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SEE SHEET 1B FOR CONVENTIONAL PLAN SHEET SYMBOLS

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-1

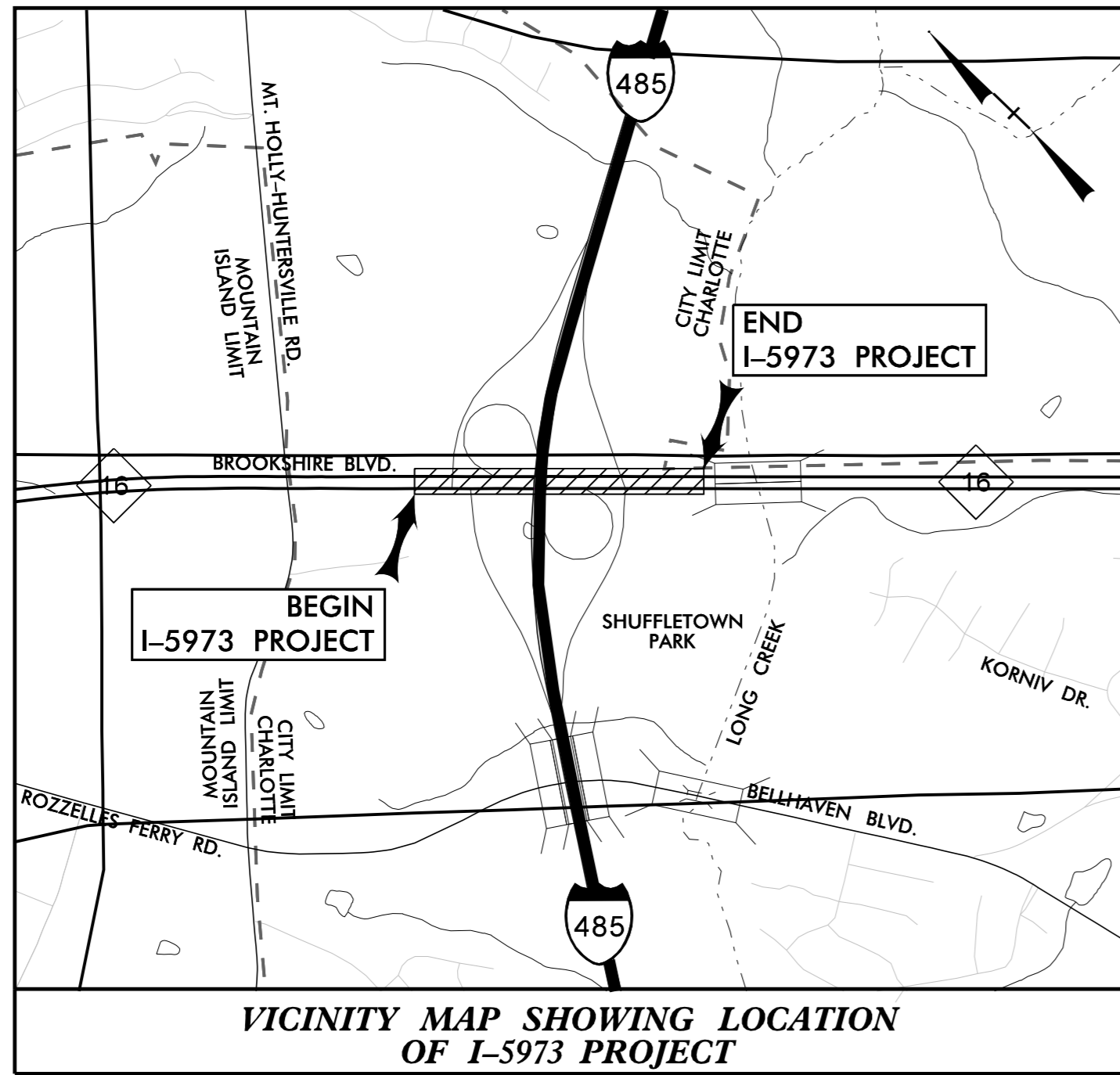
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# MECKLENBURG COUNTY

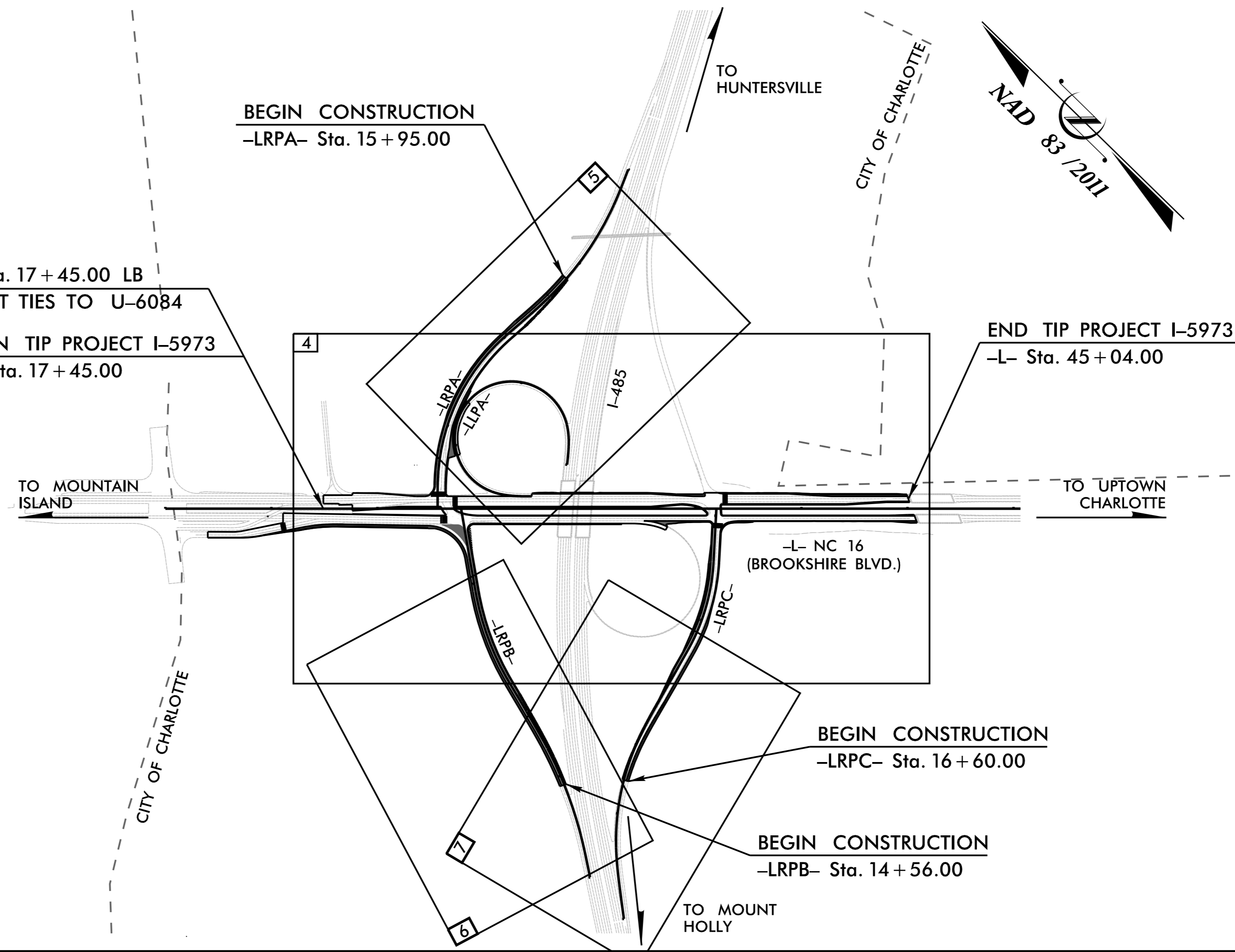
LOCATION: NC 16 (BROOKSHIRE BLVD) AND NORTHERN I-485 INTERCHANGE

TYPE OF WORK: WATER MAIN RELOCATIONS

**TIP PROJECT: I-5973**



25% PLANS

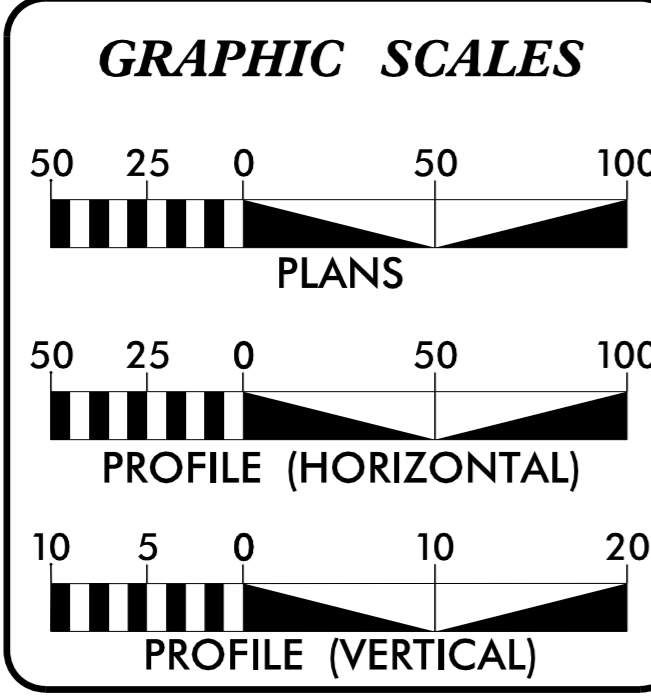


A PORTION OF THIS PROJECT IS LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF CHARLOTTE

NCDOT CONTACT:  
SEAN EPPERSON, P.E.  
NCDOT - DIVISION 10  
716 W. MAIN STREET  
ALBEMARLE, NC 28001

OWNER:	CONTACT INFORMATION BILL DEAL, P.E. (980) 722-0786 WDEAL@CI.CHARLOTTE.NC.US
PROJECT ENGINEER:	DANIEL BULA, P.E. (704) 409-1805 DAN.BULA@KIMLEY-HORN.COM 200 SOUTH TRYON STREET, SUITE 200 CHARLOTTE, NORTH CAROLINA 28202

**CONTRACT:**



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UC-1	TITLE SHEET
UC-2	NCDOT SYMBOLS
UC-3	GENERAL NOTES
UC-3A THRU UC-3F	STANDARD DETAILS
UC-4 THRU UC-7	UTILITY CONSTRUCTION PLAN

**UTILITY OWNERS**  
WATER - CHARLOTTE WATER

PLANS PREPARED FOR THE NCDOT BY:

2018 STANDARD SPECIFICATIONS

**Kimley»Horn**  
NC LICENSE #0102  
200 SOUTH TRYON STREET, SUITE 200  
CHARLOTTE, NORTH CAROLINA 28202  
PHONE: (704) 333-5131

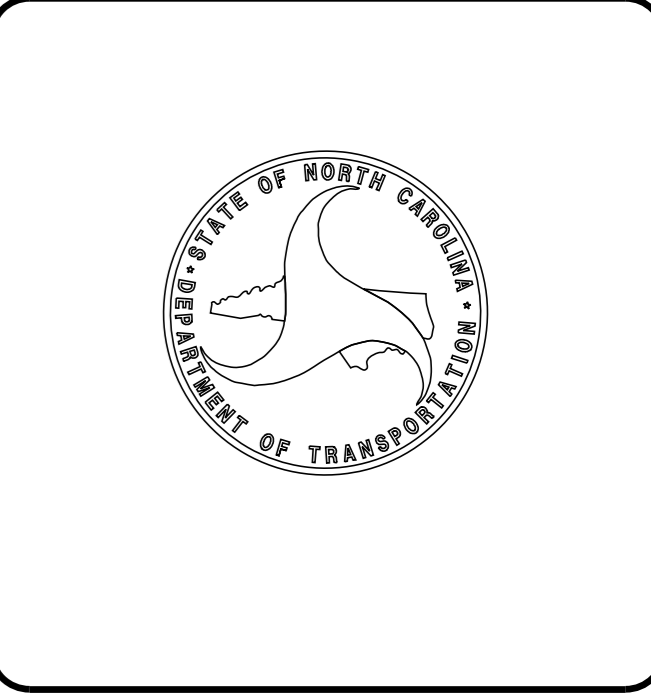
DANIEL G. BULA, P.E.  
CONSULTANT CONTACT #1

MATTHEW A. SHOESMITH, P.E.  
CONSULTANT CONTACT #2

SEAN EPPERSON, P.E.  
NCDOT CONTACT

SEAL

SIGNATURE: \_\_\_\_\_ P.E.



