

FOREST HILLS DRIVE DRAINAGE IMPROVEMENTS

LOCATION: FOREST HILLS DRIVE, CITY OF FAYETTEVILLE, NORTH CAROLINA - CUMBERLAND COUNTY

OWNER: CITY OF FAYETTEVILLE



GENERAL NOTES:

1. CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING FIELD CONDITIONS.
2. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO THE RESIDENTIAL STRUCTURES AT 1917 & 1922 FOREST HILLS DRIVE THAT RESULTS FROM HIS WORK ON THE SITE.
3. CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO THE ENGINEER, DISCREPANCIES AND CONDITIONS THAT VARY FROM INFORMATION SHOWN AND SPECIFIED THAT COULD ADVERSELY AFFECT THE PERFORMANCE OR INCREASE THE COST OF THE WORK REQUIRED.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER AND CITY OF ANY DISCREPANCIES WITH WHAT IS SHOWN ON THESE DRAWINGS.
5. POWER POLE RELOCATION BY OTHERS PRIOR TO CULVERT EXCAVATION. CONTRACTOR TO COORDINATE WITH PWC FOR POWER POLE RE-CONNECTION AND NOTIFICATION. POWER TO BE MAINTAINED AT RESIDENCES PER PWC COORDINATION. INTERRUPTION SHALL BE KEPT TO A MINIMUM. CONCRETE CULVERT EXCAVATION AND INSTALLATION WILL CONFLICT WITH OVERHEAD ELECTRIC LINES; PWC ELECTRIC DIVISION APPROVAL IS REQUIRED PRIOR TO CONSTRUCTION AND EQUIPMENT ACTIVITY AT ANY OVERHEAD ELECTRIC LINE LOCATION.
6. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY INTERRUPTING AND/OR DIVERTING ANY UTILITIES DURING CONSTRUCTION. CONTRACTOR SHALL NOTIFY UTILITY PROVIDERS PRIOR TO EXCAVATION OR RELOCATION OF ANY UTILITY ENCOUNTERED (SUCH AS GAS, CABLE AND PHONE) AND SHALL COORDINATE WITH ALL UTILITIES IN ORDER TO MAINTAIN SERVICE. INTERRUPTIONS SHALL BE KEPT TO A MINIMUM.
7. ALL EROSION CONTROL MEASURES SHALL MEET THE LATEST VERSION OF CITY OF FAYETTEVILLE STANDARD EROSION CONTROL DETAILS AND/OR SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
8. PERMITS HAVE BEEN OBTAINED FROM NC DENR, DWQ AND U.S. ARMY CORPS OF ENGINEERS FOR THE PROJECT. CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS.
9. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL PLAN AND OBTAIN APPROVAL 7 DAYS PRIOR TO ROAD CLOSURE. CONTRACTOR SHALL COORDINATE WITH RUSTY THOMPSON, CITY TRAFFIC ENGINEER AT (910) 433-1153.



LOCATION MAP

NOT TO SCALE

CITY OF FAYETTEVILLE, NC

SITE

INDEX OF SHEETS

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GENERAL CONSTRUCTION SEQUENCE:

1. INSTALL EROSION CONTROL PROTECTION.
2. RELOCATE POWER POLE.
3. BEGIN DOWNSTREAM CHANNEL CONSTRUCTION "IN THE DRY" (MAINTAIN BERM AT EXISTING CHANNEL BANK AT CHANNEL TIE-IN LOCATION TO PREVENT BACKWATER INTO CONSTRUCTION OF NEW CHANNEL).
4. INSTALL STREAM PUMP-AROUND FOR CULVERT SYSTEM DEMO.
5. REMOVE AND DISPOSE 36"(3) RCP & UPSTREAM HEADWALL AND DOWNSTREAM JUNCTION BOX (PROVIDE DEWATERING AS NEEDED).
6. INSTALL SANITARY PUMP-AROUND AT FOREST HILLS DRIVE (CONTINUE/PROVIDE DEWATERING).
7. INSTALL NEW MANHOLES & 8" DIP SANITARY SEWER LINE.
8. LOWER 12" WATER LINE & REPLACE W/RJDIP AND DEMO/REMOVE 8" SANITARY AT PROPOSED CULVERT LOCATION.
9. INSTALL DOUBLE BARREL BOX CULVERT AND HEADWALLS AT FOREST HILLS DRIVE.
10. CONSTRUCT DISSIPATOR OUTLET
8. BEGIN STREAM RESTORATION AT CULVERT/STILLING BASIN WEIR.
9. CONSTRUCT RESTORED STREAM CHANNEL AND INSTALL IN-STREAM STRUCTURES
10. DEMO & REMOVE 52 X 66 CMP TO OUTLET INCLUDING CONCRETE HEADWALL AND WINGWALLS. BACKFILL W/EXCAVATED SOILS FROM NEW CHANNEL.
11. GRADE FLOODPLAIN AND REMAINING DISTURBED AREAS.
12. INSTALL PLANTINGS FOR STREAM AND BUFFER AREAS
13. CLEAN, FINISH GRADING, & STABILIZE SITE.
14. REMOVE ALL EROSION CONTROL



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NC LICENSE C-1842

JEC PROJECT NO. 10-158-012

SHEET NO. C-1.0
MARCH 15, 2012
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STANDARD SITE ABBREVIATIONS

ABC	AGGREGATE BASE COURSE	MAX	MAXIMUM
AC	ACRES	MED	MEDIAN
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MH	MANHOLE
ALBC	ALUMINUM BOX CULVERT	MIN	MINIMUM
APPROX	APPROXIMATE	MJ	MECHANICAL JOINT
ASPH	ASPHALT	MON	MONUMENT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS	MTL	METAL
AWWA	AMERICAN WATER WORKS ASSOCIATION	MW	MONITOR WELL
B-B	BACK OF CURB TO BACK OF CURB	N/A	NOT APPLICABLE
BL	BASELINE	NAD 27	NORTH AMERICAN DATUM 1927
B/L	BASELINE	NAD 83	NORTH AMERICAN DATUM 1983
BLDG	BUILDING	NBL	NORTH BOUND LANE
BM	BENCHMARK	NC	NORMAL CROWN
BOC	BACK OF CURB	NC GRID	NORTH CAROLINA GRID
BOL	BOLLARD	NCDENR	NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
BVC	BEGIN VERTICAL CURVE	NC DOT	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
BW	BARB WIRE	NCGS	NORTH CAROLINA GEODETIC SURVEY
C&G	CURB AND GUTTER	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CATV	CABLE TELEVISION	NIP	NEW IRON PIPE
CAP	CORRUGATED ALUMINUM PIPE	NO.	NUMBER
CB	CATCH BASIN	NTS	NOT TO SCALE
CBL	CABLE	O/C	ON CENTER
CFS	CUBIC FEET PER SECOND	OD	OUTSIDE DIAMETER
CHL	CHAIN LINK	OH	OVERHEAD
CI	CURB INLET	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
CIP	CAST IRON PIPE	OVH	OVERHANG
CL	CENTERLINE	P/A	PARKING AREA
C/L	CENTERLINE	PC	POINT OF CURVATURE
CM	CONCRETE MONUMENT	PCBC	PRECAST CONCRETE BOX CULVERT
OMP	CORRUGATED METAL PIPE	PCC	POINT OF COMPOUND CURVATURE
CO	CLEAN OUT	PE	PEDESTAL
COM	COMMUNICATION	PI	POINT OF INTERSECTION
CONC	CONCRETE	PI NC	POINT OF INTERSECTION NO CURVE
CONSTR	CONSTRUCTION	PVI	POST INDICATOR VALVE
CONTR	CONTRACTOR	PL	PROPERTY LINE
COR	CORNER	POC	POINT ON CURVE
CULV	CULVERT	POS	POINT ON SPIRAL
CW	CHILLED WATER	POT	POINT ON TANGENT
Δ	DELTA	PP	POWER POLE
DCV	DETECTOR CHECK VALVE	PRC	POINT OF REVERSE CURVATURE
DDCV	DOUBLE DETECTOR CHECK VALVE	PSI	POUNDS PER SQUARE INCH
DI	DROP INLET	PT	POINT OF TANGENCY
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
∅	DIAMETER	PVI	POINT OF VERTICAL INTERSECTION
DIP	DUCTILE IRON PIPE	PVMT	PIEZOMETER
DPC	DUKE POWER COMPANY	PZ	PIEZOMETER
DRW	DRIVEWAY	R	RADIUS
DW	DOMESTIC WATER	R/W	RIGHT OF WAY
EBL	EAST BOUND LANE	RCP	REINFORCED CONCRETE PIPE
EG	EXISTING GRADE	RETW	RETAINING WALL
EIP	EXISTING IRON PIPE	REV	REVISED
ELEC	ELECTRIC	RJ	RESTRAINED JOINT
EL	ELEVATION	RPZ	REDUCED PRESSURE ZONE
ELEV	ELEVATION	RT	RIGHT
EM	ELECTRIC METER	RWM	RIGHT OF WAY MONUMENT
EM	ELECTRIC METER	SAN	SANITARY
ESP	EDGE OF PAVEMENT	SB	SOIL BORING
ESMT	EASEMENT	SBL	SOUTH BOUND LANE
EVC	END VERTICAL CURVE	SHT	SHEET
EX	EXISTING	SIA	SIAMSE CONNECTION
EXT	EXTENSION	SIG	SIGNAL
FES	FLARED END SECTION	SL	SETBACK LINE
FFE	FINISHED FLOOR ELEVATION	SP	SIGNAL POLE
FG	FINISHED GRADE	SPECS	SPECIFICATIONS
FH	FIRE HYDRANT	SS	SANITARY SEWER
FL	FLOOD LIGHT	STA	STATION
FNC	FENCE	STD	STANDARD
FCC	FACE OF CURB	STM	STORM
FPS	FEET PER SECOND	SW	SIDEWALK
FT	FOOT (OR) FEET	T	TANGENT
FT	FOOT (OR) FEET	T/	TOP
GALV	GALVANIZED	TBM	TEMPORARY BENCHMARK
GC	GENERAL CONTRACTOR	TCP	TERRA COTTA PIPE
GL	GAS LINE	TEL	TELEPHONE
GM	GAS METER	TEMP	TEMPORARY
GPM	GALLONS PER MINUTE	TOC	TOP OF CURB
GR	GRADE	TOE	TOE OF SLOPE
GRV	GRAVEL	TOP	TOP OF SLOPE
GV	GATE VALVE	TOW	TOP OF WALL
GSV	GAS VALVE	TP	TELEPHONE POLE
GW	GUY WIRE	TRANS	TRANSFORMER
H	HORIZONTAL	TYP	TYPICAL
HC	HANDICAP	U/C	UNDER CONSTRUCTION
HCP	HANDICAP PARKING	U/G	UNDERGROUND
HCR	HANDICAP RAMP	UP	UTILITY POLE
HDP	HDP	V	VERTICAL
HDW	HEADWALL	VC	VERTICAL CURVE
HP	HIGH POINT	VCP	VITREOUS CLAY PIPE
HT	HEIGHT	W/	WITH
ID	INSIDE DIAMETER	WBL	WEST BOUND LANE
IN	INCH (OR) INCHES	WL	WATER LINE
IN	INCH (OR) INCHES	WM	WATER METER
IN/HR	INCHES PER HOUR	WV	WATER VALVE
INV	INVERT	WW	WOVEN WIRE
ISL	ISLAND		
ITL	INDEPENDENT TESTING LABORATORY		
JB	JUNCTION BOX		
L	LENGTH		
LF	LINEAR FEET		
LGT	LIGHT		
LP	LIGHT POLE		
LS	LANDSCAPED		
LT	LEFT		
LOC	LOCATION		

GENERAL NOTES

- CONTACT ONE-CALL PRIOR TO CONSTRUCTION FOR EXISTING UTILITY LOCATIONS: 1 800-632-4949. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL UNDERGROUND FEATURES SHOWN ON DRAWINGS (PLANS). ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXERCISING REASONABLE EFFORTS TO PROTECT ANY KNOWN AND UNKNOWN UNDERGROUND FEATURES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IMMEDIATELY IF UNKNOWN FEATURES ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE ILLUSTRATED DESIGN.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC, AND ALL OF THE CITY FACILITIES. SHOULD DAMAGES OCCUR, THE CONTRACTOR SHALL AT HIS OWN EXPENSE REPAIR IMMEDIATELY TO THE SATISFACTION OF THE CITY AND THE ENGINEER.
- CONTRACTOR SHALL HOLD HARMLESS THE CITY AND THE ENGINEER FOR DAMAGES, INJURIES, OR OTHER ACCIDENTS WHICH OCCUR DURING THESE CONSTRUCTION ACTIVITIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF THE CONSTRUCTION SITE, INCLUDING BUT NOT LIMITED TO: HIS EQUIPMENT, COMPLETED WORK, STAGED MATERIALS, AND SITE ACCESS BY AUTHORIZED AND UNAUTHORIZED PERSONS.
- CONTRACTOR SHALL ENSURE THAT ALL TREES AND EXISTING LANDSCAPING NOT DESIGNATED FOR REMOVAL SHALL BE PROTECTED DURING CONSTRUCTION.
- ALL ELEVATIONS ARE IN REFERENCE TO TBM 1 AND TBM 2 AS SHOWN/NOTED ON SHEET C-3.0 (EXISTING SITE PLAN).
- CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING AND COORDINATION OF ALL ILLUSTRATED CONSTRUCTION ACTIVITIES AT THE JOB SITE.
- CONTRACTOR SHALL ENSURE THAT ALL WORK SHALL BE PERFORMED ACCORDING TO CURRENT OSHA SAFETY REGULATIONS. CONTRACTOR SHALL PROVIDE SAFETY TRAINING CERTIFICATION DOCUMENTATION IF REQUESTED BY CITY.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES DURING CONSTRUCTION AND SHALL MAKE REPAIRS AT HIS EXPENSE.
- WITHIN THE WORK AREA, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATION AND ELEVATION ADJUSTMENTS OF ANY EXISTING VAULTS (REGARDLESS OF FUNCTION), METER BOXES, FIRE HYDRANTS, CLEAN OUTS, MANHOLES, ETC., TO MATCH FINISHED GRADES AND SITE PLAN. ALL SUCH WORK SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO PERFORMING LOCATION AND ELEVATION ADJUSTMENTS.
- TRAFFIC CONTROL: CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION, UNLESS OMITTED BY THE CITY OF FAYETTEVILLE. THE CONTRACTOR SHALL UTILIZE SIGNS, BARRICADES, FLAG MEN, OR GUARDS AS REQUIRED TO ENSURE THE SAFETY OF ALL VEHICULAR AND PEDESTRIAN TRAFFIC DURING ALL CONSTRUCTION ACTIVITIES. ACCESS BY HOMEOWNERS TO THEIR RESIDENCES SHALL BE MAINTAINED AS SHOWN AT ALL TIMES.
- CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, THE CITY, AND ADJACENT PROPERTY OWNERS AS REQUIRED FOR WORK ON PRIVATE PROPERTY.
- CONTRACTOR SHALL NOT LEAVE ANY EXCAVATION OPEN OR UNPROTECTED DURING NON-WORKING HOURS. THE CONTRACTOR SHALL UTILIZE FENCES, SIGNS, BARRICADES, AND APPROPRIATE MEANS AS NECESSARY TO ENSURE THE SAFETY OF BOTH AUTHORIZED AND UN-AUTHORIZED PERSONS WHO ENTER THE SITE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT OF ALL WORK AS ILLUSTRATED ON PLANS AND SHALL VERIFY ALL DIMENSIONS AND GRADES AT THE JOB SITE. IF DIFFERENCES ARE FOUND, THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY SO THAT MODIFICATIONS CAN BE MADE.
- THE PRECAST CULVERT SHALL BE DESIGNED AND BUILT TO STRUCTURAL DESIGN CRITERIA AND APPROVED BY THE CITY OF FAYETTEVILLE OFFICE OF CITY ENGINEER (SEE THE TECHNICAL SPECIFICATIONS SECTION OF THE CONTRACT DOCUMENTS FOR INSTRUCTIONS REGARDING SUBMITTAL REQUIREMENTS).

CONSTRUCTION NOTES

- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE CITY OF FAYETTEVILLE'S CONSTRUCTION STANDARDS, AND IN ACCORDANCE WITH APPROVED PLANS BY THE ENGINEER. WHERE CONFLICTS ARISE, THE FINAL AUTHORITY SHALL BE THE CITY OF FAYETTEVILLE.
- CONSTRUCTION AND/OR DEMOLITION ACTIVITY IS PROHIBITED BEFORE 7 AM AND AFTER 7 PM MONDAY THROUGH FRIDAY AND BEFORE 9 AM OR AFTER 7 PM ON WEEKENDS AND HOLIDAYS.
- NO LOADING OR UNLOADING OF MATERIALS MAY BE PERFORMED BETWEEN THE HOURS OF 7 PM AND 7 AM ON WEEKDAYS OR 7 PM AND 8 AM ON WEEKENDS OR HOLIDAYS.
- ALL CONTRACTORS SHALL BE PROPERLY LICENSED UNDER NC STATE LAWS GOVERNING THEIR TRADE.
- CONTRACTOR HEREBY WARRANTS HIS WORK FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE CITY OF FAYETTEVILLE, AGAINST ANY DEFECTS DUE TO FAULTY MATERIALS OR WORKMANSHIP.
- CONTRACTOR SHALL ACCEPT ALL RESPONSIBILITY FOR PROTECTION, PLACEMENT, AND REPLACEMENT OF BACKFILL MATERIAL, AND SELECT BACKFILL (IF SELECT BACKFILL IS NEEDED).
- CONTRACTOR SHALL MAINTAIN A SET OF RECORD DRAWINGS SHOWING ANY FIELD CHANGES TO THE PROJECT. THE CONTRACTOR IS NOT AUTHORIZED TO MAKE FIELD CHANGES WITHOUT THE APPROVAL OF THE ENGINEER.
- CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE CITY OF FAYETTEVILLE (WITH AT LEAST 48 HOURS NOTICE) FOR INSPECTIONS FOR ALL FOUNDATIONS, STREAM TIE IN TO EXISTING, REBAR PLACEMENT, AND SUBSTANTIAL COMPLETION. THE CONTRACTOR SHALL NOT PLACE CONCRETE, BACKFILL OR COVER ANY FOUNDATION, AND/OR STRUCTURE UNTIL SUCH HAS BEEN OBSERVED AND APPROVED BY THE ENGINEER. ANY SUCH WORK PERFORMED PRIOR TO THE ENGINEER'S APPROVAL, SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- AT LEAST 10 DAYS PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER A WRITTEN CONSTRUCTION PROCEDURE WITH APPROXIMATE TIMES/DATES. THIS PROCEDURE SHALL SPECIFY SEQUENCES OF CONSTRUCTION, SEQUENCES OF EROSION CONTROL, GROUND DEWATERING, AND SEQUENCES OF WATER PASSAGE AND MANAGEMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE PROJECT FROM EFFECTS OF FLOOD AND STORM EVENTS, INCLUDING BUT NOT LIMITED TO WORK IN PROGRESS, COMPLETED WORK, EQUIPMENT, MATERIALS, UTILITIES, WITHIN THE PROJECT AREA OR AFFECTED BY THE PROJECT OR DAMAGED AS A RESULT OF THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF PUBLIC SAFETY ON THE SITE DURING THE PERIOD OF CONSTRUCTION (INCLUDING WEEKENDS AND HOLIDAYS).
- CONTRACTOR SHALL BE RESPONSIBLE FOR MATERIALS AND CONSTRUCTION OF WATER MANAGEMENT FEATURES SUCH AS COFFERDAMS, DIVERSION STRUCTURES, PUMP-AROUND, AND THE LIKE.
- CONTRACTOR SHALL USE RUBBER Tired EQUIPMENT ONLY AT THE STREAM RESTORATION PORTION OF THE PROJECT. USE OF OTHER EQUIPMENT TYPE (I.E. TRACKHOE) FOR STREAM CHANNEL AND FLOODPLAIN WORK REQUIRES APPROVAL FROM THE CITY OF FAYETTEVILLE, PWC AND ENGINEER

GENERAL CIVIL/SITE JOB DESCRIPTION

THIS JOB CONSISTS OF EROSION CONTROL, CLEARING AND GRUBBING, DEMOLITION, SHORING, SOIL EXCAVATION, WATER AND SEWER UTILITY WORK, PRE-CAST CONCRETE CULVERT AND CONSTRUCTION/INSTALLATION, STREAM RELOCATION/RESTORATION, RIPRAP, FILL PLACEMENT, GRADING, STREAMBANK GRADING/PLANTING AND SEEDING AND MULCHING.



BEFORE YOU DIG!
CONTACT ONE-CALL CENTER
1-800-632-4949

NOTES:

- ALL SYMBOLS AND ABBREVIATIONS MAY NOT BE APPLICABLE TO THIS PROJECT.
- THE SYMBOLS AND ABBREVIATIONS FOR THIS SET OF PLANS DO NOT NECESSARILY REFLECT SYMBOLS AND ABBREVIATIONS ON ANY OTHER PLANS.

LEGEND

- INDICATES SECTION "A" CUT WITH SECTION SHOWN ON SHEET C5; ALSO REFERRED TO AS SECTION A/C5
- INDICATES DETAIL "1" WITH DETAIL SHOWN ON SHEET C5; ALSO REFERRED TO AS DETAIL 1/C5

DEFINITION OF TERMS:

CITY - THE CITY OF FAYETTEVILLE, NC
PWC - THE PUBLIC WORKS COMMISSION OF THE CITY OF FAYETTEVILLE



STANDARD ABBREVIATIONS AND NOTES

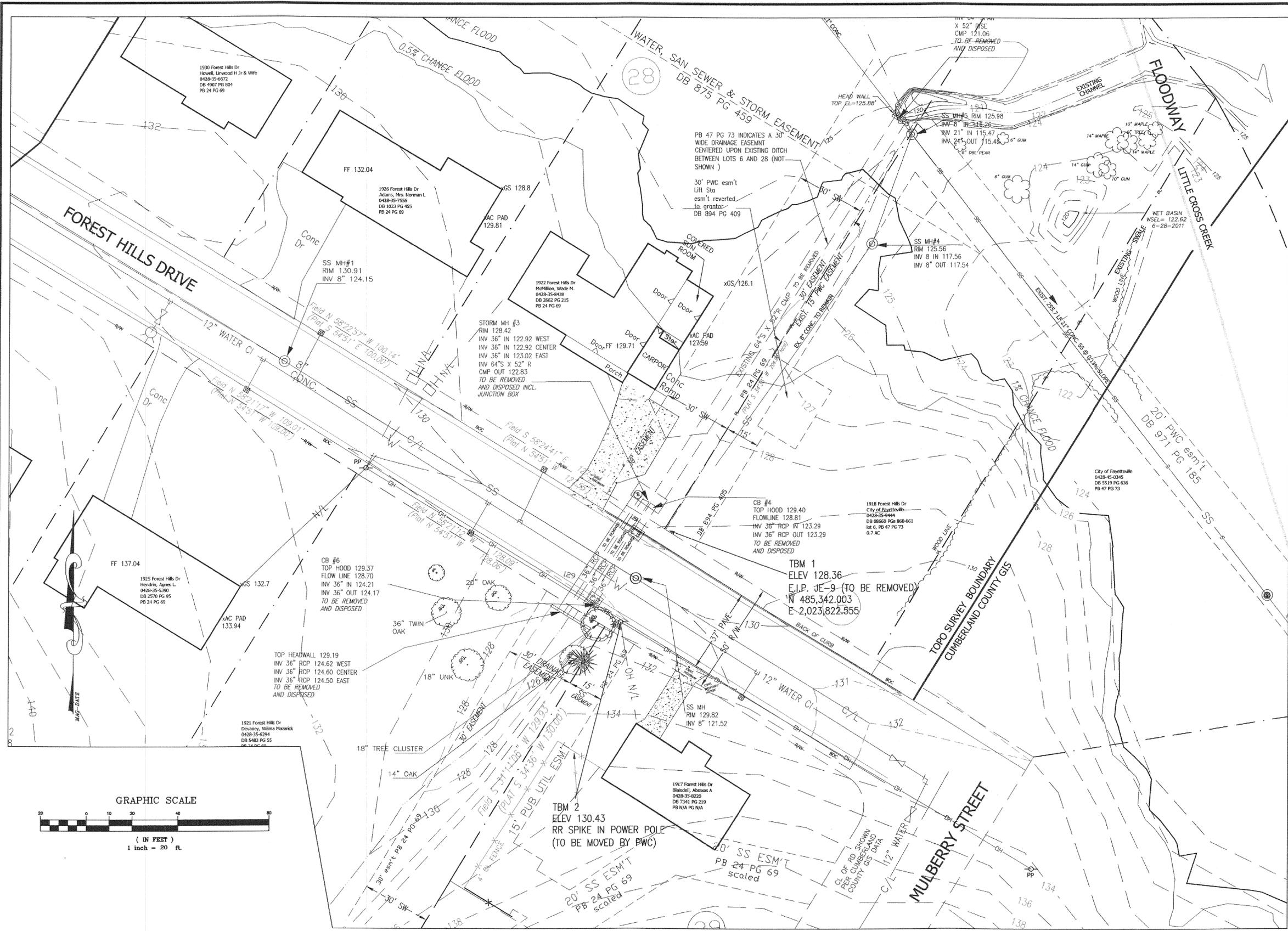
STANDARD ABBREVIATION & NOTES

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REVISIONS	
JOB NO. 10-158-012	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY CDJ
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS	"C"
FOREST HILLS DRIVE FAYETTEVILLE, NORTH CAROLINA	SHEET NO.
	2.0

3/13/2012 10:11:40 AM



VICINITY MAP
NOT TO SCALE
CITY OF
FAYETTEVILLE, NC

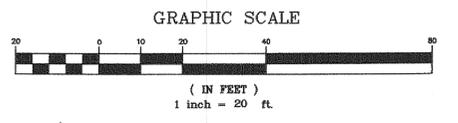
SITE

LEGEND

CENTERLINE	---
CREEK	~~~~~
CHAIN LINK FENCE	-X-X-
EASEMENT BOUNDARY	- - - - -
ELECTRIC SERVICE N/L	-OH N/L-
GIS BLDG	□
GIS LOT LINE	---
GIS R/W	---
INDEX CONTOUR	150
INTERMEDIATE CONTOUR	150
LOT NUMBER	⑤
OVERHEAD POWER LINE	OH
POWER POLE	○
ROLL CONCRETE CURB	—○—
SANITARY SEWER LINE	SS
SANITARY SEWER MANHOLE	⊙
STORM DRAIN HEADWALL	—○—
STORM DRAIN MANHOLE	⊙
STORM DRAIN DROP INLET	⊙
STORM DRAIN CATCH BASIN	⊙
STORM DRAIN PIPE	36" CMP
TREE OR VEGETATION	⊙
WATER MAIN GATE VALVE	⊙
WATER MAIN FIRE HYDRANT	⊙
WATER MAIN*	—12" WATER—
WATER METER	⊙

* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY

- NOTES:**
- EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM CUMBERLAND COUNTY, NC GEOGRAPHICAL INFORMATION SYSTEM DATA, EFFECTIVE DATE FEBRUARY, 2005, OR NCDOT LIDAR CONTOUR DATA, EFFECTIVE DATE MAY 2007; BOTH ARE PROVIDED IN 2-FOOT INCREMENTS BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD) 83 AND NAVD 88. PROPOSED FOREST HILLS DRIVE IMPROVEMENTS SHOWN WITH ONE FOOT CONTOUR INCREMENTS BASED ON FIELD SURVEY PROVIDED BY MOORMAN, KIZER, AND REITZEL (MKR), INC (115 BROADFOOT AVE, FAYETTEVILLE, NC) AUGUST 2010 AND TOPO AT 1918 FOREST HILLS DRIVE BY DUNCAN-KENNEDY LAND SURVEYING, PLLC, JUNE, 2011.
 - FLOODWAY, 100-YR FLOOD BOUNDARY SHOWN IS APPROXIMATE LOCATION, TAKEN FROM FEMA FLOOD INSURANCE STUDY MAP PANEL, DATED JANUARY 5, 2007.
 - UTILITIES SHOWN PER AS-BUILT DRAWINGS FROM PWC AND UTILITY MARKOUT BY NC ONE-CALL AND ARE APPROXIMATE LOCATIONS. CONTRACTOR SHALL OBTAIN UTILITY MARKOUT PRIOR TO CONSTRUCTION TO DETERMINE LOCATIONS OF EXISTING UTILITIES. SEWER MANHOLES NEAR CULVERT PROJECT SURVEYED BY MKR, INC.

