

TIP PROJECT: U-4906

T.I.P. NO.	SHEET NO.
U-4906	UC-1

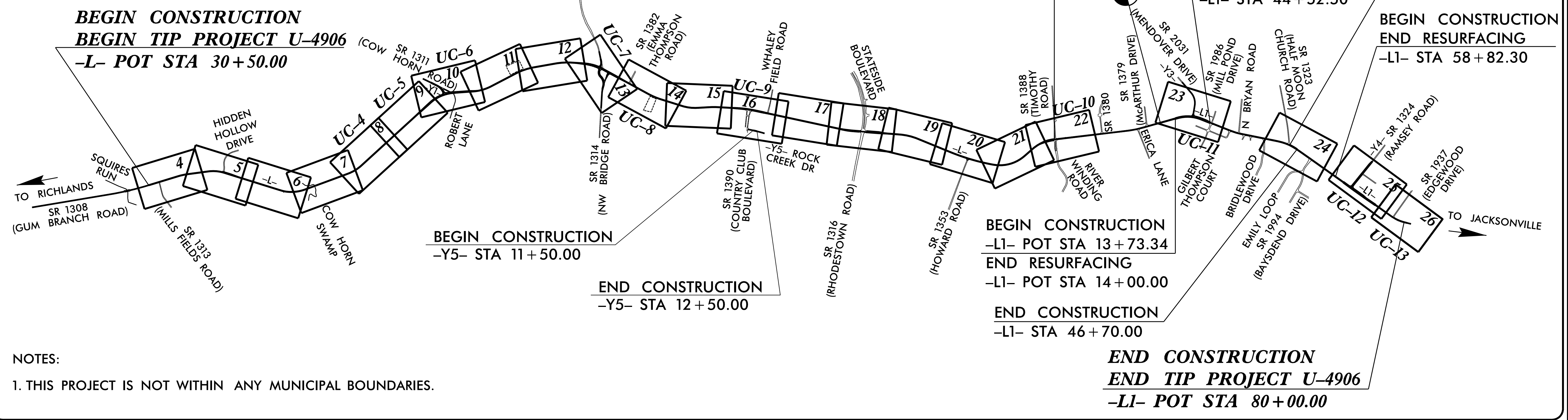
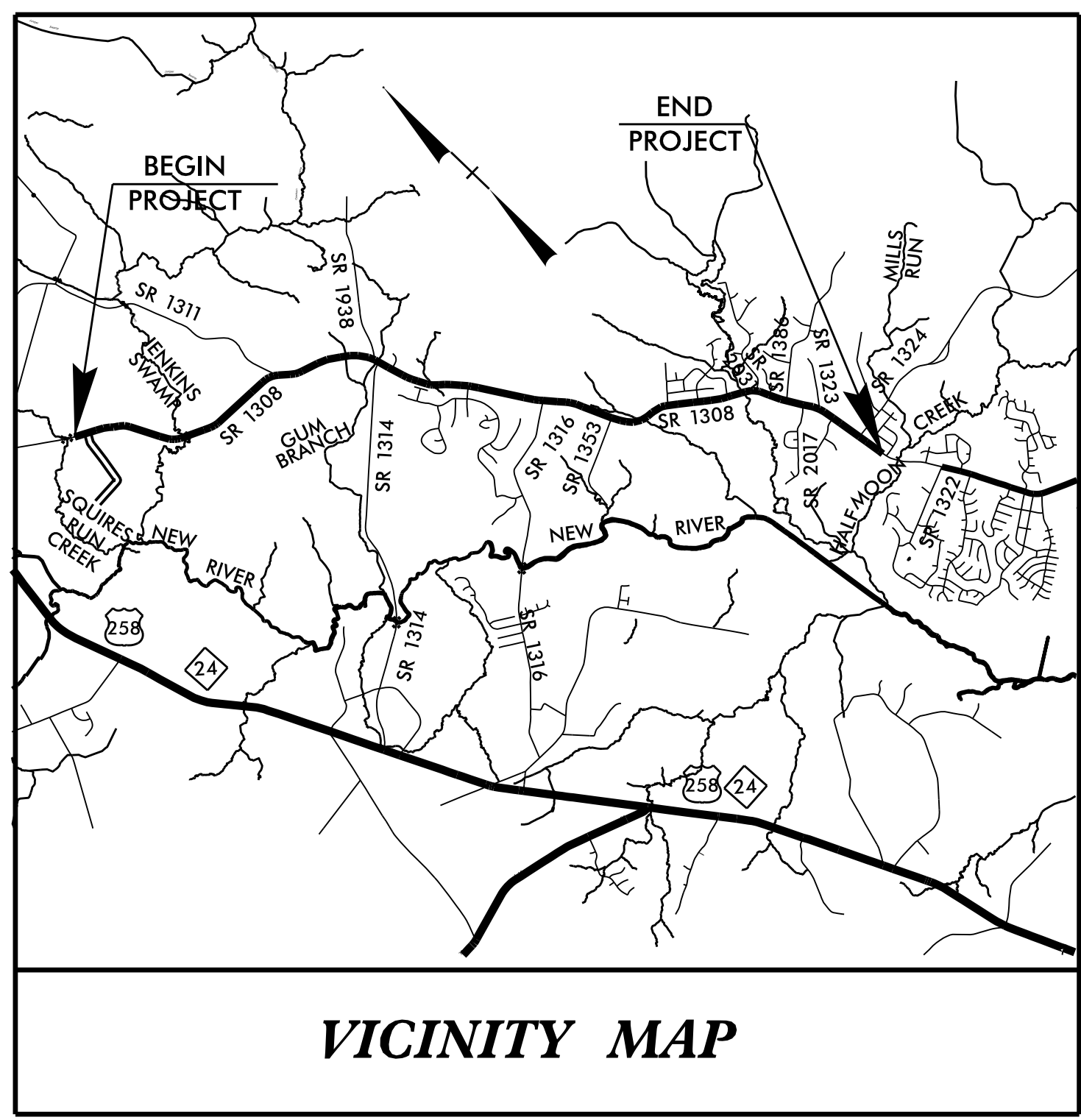
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STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

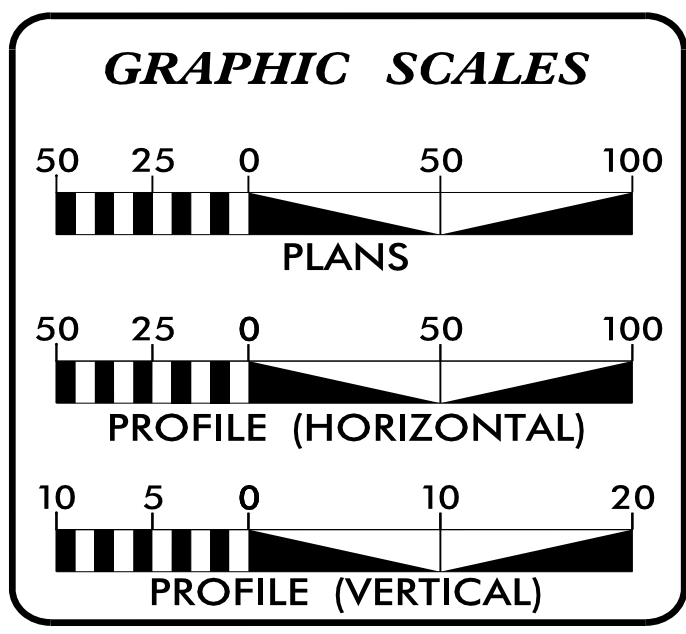
UTILITY CONSTRUCTION PLANS ONSLOW COUNTY

**LOCATION: GUM BRANCH ROAD (SR 1308) - WIDENING FROM THE
EASTERN CITY LIMITS OF RICHLANDS TO TIMOTHY ROAD (SR 1388)**

TYPE OF WORK: WATER AND SEWER LINE RELOCATION



NOTES:
1. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.



SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3 TO UC-3A	NOTES
UC-3B TO UC-3J	DETAILS
UC-4 TO UC-13	PLAN SHEETS
UC-14 TO UC-16	PROFILE SHEETS

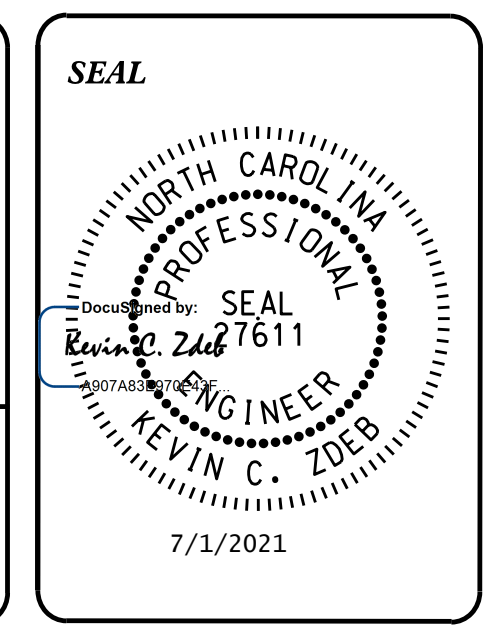
WATER AND SEWER OWNERS ON PROJECT

(A) WATER - ONWASA
 (B) SANITARY SEWER - ONWASA
 (C) WATER - CITY OF JACKSONVILLE

PREPARED IN THE OFFICE OF
Weston & Sampson NC License: C-4847
 WSE of North Carolina, PC 698 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.287.0220 Fax: 919.287.0221

FOR
HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554

KEVIN C. ZDEB, PE PROJECT ENGINEER
SAM FORSTER PROJECT DESIGNER
WEBB WHITE PROJECT UTILITY COORDINATOR



**DIVISION OF HIGHWAYS
DIVISION 3**
 5501 BARBADOS BLVD
 CASTLE HAYNE NC 28429
 PHONE (910) 341-2000
 FAX (910) 675-0143

MICHAEL L. BASS, JR. ENGINEERING TECHNICIAN - ADVANCED
LONNY SLEEPER DIVISION UTILITY ENGINEER

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)

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REV: 2/1/2012

UTILITY CONSTRUCTION

PROJECT REFERENCE NO. U-4906	SHEET NO. UC-3
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Weston Sampson WSE of North Carolina, PC 538 East Chatham Street Suite 137 Phone: 919.297.0220	
NC License: C-4847 Cary, NC 27511 Fax: 919.297.0221	

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018; AND THE ONSLOW WATER AND SEWER AUTHORITY (ONWASA) MANUAL OF STANDARDS, SPECIFICATIONS, AND DETAILS, LATEST EDITION (MAY 2016); AND THE CITY OF JACKSONVILLE MANUAL OF SPECIFICATIONS, STANDARDS, AND DESIGN, LATEST EDITION (JULY 2006).

2. THE EXISTING WATER LINE UTILITIES BELONG TO ONSLOW WATER AND SEWER AUTHORITY (ONWASA) AND THE CITY OF JACKSONVILLE.

ONWASA
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

CITY OF JACKSONVILLE (COJ)
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332

THE EXISTING SEWER LINE UTILITIES BELONG TO ONSLOW WATER AND SEWER AUTHORITY (ONWASA).

CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

3. 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.

4. 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.

5. 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 OPPROTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. 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 ADDITONAL COST TO THE DEPARTMENT.

7. 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 BY THE ENGINEER.

8. 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.

9. 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.

10. CONTRACTOR SHALL NOT OPERATE ANY VALVES ON THE EXISTING UTILITY SYSTEMS. CONTRACTOR SHALL CONTACT THE UTILITY OWNER TO CONDUCT STRATEGIC OPERATION OF VALVES FOR SERVICE INTERRUPTION IN ORDER TO PERFORM SPECIFIC WORK.

PROJECT SPECIFIC NOTES: A. APPLICABLE TO BOTH UTILITY OWNERS

1. ALL UTILITY CONSTRUCTION SHALL BE SUBJECT TO A FINAL INSPECTION BY THE UTILITY OWNER REPRESENTATIVE TO INSURE CONFORMANCE TO THE UTILITY OWNER'S STANDARDS PRIOR TO FINAL ACCEPTANCE BY THE DEPARTMENT.

2. CONTRACTOR'S ATTENTION IS DIRECTED TO SECTIONS 102, 107, AND 1550 OF THE STANDARD SPECIFICATIONS CONCERNING TRENCHLESS INSTALLATION. PRIOR TO COMMENCING ANY WORK ON ANY TRENCHLESS INSTALLATION ON THIS PROJECT, IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A DESIGN FOR THE TRENCHLESS INSTALLATION THAT IS DESIGNED, CERTIFIED, AND SEALED BY A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA, AS REQUIRED BY SUBARTICLE 1550-3(B) OF THE STANDARD SPECIFICATIONS. NO DAMAGE IS ALLOWED TO RIVER, STREAM, CREEK, WETLANDS, OR BUFFER ZONES.

3. EXISTING BURIED WATER LINE AND SANITARY FORCE MAIN TO BE ABANDONED AND NOT REMOVED BY THE CONTRACTOR SHALL BE FILLED WITH FLOWABLE FILL AND CAPPED AT EACH END.

4. ALL FITTINGS, 4-INCHES THROUGH 36-INCHES IN DIAMETER, SHALL BE DUCTILE IRON, PRESSURE CLASS 350, WITH END CONNECTIONS AS EITHER RESTRAINED JOINT OR MECHANICAL JOINT. THE USE OF PUSH-ON FITTINGS IS NOT PERMITTED.

5. PROPOSED PIPE TO BE INSTALLED FOR DOWN AND UNDER RELOCATIONS TO AVOID PROPOSED DRAINAGE PIPES SHALL BE DUCTILE IRON PIPE WITH RESTRAINED JOINT CONSTRUCTION. THE DOWN AND UNDER PIPE SEGMENT SHALL BE FULLY ASSEMBLED AS ONE CONTINUOUS SECTION BEFORE LOWERING INTO POSITION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER AND APPROVED BY THE UTILITY OWNER.

6. ALL PROPOSED PIPE TO BE INSTALLED WITHIN STEEL ENCASEMENT PIPES SHALL BE DUCTILE IRON PIPE WITH RESTRAINED JOINT CONSTRUCTION, PRESSURE CLASS 350. AN ALLOWABLE ALTERNATIVE MAY BE THE USE OF FUSIBLE PVC DR-18, DIPS, WITH A PRESSURE RATING OF 235 PSI CONFORMING TO NSF-61, IF APPROVED BY THE UTILITY OWNER.

7. PIPE USED FOR WATER MAIN HDD INSTALLATIONS, 4-INCH THROUGH 16-INCH, SHALL BE FUSIBLE PVC C-900 DR-18 DIPS PIPE.

8. EXISTING PVC PIPE SHALL BE EXCAVATED AND FIELD BENT AS NEEDED TO PROVIDE FOR HORIZONTAL AND / OR VERTICAL TRANSITION AND TIE-IN TO PROPOSED PIPE, AS DIRECTED BY THE ENGINEER.

9. EXISTING WATER LINE OR SEWER FORCE MAIN SHALL BE RESTRAINED ON THE PORTION TO REMAIN BEYOND THE FITTING/VALVE TIE-IN POINT. CONTRACTOR SHALL EXCAVATE THE EXISTING PIPE AND INSTALL THE APPROPRIATE BELL JOINT RESTRAINTS AT EACH PIPE JOINT FOR THE DISTANCE NOTED IN THE TABLE ON THE DETAIL SHEETS IN THIS PLAN SET, AS DIRECTED BY THE ENGINEER.

10. ALL NEW OR RELOCATED WATER METERS SHALL BE INSTALLED AT THE RIGHT-OF-WAY LINE, UNLESS OTHERWISE DIRECTED BY THE RESIDENT ENGINEER.

11. WATER METER BOXES SHALL NOT BE INSTALLED WITHIN PAVEMENT OR SIDEWALKS, UNLESS APPROVED BY THE UTILITY OWNER.

12. EXISTING WATER METERS THAT ARE TO REMAIN SHALL BE RECONNECTED TO THE EXISTING / PROPOSED WATER MAIN WITH NEW WATER SERVICE LINES.

13. CONTRACTOR SHALL BE RESPONSIBLE FOR RECONNECTING THE CUSTOMER SIDE SERVICE LINE TO THE NEW OR RELOCATED WATER METER.

14. EXISTING HYDRANTS AND WATER METERS TO BE REMOVED AND/OR RELOCATED SHALL BE RETURNED TO THE UTILITY OWNER FOR INSPECTION. CONTRACTOR SHALL DELIVER THESE UTILITY ITEMS TO A MUTUALLY AGREED UPON LOCATION. ALL OTHER PARTS, PIPING, AND METER BOXES REMOVED FROM THE SYSTEM SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AND BE PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

15. HYDRANTS AND WATER METERS LABELLED TO BE REMOVED SHALL NOT BE USED AS NEW MATERIALS IN THE PROPOSED CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE UTILITY OWNER.

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UTILITY CONSTRUCTION

PROJECT SPECIFIC NOTES: (CONTINUED)

B. CITY OF JACKSONVILLE

1. CONTRACTOR SHALL CALL THE CITY OF JACKSONVILLE PUBLIC SERVICES DEPARTMENT AT 910-938-6500 FOR WATER / SEWER LOCATION SERVICES BEFORE BEGINNING ANY WORK.

2. SERVICE IS TO BE CONTINUOUSLY MAINTAINED TO CUSTOMERS IN THE PROJECT AREAS, EXCEPT FOR THE MINIMUM AMOUNT OF TIME REQUIRED TO MAKE CONNECTIONS TO THE EXISTING SYSTEM. BEFORE SHUTTING OFF ANY WATER LINE, RESIDENTS ARE TO BE NOTIFIED BY THE CITY OF JACKSONVILLE IN WRITING AT LEAST 24 HOURS IN ADVANCE OF THE SHUT DOWN. THE CONTRACTOR SHALL ASSIST THE CITY IN DISTRIBUTION OF THE NOTIFICATIONS.

3. EXCEPT AS NEEDED FOR FIRE SUPPRESSION PURPOSES, THE CITY OF JACKSONVILLE SHALL BE THE SOLE OPERATOR OF ALL VALVES AND HYDRANTS ON THE CITY OF JACKSONVILLE WATER DISTRIBUTION SYSTEM. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST 48 HOURS IN ADVANCE OF REQUEST FOR OPERATION OF VALVES AND MAKING A WET TAP OR CUT-IN. ONLY IN AN EMERGENCY, MAY THE CONTRACTOR CLOSE A VALVE. CONTRACTOR SHALL KEEP A RECORD OF ANY VALVES CLOSED DURING AN EMERGENCY AND NOTIFY THE PUBLIC SERVICES DEPARTMENT AT THE EARLIEST REASONABLE TIME OF THE SPECIFIC VALVES THAT WERE CLOSED.

4. WATER LINES 14-INCH AND LARGER SHALL BE DUCTILE IRON. ALL DUCTILE IRON PIPE, 4-INCHES AND LARGER, SHALL BE PRESSURE CLASS 350.

5. WATER LINES, 6-INCH THROUGH 12-INCH, SHALL BE PVC C-900 DR-18 PIPE THAT IS D.I.P.S. FUSIBLE PVC C-900 PIPE SHALL BE USED FOR HORIZONTAL DIRECTIONAL DRILLING (HDD) ONLY, UNLESS OTHERWISE APPROVED BY THE CITY OF JACKSONVILLE.

6. CONCRETE THRUST BLOCKING, TIE RODS, RESTRAINED JOINT PIPE AND/OR OTHER MEANS OF RESTRAINT SHALL BE PROVIDED AT ALL CHANGES IN PIPE DIRECTION. CONCRETE THRUST BLOCKING IS NOT RECOMMENDED WHERE THE THRUST BLOCK MAY BEAR ON OTHER UTILITIES OR WHERE THE AREA BEHIND THE THRUST BLOCK MAY BE EXCAVATED IN THE FUTURE.

7. WATER SERVICE LINE, 3/4-INCH THROUGH 2-INCH, SHALL BE HDPE C-901 PE-4710 (DR-9 OR DR-11 OR DR-13.5) OR PE-3408/3608 (DR-9 OR DR-11), ANSI/NSF-61 CERTIFIED, COPPER TUBING SIZE (CTS) PIPE.

8. ALL VALVES, 6-INCH AND LARGER, SHALL BE RESILIENT WEDGE TYPE GATE VALVES WITH NON RISING STEM AND MECHANICAL JOINT ENDS.

9. NON-METALLIC UNDERGROUND WARNING TAPE WITH THE TEXT "CAUTION WATER LINE BELOW" SHALL BE INSTALLED 8-INCHES TO 12-INCHES BELOW FINAL GRADE DIRECTLY ABOVE ALL PVC WATER LINES DURING BACKFILL.

10. TEN GAUGE SINGLE STRAND BARE COPPER TRACER WIRE SHALL BE INSTALLED ALONG THE TOP OF ALL NON-METALLIC PIPE.

11. ALL CONCRETE USED FOR THRUST BLOCKS, THRUST COLLARS, VALVE STABILIZING PADS, CONCRETE ENCASEMENT OF PIPES, AND FIRE HYDRANT SETTING AND THRUST BLOCKS SHALL BE NCDOT CLASS A WITH A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS. READY MIX CONCRETE SHALL COMPLY WITH ASTM C94. ALL EXPOSED CONCRETE SHALL BE AIR ENTRAINED.

PROJECT SPECIFIC NOTES: (CONTINUED)

C. ONWASA

1. ALL FITTINGS SHALL BE SECURED BY TWO (2) FORMS OF RESTRAINT. RESTRAINING GLANDS AND CONCRETE THRUST BLOCKING ARE PREFERRED. WEDGE ACTION RESTRAINT GLANDS SHALL ONLY BE USED ON DUCTILE IRON PIPE. FULL CIRCUMFERENTIAL PIPE RESTRAINT GLANDS MAY BE USED ON PVC PIPE OR DUCTILE IRON PIPE. OTHER FORMS OF RESTRAINT (THREADED RODS, BELL RESTRAINT HARNESSSES, ETC.) MAY BE APPROVED BY ONWASA ON A CASE BY CASE BASIS.

2. ALL JOINTS ON FIRE HYDRANT ASSEMBLIES SHALL BE RESTRAINED.

3. ALL REVERSE (BACKSIDE) TAPS SHALL REQUIRE THE INSTALLATION OF A JOINT RESTRAINT SYSTEM.

4. ALL CONCRETE SHALL BE NCDOT CLASS A WITH A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS. MAXIMUM SLUMP OF CONCRETE SHALL BE 3.5-INCHES FOR VIBRATED IN PLACE CONCRETE AND 4-INCHES FOR NON-VIBRATED CONCRETE.

5. HEAVY GAUGE TRACER WIRE SHALL BE INSTALLED ALONG THE TOP OF ALL PIPE INSTALLED BY HORIZONTAL DIRECTIONAL DRILLING (HDD). TRACER WIRE SHALL BE FASTENED TO THE PIPE EVERY FIVE (5) FEET WITH HEAVY PLASTIC ZIP TIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE TRACER WIRE IS PULLED SUCCESSFULLY WITH THE PIPE BY PERFORMING A CONTINUITY TEST OF THE TRACER WIRE AFTER COMPLETION OF THE HDD PULLBACK.

6. PIPE USED FOR SANITARY FORCE MAIN HDD INSTALLATIONS, 4-INCH THROUGH 16-INCH, SHALL BE HDPE C-906 SDR-9 PIPE THAT IS D.I.P.S.

7. WATER LINES 18-INCH AND LARGER SHALL BE DUCTILE IRON. DUCTILE IRON PIPE, 4-INCHES TO 12-INCHES, SHALL BE PRESSURE CLASS 350. DUCTILE IRON PIPE, 14-INCHES AND LARGER, SHALL BE PRESSURE CLASS 250.

8. WATER LINES, 6-INCH THROUGH 16-INCH, SHALL BE PVC C-900 DR-18 PIPE THAT IS D.I.P.S.

9. ALL VALVES, 6-INCH TO 14-INCH, SHALL BE RESILIENT WEDGE TYPE GATE VALVES WITH NON RISING STEM AND MECHANICAL JOINT ENDS.

10. ALL VALVES, 16-INCH AND LARGER, SHALL BE BUTTERFLY VALVES WITH MECHANICAL JOINT ENDS.

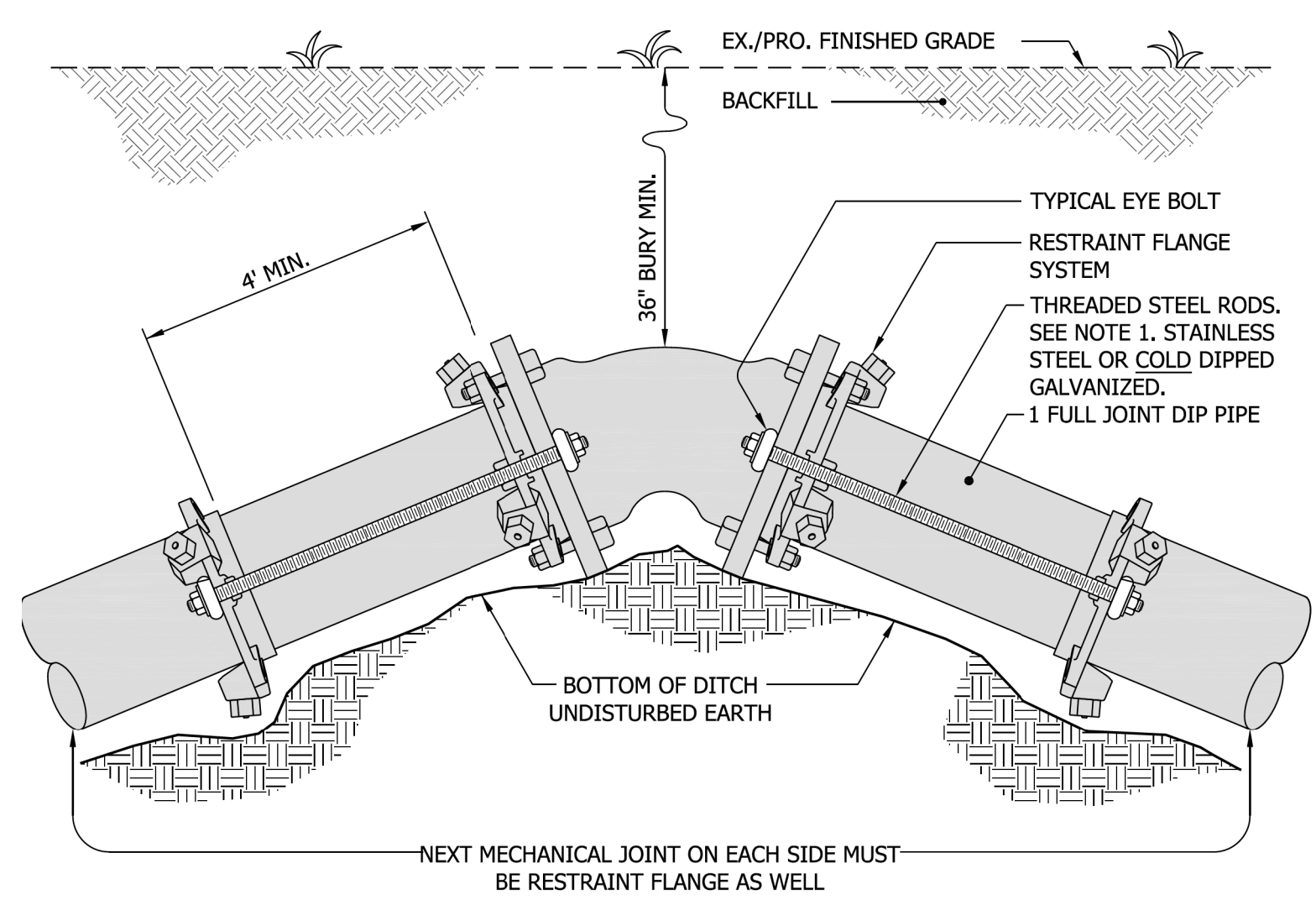
11. WATER SERVICE PIPE SHALL BE HDPE C-901 SDR-9 PIPE THAT IS C.T.S.

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-3A
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
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	
Weston Sampson WSE of North Carolina, PC 538 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 NC License: C-4847 Fax: 919.297.0221	

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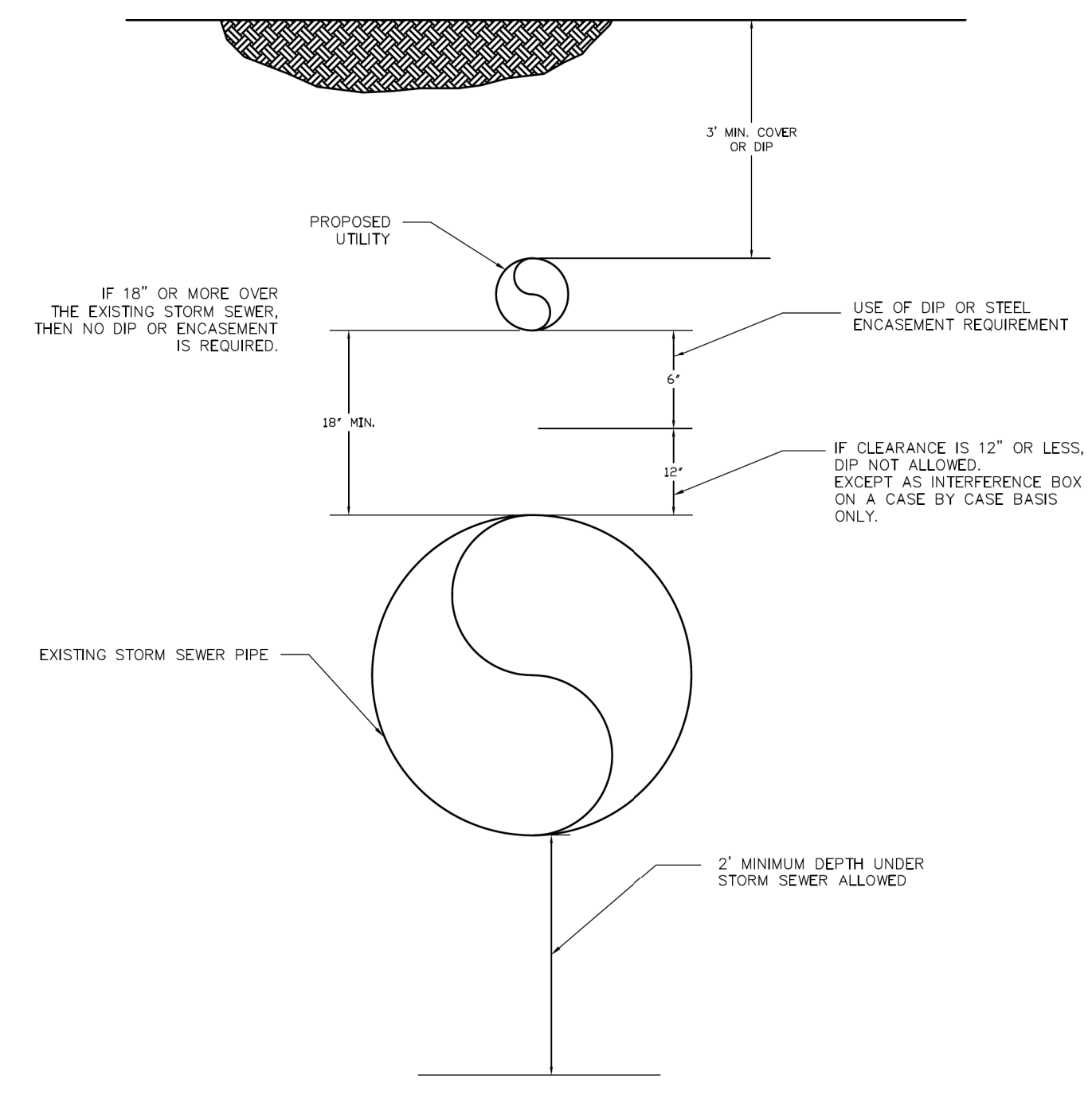
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TYPICAL EYE BOLT

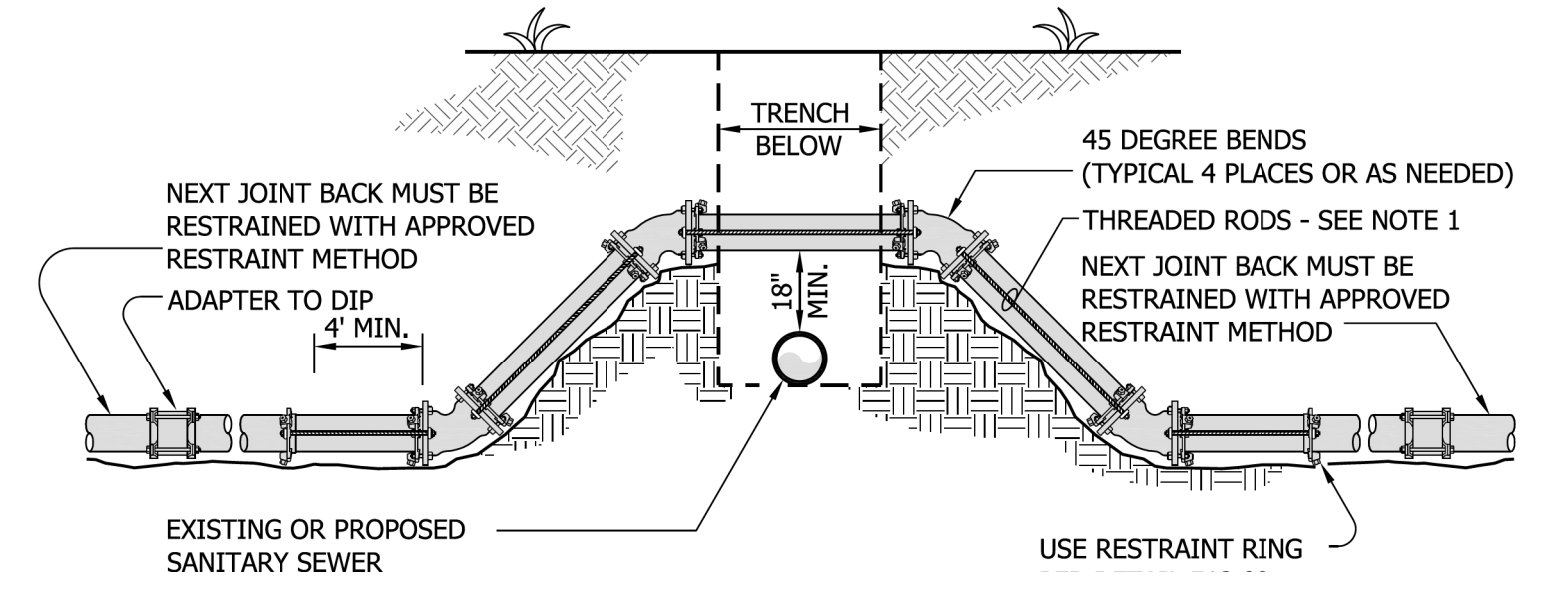
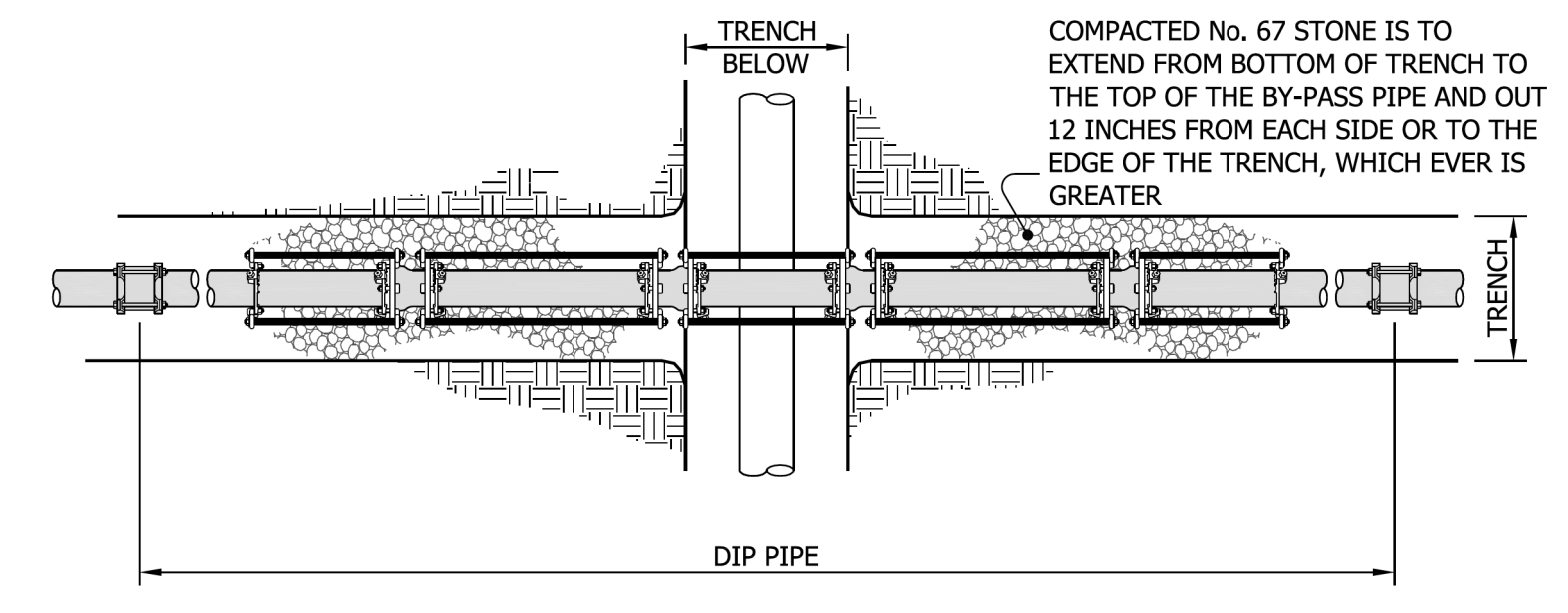


PROFILE VIEW

- NOTES:
- USE OF GRIP RINGS IN LIEU OF RESTRAINT FLANGE SYSTEM SHALL BE PERMITTED ON A CASE BY CASE BASIS BY THE PUBLIC SERVICES DIRECTOR.



