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TIP PROJECT: B-5237

T.I.P. NO.	SHEET NO.
B-5237	UC-1

Project Data Sheet

DEVELOPMENT SERVICES DEPARTMENT

Development Services Customer Service Center | 1 Exchange Plaza, Suite 400 | Raleigh, NC 27601 | 919-996-2495
Litchford Satellite Office | 8320 – 130 Litchford Road | Raleigh, NC 27601 | 919-996-4200

GENERAL INFORMATION			
Development Name: New Bethel Church Road Utility Construction		Proposed Use: Water main and sewer force main	
Property Address(es): New Bethel Church Rd. (at Mahler's Creek crossing), Garner, NC, 27529			
Wake County Property Identification Number(s) (PIN) for each parcel to which these guidelines will apply:			
PIN #n/a	PIN #n/a	PIN #n/a	PIN #n/a
What is the project type? ☐Apartment ☐Bank ☐Elderly Facility ☐Hospital ☐Hotel/Motel ☐Industrial Building ☐Mixed Residential ☐Non-Residential Condo ☐Office ☐Religious Institution ☐Residential Condo ☐Retail ☐School ☐Shopping Center ☐Single Family Residential ☐Telecommunication Tower ☐Townhouse ■Other			
Scope of Work: Replacement of approx. 350 LF of 12-inch water main and 750 LF of 30-inch sewer force main pipe due to conflicts with NCDOT bridge replacement project (B-5237).			

FOR APARTMENTS, CONDOS, AND TOWNHOMES ONLY	
1. Total number of townhouse lots: Number attached:	Number detached:
2. Total number of apartment or condominium units:	
3. Total number of Congregate Care or Life Care Dwelling units:	
4. Overall total number of dwelling units (from 1-3 above):	
5. Number of bedroom units: 1BR 2BR 3BR 4BR or more	
6. Overall unit(s) per acre densities per zoning district(s):	
DEVELOPMENT TYPE AND SITE DATA TABLE (applicable to all developments)	
Zoning Information	**Building Information**
Zoning District(s):	Proposed use of building(s):
If more than one district, provide acreage of each:	Proposed Sq. Ft. of building(s) gross:
Overlay District(s):	Existing Sq. Ft. of building(s) gross:
Total site acreage:	Total Sq. Ft. gross (existing and proposed):
Off street parking: Required Provided	Proposed height of building(s):
COA (Certificate of Appropriateness) case #	FAR (floor area ratio) %:
BOA (Board of Adjustment) case # A -	Building lot coverage %:
CUD (Conditional Use District) case # Z -	Inside City Limits? ☐Yes ■No
STORMWATER INFORMATION	
Existing impervious surface: acres/square feet	
Proposed impervious surface: acres/square feet	
Neuse River buffer: ☐Yes ■No Wetlands: ☐Yes ■No	
Flood Hazard Area: ☐Yes ■No If yes, Alluvial Soils: Flood Study: FEMA Map Panel #:	
Total disturbed area: n/a (roadway project) acres/square feet	

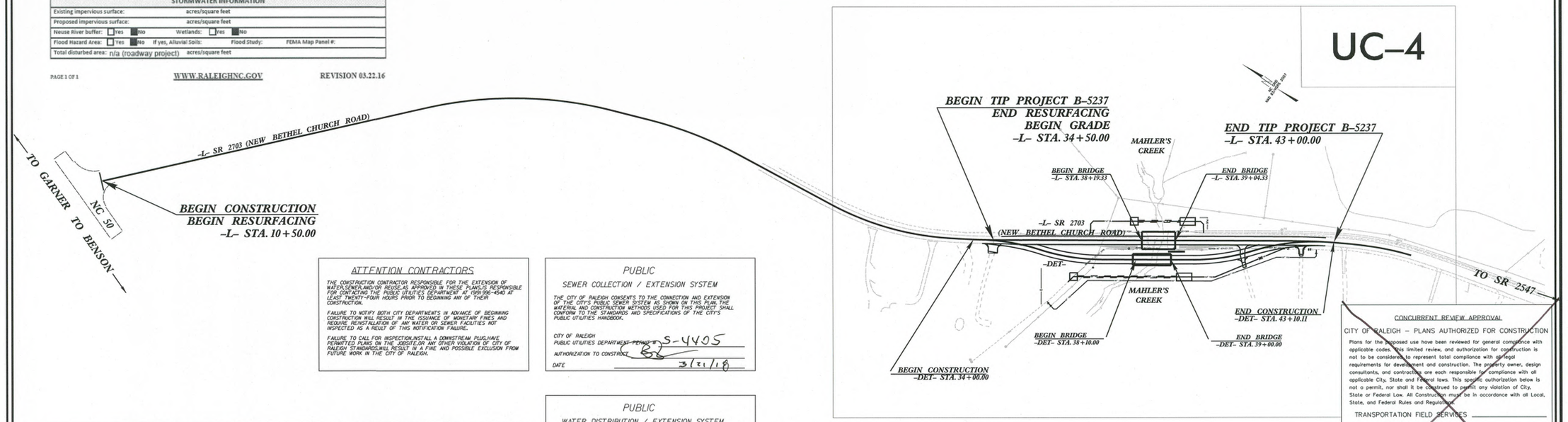
PAGE 1 OF 1 WWW.RALEIGHNC.GOV REVISION 03.22.16

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
WAKE COUNTY

LOCATION: BRIDGE NO. 248 OVER MAHLER'S CREEK ON SR 2703 (NEW BETHEL CHURCH ROAD)

TYPE OF WORK: UTILITY RELOCATIONS



ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER,SEWER,AND/OR REUSE,AS APPROVED IN THESE PLANS,IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919)996-4540 AT LEAST TWENTY-FOUR HOURS PRIOR TO BEGINNING ANY OF THEIR CONSTRUCTION.

FAILURE TO NOTIFY BOTH CITY DEPARTMENTS IN ADVANCE OF BEGINNING CONSTRUCTION WILL RESULT IN THE ISSUANCE OF MONETARY FINES AND REQUIRE REINSTALLATION OF ANY WATER OR SEWER FACILITIES NOT INSPECTED AS A RESULT OF THIS NOTIFICATION FAILURE.

FAILURE TO CALL FOR INSPECTION,INSTALL A DOWNSTREAM PLUG,HAVE PERMITTED PLANS ON THE JOBSITE,OR ANY OTHER VIOLATION OF CITY OF RALEIGH STANDARDS,WILL RESULT IN A FINE AND POSSIBLE EXCLUSION FROM FUTURE WORK IN THE CITY OF RALEIGH.

