

**TIP PROJECT: W-5704E**

T.I.P. NO.	SHEET NO.
W-5704E	UC-1

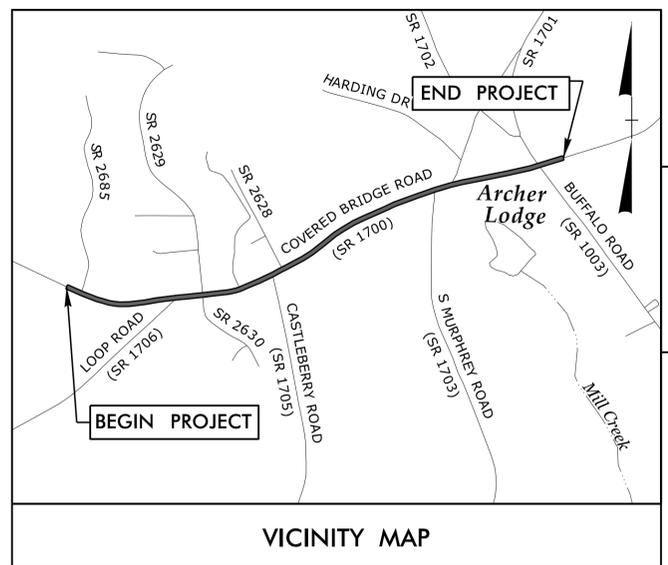
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITY CONSTRUCTION PLANS  
JOHNSTON COUNTY**

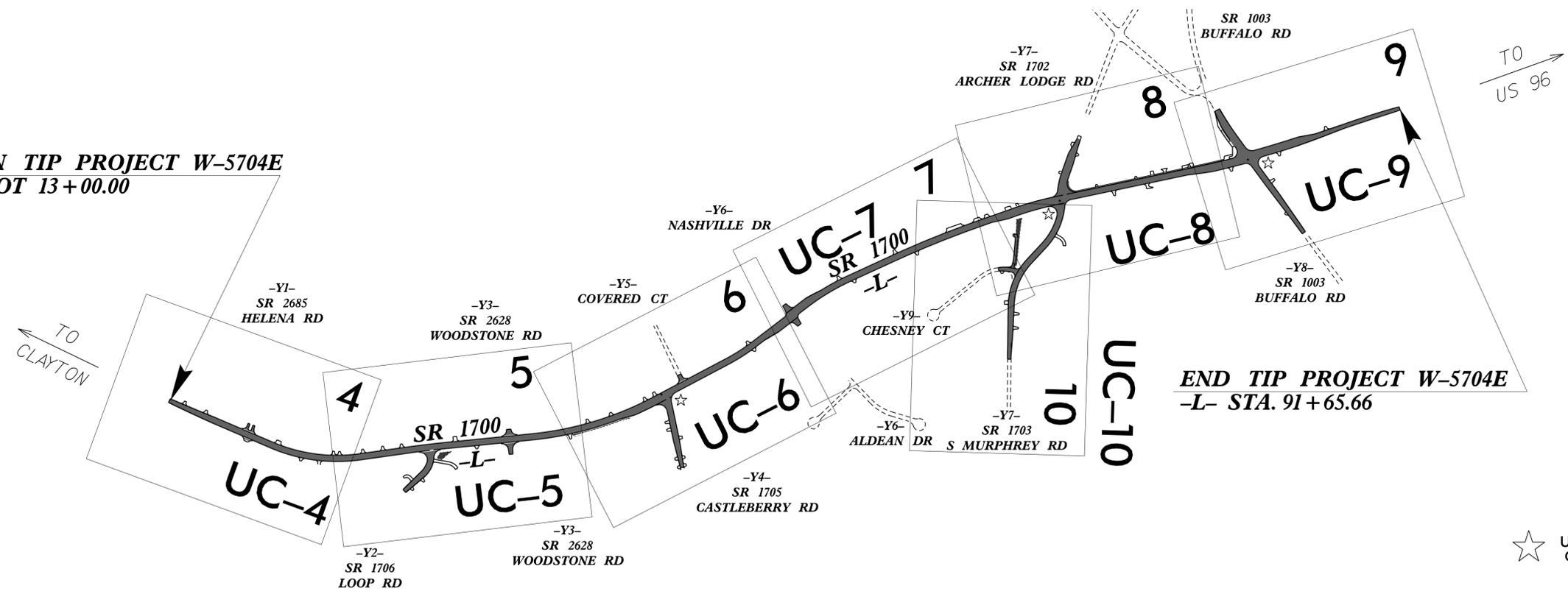
**LOCATION: SR 1700 (COVERED BRIDGE ROAD) FROM  
SR 2685 (HELENA LANE) TO SR 1003 (BUFFALO ROAD)**

**TYPE OF WORK: WATER & SEWER RELOCATIONS**



NAD 83 / NA2011

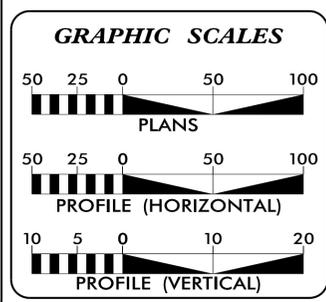
**BEGIN TIP PROJECT W-5704E  
-L- POT 13+00.00**



**END TIP PROJECT W-5704E  
-L- STA. 91+65.66**

☆ UPGRADE EXISTING  
OR NEW SIGNAL

THIS IS NOT A CONTROLLED ACCESS PROJECT.



**INDEX OF SHEETS**

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UC-11 THRU UC-17	PROFILE SHEETS

**WATER AND SEWER  
OWNER ON PROJECT**

(A) WATER - JOHNSTON COUNTY  
(B) SEWER - JOHNSTON COUNTY

PREPARED IN THE OFFICE OF:

**HINDE  
ENGINEERING**

License No. C-2639  
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513  
Ph. (919) 653-0001

Clint L. Stevens, P.E. UTILITIES PROJECT MANAGER  
Jordan K. Chapman, E.I. UTILITIES PROJECT ENGINEER  
James N. Arnold UTILITIES PROJECT DESIGNER

SEAL

**DIVISION OF HIGHWAYS  
DIVISION 4**

509 WARD BLVD.  
PO BOX 3165  
WILSON, NC 27895  
PHONE (252) 640-6400  
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Addison Gainey, PE PROJ. DEVELOPMENT ENGINEER  
Kim Moore RESIDENT ENGINEER  
Jimmy G. Sharpe SENIOR DIV. UTL. COORDINATOR  
Lonny Sleeper DIVISION UTILITIES ENGINEER

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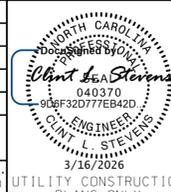


# UTILITY CONSTRUCTION



**HINDE ENGINEERING**  
License No. C-2639  
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	SHEET NO.
W-5704E	UC-3
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

## 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 2024.

2. THE EXISTING UTILITIES BELONG TO JOHNSTON COUNTY. THE CONTACT PERSON IS:

MICHAEL KEEN  
UTILITY PROJECTS MANAGER  
919-209-8333

IN THE EVENT OF A CONFLICT BETWEEN THE UTILITY OWNER'S TECHNICAL SPECIFICATIONS AND NCDOT STANDARD SPECIFICATIONS/PROJECT SPECIAL PROVISIONS, THE MOST STRINGENT SHALL GOVERN.

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 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. 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. ALL WATER LINE INSTALLED ON THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE RULES GOVERNING PUBLIC WATER SYSTEMS. VERTICAL SEPARATION BETWEEN PROPOSED WATER MAINS AND STORM DRAINAGE SHALL BE A MINIMUM OF 18-INCHES PER RECOMMENDED STANDARDS OF WATER WORKS. ALL PROPOSED WATER LINE SHALL HAVE A MINIMUM COVER OF 36-INCHES. PROPOSED WATER MAINS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10- FEET FROM SEWER MAINS (REF. RULE .0904, RULE.0906). UTILITIES BEING RELOCATED OR INSTALLED AS SHOWN ON THE UTILITY CONSTRUCTION PLANS MUST BE ADJUSTED ACCORDINGLY TO MEET THESE CRITERIA.

## PROJECT SPECIFIC NOTES:

1. ALL RECONNECT AND RELOCATE WATER METERS ON AN EXISTING WATER MAIN SHALL HAVE NEW SERVICE LINE INSTALLED TO THE EXISTING CORPORATION STOP.

2. ALL PVC PIPE SHALL BE INSTALLED NO LATER THAN 1 YEAR FROM THE DATE OF MANUFACTURE AS STAMPED ON THE PIPE.

3. ALL VALVES SHALL BE GATE VALVES UNLESS OTHERWISE NOTED.

4. ALL PIPE LESS THAN 12-INCHES IN DIAMETER SHALL HAVE MINIMUM 3 FEET OF COVER. ALL PIPE 12-INCHES IN DIAMETER AND LARGER SHALL HAVE MINIMUM 3 FEET 6 INCHES OF COVER.

5. ALL DUCTILE IRON FORCE MAIN SEWER PIPE SHALL BE LINED WITH AN EPOXY COATING SUCH AS SEWPER COAT, PROTECTO 401 OR APPROVED EQUAL.

6. ELECTRONIC MARKER BALLS SHALL BE INSTALLED OVER THE MAIN LINE AND AT ALL 22.5° BENDS OR LARGER, CAPPED OR PLUGGED ENDS, TEES AND REDUCERS.