8/17/2022 \\kimley-horn.com\SE\_CHL\CHL\_PROJ\01036453 - I-5973 (I-485 Brookshire\Utilities\Engineering\UC\Pro\280\_001\_I-5973\_UT\_TSH\_UC01.dgn

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

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

## BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
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	○
Well	○
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	---WLB---
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	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite RW Marker	-----
Proposed Control of Access Line with Concrete C/A Marker	-----
Existing Control of Access	-----
Proposed Control of Access	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage / Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----
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	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	▨

## VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----

Orchard	☼☼☼☼
Vineyard	□ Vineyard

## EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	-----
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	⊕
Storm Sewer	-----

## UTILITIES:

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

## TELEPHONE:

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

## WATER:

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

## TV:

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

## GAS:

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

## SANITARY SEWER:

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

## MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	-----
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
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.

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5/14/99

REVISIONS

8/17/2022

**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 WATER AND SEWER UTILITIES BELONG TO CHARLOTTE WATER.
3. ALL WATER LINES SHALL BE INSTALLED IN COMPLIANCE WITH THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES SHALL BE INSTALLED IN COMPLIANCE WITH THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH 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 UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. CONTRACTOR SHALL PROVIDE ACCESS FOR DEPARTMENT PERSONNEL AND 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, AND 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. CONTRACTOR SHALL MAKE INVESTIGATIONS TO DETERMINE EXACT LOCATION, SIZE, AND TYPE OF MATERIAL OF EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND TO AVOID DAMAGE TO EXISTING FACILITIES. CONTRACTOR SHALL REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT NOR OWNER.
7. CONTRACTOR SHALL 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. CONTRACTOR SHALL 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, OR 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.

**PROJECT SPECIFIC NOTES:**

1. CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHARLOTTE WATER STANDARD DETAILS AND THE PROJECT SPECIAL PROVISIONS.
2. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY CHARLOTTE WATER REPRESENTATIVE.
3. ALL SHORING SHALL BE IN ACCORDANCE WITH OSHA TRENCHING STANDARDS PART 1926, SUBPART B, AS AMENDED TO DATE.
4. ANY NECESSARY LANE CLOSURES SHALL FOLLOW GUIDELINES OUTLINED IN THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
5. IF THE PROPOSED WATER AND/OR SANITARY SEWER MAIN IS INSTALLED WITHIN 12" IN ANY DIRECTION (VERTICALLY OR HORIZONTALLY) OF A GAS MAIN, THE CONTRACTOR SHALL NOTIFY PIEDMONT NATURAL GAS COMPANY (704-525-5585).
6. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS DIRECTED.
7. IF ADDITIONAL WORK SPACE IS NEEDED, AN ENCROACHMENT SHALL BE AGREED UPON BETWEEN CONTRACTOR AND PROPERTY OWNER.
8. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS IS FOR THE USE OF THE CONTRACTOR IN PROVIDING PROTECTION FOR THE UTILITIES DURING CONSTRUCTION OPERATIONS. NCDOT, DESIGN CONSULTANT, AND/OR AGENT SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF LOCATION, SIZE, DEPTH, OR COMPLETENESS OF THE INFORMATION. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
9. CONTRACTOR SHALL SUPPORT AND PROTECT ANY EXISTING UNDERGROUND UTILITIES ENCOUNTERED DURING TRENCH EXCAVATION AND/OR PIPE INSTALLATION.
10. 10 FEET HORIZONTAL SEPARATION OR 18" VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN WATER MAINS OVER SEWER MAINS. WHEN WATER MAINS ARE BELOW SEWER MAINS OR MINIMUM SEPARATIONS CANNOT BE MAINTAINED, DUCTILE IRON PIPE SHALL BE USED FOR BOTH MAINS TO 10 FEET ON EITHER SIDE OF THE CROSSING, AND ALL ALONG THE LENGTH OF THE MAINS WHERE THE MINIMUM SEPARATION CANNOT BE MAINTAINED.
11. CHARLOTTE WATER SHALL BE NOTIFIED TWO WEEKS PRIOR TO THE BEGINNING OF WATER AND/OR SANITARY SEWER WORK. CONTACT BILL DEAL OF CHARLOTTE WATER AT (980) 772-0786 TO PROVIDE NOTIFICATION.
12. WATER AND SEWER LINES SHALL REMAIN ACTIVE DURING CONSTRUCTION.
13. SANITARY SEWER LATERAL LOCATIONS ARE APPROXIMATE AND SUBJECT TO RELOCATION DUE TO FIELD CONDITIONS. ALL 4" SANITARY SEWER LATERALS SHALL HAVE A MIN. 1% SLOPE.
14. ALL PROPOSED WATER LINES, UNLESS OTHERWISE INDICATED ON THE PLANS, SHALL BE RESTRAINED JOINT DUCTILE IRON PIPE PRESSURE CLASS 350. ALL PROPOSED SEWER LINES, UNLESS OTHERWISE INDICATED ON THE PLANS, SHALL BE CERAMIC EPOXY LINED PUSH-ON JOINT DUCTILE IRON PIPE PRESSURE CLASS 350.
15. ALL PROPOSED WATER AND SEWER LINES SHALL BE TESTED IN ACCORDANCE WITH CHARLOTTE WATER STANDARD SPECIFICATIONS.
16. CONTRACTOR SHALL MINIMIZE SHUTDOWN TIMES OF WATER AND SEWER FACILITIES, AND COORDINATE WITH CHARLOTTE WATER AND THE LOCAL FIRE DEPARTMENT.



PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-3
DESIGNED BY: DGB	
DRAWN BY: SLG	
CHECKED BY: MAS	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

**GENERAL SEQUENCE:**


**UTILITY CONSTRUCTION**

1. FOR EACH WATER LINE AND SEWER LINE RELOCATION, THE CONTRACTOR SHALL PROVIDE THE UTILITY OWNER WITH A DETAILED INSTALLATION, CONNECTION, AND SERVICE INTERRUPTION PLAN FOR APPROVAL AT LEAST SEVEN (7) DAYS PRIOR TO THE RELOCATION. AT A MINIMUM, EACH PLAN SHALL ADDRESS THE FOLLOWING:
  - A. SEQUENCE OF CONSTRUCTION OPERATIONS.
  - B. PROCEDURE FOR FLUSHING, TESTING, AND DISINFECTION OF ALL AFFECTED PIPING AND VALVES, AS REQUIRED BY THE UTILITY OWNER.
  - C. PHASING AND SCHEDULE FOR ALL CONNECTIONS, INCLUDING PLANNED SERVICE OUTAGES, DURATION, AND CONTINGENCY PLAN.
2. NO INTERRUPTION OF SERVICE WILL BE PERMITTED UNTIL THE FOREGOING PLAN HAS BEEN APPROVED BY THE UTILITY OWNER. THE UTILITY OWNER'S PERSONNEL SHALL OPERATE THE UTILITY OWNER'S EXISTING FACILITIES INVOLVED IN THE INTERRUPTIONS OF SERVICE.
3. PLANNED SERVICE CONNECTION INTERRUPTIONS SHALL LAST NO LONGER THAN 8 HOURS UNLESS OTHERWISE APPROVED BY THE UTILITY OWNER. ALL INTERRUPTIONS OF SERVICES SHALL BE COORDINATED WITH AND SCHEDULED AT TIMES ACCEPTABLE TO THE UTILITY OWNER.
4. WRITTEN WATER SERVICE INTERRUPTION NOTICES SHALL BE PROVIDED TO ALL AFFECTED CUSTOMERS AT LEAST 72 HOURS PRIOR TO EACH PLANNED INTERRUPTION.

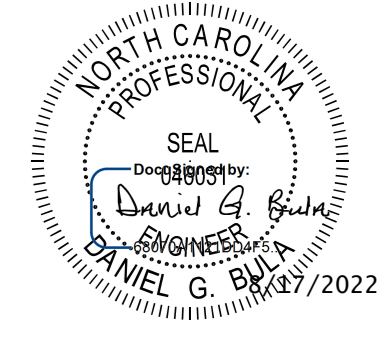
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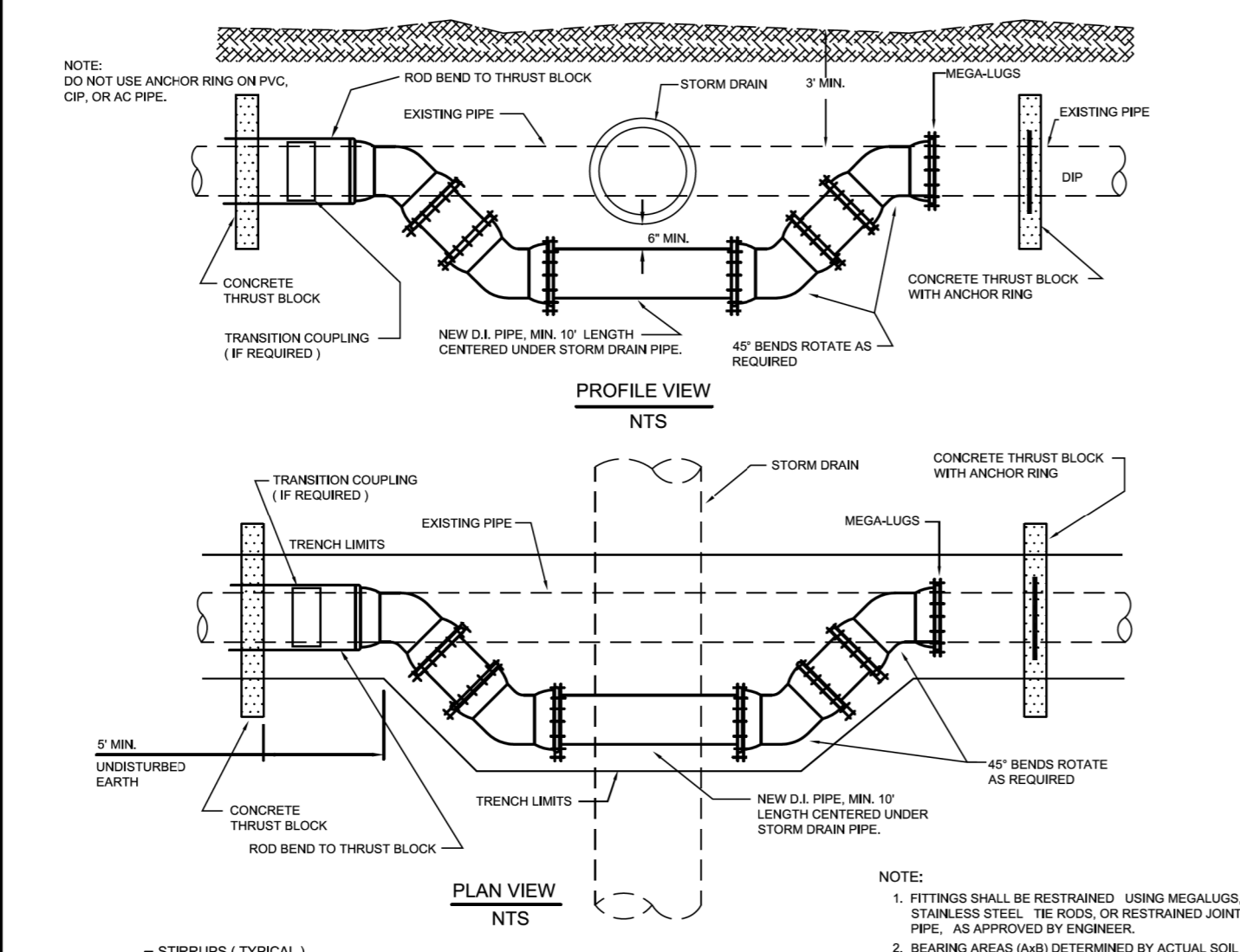
REVISIONS

8/17/2022



200 SOUTH TRYON ST, SUITE 200  
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-3A
DESIGNED BY: DGB	
DRAWN BY: SLG	
CHECKED BY: MAS	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	
UTILITY CONSTRUCTION PLANS ONLY	



**PROFILE VIEW**  
NTS

**PLAN VIEW**  
NTS

**THRUST BLOCK DETAIL**  
NTS

**SECTION AA**

**CHARLOTTE-MECKLENBURG UTILITY DEPARTMENT ENGINEERING DIVISION CHARLOTTE, NORTH CAROLINA**

RESULTANT THRUST AT FITTINGS AT 200 PSI WATER PRESSURE.	
TOTAL POUNDS.	
NOML PIPE DIAMETER	45° BEND
4 INCH	2775
6 INCH	6720
8 INCH	9660
10 INCH	14820
12 INCH	20988