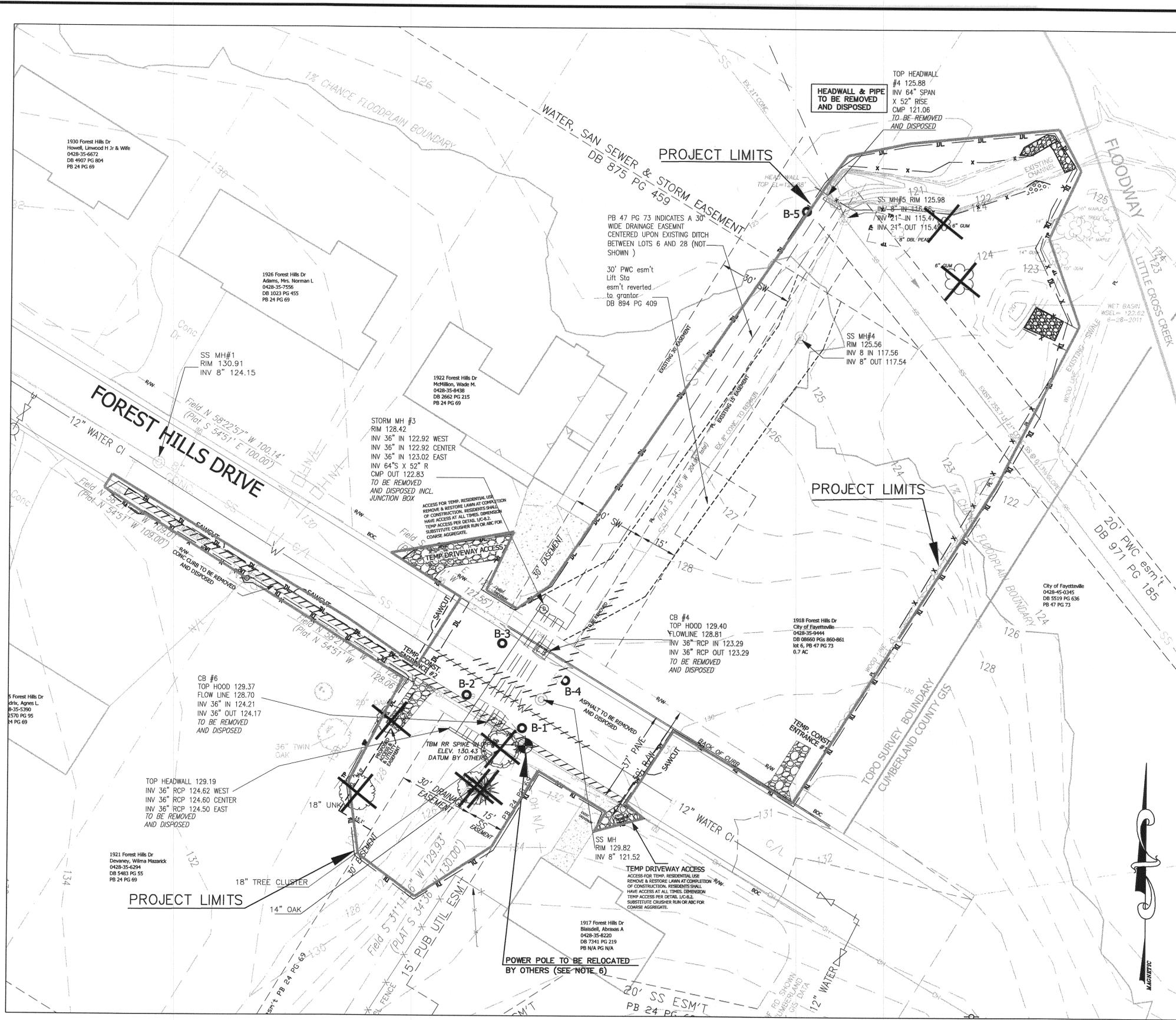


EXISTING SITE PLAN

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NC LICENSE # C-1842

REVISIONS	DESIGNED	DATE
	10-158-012	
	02-10-12 BY BAF	
	CONST. SURVEY BY	
	CHECKED BY CDJ	
	SCALE: NONE	

CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS	"C"
FOREST HILLS DRIVE FAYETTEVILLE, NC	SHEET NO.
	3.0



NOTES:

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 - ALL DRAINAGE STRUCTURE INSTALLATION WORK INCLUDING OUTLET AND INLET TRANSITIONS SHALL BE PERFORMED IN THE DRY. PUMP-AROUND SHALL BE INSTALLED PRIOR TO EXCAVATION AND CULVERT DEMOLITION.
 - ALL UTILITY PROVIDERS SHALL BE CONTACTED PRIOR TO DEMOLITION AND SHALL BE COORDINATED WITH TO PROVIDE TEMPORARY SERVICES TO RESIDENCES FOR ANY IMPACTED UTILITIES.
 - ALL WORK WITHIN THE STREAM SHALL BE DONE "IN THE DRY". THE PUMP AROUND SYSTEM SHALL MAINTAIN A DRY CHANNEL FOR REMOVAL AND INSTALLATION OF THE CULVERTY SYSTEM AND/OR ANY MISCELLANEOUS WORK WITHIN THE STREAM ALIGNMENT.
 - ALL WATER AND SEWER UTILITY WORK SHALL BE PERFORMED BY UTILITY CONTRACTOR(S) CERTIFIED BY PWC. WATER AND SEWER WORK SHALL PRECEDE DRAINAGE IMPROVEMENTS.
 - EXISTING 12-INCH WATER MAIN RELOCATION:**
CONTRACTOR SHALL RECONNECT ANY IMPACTED WATER SERVICE LEADERS PRIOR TO CONCRETE BOX CULVERT INSTALLATION. WATER SERVICE INTERRUPTIONS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL COORDINATE WITH PWC FOR ANY PLANNED INTERRUPTIONS TO SERVICES. WATER LATERALS CANNOT BE SPLICED. THEY NEED TO BE COMPLETELY REINSTATED FROM MAIN TO METER.
 - EXISTING SANITARY SEWER RELOCATION:**
ANY IMPACTED SANITARY SERVICE LEADERS SHALL BE RECONNECTED AND SERVICES SHALL BE MAINTAINED. CONTRACTOR SHALL COORDINATE WITH PWC FOR ANY INTERRUPTIONS AND COORDINATE INSTALLATION/CONSTRUCTION IMPACTS.
 - POWER POLE RELOCATION IS BY OTHERS. CONTRACTOR SHALL CONTACT PWC TO COORDINATE POWER POLE RELOCATION, RE-CONNECTION AND NOTIFICATION. CONCRETE CULVERT EXCAVATION AND INSTALLATION WILL ALSO CONFLICT WITH OVERHEAD ELECTRIC LINES; PWC ELECTRIC DIVISION APPROVAL REQUIRED PRIOR TO CONSTRUCTION ACTIVITY AT ANY OVERHEAD ELECTRIC LINE LOCATIONS.
 - PRIOR TO INSTALLATION OF CONCRETE BOX AND METAL BOX CULVERTS, GEOTECH TO DETERMINE WHERE ANY UNSUITABLE SOILS ARE PRESENT AND TO PROVIDE GUIDANCE IF ACTUAL CONDITIONS DIFFER FROM GEOTECH REPORT AND FOR REMOVAL OF UNSUITABLE SOILS. NOTIFY ENGINEER IF DISCREPANCIES ARE FOUND. SEE SHEET C-5.3 FOR MORE INFO.
 - CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO RESIDENTIAL STRUCTURES AT 1922 & 1917 FOREST HILLS DRIVE THAT RESULT FROM HIS WORK ON THE SITE.
 - EROSION CONTROL STRUCTURES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBANCE.
- DEWATERING**
- PUMP FROM SUMP PITS OUTSIDE OF EXCAVATION LIMITS.
 - PRIOR TO REMOVAL OF EXISTING CULVERT, SURFACE WATER TABLE SHOULD BE LOWERED 2' BELOW THE EXPECTED EXCAVATION DEPTH; EFFECTIVENESS OF DEWATERING SHOULD BE VERIFIED (SEE GEOTECHNICAL REPORT).
 - DEWATERING SHALL BE CONTINUOUSLY MAINTAINED AS EXCAVATION IS ADVANCED, CHECK WITH AUGER BORINGS AS EXCAVATION PROCEEDS PER GEOTECH RECOMMENDATIONS.
 - MEASURES SHALL BE MAINTAINED UNTIL SATISFACTORY SUBGRADES ARE ESTABLISHED AND CONCRETE AND PRECAST STRUCTURES ARE PLACED.
 - SIDEWALL EXCAVATION: STEPBACK W/BENCHES, CONTRACTOR TO PROVIDE BRACING AND SHORING IN ACCORDANCE WITH THE LATEST OSHA REQUIREMENTS PROVIDED BY 29 CFR 1926. SEE GEOTECHNICAL RECOMMENDATIONS.

LEGEND

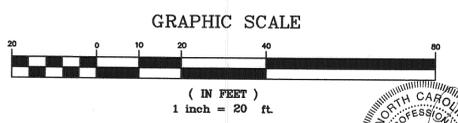
- BORING LOCATION ● B-1
- CENTERLINE ———
- CHAIN LINK FENCE — X —
- CREEK ———
- DEMOLITION ———
- DISTURBED AREA/DEMOLITION LIMITS — DL —
- EASEMENT BOUNDARY ———
- ELECTRIC SERVICE W/L — OH W/L —
- GIS BLDG [Symbol]
- GIS LOT LINE [Symbol]
- GIS R/W [Symbol]
- INDEX CONTOUR [Symbol]
- INTERMEDIATE CONTOUR [Symbol]
- LOT NUMBER [Symbol]
- OVERHEAD POWER LINE [Symbol]
- POWER POLE [Symbol]
- ROLL CONCRETE CURB [Symbol]
- SILT FENCE [Symbol]
- SANITARY SEWER LINE [Symbol]
- SANITARY SEWER MANHOLE [Symbol]
- STORM DRAIN HEADWALL [Symbol]
- STORM DRAIN MANHOLE [Symbol]
- STORM DRAIN DROP INLET [Symbol]
- STORM DRAIN CATCH BASIN [Symbol]
- STORM DRAIN PIPE [Symbol]
- TREE OR VEGETATION [Symbol]
- WATER MAIN GATE VALVE [Symbol]
- WATER MAIN FIRE HYDRANT [Symbol]
- WATER MAIN [Symbol]
- WATER METER [Symbol]

UTILITIES, ITEMS, OR STRUCTURES TO BE IMPACTED WITHIN PROJECT LIMITS:

- METAL CULVERTS
- CONCRETE PIPES UNDER FOREST HILLS DRIVE
- HEADWALLS
- DRIVEWAY APRONS AT 1922 AND 1917 FOREST HILLS DRIVE
- PAVEMENT BETWEEN SAWCUTS
- CURB & GUTTER
- 8" SANITARY SEWER, MANHOLE
- 12" WATER LINE
- POWER POLE (BY PWC)
- WATER/SEWER SERVICE CONNECTIONS (AFFECTED BY PROJECT)
- TREES/VEGETATION (MARKED W/ X)

NOTES:

- SEE OTHER SHEETS FOR DETAILS OF DEMOLITION.
- ALL UTILITIES SHALL BE LOCATED PRIOR TO EXCAVATION/DEMOLITION WORK. EXTREME CAUTION IS NEEDED TO CONFIRM LOCATION AND ELEVATION OF WATER AND SEWER DURING/AFTER EXCAVATION OF EXISTING CULVERT AND PRIOR TO INSTALLATION OF WATER/SEWER RELOCATION AND NEW CULVERT.
- ADDITIONAL CAUTION IS ALSO REQUIRED WHEN USING EQUIPMENT UNDER & AROUND OVERHEAD ELECTRIC (OH) LINES.



DEMOLITION PLAN

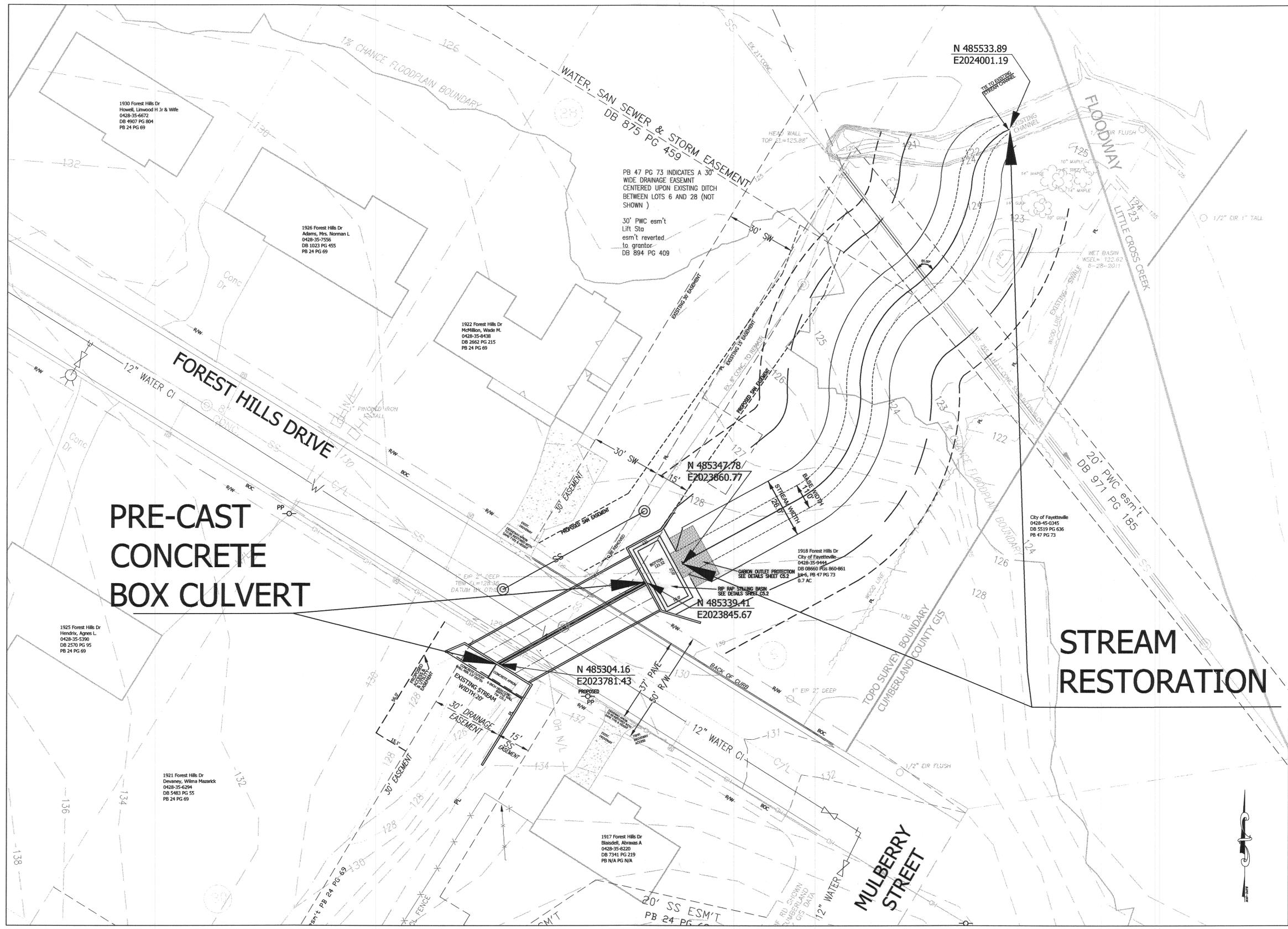
JEWELL
ENGINEERING CONSULTANTS, PC
POST OFFICE BOX 2294 (336) 996-9874
KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 996-9876
NC LICENSE # C-1842

REVISIONS	JOB NO. 10-158-012
08-17-12 PROP. EASEMENT UPDATE TO 0428-35-6294	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NC

"C"
SHEET NO.
4.0





- GENERAL NOTES:**
- CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
 - CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO THE ENGINEER, DISCREPANCIES AND CONDITIONS THAT VARY FROM INFORMATION SHOWN AND SPECIFIED THAT COULD ADVERSELY AFFECT THE PERFORMANCE OF THE WORK REQUIRED.
 - DIMENSIONS AND NORTHING/EASTING COORDINATES SHOWN ARE TO CENTERLINE OF STORMWATER DRAINAGE STRUCTURES (UNLESS OTHERWISE NOTED).
 - CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY POWER COMPANY FOR ANY CONFLICTS.
 - ALL UTILITY WORK TO BE PERFORMED BY A CERTIFIED UTILITY CONTRACTOR APPROVED BY THE CITY OF FAYETTEVILLE. ALL UTILITY WORK, WATER AND SEWER TO BE INSPECTED BY THE CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION (PWC). EXISTING 12-INCH AND WATER LINE SERVICES AND SANITARY SERVICES TO REMAIN IN SERVICE DURING CONSTRUCTION. CALL CITY OF FAYETTEVILLE PWC FOR DIRECTION CONCERNING WATER LINE IMPACTS DUE TO INTERFERENCE, INSTALLATION AND PRIOR TO ANY CONSTRUCTION NEAR WATER AND/OR SEWER UTILITIES.
 - ALL EROSION CONTROL MEASURES SHALL MEET THE CITY OF FAYETTEVILLE STANDARD EROSION CONTROL DETAILS AND/OR SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
 - PERMITS HAVE BEEN/WILL BE OBTAINED FROM NC DENR AND THE U.S. ARMY CORPS OF ENGINEERS FOR THE PROJECT. CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS.
 - LOCATIONS OF UTILITIES SHALL BE CONFIRMED BY FIELD MEASUREMENTS MADE SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO AS TO PERMIT REVISION TO CONSTRUCTION PLANS IF ACTUAL UTILITY LOCATIONS MAKE SUCH REVISIONS NECESSARY.
 - SEE GEOTECHNICAL REPORT DATED DEC 23, 2010 FOR EXCAVATION, DEWATERING, & FOUNDATION SUPPORT.

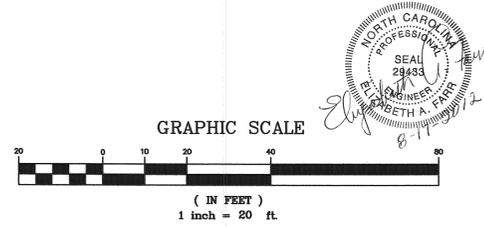
LEGEND

CENTERLINE	---
CHAIN LINK FENCE	---X---
CREEK	---
DISTURBED AREA LIMITS	---DL---
EASEMENT BOUNDARY	---
ELECTRIC SERVICE N/L	---OH N/L---
GIS BLDG	□
GIS LOT LINE	---
GIS R/W	---R/W---
INDEX CONTOUR	---150---
INTERMEDIATE CONTOUR	---150---
LOT NUMBER	⑥
OVERHEAD POWER LINE	---OH---
POWER POLE	○
ROLL CONCRETE CURB	---X---
SILT FENCE	---
SANITARY SEWER LINE	---SS---
SANITARY SEWER MANHOLE	⊙
STORM DRAIN HEADWALL	---
STORM DRAIN MANHOLE	⊙
STORM DRAIN DROP INLET	⊙
STORM DRAIN CATCH BASIN	⊙
STORM DRAIN PIPE	---
TREE OR VEGETATION	⊙
WATER MAIN GATE VALVE	⊙
WATER MAIN FIRE HYDRANT	⊙
WATER MAIN	---12" WATER---
WATER METER	⊙

**PRE-CAST
CONCRETE
BOX CULVERT**

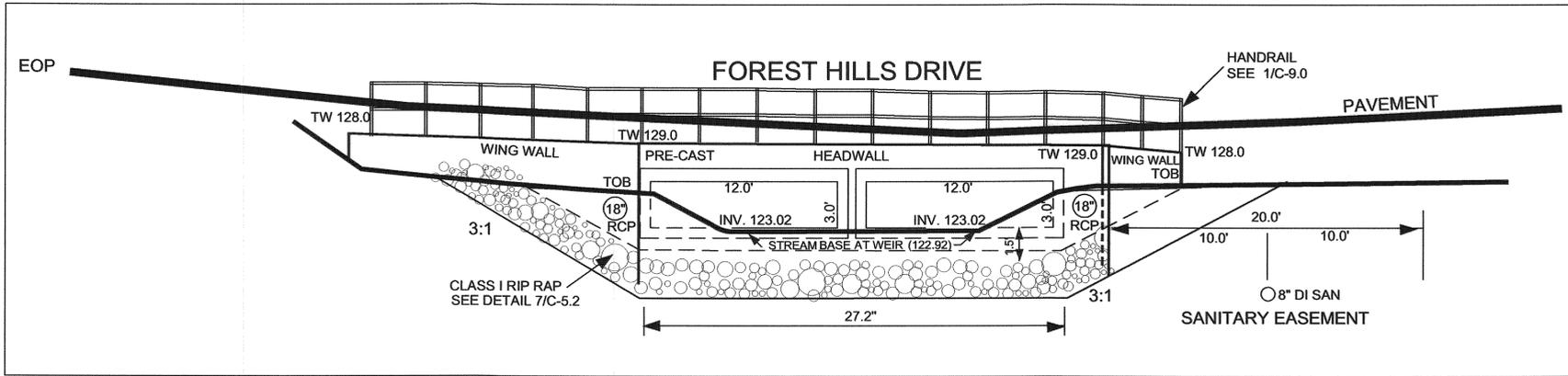
**STREAM
RESTORATION**

* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY

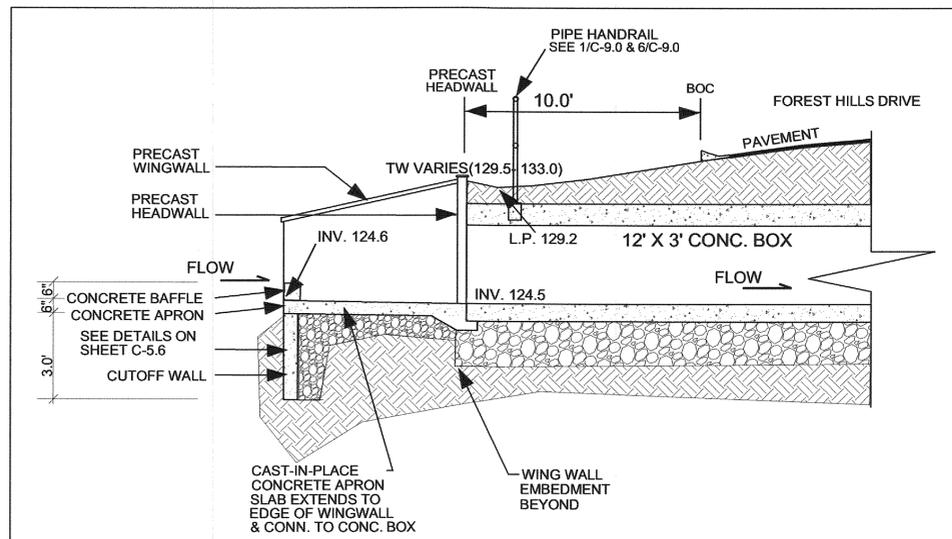


CULVERT/STREAM LAYOUT PLAN

<p>JEWELL ENGINEERING CONSULTANTS, PC POST OFFICE BOX 2294 KERNERSVILLE, NORTH CAROLINA 27285 (336) 996-9974 FAX: (336) 996-9976 NC LICENSE #: C-1842</p>	<p>REVISIONS</p> <p>08-17-12 PROP. EASEMENT UPDATE TO 0428-35-6294</p>	<p>JOB NO. 10-158-012</p> <p>DESIGNED 03-15-12 BY BAF</p> <p>CONST. SURVEY BY</p> <p>CHECKED BY CDJ</p> <p>SCALE: NONE</p>	<p>CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS</p> <p>FOREST HILLS DRIVE FAYETTEVILLE, NC</p>	<p>"C" SHEET NO. 5.0</p>
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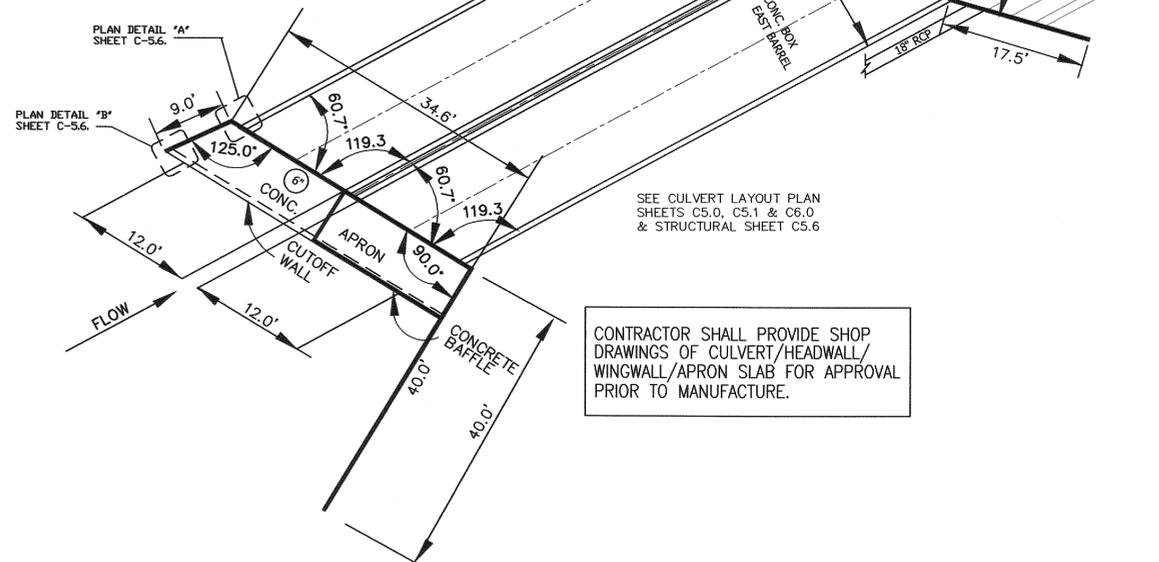


1 DOWNSTREAM STILLING BASIN, OUTLET & HEADWALLS CROSS SECTION FACING UPSTREAM
C-5.2 NOT TO SCALE

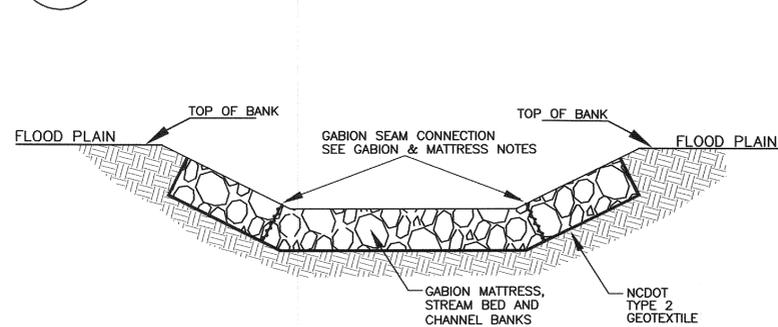


SEE SHEET C-5.6 FOR CULVERT AND SLAB STRUCTURAL DETAILS

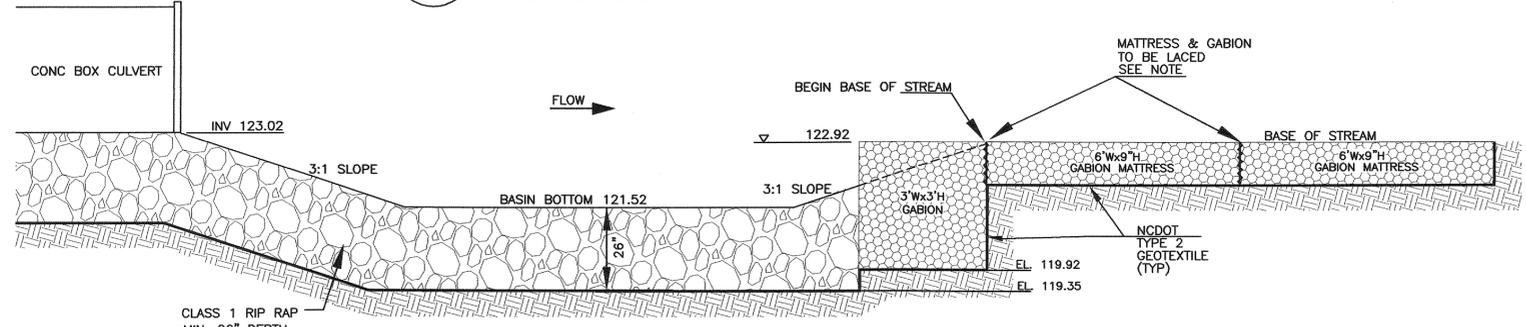
2 UPSTREAM CROSS SECTION VIEW OF CONCRETE BOX CULVERT AT APRON SLAB
C-5.2 NOT TO SCALE



4 HEADWALL/WINGWALL/CULVERT/APRON LAYOUT
C-5.2 NOT TO SCALE



3 STREAM CHANNEL AT GABION MATTRESS
C-5.2 NOT TO SCALE

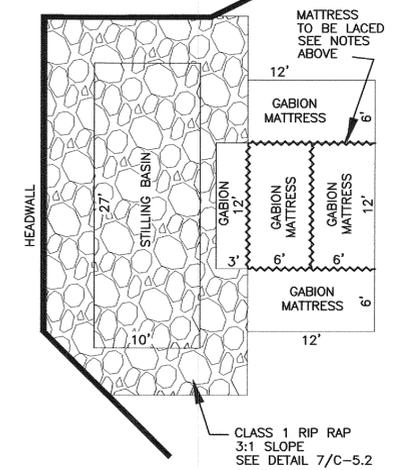


5 STILLING BASIN PROFILE
C-5.2 NOT TO SCALE

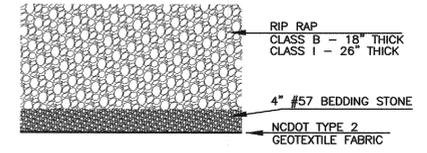
DOUBLE 12' SPAN x 3' RISE (INTERIOR DIMENSIONS)
PRE-CAST CONCRETE BOX CULVERT STRUCTURE
(MINIMUM INTERIOR AREA = 72 SQ. FT.)
ASSUMED DESIGN LIVE LOAD IS HS20-44

- GENERAL CONCRETE/CULVERT NOTES:**
- CULVERT PLACEMENT SHALL BEGIN AT OUTLET END OF THE CONCRETE BOX SECTIONS AND SHALL PROCEED UPSTREAM FOR THE CONCRETE BOX CULVERT. A UNIFORM GAP SHALL BE MAINTAINED BETWEEN PARALLEL CULVERT SECTIONS. THE GAP SHALL BE FILLED WITH FLOWABLE FILL (PER MFG DIRECTION) AFTER ALL SECTIONS HAVE BEEN INSTALLED.
 - CULVERTS SHALL BE INSTALLED AT SPECIFIED INVERTS BEGINNING AT DOWNSTREAM CONCRETE CULVERT SECTION OUTLET, PROCEEDING UPSTREAM FOR THE CONCRETE BOX FOLLOWING MFG INSTRUCTIONS AND GEOTECHNICAL RECOMMENDATIONS.
 - CONCRETE APRON AND CONCRETE BAFFLE INSTALLED ON UPSTREAM CULVERT END OVER THE CUTOFF WALL WITH NO GAPS BETWEEN THE APRON AND THE CUTOFF WALL OR BETWEEN THE APRON AND THE BAFFLE WALL.