7. FOR FIRE HYDRANTS TO BE REMOVED, THE CONTRACTOR SHALL CONTACT JOHNSTON COUNTY TO DETERMINE A SUITABLE LOCATION TO STOCKPILE THE FIRE HYDRANT AND ASSOCIATED ITEMS.

8. RECOMMENDED CONSTRUCTION PHASING TO BE COORDINATED WITH JOHNSTON COUNTY:
- A. NEW MAIN SHALL BE LAID IN SEGMENTS, STARTING AT TAPPING SLEEVES & VALVES TO PROPOSED GATE VALVES.
  - B. EACH SEGMENT SHALL BE TESTED, PASS BAC-T SAMPLE, AND BE CERTIFIED BY NCDOT & JOHNSTON COUNTY.
  - C. SWITCH BRANCH WATER LINES AND SERVICES OVER PER SEGMENT.
  - D. MOVE TO NEXT SEGMENT BETWEEN VALVES AND REPEAT STEPS AS REQUIRED.

## UTILITY CONSTRUCTION

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# STANDARD WATER DETAILS

**HINDE ENGINEERING**  
License No. C-2639  
401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

**DOCUMENT NOT CONSIDERED FINAL  
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PROJECT REFERENCE NO.	W-5704E	SHEET NO.	UC-3A
DESIGNED BY:	JJK		
DRAWN BY:	JNA		
CHECKED BY:	JJK		
APPROVED BY:	CLS		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		3/16/2026	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151		UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION

**STORM DRAIN PIPE CROSSING DETAIL**  
NOT TO SCALE

NOTES:  
1. CULVERT CROSSINGS IN EXISTING NCDOT RIGHT-OF-WAY REQUIRE 24" MIN. SEPARATION FROM BOTTOM OF CULVERT TO TOP OF WATER MAIN.  
2. IN LIEU OF RESTRAINT (TIE) RODS, APPROVED RESTRAINT JOINT PIPE MAY BE USED.

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Checked By:			
Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY  
Department of Public Utilities  
P.O. Box 2263  
Smithfield, NC 27577

**WATER STANDARD DETAIL**  
Storm Pipe Crossing

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**PIPE LAYING CONDITION**  
NOT TO SCALE

NOTE: WATER MAINS 8" Ø AND SMALLER SHALL HAVE MINIMUM OF 3" COVER. WATER MAINS LARGER THAN 8" Ø SHALL HAVE A MINIMUM OF 3'-6" COVER.

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Approved By:			
Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY  
Department of Public Utilities  
P.O. Box 2263  
Smithfield, NC 27577

**WATER STANDARD DETAIL**  
Pipe Laying Condition

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MAXIMUM TRENCH WIDTH AT TOP OF PIPE

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	48
8	32	30	54
10	34	36	60
12	36	42	66
14	38	48	72
16	40	54	78
18	42		

**VERTICAL BEND RODDING AND BLOCKING DETAIL**  
NOT TO SCALE

GENERAL NOTES:  
1. RODS AND NUTS SHALL BE OF TYPE 304 OR TYPE 316 STAINLESS STEEL.  
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.

SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NUMBER OF RODS REQUIRED
6"	4,328	2
8"	7,694	2
12"	17,312	4
16"	30,779	6
20"	48,091	8
24"	69,252	10

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Scale:			
Rev.	Description	Date	Init.

JOHNSTON COUNTY  
Department of Public Utilities  
P.O. Box 2263  
Smithfield, NC 27577

**WATER STANDARD DETAIL**  
Critical Bend Rodding and Blocking Details

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**THRUST BLOCK DETAIL**  
NOT TO SCALE

NOTES:  
1. CONCRETE SHALL BE 3,000 PSI MIN.  
2. CONCRETE FOR THRUST BLOCKING SHALL BE KEPT FAIRLY DRY, THUS MAKING THE CONCRETE WEDGE SHAPE MORE EASILY FORMED WITH THE WIDEST PART (BLOCKING AREA) AGAINST UNDISTURBED SOIL.  
3. NO CONCRETE SHALL COVER ANY BOLTS OR GLANDS.  
4. ALL FITTING AND ACCESSORIES TO BE WRAPPED WITH 10 MIL POLYETHYLENE PRIOR TO POURING BLOCKING.  
5. VOLUME OF THRUST BLOCKING SHALL BE AS SHOWN ON THE THRUST BLOCKING SCHEDULE.

PIPE SIZE	90° BEND	45° BEND	22.5° BEND	11.25° BEND	TEE	PLUG
4"	8"	12"	8"	8"	8"	8"
6"	10"	12"	8"	8"	8"	8"
8"	12"	12"	8"	8"	8"	8"
10"	14"	12"	8"	8"	8"	8"
12"	16"	12"	8"	8"	8"	8"
14"	18"	12"	8"	8"	8"	8"
16"	20"	12"	8"	8"	8"	8"
18"	22"	12"	8"	8"	8"	8"
20"	24"	12"	8"	8"	8"	8"
24"	28"	12"	8"	8"	8"	8"
30"	34"	12"	8"	8"	8"	8"
36"	40"	12"	8"	8"	8"	8"

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Rev.	Description	Date	Init.

JOHNSTON COUNTY  
Department of Public Utilities  
P.O. Box 2263  
Smithfield, NC 27577

**WATER STANDARD DETAIL**  
Thrust Block

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**THRUST COLLAR INSTALLATION**  
NOT TO SCALE

NOTE: 6" TO 18" MAINS = 12-NO. 7 BARS  
20" TO 36" MAINS = 12-NO. 8 BARS  
BARS PLACED AS SHOWN

PIPE DIAMETER	CONCRETE THRUST COLLAR		ANCHOR COLLAR	RWGS REQUIRED
	A	B		
6" & 12"	1'-0"	1'-0"	2"	ONE
16"	1'-4"	1'-0"	2"	ONE
20"	1'-4"	1'-0"	3"	ONE
24"	1'-4"	1'-0"	3"	TWO
30"	1'-4"	1'-2"	4"	TWO
36"	1'-4"	1'-4"	4"	TWO

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JOHNSTON COUNTY  
Department of Public Utilities  
P.O. Box 2263  
Smithfield, NC 27577

**WATER STANDARD DETAIL**  
Thrust Collar Installation

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# STANDARD WATER DETAILS

**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	W-5704E	SHEET NO.	UC-3B
DESIGNED BY:	JKC		
DRAWN BY:	JNA		
CHECKED BY:	JKC		
APPROVED BY:	CLS		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION

**3/4" & 1" WATER METER SERVICE DETAIL**  
 NOT TO SCALE

**NOTE:**  
 1. CONTRACTOR SHALL PLACE METER BOX IN NON TRAFFIC AREA ONLY, OUTSIDE FENCED AREAS, AND 4 FEET AWAY FROM BUSHES AND TREES THAT COULD COVER THE BOX.  
 2. PLASTIC METER BOX SHALL BE CENTURY #1015, NDS D1200, OR APPROVED EQUAL.  
 3. CONTRACTOR SHALL CENTER METER YOKE IN METER BOX.  
 4. METER YOKE TO MUELLER No. H-1404-2A, FORD No. VHH-72-TM-11 OR APPROVED EQUAL.  
 5. METER TO MEET AWWA C-200, STDs, AND SPECS.  
 6. METER TO BE PROVIDED AND SET BY JOHNSTON COUNTY. METER WILL NOT BE INSTALLED IF THE SETTER IS NOT CENTERED IN THE BOX. THE SETTER HAS BEEN PULLED UP ON ONE END, THE SETTER IS LAYING ON ITS SIDE, THE SETTER IS TO CLOSE TO THE BOX LID, THE BOX IS BELOW GRADE OR BROKEN, THE CUSTOMERS SERVICE LINE IS NOT HOOKED TO THE UNION NUT, THE 3/4 GATE VALVE HAS NOT BEEN INSTALLED WITHIN 12 INCHES OF THE METER BOX.  
 7. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.  
 8. SERVICE LINE TO HOME MUST PASS PLUMBING INSPECTION PRIOR TO SETTING METER.

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> 3/4" and 1" Water Meter Service	PAGE <b>21</b>
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**STANDARD WATER TAP DETAIL**  
 NOT TO SCALE

**NOTE:**  
 1. ALL TAPS 2" AND SMALLER SHALL BE MADE WITH TAPPING SADDLE AND VALVE. NO DIRECT TAPS SHALL BE MADE.  
 2. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

TAPPING SADDLE SHALL BE BRASS OR BRONZE FOR "CC" THREADS WITH DOUBLE STRAPS, FORD S-90, MUELLER BR2B OR APPROVED EQUAL.

TAPPING SLEEVE SHALL BE BRASS OR BRONZE FOR "CC" THREADS, FORD S-10, MUELLER H-134, JCM 403 OR APPROVED EQUAL FOR SDR-21 PVC.

CORPORATION STOP SHALL BE BRONZE WITH "CC" THREADS AND RATED 300 PSI, MUELLER B-2508, FORD FB-1000-NL, OR APPROVED EQUAL.

