

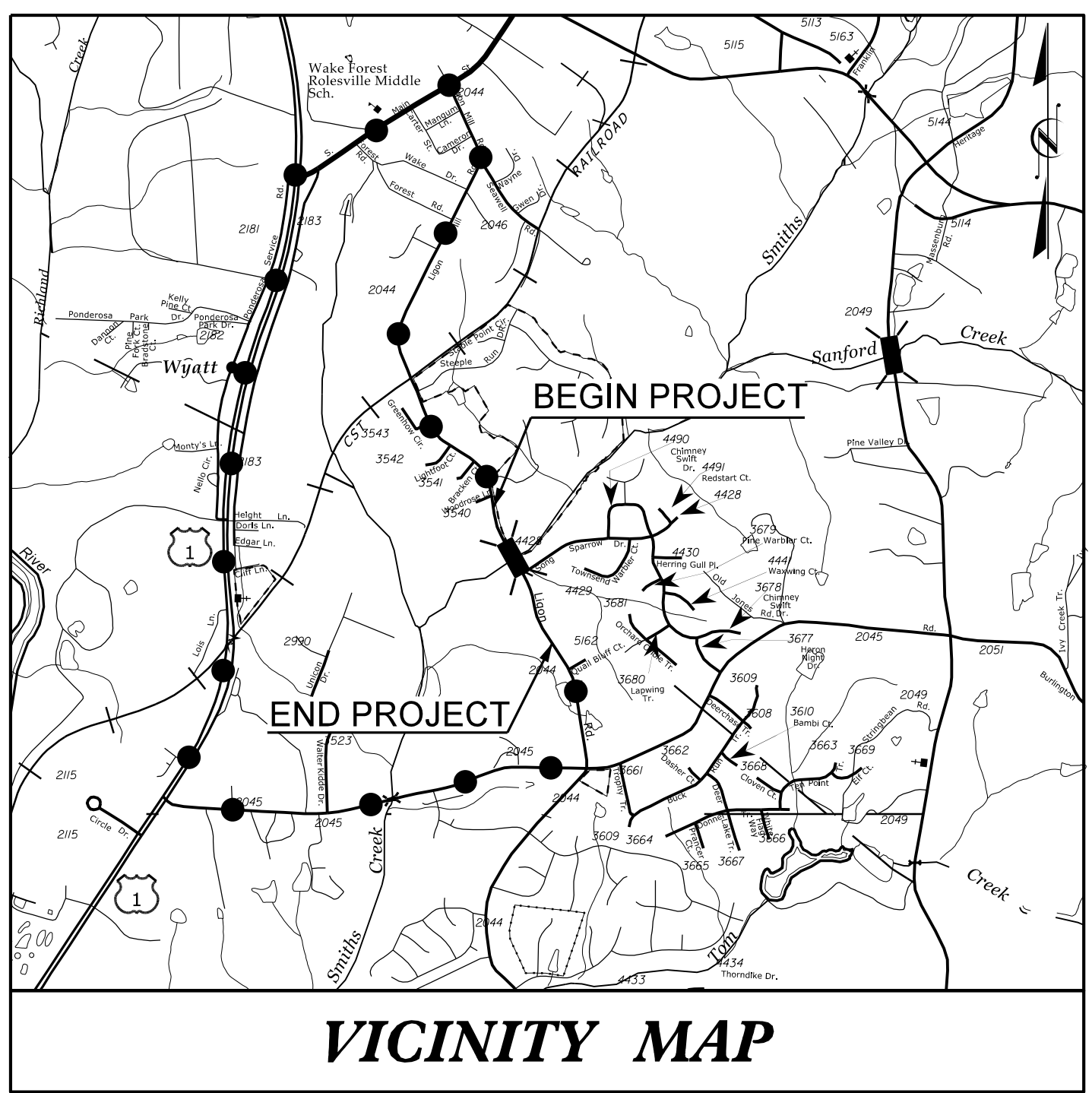
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09_08/21

TIP PROJECT: B-5318



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS
WAKE COUNTY**

LOCATION: SMITH CREEK ON SR 2044 (LIGON MILL ROAD)

TYPE OF WORK: WATER & SEWER RELOCATION

T.I.P. NO.	SHEET NO.
B-5318	UC-1

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)
 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-4929
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 City of Raleigh Public Utilities Department Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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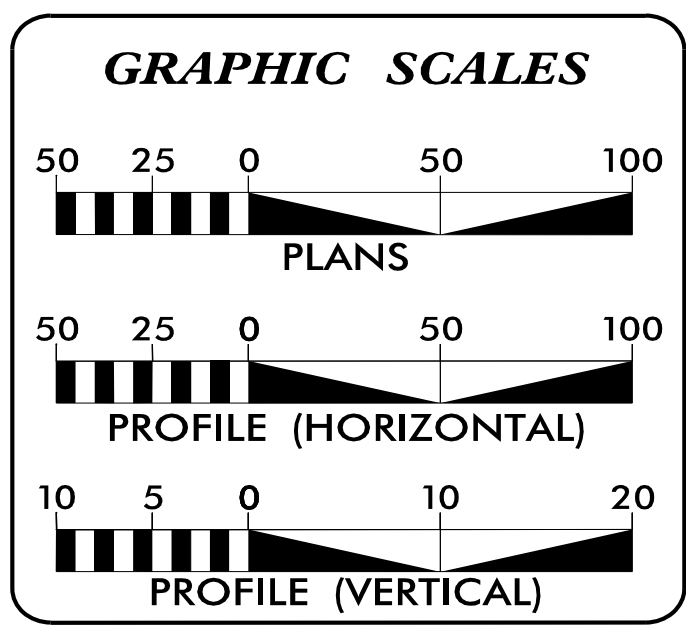
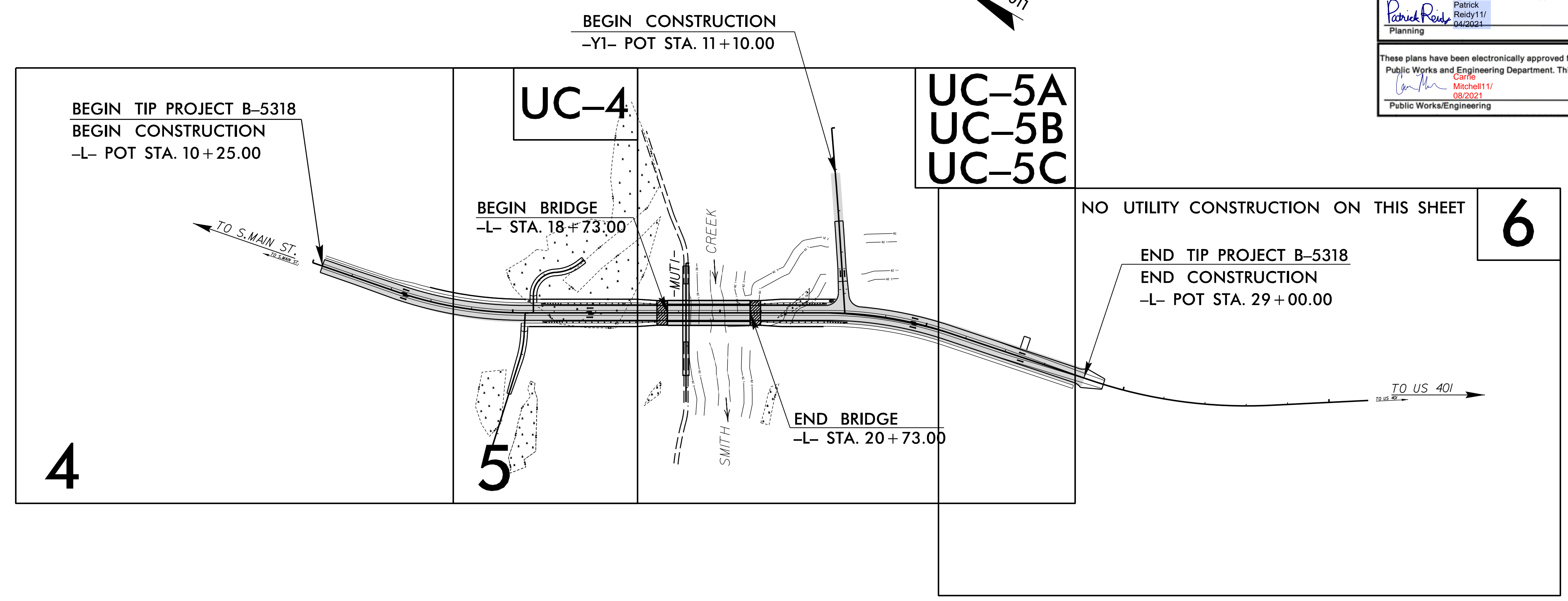
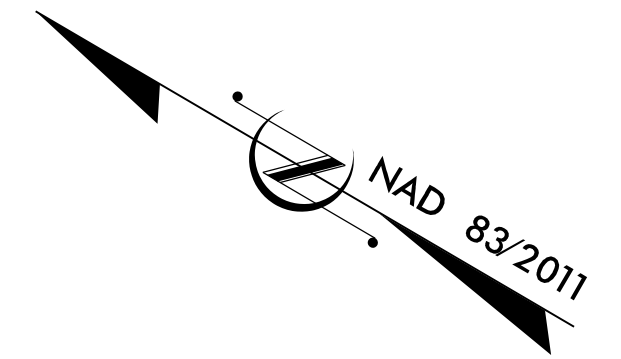
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Patrick Reidy
Patrick Reidy 11/04/2024
Planning

These plans have been electronically approved for construction by the Town of Wake Forest Public Works and Engineering Department. This approval may not be edited once issued.

Carlie Mitchell
Carlie Mitchell 11/08/2021
Public Works/Engineering



INDEX OF SHEETS

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A THRU UC-3D	DETAILS
UC-4 THRU UC-5B	UTILITY PLAN & PROFILE
UC-5C	TEMPORARY BYPASS PUMPING PLAN

WATER AND SEWER OWNERS ON PROJECT

(A) WATER CITY OF RALEIGH
(B) SANITARY SEWER CITY OF RALEIGH

PREPARED IN THE OFFICE OF

Dewberry

2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.981.9939
NC COA No. F-0929

LARRY MITCHELL, P.E. PROJECT MANAGER
TIMOTHY RITACCO, P.E. PROJECT ENGINEER
DUSTIN JAMES DESIGNER

SEAL

11/1/2021

**DIVISION OF HIGHWAYS
DIVISION 5
PROJECT DELIVERY UNIT
2612 N. DUKE STREET
DURHAM, NC 27704**

TRACY PARROT PROJECT DELIVERY ENGINEER
LISA GILCRIST, EI BRIDGE PROGRAM MANAGER
DON PROPER DIV. 5 UTILITY ENGINEER
MONROE BROWN DIV. 5 UTILITY COORDINATOR

28-OCT-2021 15:14
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\$\$\$\$\$SERVNAME\$\$\$\$\$

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

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

04/06/15

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	↓
Proposed Lateral, Tail, Head Ditch	→
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	○ RW
Proposed Right of Way Line with Iron Pin and Cap Marker	○ RW ▲
Proposed Right of Way Line with Concrete or Granite RW Marker	▲ RW
Proposed Control of Access Line with Concrete C/A Marker	○ C/A
Existing Control of Access	○ C/A
Proposed Control of Access	○ C/A
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Drainage / Utility Easement	-DUE-
Proposed Permanent Utility Easement	-PUE-
Proposed Temporary Utility Easement	-TUE-
Proposed Aerial Utility Easement	-AUE-
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

ROADS AND RELATED FEATURES:

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

VEGETATION:

Single Tree	☘
Single Shrub	☘
Hedge	~~~~~
Woods Line	~~~~~

Orchard	☘ ☘ ☘ ☘
Vineyard	□ Vineyard

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	□ CONC
Bridge Wing Wall, Head Wall and End Wall	□ CONC WW
MINOR:	
Head and End Wall	□ CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	-S-

UTILITIES:

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

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	○ T
Telephone Pedestal	□
Telephone Cell Tower	□
U/G Telephone Cable Hand Hole	○ TH
U/G Telephone Cable LOS B (S.U.E.*)	-----T-----
U/G Telephone Cable LOS C (S.U.E.*)	-----T-----
U/G Telephone Cable LOS D (S.U.E.*)	-----T-----
U/G Telephone Conduit LOS B (S.U.E.*)	-----TC-----
U/G Telephone Conduit LOS C (S.U.E.*)	-----TC-----
U/G Telephone Conduit LOS D (S.U.E.*)	-----TC-----
U/G Fiber Optics Cable LOS B (S.U.E.*)	-----TFD-----
U/G Fiber Optics Cable LOS C (S.U.E.*)	-----TFD-----
U/G Fiber Optics Cable LOS D (S.U.E.*)	-----TFD-----

WATER:

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

TV:

TV Pedestal	□
TV Tower	⊗
U/G TV Cable Hand Hole	○ TH
U/G TV Cable LOS B (S.U.E.*)	-----TV-----
U/G TV Cable LOS C (S.U.E.*)	-----TV-----
U/G TV Cable LOS D (S.U.E.*)	-----TV-----
U/G Fiber Optic Cable LOS B (S.U.E.*)	-----TV FO-----
U/G Fiber Optic Cable LOS C (S.U.E.*)	-----TV FO-----
U/G Fiber Optic Cable LOS D (S.U.E.*)	-----TV FO-----

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

5/14/19

EROSION CONTROL NOTES:

1. A LAND DISTURBING (E&SC) PERMIT IS REQUIRED FOR PROJECTS OVER 0.50 ACRE. IF MULTIPLE LOTS WITH LAND DISTURBANCE OVER 0.50 ACRE TOTAL ARE EITHER CONTIGUOUS OR NON-CONTIGUOUS IN THE SAME SUBDIVISION, BEING TAKEN DOWN BY THE SAME BUILDER/OWNER, A LAND DISTURBING PERMIT IS REQUIRED. THE COST OF THE PLAN REVIEW AND PERMIT IS \$500/ACRE ROUNDED UP (1.1 ACRES = 2 ACRES @ \$500/ACRE = \$1,000). THE FEE IS DUE AT TIME OF PLAN SUBMITTAL. DEVELOPER IS RESPONSIBLE FOR INFORMING BUILDER OF E&SC PERMIT REQUIREMENTS ON INDIVIDUAL LOTS. DISCLAIMER: TOWN OF WAKE FOREST FEES AND CHARGES ARE SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE CALL 919-435-9443 TO CONFIRM CURRENT FEES AND CHARGES.
2. IF ADDITIONAL ACREAGE IS ADDED TO AN EXISTING PERMIT REVISED FORMS, PLANS, AND ANY ADDITIONAL FEES MUST BE SUBMITTED.
3. IF OWNERSHIP OF A PROPERTY HAS CHANGED A REVISED FRO MUST BE SUBMITTED.
4. IF A PROPERTY IS TAKEN OVER BY THE BANK, THE BANK SHALL CONTACT THE TOWN AND REPAIR ALL EROSION CONTROL MEASURES TO TOWN/NC DENR STANDARDS. THEY SHALL ALSO SUBMIT A NEW FRO FORM.
5. IF A PROJECT IS NOT COMPLETE WITHIN TWO YEARS, THE PLANS MUST BE RENEWED AT \$250/ACRE. A REVISED SET OF PLANS MAY BE SUBMITTED IF ACREAGE HAS ALREADY BEEN DEVELOPED AND A CERTIFICAION OF ACCUPANY HAS BEEN ISSUED.
6. AN EROSION PRECONSTRUCTION MEETING MUST BE HELD WITH THE TOWN OF WAKE FOREST PRIOR TO START OF ANY WORK, INCLUDING INSTALLATION OF EROSION CONTROL MEASURES, DEMOLITION, CUTTING TREES, AND GRUBBING. CALL ENGINEERING AT (919) 435-9443 TO SET UP A MEETING. ALL PLANS MUST BE SIGNED AND COPIES RETURNED BACK TO THE TOWN 1 WEEK PRIOR TO PRECONSTRUCTION MEETING.
7. THE OWNER, GENERAL CONTRACTOR, GRADING COMPANY, AND EROSION CONTROL INSTALLER MUST BE PRESENT AT THE PRECONSTRUCTION MEETING.
8. THE E&SC PERMIT AND NPDES GENERAL STORMWATER PERMIT WILL BE GIVEN OUT AT THIS MEETING.
9. AFTER THE PRE-CONSTRUCTION MEETING IS HELD, THE CONTRACTOR CAN INSTALL INITIAL EROSION CONTROL MEASURES ONLY. THIS INCLUDES BUT IS NOT LIMITED TO CONSTRUCTION ENTRANCE, SILT FENCE, PERIMETER DIVERSION DITCH, CHECK DAMS (ROCK OR WADDLE TYPE), TREE PROTECTION FENCE, EXISTING INLET PROTECTION, SKIMMER SEDIMENT BASINS, AND SEDIMENT TRAPS. CLEAR ONLY AS NECESSARY TO INSTALL THESE MEASURES.
10. CONTRACTOR IS RESPONSIBLE FOR E&SC WEEKLY INSTALLATION AND MAINTENANCE LOG INCLUDING DATES OF TEMPORARY/PERMANENT GROUND COVER, A RAIN GAGE, COPY OF TOWF SIGNED PLANS ONSITE, REVISED SIGNED PLANS, NPDES LOG, AND CONSTRUCTION BOX MUST BE PRESENT AND EASILY ACCESSIBLE ONSITE.
11. ONCE MEASURES ARE INSTALLED, CONTRACTOR/FRO TO CALL TOWF FOR AN INITIAL INSPECTION. IF SITE PASSES INSPECTION, A CERTIFICATE OF COMPLIANCE WILL BE ISSUED. CONTRACTOR CAN NOW BEGIN CLEARING, GRUBBING, AND GRADING.
12. CONTRACTOR TO MAINTAIN ACCESS ROAD FOR EMERGENCIES AT ALL TIMES.
13. PHASE PROJECT TO LEAVE AS LITTLE GROUND OPEN AS POSSIBLE.
14. TEMPORARILY SEED, STRAW AND TACK OR HYDROSEED WITHIN 14 DAYS OF ANY PHASE OF GRADING, INCLUDING SLOPES. SEED BASINS AND DITCHES IMMEDIATELY AFTER CONSTRUCTION.
15. PRIOR TO REMOVAL OF TEMPORARY MEASURES, TOWN MUST APPROVE REMOVAL. ALL AREAS ABOVE TEMPORARY MEASURE MUST HAVE 85% GROUND COVER.
16. THE TOWN OF WAKE FOREST CONSTRUCTION INSPECTOR WILL EVALUATE THE SITE AT LEASE ONCE A MONTH. A COPY OF THE INSPECTION FORM WILL BE EMAILED TO THE FRO. THE WEEKLY EROSION LOG AND NPDES LOG MUST BE ONSITE AND AVAILABLE FOR REVIEW.
17. IF THE SITE IS FOUND OUT OF COMPLIANCE A NOTICE OF VIOLATION WILL BE ISSUED GIVING THE CONTRACTOR/FRO 7 WORKING DAYS TO REMEDY THE PROBLEM. IF THE SITUATION IS NOT RESOLVED WITHIN THE TIME PERIOD A FINE MAY BE ISSUED.
18. IF SEDIMENT LEAVES THE SITE A FINE MAY BE ISSUED UP TO \$5,000 PER DAY VIOLATION. IF SEDIMENT ENTERS A BUFFER, STREAM, OR WETLAND NCDWQ WILL BE NOTIFIED. THEY MAY ISSUES FINES UP TO \$25,000 PER DAY VIOLATION.
19. CALL THE TOWN UPON COMPLETION FOR A FINAL EROSION INSPECTION. A PUNCHLIST MAY BE GENERATED ADDRESSING ANY REMAINING ITEMS. THERE MUST BE 85% GROUND COVER ON THE ENTIRE SITE PRIOR TO A CERTIFICATE OF OCCUPANY. IF THE SITE IS FOUND TO BE IN COMPLIANCE AN EROSION CERTIFICATE OF COMPLETION WILL BE ISSUED.



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.981.9939
NC COA No. F-5929

PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-3
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION

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.
2. THE EXISTING UTILITIES BELONG TO THE CITY OF RALEIGH.
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. 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.
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 OF THIS CONTACT 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 OPPORTUNITY 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 ADDITIONAL 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.
8. MAKE CONNECTION 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.

SITE PERMITTING APPROVAL

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Patrick Ready 04/2021
Patrick Ready 11/05/2021
Planning

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Cary Mitchell 05/2021
Cary Mitchell 11/05/2021
Public Works/Engineering

26-OCT-2021 15:07:00
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PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-3A
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	11/1/2021
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

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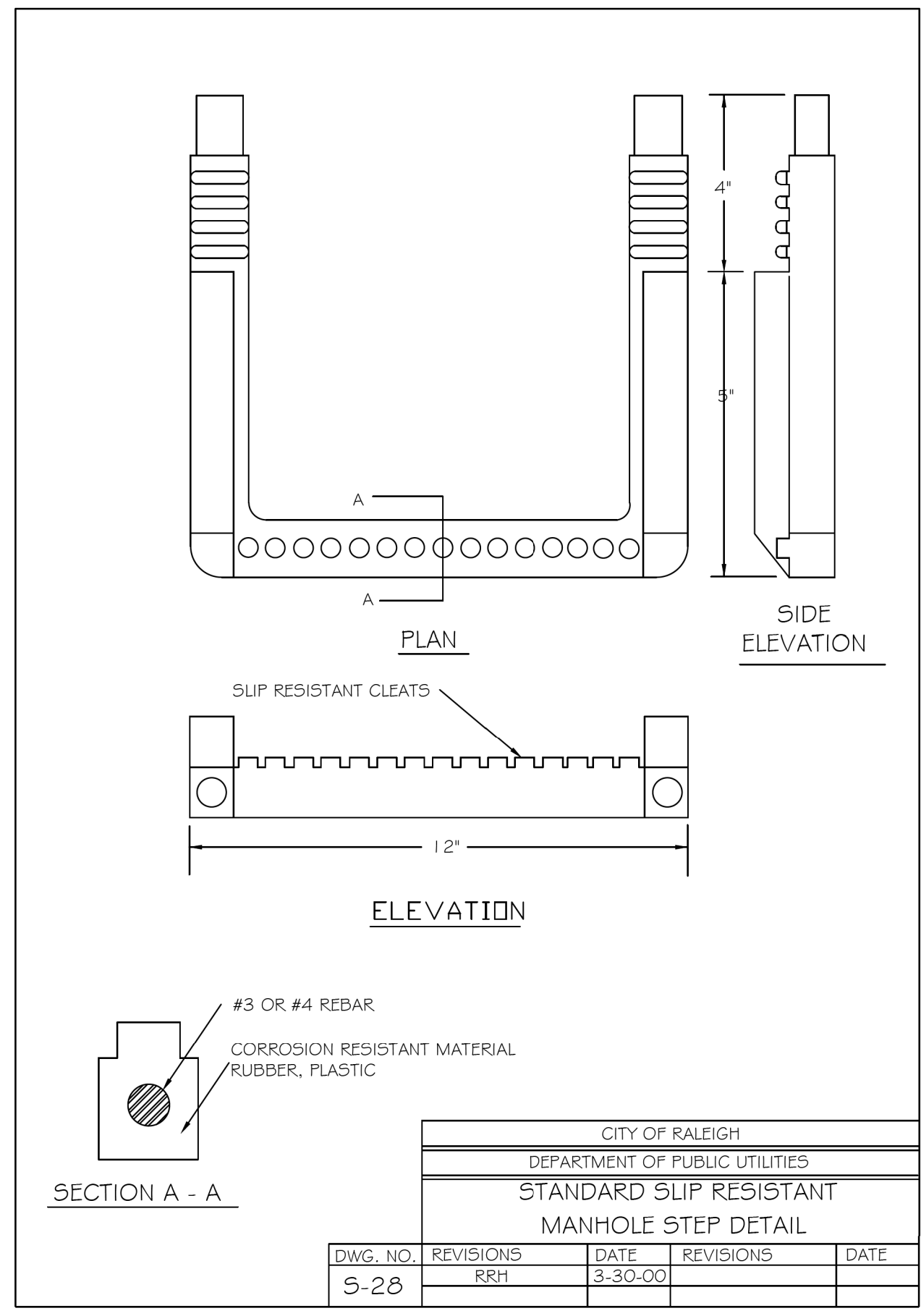
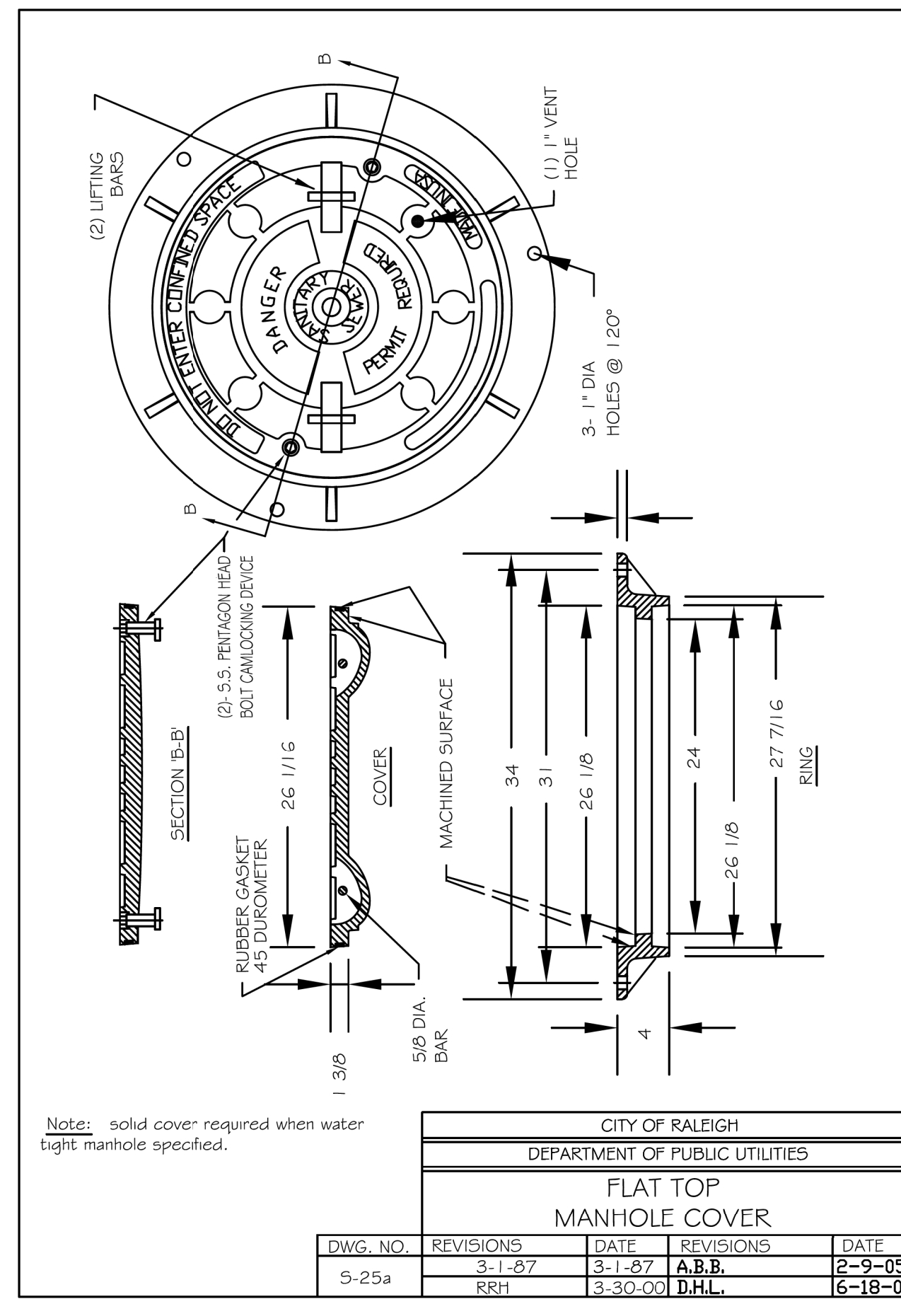
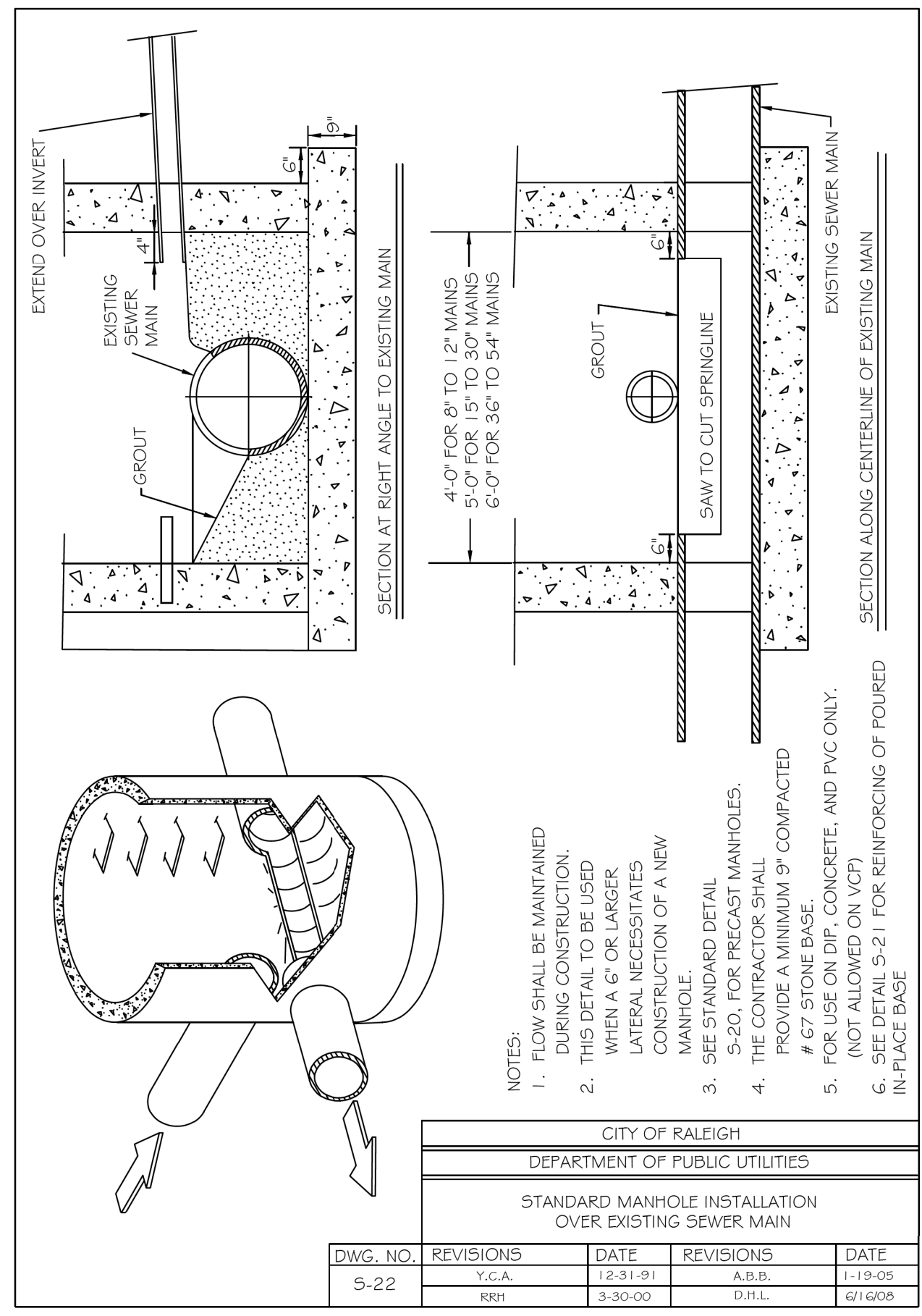
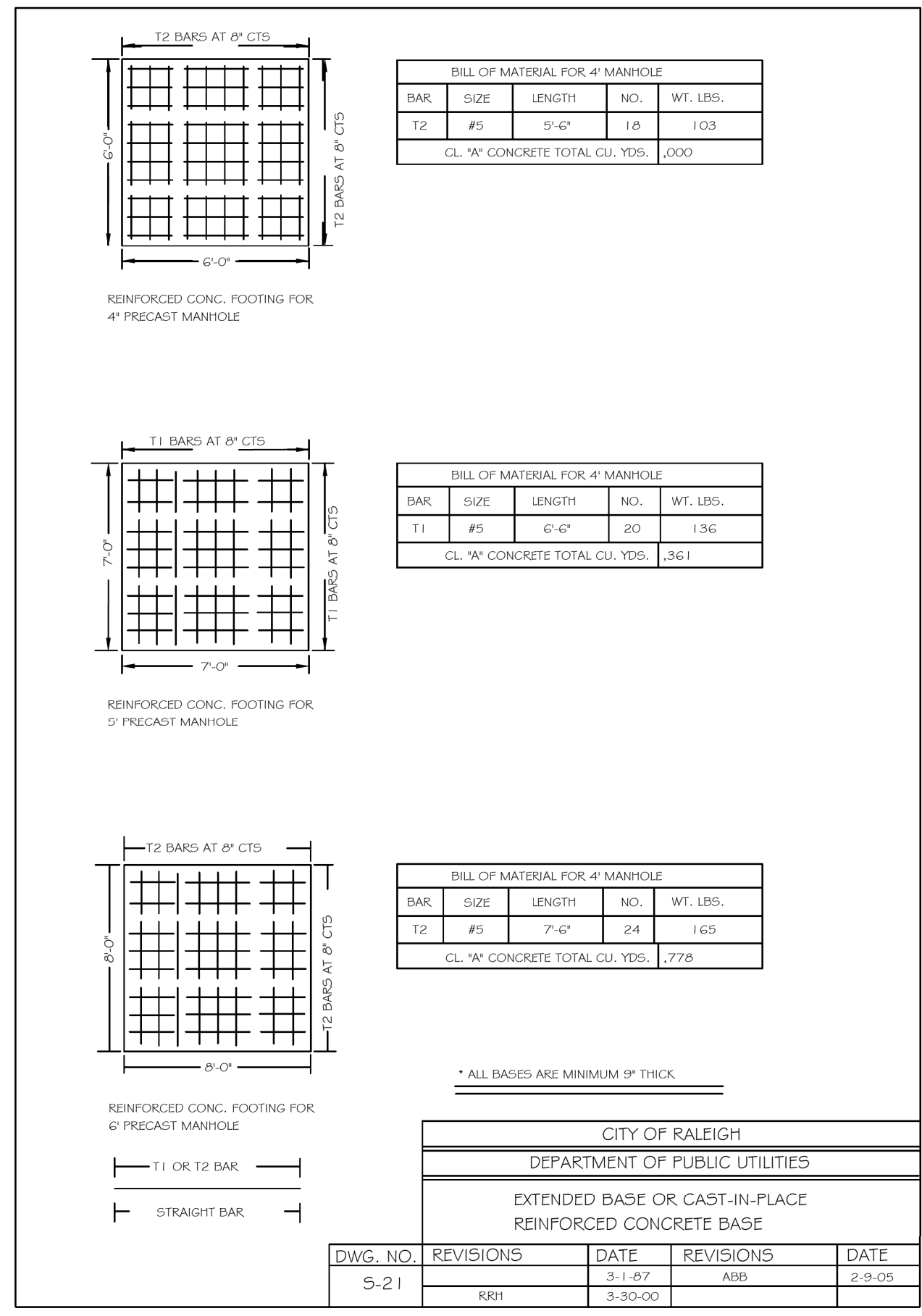
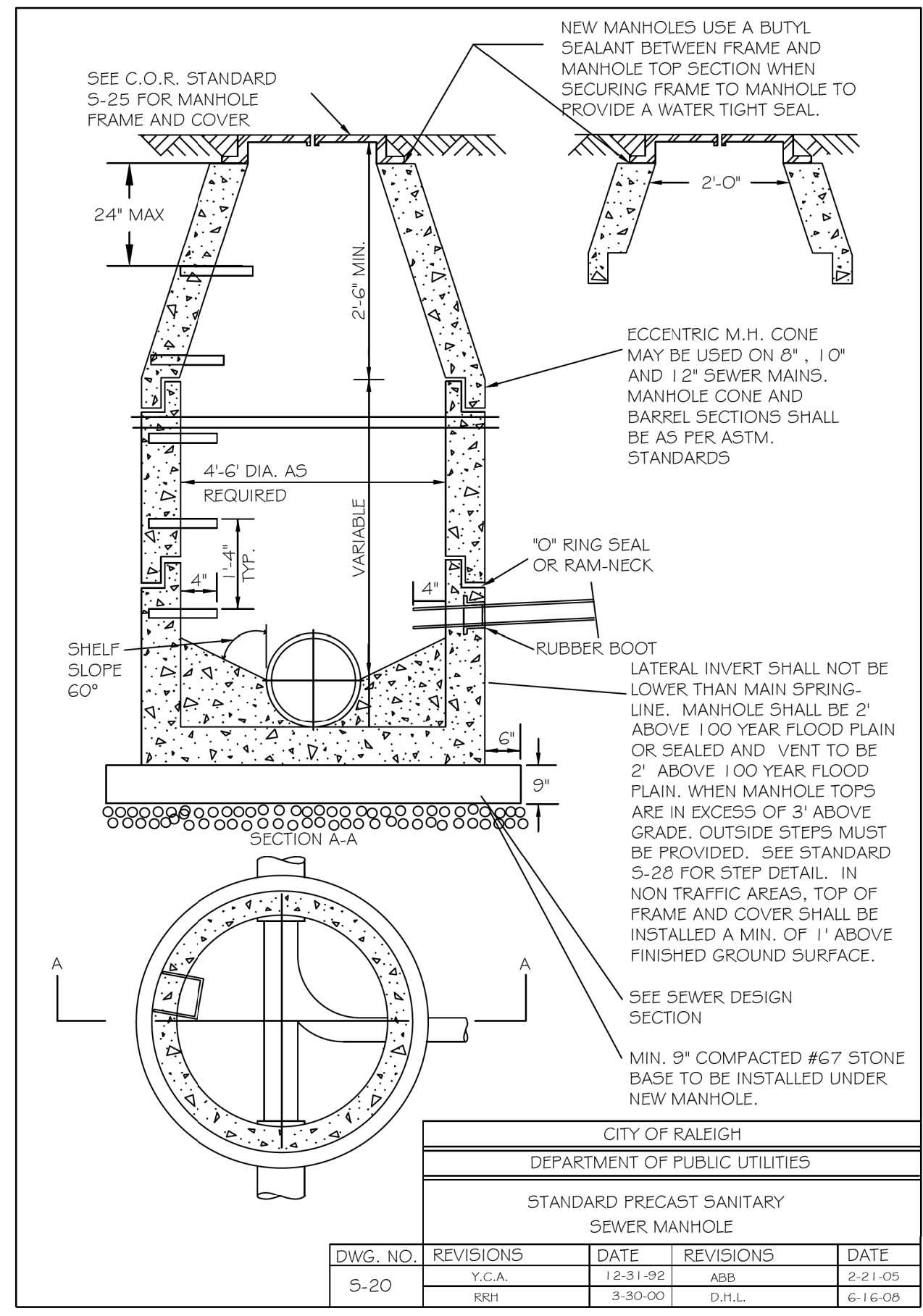
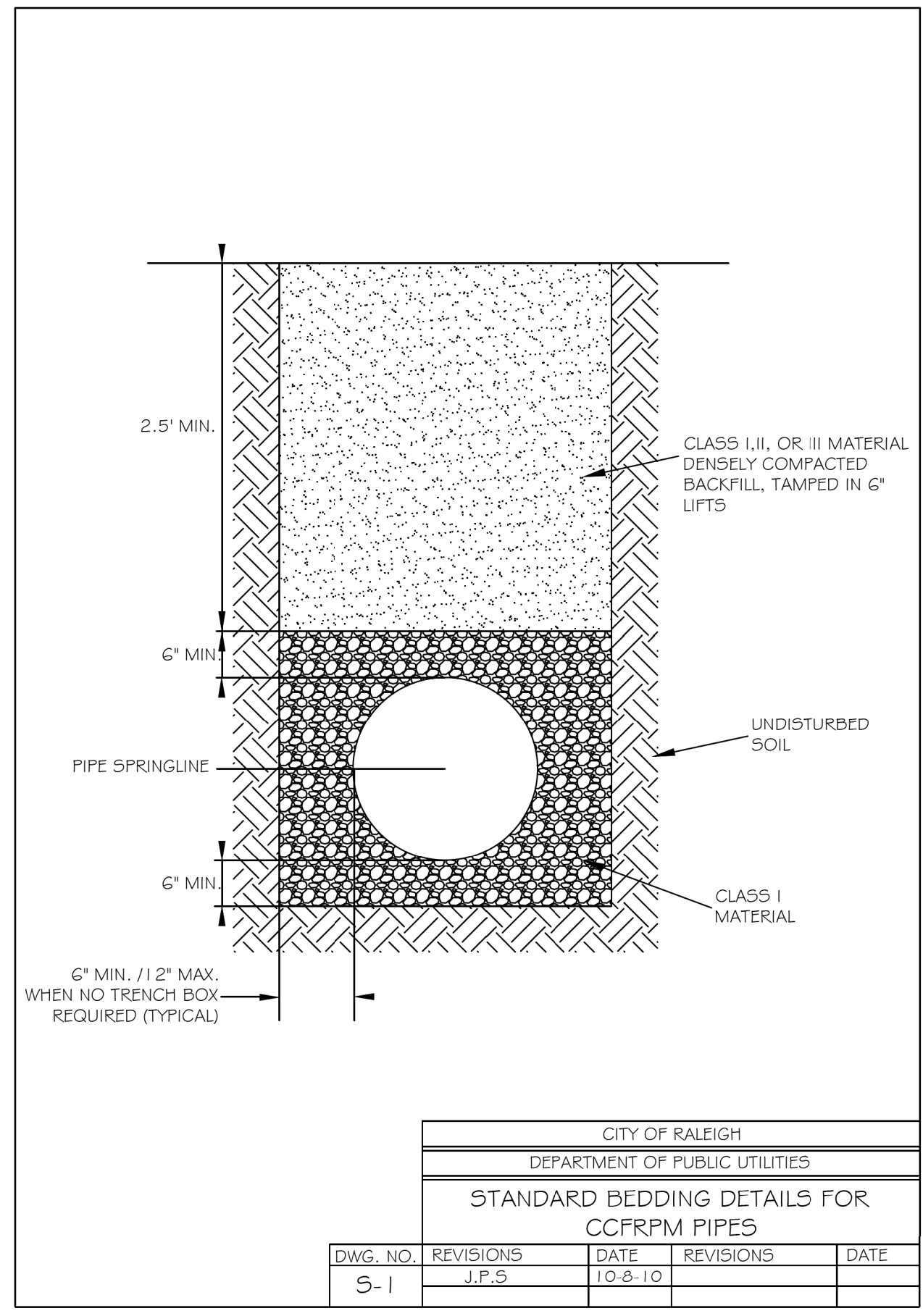
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Patrick Reidy
Patrick Reidy 11/04/2021
Planning