- GABION AND MATTRESS NOTES:**
- Gabions and mattresses shall be Maccferri brand manufactured from 8x10 double twisted hexagonal woven steel wire mesh, as per ASTM A975-97 (or engineer-approved equal).
 - Gabion baskets and mattresses shall be galvanized and PVC-coated.
 - Gabions and mattresses shall be installed in strict accordance with manufacturer recommended procedures.
 - Contractor shall follow Maccferri assembly video which shows installation and modification procedures.
 - Gabion baskets and mattresses shall be separated from surrounding soil with a geotextile fabric meeting the following specification: NCDOT TYPE 2 GEOTEXTILE.
 - Stone shall be placed in gabions and mattresses in accordance with the latest version of the Maccferri Product Installation Guide. Stones along the exposed gabion faces shall be hand-placed to achieve a dense, neat, and compact appearance.
 - NCDOT Class "B" stone shall be hand placed in gabion baskets and mattresses to achieve a densely packed system that minimizes voids. Smaller stones (no smaller than 4" minimum dimension) than those specified for Class "B" may be used to fill voids where necessary.
 - Gabions and mattresses shall be fastened to each other by using either lacing wire or ring fasteners, according to manufacturer recommended procedure.
 - Baskets should be pulled tightly together during the fastening.
 - When using ring fasteners, the use of either a mechanical or pneumatic fastening tool is required. Spacing of the rings shall be in accordance with ASTM A975-97 Table 2, Panel to Panel connection, Pull-Apart Resistance. In any case, ring fastener spacing shall not exceed six inches.
 - Care should be taken to ensure the steel ring is completely closed after installation. When this is not possible, connection must be complemented with lacing wire.
 - Lacing shall include alternating double and single loops through every mesh opening approximately every six inches.



6 STILLING BASIN LAYOUT
C-5.2 NOT TO SCALE



7 RIP RAP DETAIL (TYP)
C-5.2 NOT TO SCALE

BOX CULVERT/BASIN/SLAB LAYOUT

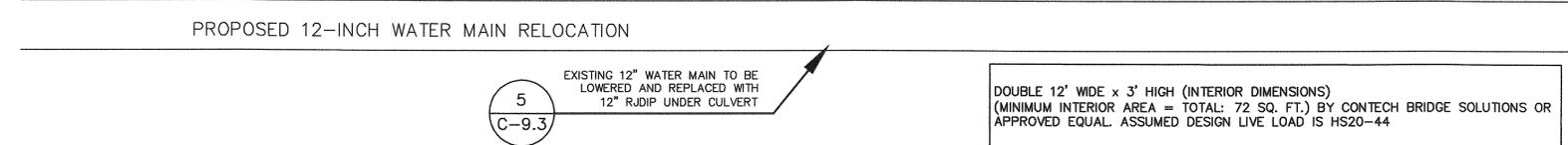
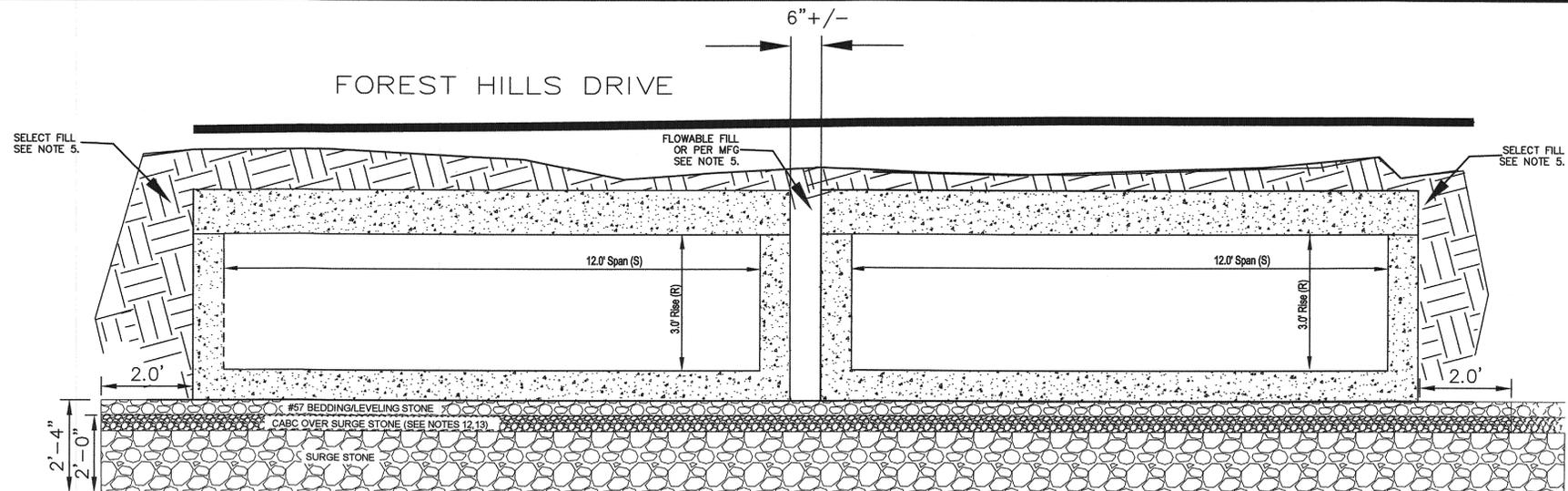
JEWELL
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POST OFFICE BOX 2294 (336) 986-9974 NC LICENSE # C-1842
KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 986-9978

REVISIONS	JOB NO. 10-158-012
DESIGNED 03-15-12 BY BAF	
CONST. SURVEY BY	
CHECKED BY CDJ	
SCALE: NONE	

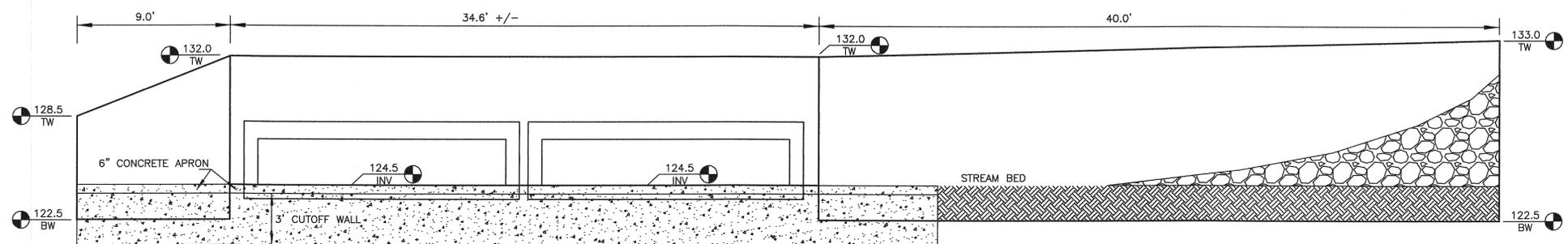
CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NC

"C"
SHEET NO.
5.2

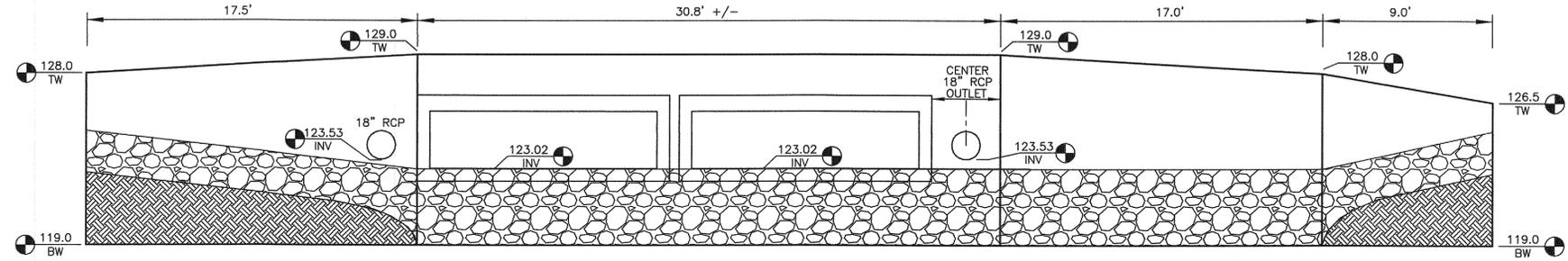




1 TYPICAL PRECAST CONCRETE BOX CULVERT (PCBC) SECTION
C-5.3 NOT TO SCALE



2 UPSTREAM ELEVATION (LOOKING DOWNSTREAM)
C-5.3 NOT TO SCALE



3 DOWNSTREAM ELEVATION (LOOKING UPSTREAM)
C-5.3 NOT TO SCALE

- PCBC NOTES:**
- PRIOR TO PCBC INSTALLATION, SUBGRADE INVESTIGATION MUST BE PERFORMED BY GEOTECH TO CONFIRM FOUNDATION CONDITIONS. THE SUBGRADE SHALL BE UNDERCUT TO SUITABLE SOILS AT GEOTECHNICAL DIRECTION. GEOTECH WILL ALSO DETERMINE APPROPRIATE FOUNDATION SUPPORT AT NEW WATER LINE.
 - WHEN JOINING PCBC SECTIONS TOGETHER, A BOX PULLER, COME-A-LONG OR OTHER SIMILAR METHOD SHALL BE USED. CONSTRUCTION EQUIPMENT, SUCH AS BACKHOES, FRONT-END LOADERS, ETC. SHALL NOT HAVE DIRECT CONTACT WITH THE PRECAST CONCRETE BOX SECTIONS.
 - JOINTS BETWEEN CONSECUTIVE PRECAST BOX SECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS AND/OR CONTRACT SPECIFICATIONS. CONSECUTIVE BOX SECTIONS SHALL BE ASSEMBLED TOGETHER SUCH THAT THE JOINT SEALANT MATERIAL PLACED IN THE TONGUE AND GROOVE OR OTHER JOINT SPACING WILL PROVIDE A SOIL TIGHT SYSTEM.
 - ALL JOINTS IN PCBC SHALL BE SOIL TIGHT SO THAT NO SOIL CAN SEEP INTO OR THROUGH THE JOINTS.
 - BACKFILL SHALL BE PLACED UNIFORMLY ON EACH SIDE OF THE CULVERT SECTIONS AS INSTALLATION PROGRESSES PER THE MANUFACTURER'S SPECIFICATIONS (SEE ALSO GEOTECHNICAL REPORT). PLACE FLOWABLE FILL BETWEEN PARALLEL SECTIONS OF BOXES. USE FLOWABLE FILL OR APPROVED EQUAL AT OUTSIDE UPSTREAM AND DOWNSTREAM BETWEEN CULVERT END FACES.
 - LIFT HOLES SHALL BE FILLED WITH A HOLE PLUG AND/OR GROUT MIXTURE.
 - ALL PCBC SECTION COMPONENTS SHALL BE INSPECTED FOR APPROVAL BY ENGINEER OR DESIGNATED CITY INSPECTOR. CONTRACTOR SHALL NOT PLACE BOX CULVERT COMPONENTS INTO TRENCH WITHOUT SUCH INSPECTION AND APPROVAL.
 - IF A PCBC SECTION HAS BEEN DAMAGED IT SHALL BE SET ASIDE AND RECORDED TO ENSURE ITS PROPER ORDER IN THE INSTALLATION SEQUENCE. IN SOME CASES DAMAGED ENDS, CHIPS, AND CRACKS DO NOT PASS THROUGH THE WALL AND CAN BE REPAIRED ON SITE, WHILE OTHERS MAY BE IRREPARABLE AND MAY HAVE TO BE RETURNED TO SUPPLIER FOR REPLACEMENT. ENGINEER SHALL DETERMINE WHEN REPAIRS ARE AUTHORIZED.
 - ALL GRANULAR BEDDING AND BACKFILL MATERIAL SHALL BE SEPARATED FROM SURROUNDING SOIL WITH 8.0 OZ, NON-WOVEN GEOTEXTILE FABRIC WITH 12" OVERLAP AT ALL SEAMS.
 - CONTRACTOR SHALL OBTAIN & SUBMIT FOR REVIEW SHOP DRAWINGS FROM CULVERT SUPPLIER SHOWING HOW THE CONCRETE CULVERT WILL MEET THE PROJECT REQUIREMENTS. CONTRACTOR SHALL ALLOW TWO WEEKS (MIN) FOR REVIEW AND APPROVAL OF SHOP DRAWINGS PRIOR TO ORDERING CULVERTS.
 - LOOSE WET FOUNDATION SUBGRADE SOILS ENCOUNTERED ALONG THE ALIGNMENT OF THE NEW CULVERT SHALL BE UNDERCUT AT LEAST 2- FEET AND THEN STABILIZED BY PLACING A SINGLE LIFT (MAX. LIFT THICKNESS OF 2- FEET) OF SURGE STONE FILL ACROSS THE UNDERCUT AREA. THE UNDERCUT AREA SHOULD EXTEND A LATERAL DISTANCE OF AT LEAST 2- FEET BEYOND THE EDGE OF THE CULVERT (SEE GEOTECH REPORT).
 - THE TOP OF THE SURGE STONE SHALL BE "CHOKED-OFF" WITH A SUFFICIENT AMOUNT OF AGGREGATE BASE COURSE (ABC) STONE TO INFILL THE UPPER VOIDS IN THE SURGE STONE. THE ABC STONE SHOULD BE VIBRATORY COMPACTED IN-PLACE WITH A 10-TON SMOOTH STEEL DRUM VIBRATORY ROLLER TO ESTABLISH A DENSE-STABLE FOUNDATION SUBGRADE FOR SUPPORT OF THE DOUBLE REINFORCED CONCRETE BOX CULVERT. GEOTECH SHALL INSPECT SURGE STONE TO CHECK THAT IT IS SUFFICIENTLY "CHOKED-OFF," AND WILL DETERMINE IF ADDITIONAL ABC IS REQUIRED (SEE GEOTECH REPORT).
 - SURGE STONE SHALL CONSIST OF A CRUSHED ROCK MIXTURE CONTAINING A MINIMUM STONE SIZE OF ABOUT 2-INCHES, A MAXIMUM STONE SIZE OF 12-INCHES, AND A MID-RANGE SIZE OF ABOUT 6 TO 8-INCHES.
 - PLACE CULVERT AT SPECIFIED INVERT AND LAYOUT ON TOP OF 4"-6" OF GRANULAR STONE OVER THE ABC/SURGE STONE TO PROVIDE UNIFORM BEARING & LEVELING SURFACE FOR THE PRECAST CONCRETE BOX SECTION.

BOX CULVERT CROSS SECTION/ELEVATION

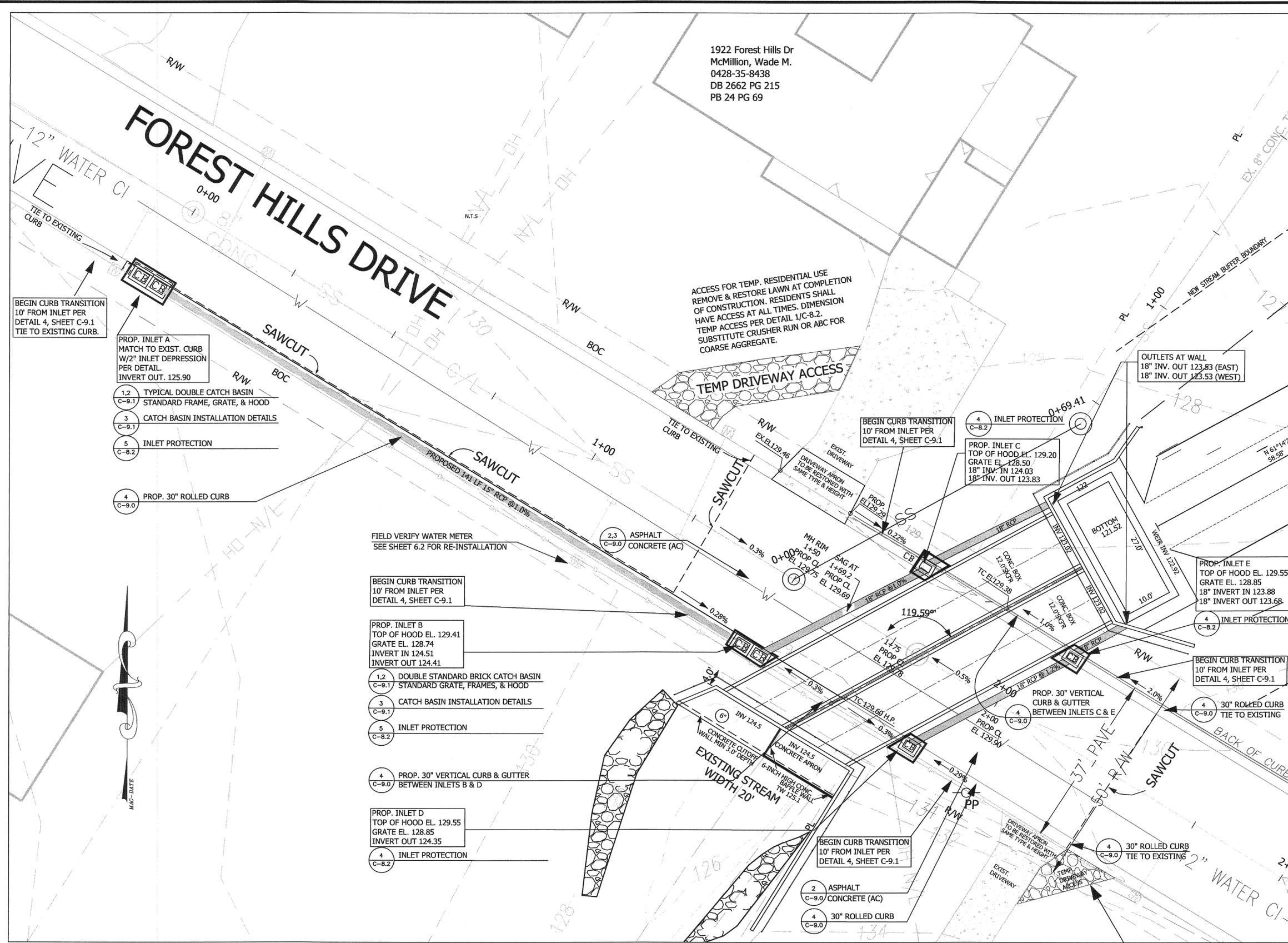
JEWELL
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(336) 996-8874
FAX: (336) 996-8878
NC LICENSE # 0-1945

REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NORTH CAROLINA

"C"
SHEET NO.
5.3





1922 Forest Hills Dr
 McMillion, Wade M.
 0428-35-8438
 DB 2662 PG 215
 PB 24 PG 69

GENERAL NOTES:

- CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
- CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO THE ENGINEER, DISCREPANCIES AND CONDITIONS THAT VARY FROM INFORMATION SHOWN AND SPECIFIED THAT COULD ADVERSELY AFFECT THE PERFORMANCE OF THE WORK REQUIRED.
- STORM DRAIN PIPE LENGTHS ARE TO INSIDE WALL OF STRUCTURES SUCH AS INLETS OR BOX CULVERTS (WHICH ARE ALONG CENTERLINE OF PIPE).
- CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY POWER COMPANY FOR ANY CONFLICTS.
- ALL UTILITY WORK TO BE PERFORMED BY A CERTIFIED UTILITY CONTRACTOR APPROVED BY THE CITY OF FAYETTEVILLE. ALL UTILITY WORK, WATER AND SEWER TO BE INSPECTED BY THE CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION (PWC). EXISTING 12-INCH AND WATER LINE SERVICES TO REMAIN IN SERVICE DURING CONSTRUCTION. CALL CITY OF FAYETTEVILLE PWC FOR DIRECTION CONCERNING WATER LINE IMPACTS DUE TO INTERRUPTION, INSTALLATION AND PRIOR TO ANY CONSTRUCTION NEAR WATER AND/OR SEWER UTILITIES.
- ALL EROSION CONTROL MEASURES SHALL MEET THE CITY OF FAYETTEVILLE STANDARD EROSION CONTROL DETAILS AND/OR SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
- PERMITS HAVE BEEN/WILL BE OBTAINED FROM NC DENR AND THE U.S. ARMY CORPS OF ENGINEERS FOR THE PROJECT. CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS.
- LOCATIONS OF UTILITIES SHALL BE CONFIRMED BY FIELD MEASUREMENTS MADE SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO AS TO PERMIT REVISION TO CONSTRUCTION PLANS IF ACTUAL UTILITY LOCATIONS MAKE SUCH REVISIONS NECESSARY.
- GEOTECH TO REVIEW, OBSERVE, & APPROVE FOUNDATION CONDITIONS TO MEET DESIGN CONSTRAINTS FOR BEARING CAPACITY.

NOTES FOR LOCAL DRAINAGE IMPROVEMENTS:

- CONSTRUCT 30" VERTICAL CURB BETWEEN CURB INLETS B & D AND C & E. BEGIN TRANSITION FOR DEPRESSED CURB INLETS AND TRANSITION FROM ROLLED TO VERTICAL CURB TEN FEET EITHER SIDE OF CENTERLINE OF PROPOSED INLETS PER DETAIL #4 ON SHEET C-9.1. ALL OTHER LOCATIONS, INSTALL 30" ROLLED CURB.
- WHERE CURB IS BUILT ADJACENT TO ROADWAY THAT HAS NOT BEEN DEMOLISHED, MATCH EDGE OF CURB TO EXISTING ROADWAY GRADES.
- WHERE ROADWAY HAS BEEN DEMOLISHED FOR SANITARY SEWER, WATER LINE AND CULVERT CONSTRUCTION, BEGINNING AT APPROXIMATELY STATION 1+00, REBUILD PER ROADWAY CENTERLINE AND CURB ELEVATIONS AS NOTED.

PIPE	SIZE	UPSTR INV	DWNSTRM INV	LENGTH (FT)	SLOPE (%)
A-B	15" RCP	125.9	124.51	142	1.0
B-C	18" RCP	124.41	124.03	38	1.0
C-OUTLET	18" RCP	123.83	123.53	30	1.0
D-E	18" RCP	124.35	123.88	38	1.2
E-OUTLET	18" RCP	123.68	123.53	14	1.1

INLET	C/L RD STATION AT CENTER OF INLET	TOP OF CURB (EL)	C/L ROAD STATION	C/L ROAD (EL)
A (rt)	0+00.0	EXIST.	0+00.0	130.91 *
B (rt)	1+50.0	129.41	1+50.0	129.75
C (lt)	1+72.45	129.22	1+53.3	129.69 (L.P.)
D (rt)	1+90.30	129.55	1+75.0	129.78
E (lt)	2+09.21	129.55	2+00.0	129.9

* APPROXIMATE ELEVATIONS, TIE INTO EXISTING PAVEMENT AND CURB LINE AND CULVERT CONSTRUCTION, BEGINNING AT APPROXIMATELY STATION 1+00, REBUILD PER ROADWAY CENTERLINE AND CURB ELEVATIONS AS NOTED.

GRAPHIC SCALE

1 inch = 10 ft.



