

ROQUEMORE ROAD CULVERT REPLACEMENT

JOHNSON CREEK TRIBUTARY NO. 2

LOCATION: VILLAGE OF CLEMMONS, NORTH CAROLINA - FORSYTH COUNTY

OWNER: VILLAGE OF CLEMMONS

GENERAL NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIARIZED WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
2. THE 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.
3. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF 18-INCH SANITARY FORCE MAIN UNDER EXISTING CULVERT TO CONFIRM AVAILABLE ELEVATION FOR PROPER PROPOSED CULVERT INSTALLATION. NOTIFY ENGINEER AND VILLAGE OF CLEMMONS STORMWATER WITH FINDINGS AND/OR DISCREPANCIES. NOTIFY POWER COMPANY FOR ANY CONFLICTS AND/OR POLE RELOCATIONS NEEDED.
4. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY INTERRUPTING AND/OR DIVERTING ANY UTILITIES DURING CONSTRUCTION. NOTIFY LARRY KIRBY AT PUBLIC WORKS (766-9170), CLEMMONS, IN ADVANCE FOR TEMPORARY ROUTING OF GAS SERVICES AND OTHER UTILITIES DURING CULVERT CONSTRUCTION. WHEN PROPOSED CULVERT HAS BEEN INSTALLED NOTIFY LARRY KIRBY FOR PERMANENT GAS LINE INSTALLATION AND SLEEVEING AND FOR NOTIFICATION OF OTHER UTILITIES PRIOR TO BACKFILLING OVER CULVERT.
5. NOTIFY LARRY KIRBY FOR EXISTING 8-INCH WATER LINE SERVICE IMPACTS DURING CULVERT REMOVAL AND CULVERT INSTALLATION. EXISTING 8-INCH WATER LINE/TEMPORARY WATER LINE OVER EXISTING CULVERT IS TO REMAIN IN SERVICE DURING AND UNTIL CONSTRUCTION IS COMPLETE FOR THE NEW CULVERT.
6. OTHER UTILITIES SUCH AS POWER, CABLE AND PHONE, LARRY KIRBY IS TO BE NOTIFIED AND BE COORDINATED FOR CONTINUOUS SERVICE. INTERRUPTIONS SHALL BE KEPT TO A MINIMUM.
7. ALL EROSION CONTROL MEASURES SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
8. ALL THE NECESSARY APPROVALS HAVE BEEN/WILL BE OBTAINED FROM THE STATE AND ARMY CORPS FOR ANY WETLANDS DISTURBANCE AND STREAM CROSSING DISTURBANCE.



VILLAGE OF CLEMMONS, NC
LOCATION MAP
 SCALE: 1" = 2000 FT

SITE

INDEX OF SHEETS

GENERAL

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ENGINEERING CONSULTANTS
 POST OFFICE BOX 2294 (336) 996-9974
 KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 996-9976
 NC LICENSE C-1842

JEC PROJECT NO. 09-087-003-001



STANDARD SITE ABBREVIATIONS

ABC	AGGREGATE BASE COURSE	MAX	MAXIMUM
AC	ACRES	MED	MEDIAN
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MH	MANHOLE
APPROX	APPROXIMATE	MIN	MINIMUM
ASPH	ASPHALT	MJ	MECHANICAL JOINT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS	MON	MONUMENT
AWWA	AMERICAN WATER WORKS ASSOCIATION	MTL	METAL
		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	NCDDOT	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
BW	BARB WIRE	NGGS	NORTH CAROLINA GEODETIC SURVEY
C&G	CURB AND CUTTER	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	PCC	POINT OF COMPOUND CURVATURE
CMP	CORRUGATED METAL PIPE	PE	PEDESTAL
CO	CLEAN OUT	PI	POINT OF INTERSECTION
COM	COMMUNICATION	PI/C	POINT OF INTERSECTION NO CURVE
CONC	CONCRETE	PIV	POST INDICATOR VALVE
CONSTR	CONSTRUCTION	R	RADIUS
CONTR	CONTRACTOR	R/W	RIGHT OF WAY
COR	CORNER	RCP	REINFORCED CONCRETE PIPE
CULV	CULVERT	RETW	RETAINING WALL
CW	CHILLED WATER	REV	REVISED
Δ	DELTA	RJ	RESTRAINED JOINT
DCV	DETECTOR CHECK VALVE	RPZ	REDUCED PRESSURE ZONE
DDCV	DOUBLE DETECTOR CHECK VALVE	RT	RIGHT
DI	DROP INLET	RWM	RIGHT OF WAY MONUMENT
DIA	DIAMETER	SAN	SANITARY
Ø	DIAMETER	SB	SOIL BORING
DIP	DUCTILE IRON PIPE	SBL	SOUTH BOUND LANE
DPC	DUKE POWER COMPANY	SHT	SHEET
DRW	DRIVEWAY	SIA	SIAMSESE CONNECTION
DW	DOMESTIC WATER	SIG	SIGNAL
EBL	EAST BOUND LANE	SL	SETBACK LINE
EG	EXISTING GRADE	SP	SIGNAL POLE
EIP	EXISTING IRON PIPE	SPECS	SPECIFICATIONS
ELEC	ELECTRIC	SS	SANITARY SEWER
EL	ELEVATION	STA	STATION
ELEV	ELEVATION	STD	STANDARD
EM	ELECTRIC METER	STM	STORM
EOP	EDGE OF PAVEMENT	SW	SIDEWALK
ESMT	EASEMENT	T	TANGENT
EVC	END VERTICAL CURVE	T/	TEMPORARY BENCHMARK
EX	EXISTING	TCP	TERRA COTTA PIPE
EXT	EXTENSION	TEL	TELEPHONE
FES	FLARED END SECTION	TEMP	TEMPORARY
FFE	FINISHED FLOOR ELEVATION	TOC	TOP OF CURB
FG	FINISHED GRADE	TOE	TOE OF SLOPE
FH	FIRE HYDRANT	TOP	TOP OF SLOPE
FL	FLOOD LIGHT	TOW	TOP OF WALL
FNC	FENCE	TP	TELEPHONE POLE
FOC	FACE OF CURB	TRANS	TRANSFORMER
FPS	FEET PER SECOND	TYP	TYPICAL
FT	FOOT (OR) FEET	U/C	UNDER CONSTRUCTION
		U/G	UNDERGROUND
		UP	UTILITY POLE
		V	VERTICAL
		VC	VERTICAL CURVE
		VCP	VITREOUS CLAY PIPE
		W/	WITH
		WB	WEST BOUND LANE
		WL	WATER LINE
		WM	WATER METER
		WV	WATER VALVE
		WW	WOVEN WIRE
GALV	GALVANIZED		
GC	GENERAL CONTRACTOR		
GL	GAS LINE		
GM	GAS METER		
GPM	GALLONS PER MINUTE		
GR	GRADE		
GRV	GRAVEL		
GV	GATE VALVE		
GSV	GAS VALVE		
GW	GUY WIRE		
H	HORIZONTAL		
HC	HANDICAP		
HCP	HANDICAP PARKING		
HCR	HANDICAP RAMP		
HDPP	HDPP		
HDW	HEADWALL		
HP	HIGH POINT		
HT	HEIGHT		
ID	INSIDE DIAMETER		
IN	INCH (OR) INCHES		
"	INCH (OR) INCHES		
IN/HR	INCHES PER HOUR		
INV	INVERT		
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 ULOCO PRIOR TO CONSTRUCTION FOR EXISTING UTILITY LOCATIONS: 1 800-532-4949. 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC, AND ALL OF THE OWNER'S FACILITIES. SHOULD DAMAGES OCCUR, THE CONTRACTOR SHALL AT HIS OWN EXPENSE REPAIR IMMEDIATELY TO THE SATISFACTION OF THE OWNER AND THE ENGINEER.
- THE CONTRACTOR SHALL HOLD HARMLESS THE OWNER AND THE ENGINEER FOR DAMAGES, INJURIES, OR OTHER ACCIDENTS WHICH OCCUR DURING THESE CONSTRUCTION ACTIVITIES.
- THE 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.
- THE CONTRACTOR SHALL ENSURE THAT ALL TREES AND EXISTING LANDSCAPING NOT DESIGNATED FOR REMOVAL SHALL BE PROTECTED DURING CONSTRUCTION.
- ALL ELEVATIONS ARE IN REFERENCE TO BENCHMARK(S) TO BE PROVIDED BY THE VILLAGE OF CLEMMONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING AND COORDINATION OF ALL ILLUSTRATED CONSTRUCTION ACTIVITIES AT THE JOB SITE. CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS PUBLIC WORKS FOR ALL UTILITY COORDINATION.
- THE CONTRACTOR SHALL ENSURE THAT ALL WORK SHALL BE PERFORMED ACCORDING TO CURRENT OSHA SAFETY REGULATIONS. CONTRACTOR TO PROVIDE SAFETY TRAINING CERTIFICATION DOCUMENTATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES DURING CONSTRUCTION AND SHALL MAKE REPAIRS AT HIS EXPENSE.
- 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: 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. BARRICADES SHALL BE PLACED AT BARKWORTH AND DRUMHELLER ROADS TO DETOUR TRAFFIC AWAY FROM CONSTRUCTION ON ROQUEMORE ROAD.
- THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, THE OWNER, AND ADJACENT PROPERTY OWNERS AS REQUIRED FOR WORK OUTSIDE OF PROPERTY LINES.
- THE 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.
- THE 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 TO THESE DRAWINGS CAN BE MADE.
- THE PRECAST CULVERT SHALL BE DESIGNED AND BUILT TO STRUCTURAL DESIGN CRITERIA AND APPROVED BY THE VILLAGE OF CLEMMONS INSPECTIONS DEPARTMENT (SEE THE TECHNICAL SPECIFICATIONS SECTION OF THE CONTRACT DOCUMENTS FOR INSTRUCTIONS REGARDING SUBMITTAL REQUIREMENTS).

CONSTRUCTION NOTES

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE CITY OF WINSTON-SALEM'S CONSTRUCTION STANDARDS, AND IN ACCORDANCE WITH APPROVED PLANS BY THE ENGINEER. WHERE CONFLICTS ARISE, THE FINAL AUTHORITY SHALL BE THE VILLAGE OF CLEMMONS.
- NORMAL WORKING HOURS SHALL BE LIMITED TO 7:00AM TO 6:00PM MONDAY THRU SATURDAY. EXCEPTIONS MUST BE APPROVED BY THE VILLAGE OF CLEMMONS.
- ALL CONTRACTORS SHALL BE PROPERLY LICENSED UNDER THE STATE LAWS GOVERNING THEIR TRADE.
- THE CONTRACTOR HEREBY WARRANTS HIS WORK FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE VILLAGE OF CLEMMONS, AGAINST ANY DEFECTS DUE TO FAULTY MATERIALS OR WORKMANSHIP.
- THE CONTRACTOR SHALL HAVE A GEOTECHNICAL ENGINEER EXAMINE AND CHECK SOILS PRIOR TO CULVERT INSTALLATION ON EITHER SIDE OF THE EXISTING 18-INCH FORCE MAIN FOR CULVERT SUPPORT. NO LOADING BY THE CULVERT IS TO BE PLACED ON THE EXISTING FORCE MAIN. GEOTECH TO DETERMINE REQUIRED FOUNDATION SUPPORT FOR THE CULVERT ADJACENT TO THE FORCE MAIN AND TO MONITOR BACKFILL OF THE CULVERT. RESULTS OF THE FIELD DENSITY TESTS SHALL BE FORWARDED TO THE VILLAGE OF CLEMMONS.
- THE CONTRACTOR SHALL ACCEPT ALL RESPONSIBILITY FOR PROTECTION, PLACEMENT, AND REPLACEMENT OF BACKFILL MATERIAL, AND SELECT BACKFILL (IF SELECT BACKFILL IS NEEDED).
- THE CONTRACTOR SHALL MAINTAIN A SET OF RECORD DRAWINGS SHOWING ANY FIELD CHANGES TO THE CULVERT. THE CONTRACTOR IS NOT AUTHORIZED TO MAKE FIELD CHANGES WITHOUT THE APPROVAL OF THE ENGINEER.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE VILLAGE OF CLEMMONS (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 AND LARRY KIRBY, PUBLIC WORKS DIRECTOR, A WRITTEN CONSTRUCTION PROCEDURE WITH APPROXIMATE TIMES/DATES. THIS PROCEDURE SHALL SPECIFY SEQUENCES OF CONSTRUCTION, SEQUENCES OF EROSION CONTROL, AND SEQUENCES OF WATER PASSAGE AND MANAGEMENT.
- THE 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF PUBLIC SAFETY ON THE SITE DURING THE PERIOD OF CONSTRUCTION (INCLUDING WEEKENDS AND HOLIDAYS).
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MATERIALS AND CONSTRUCTION OF WATER MANAGEMENT FEATURES SUCH AS COFFERDAMS, DIVERSION STRUCTURES, AND THE LIKE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND SPECIFICATIONS.