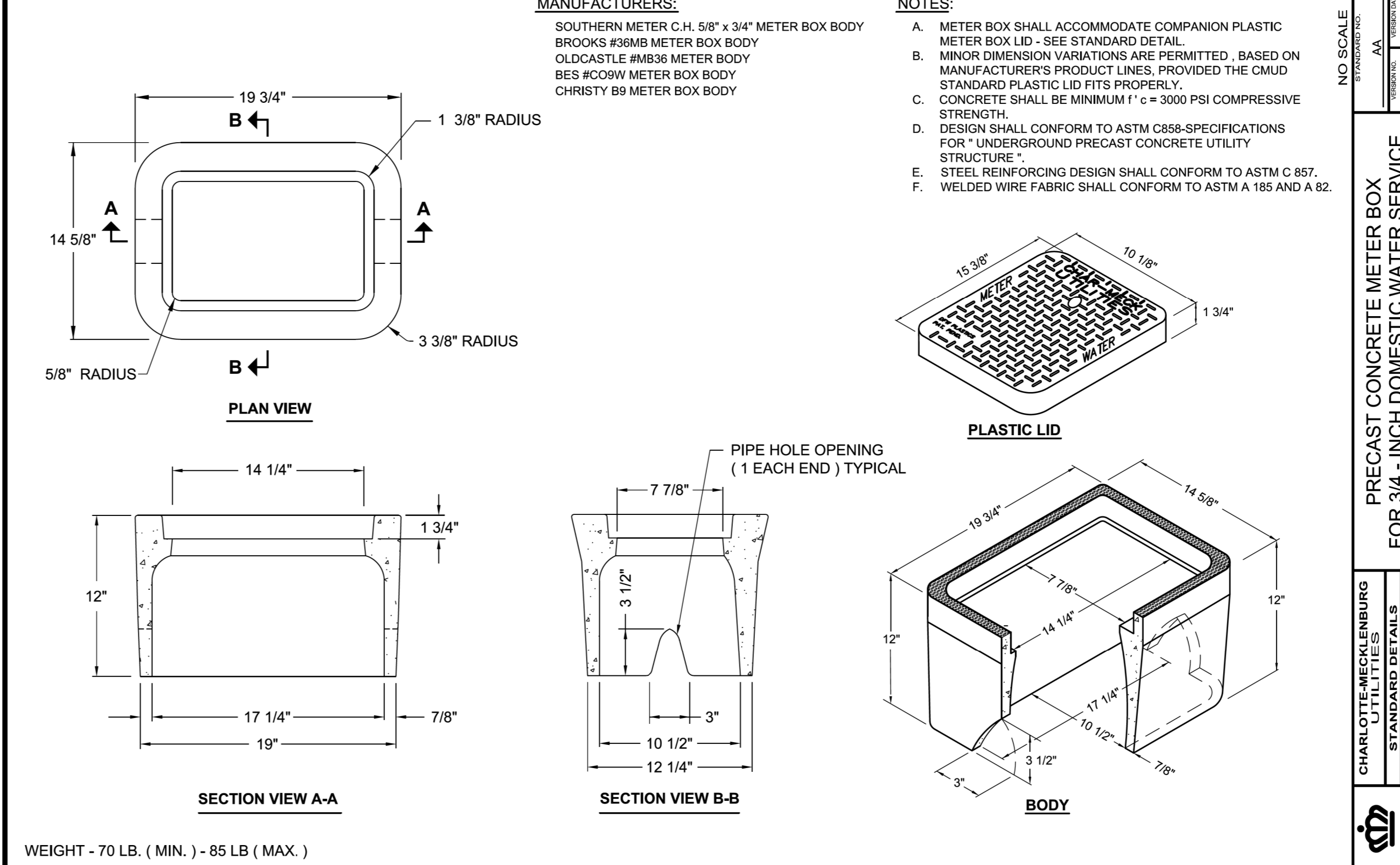
THE FOLLOWING OBTAINED SOIL VALUES FOR THE DEPTHS OF 4 FEET ARE LISTED ONLY AS A GUIDE. THE ENGINEER SHOULD SELECT THESE BEARING VALUES FOR EACH SOIL TYPE AND DEPTH OF COVER ENCOUNTERED ON THE SPECIFIC PIPELINE PROJECT. APPROPRIATE SAFETY FACTORS SHOULD BE APPLIED TO COVER FUTURE CHANGES IN PIPE DEPTH, SOIL BEARING CAPABILITIES, ETC.

SOIL	BEARING LOAD (lb/ft <sup>2</sup> )
MUCK	0
SOFT CLAY	1,000
SILT	1,500
SANDY SILT	3,000
SAND	4,000
SANDY CLAY	6,000
HARD CLAY	9,000

\* NO RESPONSIBILITY CAN BE ASSUMED FOR THE ACCURACY OF THE DATA IN THIS TABLE DUE TO THE WIDE VARIATION OF BEARING LOAD CAPABILITIES FOR EACH SOIL TYPE.

**MANUFACTURERS:**  
SOUTHERN METER C.H. 5/8" x 3/4" METER BOX BODY  
BROOKS #36MB METER BOX BODY  
OLDCASTLE #MB36 METER BOX BODY  
BES #C90W METER BOX BODY  
CHRISTY B9 METER BOX BODY

**NOTES:**  
A. METER BOX SHALL ACCOMMODATE COMPANION PLASTIC METER BOX LID - SEE STANDARD DETAIL.  
B. MINOR DIMENSION VARIATIONS ARE PERMITTED, BASED ON MANUFACTURER'S PRODUCT LINES, PROVIDED THE CMUD STANDARD PLASTIC LID FITS PROPERLY.  
C. CONCRETE SHALL BE MINIMUM f'c = 3000 PSI COMPRESSIVE STRENGTH.  
D. DESIGN SHALL CONFORM TO ASTM C858-SPECIFICATIONS FOR "UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURE".  
E. STEEL REINFORCING DESIGN SHALL CONFORM TO ASTM C 857.  
F. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 AND A 82.



**PLAN VIEW**

**SECTION VIEW A-A**

**SECTION VIEW B-B**

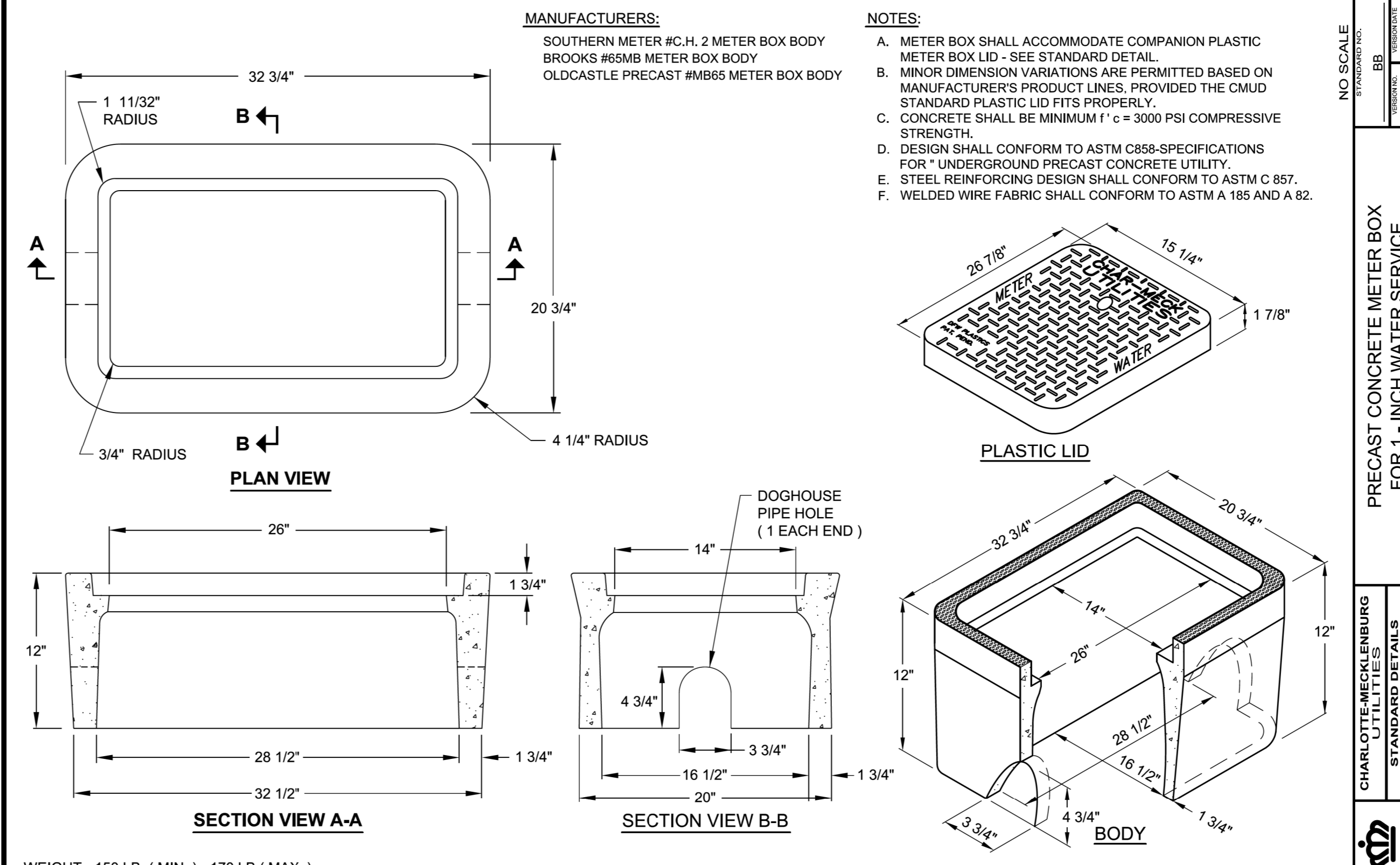
**PLASTIC LID**

**BODY**

WEIGHT - 70 LB. ( MIN. ) - 85 LB ( MAX. )

**MANUFACTURERS:**  
SOUTHERN METER #C.H. 2 METER BOX BODY  
BROOKS #65MB METER BOX BODY  
OLDCASTLE PRECAST #MB65 METER BOX BODY

**NOTES:**  
A. METER BOX SHALL ACCOMMODATE COMPANION PLASTIC METER BOX LID - SEE STANDARD DETAIL.  
B. MINOR DIMENSION VARIATIONS ARE PERMITTED BASED ON MANUFACTURER'S PRODUCT LINES, PROVIDED THE CMUD STANDARD PLASTIC LID FITS PROPERLY.  
C. CONCRETE SHALL BE MINIMUM f'c = 3000 PSI COMPRESSIVE STRENGTH.  
D. DESIGN SHALL CONFORM TO ASTM C858-SPECIFICATIONS FOR "UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURE".  
E. STEEL REINFORCING DESIGN SHALL CONFORM TO ASTM C 857.  
F. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 AND A 82.



**PLAN VIEW**

**SECTION VIEW A-A**

**SECTION VIEW B-B**

**PLASTIC LID**

**BODY**

WEIGHT - 150 LB. ( MIN. ) - 170 LB ( MAX. )

NO SCALE  
STANDARD DETAIL  
AA  
8-23-2011

PRECAST CONCRETE METER BOX FOR 3/4 - INCH DOMESTIC WATER SERVICE

CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

CHARLOTTE

NO SCALE  
STANDARD DETAIL  
BB  
8-23-2011

PRECAST CONCRETE METER BOX FOR 1 - INCH WATER SERVICE

CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

CHARLOTTE

# Kimley»Horn

200 SOUTH TRYON ST, SUITE 200  
CHARLOTTE, N.C. 28202

PROJECT REFERENCE NO. 1-5973

SHEET NO. UC-3B

DESIGNED BY: DGB

DRAWN BY: SLG

CHECKED BY: MAS

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

**PLAN VIEW**

**ELEVATION VIEW**

**END VIEW**

**NO. DESCRIPTION**

- END OF LINE VALVE - BUTTERFLY OR GATE VALVE (MJ X MJ)
- PIPE - PEI - REMOVE BELL - LENGTH = 17 FT - 19 FT
- 1" THICK 3" WIDE STEEL THRUST RING - FACTORY WELDED TO PIPE
- CONCRETE WALL BLOCK (P# = 3600 PSI MIN) 10 FT x 5 FT x WIDTH (W) WHEN REQUIRED
- REBAR - GRADE 60 PER ASTM A615 - SEE REBAR SCHEDULES, CUT WHEN REQUIRED
- MJ CAP - WITH WEDGE ACTION RESTRAINT GLAND, TAP 2" THREADED OUTLET (FNPT)
- 2" RED BRASS NIPPLE SCH 40 (MNPT x MNPT) - LENGTH = 12 INCH
- 2" RED BRASS 90° BEND (FNPT x FNPT)
- 2" RED BRASS NIPPLE SCH 40 (MNPT x MNPT) - LENGTH AS REQUIRED
- 2" GALVANNEED MALLEABLE IRON COUPLING (FNPT x FNPT)
- BUTTERFLY GATE VALVE BOX ASSEMBLY (10" + VALVES) - SEE DETAIL
- AWG #12 GAUGE COPPER TRACER WIRE - WITH BLUE INSULATION (DUAL HOPE) TERMINATE WITH 24-INCH EXCESS WIRE (COILED) IN VALVE BOX (TYP.)
- 1" SCH 40 PVC ELECTRICAL CONDUIT - LENGTH AS REQUIRED
- UNDISTURBED SOIL
- HIGH DENSITY CROSS LAMINATED POLYETHYLENE FILM TUBE (HDCLPE) AWWA C105 - 4 MILS EACH x 2 LAYER - 8 MILS TOTAL
- HOPE ADHESIVE TAPE OR HOPE ZIP LOCK TIES
- STANDARD VALVE BOX ASSEMBLY - SEE DETAIL
- 5" CAST IRON SOIL PIPE - 1-1/2" OR VALVE BOX BOTTOM SECTION
- WEDGE ACTION THRUST RESTRAINT GLAND
- PLYWOOD FORM

**NOTES:**

A. WHEN DIRECTED BY THE ENGINEER, THE CONCRETE WALL BLOCK SIZE MAY BE ADJUSTED, BASED ON ACTUAL SOIL CLASSIFICATION AND PIPE DIAMETER.