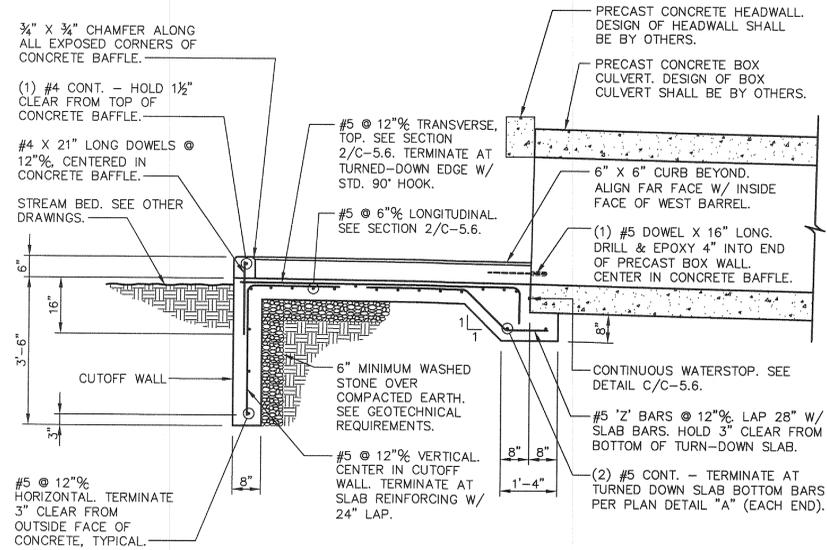
SURFACE DRAINAGE IMPROVEMENTS

JEWELL
 ENGINEERING CONSULTANTS, PC
 POST OFFICE BOX 2294 KERNERSVILLE, NORTH CAROLINA 27285
 (336) 998-9974 FAX: (336) 998-9978 NC LICENSE # C-1842

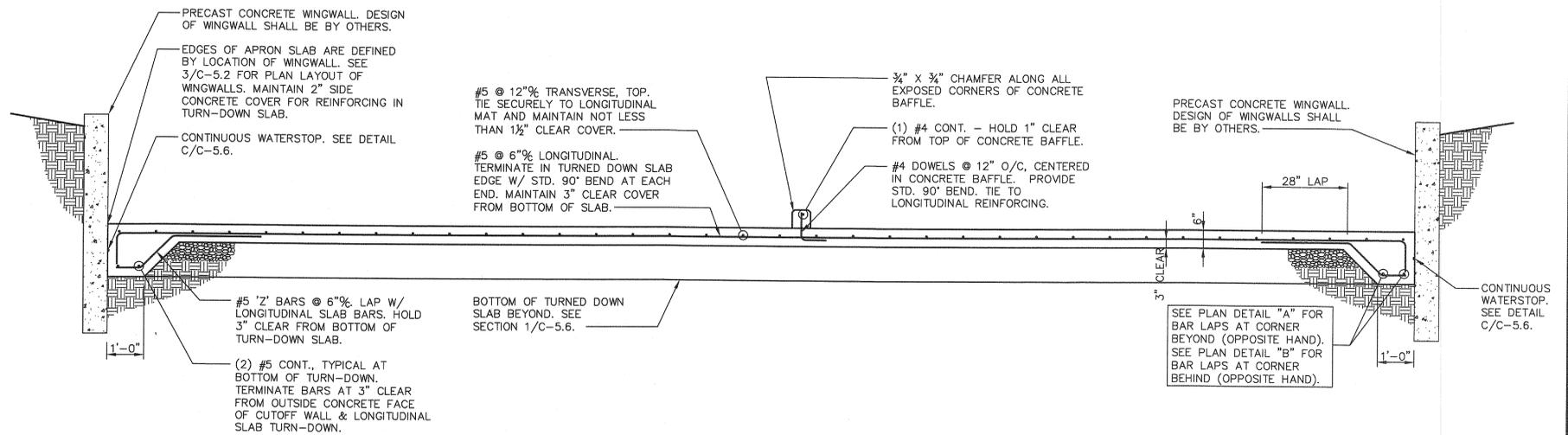
REVISIONS	DESIGNED	BY
	10-158-012	BY CCL,BAF
	03-15-12	BY CCL,BAF
		BY CDJ
		BY CDJ
		SCALE: NONE

CITY OF FAYETTEVILLE
 DRAINAGE IMPROVEMENTS
 FOREST HILLS DRIVE
 FAYETTEVILLE, NC

"C"
 SHEET NO.
 5.4



1 UPSTREAM APRON SLAB CROSS SECTION
C-5.6 1/2" = 1'-0"



2 UPSTREAM APRON SLAB LONGITUDINAL SECTION
C-5.6 1/2" = 1'-0"

APRON SLAB NOTES:

SEE SHEET C-5.2 FOR ADDITIONAL GENERAL NOTES PERTAINING TO THE CONSTRUCTION AND PLACEMENT OF THE PRECAST CONCRETE CULVERTS. SEE SHEETS C-5.2 AND C5.5 FOR LAYOUT OF PRECAST CONCRETE HEADWALL AND WING WALLS TO BE DESIGNED BY OTHERS. CONSTRUCTION OF APRON SLAB AND CUTOFF WALL ARE PRESUMED TO BEGIN AFTER PRECAST CONCRETE CULVERTS AND WING WALLS ARE IN PLACE. PRECAST CONCRETE WING WALLS AND CULVERTS SHALL SERVE AS THE BOUNDARIES FOR THREE SIDES OF THE APRON SLAB.

A. FOUNDATIONS

- EXCAVATION FOR APRON SLAB SHALL BE MAINTAINED IN A DRY CONDITION UNTIL CONCRETE IS PLACED. WHENEVER POSSIBLE, THE EXCAVATION SHALL BE MADE, THE BEARING SURFACE INSPECTED, AND THE CONCRETE PLACED THE SAME DAY. IF EXCAVATIONS MUST REMAIN OPEN OVERNIGHT, OR IF RAINFALL OR GROUNDWATER INTRUSION IS IMMINENT BEFORE PLACEMENT OF THE CONCRETE, A 2-INCH THICK "MUD-MAT" OF LEAN CONCRETE SHALL BE PLACED IN THE EXCAVATION AFTER OVER-EXCAVATING 2-INCHES IN DEPTH. ANY SOIL WHICH IS SOFTENED DUE TO MOISTURE EXPOSURE SHALL BE UNDERCUT TO FIRM SOIL AND THE DEPTH OF THE FOOTING INCREASED TO ACCOMMODATE THE SOFT SOIL THAT WAS REMOVED.

B. CAST-IN-PLACE CONCRETE

- CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI.
- CONCRETE SHALL BE MADE IN ACCORDANCE WITH DESIGN MIXES WHICH ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CASTING ANY CONCRETE. MIX DESIGNS SHALL BE PREPARED AND REPORTED BY A TESTING LABORATORY ENGAGED BY, AND AT THE EXPENSE OF THE CONTRACTOR. MIX DESIGNS SHALL INCLUDE A LETTER PREPARED BY AN INDEPENDENT TESTING LABORATORY CERTIFYING COMPLIANCE OF DESIGN MIX WITH APPROPRIATE ACI STANDARDS AND PROCEDURES, AND LIST ALL MATERIALS AND EXACT PROPORTIONS OF EACH DESIGN MIX. A RECENT SIEVE ANALYSIS OF BOTH THE FINE AND COURSE AGGREGATES SHALL BE SUBMITTED WITH THE DESIGN MIX. CONCRETE MIX DESIGN PROPORTIONS SHALL RESULT IN A 4" MAXIMUM SLUMP AT THE POINT OF PLACEMENT. CONCRETE MIXES USED IN WALLS CONTAINING A HIGH-RANGE WATER REDUCER SHALL HAVE A MAXIMUM SLUMP OF 6". THE MINIMUM CEMENT CONTENT OF ALL CONCRETE SHALL BE 520 LBS. OF CEMENT PER CUBIC YARD.
- NO CALCIUM CHLORIDE MAY BE ADDED TO THE MIX AT ANY TIME. ADMIXTURES WHICH RETARD OR ACCELERATE THE SET OF CONCRETE IS NOT PERMITTED. CONCRETE SHALL HAVE A UNIT WEIGHT OF 145 PCF. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45. ALL CONCRETE WHICH IS SUBJECT TO CONDITIONS OF FREEZING OR DE-ICING SALTS SHALL CONTAIN ENTRAINED AIR (±6%). DO NOT USE HIGH-RANGE WATER REDUCING ADMIXTURES IN AIR-ENTRAINED CONCRETE. ALL DESIGN MIXES SHALL BE PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318, CHAPTER 5.
- SELECTION OF CONCRETE MATERIALS, MIX ADMIXTURES, QUALITY CONTROL, TESTING, FORMWORK DESIGN AND CONSTRUCTION, CURING FINISHING, CLEANING AND PATCHING SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF THE AMERICAN CONCRETE INSTITUTE (ACI).

- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CONCRETE ISOLATION MATERIAL TO SEPARATE CONCRETE POURS AS REQUIRED WHETHER SHOWN IN SECTIONS OR NOT.
- CONCRETE MATERIALS SHALL CONFORM TO THE FOLLOWING STANDARDS:
CEMENT: ASTM C150, TYPE 1 - NORMAL PORTLAND TYPE
FINE/COURSE AGGREGATES: ASTM C33
AGGREGATES SHALL BE CLEAN, NATURAL, AND FREE FROM LOAM, CLAY, OR OTHER DELETERIOUS SUBSTANCES. WATER SHALL BE CLEAN AND NOT DETRIMENTAL TO CONCRETE.
- ADDITION OF WATER TO THE CONCRETE AT THE JOB SITE FOR THE PURPOSE OF INCREASING THE SLUMP OR FOR RETEMPERING CONCRETE WHICH HAS BEGUN TO SET IS STRICTLY PROHIBITED.

C. REINFORCING STEEL

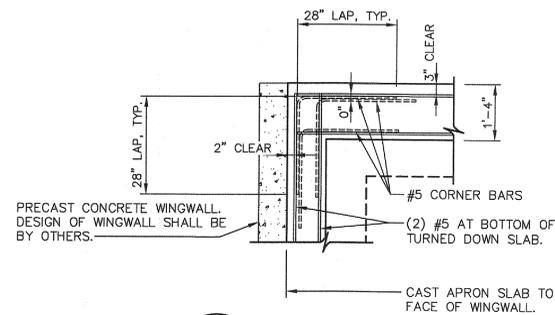
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. LAP 52 X BAR DIAMETERS AT SPLICES UNLESS OTHERWISE NOTED ON THE DRAWING.
- ALL REINFORCING STEEL SHALL BE SECURELY TIED TO PREVENT DISLOCATION DURING THE PLACING OPERATION.
- REINFORCING STEEL SHALL BE CLEAN OF MUD, DEBRIS, LOOSE RUST, CEMENT GROUT, OR ANY OTHER MATERIAL WHICH MAY INHIBIT BOND BETWEEN THE STEEL AND CONCRETE.
- ALL REINFORCING SHALL BE SECURELY TIED AND ANCHORED IN PLACE TO PREVENT DISLOCATION DURING THE PLACING OPERATION. CHAIRS/BOLSTERS SHALL BE OF NON-CORROSIVE MATERIAL.

D. WATERSTOPS

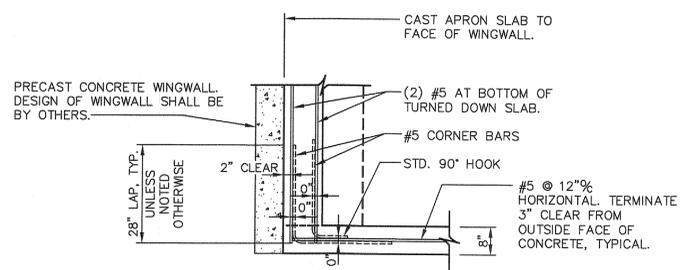
- ACTIVE BENTONITE/BUTYL RUBBER BASED WATERSTOP SHALL BE VOLCLAY RX-102 OR ENGINEER-APPROVED EQUAL. WATERSTOP AND WATERSTOP ADHESIVE SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS. A MINIMUM OF 2" CONCRETE COVERAGE IS REQUIRED.
- ALL CONCRETE SURFACES TO RECEIVE WATERSTOPS SHALL BE CLEANED OF DIRT, ROCKS, MUD, ICE, AND WATER TO A SMOOTH SURFACE FREE FROM VOIDS AND PROJECTIONS. PRIOR TO PLACING THE WATERSTOP MATERIAL, APPLY WATERSTOP ADHESIVE TO A DRY CONCRETE SURFACE.
- PLACE WATERSTOP AGAINST THE DRIED ADHESIVE BY FIRMLY PRESSING THE MATERIAL INTO PLACE. MAINTAIN THE MINIMUM RECOMMENDED CONCRETE COVERAGE OVER THE ENTIRE LENGTH OF THE WATERSTOP. PLACE MATERIAL IN MAXIMUM PRACTICAL LENGTHS TO MINIMIZE END JOINTS.
- AT END JOINTS, TIGHTLY BUTT ENDS TOGETHER TO FORM A CONTINUOUS WATERSTOP. DO NOT OVERLAP ENDS. CUT MATERIAL WITH A SHARP KNIFE OR UTILITY BLADE TO FIT ENDS TOGETHER WITHOUT OVERLAPPING.
- WHERE REQUIRED, INSTALL WATERSTOP AROUND ALL APPLICABLE PIPES OR OTHER MECHANICAL PENETRATIONS.
- PROTECT INSTALLED WATERSTOP FROM PRE-HYDRATION PRIOR TO CONCRETE PLACEMENT.
- PLACE CONCRETE AS SOON AS POSSIBLE TO ENCAPSULATE WATERSTOP.

E. MISCELLANEOUS ITEMS

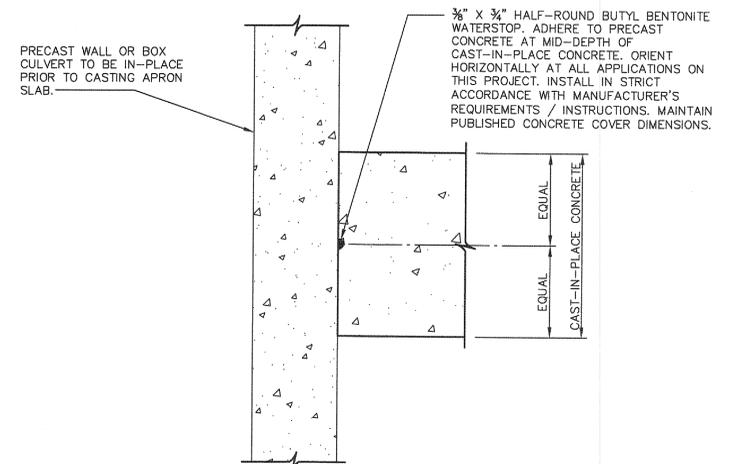
- "PROVIDE" SHALL BE INTERPRETED TO MEAN FURNISH AND INSTALL UNLESS OTHERWISE NOTED.



A PLAN DETAIL
C-5.6 1/2" = 1'-0"

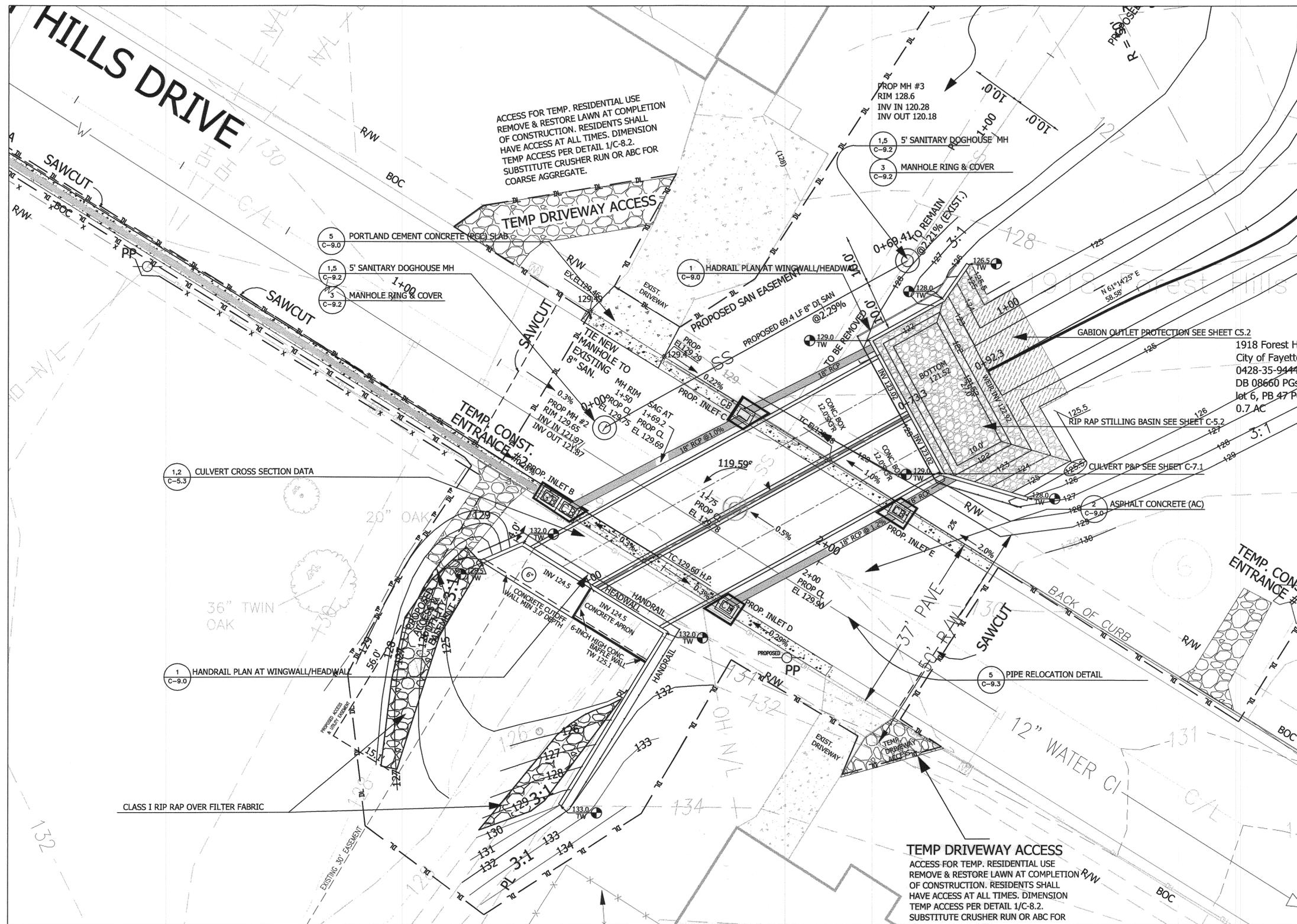


B PLAN DETAIL
C-5.6 1/2" = 1'-0"



C DETAIL
C-5.6 1 1/2" = 1'-0"

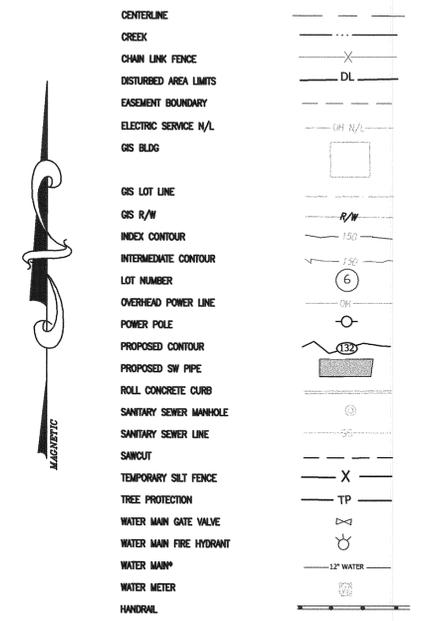
DATE	
REVISIONS	
MARK	
ENGINEERED CONCEPTS POST OFFICE BOX 35286 GREENSBORO, NC 27425-5286 OFFICE 336 605 8020 FAX 336 605 9392 WWW.ENGCONCEPTS.COM	
CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS FOREST HILLS DRIVE FAYETTEVILLE, NORTH CAROLINA APRON SLAB SECTIONS, DETAILS AND NOTES	
JOB NO.	11068
DESIGNED BY:	PBA
DRAWN BY:	JDL
APPROVED BY:	PBA
DATE:	3/14/2012
SHEET NO.	C-5.6
OF	



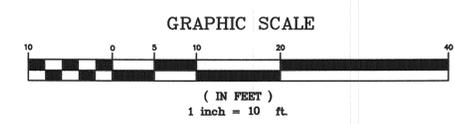
- GENERAL NOTES:**
- CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
 - CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO THE ENGINEER, DISCREPANCIES AND CONDITIONS THAT VARY FROM INFORMATION SHOWN AND SPECIFIED THAT COULD ADVERSELY AFFECT THE PERFORMANCE OF THE WORK REQUIRED.
 - DIMENSIONS AND NORTHING/EASTING COORDINATES SHOWN ARE TO CENTERLINE OF STRUCTURES SUCH AS INLETS, MANHOLES, OR END OF PIPE RUNS AS APPLICABLE (UNLESS OTHERWISE NOTED).
 - CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. POWER POLE RELOCATION BY OTHERS. NOTIFY POWER COMPANY FOR COORDINATION OF CULVERT INSTALLATION AND ANY POTENTIAL UTILITY CONFLICTS.
 - ALL UTILITY WORK TO BE PERFORMED BY A CERTIFIED UTILITY CONTRACTOR APPROVED BY THE CITY OF FAYETTEVILLE. ALL UTILITY WORK, WATER AND SEWER TO BE INSPECTED BY THE CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION (PWC). EXISTING 12-INCH AND WATER LINE SERVICES TO REMAIN IN SERVICE DURING CONSTRUCTION. CALL CITY OF FAYETTEVILLE PWC FOR DIRECTION CONCERNING WATER LINE IMPACTS DUE TO INTERRUPTION, INSTALLATION AND PRIOR TO ANY CONSTRUCTION NEAR WATER AND/OR SEWER UTILITIES.
 - ALL EROSION CONTROL MEASURES SHALL MEET THE CITY OF FAYETTEVILLE STANDARD EROSION CONTROL DETAILS AND/OR SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
 - PERMITS HAVE BEEN OBTAINED FROM NC DENR DWQ AND THE U.S. ARMY CORPS OF ENGINEERS FOR THE PROJECT. CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS.
 - LOCATIONS OF UTILITIES SHALL BE CONFIRMED BY FIELD MEASUREMENTS MADE SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO AS TO PERMIT REVISION TO CONSTRUCTION PLANS IF ACTUAL UTILITY LOCATIONS MAKE SUCH REVISIONS NECESSARY.
 - SEE GEOTECHNICAL REPORT DATED DEC 23, 2010 FOR EXCAVATION, DEWATERING, & FOUNDATION SUPPORT.

- DEWATERING**
- PUMP FROM SUMP PITS OUTSIDE OF EXCAVATION LIMITS.
 - PRIOR TO REMOVAL OF EXISTING CULVERT, SURFACE WATER TABLE SHOULD BE LOWERED 2' BELOW THE EXPECTED EXCAVATION DEPTH; EFFECTIVENESS OF DEWATERING SHOULD BE VERIFIED (SEE GEOTECHNICAL REPORT).
 - DEWATERING SHALL BE CONTINUOUSLY MAINTAINED, CHECK WITH AUGER BORINGS AS EXCAVATION PROCEEDS PER GEOTECH RECOMMENDATIONS.
 - MEASURES SHALL BE MAINTAINED UNTIL SATISFACTORY SUBGRADES ARE ESTABLISHED AND CONCRETE AND PRECAST STRUCTURES ARE PLACED.
 - SIDEWALL EXCAVATION: STEPBACK W/BENCHES, CONTRACTOR TO PROVIDE BRACING AND SHORING IN ACCORDANCE WITH THE LATEST OSHA REQUIREMENTS PROVIDED BY 29 CFR 1926.

LEGEND



* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY

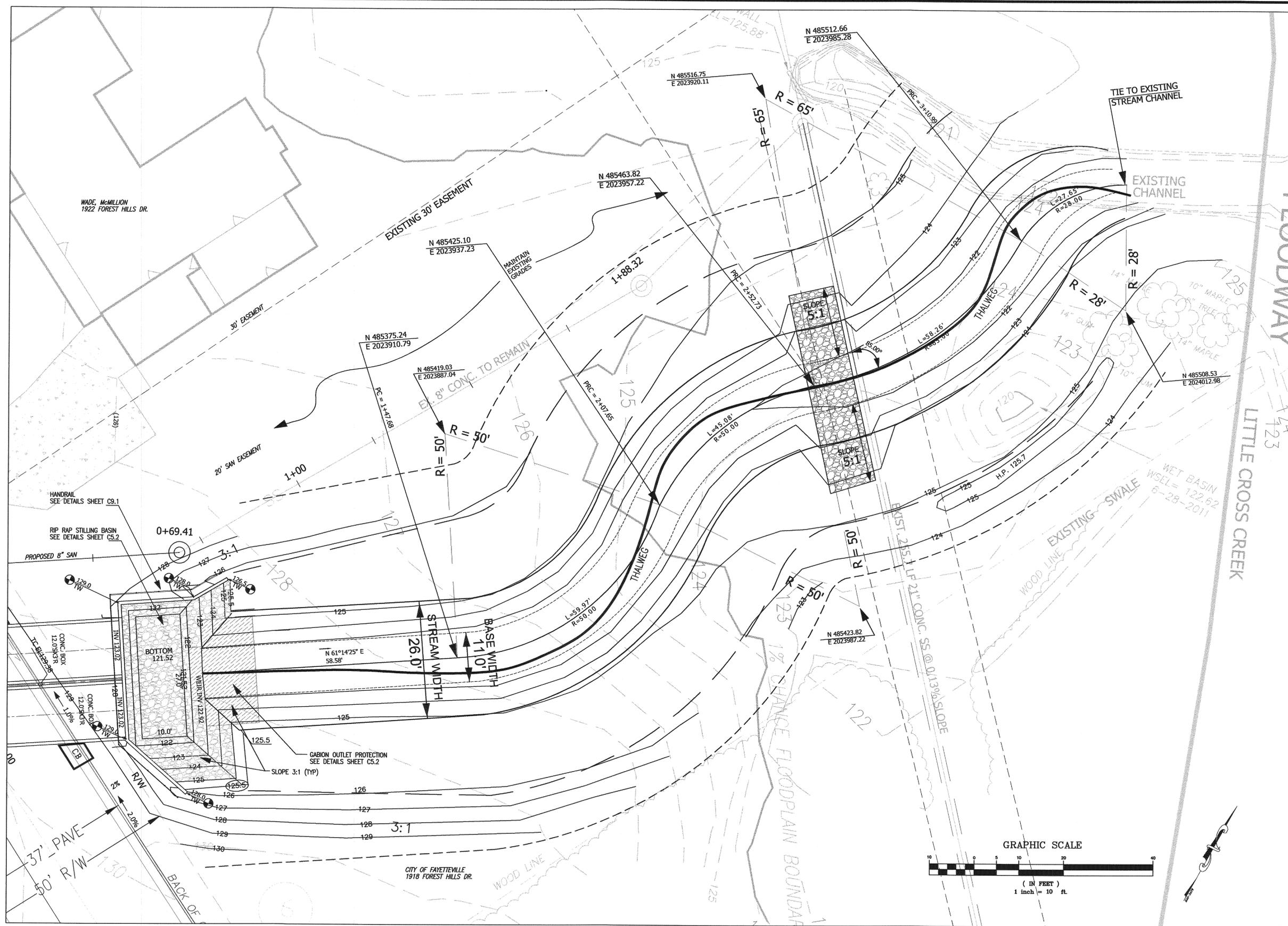


GRADING & UTILITIES PLAN AT ROAD CULVERT

JEWELL
 ENGINEERING CONSULTANTS, PC
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 KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 998-8976
 NO LICENSE # C-1842

REVISIONS	JOB NO. 10-158-012
08-17-12 PROP. EASEMENT UPDATE TO 0428-35-6294	DESIGNED 05-21-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS		"C"
FOREST HILLS DRIVE FAYETTEVILLE, NC		SHEET NO.
		6.0

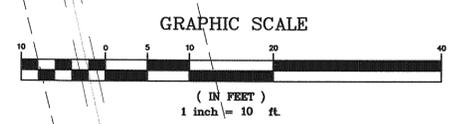


- GENERAL NOTES:**
- CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIAR WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
 - CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO THE ENGINEER, DISCREPANCIES AND CONDITIONS THAT VARY FROM INFORMATION SHOWN AND SPECIFIED THAT COULD ADVERSELY AFFECT THE PERFORMANCE OF THE WORK REQUIRED.
 - DIMENSIONS AND NORTHING/EASTING COORDINATES SHOWN ARE TO CENTERLINE OF STRUCTURES SUCH AS INLETS, MANHOLES, OR END OF PIPE RUNS AS APPLICABLE (UNLESS OTHERWISE NOTED).
 - CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY POWER COMPANY FOR ANY CONFLICTS.
 - ALL UTILITY WORK TO BE PERFORMED BY A CERTIFIED UTILITY CONTRACTOR APPROVED BY THE CITY OF FAYETTEVILLE. ALL UTILITY WORK, WATER AND SEWER TO BE INSPECTED BY THE CITY OF FAYETTEVILLE PUBLIC WORKS COMMISSION (PWC). EXISTING 12-INCH AND WATER LINE SERVICES TO REMAIN IN SERVICE DURING CONSTRUCTION. CALL CITY OF FAYETTEVILLE PWC FOR DIRECTION CONCERNING WATER LINE IMPACTS DUE TO INTERRUPTION, INSTALLATION AND PRIOR TO ANY CONSTRUCTION NEAR WATER AND/OR SEWER UTILITIES.
 - ALL EROSION CONTROL MEASURES SHALL MEET THE CITY OF FAYETTEVILLE STANDARD EROSION CONTROL DETAILS AND/OR SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
 - PERMITS HAVE BEEN/ WILL BE OBTAINED FROM NCDENR AND THE U.S. ARMY CORPS OF ENGINEERS FOR THE PROJECT. CONTRACTOR SHALL COMPLY WITH ALL PERMIT CONDITIONS.
 - LOCATIONS OF UTILITIES SHALL BE CONFIRMED BY FIELD MEASUREMENTS MADE SUFFICIENTLY IN ADVANCE OF CONSTRUCTION SO AS TO PERMIT REVISION TO CONSTRUCTION PLANS IF ACTUAL UTILITY LOCATIONS MAKE SUCH REVISIONS NECESSARY.
 - SEE GEOTECHNICAL REPORT DATED DEC 23, 2010 FOR EXCAVATION, Dewatering, & FOUNDATION SUPPORT.
- DEWATERING**
- PUMP FROM SUMP PITS OUTSIDE OF EXCAVATION LIMITS.
 - PRIOR TO REMOVAL OF EXISTING CULVERT, SURFACE WATER TABLE SHOULD BE LOWERED 2' BELOW THE EXPECTED EXCAVATION DEPTH; EFFECTIVENESS OF DEWATERING SHOULD BE VERIFIED (SEE GEOTECHNICAL REPORT).
 - DEWATERING SHALL BE CONTINUOUSLY MAINTAINED, CHECK WITH AUGER BORINGS AS EXCAVATION PROCEEDS PER GEOTECHNICAL RECOMMENDATIONS.
 - MEASURES SHALL BE MAINTAINED UNTIL SATISFACTORY SUBGRADES ARE ESTABLISHED AND CONCRETE AND PRECAST STRUCTURES ARE PLACED.
 - SIDEWALL EXCAVATION: STEPPACK W/BENCHES, CONTRACTOR TO PROVIDE BRACING AND SHORING IN ACCORDANCE WITH THE LATEST OSHA REQUIREMENTS PROVIDED BY 29 CFR 1926. SHORING IS REQUIRED AT STORMWATER EASEMENT BOUNDARY CLOSE TO THE RESIDENCE LOCATED AT 1922 FOREST HILLS DRIVE. ALSO, SEE GEOTECHNICAL RECOMMENDATIONS.

