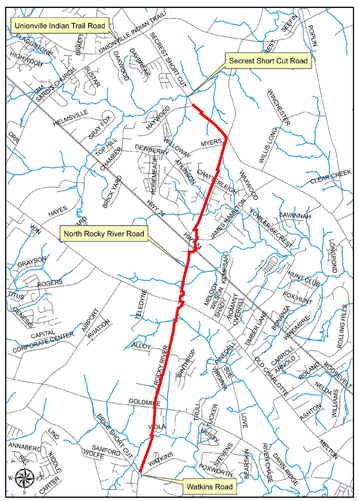
UNION COUNTY PUBLIC WORKS

853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS
ROCKY RIVER ROAD & SECREST SHORT CUT ROAD



VICINITY MAP
NO SCALE

UNION COUNTY PUBLIC WORKS PROJECT NUMBER WT-061
B&V PROJECT NO. 186110

JANUARY 2021

BID SET

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER

2021.01.25 14:37:25-05'00'

Black & Veatch International Company
Business License No. F-0794
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

050012

LEGEND

- EIP (AS DESCRIBED)
- CONCRETE MON. FOUND
- EXISTING STONE
- NPS (NO POINT SET)
- RIGHT-OF-WAY MON.
- WATER MANHOLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER VAULT
- WATER WELL
- STORM MANHOLE
- CATCH BASIN
- DROP INLET
- FLARED END SECTION
- TELEPHONE POLE
- TELEPHONE PEDESTAL
- FIBER OPTIC BOX
- GAS METER
- GAS VALVE
- GAS MARKER POST
- UTILITY POLE
- POWER POLE
- LIGHT POLE
- TRANSFORMER
- GUY WIRE
- ELECTRIC METER
- ELECTRIC BOX
- HEAT PUMP
- TRAFFIC SIGNAL BOX
- SANITARY SEWER MANHOLE
- CLEAN OUT
- CABLE TV BOX
- UNIDENTIFIED PEDESTAL
- UNIDENTIFIED OBJECT
- SATELLITE DISH
- MONITORING WELL
- POST
- MAIL BOX
- ROAD SIGN
- TEMPORARY BENCHMARK
- ×633.4 SPOT ELEVATION
- BOUNDARY LINE (AS SURVEYED)
- BOUNDARY LINE (BY DEED OR PLAT)
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- TIE LINE
- 650' MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- STORM SEWER PIPE
- PIPE END NOT FOUND OR LOCATED
- SS SANITARY SEWER LINE
- FM SANITARY FORCE MAIN LINE
- W BURIED WATERLINE
- W/P BURIED WATERLINE (BY PLANS)
- P OVERHEAD POWER LINE
- TS OVERHEAD TRAFFIC SIGNAL LINE
- U OVERHEAD UTILITY LINE
- P BURIED POWER LINE
- T BURIED TELEPHONE LINE
- FO BURIED FIBER OPTIC LINE
- TV BURIED CABLE TV LINE
- G BURIED GAS LINE
- U BURIED UTILITY LINE (UNIDENTIFIED)
- X FENCE LINE
- EDGE OF STREAM
- EDGE OF POND
- TREE LINE
- BRUSH LINE
- APPROX. 1% ANNUAL CHANCE FLOODPLAIN
- APPROXIMATE FLOODWAY
- EDGE OF WETLAND / IMPORTANT STREAM
- EARTH OR GRADE
- GRANULAR FILL OR GRAVEL
- EXISTING OR PRECAST CONCRETE
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- EROSION MATTING
- ABANDONED
- REMOVE (DO NOT REPLACE)
- RIP-RAP
- DELINEATED STREAMS
- WETLANDS
- GV GATE VALVE
- BLOW-OFF
- SILT FENCE
- CF CONSTRUCTION FENCE
- TPF TREE PROTECTION FENCE
- WATTLES
- STONE OUTLET
- GEOTECHNICAL BORING SYMBOL
- CONSTRUCTION ENTRANCE
- 1 SECTION No. OR DETAIL LETTER
- 23 DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS (OR WHERE SECTION OR DETAIL IS CUT)
- STONE SILT CHECK DAM
- HALF-RING INLET PROTECTION

ABBREVIATIONS

AC	ACRES
ALUM	ALUMINUM
ARMH	AIR RELEASE MANHOLE
B-B	BACK OF CURB TO BACK OF CURB
BC	BURIED CABLE
BH	BORE HOLE
BM	BENCH MARK
BO	BLOW-OFF
BV	BALL VALVE
BW	BARBED WIRE
CATV	CABLE TELEVISION
CB	CATCH BASIN
C&G	CURB AND GUTTER
CIP	CAST IRON PIPE EMBEDMENT OR PIPE CLASS
C/L	CENTER LINE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
CONC	CONCRETE
CONSTR	CONSTRUCTION
CM	CONCRETE MONUMENT
CY	CUBIC YARD
DET	DETAIL
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DOT	DEPARTMENT OF TRANSPORTATION
DR	DRIVE
E	EAST
EF	EACH FACE
EIP	EXIST IRON PIPE
EL, ELEV	ELEVATION
ELECT	ELECTRIC(AL)
EP	EDGE OF PAVEMENT
ESMT	EASEMENT
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTENSION
FH	FIRE HYDRANT
FIN	FINISHED
FL	FLOW LINE FLOOR ELEVATION
FLG	FLANGE
FM	FORCE MAIN
FO	FIBER OPTIC
FP	FLOOD PLAIN
FW	FLOOD WAY
GALV	GALVANIZED
GRD	GROUND
GR	GRADE
HORIZ	HORIZONTAL
HSE	HOUSE
HIGHWAY	HWY
INV	INVERT
IP	IRON PIPE
LA	LINE AHEAD
LB	LINE BACK, POUND
LF	LINEAR FEET
LN	LANE
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAIL BOX
MC	MECHANICAL COUPLING
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
MON	MONUMENT

N	NORTH
NCDOT	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
No.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
PB	NEWSPAPER BOX
PC	POINT OF CURVATURE
PE	PLAIN END
PED	PEDESTAL
PERM	PERMANENT
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PP	POWER POLE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
R, RAD	RADIUS
R&C	RING AND COVER
REINF	REINFORCED
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RR	RAILROAD
RT	RIGHT
R/W	RIGHT-OF-WAY
REQD	REQUIRED
RWTM	RAW WATER TRANSMISSION MAIN
S	SOUTH, SIGN
SB	SEDIMENT BASIN
SF	SQUARE FEET
SHT	SHEET
SL	SURVEY LINE
SPK	SPIKE
SQ	SQUARE
SR	SECONDARY ROAD (STATE MAINTAINED)
SS	SANITARY SEWER
ST	STREET
STA	STATION
STL	STEEL
SY	SQUARE YARD
T	TANGENT
TBM	TEMPORARY BENCH MARK
TCP	TERRA COTTA PIPE
TEL	TELEPHONE
TV	TELEVISION
TYP	TYPICAL
US	UNITED STATES
VC	VITRIFIED CLAY
VERT	VERTICAL
W	WEST, WIDE
W/	WITH
WL	WATERLINE
WM	WATER METER
WV	WATER VALVE
WTP	WATER TREATMENT PLANT
YR	YEAR
YI	YARD INLET
&	AND
@	AT
C/L	CENTERLINE
Ø	DIAMETER
#	NUMBER
%	PERCENT

GENERAL NOTES:

1. SOME SYMBOLS, MATERIALS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
2. LOCATION OF EXIST UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE RESPECTIVE UTILITY COMPANY TO OBTAIN A MORE PRECISE LOCATION (BOTH IN PLAN AND PROFILE) OF ALL UTILITIES (GAS, TELEPHONE, WATER, ETC.). PRIOR TO BEGINNING ANY CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE UTILITY OWNERS OF ANTICIPATED WORK NEAR THEIR LINES AND DEFINE THE REQUIREMENTS AND METHODS REQUIRED TO PROTECT, TEMPORARILY SUPPORT, ADJUST, OR RELOCATE THE UTILITY AFFECTED BY THE PROPOSED NEW WORK. CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES BY PROSPECTING A MINIMUM OF 500 FEET AHEAD OF THE TRENCHING OPERATION. (IN GENERAL, SERVICE CONNECTIONS ARE NOT SHOWN ON THE DRAWINGS.) REPAIR OF ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ADDITIONAL FITTINGS, RESTRAINED JOINT PIPE, BLOCKING, ETC REQUIRED DUE TO CONTRACTOR'S FAILURE TO LOCATE ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION SHALL BE AT CONTRACTOR'S EXPENSE.
3. AERIAL SURVEY PROVIDED BY AVIOIMAGE MAPPING SERVICES, INC. FIELD SURVEY AND BASE MAPPING WERE PROVIDED BY CESI CIVIL - GEOTECHNICAL - SURVEYING. HORIZONTAL CONTROL IS BASED UPON LOCALIZED NC GRID COORDINATES SYSTEM, NAD 83(2011). ELEVATIONS ARE BASED UPON NAVD 1988. SURVEY AND MAPPING COMPLETED BETWEEN DECEMBER 2015 AND APRIL 2016.
4. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES FOR WORK ZONE TRAFFIC SAFETY AND CONTROL. ALL WORK ZONE TRAFFIC CONTROL DEVICES AND OPERATIONS USED ON STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY OR INCIDENT MANAGEMENT SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS IN THE LATEST EDITION OF THE NC MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY (MUTCD). ALL TRAFFIC/SAFETY CONTROL DEVICES SHALL BE IN GOOD REPAIR AND SHALL BE POSITIONED AT ALL TIMES IN THE APPROPRIATE LOCATIONS FOR THE WORK OPERATION. THE CONTRACTOR SHALL CAREFULLY MONITOR SITE CONDITIONS SUCH AS LIGHT, WEATHER, TRAFFIC VOLUME, ETC. TO ENSURE THAT ALL TRAFFIC/SAFETY CONTROL MEASURES ARE OPERATING EFFECTIVELY.
5. CONTRACTOR SHALL CONTACT PROPERTY OWNERS 48 HOURS PRIOR TO WORKING IN AN EASEMENT ON THAT PROPERTY. CONTRACTOR SHALL NOT ACCESS PROPERTY OUTSIDE OF EASEMENT WITHOUT PRIOR WRITTEN PERMISSION FROM PROPERTY OWNER. A COPY OF THE WRITTEN PERMISSION FROM THE PROPERTY OWNER SHALL BE FORWARDED TO THE ENGINEER AND UNION COUNTY FOR THEIR RECORDS. CONTRACTOR SHALL PROVIDE TO ENGINEER A WRITTEN STATEMENT FROM PROPERTY OWNER THAT PROPERTY OWNER IS SATISFIED WITH CONTRACTOR'S REPAIR OF AFFECTED AREA OUTSIDE OF EASEMENT.
6. EASEMENT LINES, RIGHT-OF-WAY LINES, AND PROPERTY LINES ARE SHOWN IN THE DESIGN DRAWINGS AND ARE FOR REFERENCE ONLY.
7. MAIL BOXES, SIGNS, WATER METERS AND RETAINING WALLS SHALL BE REMOVED BY THE CONTRACTOR WHEN NECESSARY FOR PIPE INSTALLATION AND REPLACED WITHOUT DAMAGE. IF DAMAGED BY CONTRACTOR, CONTRACTOR SHALL REPLACE WITH NEW FACILITIES OR CONSTRUCTION AT NO ADDITIONAL COST TO OWNER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER MARKERS. PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF NORTH CAROLINA.
9. CONTRACTOR MAY CLEAR AND GRUB AREAS WITHIN PERMANENT EASEMENT AND TEMPORARY EASEMENT AS REQUIRED FOR CONSTRUCTION OF PIPELINE. CONTRACTOR SHALL LIMIT CLEARING WITHIN THE TEMPORARY CONSTRUCTION EASEMENT TO WHAT IS NECESSARY TO COMPLETE THE WORK.WHERE NOTED, TREES AND SHRUBS SHALL BE PROTECTED AND SAVED. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS OUTSIDE THESE LIMITS.
10. CONTRACTOR SHALL INSTALL ALL PIPELINES, PAVING, WALKWAYS, AND CURB AND GUTTER ALONG EXISTING GRADE BETWEEN ELEVATIONS DEPICTED ON THE DRAWINGS.
11. THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO OSHA, LOCAL, OR STATE REGULATIONS, WHICHEVER IS MORE STRINGENT, PERTAINING TO EXCAVATION AND TRENCHING.
12. RESTRAINED JOINTS SHALL BE PROVIDED FOR BURIED PIPING AS INDICATED ON THE DRAWINGS.
13. RESTORATION OF STRUCTURES SUCH AS CURBS AND GUTTERS, CONCRETE AND ASPHALT DRIVES AND WALKWAYS, PAVING BRICKS, FENCING, RETAINING WALLS, ETC., CROSSED BY THE PIPELINE ARE NOT ALL INDICATED ON PLANS. CONTRACTOR SHALL RESTORE ANY EXISTING STRUCTURES THAT ARE DISTURBED, DAMAGED, OR REMOVED BY CONSTRUCTION.
14. CONTRACTOR SHALL REPLACE IN THEIR ENTIRETY EXISTING PIPE CULVERTS THAT ARE REMOVED TO INSTALL THE NEW PIPELINE. CONTRACTOR TO PROVIDE AND INSTALL NEW PIPE CULVERTS OF THE SAME SIZE, MATERIAL AND CONSTRUCTION AT THE SAME LOCATION AND INVERT ELEVATION AS THOSE THAT WERE REMOVED, AND SHAPE THE DITCH TO DRAIN WITH THE REPLACED CULVERT. CONTRACTOR SHALL PROVIDE ANY TEMPORARY CULVERTS THAT MAY BE REQUIRED FOR CONTRACTOR'S OPERATIONS. CONTRACTOR SHALL COORDINATE REMOVAL AND REPLACEMENT OF ANY CULVERTS WITHIN PUBLIC RIGHT-OF-WAY WITH THE REGULATING AGENCY.
15. HORIZONTAL STATIONING ALONG THE PIPELINE ALIGNMENT IS FOR LEVEL LINE MEASUREMENT AND FOR PAYMENT OF THE PIPELINES. CONTRACTOR SHALL PROVIDE AND INSTALL THE ACTUAL PIPE LENGTH TO BE DETERMINED BY THE SLOPE OR CURVE ON WHICH THE PIPE IS INSTALLED.
16. PIPELINE SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS WITH A MINIMUM PIPE COVER OF 4 FEET BELOW EXISTING GRADE OR 3 FEET BELOW ROCKY RIVER ROAD CENTERLINE WHICHEVER IS GREATER, UNLESS OTHERWISE NOTED.
17. AIR RELEASE MANHOLES (MH) SHALL BE LOCATED AT HIGH POINTS IN THE PIPELINES AS SHOWN IN PROFILE OR WHERE DIRECTED BY ENGINEER.
18. CONTRACTOR SHALL FIELD VERIFY PRECISE LOCATION, ELEVATION, AND ARRANGEMENT OF CONNECTIONS OF NEW PIPELINES WITH EXISTING PIPELINES BASED ON FIELD CONDITIONS, INCLUDING EXPOSING EXISTING PIPING PRIOR TO FABRICATING NEW PIPING. CONTRACTOR SHALL PROVIDE FITTINGS, ADAPTERS, SOLID SLEEVE CLOSURES, AND HARNESSED MECHANICAL COUPLING; DEFLECT JOINTS; AND MODIFY EXISTING PIPING AS APPLICABLE AND AS REQUIRED TO MAKE CONNECTIONS, INCLUDING ADJUSTMENTS FOR ANY OFFSETS IN CENTERLINE ELEVATIONS BETWEEN PIPELINES. CONTRACTOR SHALL PROVIDE TEMPORARY PLUG WITH FACTORY OUTLET SIZED AS REQUIRED FOR CONTRACTOR'S TESTING WORK BEFORE MAKING CONNECTION, WHEN APPLICABLE. CONTRACTOR SHALL COORDINATE MAKING EACH CONNECTION WITH THE OWNER.
19. AT LOCATIONS WHERE THE PIPELINE CROSSES AN EXISTING FENCE, THE FENCE SHALL BE TEMPORARILY REMOVED DURING CONSTRUCTION. TEMPORARY FENCING SHALL BE PROVIDED AS REQUIRED TO SECURE LIVESTOCK OR OTHER ANIMALS THAT ARE CONTAINED BY THE FENCE. AT THE COMPLETION OF CONSTRUCTION, ALL TEMPORARY FENCING SHALL BE REMOVED AND PERMANENT FENCING AND EXISTING GATES REPLACED WITH THE SAME FENCING AND GATES AS THE EXISTING..
20. CONTRACTOR SHALL VERIFY EXISTING PIPE OUTSIDE DIAMETERS AND HAVE APPROPRIATELY SIZED SLEEVES AND ALL OTHER REQUIRED PIPE AND FITTINGS ON SITE PRIOR TO CONNECTION TO EXISTING PIPELINES.
21. STATION CALL OUTS ALONG PERMANENT EASEMENTS AND CONSTRUCTION EASEMENTS ARE ALONG THE CENTER LINE OF THE WATERLINE.
22. RESTRAINED JOINT PIPING IS REQUIRED IN THE LOCATIONS INDICATED ON THE DRAWINGS BASED UPON THE VALVE AND FITTING LOCATIONS SHOWN. OTHER PIPING MAY BE UNRESTRAINED. IF IT IS NECESSARY TO ADD FITTINGS DUE TO CONFLICTS WITH EXISTING FACILITIES, ADDITIONAL RESTRAINED JOINT PIPING SHALL BE ADDED ON EITHER SIDE OF THE ADDED FITTING OR CONCRETE THRUST BLOCKS SHALL BE PROVIDED AS REQUIRED BY THE ENGINEER.
23. EXISTING ASBESTOS CEMENT PIPELINES ARE LOCATED THROUGHOUT THE PROJECT AREA. CONTRACTOR IS RESPONSIBLE FOR ALL HEALTH AND SAFETY PRECAUTIONS FOR WORKING WITH AND NEAR ASBESTOS MATERIALS.
24. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND THE EPA REGULATIONS REGARDING REGULATED AND NON-REGULATED ASBESTOS CONTAINING MATERIALS AND UNDERSTAND THE CONSTRUCTION PROCEDURES REQUIRED TO MAINTAIN THE NON-REGULATED STATUS OF BURIED ASBESTOS CEMENT PIPE. IN AREAS WHERE ABANDONED ASBESTOS CEMENT PIPE IS ENCOUNTERED BY CONSTRUCTION ACTIVITIES, THE PIPE SHALL REMAIN ABANDONED IN PLACE AS A NON-REGULATED MATERIAL. NO PAYMENT WILL BE MADE FOR ANY COSTS ASSOCIATED WITH THE ABATEMENT OF ASBESTOS CEMENT PIPE.
25. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BASED ON SPECIFIC SITE CONDITIONS.
26. CONTRACTOR SHALL VIDEO THE ENTIRE WATER TRANSMISSION MAIN ROUTE IN ADVANCE OF COMMENCING CONSTRUCTION. A DIGITAL COPY OF THE ROUTE SHALL BE DELIVERED TO UCPW FOR THEIR FILES AND REVIEW DURING CONSTRUCTION AND AFTER PROJECT COMPLETION.
27. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PARKING FACILITIES, BUSINESSES, AND RESIDENCES AT ALL TIMES UNLESS OTHERWISE COORDINATED AND APPROVED BY THE PROPERTY OWNER AND/OR ENGINEER.
28. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO CITY OF MONROE FACILITIES AS RESULT OF CONSTRUCTION ACTIVITIES. ANY DAMAGE TO SAID FACILITIES SHALL BE REPORTED IMMEDIATELY TO THE CITY OF MONROE WATER RESOURCES DEPARTMENT AT 704-282-4601.
29. THE HORIZONTAL AND VERTICAL ELEVATIONS OF THE CITY WATER MAINS SHALL BE DETERMINED IN ADVANCE OF ALL BORINGS AND CROSSINGS. ANY TEST HOLES FOR AC MAINS SHALL BE BACKFILLED WITH EXCAVATABLE FLOWABLE FILL (LESS THAN 200 PSI COMPRESSIVE STRENGTH) FROM THE TRENCH FLOOR TO A MINIMUM OF 2-FEET ABOVE THE TOP OF THE MAIN. TEST HOLES FOR OTHER UTILITIES SHALL BE BACKFILLED IN ACCORDANCE WITH SPECIFICATION 02202 - TRENCHING AND BACKFILLING.
30. IF ANY AC WATER MAIN IS EXPOSED AT A TRENCH CROSSING, SAID WATER MAIN SHALL BE REPLACED TO THE NEAREST JOINT OUTSIDE THE TRENCH WALLS WITH CLASS 350 DIP AND CONNECTED BACK BY USE OF HYMAX COUPLING OR APPROVED EQUAL.
31. CONTRACTOR WILL NOT BE ALLOWED TO WASTE EXCESS SOIL ON THE WORK SITE. ALL DISTURBED AREAS ARE TO BE RETURNED TO PRE-CONSTRUCTION GRADES UNLESS OTHERWISE NOTED.
32. EXISTING VALVE OPERATIONS WILL BE PERFORMED BY UNION COUNTY PERSONNEL ONLY. CONTRACTOR SHALL COORDINATE WITH UNION COUNTY A MINIMUM OF 96 HOURS PRIOR TO ANY SERVICE INTERRUPTIONS OR VALVE OPERATIONS.
33. ANY WORK WITHIN THE NCDOT ROW SHALL COMPLY WITH THE NCDOT ENCROACHMENT AGREEMENT FOR THIS PROJECT AND THE CURRENT STANDARD SPECIFICATIONS AND DETAILS.
34. ANY WORK WITHIN THE CITY OF MONROE ROW SHALL COMPLY WITH THE CITY OF MONROE ENCROACHMENT AGREEMENT TO THE STREET CUT PAVEMENT REPAIR STANDARDS.
35. ANY WORK DAMAGE TO STREETS WITHIN THE CITY OF MONROE ROW SHALL BE REPAIRED IN ACCORDANCE WITH THE CITY OF MONROE THE STREET CUT PAVEMENT REPAIR STANDARDS AT THE CONTRACTORS EXPENSE.
36. CONTRACTOR SHALL FOLLOW STANDARD WATER AND SEWER SEPARATION REQUIREMENTS AS SHOWN ON DETAIL D, SHEET D5 UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
37. IN AREAS WHERE THE PIPELINE IS LOCATED OUTSIDE OF THE ROAD RIGHT-OF-WAY, THE CONTRACTOR SHALL LIMIT DISTURBANCE TO TEMPORARY AND PERMANENT EASEMENT AREAS EXCEPT FOR THE INSTALLATION OF EROSION CONTROL MEASURES AND ABANDONING PORTIONS OF THE EXISTING WATER LINE.