B. FULLY RESTRAINED JOINT PIPE MAY BE USED IN LIEU OF THIS DETAIL - SEE RESTRAINED JOINT PIPE DETAILS.

C. ALTERNATE DETAIL "B" USING A REVERSED BELL MAY BE USED IN LIEU OF DETAIL "A".

D. ALTERNATE DETAIL "C" USING WEDGE ACTION RESTRAINT GLAND MAY BE USED IN LIEU OF DETAIL "A".

**NO. ALTERNATE DESCRIPTION**

WHEN USING 3/4" HDPE (IPS) BLOW-OFF PIPE WITH STAINLESS STEEL BRASS OR BRONZE MNPT ENDS, USE THE FOLLOWING PRODUCTS:

- 2" SDR 9 HDPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED - 1/2" MINIMUM
- 2" SDR 9 HDPE (POLY) - IPS PIPE (MNPT x MNPT) - LENGTH AS REQUIRED.

PIPE DIAMETER (INCHES)	TOTAL THRUST (POUNDS)	UNDISTURBED SOIL BEARING AREA (SQ. FEET)	APPROX. SOIL BEARING PRESSURE (LB/SQ. FT)	APPROX. W (WIDTH) (MINIMUM) INCHES	CONCRETE VOLUME (APPROXIMATE) FT <sup>3</sup> / CY
14	36,770	30	1,226	14	28
16	47,558	30	1,585	16	32
18	60,730	30	1,991	18	36
20	73,288	30	2,443	18	36
24	104,558	30	3,485	18	36
30	160,859	30	5,362	20	40

REBAR SCHEDULE	PIPE DIAMETER	BAR SIZE	TOTAL REBAR LENGTH (FT)	TOTAL REBAR WEIGHT (LB)		
VERTICAL	22	4	19"	#10	158	680
HORIZONTAL	112	10	20"	#10	158	680
DIAGONAL	48	4	24"	#10	158	680

**TYPE A USING CAST IRON SOIL PIPE**

**TYPE B USING PVC PIPE**

**NO. DESCRIPTION**

- CONCRETE PAD - CAST IN PLACE.
- FINAL ASPHALT SURFACE COURSE.
- VALVE BOX COVER.
- TOP SECTION VALVE BOX.
- EXTENSION STEM AS REQUIRED.
- BOTTOM SECTION VALVE BOX.
- 6" PVC PIPE (C900 OR SDR26).
- STANDARD CONCRETE BLOCK - 2 EACH.
- GATE VALVE (OR BALL VALVE, AS APPLICABLE).
- 5" DIA. CAST IRON SOIL PIPE - BELL OF PIPE WILL RECEIVE BOTTOM SECTION OF VALVE BOX.
- EXISTING OR NEW PAVEMENT.
- COMPACTED AGGREGATE BASE COURSE (CABC).
- COMPACTED SUBGRADE.
- AWG #12 GAUGE COPPER TRACER WIRE (THWN) WITH BLUE INSULATION, TERMINATE WITH 24 INCH EXCESS WIRE (COILED) AT METER BOX AND VALVE BOX (TYP.).

**NOTES:**

A. WATER VALVE ADJUSTMENTS WILL BE COMPLETED AT LEAST 36 HOURS BEFORE RESURFACING.

B. 12" MINIMUM WIDTH OF EXCAVATION AROUND VALVE BOX.

C. DISTURBED AREAS AROUND STRUCTURE ADJUSTMENTS ARE TO BE TAMPED AND FILLED WITH 4000 PSI HIGH EARLY PORTLAND CEMENT CONCRETE.

D. ALL DAMAGED OR MISALIGNED VALVE BOXES ARE TO BE REPORTED TO INSPECTOR. OTHERWISE CONTRACTOR ASSUMES RESPONSIBILITY FOR DAMAGE OR MISALIGNMENT.

E. IF THE VERTICAL ADJUSTMENT CAUSES LESS THAN ONE INCH OVERLAP BETWEEN TOP SECTION AND RISER PIPE, CONTRACTOR WILL REMOVE AND REPLACE RISER PIPE FROM BOTTOM SECTION TO TOP TO PROVIDE 3 INCHES OF OVERLAP IN TOP SECTION FOR TYPE A OR IF THE VERTICAL ADJUSTMENT CAUSES LESS THAN ONE INCH OVERLAP BETWEEN TOP SECTION AND BOTTOM SECTION, CONTRACTOR WILL REMOVE AND RESET BOTTOM SECTION TO PROVIDE A MINIMUM OF 3 INCHES OVERLAP AT TOP SECTION/BOTTOM SECTION JOINT SECTION & BOTTOM SECTION/RISER PIPE JOINT FOR TYPE B.

F. ALL CONCRETE SHALL BE VIBRATED IN ACCORDANCE WITH N.C. DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.

G. TOP & BOTTOM SECTION TO BE CENTERED OVER NUT, NOT TO BEAR ON VALVE BODY.

H. PROVIDE CLEARANCE BETWEEN VALVE BOX/BRICK AND THE VALVE.

I. VALVE BOX ASSEMBLY SHALL CONSIST OF NO MORE THAN 3 VERTICAL SECTIONS - 1 TOP SECTION, 1 BOTTOM SECTION AND 1 PIPE RISER SECTION.

**VALVE BOX - TOP SECTION SECTION VIEW**

**VALVE BOX - BOTTOM SECTION SECTION VIEW**

**COVER - SECTION VIEW**

**NO. DESCRIPTION**

- TYPE I ADJUSTMENT RISER.
- VALVE BOX - TOP SECTION.
- 18" x 8" S.S. 3/8" x 3/8" HEX SET SCREW WITH PERMANENT THREAD LOCK (RED) - LOCITE # 271, PERMABOND H128, OR APPROVED EQUAL.
- 1/2" DIA. x 1/16" - FIELD DRILL HOLE.

**TYPE I - ADJUSTMENT RISER TOP VIEW**

**TYPE II - ADJUSTMENT RISER SECTION VIEW**

**TYPE I - ADJUSTMENT RISER SECTION VIEW**

TH - TOTAL HEIGHT	AH - ADJUSTMENT HEIGHT	H	MINIMUM WEIGHT - LBS
< 4 1/2"	< 2 1/2"	NOT APPROVED	NOT APPROVED
4 1/2"	2 1/2"	0	16
5"	3"	1 1/2"	20
6"	4"	1 1/2"	22.5
7"	5"	2 1/2"	25
8"	6"	3 1/2"	27
10"	8"	5 1/2"	32

**TYPE 1 USING PVC PIPE**

**TYPE 2 USING CAST IRON SOIL PIPE**

**NO. DESCRIPTION**

- 18" x 18" PRECAST (OR CAST IN PLACE) CONCRETE PAD OR 24" DIAMETER PRECAST PAD.
- NON-SHRINK GROUT - IN ANNULAR SPACE.
- VALVE BOX COVER.
- TOP SECTION VALVE BOX.
- EXTENSION STEM AS REQUIRED. SEE NOTES.
- BOTTOM SECTION VALVE BOX.
- 6" PVC PIPE (C900 OR SDR 26).
- PRECAST CONCRETE FOOTING - TYPE II - SEE DETAIL.
- GATE VALVE (OR BALL VALVE, AS APPLICABLE).
- 5" DIA. CAST IRON SOIL PIPE - BELL OF PIPE WILL RECEIVE BOTTOM SECTION OF VALVE BOX.
- AWG #12 GAUGE COPPER TRACER WIRE (THWN) WITH BLUE INSULATION, TERMINATE WITH 24 INCH EXCESS WIRE (COILED) AT METER BOX AND VALVE BOX (TYP.).
- 1/4" OR 3/8" ID CONDUIT - SDR 9 PEX TUBING - ASTM F 876.
- CONCRETE (ROADWAY, DRIVEWAY OR SIDEWALK) ASPHALT PAVEMENT.
- COMPACTED AGGREGATE BASE COURSE (CABC) OR ASPHALT BASE COURSE.
- COMPACTED SUBGRADE.
- NONWOVEN GEOTEXTILE FABRIC - 18" x 18" - 2 LAYERS - MIRAFI #140N OR CARTHAGE MILLS # FX - 40HS.
- PRECAST CONCRETE FOOTING - TYPE I - SEE DETAIL.

**NOTES:**

A. CONCRETE FOOTING TO BE CENTERED OVER VALVE NUT, AND SHALL NOT BEAR ON VALVE BODY.

B. PROVIDE CLEARANCE BETWEEN VALVE FOOTING AND THE VALVE.

C. WHEN OPERATING NUT DEPTH EXCEEDS 3'-0" BELOW FINISHED GRADE, PROVIDE EXTENSION STEM WITH STANDARD 2" SQUARE OPERATING NUT IN TOP SECTION OF VALVE BOX. SEE STANDARD DETAIL.

D. VALVE BOX ASSEMBLY SHALL CONSIST OF NO MORE THAN 3 VERTICAL SECTIONS - 1 TOP SECTION, 1 BOTTOM SECTION, AND 1 PIPE RISER SECTION.

E. CONCRETE PADS SHALL NOT BE USED IN PAVEMENT (CONCRETE OR ASPHALT), SIDEWALKS OR DRIVEWAYS.

REVISIONS

8/17/2022

**Kimley»Horn**  
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PROJECT REFERENCE NO. 1-5973 SHEET NO. UC-3C

DESIGNED BY: DGB  
 DRAWN BY: SLG  
 CHECKED BY: MAS  
 APPROVED BY:  
 REVISED:  
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UTILITY CONSTRUCTION PLANS ONLY

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 David G. Horn  
 No. 48805  
 EXPIRES 12/31/2022  
 JAVEL G. BAY

### UTILITY CONSTRUCTION

**1" OR 3/4" SERVICE CONNECTION**  
(LONG SIDE - PLAN VIEW)

**1" OR 3/4" SERVICE CONNECTION**  
(LONG SIDE - PROFILE VIEW)

**ROAD WITH SIDE DITCH**

**1" OR 3/4" SERVICE CONNECTION**  
(SHORT SIDE)

**DETAIL AT MAIN**  
(LONG SIDE)

**DETAIL AT MAIN**  
(SHORT SIDE)

**NO. DESCRIPTION**

- 1 WATER MAIN
- 2 DOUBLE STRAP SERVICE SADDLE - CC (TAPER) THREAD OUTLET
- 3 BALL CORPORATION STOP - CC (TAPER) THREAD x CTS COMPRESSION
- 4 TYPE K COPPER TUBING OR SDR9 HDPE (POLY) TUBING WITH INSERT STIFFENERS
- 5 5/8" x 3/4" ANGLE BALL VALVE WITH LOCK WINGS - CTS COMPRESSION x YOKE STAR NUT
- 6 5/8" DUCTILE IRON YOKE BAR
- 7 5/8" METER ASSEMBLY (BY CMUD) WITH AMR TRANSMITTER
- 8 5/8" x 3/4" BRASS 90° YOKE STAR NUT x CTS COMPRESSION CONNECTOR
- 9 CONCRETE METER BOX - SEE STD. DETAILS
- 10 HDPE METER BOX LID WITH AMR TRANSMITTER BRACKETS
- 11 AWG #12 GAUGE COPPER TRACER WIRE (THWN) - WITH BLUE INSULATION - TERMINATE IN METER BOX WITH 24" EXCESS WIRE (COILED)
- 12 SOLID STANDARD CONCRETE BRICKS - DIAGONAL AT CORNERS - 4 EACH.

