE SHIELD & DRAIN WIRES 16 AWG.
   1" CONDUIT
4. 2" CONDUIT FOR MANUFACTURERS TELEMETRY COAXIAL CABLE
5. 4" SPARE CONDUIT FOR USE BY LOCAL UTILITY.
6. 1-#2 AWG CU. THHN/THWN GROUNDING CONDUCTOR
   3/4" CONDUIT
7. 3-3/0 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
   1-#6 AWG CU. THHN/THWN GROUNDING CONDUCTOR
   2" CONDUIT
8. 1-#12 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
   1-#12 AWG CU. THHN/THWN NEUTRAL CONDUCTOR
   1-#12 AWG CU. THHN/THWN GROUNDING CONDUCTOR
   3/4" CONDUIT
9. 3-250 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
   1-250 AWG CU. THHN/THWN NEUTRAL CONDUCTOR
   1-#4 AWG CU. THHN/THWN GROUNDING CONDUCTOR
   3" CONDUIT
10. 10-#14 AWG CU. THHN/THWN ALARM CONDUCTORS
    1-#14 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    1" CONDUIT
11. 2" SPARE CONDUIT. STUB OUT 5 FT.
    USE COUPLING & PLUG TO CAP.
12. MANUFACTURER'S CABLES CONTINUOUS NO SPLICES
    2" CONDUIT
13. 4-#14 AWG CU. THHN/THWN ALARM CONDUCTORS
    1-#14 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    3/4" CONDUIT
14. 2-#6 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    1-#10 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    1" CONDUIT
15. 2-#8 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    1-#10 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    1" CONDUIT
16. 1-#8 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    3/4" CONDUIT
17. 1-#10 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    1-#10 AWG CU. THHN/THWN NEUTRAL CONDUCTOR
    1-#10 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    3/4" CONDUIT
18. 8-#14 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    3/4" CONDUIT
19. 3-3/0 AWG CU. THHN/THWN UNGROUNDED CONDUCTORS
    1-3/0 AWG CU. THHN/THWN NEUTRAL CONDUCTOR
    1-#6 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    2-1/2" CONDUIT
20. 1-#4 AWG CU. THHN/THWN GROUNDING CONDUCTOR
    1" CONDUIT
21. MANUFACTURER'S SENSOR CABLE CONTINUOUS NO SPLICES
    2" CONDUIT

DESIGNATION TYPED ON DIRECTORY	COND (")	GRND	WIRE SIZE	BRKR RAT'G	CKT NO.	CKT. NO.	BRKR RAT'G	WIRE SIZE	GRND	COND (")	DESIGNATION TYPED ON DIRECTORY
PUMP CONTROL PANEL	2"	#6	3/0	200	1	2	40	#8	#10	1"	DRY TYPE TRANSFORMER
					3	4					
					5	6	20				SPARE
SPARE				30	7	8					
					9	10					SPACES
					11	12					
SPACES					13	14					
					15	16					
					17	18					
					19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					

S/N

A B C

250 AMPERE MAIN LUG ONLY
277/480 VAC 3 PHASE 4 WIRE WYE 60HZ
FACTORY ASSEMBLED, BOLT-ON BREAKERS, 100% TIN PLATED COPPER BUSSING, SEPARATE NEUTRAL & GROUNDING BUSES, SURFACE MOUNTED
NEMA 3R, 5,13 ENCLOSURE STAINLESS STEEL

PANEL "MDP"

DESIGNATION TYPED ON DIRECTORY	COND (")	GRND	WIRE SIZE	BRKR RAT'G	CKT NO.	CKT. NO.	BRKR RAT'G	WIRE SIZE	GRND	COND (")	DESIGNATION TYPED ON DIRECTORY
AREA LIGHT	3/4"	#12	#12	20	1	2	20	#12	#12	3/4"	TELEMETRY
PUMP CONTROL PANEL	3/4"	#12	#12	20	3	4	20				SPARE
RECEPTACLE	3/4"	#12	#12	20	5	6	20	#12	#12	3/4"	BATTERY CHARGER
RACK LIGHT	3/4"	#12	#12	20	7	8	20	#12	#12	3/4"	CONTROLS
ALARM A/V	3/4"	#12	#12	20	9	10	20				SPARE
SPARE				20	11	12	30	#10	#10	3/4"	JACKET HEATER
SPACES					13	14	20	#12	#12	3/4"	RPZ HEAT RECEPTACLE
					15	16					SPACES
					17	18					
					19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					

S/N

A B

60 AMPERE MAIN CIRCUIT BREAKER
120/230 VAC 1 PHASE 3 WIRE 60HZ
FACTORY ASSEMBLED, BOLT-ON BREAKERS, 100% TIN PLATED COPPER BUSSING, SEPARATE NEUTRAL & GROUNDING BUSES, SURFACE MOUNTED
NEMA 3R,5,13 ENCLOSURE STAINLESS STEEL

PANEL "A"

Ronald E. Pledger

NORTH CAROLINA REGISTERED ENGINEERING CORPORATION DIBBLE & PLEDGER, P.A. SEAL C-0416

NORTH CAROLINA PROFESSIONAL SEAL 11654 ENGINEER RONALD E. PLEDGER

5/3/2016

DP

MECH. / ELECT. PLUMB. DESIGN BY:
DIBBLE & PLEDGER, P.A.
222 WEST MAIN STREET, WASHINGTON N.C. 27889
PHONE : (252) 946-3320 FAX: (252) 946-5160
E-MAIL: rpledger@dibblepledger.com

#1283 | LD6104

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2, 2014

No.	Revision	By	Date

PINEWOOD LIFT STATION WIRE DIAGRAM

115 Broadfoot Avenue.
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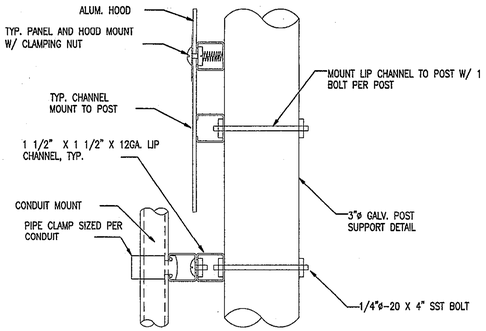
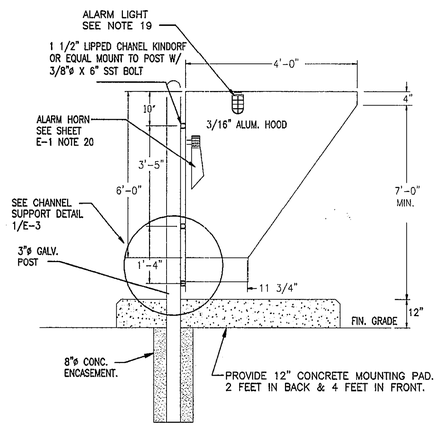
BOOK NO.

SHEET E-2

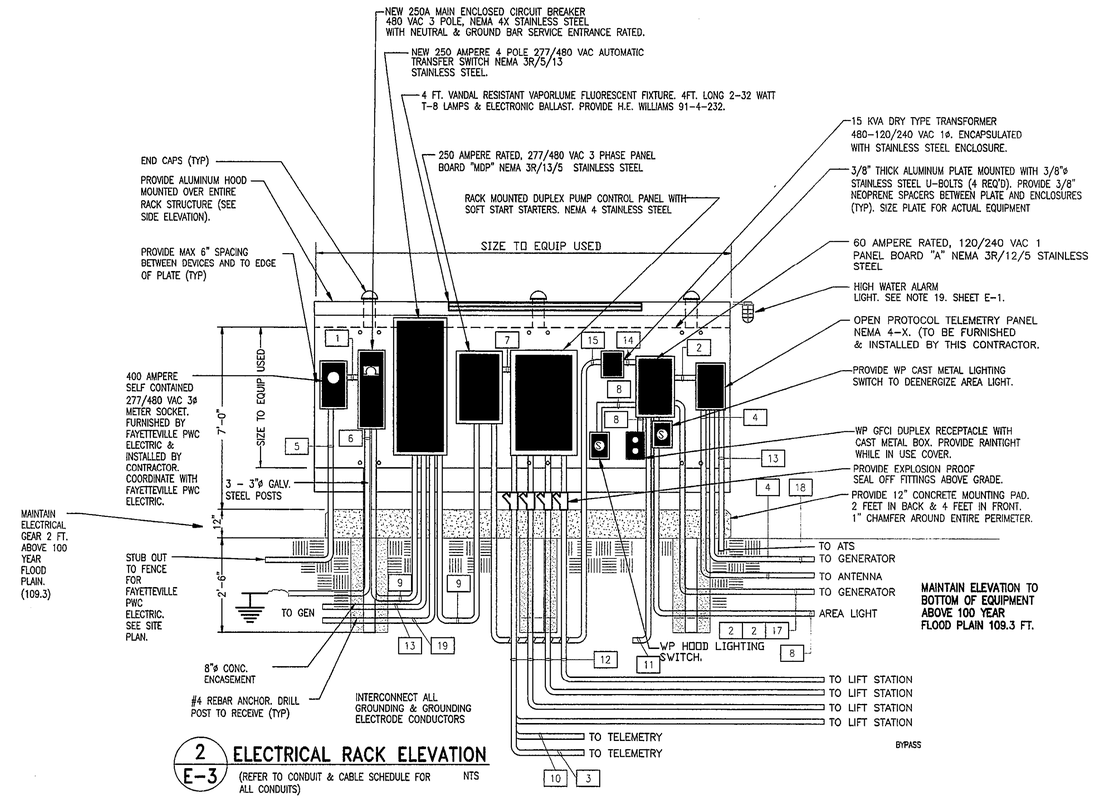


1 / E-3 CHANNEL SUPPORT DETAIL

NTS

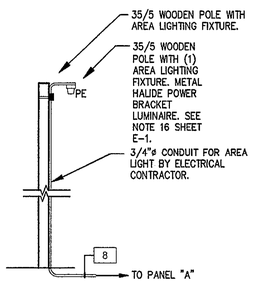


DIMENSIONS SHOWN ARE FOR REFERENCE PURPOSES ONLY. ALUMINUM COVER TO BE SIZED PER EQUIPMENT.



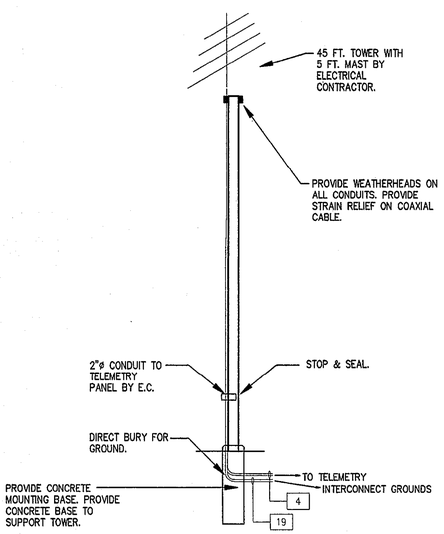
2 / E-3 ELECTRICAL RACK ELEVATION

(REFER TO CONDUIT & CABLE SCHEDULE FOR ALL CONDUITS) NTS



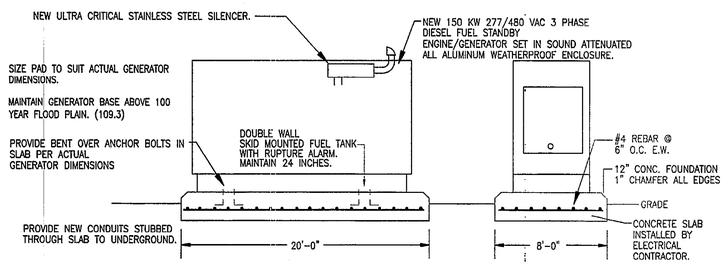
6 / E-3 AREA LIGHT POLE DETAIL

NTS



3 / E-3 AREA LIGHT & TELEMETRY ANTENNA DETAIL

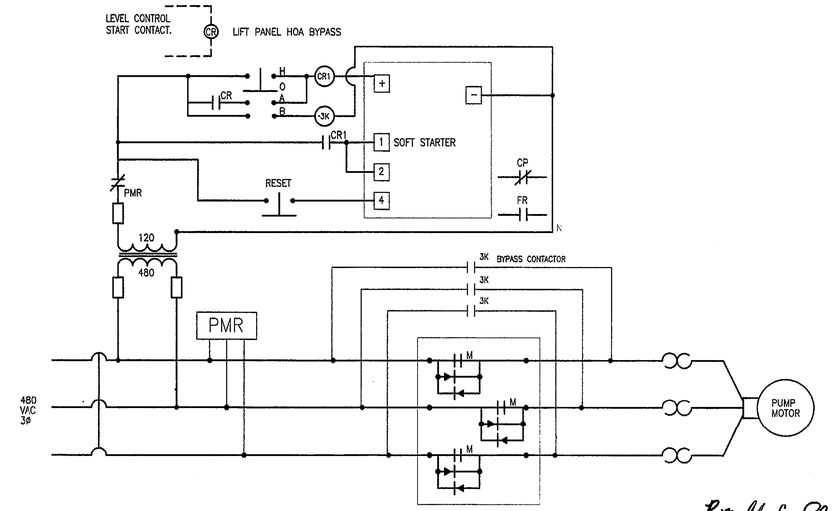
NTS



4 / E-3 150 KW ENGINE / GENERATOR PAD DETAIL

NTS

1. PROVIDE NEW 12" PAD.
2. PROVIDE ANCHOR BOLTS PER SPECIFICATIONS BENT OVER IN CONCRETE SLAB.
3. PROVIDE CONCRETE WORK PER SPECIFICATIONS. USE 4000 PSI PER SPECIFICATIONS.
4. SIZE SLAB TO ACTUAL GENERATOR USED.
5. PROVIDE 12" OFFSET AROUND GENSET USED.
6. PROVIDE VIBRATION ISOLATORS.
7. PROVIDE ALL FUEL FOR TESTING & FULL TANK UPON ACCEPTANCE.
8. MAINTAIN SUBBASE FUEL TANK MAXIMUM 24" HEIGHT. EXTEND TANK OFF END OF UNIT IF NECESSARY. CROWN ANY EXPOSED PORTION OF TANK FOR WATER RUNOFF.



5 / E-3 LIFT PUMP SOFT START / BYPASS WIRING DIAGRAM

NTS

CONTROLS

1. RUN LIGHT ON STARTER ENCLOSURE @ PANEL
2. HOA SWITCH @ STARTER ENCLOSURE
3. ELAPSED TIME METER ON STARTER ENCLOSURE
4. TIME DELAY RELAY (VARIABLE (0.1-10 MIN.)
5. PROVIDE SURGE PROTECTION DEVICE ON CKTS. IN STARTER 3ø.

Ronald E. Pledger

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NORTH CAROLINA PROFESSIONAL SEAL 11654 ENGINEER RONALD E. PLEDGER

5/3/2015

Drawn by	David E Vaughn,PE,PLS
Checked	David E Vaughn,PE,PLS
Reviewed	J. REITZEL ,PE,PLS
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PINEWOOD LIFT STATION
EQUIPMENT PLAN

No.	Revision	By	Date

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SCALE 1"=20' HORIZ.

#1283 LD6104 BOOK NO.

SHEET E-3

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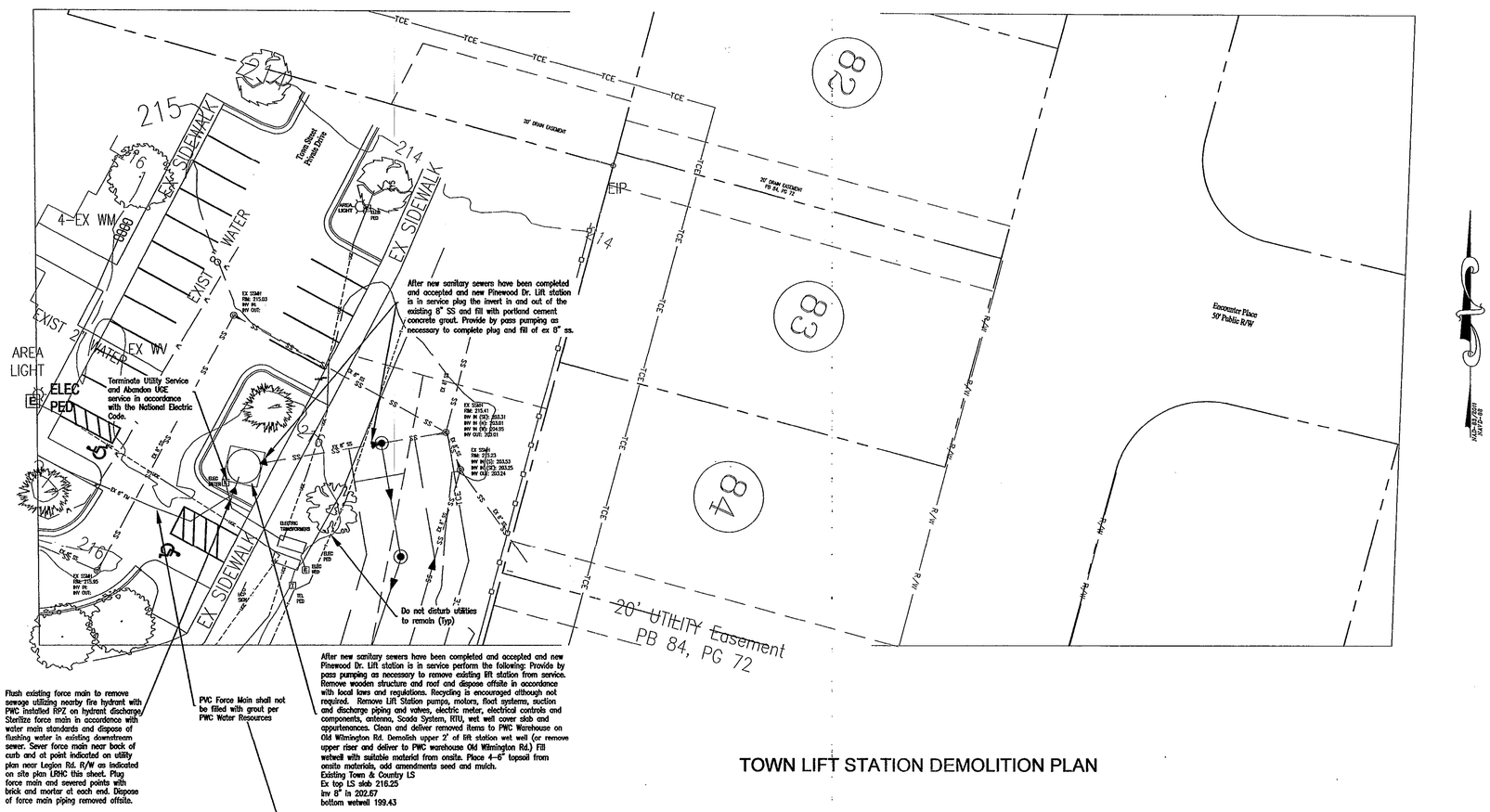
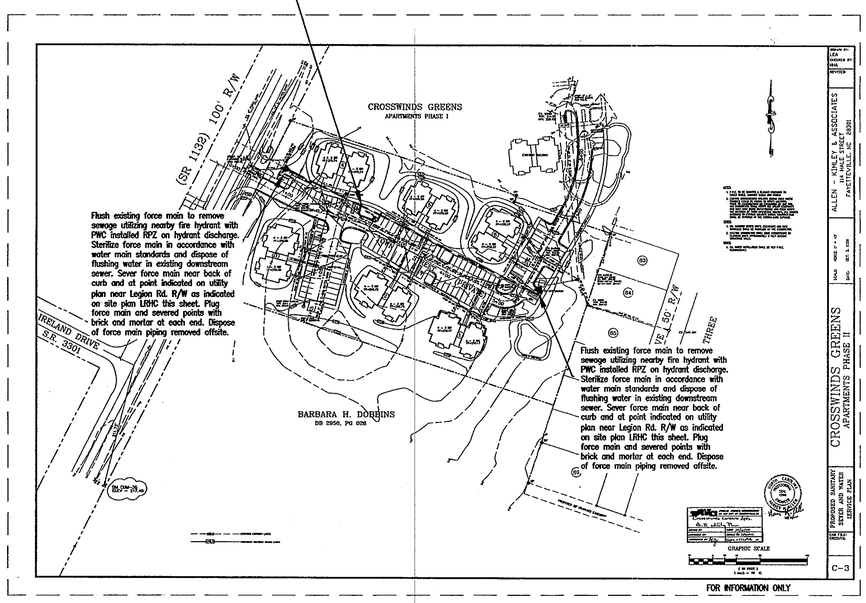
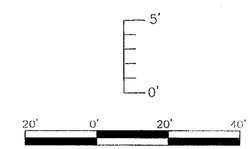
DIBBLE & PLEDGER, P.A.
222 WEST MAIN STREET, WASHINGTON N.C. 27889
PHONE : (252) 946-3320 FAX: (252) 946-5160
E-MAIL: rpledger@dibbleandpledger.com



TOWN LIFT STATION DEMOLITION PLAN





FOR NOTES AND LEGEND SEE SHEET ECP-4 & UTIL-1

CONTRACT NOTE:
All work shown on this sheet is in Contract 1 Base Bid.