GENERAL CIVIL/SITE JOB DESCRIPTION

THIS JOB CONSISTS OF EROSION CONTROL, CLEARING AND GRUBBING, DEMOLITION, SOIL EXCAVATION, CULVERT CONSTRUCTION/INSTALLATION, RIPRAP, FILL PLACEMENT, GRADING, STREAMBANK GRADING/PLANTING AND SEEDING AND MULCHING.



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

Forsyth County Utilities

(336) 727-8000

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

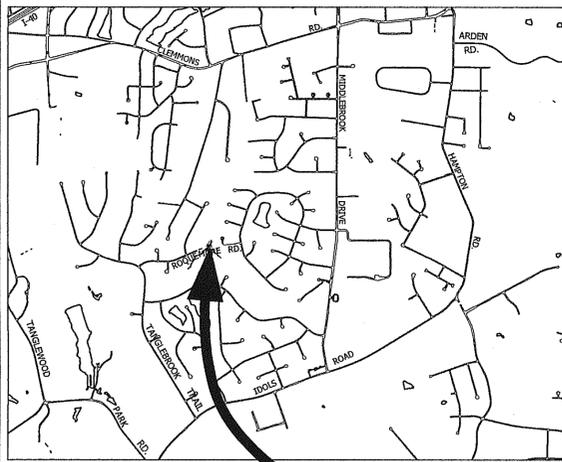
DEFINITION OF TERMS:

"VILLAGE" -- THE VILLAGE OF CLEMMONS, NC

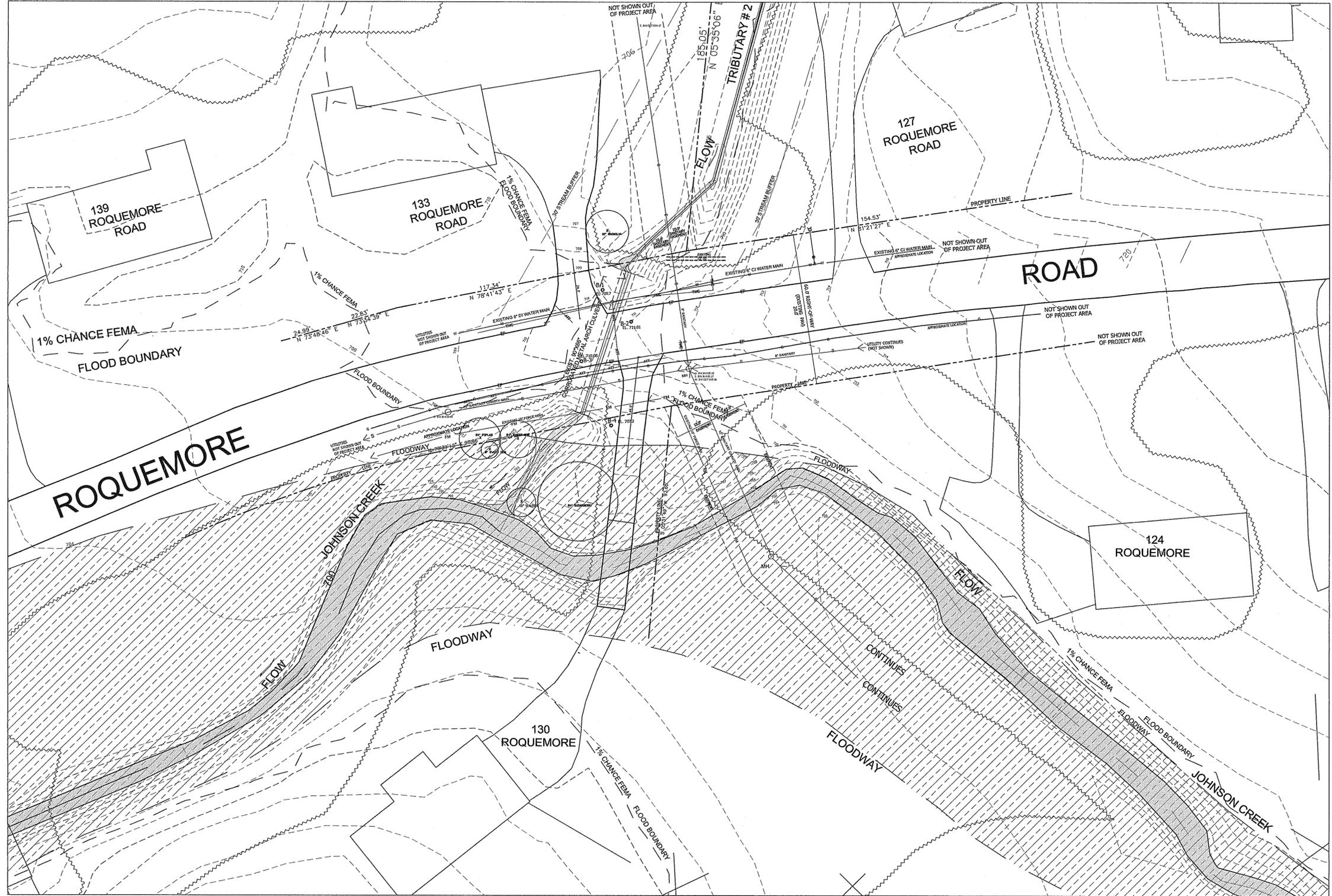


STANDARD ABBREVIATIONS AND NOTES

 ENGINEERING CONSULTANTS, PC POST OFFICE BOX 2294 KENNESVILLE, NORTH CAROLINA 27285 (336) 996-9974 FAX: (336) 996-9976	REVISIONS	JOB NO.	VILLAGE OF CLEMMONS DRAINAGE IMPROVEMENTS	"C"
		DESIGNED 10-15-09 BY BAF	ROQUEMORE ROAD	SHEET NO.
		CONST. SURVEY BY	CULVERT REPLACEMENT PLANS	2 OF 11
		CHECKED BY CDJ	AT JOHNSON CREEK TRIBUTARY # 2	
	SCALE: NONE			



VICINITY MAP
SCALE: 1" = 2000 FT
SITE
 VILLAGE OF CLEMMONS, NC

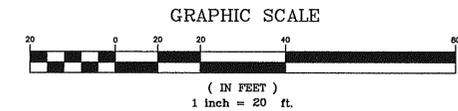


- LEGEND**
- B-1 GEOTECHNICAL BORING LOCATIONS
 - G — 2-INCH GAS MAIN
 - ATT — ATT COMMUNICATIONS
 - W — 6-INCH CI WATER MAIN *
8-INCH DI WATER MAIN *
 - S — GRAVITY SANITARY
 - FM — 18-INCH SAN FORCE MAIN
 - TWC — TIME WARNER CABLE

* UTILITIES ARE APPROXIMATE LOCATIONS ONLY AS-BUILT DRAWINGS INDICATE 8 X 6 REDUCER FOR 8" DI TO 6" CI JUST EAST OF THE CULVERT CONTRACTOR TO VERIFY LOCATIONS AND MAINTAIN ALL UTILITIES DURING CONSTRUCTION CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS FOR ALL UTILITY RELOCATION/INTERRUPTIONS, ETC

- NOTES:**
- EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM FORSYTH 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 ROQUEMORE ROAD IMPROVEMENTS SHOWN WITH ONE FOOT INCREMENTS BASED ON FIELD SURVEY PROVIDED BY THE VILLAGE OF CLEMMONS, PERFORMED JULY, 2009.
 - FLOODWAY, 100-YR FLOOD BOUNDARY SHOWN IS APPROXIMATE LOCATION, TAKEN FROM FEMA FLOOD INSURANCE STUDY MAP PANEL, DATED JANUARY 2, 2009.
 - UTILITIES SHOWN PER AS-BUILT DRAWINGS AND UTILITY MARKOUT BY NC ONE-CALL AND ARE APPROXIMATE LOCATIONS. CONTRACTOR TO OBTAIN UTILITY MARKOUT TO DETERMINE LOCATIONS OF EXISTING UTILITIES.

EXISTING STREAM ALIGNMENT



EXISTING SITE CONDITIONS

JEWELL
 ENGINEERING CONSULTANTS, PC
 POST OFFICE BOX 2224 (335) 898-8974
 KERNERSVILLE, NORTH CAROLINA 27285 FAX: (335) 898-8978

REVISIONS	JOB NO.
	DESIGNED 10-15-09 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

VILLAGE OF CLEMMONS
 DRAINAGE IMPROVEMENTS
 ROQUEMORE ROAD
 CULVERT REPLACEMENT PLANS
 AT JOHNSON CREEK TRIBUTARY # 2

"C"
 SHEET NO.
3 OF 11

NOTES:

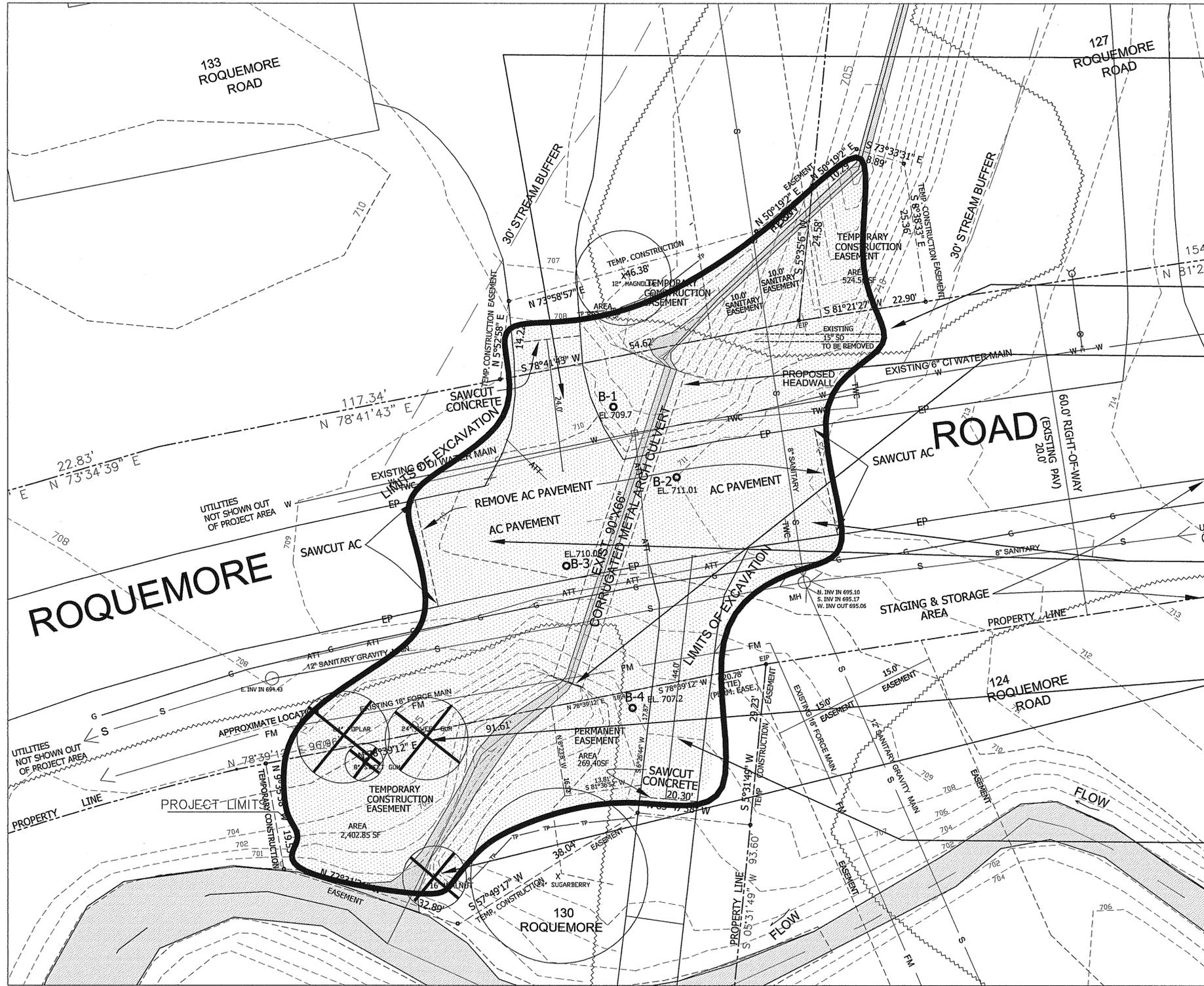
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- FLOODWAY, 100-YR FLOOD BOUNDARY SHOWN IS APPROXIMATE LOCATION, TAKEN FROM FEMA FLOOD INSURANCE STUDY MAP PANEL, DATED JANUARY 2, 2009.
- ALL EROSION CONTROL STRUCTURES AND PRACTICES ARE TO BE IN PLACE PRIOR TO EXCAVATION-SEE SHEET C-9.
- ALL STREAM WORK IS TO BE PERFORMED IN THE DRY. THE CHANNEL BANKS ARE TO BE STABILIZED PRIOR TO DIVERTING WATER BACK INTO THE STREAM CHANNEL.
- ALL WATER AND SEWER UTILITY WORK TO BE PERFORMED BY CERTIFIED UTILITY CONTRACTOR.
- CONTACT LARRY KIRBY WITH VILLAGE OF CLEMMONS FOR UTILITY NOTIFICATION (PIEDMONT GAS AND OTHERS) BEFORE EXCAVATION FOR TEMPORARY UTILITY SERVICES TO CUSTOMERS IN VICINITY OF THE CULVERT. AFTER CULVERT INSTALLATION, AND PRIOR TO BACKFILL, CONTACT LARRY KIRBY FOR UTILITY(IES) TO PERMANENTLY RECONNECT OR RE-ROUTE ANY/ALL UTILITIES.
- SANITARY 18-INCH FORCE MAIN LOCATION SHOWN PER CITY OF WINSTON-SALEM RECORD/AS-BUILT DRAWINGS. EXCAVATION IN THE AREA OF THE FORCE MAIN IS LIMITED DUE TO PROXIMITY OF FORCE MAIN AT EXISTING CULVERT. DURING REMOVAL OF EXISTING CULVERT, CONTRACTOR TO USE EXTREME CAUTION AT EXISTING CULVERT DOWNSTREAM END SO AS NOT TO IMPACT EXISTING 18-INCH FORCE MAIN. EXACT LOCATION AND ELEVATION OF FORCE MAIN IS TO BE CONFIRMED BY CONTRACTOR AND REPORTED TO VILLAGE OF CLEMMONS AND DESIGN ENGINEER. SHOULD ANY DISCREPANCY BE FOUND FROM AS-BUILT DRAWINGS IN THE LOCATION OF THE FORCE MAIN, PROPOSED CULVERT INVERTS MAY NEED TO BE REVISED. COORDINATION WITH THE VILLAGE OF CLEMMONS AND DESIGN ENGINEER IS REQUIRED FOR ANY CHANGES FROM THE APPROVED DRAWINGS.
- UTILITIES SHOWN PER UTILITY MARKOUT. CONTRACTOR IS TO CONFIRM UTILITY LOCATIONS AND UTILITY MATERIALS BY CONTACTING NC ONE-CALL AND THE CITY OF WINSTON-SALEM FOR WATER AND SEWER LOCATIONS. MAINTAIN WATER AND SEWER UTILITY SERVICES THROUGHOUT CONSTRUCTION. CONTACT LARRY KIRBY WITH VILLAGE OF CLEMMONS TO COMMUNICATE WITH UTILITY COMPANIES PRIOR TO EXCAVATION WITHIN THE PROJECT AREA.
- PROVIDE ROQUEMORE ROAD ACCESS TO PROPERTIES AT 130 AND 133 ROQUEMORE ROAD PRIOR TO AND DURING CONSTRUCTION. DRIVEWAYS AT 130 AND 133 ROQUEMORE ROAD ARE TO BE RETURNED TO EXISTING CONDITIONS AT COMPLETION OF CONSTRUCTION.
- EXISTING UTILITIES: CONTACT LARRY KIRBY PRIOR TO REMOVING EXISTING 66" X 90" CULVERT AND FOR UTILITY REMOVAL/RELOCATION. CULVERT TO BE REPLACED WITH DOUBLE BOX 8' X 5' REINFORCED CONCRETE CULVERT. INSTALL CONCRETE CRADLE OVER WEST CULVERT SECTION TO PROVIDE BED FOR 8" WATER LINE OVER CULVERT OR AT DIRECTION OF CITY OF WINSTON SALEM UTILITIES.

LEGEND

- EXISTING TREE (TYP)
- 24" POPLAR
- GEOTECHNICAL BORING LOCATIONS
- 2-INCH GAS MAIN
- ATT COMMUNICATIONS
- 6-INCH CI WATER MAIN *
- 8-INCH DI WATER MAIN *
- GRAVITY SANITARY
- 18-INCH SAN FORCE MAIN
- TIME WARNER CABLE
- TREE PROTECTION
- EXCAVATION LIMITS

* UTILITES ARE APPROXIMATE LOCATIONS ONLY. AS-BUILT DRAWINGS INDICATE 8X6 REDUCER FOR 8" DI IS LOCATED EAST OF THE EXISTING CULVERT. CONTRACTOR TO VERIFY LOCATIONS AND MAINTAIN ALL UTILITIES DURING CONSTRUCTION. AS-BUILT SEWER AND WATER DRAWINGS ARE AVAILABLE FROM CITY OF WINSTON-SALEM ENGINEERING RECORDS FOR REFERENCE. ALL UTILITIES TO BE LOCATED PRIOR TO EXCAVATION/DEMOLITION. EXTREME CAUTION IS NEEDED TO CONFIRM LOCATION AND ELEVATION OF 18-INCH FORCE MAIN DURING/AFTER EXCAVATION OF EXISTING CULVERT AND PRIOR TO INSTALLATION OF NEW CULVERT. 18-INCH FORCE MAIN IS TO REMAIN IN SERVICE, UNDISTURBED

EXISTING STREAM ALIGNMENT



REMOVE EXISTING CONCRETE DRIVEWAY AND TRANSPORT TO THE MAINTENANCE FACILITY AT 3800 DILLON INDUSTRIAL DR CLEMMONS, NC

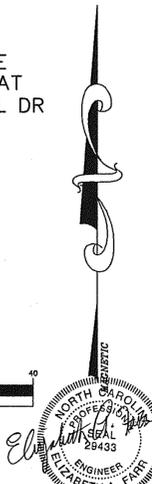
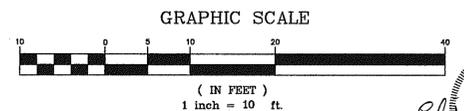
REMOVE EXISTING 15" STORM DRAIN

REMOVE EXISTING 66" X 90" CORRUGATED METAL CULVERT

ASPHALT CONCRETE (AC) REMOVE ASPHALT BETWEEN SAWCUTS AND TRANSPORT TO THE MAINTENANCE FACILITY AT 3800 DILLON INDUSTRIAL DR CLEMMONS, NC

REMOVE POPLAR, SWEET GUM AND WALNUT TREES (4 TREES TOTAL) NO VEHICLES OR HEAVY EQUIPMENT IS ALLOWED WITHIN TREE PROTECTION AREAS

REMOVE EXISTING CONCRETE DRIVEWAY AND TRANSPORT TO THE MAINTENANCE FACILITY AT 3800 DILLON INDUSTRIAL DR CLEMMONS, NC



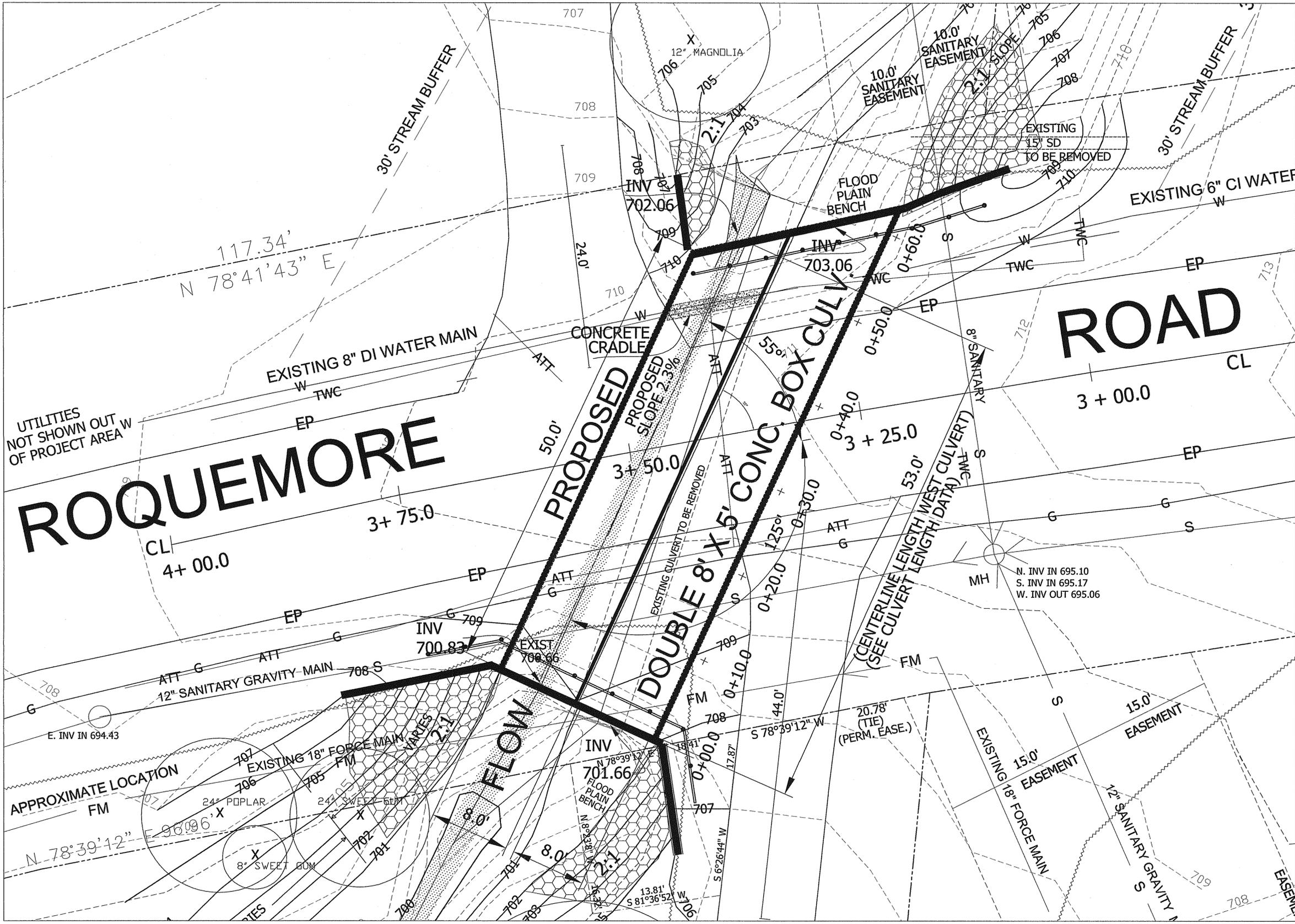
DEMOLITION PLAN

JEWELL
ENGINEERING CONSULTANTS, PC
POST OFFICE BOX 2284 (336) 896-9874
KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 896-9876

REVISIONS	JOB NO.
	DESIGNED 10-15-09 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

VILLAGE OF CLEMMONS
DRAINAGE IMPROVEMENTS
ROQUEMORE ROAD
CULVERT REPLACEMENT PLANS
AT JOHNSON CREEK TRIBUTARY # 2

"C"
SHEET NO.
4 OF 11



GENERAL NOTES:

1. THE CONTRACTOR SHALL VISIT THE SITE, BECOME FAMILIARIZED WITH ACTUAL CONDITIONS, AND SHALL VERIFY EXISTING CONDITIONS IN THE FIELD.
2. THE 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.
3. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. NOTIFY POWER COMPANY FOR ANY CONFLICTS.
4. THE CONTRACTOR IS TO CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS PUBLIC WORKS, PRIOR TO INTERRUPTING AND/OR DIVERTING ANY UTILITIES DURING CONSTRUCTION. ALL UTILITY WORK TO BE PERFORMED BY A CERTIFIED UTILITY CONTRACTOR APPROVED BY THE CITY OF WINSTON-SALEM. ALL UTILITY WORK, WATER AND SEWER TO BE PERFORMED TO THE CITY OF WINSTON-SALEM UTILITY STANDARDS. EXISTING 8-INCH AND 6" WATER LINE SERVICES TO REMAIN IN SERVICE DURING CONSTRUCTION. CALL VILLAGE OF CLEMMONS FOR DIRECTION CONCERNING WATER LINE IMPACTS DUE TO INTERRUPTION, INSTALLATION AND PRIOR TO ANY CONSTRUCTION NEAR WATER AND/OR SEWER UTILITIES.
5. ALL EROSION CONTROL MEASURES SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR).
6. ALL THE NECESSARY APPROVALS HAVE BEEN/WILL BE OBTAINED FROM THE STATE AND ARMY CORPS FOR CULVERT REMOVAL, INSTALLATION AND STREAM IMPACTS PRIOR TO ANY LAND DISTURBANCE.
7. INTERSECTION OF EXISTING ROADWAY C/L (ROAD STA. 3 + 48.20 WEST (STATIONING FROM EAST TO WEST) FROM MACNUT COURT AND INTERSECTION OF PROPOSED WEST CULVERT C/L (CULVERT STA. 0 + 28.12).