BID SET

NO.	BY	CHK	APP

DATE

REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER

[illegible]

2021.01.25 14:37:26-05'00'

BLACK & VEATCH

Black & Veatch International Company
Business License No. F-0794
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

GENERAL
LEGEND, ABBREVIATIONS, AND GENERAL NOTES

DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

A1
SHEET
2 OF 42

D10000

TREE PROTECTION NOTES:

1. TREE/CONSTRUCTION PROTECTION FENCING SHALL BE PROVIDED ALONG ALL CLEARING/CONSTRUCTION LIMITS OUTSIDE OF R/W WHERE SILT FENCE IS NOT SHOWN OR SPECIFIED.
2. TREE/CONSTRUCTION FENCING MUST BE INSTALLED AND INSPECTED PRIOR TO ANY GRADING ACTIVITY, INCLUDING THE CLEARING FOR EROSION CONTROL MEASURES. THE INSTALLATION OF TREE/CONSTRUCTION FENCING SHALL BE THE FIRST CONSTRUCTION ACTIVITY THAT OCCURS IN THE FIELD.
3. TREE/CONSTRUCTION FENCING SHALL BE MAINTAINED ON SITE UNTIL ALL WORK IS COMPLETED.

EROSION CONTROL CONSTRUCTION SEQUENCE NOTES:

1. OBTAIN AND POST A COPY OF THE CERTIFICATE OF EROSION CONTROL PLAN APPROVAL.
2. INSTALL AND NOTIFY ENGINEER TO INSPECT TREE PROTECTION FENCING BEFORE ANY LAND DISTURBING ACTIVITIES.
3. CLEAR SITE ONLY AS NECESSARY TO INSTALL EROSION CONTROL DEVICES AND TREE PROTECTION FENCING AS INDICATED ON THE PLANS AND IN THE SPECIFICATIONS.
4. UPON COUNTY AND ENGINEER'S APPROVAL OF TREE/CONSTRUCTION FENCING, INSTALL TEMPORARY EROSION CONTROL DEVICES AS INDICATED ON THE PLANS AND IN THE SPECIFICATIONS.
5. NOTIFY ENGINEER AND NCDEQ, LAND QUALITY SECTION (704-663-1699) FOR SITE INSPECTION PRIOR TO COMMENCING MAIN CONSTRUCTION OPERATIONS.
6. ONCE EROSION CONTROL DEVICES ARE APPROVED, BEGIN CONSTRUCTION OPERATIONS. CLEAR ONLY AS NECESSARY THROUGH WETLANDS FOR INSTALLATION OF UTILITY.
7. MAINTAIN EROSION CONTROL DEVICES AS NECESSARY DURING INSTALLATION OF UTILITY IMPROVEMENTS. INSPECT DEVICES AFTER EVERY RAINFALL EVENT AND CLEAN OUT ALL DEVICES WHEN HALF FULL.
8. SEE SHEET D6 FOR SELF -MONITORING AND SELF -INSPECTION NOTES.
9. WHERE INSTALLATION OF UTILITY REQUIRES THE REMOVAL OF AN EROSION CONTROL DEVICE, REPLACE DEVICE IMMEDIATELY UPON COMPLETION OR DAILY, WHICHEVER OCCURS FIRST.
10. AS CONSTRUCTION PROGRESSES, INSTALL ADDITIONAL EROSION CONTROL DEVICES AS INDICATED ON THE PLANS, CALLED FOR IN THE SPECIFICATIONS OR AS NEEDED OR DIRECTED BY THE ENGINEER.
11. PERMANENT GROUND COVER FOR ALL DISTURBED AREAS SHALL BE ACHIEVED WITHIN 14 WORKING DAYS OR 90 CALENDARS DAYS, WHICHEVER IS SHORTER, FOLLOWING THE COMPLETION OF CONSTRUCTION.
12. PROVIDE TEMPORARY BANK STABILIZATION (TARPS) UPON CROSSING OF ANY STREAMS AND DISTURBANCE TO ANY STREAM BANKS AT THE END OF EACH WORK DAY. UPON COMPLETION OF SEWER INSTALLATION AT EACH STREAM CROSSING, PROVIDE REQUIRED PERMANENT BANK STABILIZATION OF EACH STREAM CROSSING AND STREAM BANK DISTURBANCE ON THE SAME DAY THE SEWER INSTALLATION IS COMPLETE.
13. FOR WETLANDS, STABILIZE WITH APPROPRIATE WETLAND SEED MIX AS SPECIFIED IN THE USACE NATIONWIDE 12 PERMIT OR IN THE SPECIFICATIONS.
14. AFTER SITE IS STABILIZED, REQUEST INSPECTION BY THE ENGINEER. UPON APPROVAL OF SITE STABILIZATION, REMOVE TEMPORARY EROSION CONTROL DEVICES, INCLUDING TREE PROTECTION FENCING, DRESS OUT AREA AND SEED AND MULCH.

EROSION CONTROL NOTES:

1. REFER TO DETAIL SHEET D7 FOR GROUND STABILIZATION REQUIREMENTS AND MATERIALS HANDLING REQUIREMENTS.
2. INSTALL SILT FENCE OVER AND AROUND TOP OF EXISTING PIPE, INLETS, AND WATTLES AT DISTURBED AREAS, AS SHOWN ON THE PLANS.
3. ALL DISTURBED AREAS SHALL BE GRADED TO MINIMIZE RUNOFF AND TO FOLLOW EXISTING CONTOURS.
4. INSTALL SILT FENCE AROUND SPOIL PILES AND ALONG TRENCHES TO MINIMIZE SEDIMENT FROM ENTERING EXISTING DITCHES, STORM DRAINS AND MARSH CREEK.
5. ALL DISTURBED AREAS ON THE BANKS AND APPROACHES TO DITCHES, STREAMS OR CREEK CROSSINGS SHALL BE GRADED NOT TO EXCEED 2:1 RATIO AND STABILIZED WITH BANK STABILIZATION. SURFACE WATER RUNOFF SHALL BE DIVERTED FROM DISTURBED AREAS.
6. ALL DISTURBED DITCHES AND SWALES SHALL HAVE TEMPORARY LINER PER SPECIFICATION, UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS.
7. PROVIDE EROSION CONTROL AROUND STOCK/WASTE PILES AND STAGING AREAS AS NEEDED OR AS DIRECTED BY ENGINEER.
8. PROTECT STORM PIPE INLETS FROM SEDIMENT RUNOFF FROM LAND DISTURBING ACTIVITIES WITH PIPE INLET PROTECTION DEVICES, AS APPROPRIATE FOR SITE CONDITIONS.
9. REPLACE DISTURBED STORM PIPE OUTLET PROTECTION WITH EQUAL OR GREATER AMOUNT OF RIP-RAP AT END OF THE WORK DAY.
10. WHERE THE AREA AROUND AN OUTLET IS DISTURBED AND NO OUTLET PROTECTION EXISTS, CLASS "1" RIP-RAP SHALL BE PLACED AROUND PIPE OUTLET AS NEEDED OR AS DIRECTED BY THE ENGINEER.
11. ALL DISTURBED AREAS RELATED TO PIPE INSTALLATION SHALL BE FERTILIZED, LIMED, SEEDED AND MULCHED WITHIN 14 DAYS OF COMPLETION OF ANY LAND DISTURBING ACTIVITY.
12. CONSTRUCTION TIME THROUGH WETLANDS SHALL BE MINIMIZED. CONTRACTOR SHALL BEGIN CONSTRUCTION IN WETLANDS ONLY WHEN DRY PERIODS OF WEATHER IS FORECASTED.
13. FOR DISTURBED SLOPES OF 3:1 AND GREATER, THE DISTURBED AREA SHALL BE STABILIZED WITHIN 7 DAYS. ALL OTHER AREAS SHALL BE STABILIZED WITHIN 14 DAYS.
14. TEMPORARY STREAM CROSSING SHALL BE MADE BY TEMPORARY PIPE CROSSING.
15. EXCESS MATERIAL FROM EXCAVATION ACTIVITIES SHALL BE HAULED OFF SITE AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROPERLY DISPOSE OF.
16. CONTRACTOR TO PROVIDE CONCRETE WASHOUTS AT EACH CONSTRUCTION ENTRANCE, AT A MINIMUM OF 50 LF FROM ANY SURFACE WATERS OR STORM DRAINAGE INLETS.

WETLAND SEED MIX NOTES:

SEEDING

1. ACCOMPLISH SEEDING BY MEANS OF AN APPROVED POWER-DRAWN SEED DRILL, COMBINATION CORRUGATED ROLLER-SEEDER, APPROVED HAND OPERATED MECHANICAL SEEDER, OR OTHER APPROVED METHODS TO PROVIDE EVEN DISTRIBUTION OF SEED.
2. DO NOT SEED WHEN GROUND IS EXCESSIVELY WET OR EXCESSIVELY DRY. AFTER SEEDING, ROLL AREA WITH A ROLLER, NOT LESS THAN 18 INCHES IN DIAMETER AND WEIGHING NOT MORE THAN 210 POUNDS PER FOOT OF WIDTH. UPON COMPLETION OF ROLLING, WATER AREA WITH A FINE SPRAY.
3. IMMEDIATELY FOLLOWING SEEDING APPLY MULCH OR MATTING. DO NOT SEED AREAS IN EXCESS OF THAT WHICH CAN BE MULCHED ON SAME DAY.
4. APPLY WATER WITH A FINE SPRAY IMMEDIATELY AFTER EACH AREA HAS BEEN MULCHED. SATURATE TO 4 INCHES OF SOIL DEPTH.

MULCHING

1. APPLY MULCH OR MATTING AS REQUIRED TO RETAIN SOIL AND GRASS, BUT NO LESS THAN THE FOLLOWING:
   - I. SLOPES FROM O TO 20 PERCENT BY SPREADING A LIGHT COVER OF MULCH OVER SEEDED AREA AT THE RATE OF NOT LESS THAN 2 TONS PER ACRE.
   - II. SLOPES GREATER THAN 20 PERCENT MULCH WITH MATTING. PIN MATTING TO THE GROUND WITH WIRE STAPLES AT FOOT INTERVALS, IMMEDIATELY AFTER SEEDING.
   - III. USE TACK TO PREVENT DISRUPTION OF MULCH.
2. FOR TACK USE AN ASPHALT TIE -DOWN OF EMULSIFIED ASPHALT GRADE AE-3 OR CUT -BACK ASPHALT GRADE RC-2 OR OTHER APPROVED EQUAL. THE APPLICATION RATE SHALL BE 0.10 GAL/SY (11 GAL / 1000 SQ. FT.). AN APPROVED JUTE MESH OR NET MAY BE USED IN LIEU OF TACKING STRAW MULCH.
3. OTHER TYPES OF MULCH AND ANCHORING METHODS MAY BE USED UPON APPROVAL BY THE ENGINEER.

CONSTRUCTION SEQUENCE:

1. CONTRACTOR TO SUBMIT THE CONSTRUCTION SEQUENCE PLAN FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
2. ESTABLISH EROSION CONTROL MEASURES AS SHOWN. ONLY CLEAR AS NEEDED FOR INSTALLATION OF EROSION AND SEDIMENT CONTROL DEVICES OR MEASURES.
3. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER/OWNER ON THE SEQUENCE FOR TRENCHLESS ROAD CROSSINGS PRIOR TO PERFORMING ANY WORK. THE ENGINEER/OWNER CAN ELECT THAT THE TRENCHLESS ROAD CROSSING AT JAMES HAMILTON ROAD ON SHEET C18 BE COMPLETED FIRST.

STREAM CROSSING SEQUENCE NOTES:

1. STREAM CROSSING SHALL BE MADE AS DETAILED UNLESS ALTERNATE STREAM CROSSING METHODS AND PROCEDURES ARE APPROVED BY THE ENGINEER/OWNER PRIOR TO PERFORMING ANY WORK. PIPELINE INSTALLATION SHALL BE CONSTRUCTED IN THE DRY.
2. THE CONTRACTOR SHALL INSTALL/MAINTAIN SILT FENCE AND OTHER EROSION CONTROL DEVICES PARALLEL WITH THE STREAM CROSSINGS UNTIL THE PROPOSED WORK ACROSS THE STREAM IS PERFORMED.
3. INSTALL THE STREAM PUMP AROUND AS DETAILED ON DETAIL E ON SHEET D6.
4. INSTALL TEMPORARY STREAM CROSSING PER DETAIL F ON SHEET D3.
5. INSTALL PIPE ACROSS STREAM.
6. ONCE CONSTRUCTION AND CONSTRUCTION ACCESS ACROSS STREAM IS COMPLETE, REMOVE STREAM PUMP AROUND AND REMOVE TEMPORARY STREAM CROSSING.
7. STABILIZE STREAM BANKS AS SHOWN AND SPECIFIED.

BID SET

D10000

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCHMIDT

2021.01.25 14:37:27-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

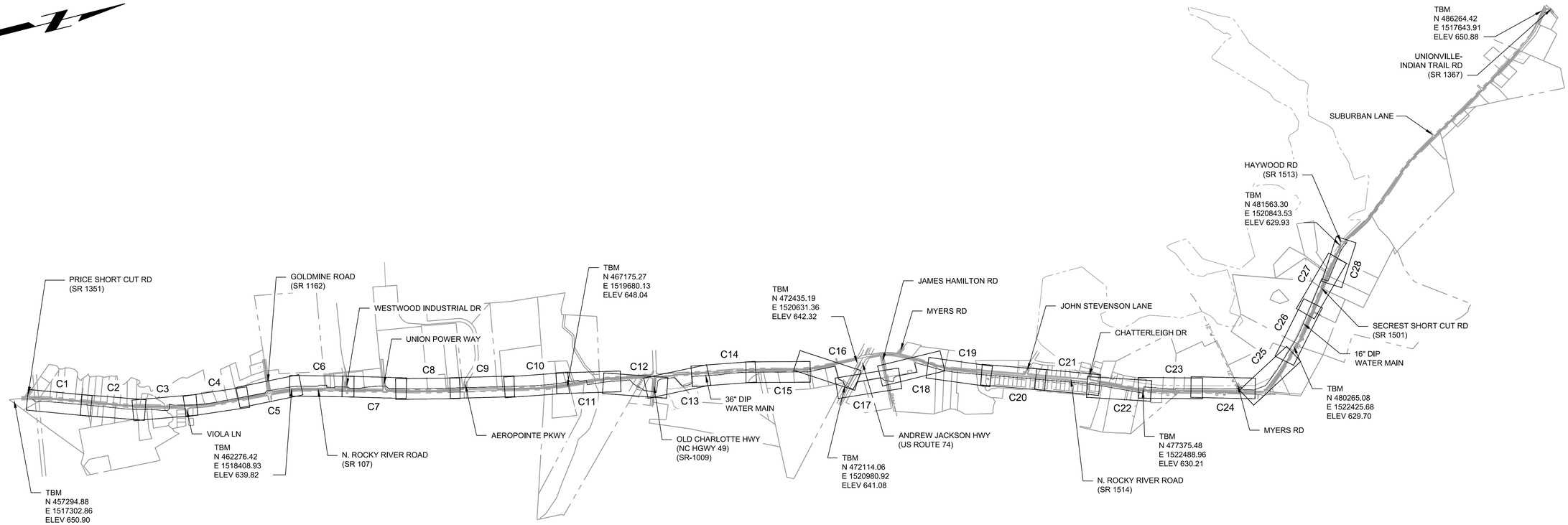
GENERAL
GENERAL NOTES

DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

A2
SHEET
3 OF 42



SHEET INDEX

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. PHILLIP SMART
2021.01.25 14:37:28-05'00'

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Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

GENERAL
SHEET INDEX AND LOCATION MAP

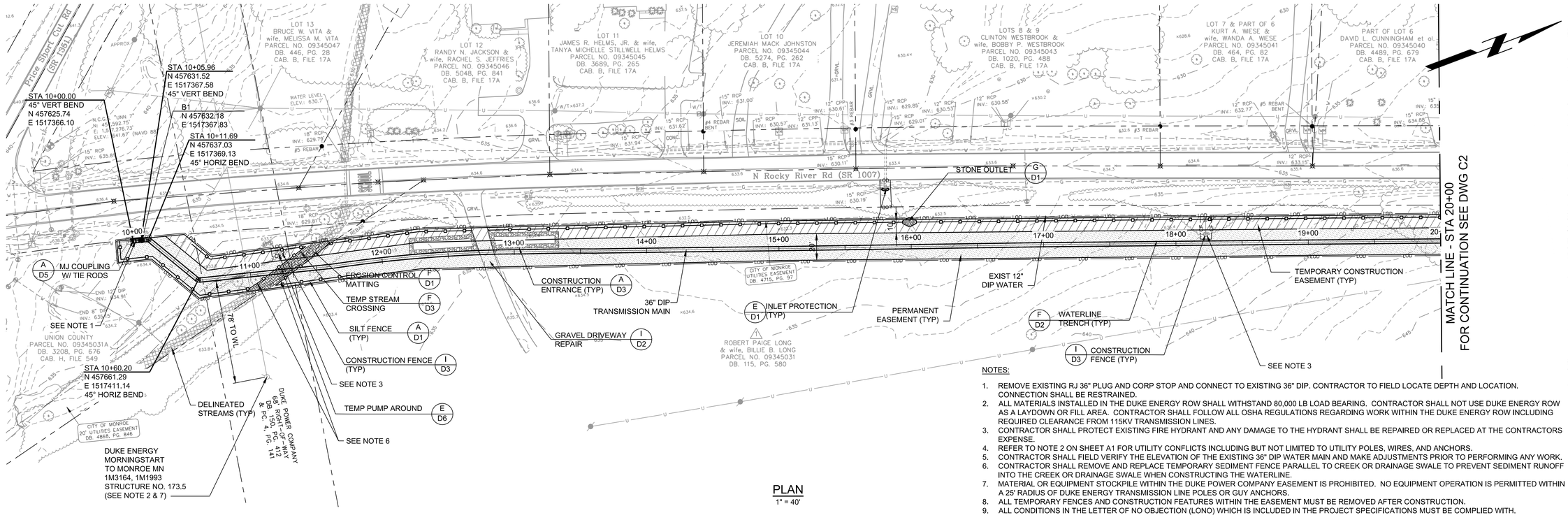
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