FOR INFORMATION ONLY

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

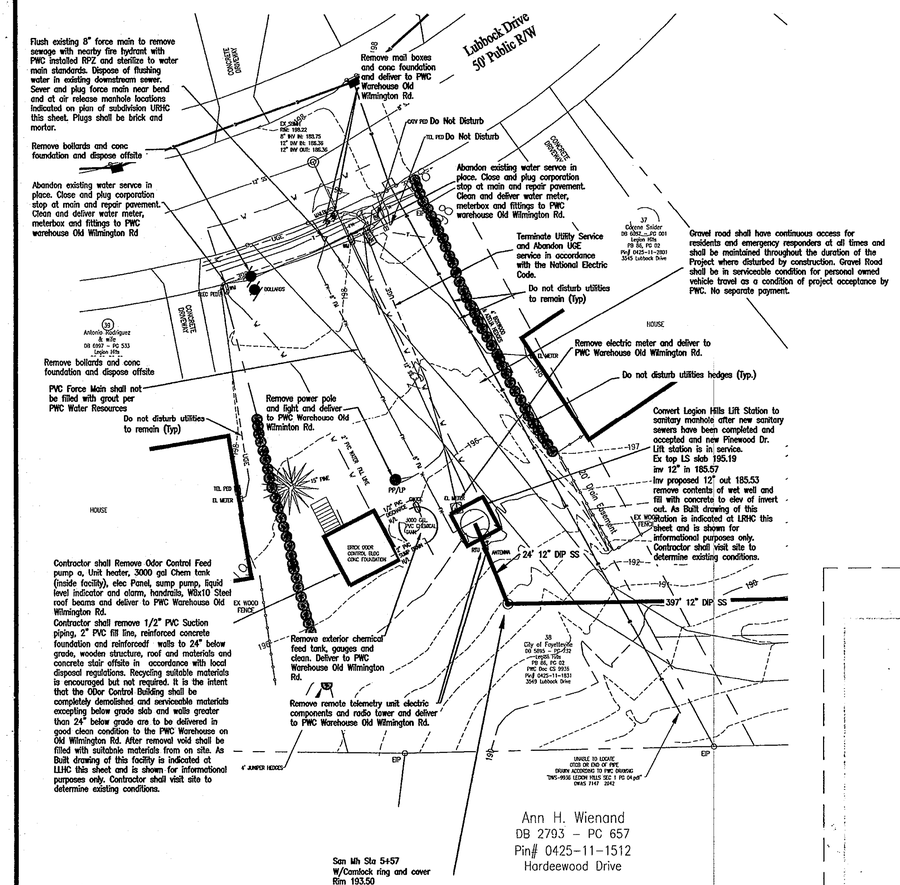
LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
TOWN LIFT STATION DEMO PLAN

No.	Revision	By	Date

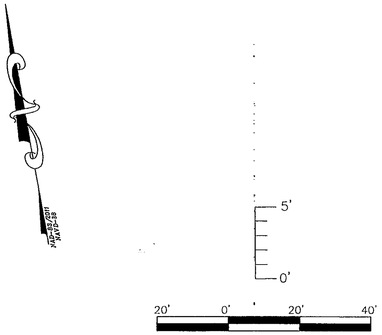
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE AS NOTED
BOOK NO.
SHEET D-1



LEGION HILLS LIFT STATION DEMOLITION PLAN



FOR NOTES AND LEGEND SEE SHEET ECP-1 & UTIL-1

CONTRACT NOTE:
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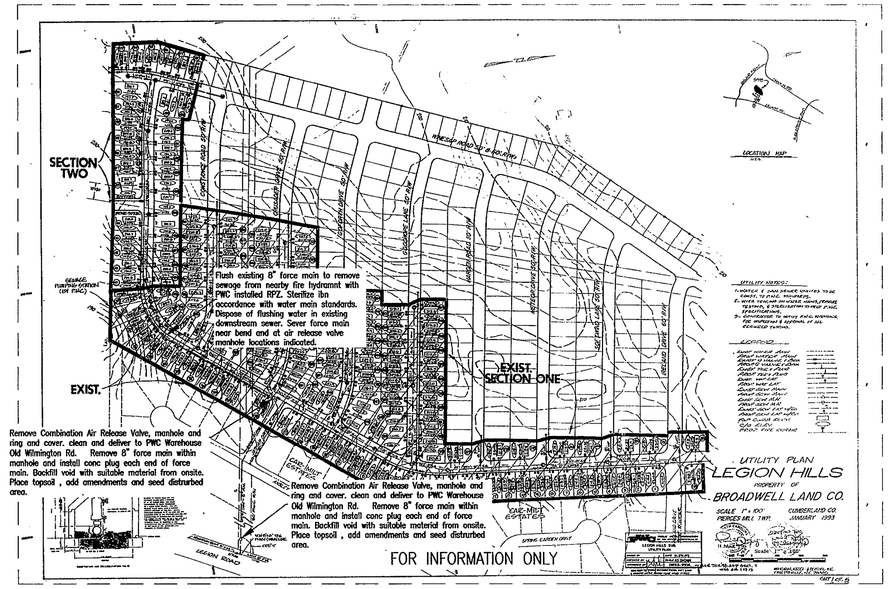
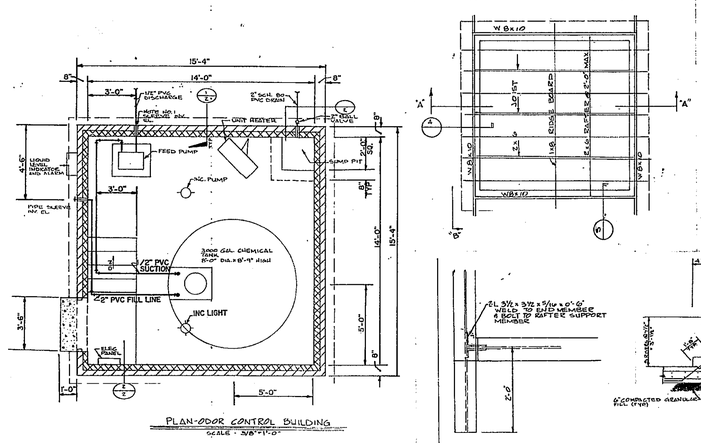
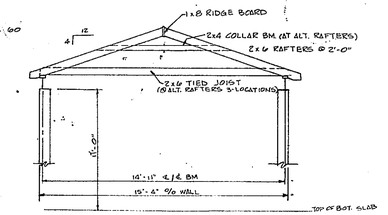
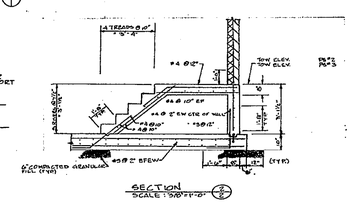


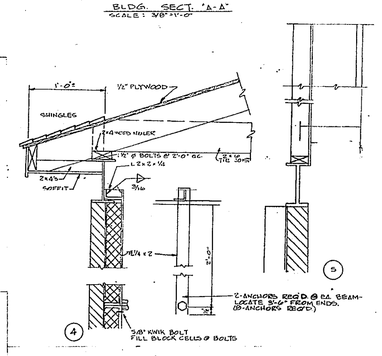


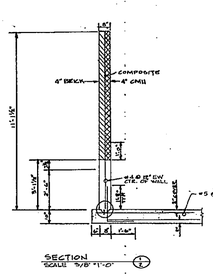
GENERAL NOTES:

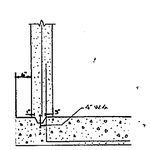
1. MATERIALS:
   A. CONCRETE f'c = 3000 PSI
   B. CONCRETE MASONRY UNITS - ASTM C90
   C. REINFORCING STEEL - ASTM A615 GRADE 60
   D. STRUCTURAL STEEL - ASTM A 36
2. CONSTRUCTION:
   A. ALL CONSTRUCTION (NAILING ETC) SHALL BE IN ACCORDANCE WITH THE N.C. STATE BUILDING CODE.
3. CHEMICAL TANK, PUMP(S), HEATER UNIT, CONTROL PANEL, INTERNAL AND EXTERNAL PIPING NOT TO BE INCLUDED IN THE PROPOSAL. HOWEVER WALL SLEEVES TO BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
4. METAL DOOR AND FRAME WILL BE FURNISHED BY THE OWNER AND INSTALLED BY CONTRACTOR.

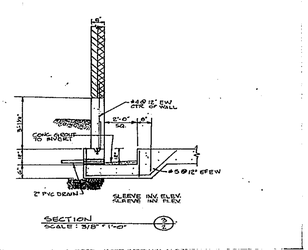


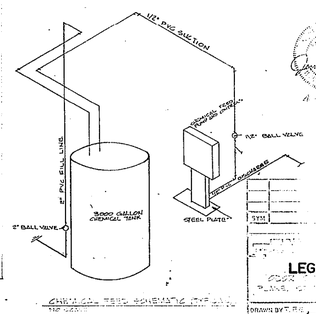


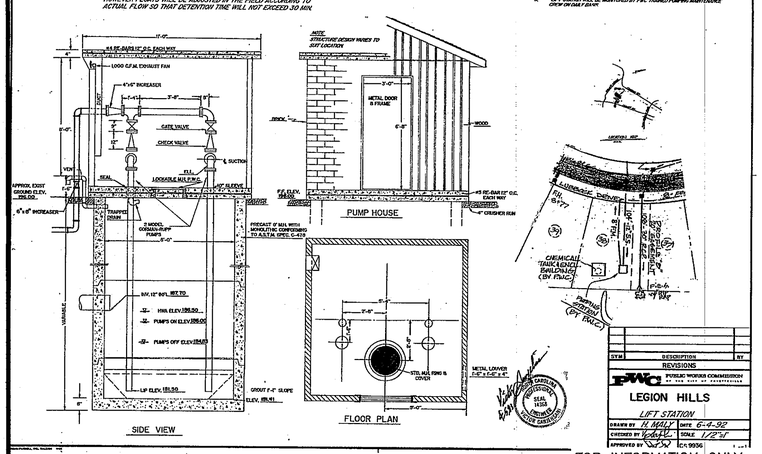


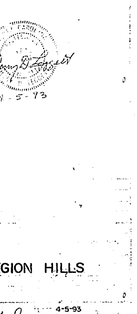












Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
LEGION HILLS LIFT STATION DEMOLITION PLAN

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

MOORMAN, KIZER & REITZEL, INC.
ENGINEERS PLANNERS SURVEYORS

SCALE AS NOTED
BOOK NO.
SHEET D-2

DESIGN CRITERIA:

Height: 18" Minimum from Channel Bottom to Ridge Top

Side Slope: 2:1 or flatter
3:1 or flatter where vehicles cross

Base Width of Ridge: 6' minimum

Spacing of Water Bars:

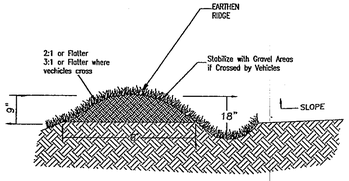
Slope(%)	Spacing(ft)
<5	125
5 to 10	100
10 to 20	75
20 to 35	50
>35	25

Grade and Angle: Crossing angle selected to provide a positive grade not to exceed 2%

Outlet: Diversions should have stable outlets, either natural or constructed. Site spacing may need to be adjusted for field conditions to use the most suitable areas for water disposal.

CONSTRUCTION SPECIFICATIONS:

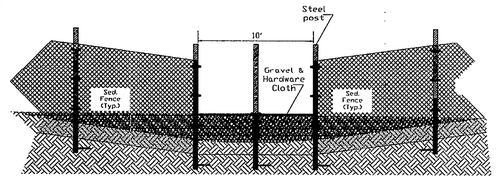
1. Install the diversion as soon as the right-of-way has been cleared and graded.
2. Disk the base for the constructed ridge before placing fill.
3. Track the ridge to compact it to the design cross section.
4. Locate the outlet on an undisturbed area. Adjust field spacing of the diversion to use the most stable outlet areas. When natural areas are not deemed satisfactory, provide outlet protection (Practices 6.40, Level Spreader, and 6.41, Outlet Stabilization Structure).
5. Immediately seed and mulch the portions of the diversions not subject to construction traffic. Stabilize with gravel areas to be crossed by vehicles.



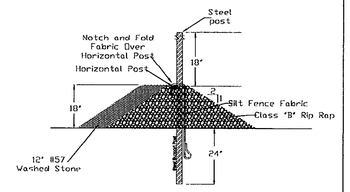
MAINTENANCE:

Periodically inspect right-of-way diversions for wear and after every heavy rainfall for erosion damage. Immediately remove sediment from the flow area and repair dike. Check outlet areas and make timely repairs as needed. When permanent road drainage is established and the area above the temporary right-of-way diversions is permanently stabilized, remove the dike and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.

R/W DIVERSION (WATER BAR)
NTS



PLAN VIEW
NTS



SECTION
NTS

CONSTRUCTION SPECIFICATIONS and MAINTENANCE

SEDIMENT FENCE:
See Sediment Fence Detail this sheet for material and installation of the sediment fence.

MAINTENANCE:
Maintain sediment fence as stated in Sediment Fence Detail.
Riprap outlet shall be clean and free of excess sediment and or debris.
Inspect fence and outlet on a weekly basis or after any significant rainfall event.

REINFORCED SEDIMENT FENCE OUTLET
NTS

WETLAND CONSTRUCTION REQUIREMENTS

1. CONSTRUCTION LIMITS/CORRIDOR (INCLUDING ROADS AND STOCKPILE AREA) TO A MAXIMUM 40 FOOT WIDTH.
2. POST CONSTRUCTION GROUND CONTOURS AND ELEVATIONS MUST BE RESTORED TO THE ORIGINAL ELEVATIONS.
3. THE TOP 6" TO 12" OF THE TRENCH SHALL BE BACKFILLED WITH THE TOPSOIL AND/OR SOIL EXISTING PRIOR TO CONSTRUCTION.
4. EXCESS MATERIAL MUST BE REMOVED TO UPLAND AREAS AND DISPOSED OF OFF-SITE. TEMPORARY PLACEMENT/STOCKPILE FOR ABSOLUTE MINIMUM PERIOD OF TIME.
5. DISTURBED SLOPES AND STREAM BANKS MUST BE STABILIZED IMMEDIATELY UPON COMPLETION OF THE UTILITY LINE OR IMMEDIATELY AT EACH STREAM CROSSING.
6. NOTIFY COE DISTRICT ENGINEER AND RECEIVE WRITTEN APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
7. INSTALL ANTI-SEEP COLLARS EVERY 150 FEET OR AS SHOWN ON PLANS.
8. NO FERTILIZER SHALL BE APPLIED WITHIN 10 FEET OF STREAM.
9. NO FRESH CONCRETE SHALL BE IN CONTACT WITH STREAMS.
10. SEEDING SHALL BE IN ACCORDANCE WITH THE SPECIFIED MIXTURE FOR WETLAND AREAS.

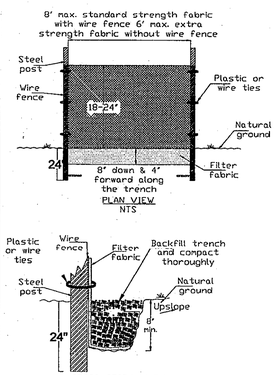
WETLAND CONSTRUCTION REQUIREMENTS			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. N.6	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JAN. 01, 2015	APPROVED BY: J.E.G.					

2015 N6 WETLAND_NOTES.dwg

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

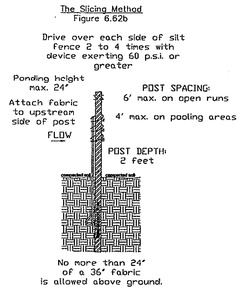
LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
EROSION CONTROL DETAILS

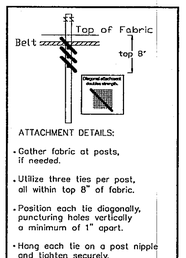
SEDIMENT FENCING

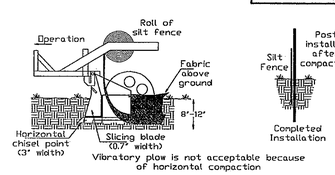


(Figure 6.62a Installation detail of a sediment fence.)

SEDIMENT FENCE
NTS







CONSTRUCTION SPECIFICATIONS

MATERIALS
1. Use a synthetic filter fabric of at least 95% by weight of polyolefins or polyester, which is certified by the manufacturer or supplier as conforming to the requirements in ASTM D 6461, which is shown in part in Table 6.62b (Refer to the *Erosion and Sediment Control Planning and Design Manual*, Chapter 6, Section 62.2).

Synthetic filter fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120° F.

2. Ensure that posts for sediment fences are 1.33 lb/linear ft steel with a minimum length of 5 feet. Make sure that steel posts have projections to facilitate fastening the fabric.

3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

CONSTRUCTION
1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.

2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)

3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.

4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have minimum 50 pound tensile strength.

5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Support posts should be driven securely into the ground a minimum of 24 inches.

6. Extra strength filter fabric with 6 feet post spacing does not require wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have minimum 50 pound tensile strength.

7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (Figure 6.62a).

8. Place 12 inches of the fabric along the bottom and side of the trench.

9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.

10. Do not attach filter fabric to existing trees.

SEDIMENT FENCE INSTALLATION USING THE SLICING METHOD
Instead of excavating a trench, placing fabric and then backfilling trench, sediment fence mayb be installed using specialty designed equipment that inserts the fabric into a cut sliced in the ground with a disc (Figure 6.62b).

INSTALLATION SPECIFICATIONS
1. The base of both end posts should be at least one foot higher than the middle of the fence. Check with a level if necessary.

2. Install posts 4 feet apart in critical areas and 6 feet apart on standard applications.

3. Install posts 2 feet deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

4. Install posts with the nipples facing away from the silt fabric.

5. Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. Also, each tie should be positioned to hang on a post nipple when tightened to prevent sagging.

6. Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

7. No more than 24 inches of a 36 inch fabric is allowed above ground level.

8. The installation should be checked and corrected for any deviations before compaction.

9. Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first, and then each side twice for a total of 4 trips.

MAINTENANCE
Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.

Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly.

Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.

Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

1. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK. (NO SEPARATE PAYMENT).

2. THE CONTRACTOR SHALL NOTIFY PLAN APPROVING AUTHORITY ONE WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO FINAL INSPECTION.

3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO CLEARING AND/OR LAND DISTURBANCE.

4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND PERMIT SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO OFF-SITE BORROW OR WASTE AREAS, STAGING OR STORAGE AREAS), THE CONTRACTOR SHALL PREPARE AND SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND TO NCDENR REGIONAL OFFICE FOR APPROVAL. CONTRACTOR SHALL PAY ALL FEES REQUIRED AND SHALL INSTALL NECESSARY MEASURES AT NO SEPARATE PAYMENT. THE CONTRACTOR SHALL PROVIDE THE OWNER AND THE ENGINEER A COPY OF THE AMENDED PERMIT.

6. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY EITHER NCDENR OR THE ENGINEER. (NO SEPARATE PAYMENT).

7. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.

8. ALL AREAS DISTURBED BY CONSTRUCTION UNLESS OTHERWISE IMPROVED SHALL BE SODDED OR SEEDED AS INDICATED AND STABILIZED.

9. DURING DEWATERING OPERATIONS, WATER SHALL BE PUMPED INTO AN APPROVED FILTERING DEVICE PRIOR TO DISCHARGE TO RECEIVING OUTLET.

10. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.

11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED BY CONTRACTOR ONCE STABILIZATION OR A SUFFICIENT GROUND COVER HAS BEEN ESTABLISHED OR AS DIRECTED BY THE ENGINEER. (NO SEPARATE PAYMENT). NCDENR'S FINAL APPROVAL IS REQUIRED.

12. TEMPORARY GRAVEL CONSTRUCTION ENTRANCE SHALL BE REQUIRED AT ALL CONSTRUCTION STAGING AREA ENTRANCES AND ALL CONSTRUCTION ACCESS LOCATIONS INTO NON-PAVED AREA. (NO SEPARATE PAYMENT).

13. WHEN CROSSING CREEK OR DRAINAGE-WAY, THE CONTRACTOR SHALL RIP-RAP WITH FABRIC DISTURBED BANKS AND CHANNEL AND RESTORE SLOPES TO ORIGINAL CONTOURS, BUT NOT STEEPER THAN 2:1 MAXIMUM. DISTURBED CREEK AREA SHALL BE STABILIZED IMMEDIATELY.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

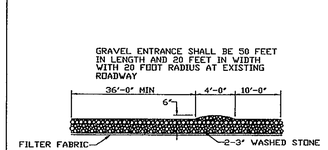
CONSTRUCTION SPECIFICATIONS
1. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.

2. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.

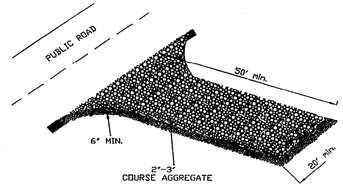
3. Provide drainage to carry water to a sediment trap or other suitable outlet.

4. Use geotextile fabrics because they improve stability of the foundation in locations subject to seepage or high water table.

MAINTENANCE
Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. After each rainfall, inspect any structure used to trap sediment and clean it out as necessary. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.



GRAVEL CONSTRUCTION ENTRANCE



TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
N.T.S.

SILTSACK
SPECIFICATIONS

NOTE: THE SILTSACK WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK ®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

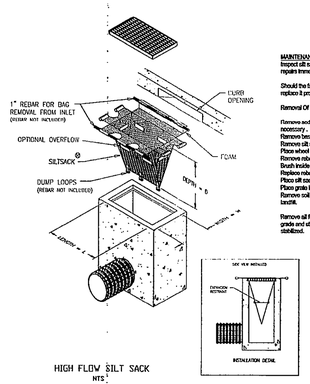
PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS	
GRAB TENSILE ELONGATION	ASTM D-4632	20 %	
PUNCTURE	ASTM D-4833	120 LBS	
MULLEN BURST	ASTM D-3786	600 PSI	
TRAPEZOID TEAR	ASTM D-4533	120 LBS	
UV RESISTANCE	ASTM D-4355	80 %	
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE	
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT	
PERMITTIVITY	ASTM D-4491	0.05 SEC -1	

HI-FLOW SILTSACK ®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS	
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS	
GRAB TENSILE ELONGATION	ASTM D-4632	20 %	
PUNCTURE	ASTM D-4833	125 LBS	
MULLEN BURST	ASTM D-3786	430 PSI	
TRAPEZOID TEAR	ASTM D-4533	45 LBS	
UV RESISTANCE	ASTM D-4355	90 %	
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE	
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT	
PERMITTIVITY	ASTM D-4491	1.5 SEC -1	

OIL-ABSORBANT SILTSACK ®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL ABSORBANT FILLER INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK ®WITH A WOVEN FILLER INSERT.



HIGH FLOW SILT SACK
NTS

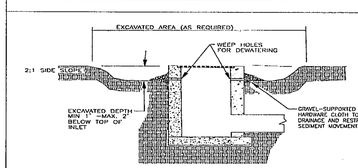
MAINTENANCE
Inspect silt sack at least once a week and after each rainfall. Make any required repairs immediately.

