

09/08/19

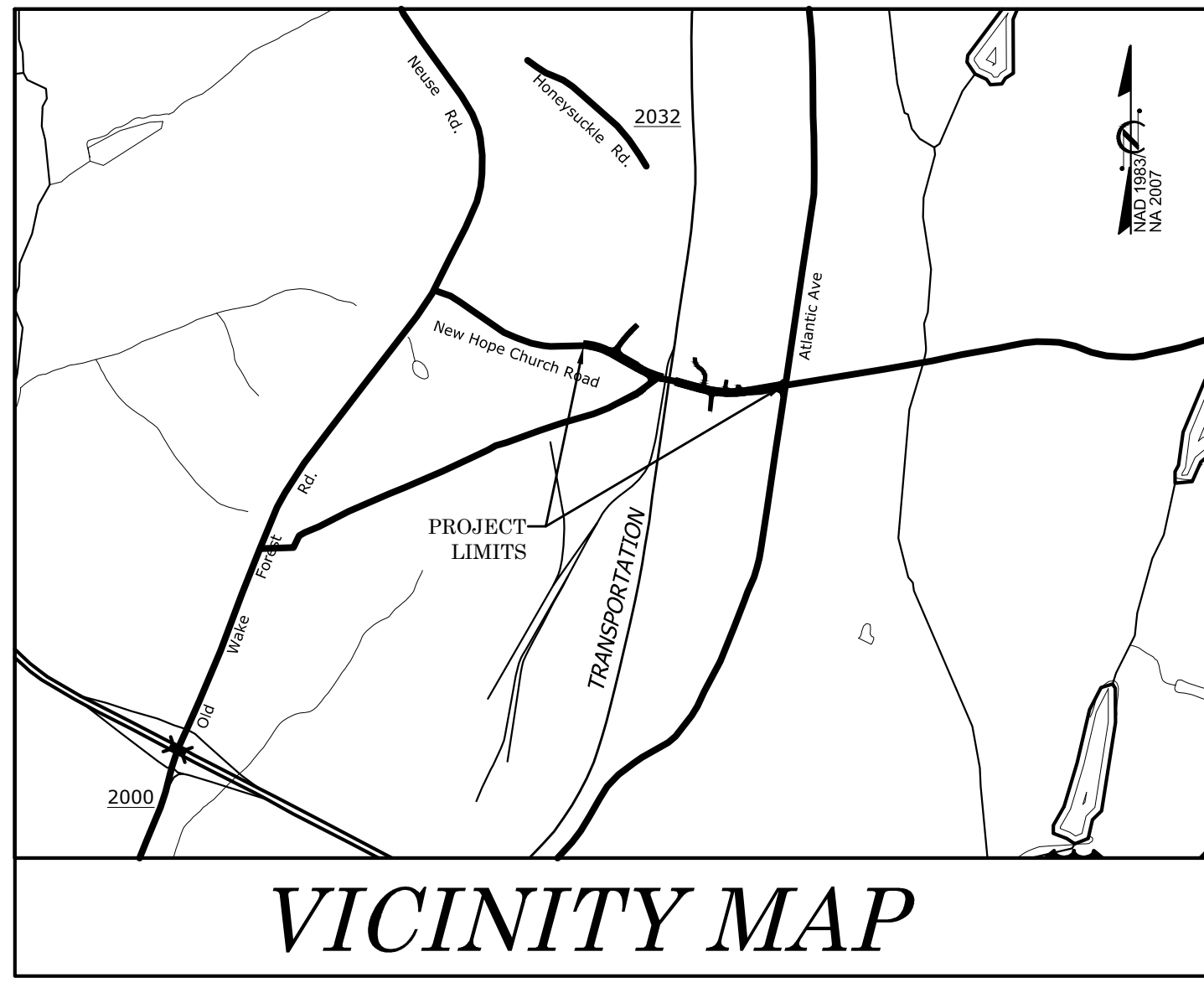
TIP PROJECT: P-5715

T.I.P. NO.	SHEET NO.
P-5715	UC-1

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS WAKE COUNTY

LOCATION: NEW HOPE CHURCH ROAD GRADE SEPARATION OVER
CSX RAIL LINE(CROSSING NO. 630607N AT MILEPOST S 152.32)
TYPE OF WORK: WATER AND SEWER UTILITY CONSTRUCTION



BEGIN TIP PROJECT P-5715
-L- POT STA. 10+66.83

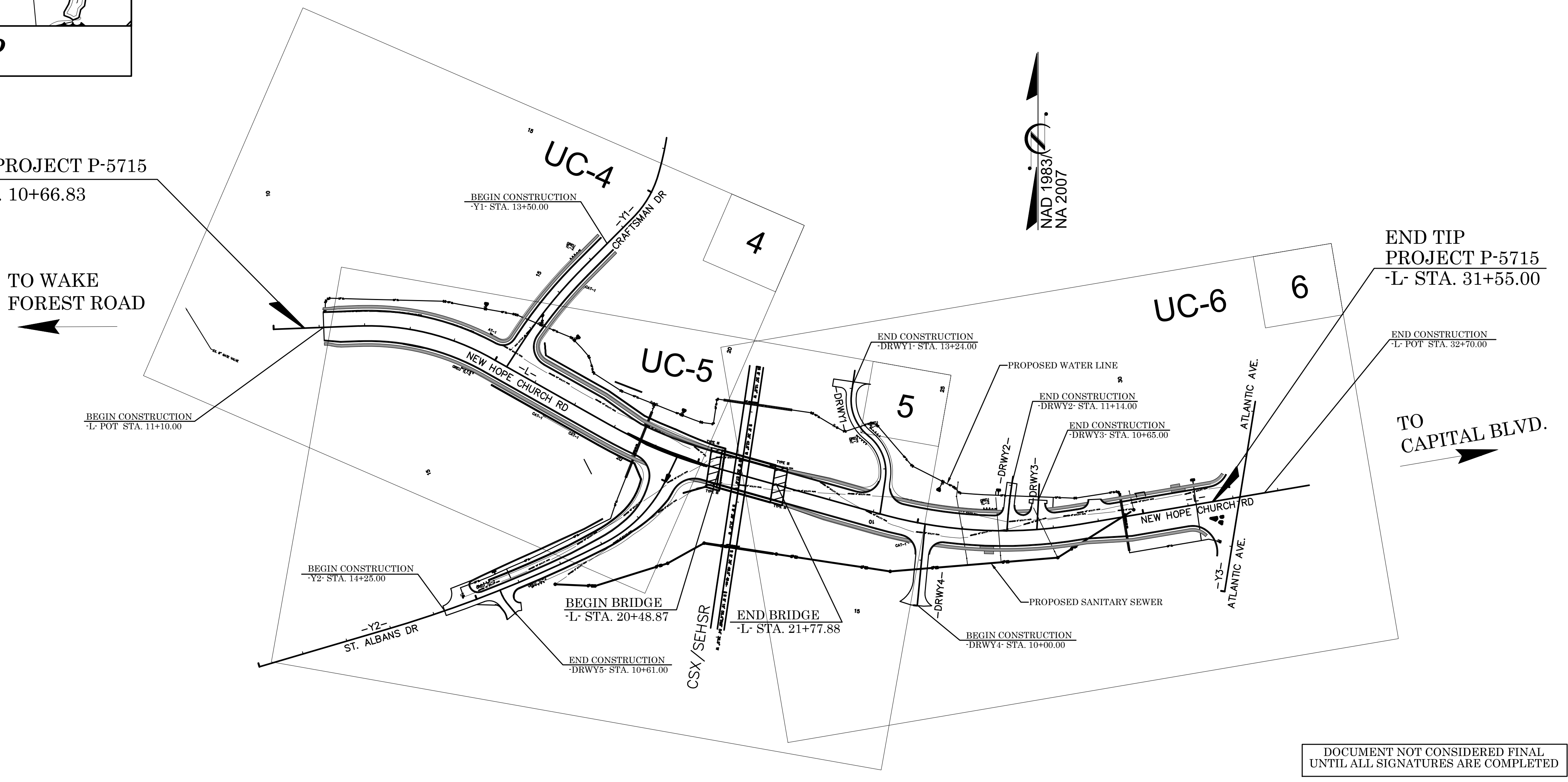
END TIP PROJECT P-5715
-L- STA. 31+55.00

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 Works Department at (919) 996-2409, and 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 reinstatement 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.

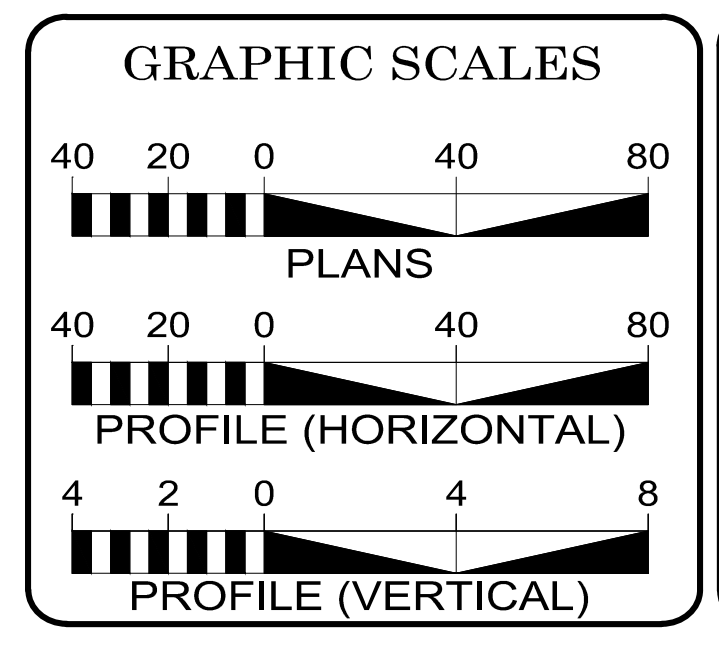
Public
Sewer Collection / Extension System
The City of Raleigh consents to the connection and extension of the City's public sewer system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.
City of Raleigh
Public Utilities Department Permit # S-4531
Authorization to Construct Alexander Justel
Date 5/15/19

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-3606
Authorization to Construct Alexander Justel
Date 5/15/19

NOTE:
1. THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF RALEIGH.



DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED



SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3E	DETAILS
UC-4 THRU UC-6	UTILITY CONSTRUCTION SHEETS
UC-7 THRU UC-9	PROFILE SHEETS

WATER AND SEWER OWNERS ON PROJECT

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

PREPARED IN THE OFFICE OF

CJS
Conveyance, PLLC

320 S. ACADEMY STREET
CARY, NC 27511
NC LICENSE #P-1611
WWW.CJSCONVEYANCE.COM

Chris L. Windley, PE	CONSULTANT CONTACT #1
Jeremy Rivenbark, PE	CONSULTANT CONTACT #2
Joey Bailey	CONSULTANT CONTACT #3

SEAL

Chris L. Windley
9/10/2024

**DIVISION OF HIGHWAYS
UTILITIES UNIT**
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6680
FAX (919) 250-4151

Ali Koucheki, PE	UTILITIES REGIONAL ENGINEER
	UTILITIES ENGINEER
Dayton Martin	UTILITIES AREA COORDINATOR
	UTILITIES COORDINATOR

SYSTEM TIME: 09/08/19 10:00:00 AM

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

NOTE
PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole		* Underground Power Line	
Telephone Pole		* Underground Telephone Cable	
Joint Use Pole		* Underground Telephone Conduit	
Utility Pole		* Underground Fiber Optics Telephone Cable	
Utility Pole with Base		* Underground TV Cable	
H-Frame Pole		* Underground Fiber Optics TV Cable	
Power Transmission Line Tower		* Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	
Power Manhole		* Underground Water Line	
Telephone Manhole		Aboveground Water Line	
Sanitary Sewer Manhole		* Underground Gravity Sanitary Sewer Line	
Hand Hole for Cable		Aboveground Gravity Sanitary Sewer Line	
Power Transformer		* Underground SS Forced Main Line	
Telephone Pedestal		Underground Unknown Utility Line	
CATV Pedestal		SUE Test Hole	
Gas Valve		Water Meter	
Gas Meter		Water Valve	
Located Miscellaneous Utility Object		Fire Hydrant	
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
End of Information	E.O.I.		

* For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

5/14/09

UTILITY CONSTRUCTION

GENERAL NOTES:

- THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.
- THE EXISTING WATER AND SEWER UTILITIES BELONG TO THE CITY OF RALEIGH.
- ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
- THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
- PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.
- THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT OR UTILITY OWNER.
- MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
- MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
- ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.
- ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS SET FORTH BY THE CITY OF RALEIGH AND THE STATE OF NORTH CAROLINA
- IN THE EVENT THAT A UTILITY ITEM IS NOT COVERED BY THESE PLANS, THEN THE STANDARDS AND SPECIFICATIONS CONTAINED IN THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT HANDBOOK COVERING SUCH ITEMS SHALL APPLY.
- ALL MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS. MANHOLE DIAMETER SHALL VARY DEPENDING ON PIPE DIAMETER AND DEPTH. ALL SEWER MANHOLES SHALL BE LINED IN ACCORDANCE WITH THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT (CORPUD) STANDARDS.
- LOCATIONS AND SIZES OF EXISTING PUBLIC AND PRIVATE UTILITIES SHOWN ON THESE PLANS ARE FROM CITY AND UTILITY COMPANY RECORDS ONLY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR FIELD LOCATING ALL UTILITIES AND FOR DAMAGES RESULTING FROM FAILURE TO DO SO.
- THE PROJECT UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE UTILITIES. ALL PUBLIC PIPE, STRUCTURES, AND FITTINGS SHALL BE INSPECTED BY THE CITY INSPECTOR PRIOR TO BEING COVERED. THE INSPECTOR MUST ALSO BE PRESENT DURING TAPPING, DISINFECTION, AND PRESSURE TESTING OF ALL MAINS.THE CONTRACTOR'S BID PRICE SHALL INCLUDE ALL INSPECTION FEES.
- TYPICAL DEPTH OF COVER FOR ALL PIPE LINES SHALL BE 3.0' UNLESS OTHERWISE SHOWN OR SPECIFIED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE CITY OF RALEIGH FOR ANY ADDITIONAL INFORMATION ON EXISTING WATER AND SEWER UTILITIES.
- LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXACT LOCATION, ORIENTATION, AND ELEVATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION OR ORDERING MATERIALS.
- CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS.
- UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL WATER PIPELINE TRENCH BEDDING SHALL BE IN ACCORDANCE WITH DETAIL W-3.A-1. ALL SEWER PIPELINE TRENCH BEDDING SHALL BE IN ACCORDANCE WITH DETAIL S-4 AND S-5 DEPENDENT ON MATERIAL.
- UNLESS OTHERWISE INDICATED, ALL GRADE ELEVATIONS SHOWN ARE ALONG THE PIPELINE ALIGNMENT ON PROFILES.
- THE CONTRACTOR SHALL PLACE SAND OR SCREENINGS ON ALL ASPHALT SURFACES THAT ARE AFFECTED BY THE INSTALLATION OF THE PIPELINES.
- THE CONTRACTOR SHALL REINSTALL ALL SIGNS AS REQUIRED BY THE NCDOT ALONG STATE ROADWAYS AND CITY STREETS AS REQUIRED BY THE CITY OF RALEIGH.
- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL SHEETING REQUIRED FOR THE INSTALLATION OF THE PIPELINES. ALL EXCAVATIONS SHALL BE KEPT WITHIN THE DESIGNATED EASEMENTS OR RIGHT-OF-WAY WIDTHS. EXCAVATION WITHIN PAVED AREAS SHALL BE KEPT TO A MINIMUM. SHEETING SHALL BE INSTALLED AS NEEDED TO PROTECT EXISTING UTILITIES.
- ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH PLANS AND BE PERFORMED BY A LICENSED NC UTILITY CONTRACTOR.
- WATERLINE ALIGNMENT SHOWN IS BASED ON STANDARD FITTINGS AVAILABLE FOR DUCTILE IRON PIPE. JOINT DEFLECTIONS SHALL NOT EXCEED 75 PERCENT OF MANUFACTURER'S RECOMMENDED DEFLECTION. "SHORT JOINTS" OF PIPE MAY BE USED FOR MORE FREQUENT DEFLECTION.
- CONTRACTOR SHALL PROVIDE A MEANS TO KEEP ALL NEW PIPING COMPLETELY ISOLATED FROM EXISTING PIPING UNTIL ALL NEW PIPING HAS BEEN TESTED, DISINFECTED,AND ACCEPTED FOR SERVICE.
- ALL UTILITIES SHALL BE CONSTRUCTED ACCORDING TO MINIMUM SEPARATION REQUIREMENTS.
- CONTRACTOR SHALL USE ALL NECESSARY FITTINGS TO CONNECT TO EXISTING WATERLINES.
- CONTRACTOR SHALL COORDINATE WATER AND SEWER INSTALLATIONS WITH EXISTING AND PROPOSED TELEPHONE, CABLE TV, GAS, FIBER OPTIC, POWER CABLE ROUTES, ETC. ALL COSTS ASSOCIATED WITH LOCATING AND REPAIRING DAMAGED BURIED CABLES ALONG