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN.THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN.THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

CONCURRENT REVIEW APPROVAL

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

TRANSPORTATION FIELD SERVICES _____
PUBLIC UTILITIES _____
STORMWATER _____
PLANNING/ZONING _____
FIRE _____
URBAN FORESTRY _____
SITE ACCESSIBILITY _____

CONTACT INFORMATION	
OWNER'S NAME:	LOUIS BENNETT, PE
PROJECT ENGINEER:	NOLAN RANEY, PE
TELEPHONE NUMBER:	(919) 653-6625
MAILING ADDRESS:	300 W MORGAN ST., SUITE 1500 DURHAM, NC 27701
EMAIL ADDRESS:	NOLAN.RANEY@KIMLEY-HORN.COM

PUBLIC IMPROVEMENTS QUANTITIES		
ITEM	UNIT	QUANTITY
PUBLIC SEWER	LF	747
PUBLIC WATER	LF	351

CONTRACT:

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

5 2.5 0 5 10
PROFILE (VERTICAL)

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC–1	TITLE SHEET
UC–2	UTILITY SYMBOLOGY
UC–3	NOTES
UC–3A THRU UC–3C	DETAILS
UC–4	UTILITY CONSTRUCTION SHEET
UC–5	PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

(1) WATER: CITY OF RALEIGH
(2) SEWER: CITY OF RALEIGH

PLANS PREPARED FOR THE NCDOT BY:

Kimley»Horn ©2017

NC LICENSE #P-0102
P.O. BOX 33068
RALEIGH, NORTH CAROLINA 27636
PHONE: (919) 677-2000

Nolan D. Raney, P.E. — *UTILITIES PROJECT ENGINEER*
Daniel G. Bula, P.E. — *UTILITIES PROJECT DESIGNER*

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037955 NOLAN D. RANEY
2/1/2018

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PREPARED IN THE OFFICE OF:
DIVISION OF HIGHWAYS
UTILITIES UNIT
UTILITIES ENGINEERING

1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

_____ *UTILITIES SECTION ENGINEER*
_____ *UTILITIES SQUAD LEADER PROJECT ENGINEER*
_____ *UTILITIES PROJECT DESIGNER*

2/1/2018 K:\DUR_Utilities\Oil\063095 - New Bethel Church Road\Utilities\Engineering\UC\Proj\B5237_ut_tsh_uc01_pshdgn

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-2

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — RW CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — THH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) — W
- U/G Water Line LOS C (S.U.E*) — W
- U/G Water Line LOS D (S.U.E*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — THH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4425
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

CONCURRENT REVIEW APPROVAL

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for this proposed use have been reviewed for general conformance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction shall be in accordance with all Local, State, and Federal Rules and Regulations.

TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

UTILITY CONSTRUCTION

GENERAL NOTES:

1. ELEVATIONS SHOWN ARE IN FEET ABOVE MEAN SEA LEVEL.
2. TYPICAL MINIMUM DEPTH OF COVER FOR BURIED FORCE MAIN SHALL BE 4 FEET UNLESS OTHERWISE SHOWN OR SPECIFIED.TYPICAL DEPTH OF COVER FOR BURIED WATERLINE SHALL BE 3 FEET UNLESS OTHERWISE SHOWN OR SPECIFIED.
3. LOCATIONS OF EXISTING SHOWN UTILITIES ARE APPROXIMATE.CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXACT LOCATION,ORIENTATION,AND ELEVATION OF EXISTING UTILITIES PRIOR TO EXCAVATION FOR THE FORCE MAIN.
4. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.
5. UNLESS OTHERWISE SHOWN OR SPECIFIED,ALL FORCE MAIN AND WATER LINE TRENCH BEDDING SHALL BE PER DETAILS S-4 AND W-3.
6. BURIED TELEPHONE AND CATV CABLES (FIBER OPTICS AND CONVENTIONAL) ARE KNOWN TO VARY DUE TO INSTALLATION TECHNIQUES.THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR COORDINATING WITH THE UTILITY COMPANY TO DETERMINE SPECIFIC CABLE LOCATIONS AND NOTIFYING THE ENGINEER OF THE EXACT ELEVATION OF THE CABLES.THE CONTRACTOR SHALL BE RESOPNSIBLE FOR ALL COSTS ASSOCIATED WITH LOCATING,RELOCTING,OR REPAIRING BURIED CABLES ALONG THE FORCE MAIN AND WATER LINE ROUTE.
7. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SHEETING REQUIRED FOR THE INSTALLATION OF THE FORCE MAIN. ALL EXCAVATIONS SHALL BE KEPT WITHIN THE DESIGNATED EASEMENT AND/OR RIGHT-OF-WAY WIDTHS. SHEETING SHALL BE INSTALLED AS REQUIRED TO PROTECT EXISTING UTILITIES.
8. CITY OF RALEIGH WILL FURNISH DESCRIPTION OF EASEMENTS UPON REQUEST.
9. THE CONTRACTOR SHALL RESTORE GRADE TO PRE-CONSTRUCTION CONDITION UNLESS OTHERWISE NOTED ON THE DRAWINGS.
10. CONTRACTOR SHALL PROVIDE A MEANS TO KEEP ALL NEW PIPING ISOLATED FROM EXISTING PIPING UNTIL ALL NEW PIPING HAS BEEN PRESSURE TESTED,FLUSHED,AND ACCEPTED BY THE CITY OF RALEIGH FOR SERVICE.
11. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION,ELEVATION,ORIENTATION, DIMENSIONS,MATERIALS,ETC.,OF EXISTING PIPE PRIOR TO ORDERING MATERIAL AND SHALL USE NECESSARY FITTINGS FOR THE CONNECTION.
12. CONTRACTOR SHALL RELOCATE EXISTING UNDERGROUND CABLES AS REQUIRED TO ACCOMMODATE INSTALLATION OF PROPOSED FORCE MAIN.COST SHALL BE PAID BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE CITY OF RALEIGH FOR ANY ADDITIONAL INFORMATION ON EXISTING WATER AND SEWER UTILITIES.
14. RESTRAINED PIPE JOINTS SHALL BE INSTALLED BETWEEN THE STATIONS INDICATED ON THE DRAWINGS.IF A BEND OR FITTING IS RELOCATED BY THE CONTRACTOR FOR HIS CONVENIENCE THEN THE REQUIRED LENGTH OF RESTRAINED JOINTS SHALL BE MAINTANED AT NO ADDITIONAL COST TO THE OWNER.IF ADDITIONAL BENDS OR FITTINGS ARE INSTALLED BY THE CONTRACTOR FOR HIS CONVENIENCE,THEN THE CONTRACTOR SHALL INSTALL THE REQUIRED LENGTH OF RESTRAINED JOINTS AS DETERMINED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.
15. FORCE MAIN AND WATER LINE ALIGNMENTS SHOWN ON THE DRAWINGS ARE BASED ON STANDARD FITTINGS AVAILABLE FOR DUCTILE IRON PIPE.JOINT DEFLECTIONS SHALL NOT EXCEED 75 PERCENT OF MANUFACTURER'S RECOMMENDED DEFLECTION.
16. DETECTOR TAPE IS REQUIRED FOR ALL BURIED PIPE.
17. ALL MANHOLE COVERS AND VALVE BOX LIDS FOR WATER LINE SHALL READ "WATER". ALL MANHOLE COVERS AND VALVE BOX LIDS FOR SEWER LINE AND FORCE MAIN SHALL READ "SEWER".ALL MANHOLE COVERS AND VALVE BOX LIDS FOR REUSE WATER SHALL READ "REUSE".
18. ALL PRESSURIZED PIPE FITTINGS SHALL BE RESTRAINED JOINT.