**NOTE:** ALL TAPS TO BE MADE ON TOP QUARTER OF MAIN.

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> Standard Water Tap	PAGE <b>20</b>
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**FIRE HYDRANT ASSEMBLY**  
 NOT TO SCALE

**NOTE:**  
 1. MIN. OF 4 CU. FT. STONE (MORE IF REQ'D).  
 2. CONC. THRUST BLOCK TO HAVE MIN. OF 6 SQ. FT. BEARING ON SOLID BANK (MORE IF REQ'D).  
 3. DRAIN HOLES AND FLANGES SHALL BE CLEAR OF CONC.  
 4. FIRE HYDRANT BARREL SHALL BE PLUMB.  
 5. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

COAT HYDRANT BONNET AND NOZZLE CAPS W/ "ALERT" REFLECTIVE FIRE HYDRANT PAINT SILVER MODEL #1440

#67 STONE FILL 6-6"

FINISHED GRADE

BURY AS SPECIFIED

CONCRETE THRUST BLOCK

#67 STONE FILL (4 C.F. MIN.)

HYDRANT LEG TO DIP

FIRE HYDRANT ASSEMBLY INCLUDES ALL ITEMS EXCEPT MAIN LINE TEE

PUMPING & HOSE CONNECTIONS EQUAL TO COUNTY STANDARD

BREAK RING TO BE SET WITHIN 2'-4" OF FINISHED GRADE

VALVE BOX

HYDRANT TEE

WATERLINE SIZE VARIES SEE PLANS

CONCRETE THRUST BLOCK

GATE VALVE VALVE SHALL BE PLACED ON THE WATER MAIN SIDE OF ROAD DITCH

3/4" TYPE 304 S.S. THREADED RODS MIN. 2 EA. PER SEGMENT OR "Aqua-Grip" RINGS OR ROMAC GRIP RINGS MAY BE USED AT JOINTS IN LIEU OF THREADED RODS

PAY ITEM

**FIRE HYDRANTS INSTALLED ON EXISTING 6" WATER MAINS, MUST BE INSTALLED USING A 6"x6" TEE CUT INTO THE EXISTING WATER MAIN. FIRE HYDRANTS INSTALLED ON EXISTING WATER MAINS LARGER THAN 6", CAN BE INSTALLED USING A TAPPING SLEEVE AND VALVE ON THE EXISTING WATER MAIN.**

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> Fire Hydrant Assembly	PAGE <b>4</b>
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**STANDARD BORE ENCASMENT**  
 NOT TO SCALE

FASTEN BRIDLE RODS TO FITTING FLANGE USING 3/4" TURNED EYE BOLTS.

3/4" S.S. BRIDLE RODS SHALL BE WELDED TO THE ENCASMENT PIPE. WELD AREAS SHALL BE PAINTED WITH 2 COATS OF BITUMINOUS BASE PAINT.

STAINLESS STEEL SPACERS

ENCLOSE ENDS WITH BRICK MASONRY & GROUT

PLAN

SECTION

STAINLESS STEEL SPACERS

CARRIER PIPE

STEEL ENCASMENT PIPE CONFORMING TO ASTM SPECIFICATION A252-81 GRADE 2 AND A BITUMINOUS COATING ON THE OUTSIDE.

**NOTES:**  
 1. CARRIER PIPE SHALL BE D.I.P. UNLESS EXPRESSLY APPROVED BY THE COUNTY.  
 2. STAINLESS STEEL SPACERS SHALL BE USED. NO TIMBER SKIDS ARE ALLOWED.  
 3. TWO SPACERS PER JOINT SHALL BE USED FOR D.I.P. CARRIER PIPE.  
 4. THREE SPACERS PER JOINT SHALL BE USED FOR PVC CARRIER PIPE.  
 5. ENCASED BORES ALONG GRAVITY COLLECTION SYSTEMS SHALL NOT REQUIRE BRIDLE RODS.  
 6. 2 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 8"Ø AND SMALLER. 4 EA. 3/4" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 10"Ø AND LARGER.  
 7. CARRIER PIPE SHALL BE INSTALLED USING 'FIELD LOK' GASKETS OR APPROVED EQUAL.

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> Standard Bore Encasement	PAGE <b>6</b>
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**VALVE AND VALVE BOX INSTALLATION**  
 NOT TO SCALE

FOR USE IN PAVED AREAS

FOR USE IN UNPAVED AREAS

FINISHED GRADE IN PAVED AREA

7/8" MIN. FINISHED GRADE IN UNPAVED AREA

VALVE BOX COVER

CONCRETE PROTECTOR RING

VALVE BOX

TAMPED BACKFILL

VALVE

WATER MAIN

TAMPED BACKFILL

BLOCKING

**NOTES:**  
 1. D.I.P. MAY BE USED FOR VALVE BOX EXTENSIONS.  
 2. VALVE BOX SHOULD NOT CONTACT WATER MAIN OR VALVE.  
 3. CONCRETE PROTECTOR RING SHALL BE USED IN ALL UNPAVED AREAS.  
 4. ALL MATERIALS USED IN THE POTABLE WATER SYSTEM MUST BE NSF61 AND NSF372 CERTIFIED AND MEET THE LATEST FEDERAL SAFE DRINKING WATER ACT REQUIREMENTS.

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> Valve and Valve Box Installation	PAGE <b>13</b>
Checked By:					
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Scale:					

**CONCRETE PROTECTOR RING**  
 NOT TO SCALE

#3 REBAR 2 EA.

10"

2"

4"

24"

**NOTE:** PROTECTOR RING SHALL BE 3,000 P.S.I. CONCRETE.

Drawn By:	Name	Date		<b>WATER STANDARD DETAIL</b> Concrete Protector Ring	PAGE <b>14</b>
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Approved By:					
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# STANDARD SEWER DETAILS

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 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
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REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

## UTILITY CONSTRUCTION

**NOTES:**

- FORCE MAIN SHALL BE DUCTILE IRON PIPE 10 LF CENTERED ACROSS MANHOLE.
- CONTRACTOR TO INSTALL FORCE MAIN AT DEPTH REQUIRED TO FACILITATE INSTALLATION OF AIR RELEASE MANHOLE AT HIGH POINT OF LINE.
- INTERIOR OF MANHOLE INCLUDING ALL PIPING SHALL BE FACTORY EPOXY COATED MIN. 50 mil SURFACE DRY. EPOXY SEALER PRIME COATING & FINISH COATING SHALL BE APPROVED BY THE COUNTY PRIOR TO INSTALLATION.
- IN LIEU OF DIP FORCE MAIN MANHOLE, C-900 PIPING WITH A CONCRETE CRADLE MAY BE USED.

**SECTION**

**AIR VACUUM/RELEASE MANHOLE FOR FORCE MAIN**  
NOT TO SCALE

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577		<b>SANITARY SEWER STANDARD DETAIL</b> Air Vacuum/Pressure Release Valve in Manhole	PAGE <b>42</b>
Checked By:						
Approved By:						
Scale:						
Rev.	Description	Date	Init.			

**POLYPROPYLENE PLASTIC STEP**  
NOT TO SCALE

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577		<b>SANITARY SEWER STANDARD DETAIL</b> Polypropylene Plastic Manhole Step	PAGE <b>35</b>
Checked By:						
Approved By:						
Scale:						
Rev.	Description	Date	Init.			

**LOCKABLE MANHOLE FRAME & COVER**  
NOT TO SCALE

Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577		<b>SANITARY SEWER STANDARD DETAIL</b> Lockable Manhole Frame & Cover	PAGE <b>29</b>
Checked By:						
Approved By:						
Scale:						
Rev.	Description	Date	Init.			