LEGEND

CENTERLINE	---
CREEK	~~~~~
CHAIN LINK FENCE	-X-X-
EASEMENT BOUNDARY	- - - - -
ELECTRIC SERVICE N/L	—○—○—
GIS BLDG	□
GIS LOT LINE	□
GIS R/W	R/W
INDEX CONTOUR	125
INTERMEDIATE CONTOUR	125.5
LOT NUMBER	6
OVERHEAD POWER LINE	—○—○—
POWER POLE	○
PROPOSED SW PIPE	—■—■—
ROLL CONCRETE CURB	—■—■—
SANITARY SEWER MANHOLE	⊙
SANITARY SEWER LINE	—○—○—
SAWCUT	—○—○—
WATER MAIN GATE VALVE	⊙
WATER MAIN FIRE HYDRANT	⊙
WATER MAIN	—○—○—
WATER METER	⊙
HANDRAIL	—○—○—

* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY



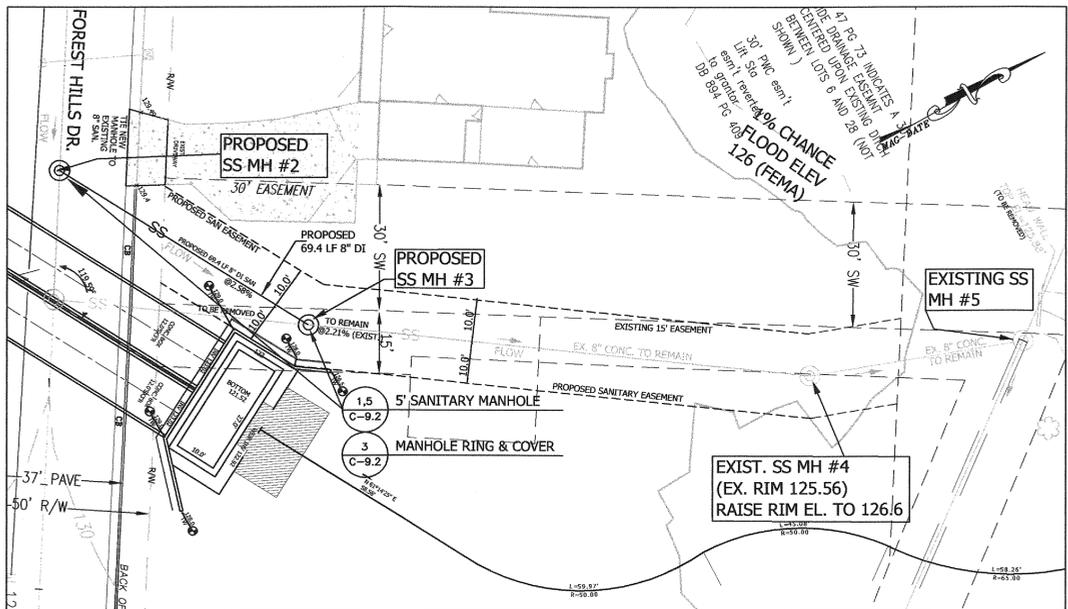
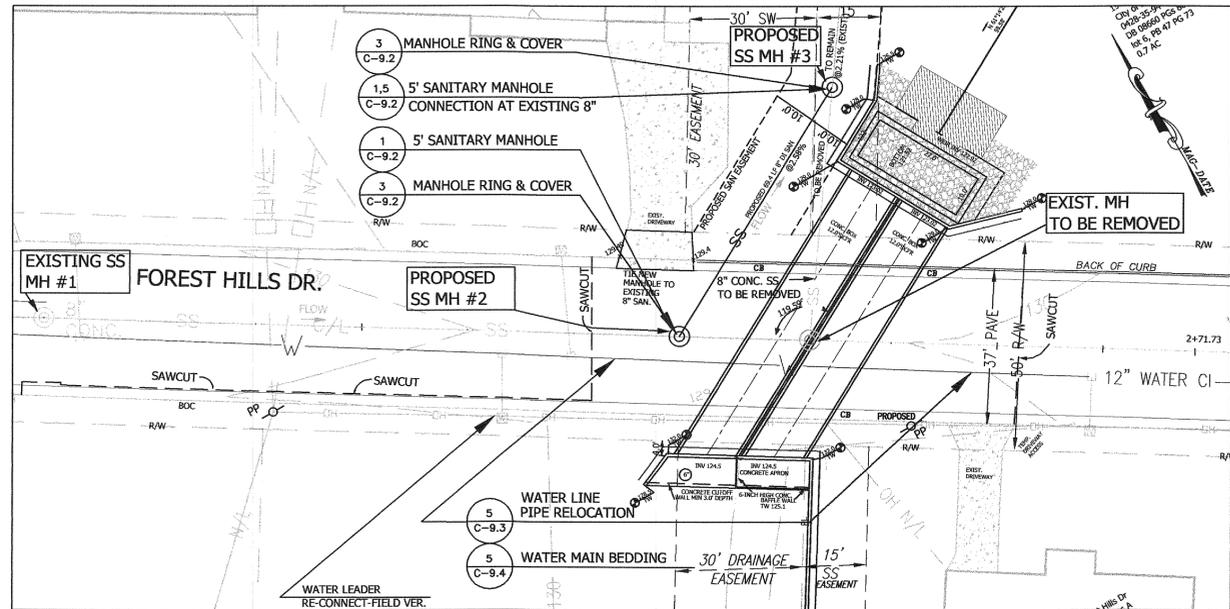
GRADING-STREAM PLAN

JEWELL
ENGINEERING CONSULTANTS, PC
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KERNERSVILLE, NORTH CAROLINA 27285
(336) 996-8974
FAX: (336) 996-8976
NC LICENSE #: C-1842

REVISIONS	JOB NO. 10-158-012
DESIGNED 03-15-12 BY BAF	
CONST. SURVEY BY	
CHECKED BY CDJ	
SCALE: NONE	

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NC

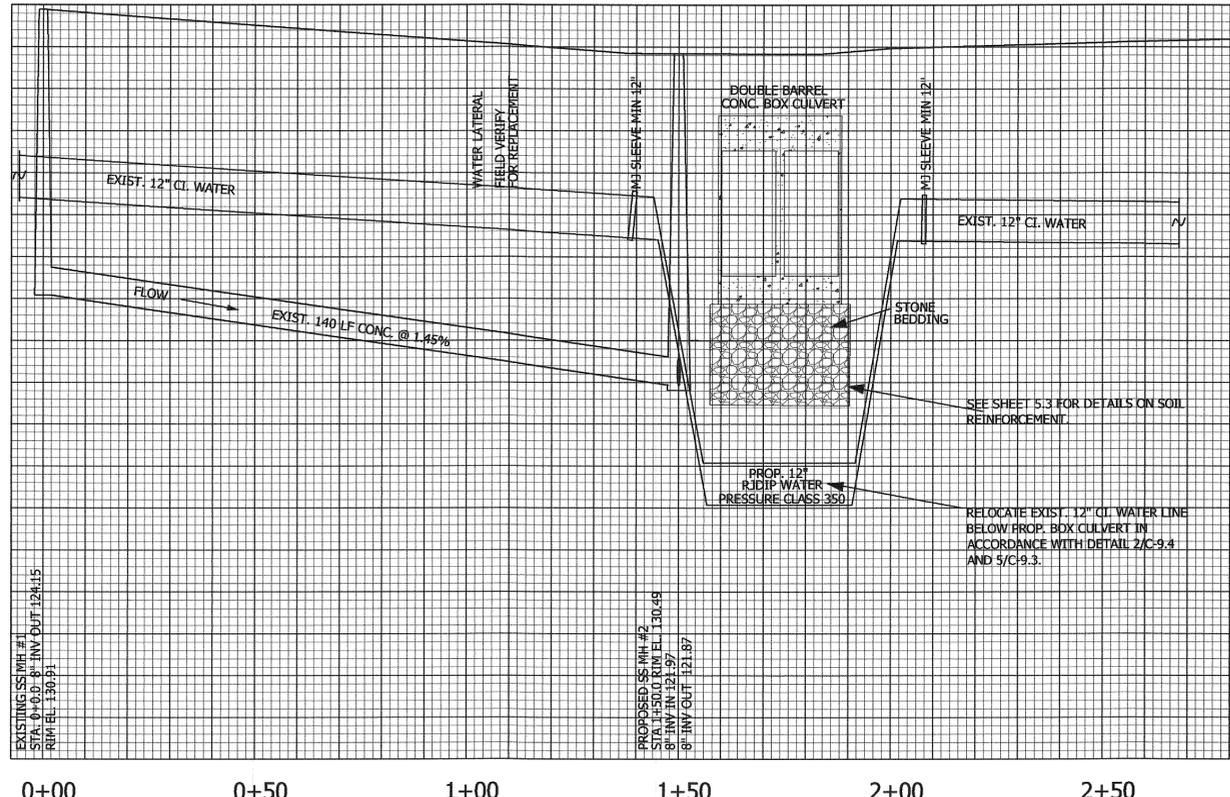
"C"
SHEET NO.
6.1



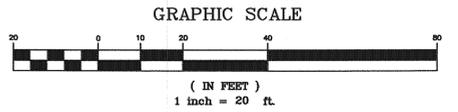
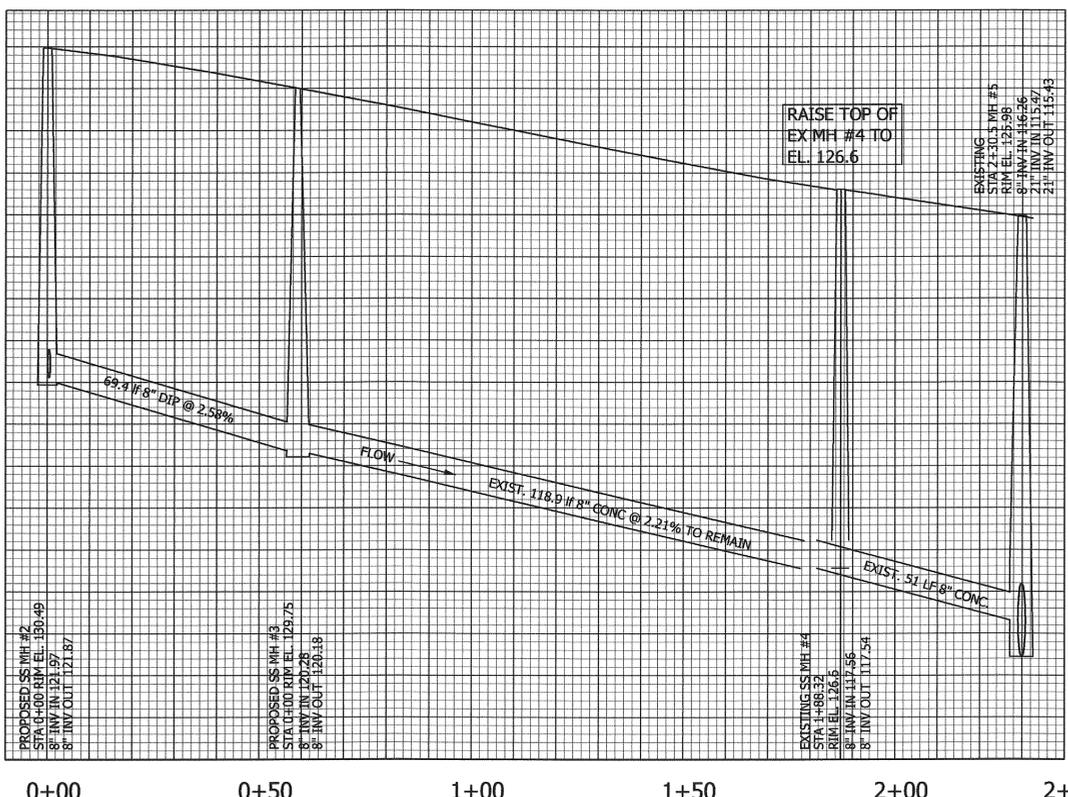
NOTES:

UTILITIES

1. IF SS OR WATER LINE SERVICE CONNECTIONS ARE FOUND TO EXIST IN RELOCATION AREA, NEW SS OR WATER LEADERS ARE TO BE INSTALLED.
2. WATER LATERALS CANNOT BE SPLICED. THEY SHALL BE COMPLETELY REINSTALLED FROM MAIN TO METER
3. AT 8" SANITARY: IF EXCAVATION DEPTH OCCURS BELOW TOP OF PIPES, FILL AROUND PIPES W/ #57 STONE FROM THE TOP OF PIPE BEDDING (STONE) TO A DEPTH OF 12" (MIN) ABOVE BEDDING MATERIAL.
4. 12" DI WATER LINE SHALL BE LOWERED 12" BELOW PCBC FOUNDATION EXCAVATION.



VERTICAL: 1" = 2 FT
 HORIZONTAL: 1" = 20 FT



SEWER & WATER UTILITIES RELOCATION PLANS & PROFILES

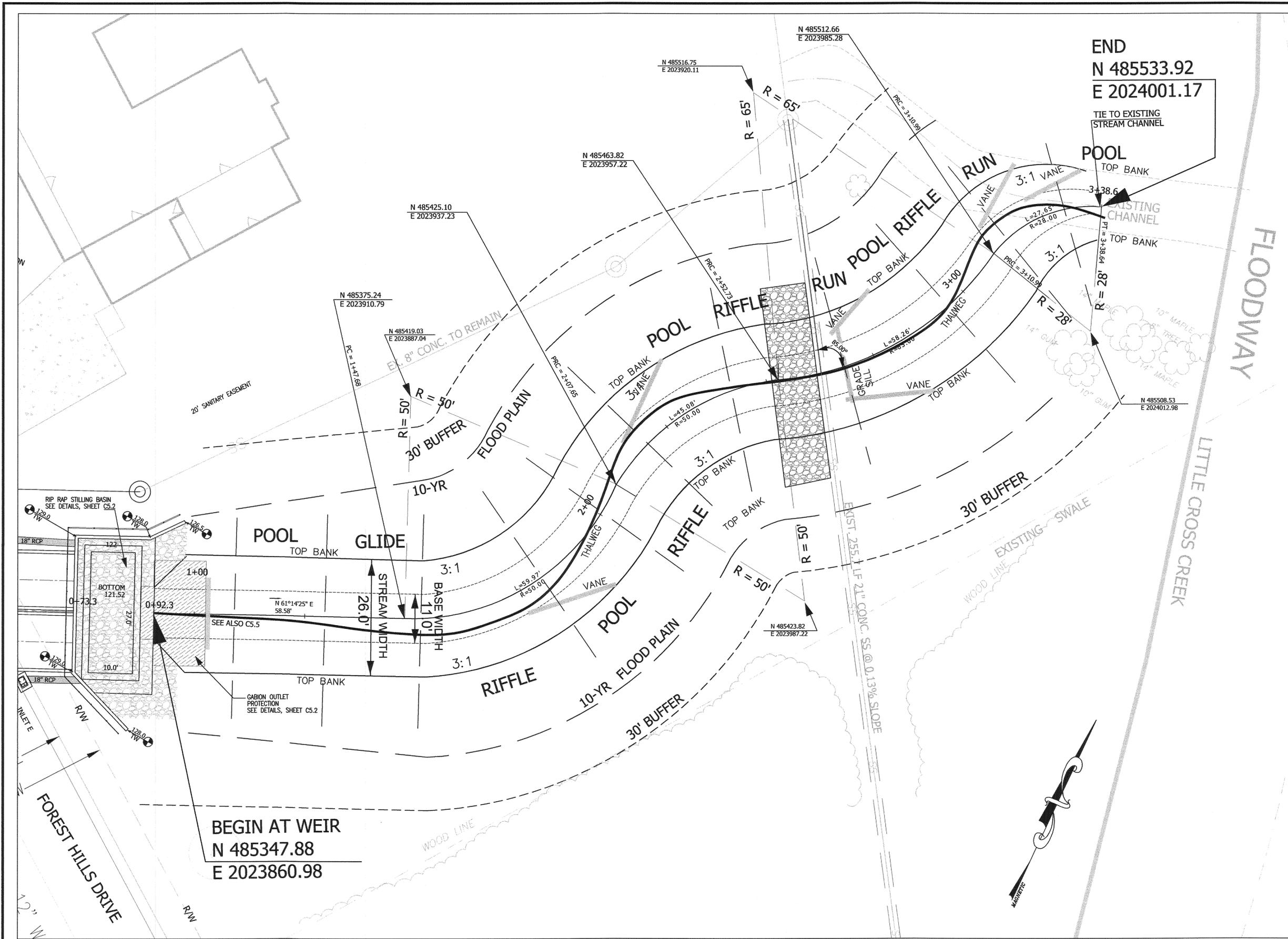
JEWELL
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 (336) 896-9874
 FAX: (336) 896-9878
 NC LICENSE #: C-1842

REVISIONS	JOB NO. 10-158-012
DESIGNED 03-15-12 BY BAF	
CONST. SURVEY BY	
CHECKED BY CDJ	
SCALE: NONE	

CITY OF FAYETTEVILLE
 DRAINAGE IMPROVEMENTS
 FOREST HILLS DRIVE
 FAYETTEVILLE, NC

"C"
 SHEET NO.
 6.2



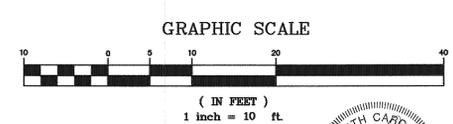


- NOTES:**
- EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM CUMBERLAND COUNTY, NC GEOGRAPHICAL INFORMATION SYSTEM DATA, EFFECTIVE DATE FEBRUARY, 2005. PROVIDED IN 2-FOOT INCREMENTS BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD) 83 AND NAVD 88. PROPOSED FOREST HILLS DRIVE IMPROVEMENTS SHOWN WITH ONE FOOT INCREMENTS BASED ON FIELD SURVEY PROVIDED BY MOORMAN, KIZER, AND REITZEL, INC (115 BROADFOOT AVE, FAYETTEVILLE, NC) AUGUST 2010. TOPO AT 1918 FOREST HILLS DRIVE WAS PERFORMED BY DUNCAN-KENNEDY LAND SURVEYING, PLLC, BRUCE PUGH ROAD, FRANKLINVILLE, NC, JULY, 2011.
 - FLOODWAY, 100-YR FLOOD BOUNDARY SHOWN IS APPROXIMATE LOCATION, TAKEN FROM FEMA FLOOD INSURANCE STUDY MAP PANEL, 0428, DATED JANUARY 5, 2007.
 - UTILITIES SHOWN PER AS-BUILT DRAWINGS AND SURVEY LOCATIONS. CONTRACTOR TO OBTAIN UTILITY MARKOUT TO DETERMINE LOCATIONS OF EXISTING UTILITIES. MAINTAIN WATER AND SEWER UTILITY SERVICES THROUGHOUT CONSTRUCTION. CONTACT PWC PRIOR TO EXCAVATION WITHIN THE PROJECT AREA FOR UTILITY CONSTRUCTION AND COMMUNICATIONS

LEGEND

PRC	REVERSE CURVE/CURVE INTERSECT
PC	BEGINNING OF CURVE
PT	CURVE/TANGENT INTERSECT
	GABIONS
	CROSS VANE (STREAM STRUCTURE)
	FORD STREAM CROSSING
CENTERLINE	
CREEK	
CHAIN LINK FENCE	
DISTURBED AREA LIMITS	
EASEMENT BOUNDARY	
ELECTRIC SERVICE N/L	
GIS BLDG	
GIS LOT LINE	
GIS R/W	
INDEX CONTOUR	
INTERMEDIATE CONTOUR	
LOT NUMBER	
OVERHEAD POWER LINE	
POWER POLE	
PROPOSED CONTOUR	
PROPOSED SW PIPE	
ROLL CONCRETE CURB	
SANITARY SEWER MANHOLE	
SANITARY SEWER LINE	
SWICUT	
TEMPORARY SILT FENCE	
TREE PROTECTION	
WATER MAIN GATE VALVE	
WATER MAIN FIRE HYDRANT	
WATER MAIN	
WATER METER	

* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY



STREAM LAYOUT PLAN

JEWELL
ENGINEERING CONSULTANTS, P.C.
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KERNERSVILLE, NORTH CAROLINA 27285 FAX: (330) 998-9976
NC LICENSE # C-1842

REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NC

"C"
SHEET NO.
7.0

3/14/2012 10:02:51 AM

- NOTES:
- THE CONTRACTOR SHALL INSTALL ALL TEMPORARY EROSION CONTROL DEVICES WITHIN THE PROJECT AREA BOUNDARY AS INDICATED ON PLANS PRIOR TO COMMENCING EARTHWORK. CONTRACTOR SHALL ENSURE THAT DRAINAGE IS DIRECTED INTO TEMPORARY SEDIMENT PITS THROUGHOUT THE CONSTRUCTION PERIOD.
 - DEMOLITION SHALL INCLUDE TREES, STUMPS, BRUSH, VEGETATION, TRASH, DEBRIS, WASTE STONE, WASTE PIPING, AND ANY OTHER UNSUITABLE MATERIAL FROM WITHIN THE PROJECT AREA BOUNDARY AND CLEARING LIMITS, UNLESS INDICATED OTHERWISE ON THESE PLANS OR DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL TAKE GREAT CARE TO NOT DISTURB THE EXISTING STREAM.
 - TREES ALONG THE STREAM AND WITHIN PORTIONS OF THE CONSTRUCTION LIMITS THAT DO NOT CONFLICT WITH CONSTRUCTION OF THE PROPOSED STREAM LOCATION SHALL REMAIN AND BE PROTECTED FROM DAMAGE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - DEMOLITION SHALL INCLUDE THE REMOVAL OF ALL DEBRIS AT ALL DRAINAGE DEVICES. THE REMOVAL OF DEBRIS SHALL BE MAINTAINED BY THE CONTRACTOR TO ALLOW CONSTANT DRAINING OF THE DEVICES DURING CONSTRUCTION.
 - TEMPORARY STABILIZATION REQUIRED TO PROTECT GROUND SURFACES FROM EROSION AFTER STREAM RELOCATION CHANNELS HAVE BEEN COMPLETED AND VEGETATED. SEE EROSION CONTROL DETAILS.
 - PLANTING SEASON: OCTOBER 15 TO APRIL 15. DURING DROUGHT, ADDITIONAL MONITORING AND WATERING WILL BE REQUIRED FOR PLANT SURVIVAL.
 - HAND PLANTING IS REQUIRED FOR ALL WOODY MIX VEGETATION PLANTINGS. FOLLOW PLANTING AND FERTILIZING INSTRUCTIONS.

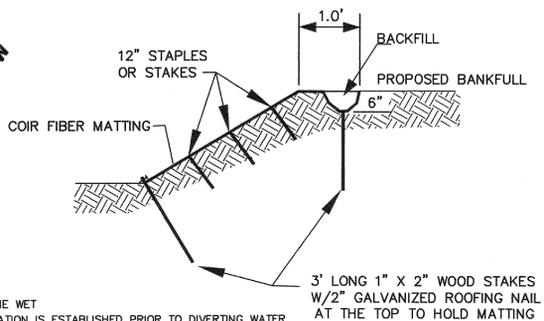
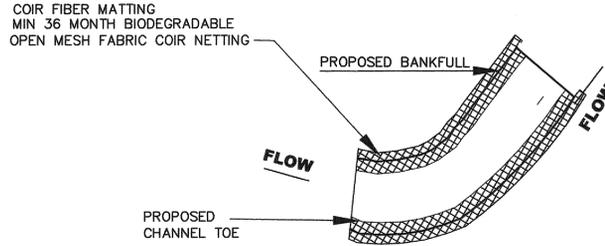
FERTILIZER CHART GUIDE

AT PLANTING TIME, FERTILIZE EACH PLANT WITH SUGGESTED TRIPLE SUPER PHOSPHATE(0-42-0) RECOMMENDATIONS.

AMOUNT	CONTAINER-SIZE
2 TABLESPOONS	1 GAL
3 TABLESPOONS	2 GAL
4 TABLESPOONS (1/4 CUP)	3 GAL
5 TABLESPOONS	4 GAL
6 TABLESPOONS	5 GAL

THE FOLLOWING SPRING, FOLLOW UP WITH A BALANCED FERTILIZER (SUCH AS 10-10-10) JUST BEFORE NEW GROWTH APPEARS.

2 FERTILIZER GUIDE
C-7.1



NOTES:

- COIR FIBER MATTING SHALL BE PLACED ON ALL CHANNEL BANKS OF THE STREAM, AND INSTALLED ON ALL CHANNEL BANKS PRIOR TO DIVERTING FLOW.
- FIBER MATTING FROM TOE OF CHANNEL TO 5 FT BEYOND BANKFULL.
- USE WOOD STAKES (NOT METAL) FOR MATTING INSTALLED IN PUMP AROUNDS OR IN THE WET
- USE OF METAL STAPLES IS ACCEPTABLE WHEN CONSTRUCTING IN THE DRY AND VEGETATION IS ESTABLISHED PRIOR TO DIVERTING WATER.
- NO PLASTIC MATTING THAT CAN ENTRAP SMALL ANIMALS SHALL BE USED FOR STREAMBANK STABILIZATION OR OTHER DISTURBED AREAS REQUIRING MATTING STABILIZATION.