These plans have been electronically approved for construction by the Town of Wake Forest Public Works and Engineering Department. This approval may not be edited once issued.

Carne Mitchell
Carne Mitchell 11/08/2021
Public Works/Engineering



DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 11/1/2021 W. MITCHELL	
UTILITIES ENGINEERING SEC.	UTILITY CONSTRUCTION
PHONE: (919) 707-6690	PLANS ONLY
FAX: (919) 250-4151	

UTILITY CONSTRUCTION

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

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-4929**

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-3587**

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection 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 # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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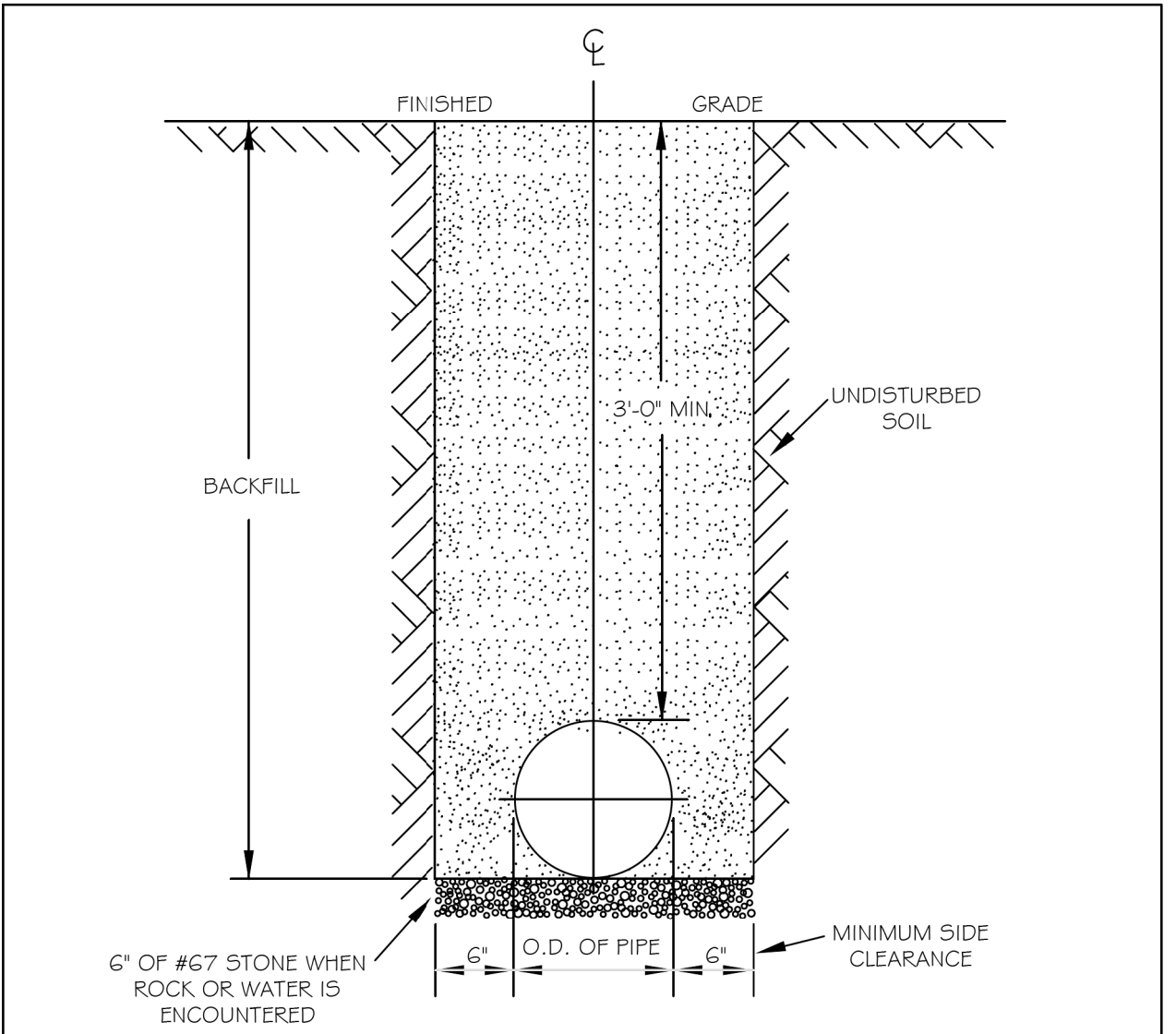
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

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Patrick Reidy
Patrick Reidy 11/04/2021
Planning

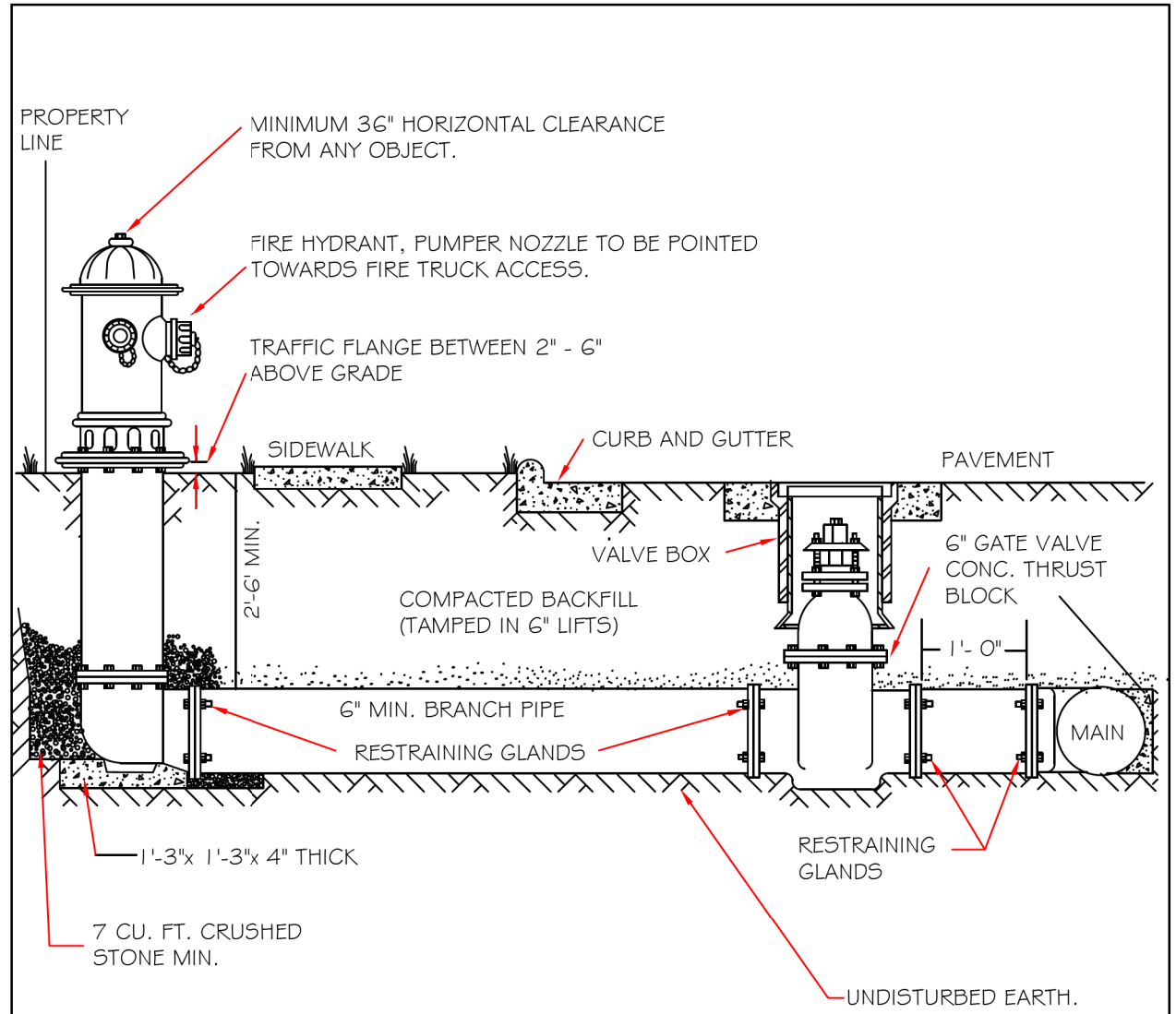
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Carrie Mitchell
Carrie Mitchell 11/08/2021
Public Works/Engineering



- 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.