PROPOSED UTILITY OVER EXISTING STORM SEWER
NOT TO SCALE



- NOTES:
- THE BYPASS IS TO BE ASSEMBLED ABOVE GROUND FIRST.
 - RECORD ALL AS-BUILT LENGTHS USING THE CENTER LINES OF THE PIPES OR BENDS AS REFERENCE POINTS.
 - ADAPTERS VARY IN TYPE ACCORDING TO THE MATERIAL OF THE EXISTING WATER MAIN.
 - USE OF GRIP RINGS IN LIEU OF RESTRAINT FLANGE SYSTEM SHALL BE PERMITTED ON A CASE BY CASE BASIS BY THE PUBLIC SERVICES DIRECTOR.

PROJECT REFERENCE NO. U-4906	SHEET NO. UC-3B
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Weston & Sampson WSE of North Carolina, PC 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 NC License: C-4647 Fax: 919.297.0221	

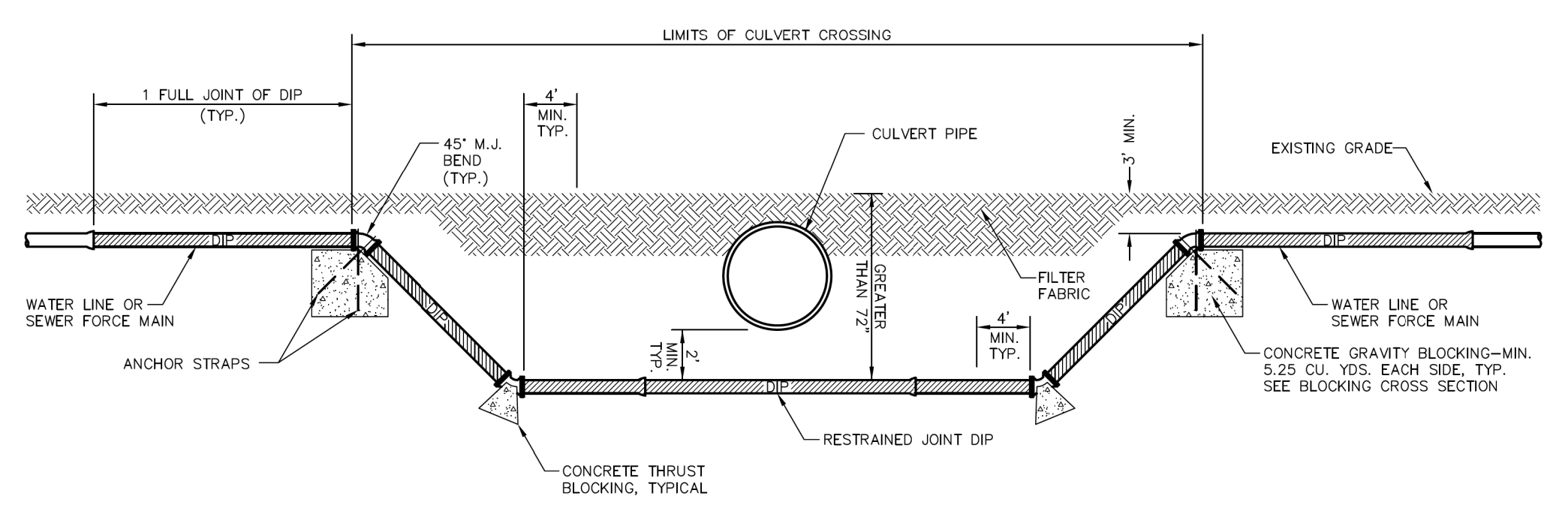
TIE ROD ANCHORS DATUM

PIPE SIZE (INCHES)	ROD DIAMETER	NUMBER OF A307 RODS REQUIRED
TEST PRESSURE = 150 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	2
12	3/4"	4
16	3/4"	6
20	3/4"	8
24	3/4"	8
30	1"	10
TEST PRESSURE = 200 PSI		
6	3/4"	2
8	3/4"	2
10	3/4"	4
12	3/4"	6
16	3/4"	8
20	3/4"	12
24	3/4"	10
30	1"	14

STAINLESS STEEL OR COLD-DIPPED GALVANIZED ASTM A307 TIE RODS

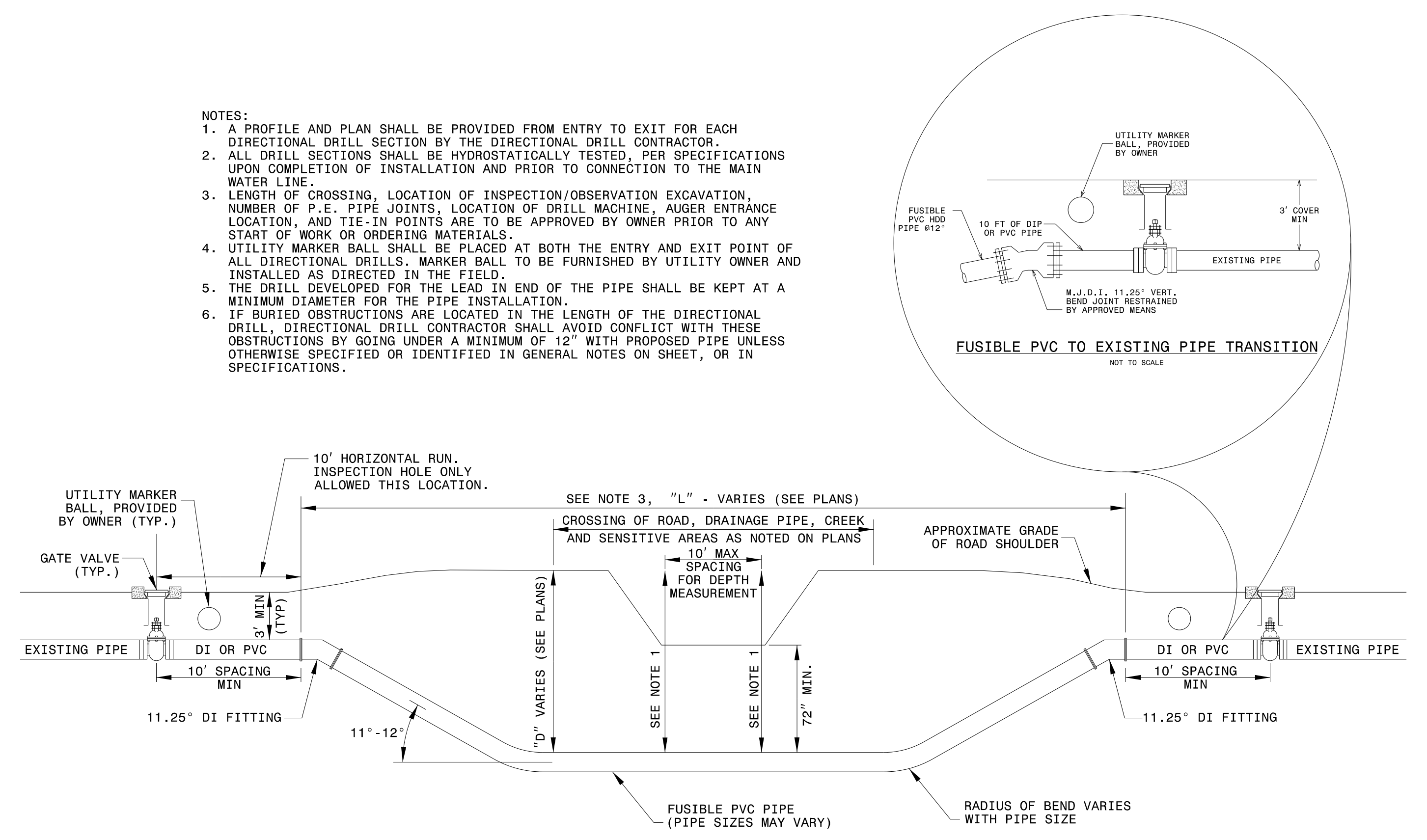
STANDARD VERTICAL BEND DETAIL
NOT TO SCALE

WATER BYPASS FOR DEEPLY BURIED WATER LINES
NOT TO SCALE

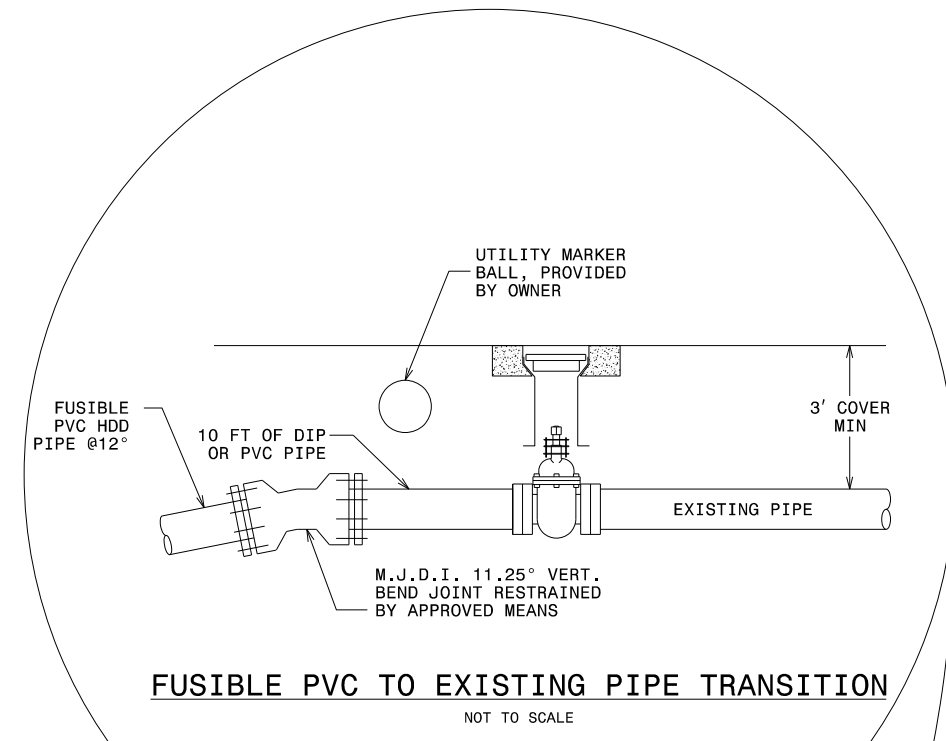


- NOTES:
- ONLY FULL 18" OR 20" JOINTS OF DUCTILE IRON PIPE SHALL BE USED ON EACH SIDE OF UPPER BENDS, UNLESS OTHERWISE APPROVED.
 - IF APPROVED FOR USE, RESTRAINING RODS SHALL BE STAINLESS STEEL OR GALVANIZED RODS WITH FIELD-APPLIED BITUMINOUS COATING.
 - PIPE UPSTREAM AND DOWNSTREAM OF UPPER BENDS, UNDER CREEK, AND BETWEEN UPPER BENDS TO BE RESTRAINED JOINT D.I.P.
 - THRUST AND GRAVITY BLOCKING NOT REQUIRED ON GRAVITY SEWER LINE.
 - EACH FITTING SHALL BE SECURED BY TWO FORMS OF RESTRAINT. RESTRAINING GLANDS AND CONCRETE THRUST BLOCKING ARE PREFERRED. WEDGE-ACTION RESTRAINT GLANDS (i.e. MEGALUGS) ARE APPROVED ONLY FOR USE ON DUCTILE IRON PIPE. FULL-CIRCUMFERENTIAL PIPE RESTRAINT GLANDS (i.e. GRIP RINGS) MAY BE USED ON PVC OR DUCTILE IRON PIPE. ALL RESTRAINT GLANDS SHALL BE SPECIFICALLY DESIGNED FOR USE ON THE TYPE OF PIPE FOR WHICH THEY ARE BEING INSTALLED. OTHER FORMS OF RESTRAINT SUCH AS THREADED ROD, BELL RESTRAINT, HARNESSSES, ETC. MAY BE APPROVED BY ONWASA ON A CASE-BY-CASE BASIS.

CULVERT CROSSING GREATER THAN 72" OF COVER
NOT TO SCALE



- NOTES:
- A PROFILE AND PLAN SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL DRILL SECTION BY THE DIRECTIONAL DRILL CONTRACTOR.
 - ALL DRILL SECTIONS SHALL BE HYDROSTATICALLY TESTED, PER SPECIFICATIONS UPON COMPLETION OF INSTALLATION AND PRIOR TO CONNECTION TO THE MAIN WATER LINE.
 - LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF P.E. PIPE JOINTS, LOCATION OF DRILL MACHINE, AUGER ENTRANCE LOCATION, AND TIE-IN POINTS ARE TO BE APPROVED BY OWNER PRIOR TO ANY START OF WORK OR ORDERING MATERIALS.
 - UTILITY MARKER BALL SHALL BE PLACED AT BOTH THE ENTRY AND EXIT POINT OF ALL DIRECTIONAL DRILLS. MARKER BALL TO BE FURNISHED BY UTILITY OWNER AND INSTALLED AS DIRECTED IN THE FIELD.
 - THE DRILL DEVELOPED FOR THE LEAD IN END OF THE PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION.
 - IF BURIED OBSTRUCTIONS ARE LOCATED IN THE LENGTH OF THE DIRECTIONAL DRILL, DIRECTIONAL DRILL CONTRACTOR SHALL AVOID CONFLICT WITH THESE OBSTRUCTIONS BY GOING UNDER A MINIMUM OF 12" WITH PROPOSED PIPE UNLESS OTHERWISE SPECIFIED OR IDENTIFIED IN GENERAL NOTES ON SHEET, OR IN SPECIFICATIONS.



FUSIBLE PVC TO EXISTING PIPE TRANSITION
NOT TO SCALE

WATER HORIZONTAL DIRECTIONAL DRILL PROFILE
NOT TO SCALE

4/15/2020
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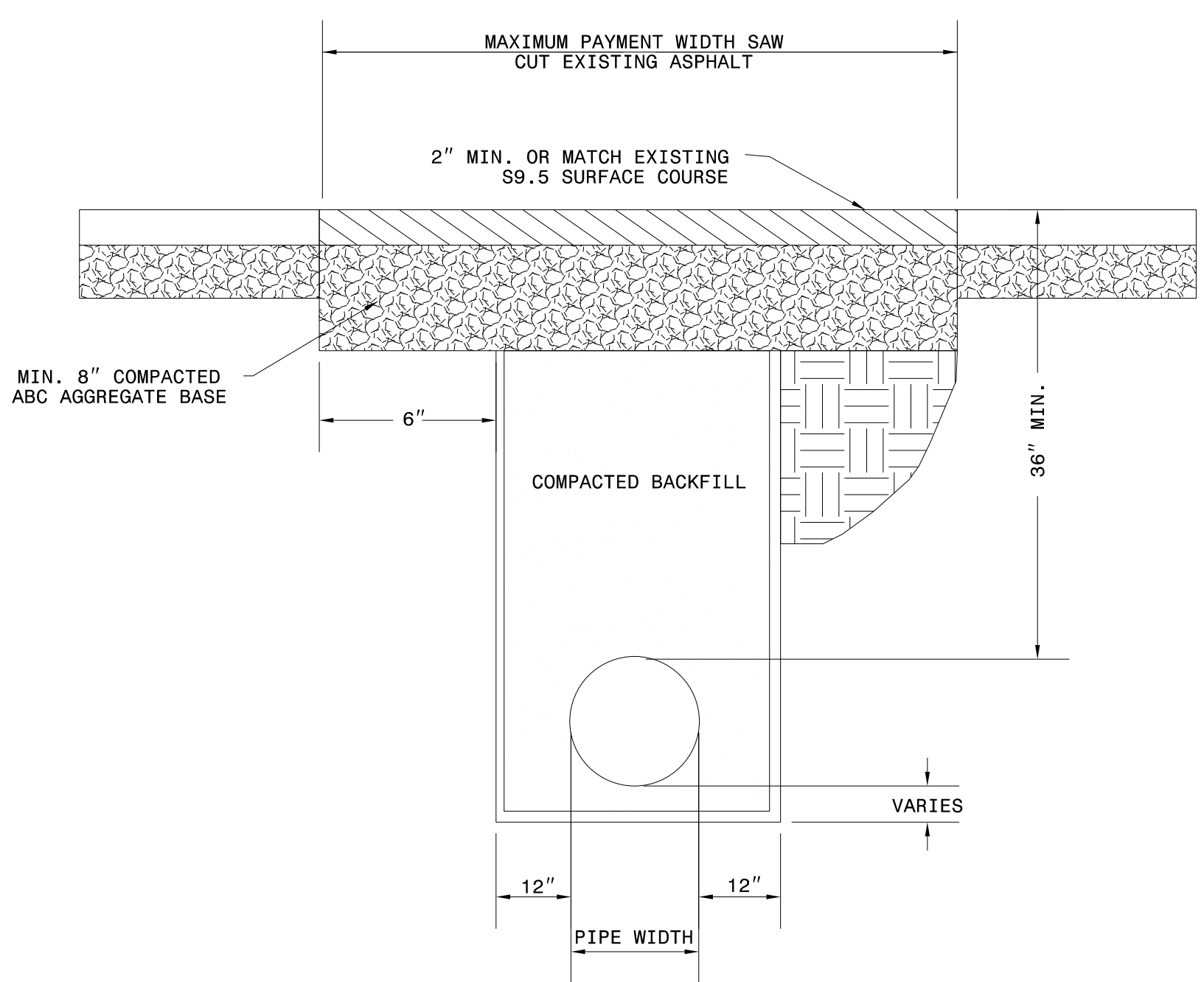
DETAILS APPLY TO BOTH UTILITY OWNERS

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-3C
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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UTILITY CONSTRUCTION

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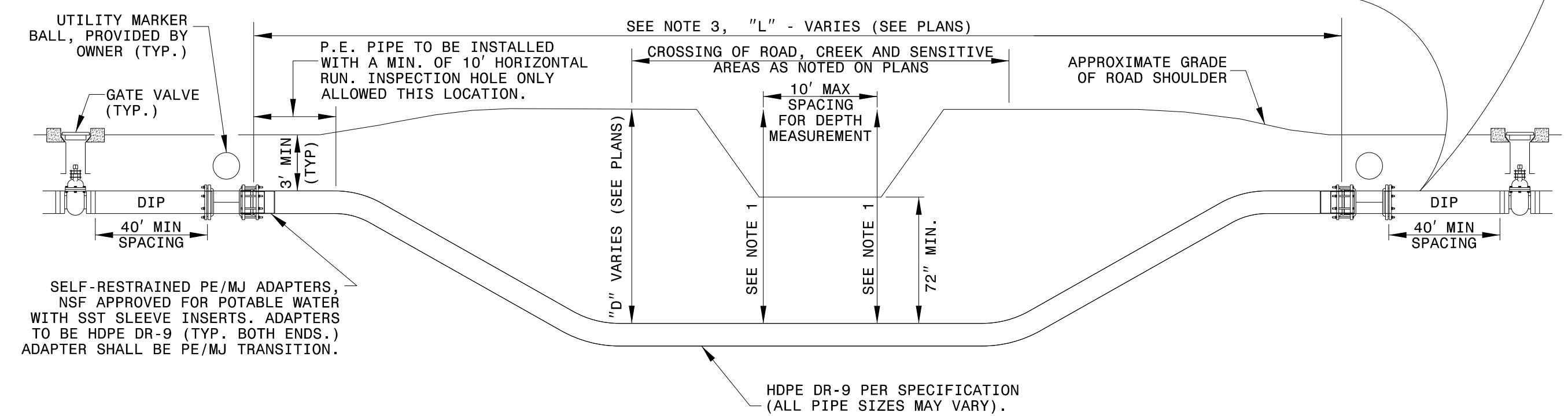
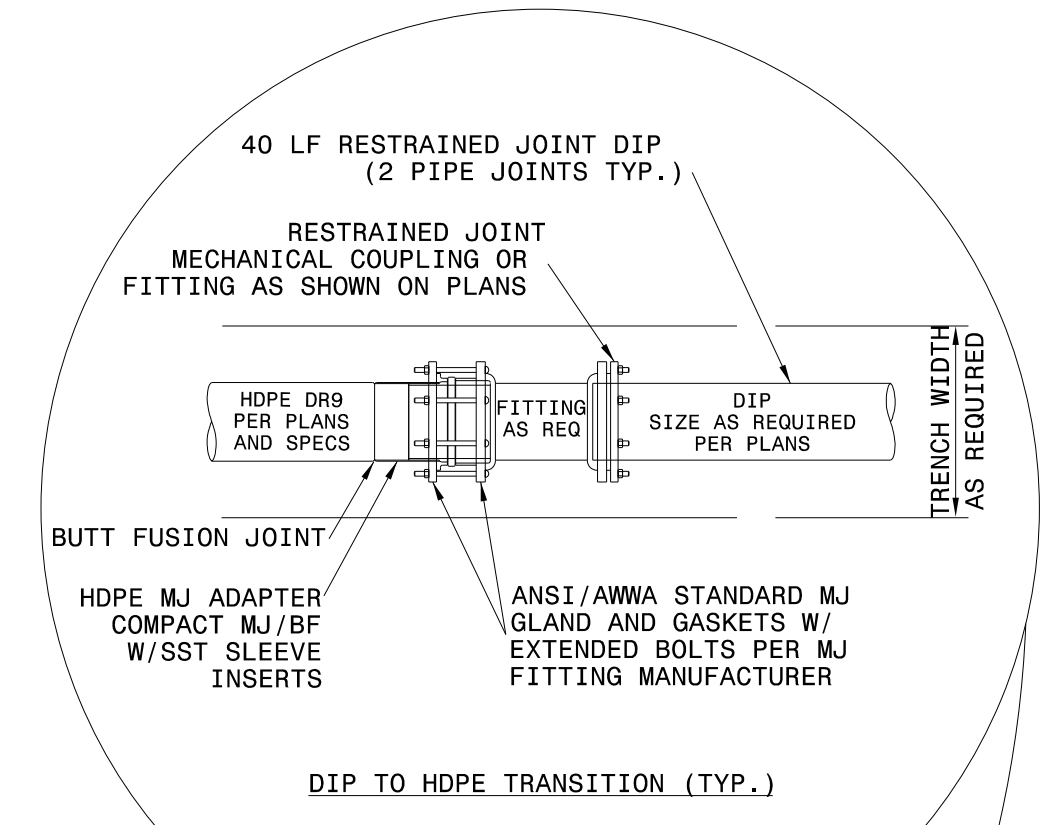
Weston & Sampson NC License: C-4647
 WSE of North Carolina, PC 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221



- NOTES:
1. THE PAVEMENT SHALL BE DEFINED BY A STRAIGHT EDGE, PREFERABLY A MACHINED SAW CUT.
 2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH DRY SOIL OR ABC STONE TO THE BOTTOM OF THE PROPOSED SUBGRADE. THE BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
 3. WITHIN ROADS MAINTAINED BY NCDOT, THE TRENCH SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH NCDOT STANDARDS.
 4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED.
 5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 2" THICK.
 6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY TO ACHIEVE A SMOOTH LEVEL PATCH.

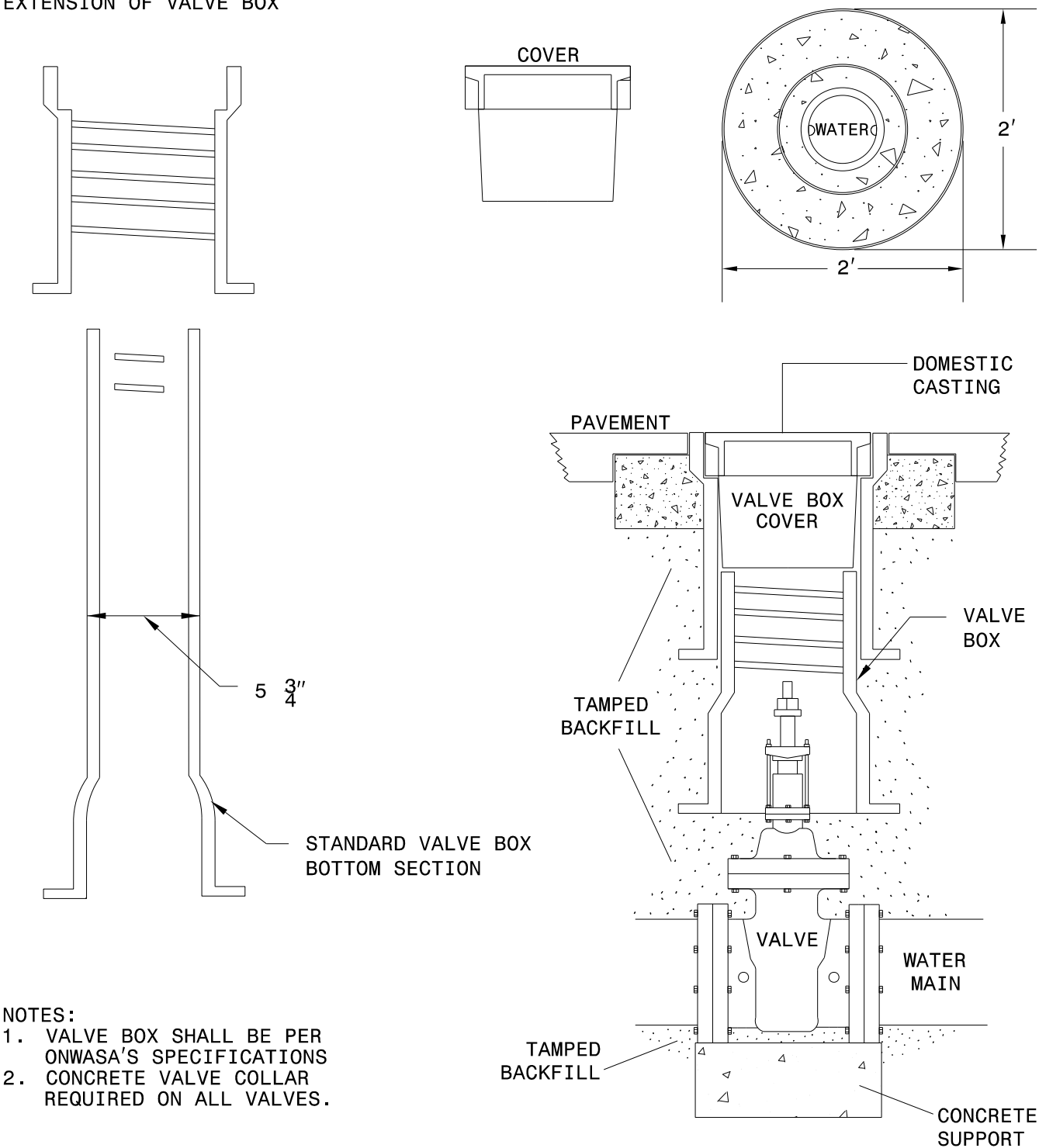
STANDARD PAVEMENT CUT AND PATCH DETAILS
NOT TO SCALE

- NOTES:
1. A PROFILE AND PLAN SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL DRILL SECTION BY THE DIRECTIONAL DRILL CONTRACTOR.
 2. ALL DRILL SECTIONS SHALL BE HYDROSTATICALLY TESTED, PER SPECIFICATIONS UPON COMPLETION OF INSTALLATION AND PRIOR TO CONNECTION TO THE FORCE MAIN.
 3. LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF P.E. PIPE JOINTS, LOCATION OF DRILL MACHINE, AUGER ENTRANCE LOCATION, AND TIE-IN POINTS ARE TO BE APPROVED BY OWNER PRIOR TO ANY START OF WORK OR ORDERING MATERIALS.
 4. UTILITY MARKER BALL SHALL BE PLACED AT BOTH THE ENTRY AND EXIT POINT OF ALL DIRECTIONAL DRILLS. MARKER BALL TO BE FURNISHED BY UTILITY OWNER AND INSTALLED AS DIRECTED IN THE FIELD.
 5. THE DRILL DEVELOPED FOR THE LEAD IN END OF THE PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION.
 6. IF BURIED OBSTRUCTIONS ARE LOCATED IN THE LENGTH OF THE DIRECTIONAL DRILL, DIRECTIONAL DRILL CONTRACTOR SHALL AVOID CONFLICT WITH THESE OBSTRUCTIONS BY GOING UNDER A MINIMUM OF 12" WITH PROPOSED PIPE UNLESS OTHERWISE SPECIFIED OR IDENTIFIED IN GENERAL NOTES ON SHEET, OR IN SPECIFICATIONS.