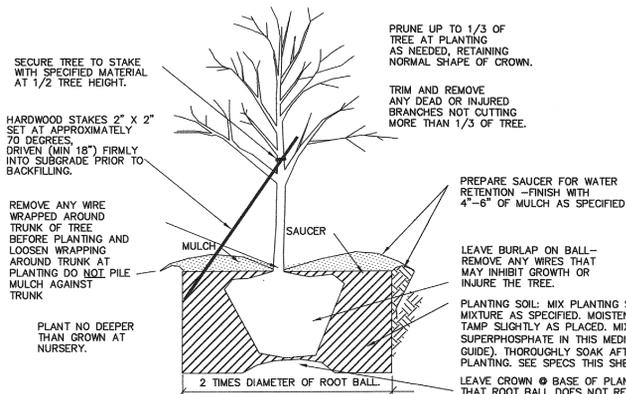
3 TYPICAL MATTING LOCATION DETAIL
C-7.1 NOT TO SCALE

LEGEND

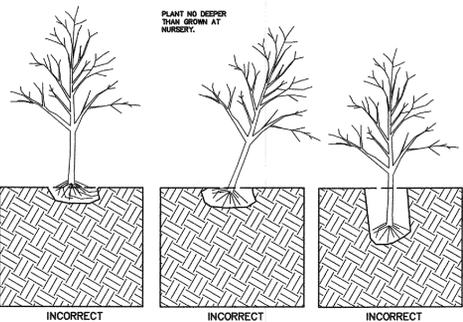
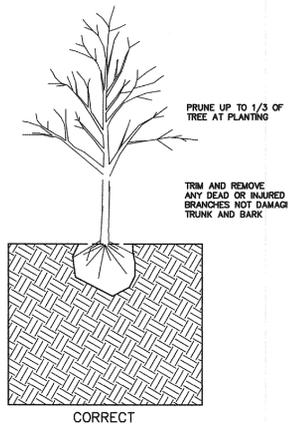
- PERM SEED MIX BUFFER/FLOOD PLAIN NATIVE WOODY & HERBACEOUS
- PERMANENT SEED MIX COIR (AT STREAM BANKS) STREAM BANK COIR PLANTING
- EXISTING VEGETATION TO REMAIN (UNDISTURBED HERBACEOUS) OR USE PARK LAWN AS NEEDED.
- HERBACEOUS (GRASSY) VEGETATION (SAN. EASEMENT AREA) (APPLY PARK LAWN SEED AS NEEDED)

PLANTING:

- AREAS TO BE PLANTED ARE SHOWN ON THE PLAN. IF UTILITIES ARE ENCOUNTERED, PLANTS MAY BE REPOSITIONED SLIGHTLY TO AVOID IMPACT.
- EACH PLANTING HOLE SHALL BE EXCAVATED AND PREPARED BY MIXING THE EXCAVATED MATERIAL INTO A PLANTING SOIL MIXTURE OF 2 PARTS PINE BARK SOIL CONDITIONER, 2 PARTS TOP SOIL AND 1 PART NATIVE MATERIAL, THOROUGHLY MIXED.
- ALL TREES SHOULD BE PLANTED AND FERTILIZED ACCORDING TO DETAILS AND FERTILIZER CHART GUIDE SHOWN ON THIS SHEET. WHEN HOLE IS ALMOST BACKFILLED, ADD WATER AND ALLOW TO SOAK IN. FILL HOLE TO FINISH GRADE AND FORM A SHALLOW SAUCER AROUND THE TREE AS SHOWN ON DETAIL. WATER ENTIRE PLANTING AREA THOROUGHLY.
- IMMEDIATELY AFTER A TREE IS PLANTED, IT SHOULD BE SUPPORTED WITH STAKES AND GUY WIRES TO FIRMLY HOLD IT IN PLACE. (SEE DETAIL - THIS SHEET)
- BEFORE PLACING MULCH, USE WEED CONTROL FABRIC AROUND EACH TREE TO A MINIMAL DIAMETER OF 24" AND FINISH WITH 4"-6" OF WELL AGED HARDWOOD MULCH.
- SPRAY TREES AND SHRUBS WITH AN ANTI-DESICCANT IF FOLIAGE IS PRESENT.

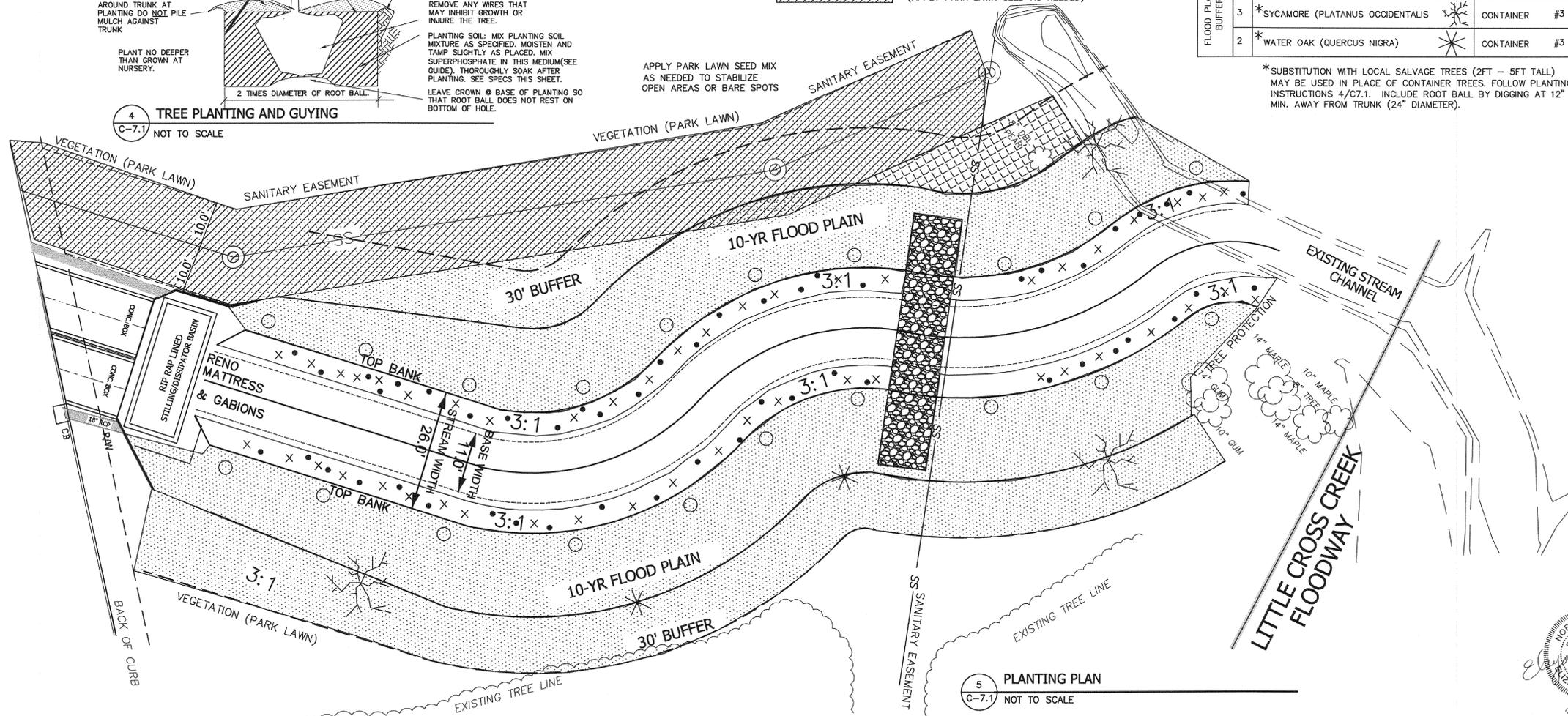


4 TREE PLANTING AND GUYING
C-7.1 NOT TO SCALE



- NOTES:
- ROOTS SHOULD BE "STRAIGHT" IN THE PLANTING HOLE. THEY SHOULD NOT BE "J" OR "U" SHAPED
 - PLANT SEEDLINGS SO THAT ROOT COLLAR IS AT THE GROUND SURFACE.
 - MAKE SURE TREES ARE NOT PLANTED TOO DEEP OR TOO SHALLOW.
 - SOIL BACKFILL IS AMENDED AS FOLLOWS: 1 PART PINE BARK, 1 PART NATIVE SOIL
 - MAKE SURE TREES ARE NOT PLANTED TOO DEEP OR TOO SHALLOW.

1 TREE PLANTING DETAIL
C-7.1 NOT TO SCALE



5 PLANTING PLAN
C-7.1 NOT TO SCALE

COIR SEEDING/PLANTING NOTES:

- PERMANENT SEEDING IS NOT TO CONTAIN ANY FESCUE GRASSES. PLACE SEEDING BELOW THE BANKFULL ELEVATION ON THE STREAMBANK (UNDER THE COIR MATTING).
- SPREAD SEED UNIFORMLY AT COIR FIBER MATTING AT CHANNEL BANKS.
- STABILIZE ALL EXPOSED AREAS AT STREAM BANKS WITH THE PERMANENT RIPARIAN BUFFER SEED MIX SHOWN BELOW.
- SILKY WILLOW & SILKY DOGWOOD TREES PLANTED IN COIR TO BE PLACED AS SHOWN. PLANT IRONWOOD TREES SPACED EVENLY ALONG TOP OF BANK AS SHOWN (APPROX. 25' APART)
- WATER CONTAINER PLANTS THOROUGHLY AT PLANTING AND WEEKLY DURING THE FIRST GROWING SEASON.
- PLANTS SHALL BE WARRANTED FOR 80% SURVIVAL AT ONE-YEAR AFTER PLANTING. IF AT THE END OF ONE-YEAR 20% OR MORE PLANTS ARE DEAD OR DEAD LIKE CONDITION, RE-PLANTING OF SUFFICIENT STOCK TO COMPLY WITH AN 80% SURVIVAL RATE SHALL BE PERFORMED.
- SEE TECHNICAL SPECIFICATIONS FOR INSTALLATION, APPLICATION AND ALL SPECIFICATIONS FOR SEEDING, WOODY AND HERBACEOUS VEGETATION

PLANTING LIST

PERMANENT SEED MIX COIR	HERBACEOUS STREAM MIX COIR	PERCENT (%)	DENSITY LBS/AC
JOE-PYE-WEED (EUPATORIUM FISTULOSUM)		20	2
RICE CUT GRASS (LEERSIA ORYZOIDES)		20	0.25
SHWITCHGRASS (PANICUM VIRGATUM)		25	10
FOX SEDGE (CAREX VULPINOIDEA)		35	3.0
TOTAL 100%			
PERMANENT SEED MIX BUFFER/FLOOD PLAIN			
DEER TONGUE (PANICUM CLANDESTINUM)		15	1.2
SOFT RUSH (JUNCUS EFFUSUS)		20	2.0
HOP SEDGE (CAREX LUPULINA)		25	2.0
VIRGINIA WILDRYE (ELYMUS VIRGINICUS)		15	15
BLACK EYED SUSAN (RUBEBKIA HIRTA)		10	5
WEeping LOVE GRASS (ERAGROSTIS CURVULA)		15	5-7
TOTAL 100%			
PARK LAWN & SAN. EASEL			
CENTIPEDED GRASS (EREMOCHLOA SP.)		100	45
TOTAL 100%			
STREAM BANK			
QTY	WOODY MIX PLANTING	TOTAL 100%	
48	SILKY WILLOW (SALIX SERICEA) X	BARE ROOT 1/0 - RANDOM SPECIES DISTRIBUTION	
52	SILKY DOGWOOD (CURNUS AMOMUM) •	BARE ROOT 1/0 - RANDOM SPECIES DISTRIBUTION	
20	IRONWOOD (CARPINUS CAROLINIANA) ○	BARE ROOT 1/0 SEEDLING RANDOMLY PLACED	
3	*SYCAMORE (PLATANUS OCCIDENTALIS) *	CONTAINER	#3
2	*WATER OAK (QUERCUS NIGRA) *	CONTAINER	#3

*SUBSTITUTION WITH LOCAL SALVAGE TREES (2FT - 5FT TALL) MAY BE USED IN PLACE OF CONTAINER TREES. FOLLOW PLANTING INSTRUCTIONS 4/07.1. INCLUDE ROOT BALL BY DIGGING AT 12" MIN. AWAY FROM TRUNK (24" DIAMETER).

STREAM PLANTING PLAN

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N.C. LICENSE #: C-1842

REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NORTH CAROLINA

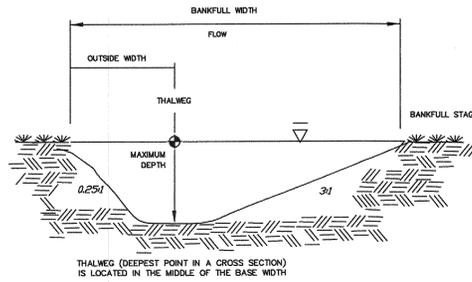
"C"
SHEET NO.
7.1



3/13/2012 10:05:17 AM

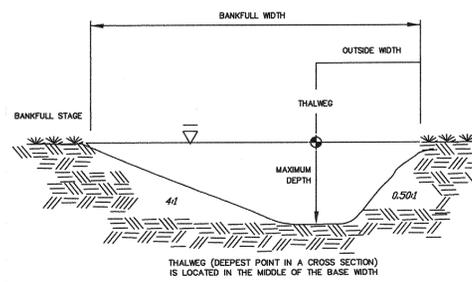
BANKFULL WIDTH	26.0'
BASE WIDTH	12.0'
MAX DEPTH	3.5'
BAR SIDE SLOPE	3:1
LEFT BANK SIDE SLOPE	0.25:1

BANKFULL WIDTH	26.0'
BASE WIDTH	7.5'
MAX DEPTH	3.75'
BAR SIDE SLOPE	4:1
RIGHT BANK SIDE SLOPE	0.50:1



NOTES:
1. ALL SHARP CORNERS SHOULD BE ROUNDED
2. GRADE POINT IS THE ELEVATION SHOWN IN THE PROFILE

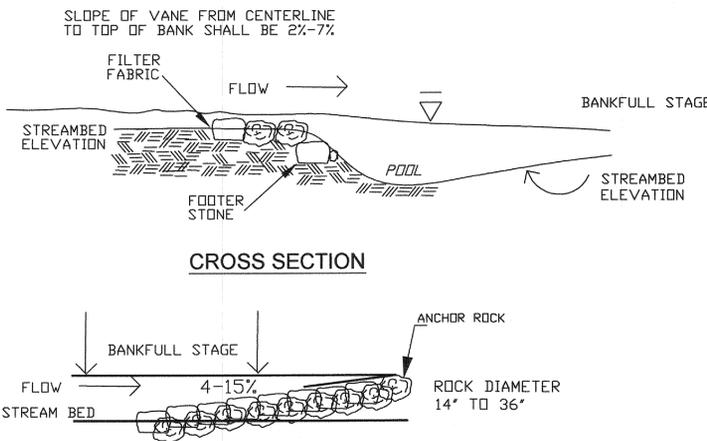
TYPICAL-SECTION - POOL LEFT
SCALE: NTS



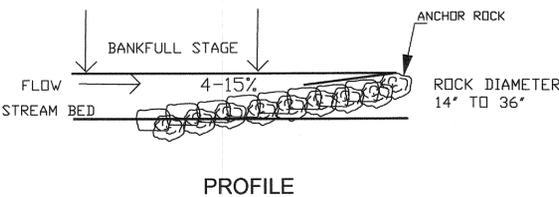
NOTES:
1. ALL SHARP CORNERS SHOULD BE ROUNDED
2. GRADE POINT IS THE ELEVATION SHOWN IN THE PROFILE

TYPICAL-SECTION - POOL RIGHT
SCALE: NTS

1 POOL CROSS SECTION
C-7.2 NOT TO SCALE LOOKING DOWNSTREAM



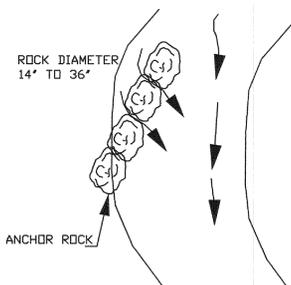
CROSS SECTION



PROFILE

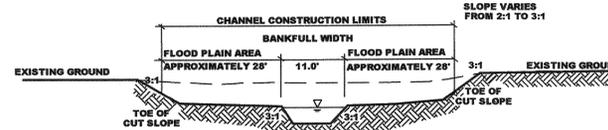
NOTE: ROCKS IN VANE ARE NOT SPACED.

STRUCTURE SPANS 1/2 TO 2/3 OF STREAM WIDTH.

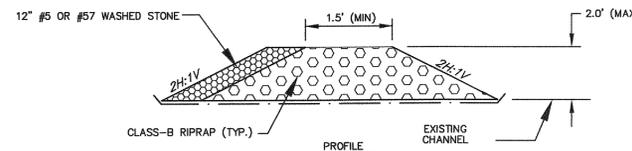


- ROCK VANES TO BE LOCATED AS SHOWN ON THE PLANS AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER.
- ROCK VANE TO BE ORIENTED UPSTREAM AT A 20 TO 30 DEGREE ANGLE.
- VANES SHALL HAVE A LENGTH THAT SPANS UP TO ONE-HALF OF THE BASE-FLOW CHANNEL WITH A SLOPE OF 2 TO 20 PERCENT AS APPROVED BY THE ENGINEER DURING CONSTRUCTION. FLATTER AND LONGER STRUCTURES WILL BE PREFERRED DURING CONSTRUCTION. SEE PROFILE DETAIL FOR CROSS VANE.
- ALL VANES SHALL INCLUDE SILLS AND GEO-FABRIC ON THE UPSTREAM SIDE OF THE SILL.
- ALL VANES SHALL HAVE A MIN. 1/2 TON ANCHOR ROCK PLACED AT THE INTERSECTION OF THE BANKFULL ELEVATION.
- THE END OF EACH VANE SHALL BE TOED INTO THE CHANNEL BED AND COMPLETELY COVERED WITH CLASS "A" STONE UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

2 SINGLE VANE DETAIL
C-7.2 NOT TO SCALE



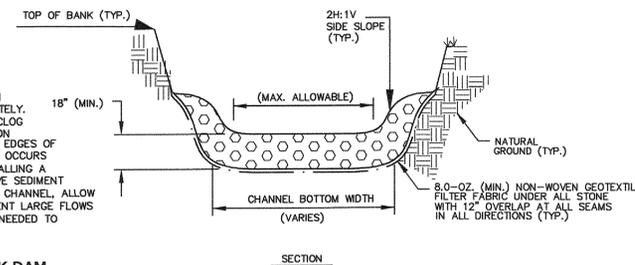
3 PROPOSED CHANNEL CROSS SECTION
C-7.2 NOT TO SCALE



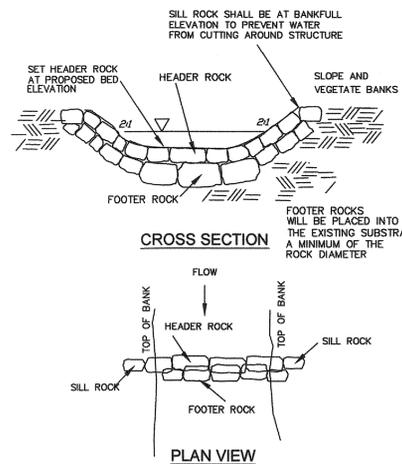
MAINTENANCE

INSPECT TEMPORARY CHECK DAMS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2" OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, ADDITIONAL MEASURES CAN BE TAKEN SUCH AS, INSTALLING A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL. ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

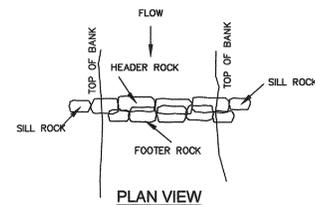
4 TEMPORARY CHECK DAM
C-7.2 NOT TO SCALE



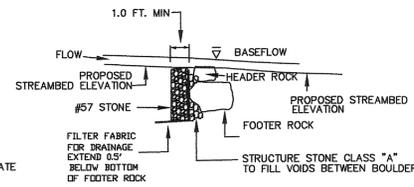
6 ROCK GRADE CONTROL SILL
C-7.2 NOT TO SCALE



CROSS SECTION

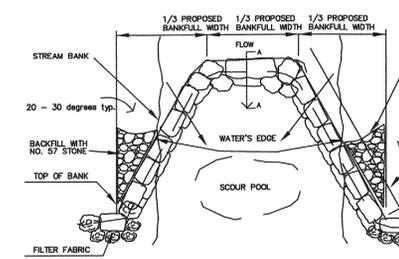


PLAN VIEW



PROFILE VIEW

NOTES:
ROCK SILL TO BE LOCATED AS SHOWN ON THE PLANS AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER.

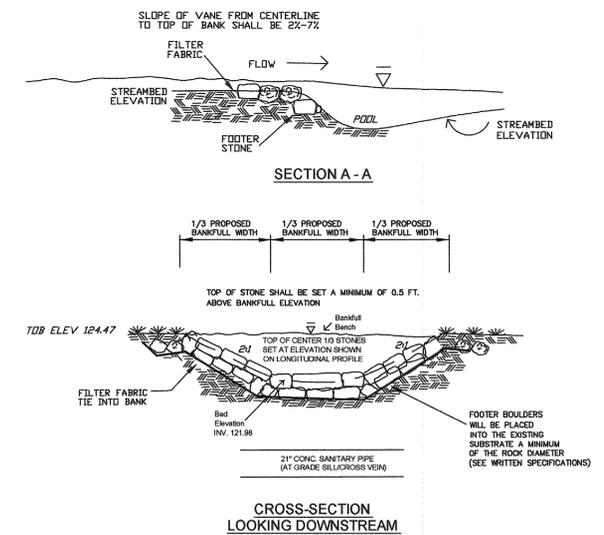


PLAN VIEW

NOTES:

- ROCK VANES TO BE LOCATED AS SHOWN ON THE PLANS AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER.
- ROCK VANE TO BE ORIENTED UPSTREAM AT A 20 TO 30 DEGREE ANGLE OFF THE BANK.
- VANES SHALL BE THE HIGHEST NEXT TO THE BANK AND CONNECTED TO THE BANKFULL ELEVATION OR SLIGHTLY BELOW.
- EACH LEG OF THE CROSS VANE SHALL HAVE A LENGTH THAT SPANS UP TO ONE-THIRD OF THE BASE-FLOW CHANNEL WITH A SLOPE OF 2 TO 7 PERCENT AS APPROVED BY THE ENGINEER DURING CONSTRUCTION. FLATTER AND LONGER STRUCTURES WILL BE PREFERRED DURING CONSTRUCTION.
- ALL CROSS VANES SHALL INCLUDE GEO-FABRIC ON THE UPSTREAM SIDE OF THE ENTIRE STRUCTURE.
- ALL CROSS VANES SHALL HAVE A MIN. 1/2 TON FOOTER ROCK PLACED ABOVE THE VANE AT THE INTERSECTION OF THE BANKFULL ELEVATION AND ALSO A TWO FOOTER 1/2 TON ROCKS PLACED BELOW EACH LEG OF THE STRUCTURE.
- PLACE VANE ROCKS ON TOP OF FOOTER ROCKS SO THAT EACH HALF OF THE VANE ROCK RESTS ON ONE HALF OF A FOOTER ROCK BELOW. OFFSET THE VANE ROCK IN THE UPSTREAM DIRECTION SO THEY SLOPE SLIGHTLY AGAINST THE FLOW DIRECTION. A PORTION OF THE VANE ROCKS SHOULD BE BELOW THE STREAM BED INVERT WITH A PORTION ABOVE THE INVERT TO THE SPECIFIED PROTRUSION HEIGHT.
- PLACE ONE OR TWO COURSES OF FOOTER ROCKS TO THE MINIMUM FOOTER ROCK DEPTH. THE MINIMUM FOOTER ROCK IS MEASURED FROM THE STREAM BED INVERT AND IS EQUAL TO A DEPTH 3 TIMES THE PROTRUSION HEIGHT OF THE VANE ROCK FOR COBBLE AND GRAVEL BED STREAMS AND 6 TIMES THE PROTRUSION HEIGHT FOR SAND BED OR FINE SAND STREAMS. LEAVE SPACE ABOVE THE FOOTER ROCKS FOR THE BELOW INVERT PORTION OF THE VANE ROCKS.
- EXCAVATE THE SCOUR POOL TO THE PROPER DEPTH.
- CONTRACTOR REQUIRED TO FIT BOLTERS TIGHTLY. GAPS BETWEEN BOLTERS SHALL BE MINIMIZED BY FITTING BOLTERS TOGETHER, PLUGGING WITH STRUCTURE STONE CLASS A AND NO. 57 STONE AND LINING WITH FILTER FABRIC.
- FOOTER ROCK/BOLTERS AND VANE BOLTERS SHALL BE NATIVE STONE OR SHOT ROCK, CUBICAL OR RECTANGULAR IN NATURE.

FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH BOLTER GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER BOLTER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE.