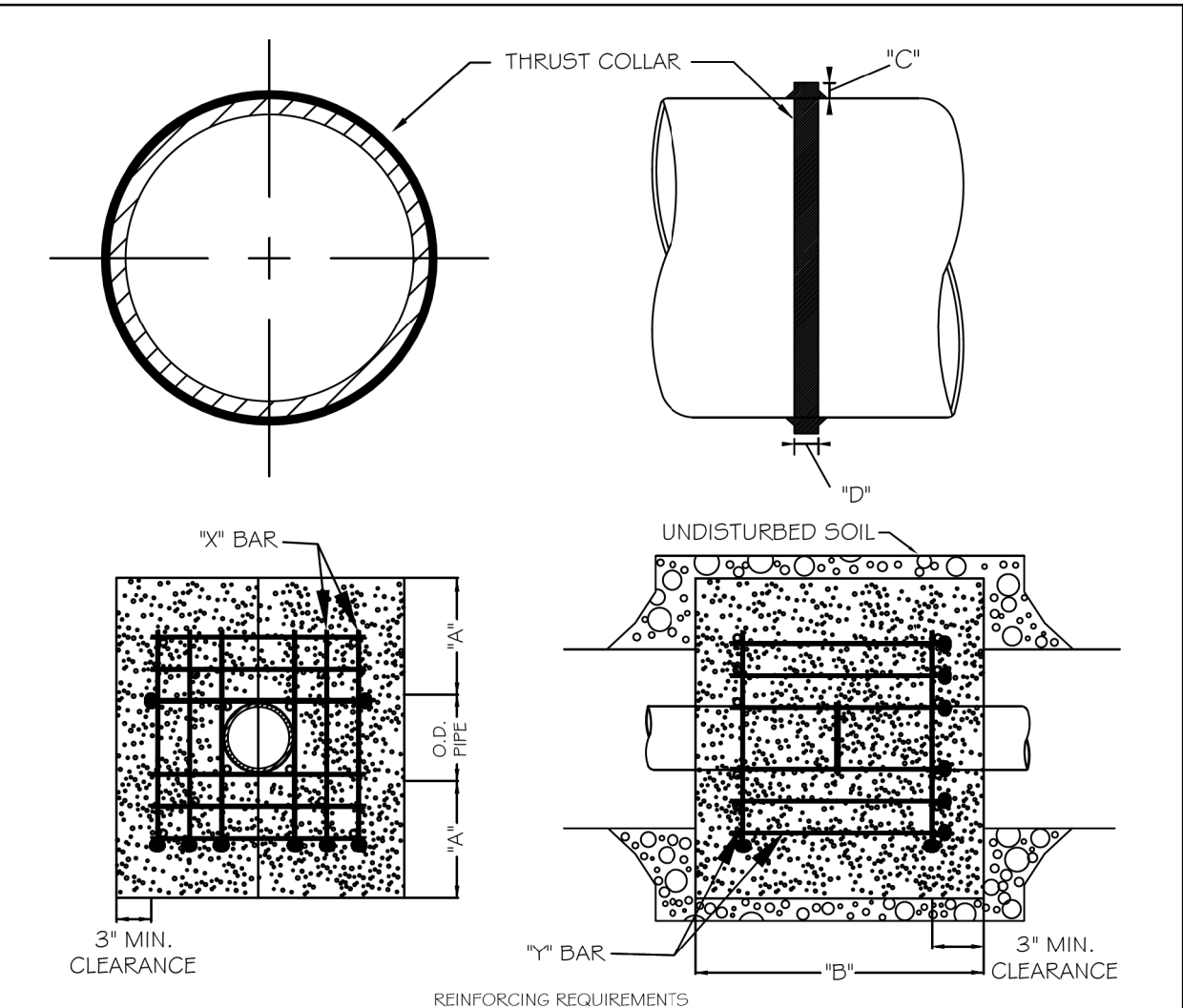
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILL REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3				
	D.W.C.	9-3-99	A.B.B.	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10



- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 - BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
 - 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
 - STEEL RODS AND BOLTS SHALL BE 3" HOT DIPPED 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 THE WORK IS 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	REVISIONS	DATE
W-4				
	A.B.B.	4-6-04	J.P.S.	2/17/09
	D.H.L.	2/14/08		



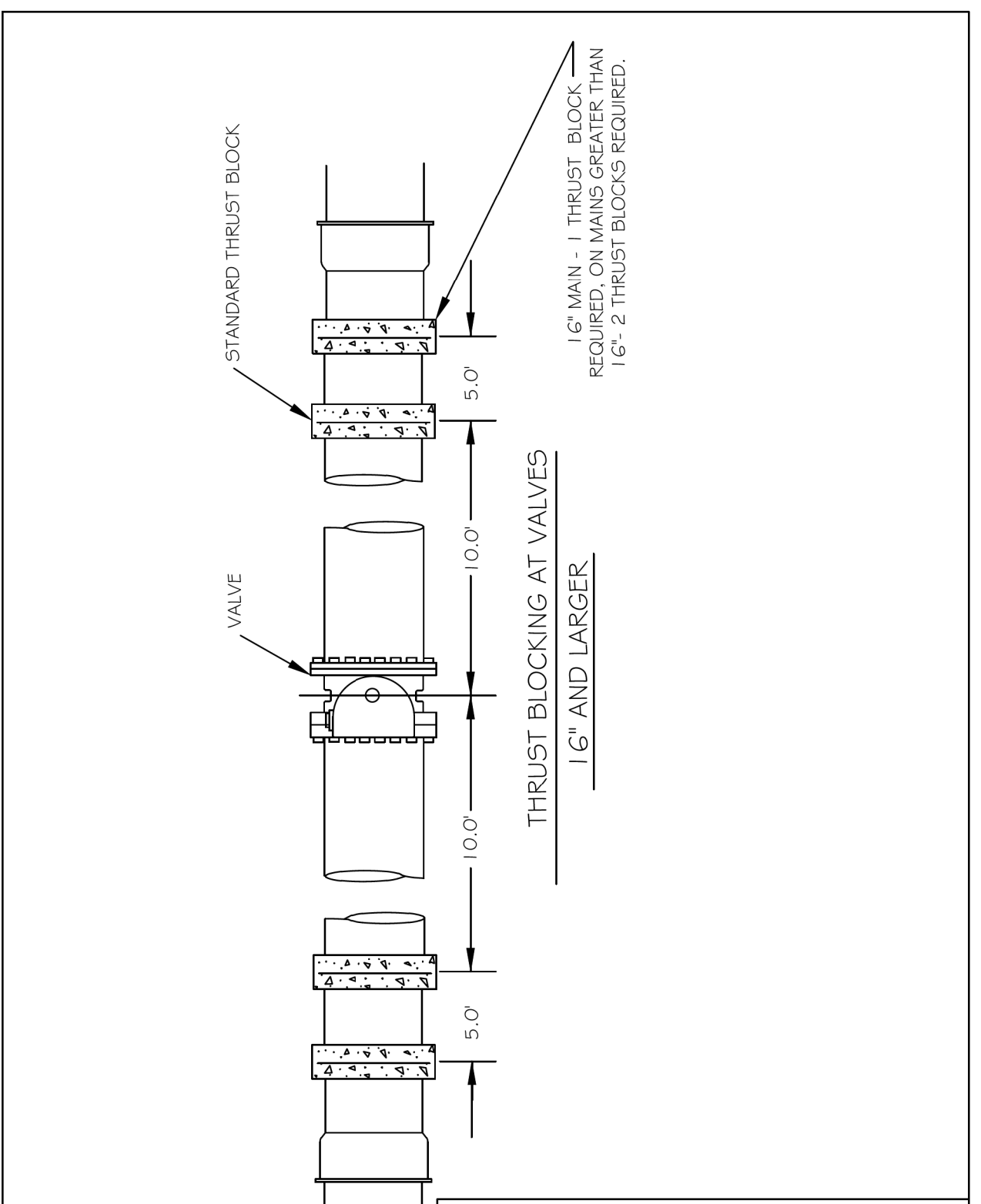
REINFORCING REQUIREMENTS

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

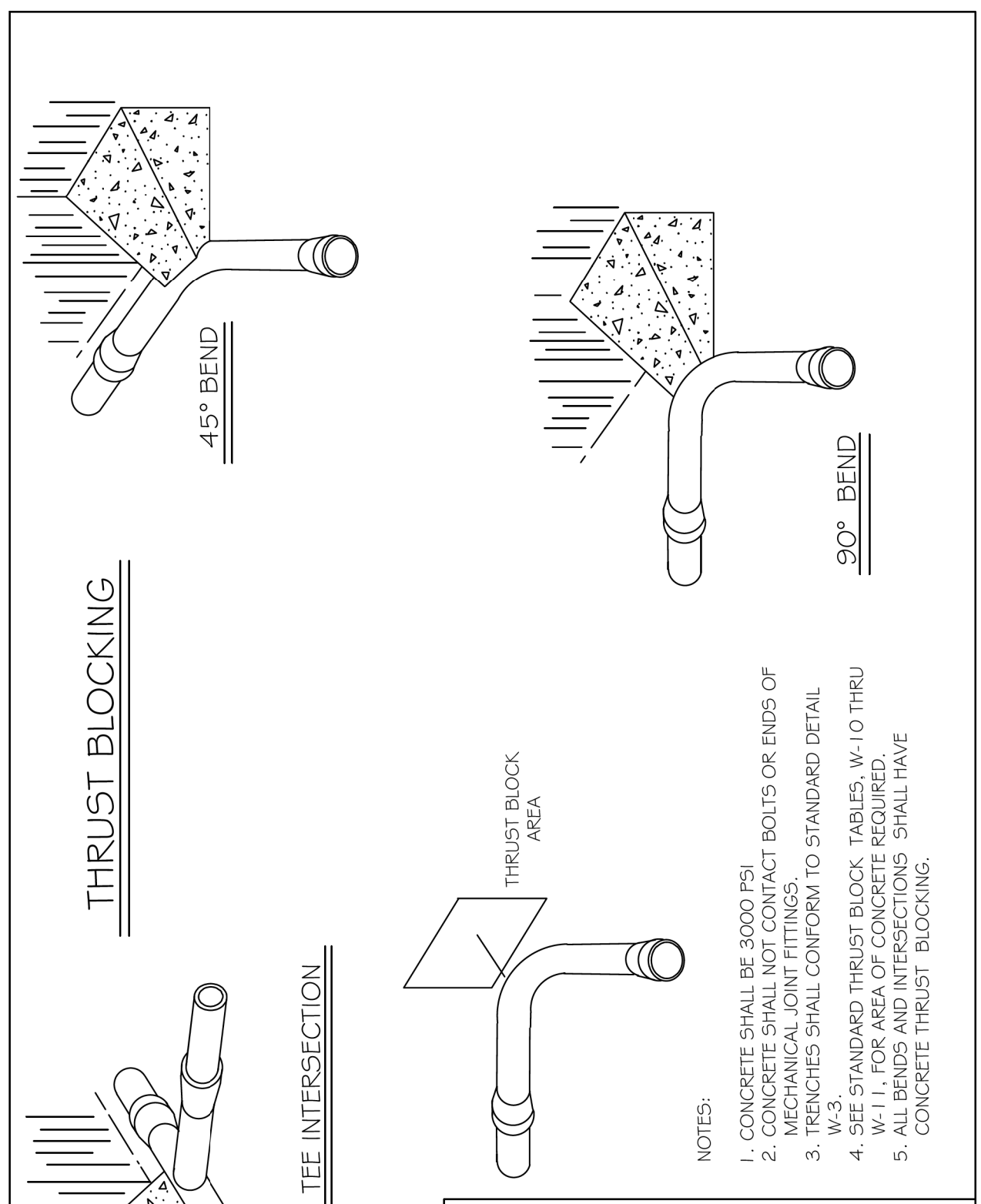
THRUST COLLAR AND THRUST SCHEDULE

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

- NOTES:
- SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
 - CONCRETE SHALL BE 3000 PSI AND TRANSIT 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.
- | CITY OF RALEIGH | | | | |
|---|-----------|---------|-----------|---------|
| DEPARTMENT OF PUBLIC UTILITIES | | | | |
| THRUST BLOCKING DESIGN DATA FOR WATER MAINS | | | | |
| DWG. NO. | REVISIONS | DATE | REVISIONS | DATE |
| W-7 | | | | |
| | D.H.L. | 2-1-00 | J.P.S. | 11-1-10 |
| | D.H.L. | 6-18-08 | | |



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-8				
	Y.C.A.	4-12-90	D.W.C.	9-7-99
	RRH	6-3-02	RRH	3-31-00



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING DETAILS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9				
	D.W.C.	3-1-87	RRH	3-31-00
	D.H.L.	9-7-99	D.H.L.	6-18-08

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

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT ²	SOFT CLAY 2000 LBS/FT ²	1600 LBS/FT ² GRAVEL / COARSE SAND	800 LBS/FT ² ATLAS DRY	SAND, COMPACT FIRM 8000 LBS/FT ²	SAND, CLEAN DRY 2000 LBS/FT ²	SOIL 1000 LBS/FT ² BUTTSAND - VERY POOR	ROCK - FLOOR TO 2000 LBS/FT ²
6"									
11 1/4°	1,108	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	3	1	
45°	4,328	2	3	3	1	1	5	1	
90°	7,996	2	4	5	1	1	8	1	
PLUG	5,655	2	3	4	1	1	6	1	
8"									
11 1/4°	1,970	1	1	2	1	1	2	1	
22 1/2°	3,922	1	2	3	1	1	4	1	
45°	7,694	2	4	5	1	1	8	1	
90°	14,215	4	8	9	2	2	15	2	
PLUG	10,053	3	5	6	2	2	10	1	
12"									
11 1/4°	4,433	2	3	3	1	1	5	1	
22 1/2°	8,826	3	5	6	2	2	9	1	
45°	17,312	5	9	11	3	3	18	2	
90°	31,983	8	16	19	4	4	32	4	
PLUG	22,619	6	12	14	3	3	23	3	
16"									
11 1/4°	7,881	2	4	5	1	1	8	1	
22 1/2°	15,691	4	8	10	2	2	16	2	
45°	30,779	8	16	19	4	4	31	4	
90°	56,861	15	29	35	8	8	57	6	
PLUG	40,213	10	21	25	5	5	41	5	