**NO SCALE**  
 STANDARD DETAILS  
 WATER

**3/4" AND 1" DOMESTIC WATER SERVICE CONNECTION**

CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

**TYPE A - GRADE RING**  
PRECAST ONLY

**TYPE B - GRADE RING**  
PRECAST OR CAST IN PLACE

**TYPE I - FOOTING - TOP SECTION**  
PRECAST ONLY

**TYPE II - FOOTING - BOTTOM SECTION**  
PRECAST ONLY

**INSTALLATION DETAIL ONE**  
SECTION VIEW

**INSTALLATION DETAIL TWO**  
SECTION VIEW

**NO. DESCRIPTION**

- 1 CONCRETE GRADE RING.
- 2 CONCRETE FOOTING.
- 3 NON WOVEN GEOTEXTILE FABRIC x 2 EACH. SLIT IN FABRIC - 6 INCHES LONG, ROTATE 90 DEGREES IN SECOND LAYER OF FABRIC.
- 4 #4 REBAR - 17-INCH DIAMETER.
- 5 #4 REBAR - LENGTH = 56 INCHES, OR (ALTERNATE - 14-INCH DIAMETER).
- 6 #4 REBAR - 12-INCH DIAMETER.
- 7 #4 REBAR - 8-INCH DIAMETER.
- 8 VALVE BOX ASSEMBLY - (SHOWN LEFT TO RIGHT) - VALVE BOX BOTTOM SECTION, OR 6-INCH DIAMETER C900 PVC PIPE, OR 6-INCH DIAMETER SDR 26 PVC PIPE.
- 9 VALVE - 12-INCH OR SMALLER.
- 10 VALVE - 12-INCH OR SMALLER.
- 11 TOP SECTION OF VALVE BOX.

**DESIGN REQUIREMENTS**

- CONCRETE -  $f_c = 4000$  PSI (PRECAST), OR 3600 PSI (CAST-IN-PLACE).
- STEEL REINFORCEMENT - REBARS - GRADE 60 (60,000 PSI) - ASTM A-615, OR WELDED WIRE FABRIC - ASTM A-185.
- NON WOVEN GEOTEXTILE FABRIC - CARTRIDGE MILLS #X-40HS, MIRAFI #140N, OR APPROVED EQUAL.

**NOTES:**

- FOR PRECAST GRADE RINGS - FILL VOID BETWEEN GRADE RING AND CAST IRON VALVE BOX TOP SECTION WITH NON-SHRINK GROUT.
- FOR CAST-IN-PLACE GRADE RINGS - TOP SECTION OF CAST IRON VALVE BOX SHALL BE CAST IN THE CONCRETE.
- TYPE A GRADE RINGS SHALL BE REQUIRED ON ROAD SHOULDERS WITHOUT CURBS.
- TYPE I FOOTINGS SHALL BE REQUIRED IN NEW CONSTRUCTION WHEN THE CAST IRON VALVE BOX IS LOCATED DIRECTLY IN THE ASPHALT.
- TYPE II FOOTINGS SHALL BE REQUIRED AT ALL VALVE INSTALLATIONS. FOR INSTALLATION DETAIL TWO - ONLY ONE VALVE BOX ASSEMBLY (PART #9) SHALL BE REQUIRED. FOOTINGS SHALL NOT REST ON THE VALVE, AND SHALL BE CENTERED ON THE VALVE OPERATING NUT AS SHOWN.

**NO SCALE**  
 STANDARD DETAILS  
 WATER

**VALVE BOX - CONCRETE GRADE RINGS AND FOOTINGS (12" AND SMALLER VALVES - ONLY)**

CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

**1" OR 3/4" SERVICE CONNECTION**  
(SHORT SIDE - IN PAVEMENT)

**METER BOX IN SIDEWALK**  
(REQUIRES PRIOR CMU APPROVAL)

**METER DETAIL**  
(SIDE)

**METER DETAIL**  
(END)

**METER BOX IN SIDEWALK DETAIL**  
(REQUIRES PRIOR CMU APPROVAL)  
(BOX SHALL BE SUPPORTED BY CONCRETE SIDEWALK - AS SHOWN)

**NO. DESCRIPTION**

- 1 WATER MAIN
- 2 DOUBLE STRAP SERVICE SADDLE - CC (TAPER) THREAD OUTLET
- 3 BALL CORPORATION STOP - CC (TAPER) THREAD x CTS COMPRESSION
- 4 TYPE K COPPER TUBING OR SDR9 HDPE (POLY) TUBING WITH INSERT STIFFENERS
- 5 5/8" x 3/4" ANGLE BALL VALVE WITH LOCK WINGS - CTS COMPRESSION x YOKE STAR NUT
- 6 5/8" DUCTILE IRON YOKE BAR
- 7 5/8" METER ASSEMBLY (BY CMUD) WITH AMR TRANSMITTER
- 8 5/8" x 3/4" BRASS 90° YOKE STAR NUT x CTS COMPRESSION CONNECTOR
- 9 CONCRETE METER BOX - SEE STD. DETAILS
- 10 HDPE METER BOX LID WITH AMR TRANSMITTER BRACKET
- 11 AWG #12 GAUGE COPPER TRACER WIRE (THWN) - WITH BLUE INSULATION - TERMINATE IN METER BOX WITH 24" EXCESS WIRE (COILED)
- 12 SOLID STANDARD CONCRETE BRICKS - DIAGONAL AT CORNERS - 4 EACH.

**NO SCALE**  
 STANDARD DETAILS  
 WATER

**3/4" AND 1" DOMESTIC WATER SERVICE CONNECTION**

CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

**METER BOX BODY**

**PLAN VIEW**

**SECTION A-A**

**SECTION B-B**

**SECTION C-C RIB DETAIL**

**BODY**

**LID**

**BOTTOM VIEW**

**NOTES:**

- MATERIAL SHALL BE HIGH DENSITY POLYETHYLENE.
- LOAD RATING = HS20.
- COLOR SHALL BE CHARLOTTE GRAY.
- SUPPLIER / MANUFACTURER: SOUTHEASTERN DISTRIBUTORS MODEL MB 16 - HD.

METER BOX BODY WEIGHT = 13.50 LBS.  
 LID WEIGHT - INCLUDING REBARS - 5.30 LBS.

**NO SCALE**  
 STANDARD DETAILS  
 WATER

**PLASTIC METER BOX AND LID FOR 3/4" - 1" INCH DOMESTIC WATER SERVICE**

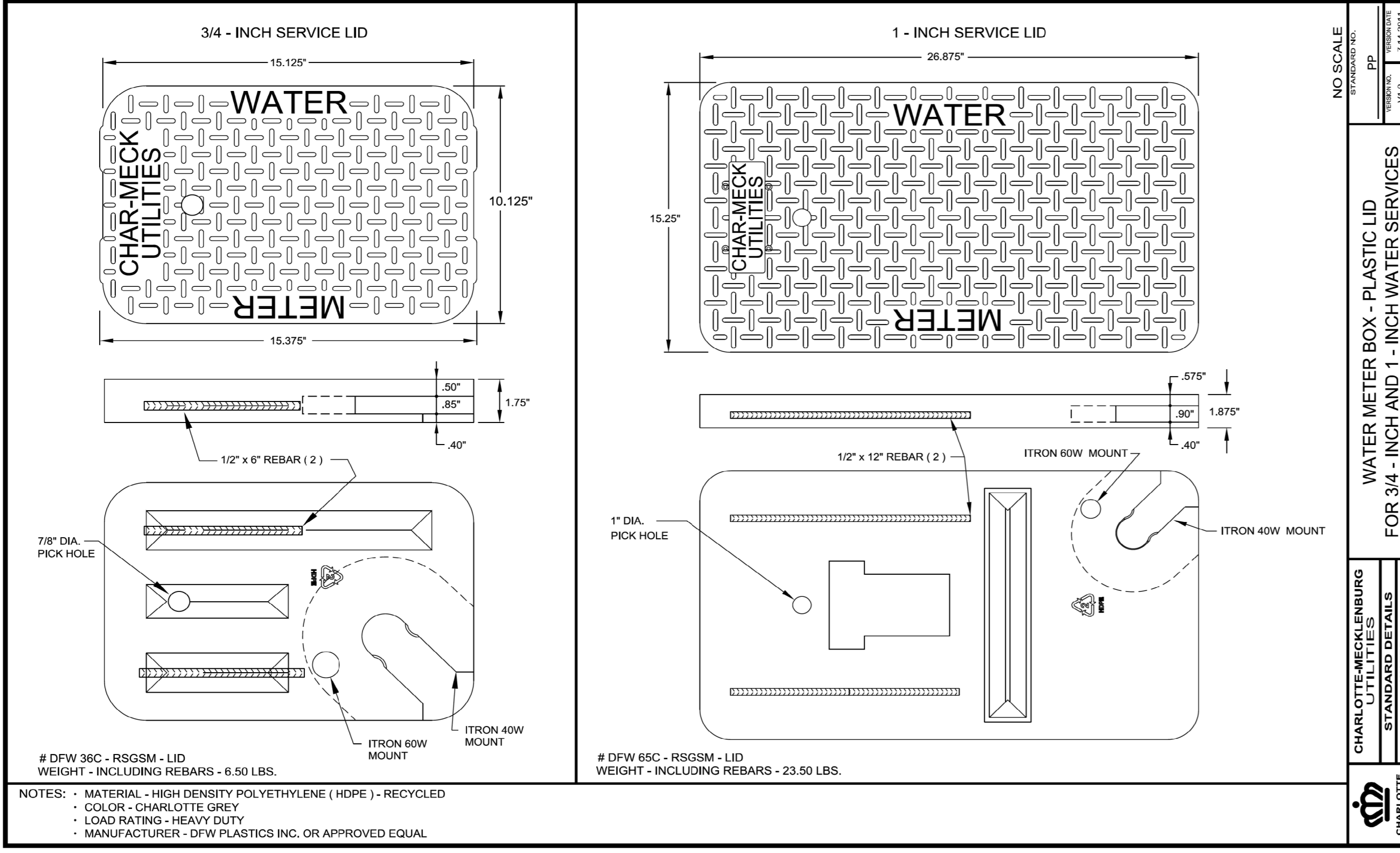
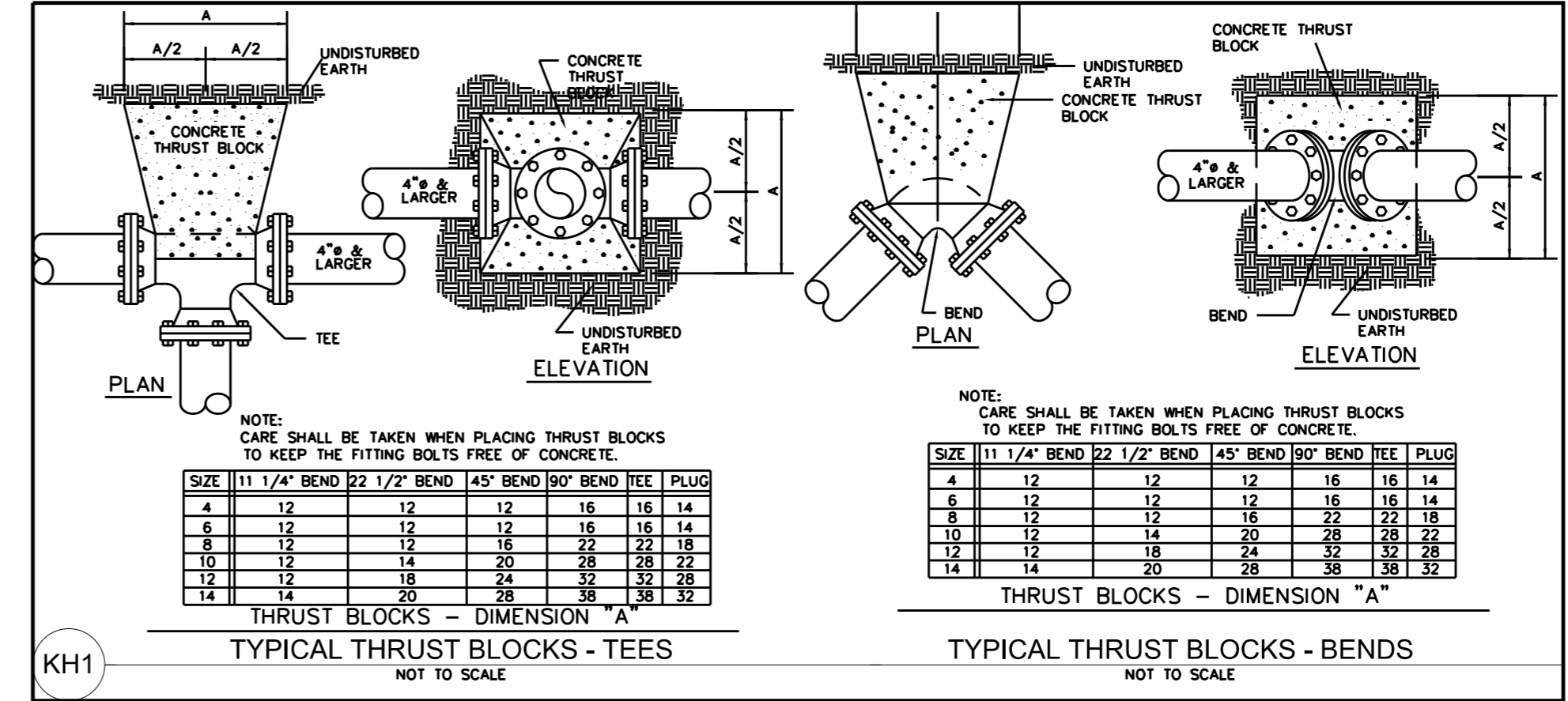
CHARLOTTE-MECKLENBURG UTILITIES STANDARD DETAILS WATER