SECTION A-A

CROSS-SECTION LOOKING DOWNSTREAM

5 ROCK CROSS VANE
C-7.2 NOT TO SCALE

STREAM DETAILS

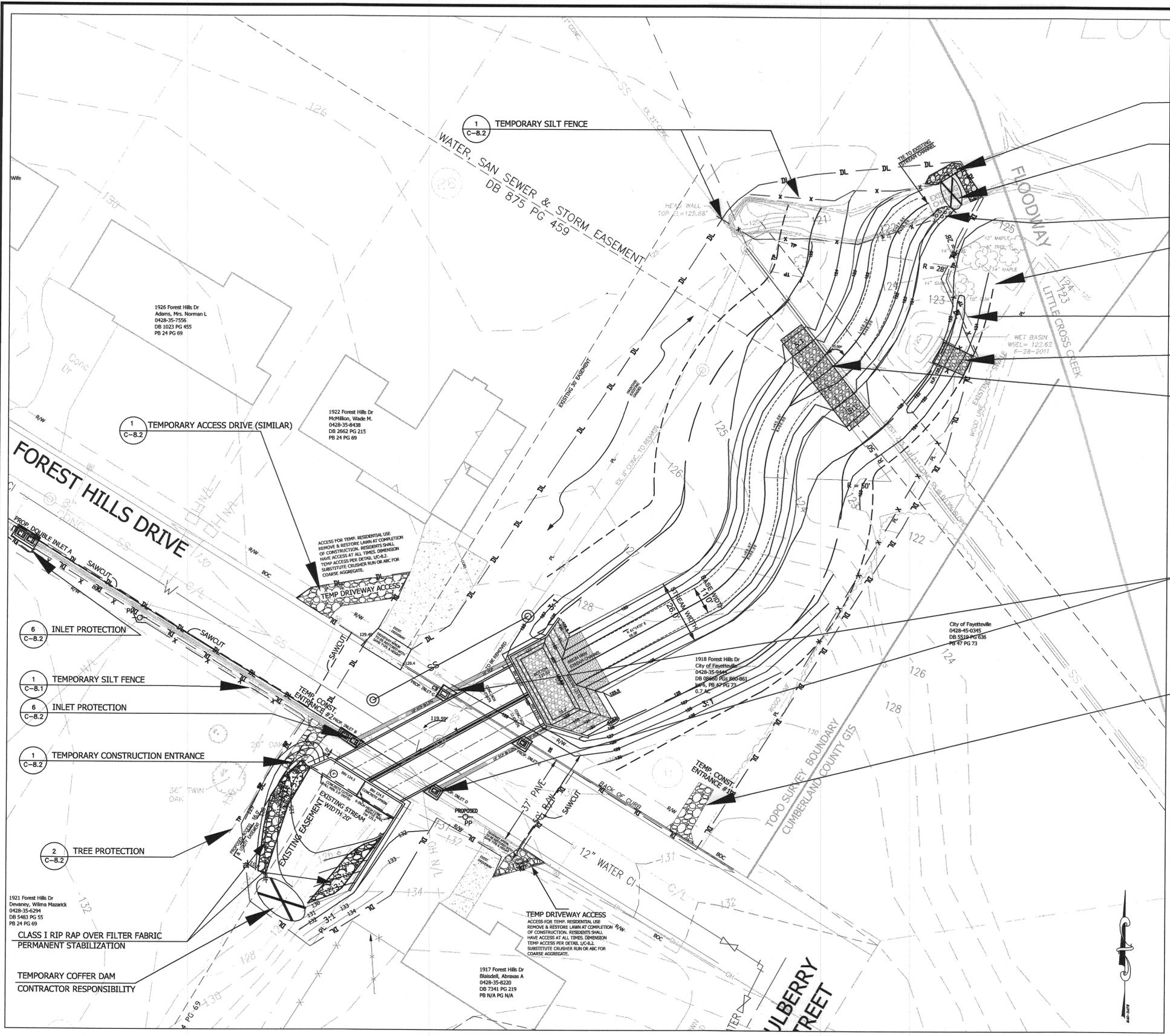
JEWELL
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(336) 996-0974
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NO LICENSE #
C-1842

REVISIONS	DATE	BY

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NORTH CAROLINA

"C"
SHEET NO.
7.2





- NOTES**
- AREA OF DISTURBANCE INCLUDING TEMP. DRIVES: 0.94 ACRES
 - FOREST HILLS DRIVE MAY BE USED FOR STORAGE OF CULVERTS & ASSOCIATED STRUCTURAL MATERIALS. SOILS TO BE STORED IN STAGING AND STORAGE AREA OF LOT.
 - CONSTRUCTION SEQUENCE (SEE COVER SHEET)
 - EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM CUMBERLAND COUNTY, NC GEOGRAPHICAL INFORMATION SYSTEM DATA, EFFECTIVE DATE FEBRUARY, 2005, PROVIDED IN 2-FOOT INCREMENTS BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD) 83. PROPOSED FOREST HILLS DRIVE IMPROVEMENTS SHOWN WITH ONE FOOT IMPROVEMENTS BASED ON FIELD SURVEY PROVIDED BY MOORMAN, KIZER, AND RETZEL, INC (115 BROADFOOT AVE, FAYETTEVILLE, NC) AUGUST 2016. TOPO AT 1918 FOREST HILLS DRIVE PERFORMED BY DUNCAN-KENNEDY LAND SURVEYING, PLLC, JULY, 2011
 - CONTRACTOR SHALL INSTALL ALL TEMPORARY EROSION CONTROL DEVICES WITHIN THE PROJECT AREA BOUNDARY AS INDICATED ON THIS SHEET PRIOR TO COMMENCING EARTHWORK. CONTRACTOR SHALL ENSURE THAT DRAINAGE IS DIRECTED INTO TEMPORARY SEDIMENT DEVICES THROUGHOUT THE CONSTRUCTION PERIOD.
 - DEMOLITION SHALL INCLUDE THE REMOVAL FROM THE SITE OF TREES WHERE NOTED, STUMPS, BRUSH, VEGETATION, TRASH, DEBRIS, WASTE STONE, WASTE PIPING/CULVERT, AND ANY OTHER UNSUITABLE MATERIAL FROM WITHIN THE PROJECT AREA BOUNDARY AND CLEARING LIMITS, UNLESS INDICATED OTHERWISE ON THESE PLANS OR DIRECTED BY THE ENGINEER.
 - TREES ALONG THE STREAM AND WITHIN PORTIONS OF THE CONSTRUCTION LIMITS THAT DO NOT CONFLICT WITH CONSTRUCTION OF THE PROPOSED CULVERT SHALL REMAIN AND BE PROTECTED FROM DAMAGE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ALL WORK PERFORMED IN THE STREAM CHANNEL IS TO BE DONE IN THE DRY.
 - DEMOLITION SHALL INCLUDE THE REMOVAL OF ALL DEBRIS AT ALL DRAINAGE DEVICES. THE REMOVAL OF DEBRIS SHALL BE MAINTAINED BY THE CONTRACTOR TO ALLOW CONSTANT DRAINING OF THE DEVICES DURING CONSTRUCTION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCOMMODATION AND MAINTENANCE OF BASE AND STORM FLOWS IN ALL AREAS OF THE PROJECT SITE THROUGHOUT THE CONSTRUCTION PERIOD.
 - DE-WATERING OF STRUCTURES WITH SEDIMENT-LADEN WATER DIRECTLY TO STREAMS IS PROHIBITED. THE CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE THAT SUCH PROHIBITED ACTIVITIES DO NOT OCCUR. FOLLOW MAINTENANCE OF EROSION CONTROL STRUCTURES PER DETAILS.
 - PROPOSED STREAM BANK DISTURBANCE WORK SHALL BE CONDUCTED IN A DRY CHANNEL AS INDICATED. THE CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE THAT SUCH REQUIREMENTS ARE SATISFIED.
 - CONTRACTOR SHALL USE PUMPS CAPABLE OF CARRYING BASE FLOW OF THE STREAM AS NEEDED FOR RELOCATION PROPOSED STREAM CHANNEL. IF PUMPS ON THE JOB SITE CANNOT KEEP UP WITH BASE FLOW, CONTRACTOR SHALL STOP WORK AND OBTAIN PUMPS CAPABLE OF HANDLING THE FLOW.
 - CONTRACTOR SHALL UTILIZE 2 PUMPS (ONE FOR BACKUP) A MINIMUM 4 INCH DIAMETER TO HANDLE THE BASE STREAM FLOW (100 GPM MIN) THROUGH THE CONSTRUCTION SITE. THE PUMP AROUND PROCESS SHALL EXTEND DOWNSTREAM OF CONSTRUCTION ACTIVITIES. AREA ABOVE COFFER DAM DOWNSTREAM OF OUTLET SHOULD BE MONITORED FOR COLLECTION OF SEDIMENT AND CLEANED OF SEDIMENT AS NEEDED.
 - AS EACH PORTION OF CONSTRUCTION IS COMPLETE, INSTALL STABILIZATION. AT END OF PROJECT, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES, INSTALL PERMANENT STABILIZATION, AND RESTORE THE SITE AS CLOSE AS POSSIBLE TO ORIGINAL CONDITIONS.
 - CONTRACTOR TO PREVENT SEDIMENT FROM LEAVING SITE. EQUIPMENT & TRUCKS EXITING SITE SHALL BE CLEANED/WASHED AS NEEDED TO REMOVE SEDIMENT/MUD PRIOR TO EXITING PROJECT SITE.
 - DEWATERING SHALL BE PERFORMED WITH APPROVED EROSION CONTROL PRACTICES SUCH THAT NO SEDIMENT LEAVES THE SITE OR ENTERS THE STREAM.

STREAM DATA

WATERSHED AREA	(143 AC) 0.22 SQMI
MEAN ANNUAL FLOW *	1.0 CFS/SQMI X 0.22SQMI = 100.3 GPM +/-
* USGS WATER RESOURCES INVESTIGATIONS 46-74, FEB 1975	

LEGEND

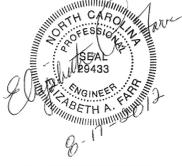
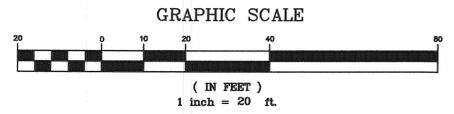
- CENTERLINE
- CREEK
- CHAIN LINK FENCE
- EASEMENT BOUNDARY
- ELECTRIC SERVICE N/A
- GIS BLDG
- GIS LOT LINE
- GIS R/W
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- LOT NUMBER
- OVERHEAD POWER LINE
- POWER POLE
- ROLL CONCRETE CURB
- STORM DRAIN HEADWALL
- STORM DRAIN MANHOLE
- STORM DRAIN DROP INLET
- STORM DRAIN CATCH BASIN
- STORM DRAIN PIPE
- SANITARY SEWER MANHOLE
- SANITARY SEWER LINE
- TREE OR VEGETATION
- WATER MAIN GATE VALVE
- WATER MAIN FIRE HYDRANT
- WATER MAIN*
- WATER METER

* UTILITIES SHOWN AS APPROXIMATE LOCATIONS ONLY

ECS LEGEND

- DL - DISTURBED AREA LIMITS
- IP - INLET PROTECTION*
- RRP - RIP RAP / GRAVEL
- TP - TEMPORARY TREE PROTECTION
- TSO - TEMPORARY STONE OUTLET
- TCO - TEMPORARY COFFER DAM
- TSF - TEMPORARY SILT FENCE

* SEE SHEET C-10.1 FOR INLET PROTECTION DETAILS



EROSION CONTROL PLAN

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C-1842

REVISIONS	JOB NO. 10-158-012
08-17-12 PROP. EASEMENT UPDATE TO 0428-35-6294	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NC

"C"
SHEET NO.
8.0

TEMPORARY SEEDING SCHEDULE

SUMMER (COASTAL PLAIN, APRIL 15 - AUG 15)

TEMPORARY SEEDING MIXTURE		
DATES	SPECIES	RATE (LBS./ACRE)
APRIL 15 - AUGUST 15	GERMAN MILLET	40
APRIL 15 - AUGUST 15	TALL FESCUE	80

SOIL AMENDMENTS
 APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. SOILS WITH pH HIGHER THAN 6 NEED NOT BE LIMED. IF THE pH OF THE SOIL IS UNKNOWN, AN APPLICATION OF GROUND LIME AT THE RATE OF 75 LBS/1000 SF.
 APPLY LIME AND INCORPORATE INTO TOP 4" TO 6" OF SOIL.
 APPLY FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. WHEN THE SOIL TEST IS UNAVAILABLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700-1000 LB/ACRE INCORPORATED INTO THE TOP 4" TO 6" OF SOIL.

MULCH
 * APPLY 4,000 LBS./ACRE GRAIN STRAW OR ENGINEER APPROVED EQUIVALENT COVER.
 * ANCHOR MULCH WITH A MULCH ANCHORING TOOL, NETTING, OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 200 GAL./ACRE. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

WATER
 MINIMUM OF 1" OF RAINFALL PER WEEK (IF NOT SUPPLIED NATURALLY, CONTRACTOR SHALL SUPPLY THE REMAINING AMOUNT UNTIL GROUND COVER HAS BEEN ESTABLISHED).

MAINTENANCE
 RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

LATE WINTER AND EARLY SPRING (COASTAL PLAIN, FEB. 15 - APR 15)

TEMPORARY SEEDING MIXTURE		
DATES	SPECIES	RATE (LBS./ACRE)
OCTOBER 25 - DECEMBER 30	RYE GRAIN	120
OCTOBER 25 - DECEMBER 30	TALL FESCUE	80

NOTE: BETWEEN DECEMBER 30 - FEBRUARY 15, ADD 50 OBS/ACRE OF ANNUAL KOBE LESPEDEZA

SOIL AMENDMENTS
 APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. SOILS WITH pH HIGHER THAN 6 NEED NOT BE LIMED. IF THE pH OF THE SOIL IS UNKNOWN, AN APPLICATION OF GROUND LIME AT THE RATE OF 75 LBS/1000 SF.
 APPLY LIME AND INCORPORATE INTO TOP 4" TO 6" OF SOIL.
 APPLY FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. WHEN THE SOIL TEST IS UNAVAILABLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700-1000 LB/ACRE INCORPORATED INTO THE TOP 4" TO 6" OF SOIL.

MULCH
 * APPLY 4,000 LBS./ACRE GRAIN STRAW OR ENGINEER APPROVED EQUIVALENT COVER.
 * ANCHOR MULCH WITH A MULCH ANCHORING TOOL, NETTING, OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 200 GAL./ACRE. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

WATER
 MINIMUM OF 1" OF RAINFALL PER WEEK (IF NOT SUPPLIED NATURALLY, CONTRACTOR SHALL SUPPLY THE REMAINING AMOUNT UNTIL GROUND COVER HAS BEEN ESTABLISHED).

MAINTENANCE
 RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

FALL (COASTAL PLAIN, AUG 25 - OCT)

TEMPORARY SEEDING MIXTURE		
DATES	SPECIES	RATE (LBS./ACRE)
AUGUST 25 - OCTOBER	TALL FESCUE	80

SOIL AMENDMENTS
 APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. SOILS WITH pH HIGHER THAN 6 NEED NOT BE LIMED. IF THE pH OF THE SOIL IS UNKNOWN, AN APPLICATION OF GROUND LIME AT THE RATE OF 75 LBS/1000 SF.
 APPLY LIME AND INCORPORATE INTO TOP 4" TO 6" OF SOIL.
 APPLY FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS. WHEN THE SOIL TEST IS UNAVAILABLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700-1000 LB/ACRE INCORPORATED INTO THE TOP 4" TO 6" OF SOIL.

MULCH
 * APPLY 4,000 LBS./ACRE GRAIN STRAW OR ENGINEER APPROVED EQUIVALENT COVER.
 * ANCHOR MULCH WITH A MULCH ANCHORING TOOL, NETTING, OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 200 GAL./ACRE. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

WATER
 MINIMUM OF 1" OF RAINFALL PER WEEK (IF NOT SUPPLIED NATURALLY, CONTRACTOR SHALL SUPPLY THE REMAINING AMOUNT UNTIL GROUND COVER HAS BEEN ESTABLISHED).

MAINTENANCE
 REPAIR AND RE-FERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LBS./ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LBS./ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

PERMANENT SEEDING SCHEDULE (NOT FOR STREAM BANKS)

LATE WINTER AND EARLY SPRING

PERMANENT SEEDING MIXTURE (GENTLE SLOPES OR POOR SOILS; LOW MAINTENANCE)		
DATES (LATE WINTER)	SPECIES	RATE (LBS./ACRE)
FEBRUARY 15 - APRIL 15	TALL FESCUE	80
FEBRUARY 15 - APRIL 15	SERICEA LESPEDEZA	30
FEBRUARY 15 - APRIL 15	KOBE LESPEDEZA	10

NOTE: OVERSEEDING OF KOBE LESPEDEZA OVER FALL-SEEDED TALL FESCUE IS VERY EFFECTIVE. FALL IS BEST FOR TALL FESCUE AND LATE WINTER FOR LEPEDEZAS.

NOTE: TO EXTEND SPRING SEEDING INTO JUNE, ADD 15 LBS./ACRE HULLED BERMUDAGRASS

FALL

PERMANENT SEEDING MIXTURE (STEEP SLOPES OR POOR SOILS; LOW MAINTENANCE)		
DATES	SPECIES	RATE (LBS./ACRE)
AUGUST 25 - OCTOBER 15	TALL FESCUE	100
AUGUST 25 - OCTOBER 15	SERICEA LESPEDEZA	30
AUGUST 25 - OCTOBER 15	KOBE LESPEDEZA	10

SEEDING NOTES
 1. AFTER AUGUST 15 USE UNSCARIFIED SERICEA SEED.
 2. WHERE NEAT APPEARANCE IS DESIRED OR TO EXTEND SPRING SEEDING INTO JUNE, OMIT SERICEA AND SUBSTITUTE 40 LBS./ACRE BAHIAGRASS OR 15 LBS./ACRE BERMUDAGRASS.

SOIL AMENDMENTS
 APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. SOILS WITH pH HIGHER THAN 6 NEED NOT BE LIMED. APPLY LIME AND INCORPORATE INTO TOP 4" TO 6" OF SOIL.
 APPLY FERTILIZER ACCORDING TO SOIL TEST RECOMMENDATIONS ONLY.

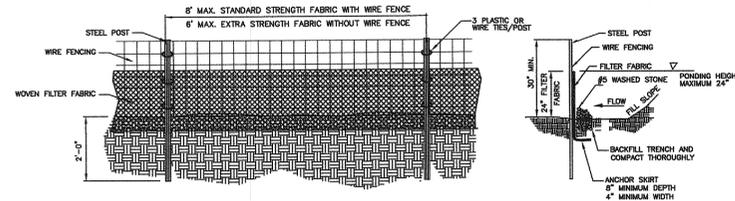
MULCH
 * APPLY 4,000 - 5,000 LBS./ACRE GRAIN STRAW OR ENGINEER APPROVED EQUIVALENT COVER.
 * ANCHOR MULCH WITH BY RÖVING, NETTING, OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 200 GAL./ACRE. NETTING IS PREFERRED ANCHORING METHOD ON STEEP SLOPES.

WATER
 MINIMUM OF 1" OF RAINFALL PER WEEK (IF NOT SUPPLIED NATURALLY, CONTRACTOR SHALL SUPPLY THE REMAINING AMOUNT UNTIL GROUND COVER HAS BEEN ESTABLISHED).

MAINTENANCE
 RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RE-SEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE. GENERALLY, A STAND OF VEGETATION CANNOT BE DETERMINED TO BE FULLY ESTABLISHED UNTIL SOIL COVER HAS BEEN MAINTAINED FOR ONE FULL YEAR FROM PLANTING. INSPECT SEEDING AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEEDINGS WITHIN THE SAME SEASON, IF POSSIBLE.

SEED BED PREPARATION

- RIP THE ENTIRE AREA TO 6" DEPTH.
- REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
- APPLY AGRICULTURAL LIME AND FERTILIZER UNIFORMLY (IN ACCORDANCE WITH SOIL AMENDMENTS SPECIFICATIONS LISTED FOR THE RESPECTIVE SEEDING SCHEDULE) AND MIX WITH SOIL.
- CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED 4" TO 8" DEPTH.
- SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING AND SEED ACCORDING TO SCHEDULE.
- MULCH IN ACCORDANCE WITH MULCH SPECIFICATIONS LISTED FOR THE RESPECTIVE SEEDING SCHEDULE IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
- INSPECT ALL SEEDING AREAS FOR COMPLIANCE WITH THE REQUIREMENTS OF THE SEEDING SCHEDULE AND OTHER REQUIREMENTS LISTED ON THIS SHEET. IF STAND SHOULD BE OVER 60% DAMAGED, RE-ESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
- GROUND COVER - PROTECTIVE COVER MUST BE ESTABLISHED ON ALL DISTURBED AREAS WITHIN 21 CALENDAR DAYS AFTER LAND DISTURBING ACTIVITY IS COMPLETED OR HAS TEMPORARILY CEASED.



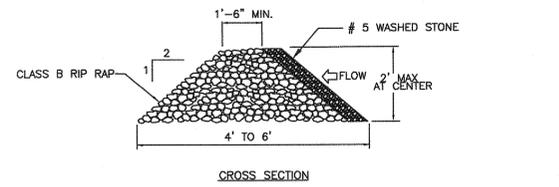
- GENERAL NOTES:**
- FILTER FABRIC FENCE SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
 - WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
 - STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
 - WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
 - TURN SILT FENCE UP SLOPE AT ENDS.
 - WIRE MESH SHALL BE MIN. 13 GAGE WITH MAXIMUM 12" OPENINGS.
 - WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
 - ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWM BUFFERS, STREAMS OR WETLANDS (REFER TO SWM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.

1 TEMPORARY SILT FENCE DETAIL
 C-8.1 NOT TO SCALE REFER TO C.O.F. STD DET EC-5

- DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
- SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
- DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

- INSPECT FILTER BARRIERS BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT AT LEAST ONCE/ WEEK OR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
- SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
- SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

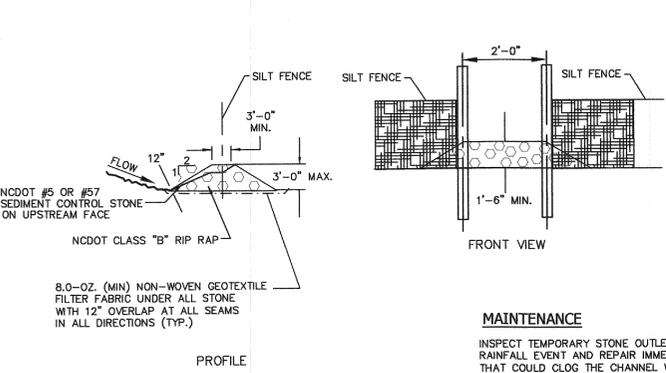


- GENERAL NOTES:**
- RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
 - CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
 - ENSURE THAT MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE DOWNSTREAM DAM (SEE DIAGRAM).
 - KEEP THE CENTER STONE SECTION AT LEAST 9 INCHES BELOW NATURAL GROUND LEVEL WHERE THE DAM ABUTS THE CHANNEL BANKS.
 - EXTEND STONE AT LEAST 1.5 FT BEYOND THE DITCH BANK TO KEEP WATER FROM CUTTING AROUND THE ENDS OF THE CHECK DAM.
 - MAKE SURE THE CHANNEL REACH ABOVE THE MOST UPSTREAM DAM IS STABLE.
 - PROTECT THE CHANNEL AFTER THE LOWEST CHECK DAM FROM HEAVY FLOW THAT COULD CAUSE EROSION.

MAINTENANCE NOTES:

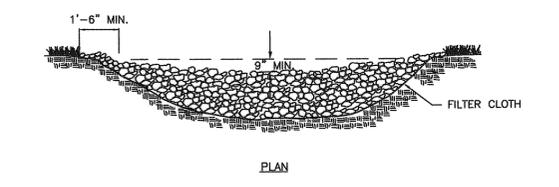
- INSPECT CHECK DAMS AND CHANNELS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/4 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMGS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED.
- ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, ADDITIONAL MEASURES CAN BE TAKEN SUCH AS, INSTALLING A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL (PRACTICE 6.31).

3 TEMPORARY ROCK CHECK DAM
 C-8.1 NOT TO SCALE REFER TO C.O.F. STD DET EC-6



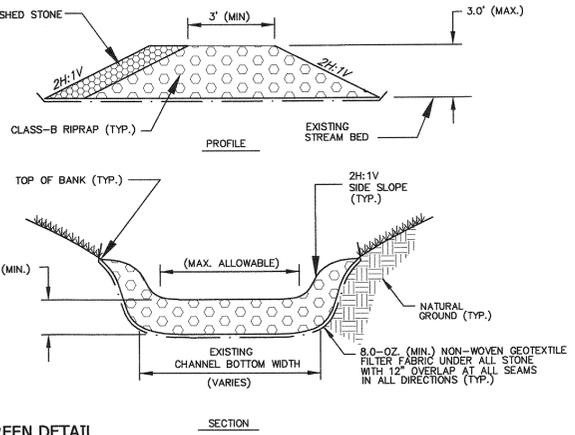
MAINTENANCE
 INSPECT TEMPORARY STONE OUTLETS WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMGS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED. ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE AND AROUND THE STONE. CORRECT ALL DAMAGE IMMEDIATELY.
 REMOVE THE SEDIMENT ACCUMULATED BEHIND THE OUTLET AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION. ALLOW THE CHANNEL OR RUNOFF TO DRAIN THROUGH THE STONE OUTLET AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE STONE OUTLET. ADD STONES TO THE STRUCTURE AS NEEDED TO MAINTAIN ADEQUATE HEIGHT AND SIZE TO PREVENT SEDIMENT FROM PASSING OVER.

2 TEMPORARY STONE OUTLET DETAIL
 C-8.1 NOT TO SCALE



MAINTENANCE
 INSPECT TEMPORARY STREAM SILT SCREEN FOR SEDIMENT BUILD-UP PERIODICALLY AND REMOVE DEPOSITS. ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE SCREEN. ADD STONES AS NEEDED TO MAINTAIN SCREEN HEIGHT AND CROSS SECTION TO ALLOW STREAM FLOW.

4 TEMPORARY ROCK SILT SCREEN DETAIL
 C-8.1 NOT TO SCALE



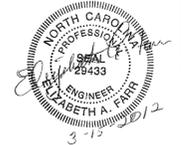
5 TEMPORARY ROCK SILT SCREEN DETAIL
 C-8.1 NOT TO SCALE

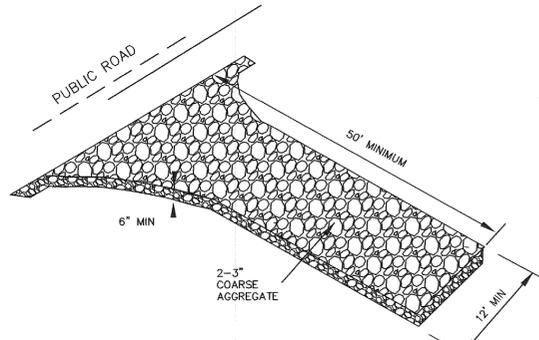
EROSION CONTROL DETAILS -1

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REVISIONS	JOB NO. 10-158-12
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE DRAINAGE IMPROVEMENTS	"C"
FOREST HILLS DRIVE FAYETTEVILLE, NORTH CAROLINA	SHEET NO.
	8.1

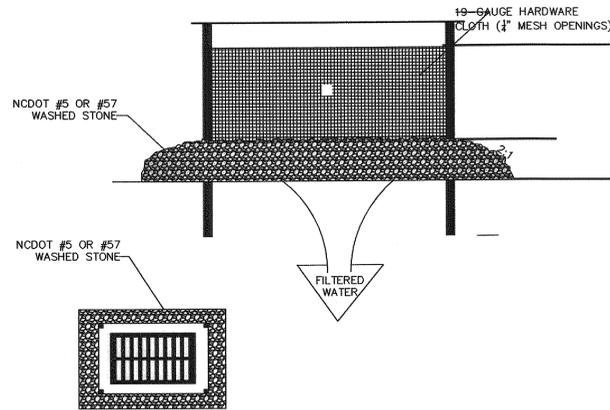




- NOTES:
1. APPLICABLE AT ALL POINTS OF INGRESS & EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.
 2. GRAVEL PAD TO BE 12'x50' AND 6\"/>

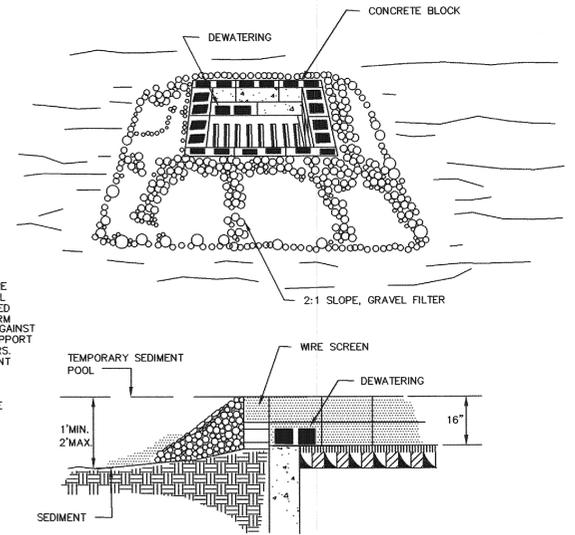
GENERAL NOTES:

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUND COVER.



CONSTRUCTION SPECIFICATIONS

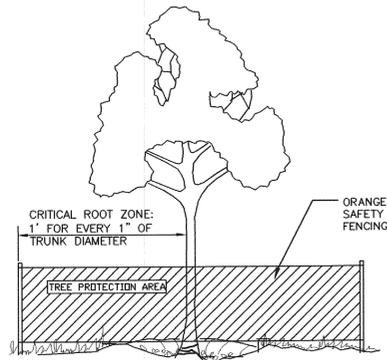
1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE ON THE BOTTOM ROW TO ALLOW POOL DRAINAGE. THE FOUNDATION SHOULD BE EXCAVATED AT LEAST 2 INCH BELOW THE CREST OF THE STORM DRAIN. PLACE THE BOTTOM ROW OF THE BLOCK AGAINST THE EDGE OF THE STORM DRAIN FOR LATERAL SUPPORT AND TO AVOID WASHOUTS WHEN OVERFLOW OCCURS. IF NEEDED, GIVE LATERAL SUPPORT TO SUBSEQUENT BLOCK OPENINGS.
2. CAREFULLY FIT HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENING OVER ALL BLOCK OPENING TO HOLD GRAVEL IN PLACE.
3. USE CLEAN GRAVEL 3/4- TO 1 1/2-INCH IN DIAMETER, PLACED 2 INCHES BELOW THE TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER AND SMOOTH IT TO AN EVEN GRADE. DOT #57 WASHED STONE IS RECOMMENDED.



1 TEMPORARY CONSTRUCTION ENTRANCE
C-8.2 / NOT TO SCALE REFER TO C.O.F. STD DET EC-2

4 TYPICAL HARDWARE CLOTH AND GRAVEL DROP INLET PROTECTION
C-8.2 / NOT TO SCALE REFER TO C.O.F. STD DET EC-1C

6 TYPICAL BLOCK AND GRAVEL DROP INLET PROTECTION
C-8.2 / NOT TO SCALE REFER TO C.O.F. STD DET EC-1



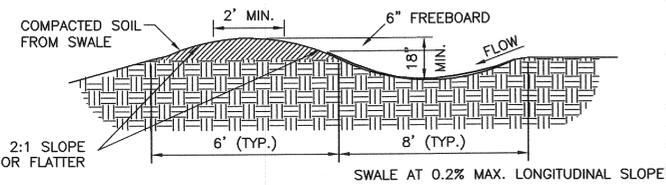
2 REQUIRED TREE PROTECTION DETAIL
C-8.2 / NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. FORD STREAM CROSSING SHALL BE INSTALLED IN SANITARY SEWER EASEMENT AS PERMANENT UTILITY CROSSING FOR MAINTENANCE VEHICLES.
2. FORD SHALL BE STABILIZED WITH RIP RAP OVER GEOTEXTILE FABRIC.
3. KEEP STREAM CROSSING AT RIGHT ANGLES TO THE STREAM FLOW.
5. ALIGN ROAD APPROACHES WITH THE CENTER LINE OF THE CROSSING FOR A MIN. DISTANCE OF 30 FEET. ENSURE THAT BYPASS CHANNELS NECESSARY TO DEWATER THE CROSSING SITE, ARE STABLE BEFORE DIVERTING THE STREAM.
6. ENSURE THAT PERMANENT MEASURES NEEDED TO CONTROL EROSION FROM ROAD WATER RUNOFF MEET ALL CONSTRUCTION REQUIREMENTS FOR THOSE PRACTICES. TO DEWATER THE CROSSING SITE, ARE STABLE BEFORE DIVERTING THE STREAM.