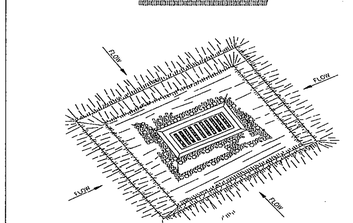
Should the fabric of a silt sack collapse, tear, decompose or become ineffective, replace it promptly.

Removal Of Accumulated Silt

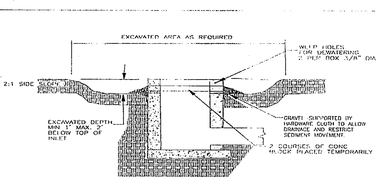
Remove sediment deposits, soil on tops and around liners at inlet opening as necessary.
Remove beds cover grate.
Remove silt sack by attaching cables to rebar for lifting
Place wheel barrow or similar device under bag.
Remove rebar from dump loops and empty bag.
Brush inside of bag to remove soil materials left after dumping operation.
Replace rebar in dump loops.
Place silt sack in basin, insure emptying flaps are that
Place grate insure sack is properly positioned in inlet.
Remove soil from wheel barrow and haul to approved disposal area or permitted landfill.

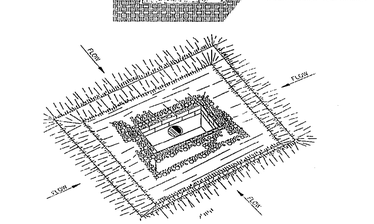
Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.





TEMPORARY EXCAVATED DROP INLET PROTECTION
NTS





TEMPORARY EXCAVATED INLET PROTECTION
NTS

CONSTRUCTION SPECIFICATIONS
1. Clear the area of all debris that might hinder excavation and disposal of spoil
2. Grade the approach to the inlet uniformly.
3. Protect weep holes by gravel.
4. When the contributing drainage area has been permanently stabilized, seal weep holes, fill the basin with stable soil to final grading elevations, compact it properly, and stabilize.

MAINTENANCE
Inspect, clean, and properly maintain the excavated basin after every storm until the contributing drainage area has been permanently stabilized. To provide satisfactory basin efficiency, remove sediment when the volume of the basin has been reduced by one-half. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize it appropriately.

MOORMAN, KIZER & REITZEL, INC.
ENGINEERS PLANNERS SURVEYORS
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

No.	Revision	By	Date

SCALE
BOOK NO.
SHEET
DET-1

TEMPORARY SEEDING RECOMMENDATIONS (a)

Winter and Early Spring

SEEDING MIXTURE

SPECIES	RATE (LB./ACRE)
Rye (grain)	120
Annual lespedeza (kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duraton of temporary cover is not to extend beyond June.

SEEDING DATES

Mountains--Above 2500 ft. Feb. 15-May 15
Below 2500 ft. Feb. 1-May 1
Piedmont--Jan. 1-May 1
Coastal Plain--Dec. 1-Apr. 15

SOIL AMENDMENTS

Follow recommendations of 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 straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

MAINTENANCE

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS (b)

Summer

SEEDING MIXTURE

SPECIES	RATE (LB./ACRE)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may by substituted at a rate of 50 lb./acre.

SEEDING DATES

Mountains--May 15-Aug. 15
Piedmont--May 1-Aug. 15
Coastal Plain--Apr. 15-Aug. 15

SOIL AMENDMENTS

Follow recommendations of 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 straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

MAINTENANCE

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS (c)

Fall

SEEDING MIXTURE

	RATE (LB./ACRE)
Rye (grain)	120

SEEDING DATES

Mountains--Aug. 15-Dec. 15
Coastal Plain and piedmont--Aug. 15-Dec. 30

SOIL AMENDMENTS

Follow soil tests or apply 2,000 lb./acre ground agricultural limestone and 1,000 lb./acre 10-10-10 fertilizer.

Apply 4,000 lb./acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

MAINTENANCE

Repair and refertilize damaged areas immediately. Topdress with 50 lb./acre of nitrogen in march. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb./acre Kobe (Piedmont and Costal Plain) or korean (Mountains) lespedza in late February or early March.

Fertilizer Topdressing:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre (560kg per hectare). Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre (560 kg per hectare). Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

Crimping Straw Mulch:

Crimping will be required on these project adjacent to any section of roadway where traffic is to be maintained or allowed during construction. In areas within six feet (2 meters) of the edge of pavement, straw is to be crimped and the immediately tacked with asphalt tack.

Crimping of straw in lieu of asphalt tack will be allowed on this project subject to the following conditions:

All areas seeded and mulched shall be crimped and/or tacked with asphalt as directed by the Engineer.

Crimping will be limited to slopes 4:1 or flatter unless the Contractor can demonstrate to the Engineer that the steeper slopes can be negotiated without altering the typical

Straw mulch to be of sufficient length and quality to withstand the crimping operation and provide adequate ground cover.

Crimping equipment including power source shall be subject to the approval of the Engineer providing that maximum spacing of crimper blades shall not exceed 8 inches (200 mm).

MAINTENANCE SCHEDULE:

1. All erosion and sediment control practices will be checked for stability and operation following every storm event, but in no case less than once every week. Any repairs or cleaning necessary to maintain erosion and sediment control practices shall be completed immediately.

2. All seeded areas will be refertilized, reseeded as necessary, and mulched according to the

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined by the Engineer. All rates per acre (kilograms per hectare)

March 1 - August 31

50# (55kg)	Tall Fescue	
5# (6kg)	Centipede	
25# (28kg)	Bermudagrass (hulled)	
500# (560kg)	Fertilizer	
4000# (4500kg)	Limestone	

September 1 - February 28

50# (55kg)	Tall FEscue
5# (6kg)	Centipede
35# (40kg)	Bermudagras (unhulled)
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

Slopes 2:1 and Steeper and Waste and Borrow Locations:

March 1 - August 31

75# (85kg)	Tall Fescue
25# (28kg)	Bermudagrass (hulled)
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

September 1 - February 28

75# (85kg)	Tall Fescue
35# (40kg)	Bermudagras (unhulled)
500# (560kg)	Fertilizer
4000# (4500kg)	Limestone

PERMANENT SEEDING SPECIFICATION

1. All disturbed areas shall be dressed to typical sections and plowed to a depth of 5 inches. The top 2 inches shall be pulverized to provide uniform seedbed. NOTE: Lime should be applied with necessary equipment to give uniform distribution of these materials. The hand-bucket method is not acceptable. Lime and fertilizer should be incorporated into the soil prior to

2. The following are rates and kinds of these materials to be FERTILIZED:

	RATES
Abruzzi Rye	50 lbs.
Pensacola Bahiagrass	50 lbs.
Kentucky 31 Fescue	50 lbs.
Korean Lespedeza	15 lbs.
Centipedegrass	50 lbs.
Common Bermudagrass	25 lbs.
10-20-20 Fertilizer	500 lbs.
Agricultural Limestone	4000 lbs.

3. Seeded area shall be cultipacked to firm seedbed and to cover seed.

4. Grain straw shall be applied over seeded areas as mulch. No bare ground shall be visible in the mulched area if proper applications is achieved. Thick clumps of straw are not permissible as uniform coverage is expected. Straws shall be applied at a minimum of 4000

5. The mulched area shall be tacked with liquid asphalt sufficient too hold straw in place where directed by Engineer.

6. Ditch treatment shall be used in areas where steep grades could cause ditch erosion. Use of jute mesh, excelsior matting, or fiberglass roving is acceptable. ditch treatment should be installed before mulching operation.

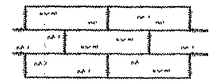
7. Builder is to provide a permanent ground cover sufficient to restrain erosion on such exposed areas within 15 working days or 90 calendar days, whichever is shorter, after completion of construction or development.

Approved Tall Fescue Cultivars:

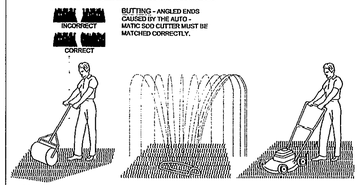
Adventure	Adventure II	Anigo
Apache	Apache II	Arid
Brookstone	Bonanza	Bonanza II
Chesapeake	Chieftain	Coronado
Debutante	Duster	Falcon
Finelawn Petite	Finelawn	Finelawn I
Grande	Guardian	Houndog
Jaguar III	Kentucky 31	Kitty Hawk
Montauk	Mustang	Olympic
Phoenix	Pixie	Pyramid
Rebel Jr.	Rebel II	Renegade
Shenandoah	Tempo	Titan
Trailblazer	Tribute	Vegas
Wrangler		

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

SODDING



LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASONS TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.



APPEARANCE OF GOOD SOD

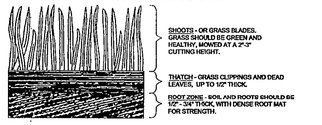


Figure 6-6.2

MAINTENANCE

After the first week, water as necessary to maintain adequate moisture in the root zone and prevent dormancy of the sod.

Do not remove more than one-third of the shoot in any mowing. Grass height should be maintained between 2 and 3 inches unless otherwise specified.

After the first growing season, established sod required fertilization, and may also require lim. Follow soil test recommendations when possible.

SOD INSTALLATION

1. Moistening the sod after it is unrolled helps maintain its viability. Store it in the shade during installation.

2. Raise the soil surface to break the crust just before laying sod. During the summer, lightly irrigate the soil, immediately before laying the sod to cool the soil and reduce root burning and dieback.

3. Do not sod on gravel, frozen soils, or soils that have been treated recently with sterilants or herbicides.

4. Lay the first row of sod in a straight line with subsequent rows placed parallel to and butting tightly against each other. Stagger strips in a brick-like pattern. Be sure that the sod is not stretched or overlapped and that all joints are butted tightly to prevent voids. Use a knife or sharp spade to trim and fit irregularly shaped areas.

5. Install strips of sod with their longest dimension perpendicular to the slope. On slopes 3:1 or greater, or whatever erosion may be a problem, secure sod with pegs or staples.

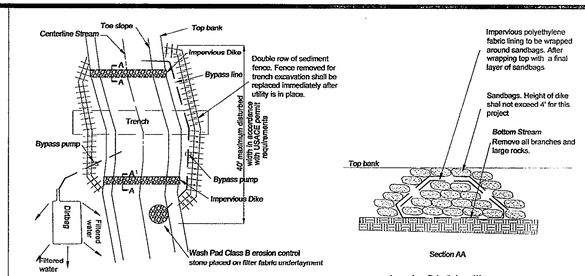
6. As sodding of clearly defined areas is completed, roll sod to provide firm contact between roots and soil.

7. After rolling, irrigate until the soil is wet 4 inches below the sod.

8. Keep sodded areas moist to a depth of 4 inches until the grass takes root. This can be determined by gently tugging on the sod--resistance indicates that rooting has occurred.

9. Mowing should not be attempted until the sod is firmly rooted, usually 2-3 weeks.

See Figure 6-6.2



1. Utility shall be constructed during low flow periods
2. Limit clearing to the minimum necessary for construction.
3. Ensure that bypass piping and pump fittings are in serviceable condition and do not leak.
4. Provide temporary or permanent stabilization with ground cover as soon as practicable but in any event within 7 days of last land disturbing activity.
5. Inspect sediment fence and Impervious dike for sediment deposits, erosion, channel blockages, channel degradation, slope failure and piping periodically and after each rainfall event. Remove sediment from fencing and dikes and dispose of offsite in a permitted landfill. Make necessary repairs to structure immediately to prevent further damage to the installation.
6. All measures are to be removed immediately after crossing has been stabilized. See Stream crossing detail for rip rap where specified and or indicated on plans.

Impervious Polyethylene Wrap

PROPERTY	METHOD	UNITS	:3
Thickness	ASTM D 5199	mm	0.3
Polymer Type (1)	ASTM D 1777 -		FPP
Specific gravity	ASTM D 792	g/cm3	.91
Tensile Strength at Yield (MD, TD)	ASTM D 6693 IV	kN/m	5, 4
Tensile Strength at Break (MD, TD)	ASTM D 6693 IV	kN/m	28, 22
Elongation at Break	ASTM D 6693 IV	%	900
Tear Resistance (MD, TD)	ASTM D 1004 C	N	25, 25
Puncture Resistance	ASTM D 4833	N	90
Water Vapour Transmission (23 C, 50% RH)	ASTM E 96	g/m2/24hrs	-
Methane (CH4)Transmission (23 C, 50% RH)	-	cc/m2/24hrs	-
Carbon Black Content	OEE 8.2.4-92-01	%	2-3
OIT	ASTM D 3895	minutes	> 100

Stream Crossing Detail

MTS

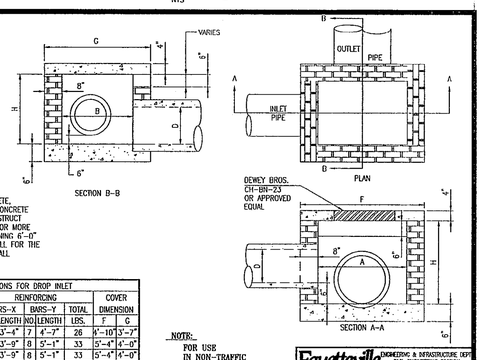
NOTES:

ALL BASINS OVER 3'-6" DEPTH SHALL BE PROVIDED WITH STEPS 1'-2" O.C.

EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 1" MOTAR JOINTS SHALL BE 1/2" ± 1/8"

ALL EXPOSED JOINTS SHALL BE CONCAVE TOOLED

JUMBO BRICK, PRECAST CONCRETE, AND/OR PRECAST SEGMENTAL CONCRETE BLOCKS MAY BE USED TO CONSTRUCT BASIN. BASIN 8'-0" IN HEIGHT OR MORE SHALL HAVE A 12" WALL BEGINNING 6'-0" FROM TOP OF WALL AND 8" WALL FOR THE REMAINING 6'-0" TO TOP OF WALL



MIN DIMENSIONS FOR DROP INLET										
DIM'S OF BOX & PIPE				REINFORCING					COVER	
PIPE	SPAN	WIDTH	HEIGHT	H(MIN)	NO	BARS-X LENGTH	NO	BARS-Y LENGTH	TOTAL LBS.	DIMENSION F	C
D	A	B									
15"	3'-6"	2'-3"	2'-7"	2	3'	3'-4"	7	4'-7"	26	4'-10"	3'-7"
18"	4'-0"	2'-8"	2'-11"	2	3'-9"	8	5'-1"	33	5'-4"	4'-0"
24"	4'-0"	2'-8"	3'-5"	2	3'-9"	8	5'-1"	33	5'-4"	4'-0"
30"	4'-0"	3'-6"	3'-11"	2	4'-7"	9	5'-1"	37	5'-4"	4'-10"
36"	4'-0"	3'-6"	4'-6"	2	4'-7"	9	5'-1"	37	5'-4"	4'-10"
42"	4'-0"	3'-6"	4'-11"	2	4'-7"	9	5'-1"	37	5'-4"	4'-10"
48"	4'-6"	4'-0"	5'-5"	2	5'-4"	10	5'-7"	45	5'-10"	5'-4"

NOTE:
FOR USE IN NON-TRAFFIC AREAS ONLY.

SHEET 1 OF 2

DR-11

CAD FILE: DROPINLET

Fayetteville — ENGINEERING & INFRASTRUCTURE DEPT. CIVIL ENGINEERING DIVISION 433 HAY ST. 28301 (910) 433-1656

DROP INLET WITH GRATE (FLUSH) ADOPTED FROM NCDOT STANDARD NO. 840.15

DATE 3/24/2008 DRAWN BY C.W.
SCALE N. T. S. CK'D BY C.A.

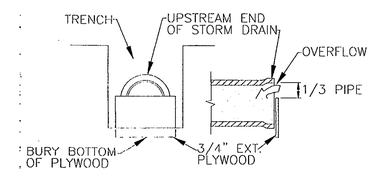


FIGURE 1: PLYWOOD PROTECTION

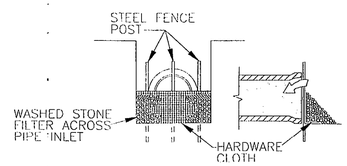
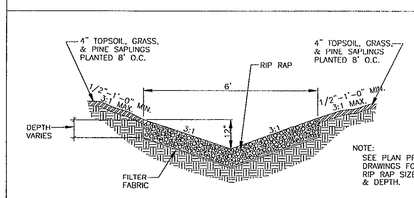


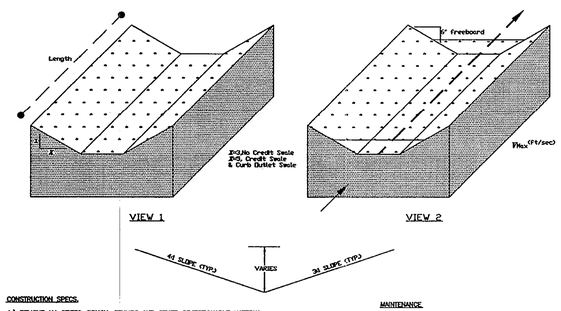
FIGURE 2: STONE FILTER PROTECTION

INLET PROTECTION FOR STORM DRAINAGE UNDER CONSTRUCTION
N.T.S.



NOTE:
SEE PLAN PROFILE DRAWINGS FOR RIP RAP SIZE & DEPTH.

RIP RAP SWALE DETAIL
N.T.S.



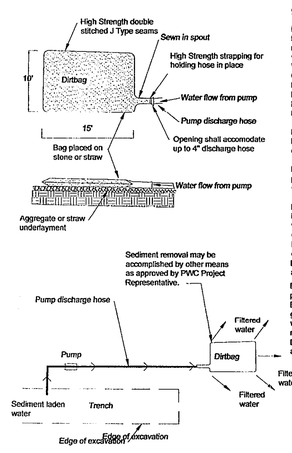
CONSTRUCTION SPECS.

1.) REMOVE ALL TREES, BRUSH, STUMPS AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA AND DISPOSE OF PROPERLY.
2.) EXCAVATE THE CHANNEL AND SHAPE IT TO NEAT LINES AND DIMENSIONS SHOWN ON THE PLANS PLUS A 0.2 FT. OVERCUT AROUND THE CHANNEL PERIMETER TO ALLOW FOR BUILDING DURING SEED BED PREPARATIONS AND SOD BUILDUP.
3.) REMOVE AND PROPERLY DISPOSE OF ALL EXCESS SOIL SO THAT SURFACE WATER MAY ENTER THE CHANNEL FREELY.
4.) THE PROCEDURE USED TO ESTABLISH GRASS IN THE CHANNEL WILL DEPEND UPON THE SEVERITY OF THE CONDITIONS AND SELECTION OF SPECIES. PROTECT THE CHANNEL WITH A PERMANENT TURF REINFORCEMENT MAT SUFFICIENT TO WITHSTAND ANTICIPATED VELOCITIES DURING THE ESTABLISHMENT OF THE PERIOD. (APPED. 8.05)

MAINTENANCE

DURING THE ESTABLISHMENT PERIOD, CHECK GRASS-LINED CHANNELS AFTER EVERY RAINFALL. AFTER GRASS IS ESTABLISHED, PERIODICALLY CHECK THE CHANNEL; CHECK IT AFTER EVERY HEAVY RAINFALL EVENT. IMMEDIATELY MAKE REPAIRS. IT IS PARTICULARY IMPORTANT TO CHECK THE CHANNEL OUTLET AND ALL ROAD CROSSINGS FOR BANK STABILITY AND EVIDENCE OF PIPING OR SCOUR HOLES. REMOVE ALL SIGNIFICANT SEDIMENT ACCUMULATIONS TO MAINTAIN THE DESIGNED CARRYING CAPACITY. KEEP THE GRASS IN A HEALTHY, VIGOROUS CONDITION AT ALL TIMES, SINCE IT IS THE PRIMARY EROSION PROTECTION FOR THE CHANNEL. (PRACTICE 6.11, PERMANENT SEEDING)

GRASSED SWALE
NTS



CONSTRUCTION SPECIFICATIONS and MAINTENANCE

DIRTBAG:
Polypropylene nonwoven geotextilesewn intio a bag with a double needle matching using a high strength thread. Seams shall have an average wide width strength per ASTM D-4884 of 60 lbs. inch

Weight	ASTM D-3776 8 oz/yd
Grab Tensile	ASTM D-4632 205 lbs.
Puncture	ASTM D-4833 110 lbs.
Flow Rate	ASTM D-4491 110 GPM
Permitivity	ASTM D-4491 1.5 sec
Mullen Burst	ASTM D-3790 350 PSI

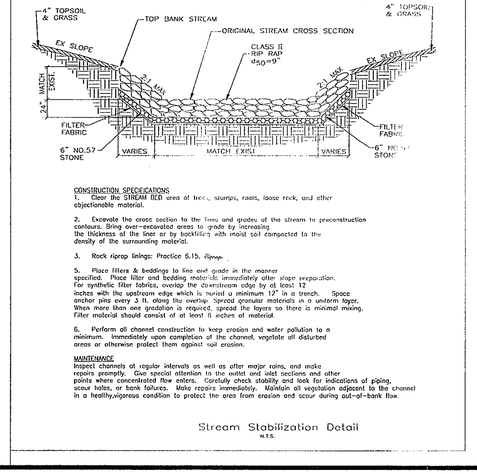
MAINTENANCE:
Inspect hoses to insure no sediment laden water is escaping prior to treatment.

Inspect Dirt Bag to determine if any cuts etc have occurred that allow polluted water to escape untreated. Repair any cuts etc. In accordance with manufacturers recommendations.

Inspect seepage rate from Dirtbag periodically to determine if dirt bag is becoming sediment laden. When seepage rate is diminished to the point where the seepage rate is less than the pumping rate discontinue pumping operations and remove dirtbag from site and dispose of sediment in a permitted landfill or approved disposal area. Replace dirt bag and reconnect hoses, pump etc and continue operations.
Dirtbag shall be lifted with straps per manufacturer recommendations and hauled away after use.