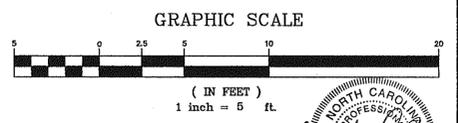
CULVERT LENGTH DATA

CULVERT	WEST INNER WALL	EAST INNER WALL	CENTERLINE
WEST	50.0'	56.6'	53.0'
EAST	57.1'	63.1'	60.1'
LENGTH TOTALS	107.1'	119.7'	113.1'
CENTERLINE	NA	NA	56.57'

LEGEND

● B-1	GEOTECHNICAL BORING LOCATIONS
— G —	2-INCH GAS MAIN
— ATT —	ATT COMMUNICATIONS
— W —	6-INCH CI WATER MAIN * 8-INCH DI WATER MAIN *
— S —	GRAVITY SANITARY
— FM —	18-INCH SAN FORCE MAIN
— TWC —	TIME WARNER CABLE
— TP —	TREE PROTECTION

* UTILITIES ARE APPROXIMATE LOCATIONS ONLY AS-BUILT DRAWINGS INDICATE 8 X 6 REDUCER FOR 8" DI TO 6" CI JUST EAST OF THE CULVERT CONTRACTOR TO VERIFY LOCATIONS AND MAINTAIN ALL UTILITIES DURING CONSTRUCTION CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS FOR ALL UTILITY RELOCATION/INTERRUPTIONS, ETC



10-21-2009
 NORTH CAROLINA PROFESSIONAL ENGINEER
 ELIZABETH A. FARR
 8243

CULVERT LAYOUT PLAN

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 (336) 886-9874 FAX: (336) 886-9876

REVISIONS	JOB NO.
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	CHECKED BY CDJ
	SCALE: NONE

VILLAGE OF CLEMMONS
 DRAINAGE IMPROVEMENTS
 ROQUEMORE ROAD
 CULVERT REPLACEMENT PLANS
 AT JOHNSON CREEK TRIBUTARY # 2

"C"
 SHEET NO.
 5 OF 11

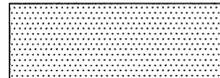
NOTES:

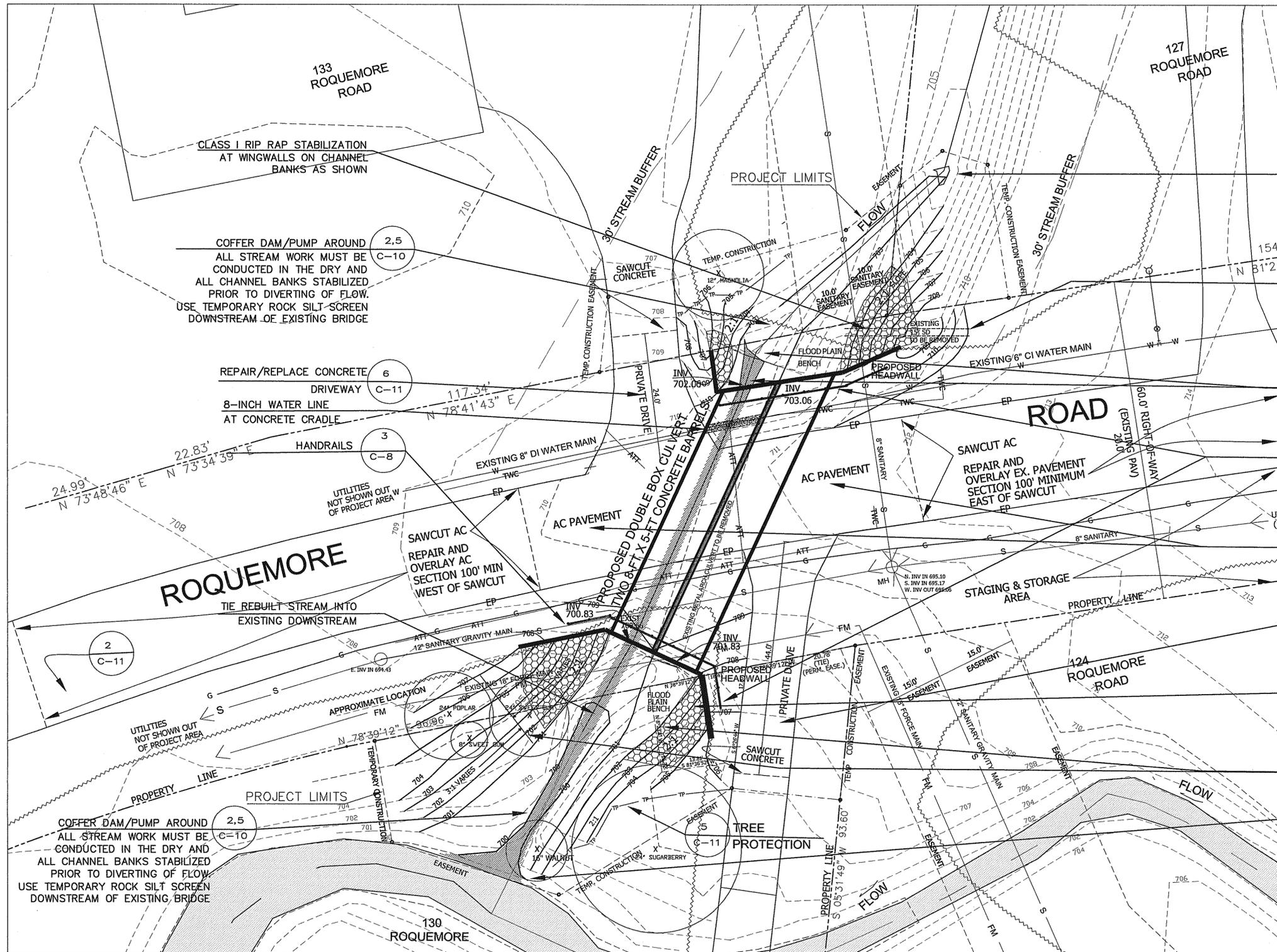
- EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM FORSYTH COUNTY, NC GEOGRAPHICAL INFORMATION SYSTEM DATA, EFFECTIVE DATE FEBRUARY, 2005, PROVIDED IN 2-FOOT INCREMENTS BASED ON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM (NAD) 83, VERTICLE DATUM NAVD 88. PROPOSED ROQUEMORE ROAD IMPROVEMENTS SHOWN WITH ONE FOOT INCREMENTS BASED ON FIELD SURVEY PROVIDED BY THE VILLAGE OF CLEMMONS, PERFORMED JULY, 2009.
- FLOODWAY, 100-YR FLOOD BOUNDARY SHOWN IS APPROXIMATE LOCATION, TAKEN FROM FEMA FLOOD INSURANCE STUDY MAP PANEL, DATED JANUARY 2, 2009.
- ALL STREAM WORK IS TO BE PERFORMED IN THE DRY. THE CHANNEL BANKS ARE TO BE STABILIZED PRIOR TO DIVERTING WATER BACK INTO THE STREAM CHANNEL.
- ALL WATER AND SEWER UTILITY WORK TO BE PERFORMED BY CERTIFIED UTILITY CONTRACTOR.
- CONTACT LARRY KIRBY WITH VILLAGE OF CLEMMONS FOR UTILITY NOTIFICATION (PIEDMONT GAS AND OTHERS) BEFORE EXCAVATION FOR TEMPORARY UTILITY SERVICES TO CUSTOMERS IN VICINITY OF THE CULVERT. AFTER CULVERT INSTALLATION, AND PRIOR TO BACKFILL, CONTACT LARRY KIRBY FOR UTILITY(IES) TO PERMANENTLY RECONNECT OR RE-ROUTE ANY/ALL UTILITIES.
- SANITARY 18-INCH FORCE MAIN LOCATION SHOWN PER CITY OF WINSTON-SALEM RECORD/AS-BUILT DRAWINGS. EXCAVATION IN THE AREA OF THE FORCE MAIN IS LIMITED DUE TO PROXIMITY OF FORCE MAIN AT EXISTING CULVERT. DURING REMOVAL OF EXISTING CULVERT, CONTRACTOR TO USE EXTREME CAUTION AT DOWNSTREAM END SO AS NOT TO IMPACT EXISTING 18-INCH FORCE MAIN OR 12-INCH GRAVITY SEWER MAIN. EXACT LOCATION AND ELEVATION OF FORCE MAIN IS TO BE CONFIRMED BY CONTRACTOR AND REPORTED TO VILLAGE OF CLEMMONS AND DESIGN ENGINEER. SHOULD ANY DISCREPANCY BE FOUND FROM AS-BUILT DRAWINGS IN THE LOCATION OF THE FORCE MAIN, PROPOSED CULVERT INVERTS MAY NEED TO BE REVISED. COORDINATION WITH THE VILLAGE OF CLEMMONS AND DESIGN ENGINEER IS REQUIRED FOR ANY CHANGES FROM THE APPROVED DRAWINGS.
- UTILITIES SHOWN PER UTILITY MARKOUT. CONTRACTOR IS TO CONFIRM UTILITY LOCATIONS AND UTILITY MATERIALS BY CONTACTING UTILITY LOCATING AND IDENTIFICATION SERVICES AND CONTACT THE CITY OF WINSTON-SALEM FOR WATER AND SEWER LOCATION/MARKOUT. MAINTAIN WATER AND SEWER UTILITY SERVICES THROUGHOUT CONSTRUCTION. CONTACT LARRY KIRBY WITH VILLAGE OF CLEMMONS PRIOR TO EXCAVATION WITHIN THE PROJECT AREA FOR UTILITY CONSTRUCTION AND RELOCATION COMMUNICATIONS.
- PROVIDE ROQUEMORE ROAD ACCESS TO PROPERTIES AT 130 AND 133 ROQUEMORE ROAD PRIOR TO AND DURING CONSTRUCTION. DRIVEWAYS ARE TO BE RETURNED TO EXISTING CONDITIONS AT COMPLETION OF CONSTRUCTION. PROVIDE TEMPORARY DRIVEWAY ACCESS WHERE VILLAGE OF CLEMMONS DIRECTS FOR RESIDENCES AT 130 AND 133 ROQUEMORE. ALL RESIDENTIAL DRIVEWAYS ON ROQUEMORE SHALL REMAIN ACCESSIBLE TO RESIDENTS DURING CONSTRUCTION.
- EXISTING WATER LINE: CONTACT LARRY KIRBY PRIOR TO REMOVING EXISTING 66" X 90" CULVERT AND FOR UTILITY REMOVAL/RELOCATION. CULVERT TO BE REPLACED WITH DOUBLE BOX 8' X 5' REINFORCED CONCRETE CULVERT. INSTALL CONCRETE CRADLE OVER WEST CULVERT SECTION TO BED 8" WATER LINE ON CULVERT. WATER LINE TO BE SECURED TO TOP OF CULVERT SURFACE OR AT WINSTON-SALEM UTILITIES DIRECTION (CONTACT LARRY KIRBY PRIOR TO ANY UTILITY ASSOCIATED ACTIVITY).