A3
SHEET
4 OF 42

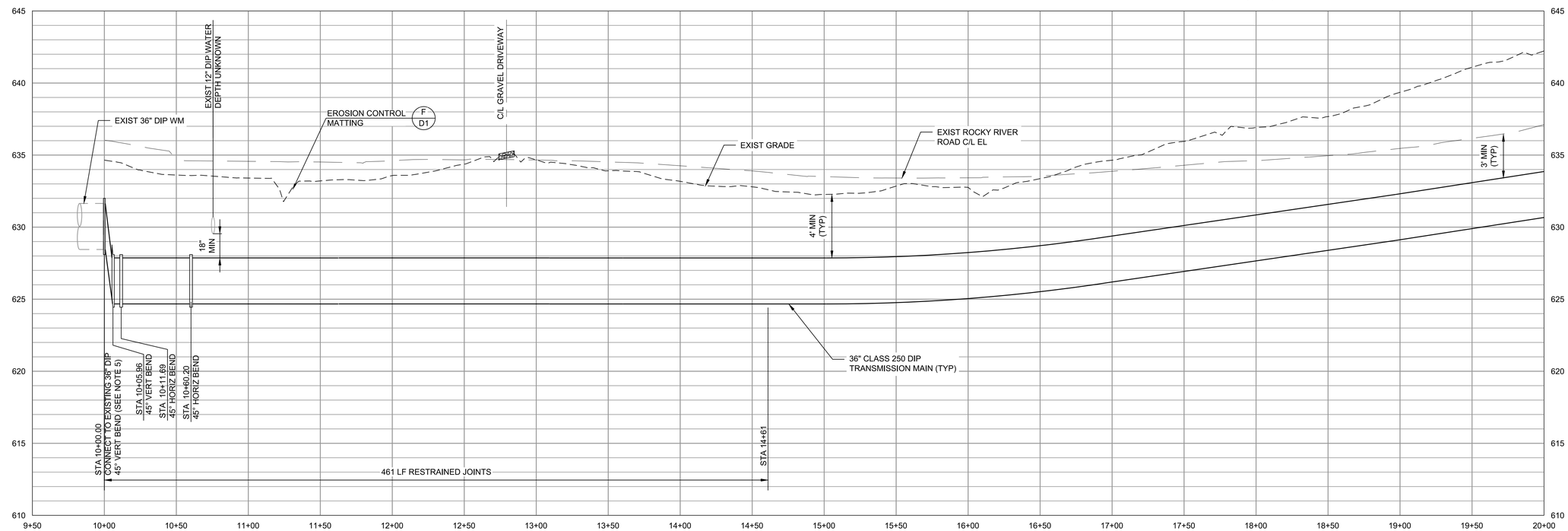
D10000



PLAN
1" = 40'

NOTES:

1. REMOVE EXISTING RJ 36" PLUG AND CORP STOP AND CONNECT TO EXISTING 36" DIP. CONTRACTOR TO FIELD LOCATE DEPTH AND LOCATION. CONNECTION SHALL BE RESTRAINED.
2. ALL MATERIALS INSTALLED IN THE DUKE ENERGY ROW SHALL WITHSTAND 80,000 LB LOAD BEARING. CONTRACTOR SHALL NOT USE DUKE ENERGY ROW AS A LAYDOWN OR FILL AREA. CONTRACTOR SHALL FOLLOW ALL OSHA REGULATIONS REGARDING WORK WITHIN THE DUKE ENERGY ROW INCLUDING REQUIRED CLEARANCE FROM 115KV TRANSMISSION LINES.
3. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
4. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
5. CONTRACTOR SHALL FIELD VERIFY THE ELEVATION OF THE EXISTING 36" DIP WATER MAIN AND MAKE ADJUSTMENTS PRIOR TO PERFORMING ANY WORK.
6. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.
7. MATERIAL OR EQUIPMENT STOCKPILE WITHIN THE DUKE POWER COMPANY EASEMENT IS PROHIBITED. NO EQUIPMENT OPERATION IS PERMITTED WITHIN A 25' RADIUS OF DUKE ENERGY TRANSMISSION LINE POLES OR GUY ANCHORS.
8. ALL TEMPORARY FENCES AND CONSTRUCTION FEATURES WITHIN THE EASEMENT MUST BE REMOVED AFTER CONSTRUCTION.
9. ALL CONDITIONS IN THE LETTER OF NO OBJECTION (LONO) WHICH IS INCLUDED IN THE PROJECT SPECIFICATIONS MUST BE COMPLIED WITH.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. Wesley Pierce
2021.01.25 14:37:29-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building One Services
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 9+50 TO STA 20+00

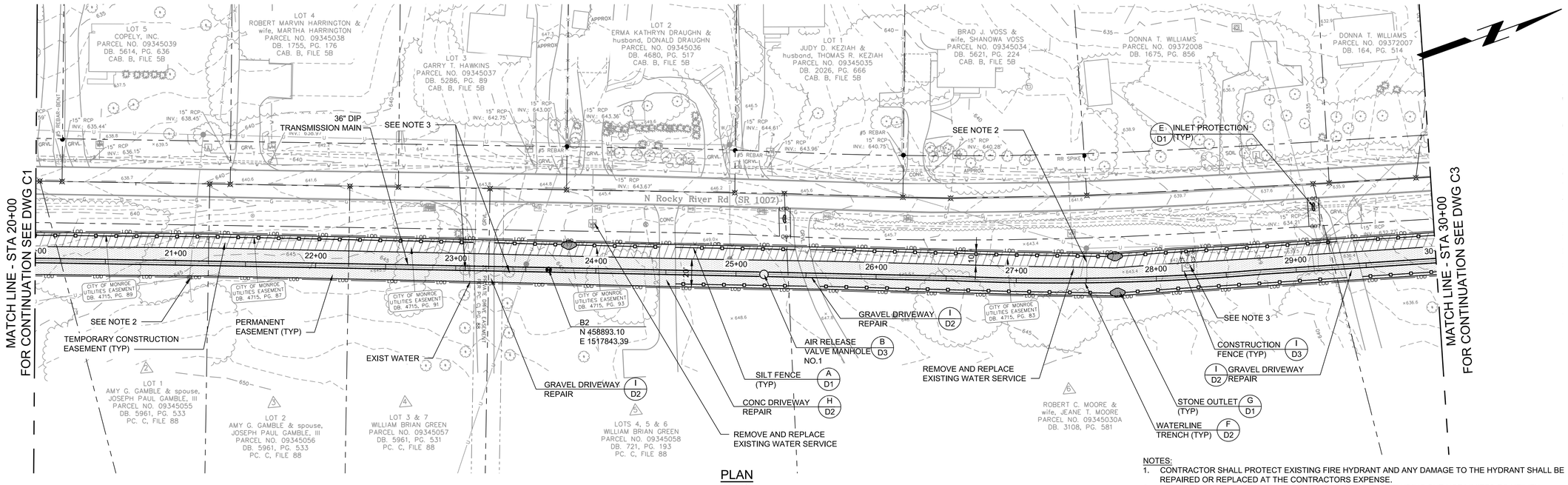
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

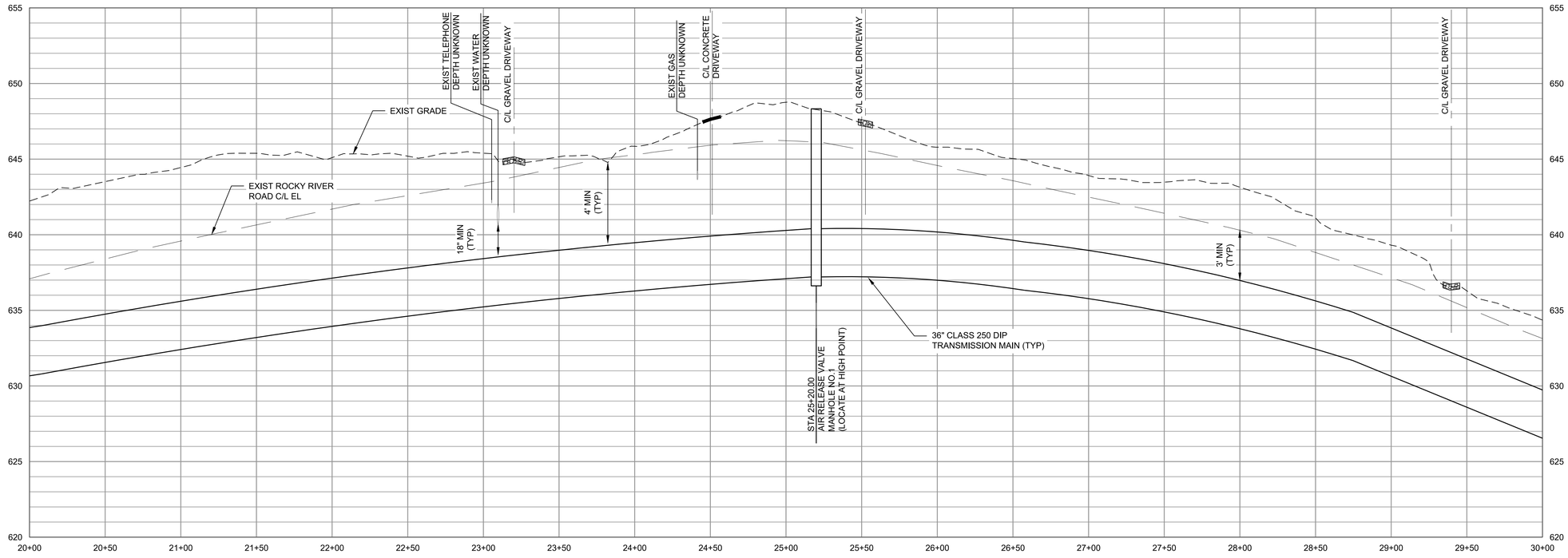
C1
SHEET
5 OF 42

FD7000_PW
D10000



PLAN
1" = 40'

NOTES:
1. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
2. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
3. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM PHILLIP SCOTT
2021.01.25 14:37:30-05'00'

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UNION COUNTY PUBLIC WORKS
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PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 20+00 TO STA 30+00

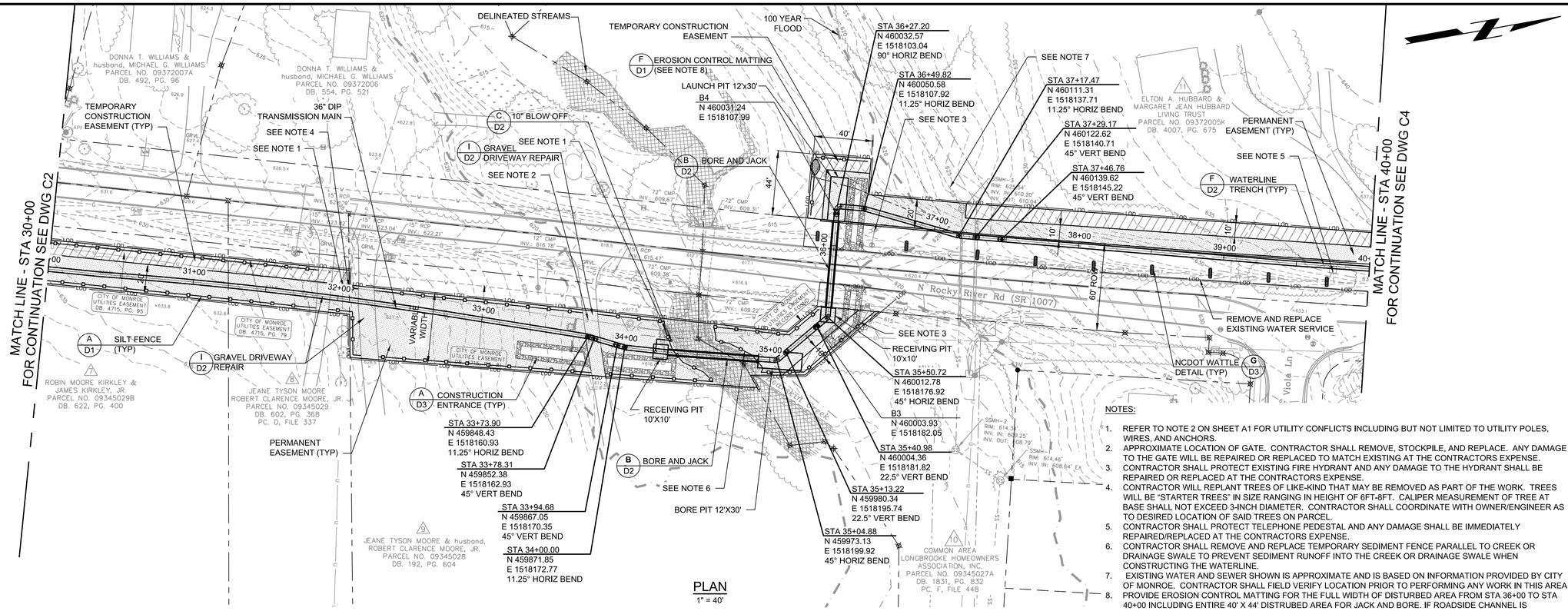
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C2
SHEET
6 OF 42

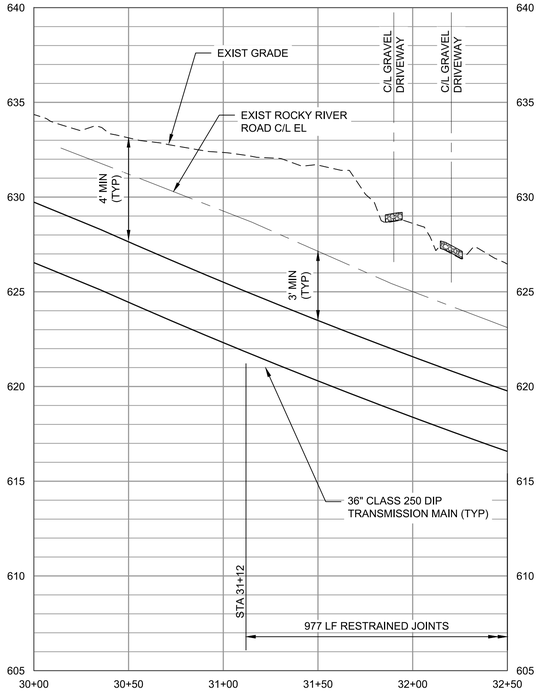
FD7000_PW
D10000

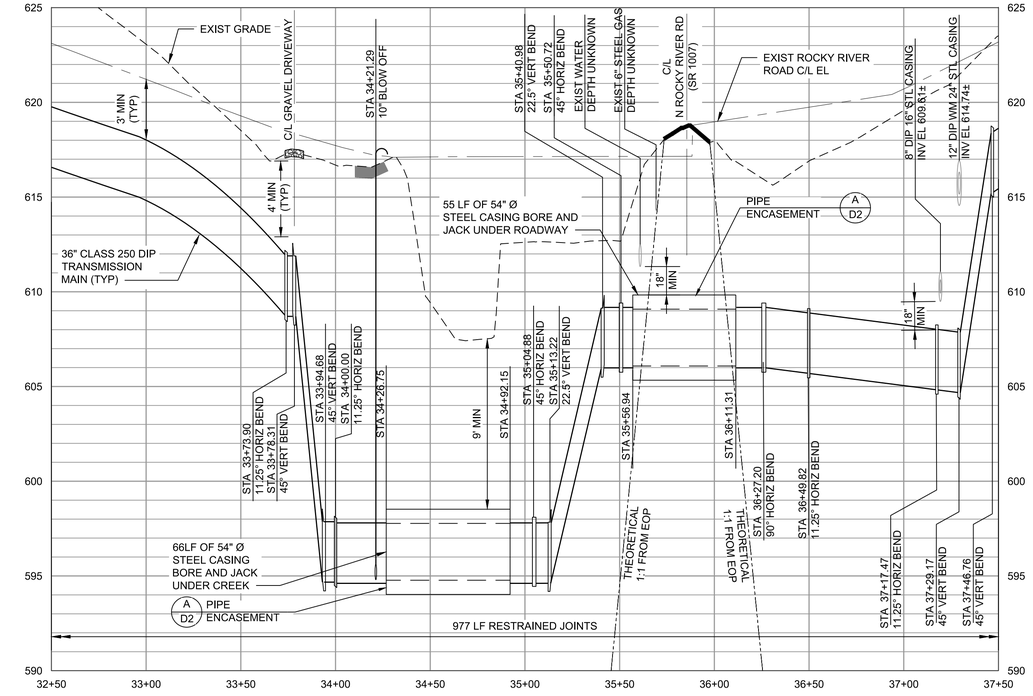


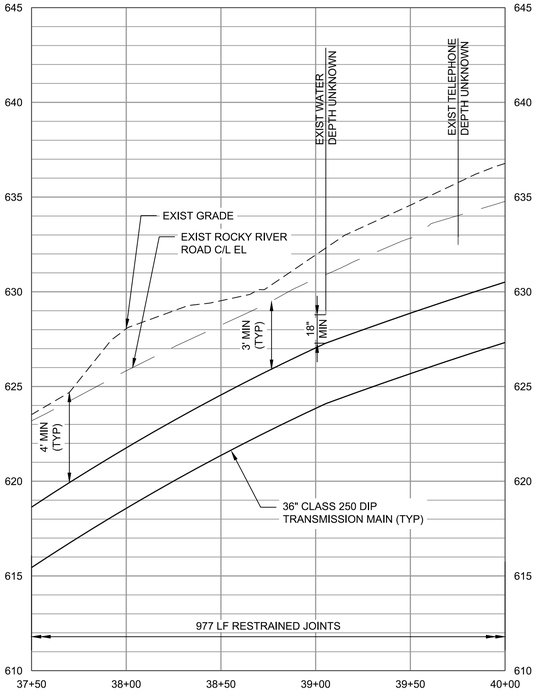
PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. APPROXIMATE LOCATION OF GATE. CONTRACTOR SHALL REMOVE, STOCKPILE, AND REPLACE. ANY DAMAGE TO THE GATE WILL BE REPAIRED OR REPLACED TO MATCH EXISTING AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR SHALL PROTECT TELEPHONE PEDESTAL AND ANY DAMAGE SHALL BE IMMEDIATELY REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE.
6. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.
7. EXISTING WATER AND SEWER SHOWN IS APPROXIMATE AND IS BASED ON INFORMATION PROVIDED BY CITY OF MONROE. CONTRACTOR SHALL FIELD VERIFY LOCATION PRIOR TO PERFORMING ANY WORK IN THIS AREA.
8. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 36+00 TO STA 40+00 INCLUDING ENTIRE 40' X 44' DISTRUBED AREA FOR JACK AND BORE. IF ROADSIDE CHANNEL IS DISTURBED, LINE CHANNEL WITH CLASS B RIPRAP FROM APPROX STA 37+00 TO STA 40+00.







PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. MILTON LEWIS STREET
2021.01.25 14:37:31 -05'00'

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10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 30+00 TO STA 40+00

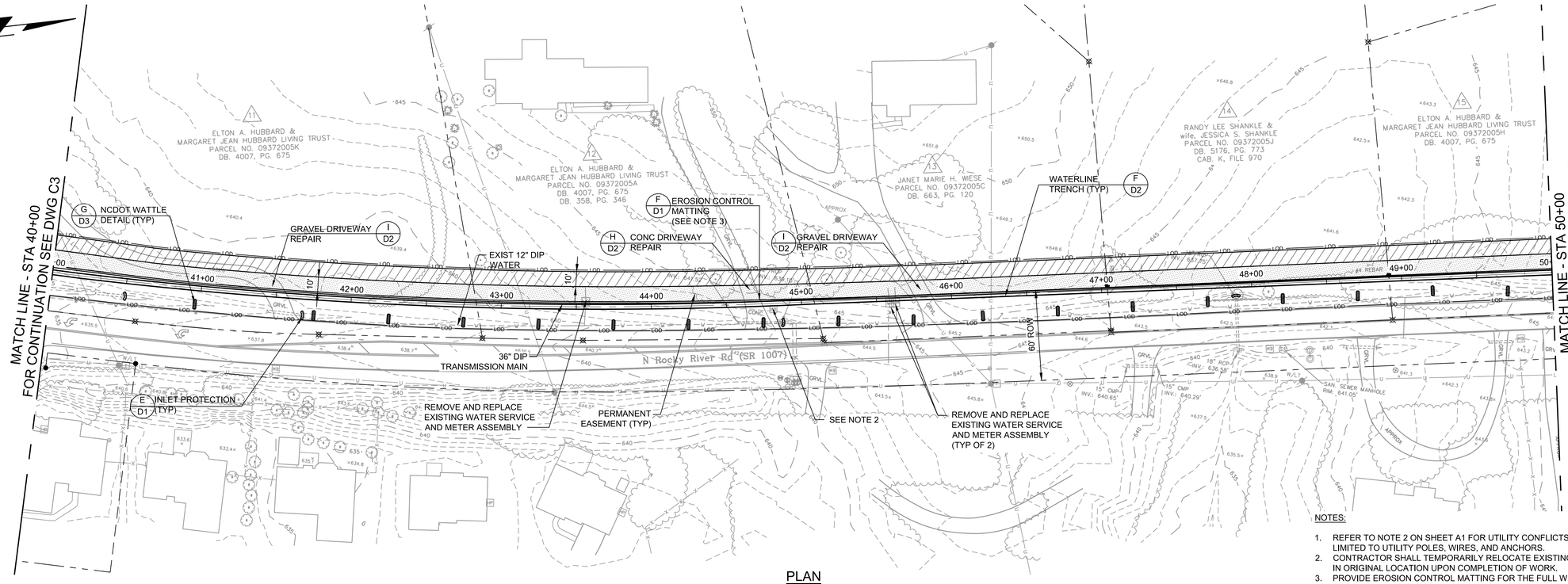
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C3
SHEET
7 OF 42

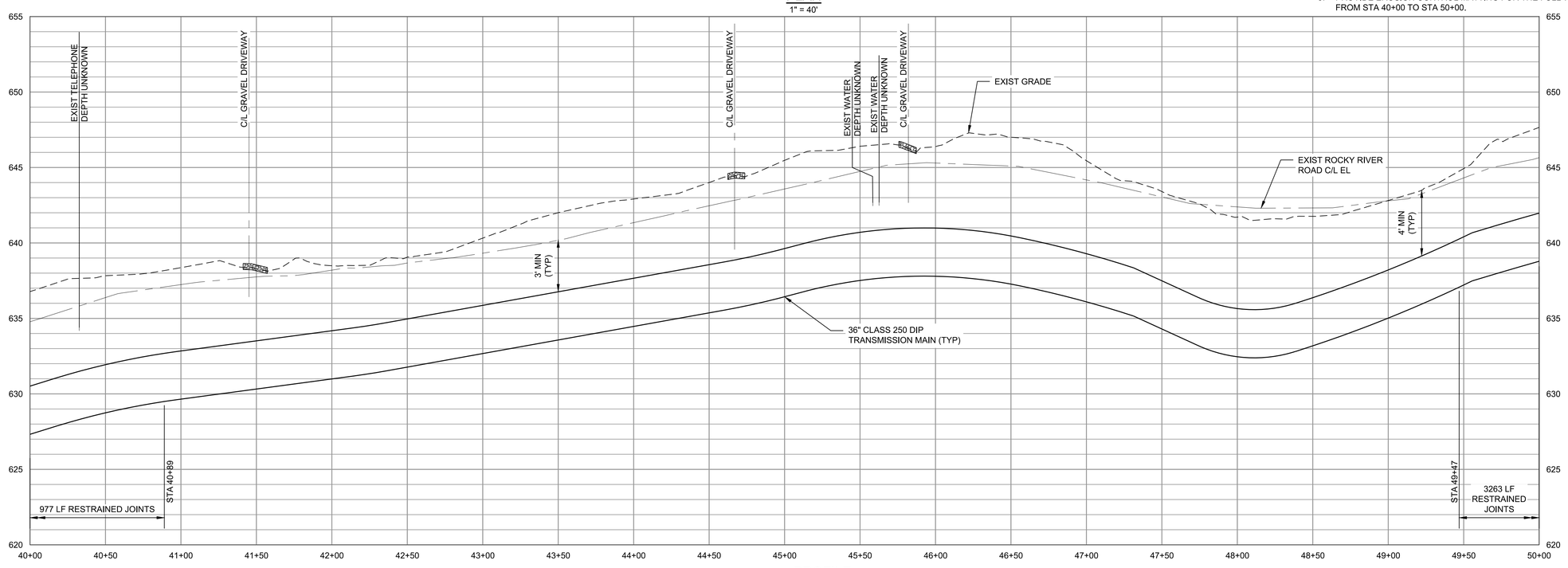
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL TEMPORARILY RELOCATE EXISTING MAILBOX AND REINSTALL IN ORIGINAL LOCATION UPON COMPLETION OF WORK.
3. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 40+00 TO STA 50+00.



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM PAUL SCOTT
2021.01.25 14:37:32-05'00'

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Building a sustainable world.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 40+00 TO STA 50+00

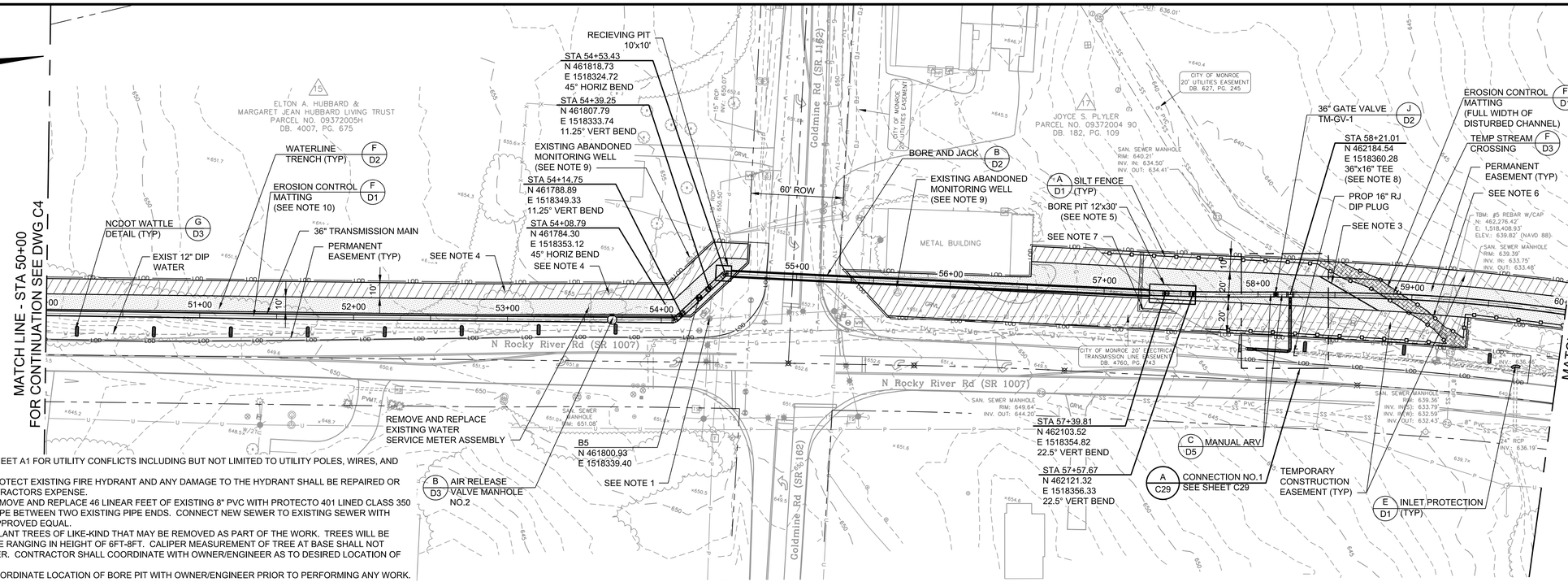
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C4
SHEET
8 OF 42

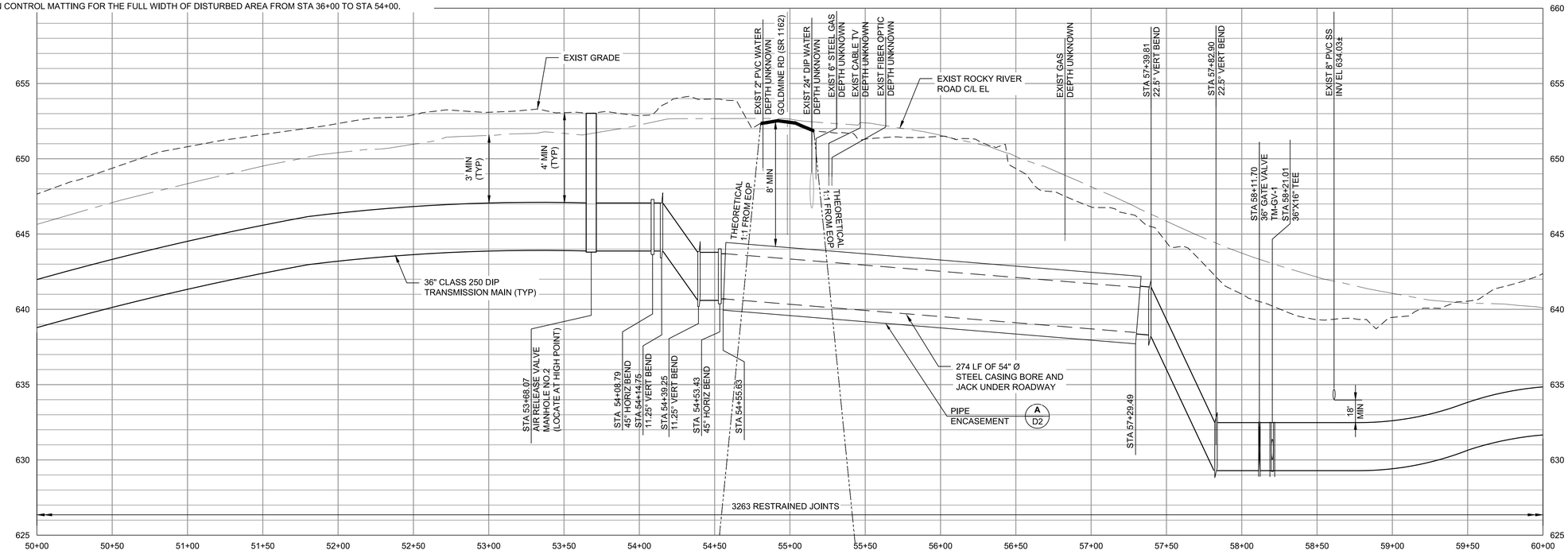
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 46 LINEAR FEET OF EXISTING 8" PVC WITH PROTECTO 401 LINED CLASS 350 DIP AT A CONSTANT SLOPE BETWEEN TWO EXISTING PIPE ENDS. CONNECT NEW SEWER TO EXISTING SEWER WITH HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR SHALL COORDINATE LOCATION OF BORE PIT WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
6. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE DRAINAGE SWALE WHEN CONSTRUCTING THE TRANSMISSION MAIN.
7. CONTRACTOR SHALL INSTALL/MAINTAIN WATER FILLED JERSEY BARRIERS WHILE BORE PIT IS OPEN.
8. INSTALL CONCRETE THRUST BLOCK AT PROPOSED TEE PER DETAIL 16 ON DETAIL SHEET D4.
9. CONTRACTOR SHALL PROVIDE GAS AND OIL RESISTANT GASKETS PER SPECIFICATION 15061 FROM STA 53+00 TO STA 58+00. CONTRACTOR SHALL NOTIFY ENGINEER IF ANY EXCAVATED MATERIAL APPEARS TO CONTAIN ANY HAZARDOUS MATERIALS.
10. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 36+00 TO STA 54+00.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM PAUL SCOTT
2021.01.25 14:37:33-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 50+00 TO STA 60+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

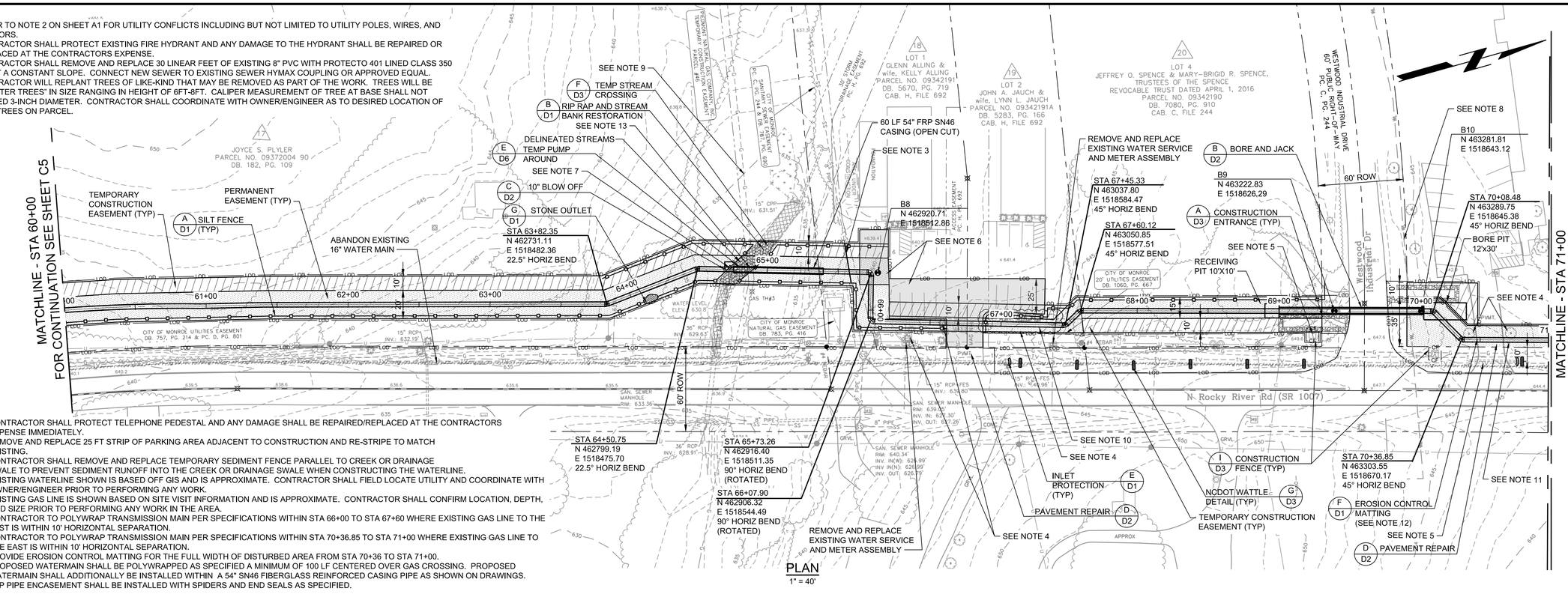
PROJECT NO.
186110

C5
SHEET
9 OF 42

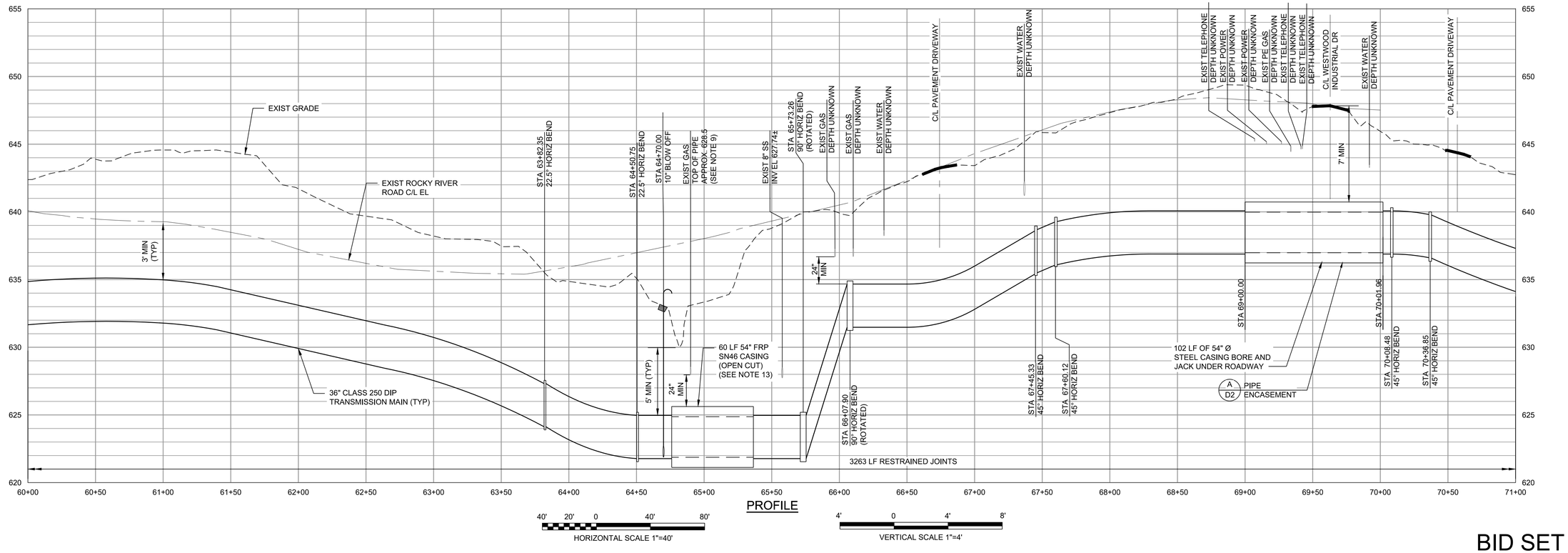
FD7000_PW
D10000

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 30 LINEAR FEET OF EXISTING 8" PVC WITH PROTECTO 401 LINED CLASS 350 DIP AT A CONSTANT SLOPE. CONNECT NEW SEWER TO EXISTING SEWER HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR SHALL PROTECT TELEPHONE PEDESTAL AND ANY DAMAGE SHALL BE REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE IMMEDIATELY.
6. REMOVE AND REPLACE 25 FT STRIP OF PARKING AREA ADJACENT TO CONSTRUCTION AND RE-STRIPE TO MATCH EXISTING.
7. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.
8. EXISTING WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
9. EXISTING GAS LINE IS SHOWN BASED ON SITE VISIT INFORMATION AND IS APPROXIMATE. CONTRACTOR SHALL CONFIRM LOCATION, DEPTH, AND SIZE PRIOR TO PERFORMING ANY WORK IN THE AREA.
10. CONTRACTOR TO POLYWRAP TRANSMISSION MAIN PER SPECIFICATIONS WITHIN STA 66+00 TO STA 67+60 WHERE EXISTING GAS LINE TO THE EAST IS WITHIN 10' HORIZONTAL SEPARATION.
11. CONTRACTOR TO POLYWRAP TRANSMISSION MAIN PER SPECIFICATIONS WITHIN STA 70+36.85 TO STA 71+00 WHERE EXISTING GAS LINE TO THE EAST IS WITHIN 10' HORIZONTAL SEPARATION.
12. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 70+36 TO STA 71+00.
13. PROPOSED WATERMAIN SHALL BE POLYWRAPPED AS SPECIFIED A MINIMUM OF 100 LF CENTERED OVER GAS CROSSING. PROPOSED WATERMAIN SHALL ADDITIONALLY BE INSTALLED WITHIN A 54" SN46 FIBERGLASS REINFORCED CASING PIPE AS SHOWN ON DRAWINGS. FRP PIPE ENCASEMENT SHALL BE INSTALLED WITH SPIDERS AND END SEALS AS SPECIFIED.