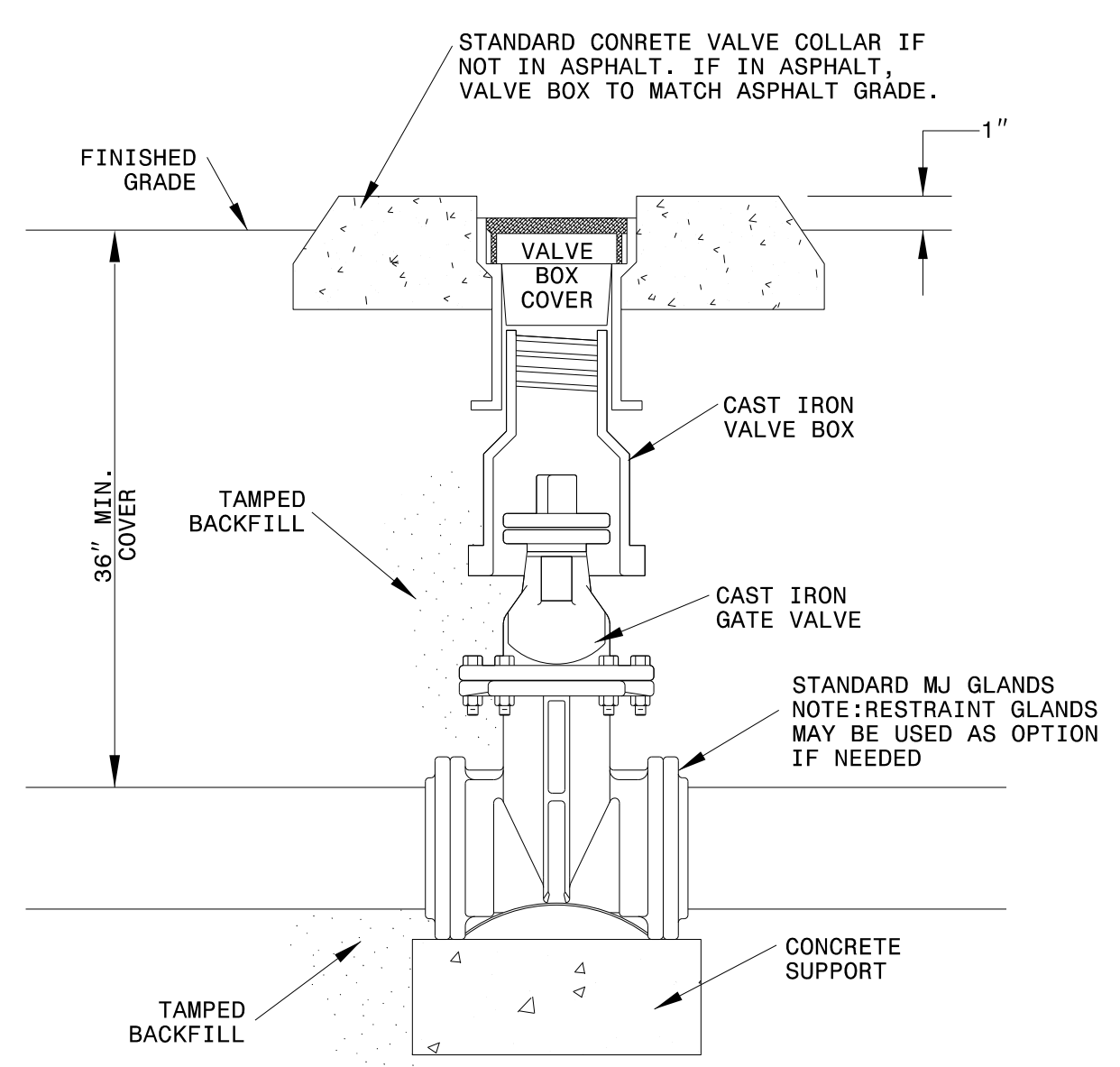
FORCE MAIN HORIZONTAL DIRECTIONAL DRILL
PROFILE
NOT TO SCALE

APPROVED METHOD FOR EXTENSION OF VALVE BOX

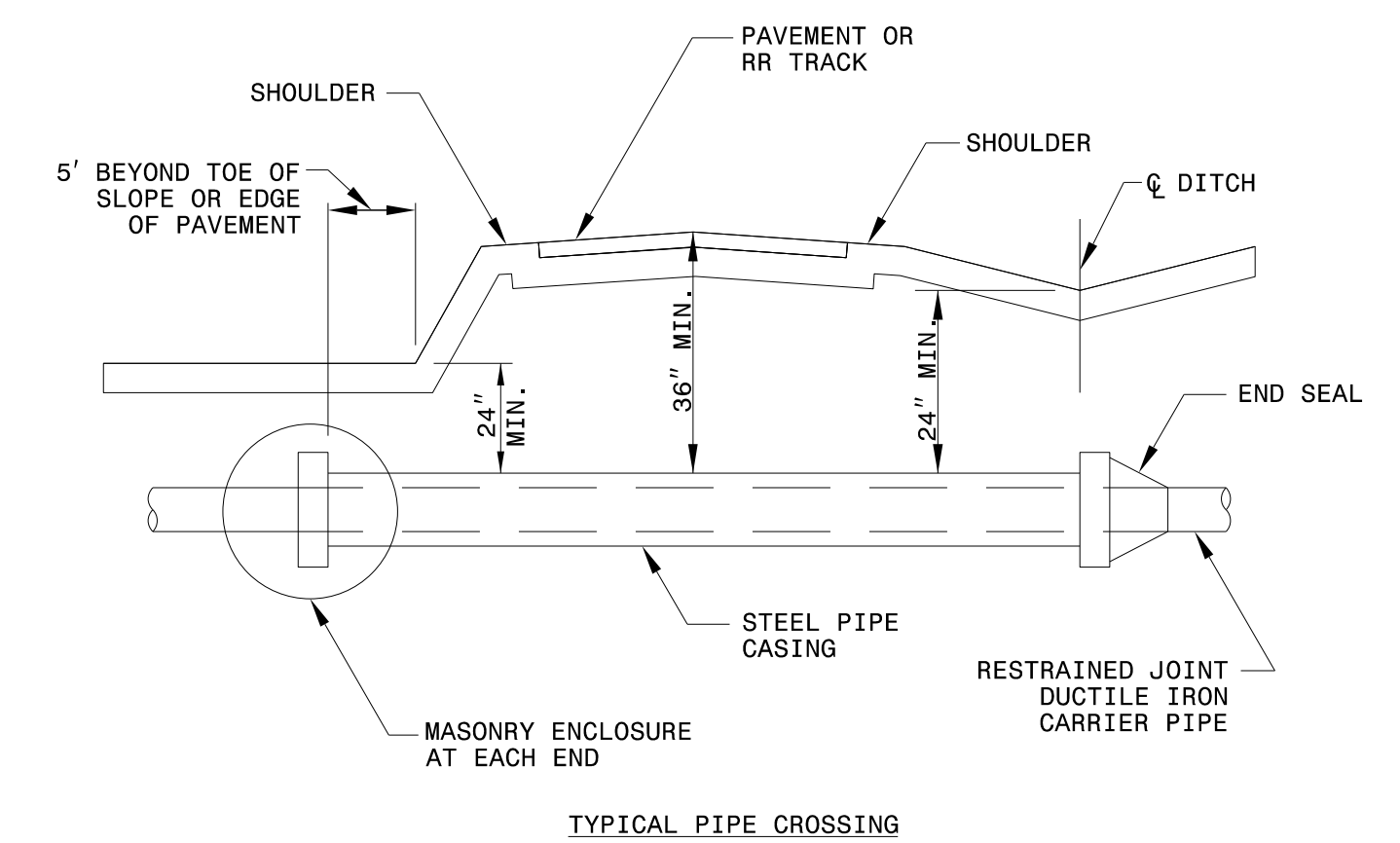


- NOTES:
1. VALVE BOX SHALL BE PER ONWASA'S SPECIFICATIONS
 2. CONCRETE VALVE COLLAR REQUIRED ON ALL VALVES.

VALVE BOX INSTALLATION
NOT TO SCALE



INLINE VALVE DETAIL
NOT TO SCALE



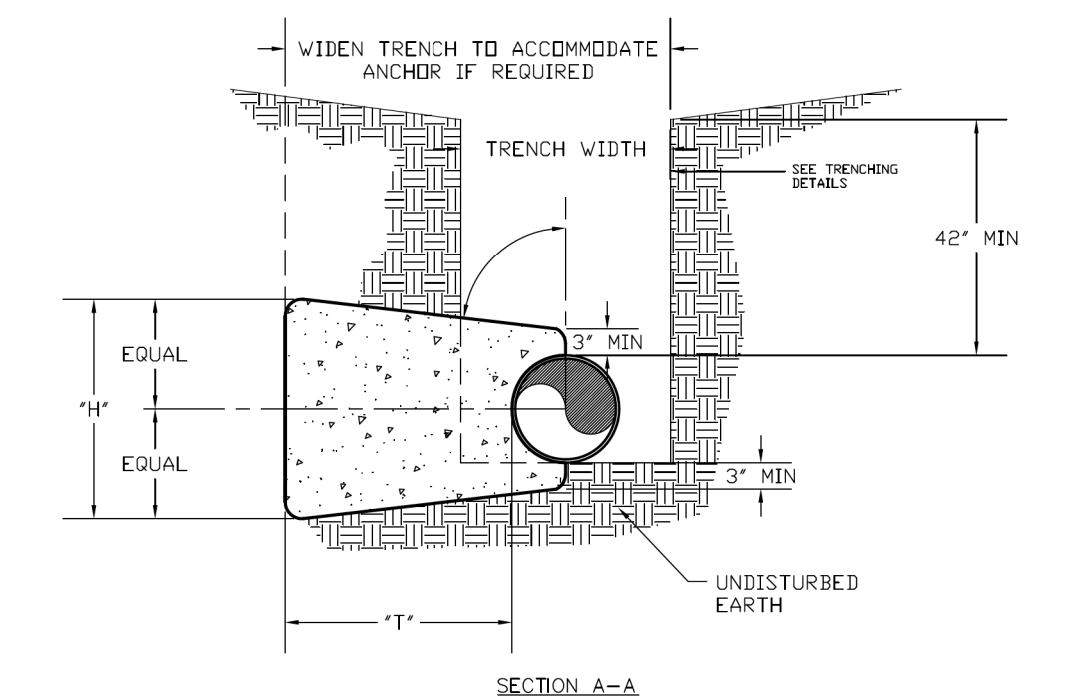
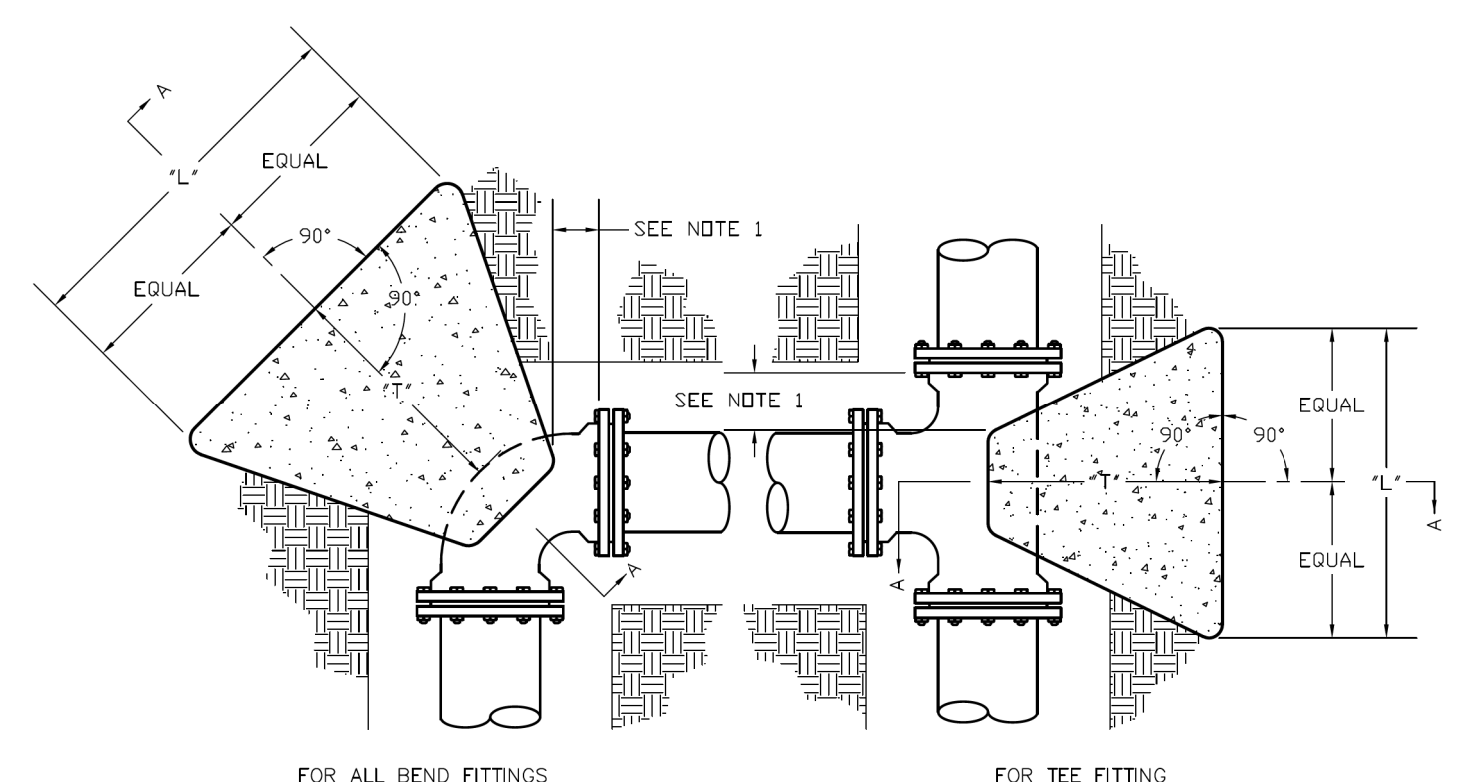
ENCASEMENTS SHALL EXTEND FROM DITCH LINE TO DITCH LINE IN CUT SECTIONS, FIVE (5) FEET BEYOND THE TOE OF SLOPES IN FILL SECTIONS, AND TEN (10) FEET BEYOND EDGE OF PAVEMENT IN SECTIONS WITH NO DITCH OR FILL AREA.

- NOTES:
1. STEEL ENCASMENT PIPE SHALL CONFORM TO THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
 2. CARRIER PIPE SHALL BE ADEQUATELY SUPPORTED THE ENTIRE LENGTH WITHIN THE CASING BY USING SPACERS OR "SPIDER" STEEL SUPPORTS AT A MAXIMUM OF 9 FOOT CENTERS (ONE AT EACH JOINT AND ONE INTERMEDIATE). OTHER METHODS MUST MEET APPROVAL OF THE ENGINEER.

DRY BORE AND JACK PIPE ENCASMENT
NOT TO SCALE

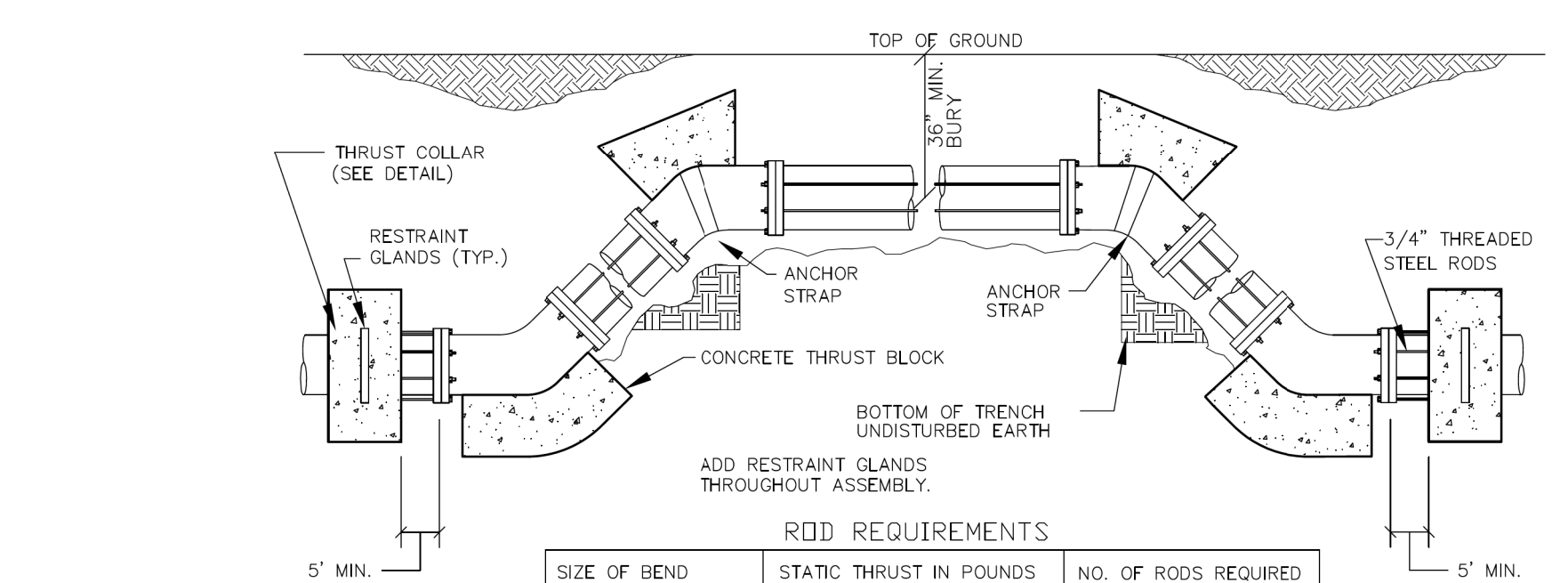
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DETAILS APPLY TO ONWASA FACILITIES



- NOTES:
1. CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
 2. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
 3. CONCRETE TO BE MINIMUM 3,000 PSI @ 28 DAYS.
 4. WHEN SACKCRETE IS TO BE USED, IT SHALL BE PROPERLY MIXED PER MANUFACTURER SPECIFICATIONS.

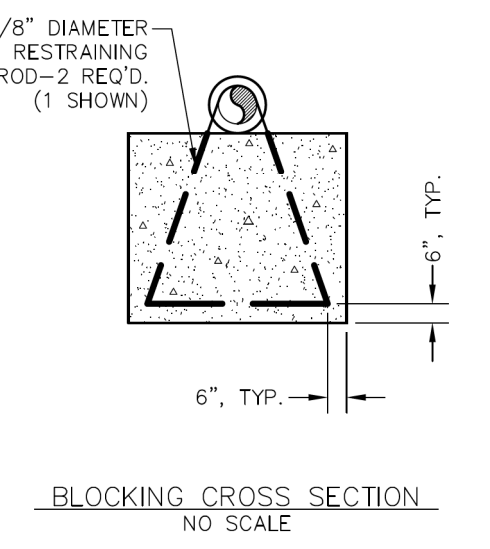
THRUST BLOCKING
NOT TO SCALE



ROD REQUIREMENTS		
SIZE OF BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	4
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

- GENERAL NOTES:
1. ALL FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CONCRETE FROM CONTACTING FITTINGS, BOLTS, OR ENDS OF MECHANICAL JOINT BENDS.
 2. EACH FITTING SHALL BE SECURED BY TWO FORMS OF RESTRAINT: RESTRAINT GLANDS AND CONCRETE THRUST BLOCKING ARE PREFERRED. WEDGE-ACTION RESTRAINT GLANDS (I.E. MEGALUGS) ARE APPROVED ONLY FOR USE ON DUCTILE IRON PIPE. FULL-CIRCUMFERENTIAL PIPE RESTRAINT GLANDS (I.E. GRIP RINGS) MAY BE USED ON PVC OR DUCTILE IRON PIPE. ALL RESTRAINT GLANDS SHALL BE SPECIFICALLY DESIGNED FOR USE ON THE TYPE OF PIPE FOR WHICH THEY ARE BEING INSTALLED. OTHER FORMS OF RESTRAINT SUCH AS THREADED ROD, BELL RESTRAINT HARNESSSES, ETC. MAY BE APPROVED BY ONWASA ON A CASE-BY-CASE BASIS.
 3. IF APPROVED FOR USE BY ONWASA, STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
 4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.

THRUST BLOCKING
NOT TO SCALE



TEST PRESSURE = 150 PSI

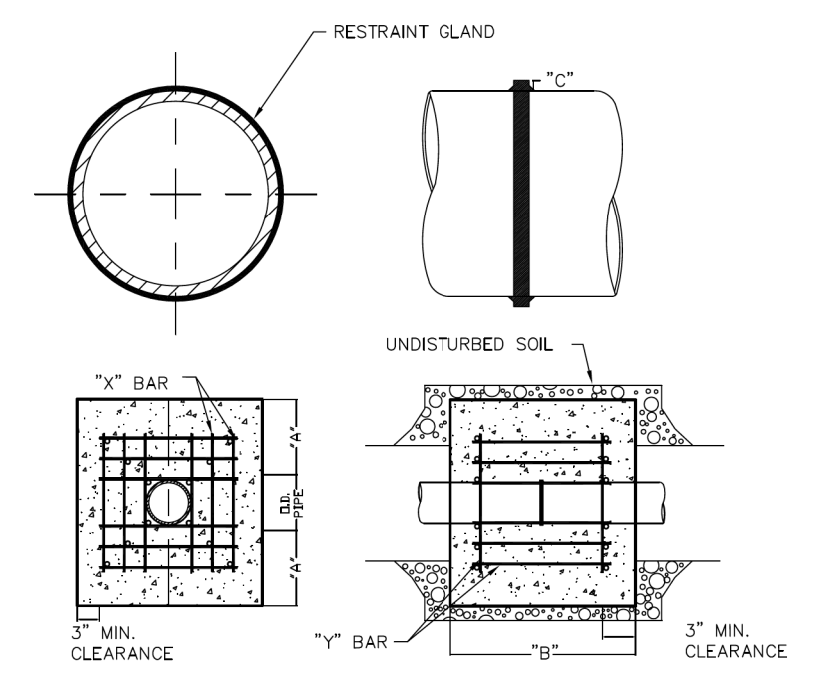
PIPE SIZE	TYPE FITTING	DIMENSIONS (FT)			VOLUME CONCRETE CU. YD.
		L*	H*	T*	
4 INCHES	11 1/4"	----	----	----	----
	22 1/2"	1.00	1.00	1.50	0.06
	45"	1.00	1.00	1.50	0.06
	90"	1.00	1.00	2.50	0.09
TEE		1.00	1.00	2.00	0.07
6 INCHES	11 1/4"	1.00	1.00	2.50	0.09
	22 1/2"	1.00	1.00	2.50	0.09
	45"	1.00	1.00	2.50	0.09
	90"	1.50	1.50	2.50	0.15
TEE		1.50	1.50	2.00	0.12
8 INCHES	11 1/4"	1.50	1.50	2.50	0.15
	22 1/2"	1.50	1.50	2.50	0.15
	45"	1.50	1.50	2.50	0.15
	90"	2.00	2.00	3.00	0.28
TEE		2.00	2.00	2.50	0.23
12 INCHES	11 1/4"	2.00	2.00	2.50	0.23
	22 1/2"	2.00	2.00	2.50	0.23
	45"	2.00	2.00	2.75	0.25
	90"	3.00	3.00	3.00	0.39
TEE		3.00	2.00	2.50	0.32
16 INCHES	11 1/4"	2.00	2.00	3.00	0.28
	22 1/2"	3.00	2.00	3.00	0.39
	45"	4.00	3.00	3.50	0.84
	90"	6.50	3.50	3.50	1.54
TEE		6.50	3.50	3.00	1.32

TEST PRESSURE = 200 PSI

PIPE SIZE	TYPE FITTING	DIMENSIONS (FT)			VOLUME CONCRETE CU. YD.
		L*	H*	T*	
4 INCHES	11 1/4"	1.00	1.00	1.00	0.04
	22 1/2"	1.00	1.00	1.50	0.06
	45"	1.00	1.00	1.50	0.06
	90"	1.50	1.50	2.50	0.15
TEE		1.50	1.50	2.00	0.12
6 INCHES	11 1/4"	1.00	1.00	2.50	0.09
	22 1/2"	1.00	1.00	2.50	0.09
	45"	1.50	1.50	2.50	0.15
	90"	1.50	1.50	2.50	0.15
TEE		1.50	1.50	2.00	0.12
8 INCHES	11 1/4"	1.50	1.50	2.50	0.15
	22 1/2"	1.50	1.50	2.50	0.15
	45"	1.50	1.50	2.50	0.15
	90"	2.50	2.00	3.00	0.33
TEE		2.50	2.00	2.50	0.28
12 INCHES	11 1/4"	2.00	2.00	2.50	0.23
	22 1/2"	2.00	2.00	2.50	0.23
	45"	2.00	2.00	2.75	0.23
	90"	3.00	3.00	3.00	0.39
TEE		3.00	2.00	2.50	0.42
16 INCHES	11 1/4"	2.00	2.00	3.00	0.28
	22 1/2"	3.00	2.00	3.00	0.39
	45"	5.50	3.00	3.50	1.13
	90"	7.50	4.00	3.50	2.01
TEE		7.50	4.00	3.00	1.72

- CHART NOTES:
1. IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
 2. BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
 - a. BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL
 - b. SOIL BEARING PRESSURE = 2000 PSF
 - c. VELOCITY OF FLOW = 15 FPS
 3. THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
 4. NEITHER THE HEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION, THEREFORE, BLOCKING SIZE IS CONSERVATIVE.

THRUST BLOCKING
NOT TO SCALE



I.D. PIPE	REBAR SIZE	REINFORCING REQUIREMENTS				NO. REQUIRED
		"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	
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

I.D. PIPE	THRUST COLLAR, AND THRUST SCHEDULE				
	"A"	"B"	"C"=6"-16", 20"-24", 30"-36", 48"		
6" - 36"	1'-4"	1'-7"	2"	3"	4"
48" & greater	1'-8"	1'-9"			6"

- 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 EMBEDMENT DETAIL.
 4. BACKFILL TAMPED IN 6" LIFTS PER STANDARD EMBEDMENT DETAIL.

THRUST BLOCKING
NOT TO SCALE

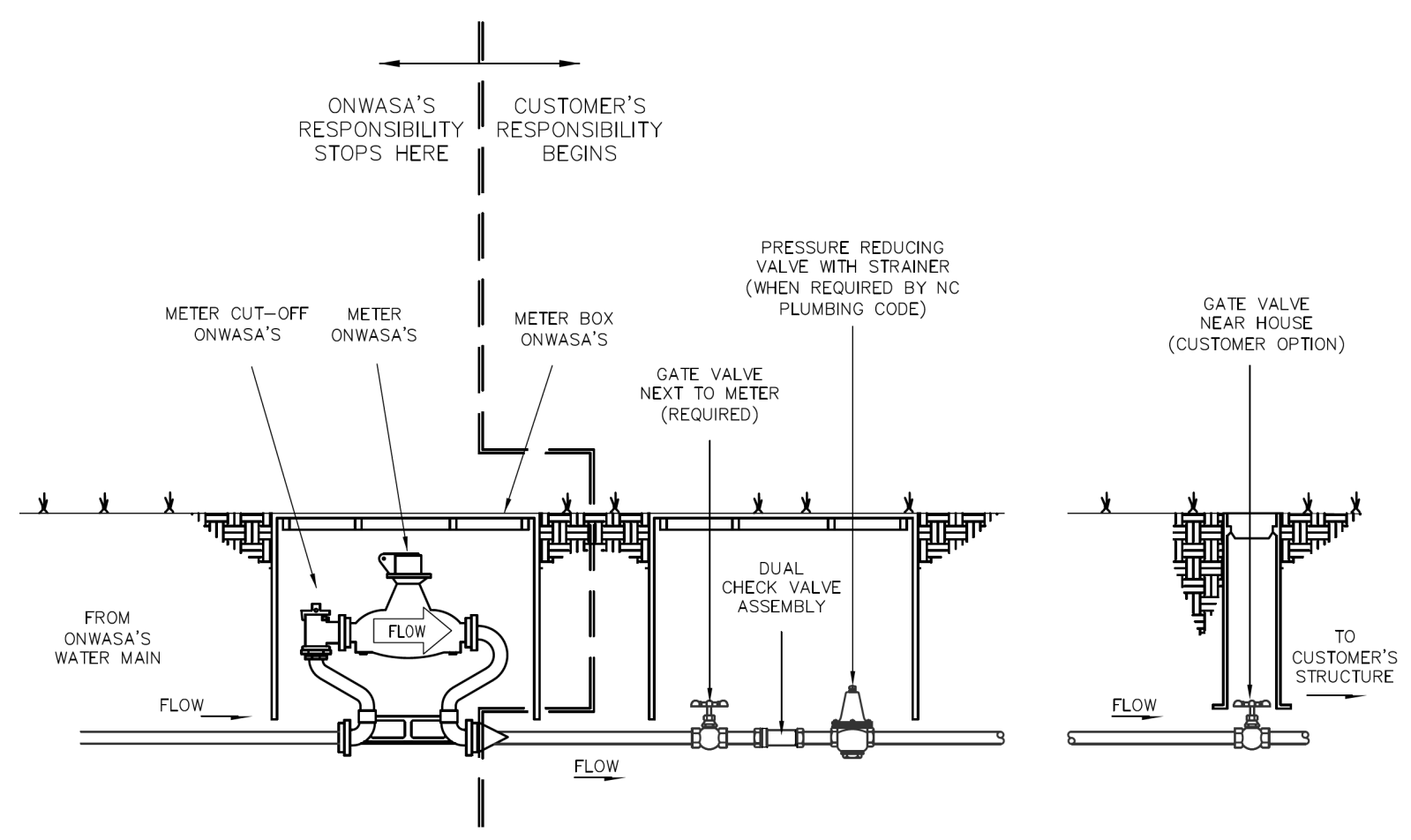
PROJECT REFERENCE NO. U-4906	SHEET NO. UC-3D
DESIGNED BY: SHF	
DRAWN BY: SHF	
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UTILITY CONSTRUCTION

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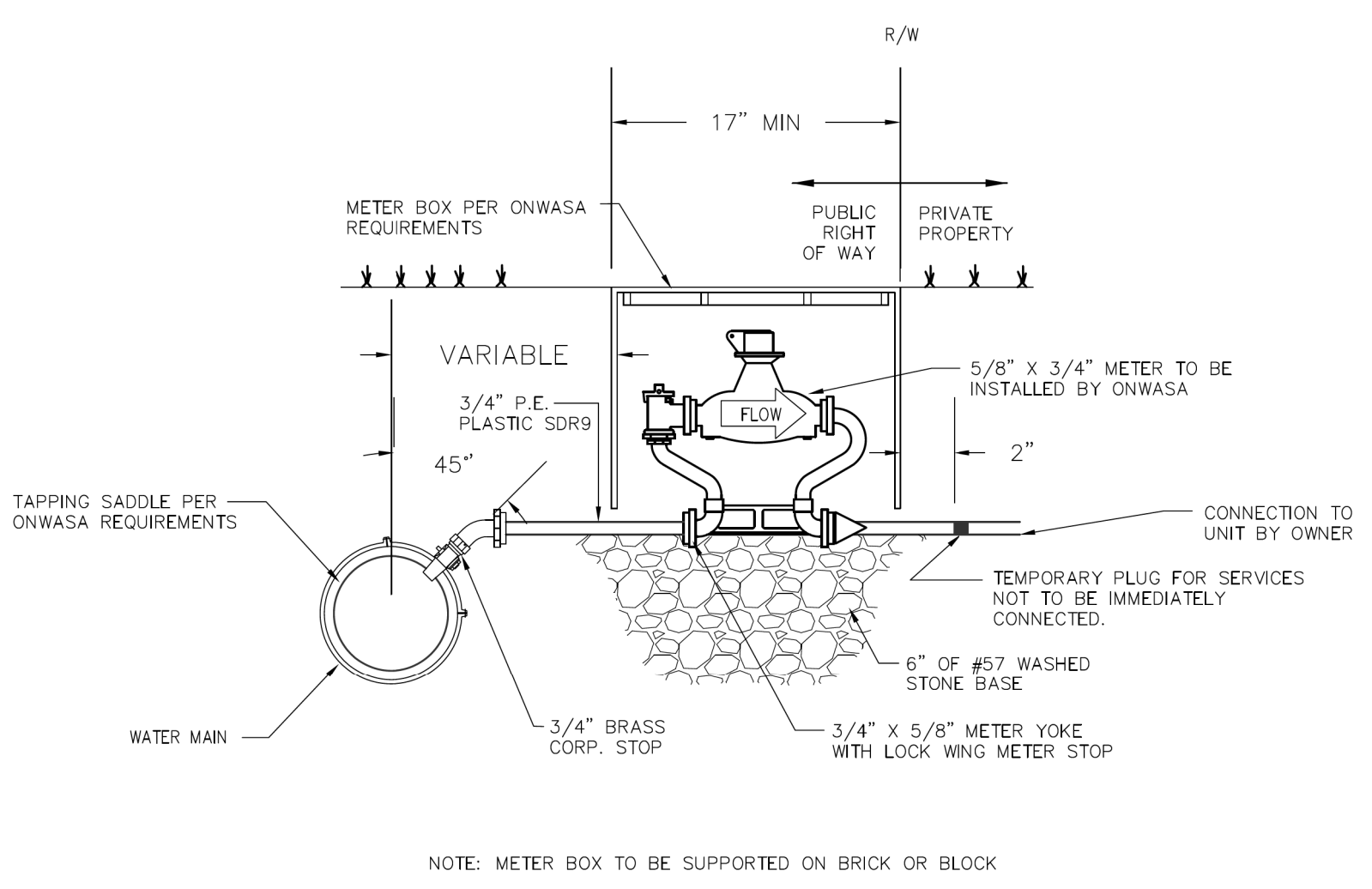


North Carolina Plumbing Code Section 608 requires a gate valve, backflow prevention and a pressure reducing valve on all connections with the Public Water Supply.

1. A gate valve and a pressure reducing valve **MUST** be installed directly behind the meter (see diagram above).
2. An additional gate valve located near the house is recommended, but not required.
3. All materials shall be pressure rated to one hundred-fifty (150 psi).
4. The water meter will be locked upon installation. Please contact the Onslow Water and Sewer Authority (ONWASA) twenty-four (24) hours in advance to schedule the inspection of the valves.
5. All valves **MUST** be installed prior to unlocking the meter.

Meter Placement Note:
Place the blue flag approximately thirty (30) feet from the center of the road Utility Right of Way for proper placement of ONWASA's water meter. All efforts will be made to install the meter where it is marked; however, ONWASA reserves the right to place the meter in the most feasible location to all parties involved. If the blue flag is not placed in a feasible location, it may result in a delay of installation.