STANDARD UTILITY NOTES:

1. ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS,DETAILS & SPECIFICATIONS (REFERENCE:CORPUD HANDBOOK, CURRENT EDITION)
2. UTILITY SEPARATION REQUIREMENTS:
   A. A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER.IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED,FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER,THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
   B. WHEN INSTALLING WATER &/OR SEWER MAINS,THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'.IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS,THE VARIATION ALLOWED IS THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18' ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
   C. WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION,OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN,DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
   D. 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES,UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
   E. MAINTAIN 18" MIN.VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS; MAINTAIN 24" MIN.VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS.WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED,SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN.CLEARANCE (PER CORPUD DETAILS W-41 & S-49).
   F. ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN.VERTICAL SEPARATION REQUIRED.
3. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 72 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
5. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
6. IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
7. INSTALL WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT.
8. INSTALL 4" PVC SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
9. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
10. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ,USACE &/OR FEMA FOR ANY RIPARIAN BUFFER,WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
11. NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
12. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
13. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA.THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST.THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM,WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

PROJECT SPECIFIC NOTES:

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL CITY OF RALEIGH AND/OR NCDOT STANDARDS AND SPECIFICATIONS.
2. A THRUST RESTRAINT DESIGN PRESSURE OF 350 PSI SHALL BE USED.
3. ALL FORCE MAIN PIPE SHALL BE CLASS 51 DUCTILE IRON. ALL WATER LINE PIPE SHALL BE PC 350 DUCTILE IRON.
4. ALL DUCTILE IRON FORCE MAIN PIPE AND FITTINGS SHALL BE LINED WITH PROTECTO 401.
5. SEE SECTIONS 102,107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE BORING AND JACKING DESIGNED AND SEALED BY A LICENSED NORTH CAROLINA PROFESSIONAL ENGINEER, AND SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO INSTALLATION. SPECIAL CARE SHALL BE TAKEN TO PREVENT DAMAGE TO RIVERS, WETLANDS, OR BUFFER ZONES.

GENERAL WASTEWATER FLOW MANAGEMENT NOTES:

1. THE CONTRACTOR SHALL PROVIDE A DETAILED "WASTEWATER INTERRUPTION AND DIVERSION PLAN", WHICH MAY INCLUDE THE FOLLOWING METHODS FOR MANAGING FLOWS DURING CONSTRUCTION:
   1.1 A TEMPORARY PUMP STATION SHUT DOWN, ALLOWING FOR WORK TO BE COMPLETED DURING THE SHUT DOWN AND RECONNECTING PIPING/RESTARTING THE PUMP STATION AS REQUIRED TO PUMP DOWN THE WET WELL.
   1.2 THE INSTALLATION OF TEMPORARY BYPASS PIPING (AND PUMPS, IF NECESSARY) TO SAFELY ROUTE THE FORCE MAIN AROUND THE CONSTRUCTION AREA.
   1.3 PUMPING AND HAULING WASTEWATER FROM THE PUMP STATION WET WELL(S) AND DISCHARGING AT A LOCATION PRE-APPROVED BY THE OWNER.

   ONE PUMP AND HAUL TRUCK SHALL REMAIN ON SITE FOR EMERGENCY BACKUP PURPOSES.
2. NO PIPING, PUMPS, ELECTRICAL, OR OTHER SYSTEMS CRITICAL TO THE SYSTEM'S OPERATION SHALL BE REMOVED UNTIL THE WASTEWATER INTERRUPTION AND DIVERSION PLAN IS OPERATIONAL AND APPROVED BY THE ENGINEER/OWNER.
3. THE WASTEWATER INTERRUPTION AND DIVERSION PLAN SHALL REMAIN ENTIRELY IN PLACE AND FULLY OPERATIONAL UNTIL THE NEW LINE HAS BEEN TESTED AND APPROVED, FLOW IS DIVERTED TO THE NEW LINE, AND UNTIL THE REMOVAL/SHUT DOWN IS APPROVED BY THE ENGINEER/OWNER.
4. FORCE MAIN CONNECTIONS SHALL BE VISUALLY OBSERVED FOR LEAKS AS THE PUMP STATION IS BROUGHT BACK ONLINE THROUGH A MINIMUM OF TWO COMPLETE PUMP CYCLES AFTER THE FORCE MAIN HAS BEEN FILLED TO NORMAL OPERATING CONDITIONS.
5. ANY OBSERVED LEAKS SHALL BE ELIMINATED BY THE CONTRACTOR IN A MANNER APPROVED BY THE ENGINEER/OWNER.

REVISIONS

Kimley»Horn ©2014
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-3
DESIGNED BY: DGB	
DRAWN BY: DGB	
CHECKED BY: ZGP	
APPROVED BY: NDR	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	

NORTH CAROLINA PROFESSIONAL SEAL 037953 ENGINEER NOLAN D. RANEY
2/1/2018
UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/12/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/12/18

CONCURRENT REVIEW APPROVAL
CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This special authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.
TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

2/1/2018 K:\DUR_Utilities\Oil\063095 - New Bethel Church Road\Utilities\Engineering\UC\Proj\B5237_ut_notes_uc03_pstudgn

REVISIONS

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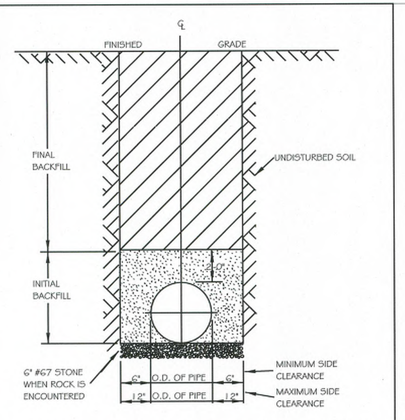
PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-3A
DESIGNED BY: DGB	
DRAWN BY: DGB	
CHECKED BY: ZGP	
APPROVED BY: NDR	
REVISED:	

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
UTILITIES ENGINEERING SEC.
PHONE: (919)707-6690
FAX: (919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 037953 ENGINEER NOLAN D. RANEY 2/1/2018

UTILITY CONSTRUCTION PLANS ONLY

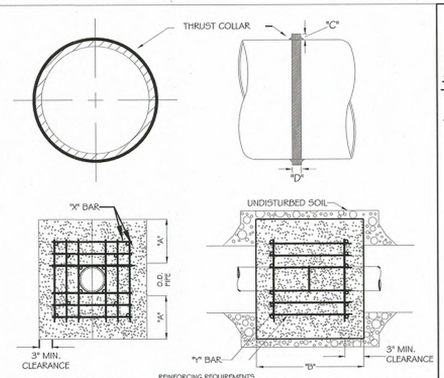
UTILITY CONSTRUCTION



NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
5. ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
6. IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
7. NO BOULDERS 6" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C.	9-3-99		
	RRH	3-30-00		



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"A" BAR LENGTH	"A" BAR WEIGHT	"A" BAR LENGTH	"A" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

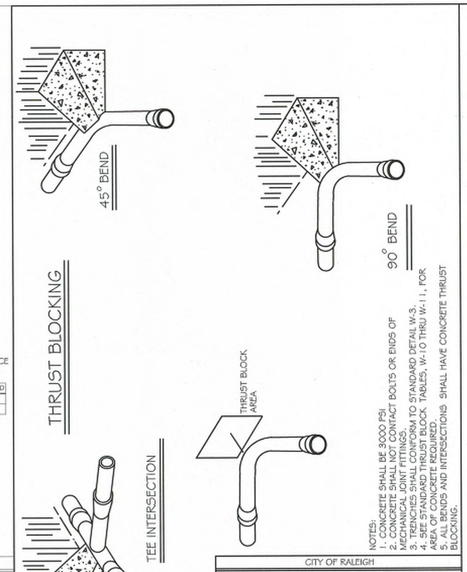
THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	2"	3/8"
20" - 24"	1'-4"	1'-7"	3"	1/2"
30" - 36"	1'-4"	1'-7"	4"	5/8"
48" & greater	1'-8"	1'-9"	6"	7/8"