PLAN
1" = 40'



PROFILE

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM PHILLIP SCOTT
2021.01.25 14:37:34-05'00'

BLACK & VEATCH
Black & Veatch International Company
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 60+00 TO STA 71+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C6
SHEET
10 OF 42

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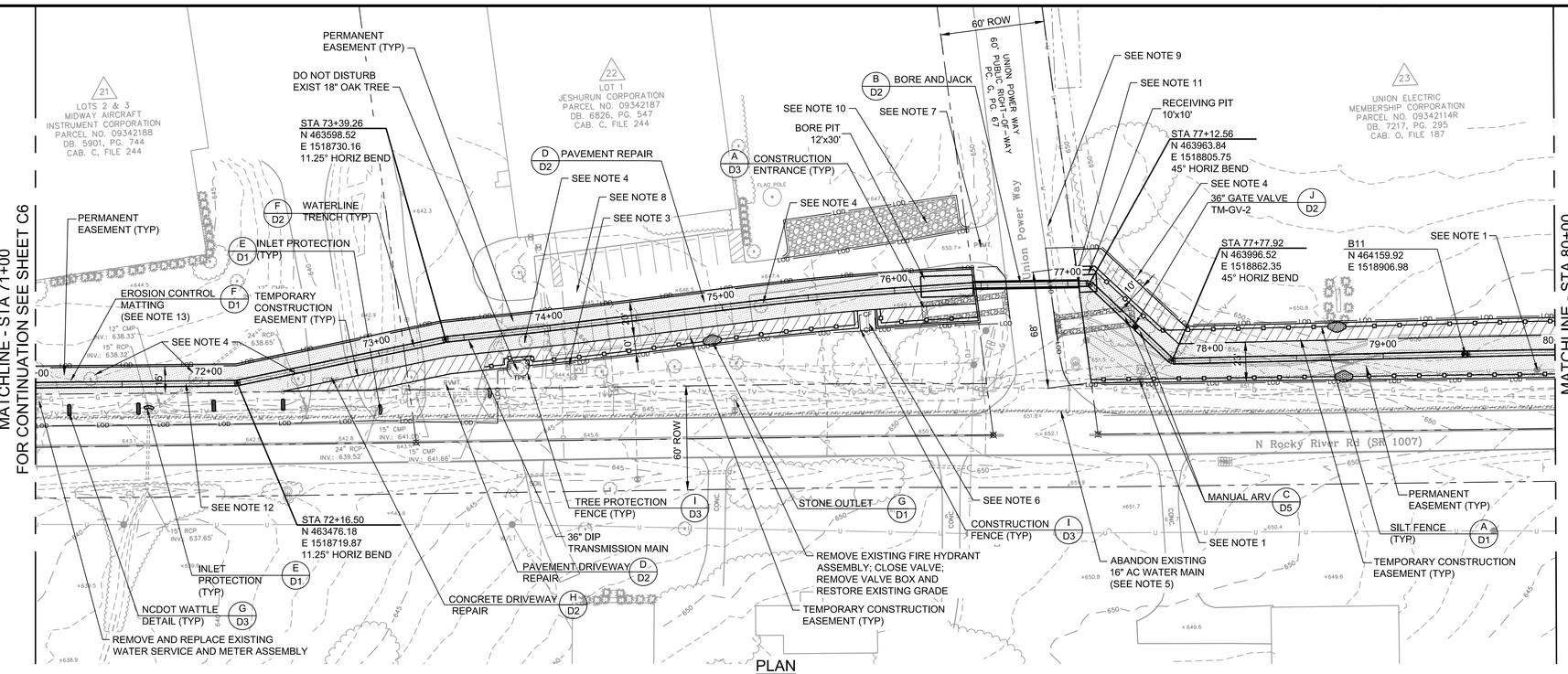
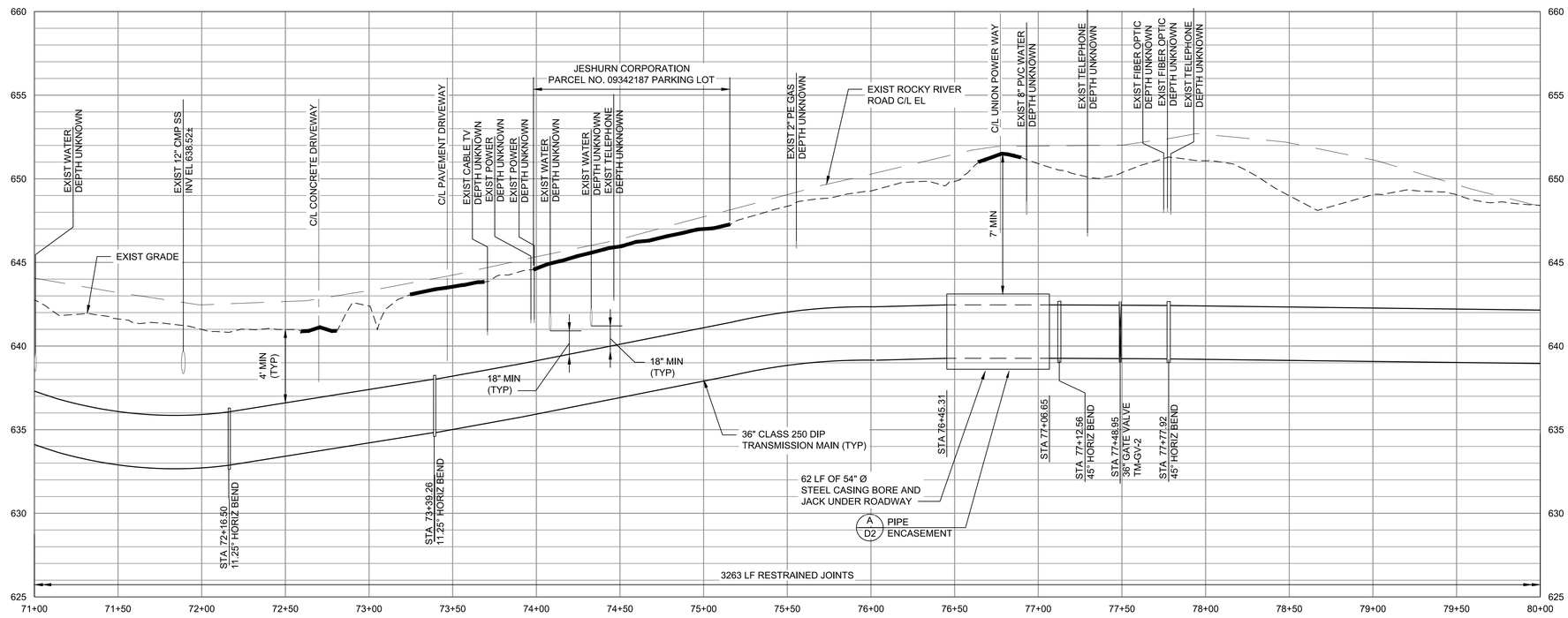


PLAN
1" = 40'



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL PROTECT EXISTING WATER SERVICE, VAULT, AND HYDRANT AND MAINTAIN WATER SERVICE. ANY INTERRUPTION TO WATER SERVICE SHALL BE COORDINATED AND APPROVED WITH THE OWNER/ENGINEER AND BUSINESS OWNER PRIOR TO PERFORMING ANY WORK.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. APPROXIMATE LOCATION OF EXISTING AC WATERLINE IS SHOWN IN PLAN. CONTRACTOR SHALL FIELD VERIFY LOCATION PRIOR TO PERFORMING ANY WORK. CONTRACTOR SHALL TAKE NECESSARY MEASURES TO PROTECT AND TEMPORARILY SUPPORT EXISTING WATERLINE DURING CONSTRUCTION.
6. CONTRACTOR SHALL PROTECT EXISTING SIGN, AND PLANTING AREA; AND IF CONSTRUCTION ACTIVITIES REQUIRE REMOVAL AND STOCKPILE, CONTRACTOR SHALL COORDINATE REPLACEMENT LOCATION WITH THE OWNER/ENGINEER. REMOVAL, STOCKPILE, AND REPLACEMENT IF REQUIRED IS AT THE CONTRACTORS EXPENSE.
7. CONSTRUCTION EQUIPMENT / TRAFFIC ARE AT NO TIME ALLOWED TO USE ASPHALT DRIVEWAY EXCEPT FOR CONSTRUCTION OF TEMPORARY PARKING AREA.
8. ASPHALT PARKING LOT AND SOUTH DRIVEWAY ARE TO BE REPAIRED AND PAVED WITHIN ONE WEEK OF COMPLETION OF PIPE INSTALLATION ACROSS ASPHALT AREAS ON THE PROPERTY. PROVIDE TEMPORARY STRIPING IMMEDIATELY TO MATCH EXISTING. PROVIDE PERMANENT STRIPING ONCE PAVEMENT HAS CURED.
9. EXISTING WATERLINE SHOWN IS APPROXIMATE AND CONTRACTOR SHALL FIELD LOCATE THE WATERLINE AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
10. INSTALL TEMPORARY GRAVEL PARKING AREA. UPON COMPLETION OF CONSTRUCTION ALONG PARCEL 20 REMOVE TEMPORARY GRAVEL PARKING AREA AND RESEED DISTURBED AREA.
11. APPROXIMATE LOCATION OF EXISTING ABOVE GRADE UTILITY BOX. CONTRACTOR SHALL FIELD LOCATE UTILITY BOX AND REMOVE AND REPLACE TO PERFORM PROPOSED WORK. ALL COSTS ASSOCIATED WITH REMOVAL AND REPLACEMENT OF UTILITY BOX WILL BE AT THE CONTRACTORS EXPENSE.
12. CONTRACTOR TO POLYWRAP TRANSMISSION MAIN PER SPECIFICATIONS WITHIN STA 71+00 TO STA 72+50 WHERE EXISTING GAS LINE TO THE EAST IS WITHIN 10' HORIZONTAL SEPARATION.
13. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 71+00 TO STA 72+50.

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER RICHARD S. SMITH
2021.01.25 14:37:34-05'00'

BLACK & VEATCH

Black & Veatch International Company
Business Unit: Water
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 71+00 TO STA 80+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C7
SHEET
11 OF 42

BID SET

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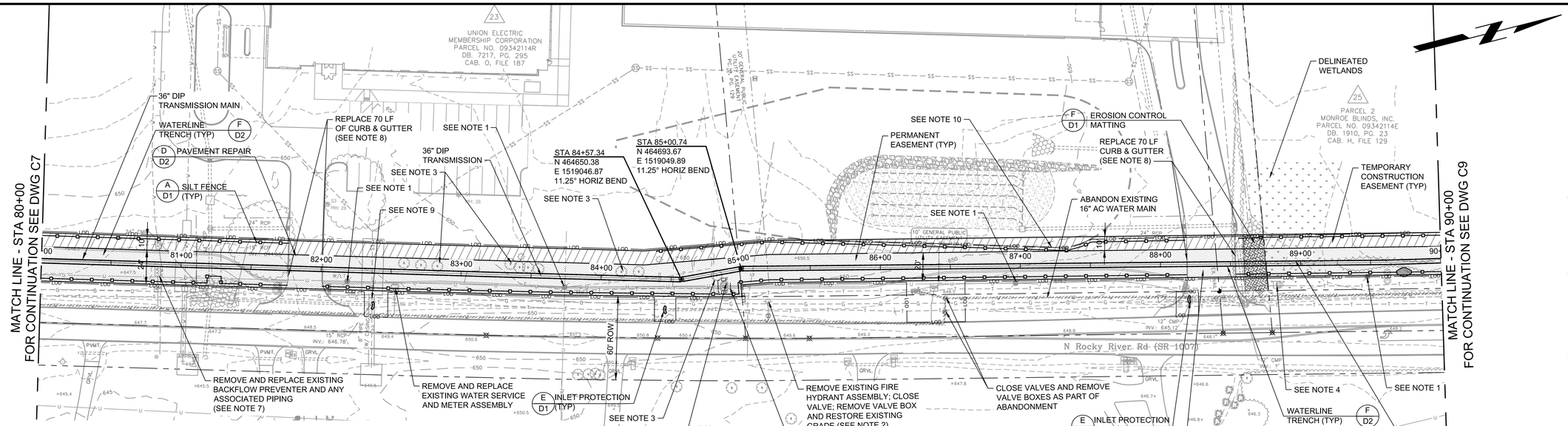
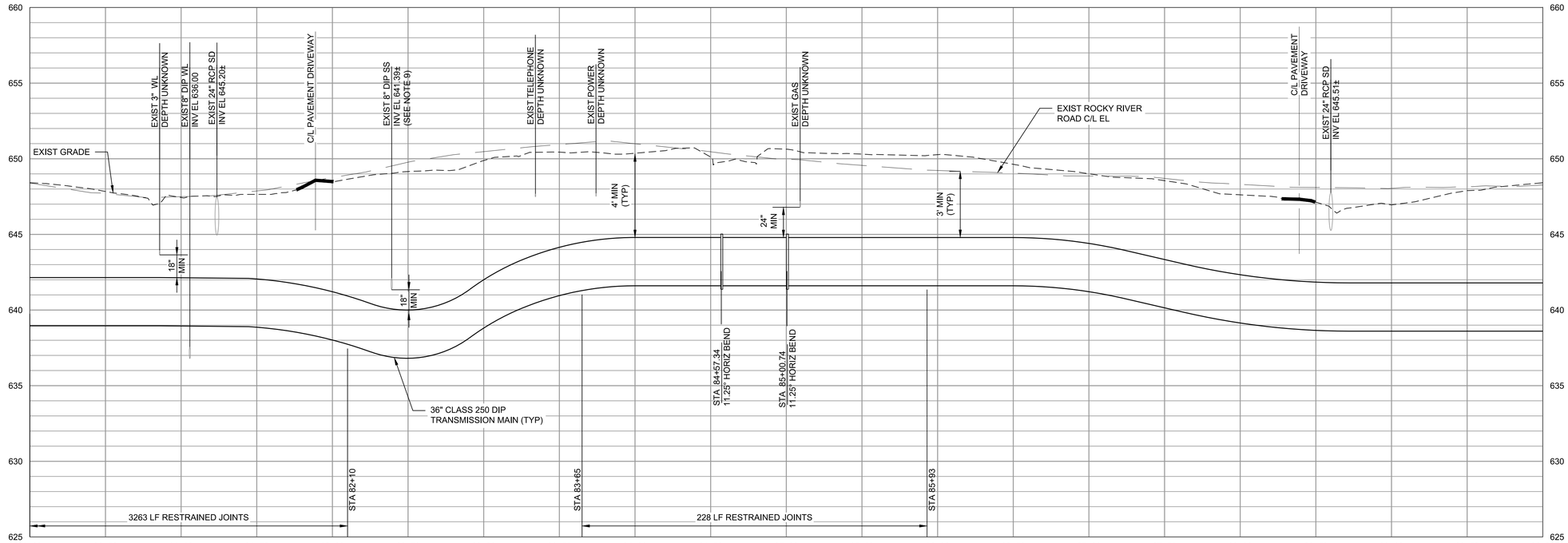


PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE. FOLLOWING ABANDONMENT OF EXISTING WATER MAIN CONTRACTOR SHALL REMOVE FIRE HYDRANT AS NOTED.
3. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
4. CONTRACTOR SHALL PROTECT TELEPHONE PEDESTAL AND ANY DAMAGE SHALL BE REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE IMMEDIATELY.
5. EXISTING UTILITIES INSTALLED AS PART OF THE REDEVELOPMENT OF PARCEL 23 ARE SHOWN BASED ON CONSTRUCTION DRAWINGS AND INFORMATION FROM PROPERTY OWNER. CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO PERFORMING ANY WORK AND ADVISE ENGINEER AND OWNER OF ANY CONFLICTS.
6. REDEVELOPMENT OF PARCEL 23 INCLUDED REGRADING ALONG THE PIPELINE CORRIDOR. THE REVISED GRADE IS NOT SHOWN ON THE PROFILE. IN ALL AREAS, THE NEW TRANSMISSION MAIN SHALL BE INSTALLED 4' MIN BELOW EXISTING GRADE AND 3' MIN BELOW THE EXISTING ROCKY RIVER ROAD C/L.
7. WATER SERVICE SHALL NOT BE INTERRUPTED AND CONTRACTOR SHALL PROVIDE TEMPORARY WATER SERVICE DURING RELOCATION AND REPLACEMENT OF THE EXISTING BACKFLOW PREVENTER AND ASSEMBLY. ANY COST ASSOCIATED WITH THIS SHALL BE INCIDENTAL TO THE WORK. CONTRACTOR SHALL PERFORM NIGHT OR WEEKEND WORK AS NECESSARY TO MAINTAIN WATER SERVICE DURING HOURS OF OPERATION. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING NIGHT/WEEKEND WORK.
8. CONTRACTOR SHALL REPLACE SIDEWALK, ADA RAMPS, AND CURB AND GUTTER TO THE NEXT JOINT TO MATCH EXISTING.
9. CONTRACTOR SHALL REPLACE EXISTING 8" DIP WITH 8" PC 350 DIP AS NEEDED TO CONSTRUCT TRANSMISSION MAIN. SEWER SERVICE SHALL NOT BE INTERRUPTED AND CONTRACTOR SHALL PROVIDE BYPASS PUMPING. ANY COST ASSOCIATED WITH THIS SHALL BE INCIDENTAL TO THE WORK
10. CONTRACTOR SHALL LIMIT ALL WORK TO OUTSIDE STORMWATER BMP.



PROFILE
HORIZONTAL SCALE 1"=40'
VERTICAL SCALE 1"=4'

BID SET

REVISIONS AND RECORD OF USE

NO.	BY	CHK	APP	DATE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:35-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building One Strategic Way, 66094
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 80+00 TO STA 90+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C8
SHEET
12 OF 42

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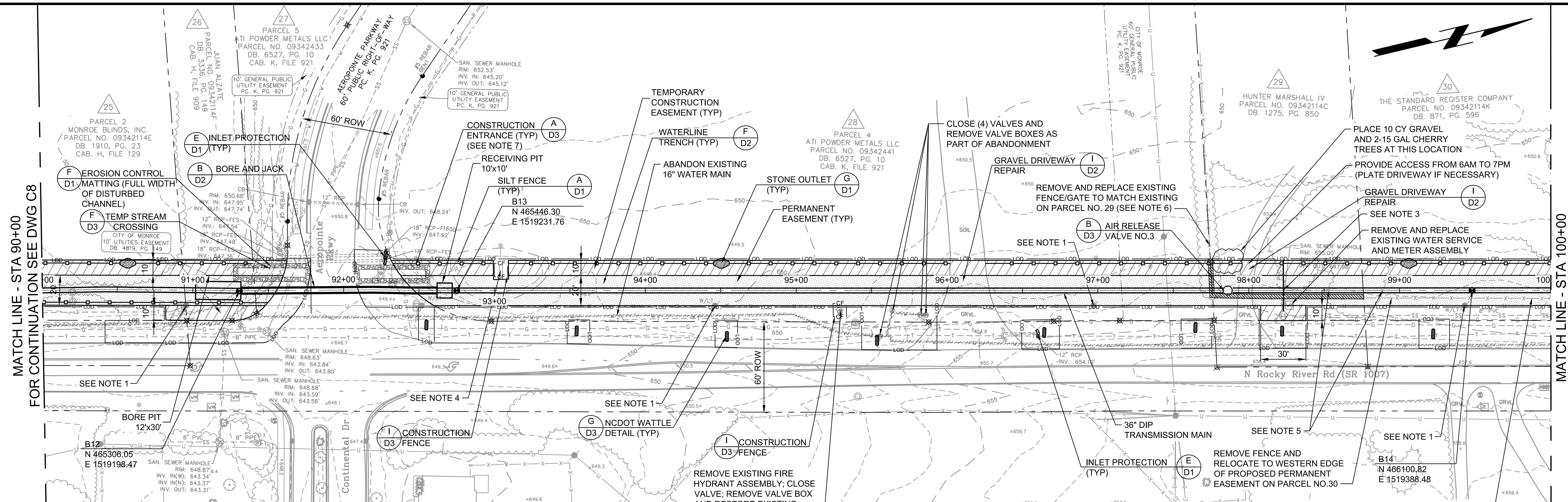

PLAN
1" = 40'

NOTES:

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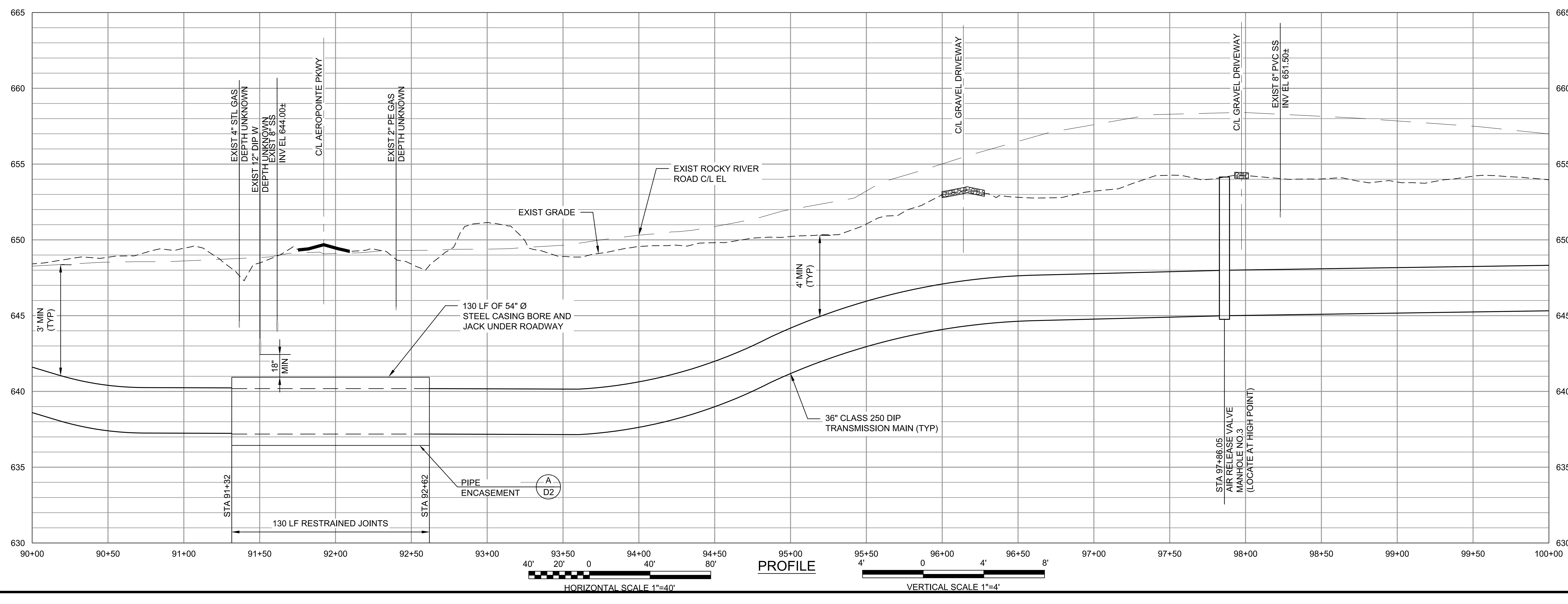
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE. FOLLOWING ABANDONMENT OF EXISTING WATER MAIN CONTRACTOR SHALL REMOVE FIRE HYDRANT AS NOTED.
3. CONTRACTOR SHALL REMOVE AND REPLACE 32 LINEAR FEET OF EXISTING 8" PVC WITH 32 FT OF PROTECTO 401 LINED CLASS 350 DIP AT A CONSTANT SLOPE. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR SHALL PROVIDE ORANGE CONSTRUCTION FENCE AROUND SIGN.
5. CONTRACTOR SHALL REPLACE ANY TREES TO BE REMOVED AS PART OF CONSTRUCTION ACTIVITIES ON PARCEL NO. 29 WITH A CREPE MYRTLES. CONTRACTOR SHALL COORDINATE LOCATION OF CREPE MYRTLES WITH PROPERTY OWNER.
6. CONTRACTOR SHALL PROVIDE TEMPORARY 6' CHAIN LINK FENCE AND GATES TO SECURE PARCEL NO. 29 AND 30 UNTIL EXISTING FENCE IS REINSTALLED/REPLACED. REMOVE AND DO NOT REPLACE EXISTING FENCE PER THE EXTENTS SHOWN IN THE PLANS. TEMPORARY FENCE SHALL BE INSTALLED ALONG WESTERN EDGE OF TEMPORARY CONSTRUCTION EASEMENT
7. CONTRACTOR SHALL ADJUST CONSTRUCTION ENTRANCE TO PREVENT DAMAGE TO EXISTING STORMWATER FLARED-END-SECTIONS ON EITHER SIDE OF AEROPOINTE PKWY. ANY DAMAGE TO EXISTING STORMWATER PIPES OR STRUCTURES SHALL BE REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE IN ACCORDANCE WITH THE CITY OF MONROE REQUIREMENTS.



PROFILE

BID SET

NO. | BY | CHK | APP
REVISIONS AND RECORD OF USE
DATE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. STOUT
2021.01.25 14:37:36-05'00'

BLACK & VEATCH
Black & Veatch International Company
Business License No. F-0794
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 90+00 TO STA 100+00

DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C9
SHEET
13 OF 42

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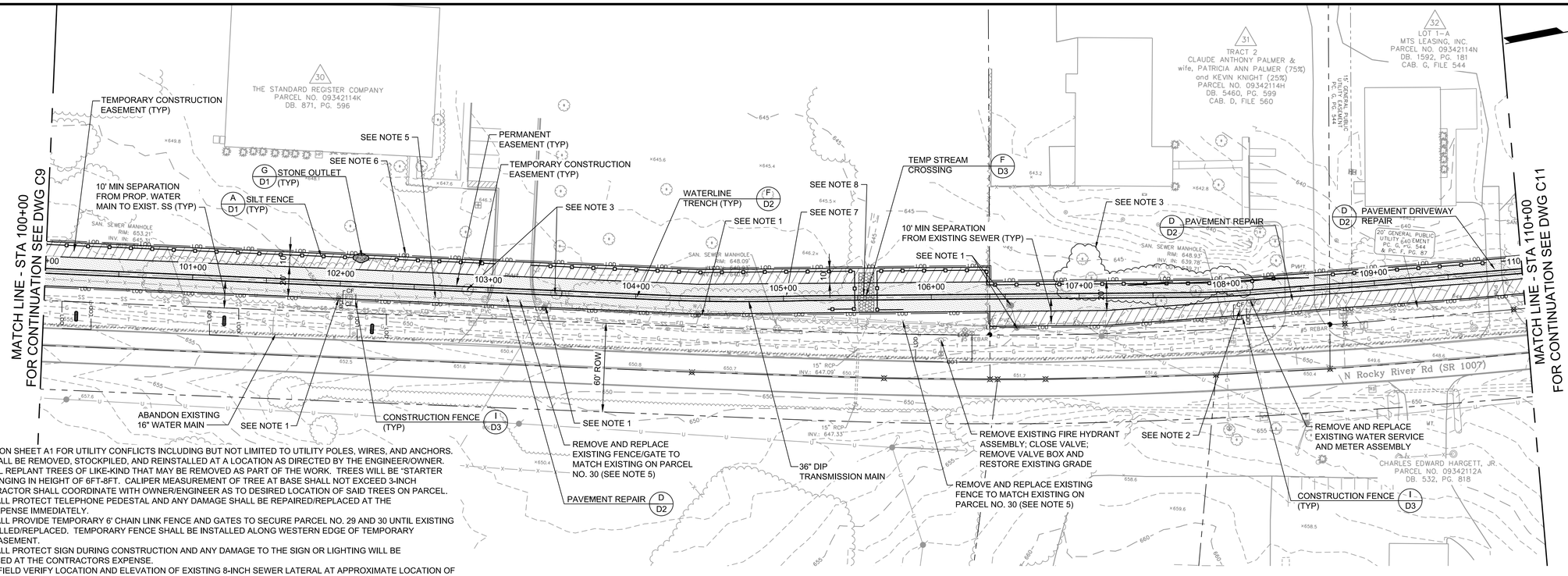

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. EXISTING SIGN SHALL BE REMOVED, STOCKPILED, AND REINSTALLED AT A LOCATION AS DIRECTED BY THE ENGINEER/OWNER.
3. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
4. CONTRACTOR SHALL PROTECT TELEPHONE PEDESTAL AND ANY DAMAGE SHALL BE REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE IMMEDIATELY.
5. CONTRACTOR SHALL PROVIDE TEMPORARY 6' CHAIN LINK FENCE AND GATES TO SECURE PARCEL NO. 29 AND 30 UNTIL EXISTING FENCE IS REINSTALLED/REPLACED. TEMPORARY FENCE SHALL BE INSTALLED ALONG WESTERN EDGE OF TEMPORARY CONSTRUCTION EASEMENT.
6. CONTRACTOR SHALL PROTECT SIGN DURING CONSTRUCTION AND ANY DAMAGE TO THE SIGN OR LIGHTING WILL BE REPAIRED/REPLACED AT THE CONTRACTORS EXPENSE.
7. CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF EXISTING 8-INCH SEWER LATERAL AT APPROXIMATE LOCATION OF STA 105+00 PRIOR TO BEGINNING ANY WORK IN THE AREA.
8. LINE DISTURBED CHANNEL WITH CLASS B RIPRAP FOR FULL WIDTH OF PERMANENT AND TEMPORARY EASEMENT.

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:37-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 100+00 TO STA 110+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

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SHEET
14 OF 42

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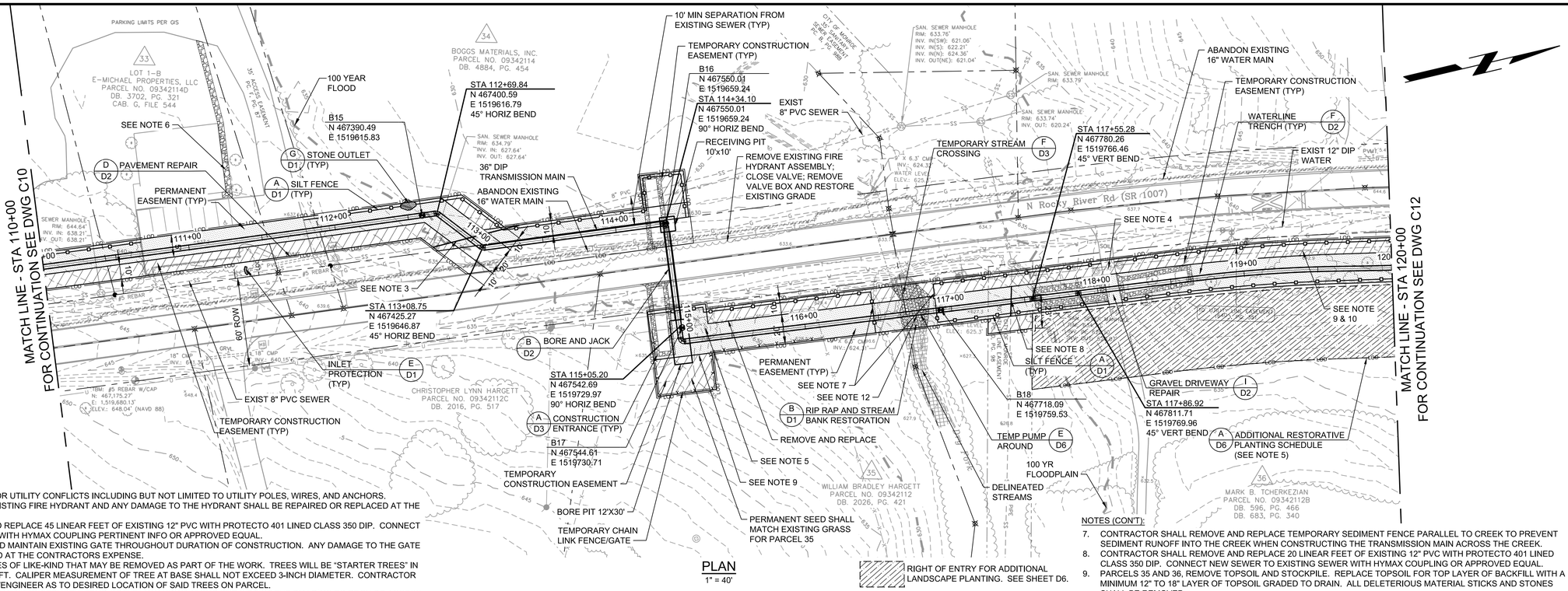


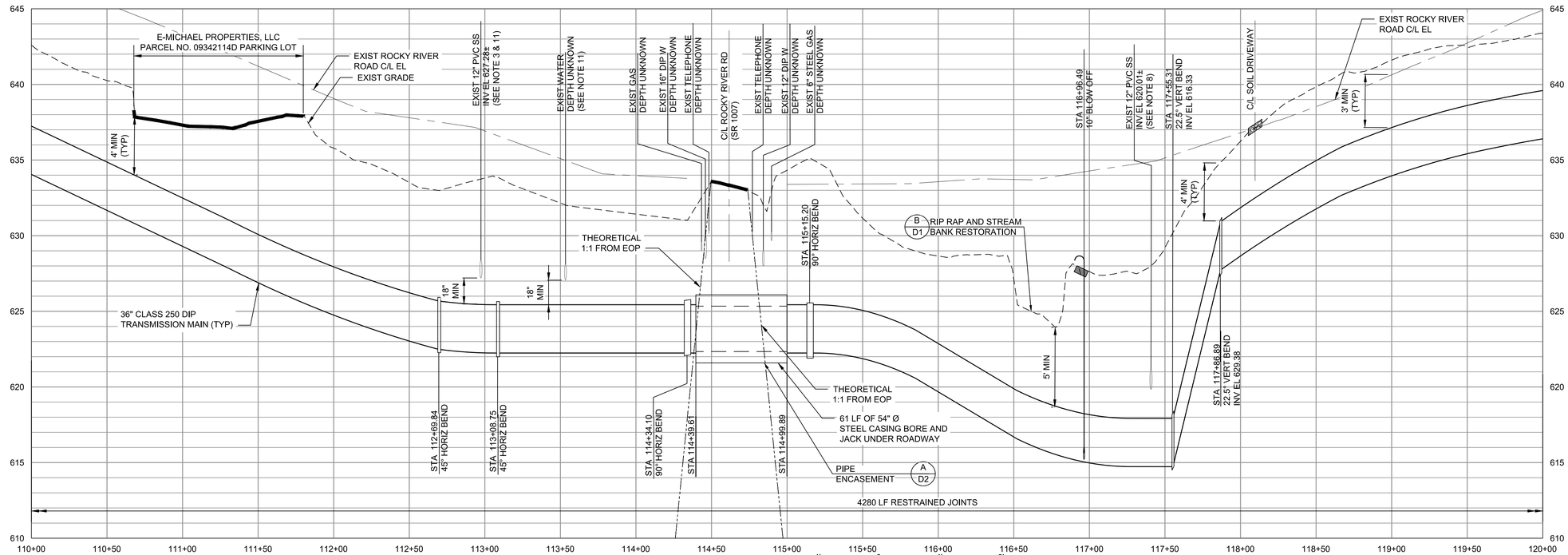
PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 45 LINEAR FEET OF EXISTING 12" PVC WITH PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH HYMAX COUPLING PERTINENT INFO OR APPROVED EQUAL.
4. CONTRACTOR SHALL PROTECT AND MAINTAIN EXISTING GATE THROUGHOUT DURATION OF CONSTRUCTION. ANY DAMAGE TO THE GATE SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
5. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
6. ON PARCEL NO.33 CONTRACTOR SHALL CONSTRUCT A TEMP GRAVEL WALKWAY ALONG THE SIDE OF THE BUILDING TO PROVIDE ACCESS FROM THE REAR PARKING LOT TO THE FRONT DOOR. THE WALKWAY SHALL BE APPROX 4 FT WIDE AND EXTEND AS SHOWN OR NO MORE THAN 100 LF. GRAVEL WALKWAY SHALL BE NCDOT # 57 STONE 2" THICK UNDERLAIN WITH TYPE A FABRIC AS SPECIFIED ON COMPACTED SUBGRADE. LOCATION SHALL BE COORDINATED WITH THE PROPERTY OWNER. UPON COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE WALKWAY AND RESTORE AREA TO EXISTING OR BETTER CONDITION.

NOTES (CON'T):

7. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK TO PREVENT SEDIMENT RUNOFF INTO THE CREEK WHEN CONSTRUCTING THE TRANSMISSION MAIN ACROSS THE CREEK.
8. CONTRACTOR SHALL REMOVE AND REPLACE 20 LINEAR FEET OF EXISTING 12" PVC WITH PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH HYMAX COUPLING OR APPROVED EQUAL.
9. PARCELS 35 AND 36, REMOVE TOPSOIL AND STOCKPILE. REPLACE TOPSOIL FOR TOP LAYER OF BACKFILL WITH A MINIMUM 12" TO 18" LAYER OF TOPSOIL GRADED TO DRAIN. ALL DELETERIOUS MATERIAL STICKS AND STONES SHALL BE REMOVED.
10. PRESERVE TREES/SHRUBS IN THE TEMPORARY CONSTRUCTION EASEMENT ON PARCEL 36.
11. CONTRACTOR SHALL CONFIRM THE DEPTH OF THE EXISTING WATER MAINS PRIOR TO PERFORMING ANY WORK IN THE AREA.
12. CONTRACTOR SHALL SUBMIT A PLAN TO ENGINEER FOR REVIEW FOR CONSTRUCTION OF PIPELINE IN THE DRY WHILE MAINTAINING STREAM FLOW.



PROFILE

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. WILLIAM D. SPIRES
2021.01.25 14:37:38-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building One Strong Company
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 110+00 TO STA 120+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C11
SHEET
15 OF 42

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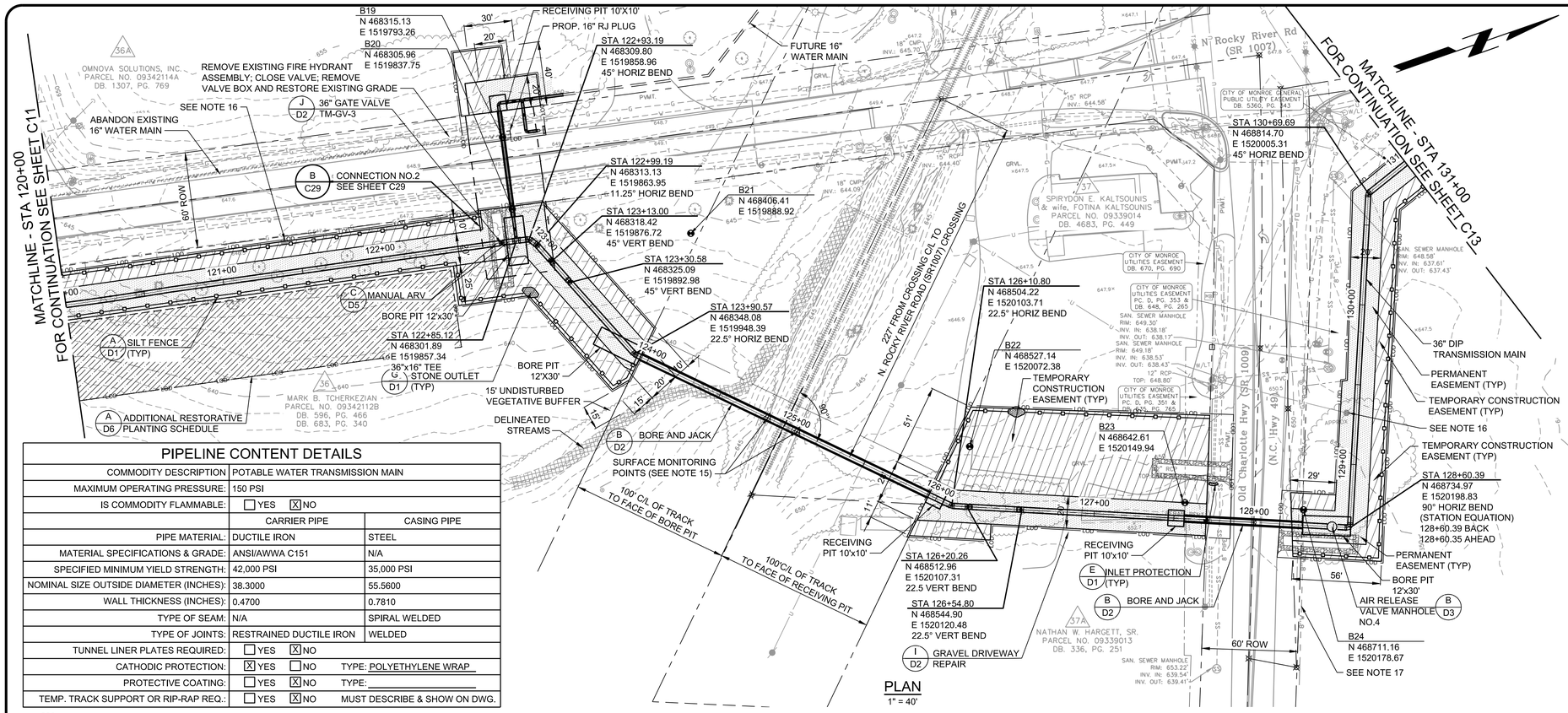