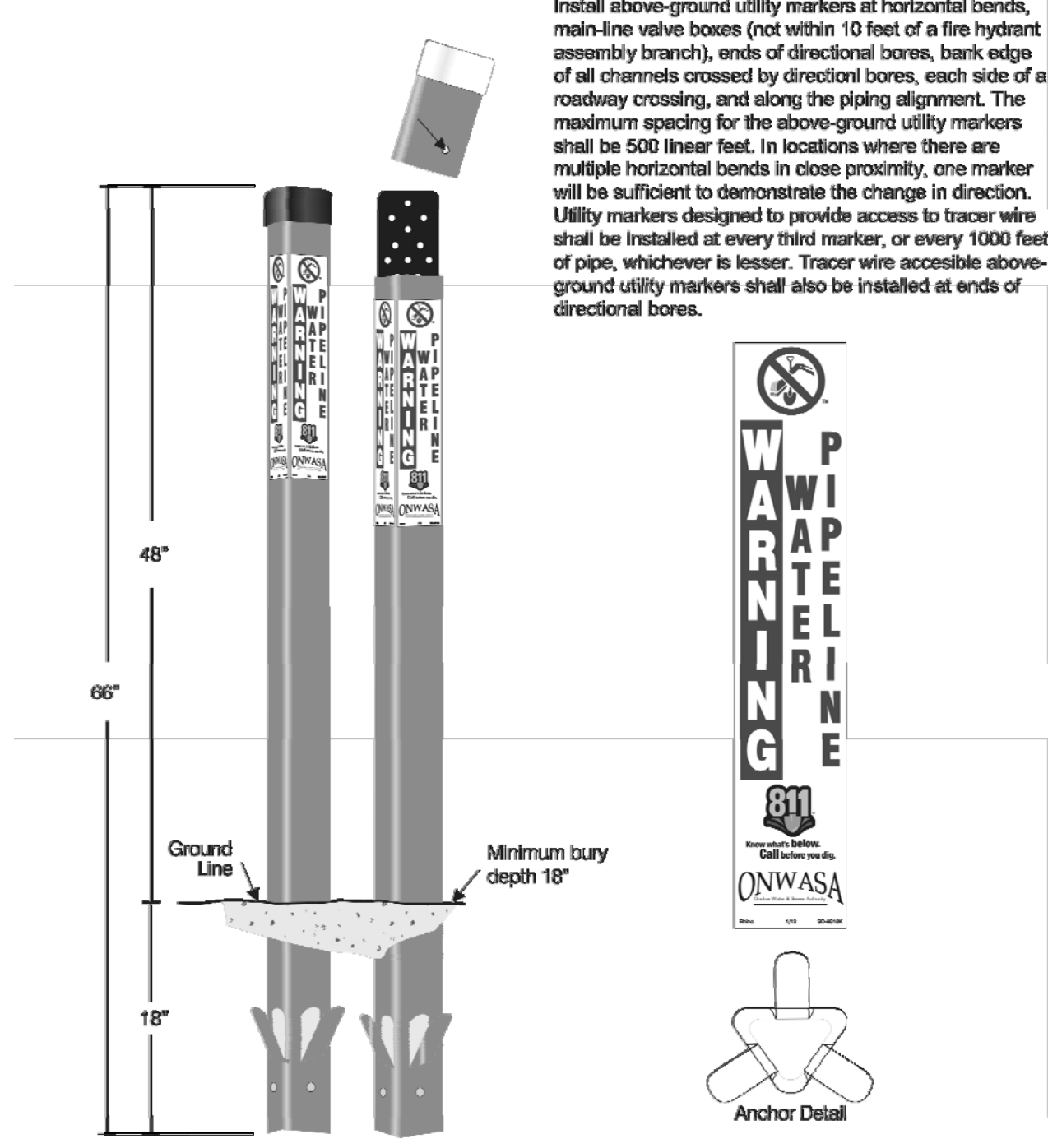
3/4" TO 1" METER INSTALLATION
NOT TO SCALE



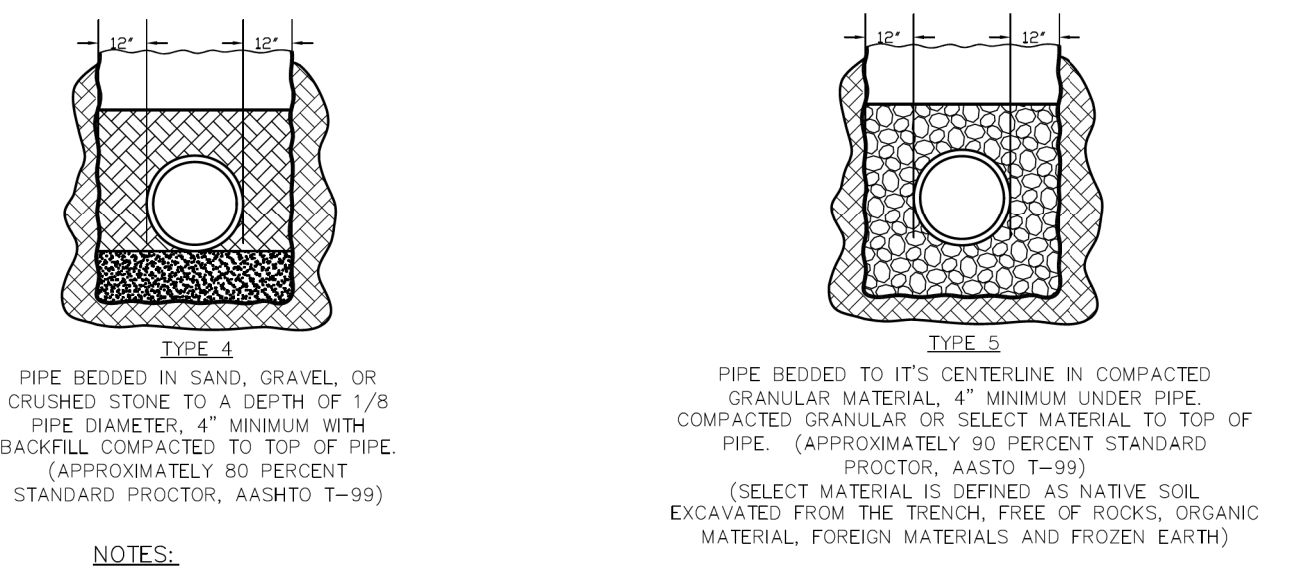
3/4" TO 1" SERVICE CONNECTION AND METER
NOTE: METER BOX TO BE SUPPORTED ON BRICK OR BLOCK
NOT TO SCALE

Parts List
 1 - Rhino # TVF86UB - Rhino TriView Flex™, 66" Blue with Black Cap OR
 1 - Rhino # TVT86UW2 - Rhino TriView™ Teet Station, 66", 2 Inside Terminals, Blue with White Cap
 1 - Cap Lock - TS-LOOK for Teet Stations
 3 - Decal # SD-8516K Custom Decals

NOTES:
 The TriGrip Anchor Flaps™ shall be extended prior to burial of the post. Soil shall be compacted during placement of marker post.
 All materials shall be provided by Rhino Marking & Protection Systems, Inc.

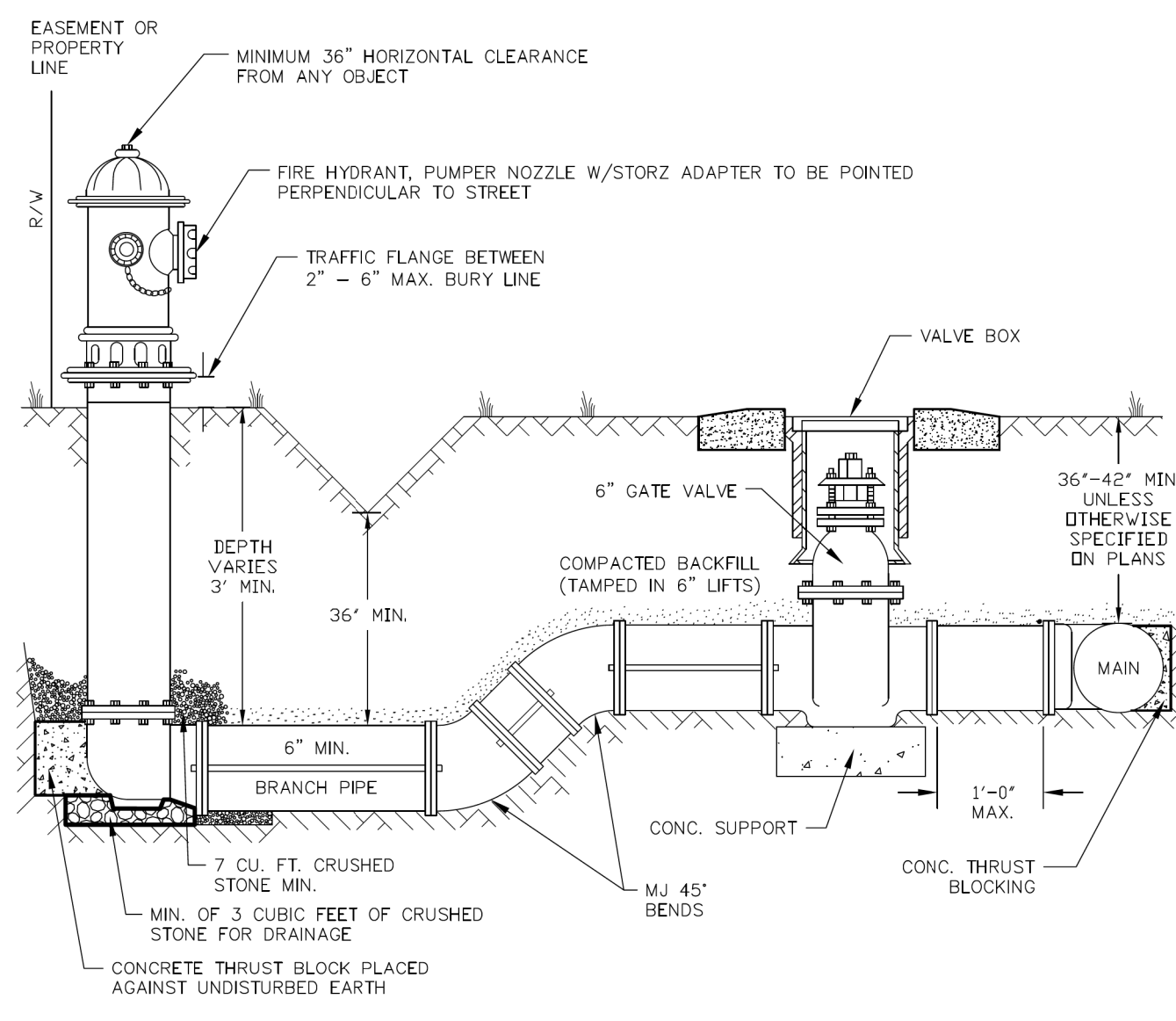


STANDARD UTILITY MARKER FOR WATER MAIN
NOT TO SCALE



NOTES:
 1. FOR NORMAL PIPE SIZES 14 INCH AND LARGER, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE 1.
 2. CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

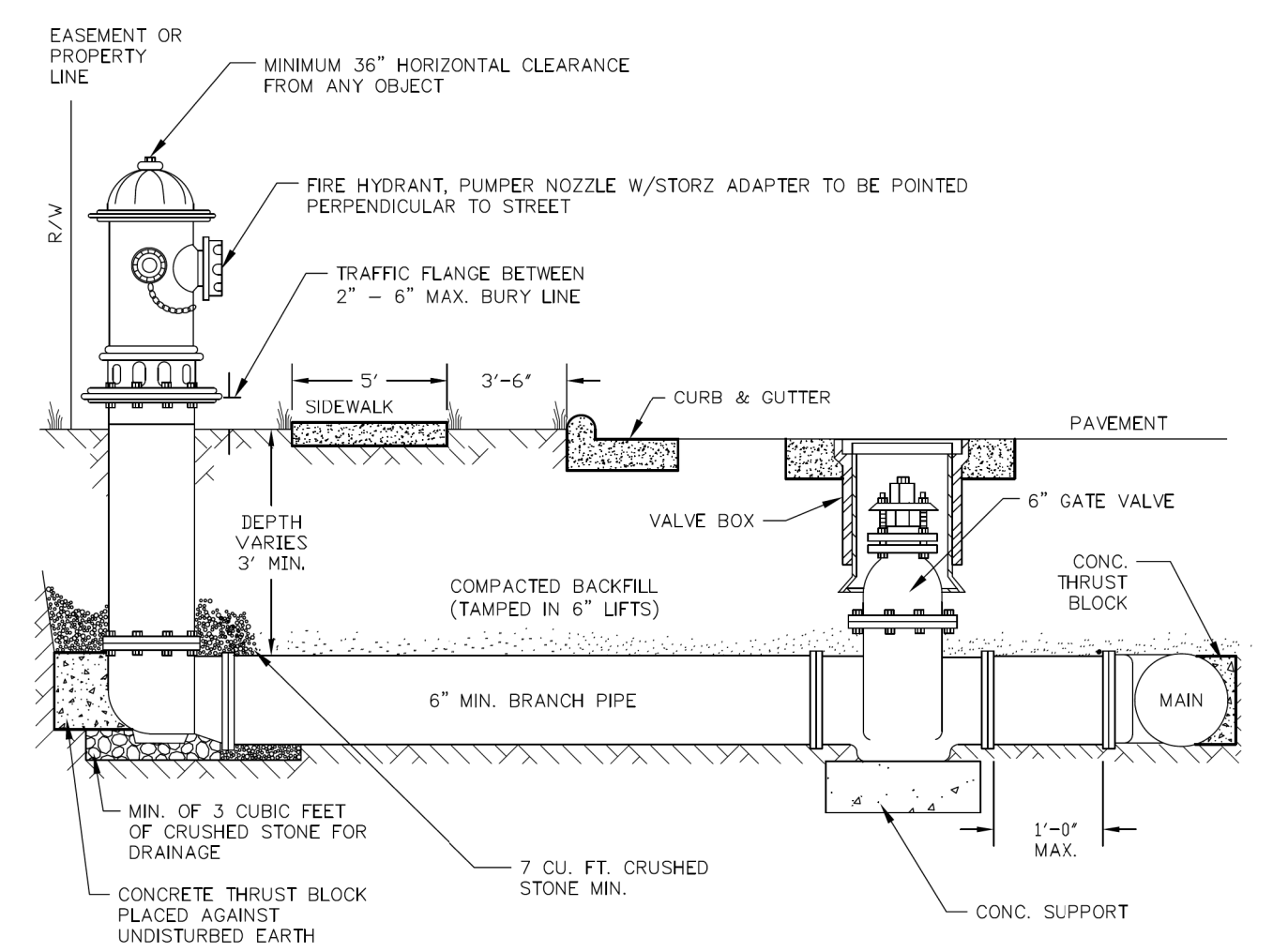
WATER MAIN EMBEDMENT DETAILS
NOT TO SCALE



NOTES:
 1. FIRE HYDRANT MANUFACTURER SHALL BE AS REQUIRED BY PROJECT SPECIFICATIONS.
 2. FIRE HYDRANT SHALL BE INSTALLED USING HYDRANT TEE.
 3. BRANCH PIPE SHALL BE DUCTILE IRON.
 4. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
 5. ALL JOINTS ON FIRE HYDRANT ASSEMBLIES SHALL BE RESTRAINED.
 6. ALL FIRE HYDRANTS SHALL BE LOCATED WITHIN DEDICATED STREET RIGHT-OF-WAY OR A 20-FOOT PUBLICLY DEDICATED PERMANENT UTILITY EASEMENT TO ONWASA.
 7. INSTALL BOLLARD GUARD POST AS PER DRAWINGS OR CONDITIONS MANDATE.
 8. HYDRANT SHALL NOT BE INSTALLED SO THAT THE FINISHED ELEVATION OF SURROUNDING AREA (INCLUDING LANDSCAPING, MULCH, GRAVEL, ETC.) IS ABOVE THE MAXIMUM BURY LINE OF THE HYDRANT.
 9. MAXIMUM PERMISSIBLE EXTENSION LENGTH IS 2- FEET.
 10. IF HYDRANT LEG IS LESS THAN 10- FEET LONG, THE HYDRANT SHALL BE RODDED BACK TO THE VALVE.

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

FIRE HYDRANT ASSEMBLY SHOULDER/DITCH SECTION
NOT TO SCALE



NOTES:
 1. FIRE HYDRANT MANUFACTURER SHALL BE AS REQUIRED BY PROJECT SPECIFICATIONS.
 2. FIRE HYDRANT SHALL BE INSTALLED USING HYDRANT TEE.
 3. BRANCH PIPE SHALL BE DUCTILE IRON.
 4. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
 5. ALL JOINTS ON FIRE HYDRANT ASSEMBLIES SHALL BE RESTRAINED.
 6. ALL FIRE HYDRANTS SHALL BE LOCATED WITHIN DEDICATED STREET RIGHT-OF-WAY OR A 20-FOOT PUBLICLY DEDICATED PERMANENT UTILITY EASEMENT TO ONWASA.
 7. INSTALL BOLLARD GUARD POST AS PER DRAWINGS OR CONDITIONS MANDATE.
 8. HYDRANT SHALL NOT BE INSTALLED SO THAT THE FINISHED ELEVATION OF SURROUNDING AREA (INCLUDING LANDSCAPING, MULCH, GRAVEL, ETC.) IS ABOVE THE MAXIMUM BURY LINE OF THE HYDRANT.
 9. MAXIMUM PERMISSIBLE EXTENSION LENGTH IS 2- FEET.
 10. IF HYDRANT LEG IS LESS THAN 10- FEET LONG, THE HYDRANT SHALL BE RODDED BACK TO THE VALVE.

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

FIRE HYDRANT ASSEMBLY CURB AND GUTTER SECTION
NOT TO SCALE

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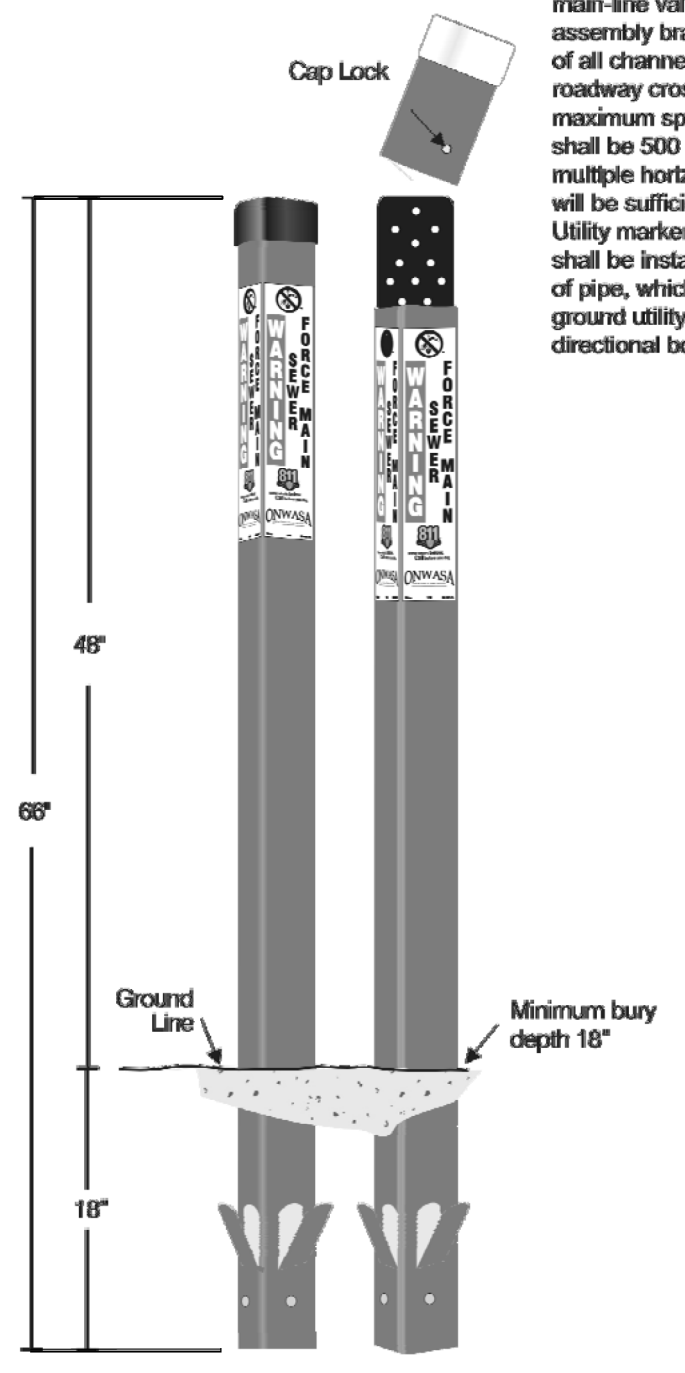
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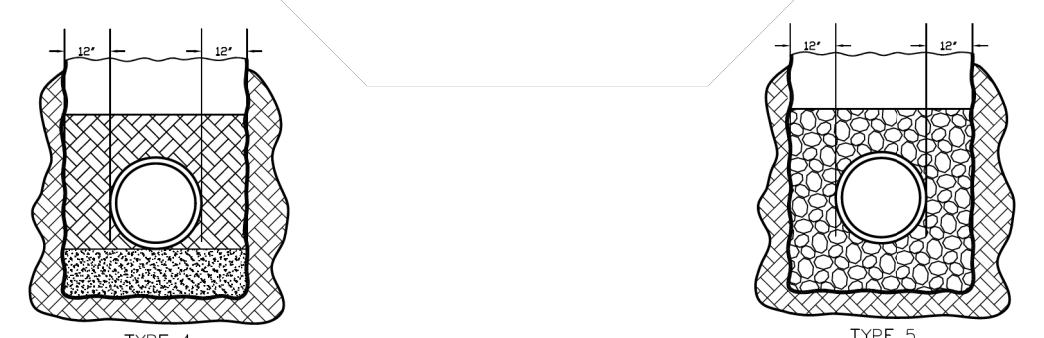
Weston & Sampson NC License: C-4647
 WSE of North Carolina, PC 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221

- Parts List**
- 1 - Rhino # TVF66GB - Rhino TriView Flex™, 66" Green with Black Cap OR
 - 1 - Rhino # TVT66GW2 - Rhino TriView™ Test Station, 66", 2 Inside Terminals, Green with White Cap
 - 1 - Cap Lock - TS-LOCK for Test Stations
 - 3 - Decal # SD-8517K Custom Decals

NOTES:
 The TriGrip Anchor Flaps™ shall be extended prior to burial of the post. Soil shall be compacted during placement of marker post.
 All materials shall be provided by Rhino Marking & Protection Systems, Inc.
 Install above-ground utility markers at horizontal bends, main-line valve boxes (not within 10 feet of a fire hydrant assembly branch), ends of directional bores, bank edge of all channels crossed by directional bores, each side of a roadway crossing, and along the piping alignment. The maximum spacing for the above-ground utility markers shall be 500 linear feet. In locations where there are multiple horizontal bends in close proximity, one marker will be sufficient to demonstrate the change in direction. Utility markers designed to provide access to tracer wire shall be installed at every third marker, or every 1000 feet of pipe, whichever is lesser. Tracer wire accessible above-ground utility markers shall also be installed at ends of directional bores.



STANDARD UTILITY MARKER FOR SEWER FORCE MAIN
NOT TO SCALE

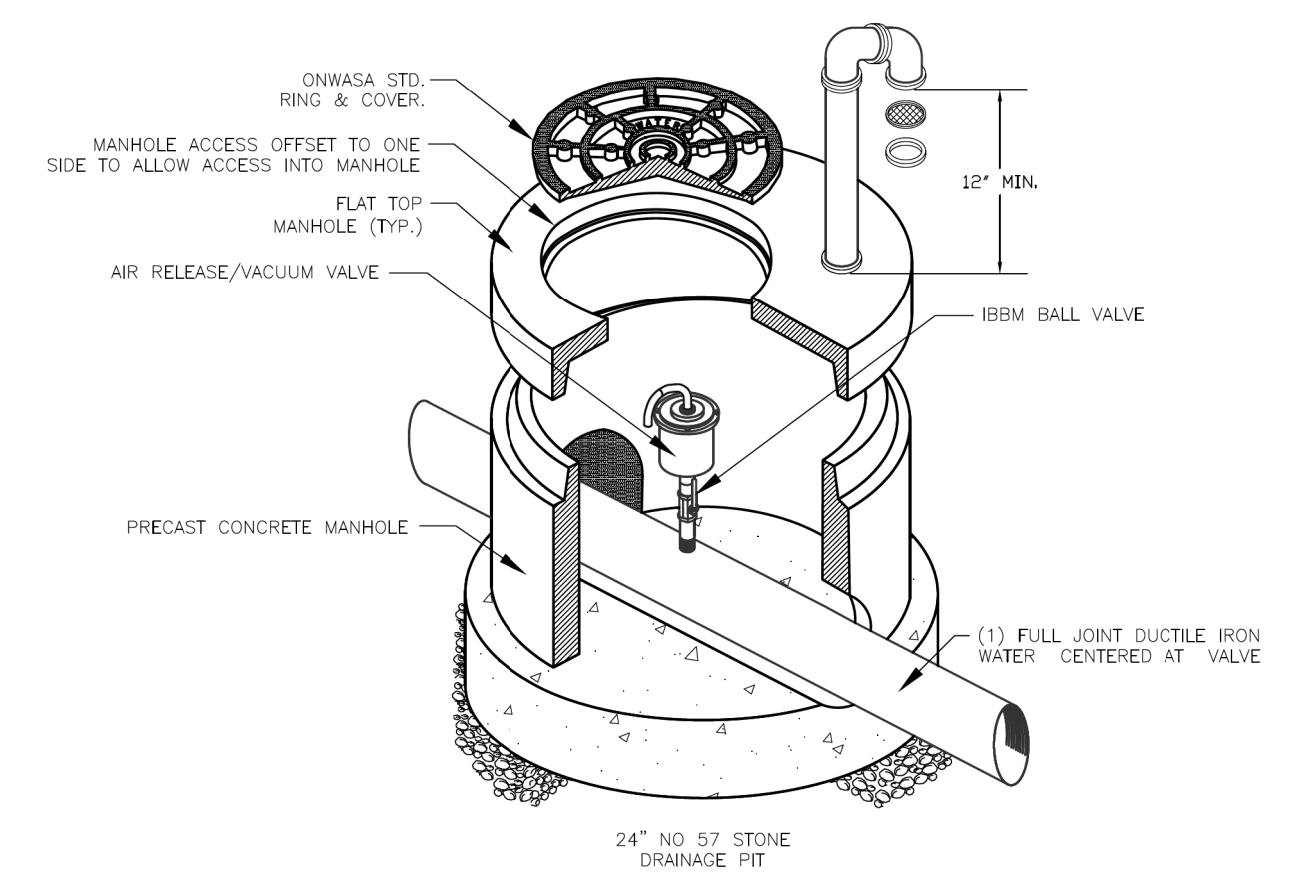


TYPE 4
 PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF 1/8 PIPE DIAMETER, 4" MINIMUM WITH BACKFILL COMPACTED TO TOP OF PIPE
 (APPROXIMATELY 80 PERCENT STANDARD PROCTOR, AASHTO T-99)

TYPE 5
 PIPE BEDDED TO ITS CENTERLINE IN COMPACTED GRANULAR MATERIAL, 4" MINIMUM UNDER PIPE. COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE.
 (APPROXIMATELY 90 PERCENT STANDARD PROCTOR, AASHTO T-99)
 (SELECT MATERIAL IS DEFINED AS NATIVE SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, ORGANIC MATERIAL, FOREIGN MATERIALS AND FROZEN EARTH)

- NOTES:**
- FOR NORMAL PIPE SIZES 14 INCH AND LARGER, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE 1.
 - CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCE BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

SEWER FORCE MAIN EMBEDMENT DETAILS
NOT TO SCALE



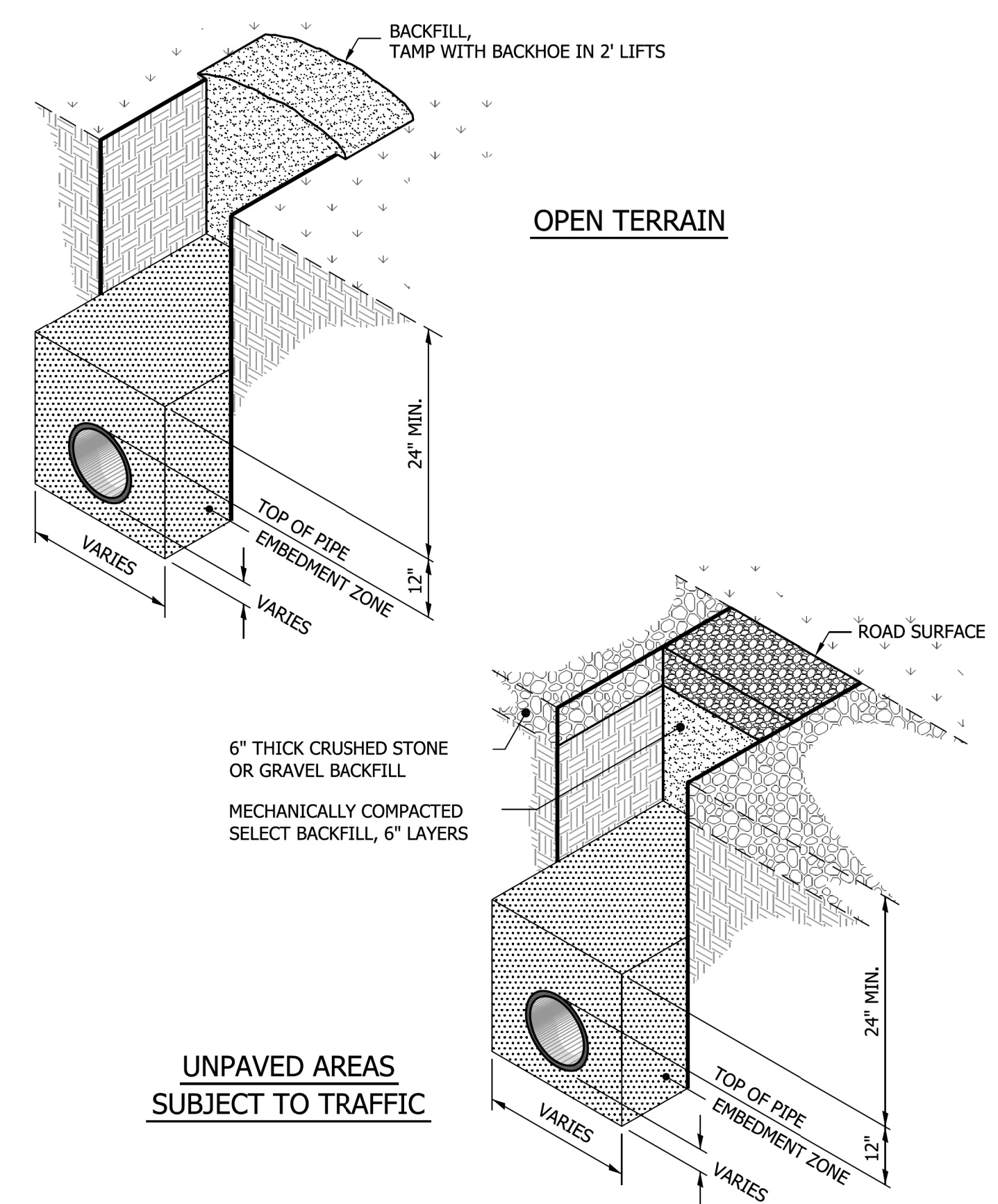
- WHEN TAPPING THE SEWER MAIN, DO NOT EXCEED THE PIPE MANUFACTURERS ALLOWANCES.
- ON ALL AIR RELEASE VALVES USE DOUBLE STRAP SERVICE SADDLE.
- UNLESS OTHERWISE INDICATED ON THE PLANS, MANHOLE SHALL BE FLAT-TOP.
- AIR RELEASE/VACUUM VALVE SHALL BE CRISPIN S SERIES OR VAL-MATIC SERIES 300.
- IF FORCE MAIN IS DUCTILE IRON UPSTREAM AND DOWNSTREAM OF AIR RELEASE VALVE, 5 FULL SECTIONS OF DUCTILE IRON PIPE, WITH EPOXY LINING PER THE PROJECT SPECIFICATIONS, SHALL BE CENTERED AT THE VALVE.
- AIR RELEASE/VACUUM VALVE MANHOLES SHALL BE 5" MINIMUM INSIDE DIAMETER.
- BOTTOM OF VENT PIPE SHALL BE A MINIMUM OF 12" OR 3' ABOVE FLOOD ELEVATION, WHICHEVER IS APPLICABLE

AIR RELEASE VALVE SEWER
NOT TO SCALE

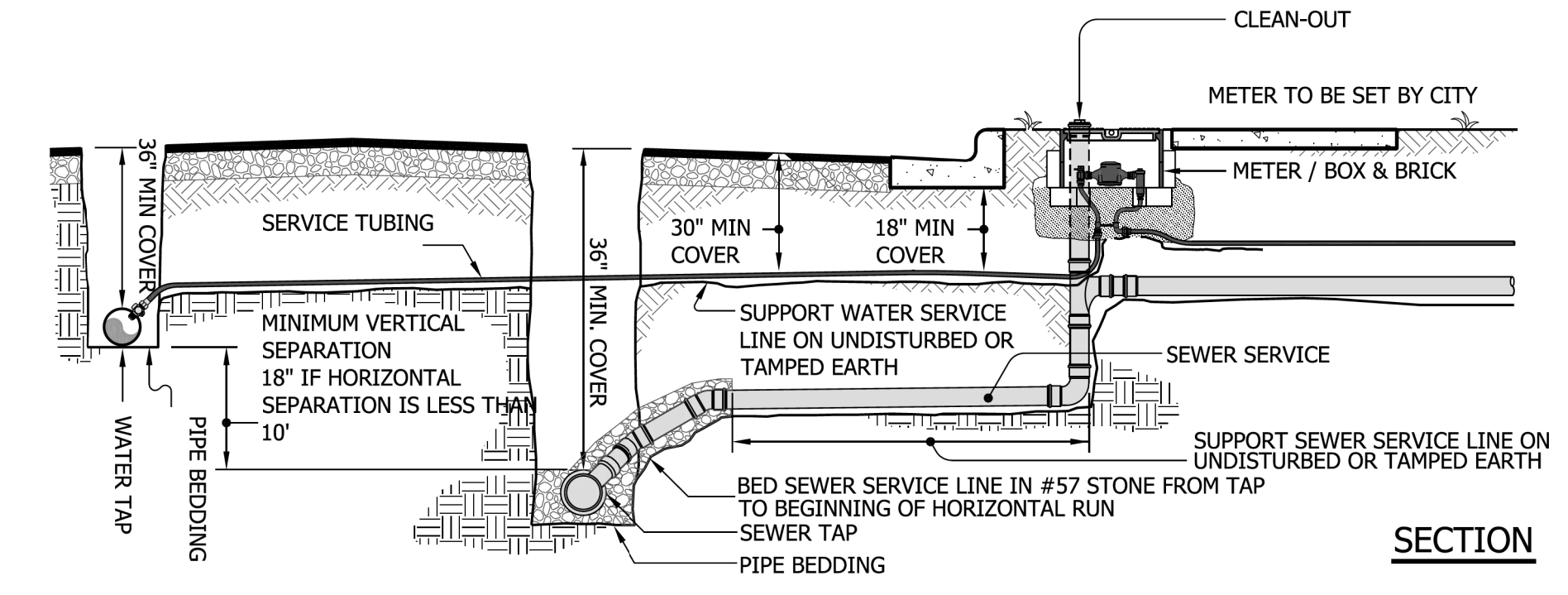
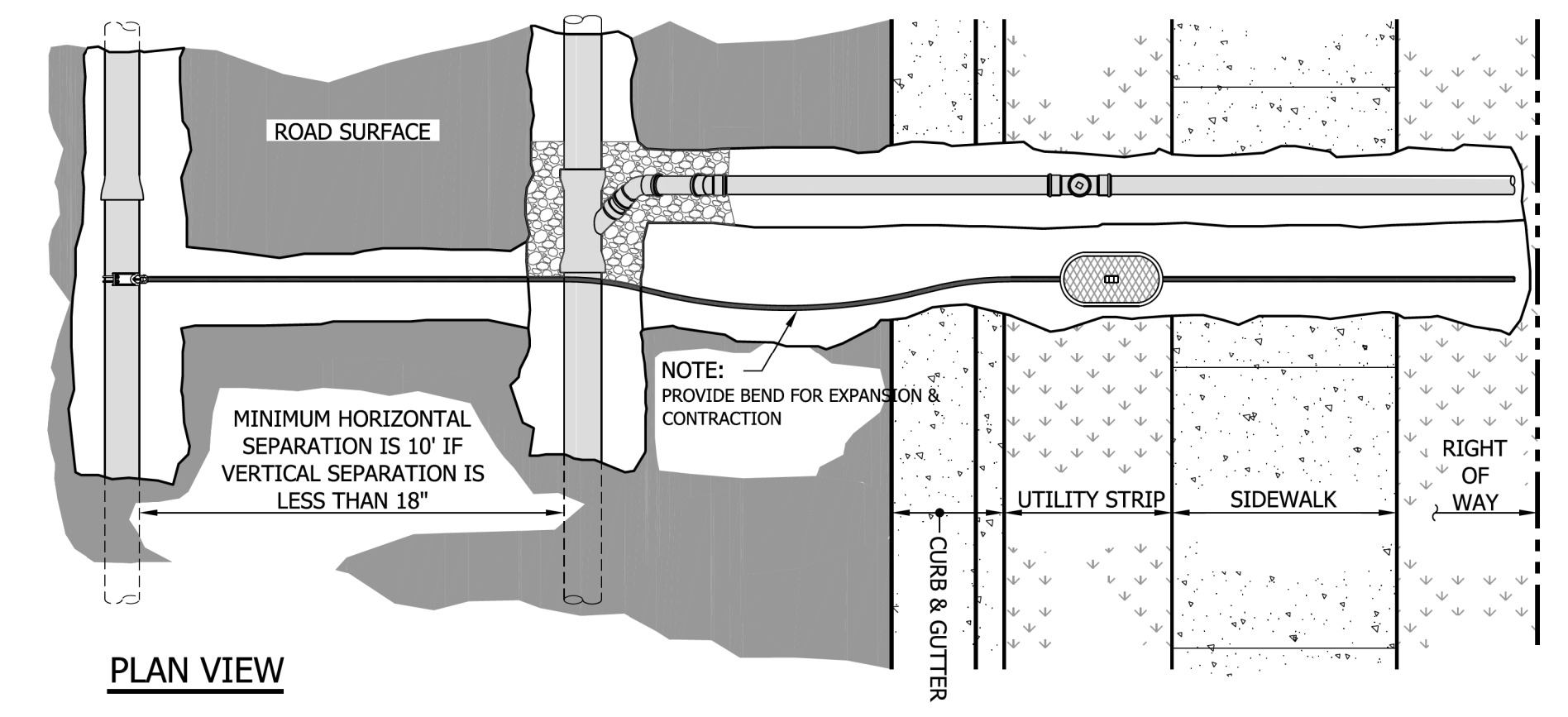
DETAILS APPLY TO ONWASA FACILITIES