NOTES:
1. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
2. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
4. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
5. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RESTRAINING COLLAR DESIGN DATA FOR SEWER FORCE MAIN

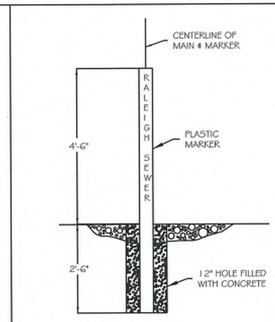
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-6	RRH	1-21-00		
	D.H.L.	6-18-08		



NOTES:
1. CONCRETE SHALL BE 3000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. THRUST BLOCKING SHALL CONFORM TO STANDARD DETAIL W-3.
4. SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCKING VIEWS

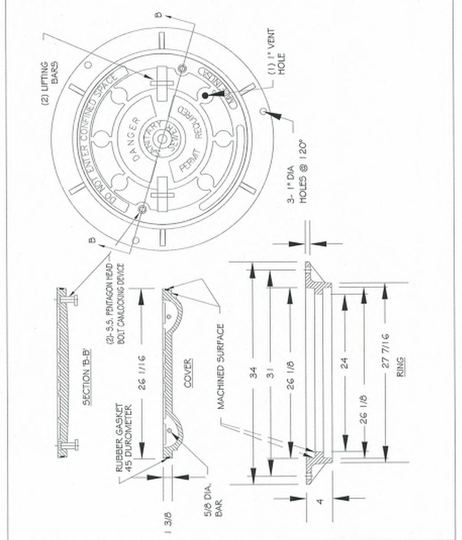
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-7		3-1-87	RRH	3-31-00
	D.W.C.	9-7-99	D.H.L.	6-18-08



NOTES:
1. PLASTIC MARKER SHALL BE GREEN IN COLOR.
2. MARKERS SHALL BE LABELED "RALEIGH SEWER"
3. TO BE SPACED EVERY 300 FEET ON EACH SIDE OF ANY ROADWAY OR JUNCTION.
4. MARKERS SHALL BE ROUND 4" IN DIAMETER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MAIN MARKER FOR SEWER FORCE MAINS IN EASEMENTS

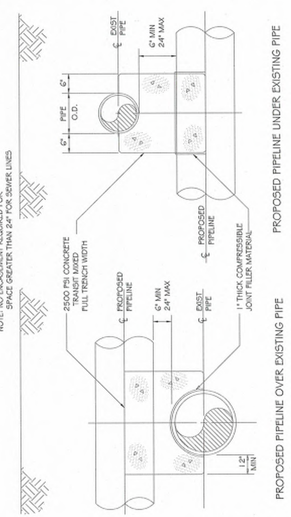
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-8	RRH	1-21-00		
	DHL	6-18-08		



Note: solid cover required when water tight manhole specified.

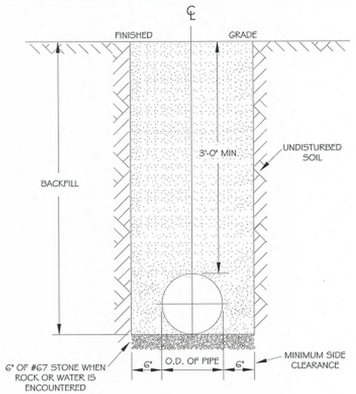
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
FLAT TOP MANHOLE COVER

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25a	3-1-87	3-1-87	A.B.B.	2-9-05
	RRH	3-30-00	D.H.L.	6-18-08



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS

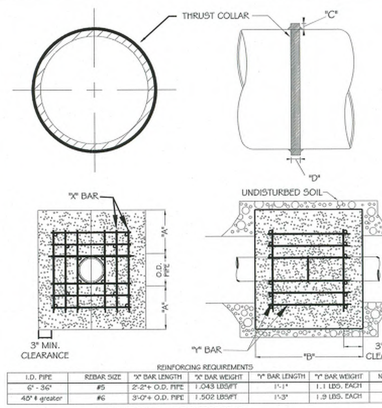
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-49	DHL	2-20-08		



NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS.
5. ACHIEVE 95% COMPACTION IN BACKFILL.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-99	ABB	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"A" BAR LENGTH	"A" BAR WEIGHT	"A" BAR LENGTH	"A" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	2"	3/8"
20" - 24"	1'-4"	1'-7"	3"	1/2"
30" - 36"	1'-4"	1'-7"	4"	5/8"
48" & greater	1'-8"	1'-9"	6"	7/8"

NOTES:
1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN DATA FOR WATER MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	1-21-00	J.P.S.	11-1-10
	D.H.L.	6-18-08		

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

CONCURRENT REVIEW APPROVAL

CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction shall be in accordance with all Local, State, and Federal Rules and Regulations.

TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

2/1/2018 K:\DUR_Utilities\0l1063095 - New Bethel Church Road\Utilities\Engineering\UC\Pro\B5237_uf_dtl_uc03a_pshdgn

REVISIONS

K:\DUR_Utilities\0I063095 - New Bethel Church Road\Utilities\Engineering\UCPro\B5237_ut_drl_ucp03a_pshdgn

2/1/2018

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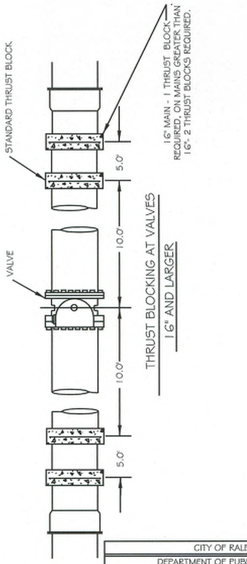
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-3B
DESIGNED BY: DGB	
DRAWN BY: DGB	
CHECKED BY: NDR	
APPROVED BY: NDR	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 047955 ENGINEER NOLAN D. RAINEY
2/1/2018

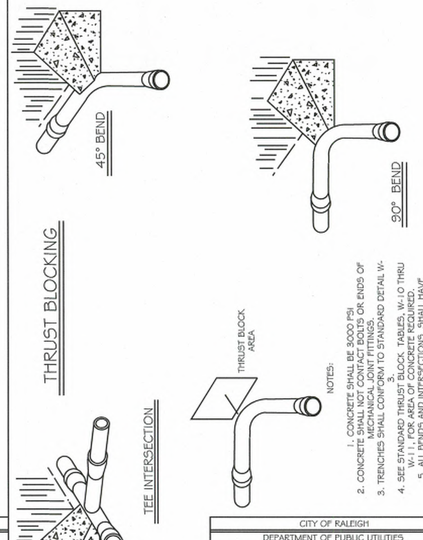
UTILITY CONSTRUCTION



THRUST BLOCKING AT VALVES 16" AND LARGER

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-8	Y.C.A.	4-12-90	D.W.C.	9-7-99
		6-92	RRH	3-31-00



NOTES:
1. CONCRETE SHALL BE 3000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO STANDARD DETAIL W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
4. SEE STANDARD THRUST BLOCK, TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND TEES WITHOUT RODS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCKING VIEWS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-16-06

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	LOOSE SAND 1600 LBS/FT²	8000 LBS/FT² DRY CLAY - ALWAYS DRY	SAND, COMPACT FIRM 8000 LBS/FT²	SAND, CLEAN DRY 4000 LBS/FT²	SOIL 1000 LBS/FT² GUARDSAND - VERY POOR	ROCK - POOR 10,000 LBS/FT²
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6° - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE 6	REVISIONS	DATE
W-10	D.W.C.	-23-99		