THE PROJECT ROUTE SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

- TESTING PROCEDURES AND REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT HANDBOOK.
- CONTRACTOR SHALL ABANDON UTILITIES AS REQUIRED IN THE NCDOT STANDARD SPECIFICATIONS OR APPROVED CSX TRANSPORTATION ENCROACHMENT AGREEMENT, AS APPLICABLE. WHERE GROUT IS UTILIZED THE CONTRACTOR SHALL DETERMINE APPROXIMATE AMOUNT REQUIRED FOR ABANDONMENT AND TRACK VERSUS VOLUME PUMPED TO AVOID POTENTIAL DAMAGE CAUSED BY GROUT LEAKAGE THROUGH UNKNOWN SERVICES OR OTHER CONNECTIONS TO PIPE.
- CONTRACTOR SHALL KEEP EXISTING WATERLINES ACTIVE AND IN SERVICE UNTIL CONNECTIONS ARE READY TO BE MADE. DOWNTIME OF EXISTING WATERLINE SHALL BE MINIMIZED. CONSTRUCTION PHASING SHALL BE COORDINATED TO ALLOW FOR THE NEW WATERLINE TO BE INSTALLED AND TESTED PRIOR TO CONNECTIONS TO EXISTING WATERLINES BEING MADE.
- ALL WATER VALVES SHALL BE DIRECT BURY MJ GATE VALVES. VALVES WITHIN RESTRAINED JOINT SECTIONS SHALL UTILIZE MEGA-LUGS FOR RESTRAINT.
- WHERE A THEORETICAL 1:1 SLOPE FALLS WITHIN ANY TRAVEL LANE,THE CONTRACTOR SHALL PROVIDE ACTIVE TRENCH SHORING DURING CONSTRUCTION.
- ALL GRAVITY SEWER PIPE SHALL BE PROTECTO 401 LINED PC 350 DIP. ALL WATER PIPE SHALL BE PER CORPUD STANDARDS.
- WHERE CLEARANCES BETWEEN PROPOSED PIPES IS LESS THAN 18",REFER TO DETAILS W-41 AND S-49 FOR SUPPORT DETAIL.
- A BYPASS PLAN SEALED BY A NC PROFESSIONAL ENGINEER MUST BE SUBMITTED TO PUBLIC UTILITIES PRIOR TO PUMPING OPERATIONS TO COORDINATE WITH ADMINISTRATION ENGINEERING STAFF. PUMPS SHOULD BE SIZED TO HANDLE THE PEAK DAILY FLOW (2.5 TIMES THE AVERAGE DAILY FLOW) FOR THE LINE OR AREA OF WORK. THE CONTRACTOR SHALL SECURE PUMPS FROM A PUMP SUPPLIER ACCORDING TO THE PROVIDED FLOW INFORMATION. PUMPING OPERATIONS MUST BE MONITORED 24 HOURS A DAY FOR EACH DAY OF THE PUMPING OPERATION BY QUALIFIED PERSONNEL IN ORDER TO RESPOND TO PROBLEMS OR FAILURES.1007. REDUNDANCY IS REQUIRED FOR PUMPING OPERATIONS. IN ADDITION, BACK UP PUMPS ARE TO BE CONNECTED TO THE BYPASS FORCE MAIN TO FACILITATE IMMEDIATE USE UPON FAILURE OF THE PRIMARY PUMPS.
- THE UNIT COST FOR RECONNECTING, RELOCATING, AND/OR ADJUSTING EXISTING WATER AND SEWER SERVICES/METERS SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND OTHER SERVICES REQUIRED FOR A FINAL AND FULLY OPERATIONAL INSTALLATION. ASPHALT PLACEMENT WILL BE PAID PER NCDOT SECTION 610 PAY ITEMS. ALL OTHER RESTORATION, INCLUDING CURB, SIDEWALK, CONCRETE, DRIVEWAYS, BRICK, TRAFFIC ISLANDS, ETC. SHALL BE CONSIDERED INCIDENTAL TO EACH INSTALLATION.
- PLASTIC MARKERS PER DETAIL W-13 AND CORPUD STANDARD SPECIFICATIONS SHALL BE INSTALLED AT ALL HORIZONTAL BENDS AND EVERY 300 FEET. SUCH WORK SHALL BE CONSIDERED INCIDENTAL TO THE PIPELINE INSTALLATION.
- ALL GATE VALVES SHALL BE DIRECT BURY GATE VALVES WITH A VALVE BOX. VALVES SHALL BE RESTRAINED TO PROPOSED WATERLINE USING A "MEGA-LUG" OR APPROVED EQUAL RESTRAINT.

STANDARD UTILITY NOTES:

- ALL MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS AND SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK,CURRENT EDITION)
- UTILITY SEPARATION REQUIREMENTS:
 - A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND 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 AND INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
 - WHEN INSTALLING WATER AND/OR SEWER MAINS,THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'.IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS,THE WATER MAIN CAN BE INSTALLED IN A SEPARATE TRENCH WITH THE BOTTOM ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER MAIN AS AN ALLOWABLE VARIATION. THIS VARIATION MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
 - WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS EXTENDED 10" ON EACH SIDE OF CROSSING MUST BE SPECIFIED FOR BOTH WATER AND SEWER AND INSTALLED TO WATERLINE SPECIFICATIONS.
 - 10.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER AND STORM SEWER FACILITIES INSTALLED LONGITUDINAL TO THE OTHER, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
 - MAINTAIN 18" MIN.VERTICAL SEPARATION AT ALL WATERMAIN AND STORM DRAIN CROSSINGS. MAINTAIN 24" MIN.VERTICAL SEPARATION AT ALL SANITARY SEWER AND STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS AND A CONCRETE CRADLE HAVING 6" MIN.CLEARANCE (PER CORPUD DETAILS W-41 AND S-49).
 - ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER AND SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
- ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW AND APPROVAL OF AN AMENDED PLAN AND/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER AND SEWER SERVICE TO EXISTING RESIDENCES AND BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
- 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER AND 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 AND REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
- INSTALL WATER SERVICES WITH METERS LOCATED AT RIGHT-OF-WAY (ROW) OR PUE UNLESS INDICATED OTHERWISE ON THE PLANS.
- INSTALL 4" PVC SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE AND SPACED EVERY 75 LINEAR FEET MAXIMUM.
- 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.
- ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWO,USACE AND/OR FEMA FOR ANY RIPARIAN BUFFER,WETLAND AND/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
- NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK

(INCLUDING MAIN EXTENSIONS AND SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.

- 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 (ASSET 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@RAEIGHNC.GOV FOR MORE INFORMATION.
- PROPOSED WATER LINE SHALL BE D.I.R.J. (DUCTILE IRON RESTRAINED JOINT) PIPE AS INDICATED ON THE PLAN AND PROFILES ON SHEET NO.'S UC-4, UC-5, UC-6, UC-7, UC-8.
- PETROLEUM RESISTANT GASKETS SHALL BE USED ON WATER MAIN FROM 16" LINE STATION 22+00 TO 16" LINE STATION 24+50 DUE TO PETROLEUM CONTAMINATED SOILS. PETROLEUM RESISTANT GASKETS AND BOOTS SHALL BE USED ON 8" SEWER MAIN PIPING AND AT MANHOLE CONNECTIONS FROM SSMH-8 TO THE DOWNSTREAM INVERT OF SSMH-5 DUE TO PETROLEUM CONTAMINATED SOILS. IF ANY ADDITIONAL CONTAMINATED SOILS ARE ENCOUNTERED, EXTEND USE OF PETROLEUM RESISTANT PRODUCTS 40' BEYOND THE LIMITS OF THE CONTAMINATION.
- CONTRACTOR SHALL MAKE POINT REPAIR ON EXISTING 8" SANITARY SEWER WHERE EXISTING SAG IN LINE SHALL BE ELIMINATED. THE EXISTING PIPE AT THE POINT OF THE SAG AND ONE JOINT OF PIPE ON EITHER SIDE SHALL BE RAISED TO PROVIDE A CONSISTENT AND POSITIVE SLOPE. THE ELEVATED SECTION OF PIPE SHALL BE SUPPORTED BY A FLOWABLE FILL CRADLE POURED IN PLACE. HIGH EARLY STRENGTH CONCRETE PER NCDOT STANDARDS (1000-5) SHALL BE UTILIZED FOR THE CRADLE. THE CONCRETE CRADLE SHALL BE 10' IN LENGTH ALONG THE PIPE CENTERED ON THE SAG AREA. THE CONCRETE CRADLE SHALL EXTEND 6" ON EACH SIDE OF THE PIPE O.D. AND TO A DEPTH 6" BELOW THE PIPE. SIX INCHES (6") OF #57 STONE BASE SHALL BE PLACED BENEATH THE CRADLE IN THE BOTTOM OF THE TRENCH BEFORE POURING THE CRADLE. THE STONE SHALL EXTEND 6" BEYOND THE CONCRETE CRADLE ON EACH SIDE. THE ENTIRE EXCAVATION SHALL BE BACKFILLED WITH STONE TO A DEPTH OF 6" ABOVE THE PIPE CROWN (OUTSIDE CRADLE EXTENTS) TO ENSURE THERE IS NO ISSUE WITH PROPER PIPE BEDDING ON EITHER SIDE OF THE CRADLE. A CITY OF RALEIGH INSPECTOR MUST BE PRESENT AT THE TIME OF THE REPAIR WORK AND BE ALLOWED TO INSPECT THE REPAIR PRIOR TO BACKFILLING AND COVER OF THE REPAIR WORK.

LIST OF STANDARD DRAWINGS (SEE SHEETS UC-3A THRU UC-3E)

- W-2 STANDARD ASPHALT PAVEMENT REPLACEMENT
- W-3 TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON
- W-4 STANDARD FIRE HYDRANT INSTALLATION DETAIL
- W-5 STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE
- W-7 THRUST BLOCKING DESIGN DATA FOR WATER MAINS
- W-8 STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS
- W-9 STANDARD THRUST BLOCKING VIEWS
- W-10 THRUST BLOCKING DESIGN QUANTITY TABLE
- W-12 STANDARD VERTICAL BEND
- W-13 STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER IN EASEMENTS
- W-14 4"-24" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
- W-15 VALVE RESTRAINT AT TEES AND CROSSES FOR LINES (4"-24")
- W-17 VALVE BOX INSTALLATION AND EXTENSION DETAIL
- W-18 5 1/4" VALVE BOX DROP LID WITH 4" SKIRT
- W-19 STANDARD WATER AIR RELEASE VALVE
- W-20 STANDARD MANHOLE COVER
- W-23 STANDARD 3/4" AND 1" WATER SERVICE INSTALLATION
- W-24 ONE OR TWO FAMILY DWELLINGS BACKFLOW PREVENTION/ METER ASSEMBLY INSTALLATION
- W-25 WATER METER BOX DETAIL
- W-31 TYPICAL 1 1/2"-2" WATER MAIN BOX INSTALLATION
- W-34 FIRE, DOMESTIC & IRRIGATION OPTIONS SCHEMATIC
- W-35 IRRIGATION TAP ON NEW AND EXISTING SERVICES
- W-36 TYPICAL REDUCED PRESSURE ZONE BACKFLOW PREVENTER ASEMBLY
- W-37 TYPICAL FIRE MAIN DOUBLE DETECTOR CHECK VALVE ASSEMBLY
- W-40 PIPE ALIGNMENT GUIDE
- W-41 CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS
- S-3 STANDARD ASPHALT PAVEMENT PATCH DETAIL
- S-4 TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON
- S-5 TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN
- S-20 STANDARD PRECAST SANITARY SEWER MANHOLE
- S-20A GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER
- S-21 EXTENDED BASE OR CAST-IN-PLACE REINFORCED CONCRETE BASE
- S-25 STANDARD MANHOLE COVER
- S-27 WATER-TIGHT MANHOLE FRAME WITH CAM LOCK COVER
- S-28 STANDARD SLIP RESISTANT MANHOLE STEP DETAIL
- S-29 STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES
- S-30 TYPICAL SANITARY SEWER LATERAL CONNECTION
- S-30A TYPICAL SANITARY SEWER LATERAL TRACER WIRE
- S-32 LATERAL SADDLE INSTALLATION DETAIL FOR VCP AND DUCTILE IRON PIPE
- S-34 4" CLEANOUT PLUG
- S-39 PIPE ALIGNMENT GUIDE

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3A
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

NOTES:

- THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAW CUT MACHINE.
- THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
- THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
- THE ENTIRE THICKNESS VERTICAL EDGE OF CUT SHALL BE TACKED.
- THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
- THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
- REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING, W-3, FOR ADDITIONAL DETAILS.
- NO HAND PATCHING ALLOWED.
- PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD ASPHALT PAVEMENT PATCH DETAIL			
DWG. NO.	REVISIONS	DATE	DATE
W-2	RR1	3-31-00	4-18-04
	D.W.C.	11-1-99	J.F.S. 10-29-10

NOTES:

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

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON			
DWG. NO.	REVISIONS	DATE	DATE
W-3	D.W.C.	3-3-99	2-15-05
	RR1	3-31-00	J.F.S. 10-29-10

NOTES:

- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARGING, KENNEDY, MRH, WATERCROSS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
- BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96.
- 6" GATE VALVE SHALL BE AWWA C500-96 OPEN LEFT.
- STEEL RODS AND BOLTS SHALL BE 3/8" HOT DIP GALVANIZED.
- FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
- RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
- FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW.