REVISIONS

5/14/99

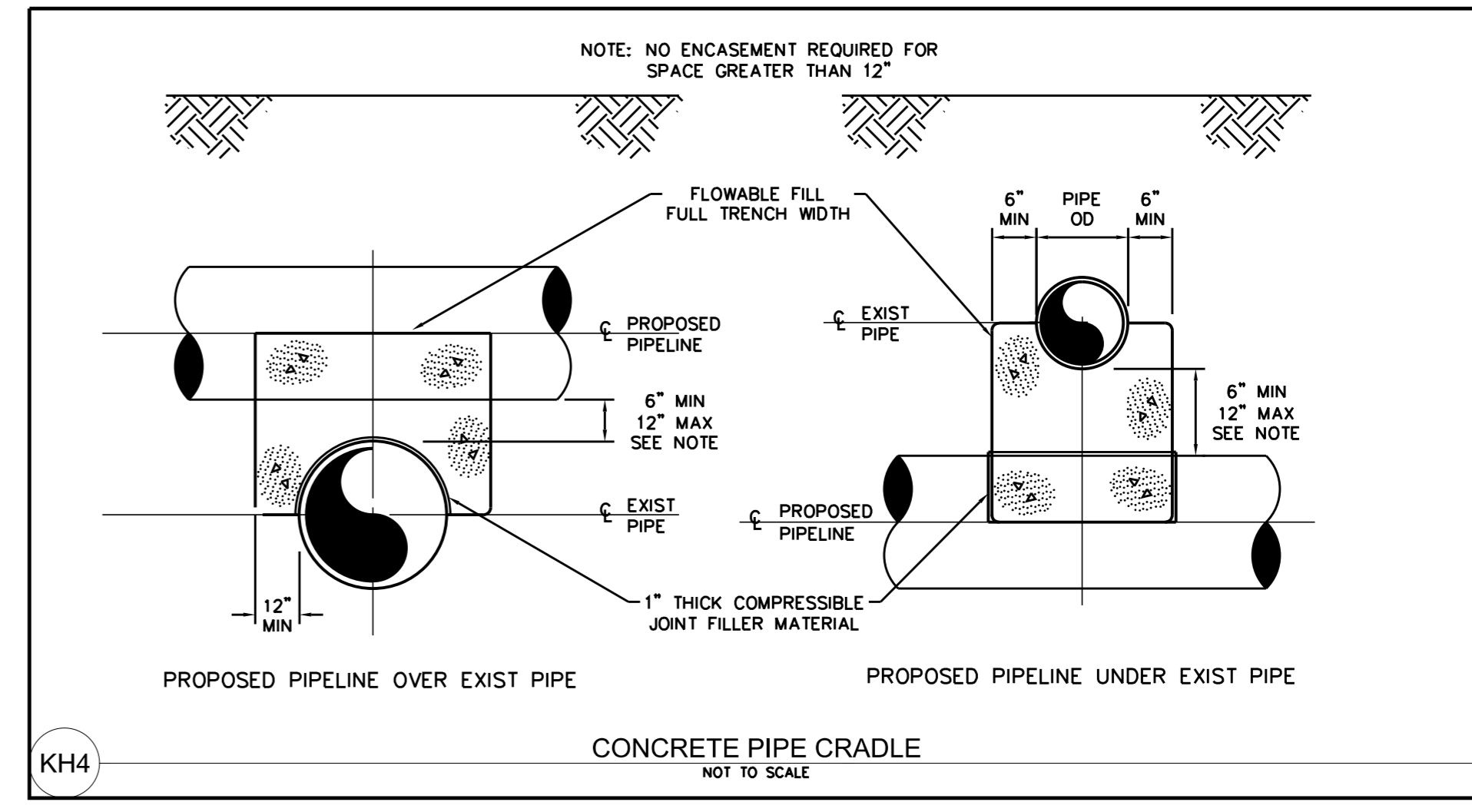
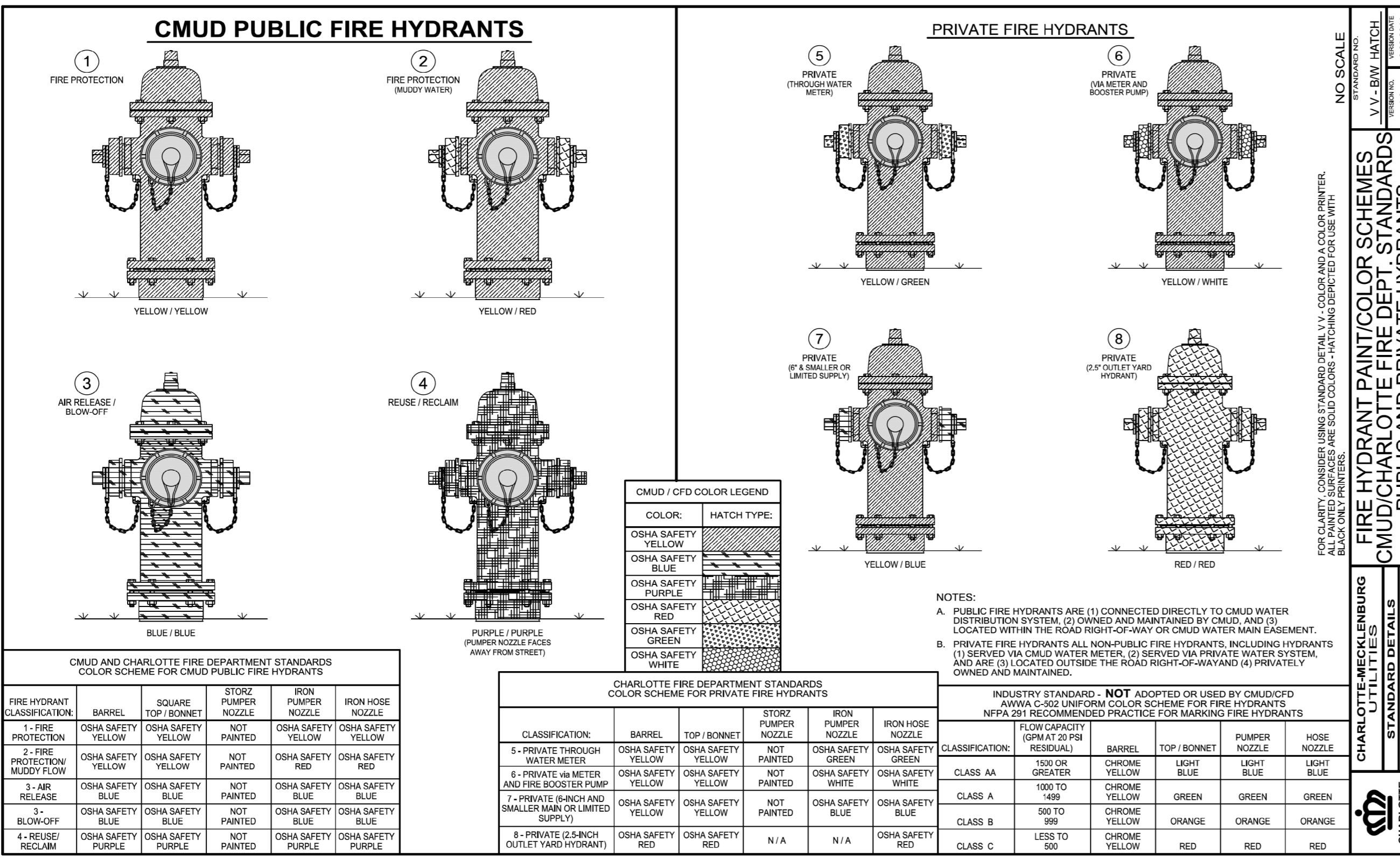
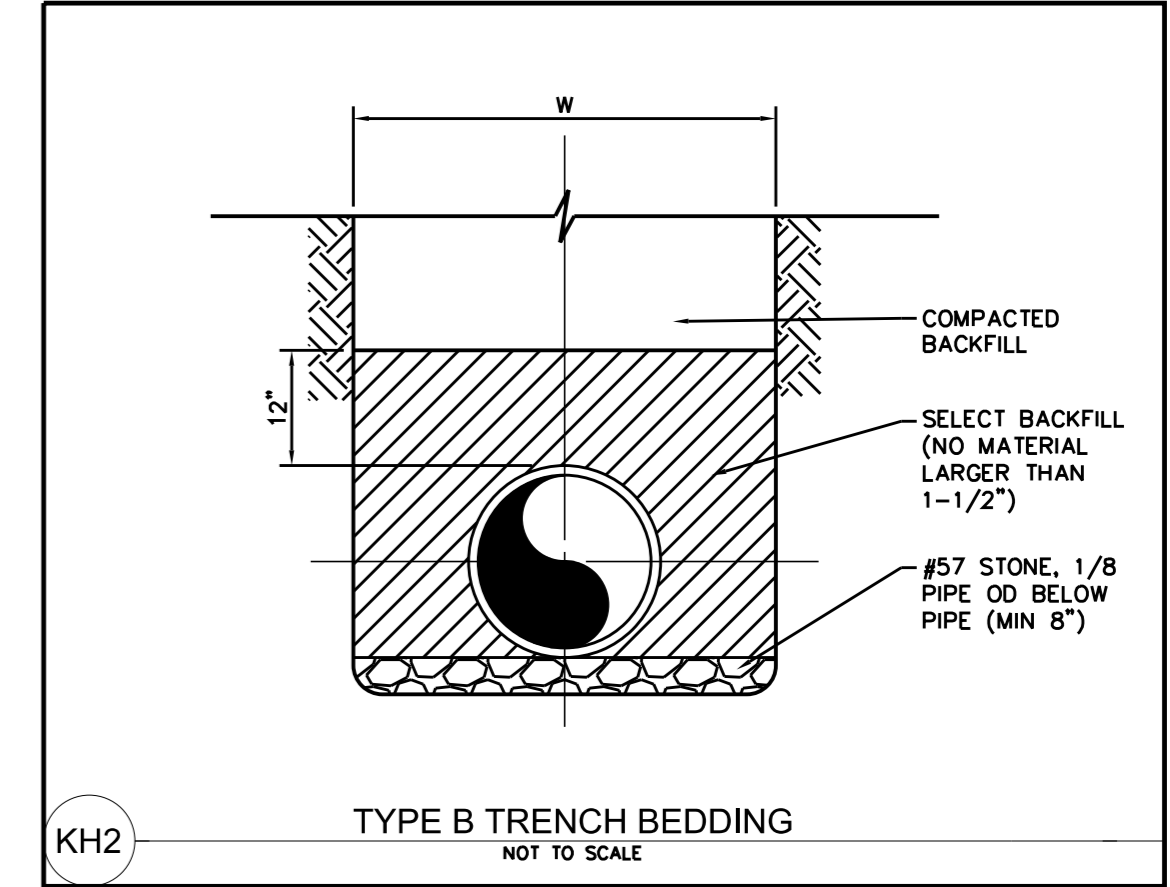
PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-3D
DESIGNED BY: DGB	
DRAWN BY: SLG	
CHECKED BY: MAS	
APPROVED BY:	
REVISED:	
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# UTILITY CONSTRUCTION