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

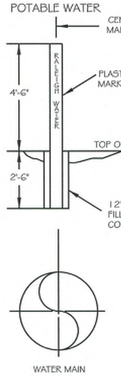
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	GRAVEL/COARSE SAND 1600 LBS/FT²	8000 LBS/FT² DRY CLAY - ALWAYS DRY	SAND, COMPACT FIRM 8000 LBS/FT²	SAND, CLEAN DRY 4000 LBS/FT²	SOIL 1000 LBS/FT² GUARDSAND - VERY POOR	ROCK - POOR 10,000 LBS/FT²
24"									
11 1/4°	17,734	5	9	11	3	3	5	18	2
22 1/2°	35,305	9	18	22	5	5	9	36	4
45°	69,252	18	35	42	9	9	18	70	7
90°	127,936	32	64	77	16	16	32	128	13
PLUG	90,478	23	46	55	12	12	23	91	10
30"									
11 1/4°	27,709	7	14	17	4	4	7	2	3
22 1/2°	55,163	14	28	34	7	7	14	56	6
45°	108,200	28	55	65	14	14	28	109	11
90°	199,900	50	100	120	25	25	50	200	20
PLUG	141,372	36	71	85	18	18	36	142	15
36"									
11 1/4°	39,901	10	20	24	5	5	10	40	4
22 1/2°	79,439	20	40	48	10	10	20	30	8
45°	155,816	39	78	94	20	20	39	156	16
90°	287,855	72	144	172	36	36	72	288	29
PLUG	203,575	51	102	122	26	26	51	204	21
48"									
11 1/4°	70,935	18	36	43	9	9	18	71	8
22 1/2°	141,218	36	71	85	18	18	36	142	15
45°	277,007	70	139	166	35	35	70	277	28
90°	511,742	128	256	320	64	64	128	512	52
PLUG	361,911	91	181	217	46	46	91	362	37

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6° - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING
DESIGN QUANTITY TABLE

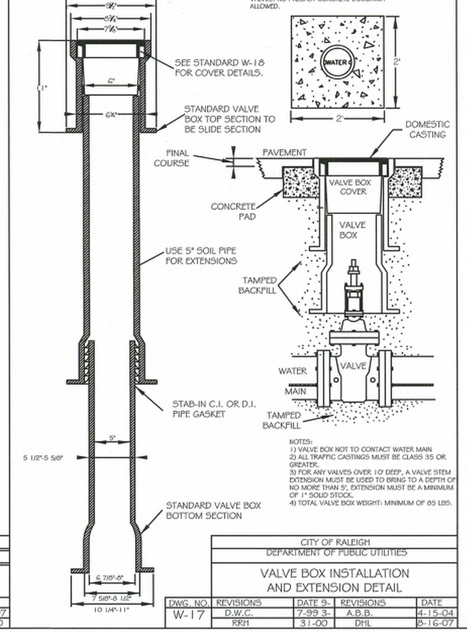
DWG. NO.	REVISIONS	DATE 6-	REVISIONS	DATE
W-11	D.W.C.	23-99		



NOTES
1. POTABLE WATER MARKER TO BE BLUE IN COLOR.
2. POTABLE WATER MARKER TO BE LABELED "RALEIGH WATER".
3. TO BE SPACED ALONG CENTERLINE OF MAIN EVERY 300 FEET.
4. MARKERS TO BE ROUND AND 4" IN DIAMETER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MAIN & VALVE MARKERS FOR POTABLE & RELIQUE WATER IN EASEMENTS

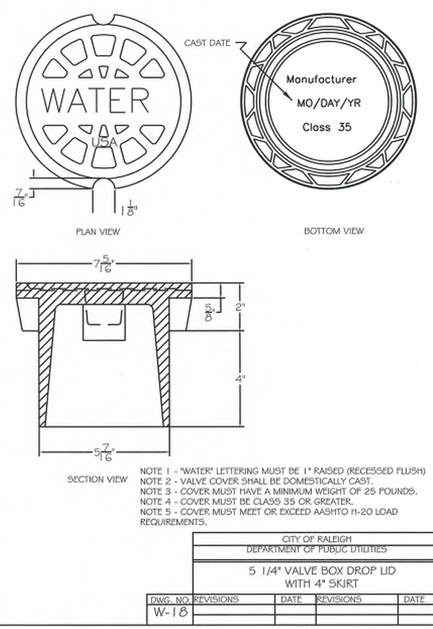
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13	D.W.C.	9-7-99	DHL	8-16-07
	RRH	3-31-00	J.P.S.	11-1-10



NOTES:
1) VALVE BOX NOT TO CONTACT WATER MAIN
2) ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3) FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'. EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
4) TOTAL VALVE BOX WEIGHT MINIMUM OF 85 LBS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE BOX INSTALLATION AND EXTENSION DETAIL

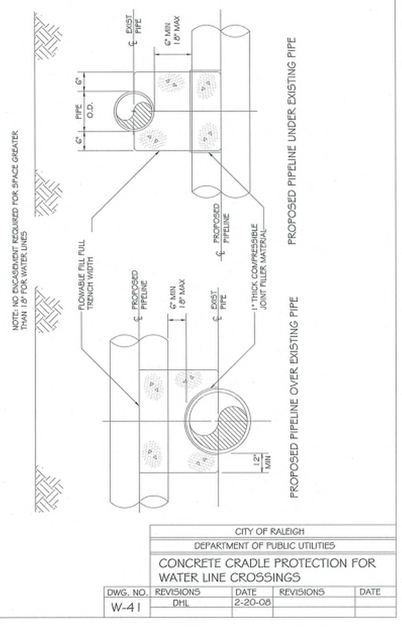
DWG. NO.	REVISIONS	DATE 9-	REVISIONS	DATE
W-17	D.W.C.	7-99 3-	A.B.B.	4-15-04
	RRH	31-00	DHL	8-16-07



NOTE 1 - "WATER" LETTERING MUST BE 1" RAISED (RECESSED FLUSH)
NOTE 2 - VALVE COVER SHALL BE DOMESTICALLY CAST.
NOTE 3 - COVER MUST HAVE A MINIMUM WEIGHT OF 25 POUNDS.
NOTE 4 - COVER MUST BE CLASS 35 OR GREATER.
NOTE 5 - COVER MUST MEET OR EXCEED AASHTO H-20 LOAD REQUIREMENTS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
5 1/4" VALVE BOX DROP LID WITH 4" SKIRT

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	DHL	2-20-08		

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

CONCURRENT REVIEW APPROVAL
CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

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TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

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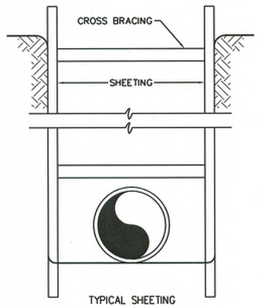
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-3C
DESIGNED BY: DGB	
DRAWN BY: DGB	
CHECKED BY: NDR	
APPROVED BY: NDR	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