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD FIRE HYDRANT INSTALLATION DETAIL			
DWG. NO.	REVISIONS	DATE	DATE
W-4	ABB	4-6-04	2/7/09
	DHL	2/14/06	

NOTES:

- ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
- ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE			
DWG.	REVISIONS	DATE	DATE
W-5	MAB	5-30-18	
	KAT	9-15-17	

NOTES:

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

I.D. PIPE	REBAR SIZE	"A" BAR LENGTH	"B" BAR WEIGHT	"C" BAR LENGTH	"D" BAR WEIGHT	NO. REQUIRED
12" - 24"	#5	2'-0" MIN. LESS 1" DIA. LEFT	1.34 LB/FT	11'-0"	1.1 LB/FT	X-24, Y-12
48" & greater	#6	2'-0" O.D. PIPE 1.502 LEFT	1.53 LB/FT	11'-0"	1.3 LB/FT	X-24, Y-12

I.D. PIPE	"A"	"B"	"C"	"D"
12" - 18"	1'-0"	1'-0"	2'	3/8"
20" - 24"	1'-4"	1'-7"	3'	1/2"
30" - 36"	1'-4"	1'-7"	4'	5/8"
48" & greater	1'-0"	1'-0"	6'	7/8"

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
THRUST BLOCKING DESIGN DATA FOR WATER MAINS			
DWG. NO.	REVISIONS	DATE	DATE
W-7	RR1	2-1-00	J.F.S. 11-1-10
	D.H.L.	6-18-06	

NOTES:

- CONCRETE SHALL BE 3000 PSI.
- CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF PIPE.
- TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
- W-3 STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
- ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS			
DWG. NO.	REVISIONS	DATE	DATE
W-8	Y.C.A.	4-12-90	9-7-99
	D.W.C.	6-92	RR1 3-31-00

NOTES:

- CONCRETE SHALL BE 3000 PSI.
- CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF PIPE.
- TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
- W-3 STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
- ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD THRUST BLOCKING VIEWS			
DWG. NO.	REVISIONS	DATE	DATE
W-9	D.W.C.	3-1-87	3-31-00
	RR1	9-7-99	D.H.L. 6-18-06

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	INTERSECTING PIPE CLAY 1800 TO 1850 P.S.I.	SOFT CLAY 1800 TO 2000 P.S.I.	LEAD (BENTZ GRAVEL) CONCRETE	WOOD (BENTZ GRAVEL) W/REBAR	BRAND CONCRETE FIRM 2800 LB/FT ³	BRAND CLEAN PLY WOOD 2800 LB/FT ³	SOIL LOAD (BENTZ GRAVEL) OVERSAND 1400 P.S.I.	ROCK, POOR TO GOOD 1850 P.S.I.
6"	1,108	1	1	1	1	1	1	2	1
22 1/2"	2,207	1	2	2	1	1	1	3	1
45°	4,326	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"	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	6	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"	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"	7,681	2	4	5	1	1	2	6	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

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	DATE
W-10	D.W.C.	6-23-99	

NOTES:

- STEEL RODS AND BOLTS SHALL BE 3/8" HOT DIP GALVANIZED.
- CONCRETE SHALL BE 3000 PSI AND TRAMM MIXED.
- RESTRAINING MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
- MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
- 3" WINDMILL COVER MUST BE MAINTAINED ON ALL WATER MAINS.

SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,326	2
8"	7,694	4
12"	17,312	4
16"	30,779	6
24"	69,252	6

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD VERTICAL BEND			
DWG. NO.	REVISIONS	DATE	DATE
W-12	ABB	4-6-04	J.F.S. 11-1-10
	D.H.L.	6-18-06	