INTERNAL DIAMETER OF PIPE	WIDTH OF TRENCH	DEPTH OF CUT	S MAXIMUM PAVEMENT REPLACEMENT WIDTH
4"-6"	3'-9"	2'-0"	S=W+4'
8"-10"	3'-9"	2'-2"	S=W+8'
12"	3'-9"	O.D.+2'	S=W+12'
14"-16"	4'-2"	O.D.+2'	S=W+16'
18"	4'-4"	O.D.+2'	S=W+20'
20"-21"	4'-8"	O.D.+2'	S=W+24'
24"	4'-11"	O.D.+2'	S=W+28'
27"	5'-9"	O.D.+2'	S=W+32'
30"	6'-7"	O.D.+2'	
36"	7'-4"	O.D.+2'	
42"	8'-2"	O.D.+2'	
48"	8'-9"	O.D.+2'	
54"	9'-4"	O.D.+2'	
60"	9'-10"	O.D.+2'	
72"	11'-0"	O.D.+2'	
78"	11'-8"	O.D.+2'	
84"	12'-0"	O.D.+2'	
90"	12'-8"	O.D.+2'	
96"	13'-0"	O.D.+2'	
108"	14'-0"	O.D.+2'	

**W = TRENCH WIDTH AT BOTTOM OF PIPE. TRENCH SIDE SLOPES SHALL BE IN ACCORDANCE WITH OSHA REQUIREMENTS.**



REVISIONS

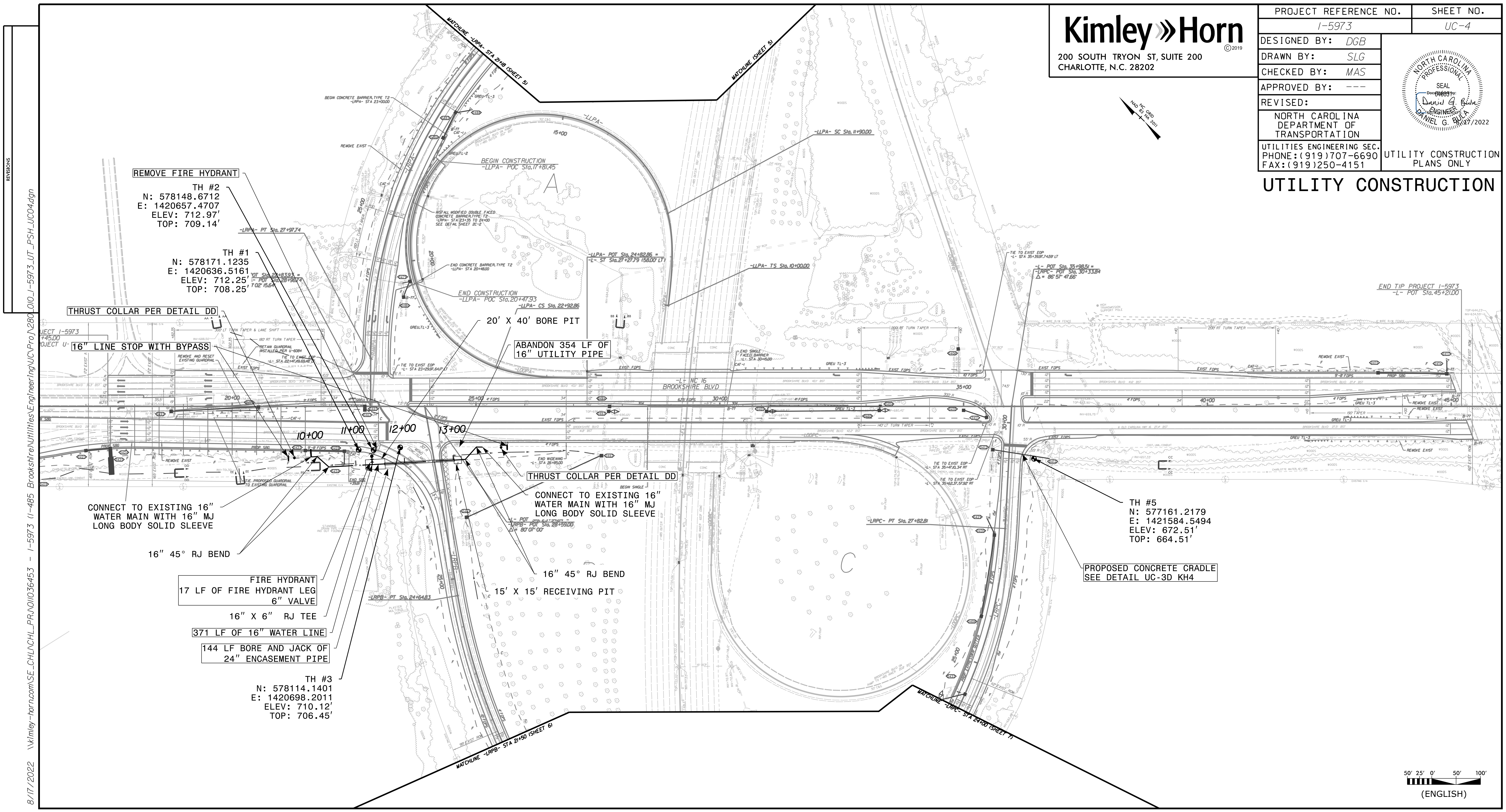
8/17/2022



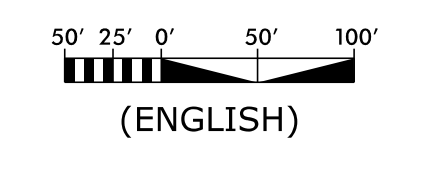
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PROJECT REFERENCE NO. 1-5973	SHEET NO. UC-4
DESIGNED BY: DGB	
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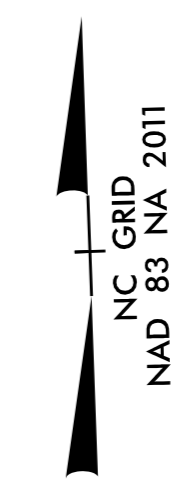
# UTILITY CONSTRUCTION



8/17/2022 \\kimley-horn.com\SE\_CHLNCHL\_PRA\01036453 - 1-5973 (1-485 BrookshireUtilitiesEngineering\UC Proj\260\_0101-5973\_UT\_PSH\_UC04.dgn

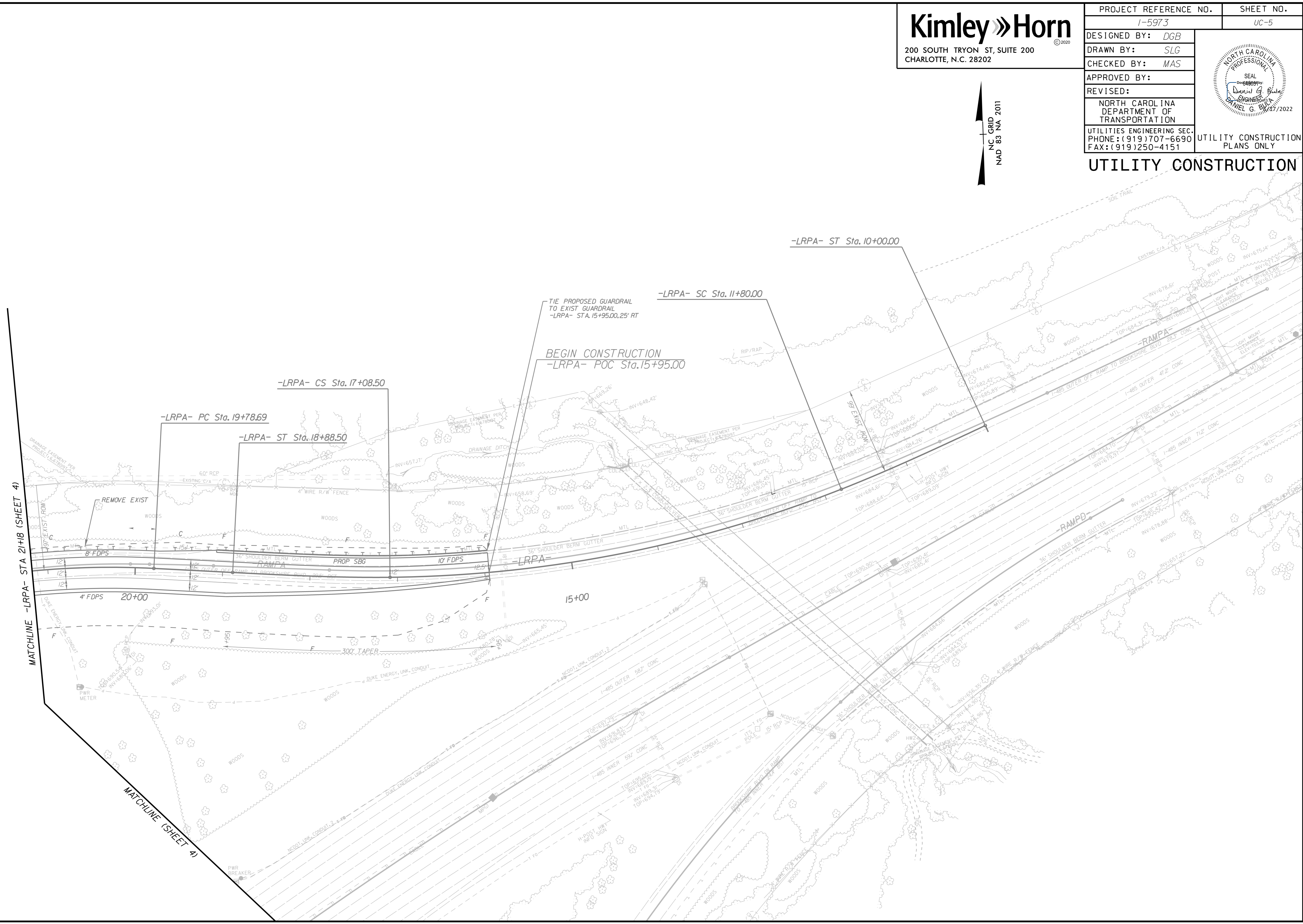


PROJECT REFERENCE NO.	1-5973	SHEET NO.	UC-5
DESIGNED BY:	DGB		
DRAWN BY:	SLG		
CHECKED BY:	MAS		
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**UTILITY CONSTRUCTION**

REVISIONS

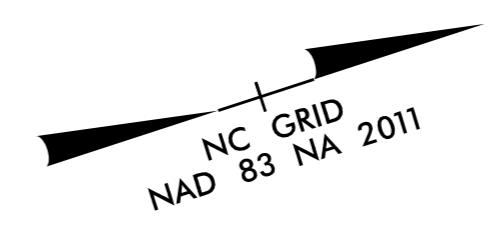


MATCHLINE -LRPA- STA 21+18 (SHEET 4)

MATCHLINE (SHEET 4)

5/14/99

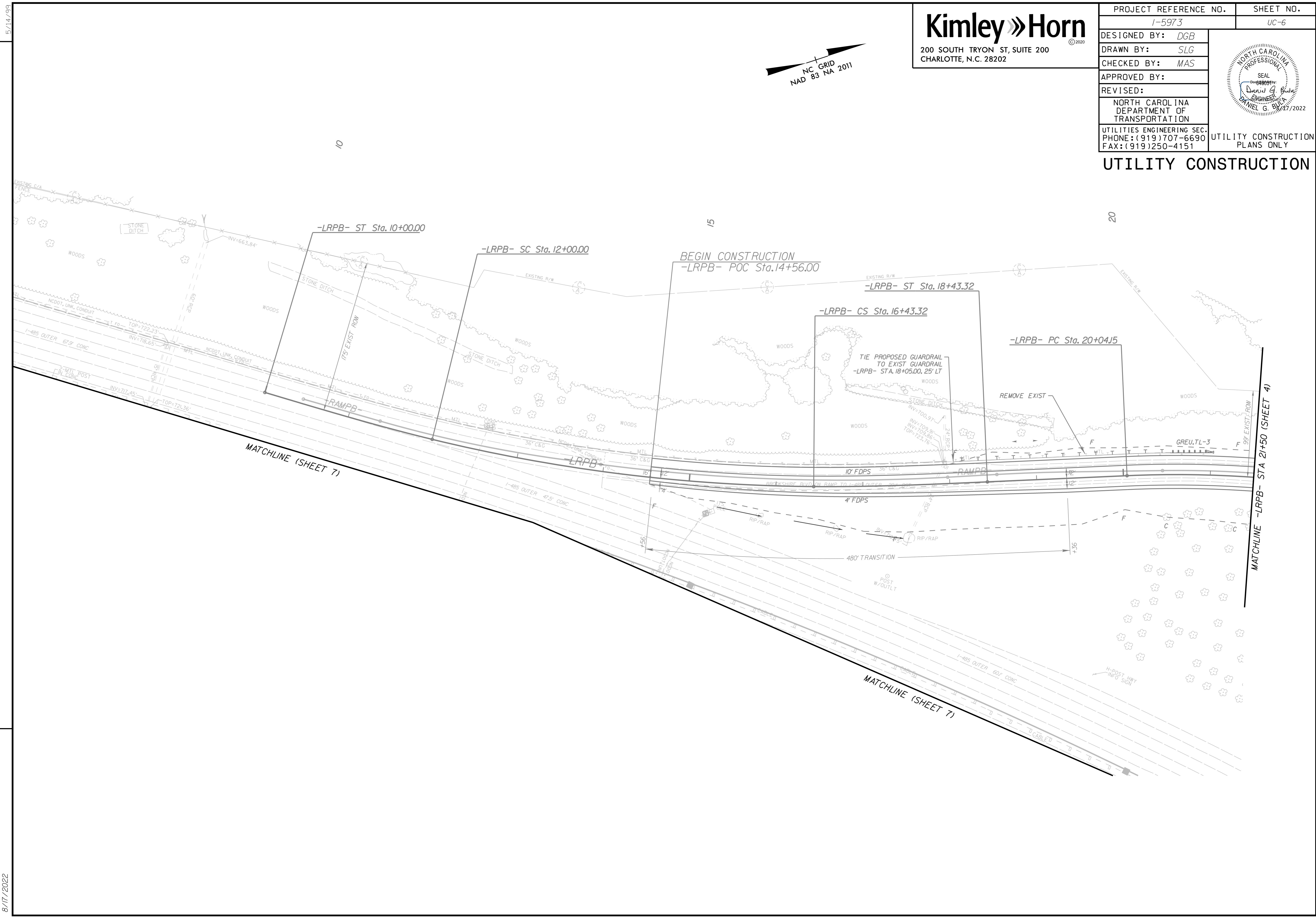
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PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-6
DESIGNED BY: DGB	
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# UTILITY CONSTRUCTION