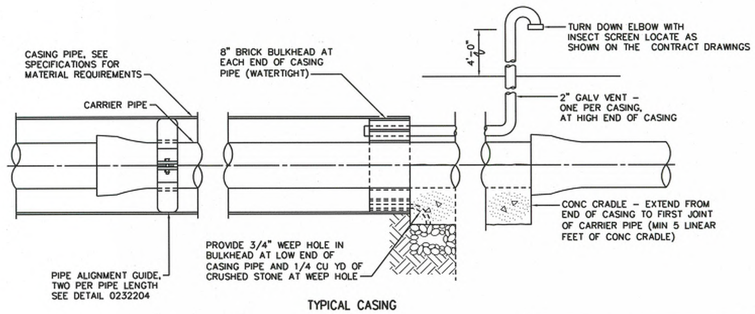
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037453 NOLAN D. RANEY — 2/1/2018

UTILITY CONSTRUCTION

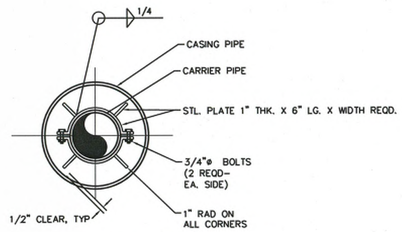
REVISIONS



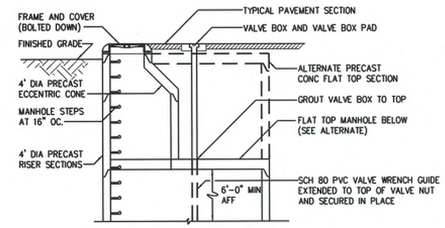
TYPICAL SHEETING
0222121



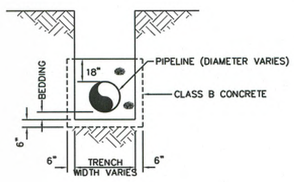
TYPICAL CASING
0232201



PIPE ALIGNMENT GUIDE
0232204



FLAT TOP / ECCENTRIC CONE SECTION



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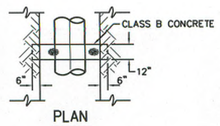
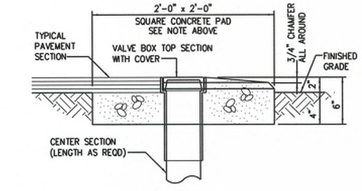


PLAN

ANTI-SEEPAGE COLLAR
0260113

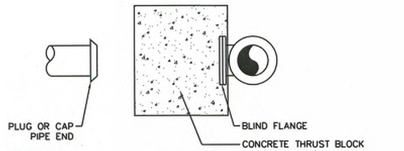


VALVE BOX PAD
0264005

THREADED ROD SCHEDULE															
	DESIGN PRESSURE (DIMENSIONS IN INCHES)														
PIPE SIZE	50 PSI		100 PSI		150 PSI		200 PSI		250 PSI		300 PSI		350 PSI		
	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	BOLTS NO–DIA	TAB THK	
4,6	2–3/4	1	2–3/4	1	2–3/4	1	2–3/4	1	2–3/4	1	2–3/4	1	2–3/4	1	
8	2–3/4	1 1/4	2–3/4	1 1/4	2–3/4	1 1/4	2–3/4	1 1/4	2–3/4	1 1/4	4–3/4	1 1/4	4–3/4	1 1/4	
10	2–3/4	1 1/4	2–3/4	1 1/4	2–3/4	1 1/4	4–3/4	1 1/4	4–3/4	1 1/4	4–3/4	1 1/4	4–3/4	1 1/4	
12	2–3/4	1 1/4	2–3/4	1 1/4	4–3/4	1 1/4	4–3/4	1 1/4	6–3/4	1 1/4	6–3/4	1 1/4	6–3/4	1 1/4	
14	2–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	
16	2–3/4	1 1/2	4–3/4	1 1/2	6–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	4–3/4	1 1/2	6–3/4	1 1/2	
18	2–3/4	1 3/4	4–3/4	1 3/4	6–3/4	1 3/4	4–3/4	1 3/4	6–3/4	1 3/4	6–3/4	1 3/4	6–3/4	1 3/4	
20	4–3/4	1 3/4	4–3/4	1 3/4	4–3/4	1 3/4	4–3/4	1 3/4	6–3/4	1 3/4	8–3/4	1 3/4	8–3/4	1 3/4	
24	4–3/4	2	4–3/4	2	6–3/4	2	6–3/4	2	8–3/4	2	10–3/4	2	10–3/4	2	
30	4–1	2 1/4	4–1	2 1/4	4–1	2 1/4	6–1	2 1/4	8–1	2 1/4	10–1	2 1/4	10–1	2 1/4	
36	4–1	2 1/2	4–1	2 1/2	6–1	2 1/2	8–1	2 1/2	10–1	2 1/2	12–1	2 1/2	14–1	2 1/2	
42	4–1 1/4	2 3/4	4–1 1/4	2 3/4	6–1 1/4	2 3/4	8–1 1/4	2 3/4	10–1 1/4	2 3/4	12–1 1/4	2 3/4	12–1 1/4	2 3/4	
48	6–1 1/4	2 3/4	4–1 1/4	2 3/4	8–1 1/4	2 3/4	8–1 1/4	2 3/4	12–1 1/4	2 3/4	12–1 1/4	2 3/4	14–1 1/4	2 3/4	
54	6–1 1/4	3	6–1 1/4	3	8–1 1/4	3	12–1 1/4	3	14–1 1/4	3	16–1 1/4	3	16–1 1/4	3	

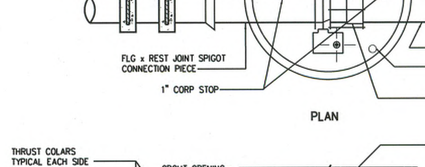
1. THREADED RODS FOR ALL PIPE DIAMETERS IN THE SHADED AREA SHALL BE ASTM A193 (GRADE B7).
2. ALL OTHER THREADED RODS SHALL BE ASTM A36. ALL TABS SHALL BE ASTM A572 GR50.
3. ASTM A193 (GRADE B7) RODS SHALL BE LABELED AND BUNDLED SEPARATELY.
4. THIS SCHEDULE SHALL APPLY FOR HARNESSED FLANGED ADAPTERS, HARNESSED FLEXIBLE COUPLINGS AND ALL MECHANICAL JOINT COUPLINGS, SLEEVES ETC. THAT ARE REQUIRED TO BE HARNESSED.
5. RODS THREADED AT ENDS (INCLUDING NUTS) SHALL BE EQUALLY SPACED AROUND PIPE BETWEEN ALL MECHANICAL JOINT FITTINGS (TEE, VALVES, BEND, PLUG, ETC.) OR AS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS. THREADED RODS SHALL BE AS SHOWN IN THE THREADED ROD SCHEDULE. SEE NOTE 6.
6. RODS, NUTS, ETC., IN CONTACT WITH SOIL SHALL BE PAINTED WITH TWO COATS COAL TAR (MIN 26 DRY MIL THICKNESS) TNEMEC 46-465 HI-BUILD OR EQUAL.