4/15/2020
 \\ws03\local\WSE\Projects\NC_CarrollServer\Engineer\Jobs\0696\026\12100 U-4906\Utilities\Engineering\UC\Proj\U4906_ut_dtl\UC03G_psh.dgn
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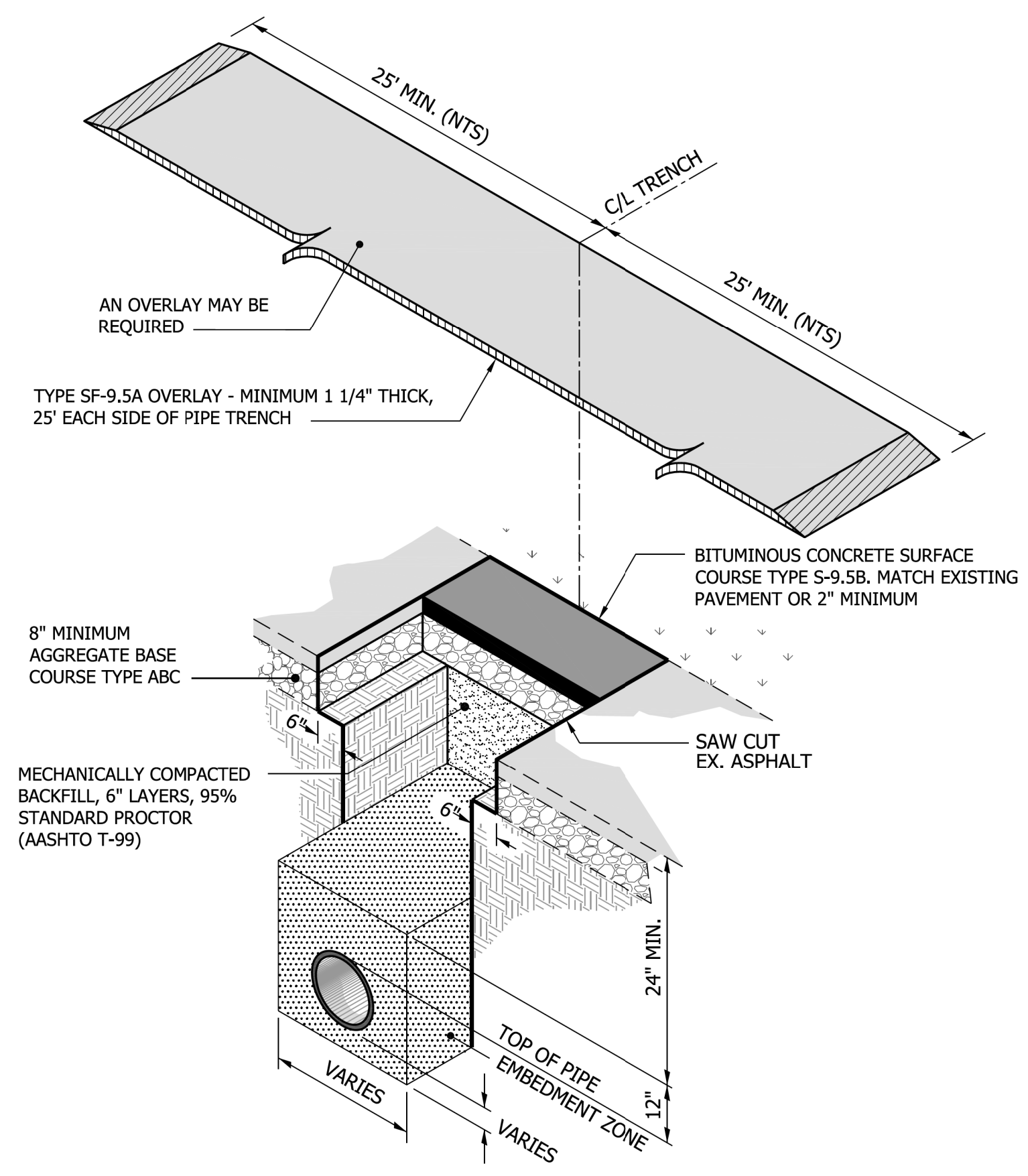
8/17/99



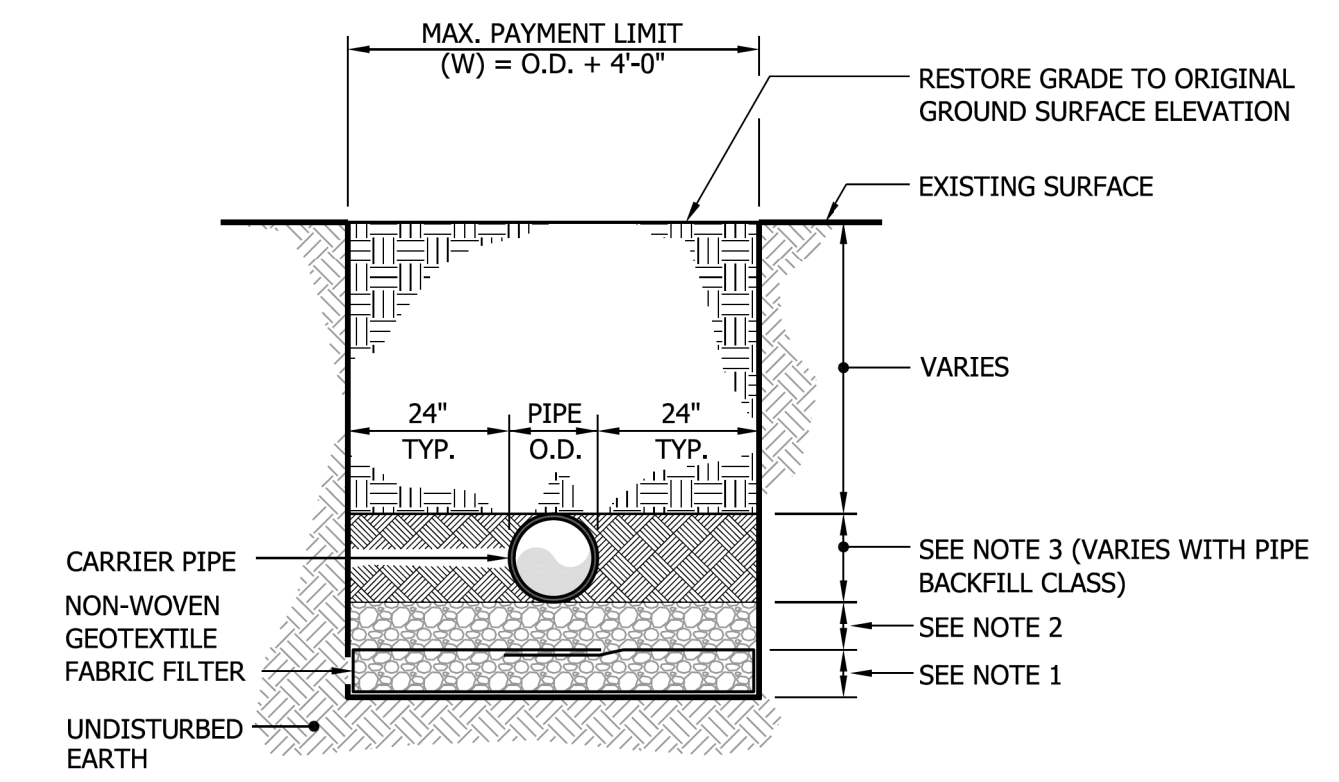
TYPICAL TRENCH BACKFILL AND SURFACE REPAIR DETAILS
NOT TO SCALE



TYPICAL RESIDENTIAL WATER & SEWER SERVICE SCHEMATIC
NOT TO SCALE



TYPICAL TRENCH BACKFILL AND SURFACE REPAIR DETAILS
NOT TO SCALE



- NOTES:
- 8" DEEP NO. 57 STONE OR EQUAL WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC LIGHTLY COMPACTED. OVERLAP FABRIC BY MINIMUM ONE PIPE O.D.
 - 4" DEEP NO. 57 STONE OR EQUAL LIGHTLY COMPACTED PIPE BEDDING.
 - GENERAL BACKFILL COMPACTED TO 90% STANDARD PROCTOR DENSITY IN 6" MAXIMUM LIFTS.

UNSUITABLE SUBGRADE TRENCH DETAIL - TYPE A
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-3G
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION

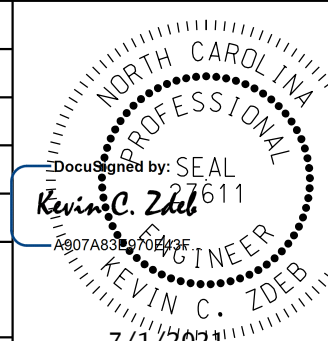
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Weston & Sampson

WSE of North Carolina, PC
598 East Chatham Street
Phone: 919.297.0220

NC License: C-4647
Suite 137
Cary, NC 27511
Fax: 919.297.0221

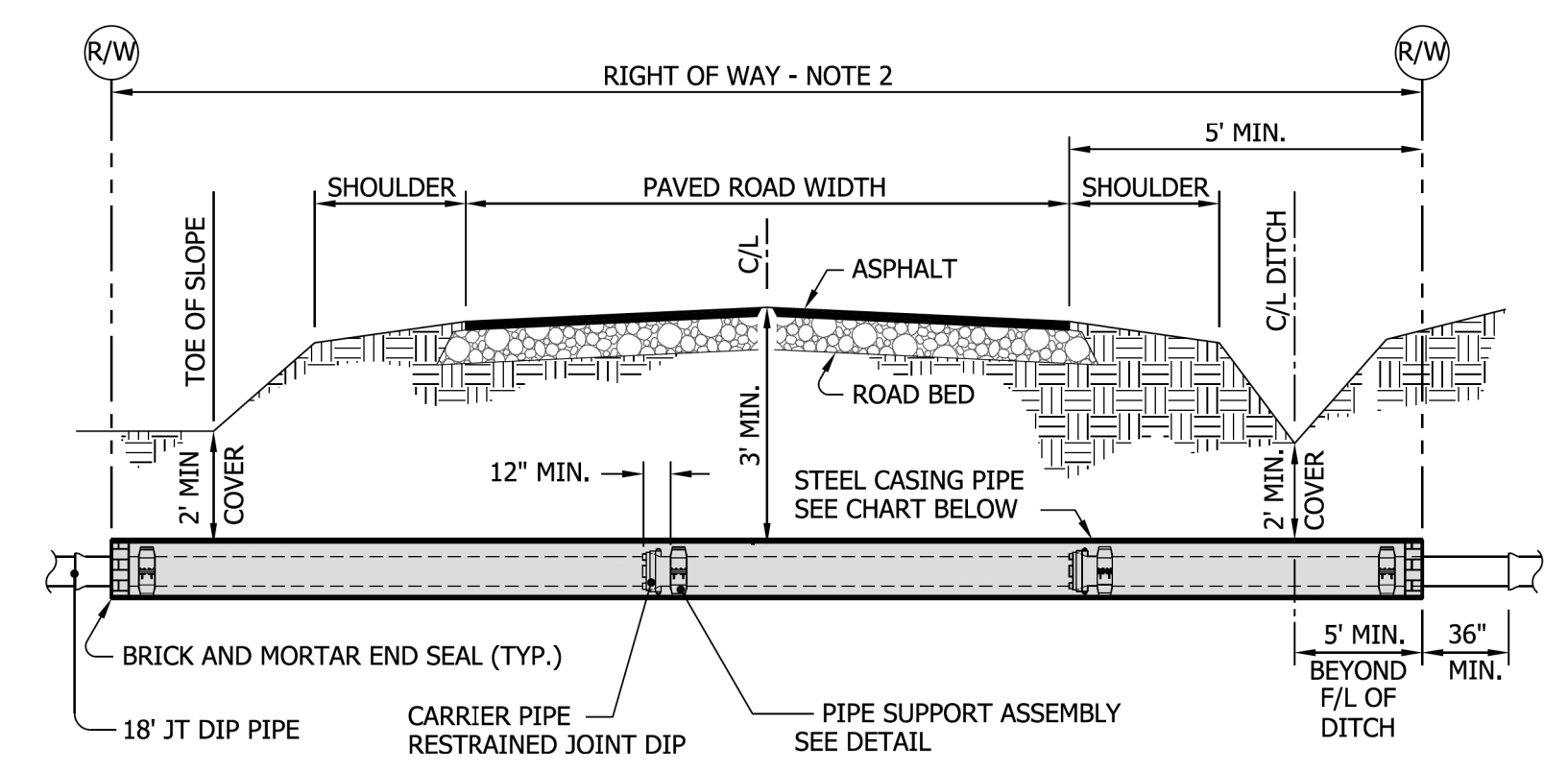
DETAILS APPLY TO CITY OF JACKSONVILLE FACILITIES

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-3H
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
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

Weston & Sampson
 WSE of North Carolina, PC
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 NC License: C-4647 Fax: 919.297.0221



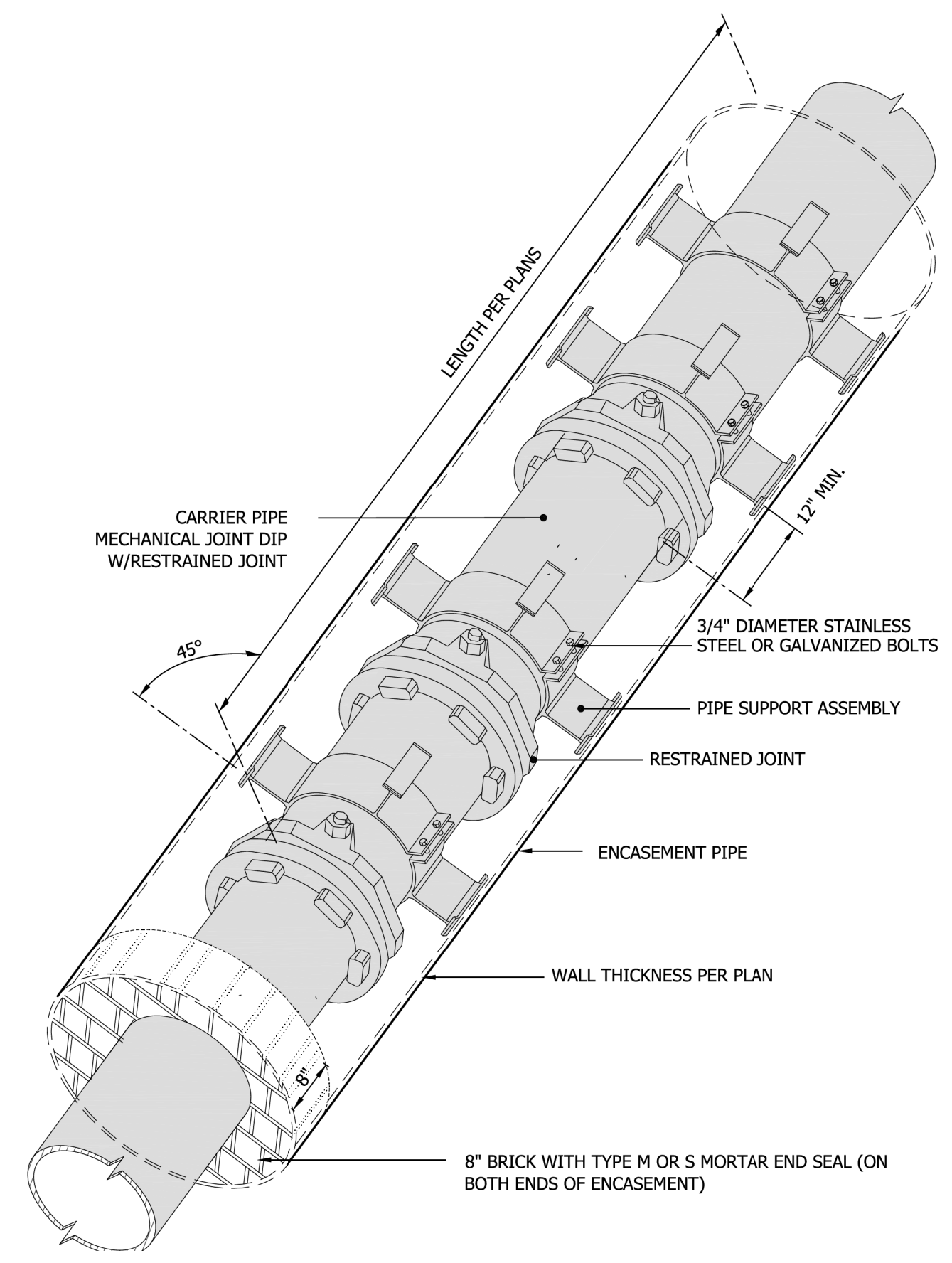
CARRIER PIPE		CASING PIPE			
NOMINAL DIAMETER	OUTSIDE DIAMETER	RAILROAD		HIGHWAY	
		OUTSIDE DIAMETER	WALL THICKNESS	OUTSIDE DIAMETER	WALL THICKNESS
6" & UNDER	6.90"	12 3/4"	0.188"	12 3/4"	0.188"
8"	9.05"	16"	0.281"	16"	0.250"
10"	11.10"	20"	0.344"	20"	0.250"
12"	13.20"	24"	0.375"	24"	0.250"
14"	15.30"	28"	0.438"	28"	0.312"
16"	17.40"	30"	0.469"	30"	0.312"
18"	19.50"	30"	0.469"	30"	0.312"
20"	21.60"	42"	0.625"	42"	0.500"
24"	25.80"	42"	0.625"	42"	0.500"

*DIMENSIONS ARE WITHOUT COATINGS

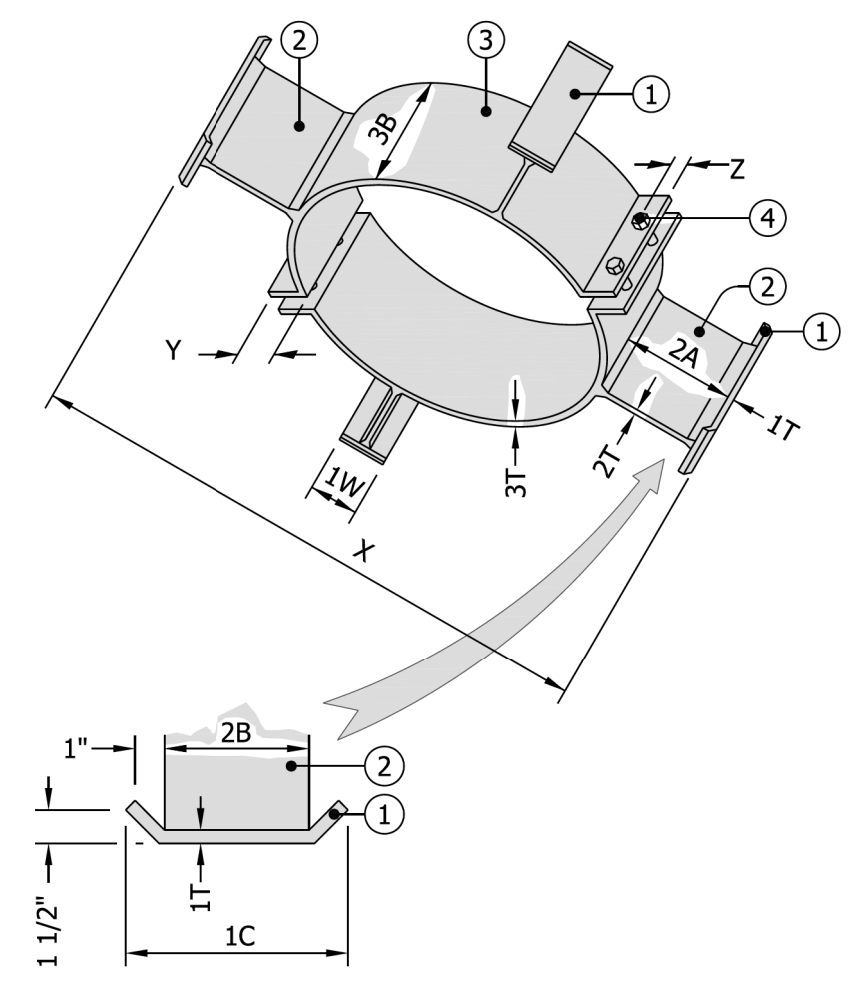
NOTES:

1. INSTALLATION BY DRY BORE & JACKING.
2. BORE TO RUN FROM RIGHT-OF-WAY TO RIGHT-OF-WAY UNLESS APPROVED OTHERWISE BY CITY OF JACKSONVILLE.
3. GREASE ENCASEMENT PIPE AS REQUIRED FOR EASE OF INSTALLATION.
4. STEEL PIPE TO BE 35,000 PSI MIN. YIELD STRENGTH, GRADE B.

TYPICAL DETAIL FOR BORE UNDER PAVED ROADS/HIGHWAYS
 NOT TO SCALE



TYPICAL DETAIL FOR BORE UNDER PAVED ROADS/HIGHWAYS WITH END SEALS
 NOT TO SCALE



C.P. NOMINAL DIA.	PIPE SUPPORT ASSEMBLY MARK NUMBER								DIMENSIONS			
	①		②		③		4		X	Y	Z	
	C	W	T	B	A	T	B	T				
6"	5"	2"	3/8"	3"	1"	3/8"	3"	3/8"	1/2" DIA. 1 REQ'D	10.40"	1 7/8"	3/4"
8"	6"	2"	3/8"	4"	1 3/4"	3/8"	3"	3/8"	1/2" DIA. 1 REQ'D	14.05"	1 7/8"	3/4"
10"	6"	2"	3/8"	4"	4 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.10"	3"	1 3/8"
12"	6"	2"	3/8"	4"	3 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.20"	3"	1 3/8"
14"	6"	2"	3/8"	4"	2 3/4"	3/8"	4"	3/8"	1/2" DIA. 1 REQ'D	22.30"	3"	1 3/8"
16"	8"	3"	3/8"	6"	4 1/4"	3/8"	6"	3/8"	3/4" DIA. 1 REQ'D	27.40"	3"	1 3/8"
18"	8"	3"	3/8"	6"	3 1/4"	3/8"	6"	3/8"	3/4" DIA. 1 REQ'D	27.50"	3"	1 3/8"
24"	12"	4"	1/2"	10"	5 3/4"	1/2"	10"	1/2"	1/2" DIA. 2 REQ'D	39.30"	3"	1 3/8"
30"	12"	4"	1/2"	10"	2 1/2"	1/2"	10"	1/2"	1/2" DIA. 2 REQ'D	39.00"	3"	1 3/8"

TYPICAL DETAIL FOR BORE UNDER PAVED ROADS/HIGHWAYS
 NOT TO SCALE

4/15/2020
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 8/17/99

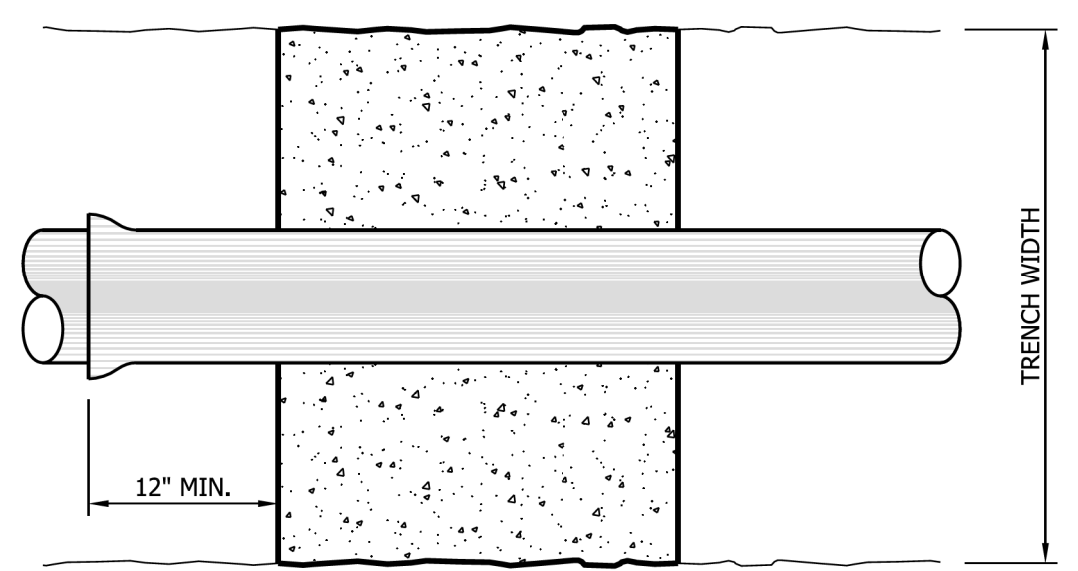
DETAILS APPLY TO CITY OF JACKSONVILLE FACILITIES

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-31
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

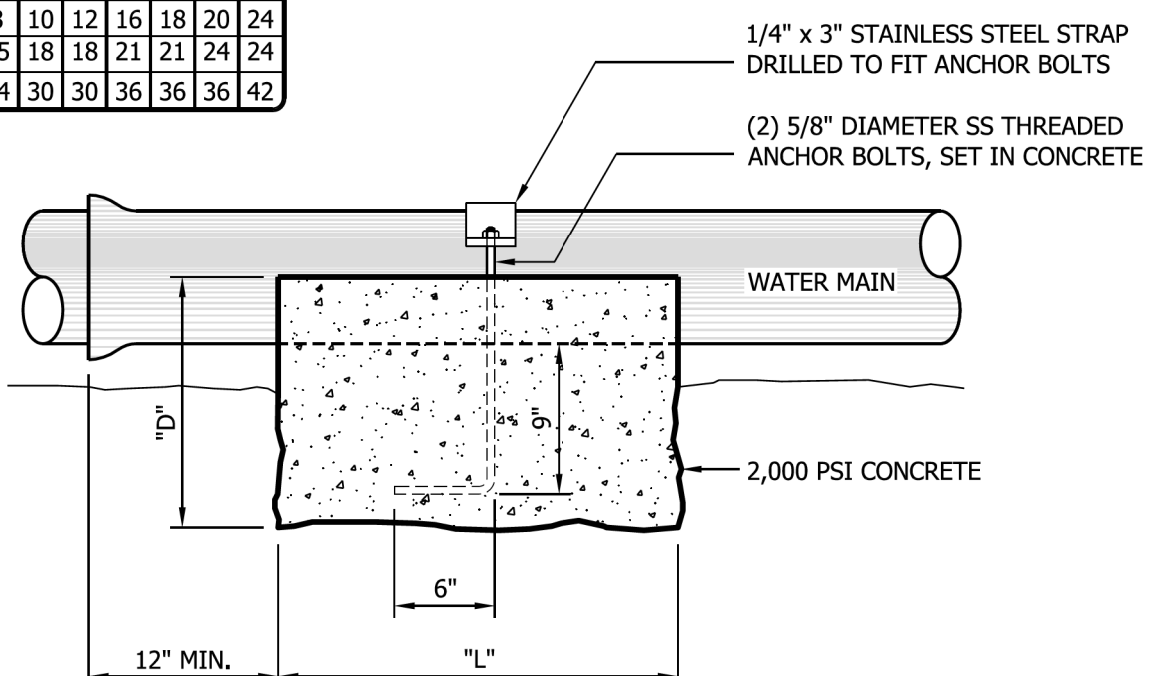
UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

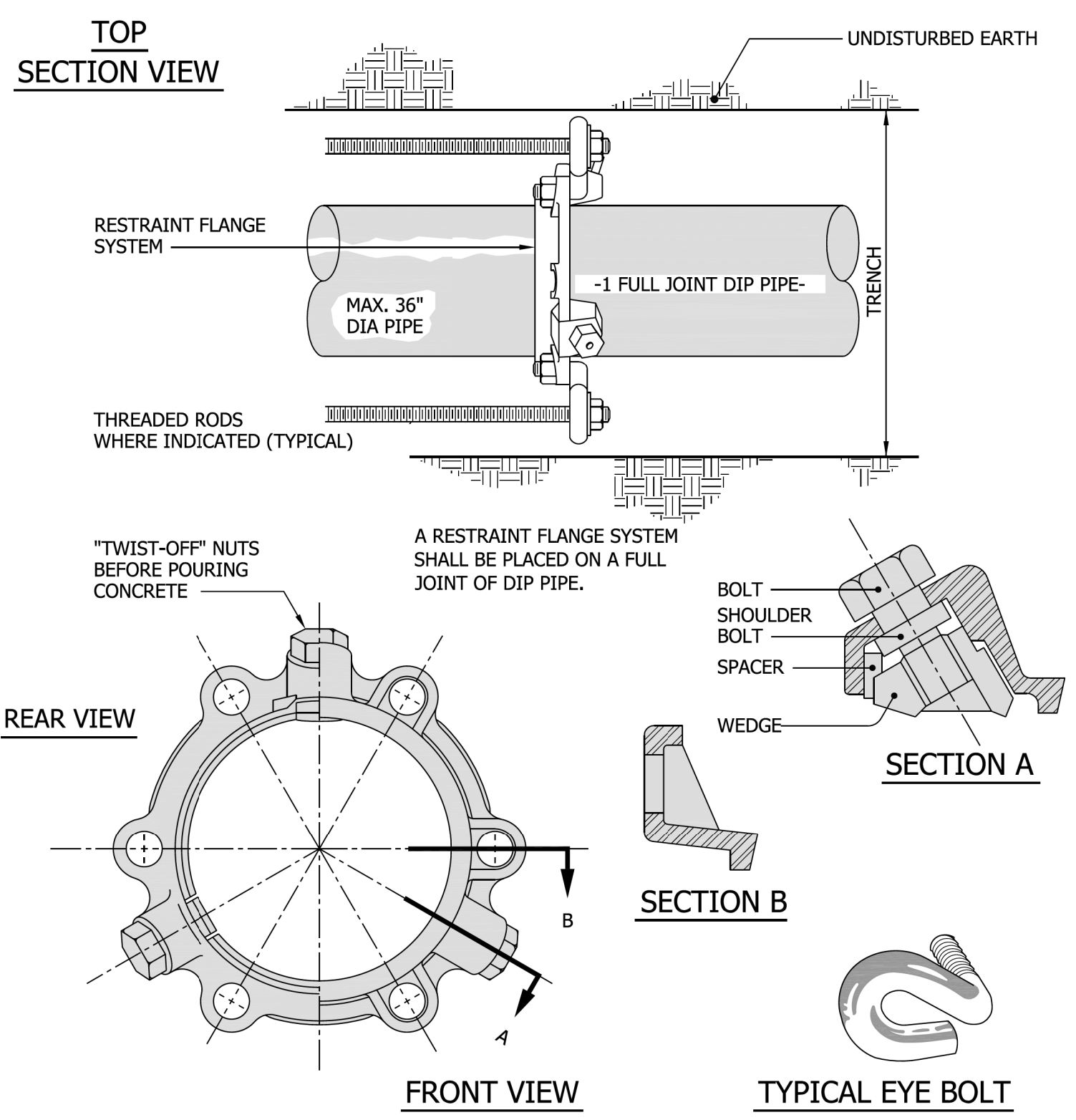
Weston & Sampson NC License: C-4647
 WSE of North Carolina, PC 538 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221