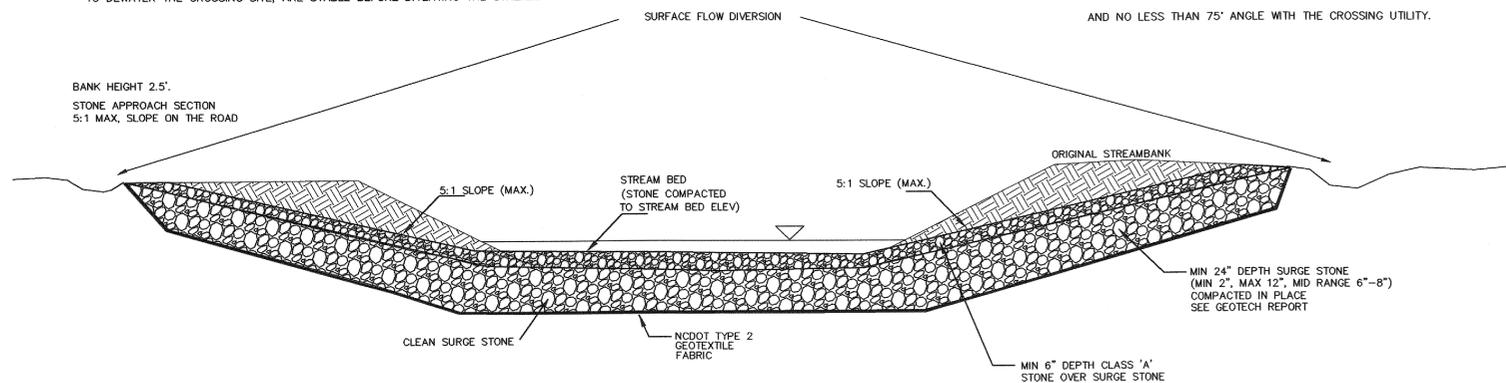
MAINTENANCE

1. INSPECT PERMANENT STREAM CROSSINGS PERIODICALLY AND AFTER MAJOR STORMS TO CHECK FOR CHANNEL BLOCKAGE, EROSION OF ABUTMENTS, CHANNEL DEGRADATION, RIP RAP OUTLET DISPLACEMENT, SLOPE FAILURE, AND PIPING. MAKE ALL NEEDED REPAIRS IMMEDIATELY TO PREVENT FURTHER DAMAGE TO THE INSTALLATION.
3. PERMANENT UTILITY CROSSING SHALL BE MAINTAINED PROPERLY. MONITOR CROSSING FOR LOOSENED ROCK OR EROSION AT THE APPROACH SECTIONS AND REPAIR WITH WASHED STONE.



MAINTENANCE:
INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL DURING CONSTRUCTION OPERATION. IMMEDIATELY REMOVE ANY SEDIMENT AND OBSTRUCTIONS FROM THE FLOW AREA, AND REPAIR THE DIVERSION RIDGE. CHECK OUTLETS, AND MAKE TIMELY REPAIRS AS NEEDED. MAINTAIN THE VEGETATION IN A VIGOROUS, HEALTHY CONDITION AT ALL TIMES. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE BERM AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE IT.

3 TEMPORARY DIVERSION SWALE DETAIL (PERMANENT DRAINAGE DITCH-SIMILAR)
C-8.2 / NOT TO SCALE



5 STREAM CROSSING (FORD)
C-8.2 / NOT TO SCALE



EROSION CONTROL DETAILS-2

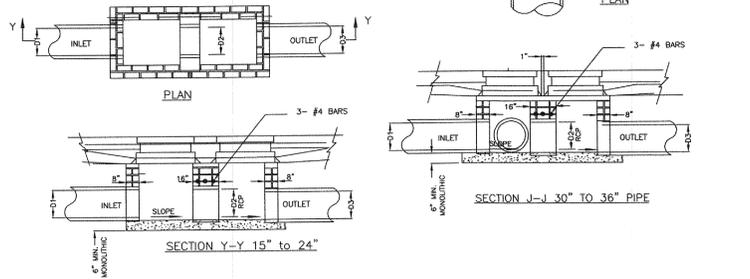
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REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

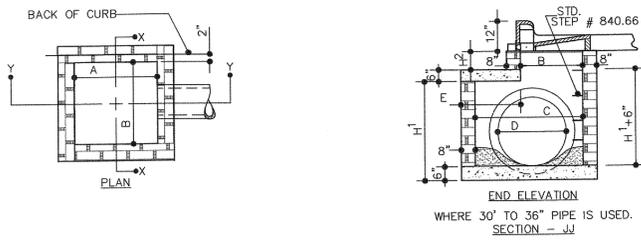
CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NORTH CAROLINA

"C"
SHEET NO.
8.2

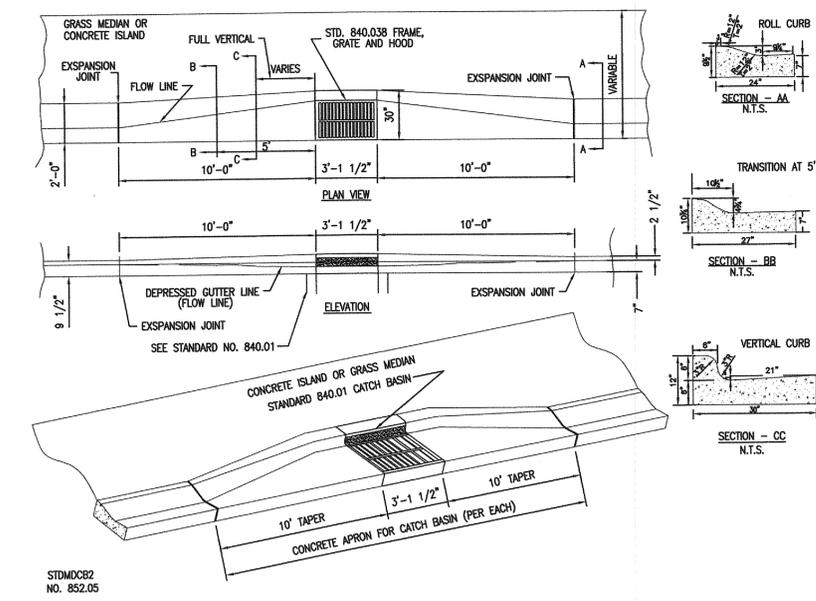
- GENERAL NOTES:**
- DOUBLE CATCH BASIN ONLY FOR USE ON CITY-MAINTAINED STREETS. INSTALLATION ON STREETS WITHIN EXISTING/FUTURE NCDOT-MAINTAINED RIGHT-OF-WAY AND IN ETAs REQUIRES A MINIMUM OF ONE 4'-0" LONG SECTION OF REINFORCED CONCRETE PIPE BETWEEN CATCH BASINS.
 - SEE NCDOT STANDARD 840.01 FOR DETAILS BASED ON PIPE SIZE PER CROSS SECTION. CONSTRUCT TWO SINGLE BASINS FOR NCDOT STANDARD WITH DOUBLE INTERIOR WALL.
 - ALL CONCRETE TO BE 3000 P.S.I. COMPRESSIVE STRENGTH.
 - BASE SLAB SHALL BE MONOLITHIC.
 - SEE QTY OF FAYETTEVILLE STANDARDS SD-4 AND SD-5 FOR PLACEMENT OF CATCH BASIN.
 - PIPE SECTION D2 CONNECTING CATCH BASINS SHALL HAVE A MINIMUM DIAMETER SAME AS OF OUTLET PIPE D3.
 - ALL REINFORCING STEEL SHOWN ON NCDOT STANDARDS IS TO BE PROVIDED AS CONTINUOUS MEMBERS. (NO LAPS, USED AS A SINGLE CONTINUOUS BAR IN THE SLAB)



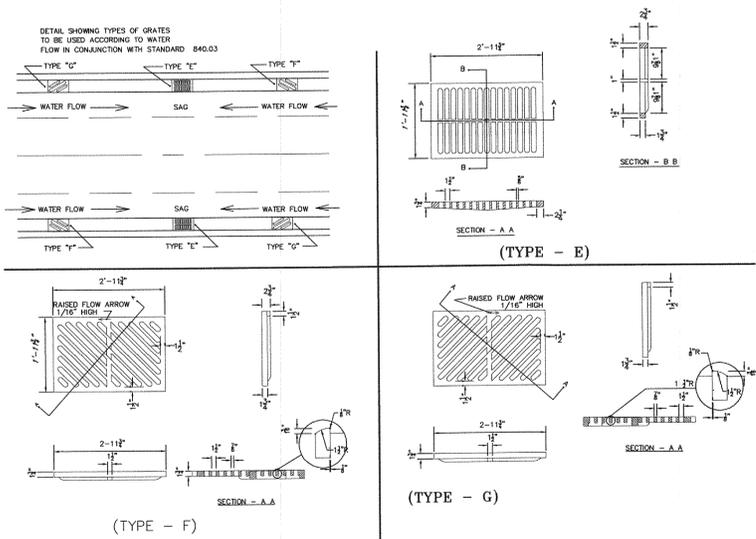
1 TYPICAL BRICK DOUBLE CATCH BASIN (15" - 36" PIPE)
C-9.1 NOT TO SCALE REFER TO C.O.F. STD DET DR-4



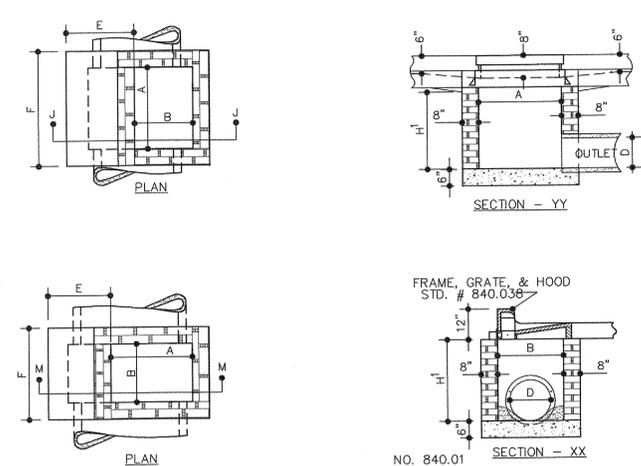
END ELEVATION
WHERE 30" TO 36" PIPE IS USED.
SECTION - JJ



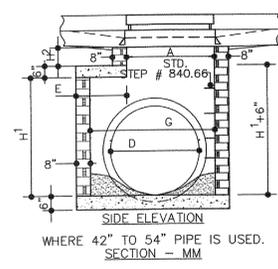
4 STANDARD CATCH BASIN TRANSITION FOR ROLL CURB AND GUTTER
C-9.1 NOT TO SCALE REFER TO C.O.F. STD DET SD-4



2 STANDARD FRAME, GRATES, AND HOOD
C-9.1 NOT TO SCALE REFER TO C.O.F. STD DET DR-22



FRAME, GRATE, & HOOD
STD. # 840.036
SECTION - XX
NO. 840.01



SIDE ELEVATION
WHERE 42" TO 54" PIPE IS USED.
SECTION - MM

- GENERAL NOTES:**
- MORTAR JOINTS 1/2" 1/8" THICK.
 - 3000 P.S.I. CONCRETE TO BE USED.
 - THE POURING OF FLOOR SLAB TO BE ACCOMPLISHED BY FORMING.
 - ALL CATCH BASINS OVER 3'-6" IN DEPTH SHALL BE PROVIDED WITH STEPS 1' - 2' ON CENTERS.
 - USE TYPE "E" & "G" GRATE UNLESS OTHERWISE INDICATED.
 - JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF CLAY BRICKS.
 - FOR 8'-0" IN HEIGHT OR LESS USE 8" WALL OVER 8'-0" IN HEIGHT USE 12" WALL TO 6'-0" FROM TOP OF WALL, 8" WALL FOR THE REMAINING 6'-0"
 - INVERTS SHALL BE SHAPED TO FORM A SMOOTH, REGULAR SURFACE, SLOPED TO PREVENT SEDIMENTATION.

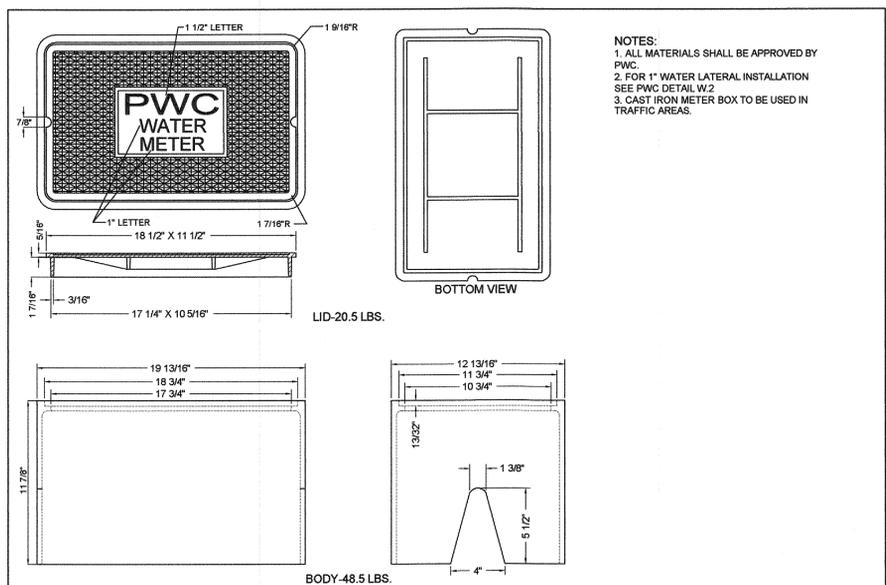
DIMENSIONS OF BOX AND PIPE		COVER						REINFORCING			* CUBIC YARDS OF BRICK MASONRY		DEDUCTIONS FOR ONE PIPE		
D	H	A	B	C	E	F	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.	NO.
15	10	2	2	2	2	2	1	1	1	1	1	1	1	1	1
18	12	2	2	2	2	2	1	1	1	1	1	1	1	1	1
24	18	3	3	3	3	3	1	1	1	1	1	1	1	1	1
30	24	4	4	4	4	4	1	1	1	1	1	1	1	1	1
36	30	5	5	5	5	5	1	1	1	1	1	1	1	1	1
42	36	6	6	6	6	6	1	1	1	1	1	1	1	1	1
48	42	7	7	7	7	7	1	1	1	1	1	1	1	1	1
54	48	8	8	8	8	8	1	1	1	1	1	1	1	1	1

3 STANDARD BRICK CATCH BASIN (15-54" PIPE)
C-9.1 NOT TO SCALE REFER TO C.O.F. STD DET DR-3, & 3.1

REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
DRAINAGE IMPROVEMENTS
FOREST HILLS DRIVE
FAYETTEVILLE, NORTH CAROLINA

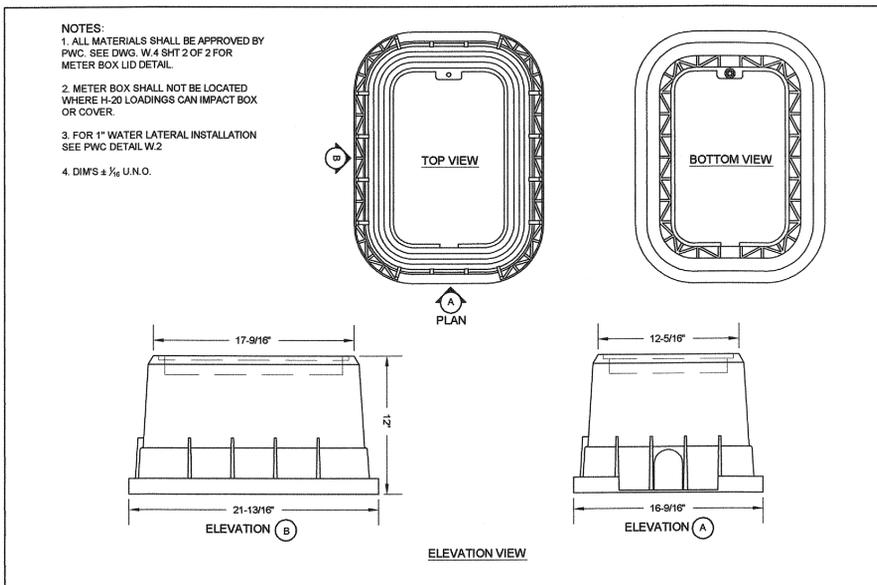




NOTES:
 1. ALL MATERIALS SHALL BE APPROVED BY P.W.C.
 2. FOR 1" WATER LATERAL INSTALLATION SEE PWC DETAIL W.2
 3. CAST IRON METER BOX TO BE USED IN TRAFFIC AREAS.

1-INCH CAST IRON METER BOX & COVER		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO. DATE REVISION	
SHEET NO. 1 OF 1		DWG. NO. W.4B		1 3/10 CHANGED BOX & LID DIMENSIONS	
DATE: JAN. 01, 2012		APPROVED BY: J.E.G.		WATER RESOURCES ENGINEERING DEPARTMENT	

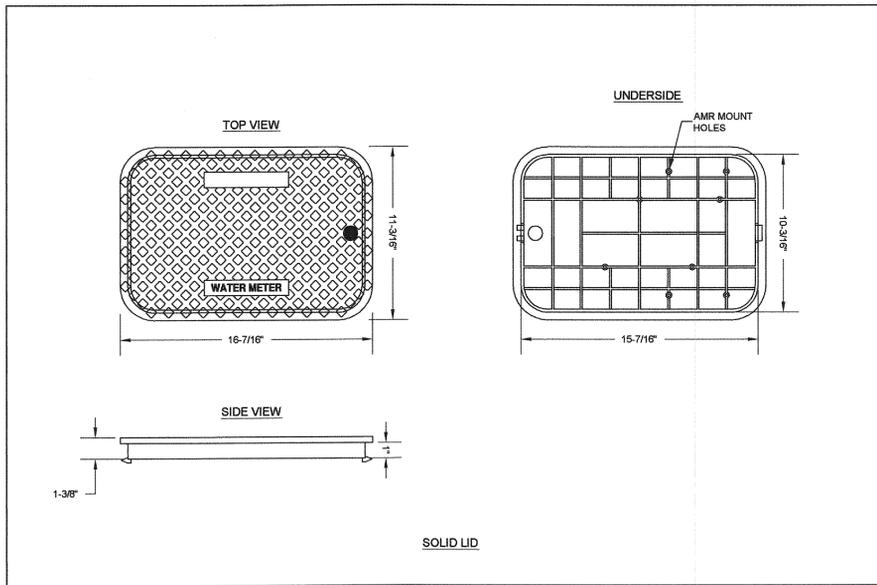
1 1-INCH CAST IRON METER BOX & COVER
C-9.4 NOT TO SCALE



NOTES:
 1. ALL MATERIALS SHALL BE APPROVED BY P.W.C. SEE DWG. W.4 SHT 2 OF 2 FOR METER BOX LID DETAIL.
 2. METER BOX SHALL NOT BE LOCATED WHERE H-20 LOADINGS CAN IMPACT BOX OR COVER.
 3. FOR 1" WATER LATERAL INSTALLATION SEE PWC DETAIL W.2
 4. DIMS ± 1/16 U.N.O.

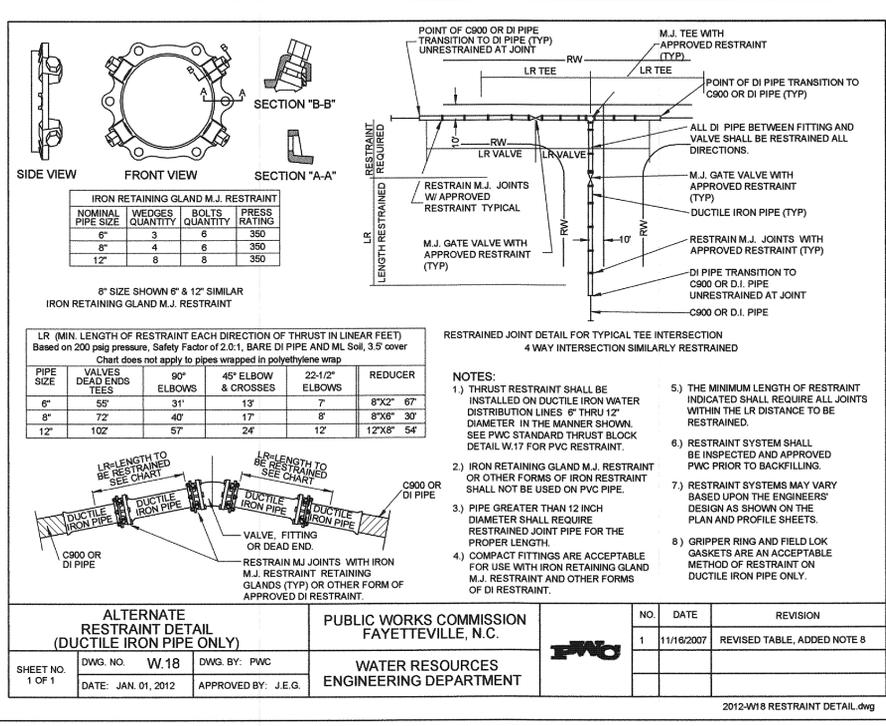
1-INCH METER BOX DETAILS		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO. DATE REVISION	
SHEET NO. 1 OF 2		DWG. NO. W.4		1 3/10 CHANGED BOX DIMENSIONS	
DATE: JAN. 01, 2012		APPROVED BY: J.E.G.		WATER RESOURCES ENGINEERING DEPARTMENT	

3 1-INCH METER BOX DETAILS
C-9.4 NOT TO SCALE

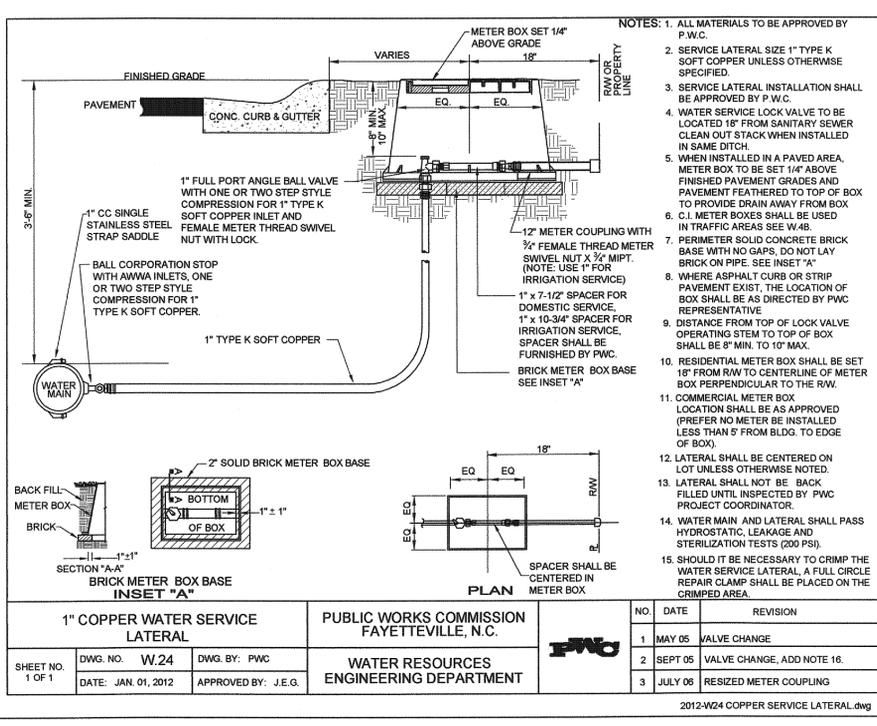


1-INCH METER BOX LID		PUBLIC WORKS COMMISSION FAYETTEVILLE, N.C.		NO. DATE REVISION	
SHEET NO. 2 OF 2		DWG. NO. W.4		1 7/07 REVISED LID	
DATE: JAN. 01, 2012		APPROVED BY: J.E.G.		WATER RESOURCES ENGINEERING DEPARTMENT	

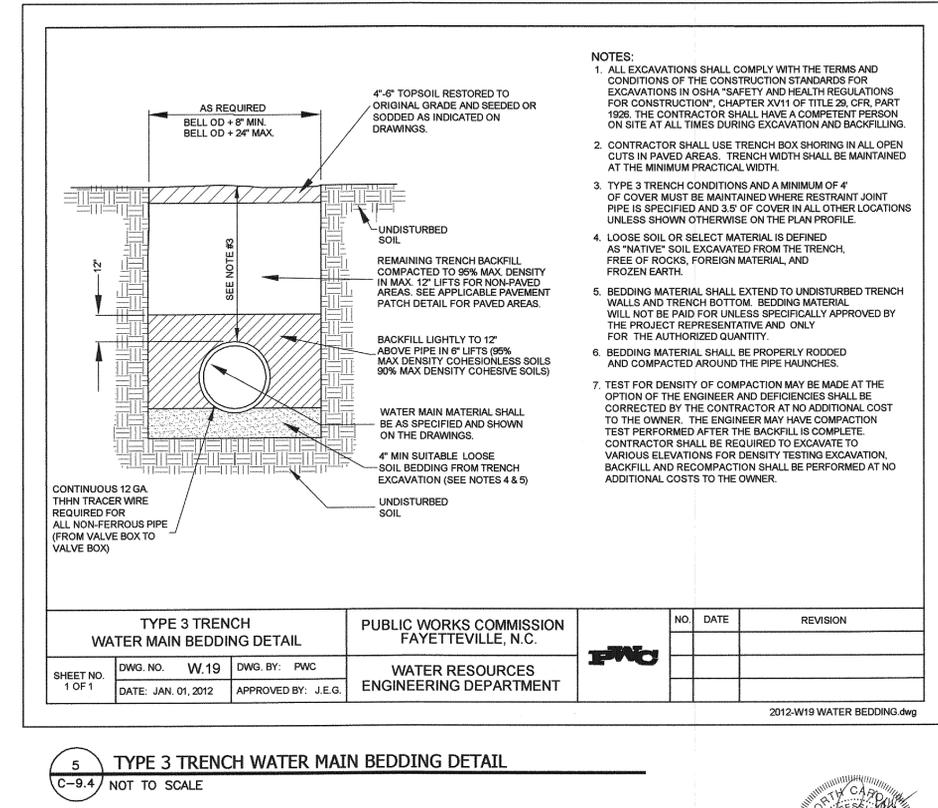
5 1-INCH METER BOX LID
C-9.4 NOT TO SCALE



2 ALTERNATE RESTRAINT DETAIL (DUCTILE IRON PIPE ONLY)
C-9.4 NOT TO SCALE



4 1" COPPER WATER SERVICE LATERAL
C-9.4 NOT TO SCALE



5 TYPE 3 TRENCH WATER MAIN BEDDING DETAIL
C-9.4 NOT TO SCALE

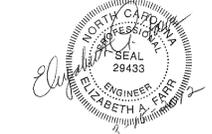
CIVIL DETAILS -5

JEWELL
 ENGINEERING CONSULTANTS, PC
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 KERNERSVILLE, NORTH CAROLINA 27285
 (336) 996-9974
 FAX: (336) 996-9976
 NC LICENSE #: C-1642

REVISIONS	JOB NO. 10-158-012
	DESIGNED 03-15-12 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

CITY OF FAYETTEVILLE
 DRAINAGE IMPROVEMENTS
 FOREST HILLS DRIVE
 FAYETTEVILLE, NORTH CAROLINA

"C"
 SHEET NO.
9.4



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