1516403

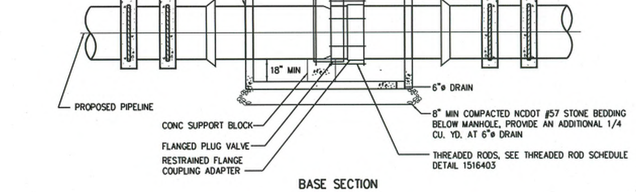


NOTES:
1. CLOSE VALVES TO KILL LINE
2. SEVER AND REMOVE PIPE SECTION
3. BLIND FLANGE TO TEE OR EXISTING PIPING
4. PLUG OR CAP ABANDONED PIPE END
5. INSTALL THRUST BLOCK

CUT AND CAP EXISTING WATERLINE
0232203

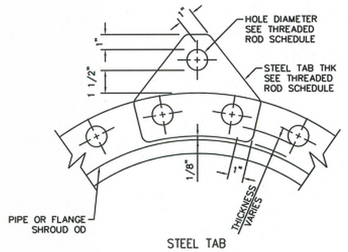


PLAN

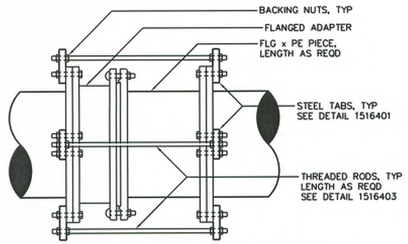


BASE SECTION

TYPICAL PLUG VALVE ASSEMBLY
0264009

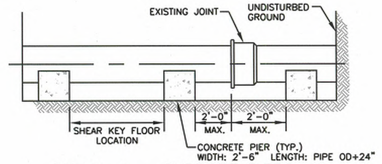


STEEL TAB
1516401

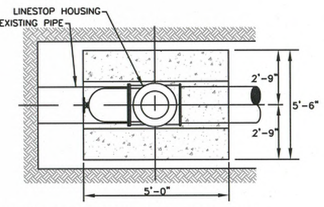


NOTE: ALL FLANGED ADAPTERS SHALL BE HARNESSED AND BACK BOLTED TO PREVENT MOVEMENT IN EITHER DIRECTION. SEE THREADED ROD SCHEDULE FOR ROD DIAMETER, MATERIAL AND STEEL TAB THICKNESS.

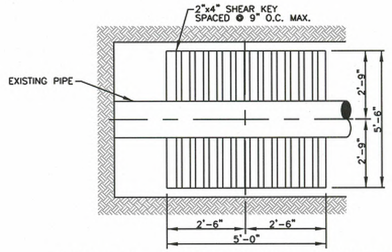
HARNESSED FLANGED ADAPTER
1516402



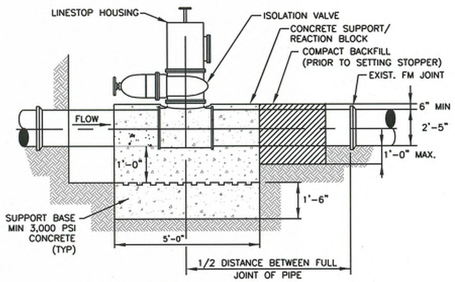
DETAIL A – SUPPORT PIERS



LINESTOP ASSEMBLY–TOP VIEW



DETAIL B – TOP VIEW OF SUPPORT BASE



LINESTOP ASSEMBLY–SIDE VIEW
NOTE: FOR CLARITY, SUPPORT PIERS ARE NOT SHOWN

NOTE: PROVIDE PLASTIC LINER BETWEEN ALL CONCRETE TO PIPE INTERFACES.

0264010
LINESTOP ON 30" FORCE MAIN
NOT TO SCALE

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
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DATE 3/21/18

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TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

K:\DUR_Utilities\011063095 - New Bethel Church Road\Utilities\Engineering\UCPro\B5237_ut_dtl_uc03a_pshdgn
2/1/2018

Kimley»Horn	PROJECT REFERENCE NO.	SHEET NO.
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068	B-5237	UC-4

DESIGNED BY: DGB
DRAWN BY: DGB
CHECKED BY: ZGP
APPROVED BY: NDR
REVISED:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

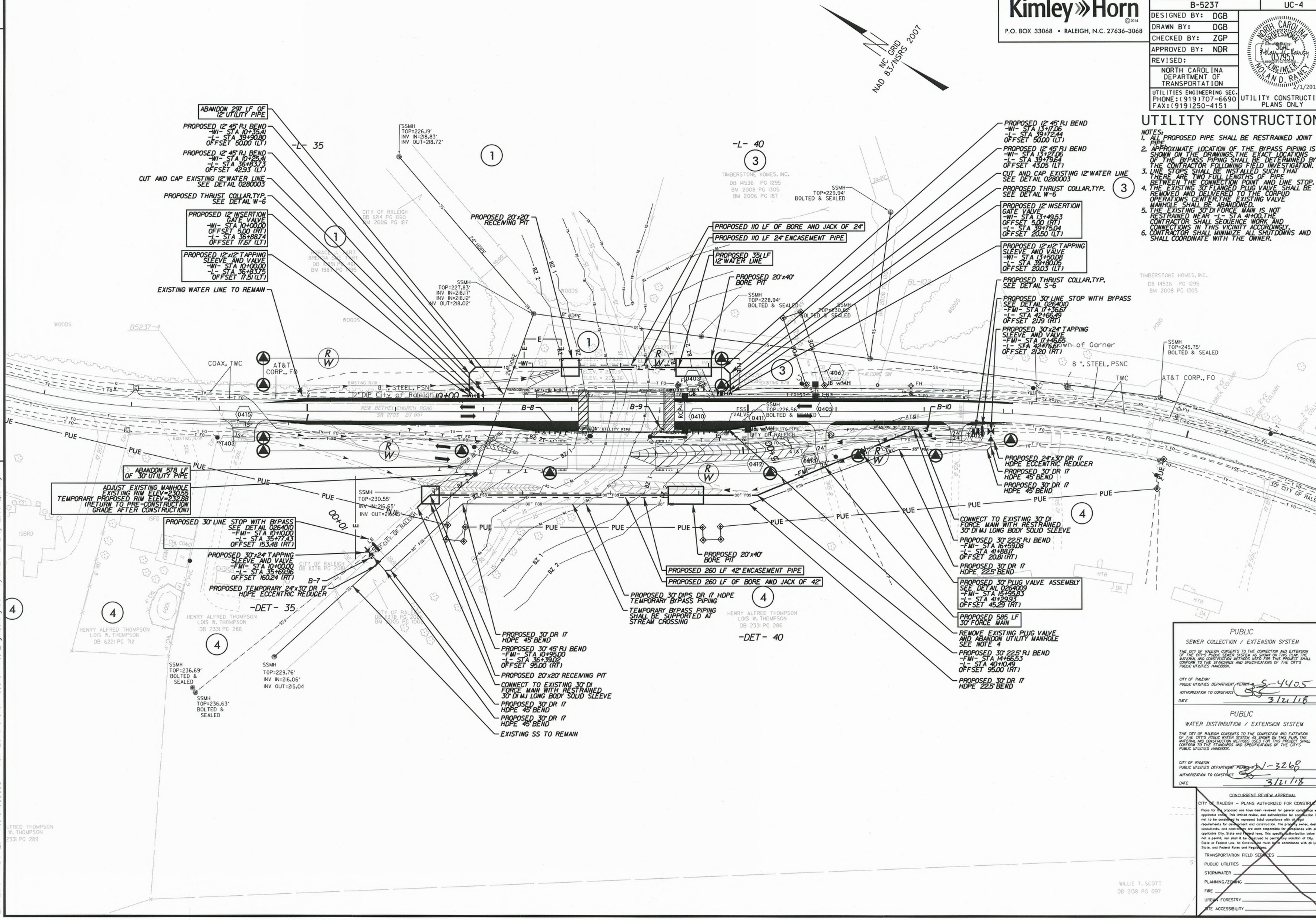
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151