**PIPE LAYING CONDITION E**  
NOT TO SCALE

**NOTE:**

- PIPE SHALL BE BEDDED UP TO SPRING LINE AND MINIMUM 4\"/>

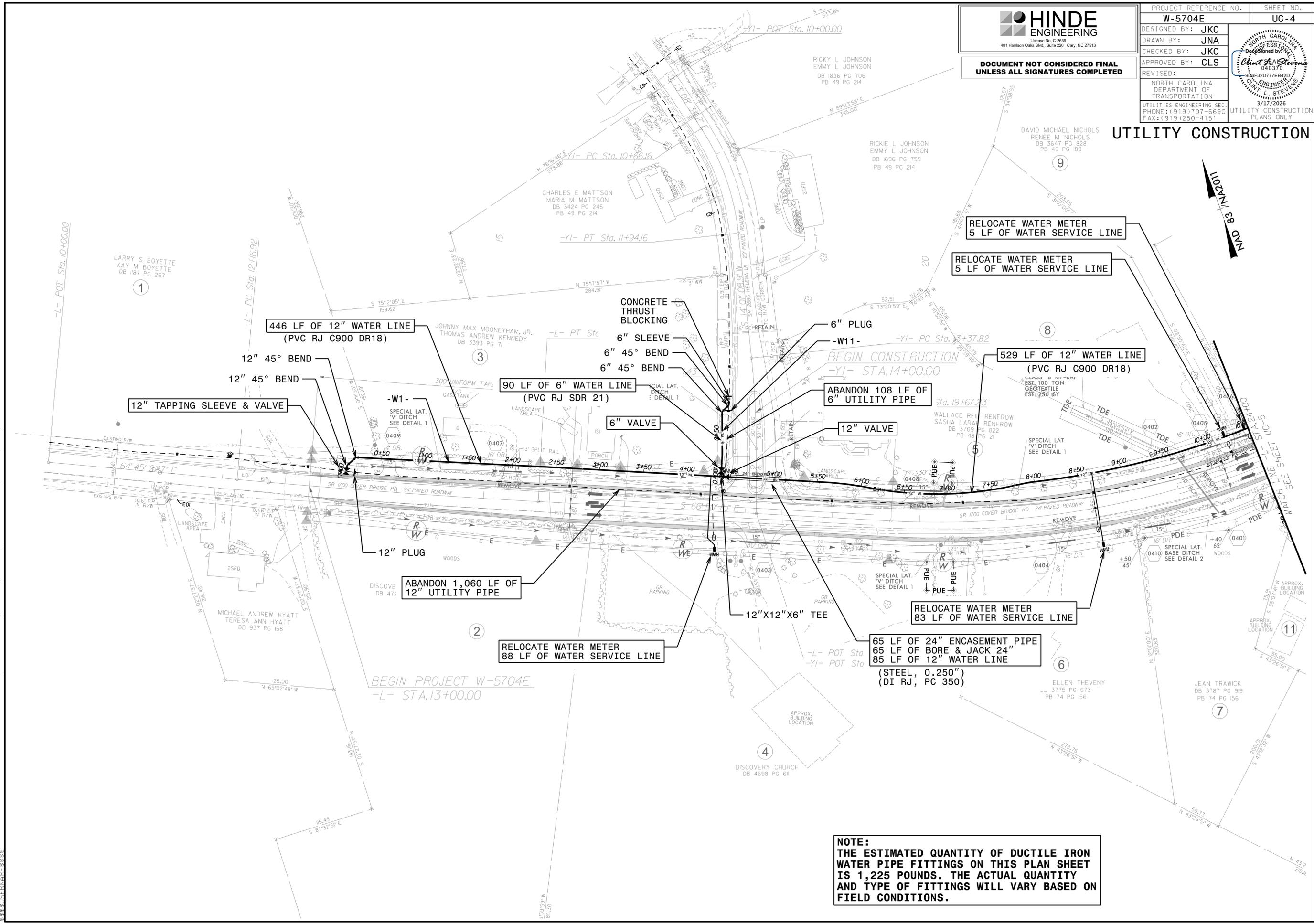
Drawn By:	Name	Date	JOHNSTON COUNTY Department of Public Utilities P.O. Box 2263 Smithfield, NC 27577		<b>SANITARY SEWER STANDARD DETAIL</b> Pipe Laying Conditions E	PAGE <b>38</b>
Checked By:						
Approved By:						
Scale:						
Rev.	Description	Date	Init.			

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**HINDE ENGINEERING**  
 License No. C-2639  
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO. <b>W-5704E</b>	SHEET NO. <b>UC-4</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
CHECKED BY: <b>JKC</b>	
APPROVED BY: <b>CLS</b>	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
<b>UTILITY CONSTRUCTION</b>	



**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON  
 WATER PIPE FITTINGS ON THIS PLAN SHEET  
 IS 1,225 POUNDS. THE ACTUAL QUANTITY  
 AND TYPE OF FITTINGS WILL VARY BASED ON  
 FIELD CONDITIONS.

17 MAR 2026 14:32 PROJECTS\2017\A20171106.00.TGS..W-5704E\Design\Utilities\Engineering\UC\ProJ\W-5704E\_Ut\_rdy4\_UC04\_psh.dgn



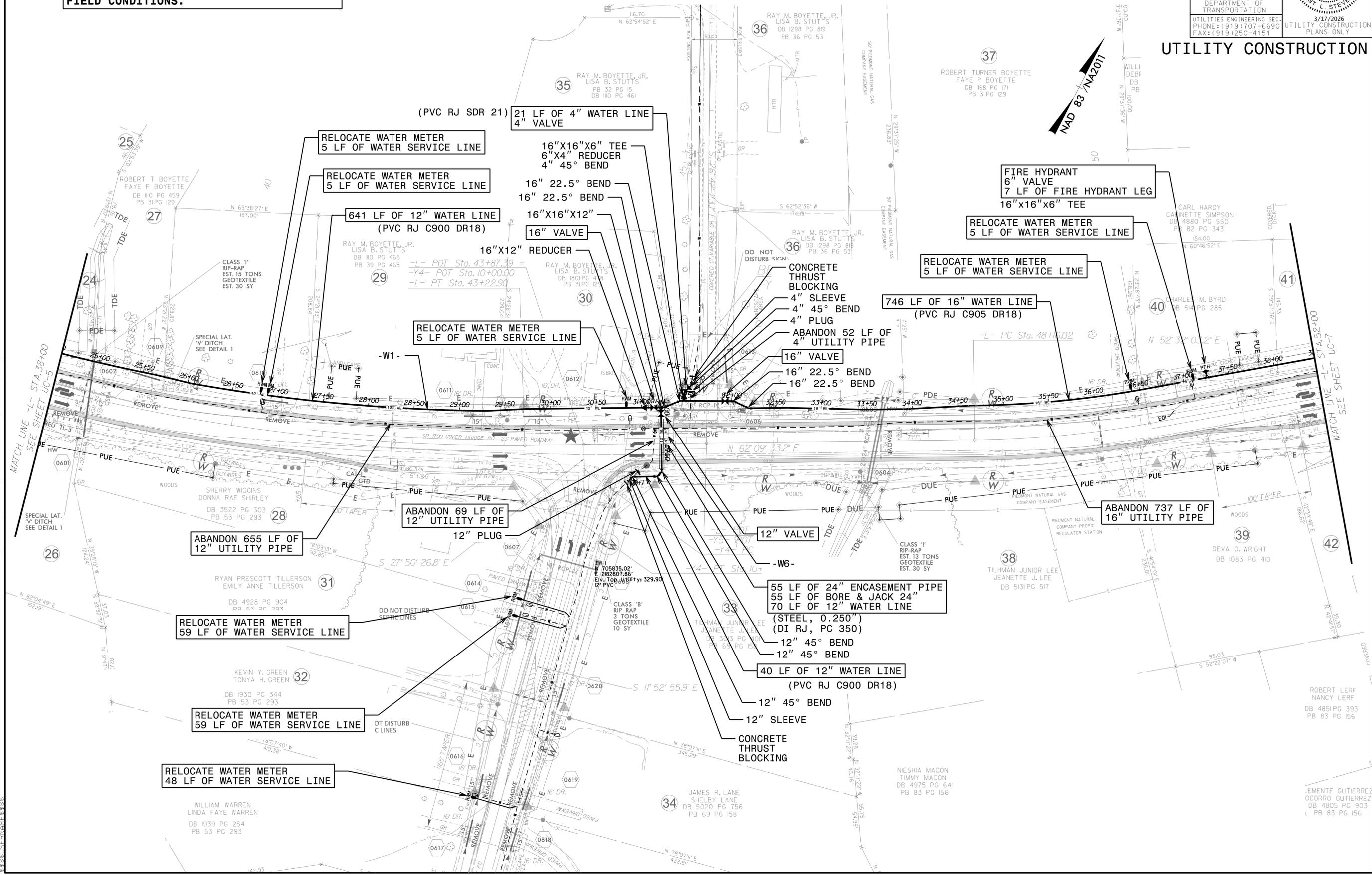
**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON  
 WATER PIPE FITTINGS ON THIS PLAN SHEET  
 IS 4,020 POUNDS. THE ACTUAL QUANTITY  
 AND TYPE OF FITTINGS WILL VARY BASED ON  
 FIELD CONDITIONS.

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 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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PROJECT REFERENCE NO.	W-5704E	SHEET NO.	UC-6
DESIGNED BY:	JJK		
DRAWN BY:	JNA		
CHECKED BY:	JJK		
APPROVED BY:	CLS		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		3/17/2026	
UTILITIES ENGINEERING SEC.		UTILITY CONSTRUCTION PLANS ONLY	
PHONE: (919) 707-6690		FAX: (919) 250-4151	