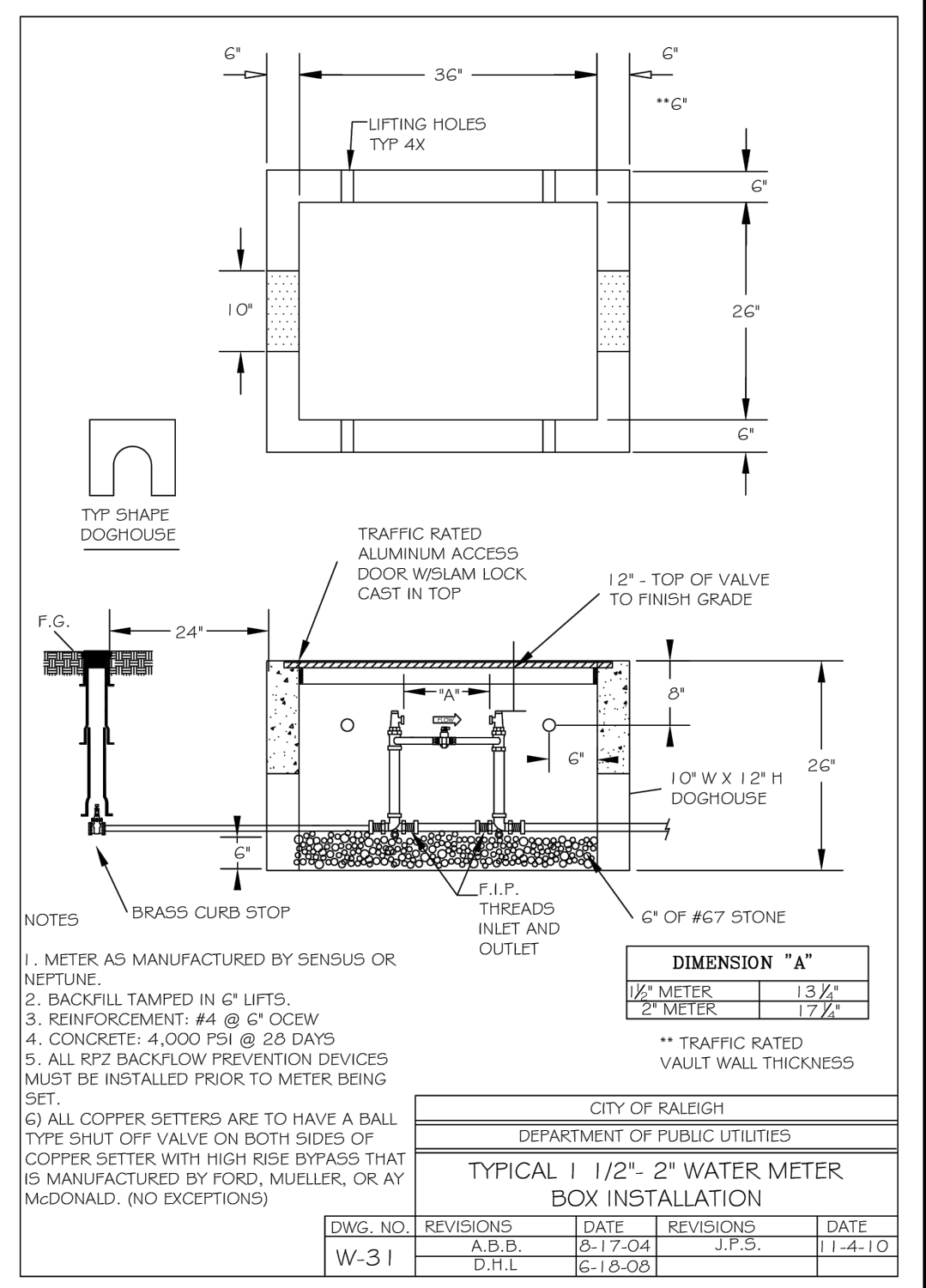
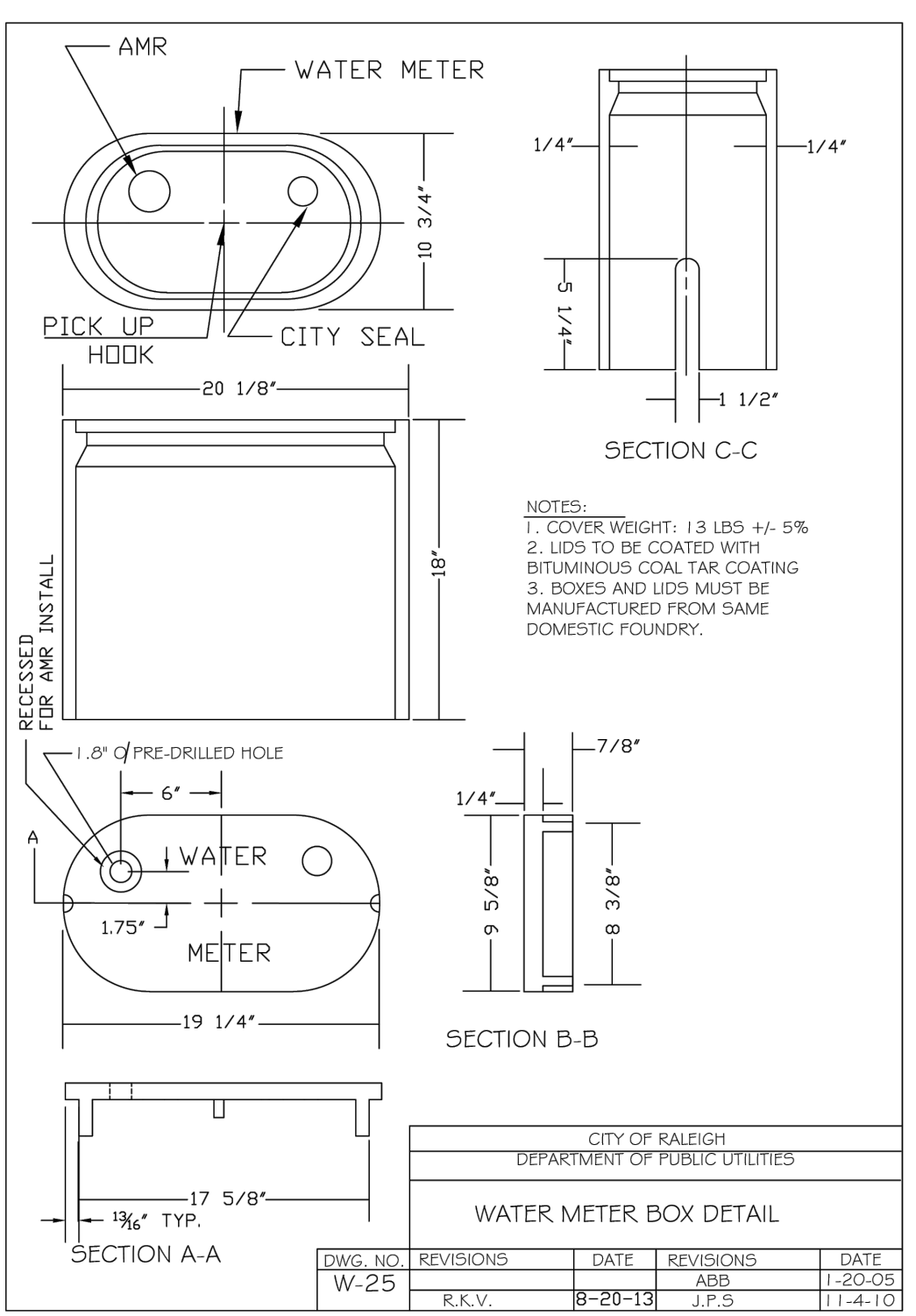
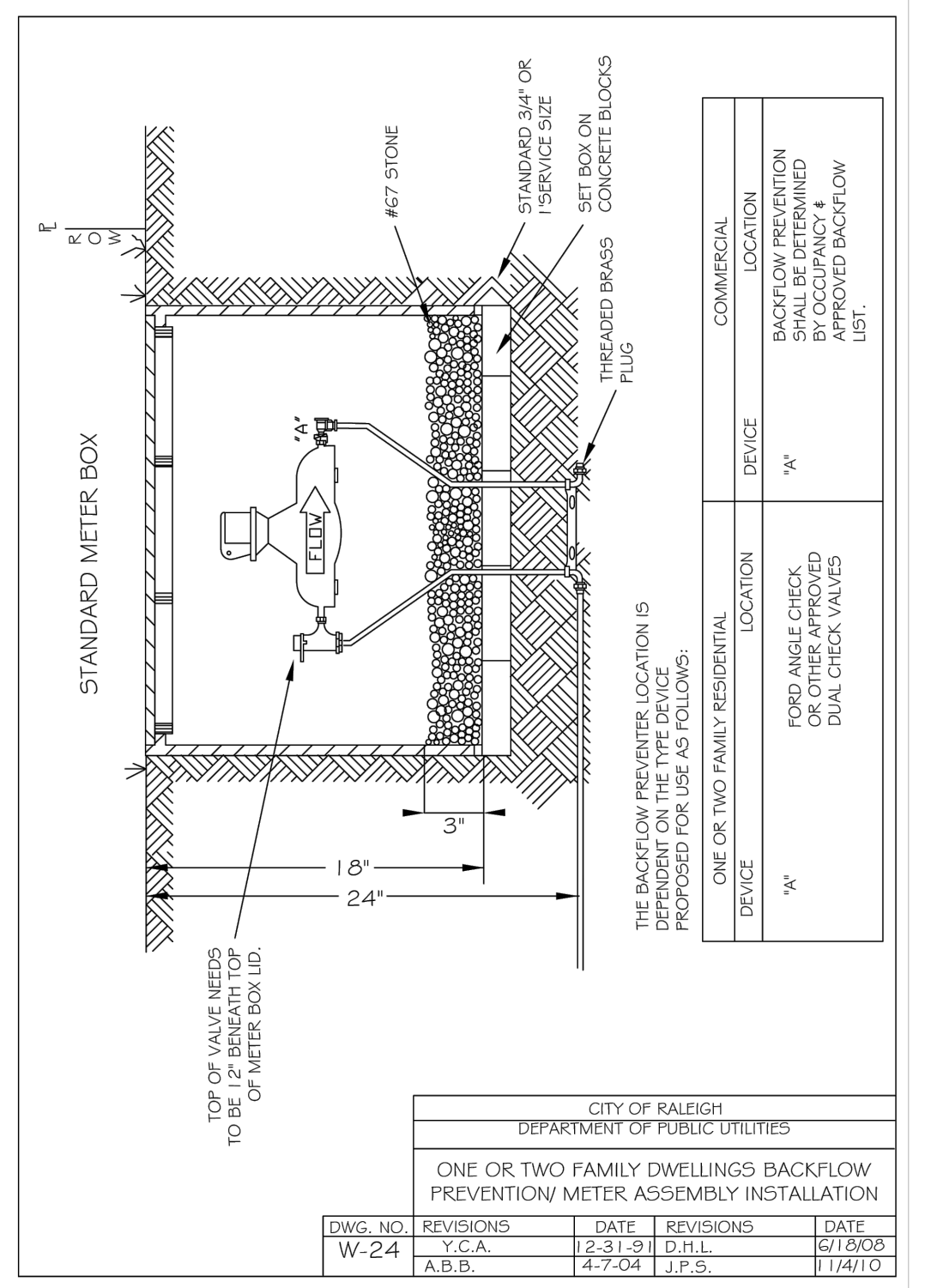
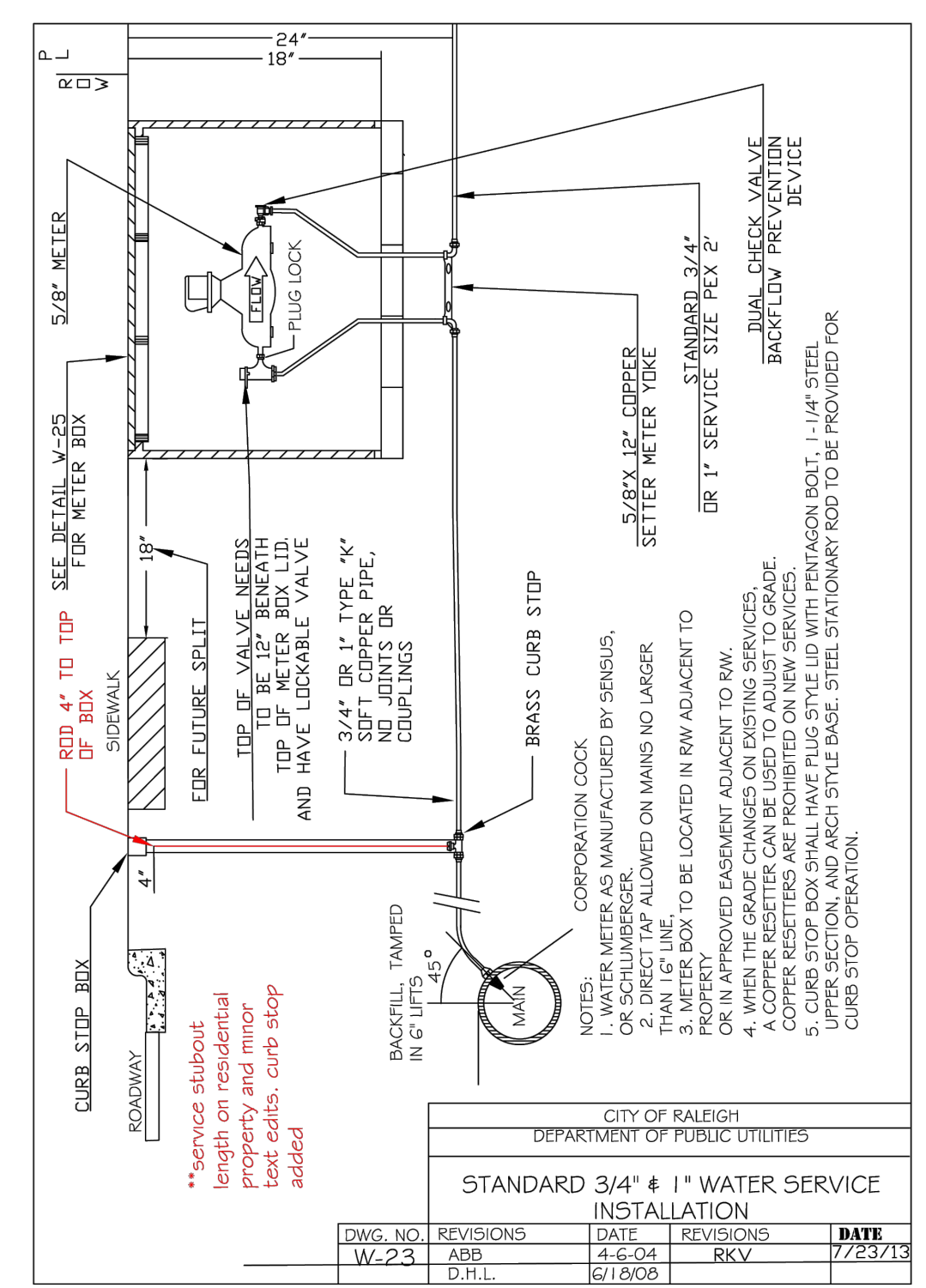
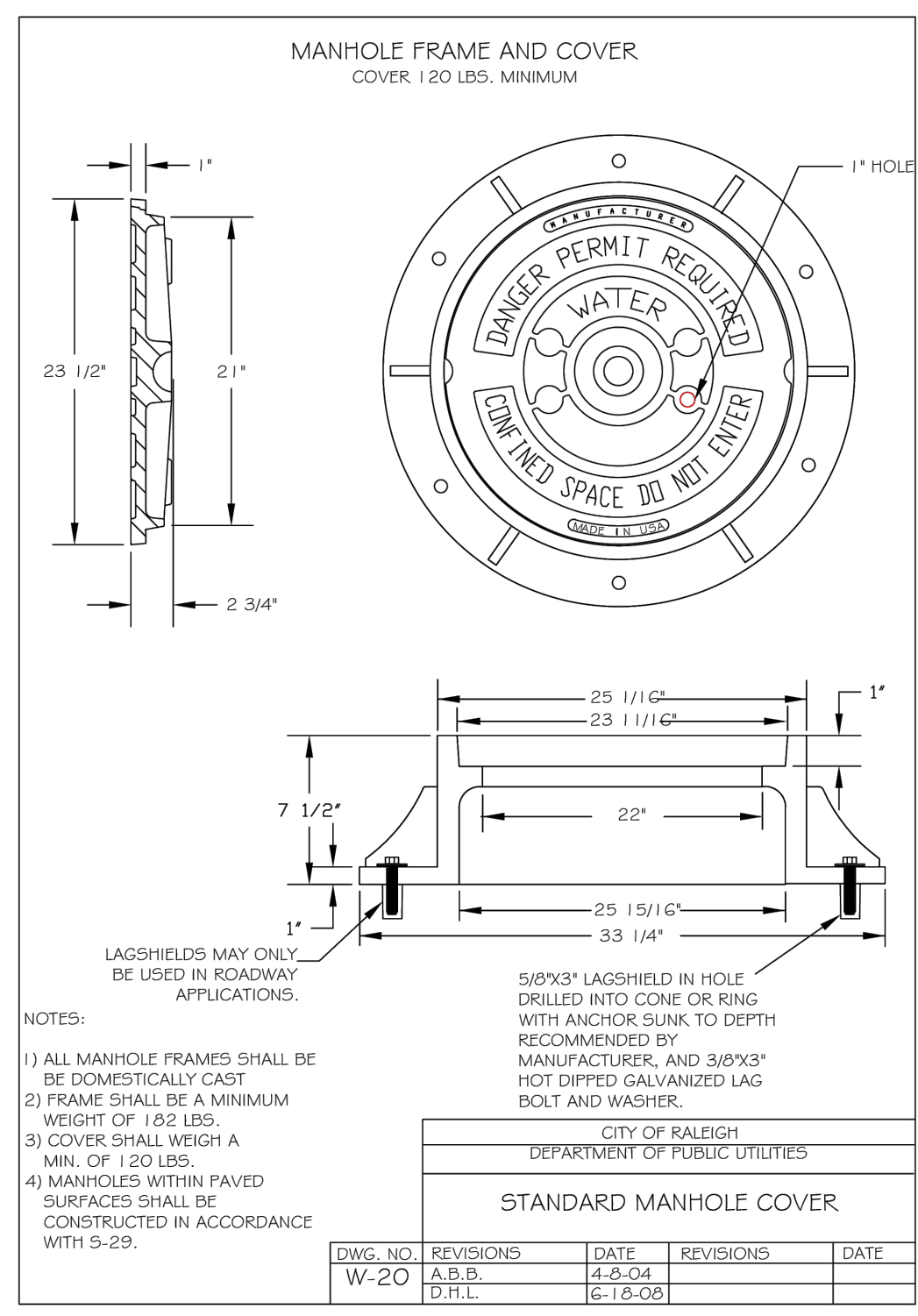