Dirtbag® is full when it no longer can efficiently filter sediment or allow water to pass at a reason able rate. Flow rates will vary depending on the size of Dirtbag®, the type and amount of sediment discharged into Dirtbag®, the type of ground, rock or other substance under the bag and the degree of the slope on which the bag lies. Under most circumstances Dirtbag® will accommodate flow rates of 750 gallons per minute. Use of excessive flow rates or overfilling Dirtbag® with sediment will cause the bag to rupture or failure of the hose attachment straps. *Must be monitored during use.

Trench Dewatering Detail
NTS



CONSTRUCTION SPECIFICATIONS

1. Clear the STREAM BED area of trees, stumps, roots, loose rock, and other objectionable material.

2. Excavate the cross section to the lines and grades of the stream to preconstruction contours. Bring over-excavated areas to grade by increasing the thickness of the liner or by backfilling with moist soil compacted to the density of the surrounding material.

3. Rock riprap linings: Practice 6.15, Riprap.

5. Place filters & beddings to line and grade in the manner specified. Place filter and bedding materials immediately after slope preparation. For synthetic filter fabrics, overlap the downstream edge by at least 12 inches with the upstream edge which is buried a minimum 12" in a trench. Space anchor pins every 3 ft. along the overlap. Spread granular materials in a uniform layer. When more than one gradation is required, spread the layers so there is minimal mixing. Filter material should consist of at least 6 inches of material.

6. Perform all channel construction to keep erosion and water pollution to a minimum. Immediately upon completion of the channel, vegetate all disturbed areas or otherwise protect them against soil erosion.

MAINTENANCE
Inspect channels at regular intervals as well as after major rains, and make repairs promptly. Give special attention to the outlet and inlet sections and other points where concentrated flow enters. Carefully check stability and look for indications of piping, scour holes, or bank failures. Make repairs immediately. Maintain all vegetation adjacent to the channel in a healthy,vigorous condition to protect the area from erosion and scour during out-of-bank flow.

Stream Stabilization Detail
N.T.S.

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JAN 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
EROSION CONTROL DETAILS

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

MOORMAN, KIZER & REITZEL, INC.
ENGINEERS PLANNERS SURVEYORS

SCALE
BOOK NO.
SHEET DET-2

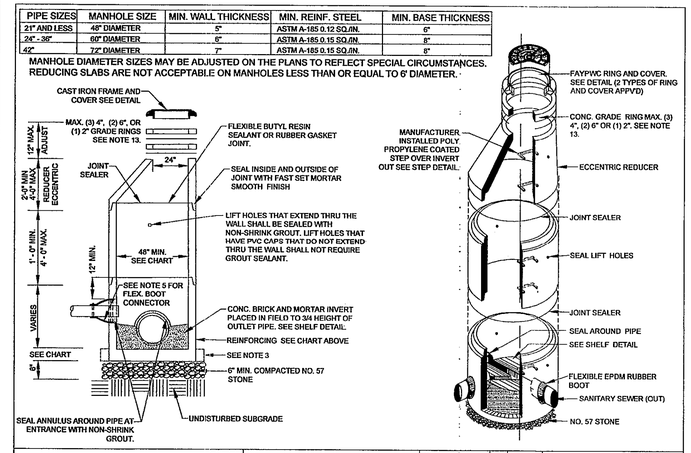
1. CONTRACTOR SHALL REPAIR ALL SEWER LATERALS AND MAINS DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY REPORT ALL SEWER MAIN AND LATERAL BREAKS TO THE FAYPWC PROJECT COORDINATOR. THE CONTRACTOR SHALL INITIATE IMMEDIATE REPAIRS IN ACCORDANCE WITH FAYPWC STANDARDS.
2. SEWER MAINS, LATERALS, AND MANHOLES SHALL BE INSTALLED UTILIZING A FAYPWC APPROVED CUT-SHEET, INDICATING INSTALLATION DEPTH.
3. TRANSFER OF SEWER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
   A. INSTALL AND TEST NEW MAINS, MANHOLES, AND LATERALS. CLEANOUTS SHALL BE INSTALLED 18" INSIDE R/W UNLESS OTHERWISE DIRECTED BY FAYPWC.
   B. CONNECT EXISTING PLUMBING TO NEW LATERAL UTILIZING THE NECESSARY FITTINGS AS DIRECTED BY FAYPWC.
   C. AFTER ALL SERVICES HAVE BEEN TRANSFERRED TO THE NEW MAIN, THE EXISTING SEWER SYSTEM SHALL BE ABANDONED IN ACCORDANCE WITH FAYPWC REQUIREMENTS.
4. WHEN THE EXISTING MAIN IS NOT TO BE ABANDONED, THE CONTRACTOR SHALL UNCOVER THE EXISTING LATERAL AT THE MAIN, CUT AND PLUG BOTH ENDS, REMOVE THE EXISTING CLEANOUT AND COMBINATION, AND PLUG THE LATERAL TO ABANDON THE OLD SERVICE.
5. SEWER PLUGS SHALL BE INSTALLED TO ELIMINATE ANY DEBRIS OR OTHER MATERIAL FROM ENTERING THE ACTIVE SEWER SYSTEM. UPON ACCEPTANCE OF THE NEW SEWER SYSTEM, THE CONTRACTOR SHALL CLEAN THE NEW MAINS, REMOVE ALL DEBRIS, AND THEN REMOVE THE PLUG.
6. ALL EXISTING UTILITIES IMPACTED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISHED GRADE, IN ACCORDANCE WITH FAYPWC REQUIREMENTS.
7. SEPARATION REQUIREMENTS:
   A. LATERAL SEPARATION OF SEWERS AND WATER MAINS: WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION - IN WHICH CASE:
      i. THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL; OR
      ii. THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER MAIN/LATERAL WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL
   B. CROSSING A WATER MAIN OVER A SEWER: WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER MAIN/LATERAL, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION - IN WHICH CASE BOTH THE WATER MAIN AND SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF FERROUS MATERIAL AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
   C. CROSSING WATER MAIN UNDER A SEWER: WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER MAIN/LATERAL, BOTH THE WATER MAIN AND THE SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF DUCTILE IRON MATERIAL AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
   D. CROSSING STORM DRAINAGE LINES: A MINIMUM OF 24-INCHES OF VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN A SEWER MAIN/LATERAL CROSSING UNDER A STORM DRAINAGE LINE UNLESS DUCTILE IRON PIPE IS USED. IF DUCTILE IRON PIPE IS USED, A MINIMUM OF SIX(6) INCHES OF SEPARATION SHALL BE MAINTAINED, UNLESS OTHERWISE APPROVED BY FAYPWC.

GENERAL NOTES SANITARY SEWER UTILITY		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.1	DWG. BY: FAYPWC		1	07/16	ADDED NOTE 6
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT			

S1-SEWER-NOTES.dwg

PIPE SIZES	MANHOLE SIZE	MIN. WALL THICKNESS	MIN. REINF. STEEL	MIN. BASE THICKNESS
21" AND LESS	48" DIAMETER	5"	ASTM A-185 0.12 SQ./IN.	6"
24" - 36"	60" DIAMETER	6"	ASTM A-185 0.15 SQ./IN.	8"
42"	72" DIAMETER	7"	ASTM A-185 0.15 SQ./IN.	8"

MANHOLE DIAMETER SIZES MAY BE ADJUSTED ON THE PLANS TO REFLECT SPECIAL CIRCUMSTANCES. REDUCING SLABS ARE NOT ACCEPTABLE ON MANHOLES LESS THAN OR EQUAL TO 6' DIAMETER.



STANDARD MANHOLE N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. S.2	DWG. BY: FAYPWC		1	02/07	CREATED S.2A ADDED NOTES 13-17
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	07/13	ADDED SHEET 2 OF 2

S2-STANDARD-MANHOLE.dwg

NOTES:
1. PRECAST REINFORCED CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C-478.
2. MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000PSI.
3. MANHOLES GREATER THAN 12' DEPTH SHALL HAVE MINIMUM 6" EXTENDED BASE.
4. FLEXIBLE BUTYL RESIN JOINT SEALANT SHALL BE IN ACCORDANCE WITH ASTM C990. RUBBER GASKET JOINTS SHALL BE IN ACCORDANCE WITH ASTM C-443.
5. FLEXIBLE EPDM RUBBER BOOT CONNECTORS SHALL BE IN ACCORDANCE WITH ASTM C923, INSTALLED BY MANUFACTURER WITH STAINLESS STEEL COMPRESSION RING AND TAKE-UP CLAMP. CONNECTION TO MAIN SHALL BE BY CONTRACTOR WITH STAINLESS STEEL PIPE CLAMP.
6. CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING MANHOLE AND FIELD INSTALLING A FLEX BOOT CONNECTOR. DO NOT ALLOW DEBRIS TO ENTER SYSTEM.
7. MORTAR SHALL BE QUICK SETTING, NON-SHRINK GROUT MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
8. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH ASTM C478 AND OSHA REGULATIONS. ALIGN STEPS WITH INVERT OUT.
9. PRECAST INVERTS ARE NOT ALLOWED. STANDING WATER IN INVERT OF MANHOLE IS NOT ACCEPTABLE.
10. VERTICAL DROPS BETWEEN THE INFLOW PIPES AND OUTFLOW PIPES SHALL REQUIRE THE FOLLOWING:
    A. GREATER THAN 2.5' SEE DROP STRUCTURE DETAIL (MIN. 5' DIAMETER MH REQUIRED).
    B. 1' TO 2.5' SEE PIPE SLIDE DETAIL.
    C. LESS THAN 1' SEE MORTAR SLIDE DETAIL.
11. AN ECCENTRIC CONE SHALL BE UTILIZED ON ALL MANHOLES, UNLESS OTHERWISE APPROVED BY FAYPWC.
12. INVERT ON PLANS IS TO MANHOLE CENTERLINE.
13. CONCRETE GRADE RINGS SHALL NOT BE USED FOR ABOVE GRADE ADJUSTMENTS (IE: OUTFALL AREAS). USE OF GRADE RINGS ARE ALLOWABLE IN YARD AREAS AND PAVEMENT, WHERE THE RING AND COVER ARE AT GROUND LEVEL.
14. THE MINIMUM SLOPE ACROSS THE INVERT OF THE MANHOLE SHALL BE 1%, UNLESS OTHERWISE APPROVED BY FAYPWC.
15. THE EXTERIOR MANHOLE RISER JOINTS, INCLUDING THE JOINT AT THE CONE, SHALL BE SEALED ON THE OUTSIDE BY AN APPROVED JOINT WRAP. THE WRAP SHALL BE IN ACCORDANCE WITH FAYPWC SPECIFICATIONS.
16. MANHOLE BOOT FOR 4-INCH LATERALS. SHOULD IT BE NECESSARY TO INSTALL A 4-INCH LATERAL INTO A MANHOLE, THE RUBBER BOOT THAT THE LATERAL IS INSERTED INTO SHALL BE SECURELY FASTENED TO THE CORE HOLE BY UTILIZING A STAINLESS STEEL BAND THAT IS TIGHTENED USING A JACK OR A TORQUE WRENCH (DIRECT DRIVE). BOTH STANDARD SIZE AND STEP DOWN BOOTS ARE ALLOWED. THE TORQUE WRENCH SHALL BE SUPPLIED BY THE MANUFACTURER. NO OTHER TYPE BANDS OR METHOD OF SECURING THE BOOT TO THE MANHOLE SHALL BE ACCEPTED.

    FOR FOUR (4) INCH SDR 26 LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL BE 3.5 INCHES TO 4.25 INCHES.

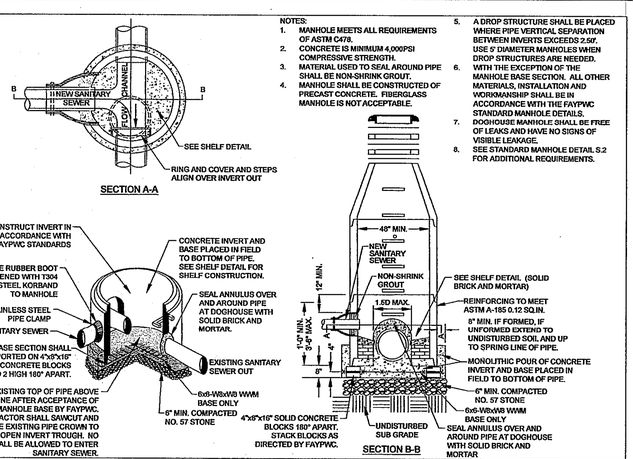
    FOR FOUR (4) INCH DUCTILE IRON LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL EITHER BE AS FOR VC OR 4.25 INCHES TO 4.81 INCHES.

    IN ALL CASES, THE BOOT SHALL BE TIGHTENED ON THE LATERAL BY MEANS OF A SINGLE STAINLESS STEEL STRAP.

    THE LATERAL INVERT SHALL BE AT THE TOP OF THE SHELF.
17. NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
18. NO MORE THAN 5 LATERALS SHALL ENTER A 5' DIAMETER
19. USE OF TEE-WYES ON LATERALS IS NOT ALLOWED.
20. ALL MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH FAYPWC STANDARDS.

STANDARD MANHOLE		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. S.2	DWG. BY: FAYPWC		1	01/08	CREATED DETAIL, ADDED NOTES 14-20
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	07/13	REVISED NOTES 5, 10, 11, 15, CONVERTED TO S.2 SHEET 2 OF 2

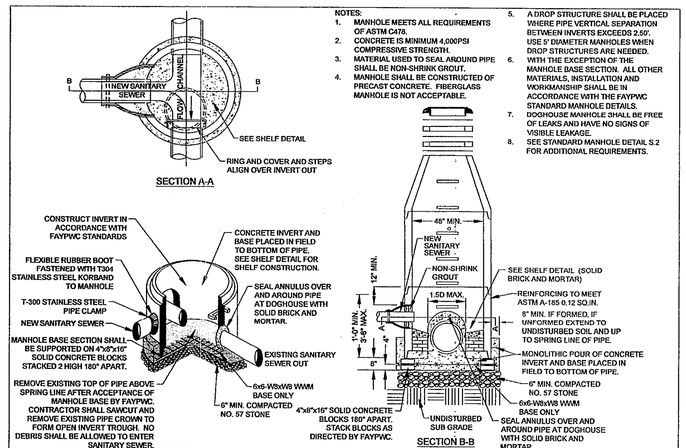
S2-STANDARD-MANHOLE.dwg



NOTES:
1. MANHOLE MEETS ALL REQUIREMENTS OF ASTM C478.
2. CONCRETE IS MINIMUM 4,000PSI COMPRESSIVE STRENGTH.
3. MATERIAL USED TO SEAL AROUND PIPE SHALL BE NON-SHRINK GROUT.
4. MANHOLE SHALL BE CONSTRUCTED OF PRECAST CONCRETE. FIBERGLASS MANHOLE IS NOT ACCEPTABLE.
5. A DROP STRUCTURE SHALL BE PLACED WHERE PIPE VERTICAL SEPARATION BETWEEN INVERTS EXCEEDS 2.50'. USE 5' DIAMETER MANHOLES WHEN DROP STRUCTURES ARE NEEDED.
6. WITH THE EXCEPTION OF THE MANHOLE BASE SECTION. ALL OTHER MATERIALS, INSTALLATION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FAYPWC STANDARD MANHOLE DETAILS.
7. DOGHOUSE MANHOLE SHALL BE FREE OF LEAKS AND HAVE NO SIGNS OF VISIBLE LEAKAGE.
8. SEE STANDARD MANHOLE DETAIL S.2 FOR ADDITIONAL REQUIREMENTS.

DOGHOUSE MANHOLE (MAINS 15" OR LESS) N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. S.3	DWG. BY: FAYPWC		1	07/16	ADDED SHEET 2
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	11/25/08	MADE CHANGES TO NOTES

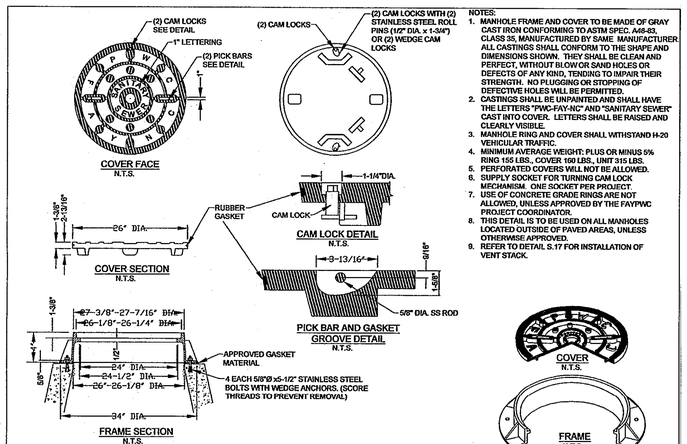
S3-DOGHOUSE-MH.dwg



NOTES:
1. MANHOLE MEETS ALL REQUIREMENTS OF ASTM C478.
2. CONCRETE IS MINIMUM 4,000PSI COMPRESSIVE STRENGTH.
3. MATERIAL USED TO SEAL AROUND PIPE SHALL BE NON-SHRINK GROUT.
4. MANHOLE SHALL BE CONSTRUCTED OF PRECAST CONCRETE. FIBERGLASS MANHOLE IS NOT ACCEPTABLE.
5. A DROP STRUCTURE SHALL BE PLACED WHERE PIPE VERTICAL SEPARATION BETWEEN INVERTS EXCEEDS 2.50'. USE 5' DIAMETER MANHOLES WHEN DROP STRUCTURES ARE NEEDED.
6. WITH THE EXCEPTION OF THE MANHOLE BASE SECTION. ALL OTHER MATERIALS, INSTALLATION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FAYPWC STANDARD MANHOLE DETAILS.
7. DOGHOUSE MANHOLE SHALL BE FREE OF LEAKS AND HAVE NO SIGNS OF VISIBLE LEAKAGE.
8. SEE STANDARD MANHOLE DETAIL S.2 FOR ADDITIONAL REQUIREMENTS.

DOGHOUSE MANHOLE (MAINS 15" OR LESS) N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. S.3	DWG. BY: FAYPWC		1	07/16	ADDED SHEET 2
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	11/25/08	MADE CHANGES TO NOTES

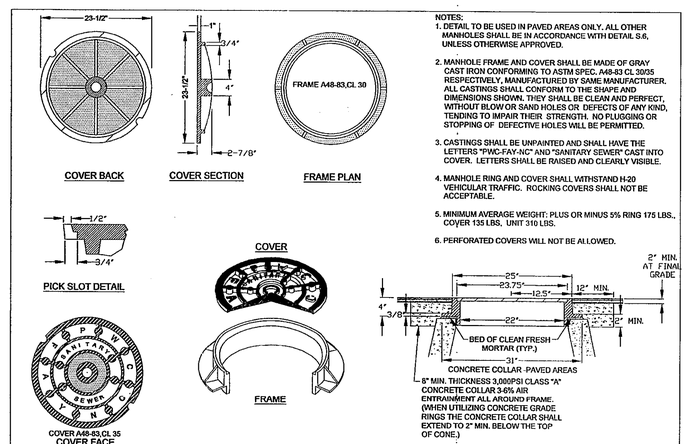
S3-DOGHOUSE-MH.dwg



NOTES:
1. MANHOLE FRAME AND COVER TO BE MADE OF GRAY CAST IRON CONFORMING TO ASTM SPEC. A48-83, CLASS 35, MANUFACTURED BY SAME MANUFACTURER ALL CASTINGS SHALL CONFORM TO THE SHAPE AND DIMENSIONS SHOWN. THEY SHALL BE CLEAN AND PERFECT, WITHOUT BLOW OR SAND HOLES OR DEFECTS OF ANY KIND, TENDING TO IMPAIR THEIR STRENGTH. NO PLUGGING OR STOPPING OF DEFECTIVE HOLES WILL BE PERMITTED.
2. CASTINGS SHALL BE UNPAINTED AND SHALL HAVE THE LETTERS "PWC-FAY-NC" AND "SANITARY SEWER" CAST INTO COVER. LETTERS SHALL BE RAISED AND CLEARLY VISIBLE.
3. MANHOLE RING AND COVER SHALL WITHSTAND H-20 VEHICULAR TRAFFIC.
4. MINIMUM AVERAGE WEIGHT: PLUS OR MINUS 5% RING 175 LBS., COVER 150 LBS., UNIT 310 LBS.
5. PERFORATED COVERS WILL NOT BE ALLOWED.
6. SUPPLY SOCKET FOR TURNING CAM LOCK MECHANISM. ONE SOCKET PER PROJECT.
7. USE OF CONCRETE GRADE RINGS ARE NOT ALLOWED, UNLESS APPROVED BY THE FAYPWC PROJECT COORDINATOR.
8. THIS DETAIL IS TO BE USED ON ALL MANHOLES LOCATED OUTSIDE OF PAVED AREAS, UNLESS OTHERWISE APPROVED.
9. REFER TO DETAIL S.17 FOR INSTALLATION OF VENT STACK.