LEGEND

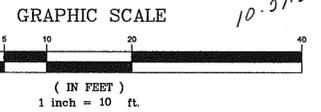
- B-1 GEOTECHNICAL BORING LOCATIONS
- G — 2-INCH GAS MAIN
- ATT — ATT COMMUNICATIONS
- W — 6-INCH CI WATER MAIN *
- S — 8-INCH DI WATER MAIN *
- S — GRAVITY SANITARY
- FM — 18-INCH SAN FORCE MAIN
- TWC — TIME WARNER CABLE
- TP — TREE PROTECTION
- — EDGE OF WOODS
- - - - - TEMP. CONSTR. EASEMENT

* UTILITIES ARE APPROXIMATE LOCATIONS ONLY AS-BUILT DRAWINGS INDICATE 8 X 6 REDUCER FOR 8" DI TO 6" CI JUST EAST OF THE CULVERT CONTRACTOR TO VERIFY LOCATIONS AND MAINTAIN ALL UTILITIES DURING CONSTRUCTION CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS FOR ALL UTILITY RELOCATION/INTERRUPTIONS, ETC

-  PROPOSED STREAM ALIGNMENT
-  EXISTING STREAM ALIGNMENT



- 3 TIE REBUILT STREAMBANK INTO EXISTING UPSTREAM
- 3 REMOVE EXISTING 15" STORM DRAIN AND GRADE DITCHLINE STABILIZE WITH RIPRAP AND PERMANENT GRASS WITH TURF REINFORCEMENT
- 3 TIE REBUILT STREAM BED INTO EXISTING STREAM
- 3 METAL HANDRAILS
- 2 ASPHALT CONCRETE (AC)
- 6 REPAIR/REPLACE CONCRETE(PCC) DRIVEWAY AT COMPLETION OF CULVERT INSTALLATION
- 4 CLASS I RIP RAP STABILIZATION AT WINGWALLS ON CHANNEL BANKS AS SHOWN
- 4 STREAM BANK STABILIZATION
- 4 BEGIN REBUILT STREAMBANK TIE INTO DOWNSTREAM TOP BANK. ALL CHANNELS TO BE STABILIZED PRIOR TO DIVERTING OF FLOW INTO CHANNELS.



SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 ELIZABETH A. FAIR
 26433
 10-27-2009

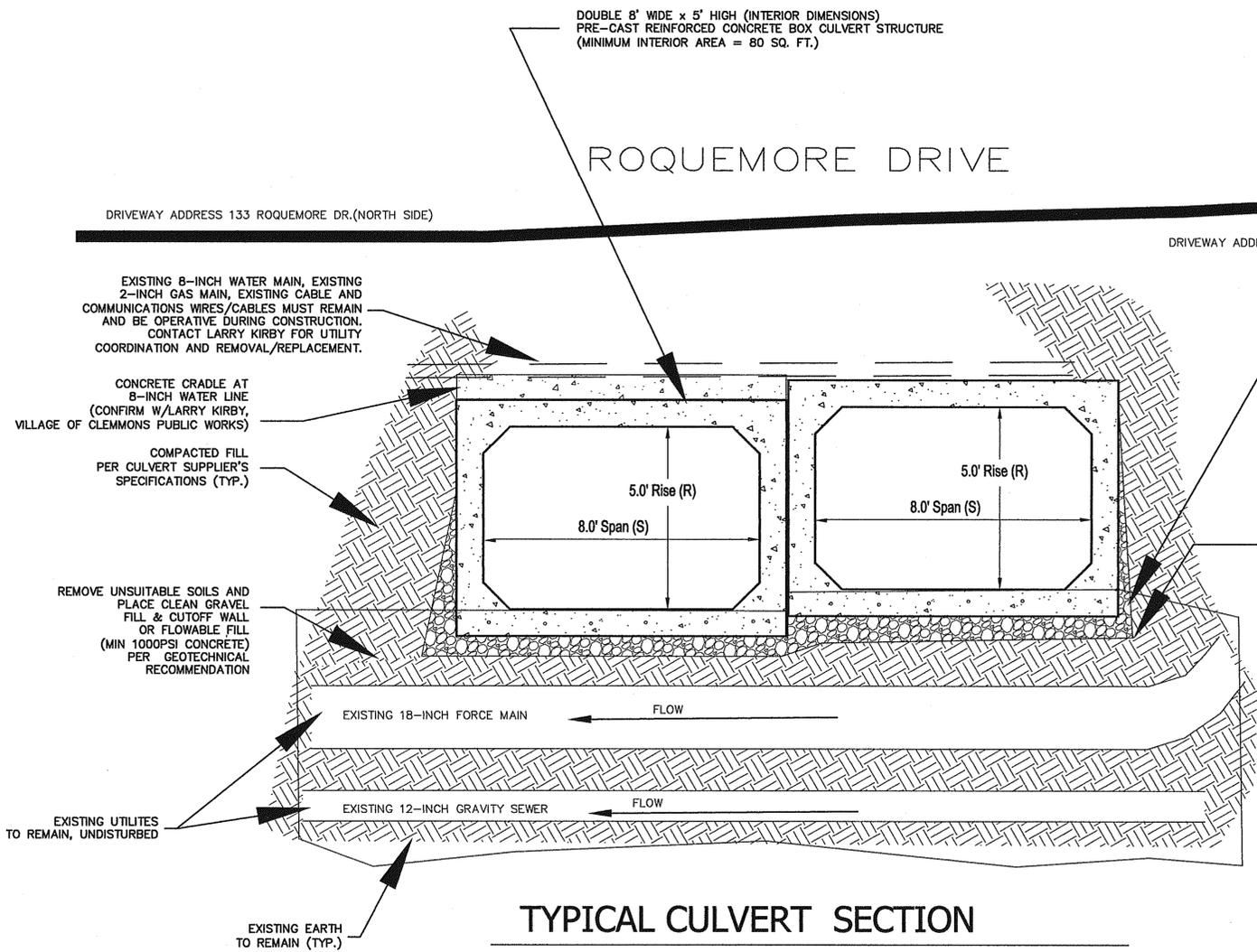
PROPOSED GRADING & UTILITIES PLAN

JEWELL
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 KERNERSVILLE, NORTH CAROLINA 27285 FAX: (338) 898-9978

REVISIONS	JOB NO.
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	SCALE: NONE

VILLAGE OF CLEMMONS
 DRAINAGE IMPROVEMENTS
 ROQUEMORE ROAD
 CULVERT REPLACEMENT PLANS
 AT JOHNSON CREEK TRIBUTARY # 2

"C"
 SHEET NO.
 6 OF 11



TYPICAL CULVERT SECTION

SCALE: NONE

DOUBLE 8' WIDE x 5' HIGH (INTERIOR DIMENSIONS)
 PRE-CAST REINFORCED CONCRETE BOX CULVERT STRUCTURE
 (MINIMUM INTERIOR AREA = 80 SQ. FT.) WITH
 7-INCH MAX. THICKNESS REINFORCED CONCRETE WALLS AT
 BOTTOM AND TOP. ASSUMED DESIGN LIVE LOAD IS HS20-44

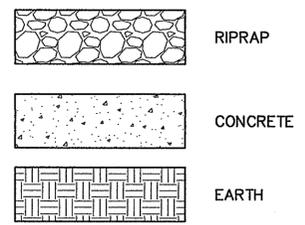
FINE GRANULAR MATERIAL TO A DEPTH OF APPROXIMATELY 3-INCHES THICKNESS FOR LEVELING AND BEDDING OF BOX CULVERTS. STONE THICKNESS PER MANUFACTURER INSTRUCTIONS FOR REQUIRED TYPE, SIZE AND THICKNESS SPECIFICATIONS AND MIN DIMENSIONS FOR OVERALL PLACEMENT

IN ADDITION, GEOTECH TO CONFIRM REQUIRED UNDERCUT OF UNSUITABLE SOILS FOR CULVERT PLACEMENT & CULVERT FOUNDATION. THICKNESS/DEPTH TO BE DETERMINED BY ONSITE GEOTECH FOR PROPOSED CULVERT FOUNDATION WHEN EXISTING CULVERT IS EXCAVATED. (SEE ALSO NOTES)

CLEAN GRAVEL WITH CUTOFF WALL OR FLOWABLE FILL (1000PSI MIN CONC.) AS INDICATED BY GEOTECHNICAL INVESTIGATION AND CONFIRMED BY ONSITE GEOTECHNICAL ENGINEER.

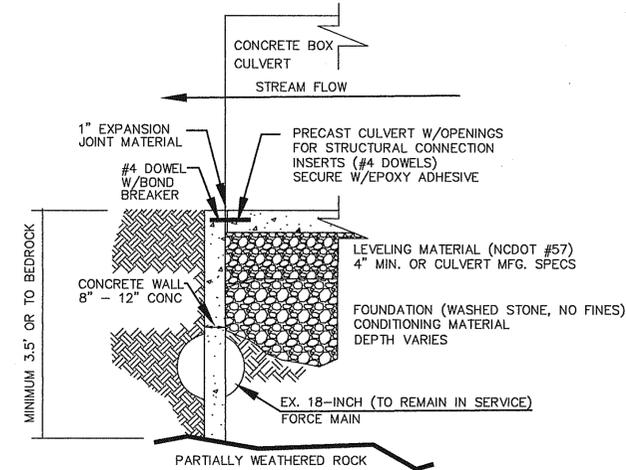
8.0-OUNCE NON-WOVEN GEOTEXTILE FABRIC WITH 12" OVERLAP AT ALL SEAMS IN ALL DIRECTIONS (TYP.)

LEGEND

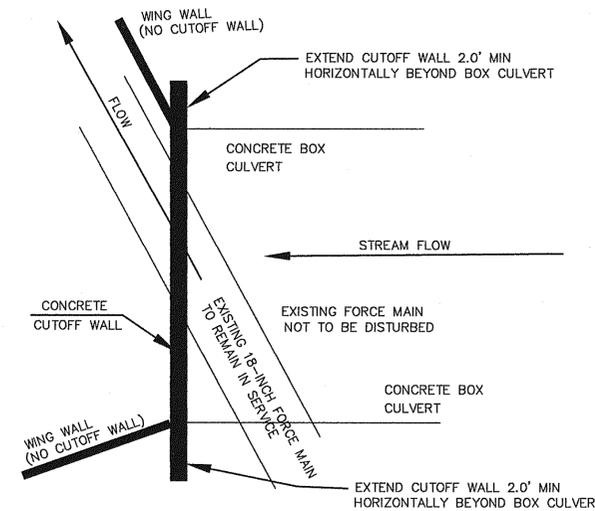


NOTES:
 CONTRACTOR SHALL TAKE GREAT CARE TO ENSURE THAT THE EXISTING STREAM BANKS REMAIN UNDISTURBED THROUGHOUT THE CONSTRUCTION PERIOD (EXCEPT WHERE INSTRUCTED ON THE PLANS).