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

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

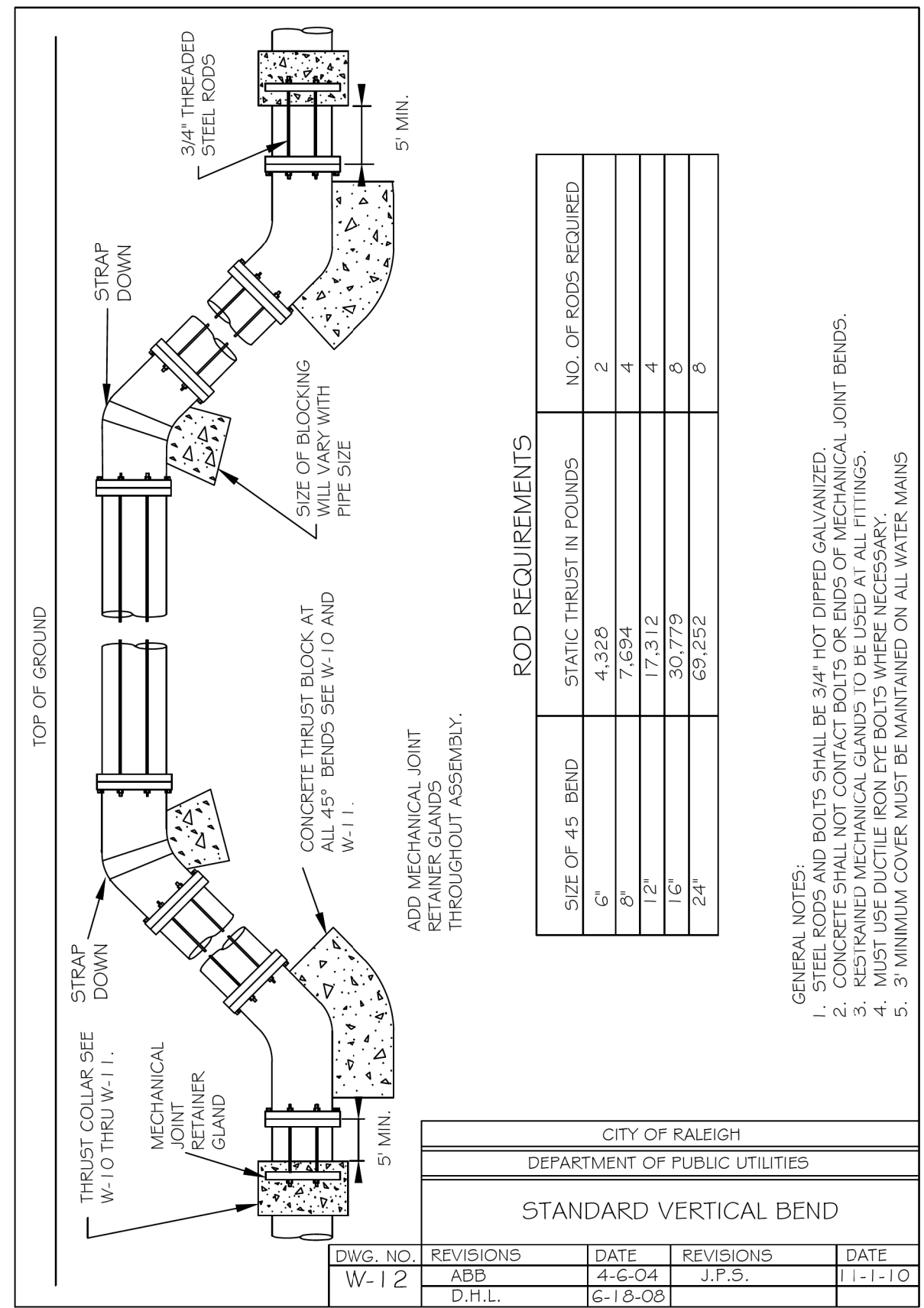
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN QUANTITY TABLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10				
	D.W.C.	6-23-99		

5/14/99

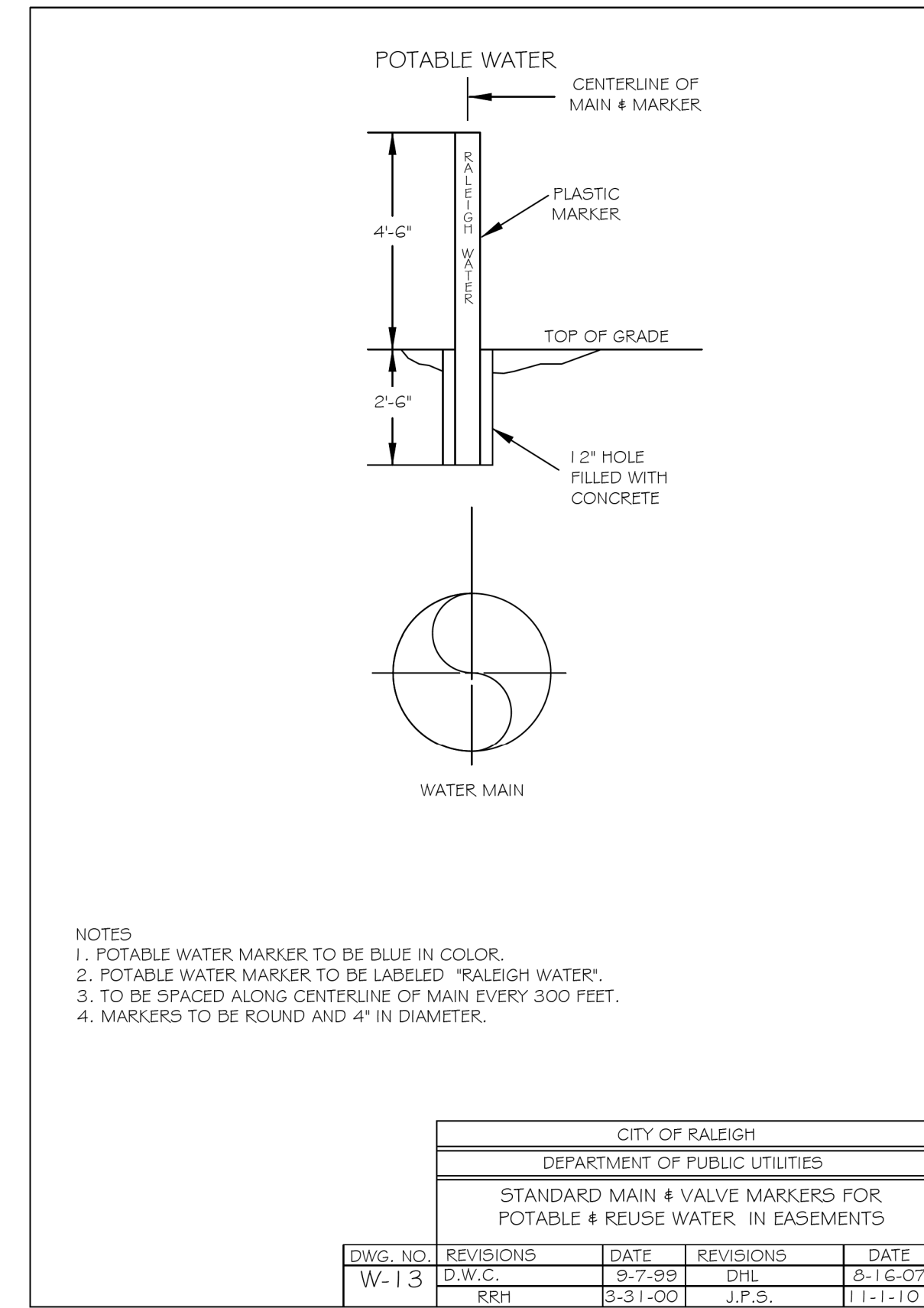
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PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-3C
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
11/1/2008	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

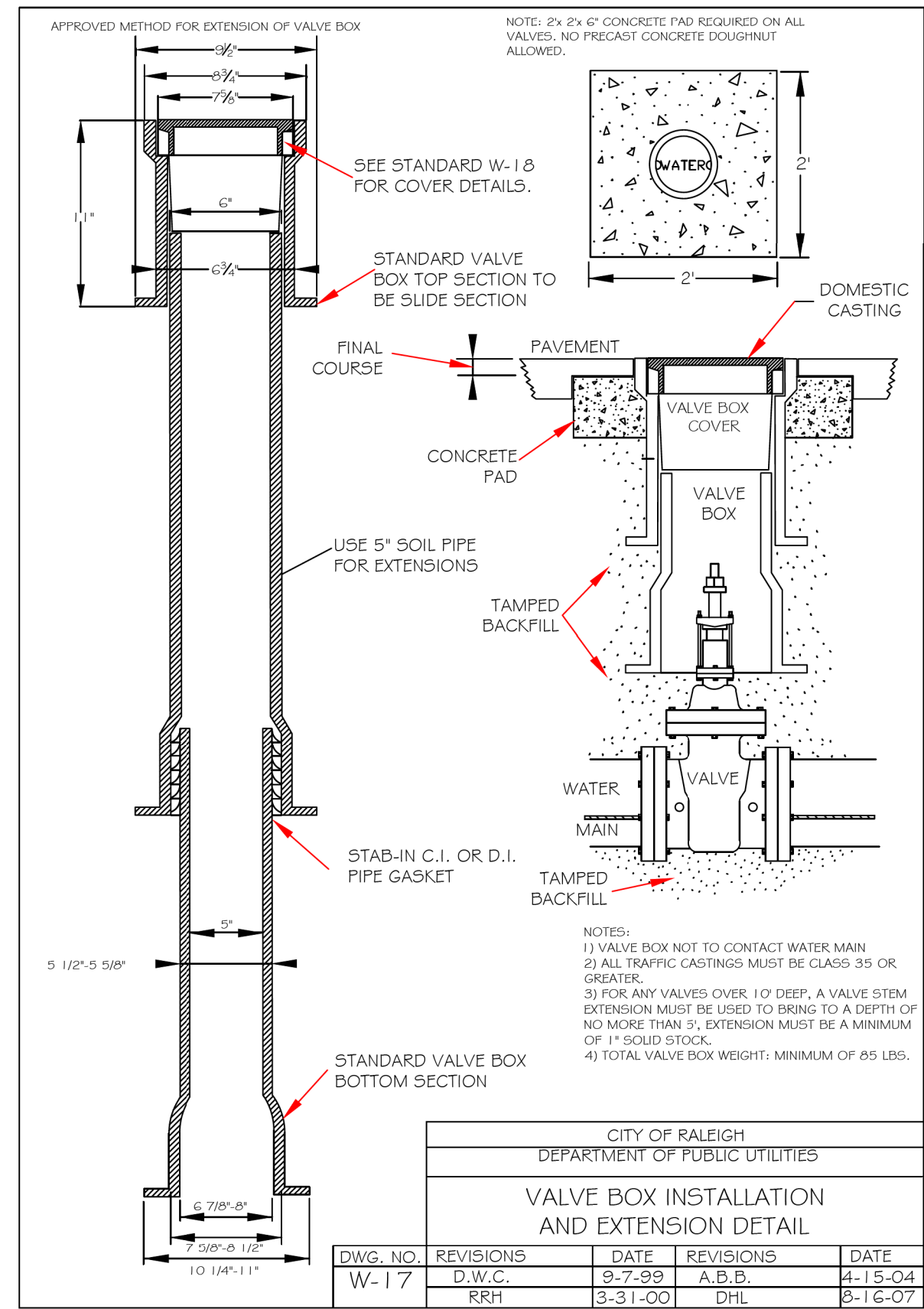
UTILITY CONSTRUCTION



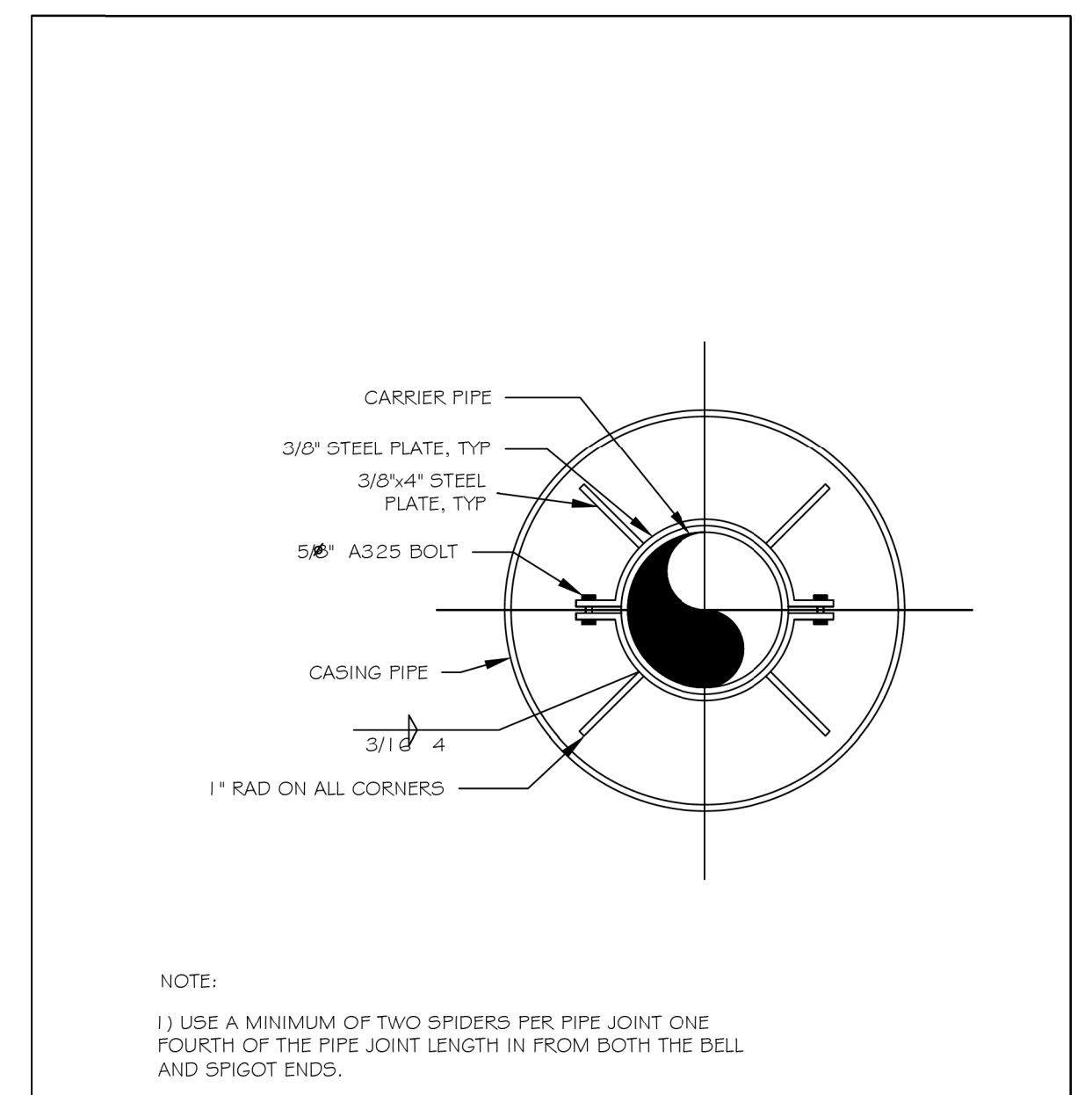
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD VERTICAL BEND				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ARB	4-6-04	J.F.S.	1-1-10
	D.H.L.	6-18-08		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER, IN EASEMENTS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13	D.H.L.	9-7-89	D.H.L.	8-16-07
	RRH	3-31-00	J.F.S.	11-1-10



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
VALVE BOX INSTALLATION AND EXTENSION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	RRH	9-7-89	A.B.B.	4-15-04
	RRH	3-31-00	D.H.L.	8-16-07



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
PIPE ALIGNMENT GUIDE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-40	RRH	3-31-00		
	A.B.B.	4-16-04		

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

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City of Raleigh Public Utilities Department Permit # N/A