STANDARD NON-TRAFFIC AREA MANHOLE RING AND COVER WITH WIPER GASKET & CAM LOCK N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.6	DWG. BY: FAYPWC		1	12/08	REVISED DIMENSIONS ON FRAME SECTION
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	07/09	REVISED NOTES ON FRAME SECTION/REVISED NOTE 3
				3	07/17	ADDED NOTE ON WEDGE CAM LOCKS

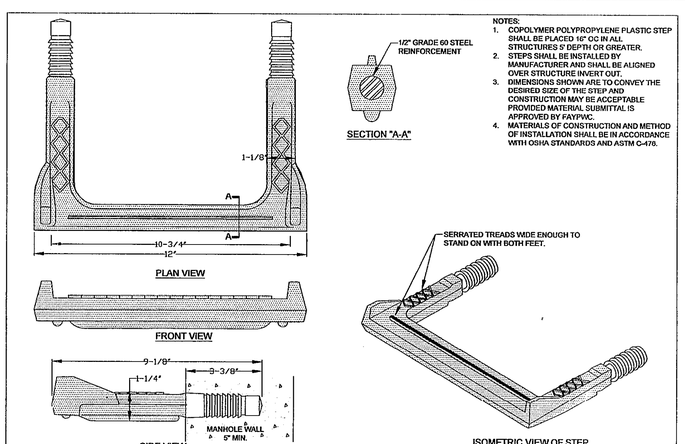
S6-RING-COVER.dwg



NOTES:
1. DETAIL TO BE USED IN PAVED AREAS ONLY. ALL OTHER MANHOLES SHALL BE IN ACCORDANCE WITH DETAIL S.6, UNLESS OTHERWISE APPROVED.
2. MANHOLE FRAME AND COVER SHALL BE MADE OF GRAY CAST IRON CONFORMING TO ASTM SPEC. A48-83 CL 30/35 RESPECTIVELY, MANUFACTURED BY SAME MANUFACTURER. ALL CASTINGS SHALL CONFORM TO THE SHAPE AND DIMENSIONS SHOWN. THEY SHALL BE CLEAN AND PERFECT, WITHOUT BLOW OR SAND HOLES OR DEFECTS OF ANY KIND, TENDING TO IMPAIR THEIR STRENGTH. NO PLUGGING OR STOPPING OF DEFECTIVE HOLES WILL BE PERMITTED.
3. CASTINGS SHALL BE UNPAINTED AND SHALL HAVE THE LETTERS "PWC-FAY-NC" AND "SANITARY SEWER" CAST INTO COVER. LETTERS SHALL BE RAISED AND CLEARLY VISIBLE.
4. MANHOLE RING AND COVER SHALL WITHSTAND H-20 VEHICULAR TRAFFIC. ROCKING COVERS SHALL NOT BE ACCEPTABLE.
5. MINIMUM AVERAGE WEIGHT: PLUS OR MINUS 5% RING 175 LBS., COVER 135 LBS. UNIT 310 LBS.
6. PERFORATED COVERS WILL NOT BE ALLOWED.

STANDARD TRAFFIC AREA MANHOLE RING AND COVER N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.7	DWG. BY: FAYPWC		1	01/05	CHANGED NON TRAFFIC DETAIL
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT	2	07/05	ADDED NOTE ON CONC. COLLAR
				3	02/07	REMOVED NON TRAFFIC AREA REVISED NOTES
				4	07/08	REVISED ASPHALT THICKNESS

S7-RING-COVER.dwg



NOTES:
1. COPOLYMER POLYPROPYLENE PLASTIC STEP SHALL BE PLACED 12" O.C IN ALL STRUCTURES 5' DEPTH OR GREATER.
2. STEPS SHALL BE INSTALLED BY MANUFACTURER AND SHALL BE AUGNED OVER STRUCTURE INVERT OUT.
3. DIMENSIONS SHOWN ARE TO CONVEY THE DESIRED SIZE OF THE STEP AND CONSTRUCTION MAY BE ACCEPTABLE PROVIDED MATERIAL SUBMITTAL IS APPROVED BY FAYPWC.
4. MATERIALS OF CONSTRUCTION AND METHOD OF INSTALLATION SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND ASTM C-478.

STRUCTURE STEP N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.8	DWG. BY: FAYPWC				
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.	WATER RESOURCES ENGINEERING DEPARTMENT			

S8-STEP.dwg

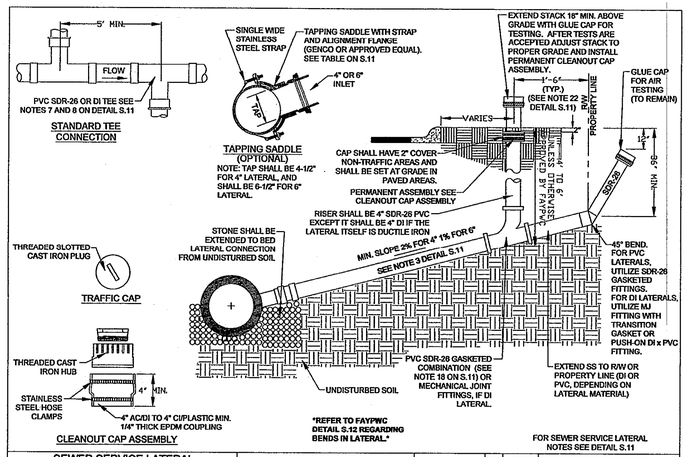
Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
SANITARY SEWER DETAILS

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE
BOOK NO.
SHEET DET-3



SEWER SERVICE LATERAL (4-INCH AND 6-INCH) N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.10	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	01/13	REVISED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.			2	01/14	ADDED TAILPIECE, NOTES
					3	01/15	REVISED NOTES RE: TAILPIECE

S10-RESSLAT.dwg

SEWER SERVICE LATERAL NOTES

1. HOLE IN SANITARY SEWER MAIN MUST BE CUT WITH SHELL CUTTER NO HAMMER TAPS ALLOWED.
2. LATERAL SHALL CONFORM TO ASTM SPECS. D-3034 SDR-26 UNLESS OTHERWISE INDICATED AS DI.
3. ALL PIPE AND FITTINGS SHALL BE 4" OR 6" UNLESS OTHERWISE SPECIFIED.
4. ALL DI PIPE SHALL HAVE AN INTERIOR LINING OF CERAMIC EPOXY (PROTECTO 401). THE ENTIRE DI LATERAL SHALL BE COMPRISED OF DI PIPE AND MECHANICAL JOINT FITTINGS.
5. ALL CONNECTIONS SHALL HAVE RUBBER GASKET SEALS INSTALLED.
6. SANITARY SEWER SERVICE CLEANOUT STACK SHALL BE LOCATED 1' FROM WATER SERVICE LOCK VALVE WHEN IN THE SAME DITCH.
7. INSTALLATION OTHER THAN AS SHOWN MUST BE APPROVED BY THE FAYPWC.
8. CONNECTIONS TO THE TOP OF MAIN SHALL NOT BE ALLOWED, UNLESS OTHERWISE APPROVED BY THE FAYPWC PROJECT COORDINATOR.
9. SLOPE AND DEPTH OF THE SERVICE LATERAL SHALL BE DETERMINED BY THE TOPOGRAPHY OF THE LOT AS APPROVED BY THE FAYPWC ENGINEER OR AS INDICATED ON THE DRAWINGS.
10. LATERAL SHALL CONFORM TO THE 2% MINIMUM SLOPE FOR THE 4" OR THE 1% MINIMUM SLOPE FOR THE 6". MAXIMUM CLEANOUT SPACING FOR 4" PIPE 75', 6" PIPE 100'.
11. SEE INTERIOR DROP STRUCTURE OR SLIDE, MORTAR SLIDE AND SHELF DETAIL FOR VERTICAL DROPS OF MAINS AND LATERALS.
12. LATERALS LESS THAN 3' IN DEPTH OR GREATER THAN 20' DEPTH SHALL UTILIZE DUCTILE IRON PIPE AND FITTINGS WITH CERAMIC EPOXY (PROTECTO 401), OR WHEN SEPARATION REQUIREMENTS CANNOT BE MET.
13. ENTIRE SEWER LATERAL ASSEMBLY SHALL BE AIR TESTED CONCURRENTLY WITH SEWER MAIN.
14. INDIVIDUAL LATERALS SHALL BE CLEANED AND FLUSHED PRIOR TO FLUSHING SANITARY SEWER MAINS.
15. LATERAL SHALL NOT BE BACK-FILLED UNTIL INSPECTED BY THE FAYPWC PROJECT COORDINATOR.
16. WYE CONNECTIONS SHALL NOT BE USED TO TIE LATERALS INTO A MANHOLE.
17. IF BENDS ARE APPROVED BY THE PROJECT COORDINATOR, STONE BEDDING IS REQUIRED TO BE INSTALLED FROM UNDISTURBED (SEE DETAIL S.12) SOIL TO BOTTOM OF BEND.
18. PVC COMBINATION SHALL BE A MOLDED WYE AND BEND, GASKETED, SDR-26, AS MANUFACTURED BY HARCO, GPK OR APPROVED EQUAL.
19. NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
20. ALL LATERALS (4" AND 6") SHALL UTILIZE A 4" RISER (STACK).
21. REFER TO DETAIL S.12 FOR SEPARATION REQUIREMENTS.
22. FOR SINGLE FAMILY RESIDENTIAL LOTS, CLEANOUT SHALL BE LOCATED 18" FROM RIGHT-OF-WAY OR EASEMENT. FOR ALL NON-SINGLE FAMILY LOTS, CLEANOUT SHALL BE NO CLOSER THAN 10' TO FRONT OF BUILDING, UNLESS OTHERWISE APPROVED BY FAYPWC.

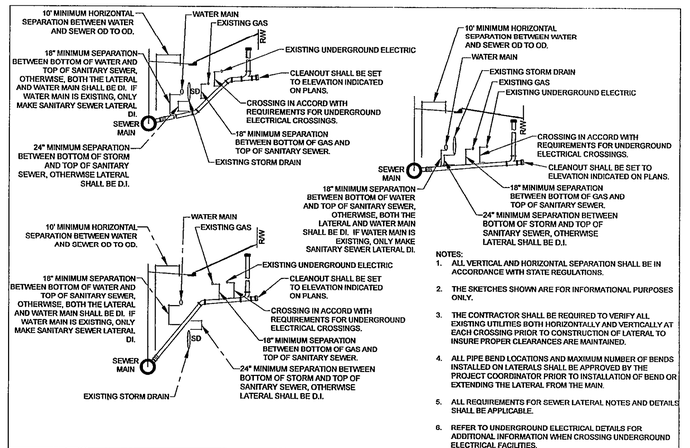
THE FOLLOWING TABLE SUMMARIZES THE MATERIALS TO BE UTILIZED FOR SEWER MAIN TO LATERAL CONNECTIONS:

	PVC Main	DI Main
DI Lateral	DI fitting or approved saddle	MJ fitting or approved saddle
PVC Lateral	PVC fitting or approved saddle	MJ fitting with transition gasket or approved saddle

NOTE: REFER TO FAYPWC TECHNICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SEWER SERVICE LATERAL NOTES (4-INCH AND 6-INCH)			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.11	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT		2	10/11	REVISED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.			3	01/13	REVISED NOTES AND ADDED TABLE
					4	01/15	REVISED NOTE 22, TABLE

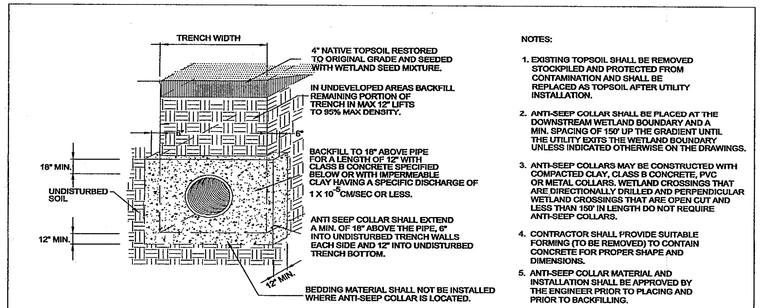
S11-RESSLAT-NOTES.dwg



NOTES:
1. ALL VERTICAL AND HORIZONTAL SEPARATION SHALL BE IN ACCORDANCE WITH STATE REGULATIONS.
2. THE SKETCHES SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY.
3. THE CONTRACTOR SHALL BE REQUIRED TO VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY AT EACH CROSSING PRIOR TO CONSTRUCTION OF LATERAL TO INSURE PROPER CLEARANCES ARE MAINTAINED.
4. ALL PIPE BEND LOCATIONS AND MAXIMUM NUMBER OF BENDS INSTALLED ON LATERALS SHALL BE APPROVED BY THE PROJECT COORDINATOR PRIOR TO INSTALLATION OF BEND OR EXTENDING THE LATERAL FROM THE MAIN.
5. ALL REQUIREMENTS FOR SEWER LATERAL NOTES AND DETAILS SHALL BE APPLICABLE.
6. REFER TO UNDERGROUND ELECTRICAL DETAILS FOR ADDITIONAL INFORMATION WHEN CROSSING UNDERGROUND ELECTRICAL FACILITIES.

SEWER SERVICE LATERAL UTILITY CONFLICT SEPARATION REQUIREMENTS N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.12	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	01/05	REVISED NOTES 1 AND 6
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.			2	11/06	ADDED NOTE ON DI LATERALS
					3	03/10	ADDED LATERAL & WM SEPARATION

S12-UTIL-CONFLICT.dwg

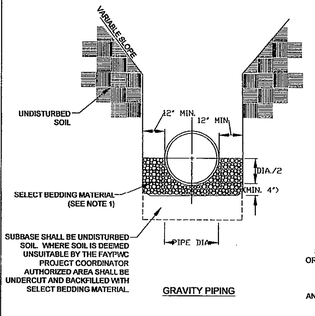


CLASS B CONCRETE SPECIFICATIONS	
A) MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ROUNDED COURSE AGGREGATE	5.0
B) MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ANGULAR COURSE AGGREGATE	5.5
C) MAXIMUM WATER-CEMENT RATIO GALLONS PER SACK	6.8
D) SLUMP RANGE	2" TO 4"
E) MINIMUM STRENGTH - 28 DAY PSI	2,500

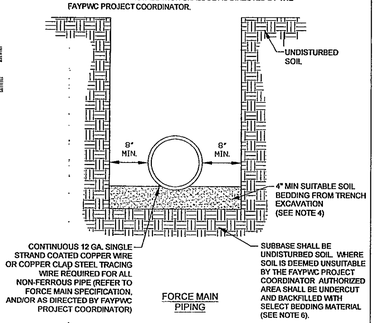
ANTI SEEP COLLAR

NOTES:
1. EXISTING TOPSOIL SHALL BE REMOVED STOCKPILED AND PROTECTED FROM CONTAMINATION AND SHALL BE REPLACED AS TOPSOIL AFTER UTILITY INSTALLATION.
2. ANTI-SEEP COLLAR SHALL BE PLACED AT THE DOWNSTREAM WETLAND BOUNDARY AND A MIN. SPACING OF 150' UP THE GRADIENT UNTIL THE UTILITY EXITS THE WETLAND BOUNDARY UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
3. ANTI-SEEP COLLARS MAY BE CONSTRUCTED WITH COMPACTED CLAY, CLASS B CONCRETE, PVC OR METAL COLLARS. WETLAND CROSSINGS THAT ARE DIRECTIONALLY DRILLED AND PERPENDICULAR WETLAND CROSSINGS THAT ARE OPEN CUT AND LESS THAN 150' IN LENGTH DO NOT REQUIRE ANTI-SEEP COLLARS.
4. CONTRACTOR SHALL PROVIDE SUITABLE FORMING (TO BE REMOVED) TO CONTAIN CONCRETE FOR PROPER SHAPE AND DIMENSIONS.
5. ANTI-SEEP COLLAR MATERIAL AND INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING AND PRIOR TO BACKFILLING.
6. CONSTRUCTION AND SEEDING IN WETLAND AREAS SHALL BE IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS AND THE OWNER'S PERMIT REQUIREMENTS.
7. IF CONCRETE IS USED DURING THE CONSTRUCTION,THEN ALL NECESSARY MEASURES SHALL BE TAKEN TO PREVENT DIRECT CONTACT BETWEEN UNCURED OR CURING CONCRETE AND WATERS OF THE STATE. WATER THAT INADVERTENTLY CONTACTS UNCURED CONCRETE SHALL NOT BE DISCHARGED TO WATERS OF THE STATE DUE TO THE POTENTIAL FOR ELEVATED pH AND POSSIBLE AQUATIC LIFE/FISH KILLS.

NOTES:
1. THE SELECT BEDDING MATERIAL SHALL BE WELL GRADED CRUSHED ROCK (NO. 5 OR NO. 57 STONE) FOR THE FULL WIDTH OF THE TRENCH.
2. SELECT BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
3. SELECT BEDDING MATERIAL SHALL BE PROPERLY PLACED TO THE SPRING LINE OF THE PIPE FOR ITS ENTIRE LENGTH.
4. SUITABLE SOIL BEDDING IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
5. SUITABLE BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
6. IF GROUND CONDITIONS WARRANT, IT MAY BE NECESSARY TO BED DUCTILE IRON FORCE MAINS IN SELECT BEDDING MATERIAL (NO. 5 OR NO. 57 STONE) TO THE SPRINGLINE OF THE PIPE. SUCH INSTALLATION SHALL BE AS DIRECTED BY THE FAYPWC PROJECT COORDINATOR.



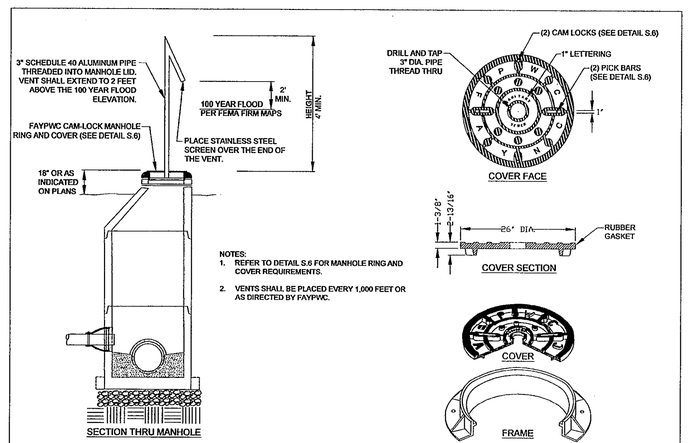
GRAVITY PIPING



FORCE MAIN PIPING

SEWER BEDDING N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.13	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT		1	01/01/16	REVISED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.			2	01/01/05	REVISED NOTES

S13-SEWER-BEDDING.dwg



NOTES:
1. REFER TO DETAIL S.6 FOR MANHOLE RING AND COVER REQUIREMENTS.
2. VENTS SHALL BE PLACED EVERY 1,000 FEET OR AS DIRECTED BY FAYPWC.

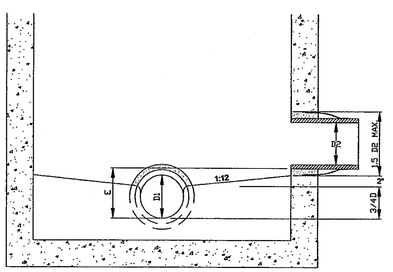
MANHOLE VENT N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.17	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.					

S17-MH-VENT.dwg

TO FIND "E" ENTER CHART AT LEFT WITH EFFLUENT PIPE SIZE AND ENTER PIPE AT TOP WITH INFLUENT PIPE SIZE. "E" DISTANCE IS POINT OF CONVERGENCE OF COLUMN AND R/W.

D1 \ D2	4"	6"	8"	12"	15"	18"	24"
8	9.00	9.50	10.00	-	-	-	-
12	11.00	11.50	12.00	13.00	-	-	-
15	14.25	14.75	15.25	16.25	17.00	-	-
18	16.50	17.00	17.50	18.50	19.25	20.00	-
24	21.00	21.50	22.00	23.00	23.75	24.50*	26.00

WHERE 8" MANHOLE IS REQUIRED ADD 1/2" TO "E" DISTANCE TO ACCOUNT FOR THE ADDITIONAL 6" OF SHELF SLOPE.

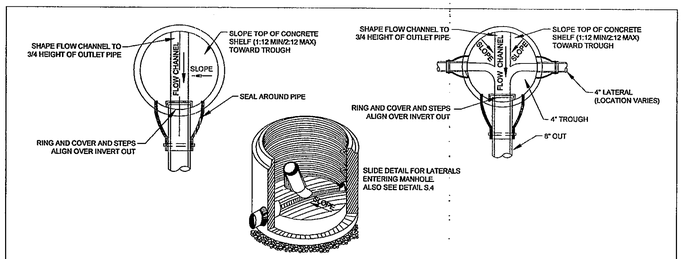


MAIN OR LATERAL MIN. SLOPE
4" @ 2.00% MIN.
6" @ 0.67% MIN.MAIN
6" @ 2.00% MIN.LATERAL
8" @ 0.40% MIN.
12" @ 0.22% MIN.
15" @ 0.15% MIN.
18" @ 0.12% MIN.

NOTES:
1. SEE FAYPWC STANDARD MANHOLE AND PIPE SLIDE, MORTAR SLIDE, AND SHELF DETAILS FOR ADDITIONAL INFORMATION.
2. THE "E" DISTANCES INDICATED ARE FOR CONNECTION TO AN EXISTING OUTFALL AND ARE THE MINIMUM DISTANCE ALLOWABLE.
3. WHERE SANITARY SEWER OUTFALLS AND MAINS ARE BEING CONSTRUCTED THE TOP OF THE EFFLUENT PIPE AND THE TOP OF THE INFLUENT PIPE SHALL BE AT THE SAME ELEVATION UNLESS CONDITIONS ARE PROHIBITIVE TO THIS PRACTICE.

MH CONNECTION DESIGN GUIDE N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.18	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.					