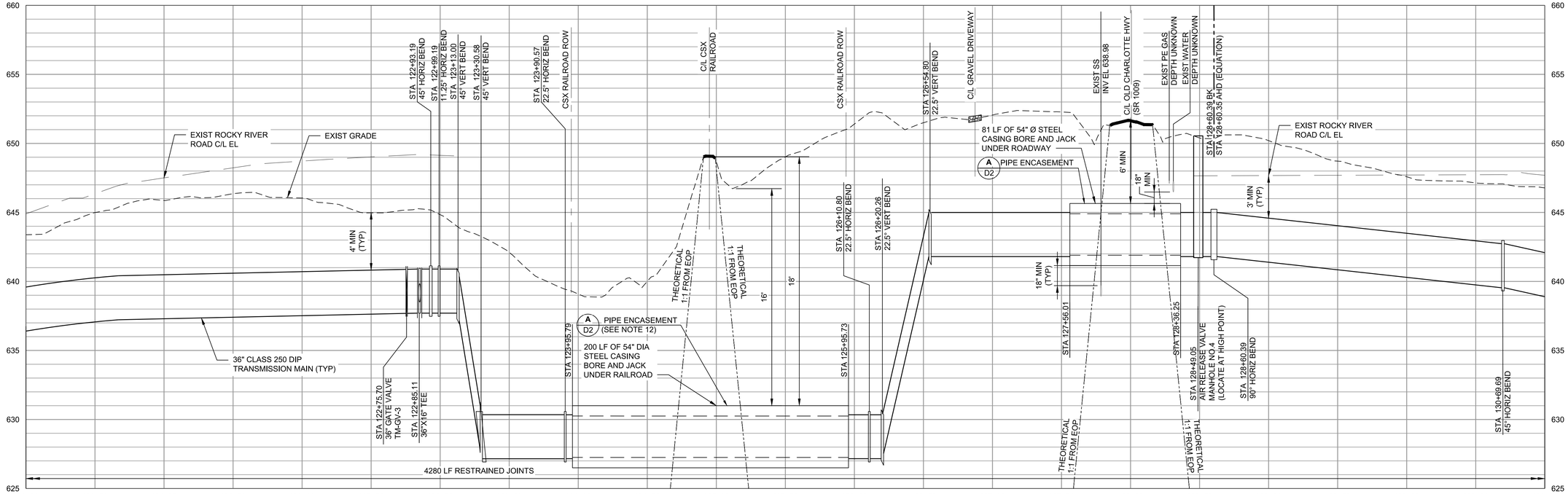
PLAN
1" = 40'

PIPELINE CONTENT DETAILS

COMMODITY DESCRIPTION	POTABLE WATER TRANSMISSION MAIN	
MAXIMUM OPERATING PRESSURE:	150 PSI	
IS COMMODITY FLAMMABLE:	☐ YES ☒ NO	
	CARRIER PIPE	CASING PIPE
PIPE MATERIAL:	DUCTILE IRON	STEEL
MATERIAL SPECIFICATIONS & GRADE:	ANSI/AWWA C151	N/A
SPECIFIED MINIMUM YIELD STRENGTH:	42,000 PSI	35,000 PSI
NOMINAL SIZE OUTSIDE DIAMETER (INCHES):	38.3000	55.5600
WALL THICKNESS (INCHES):	0.4700	0.7810
TYPE OF SEAM:	N/A	SPIRAL WELDED
TYPE OF JOINTS:	RESTRAINED DUCTILE IRON	WELDED
TUNNEL LINER PLATES REQUIRED:	☐ YES ☒ NO	
CATHODIC PROTECTION:	☒ YES ☐ NO TYPE: POLYETHYLENE WRAP	
PROTECTIVE COATING:	☐ YES ☒ NO TYPE:	
TEMP. TRACK SUPPORT OR RIP-RAP REQ.:	☐ YES ☒ NO MUST DESCRIBE & SHOW ON DWG.	

NOTES:

1. REFER TO THE CSX PIPELINE DESIGN & CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. THE FRONT OF THE PIPE SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENTS OR DEVICES THAT WILL POSITIVELY PREVENT THE AUGER FROM LEADING THE PIPE SO THAT NO UNSUPPORTED EXCAVATION IS AHEAD OF THE PIPE.
3. THE OPERATION SHALL BE PROGRESSED ON A 24-HOUR BASIS WITHOUT STOPPAGE (EXCEPT FOR ADDING LENGTHS OF PIPE) UNTIL THE LEADING EDGE OF THE PIPE HAS REACHED THE RECEIVING PIT.
4. THE AUGER AND CUTTING HEAD ARRANGEMENT SHALL BE REMOVABLE FROM WITHIN THE PIPE IN THE EVENT AN OBSTRUCTION IS ENCOUNTERED.
5. PIPELINE SHALL BE PROMINENTLY MARKED AT BOTH SIDES OF THE CSX PROPERTY LINES BY DURABLE, WEATHERPROOF SIGNS LOCATED OVER THE CENTERLINE OF THE PIPE IN ACCORDANCE WITH CSX SPECIFICATIONS.
6. NO CONSTRUCTION OR ENTRY UPON THE CSX CORRIDOR IS PERMITTED UNTIL THE DOCUMENT TRANSACTION IS COMPLETED, YOU ARE IN RECEIPT OF A FULLY EXECUTED DOCUMENT, AND YOU HAVE OBTAINED AUTHORITY FROM THE LOCAL ROADMASTER.
7. IF REQUIRED, A DEWATERING PLAN IN ACCORDANCE WITH CSX SPECIFICATIONS WILL BE SUBMITTED TO THE CSX REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO ANY DEWATERING OPERATIONS.
8. BLASTING IS NOT PERMITTED UNDER OR ON CSX PROPERTY. SEE CSX873182 EXHIBIT A.
9. CSX DOES NOT GRANT OR CONVEY AN EASEMENT FOR THIS INSTALLATION.
10. EXISTING PIPES TO BE ABANDONED WILL BE COMPLETELY FILLED WITH CEMENT GROUT, COMPACTED SAND , OR FLOWABLE FILL.
11. REFER TO PROJECT SPECIFICATIONS FOR CSX RAILROAD ENCROACHMENT AGREEMENT.
12. STEEL CASING PIPE SHALL BE SPIRAL WELDED STEEL WITH A MINIMUM WALL THICKNESS EQUAL TO 0.781 INCHES AND A MINIMUM YIELD STRENGTH EQUAL TO 35,000 PSI.
13. CONTRACTOR SHALL PROVIDE DURABLE WEATHERPROOF SIGNS ON BOTH SIDES OF TRACK AT RR R/W LINES LOCATED OVER THE CENTERLINE OF THE PIPE PER CSX TRANSPORTATION DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS.
14. CONTRACTOR SHALL FOLLOW THE LATEST EDITION OF THE CSX TRANSPORTATION DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS.
15. CONTRACTOR SHALL PROVIDE GEOTECHNICAL MONITORING POINTS PER SPECIFICATION 02309. LOCATION OF SURFACE MONITORING POINT IS APPROX. CONTRACTOR SHALL ADJUST AS NEEDED.
16. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES AND ANCHORS.
17. EXISTING 8" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.



PROFILE
HORIZONTAL SCALE 1"=40'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:39-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 120+00 TO STA 131+00

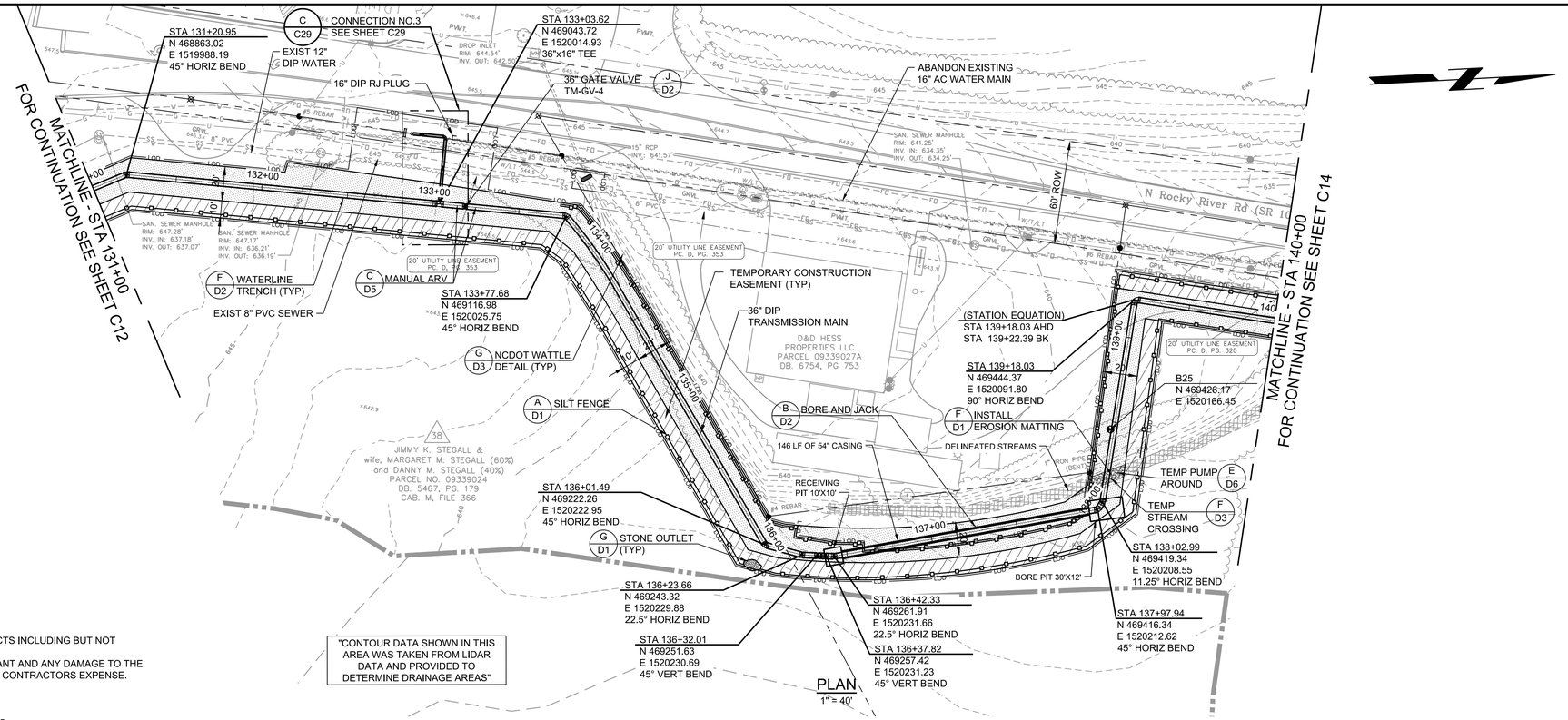
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C12
SHEET
16 OF 42

FD7000_PW
D10000



NOTES:

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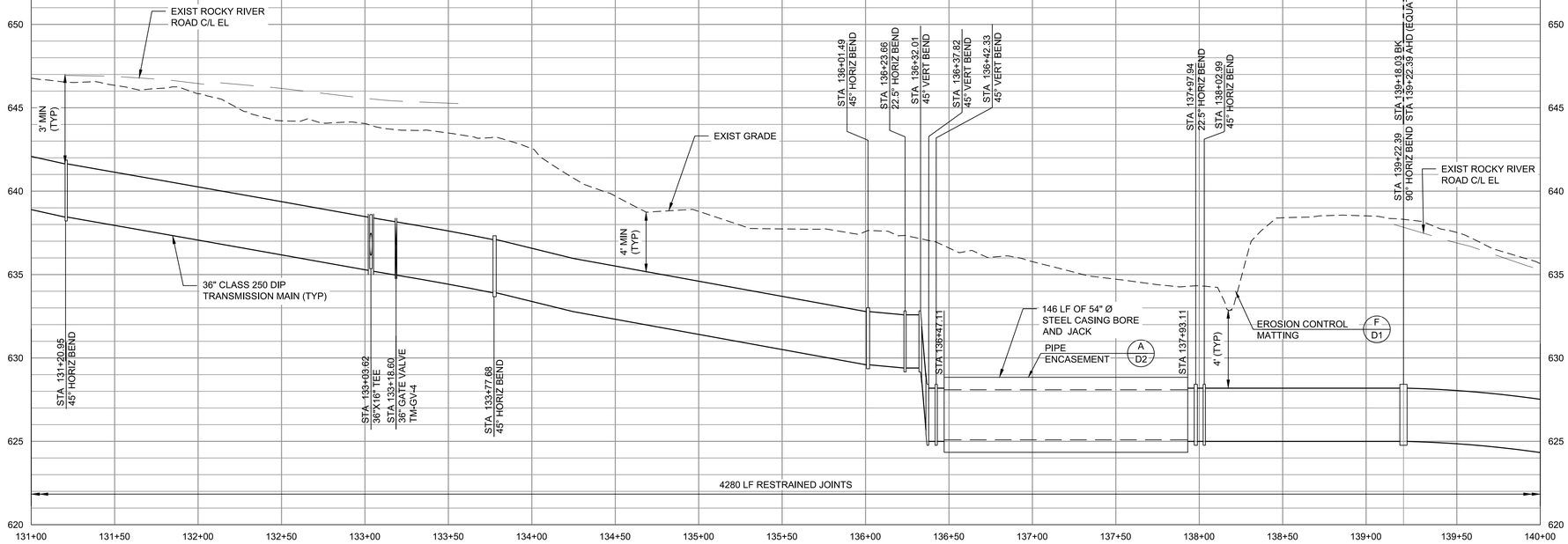


PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. PHILLIP SWEET
2021.01.25 14:37:40-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 131+00 TO STA 140+00

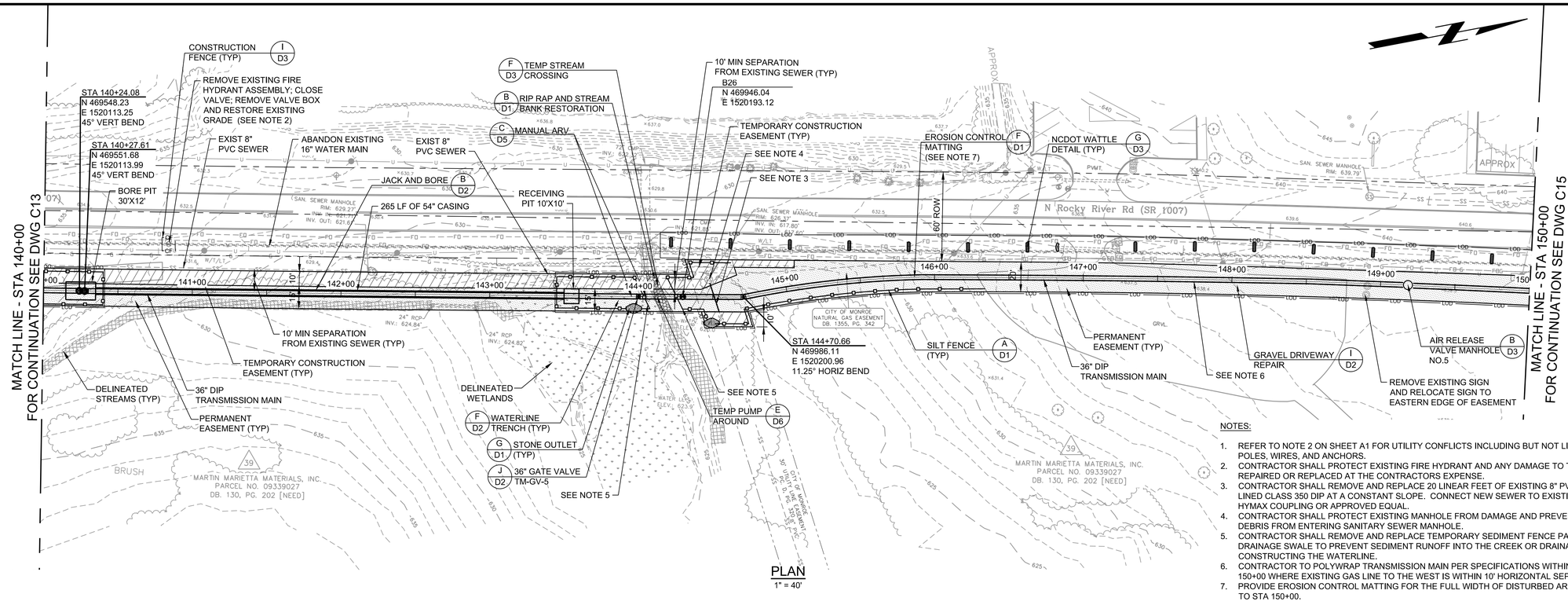
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C13
SHEET
17 OF 42

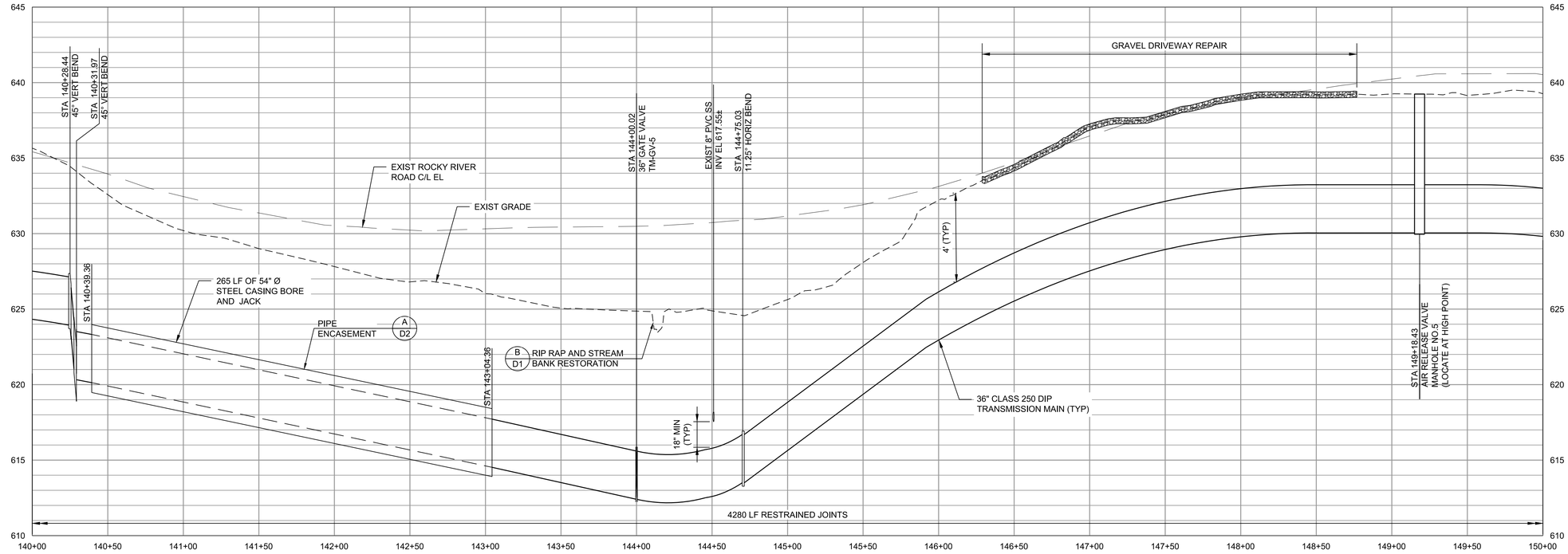
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 20 LINEAR FEET OF EXISTING 8" PVC PROTECTO 401 LINED CLASS 350 DIP AT A CONSTANT SLOPE. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR SHALL PROTECT EXISTING MANHOLE FROM DAMAGE AND PREVENT SEDIMENT AND DEBRIS FROM ENTERING SANITARY SEWER MANHOLE.
5. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.
6. CONTRACTOR TO POLYWRAP TRANSMISSION MAIN PER SPECIFICATIONS WITHIN STA 144+00 TO STA 150+00 WHERE EXISTING GAS LINE TO THE WEST IS WITHIN 10' HORIZONTAL SEPARATION.
7. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 144+25 TO STA 150+00.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. STOUT
2021.01.25 14:37:41-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 140+00 TO STA 150+00