**UTILITY CONSTRUCTION**



17 MAR 2026 14:33 PROJECTS\2017\A20171106\00\_TGS\_W-5704E\ut\_rdy6\_UC06\_psh.dgn  
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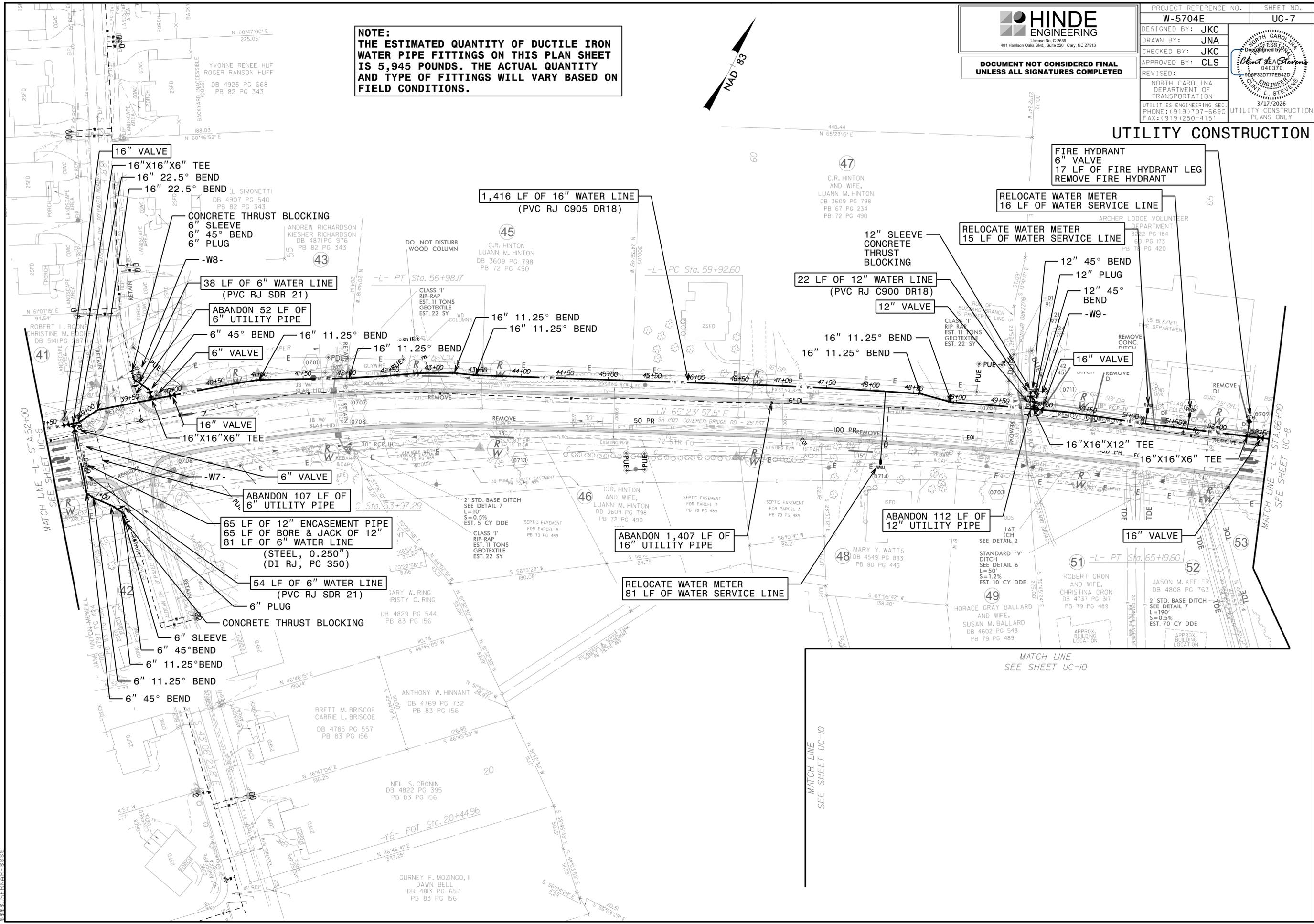
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 UNLESS ALL SIGNATURES COMPLETED**

PROJECT REFERENCE NO. <b>W-5704E</b>	SHEET NO. <b>UC-7</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
CHECKED BY: <b>JKC</b>	
APPROVED BY: <b>CLS</b>	
REVISED:	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITY CONSTRUCTION PLANS ONLY	

**NOTE:  
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 5,945 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.**



**UTILITY CONSTRUCTION**



7. MAR. 2026 14:33 PROJECTS\2017\A20171106.00.TGS.W-5704E\Design\Utilities\UC-Proj\W-5704E\_ut.edy7\_UC07\_psh.dgn

MATCH LINE -L- STA. 52+00  
 SEE SHEET UC-6

MATCH LINE -L- STA. 66+00  
 SEE SHEET UC-8

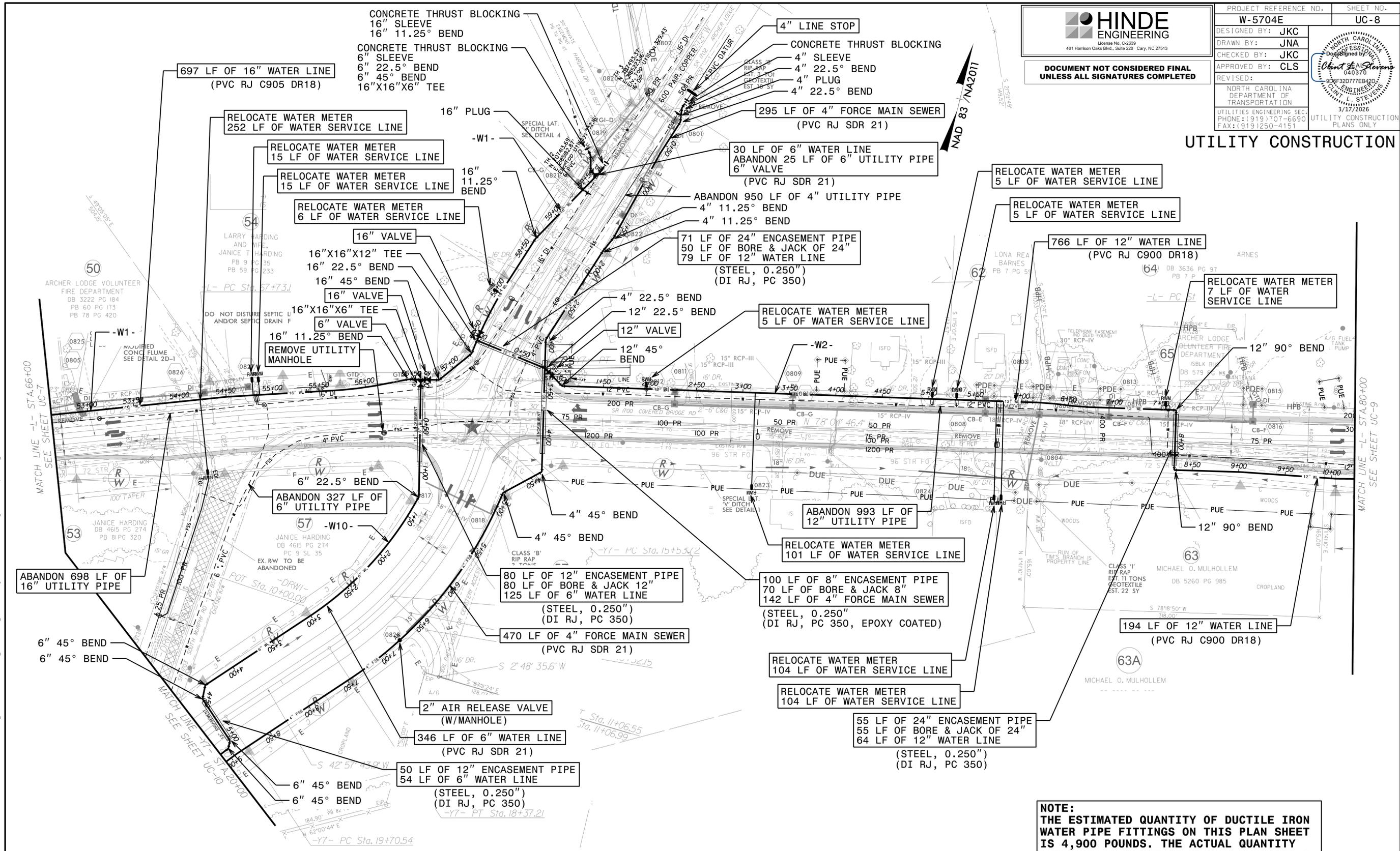
MATCH LINE  
 SEE SHEET UC-10

MATCH LINE  
 SEE SHEET UC-10

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 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

PROJECT REFERENCE NO. <b>W-5704E</b>	SHEET NO. <b>UC-8</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
CHECKED BY: <b>JKC</b>	
APPROVED BY: <b>CLS</b>	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
<b>UTILITY CONSTRUCTION</b>	



**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 4,900 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON SEWER PIPE FITTINGS ON THIS PLAN SHEET IS 340 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