S18-PENETRATION-DETAIL.dwg



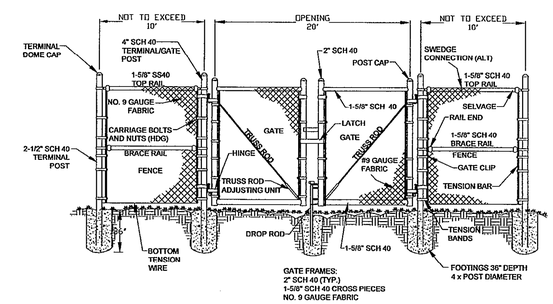
NOTES:
1. MANHOLE AND CONNECTIONS SHALL BE IN ACCORDANCE WITH FAYPWC STANDARD MANHOLE.
2. BRICK USED FOR INVERT AND SHELF CONSTRUCTION SHALL BE NCDOT STANDARD CONCRETE JUMBO BRICK, MEETING ASTM C55 GRADE J-11 EXCEPT ABSORPTION LESS THAN 10 LBS/CUFT.
3. MATERIAL USED TO SEAL AROUND PIPE SHALL BE NON-SHRINK GROUT.
4. MANHOLE SHALL BE CONSTRUCTED OF PRECAST CONCRETE. FIBERGLASS MANHOLE IS NOT ACCEPTABLE.
5. MANHOLE MEETS ALL REQUIREMENTS OF ASTM C478.
6. CONCRETE IS MINIMUM 4,000PSI COMPRESSIVE STRENGTH.
7. MANHOLES GREATER THAN 12' IN DEPTH SHALL HAVE MINIMUM 6' EXTENDED BASE.
8. SEE STANDARD MANHOLE DETAIL FOR ADDITIONAL REQUIREMENTS.
9. MORTAR SLIDE SHALL BE USED FOR LESS THAN 1 FOOT SEPARATION BETWEEN INVERT OUT AND INVERT OF INCOMING PIPE.
10. PIPE SLIDE REQUIRED WHERE VERTICAL SEPARATION BETWEEN PIPE INVERTS IS GREATER THAN 1' AND LESS THAN OR EQUAL TO 2.5'.
11. INTERIOR DROP STRUCTURE REQUIRED WHERE VERTICAL SEPARATION BETWEEN INVERTS EXCEEDS 2.50'. SEE INTERIOR DROP STRUCTURE DETAIL.
12. VERIFY SLIDE INSTALLATION WITH PROJECT COORDINATOR PRIOR TO CONSTRUCTION.
13. MANHOLE AND CONNECTIONS SHALL BE IN ACCORDANCE WITH FAYPWC STANDARD MANHOLE DETAIL.
14. THE MINIMUM SLOPE ACROSS THE INVERT OF THE MANHOLE SHALL BE 1%, UNLESS OTHERWISE APPROVED BY FAYPWC.
15. WHEN EXTENDING IN FUTURE, CONNECT TO EXISTING MANHOLE PER FAYPWC STANDARDS.
16. THE LATERAL INVERT SHALL BE AT THE TOP OF SHELF. AT TERMINAL MANHOLES, THE CROWN OF THE LATERAL SHALL BE NO LOWER THAN THE CROWN OF THE OUTGOING SEWER MAIN, UNLESS OTHERWISE APPROVED BY FAYPWC.
17. NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4' DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4' DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH UNLESS THEY HAVE A SLIDE OR DROP STRUCTURE. 5' DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
18. NO MORE THAN 5 LATERALS SHALL ENTER A 5' DIAMETER MANHOLE.
19. USE OF TEE-WYES ON LATERALS IS NOT ALLOWED.

TERMINAL MANHOLE N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.20	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.					

S20-TERMINAL-MANHOLE.dwg

NOTES:
1. HEIGHT OF FENCE SHALL BE 6 FEET, UNLESS OTHERWISE APPROVED BY FAYPWC.
2. USE OF COATED AND/OR PLASTIC COATED FABRIC MAY BE REQUIRED TO MATCH EXISTING FENCING. COLOR AND TYPE OF FABRIC TO BE APPROVED BY FAYPWC.
3. WIDTH OF FENCE AND/OR GATES SHALL BE AS APPROVED BY FAYPWC.
4. FAYPWC TO PROVIDE LOCK AND CHAIN.
5. LOCATION OF GATE WITHIN FAYPWC EASEMENT TO BE AS DIRECTED AND APPROVED BY FAYPWC.

● See Drawing S-1 Lift Station Site Plan for Integral PVC Screening Requirements



TYPICAL CHAIN LINK GATE AND FENCING N.T.S.			PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.17	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT				
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.					

M17-TYPICAL-CHAINLINK-GATE-AND-FENCE.dwg

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2017

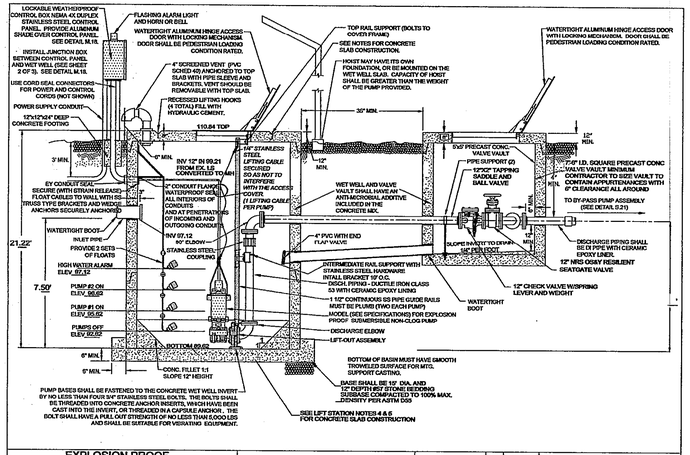
LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION SANITARY SEWER DETAILS

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

M&R ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

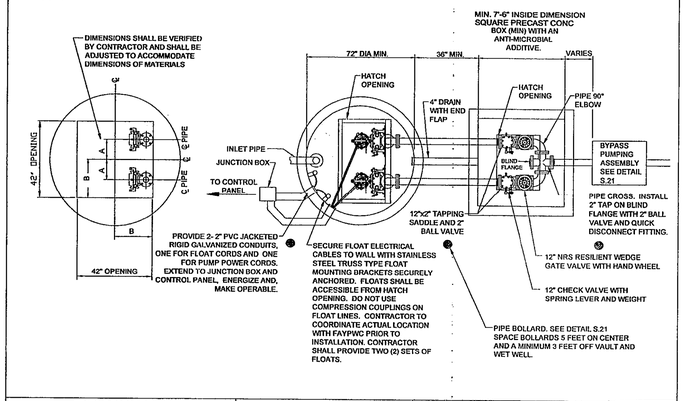
SCALE
BOOK NO.
SHEET DET-4



EXPLOSION PROOF SUBMERSIBLE LIFT STATION N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 3	DWG. NO. S.16	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	07/16	REVISED AND UPDATED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	11/07	NOTES CHANGED
				3	01/04	NOTE CHANGED

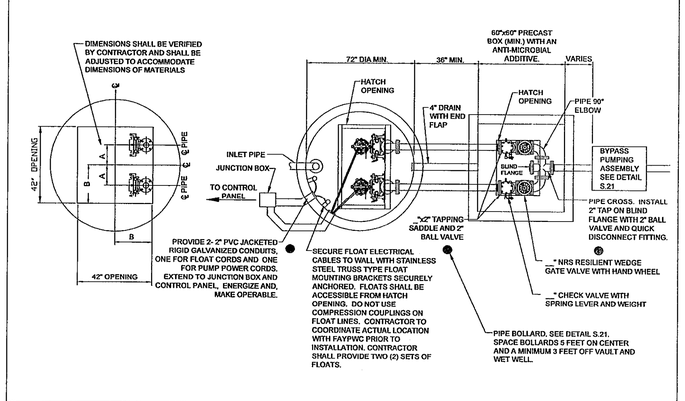
S16-SUB-LIFT-STA.dwg

NOTES:
WET WELL AND VALVE VAULT SHALL HAVE AN ANTI-MICROBIAL ADDITIVE INCLUDED IN THE CONCRETE MIX.



EXPLOSION PROOF SUBMERSIBLE LIFT STATION N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 3	DWG. NO. S.16	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	07/16	REVISED AND UPDATED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	11/16/07	NOTES CHANGED
				3	10/13/03	NOTE ADDED

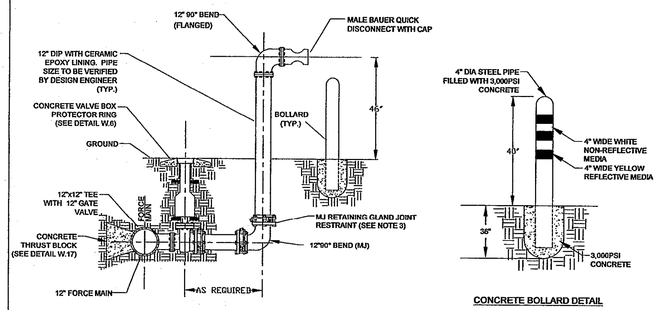
S16-SUB-LIFT-STA.dwg



EXPLOSION PROOF SUBMERSIBLE LIFT STATION N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 3	DWG. NO. S.16	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	07/16	REVISED AND UPDATED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	11/16/07	NOTES CHANGED
				3	10/13/03	NOTE ADDED

S16-SUB-LIFT-STA.dwg

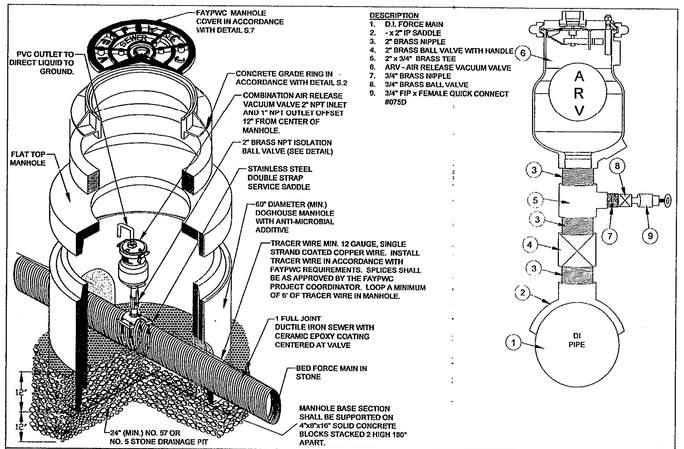
NOTES:
1. ALL MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH FAYPWC STANDARDS.
2. ALL DUCTILE IRON PIPE SHALL HAVE AN INTERIOR LINING OF CERAMIC EPOXY (PROTECTO 401) OR APPROVED EQUAL.
3. ALL BELOW GRADE FITTINGS SHALL BE MECHANICAL JOINT WITH RETAINING GLAND JOINT RESTRAINT (IE: MEGA-LUGS).



CONCRETE BOLLARD DETAIL

FORCE MAIN BY-PASS PUMPING ASSEMBLY N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. S.21	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.				

S21-FORCE-MAIN-BY-PASS-PUMPING-ASSEMBLY.dwg



COMBINATION AIR RELEASE VACUUM VALVE (SEWER SERVICE) N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. S.14	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	3	07/09	UPDATE DRAWING, ADD DESCRIPTION
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		4	01/13	REVISED VALVE OUTLET SIDE, ADDED NOTE ON TRACER WIRE

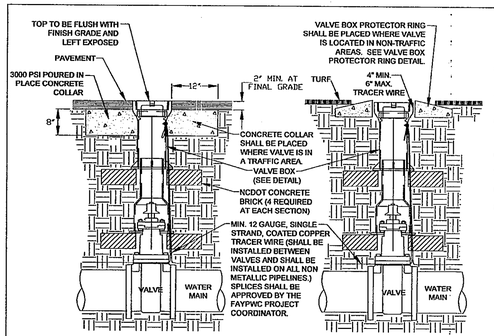
S14-SEWER-AIR-RELEASE-VALVE.dwg

NOTES:
1. COMBINATION AIR RELEASE VALVES SHALL BE OF THE SINGLE HOUSING STYLE THAT COMBINES THE OPERATING FEATURES OF BOTH AN AIR VACUUM AND AIR RELEASE VALVE.
2. THE COMBINATION AIR RELEASE VALVE SHALL HAVE 2" NPT INLET AND 1" NPT OUTLET CONNECTIONS AND A 3/16 INCH DIAMETER ORIFICE (OR ORIFICE SHALL BE DETERMINED BY THE ENGINEER) FOR A MAX. 200PSI WORKING PRESSURE.
3. ALL MATERIALS SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE FAYETTEVILLE PUBLIC WORKS COMMISSION.
4. MANHOLE, FRAME, AND COVER SHALL BE IN ACCORDANCE WITH FAYPWC STANDARD DETAILS.
5. 2" TAPPING SADDLE SHALL BE DUCTILE IRON WITH STAINLESS STEEL STRAPS, BOLTS, NUTS, AND WASHERS.
6. SADDLES FOR PIPE SIZES 8" THRU 24" SHALL BE DOUBLE STRAP.
7. ALL INTERNAL PARTS SHALL BE 316 STAINLESS STEEL.
8. THE COMBINATION AIR RELEASE VALVE SHALL HAVE A SINGLE FLOAT DESIGN.
9. ALL COMBINATION AIR RELEASE VALVES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
10. ALL COMBINATION AIR RELEASE VALVES SHALL BE CRISPIN MODEL UX20, ARI D-020, H-TEC 986, OR APPROVED EQUAL.
11. COMBINATION AIR RELEASE VALVE SHALL BE CENTERED IN MANHOLE. OFFSET THE RING AND COVER TO ALLOW ACCESS.
12. TOP OF FORCE MAIN SHALL BE A MIN. 4' DEEP AT AIR RELEASE VALVE, UNLESS OTHERWISE REQUIRED DUE TO FORCE MAIN AND/OR COMBINATION AIR RELEASE VALVE SIZE.
13. COMBINATION AIR RELEASE VALVE BODIES SHALL BE MADE OF STAINLESS STEEL OR REINFORCED NYLON.
14. THE MANHOLE SHALL BE CAST WITH AN ANTI-MICROBIAL ADDITIVE (CON-SHIELD OR APPROVED EQUAL).

COMBINATION AIR RELEASE VACUUM VALVE (SEWER SERVICE)		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. S.14	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	3	07/09	UPDATE NOTES, ADD NOTES 13-14
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		4	01/13	REVISED NOTES 3 AND 4, ADDED NOTES 6-7
				5	07/16	REVISED NOTES

S14-SEWER-AIR-RELEASE-VALVE.dwg

NOTES:
1. COMBINATION AIR RELEASE VALVES SHALL BE OF THE SINGLE HOUSING STYLE THAT COMBINES THE OPERATING FEATURES OF BOTH AN AIR VACUUM AND AIR RELEASE VALVE.
2. THE COMBINATION AIR RELEASE VALVE SHALL HAVE 2" NPT INLET AND 1" NPT OUTLET CONNECTIONS AND A 3/16 INCH DIAMETER ORIFICE (OR ORIFICE SHALL BE DETERMINED BY THE ENGINEER) FOR A MAX. 200PSI WORKING PRESSURE.
3. ALL MATERIALS SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE FAYETTEVILLE PUBLIC WORKS COMMISSION.
4. MANHOLE, FRAME, AND COVER SHALL BE IN ACCORDANCE WITH FAYPWC STANDARD DETAILS.
5. 2" TAPPING SADDLE SHALL BE DUCTILE IRON WITH STAINLESS STEEL STRAPS, BOLTS, NUTS, AND WASHERS.
6. SADDLES FOR PIPE SIZES 8" THRU 24" SHALL BE DOUBLE STRAP.
7. ALL INTERNAL PARTS SHALL BE 316 STAINLESS STEEL.
8. THE COMBINATION AIR RELEASE VALVE SHALL HAVE A SINGLE FLOAT DESIGN.
9. ALL COMBINATION AIR RELEASE VALVES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
10. ALL COMBINATION AIR RELEASE VALVES SHALL BE CRISPIN MODEL UX20, ARI D-020, H-TEC 986, OR APPROVED EQUAL.
11. COMBINATION AIR RELEASE VALVE SHALL BE CENTERED IN MANHOLE. OFFSET THE RING AND COVER TO ALLOW ACCESS.
12. TOP OF FORCE MAIN SHALL BE A MIN. 4' DEEP AT AIR RELEASE VALVE, UNLESS OTHERWISE REQUIRED DUE TO FORCE MAIN AND/OR COMBINATION AIR RELEASE VALVE SIZE.
13. COMBINATION AIR RELEASE VALVE BODIES SHALL BE MADE OF STAINLESS STEEL OR REINFORCED NYLON.
14. THE MANHOLE SHALL BE CAST WITH AN ANTI-MICROBIAL ADDITIVE (CON-SHIELD OR APPROVED EQUAL).



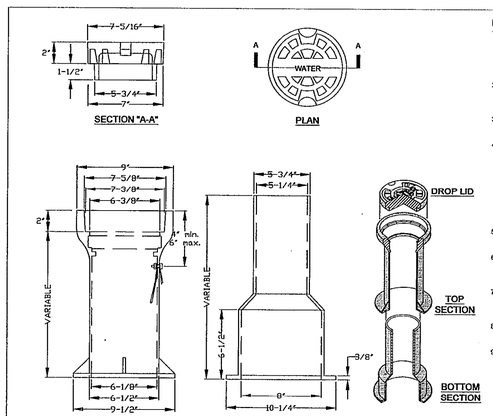
VALVE IN TRAFFIC AREA

VALVE IN NON-TRAFFIC AREA

NOTES:
1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH FAYPWC STANDARDS.
2. RESILIENT WEDGE GATE VALVE SHALL BE AS MANUFACTURED BY MUELLER CORP., AMERICAN DARLING OR CLOW CORP.
3. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
4. VALVE BODY, BONNET, AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF61.
5. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
6. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 250PSI.
7. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
8. SEE VALVE BOX PROTECTOR RING DETAIL FOR ADDITIONAL INFORMATION.
9. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.

GATE VALVE N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.6	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	6/06	ADDED NOTE #9
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	7/09	CLARIFIED NOTES

W6-GATEVALVE.dwg



NOTES:
1. VALVE BOX SHALL BE 3 PART SLIP-TYPE MANUFACTURED BY SIGMA CORPORATION (VB-462), TYLER UNION (6855 SERIES), STAR PIPE PRODUCTS (VB-0034), OR APPROVED EQUAL.
2. VALVE BOX SHALL BE 3-PIECE CLOSE GRAINED CAST IRON SLIP-TYPE VALVE BOX WITH A MINIMUM THICKNESS OF 3/16".
3. VALVE BOX SHALL HAVE RAISED LETTERS "WATER" CAST INTO COVER.
4. VALVE BOX SHALL HAVE 3/8" HOLE DRILLED IN TOP SECTION THRU WHICH A 1/4"x1-1/2" GALVANIZED BOLT SHALL BE USED TO SECURE A MINIMUM 12 GAUGE, SINGLE STRAND, COATED COPPER OR COPPER CLAD STEEL TRACER WIRE FOR NON-FERROUS PIPE. A 1/2" WASHER SHALL BE USED BETWEEN NUT AND INSIDE OF BOX. TIGHTEN HAND TIGHT.
5. SCREW TYPE VALVE BOXES ARE NOT ACCEPTABLE.
6. DIMENSIONS SHOWN VARY BASED UPON THE MANUFACTURER. ACTUAL DIMENSIONS SHALL BE APPROVED BY FAYPWC.
7. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.
8. TRACING WIRE SHALL BE INSTALLED OUTSIDE OF BOX.
9. REFER TO FAYPWC DETAIL W.6 FOR INSTALLATION REQUIREMENTS.

VALVE BOX N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	PWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.7	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	07/09	ADDED NOTES 7, 8 & CLARIFIED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	01/14	REVISED NOTES 1, 4, 6

W7-VALVEBOX.dwg

Drawn by David E. Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2017

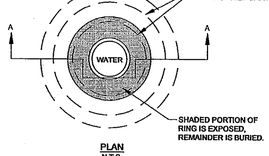
LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION FORCE MAIN/MISCELLANEOUS DETAILS

No.	Revision	By	Date

115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

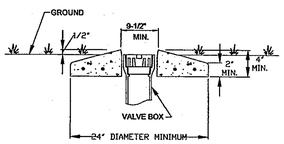
ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.

SCALE
BOOK NO.
SHEET DET-5

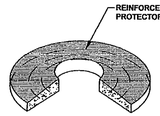


PLAN
N.T.S.

NOTES:
1. CONCRETE PROTECTOR RING SHALL BE 2500PSI PRECAST REINFORCED CONCRETE.
2. VALVE BOX SHALL BE AT GRADE WITH PROTECTOR RING EXTENDING 1/2" ABOVE GRADE.
3. SEE GATE VALVE AND BOX DETAIL.
4. VALVE BOX PROTECTOR RINGS SHALL BE INSTALLED AROUND VALVE BOX IN UNPAVED NON-TRAFFIC AREAS AND SHALL NOT CREATE A HINDRANCE TO MOWING OPERATIONS.



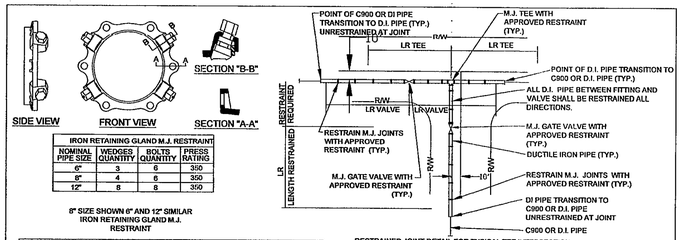
SECTION A-A
N.T.S.



CUT AWAY VIEW
N.T.S.

VALVE BOX PROTECTOR RING N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.8 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

W8-CONC-PROTECTOR-RING.dwg



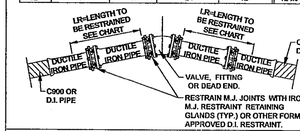
IRON RETAINING GLAND M.J. RESTRAINT			
NOMINAL PIPE SIZE	WEDGES QUANTITY	BOLTS QUANTITY	PRESS RATING
6"	3	6	350
8"	4	6	350
12"	8	6	350

8" SIZE SHOWN 6" AND 12" SIMILAR
IRON RETAINING GLAND M.J. RESTRAINT

RESTRAINED JOINT DETAIL FOR TYPICAL TEE INTERSECTION
4-WAY INTERSECTION SIMILARLY RESTRAINED

LR (MIN. LENGTH OF RESTRAINT EACH DIRECTION OF THRUST IN LINEAR FEET)
Based on 200 psig pressure, Safety Factor of 2.0:1, BARE DI PIPE AND ML Soil, 3.5' cover
Chart does not apply to pipes wrapped in polyethylene wrap

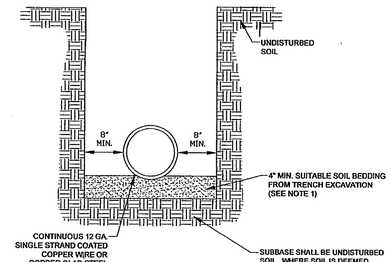
PIPE SIZE	VALVES DEAD ENDS TEES	90° ELBOWS	45° ELBOW & CROSSES	22-1/2° ELBOWS	REDUCER
6"	55'	31'	13'	7'	6"x2" 67'
8"	72'	40'	17'	8'	8"x6" 30'
12"	102'	57'	24'	12'	12"x8" 54'



NOTES:
1. THRUST RESTRAINT SHALL BE INSTALLED ON DUCTILE IRON WATER DISTRIBUTION LINES 6" THRU 12" DIAMETER IN THE MANNER SHOWN. SEE FAYPWC STANDARD THRUST BLOCK DETAIL W.17 FOR PVC RESTRAINT.
2. IRON RETAINING GLAND M.J. RESTRAINT OR OTHER FORMS OF IRON RESTRAINT SHALL NOT BE USED ON PVC PIPE.
3. PIPE GREATER THAN 12 INCH DIAMETER SHALL REQUIRE RESTRAINED JOINT PIPE FOR THE PROPER LENGTH.
4. COMPACT FITTINGS ARE ACCEPTABLE FOR USE WITH IRON RETAINING GLAND M.J. RESTRAINT AND OTHER FORMS OF D.I. RESTRAINT.
5. THE MINIMUM LENGTH OF RESTRAINT INDICATED SHALL REQUIRE ALL JOINTS WITHIN THE LR DISTANCE TO BE RESTRAINED.
6. RESTRAINT SYSTEM SHALL BE INSPECTED AND APPROVED BY FAYPWC PRIOR TO BACKFILLING.
7. RESTRAINT SYSTEMS MAY VARY BASED UPON THE ENGINEERS' DESIGN AS SHOWN ON THE PLAN AND PROFILE SHEETS.
8. GRIPPER RING AND FIELD LOK GASKETS ARE AN ACCEPTABLE METHOD OF RESTRAINT ON DUCTILE IRON PIPE ONLY.