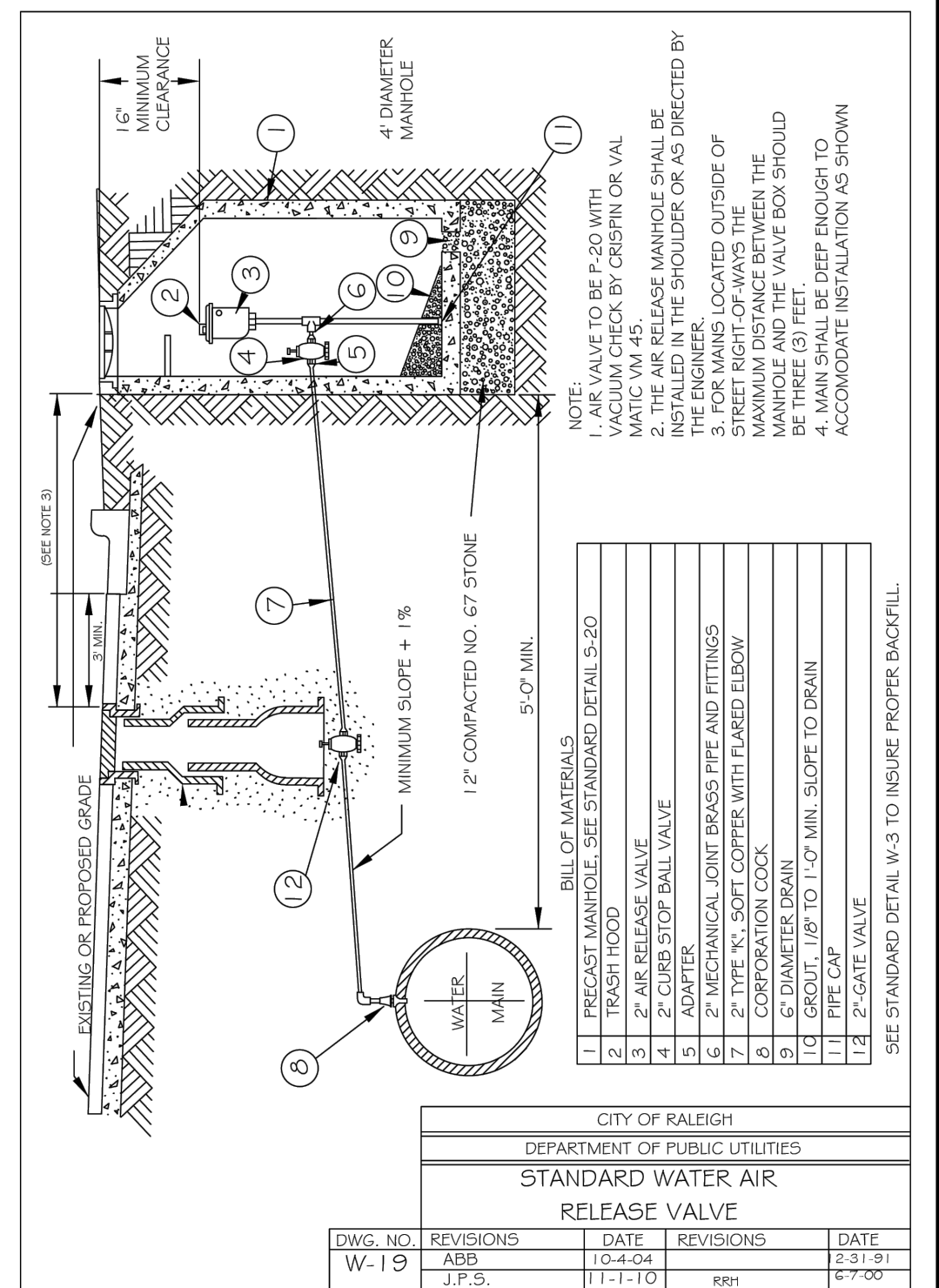
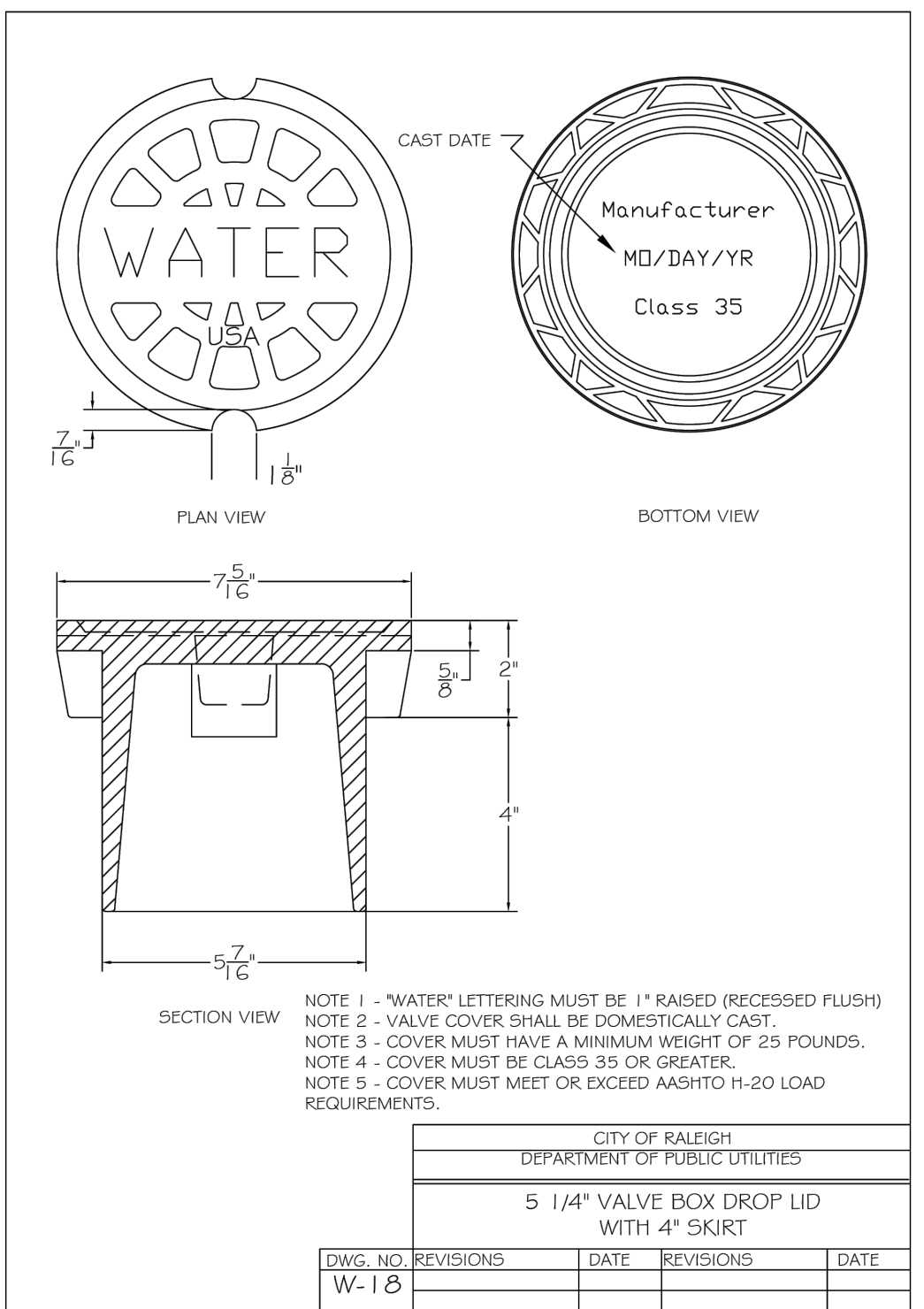
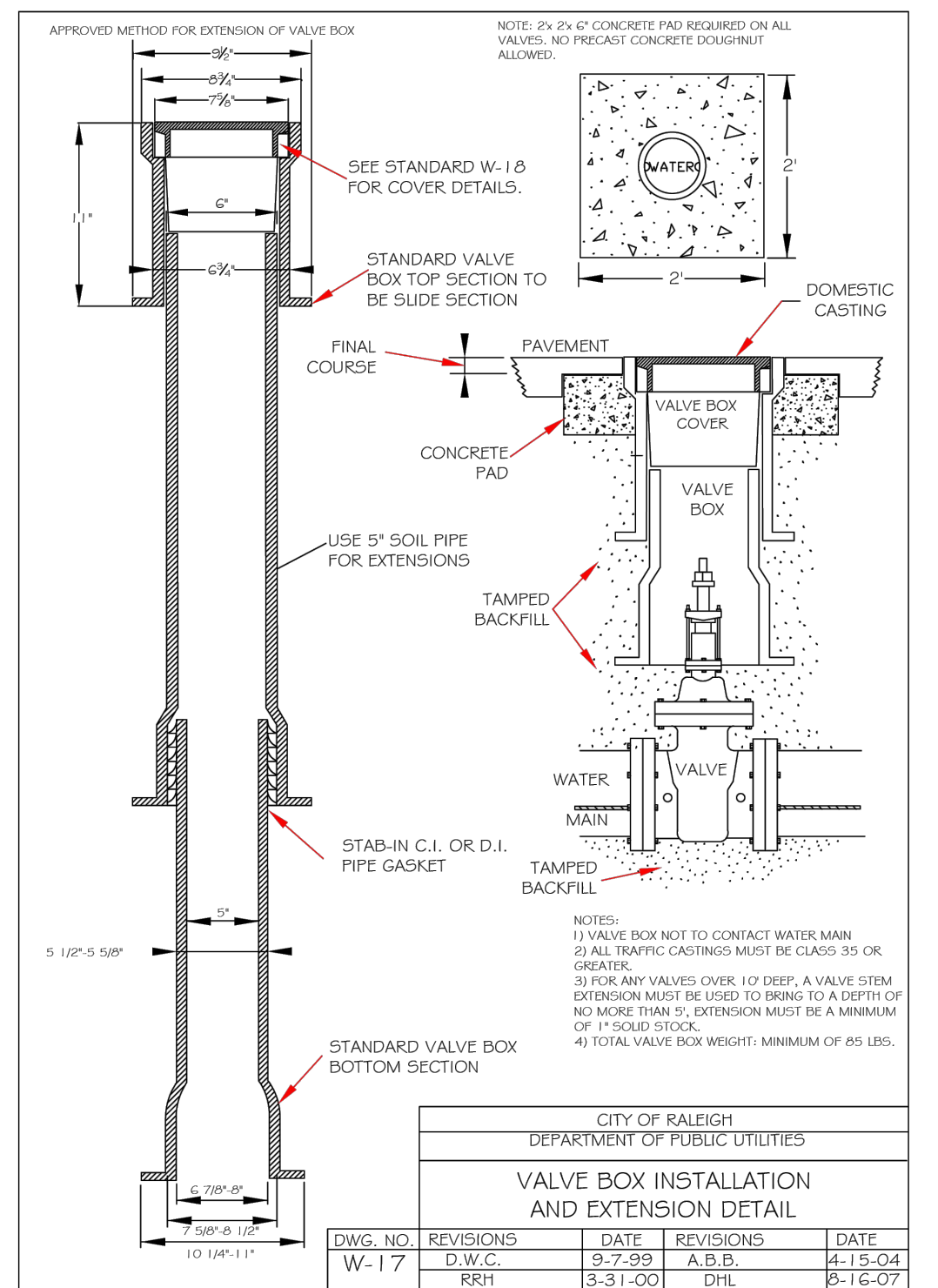
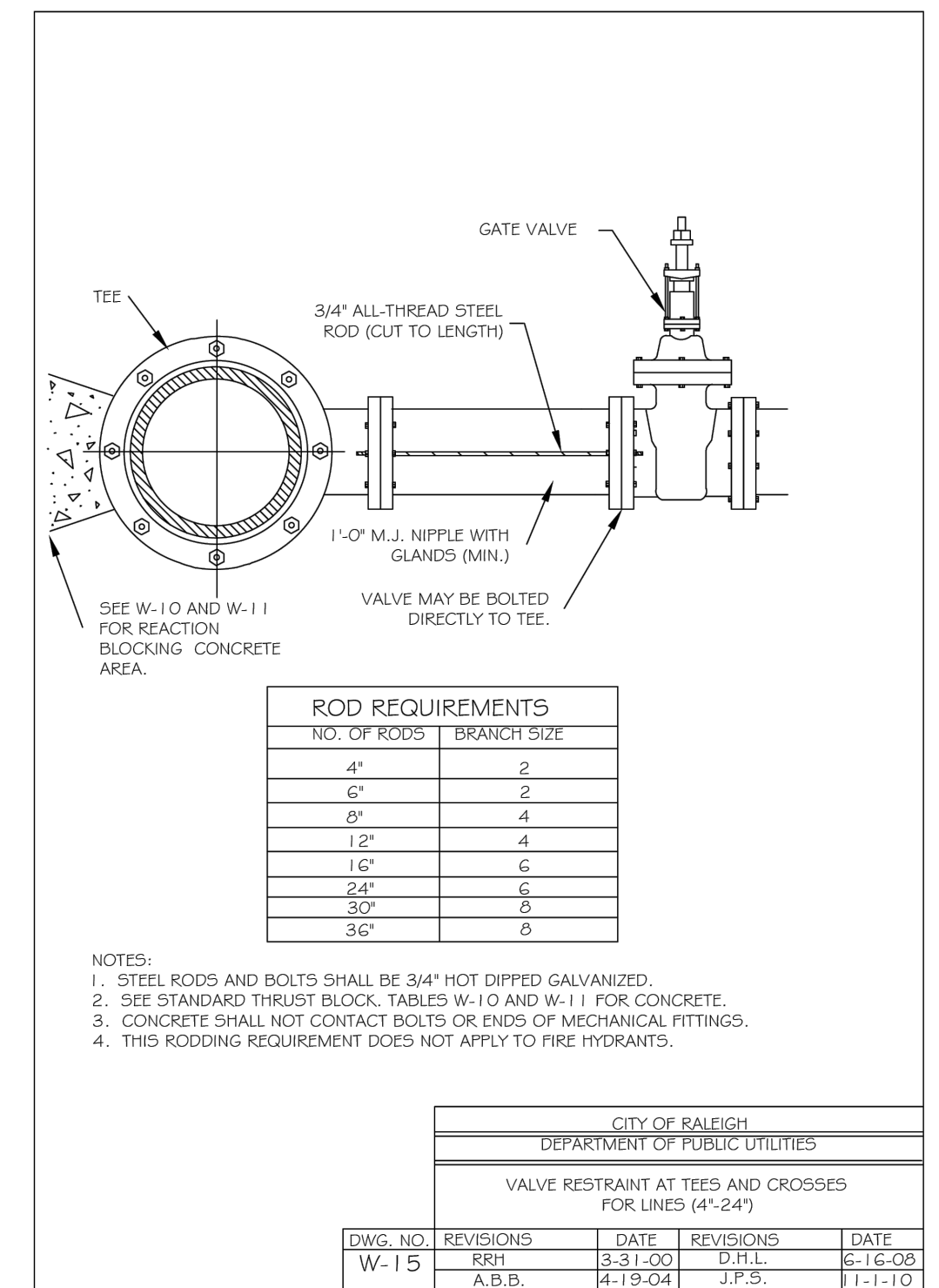
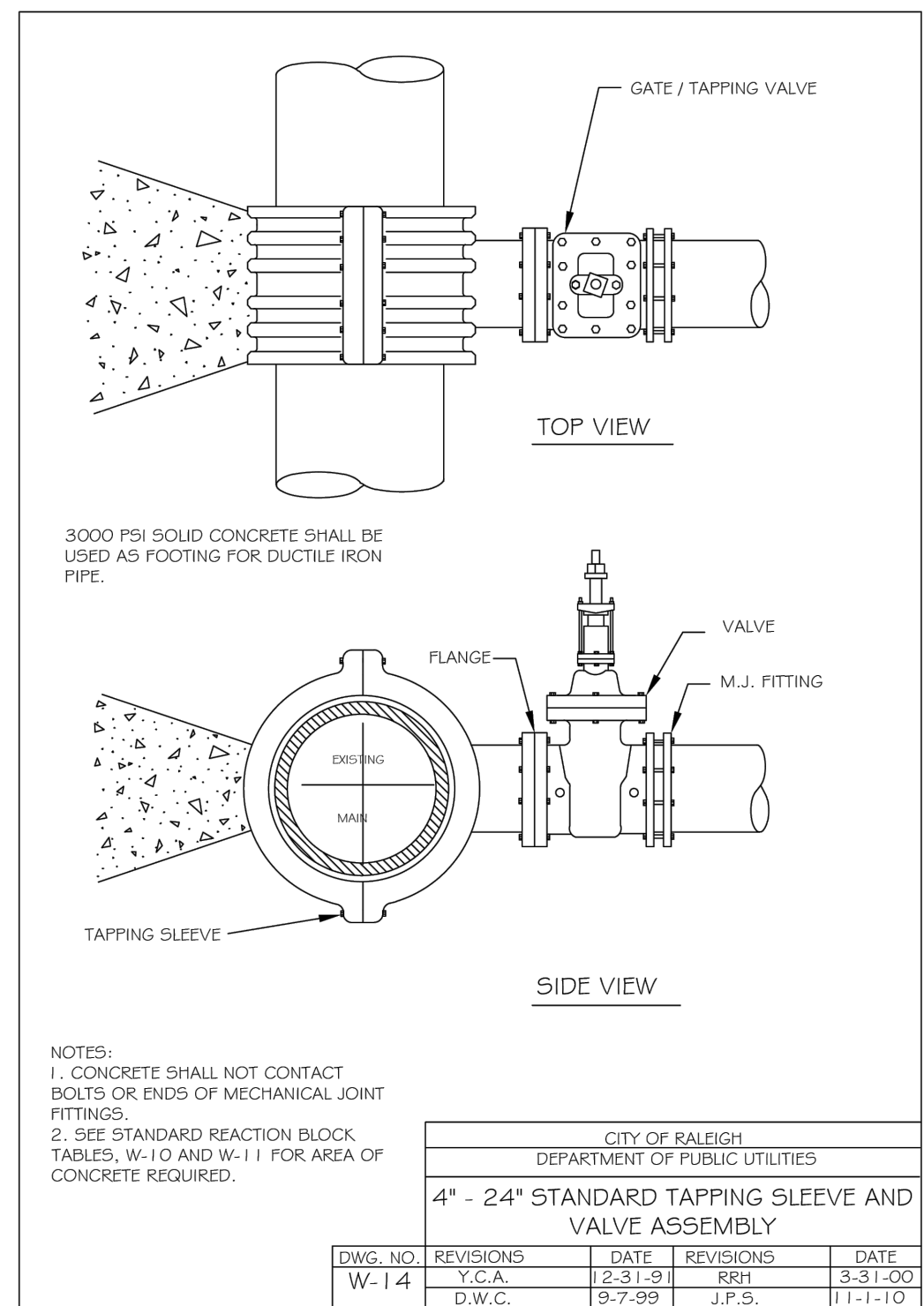
NOTES:

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

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER, IN EASEMENTS			
DWG. NO.	REVISIONS	DATE	DATE
W-13	D.W.C.	9-7-99	8-16-07
	RR1	3-31-00	J.F.S. 11-1-10

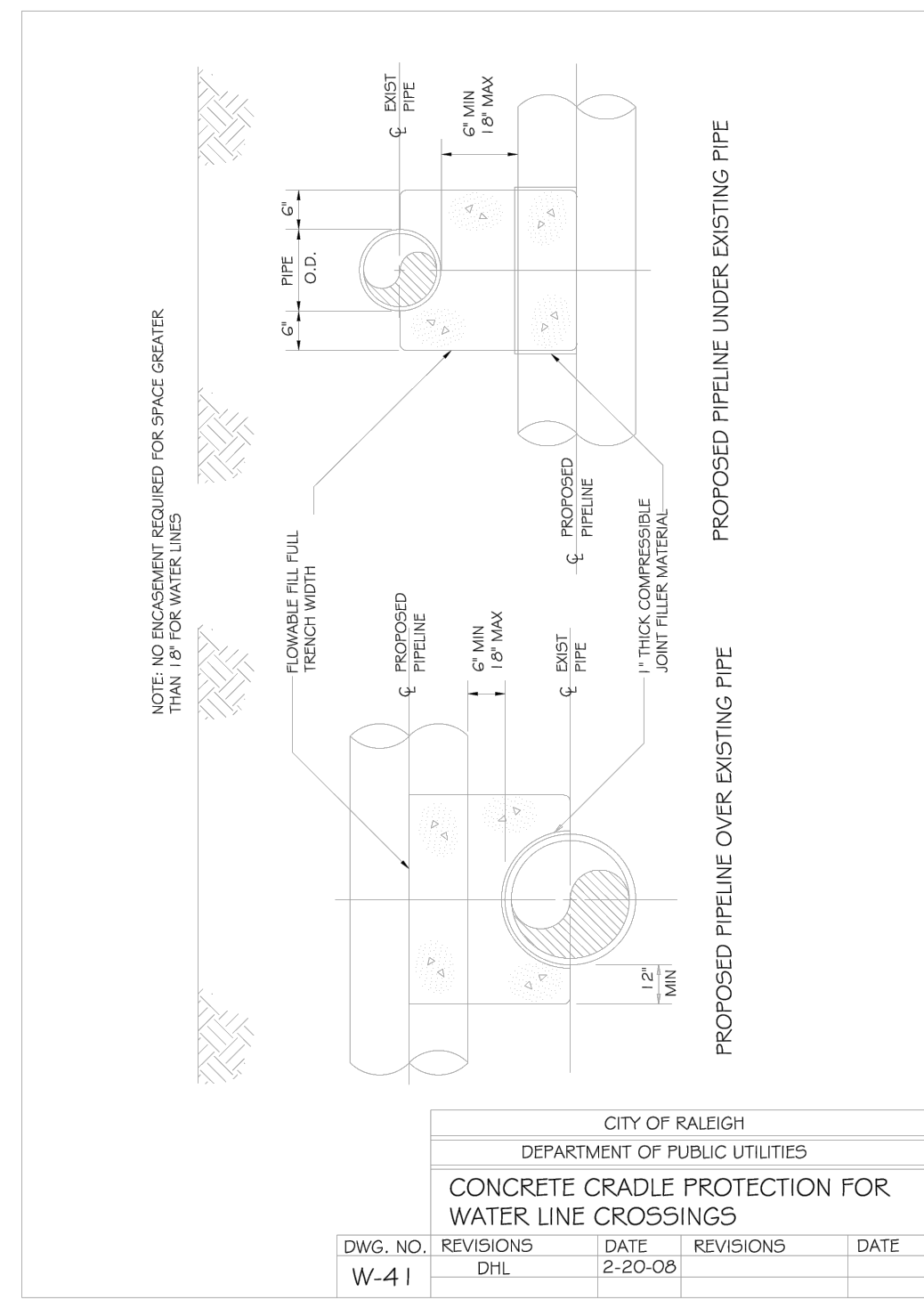
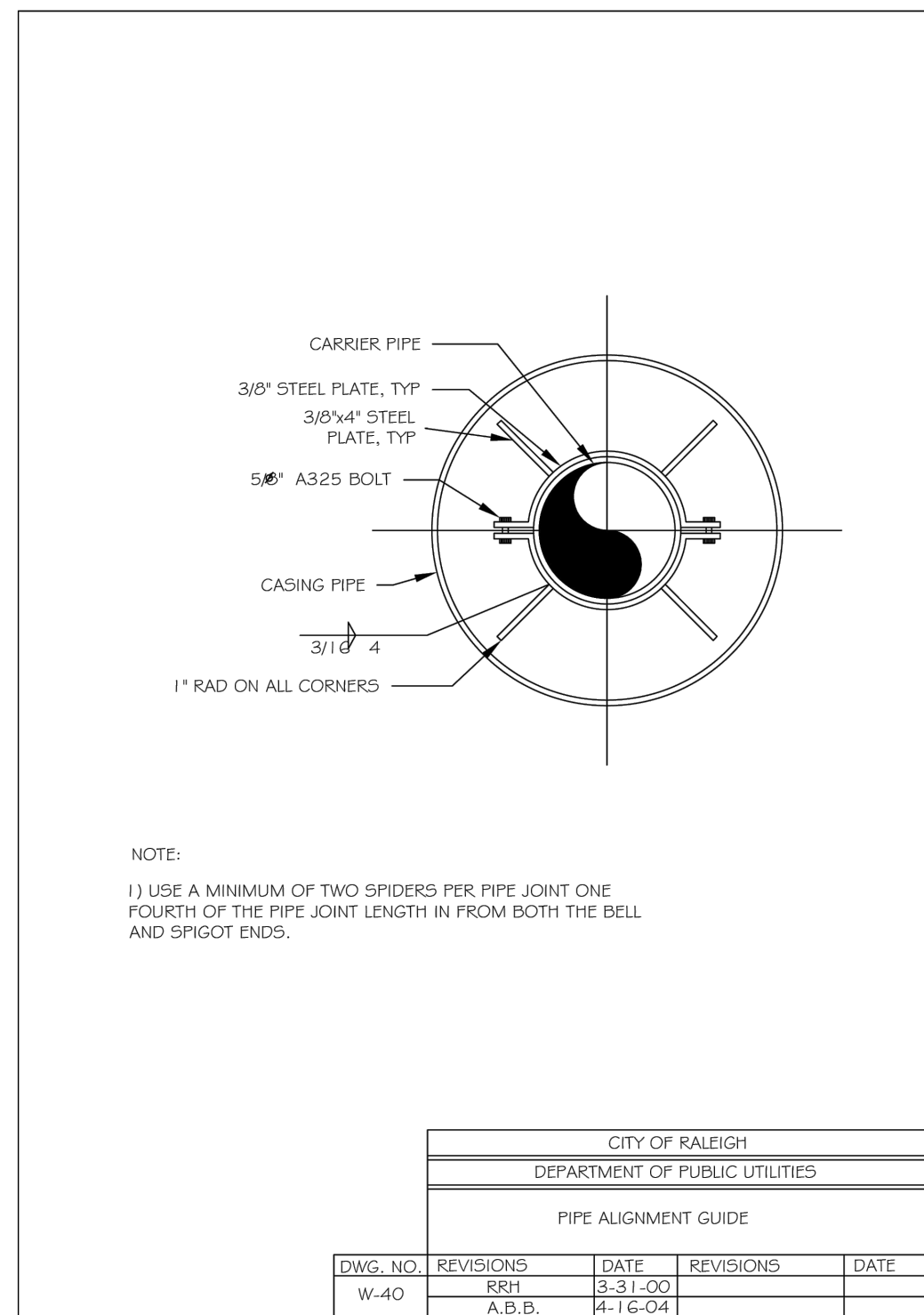
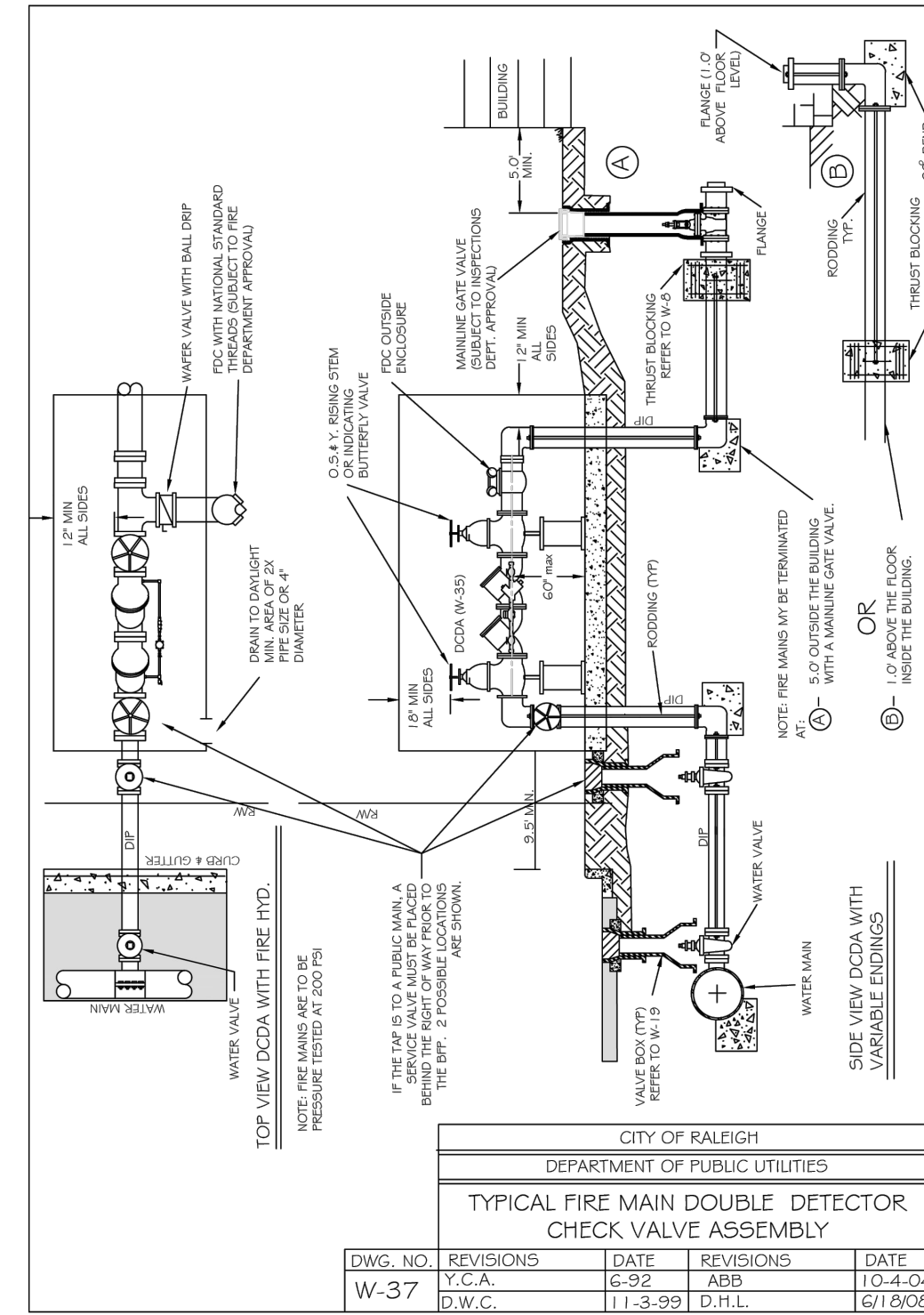
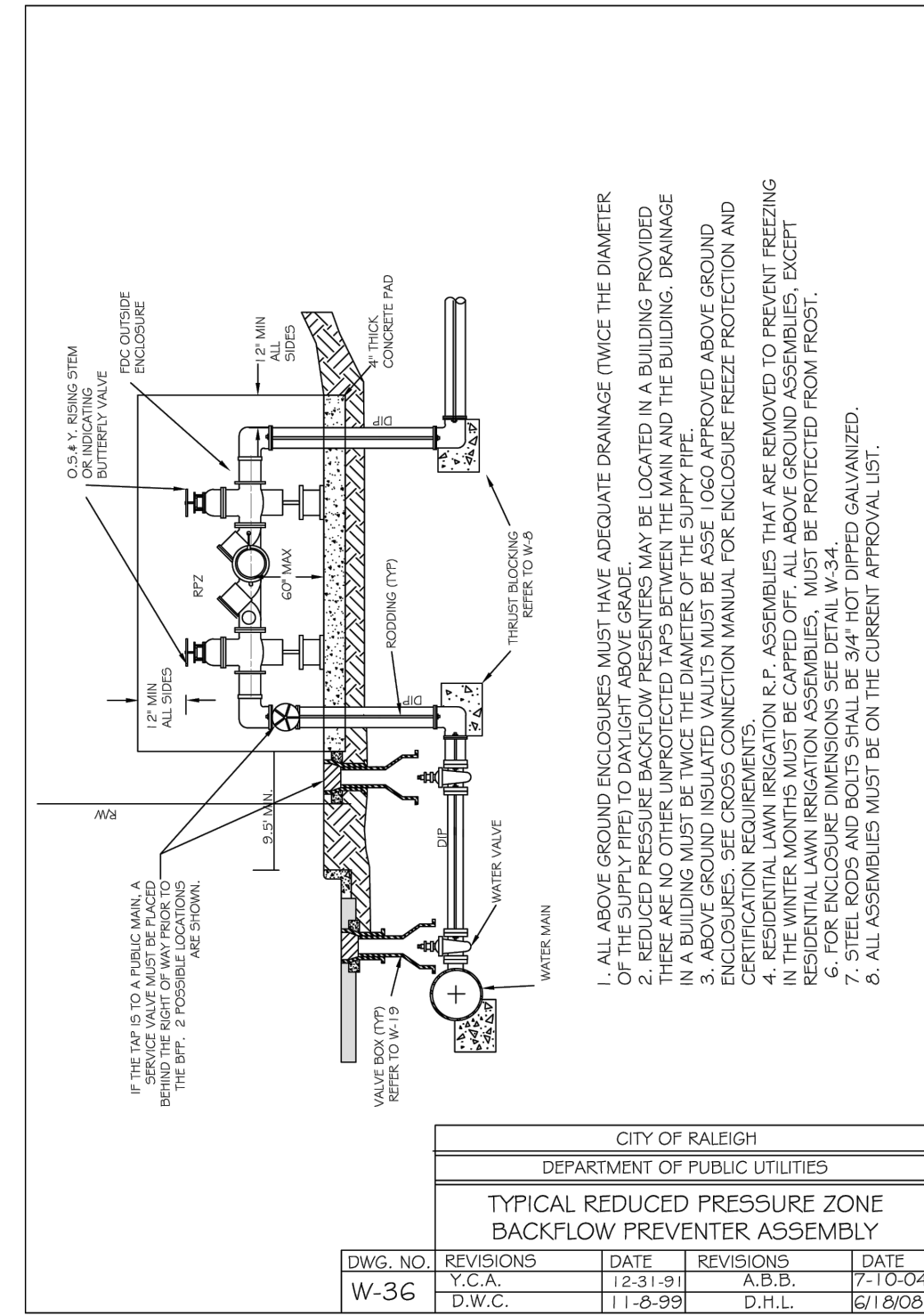
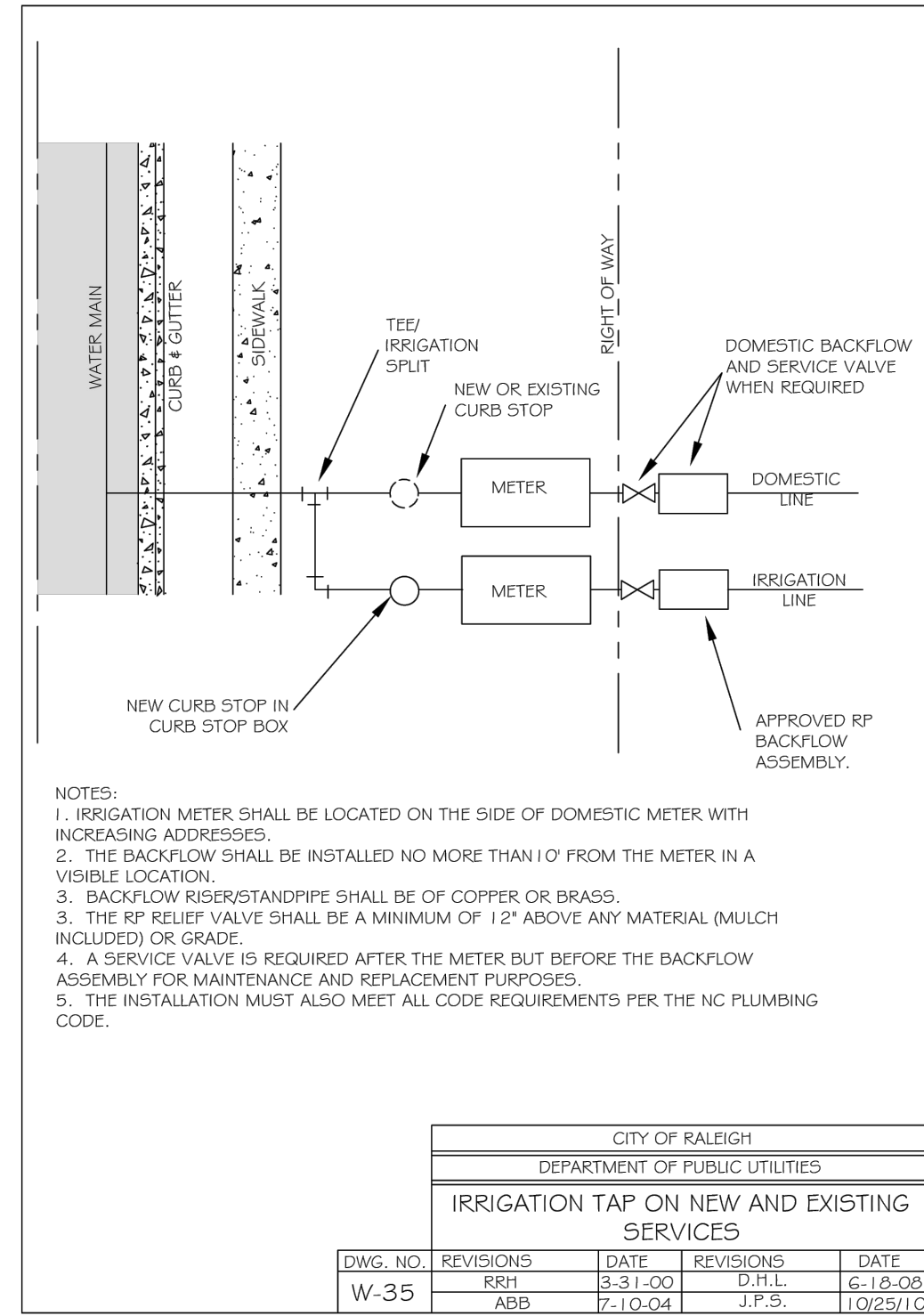
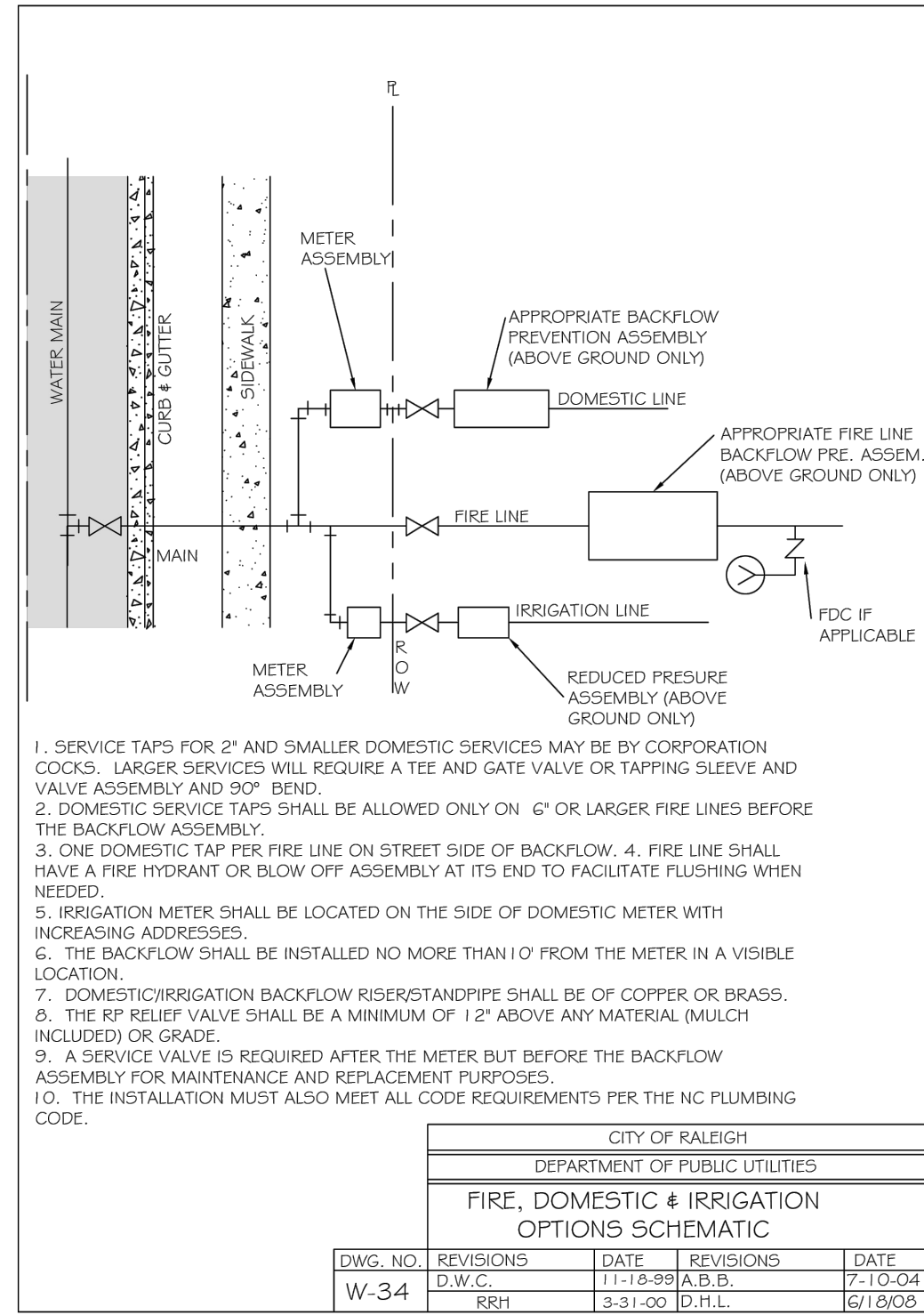
PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3B
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3C
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
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UTILITY CONSTRUCTION PLANS ONLY	



PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3D
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

PAVEMENT PATCH DETAIL

NOTES:
 1. IN NCDOT MAINTAINED ROADWAYS ENCROACHMENT PAVEMENT PATCH REQUIREMENTS SHALL TAKE PRECEDENCE.
 2. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAWCUT MACHINE.
 3. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
 4. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
 5. THE ENTIRE THICKNESS AND VERTICAL EDGE OF CUT SHALL BE TACKED.
 6. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
 7. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
 8. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING (5-4 & 5-5) FOR ADDITIONAL DETAILS.
 9. NO HAND PATCHING ALLOWED.
 10. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD ASPHALT PAVEMENT PATCH DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-3	D.W.C.	11-11-99	A.B.B.	11-19-04	
	RRH	3-30-00	J.P.S.	0-8-10	

TRENCH BOTTOM DIMENSIONS FOR DUCTILE IRON

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 8" 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	
5-4	D.W.C.	9-3-99	A.B.B.	9-3-99	
	RRH	3-30-00	D.H.L.	6-18-08	

TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN

NOTES:
 1. FOR 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.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-5	D.W.C.	9-3-99	A.B.B.	9-3-99	
	RRH	7-2-02	RRH	8-30-00	

STANDARD PRECAST SANITARY SEWER MANHOLE

NOTES:
 1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT. THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT. THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7.5 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OR CUTS IN THE TRACER WIRE SHALL BE PERMITTED. WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
 2. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNER'S REPRESENTATIVE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD PRECAST SANITARY SEWER MANHOLE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-20	D.W.C.	12-31-99	ARR	2-21-05	
	RRH	3-30-00	D.H.L.	6-16-09	

GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER

NOTES:
 1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT. THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT. THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7.5 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OR CUTS IN THE TRACER WIRE SHALL BE PERMITTED. WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
 2. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNER'S REPRESENTATIVE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-20A	RRH	09-14			

STANDARD MANHOLE COVER

NOTES:
 1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
 2) FRAME SHALL BE A MINIMUM WEIGHT OF 165 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
 3) COVER SHALL WEIGH A MIN. OF 120 LBS.
 4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES EXTENDED BASE OR CAST-IN-PLACE REINFORCED CONCRETE BASE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-21	RRH	3-30-00	ARR	2-9-05	

WATER-TIGHT MANHOLE FRAME WITH CAM LOCK COVER

NOTES:
 1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
 2) FRAME SHALL BE A MINIMUM WEIGHT OF 165 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
 3) COVER SHALL WEIGH A MIN. OF 120 LBS.
 4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES WATER-TIGHT MANHOLE FRAME WITH CAM LOCK COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-25	RRH	3-1-07	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	

STANDARD SLIP RESISTANT MANHOLE STEP DETAIL

NOTES:
 1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT. THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT. THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7.5 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OR CUTS IN THE TRACER WIRE SHALL BE PERMITTED. WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
 2. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNER'S REPRESENTATIVE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD SLIP RESISTANT MANHOLE STEP DETAIL					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-28	RRH	3-30-00			

GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER

NOTES:
 1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT. THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT. THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7.5 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OR CUTS IN THE TRACER WIRE SHALL BE PERMITTED. WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
 2. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNER'S REPRESENTATIVE.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-20A	RRH	09-14			