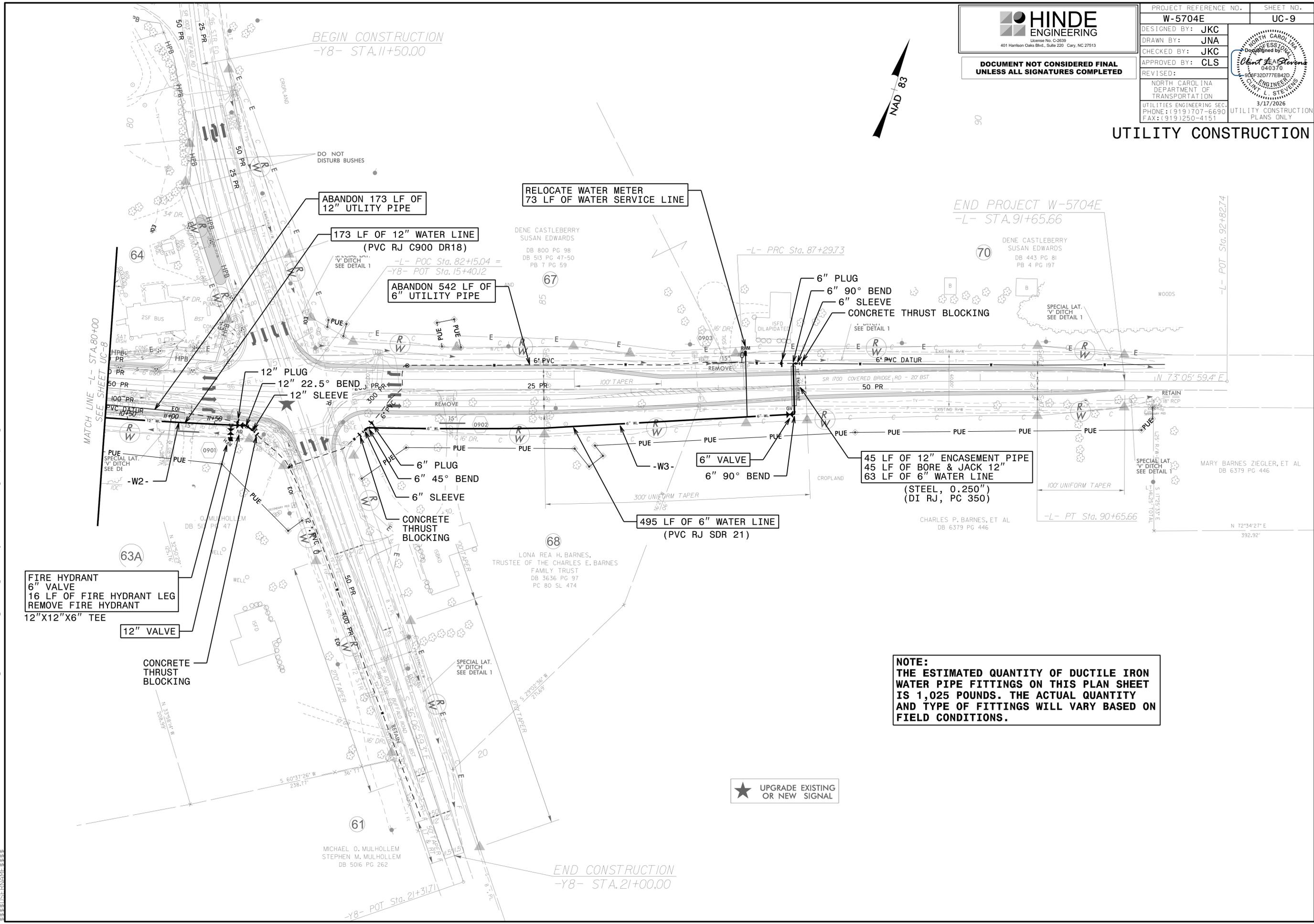
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PROJECT REFERENCE NO. <b>W-5704E</b>	SHEET NO. <b>UC-9</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
CHECKED BY: <b>JKC</b>	
APPROVED BY: <b>CLS</b>	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY 3/17/2026	

**UTILITY CONSTRUCTION**



**FIRE HYDRANT**  
 6" VALVE  
 16 LF OF FIRE HYDRANT LEG  
 REMOVE FIRE HYDRANT  
 12"X12"X6" TEE

**12" VALVE**

**CONCRETE THRUST BLOCKING**

**ABANDON 173 LF OF 12" UTILITY PIPE**

**173 LF OF 12" WATER LINE (PVC RJ C900 DR18)**

**ABANDON 542 LF OF 6" UTILITY PIPE**

**RELOCATE WATER METER 73 LF OF WATER SERVICE LINE**

**495 LF OF 6" WATER LINE (PVC RJ SDR 21)**

**45 LF OF 12" ENCASEMENT PIPE  
 45 LF OF BORE & JACK 12"  
 63 LF OF 6" WATER LINE (STEEL, 0.250") (DI RJ, PC 350)**

**NOTE:**  
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 1,025 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.

★ **UPGRADE EXISTING OR NEW SIGNAL**

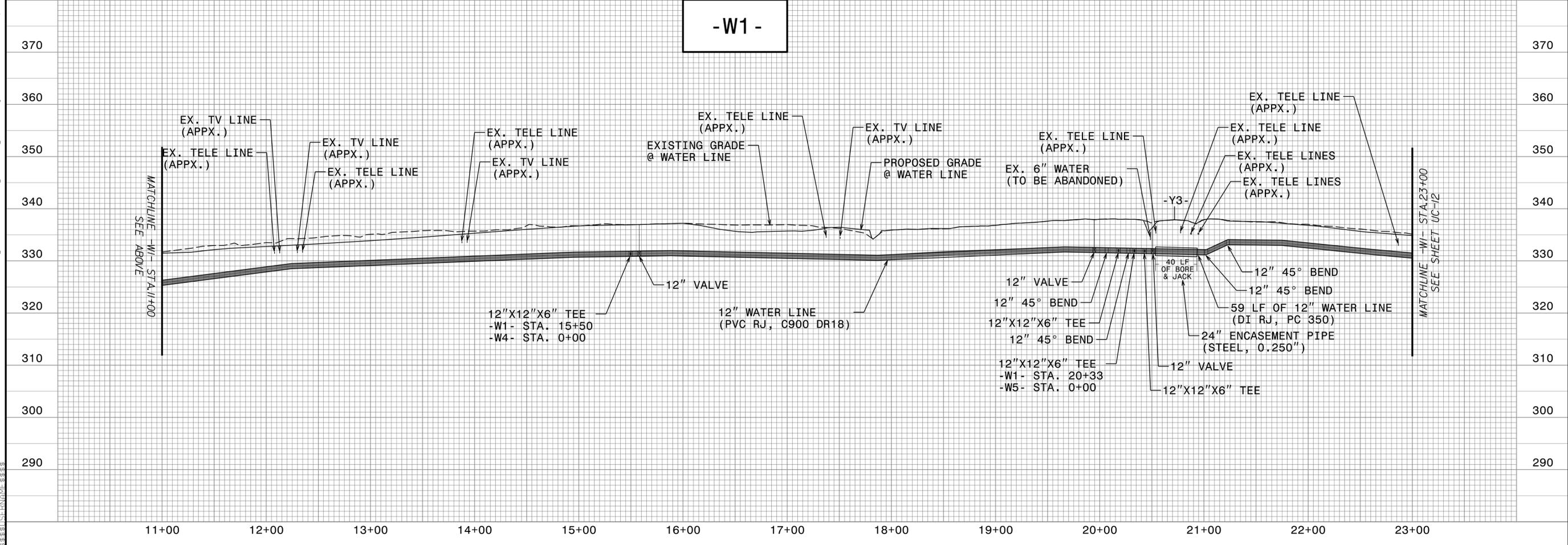
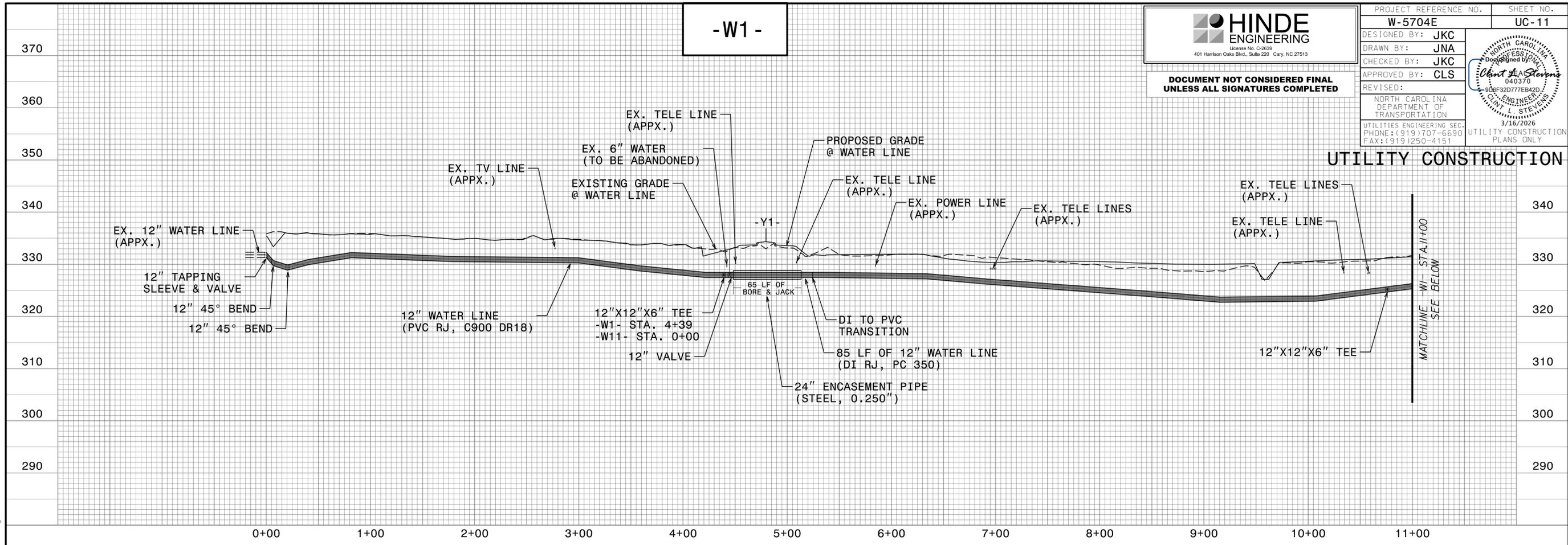
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PROJECT REFERENCE NO. <b>W-5704E</b>	SHEET NO. <b>UC-11</b>
DESIGNED BY: <b>JKC</b>	
DRAWN BY: <b>JNA</b>	
CHECKED BY: <b>JKC</b>	
APPROVED BY: <b>CLS</b>	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 3/16/2026 UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151