ALTERNATE RESTRAINT DETAIL (DUCTILE IRON PIPE ONLY) N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.18 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	11/16/07	REVISED TABLE, ADDED NOTE 8
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

W18-RESTRAINT-DETAIL.dwg



NOTES:
1. SUITABLE SOIL BEDDING IS DEFINED AS "NATIVE" SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH.
2. SUITABLE BEDDING MATERIAL SHALL EXTEND TO UNDISTURBED TRENCH WALLS.
3. IF GROUND CONDITIONS WARRANT, IT MAY BE NECESSARY TO BED DUCTILE IRON WATER MAINS IN SELECT BEDDING MATERIAL (NO. 5 OR NO. 57 STONE) TO THE SPRINGLINE OF THE PIPE. SUCH INSTALLATION SHALL BE AS DIRECTED BY THE FAYPWC PROJECT COORDINATOR.

WATER MAIN BEDDING DETAIL N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. W.19 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	01/01/17	REVISED NOTES
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.		2	07/01/13	REVISED NOTE RE: TRACER WIRE

W19-WATER-BEDDING.dwg

1. ACCESS TO SITES SHALL BE BY PUBLIC RIGHT-OF-WAYS AND UTILITY EASEMENTS. OTHER ACCESS LOCATIONS REQUIRED SHALL BE SECURED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. SUPPLEMENTAL EROSION CONTROL MEASURES SHALL BE REQUIRED TO INCLUDE CONSTRUCTION ENTRANCES, SILT FENCING, RESTORATION, ETC. ADDITIONAL MEASURES SHALL BE INCLUDED AS PART OF A SUPPLEMENTAL EROSION CONTROL PLAN PREPARED BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE CONSTRUCTION STAGING AREA AT HIS EXPENSE.
3. THE CONTRACTOR IS EXPECTED AND REQUIRED TO COOPERATE WITH THE PROPERTY OWNERS AFFECTED BY THE WORK. PRIVATE AGREEMENTS WITH PROPERTY OWNERS MUST BE IN WRITING ON A FORM APPROVED BY THE ENGINEER AND A COPY SHALL BE PROVIDED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION ACTIVITIES AFFECTED BY SAID AGREEMENT. THE AGREEMENT MUST SPECIFY THAT FAYPWC, THE CITY AND THE ENGINEER SHALL BE HELD HARMLESS AGAINST ALL CLAIMS ARISING FROM THE AGREEMENT. THE OWNER DISCOURAGES PRIVATE AGREEMENTS BEFORE FINAL ACCEPTANCE, A RELEASE FROM EACH PROPERTY OWNER THAT THE CONTRACTOR HAS MADE AN AGREEMENT WITH SHALL BE REQUIRED. THE PROPERTY OWNER'S RELEASE IS A CONDITION OF FINAL ACCEPTANCE.
4. CONTRACTOR SHALL MAINTAIN A NEAT AND CLEAN JOB-SITE TO INCLUDE STAGING/STORAGE AREAS AS FOLLOWS:
   - PERFORM DUST CONTROL BY WATERING DAILY OR AS DIRECTED BY THE ENGINEER.
   - SWEEP STREETS A MINIMUM OF ONCE WEEKLY (FRIDAY) OR AS DIRECTED BY THE ENGINEER.
   - BLADE, LEVEL, AND RE-COMPACT ALL EXPOSED TRENCHES WEEKLY (OR AS DIRECTED BY THE ENGINEER) TO PRODUCE A SMOOTH "RIDE".
   - PERFORM DAILY CLEAN-UP OF ALL DIRT, DEBRIS, AND SCRAP MATERIALS.
   - REMOVE EXCESS EQUIPMENT, MATERIALS, TOOLS, ETC. NOT NEEDED.
5. EXCESS SUITABLE SOIL EXCAVATED DURING CONSTRUCTION SHALL BE STOCKPILED FOR USE ON THE PROJECT OR DISPOSED OF OFF-SITE AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL NOT BE ALLOWED TO STOCKPILE MATERIALS OR EXCESS MATERIALS IN THE STREET RIGHT-OF-WAYS AT ANY TIME. THE CONTRACTOR SHALL PROVIDE A SUFFICIENT AND SUITABLE STOCKPILE AREA AND LOCATION AT THE CONTRACTOR'S EXPENSE.
6. CONTRACTOR SHALL PROVIDE MEASURES DURING CONSTRUCTION TO SECURE THE SITE AND EXCAVATION FROM THE GENERAL PUBLIC AND COMPLY WITH ALL O.S.H.A. REGULATIONS. JOB SITE SAFETY IS THE EXCLUSIVE AND SOLE RESPONSIBILITY OF THE CONTRACTOR. OPEN EXCAVATION LEFT UNATTENDED OR OVER NIGHT IS NOT ACCEPTABLE AND SHALL BE FILLED IMMEDIATELY.
7. CONTRACTOR SHALL REPAIR OR REPLACE DRIVES DISTURBED BY CONSTRUCTION TO EXISTING OR BETTER CONDITIONS. NO SEPARATE PAYMENT UNLESS OTHERWISE INDICATED.
8. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING WHERE FENCES ARE REMOVED FOR CONSTRUCTION. CONTRACTOR SHALL COORDINATE FENCE REMOVAL/REINSTALLATION WITH INDIVIDUAL PROPERTY OWNERS PRIOR TO REMOVAL. CONTRACTOR SHALL REINSTALL ALL SHEDS, FENCES, ETC. TO AS GOOD OR BETTER THAN EXISTING CONDITIONS UNLESS OTHERWISE INDICATED. (NO SEPARATE PAYMENT).
9. CONTRACTOR SHALL REPLACE ALL DISTURBED MAILBOXES, SIGNS, ETC. DISTURBED DURING CONSTRUCTION WITHIN 24 HOURS OF DISTURBANCE. PERMANENT ROAD SIGNAGE DISTURBED SHALL BE REPLACED IMMEDIATELY AND IF NECESSARY ROADWAY SIGNS SHALL BE TEMPORARILY INSTALLED IN A LOCATION CONSISTENT WITH THE N.C.M.U.T.C.D. TO PROVIDE CONTINUOUS TRAFFIC AWARENESS OF ROADWAY CONDITIONS. (NO SEPARATE PAYMENT).
10. CONTRACTOR SHALL PROVIDE SECURITY FENCING, SECURITY GUARD, AND ANY AND ALL OTHER MEASURES CONTRACTOR DEEMS NECESSARY TO PROTECT EQUIPMENT AND MATERIALS STORED ON THE PROJECT. (NO SEPARATE PAYMENT).
11. WHERE CONTRACTOR CEASES WORK OPERATIONS FOR A 72 HOUR PERIOD OR LONGER, SUCH AS HOLIDAYS, ETC., THE FOLLOWING SHALL BE ACCOMPLISHED PRIOR TO THE WORK STOPPAGE:
    a. CONTRACTOR SHALL STORE ALL EQUIPMENT IN THE CONTRACTOR STAGING AREA OR OFF SITE.
    b. THE CONTRACTOR SHALL SWEEP ALL STREETS, PERFORM GENERAL CLEANUP AND SHALL PERFORM MAINTENANCE ON ALL EXPOSED PATCHES.
12. CONTRACTOR SHALL SCHEDULE WORK AND MATERIAL DELIVERIES SO THAT STORED MATERIAL QUANTITIES ON THE JOB SITE SHALL BE MINIMIZED.

GENERAL NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. N.1 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

N1-GENERAL-NOTES.dwg

13. CONTRACTOR SHALL STORE ALL MATERIALS IN THE CONTRACTOR STAGING AREA 72 HOURS PRIOR TO INCORPORATING INTO THE WORK TO REDUCE OBSTRUCTIONS TO TRAFFIC AND INCONVENIENCE TO RESIDENTS. WHERE UTILITIES ARE BEING CONSTRUCTED IN EASEMENTS OUT OF TRAFFIC AREAS CONTRACTOR MAY STORE MATERIALS AHEAD OF CONSTRUCTION FOR A DISTANCE NOT GREATER THAN 1500 FEET UNLESS APPROVED OTHERWISE BY THE ENGINEER.
14. AT THE PROPERTY OWNER'S REQUEST, THE CONTRACTOR SHALL DIG UP EXISTING SHRUBS AND BUSHES WITHIN UTILITY EASEMENT TO BE DISTURBED BY CONSTRUCTION AND SET OUTSIDE THE UTILITY EASEMENT AREA IN A LOCATION DETERMINED BY THE PROPERTY OWNER (NO SEPARATE PAYMENT). PROPERTY OWNER WILL BE RESPONSIBLE FOR REPLANTING SHRUBS AND BUSHES SO REMOVED, AND SHALL BE RESPONSIBLE FOR RE-ESTABLISHING GROWTH. IF NO REQUEST IS MADE BY THE PROPERTY OWNER, DISTURBED SHRUBS AND BUSHES SHALL BE REMOVED AND DISPOSED OF OFF-SITE UNLESS OTHERWISE INDICATED.
15. CLEARING AND GRUBBING SHALL BE RESTRICTED TO PERMANENT EASEMENTS ONLY. CONTRACTOR SHALL LIMIT TREE/BRUSH CLEARING IN THE TEMPORARY EASEMENTS, BETWEEN HOUSES, AND ALONG PROPERTY LINES TO ONLY ABSOLUTELY NECESSARY FOR CONSTRUCTION.

ORDER OF PRECEDENCE GENERAL NOTES/TECHNICAL SPECIFICATIONS/PHOTOS

1. THE NOTES CONTAINED HEREIN ARE INTENDED TO SUPPLEMENT THE TECHNICAL SPECIFICATIONS AND PROVIDE EASY REFERENCE FOR THE CONTRACTOR. IN NO CASE SHALL THESE NOTES VOID ANY PART, SECTION, OR REQUIREMENT OUTLINED IN THE TECHNICAL SPECIFICATIONS CONTAINED IN THE CONTRACT DOCUMENTS. IF CONFLICTS OCCUR BETWEEN THE TECHNICAL SPECIFICATIONS AND THE NOTES CONTAINED HEREIN, THE TECHNICAL SPECIFICATIONS SHALL SUPERSEDE.
2. PHOTOGRAPHS CONTAINED IN DRAWINGS ARE FOR INFORMATION PURPOSES ONLY AND THE CONTRACTOR SHALL NOT RELY ON THE LIMITED NUMBER OF PHOTOGRAPHS AS BEING REPRESENTATIVE OF ACTUAL SITE CONDITIONS. CONTRACTOR IS CHARGED WITH PERFORMING SITE INVESTIGATIONS TO ASCERTAIN EXISTING SITE CONDITIONS.

GENERAL NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. N.1 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

N1-GENERAL-NOTES.dwg

UTILITY GENERAL NOTES

1. PRIOR TO COMMENCEMENT OF ANY WORK WITHIN EASEMENTS OR RIGHTS-OF-WAYS THE CONTRACTOR IS REQUIRED TO NOTIFY CONCERNED UTILITY COMPANIES IN ACCORDANCE WITH GS 87-102. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. NO SEPARATE PAYMENT. EXISTING UTILITIES SHOWN ARE TAKEN FROM MAPS FURNISHED BY VARIOUS UTILITY COMPANIES AND HAVE NOT BEEN PHYSICALLY LOCATED (IE: TELEPHONE, GAS, CABLE, ETC.).
2. THE CONTRACTOR SHALL DIG UP EACH UTILITY WHICH MAY CONFLICT WITH CONSTRUCTION 14 DAYS IN ADVANCE TO VERIFY LOCATIONS (HORIZONTALLY AND VERTICALLY) TO ALLOW THE ENGINEER AN OPPORTUNITY TO ADJUST THE DESIGN TO AVOID CONFLICTS (NO SEPARATE PAYMENT).
3. ALL SANITARY SEWER AND WATER CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARDS AND SPECIFICATIONS OF THE FAYETTEVILLE PUBLIC WORKS COMMISSION. STORM DRAINAGE, STREET CONSTRUCTION AND PAVING SHALL BE IN ACCORDANCE WITH THE CITY OF FAYETTEVILLE.
4. UTILITY SERVICES TO INDIVIDUAL PROPERTIES ARE NOT SHOWN IN THE PROFILES FOR SIMPLICITY OF THE DRAWINGS. SERVICES MAY INCLUDE WATER LATERALS, TELEPHONE, ELECTRIC, CABLE, GAS, ETC.
5. CONTRACTOR SHALL COORDINATE WITH UTILITY OWNER AND BE RESPONSIBLE FOR TEMPORARY RELOCATION AND/OR SECURING EXISTING UTILITY POLES AND SIGNS AND/OR UTILITIES IN ACCORDANCE WITH UTILITY OWNER REQUIREMENTS DURING THE UTILITY MAIN INSTALLATION AND STREET CONSTRUCTION. (NO SEPARATE PAYMENT).
6. CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORTS FOR UTILITY CROSSINGS AND REPAIR DAMAGES DUE TO CONSTRUCTION TO THE SATISFACTION OF THE UTILITY INVOLVED AT NO ADDITIONAL EXPENSE TO THE OWNER. UNDERGROUND ELECTRICAL CROSSINGS SHALL BE CROSSED IN ACCORDANCE WITH THE N.E.C. AND TECHNICAL SPECIFICATION SECTION UNDERGROUND ELECTRICAL CROSSING REQUIREMENTS.
7. WHERE DEEMED NECESSARY BY THE ENGINEER THAT A SUBSURFACE DRAINAGE SYSTEM IS REQUIRED, THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, LABOR, EQUIPMENT, TIE-INS TO EXISTING DRAINAGE STRUCTURES AND ALL OTHER INCIDENTALS NECESSARY TO PROVIDE COMPLETE INSTALLATION IN ACCORDANCE WITH CITY OF FAYETTEVILLE STANDARDS. IMPROPERLY INSTALLED AND NON-FUNCTIONING DRAINAGE SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. EXISTING FRENCH DRAINAGE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AND/OR REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER.
8. STORM DRAINAGE REPAIRS BY CONTRACTOR DUE TO CONSTRUCTION DAMAGE AND JOINTS EXPOSED DURING CONSTRUCTION SHALL BE INSPECTED BY THE OWNER PRIOR TO BACKFILLING.

UTILITY GENERAL NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. N.2 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

N2-UTILITY-NOTES.dwg

1. THE PROPOSED WORK WILL BE CONSTRUCTED WITHIN A FULLY DEVELOPED SUBDIVISION. THE CONTRACTOR IS REQUIRED TO DEVELOP GOOD RELATIONS WITH THE RESIDENTS WHICH INCLUDES THE FOLLOWING MANDATORY MINIMUM REQUIREMENTS:
   - NO SPEEDING WITH EQUIPMENT AND/OR VEHICLES (25 MPH MAXIMUM).
   - DO NOT BLOCK DRIVEWAYS AT ANY TIME.
   - DO NOT LITTER AT ANY TIME.
   - DO NOT USE RESIDENT'S WATER WITHOUT THEIR PERMISSION (SIGNED AGREEMENT REQUIRED).
   - ALL REQUIREMENTS FOR BACK FLOW PREVENTION BY THE PLUMBING CODE WILL BE ADHERED TO.
   - RESPOND TO RESIDENT'S COMPLAINTS WITHIN 24 HOURS.
   - DO NOT USE ABUSIVE LANGUAGE, PROFANITY, OR CAT-CALLING.
   - WEAR PROPER PROTECTIVE CLOTHING (HARD HATS, PROPER SHOES, SHIRTS, ETC.).
   - MAINTAIN PROPER SAFETY MEASURES, PARTICULARLY ALONG OPEN TRENCHES, PLACING CONES ON RAISED MANHOLES, AND BACK FILLING OPEN TRENCHES IF CONSTRUCTION IS STOPPED AND THE OPEN TRENCH IS NOT MANNED.
   - PERSONNEL MUST WEAR CITY APPROVED SAFETY VEST AT ALL TIMES WHILE WORKING IN THE CITY AND/OR NCDOT RIGHT-OF-WAY.
   - ALL TRAFFIC CONTROL FLAG PERSONS AND AT LEAST ONE PERSON ON EACH WORK CREW MUST BE FLUENT IN THE ENGLISH LANGUAGE.

IF THE CONTRACTOR AND/OR SUBCONTRACTORS CANNOT ADEQUATELY PERFORM AND/OR COMPLY WITH THESE REQUIREMENTS, THE INDIVIDUAL, SUBCONTRACTOR, OR EMPLOYEES MAY BE DIRECTED TO LEAVE THE PROJECT PERMANENTLY. INCONSIDERATE, NON-COOPERATIVE ATTITUDES AND ACTIONS WILL NOT BE TOLERATED.

GENERAL NOTES (RESIDENT RELATIONS-REQUIRED)		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. N.3 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

N3-RESIDENT-NOTES.dwg

1. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLANS FOR WORK ZONE TRAFFIC CONTROL TO CITY TRAFFIC SERVICES DEPARTMENT (910-433-1660) FOR CITY STREETS AND TO MR. GARY BURTON (910-486-1496) FOR NCDOT STREETS. CONTRACTOR SHALL NOT PLACE ANY TRAFFIC CONTROL DEVICES WITHOUT HAVING APPROVAL FROM APPLICABLE TRANSPORTATION DEPARTMENT EITHER NCDOT OR THE CITY OF FAYETTEVILLE.
2. CONTRACTOR SHALL INSURE ACCESS TO ALL PROPERTIES BY PROPERTY OWNERS AT ALL TIMES.
3. CONTRACTOR SHALL NOTIFY CITY ENGINEERING OFFICE ONE WEEK IN ADVANCE OF ANY ROAD CLOSINGS AND COORDINATE ALL ROAD CLOSINGS/UTILITY INTERRUPTIONS WITH PROPERTY OWNERS AFFECTED 48 HOURS PRIOR TO CLOSING/INTERRUPTING SERVICES.
4. MINIMUM ONE-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNLESS ROAD CLOSURE IS APPROVED BY CITY OF FAYETTEVILLE TRAFFIC SERVICES DEPARTMENT IN WRITING, 5 DAYS IN ADVANCE OF ROAD CLOSURE. AN APPROVED DETOUR PLAN PREPARED BY THE CONTRACTOR SHALL BE REQUIRED AND THE MEASURES INSTALLED PRIOR TO CLOSURE.
5. CONTRACTOR SHALL COORDINATE/NOTIFY TRAFFIC SERVICES DAILY (BEFORE 4:00PM) AS TO WHICH STREETS WILL BE UNDER CONSTRUCTION IMPEDING TRAFFIC FLOW THE FOLLOWING DAY.
6. THE CONTRACTOR SHALL NOT IMPEDE TRAFFIC AT ANY TIME UNTIL THE APPROVED TRAFFIC CONTROL DEVICES ARE IN PLACE.
7. ALL TRAFFIC CONTROL MEASURES, DEVICES, INSTALLATION, METHODS, SEQUENCING AND PLANS SHALL BE IN STRICT ACCORDANCE WITH MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND SUPPLEMENTS SUCH AS NCDOT AND/OR CITY OF FAYETTEVILLE TRAFFIC SERVICES.

TRAFFIC CONTROL NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. N.4 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	01/05	ADDED PHONE #'S
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

N4-TRAFFIC-CONTROL-NOTES.dwg

1. CONTRACTOR SHALL SAW CUT OR MILL ALL PAVEMENTS STRAIGHT AND TRUE PRIOR TO TRENCHING. CONTRACTOR SHALL SAW CUT PATCH AREAS AGAIN IMMEDIATELY PRIOR TO PATCH PAVING . THE FINAL SAW CUT FOR PATCHES SHALL BE STRAIGHT WITH A NEAT SQUARE EDGE AND OF UNIFORM WIDTH PARALLEL WITH THE EDGE OF PAVEMENT/CURB LINE. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNERS APPROVAL.
2. CONTRACTOR SHALL SWEEP STREETS AND PROVIDE DUST CONTROL AT ALL TIMES VIA WATER TRUCK, BROOMS, COMPACTORS, ETC. DEBRIS FROM SWEEPING OPERATIONS SHALL NOT BE DIRECTED TOWARD YARDS. CLEAN UP OF DEBRIS, TRASH, EXCESS MATERIALS ETC. SHALL BE PERFORMED DAILY.
3. ANY TRENCHES OPENED FOR PAVING SHALL BE PAVED BY THE END OF THE SAME DAY. IF WEATHER CONDITIONS CHANGE, EQUIPMENT BREAKS DOWN, OR ANY OTHER OCCURRENCE THAT STOPS THE PAVING OPERATIONS OCCURS, BACKFILL ALL PREPARED AREAS SO THEY ARE PASSABLE BY TRAFFIC.
4. THE CONTRACTOR SHALL PATCH PAVE SERVICE LATERALS ON THE SAME DAY THAT MAIN LINE TRENCHES ARE PAVED. LATERALS SHALL BE PATCHED ON BOTH SIDES OF THE STREET AS PAVING PROGRESSES.
5. THE CONTRACTOR SHALL BE REQUIRED TO IMPLEMENT PROPER TRAFFIC CONTROL PROVISIONS AND ANY DEVICES REQUIRED TO IDENTIFY OBSTRUCTIONS OR HAZARDS WITHIN THE RIGHT-OF-WAY TO INCLUDE REFLECTIVE CONES AT EACH SERVICE LATERAL, REFLECTIVE BARRELS ON RAISED MANHOLES, ETC.
6. AT NO TIME SHALL THE CONTRACTOR LEAVE UNATTENDED AND/OR IMPROPERLY SECURE MAIN OR LATERAL TRENCHES WITH A VERTICAL ELEVATION DROP EXCEEDING 1" FROM EXISTING ASPHALT TO TRENCH SUB GRADE UNATTENDED OR OVERNIGHT.