- PRIOR TO BOX CULVERT INSTALLATION, SUBGRADE INVESTIGATION IS TO BE PERFORMED BY GEOTECH TO CONFIRM LOCATION AND ELEVATION OF AN EXISTING 18-INCH SANITARY FORCE MAIN. FINDINGS ARE TO BE SUBMITTED TO THE VILLAGE OF CLEMMONS AND THE ENGINEER FOR REVIEW. THE SUBGRADE SHOULD BE UNDERCUT TO SUITABLE SOILS OR AT GEOTECHNICAL DIRECTION. WHERE SUITABLE SOIL FOUND, COMPACT SUITABLE SOIL TO THE EXTENT THAT THE INSTALLED PRECAST REINFORCED CONCRETE BOX SECTIONS WILL REMAIN AT THE SAME GRADE AND LINE AS AT TIME OF INSTALLATION (SEE GEOTECH INVESTIGATION REPORT). THE 18-INCH FORCE MAIN AND 12-INCH GRAVITY SANITARY MAIN ARE TO REMAIN UNDISTURBED, IN SERVICE. THE PROPOSED BOX CULVERT IS NOT TO REST DIRECTLY ON THE FORCE MAIN. GEOTECH WILL DETERMINE APPROPRIATE FOUNDATION SUPPORT AT THOSE EXISTING UTILITIES.
- UNSUITABLE SOIL TO BE REMOVED AND REPLACED WITH CLEAN GRAVEL OR FLOWABLE FILL AT SUBGRADE. SEE GEOTECHNICAL REPORT. GEOTECHNICAL ENGINEER TO DETERMINE SUITABLE SUBGRADE SOIL DEPTH.
- PLACE CULVERT AT SPECIFIED INVERT AND LAYOUT ON TOP OF 3" TO 4" OF GRANULAR MATERIAL DRAINAGE STONE ON THE TRENCH BOTTOM TO PROVIDE A UNIFORM BEARING FOR THE PRECAST REINFORCED CONCRETE BOX SECTION. THE GRANULAR MATERIAL SHALL PROVIDE A SLIGHTLY YIELDING UNIFORM SUPPORT UNDER THE BOTTOM WIDTH AND LENGTH OF THE BOX SECTION.
- BEGIN PLACEMENT AT OUTLET END OF THE LINE OF BOX SECTIONS. MAINTAIN 3"-4" GAP BETWEEN PARALLEL CULVERT SECTIONS. FILL GAP WITH FLOWABLE FILL AFTER ALL SECTIONS HAVE BEEN INSTALLED--SEE ALSO SHEET C-7.
- WHEN JOINING BOX SECTIONS TOGETHER, USE OF A BOX PULLER, COME-A-LONG OR OTHER SIMILAR METHOD SHOULD BE USED. CONSTRUCTION EQUIPMENT, SUCH AS BACKHOES, FRONT-END LOADERS, ETC. MUST NOT HAVE DIRECT CONTACT WITH THE PRECAST CONCRETE BOX SECTIONS. DIRECT CONTACT BETWEEN INSTALLATION MACHINERY AND THE BOX SECTIONS IS PROHIBITED.
- SPACES 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 MATERIAL PLACED IN THE TONGUE AND GROOVE OR OTHER JOINT SPACING WILL PROVIDE A TIGHT SYSTEM.
- FOR MULTIPLE BARREL INSTALLATIONS, POSITIVE LATERAL SUPPORT BETWEEN THE PRECAST BOXES SHALL BE PROVIDED. SUPPORT CAN BE PROVIDED BY GROUT, FINE SAND OR GRANULAR MATERIAL.
- BACKFILL SHALL BE PLACED UNIFORMLY ON EACH SIDE OF THE PRECAST BOX SECTIONS AS INSTALLATION PROGRESSES PER THE MANUFACTURER'S SPECIFICATIONS.
- LIFT HOLES SHALL BE FILLED WITH A HOLE PLUG AND/OR GROUT MIXTURE.
- THE PRECAST BOX SECTION JOINTS SHALL BE SEALED PER MANUFACTURER'S SPECIFICATIONS FOR THIS PROJECT.
- IF A BOX HAS BEEN DAMAGED IT SHOULD BE SET ASIDE AND RECORDED TO ENSURE ITS PROPER ORDER IN THE INSTALLATION SEQUENCE. IN SOME CASES DAMAGED ENDS, CHIPS AND CRACKS, WHICH DO NOT PASS THROUGH THE WALL, CAN BE REPAIRED ON SITE, WHILE OTHERS ARE IRREPARABLE AND MAY HAVE TO BE RETURNED TO THE SUPPLIER FOR REPLACEMENT. ALL BOXES SHOULD BE EXAMINED UPON ARRIVAL TO THE SITE BY THE VILLAGE INSPECTOR OR ENGINEER FOR ACCEPTANCE OR REJECTION PRIOR TO FINAL INSTALLATION.
- CONCRETE VERTICLE CUTOFF WALL EXTENDS TO ROCK OR A MINIMUM OF 3.5' BENEATH LEVELING MATERIAL ON DOWNSTREAM (OUTLET) END ONLY. CAREFULLY WORK AROUND EXISTING 18-INCH FORCE MAIN. CONNECT VERTICLE WALL AT CULVERT BASE WITH #4 DOWELS AS SHOWN AT 12" O.C. IN PRECAST BOX UNLESS OTHERWISE SPECIFIED BY MFG.



ALT. A CUTOFF WALL SECTION VIEW



ALT. A CUTOFF WALL PLAN VIEW

SCALE: NONE

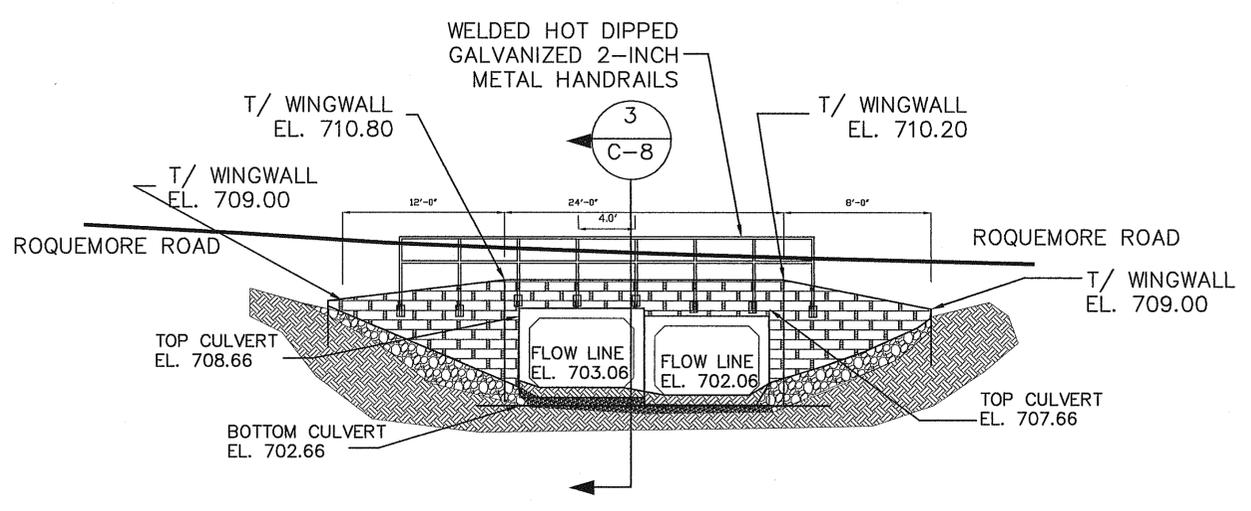
ELABETH A. PARR
 ENGINEER
 NORTH CAROLINA PROFESSIONAL SEAL
 29433
 10.27.2009

CULVERT CROSS SECTION

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 ENGINEERING CONSULTANTS, PC
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 KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 996-9976

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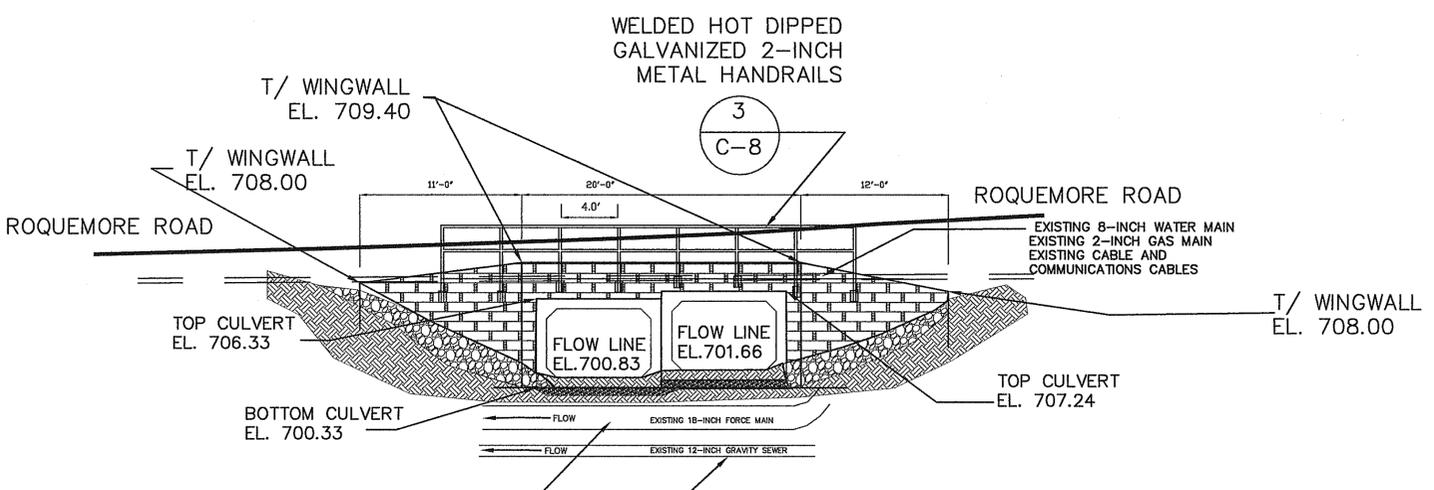
VILLAGE OF CLEMMONS
 DRAINAGE IMPROVEMENTS
 ROQUEMORE ROAD
 CULVERT REPLACEMENT PLANS
 AT JOHNSON CREEK TRIBUTARY # 2



UPSTREAM CULVERT INLET HEADWALL AND WINGWALLS DETAIL (LOOKING DOWNSTREAM)

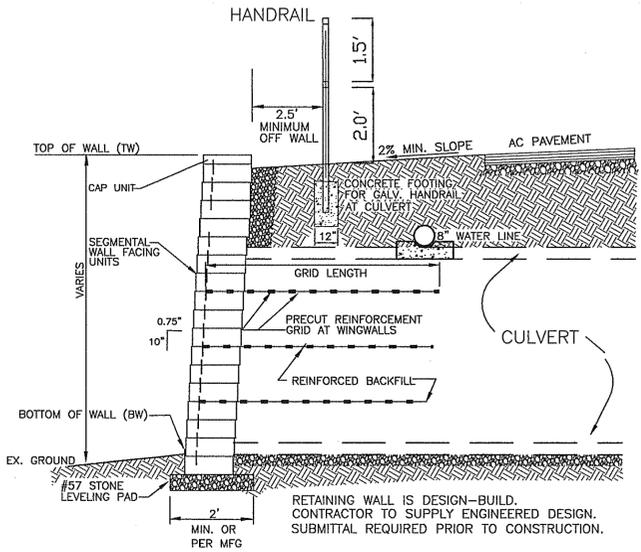
1
C-8 SCALE: NONE

DOUBLE 8' WIDE x 5' HIGH (INTERIOR DIMENSIONS) PRE-CAST CONCRETE BOX CULVERT STRUCTURE (MINIMUM INTERIOR AREA = 80 SQ. FT.) WITH 7-INCH MAX. THICKNESS REINFORCED CONCRETE WALLS BOTTOM AND TOP. ASSUMED DESIGN LIVE LOAD IS HS20-44



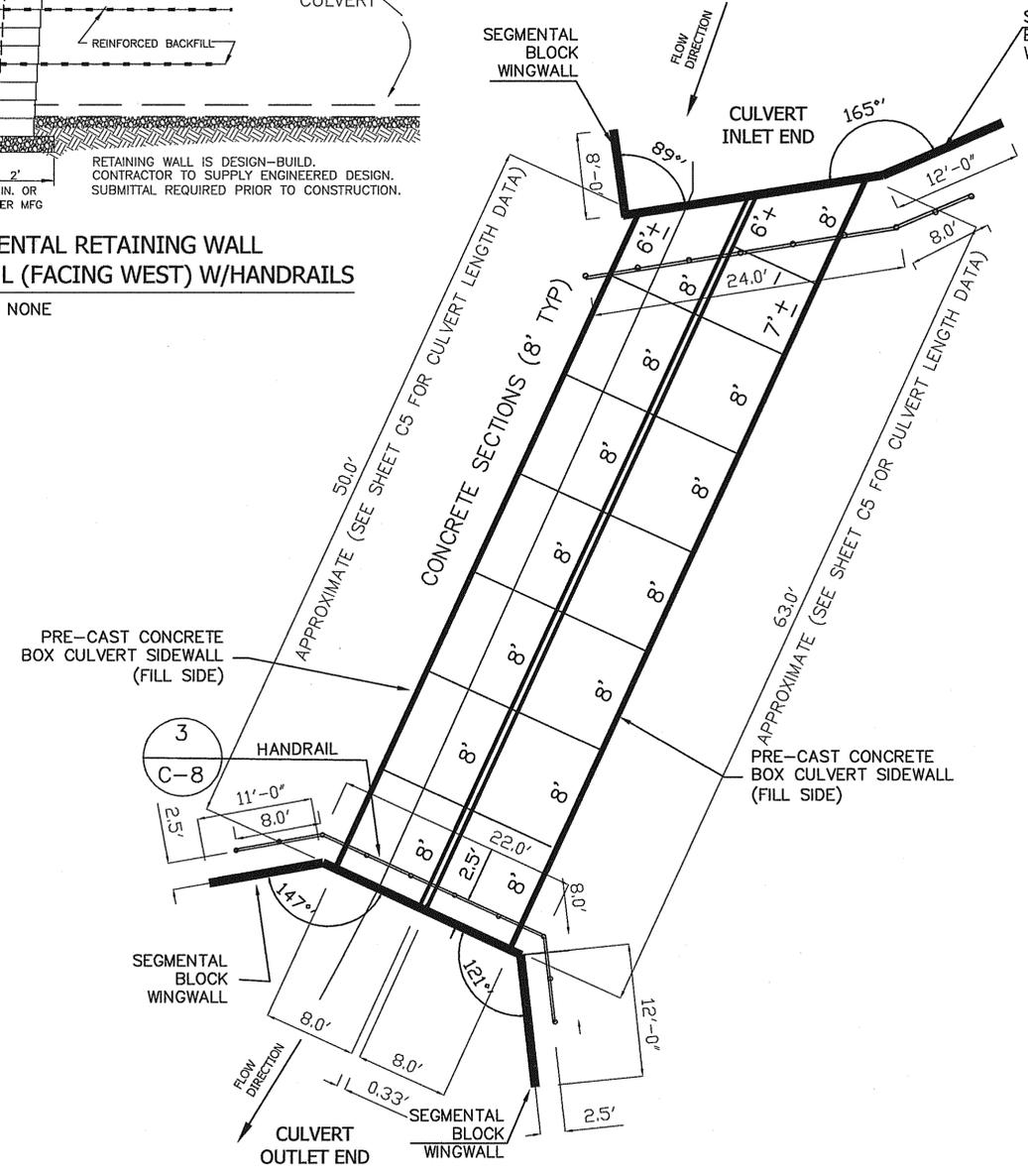
DOWNSTREAM CULVERT OUTLET HEADWALL AND WINGWALLS DETAIL (LOOKING UPSTREAM)