STRAIGHT PIPE	
SIZE	6 8 10 12 16 18 20 24
"D"	15 15 18 18 21 21 24 24
"L"	24 24 30 30 36 36 36 42

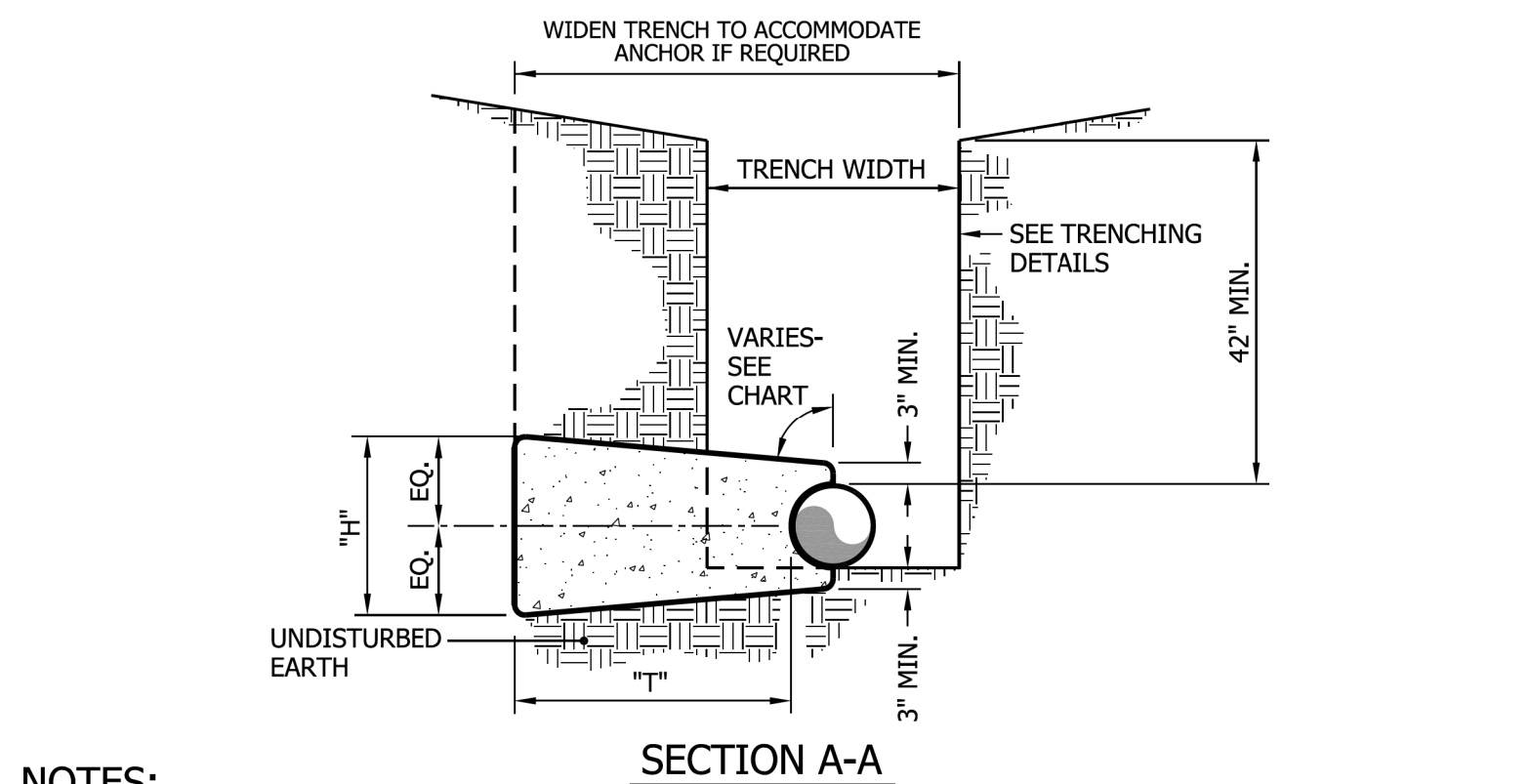
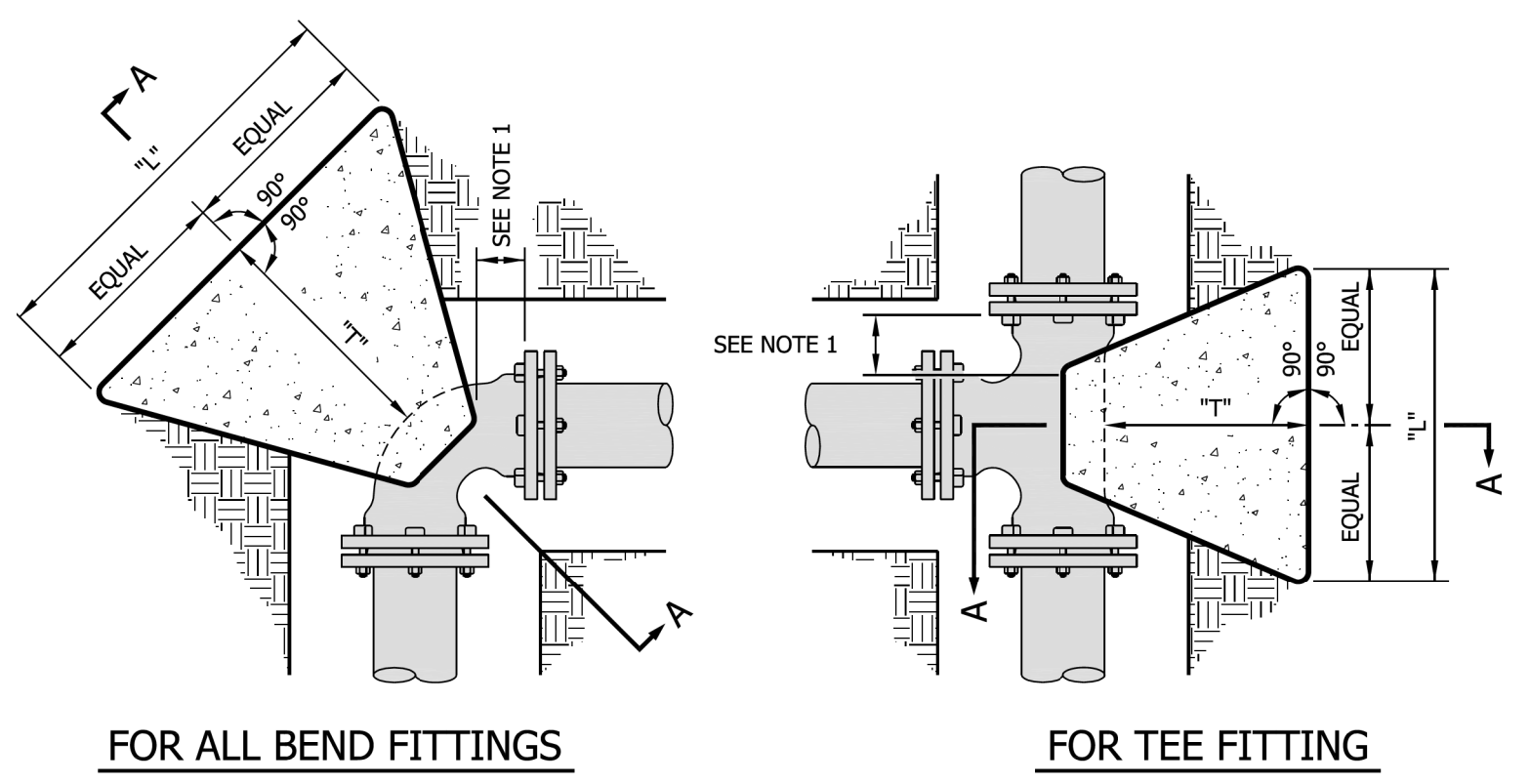


STANDARD ANCHOR BLOCK DETAIL
NOT TO SCALE



- NOTES:
- BACKFILL AND COMPACT IN 6" LAYERS.
 - PLACE RESTRAINT FLANGE ON ONE FULL JOINT OF PIPE.

BLOCKING WITH RESTRAINT FLANGE SYSTEM
NOT TO SCALE



- NOTES:**
- CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
 - FITTINGS ARE TO BE COMPLETELY WRAPPED WITH PLASTIC, PRIOR TO POURING CONCRETE.
 - CONCRETE TO BE MINIMUM 3,000 PSI. @ 28 DAYS.
 - WHEN SACKRETE IS TO BE USED, IT SHALL BE PROPERLY MIXED PER MANUFACTURER SPECIFICATIONS.

BLOCKING DETAIL FOR HORIZONTAL BENDS AND TEE
NOT TO SCALE

TEST PRESSURE = 150 P.S.I.

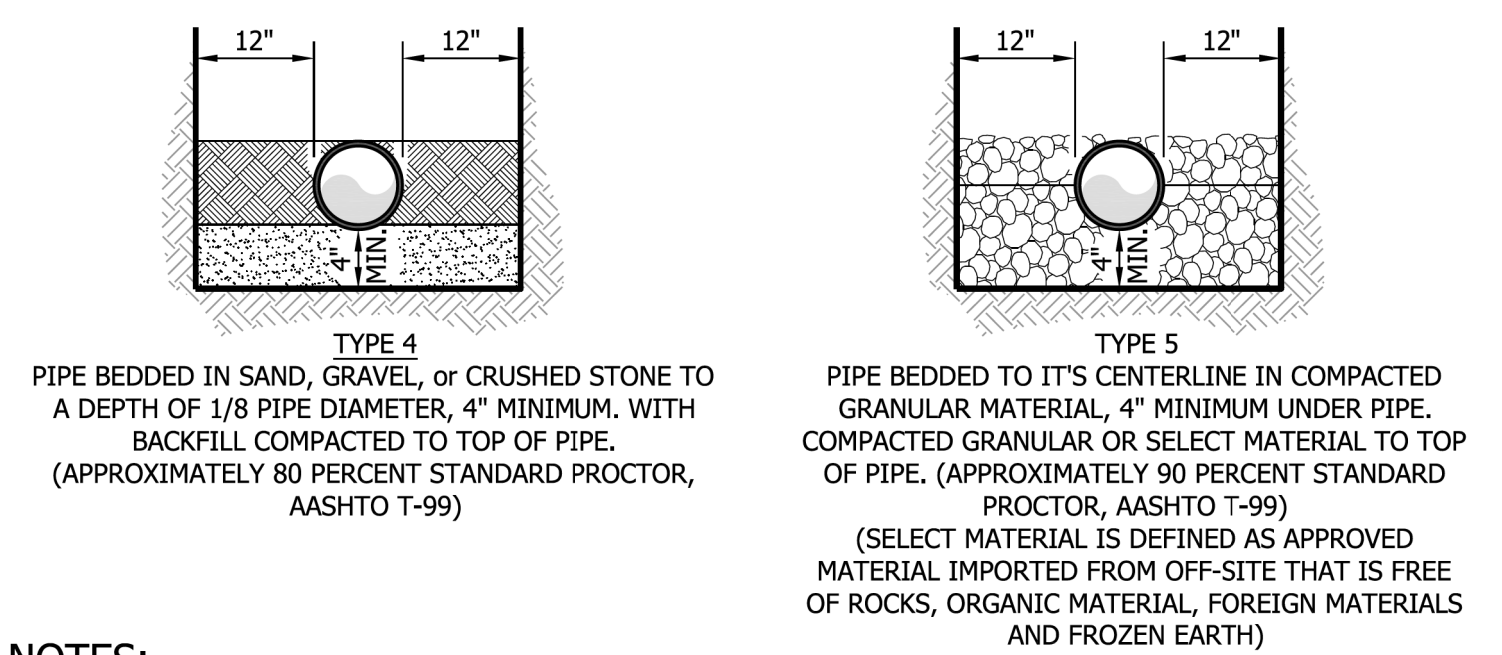
PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.)			VOLUME CONCRETE CU. YD.
		"L"	"H"	"T"	
<4 INCHES	11 1/4°	---	---	---	---
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.00	1.00	2.50	0.09
	TEE	1.00	1.00	2.00	0.07
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.00	1.00	2.50	0.09
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.00	2.00	3.00	0.28
	TEE	2.00	2.00	2.50	0.23
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.75	0.25
	90°	3.00	2.00	3.00	0.39
	TEE	3.00	2.00	2.50	0.32
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.28
	45°	3.00	2.50	3.00	0.47
	90°	4.50	3.00	3.50	0.94
	TEE	4.50	3.00	3.00	0.81
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	2.00	2.00	3.00	0.39
	45°	4.00	3.00	3.50	0.84
	90°	6.50	3.50	3.50	1.54
	TEE	6.50	3.50	3.00	1.32

TEST PRESSURE = 200 P.S.I.

PIPE SIZE	TYPE FITTING	DIMENSIONS (Ft.)			VOLUME CONCRETE CU. YD.
		"L"	"H"	"T"	
<4 INCHES	11 1/4°	1.00	1.00	1.00	0.04
	22 1/2°	1.00	1.00	1.50	0.06
	45°	1.00	1.00	1.50	0.06
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
4 INCHES	11 1/4°	1.00	1.00	2.50	0.09
	22 1/2°	1.00	1.00	2.50	0.09
	45°	1.50	1.50	2.50	0.15
	90°	1.50	1.50	2.50	0.15
	TEE	1.50	1.50	2.00	0.12
6 INCHES	11 1/4°	1.50	1.50	2.50	0.15
	22 1/2°	1.50	1.50	2.50	0.15
	45°	1.50	1.50	2.50	0.15
	90°	2.50	2.00	3.00	0.33
	TEE	2.50	2.00	2.50	0.28
8 INCHES	11 1/4°	2.00	2.00	2.50	0.23
	22 1/2°	2.00	2.00	2.50	0.23
	45°	2.00	2.00	2.50	0.23
	90°	4.00	2.00	3.00	0.50
	TEE	4.00	2.00	2.50	0.42
12 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	3.00	2.00	3.00	0.39
	45°	4.00	2.50	3.00	0.61
	90°	5.50	3.00	3.50	1.13
	TEE	5.50	3.00	3.00	0.97
16 INCHES	11 1/4°	2.00	2.00	3.00	0.28
	22 1/2°	4.00	2.00	3.00	0.50
	45°	5.50	3.00	3.50	1.13
	90°	7.50	4.00	3.50	2.01
	TEE	7.50	4.00	3.00	1.72

- CHART NOTES:**
- IF BLOCKING EXCAVATION IS IN LIGHTLY COMPACTED FILL AREAS, OR IN AREAS WHERE BOULDERS OR STUMPS HAVE BEEN REMOVED, BLOCKING SIZE MUST BE RE-SIZED FOR THE SPECIFIC LOCATION/CIRCUMSTANCE BY A NC LICENSED PROFESSIONAL ENGINEER.
 - BLOCKING SIZES SHOWN IN THESE TABLES ASSUME THE FOLLOWING:
 - BLOCKING IS CONSTRUCTED IN RESIDUAL SOILS AS SHOWN IN DETAIL
 - SOIL BEARING PRESSURE = 2000 PSF
 - VELOCITY OF FLOW = 15 FPS
 - THIS DETAIL NOT APPLICABLE TO REDUCING BENDS.
 - NEITHER THE WEIGHT OF THE CONCRETE BLOCKING NOR FRICTION BETWEEN CONCRETE BLOCKING AND SOIL WAS ADDED INTO BLOCKING SIZES COMPUTATION. THEREFORE, BLOCKING SIZE IS CONSERVATIVE.

BLOCKING DETAIL FOR HORIZONTAL BENDS AND TEE
NOT TO SCALE



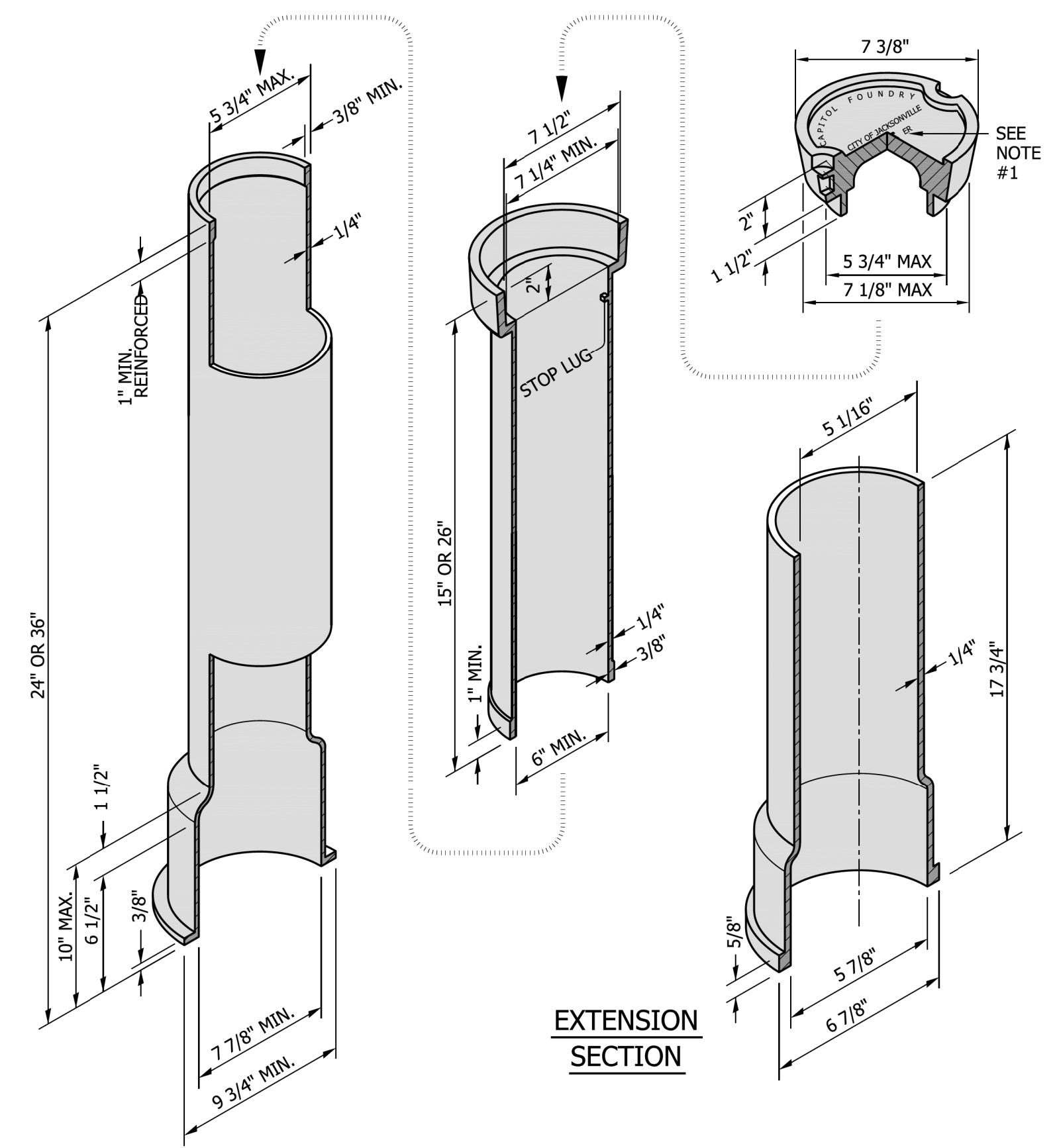
- NOTES:**
- FOR NORMAL PIPE SIZES 14 INCH AND LARGER, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE.
 - CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.

WATER MAIN EMBEDMENT DETAILS
NOT TO SCALE

8/17/99
 4/15/2020
 \\wse03\local\WSE\Projects\NCA_Carry\oldServer\Engineer\Jobs\0696\026\12100 U-4906\Utilities\Engineering\UC\Proj\U4906_ut_dtl_UC031_psh.dgn
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DETAILS APPLY TO CITY OF JACKSONVILLE FACILITIES

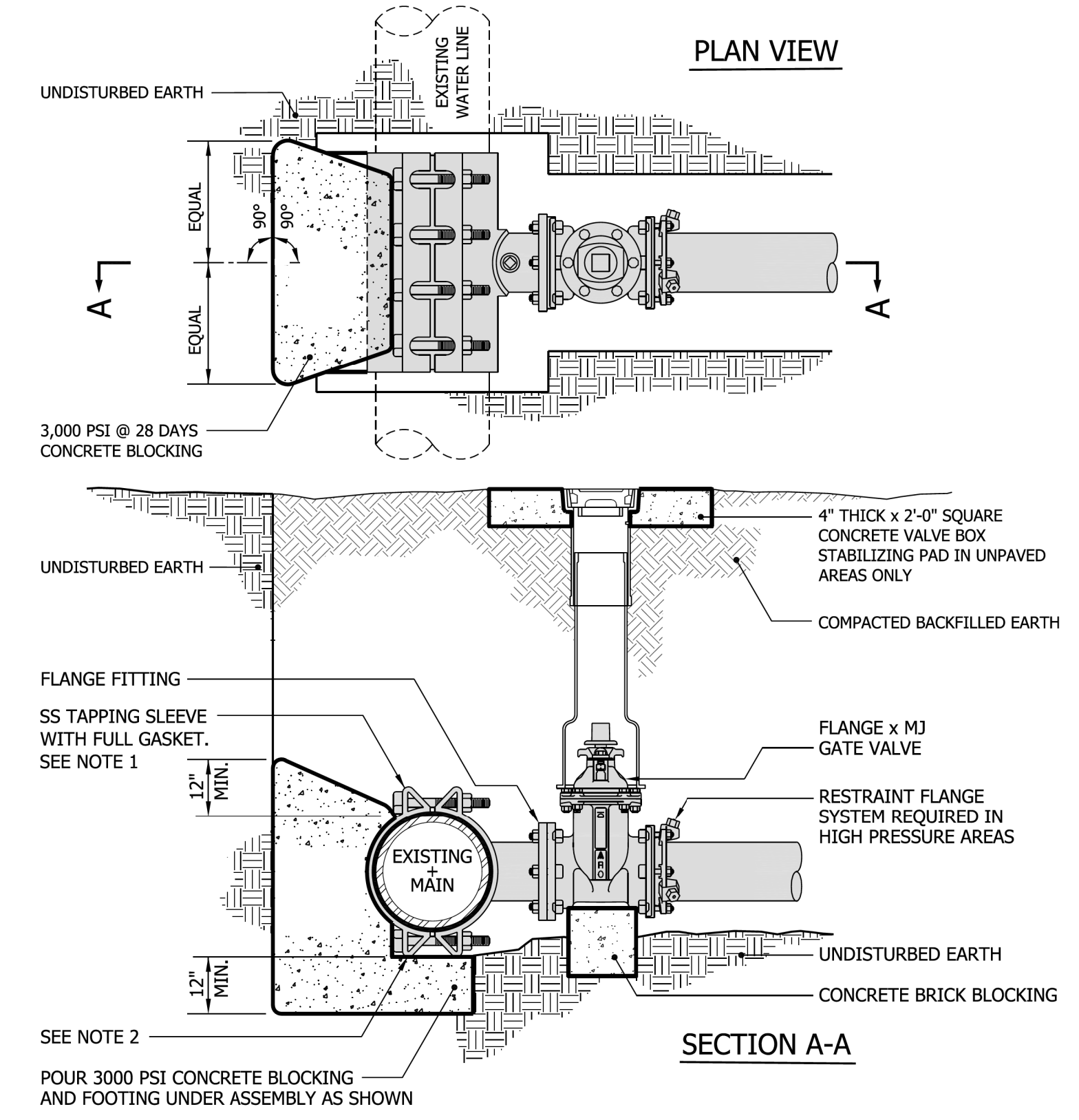
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 8/17/99



NOTES:

- USE HEAVY DUTY TRAFFIC LID MARKED "WATER" (OR "SEWER" IF APPLICABLE).
- VALVE BOX FINISH: ASPHALT COATED

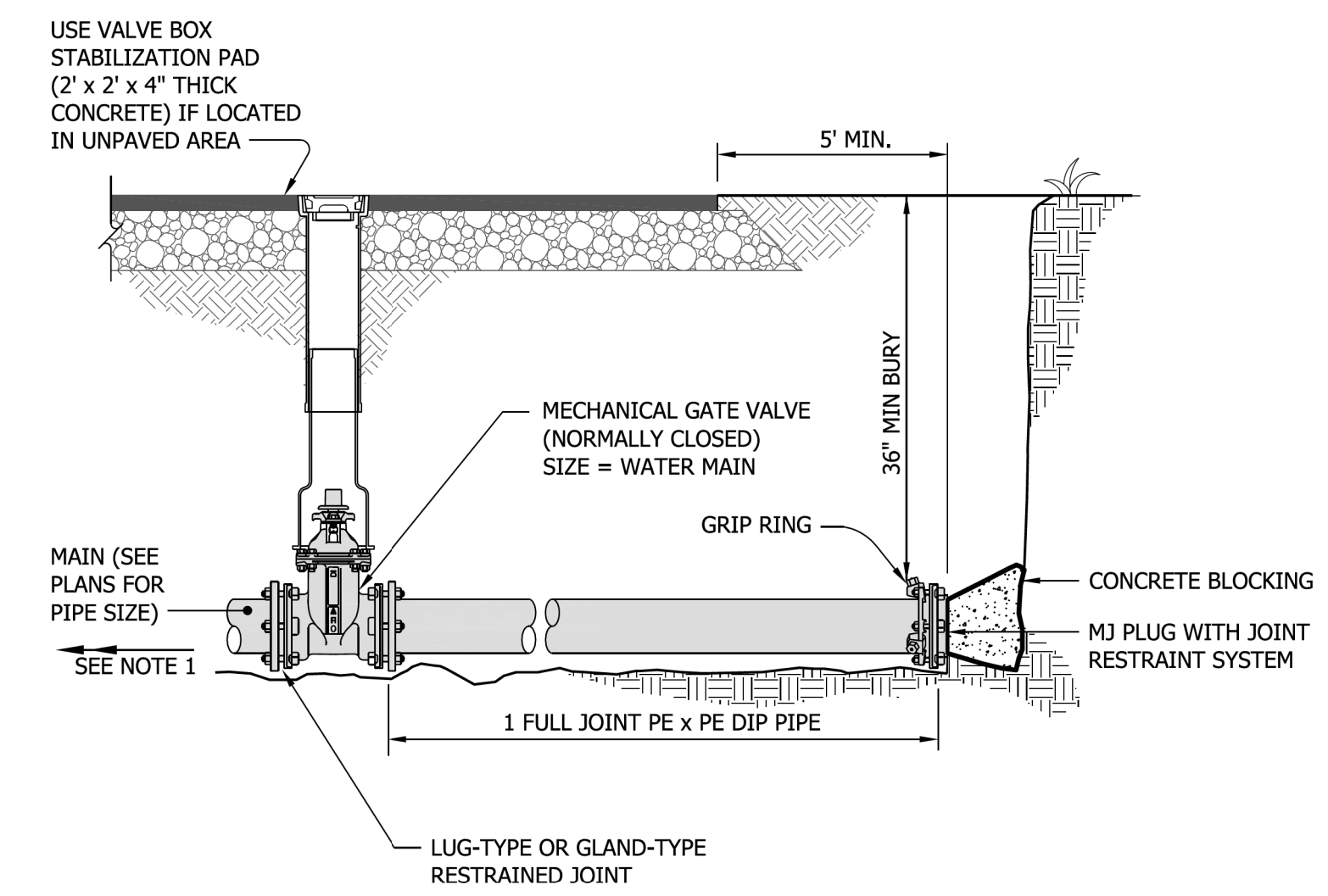
STANDARD SLIP TYPE VALVE BOX DETAIL
NOT TO SCALE



NOTES:

- CONCRETE BLOCKING IS TO BE FORMED TO ENSURE ACCESSIBILITY TO FITTINGS AND POURED AGAINST UNDISTURBED EARTH.
- FITTINGS ARE TO BE COMPLETELY WRAPPED WITH PLASTIC, PRIOR TO POURING CONCRETE.
- CONCRETE TO BE MINIMUM 3,000 PSI. @ 28 DAYS.

4" TO 12" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY
NOT TO SCALE

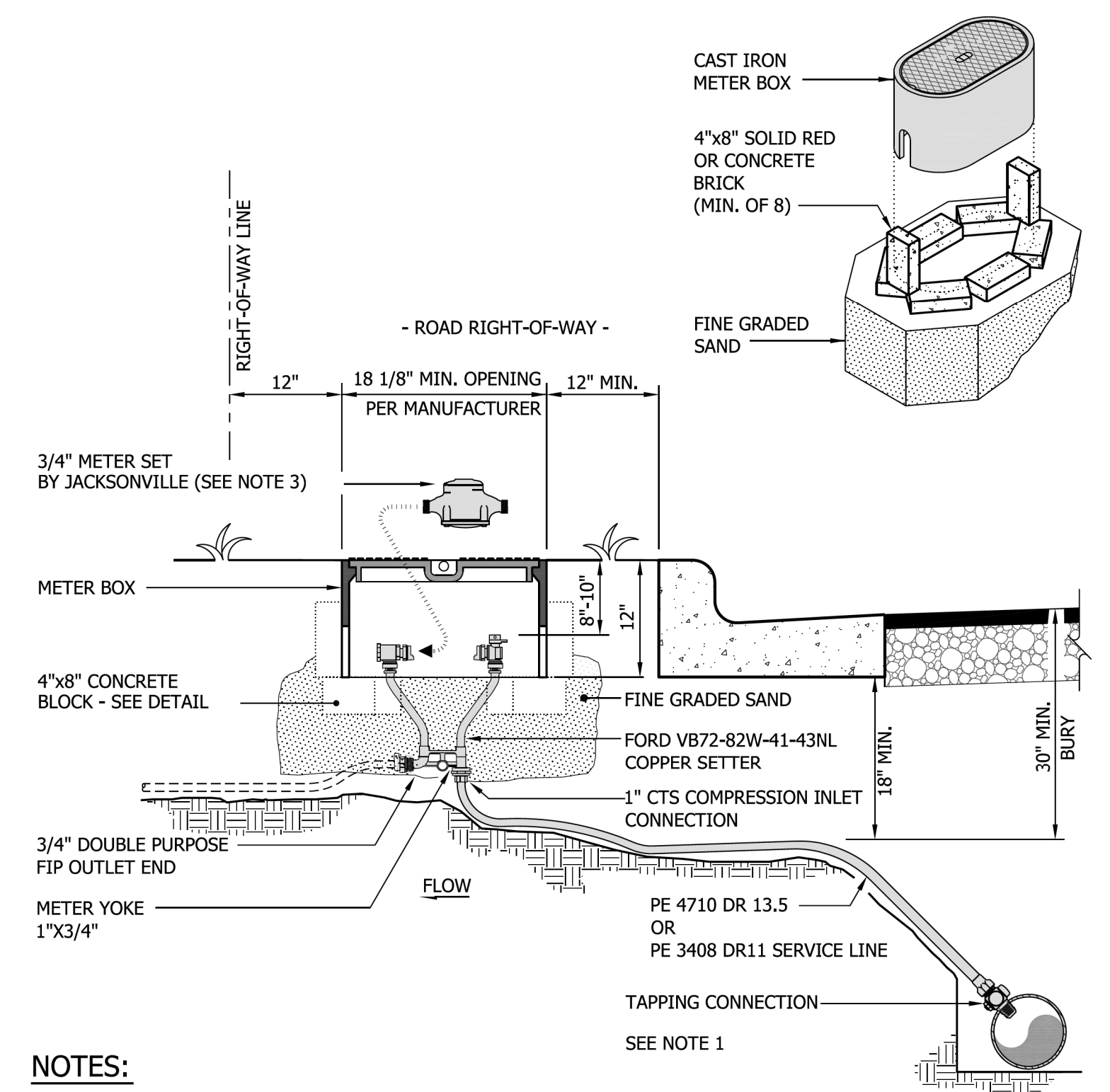


NOTES:

- PIPE "UPSTREAM" OF VALVE SHALL BE RESTRAINED BY AN APPROVED RESTRAINING SYSTEM ACCORDING TO THE FOLLOWING:

NOMINAL PIPE SIZE	RESTRAINT LENGTH
6"	36'
8"	47'
12"	65'
16"	84'
24"	118'

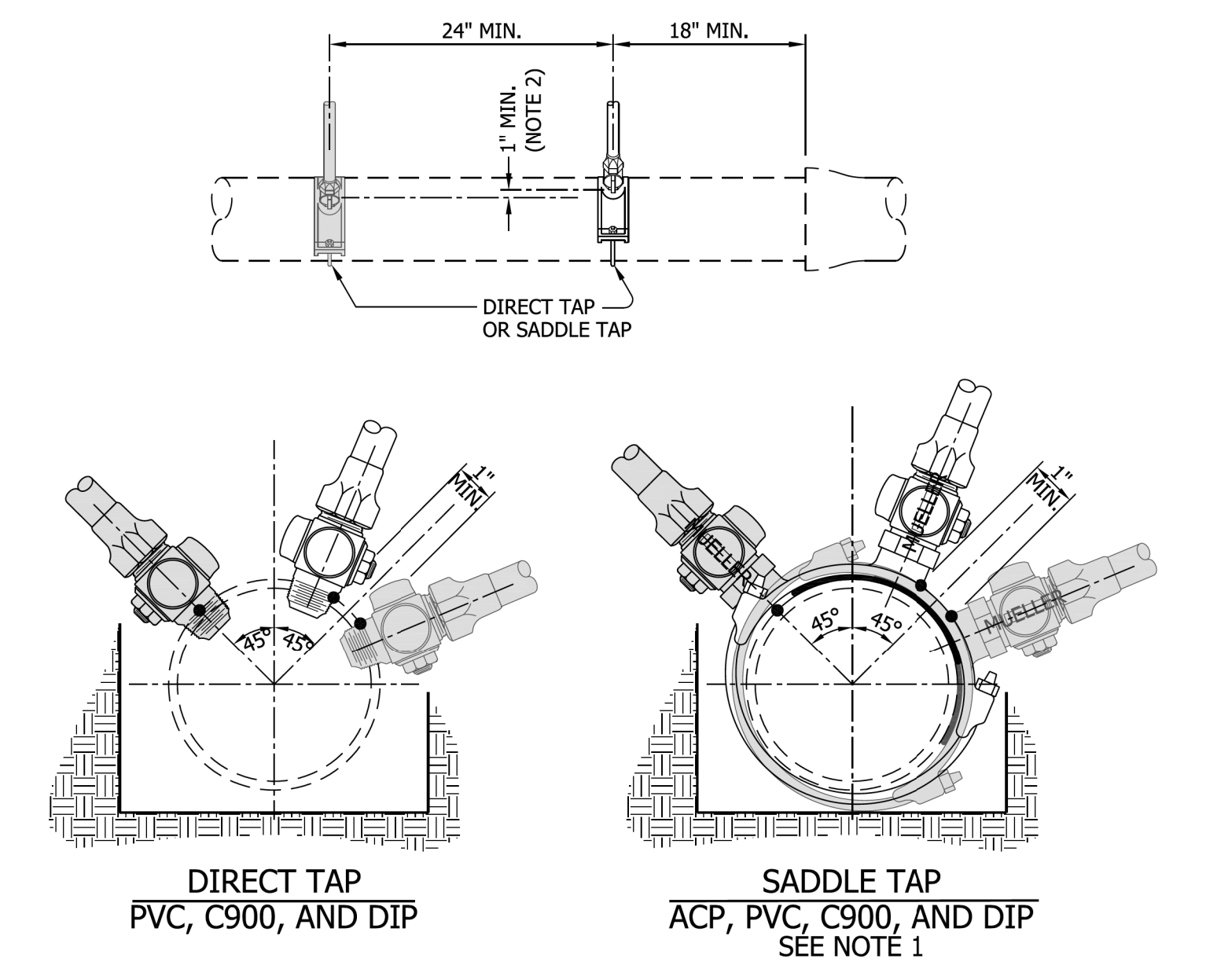
STANDARD WATER MAIN PLUG DETAIL
NOT TO SCALE



NOTES:

- IF INSTALLATION IS FOR STUB-OUT METER, METER SHOULD BE PURCHASED FROM CITY OF JACKSONVILLE (AT APPLICANTS EXPENSE).
- METER MUST BE LEVEL, STRAIGHT, & CENTERED IN BOX ACROSS METER CONNECTIONS.
- SUBSTITUTION REQUIRES APPROVAL BY CITY OF JACKSONVILLE PUBLIC SERVICES DIRECTOR.
- METER SHOULD NOT BE LOCATED IN A DRIVEWAY. IF METER MUST BE LOCATED IN DRIVEWAY, A TRAFFIC RATED BOX AND COVER SHALL BE USED EQUAL TO OR EXCEEDING THE MID-STATES PLASTICS, INC. "BC" SERIES RECTANGULAR METER BOX PART NO. MSBCF1118-12

STANDARD 3/4" DOMESTIC METER INSTALLATION
NOT TO SCALE



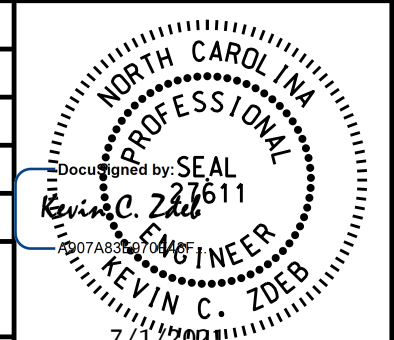
NOTES:

- ALL BRONZE SADDLES TO BE SINGLE STRAP FOR 1".
- IF 2 TAPS ARE MADE ON EACH SIDE OF THE MAIN THERE SHALL BE A MINIMUM OF 24" HORIZONTAL SEPARATION. MULTIPLE TAPS ON THE SAME SIDE SHALL HAVE A MINIMUM 24" HORIZONTAL SEPARATION AND BE STAGGERED A MINIMUM OF 1" VERTICALLY TO PREVENT DAMAGE TO THE MAIN.