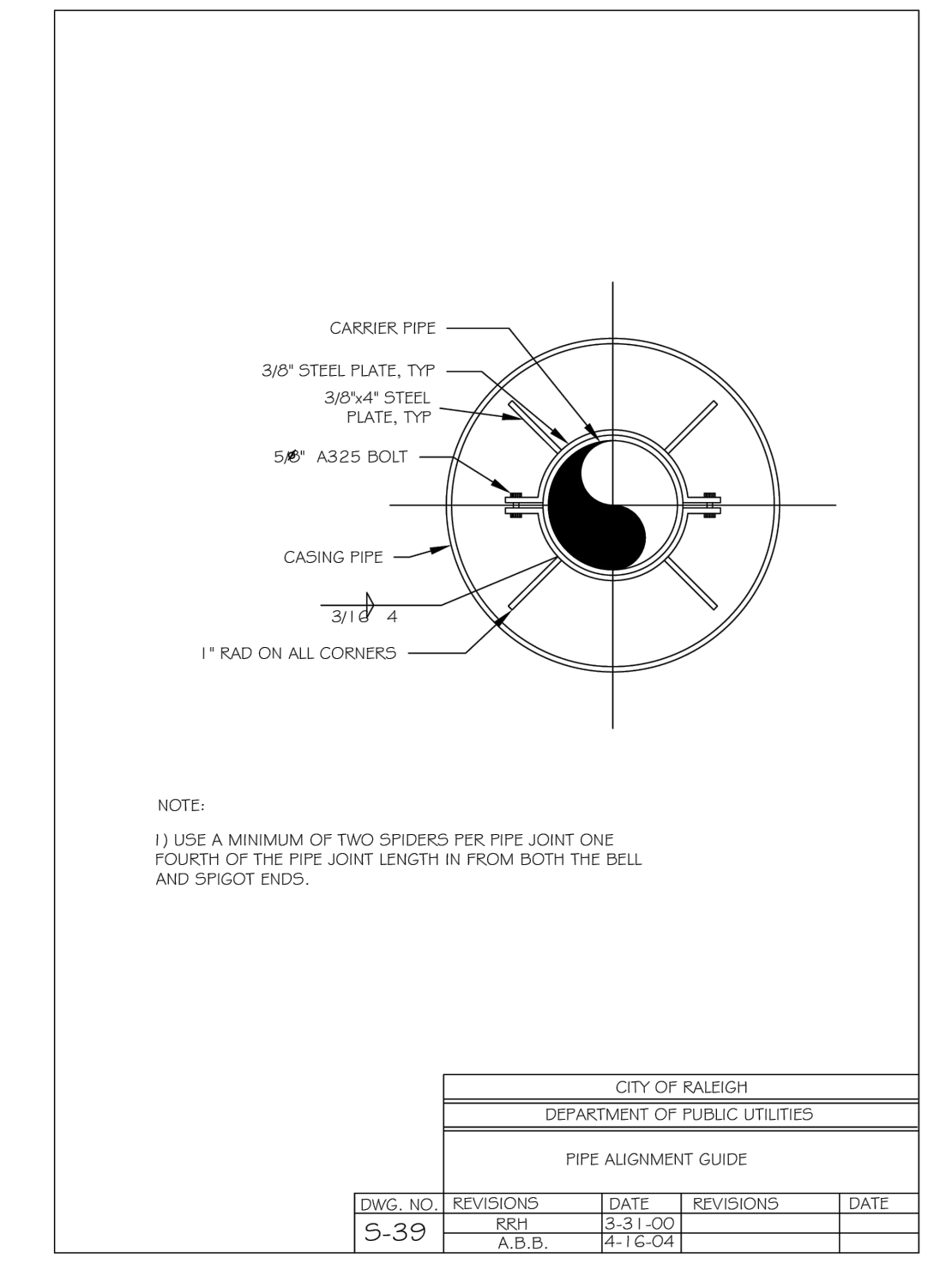
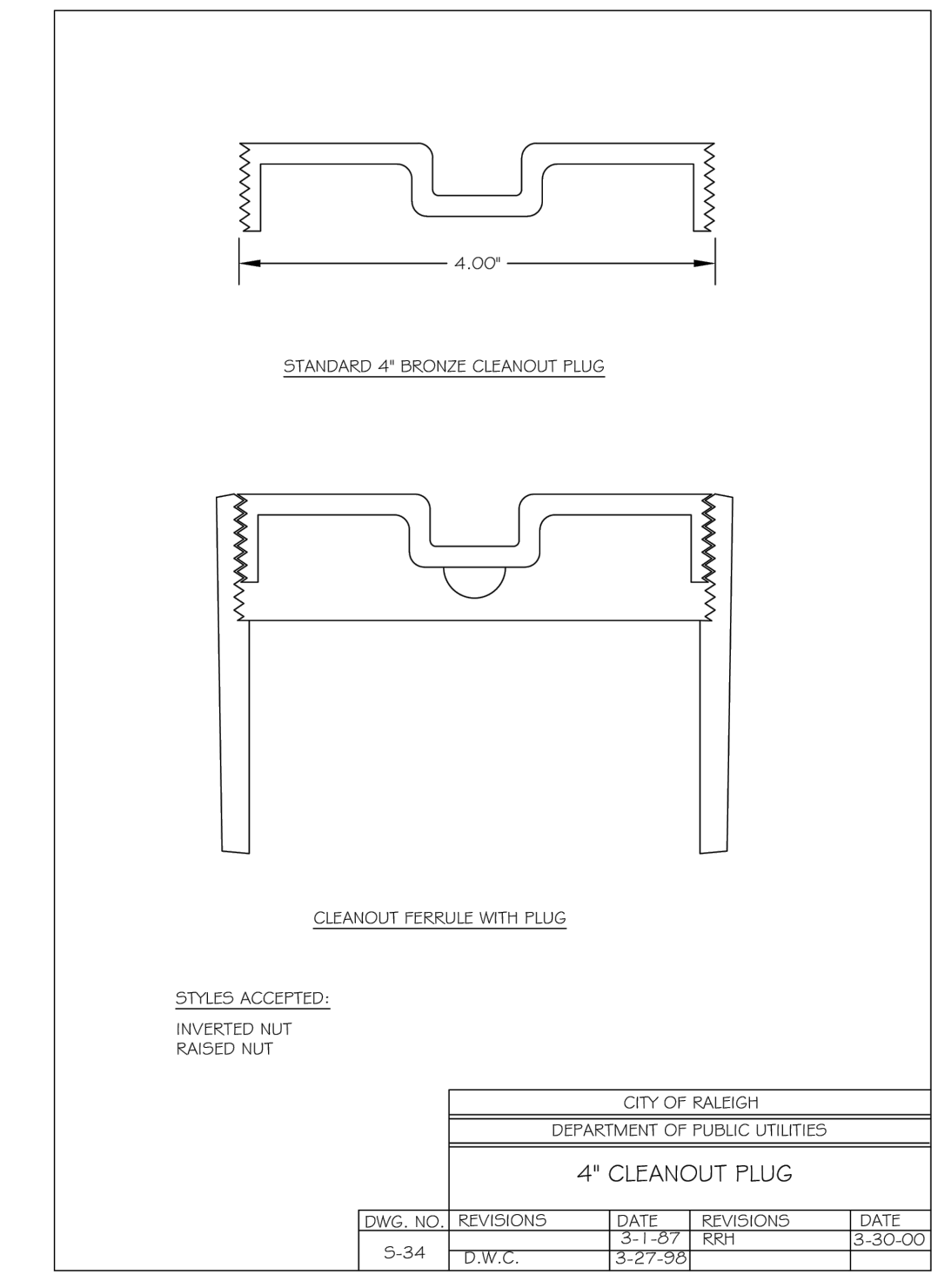
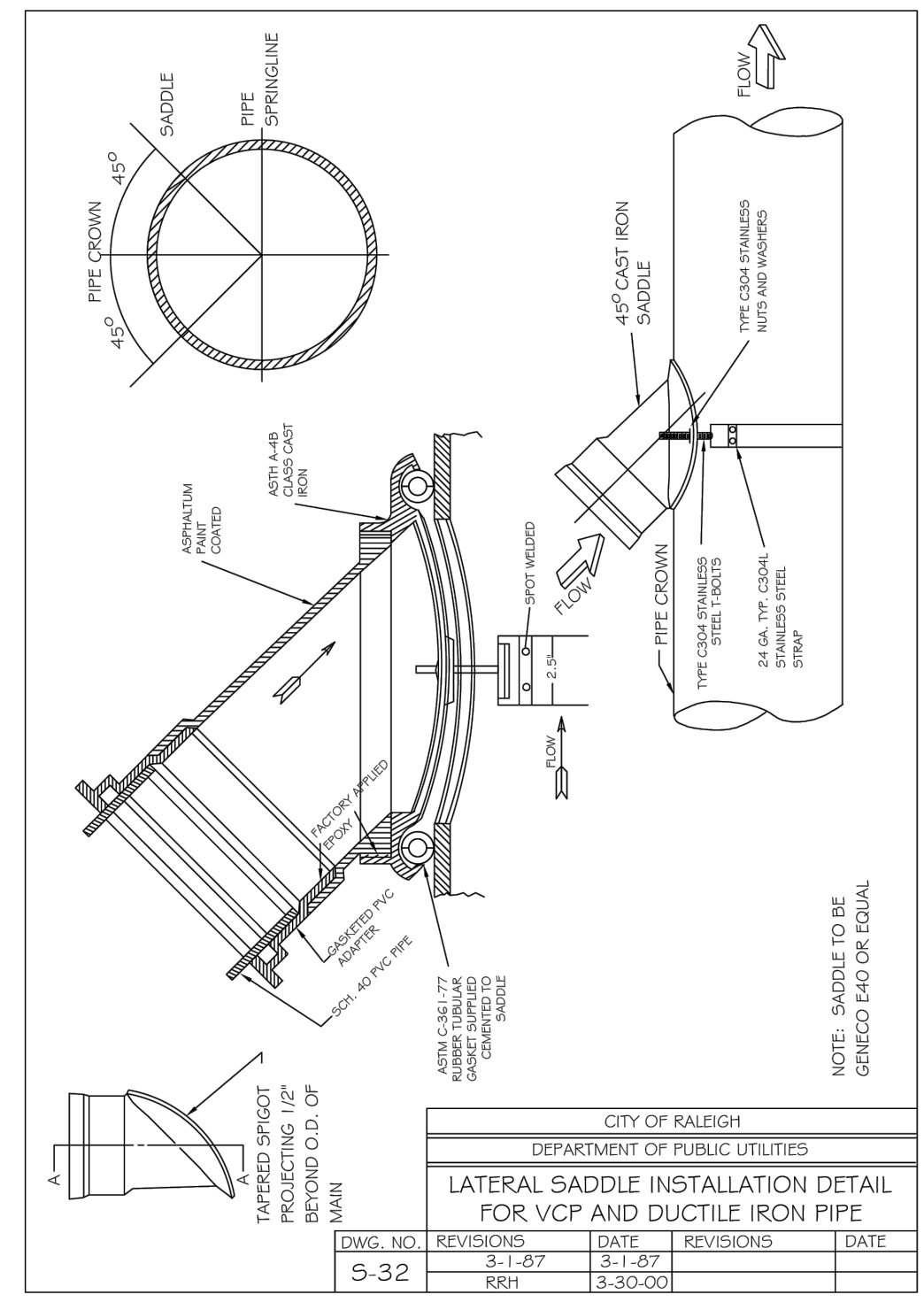
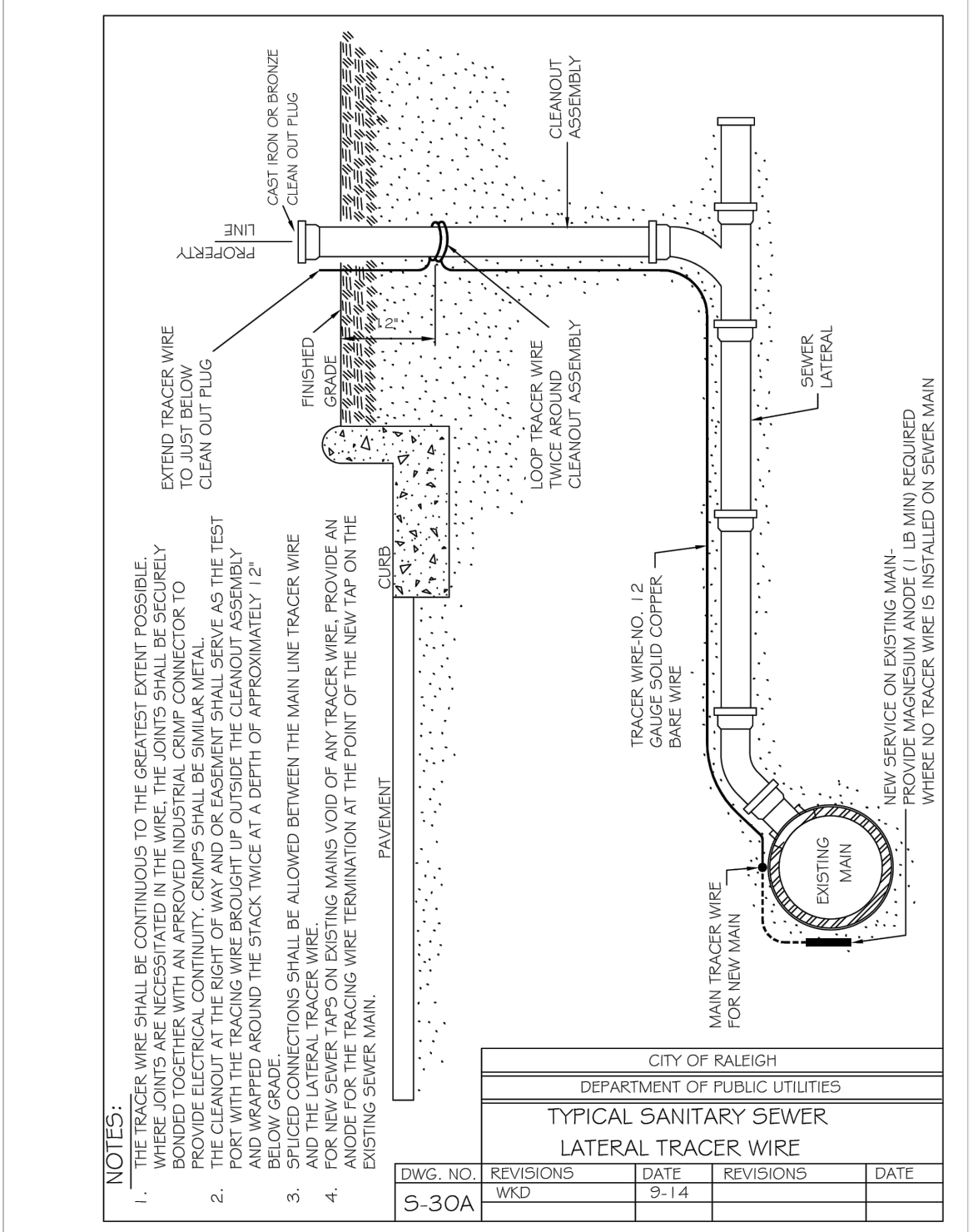
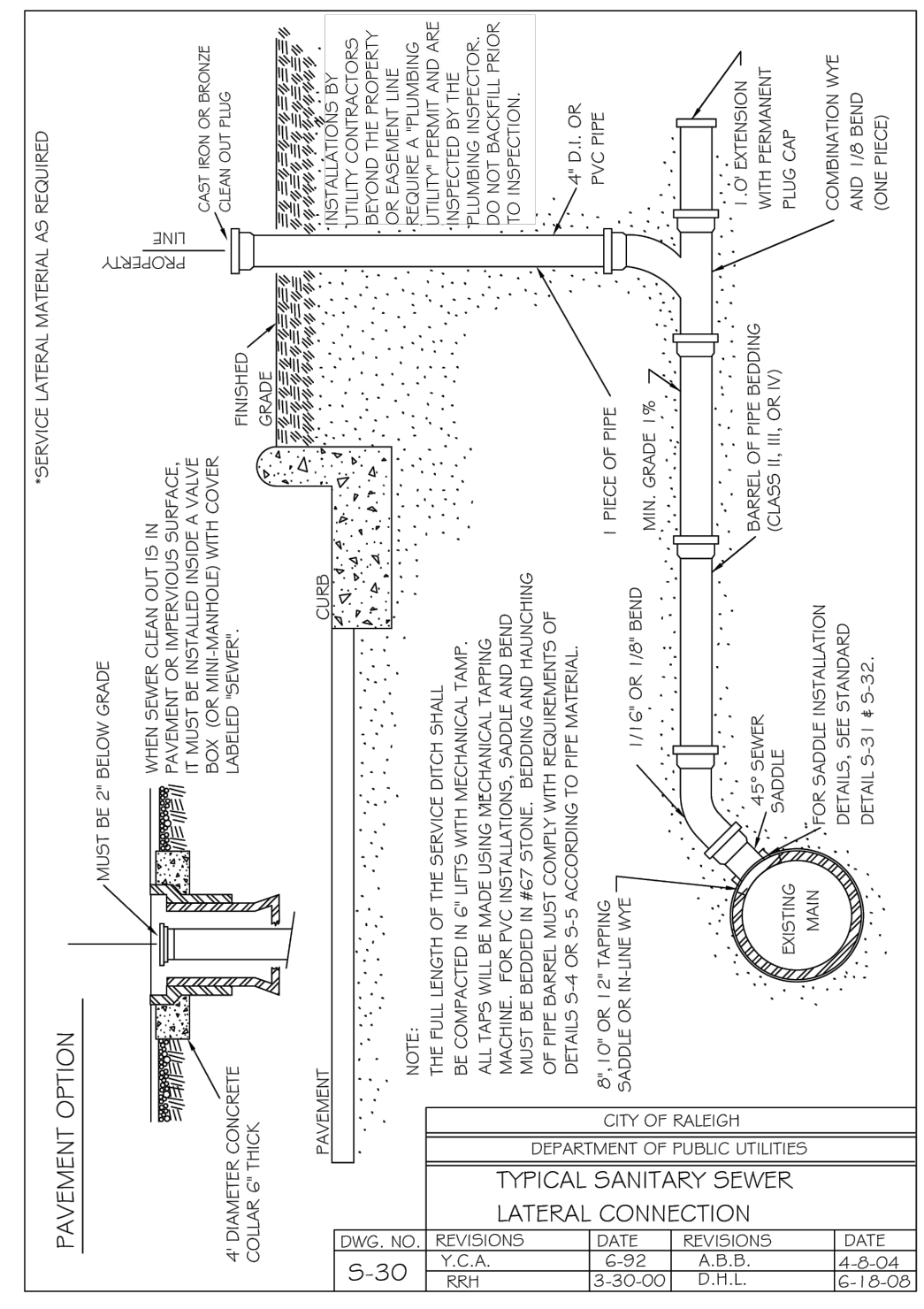
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES

NOTES:
 1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
 2) FRAME SHALL BE A MINIMUM WEIGHT OF 165 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
 3) COVER SHALL WEIGH A MIN. OF 120 LBS.
 4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

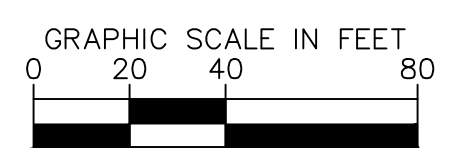
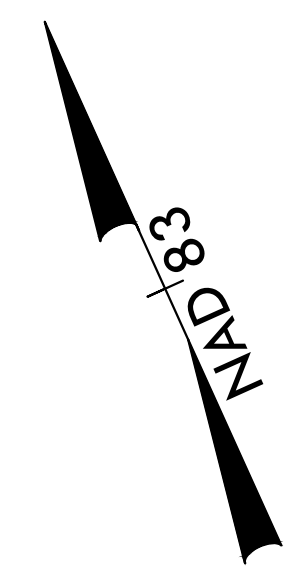
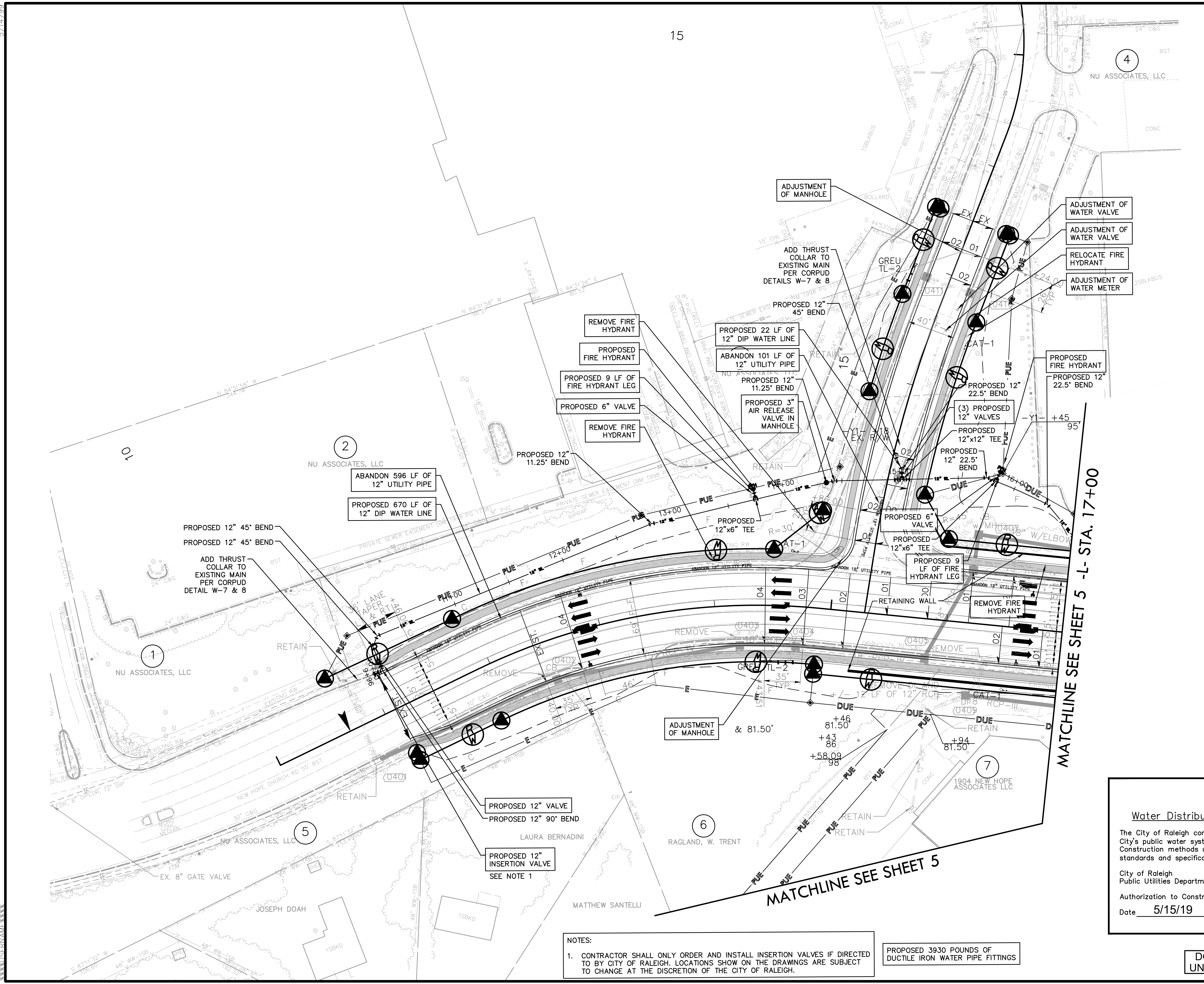
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
5-29	Y.C.A.	12-31-01	ARR	9-20-04	
	RRH	3-30-00	D.H.L.	1-29-07	

PROJECT TYPICAL DETAILS

PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-3E
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED BY:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



PROJECT REFERENCE NO.	SHEET NO.
P-5715	UC-4
DESIGNED BY: JGB	
DRAWN BY: JGB	
CHECKED BY: CLW	
APPROVED BY: CLW	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



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-3606

Authorization to Construct Alexander Justel

Date 5/15/19

NOTES:

1. CONTRACTOR SHALL ONLY ORDER AND INSTALL INSERTION VALVES IF DIRECTED TO BY CITY OF RALEIGH. LOCATIONS SHOWN ON THE DRAWINGS ARE SUBJECT TO CHANGE AT THE DISCRETION OF THE CITY OF RALEIGH.

PROPOSED 3930 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**