NORTH CAROLINA PROFESSIONAL SEAL 037953 ENGINEER NOLAND D. RANEY 2/1/2018

UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

NOTES:
1. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT PIPE.
2. APPROXIMATE LOCATION OF THE BYPASS PIPING IS SHOWN ON THE DRAWINGS.THE EXACT LOCATIONS OF THE BYPASS PIPING SHALL BE DETERMINED BY THE CONTRACTOR FOLLOWING FIELD INVESTIGATION.
3. LINE STOPS SHALL BE INSTALLED SUCH THAT THERE ARE TWO FULL LENGTHS OF PIPE BETWEEN THE CONNECTION POINT AND LINE STOP.
4. THE EXISTING 30" FLANGED PLUG VALVE SHALL BE REMOVED AND DELIVERED TO THE CORPUD OPERATIONS CENTER.THE EXISTING VALVE MANHOLE SHALL BE ABANDONED.
5. THE EXISTING 30" DI FORCE MAIN IS NOT RESTRAINED NEAR -L- STA 41+00.THE CONTRACTOR SHALL SEQUENCE WORK AND CONNECTIONS IN THIS VICINITY ACCORDINGLY.
6. CONTRACTOR SHALL MINIMIZE ALL SHUTDOWNS AND SHALL COORDINATE WITH THE OWNER.



PUBLIC

SEWER COLLECTION / EXTENSION SYSTEM

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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC

WATER DISTRIBUTION / EXTENSION SYSTEM

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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
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TRANSPORTATION FIELD SERVICES ____
PUBLIC UTILITIES ____
STORMWATER ____
PLANNING/ZONING ____
FIRE ____
URBAN FORESTRY ____
SITE ACCESSIBILITY ____

REVISIONS

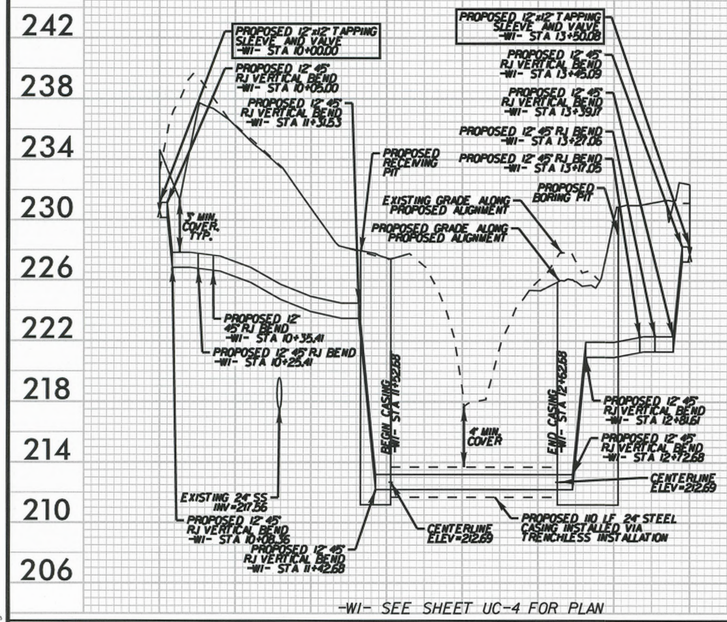
2/1/2018 K:\DUR_Utilities\011063095 - New Bethel Church Road\Utilities\Engineering\UC\Proj\B5237_ut_rdy4_uc04_psh.dgn

Kimley»Horn ©2018
P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

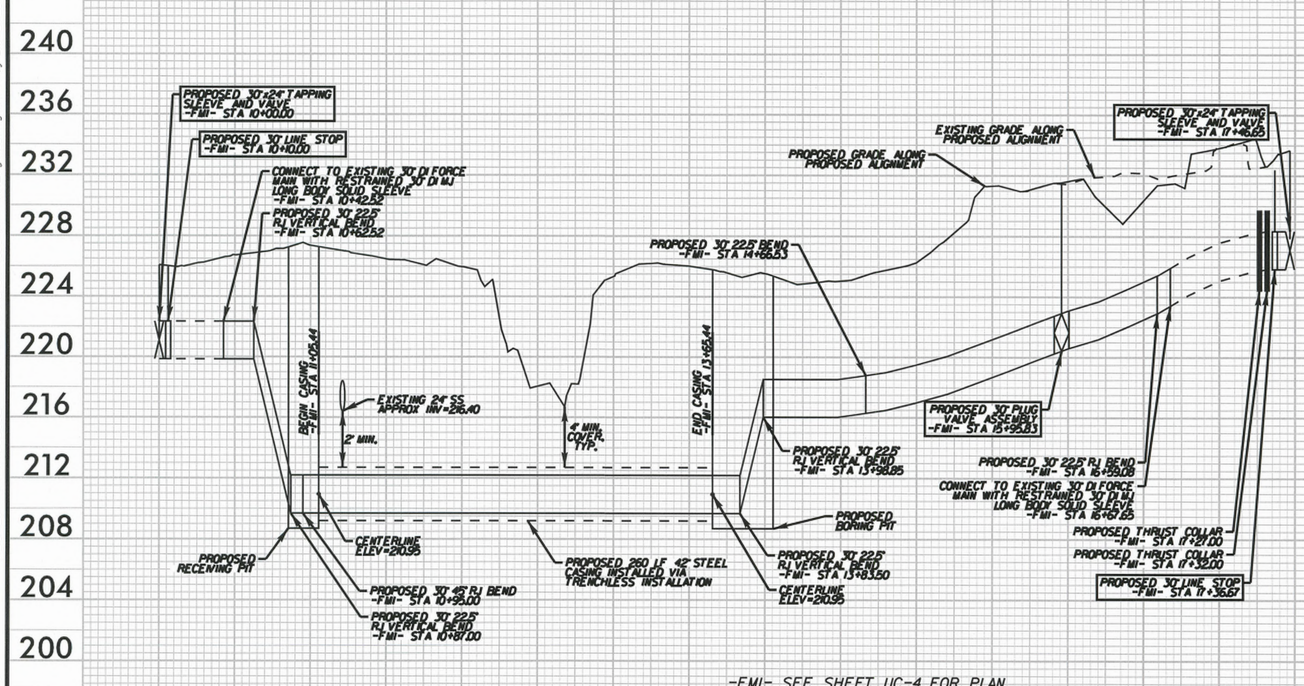
PROJECT REFERENCE NO.	SHEET NO.
B-5237	UC-5
DESIGNED BY: DGB	
DRAWN BY: DGB	
CHECKED BY: NDR	
APPROVED BY: NDR	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE:(919)707-6690 FAX:(919)250-4151	UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 037559 ENGINEER NOLAN D. RAILEY
2/1/2018

REVISIONS



-WI- SEE SHEET UC-4 FOR PLAN



-FMI- SEE SHEET UC-4 FOR PLAN

UTILITY CONSTRUCTION

NOTES:
1. ALL PROPOSED PIPE SHALL BE RESTRAINED JOINT PIPE.

PUBLIC
SEWER COLLECTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4405
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

PUBLIC
WATER DISTRIBUTION / EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3268
AUTHORIZATION TO CONSTRUCT
DATE 3/21/18

CONCURRENT REVIEW APPROVAL
CITY OF RALEIGH – PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This special authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations.

TRANSPORTATION FIELD SERVICES
PUBLIC UTILITIES
STORMWATER
PLANNING/ZONING
FIRE
URBAN FORESTRY
SITE ACCESSIBILITY

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2/1/2018