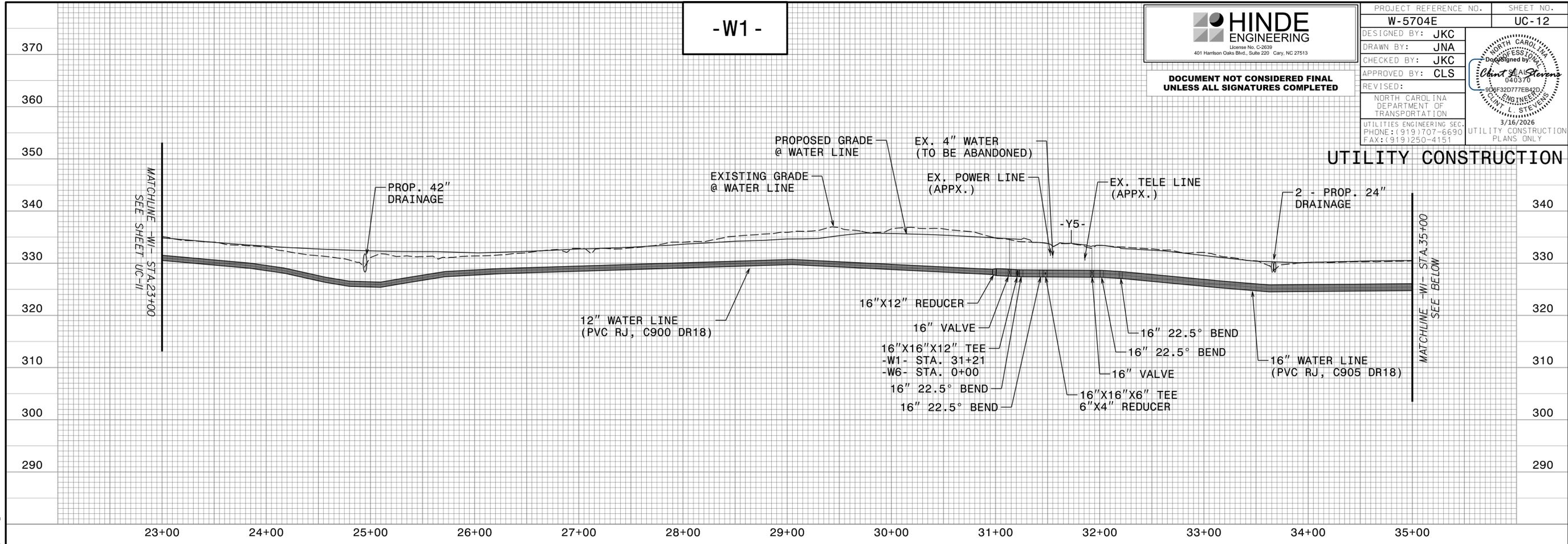
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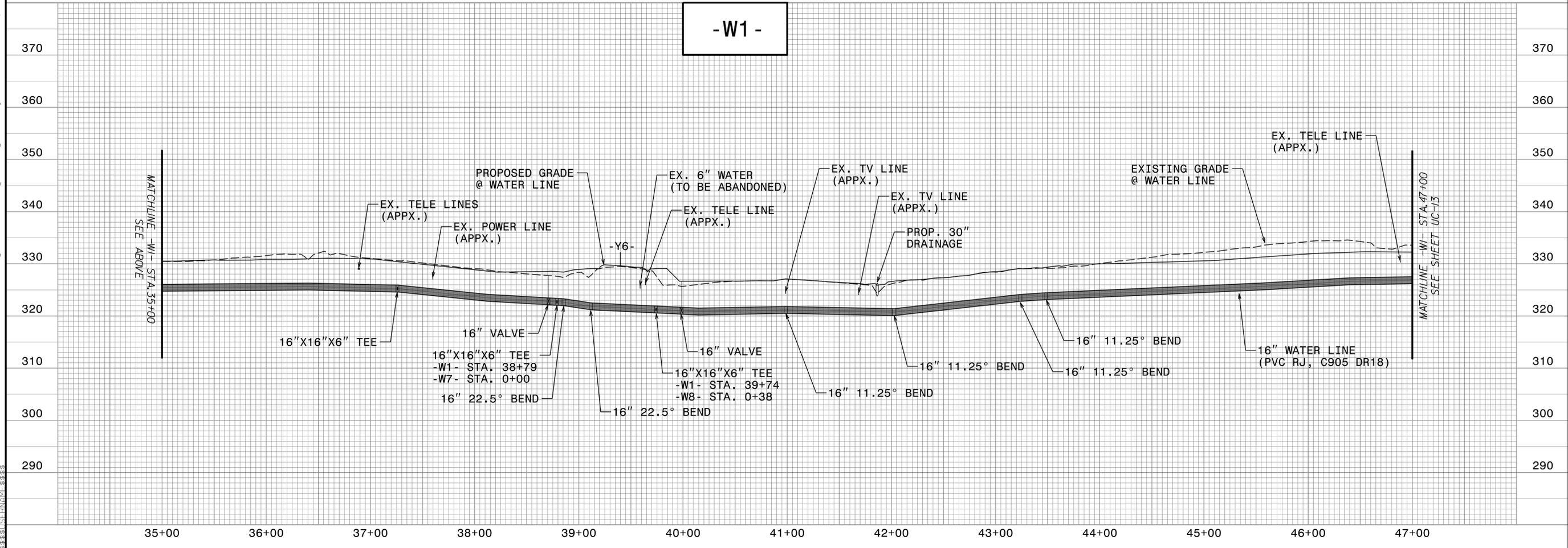


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PROJECT REFERENCE NO.	SHEET NO.
W-5704E	UC-12
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
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-W1-



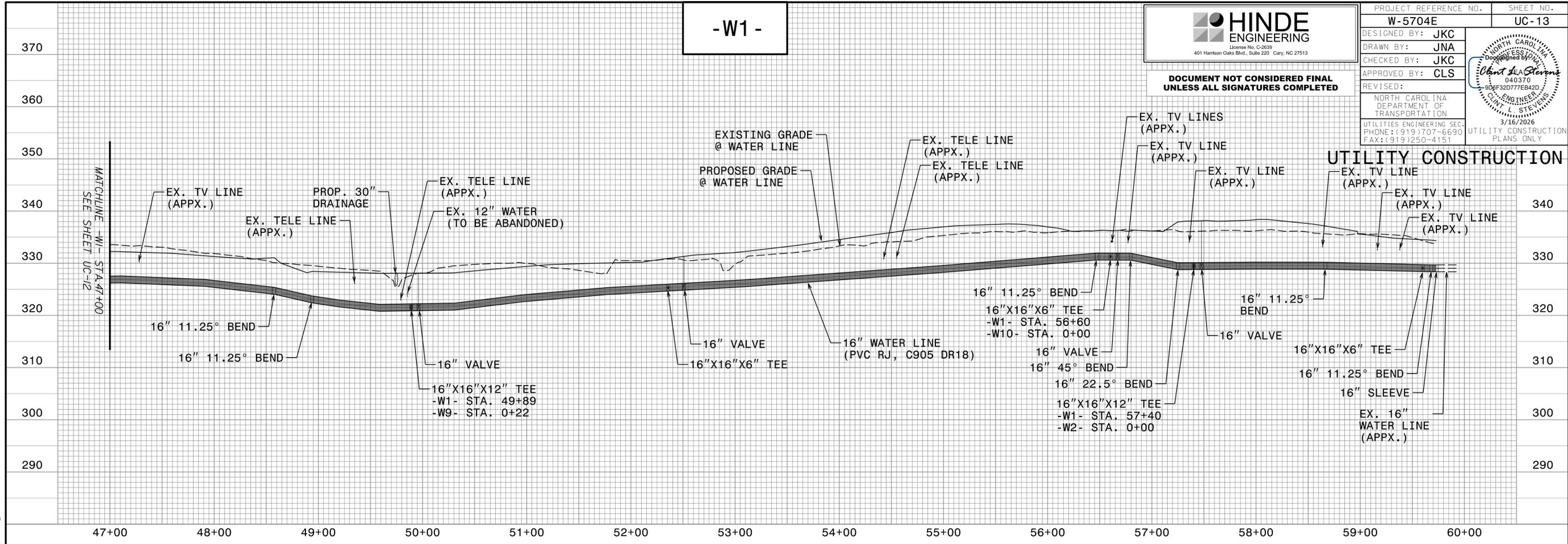
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-W1-