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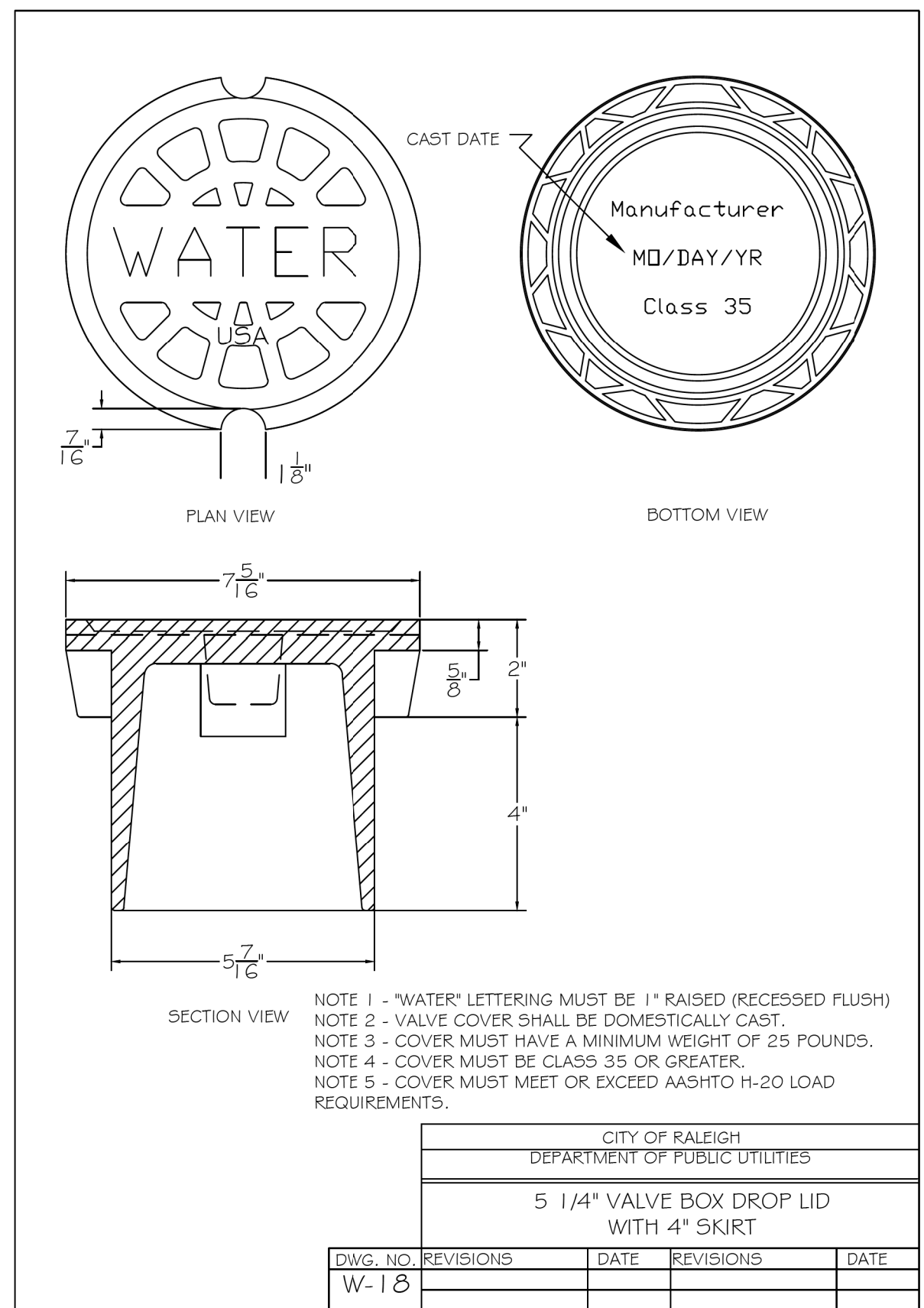
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Patrick Reidy 08/2021
 Patrick Reidy
 08/2021

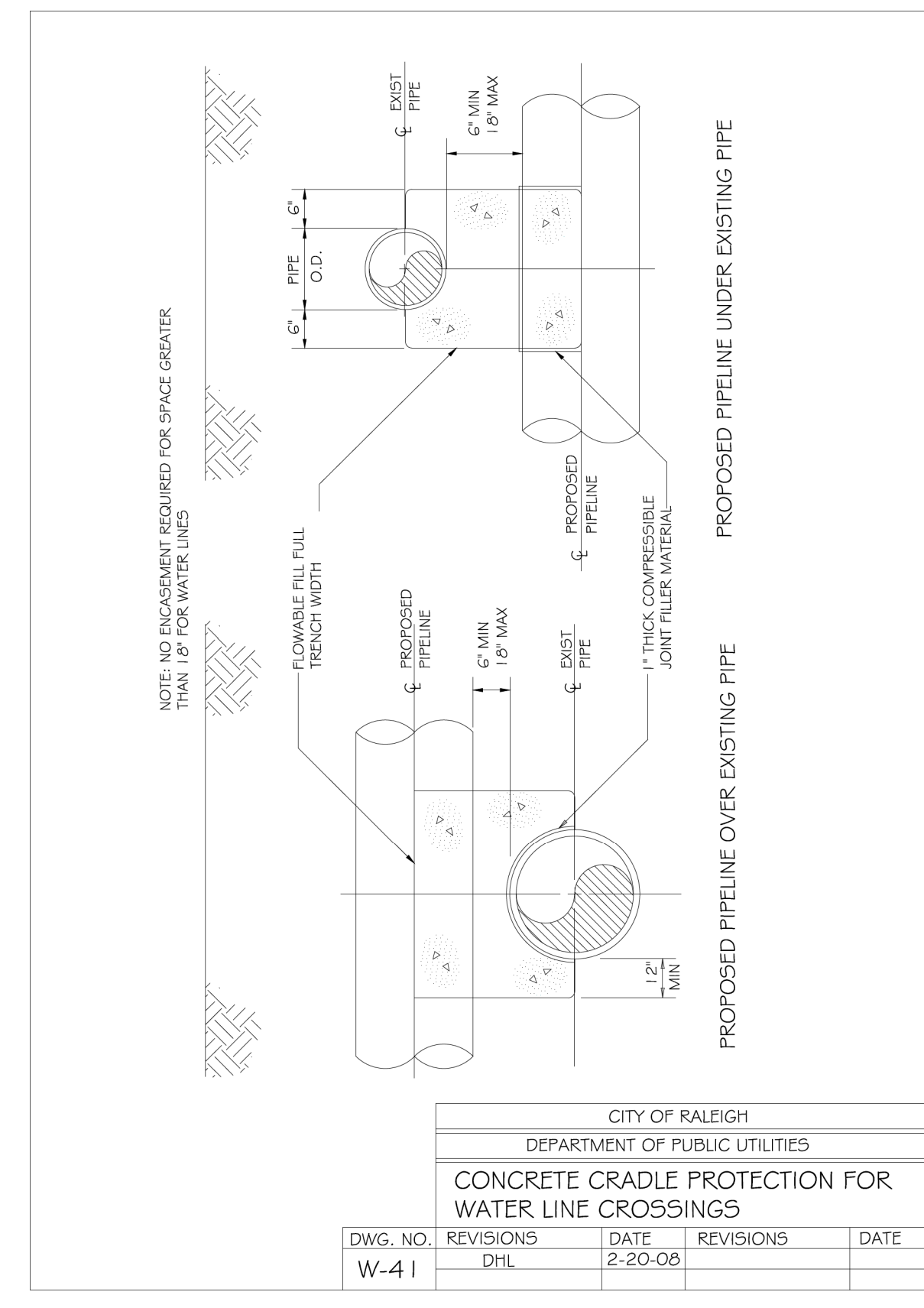
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Carrie Mitchell 08/2021
 Carrie Mitchell
 08/2021

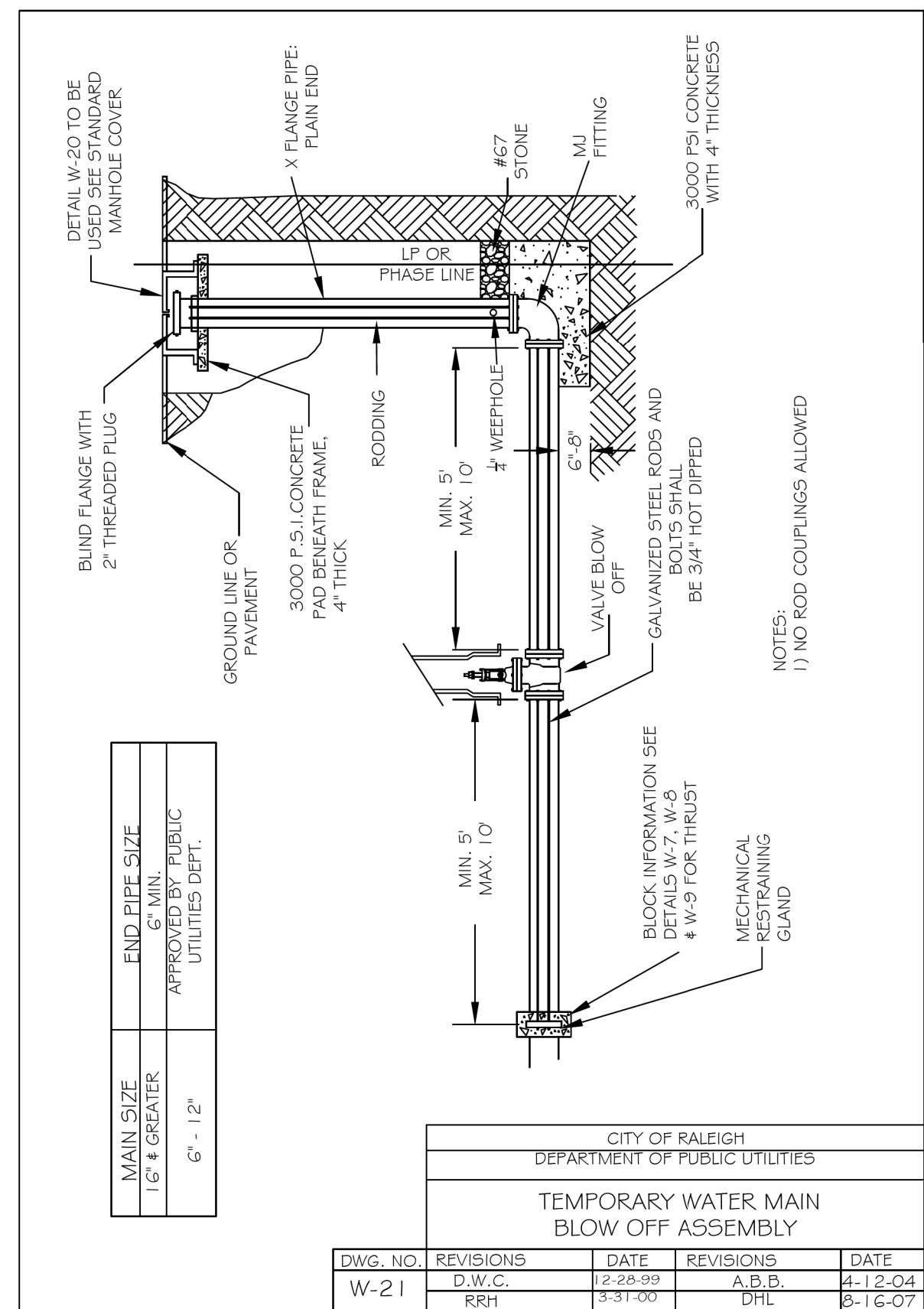
Public Works/Engineering



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
5 1/4" VALVE BOX DROP LID WITH 4" SKIRT				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	D.H.L.	2-20-09		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TEMPORARY WATER MAIN BLOW OFF ASSEMBLY				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-21	D.W.C.	2-28-99	A.B.B.	4-12-04
	RRH	3-31-00	D.H.L.	8-16-07

5/14/99



2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: (919) 881-9939
NC COA No. F-5929

PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-3D
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	11/1/2021
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY

UTILITY CONSTRUCTION

SITE PERMITTING APPROVAL

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City of Raleigh Public Utilities Department Permit # N/A

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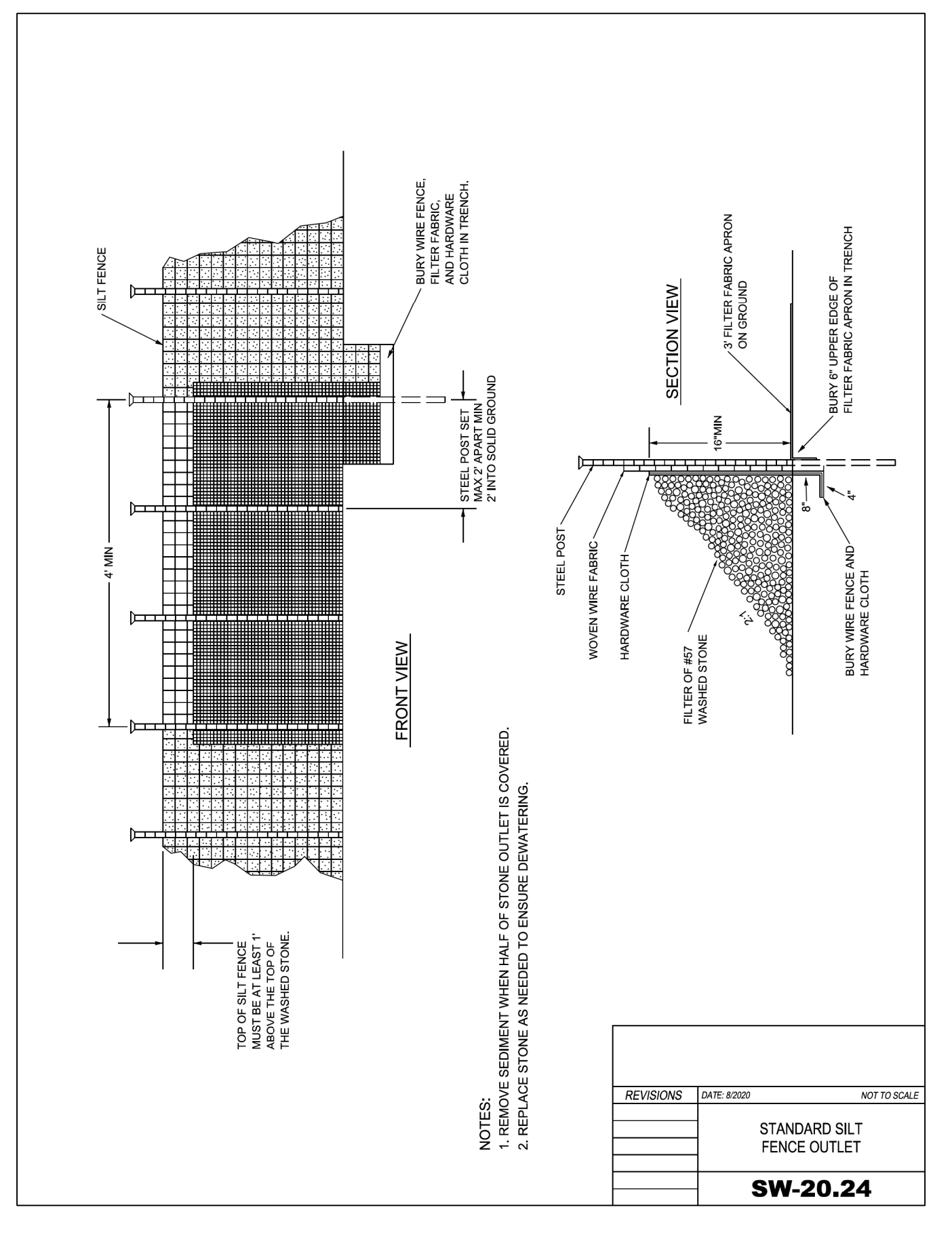
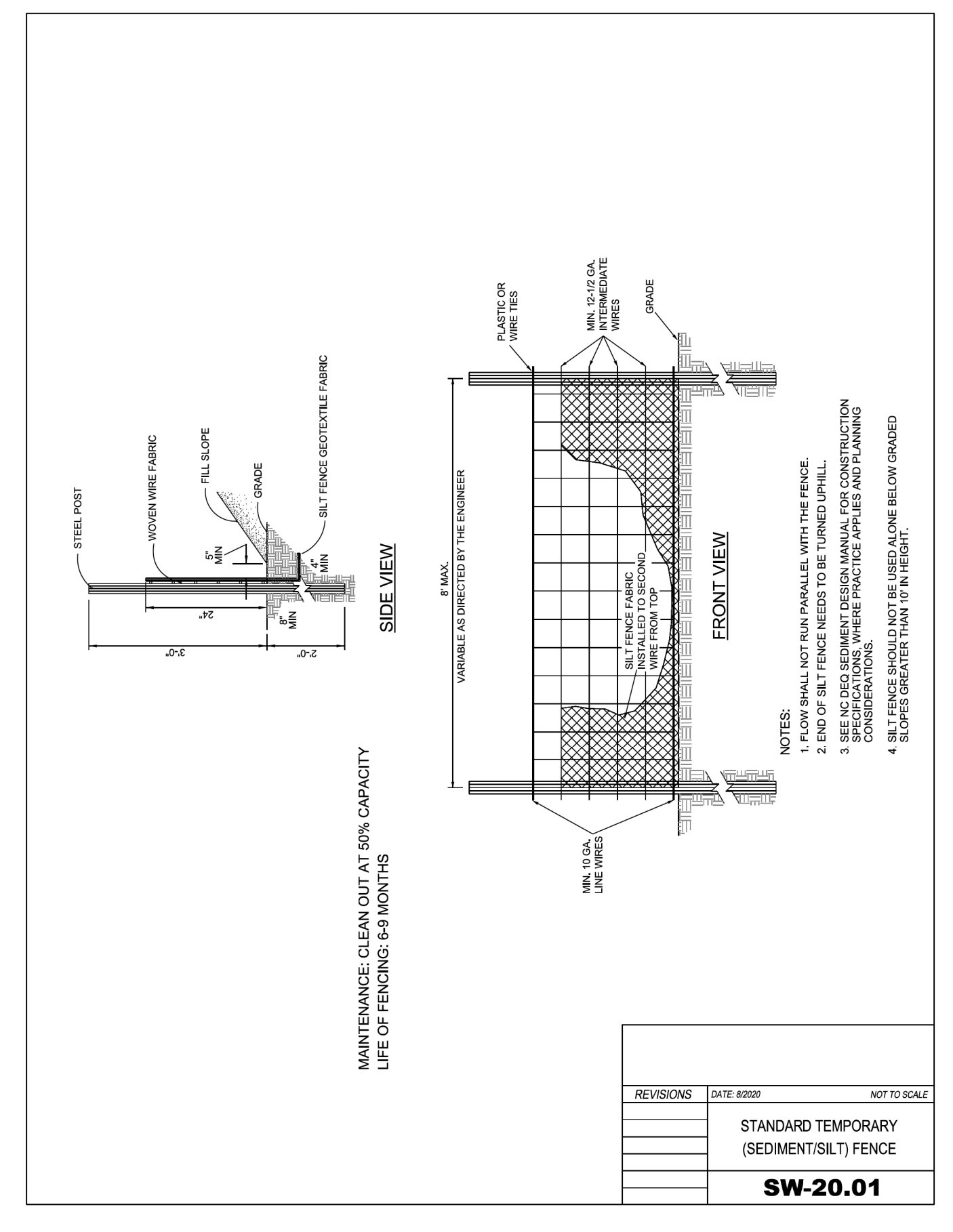
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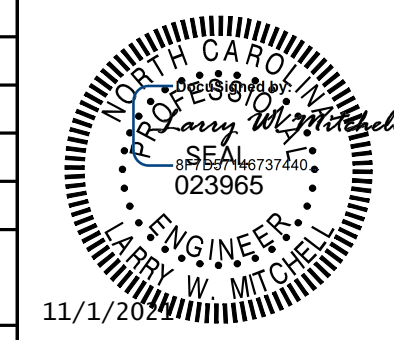
Patrick Reidy
Patrick Reidy 11/04/2021
Planning