STANDARD 1" WATER TAPPING DETAIL
NOT TO SCALE

PROJECT REFERENCE NO. U-4906	SHEET NO. UC-3J
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISER:	7/1/2021
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	
Weston & Sampson WSE of North Carolina, PC 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 NC License: C-4647 Fax: 919.297.0221	

DETAILS APPLY TO CITY OF JACKSONVILLE FACILITIES

PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-6
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 WSE of North Carolina, PC
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 License: C-4647 Fax: 919.297.0221

UTILITY OWNERS ON THIS SHEET:

ONWASA
 UTILITY: 6" 10" WATER
 12" SANITARY
 FORCE MAIN
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

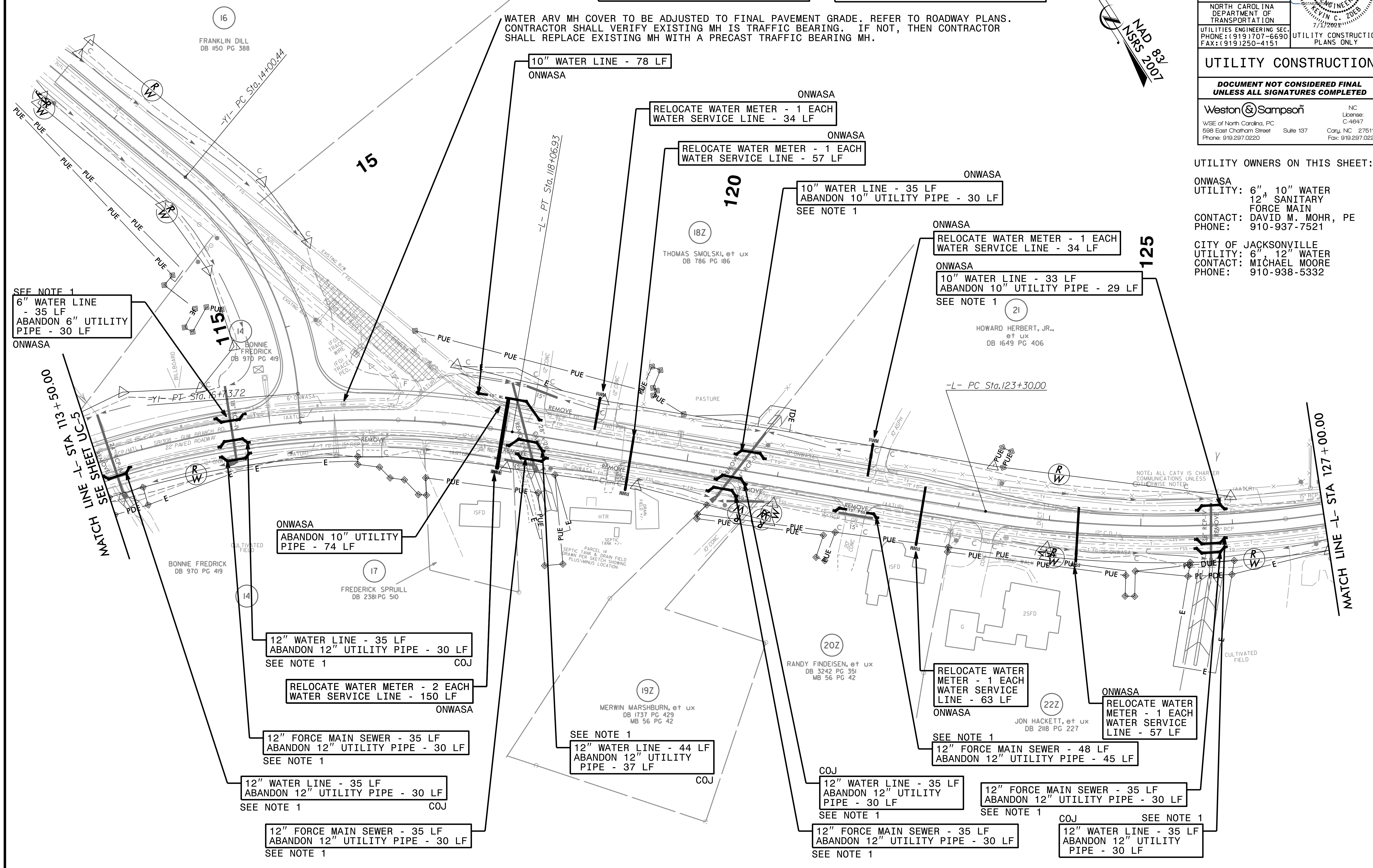
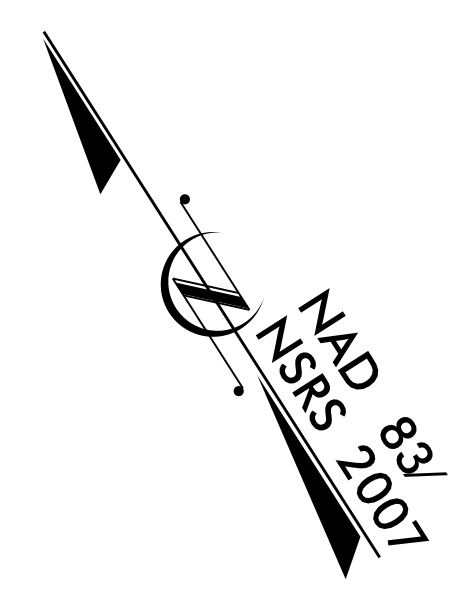
CITY OF JACKSONVILLE
 UTILITY: 6" 12" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332

- NOTES:
 1. PROPOSED DOWN AND UNDER RELOCATION OF UTILITY. REFER TO DETAIL ON SHEET UC-3B.
 2. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 3. REFER TO WATER METER DETAILS ON SHEET UC-3E.

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 6310 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 4300 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

WATER ARV MH COVER TO BE ADJUSTED TO FINAL PAVEMENT GRADE. REFER TO ROADWAY PLANS. CONTRACTOR SHALL VERIFY EXISTING MH IS TRAFFIC BEARING. IF NOT, THEN CONTRACTOR SHALL REPLACE EXISTING MH WITH A PRECAST TRAFFIC BEARING MH.



SEE NOTE 1
 6" WATER LINE - 35 LF
 ABANDON 6" UTILITY PIPE - 30 LF
 ONWASA

10" WATER LINE - 78 LF
 ONWASA

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 34 LF
 ONWASA

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 57 LF
 ONWASA

10" WATER LINE - 35 LF
 ABANDON 10" UTILITY PIPE - 30 LF
 SEE NOTE 1
 ONWASA

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 34 LF
 ONWASA

10" WATER LINE - 33 LF
 ABANDON 10" UTILITY PIPE - 29 LF
 SEE NOTE 1
 ONWASA

ONWASA
 ABANDON 10" UTILITY PIPE - 74 LF

12" WATER LINE - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1
 COJ

RELOCATE WATER METER - 2 EACH
 WATER SERVICE LINE - 150 LF
 ONWASA

12" FORCE MAIN SEWER - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1

12" WATER LINE - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1
 COJ

12" FORCE MAIN SEWER - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1

SEE NOTE 1
 12" WATER LINE - 44 LF
 ABANDON 12" UTILITY PIPE - 37 LF
 COJ

12" WATER LINE - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1
 COJ

12" FORCE MAIN SEWER - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 63 LF
 ONWASA

SEE NOTE 1
 12" FORCE MAIN SEWER - 48 LF
 ABANDON 12" UTILITY PIPE - 45 LF

12" FORCE MAIN SEWER - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1

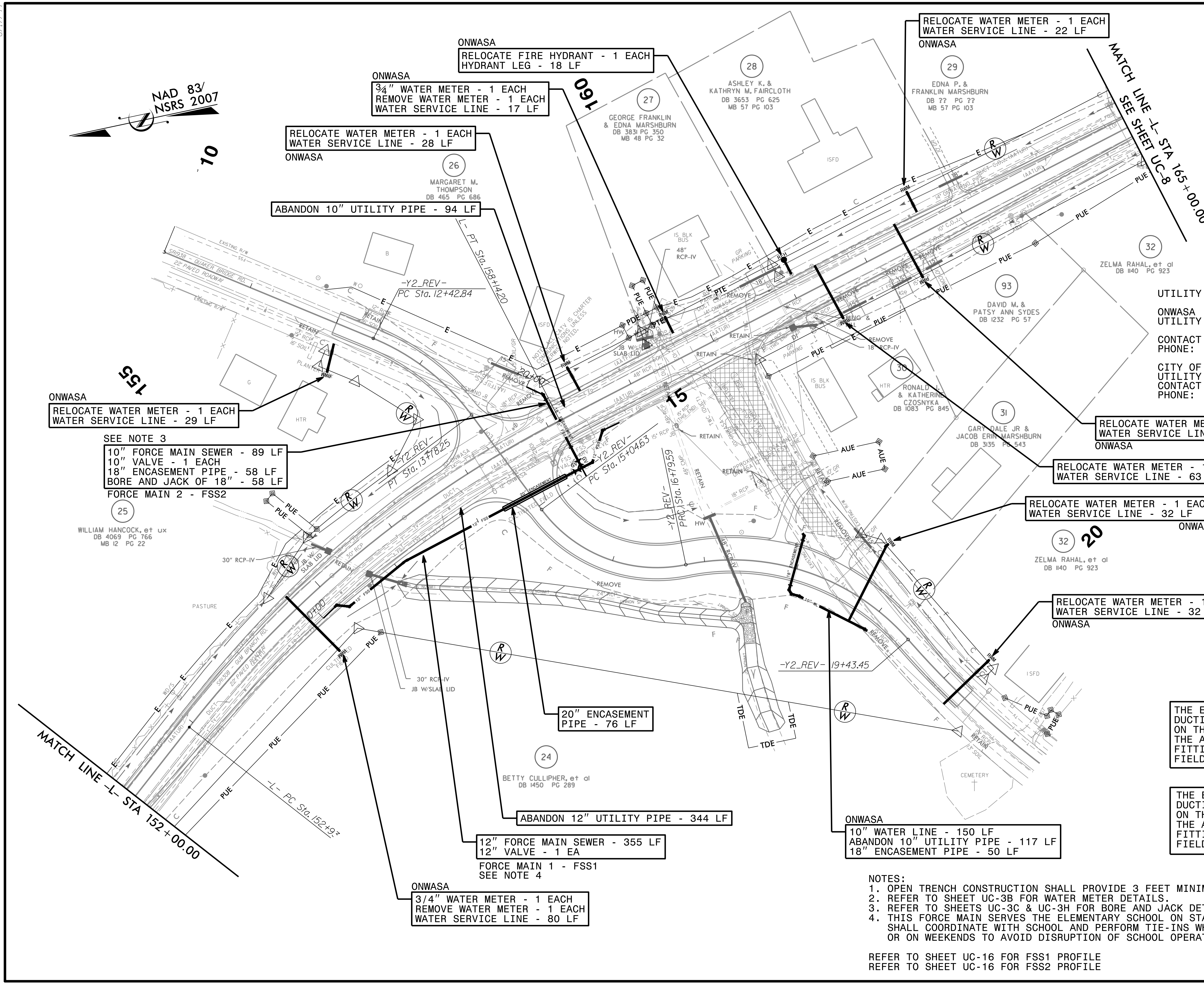
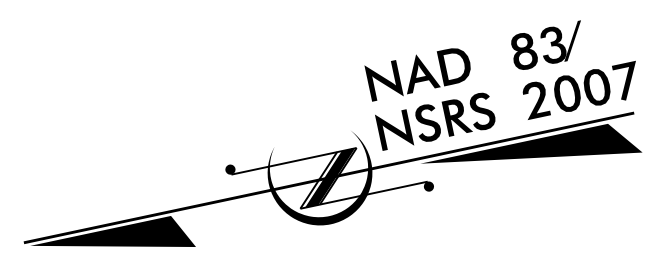
12" WATER LINE - 35 LF
 ABANDON 12" UTILITY PIPE - 30 LF
 SEE NOTE 1
 COJ

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 57 LF

5/26/2021
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8/17/99

PROJECT REFERENCE NO. U-4906	SHEET NO. UC-7
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
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	
Weston Sampson WSE of North Carolina, PC 598 East Chatham Street Suite 137 Phone: 919.297.0220	
NC Licensee: C-4647 Cary, NC 27511 Fax: 919.297.0221	



UTILITY OWNERS ON THIS SHEET:

ONWASA
 UTILITY: 8", 10", 14" WATER
 10", 12" SANITARY FORCE MAIN
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

CITY OF JACKSONVILLE
 UTILITY: 10", 12" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 29 LF

SEE NOTE 3
 10" FORCE MAIN SEWER - 89 LF
 10" VALVE - 1 EACH
 18" ENCASEMENT PIPE - 58 LF
 BORE AND JACK OF 18" - 58 LF
 FORCE MAIN 2 - FSS2

WILLIAM HANCOCK, et ux
 DB 4069 PG 766
 MB 12 PG 22

ONWASA
 RELOCATE FIRE HYDRANT - 1 EACH
 HYDRANT LEG - 18 LF

ONWASA
 3/4" WATER METER - 1 EACH
 REMOVE WATER METER - 1 EACH
 WATER SERVICE LINE - 17 LF

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 28 LF

ABANDON 10" UTILITY PIPE - 94 LF

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 63 LF
 ONWASA

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 63 LF
 ONWASA

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 32 LF
 ONWASA

ZELMA RAHAL, et al
 DB 1140 PG 923

RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 32 LF
 ONWASA

20" ENCASEMENT
 PIPE - 76 LF

ABANDON 12" UTILITY PIPE - 344 LF

12" FORCE MAIN SEWER - 355 LF
 12" VALVE - 1 EA
 FORCE MAIN 1 - FSS1
 SEE NOTE 4

ONWASA
 3/4" WATER METER - 1 EACH
 REMOVE WATER METER - 1 EACH
 WATER SERVICE LINE - 80 LF

ONWASA
 10" WATER LINE - 150 LF
 ABANDON 10" UTILITY PIPE - 117 LF
 18" ENCASEMENT PIPE - 50 LF

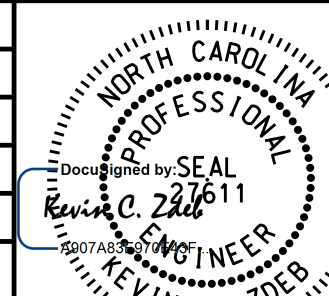
THE ESTIMATED QUANTITY OF
 DUCTILE IRON WATER PIPE FITTINGS
 ON THIS PLAN SHEET IS 785 LBS.
 THE ACTUAL QUANTITY AND TYPE OF
 FITTINGS WILL VARY BASED ON
 FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF
 DUCTILE IRON SEWER PIPE FITTINGS
 ON THIS PLAN SHEET IS 1630 LBS.
 THE ACTUAL QUANTITY AND TYPE OF
 FITTINGS WILL VARY BASED ON
 FIELD CONDITIONS.

- NOTES:**
1. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 2. REFER TO SHEET UC-3B FOR WATER METER DETAILS.
 3. REFER TO SHEETS UC-3C & UC-3H FOR BORE AND JACK DETAILS.
 4. THIS FORCE MAIN SERVES THE ELEMENTARY SCHOOL ON STATESIDE BLVD. CONTRACTOR SHALL COORDINATE WITH SCHOOL AND PERFORM TIE-INS WHEN SCHOOL IS NOT IN SESSION OR ON WEEKENDS TO AVOID DISRUPTION OF SCHOOL OPERATIONS.

REFER TO SHEET UC-16 FOR FSS1 PROFILE
 REFER TO SHEET UC-16 FOR FSS2 PROFILE

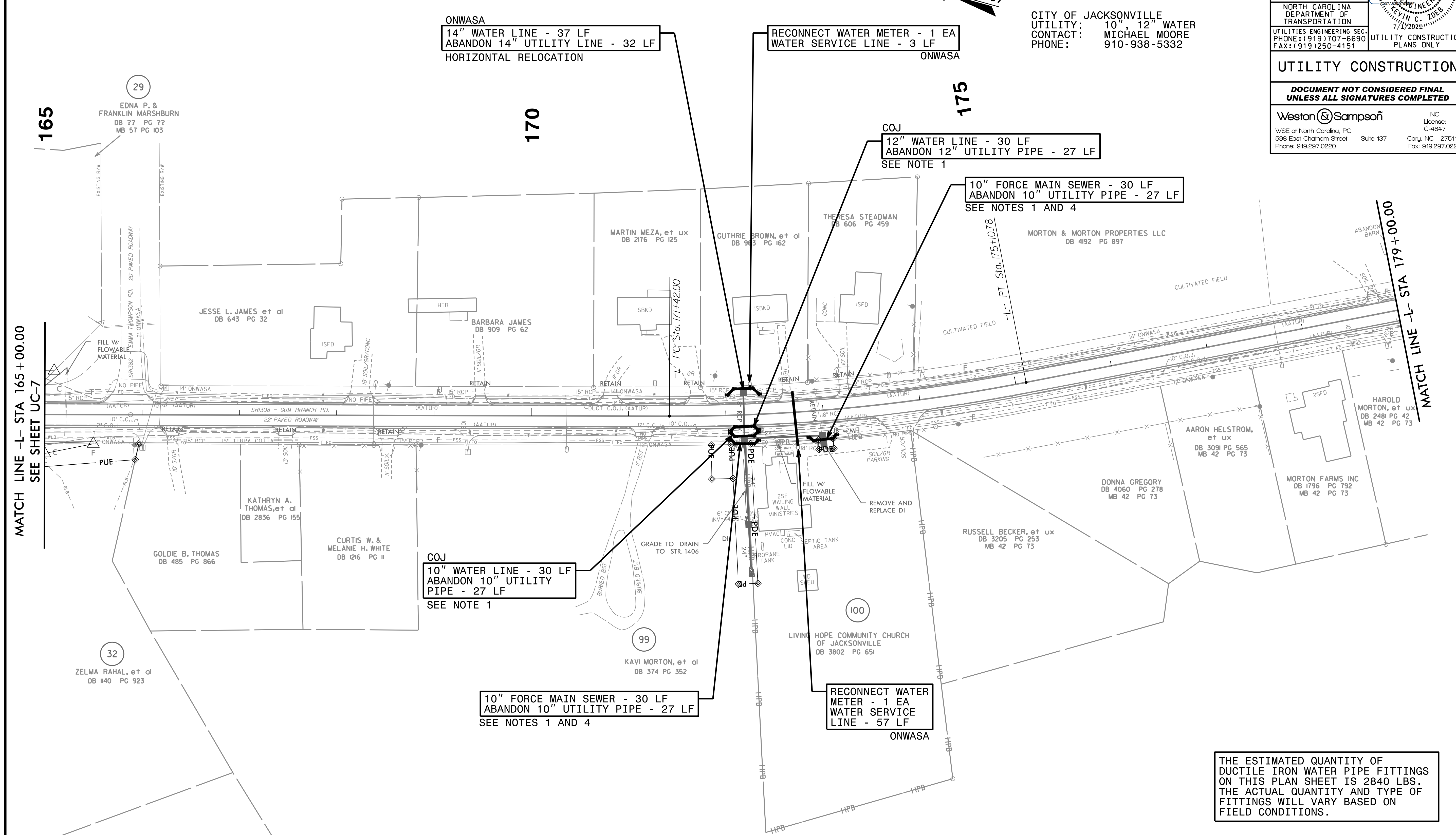
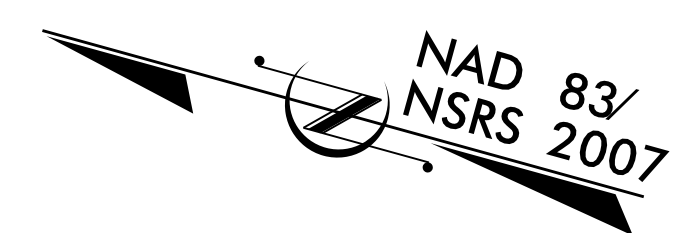
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PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-8
DESIGNED BY: SHF	 NORTH CAROLINA PROFESSIONAL ENGINEER Kevin C. Zolb License No. 22461 7/1/2022
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY OWNERS ON THIS SHEET:

ONWASA
 UTILITY: 14" WATER
 10" SANITARY FORCE MAIN
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

CITY OF JACKSONVILLE
 UTILITY: 10", 12" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332



MATCH LINE -L- STA 165+00.00
SEE SHEET UC-7

MATCH LINE -L- STA 179+00.00

ONWASA
 14" WATER LINE - 37 LF
 ABANDON 14" UTILITY LINE - 32 LF
 HORIZONTAL RELOCATION

RECONNECT WATER METER - 1 EA
 WATER SERVICE LINE - 3 LF
 ONWASA

COJ
 12" WATER LINE - 30 LF
 ABANDON 12" UTILITY PIPE - 27 LF
 SEE NOTE 1

10" FORCE MAIN SEWER - 30 LF
 ABANDON 10" UTILITY PIPE - 27 LF
 SEE NOTES 1 AND 4

COJ
 10" WATER LINE - 30 LF
 ABANDON 10" UTILITY PIPE - 27 LF
 SEE NOTE 1

10" FORCE MAIN SEWER - 30 LF
 ABANDON 10" UTILITY PIPE - 27 LF
 SEE NOTES 1 AND 4

RECONNECT WATER METER - 1 EA
 WATER SERVICE LINE - 57 LF
 ONWASA

THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 2840 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 1720 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

- NOTES:
1. PROPOSED DOWN AND UNDER RELOCATION OF UTILITY. REFER TO DETAIL ON SHEET UC-3B.
 2. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 3. REFER TO WATER METER DETAILS ON SHEET UC-3E.
 4. SANITARY FORCE MAIN IS ACTUALLY 10" IN THIS LOCATION, ACCORDING TO ONWASA.

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5/26/2021 4:16:09 PM
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PROJECT REFERENCE NO. U-4906	SHEET NO. UC-10
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

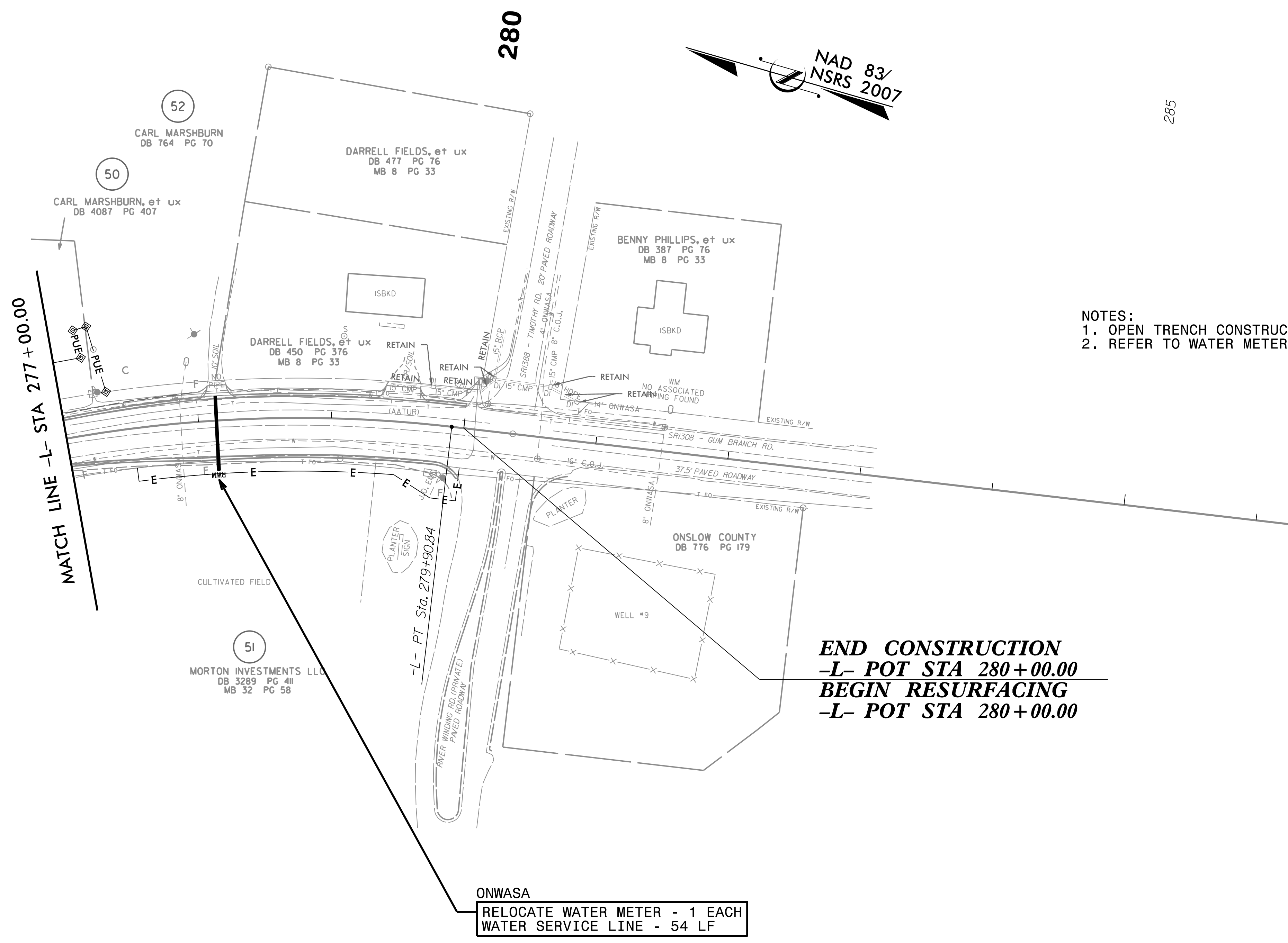
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

Weston Sampson
 WSE of North Carolina, PC
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 License: C-4647 Fax: 919.297.0221

UTILITY OWNERS ON THIS SHEET:

ONWASA
 UTILITY: 8", 14" WATER
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

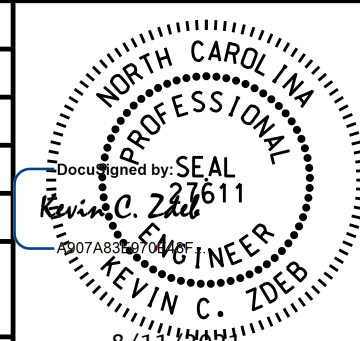
CITY OF JACKSONVILLE
 UTILITY: 16" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332



- NOTES:
 1. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 2. REFER TO WATER METER DETAILS ON SHEET UC-3B.

END CONSTRUCTION
-L- POT STA 280+00.00
BEGIN RESURFACING
-L- POT STA 280+00.00

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 54 LF

PROJECT REFERENCE NO. U-4906	SHEET NO. UC-11
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

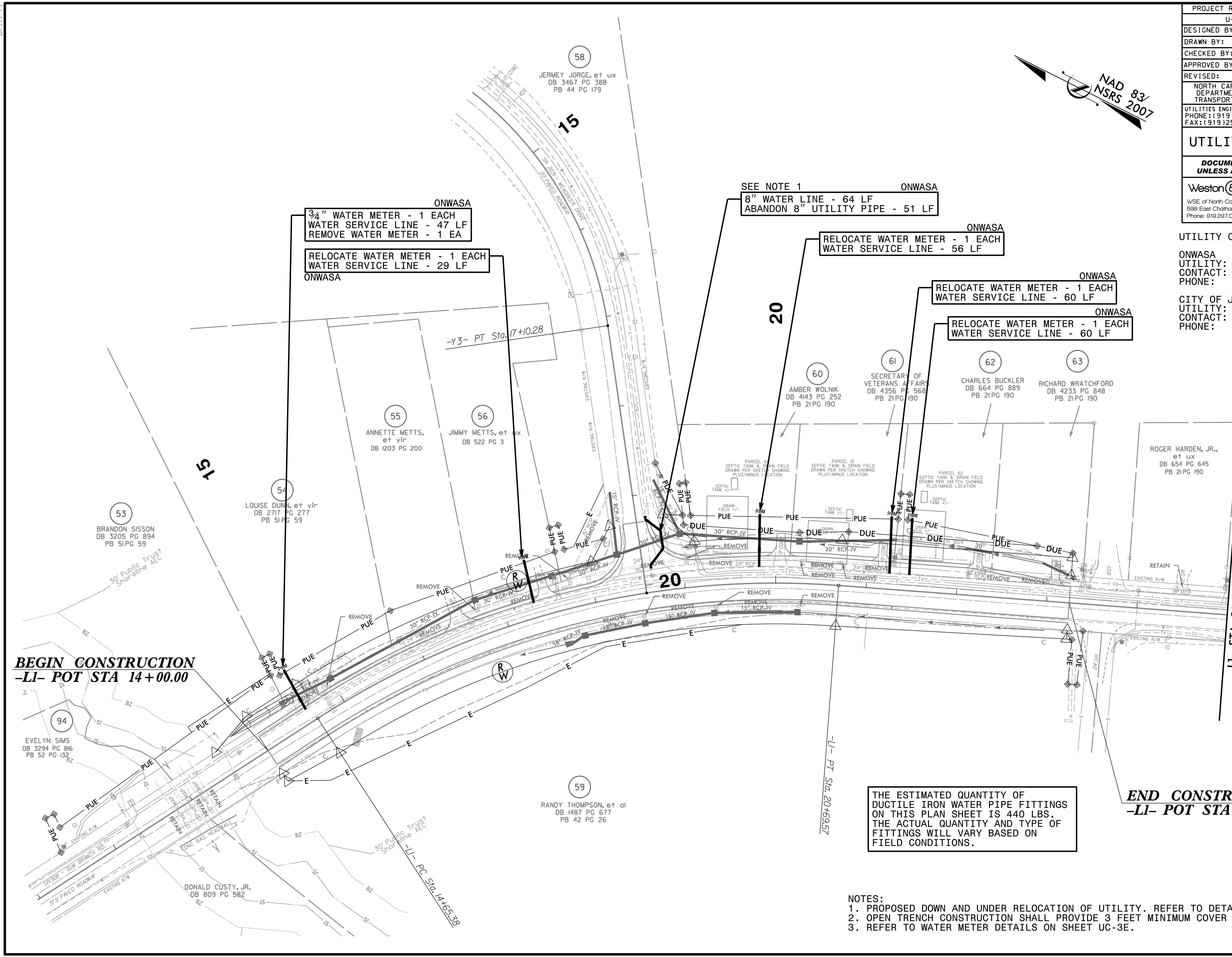
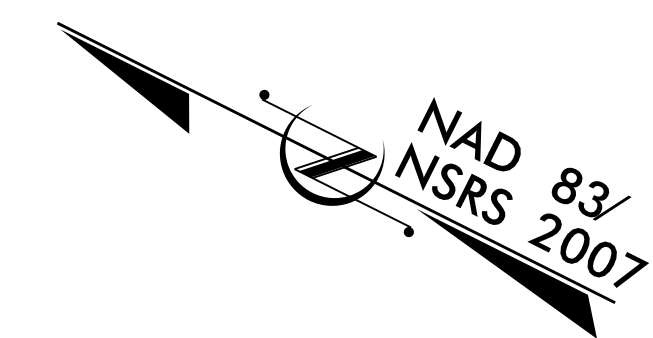
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Weston Sampson
 WSE of North Carolina, PC
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 NC License: C-4647

UTILITY OWNERS ON THIS SHEET:

ONWASA
 UTILITY: UNK, 8" WATER
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521

CITY OF JACKSONVILLE
 UTILITY: 16" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332



ONWASA
 3/4" WATER METER - 1 EACH
 WATER SERVICE LINE - 47 LF
 REMOVE WATER METER - 1 EA

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 29 LF

SEE NOTE 1 ONWASA
 8" WATER LINE - 64 LF
 ABANDON 8" UTILITY PIPE - 51 LF

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 56 LF

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 60 LF

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 60 LF

60
 AMBER WOLNIK
 DB 4143 PG 252
 PB 21PG 190

61
 SECRETARY OF VETERANS AFFAIRS
 DB 4356 PG 568
 PB 21PG 190

62
 CHARLES BUCKLER
 DB 664 PG 889
 PB 21PG 190

63
 RICHARD WRATCHFORD
 DB 4233 PG 848
 PB 21PG 190

ROGER HARDEN, JR.,
 et ux
 DB 654 PG 645
 PB 21PG 190

59
 RANDY THOMPSON, et al
 DB 1487 PG 677
 PB 42 PG 26

BEGIN CONSTRUCTION
-LI- POT STA 14+00.00

END CONSTRUCTION
-LI- POT STA 23+25.00

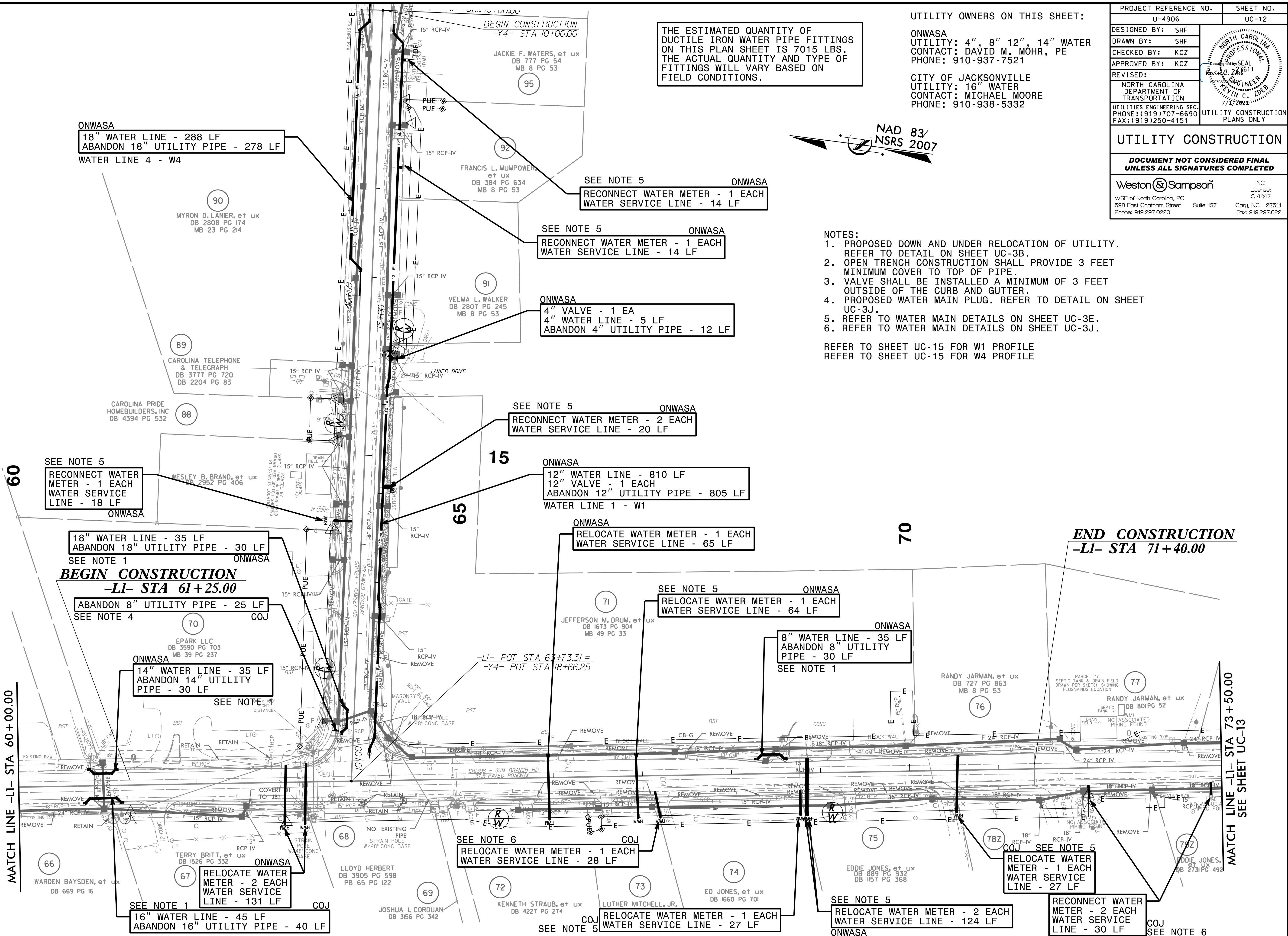
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 440 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

- NOTES:
1. PROPOSED DOWN AND UNDER RELOCATION OF UTILITY. REFER TO DETAIL ON SHEET UC-3B.
 2. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 3. REFER TO WATER METER DETAILS ON SHEET UC-3E.