PAVEMENT REPAIR NOTES		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.1 / DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	07/10	REVISED, DELETED NOTES
	DATE: JULY 01, 2017 / APPROVED BY: J.E.G.				

M1-PAVEMENT-REPAIR-NOTES.dwg

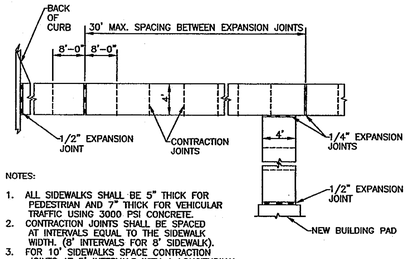
Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION FORCE MAIN/MISCELLANEOUS DETAILS

No.	Revision	By	Date

ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

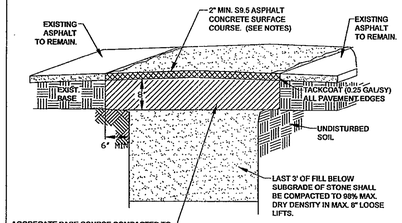
SCALE
BOOK NO.
SHEET
DET-6



NOTES:

1. ALL SIDEWALKS SHALL BE 5" THICK FOR PEDESTRIAN AND 7" THICK FOR VEHICULAR TRAFFIC USING 3000 PSI CONCRETE.
2. CONTRACTION JOINTS SHALL BE SPACED AT INTERVALS EQUAL TO THE SIDEWALK WIDTH. (8' INTERVALS FOR 8' SIDEWALK).
3. FOR 10' SIDEWALKS SPACE CONTRACTION JOINTS AT 5' INTERVALS WITH A LONGITUDINAL CONTRACTION JOINT IN THE CENTERLINE OF SIDEWALK.
4. CONTRACTION JOINTS SHALL BE 1" DEEP & EDGED WITH 1/8" RADIUS.
5. WHERE SIDEWALKS ABUT ROADWAY OR PARKING AREAS & NO CURB IS SPECIFIED, THICKENED EDGE WALKS SHALL BE USED.
6. 1/2" EXPANSION MATERIAL REQUIRED WHERE CONCRETE WALKS ABUT CONCRETE STRUCTURES.
7. A LAYER OF 15# FELT IS REQUIRED BETWEEN WALK & ADJACENT PARALLELING CONCRETE CURB.

CONCRETE SIDEWALK DETAIL

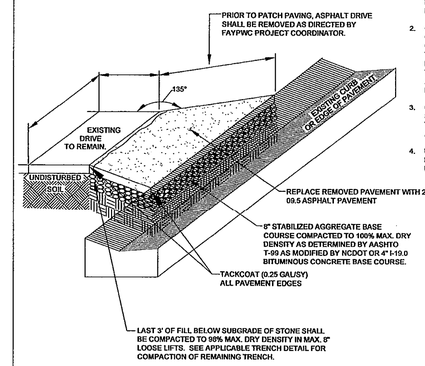


NOTES:

1. CONTRACTOR SHALL PATCH PAVEMENT TO THE SAME PAVEMENT PROFILE AS EXISTED PRIOR TO REMOVING PAVEMENT.
2. WHERE PATCH OF ASPHALT CURBING OCCURS CONTRACTOR SHALL MATCH EXISTING CURB GRADES WITHIN 0.02 FEET. PATCHES THAT ARE ABOVE THE CURB GRADE LINE WILL NOT BE ACCEPTABLE AND SHALL BE REMOVED AND REPLACED. CURB PATCH SHALL BE THE SAME SHAPE/TEMPLATE AS THE EXISTING CURB.
3. CONTRACTOR SHALL BE REQUIRED TO PROVIDE TRAFFIC CONTROL AND DEVICES AS REQUIRED BY THE M.U.T.C.D. OR NC SUPPLEMENT. WORK CANNOT PROCEED UNTIL THE MEASURES ARE IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT NEW PAVEMENT FROM TRAFFIC AND OTHER SOURCES OF DAMAGE UNTIL ASPHALT HAS SUFFICIENTLY COOLED TO PREVENT DAMAGE.
4. CONTRACTOR SHALL SAWCUT EXISTING PAVEMENT STRAIGHT AND TRUE IMMEDIATELY PRIOR TO PAVING. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNERS APPROVAL.
5. PATCH PAVING ON NCDOT MAINTAINED ROADS SHALL BE IN ACCORDANCE WITH THE APPROVED NCDOT ENCROACHMENT.
6. PROVIDE A MINIMUM OF 2" PAVEMENT (S9.5). IF THE EXISTING PAVEMENT IS 2" OR LESS, MATCH EXISTING PAVEMENT THICKNESS IF OVER 2".
7. FOR PATCHES UP TO 4" THICK, PLACE S9.5 IN 2 LIFTS.
8. FOR PATCHES OVER 4" THICK, PLACE BINDER (I-19.0) TO 2" BELOW SURFACE. INSTALL BINDER IN 2" (MAX.) LIFTS. THE FINAL 2" SHALL BE SURFACE (S9.5).
9. ALL PATCHES SHALL HAVE A MINIMUM OF 6" ABC UNDER ALL PAVEMENT, INCLUDING CURB AS REQUIRED.

PERMANENT PAVEMENT PATCH N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.2	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	01/07	CHANGED ASPHALT MIX
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	08/10	REVISED, DELETED NOTES

M2-PER-PATCH.dwg

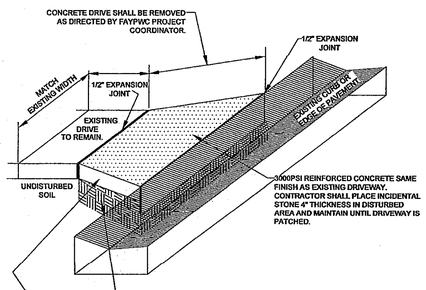


NOTES:

1. CONTRACTOR SHALL PATCH PAVEMENT TO THE SAME PAVEMENT PROFILE AND SHAPE AS EXISTED PRIOR TO REMOVING PAVEMENT.
2. CONTRACTOR SHALL BE REQUIRED TO PROVIDE TRAFFIC CONTROL AND DEVICES AS REQUIRED BY THE M.U.T.C.D. OR NC SUPPLEMENT. WORK CANNOT PROCEED UNTIL THE MEASURES ARE IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT NEW PAVEMENT FROM TRAFFIC AND OTHER SOURCES OF DAMAGE UNTIL ASPHALT HAS SUFFICIENTLY COOLED TO PREVENT DAMAGE.
3. CONTRACTOR SHALL SAWCUT EXISTING PAVEMENT STRAIGHT AND TRUE IMMEDIATELY PRIOR TO PAVING. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNERS APPROVAL.
4. UNDER NO CIRCUMSTANCES SHALL THE DISTURBED AREA EXTEND BEYOND THE RIGHT-OF-WAY AND/OR THE EASEMENT LIMITS.

ASPHALT DRIVEWAY/ PARKING LOT PATCH N.T.S		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.4	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	08/10	REVISED, DELETED NOTES
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.				

M4-ASPH-DRIVE-PATCH.dwg

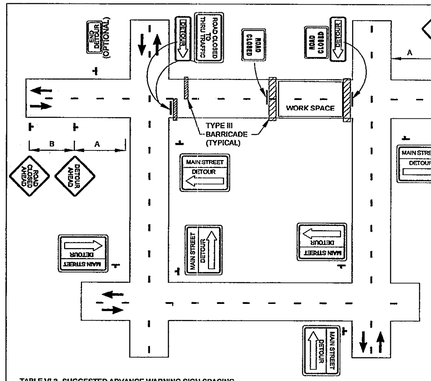


NOTES:

1. CONTRACTOR SHALL REPLACE PAVEMENT TO THE SAME CROSS SECTION AS EXISTED PRIOR TO REMOVAL.
2. CONTRACTOR SHALL BE REQUIRED TO PROVIDE TRAFFIC CONTROL AND DEVICES AS REQUIRED BY THE M.U.T.C.D. OR NC SUPPLEMENT. WORK CANNOT PROCEED UNTIL THE MEASURES ARE IN PLACE. CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT NEW PAVEMENT FROM TRAFFIC AND OTHER SOURCES OF DAMAGE.
3. UNDER NO CIRCUMSTANCES SHALL THE DISTURBED AREA EXTEND BEYOND THE RIGHT-OF-WAY AND/OR THE EASEMENT LIMITS. UNLESS OTHERWISE APPROVED BY THE FAYPWC PROJECT COORDINATOR.
4. THE FINAL PRODUCT SHALL BE SUBJECT TO THE OWNER'S APPROVAL.
5. SAWCUT CONCRETE DRIVE STRAIGHT AND TRUE. JAGGED SAWCUTS SHALL NOT BE ACCEPTABLE. SAWCUTS SHALL BE STRAIGHT UNIFORM WIDTHS PERPENDICULAR TO THE DRIVEWAY.
6. MINIMUM RESIDENTIAL CONCRETE DRIVEWAY THICKNESS SHALL BE 5". MINIMUM COMMERCIAL CONCRETE DRIVEWAY THICKNESS SHALL BE 7".
7. CONTRACTOR SHALL CONTACT THE CITY OF FAYETTEVILLE'S CONSTRUCTION MANAGEMENT DEPARTMENT AT (910) 433-1656 A MINIMUM OF 24 HOURS IN ADVANCE FOR AN INSPECTION OF THE CONCRETE FORMS.
8. PROVIDE EXPANSION JOINT(S) AS REQUIRED BY THE CITY OF FAYETTEVILLE FOR FUTURE SIDEWALK PLACEMENT.
9. CURING COMPOUND SHALL BE UTILIZED, AS SPECIFIED BY THE CITY OF FAYETTEVILLE.
10. NEW EXPANSION JOINTS SHALL BE PLACED 4 TO 10 FEET FROM EXISTING EXPANSION JOINTS, AS SPECIFIED BY THE FAYPWC PROJECT COORDINATOR.
11. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF FAYETTEVILLE REQUIREMENTS.

CONCRETE DRIVEWAY PATCH N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.5	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.				

M5-CONC-DRIVE-PATCH.dwg



NOTES:

1. DISPLAY SIMILAR SIGNS AND DEVICES FOR THE OPPOSITE MOVEMENT.
2. USE THIS PLAN FOR CITY STREETS.
3. THE USE OF A STREET NAME SIGN MOUNTED WITH THE M4-9 DETOUR SIGN IS OPTIONAL. WHEN USED, THE STREET NAME PLATE IS PLACED ABOVE THE DETOUR SIGN. THE PLATE SHALL HAVE BLACK ON DIAMOND GRADE ORANGE LEGEND.
4. AN M4-9 DETOUR SIGN WITH AN ADVANCE TURN ARROW MAY BE USED IN ADVANCE OF A TURN. ON MULTILANE STREETS SUCH SIGNS SHALL BE USED.
5. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCED WARNING SIGNS.
6. WARNING LIGHTS MAY BE USED ON TYPE III BARRICADES.
7. M4-9 DETOUR SIGNS MAY BE LOCATED ON THE FAR SIDE OF THE INTERSECTIONS.
8. THIS STANDARD DERIVED FROM PART VI OF THE M.U.T.C.D., (STANDARDS AND GUIDES FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS) ISSUED APRIL 1995.

TABLE VI-3 SUGGESTED ADVANCE WARNING SIGN SPACING

ROAD TYPE	DISTANCE BETWEEN SIGNS A	B	C
URBAN LOW-SPEED	200	200	200
URBAN HIGH SPEED	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,600	2,600

FIGURE TA-20 DETOUR FOR CLOSED STREET N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.7	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.				

M7-DETOUR-ROAD-CLOSED.dwg

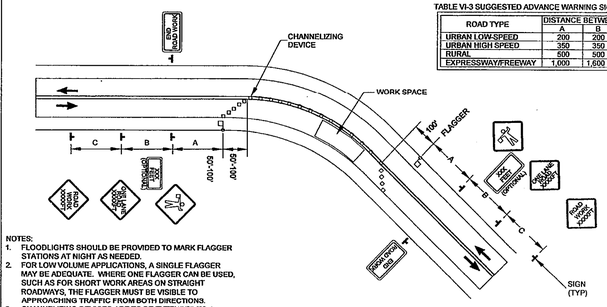


TABLE VI-3 SUGGESTED ADVANCE WARNING SIGN SPACING

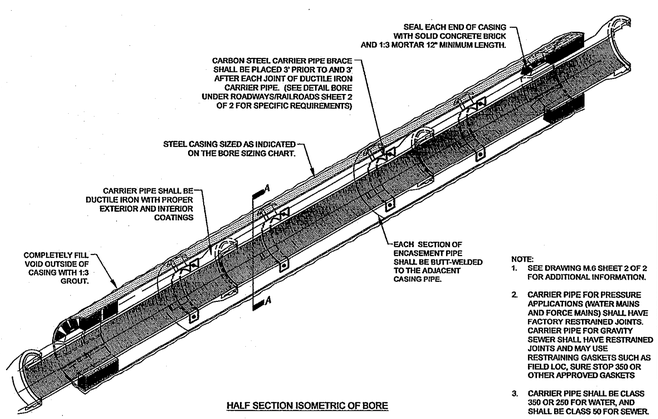
ROAD TYPE	DISTANCE BETWEEN SIGNS A	B	C
URBAN LOW-SPEED	200	200	200
URBAN HIGH SPEED	350	350	350
RURAL	500	500	500
EXPRESSWAY/FREEWAY	1,000	1,600	2,600

NOTES:

1. FLOODLIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. FOR LOW VOLUME APPLICATIONS, A SINGLE FLAGGER MAY BE ADEQUATE. WHERE ONE FLAGGER CAN BE USED, SUCH AS FOR SHORT WORK AREAS ON STRAIGHT ROADWAYS, THE FLAGGER MUST BE VISIBLE TO APPROACHING TRAFFIC FROM BOTH DIRECTIONS.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. THE ROAD WORK AHEAD AND THE END ROAD WORK SIGNS MY BE OMITTED FOR SHORT DURATION OPERATIONS.
5. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCED WARNING SIGNS.
6. THIS STANDARD DERIVED FROM PART VI OF THE M.U.T.C.D., (STANDARDS AND GUIDES FOR STREET AND HIGHWAY CONSTRUCTION MAINTENANCE, UTILITY, AND INCIDENT MANAGEMENT OPERATIONS) ISSUED APRIL 1995.

FIGURE TA-10 LANE CLOSURE ONE LANE TWO-WAY TRAFFIC N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 1	DWG. NO. M.8	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT			
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.				

M8-DETOUR-ROAD-CLOSED.dwg



HALF SECTION ISOMETRIC OF BORE

NOTE:

1. SEE DRAWING M.6 SHEET 2 OF 2 FOR ADDITIONAL INFORMATION.
2. CARRIER PIPE FOR PRESSURE APPLICATIONS (WATER MAINS AND FORCE MAINS) SHALL HAVE FACTORY RESTRAINED JOINTS. CARRIER PIPE FOR GRAVITY SEWER SHALL HAVE RESTRAINED JOINTS AND MAY USE RESTRAINING GASKETS SUCH AS FIELD LOC, SURE STOP 350 OR OTHER APPROVED GASKETS
3. CARRIER PIPE SHALL BE CLASS 350 OR 250 FOR WATER, AND SHALL BE CLASS 50 FOR SEWER.

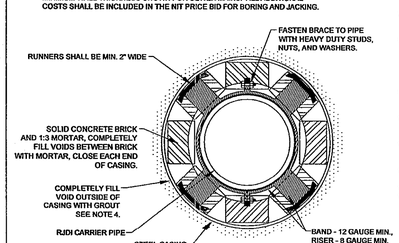
BORE UNDER ROADWAYS/RAILROADS N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 1 OF 2	DWG. NO. M.6	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	01/05	ADDED NOTES 2 & 3
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	10/09	CLARIFIED RESTRAINT REQUIREMENTS

M6-BORE-ROAD-RAIL.dwg

BORE SIZING CHART*

CARRIER PIPE SIZE	MIN. CASING SIZE	ROADWAYS MIN. WALL THICKNESS	RAILROADS MIN. WALL THICKNESS
4"	10"	0.156"	0.188"
6"	12"	0.25"	0.281"
8"	16"	0.25"	0.281"
12"	24"	0.25"	0.375"
16"	30"	0.312"	0.469"
18"	30"	0.312"	0.469"
24"	36"	0.375"	0.532"
30"	42"	0.500"	0.625"
36"	48"	0.500"	0.688"

*CONTRACTOR MAY SUBSTITUTE A LARGER SIZE CASING PIPE HAVING THE MINIMUM WALL THICKNESS SHOWN FOR SEWER MAINS. ALL ADDITIONAL COSTS SHALL BE INCLUDED IN THE NIT PRICE BID FOR BORING AND JACKING.



SECTION "A-A" CARBON STEEL CARRIER PIPE BRACE

NOTES:

1. INSTALLATION SHALL BE DRY BORE AND JACKING OF SMOOTH WALL STEEL PIPE. JETTING OR WET BORING WITH WATER SHALL NOT BE ALLOWED.
2. SEE BORE SIZING CHART FOR CARRIER PIPE SIZE AND STEEL CASING SIZE, MINIMUM DIAMETER, AND WALL THICKNESS.
3. CASING PIPE SHALL BE IN ACCORDANCE WITH ASTM A-53, GRADE B WITH A MINIMUM YIELD STRENGTH OF 35,000PSI.
4. EACH END OF ENCASEMENT TO BE PLUGGED WITH BRICK. ALL VOIDS OUTSIDE THE CASING PIPE SHALL BE COMPLETELY FILLED WITH 1:3 PORTLAND CEMENT GROUT AT SUFFICIENT PRESSURE TO INSURE NO SETTLEMENT OF ROADWAY/RAILROAD. METHOD OF GROUTING SHALL BE AS APPROVED BY THE PERMITTING AGENCY.
5. IT IS RECOMMENDED THAT THE BORE BE ACCOMPLISHED BEFORE PIPE CONSTRUCTION BEGINS.
6. THE BORING SHALL BE PERFORMED FROM "UPSTREAM" TO "DOWNSTREAM" DIRECTION MAINTAINING THE CRITICAL DOWNSTREAM INVERT ELEVATION. SHOULD THE BORE NOT BE ON GRADE, A REVISED PLAN SHALL BE SUBMITTED TO FAYPWC FOR APPROVAL.
7. THE BORING OPERATION SHALL BE CONDUCTED IN A MANNER THAT THE FLOW OF TRAFFIC IS NOT IMPEDED OR IN SUCH A MANNER SO AS NOT TO CREATE A HAZARD.
8. IF AN OBSTRUCTION IS ENCOUNTERED DURING THE BORING OPERATION, THE AUGER SHALL BE WITHDRAWN, THE EXCESS CASING PIPE CUT-OFF, CAPPED AND THE INTERIOR AND EXTERIOR VOIDS SHALL BE COMPLETELY FILLED WITH 1:3 PORTLAND CEMENT GROUT UNDER PRESSURE. NO SEPARATE PAYMENT FOR UNSUCCESSFUL BORES.
9. CONTRACTOR SHALL FIELD ADJUST AND INSTALL PROPER PIPE BRACES TO ACCOMPLISH GRADE AND INVERTS AS SHOWN ON THE DRAWINGS.
10. A MANUAL CONTROL STEERING HEAD OR OTHER GUIDANCE SYSTEM IS RECOMMENDED FOR BORES 30" DIAMETER AND/OR LARGER AND FOR BORES EXCEEDING 100' IN LENGTH OR AS SPECIFIED.
11. SUBCONTRACTORS SHALL ADHERE TO ALL PERMIT REQUIREMENTS AND SHALL PROVIDE APPROVED INSURANCE CERTIFICATES AS REQUIRED.
12. CONTRACTOR SHALL EXECUTE AND PERFORM ALL REQUIREMENTS AND CONDITIONS STIPULATED BY THE PERMITTING AGENCY.
13. SEE DRAWING M.6 SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.
14. CARRIER PIPE FOR PRESSURE APPLICATIONS (WATER MAINS AND FORCE MAINS) SHALL HAVE FACTORY RESTRAINED JOINTS. CARRIER PIPE FOR GRAVITY SEWER SHALL HAVE RESTRAINED JOINTS AND MAY USE RESTRAINING GASKETS SUCH AS FIELD LOK, SURE STOP 350 OR OTHER APPROVED GASKETS.

BORE UNDER ROADWAYS/RAILROADS N.T.S.		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.	FWC	NO.	DATE	REVISION
SHEET NO. 2 OF 2	DWG. NO. M.6	DWG. BY: FAYPWC	WATER RESOURCES ENGINEERING DEPARTMENT	1	02/11/04	ADDED 6" CARRIER PIPE TO BORE SIZING CHART
	DATE: JULY 01, 2017	APPROVED BY: J.E.G.		2	07/10	REVISED NOTES, SIZING CHART

M6-BORE-ROAD-RAIL.dwg

Drawn by David E Vaughn,PE,PLS
Checked David E Vaughn,PE,PLS
Reviewed J. REITZEL ,PE,PLS
Date JULY 2017

LEGION HILLS OUTFALL & NEW PINEWOOD LIFT STATION
MISCELLANEOUS DETAILS

No.	Revision	By	Date

ENGINEERS PLANNERS SURVEYORS
MOORMAN, KIZER & REITZEL, INC.
115 Broadfoot Avenue.
Fayetteville, N.C.
P.O. Box 53774
Phone 910-484-5191

SCALE
BOOK NO.
SHEET
DET-7