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Carrie Mitchell
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Public Works/Engineering

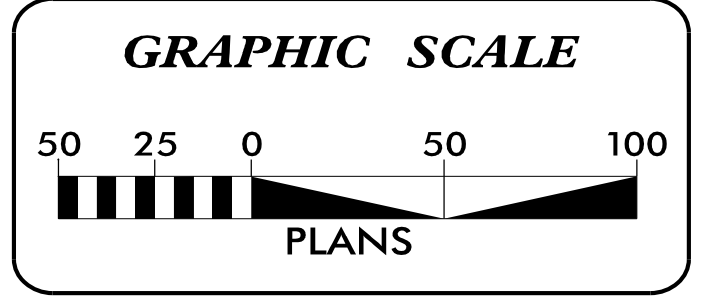


DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



NAD 83/NSRS 2007

UTILITY CONSTRUCTION



SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

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City of Raleigh Public Utilities Department Permit # N/A

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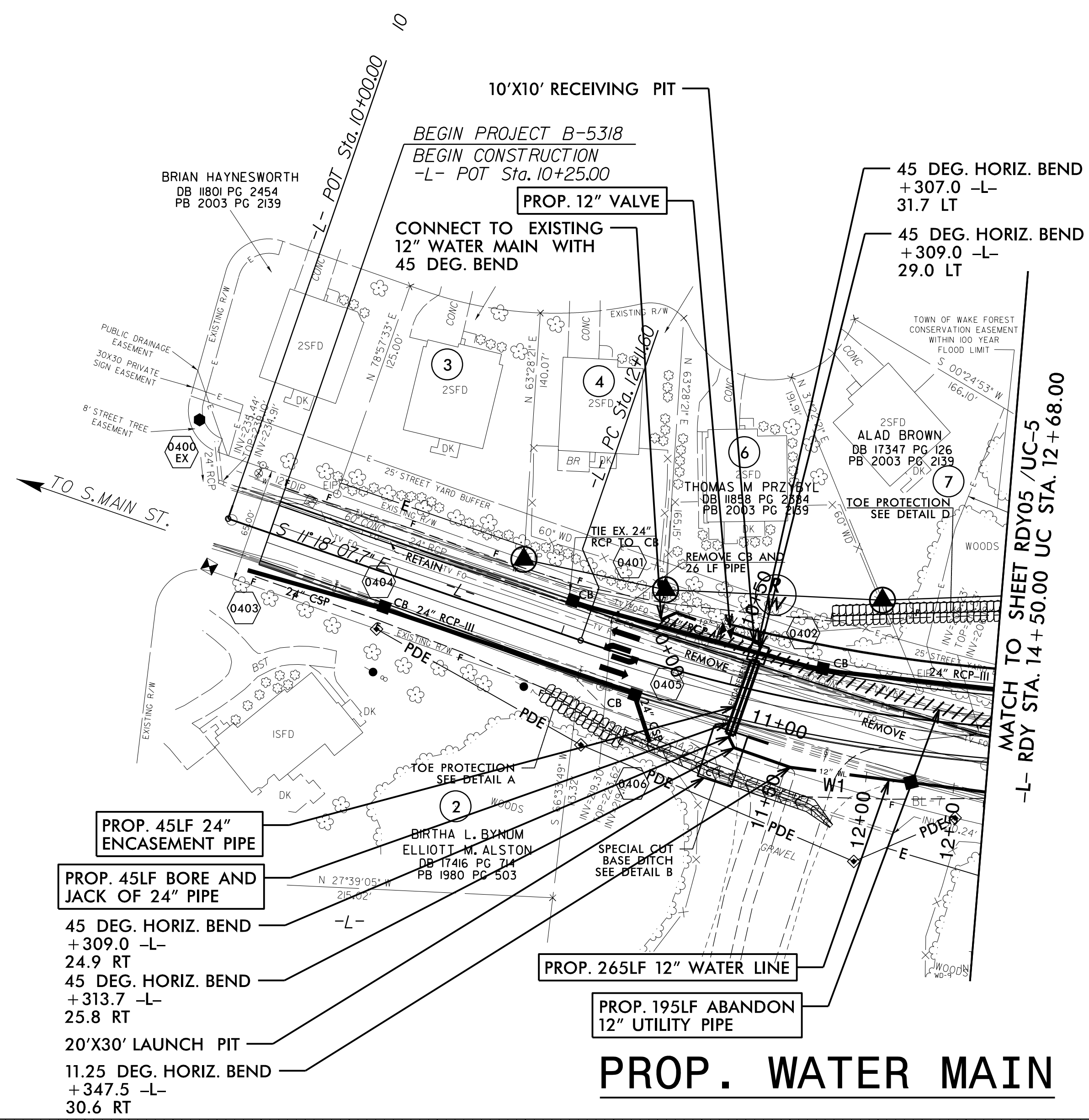
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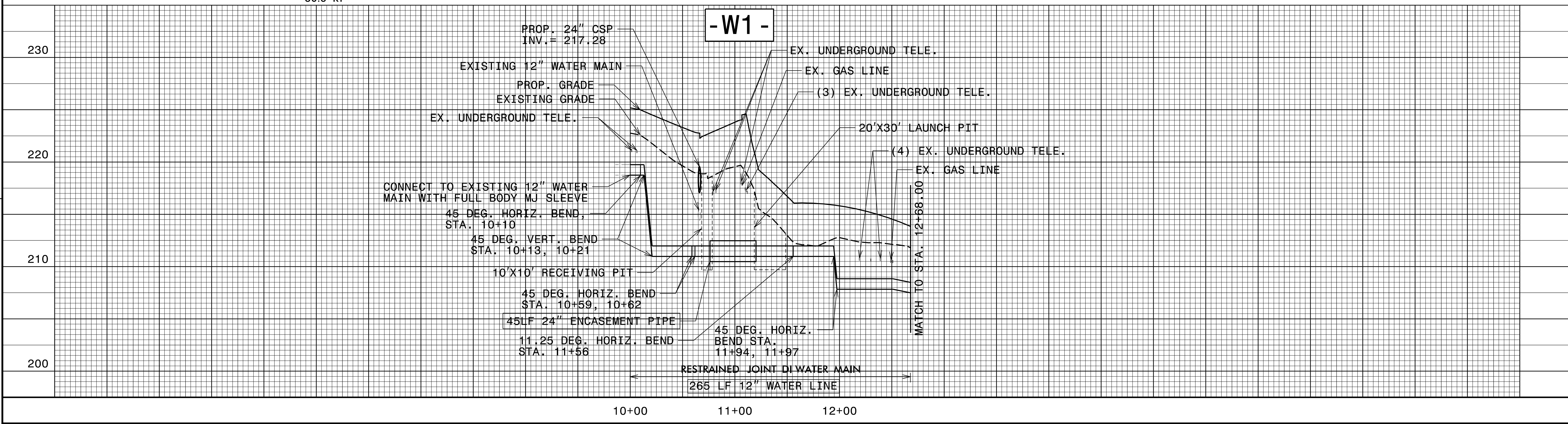
Patrick Reidy Patrick Reidy 11/04/2021
Planning

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Carrie Mitchell Carrie Mitchell 11/08/2021
Public Works/Engineering



PROP. WATER MAIN



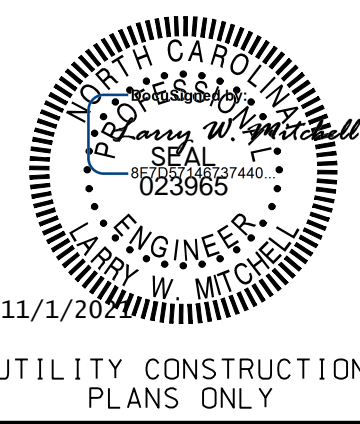
NOTE:
THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1600 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

REVISIONS

8/17/99

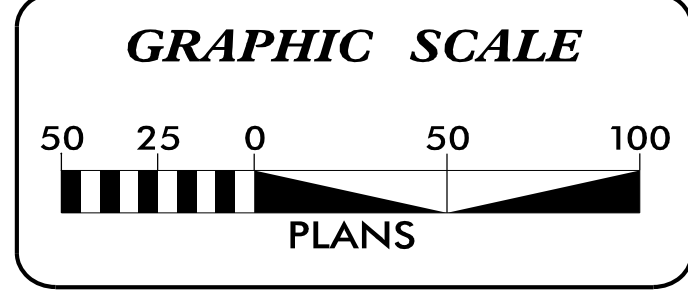


PROJECT REFERENCE NO.	RDY05
SHEET NO.	UC-5A
DESIGNED BY:	B-5318
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	11/1/2021
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	UTILITY CONSTRUCTION PLANS ONLY



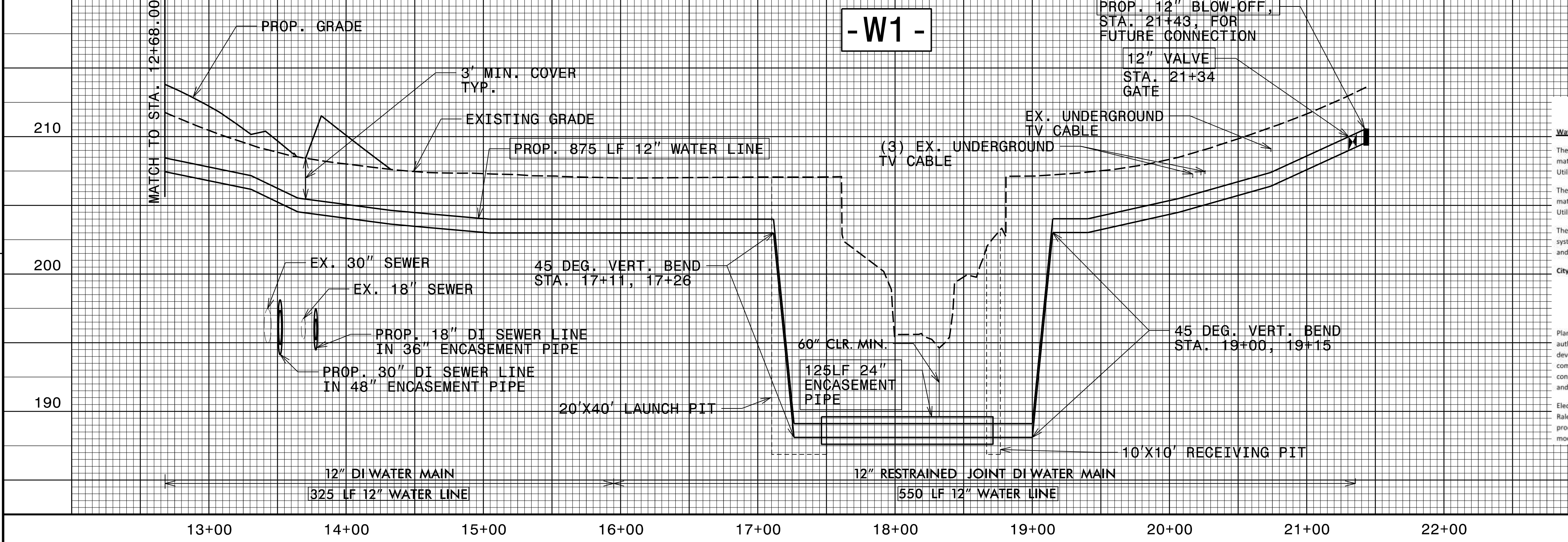
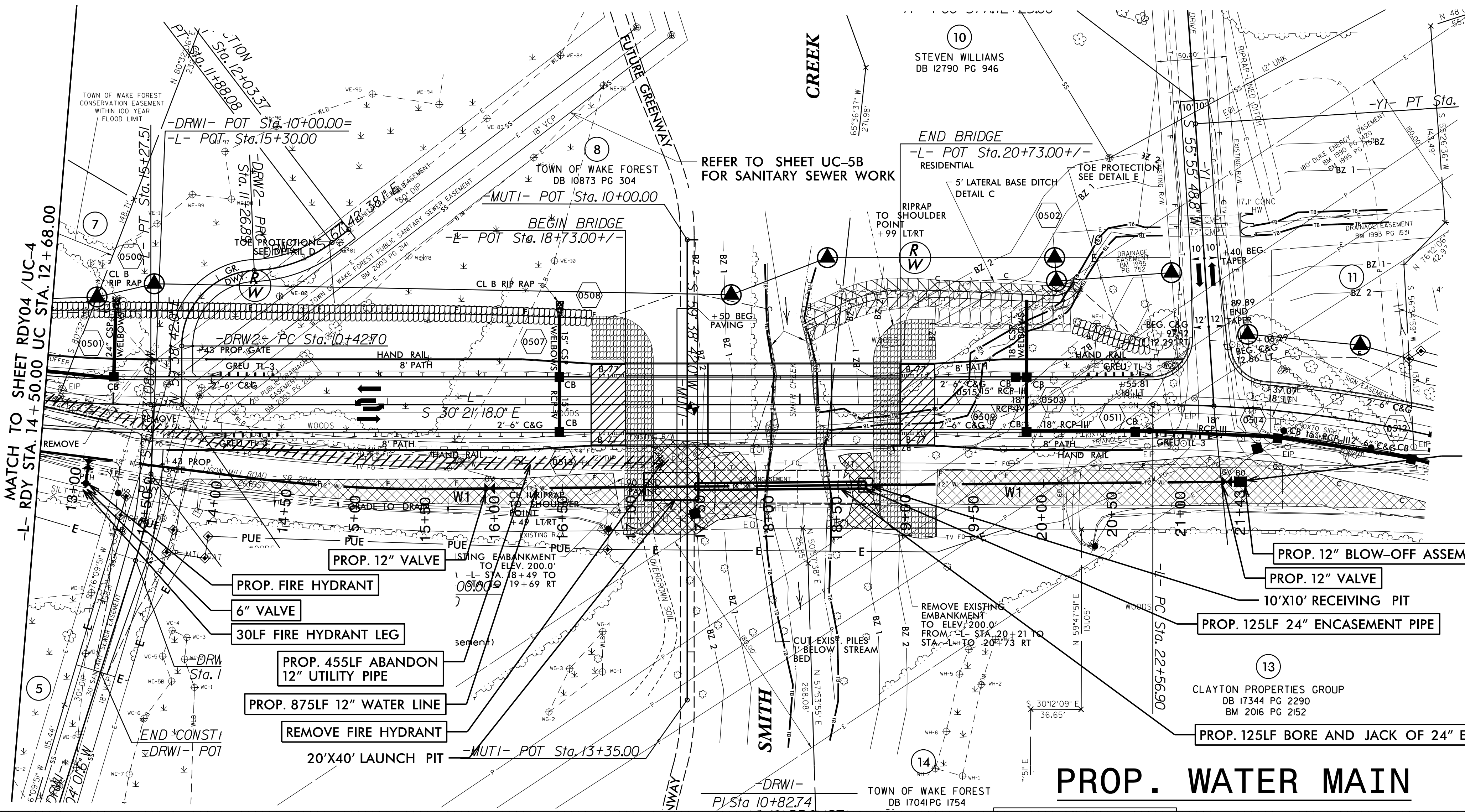
NAD 83 NSRS 2007