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 8/17/99

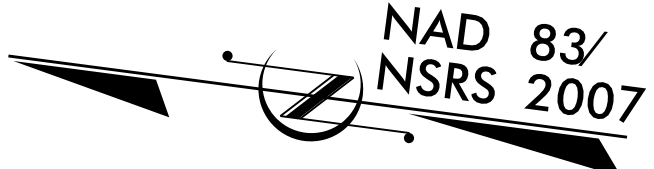
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8/17/99



THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 7015 LBS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

UTILITY OWNERS ON THIS SHEET:
 ONWASA
 UTILITY: 4", 8" 12", 14" WATER
 CONTACT: DAVID M. MOHR, PE
 PHONE: 910-937-7521
 CITY OF JACKSONVILLE
 UTILITY: 16" WATER
 CONTACT: MICHAEL MOORE
 PHONE: 910-938-5332



PROJECT REFERENCE NO. U-4906	SHEET NO. UC-12
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 Weston Sampson
 W/SE of North Carolina, PC
 598 East Chatham Street Suite 137 Cary, NC 27511
 Phone: 919.297.0220 NC License: C-4647 Fax: 919.297.0221

- NOTES:
1. PROPOSED DOWN AND UNDER RELOCATION OF UTILITY. REFER TO DETAIL ON SHEET UC-3B.
 2. OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER TO TOP OF PIPE.
 3. VALVE SHALL BE INSTALLED A MINIMUM OF 3 FEET OUTSIDE OF THE CURB AND GUTTER.
 4. PROPOSED WATER MAIN PLUG. REFER TO DETAIL ON SHEET UC-3J.
 5. REFER TO WATER MAIN DETAILS ON SHEET UC-3E.
 6. REFER TO WATER MAIN DETAILS ON SHEET UC-3J.
- REFER TO SHEET UC-15 FOR W1 PROFILE
 REFER TO SHEET UC-15 FOR W4 PROFILE

ONWASA
 18" WATER LINE - 288 LF
 ABANDON 18" UTILITY PIPE - 278 LF
 WATER LINE 4 - W4

SEE NOTE 5 ONWASA
 RECONNECT WATER METER - 1 EACH
 WATER SERVICE LINE - 14 LF

SEE NOTE 5 ONWASA
 RECONNECT WATER METER - 1 EACH
 WATER SERVICE LINE - 14 LF

ONWASA
 4" VALVE - 1 EA
 4" WATER LINE - 5 LF
 ABANDON 4" UTILITY PIPE - 12 LF

SEE NOTE 5 ONWASA
 RECONNECT WATER METER - 2 EACH
 WATER SERVICE LINE - 20 LF

ONWASA
 12" WATER LINE - 810 LF
 12" VALVE - 1 EACH
 ABANDON 12" UTILITY PIPE - 805 LF
 WATER LINE 1 - W1

ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 65 LF

SEE NOTE 5 ONWASA
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 64 LF

ONWASA
 8" WATER LINE - 35 LF
 ABANDON 8" UTILITY PIPE - 30 LF
 SEE NOTE 1

SEE NOTE 5 ONWASA
 RECONNECT WATER METER - 1 EACH
 WATER SERVICE LINE - 18 LF

18" WATER LINE - 35 LF
 ABANDON 18" UTILITY PIPE - 30 LF
 SEE NOTE 1 ONWASA
BEGIN CONSTRUCTION
 -L1- STA 61+25.00

ABANDON 8" UTILITY PIPE - 25 LF
 SEE NOTE 4 COJ

ONWASA
 14" WATER LINE - 35 LF
 ABANDON 14" UTILITY PIPE - 30 LF

SEE NOTE 6 COJ
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 28 LF

ONWASA
 RELOCATE WATER METER - 2 EACH
 WATER SERVICE LINE - 131 LF

SEE NOTE 1 COJ
 16" WATER LINE - 45 LF
 ABANDON 16" UTILITY PIPE - 40 LF

SEE NOTE 5 COJ
 RELOCATE WATER METER - 1 EACH
 WATER SERVICE LINE - 27 LF

SEE NOTE 5 ONWASA
 RELOCATE WATER METER - 2 EACH
 WATER SERVICE LINE - 124 LF

RECONNECT WATER METER - 2 EACH
 WATER SERVICE LINE - 30 LF
 COJ SEE NOTE 6

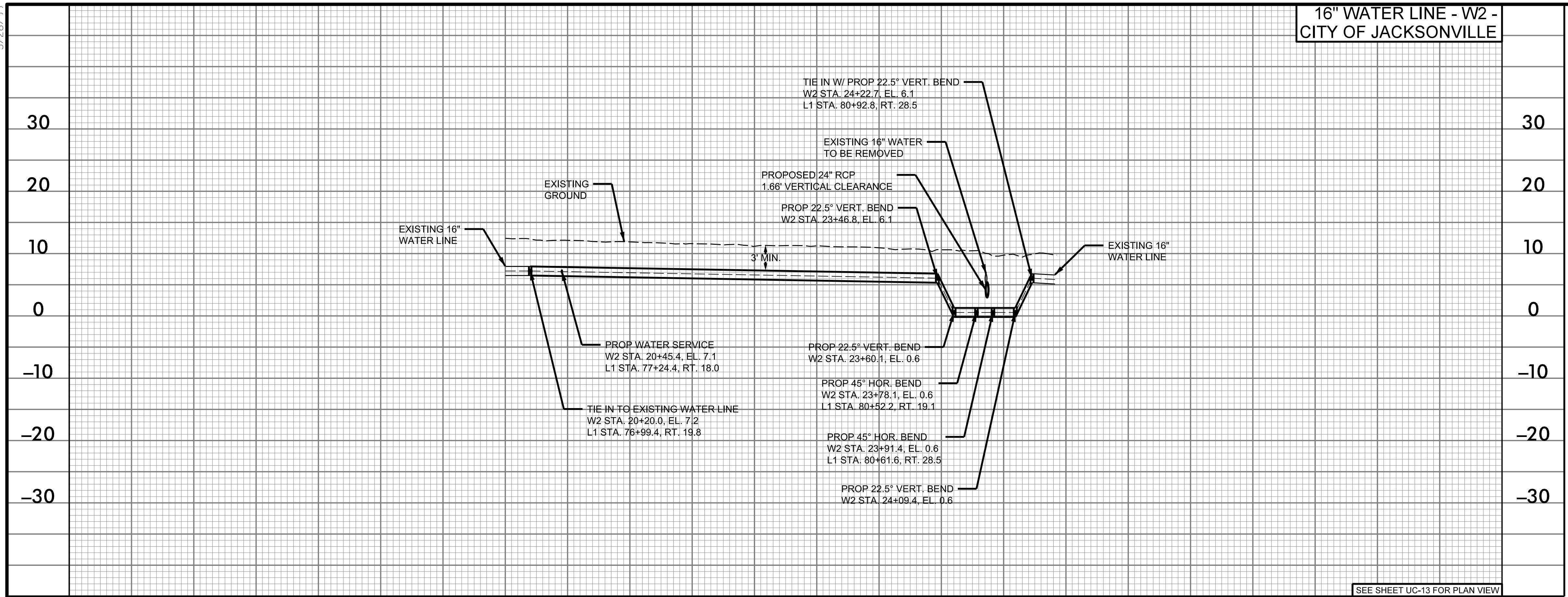
MATCH LINE -L1- STA 60+00.00

MATCH LINE -L1- STA 73+50.00
SEE SHEET UC-13

END CONSTRUCTION
-L1- STA 71+40.00

5/28/2014

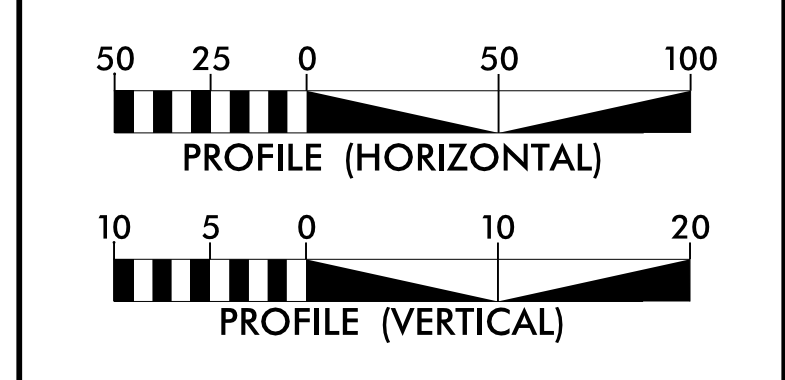
16" WATER LINE - W2 - CITY OF JACKSONVILLE



PROJECT REFERENCE NO. U-4906	SHEET NO. UC-14
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISD:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

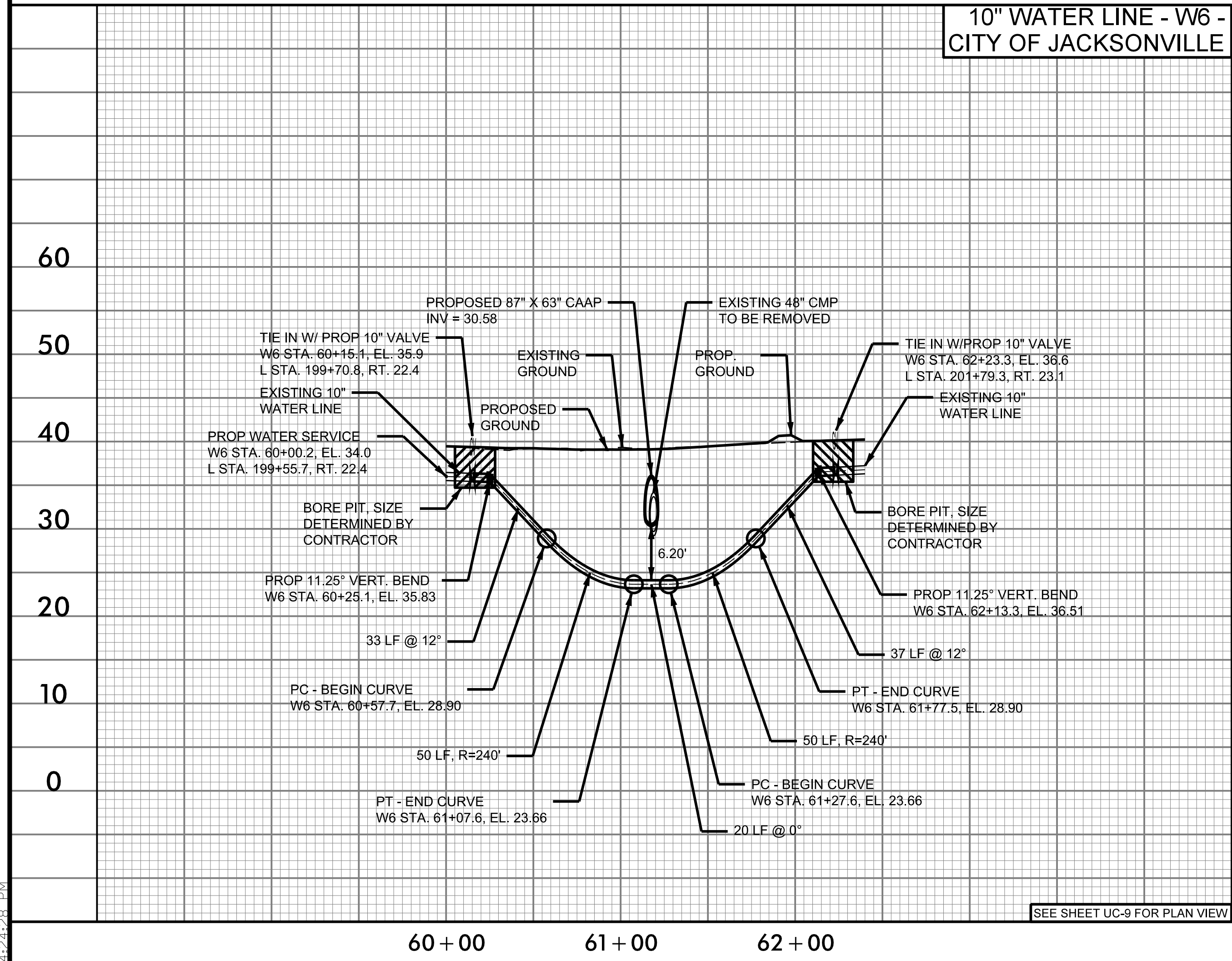
Weston & Sampson NC License: C-4047
 588 East Chatham Street, Suite 137, Cary, NC 27511
 Phone: 919.297.0220 Fax: 919.297.0221



- NOTES:
- EXISTING PIPE AT TIE-IN LOCATIONS ARE ESTIMATED BASED ON TEST HOLE INFORMATION PROVIDED BY OTHERS OR ASSUMED TO HAVE 3 FEET OF COVER. CONTRACTOR SHALL FIELD VERIFY PIPE LOCATION BEFORE STARTING WORK.
 - ALL PROPOSED PIPE ELEVATIONS IN PROFILE REFER TO CENTER OF PIPE.
 - OPEN TRENCH CONSTRUCTION SHALL PROVIDE 3 FEET MINIMUM COVER FROM FINAL GRADE TO TOP OF PIPE.
 - DIRECTIONAL DRILL AND BORE AND JACK INSTALLATIONS SHALL BE IN ACCORDANCE WITH DETAILS.

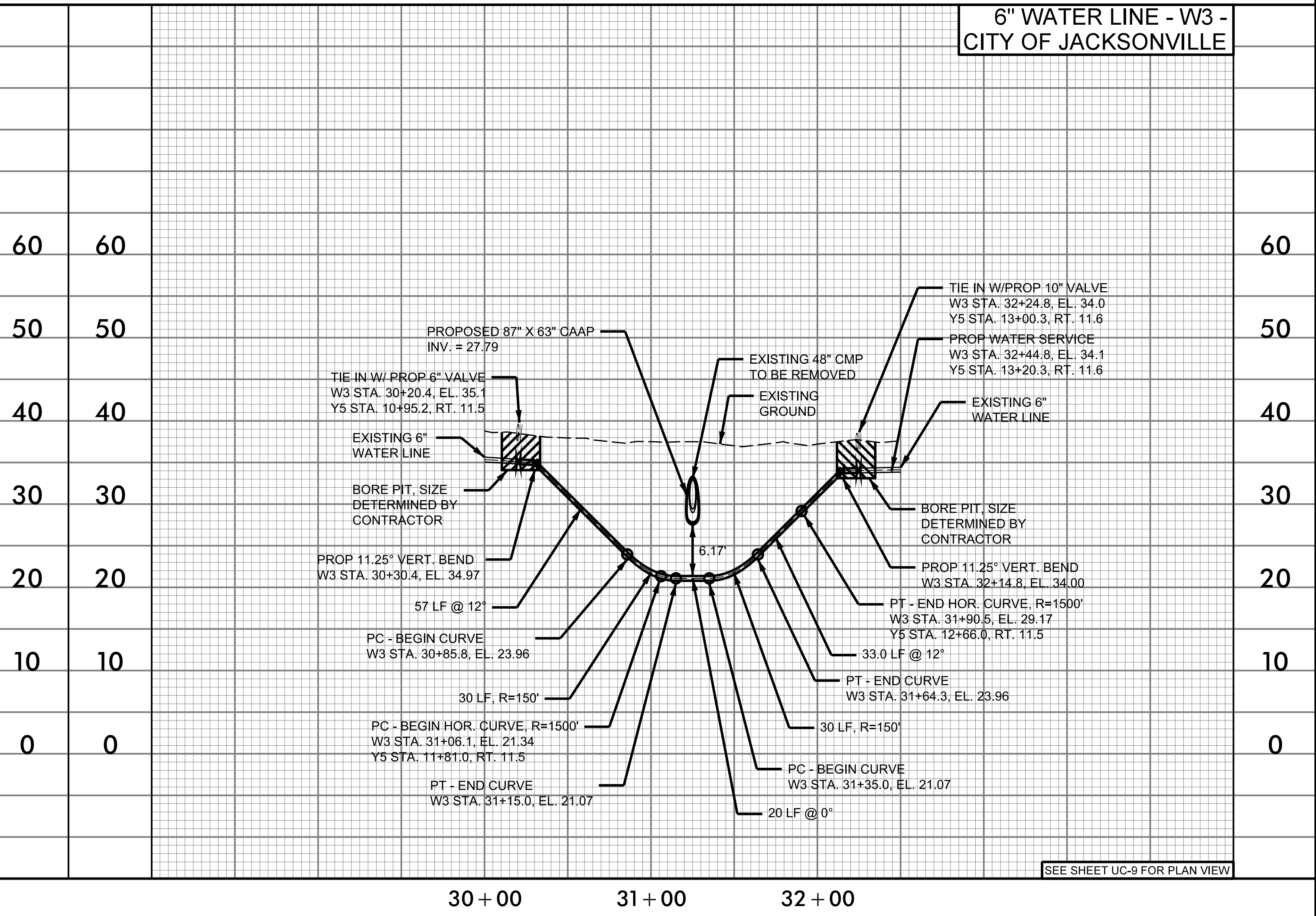
5/25/2014 local\WSE-Projects\NC\Cary\OldServer\Engineer\Jobs\0696\026\12100_U-4906\Utilities\Engineering\UC\Proj\U4906_ut.pfl_UC14_psh.dgn

10" WATER LINE - W6 - CITY OF JACKSONVILLE



SEE SHEET UC-9 FOR PLAN VIEW

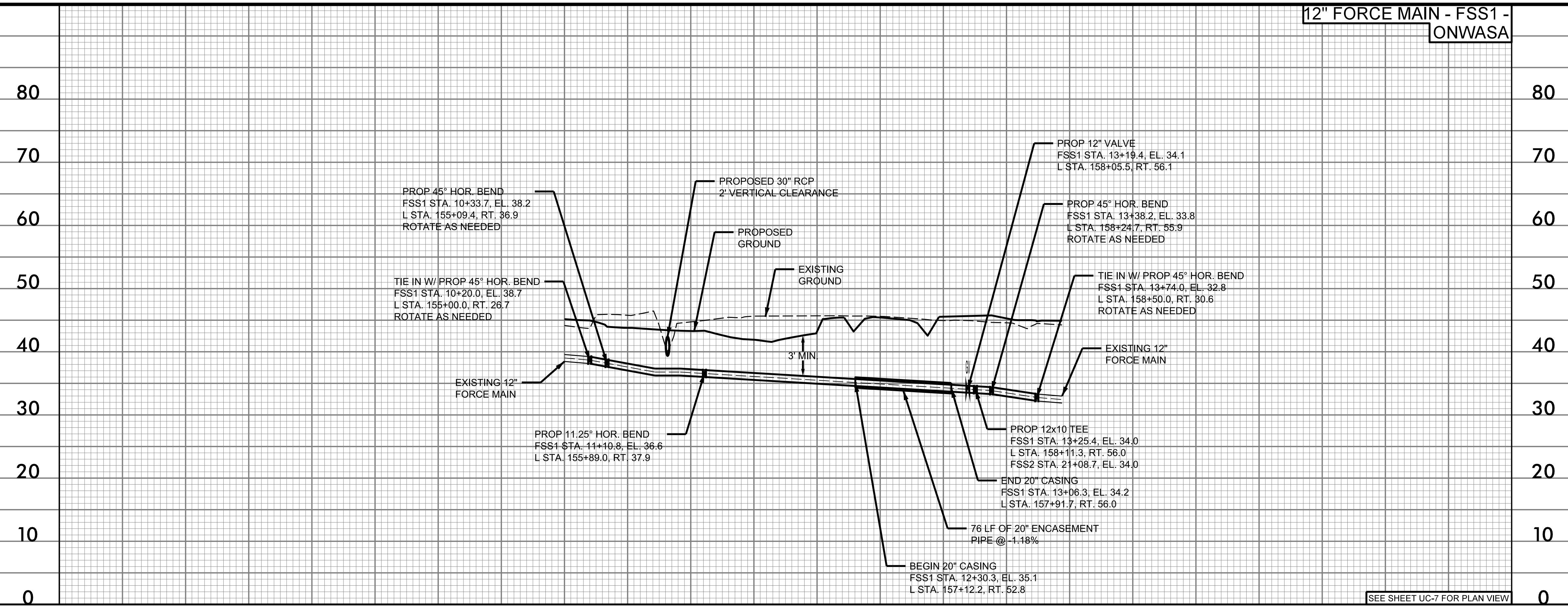
6" WATER LINE - W3 - CITY OF JACKSONVILLE



SEE SHEET UC-9 FOR PLAN VIEW

5/28/2016

5/28/2016 4:27:37 PM C:\Users\jgibson\Documents\Projects\WSE\Projects\NC\Cary\Projects\Utilities\Engineering\UC\Proj\U4906_ut.pfl\UC16_psh.dgn

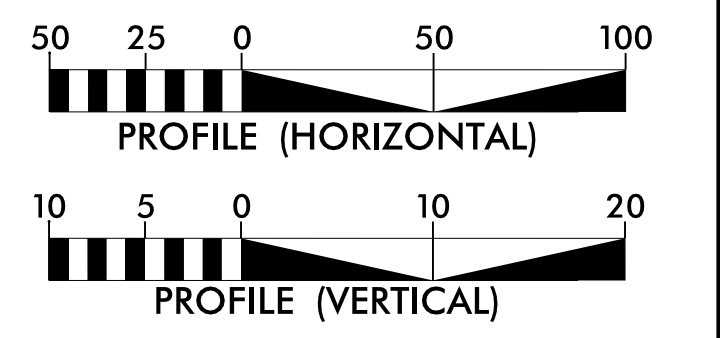


SEE SHEET UC-7 FOR PLAN VIEW

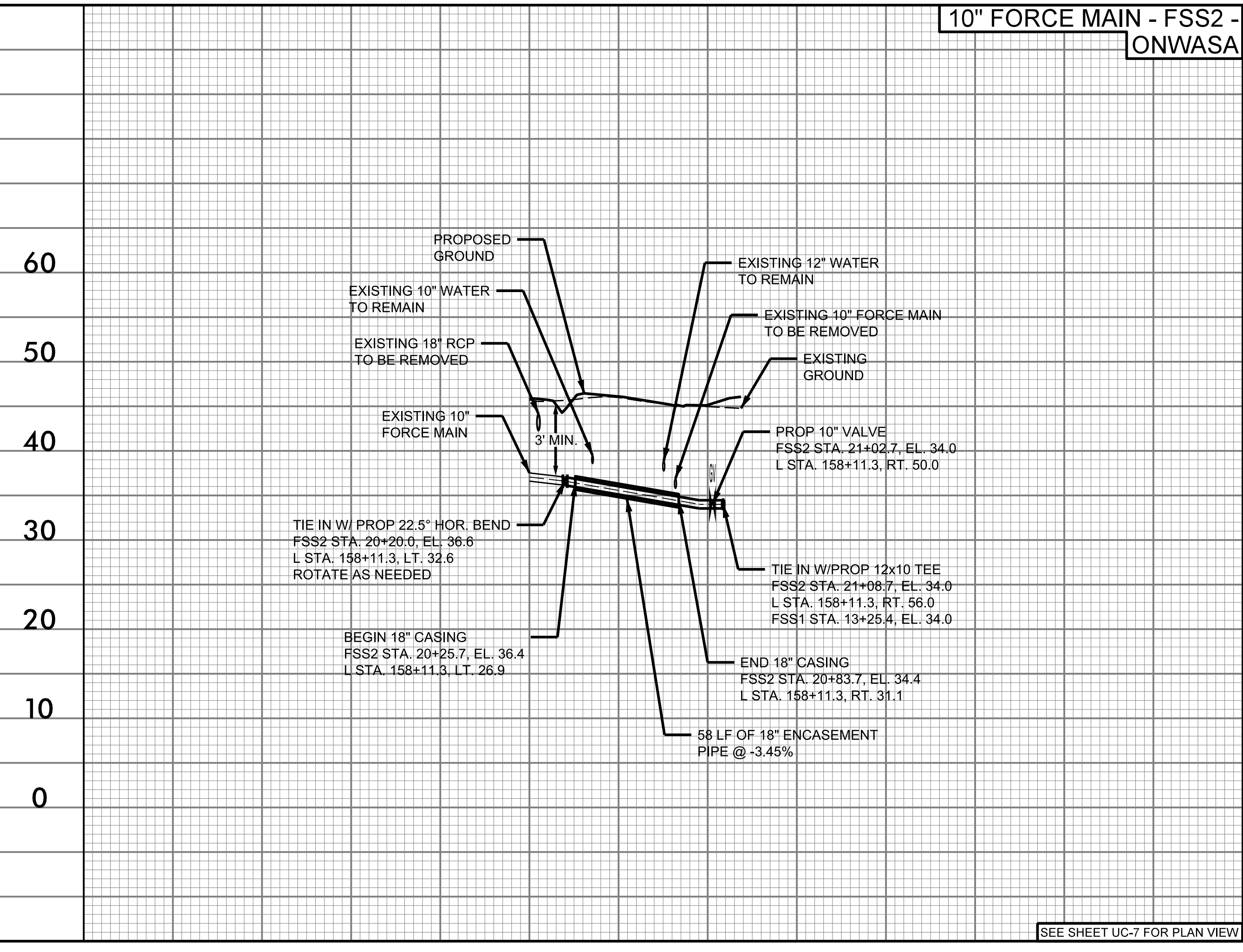
PROJECT REFERENCE NO.	SHEET NO.
U-4906	UC-16
DESIGNED BY: SHF	
DRAWN BY: SHF	
CHECKED BY: KCZ	
APPROVED BY: KCZ	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 UTILITY CONSTRUCTION PLANS ONLY	

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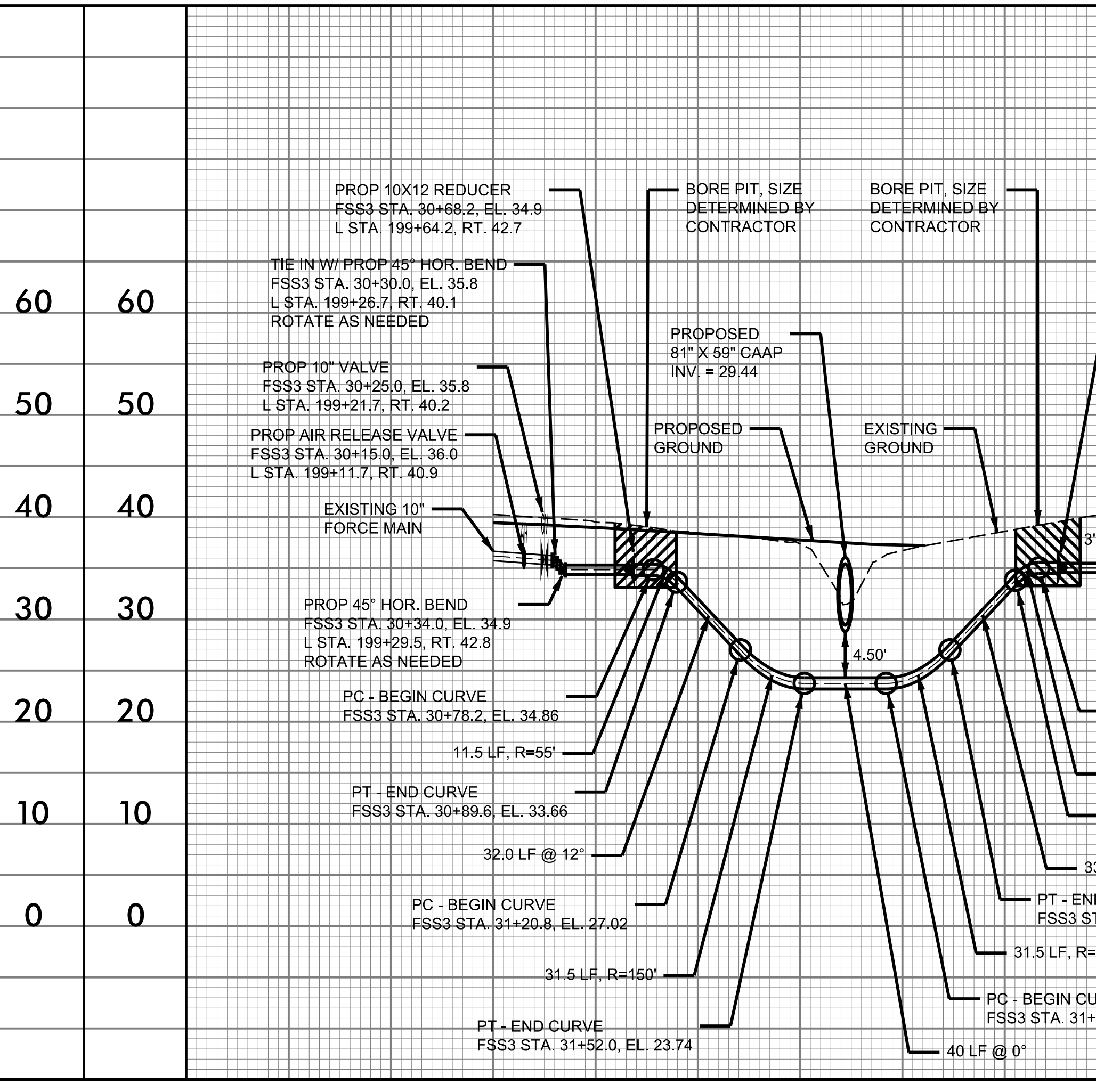
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 WSE of North Carolina, PC
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 - DIRECTIONAL DRILL AND BORE AND JACK INSTALLATIONS SHALL BE IN ACCORDANCE WITH DETAILS.
 - HDPE PIPE SHALL BE FIELD BENT WITH THE MANUFACTURERS MINIMUM ALLOWABLE BEND RADIUS.



SEE SHEET UC-7 FOR PLAN VIEW



SEE SHEET UC-9 FOR PLAN VIEW