2
C-8 SCALE: NONE



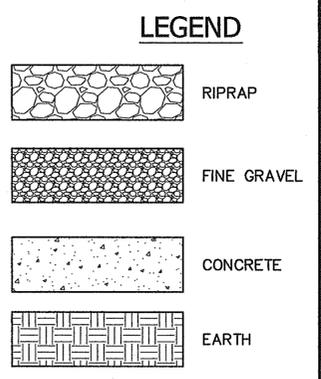
SEGMENTAL RETAINING WALL DETAIL (FACING WEST) W/HANDRAILS

3
C-8 SCALE: NONE



TYPICAL CULVERT HEADWALLS AND WINGWALLS PLAN (PRE-CAST CONCRETE SECTIONS SHOWN FOR SCHEMATIC LAYOUT ONLY. DIFFERENT MANUFACTURER'S SECTION LENGTHS MAY VARY)

4
C-8 SCALE: NONE



NOTE: CONTRACTOR SHALL TAKE GREAT CARE TO ENSURE THAT THE EXISTING STREAM BANKS REMAIN UNDISTURBED THROUGHOUT THE CONSTRUCTION PERIOD (EXCEPT WHERE INSTRUCTED ON THE PLANS).

- PRIOR TO CULVERT INSTALLATION, SUBGRADE INVESTIGATION IS TO BE PERFORMED BY GEOTECH TO CONFIRM LOCATION AND ELEVATION OF AN EXISTING 18-INCH SANITARY FORCE MAIN. FINDINGS ARE TO BE SUBMITTED TO THE VILLAGE OF CLEMMONS AND THE ENGINEER FOR REVIEW. THE SUBGRADE SHOULD BE COMPACTED TO THE EXTENT THAT THE INSTALLED PRECAST REINFORCED CONCRETE BOX SECTIONS WILL REMAIN AT THE SAME GRADE AND LINE AS AT TIME OF INSTALLATION. THE 18-INCH FORCE MAIN AND 12" GRAVITY SANITARY MAIN ARE TO REMAIN UNDISTURBED. THE PROPOSED BOX CULVERT IS NOT TO REST DIRECTLY ON THE FORCE MAIN. GEOTECH WILL DETERMINE APPROPRIATE FOUNDATION SUPPORT AT THOSE EXISTING UTILITIES. UNSUITABLE SOILS FOR SUBGRADE SHOULD BE REMOVED AND REPLACED WITH CLEAN STONE FOR CULVERT FOUNDATION PER GEOTECHNICAL RECOMMENDATIONS.
- PLACE CULVERT AT SPECIFIED INVERT AND LAYOUT ON TOP OF 3" TO 4" OF GRANULAR MATERIAL DRAINAGE STONE ON THE TRENCH BOTTOM TO PROVIDE A UNIFORM BEARING FOR THE PRECAST REINFORCED CONCRETE BOX SECTION. THE GRANULAR MATERIAL SHALL PROVIDE A SLIGHTLY YIELDING UNIFORM SUPPORT UNDER THE BOTTOM WIDTH AND LENGTH OF THE BOX SECTION. INSTALL WEST CULVERT BARREL ALONG CENTERLINE. MAINTAIN 3" - 4" SPACE BETWEEN WEST AND EAST CULVERT. A 4" X 4" WOOD MEMBER MAY BE PLACED BETWEEN BOXES. THE EAST AND WEST CULVERT FACES SHOULD LINE UP. FILL SPACE BETWEEN PARRALLEL BOX SECTIONS WITH FLOWABLE FILL. PLACE NCDOT CLASS A CONCRETE IN 3"-4" VOID AT EACH END OF THE CULVERT FOR A DISTANCE OF APPROXIMATELY 24" FROM EACH END TERMINATING AT THE FLOWABLE FILL.
- WING-WALLS/HEADWALLS FOR CULVERT ARE SEGMENTAL RETAINING WALLS AND SHALL BE DESIGNED FOR STREAM FLOODING APPLICATION.



10.27.2009

BOX CULVERT DETAILS

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ENGINEERING CONSULTANTS, PC
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KERNERSVILLE, NORTH CAROLINA 27285 FAX: (336) 998-9976

REVISIONS	JOB NO.
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	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

VILLAGE OF CLEMMONS
DRAINAGE IMPROVEMENTS
ROQUEMORE ROAD
CULVERT REPLACEMENT PLANS
AT JOHNSON CREEK TRIBUTARY # 2

"C"
SHEET NO.
8 OF 11

LEGEND

NOTES:

- EXISTING TOPOGRAPHIC CONTOURS SHOWN ARE FROM FORSYTH COUNTY, NC GEOGRAPHICAL INFORMATION SYSTEM DATA, DATE, 2005 IN 2 FOOT INCREMENTS. PROPOSED ROQUEMORE ROAD IMPROVEMENTS SHOWN WITH ONE FOOT INCREMENTS BASED ON FIELD SURVEY PROVIDED BY THE VILLAGE OF CLEMMONS.
- THE 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 AND IS DIRECTED INTO TEMPORARY SEDIMENT PITS THROUGHOUT THE CONSTRUCTION PERIOD.
- DEMOLITION SHALL INCLUDE THE REMOVAL FROM THE SITE OF TREES WHERE NOTED (EXCEPT THOSE SPECIFIED IN NOTES 4 AND 5 BELOW), 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. 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 CULVERT 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.
- THE 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.
- THE 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 FOR TRIBUTARY NO. 2 TO HANDLE THE BASE STREAM FLOW (162 GPM MIN) THROUGH THE CONSTRUCTION SITE. THE PUMP AROUND PROCESS SHALL EXTEND DOWNSTREAM OF CONSTRUCTION ACTIVITIES AND DISCHARGE IMMEDIATELY UPSTREAM OF THE TEMPORARY ROCK SILT SCREEN PRIOR TO ENTERING JOHNSON CREEK.

CONSTRUCTION SEQUENCE:

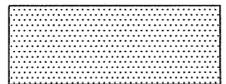
- GENERAL NOTE: ALL PROPOSED STREAM CHANNEL WORK TO BE CONDUCTED WITHIN A DRY CHANNEL. ALL CHANNELS MUST BE STABILIZED PRIOR TO DIVERTING FLOW.
- INSTALL TEMPORARY CONSTRUCTION ENTRANCES AS SHOWN ON PLANS AND OTHER EROSION CONTROL MEASURES AS INDICATED.
 - ALL UTILITY PROVIDERS TO BE CONTACTED BY VILLAGE OF CLEMMONS (LARRY KIRBY). UTILITY SERVICES TO REMAIN UNINTERRUPTED DURING CONSTRUCTION. CONTACT LARRY KIRBY PRIOR TO DISTURBANCE. CONTACT LARRY KIRBY TO NOTIFY PIEDMONT GAS FOR GAS MAIN REMOVAL AND REPLACEMENT. COORDINATE ALL UTILITY WORK WITH VENDORS.
 - INSTALL PUMP AROUND BYPASS SYSTEMS TO WORK IN DRY CHANNEL.
 - ANY SEDIMENT THAT SETTLES INTO THE DRY CHANNEL DURING CONSTRUCTION IS TO BE REMOVED.
 - PROVIDE ACCESS FOR RESIDENCES 130 AND 133 ROQUEMORE ROAD DURING CULVERT REMOVAL AND REPLACEMENT CONSTRUCTION. RESIDENTIAL ACCESS SHALL BE ACCESSIBLE AT ALL TIMES VIA ROQUEMORE ROAD. PROVIDE PARKING SPACE FOR RESIDENTIAL VEHICLES ON ROQUEMORE ROAD AT 130 AND 133 ADDRESSES.
 - PERFORM DEMOLITION OF EXISTING METAL PIPE CULVERT.
 - INSTALL NEW CULVERT AND CONSTRUCT WINGWALLS, GRADE AND CONSTRUCT RELOCATED STREAM BED AND TIE INTO EXISTING STREAM BED UPSTREAM AND DOWNSTREAM OF CULVERT. GRADE UPSTREAM AND DOWNSTREAM FLOOD PLAIN BENCH AS SHOWN AT EAST CULVERT.
 - CONTACT LARRY KIRBY TO COORDINATE WITH ALL UTILITY PROVIDERS FOR PERMANENT RELOCATION AND INSTALLATION OVER NEW CULVERT. COORDINATE UTILITY WORK WITH HANDRAIL INSTALLATION. UTILITIES SHALL NOT BE IMPACTED BY HANDRAIL FOOTING INSTALLATION.
 - APPLY EROSION CONTROL STABILIZATION. AFTER ALL CHANNEL STABILIZATION IS COMPLETE IN THE NEW CHANNELS DIVERT FLOW INTO THE CHANNEL.
 - REMOVE ALL TEMPORARY EROSION CONTROL MEASURES, INSTALL PERMANENT STABILIZATION AND RESTORE THE SITE AS CLOSELY AS POSSIBLE TO ORIGINAL CONDITIONS.

STREAM DATA

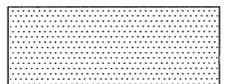
WATERSHED AREA (TRIBUTARY #2)	(231 AC) 0.36 SQMI
MEAN ANNUAL FLOW *	1.0 CFS/SQMI X 0.365SQMI = 161.6 GPM +/-
* USGS WATER RESOURCES INVESTIGATIONS 46-74, FEB 1975	

LEGEND

- G 2-INCH GAS MAIN
- ATT ATT COMMUNICATIONS
- W 6-INCH CI WATER MAIN *
- 8-INCH DI WATER MAIN *
- S GRAVITY SANITARY
- FM 18-INCH SAN FORCE MAIN
- TWC TIME WARNER CABLE
- TP TEMPORARY TREE PROTECTION
- TEMPORARY STONE OUTLET
- TEMPORARY COFFER DAM
- TEMPORARY ROCK SILT SCREEN
- TEMPORARY SILT FENCE
- DISTURBANCE LIMITS (DL)
- DRAINAGE SWALE (W/EC MATTING)