UTILITY CONSTRUCTION



NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1200 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

ENSURE VALVE AND BLOW-OFF ARE OUT OF DUKE ENERGY TRANSMISSION EASEMENT



REVISIONS

These plans have been electronically approved for construction by the Town of Wake Forest Planning Department. This approval may not be edited once issued.
 Patrick Reid, Raleigh, NC, 04/2021
 Planning

These plans have been electronically approved for construction by the Town of Wake Forest Public Works and Engineering Department. This approval may not be edited once issued.
 Mitchell, Raleigh, NC, 08/2021
 Public Works/Engineering

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

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-4929

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-3587

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection 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 # N/A

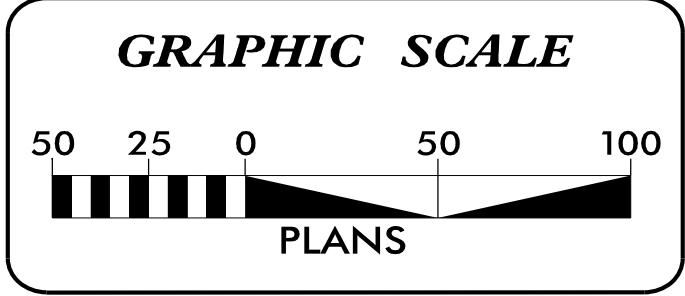
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.



PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-5B
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	11/1/2021
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



UTILITY CONSTRUCTION

NOTE:
EXISTING SANITARY SEWER LINES AND MANHOLES NOTED TO BE ABANDONED SHALL BE REMOVED AS NECESSARY BY THE CONTRACTOR TO CONSTRUCT PROPOSED LINES.

SITE PERMITTING APPROVAL

Water and Sewer Permits (If applicable)

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City of Raleigh Public Utilities Department Permit # **N/A**

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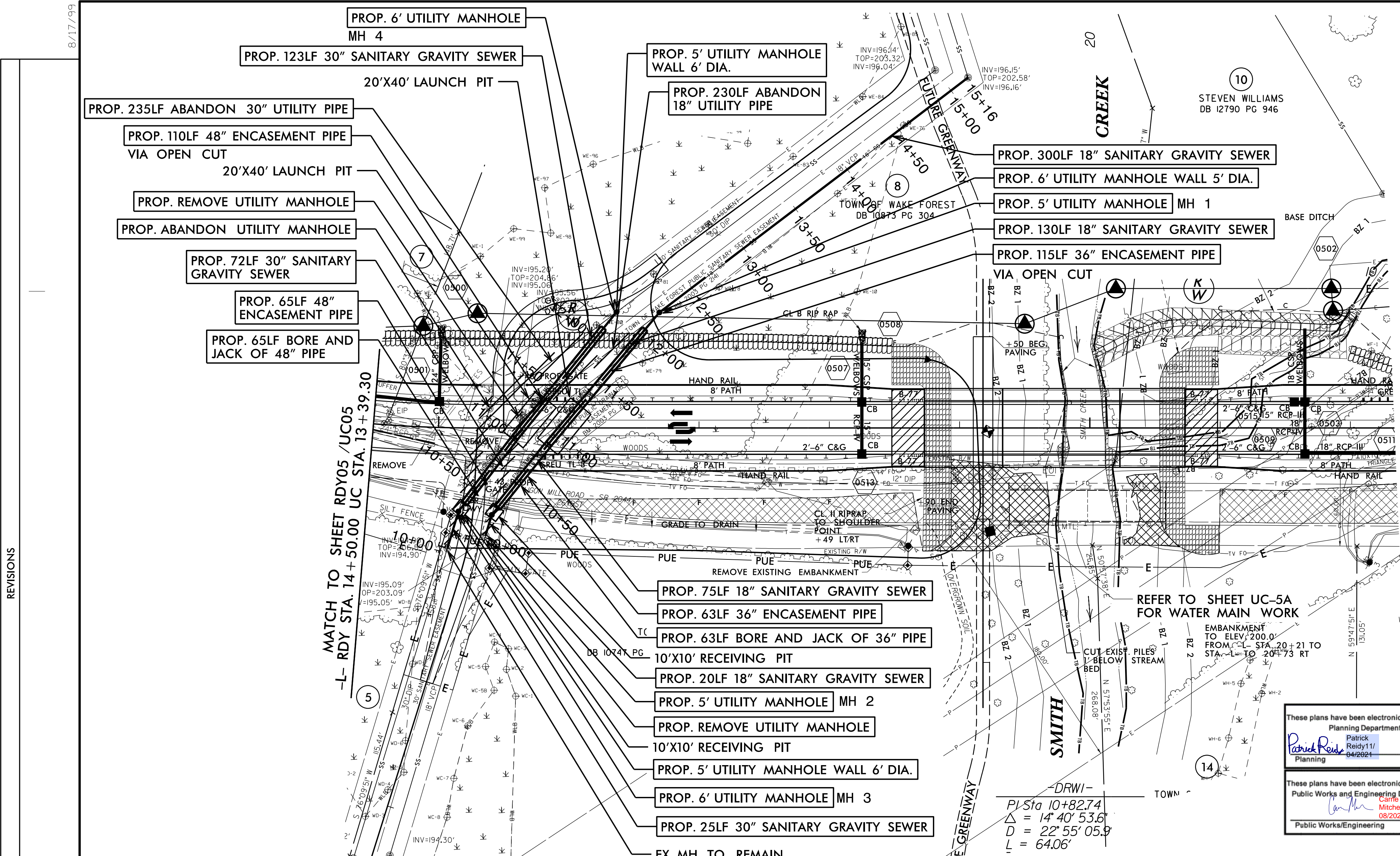
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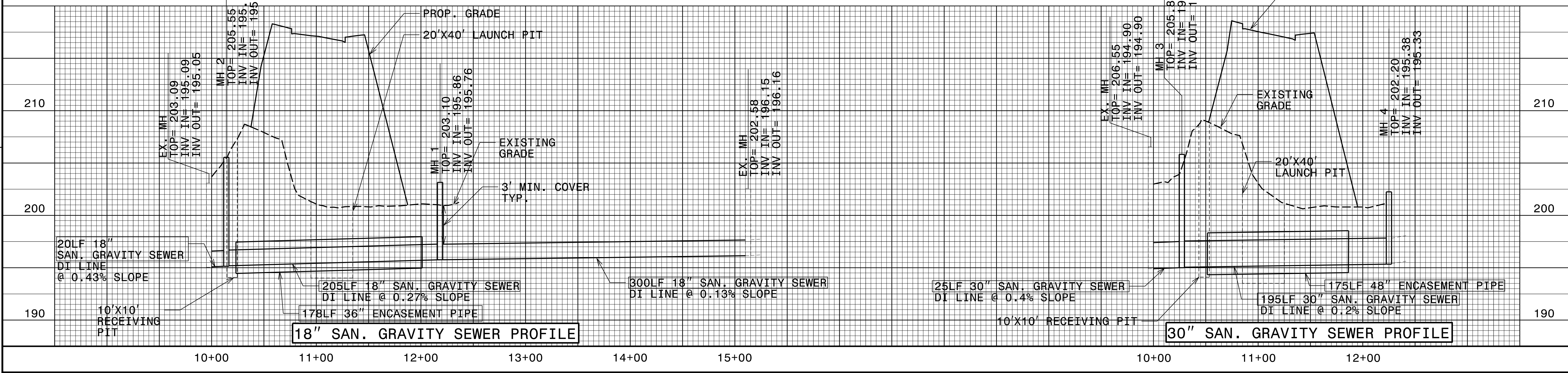
Patrick Reidy
Patrick Reidy 11/04/2021
Planning

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Carla Mitchell
Carla Mitchell 11/08/2021
Public Works/Engineering



PROP. SANITARY GRAVITY SEWER



REVISIONS

8/17/99

8/17/99



PROJECT REFERENCE NO.	SHEET NO.
B-5318	UC-5C
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
REVISED:	11/1/2008
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

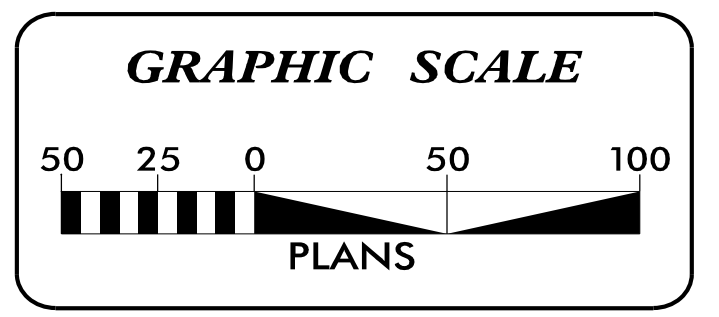
THE BYPASS LINES (AND ANY ACTIVITIES RELATED TO CONSTRUCTION/MAINTENANCE OF THE LINES) MUST NOT ENCRUCH INTO WETLAND AREAS OUTSIDE OF THE PROPOSED ROADWAY FILL SLOPE. CONTACT THE DIVISION ENVIRONMENTAL OFFICER FOR GUIDANCE.

GENERIC UTILITY ITEM
30" BYPASS LINE TO 30" SEWER

GENERIC UTILITY ITEM
BYPASS PUMPING COST PAID EVENLY BETWEEN NCDOT AND COR

GENERIC UTILITY ITEM
18" BYPASS LINE TO 30" SEWER

UTILITY CONSTRUCTION



NOTE:
ALL BYPASS PUMPING WORK TO BE CONFINED TO RIGHT-OF-WAY, EXISTING SANITARY SEWER EASEMENTS AND/OR PUE.

NO UTILITY CONSTRUCTION WORK BEYOND MATCHLINE

SITE PERMITTING APPROVAL

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City of Raleigh Public Utilities Department Permit # N/A

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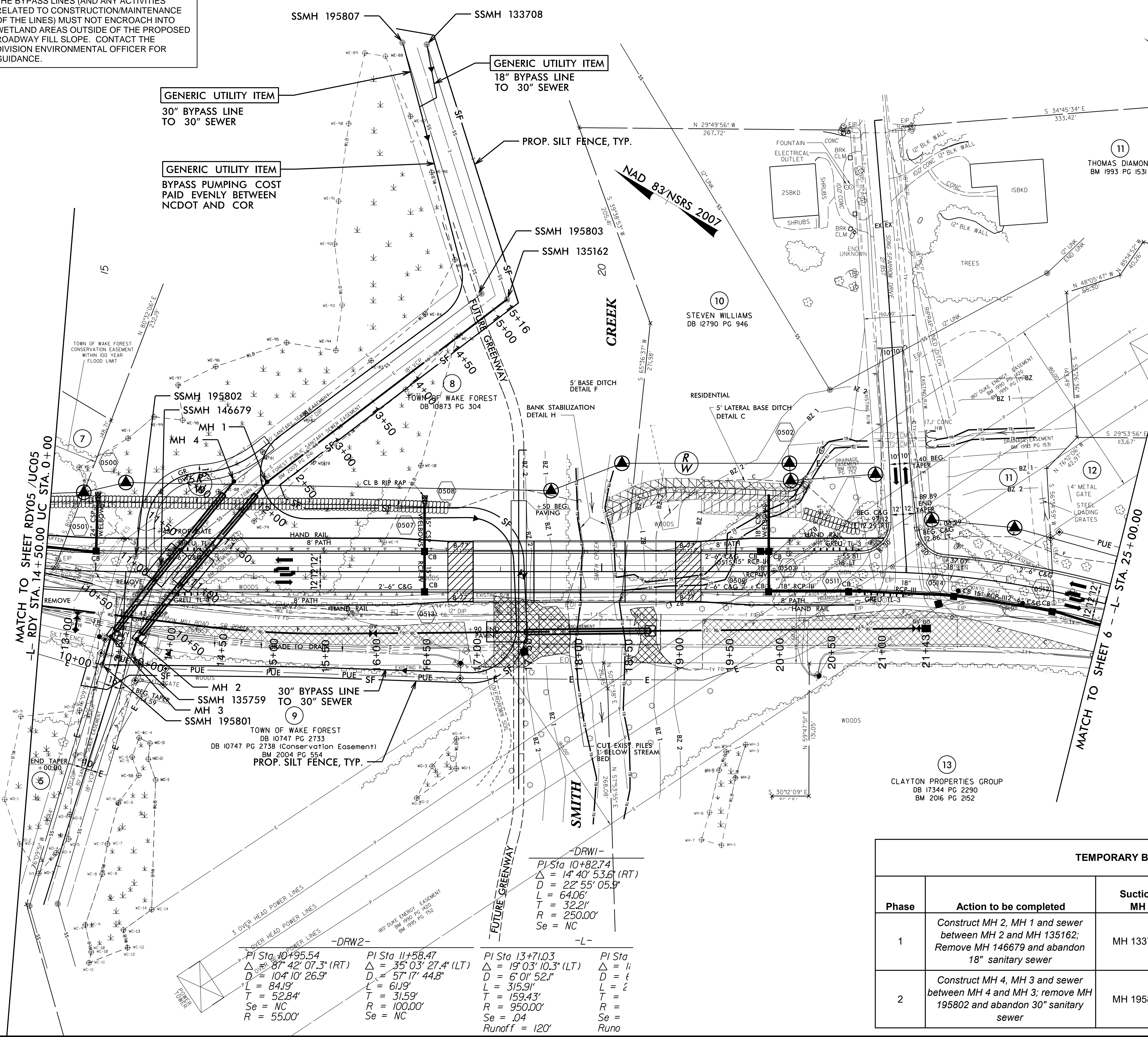
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Patrick Reidy
Patrick Reidy
08/20/21
Planning

These plans have been electronically approved for construction by the Town of Wake Forest Public Works and Engineering Department. This approval may not be edited once issued.

Michael H.
Michael H.
08/20/21
Public Works/Engineering



-DRW1-
PI Sta 10+82.74
Δ = 14° 40' 53.6" (RT)
D = 22° 55' 05.9"
L = 64.06'
T = 32.21'
R = 250.00'
Se = NC

-DRW2-
PI Sta 10+95.54
Δ = 8° 42' 07.3" (RT)
D = 104° 10' 26.9"
L = 84.19'
T = 52.84'
Se = NC
R = 55.00'

PI Sta 11+58.47
Δ = 35° 03' 27.4" (LT)
D = 57° 17' 44.8"
L = 61.19'
T = 31.59'
R = 100.00'
Se = NC

PI Sta 13+71.03
Δ = 19° 03' 10.3" (LT)
D = 6° 01' 52.1"
L = 315.91'
T = 159.43'
R = 950.00'
Se = .04
Runoff = 120'

TEMPORARY BYPASS PUMPING PLAN							
Phase	Action to be completed	Suction MH	Discharge MH	MAX. LIFT (FT)	DISTANCE (FT)	AVG FLOW (GPM)	PEAK FLOW (GPM)
1	Construct MH 2, MH 1 and sewer between MH 2 and MH 135162; Remove MH 146679 and abandon 18" sanitary sewer	MH 133708	MH 195801	10	1300	TBD	TBD
2	Construct MH 4, MH 3 and sewer between MH 4 and MH 3; remove MH 195802 and abandon 30" sanitary sewer	MH 195807	MH 195801	10	1300	TBD	TBD

REVISIONS

8/17/99