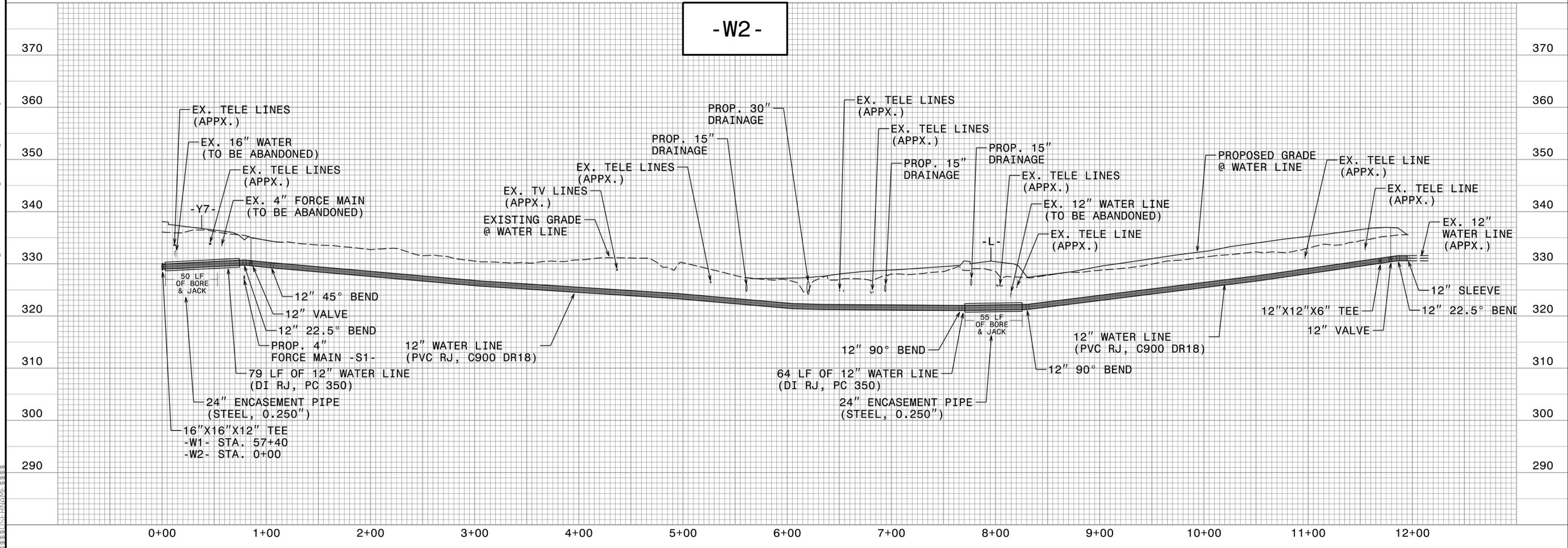


DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. W-5704E	SHEET NO. UC-13
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
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-W2-



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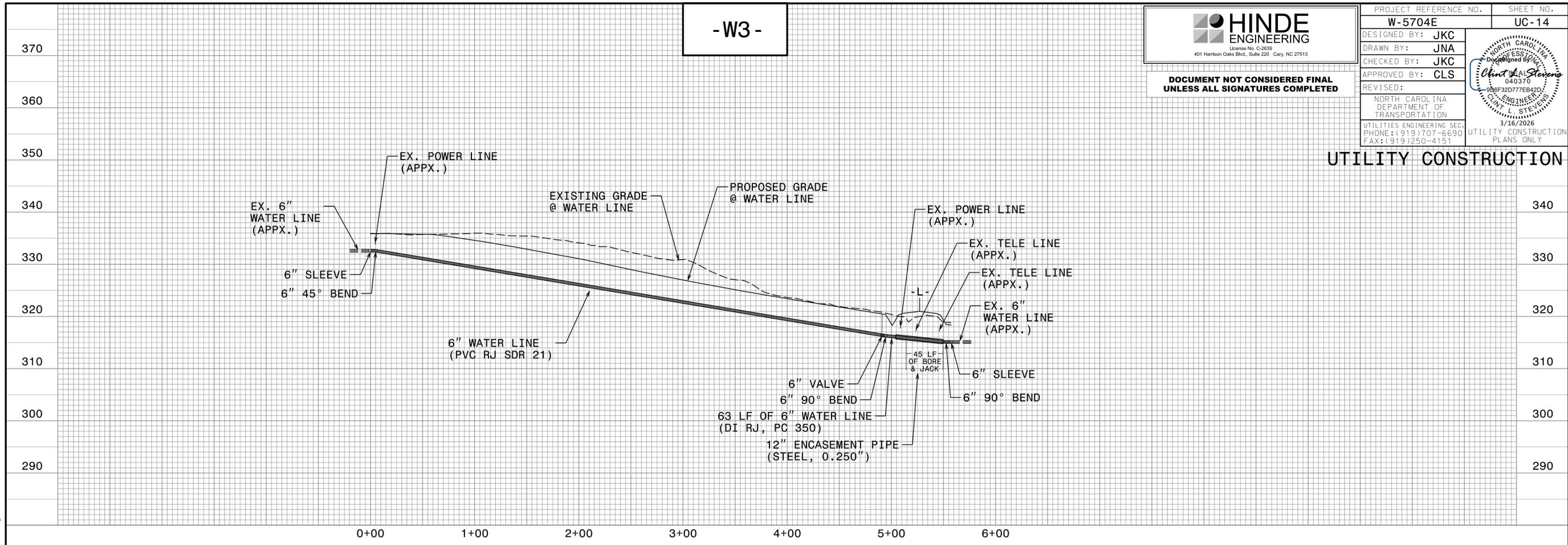
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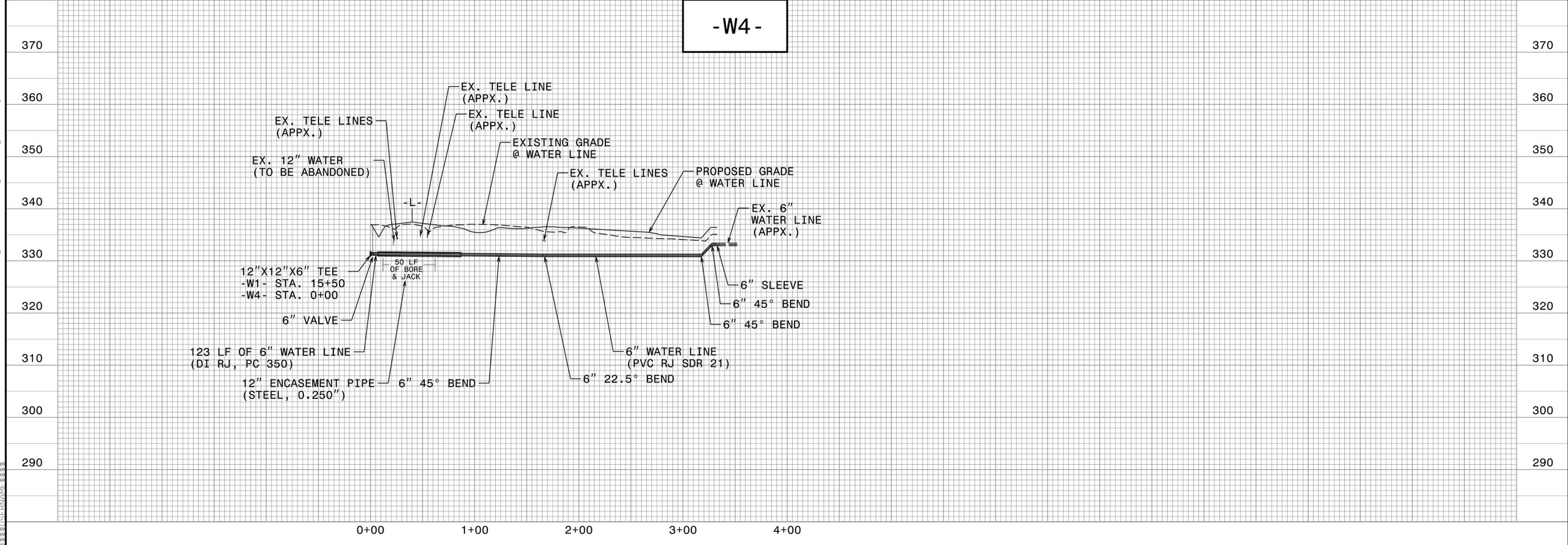
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UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
W-5704E	UC-14
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
3/16/2026	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION



-W4-



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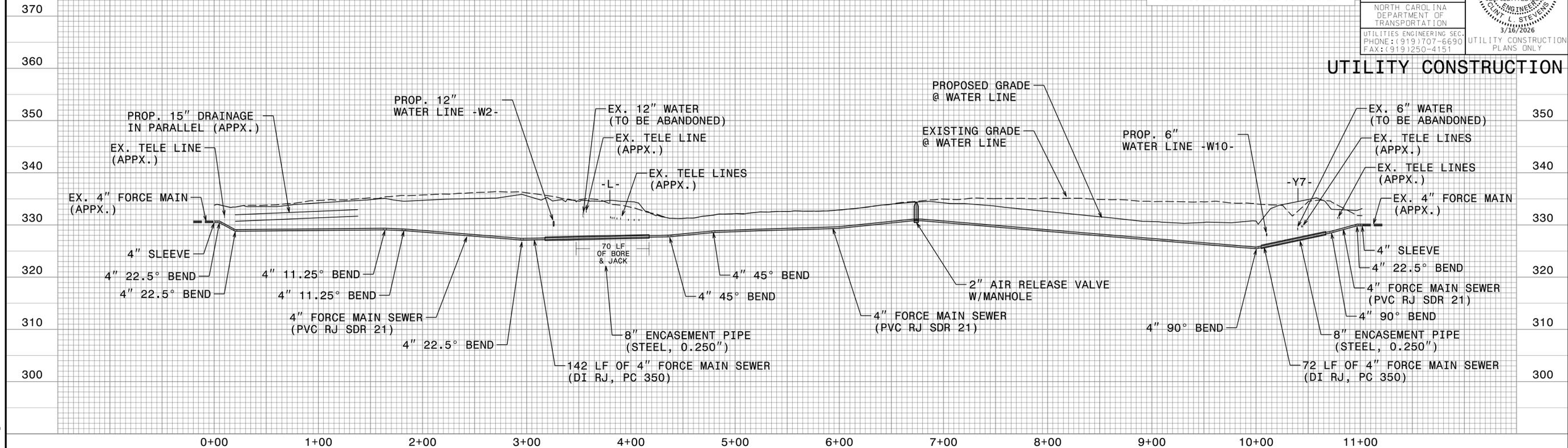
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DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. W-5704E	SHEET NO. UC-17
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION



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