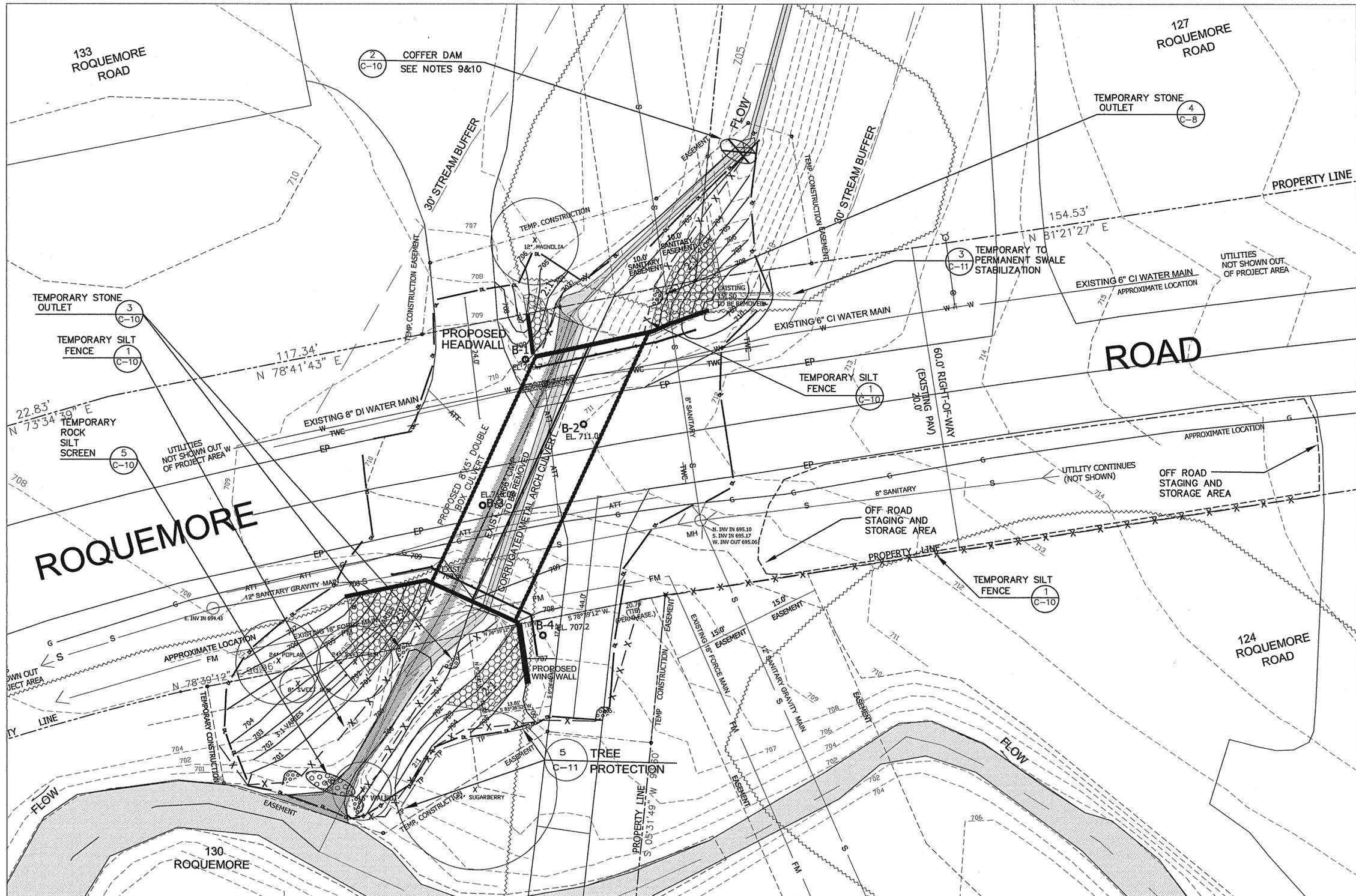


EXISTING STREAM ALIGNMENT

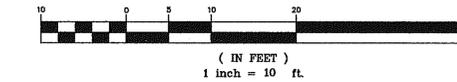


PROPOSED STREAM ALIGNMENT

* UTILITIES ARE APPROXIMATE LOCATIONS ONLY AS-BUILT DRAWINGS INDICATE 8 X 6 REDUCER FOR 8" DI TO 6" CI JUST EAST OF THE CULVERT CONTRACTOR TO VERIFY LOCATIONS AND MAINTAIN ALL UTILITIES DURING CONSTRUCTION CONTACT LARRY KIRBY, VILLAGE OF CLEMMONS FOR ALL UTILITY RELOCATION/INTERRUPTIONS, ETC



GRAPHIC SCALE



10.27.2009

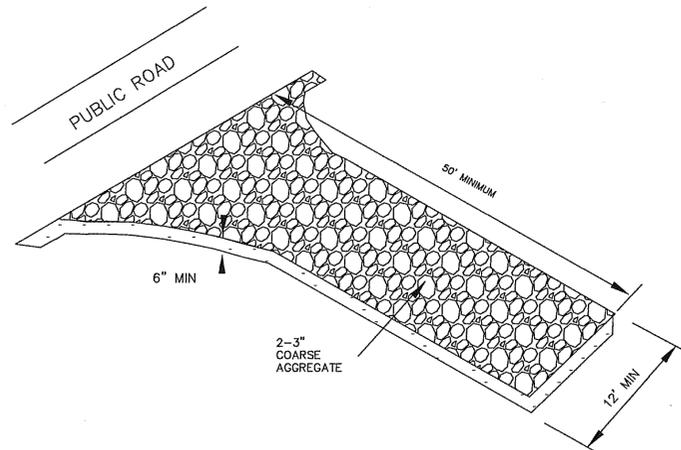
EROSION CONTROL PLAN

JEWELL
ENGINEERING CONSULTANTS, PC
POST OFFICE BOX 2284
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REVISIONS	JOB NO.
	DESIGNED 10-15-09 BY BAF
	CONST. SURVEY BY
	CHECKED BY CDJ
	SCALE: NONE

VILLAGE OF CLEMMONS
DRAINAGE IMPROVEMENTS
ROQUEMORE ROAD
CULVERT REPLACEMENT PLANS
AT JOHNSON CREEK TRIBUTARY # 2

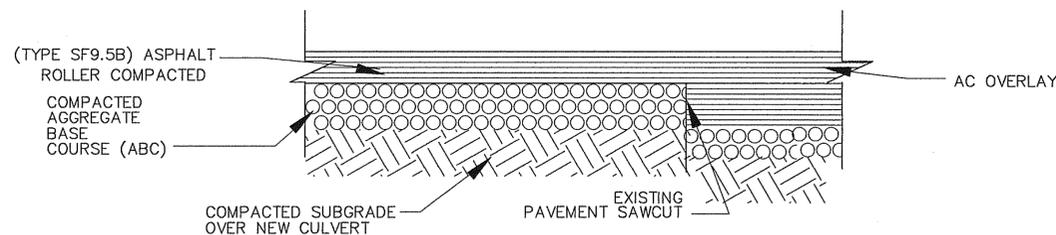
"C"
SHEET NO.
9 OF 11



MAINTENANCE:

MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

1 TEMPORARY CONSTRUCTION ENTRANCE
C-11 NOT TO SCALE



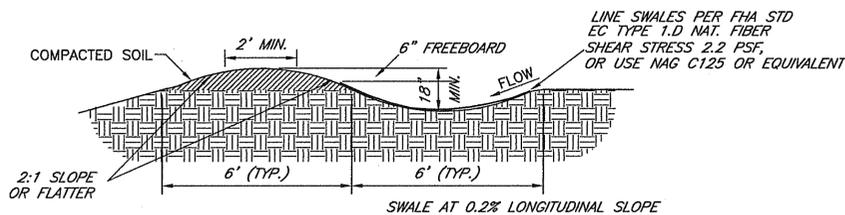
SECTIONS

TYPE	SF9.5A	SF9.5B	I19.0B	STONE BASE	(AT CULVERT)
LIGHT-DUTY AC					
AC OVERLAY	0"	2"	0"	8"	

NOTES:

1) PAVEMENT SECTION TO BE CONFIRMED BY THE GEOTECHNICAL ENGINEER THROUGH TESTING THE COMPACTED SUBGRADE, ONCE PREPARED.

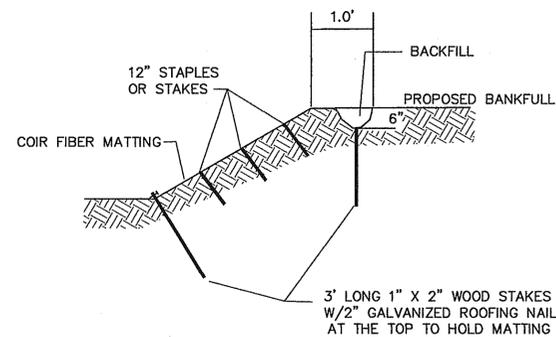
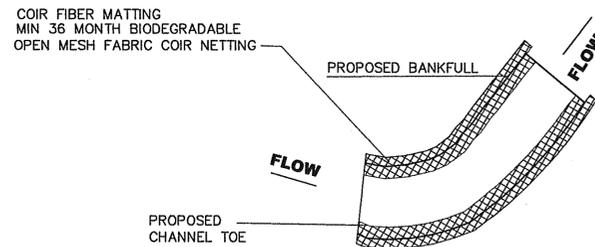
2 ASPHALT CONCRETE (AC) PAVEMENT
C-11 NOT TO SCALE



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-11 NOT TO SCALE



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.

TYPICAL MATTING LOCATION DETAIL

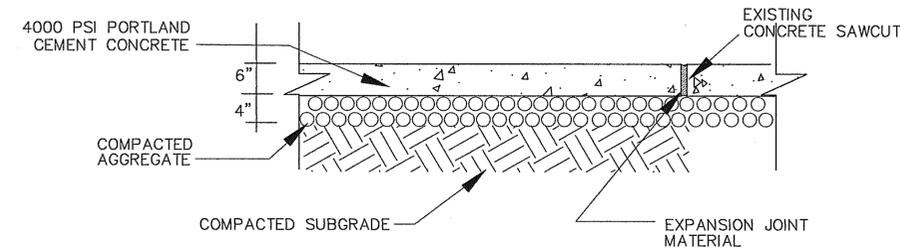
NOT TO SCALE

4 TBD
C-11 NOT TO SCALE

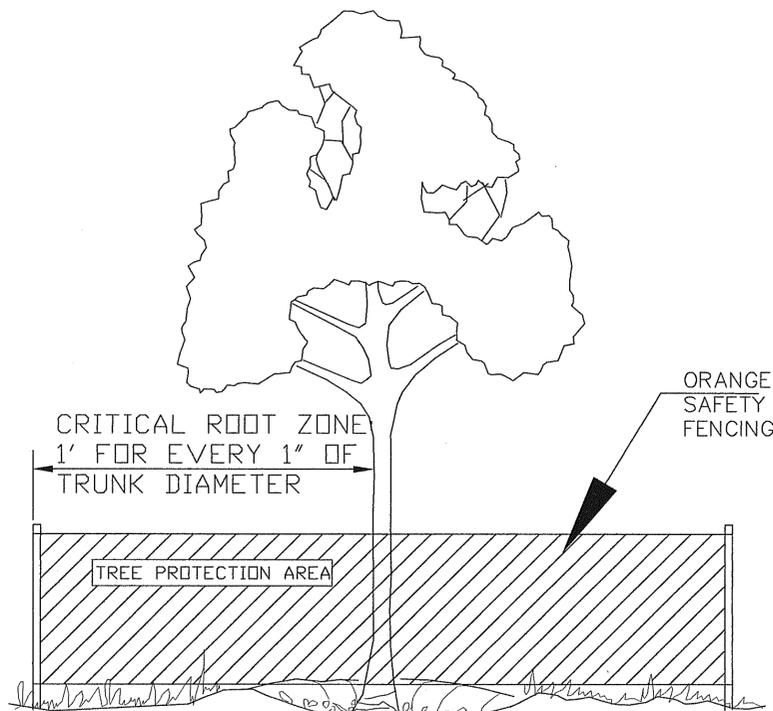
COIR SEEDING/PLANTING NOTES:

- 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 CONTAINER TREES IN COIR TO BE PLACED AT 2 PLANTS PER SY OR AT 3FT O.C. FROM TOE OF BANK TO APPROXIMATELY 3' ABOVE TOE. PLANT RED BUD TREES AT 15' O.C. OR SPACED EVENLY ALONG BANK AT 4' TO 6' ABOVE TOE OF BANK.
- WATER CONTAINER PLANTS THOROUGHLY AT PLANTING

HERBACEOUS STREAM MIX COIR			
PERMANENT SEED MIX COIR	APPROXIMATELY LBS OF MIX		
		RIVER OATS (CHASMANTHIUM LATIFOLIA)	2-LB
		JOE-PYE-WEED (EUPATORIUM FISTULOSUM)	4-OZ.
		RICE CUT GRASS (LEERSIEA ORYZOIDES)	2-LB
		SHWITCHGRASS (PANICUM VIRGATUM)	2-OZ.
		CUTLEAVED CONEFLOWER (RUDBEKIA LACINATA)	4-OZ.
		IRONWEED (VERONIA NOVEBOACRENSIS)	5-OZ.
QTY	20	SILKY WILLOW (SALIX SERICEA)	CONTAINER 1-GAL
	6	SILKY DOGWOOD (CURNUS AMOMUM)	CONTAINER 1-GAL
	9	RED BUD (CERCIS CANADENSIS)	CONTAINER 2-GAL



6 PORTLAND CEMENT CONCRETE (PCC)
C-11 NOT TO SCALE



REQUIRED TREE PROTECTION DETAIL

5 TREE PROTECTION
C-11 NOT TO SCALE



CIVIL & EROSION CONTROL DETAILS-2

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