REVISIONS



8/17/2022

5/14/99

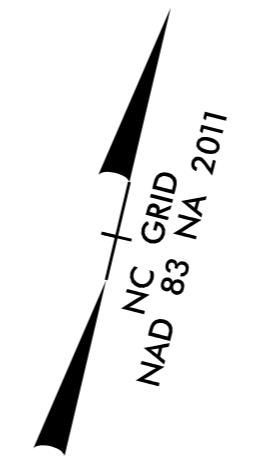
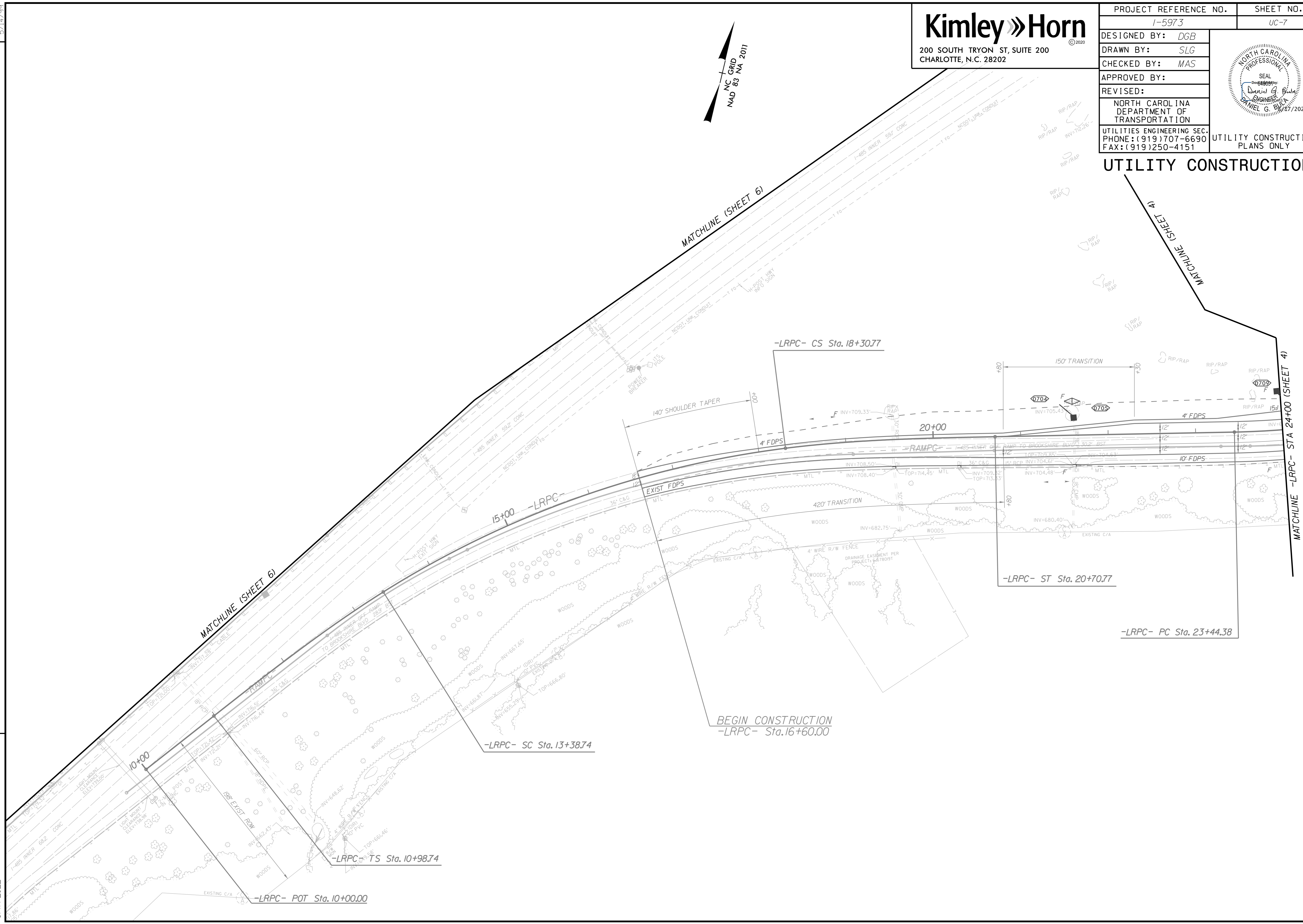
REVISIONS

8/17/2022

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PROJECT REFERENCE NO.	SHEET NO.
I-5973	UC-7
DESIGNED BY: DGB	
DRAWN BY: SLG	
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919)707-6690 FAX: (919)250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

# UTILITY CONSTRUCTION



MATCHLINE (SHEET 6)

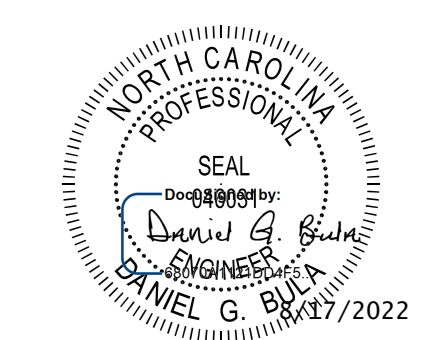
MATCHLINE (SHEET 4)

MATCHLINE -LRPC- STA 24+00 (SHEET 4)

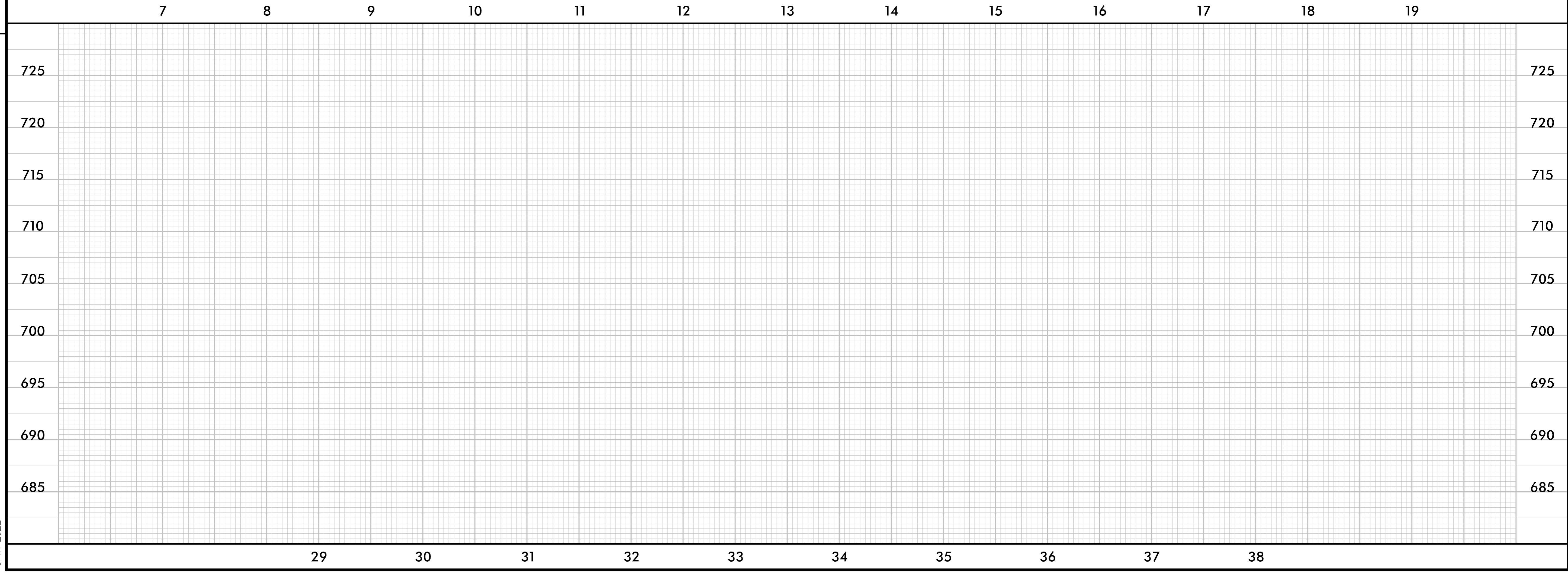
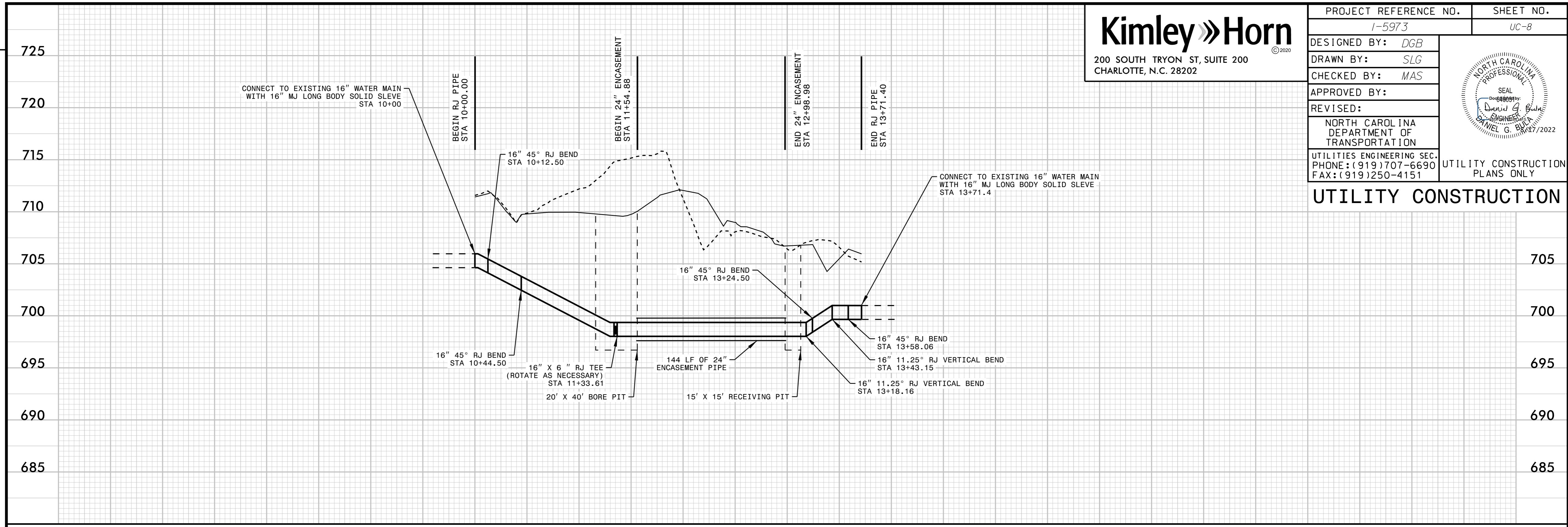
BEGIN CONSTRUCTION  
-LRPC- Sta. 16+60.00

8/17/2022

**Kimley»Horn**  
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PROJECT REFERENCE NO.	1-5973	SHEET NO.	UC-8
DESIGNED BY:	DGB		
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REVISIONS



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