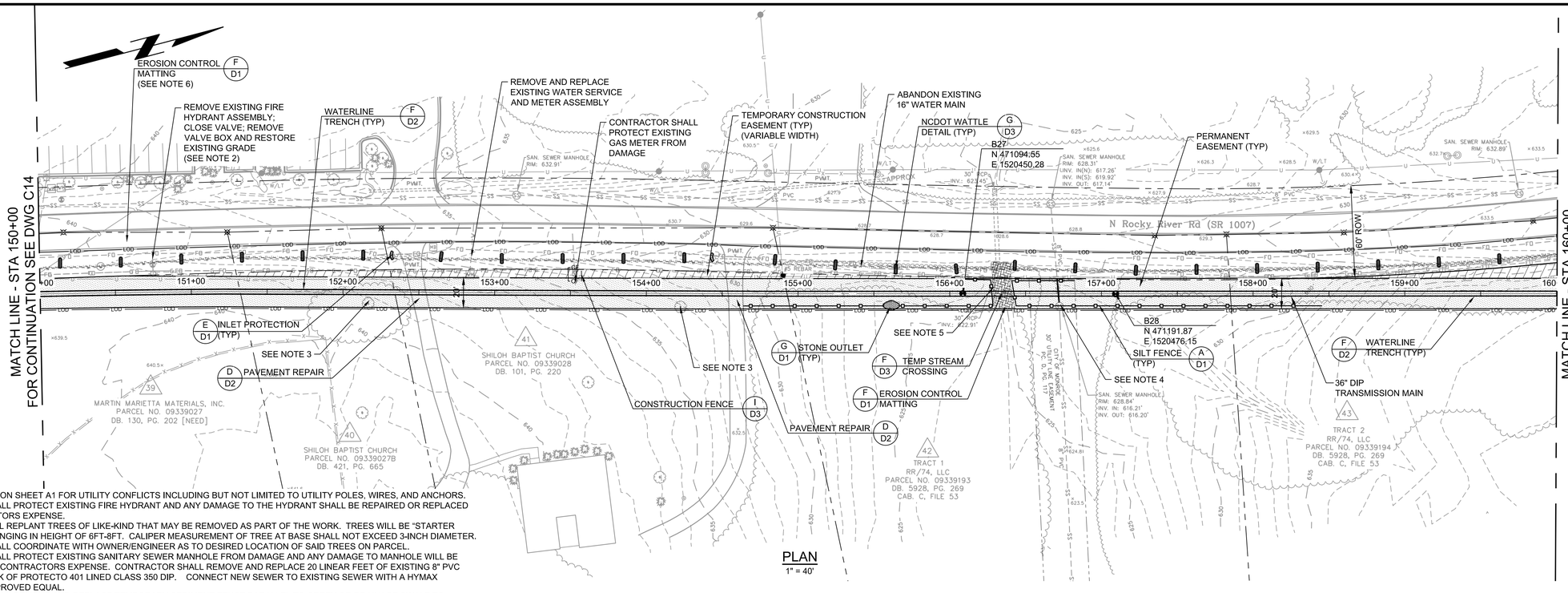
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

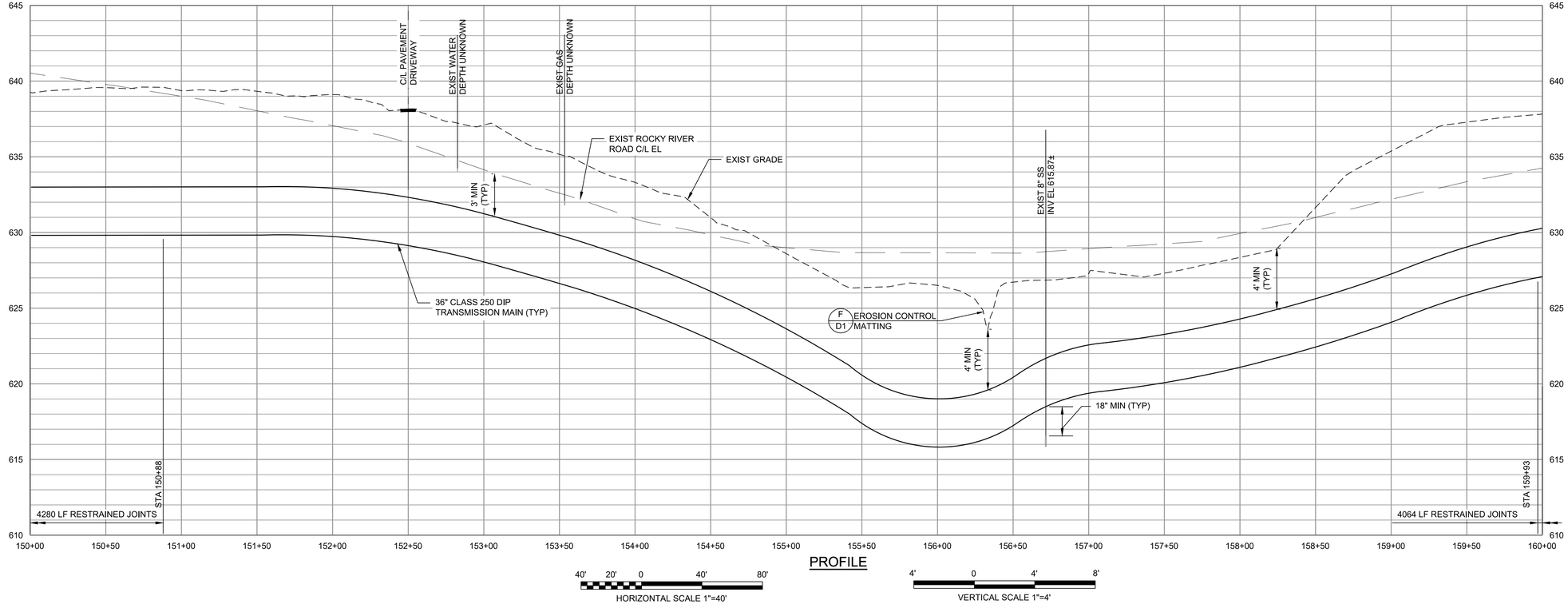
C14
SHEET
18 OF 42

FD7000_PW
D10000



NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
4. CONTRACTOR SHALL PROTECT EXISTING SANITARY SEWER MANHOLE FROM DAMAGE AND ANY DAMAGE TO MANHOLE WILL BE REPAIRED AT THE CONTRACTORS EXPENSE. CONTRACTOR SHALL REMOVE AND REPLACE 20 LINEAR FEET OF EXISTING 8" PVC WITH A 20 FT STICK OF PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
5. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.
6. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 150+00 TO STA 160+00.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCHOLL
2021.01.25 14:37:41-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 150+00 TO STA 160+00

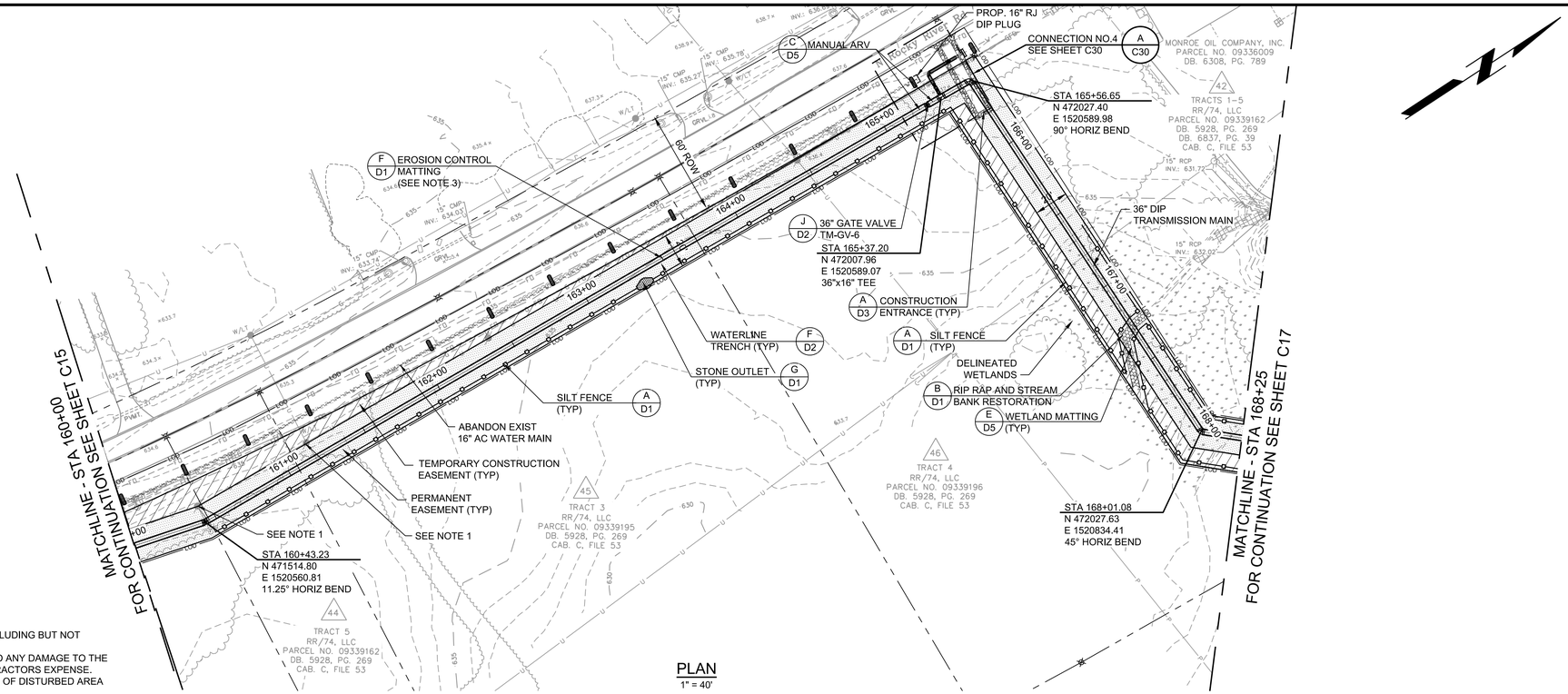
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C15
SHEET
19 OF 42

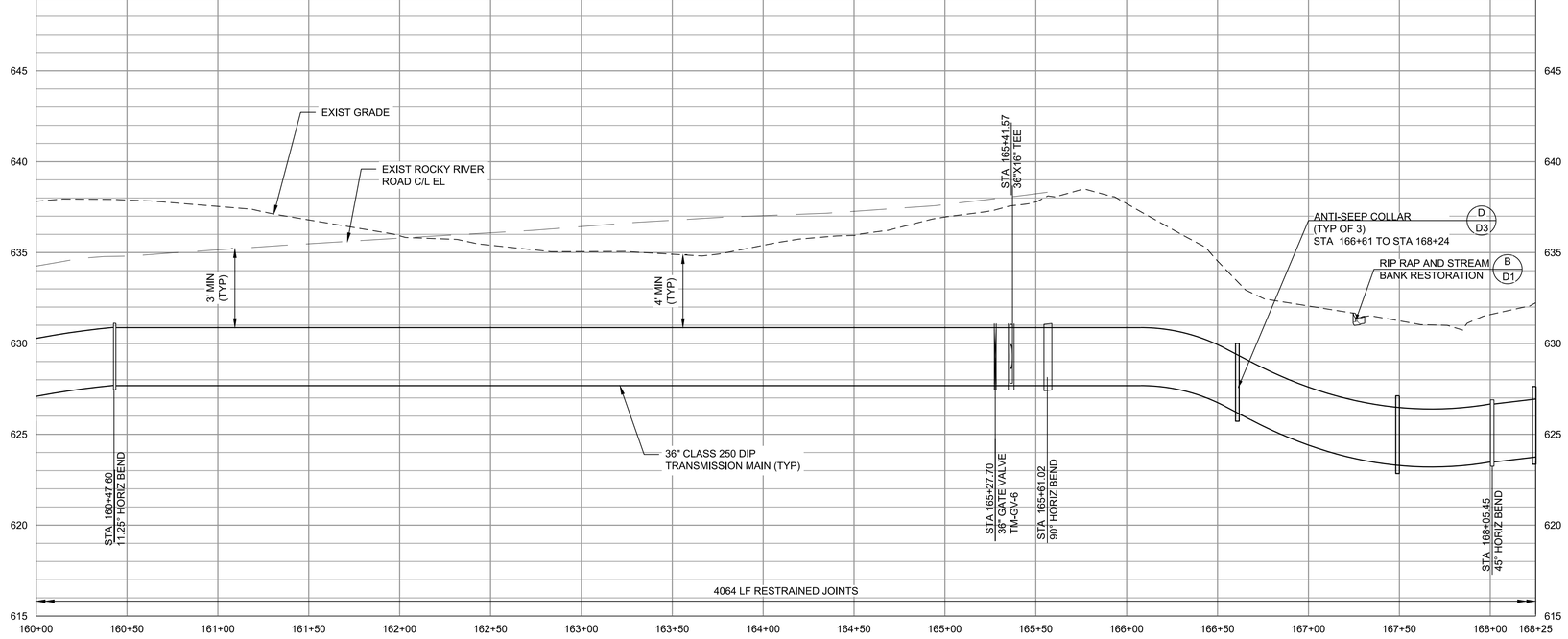
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA FROM STA 160+00 TO STA 165+57.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCOTT
2021.01.25 14:37:42-05'00'

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Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 160+00 TO STA 168+25

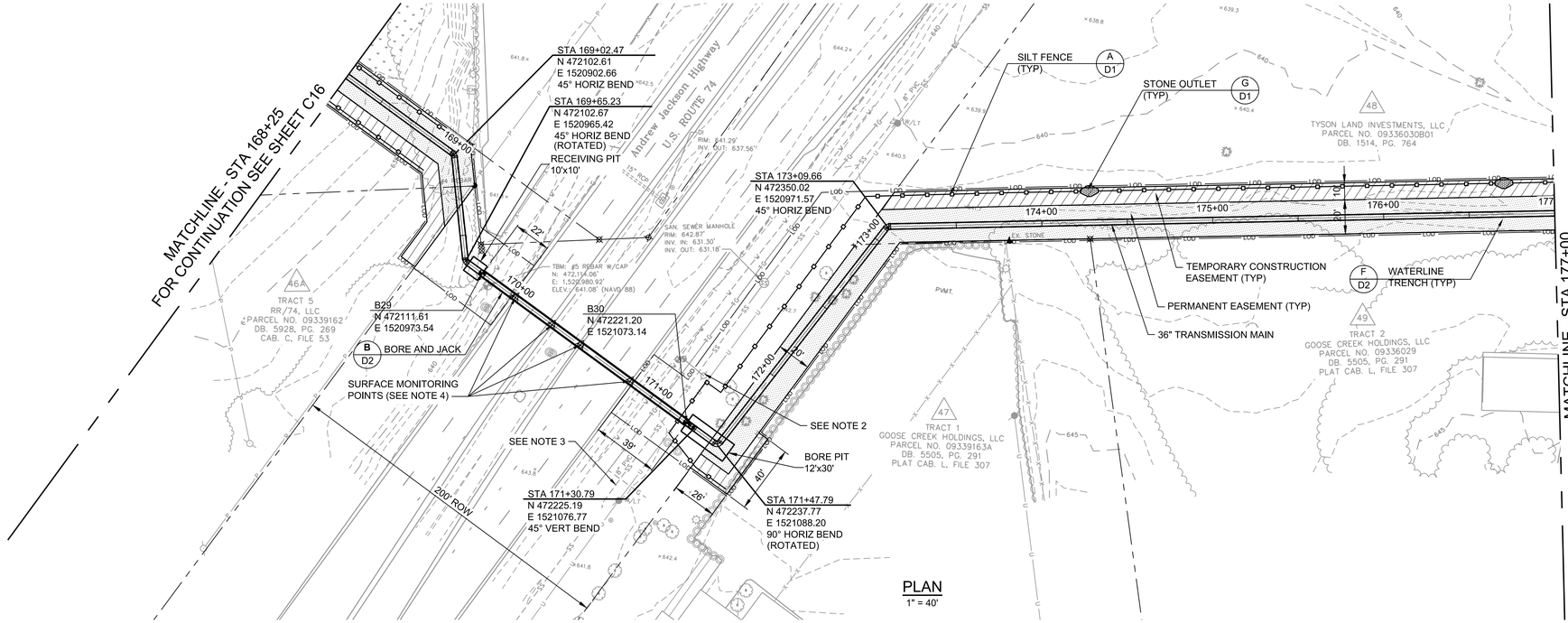
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C16
SHEET
20 OF 42

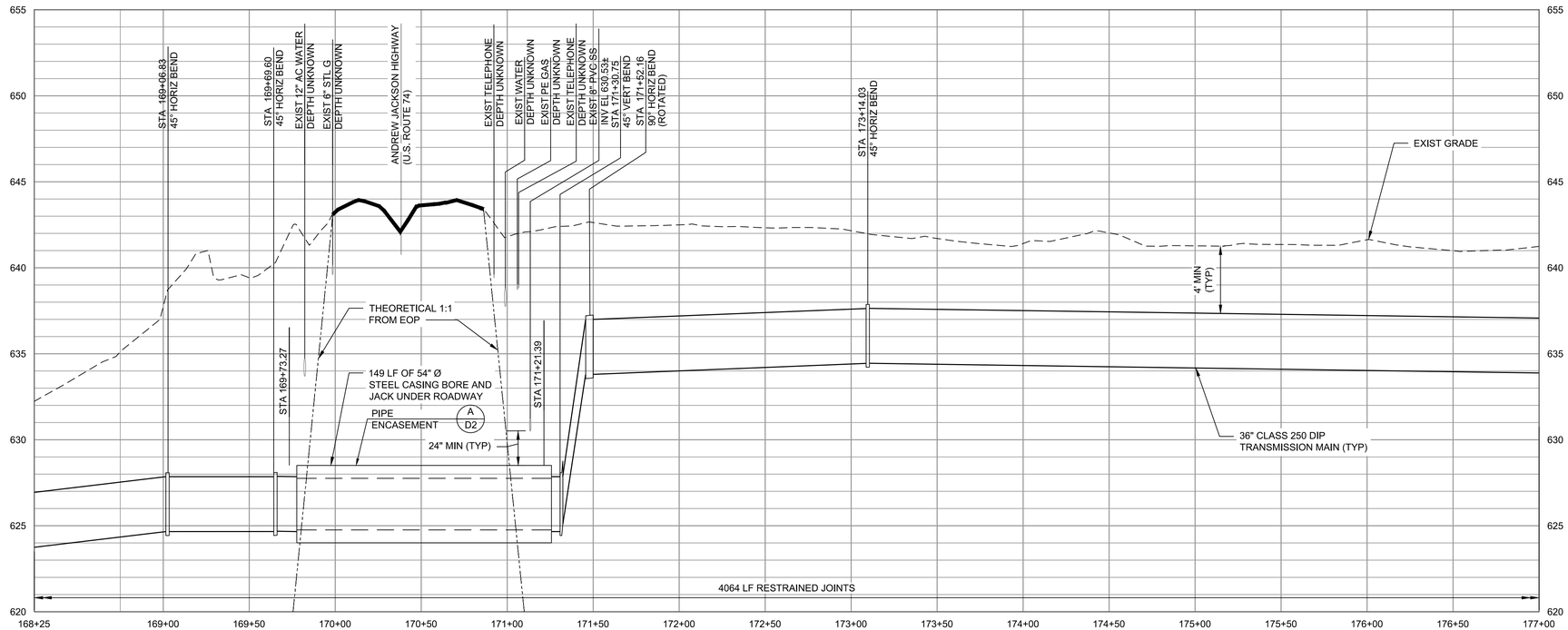
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. EXISTING DOWNSTREAM SANITARY SEWER MANHOLE IS LOCATED APPROXIMATELY 395 LF SOUTHEAST OF UPSTREAM MANHOLE.
4. CONTRACTOR SHALL PROVIDE GEOTECHNICAL MONITORING POINTS PER SPECIFICATION 02309. LOCATION OF SURFACE MONITORING POINT IS APPROX. CONTRACTOR SHALL ADJUST AS NEEDED.



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL T. LOVE
2021.01.25 14:37:43-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building One Strong Future
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 168+25 TO STA 177+00

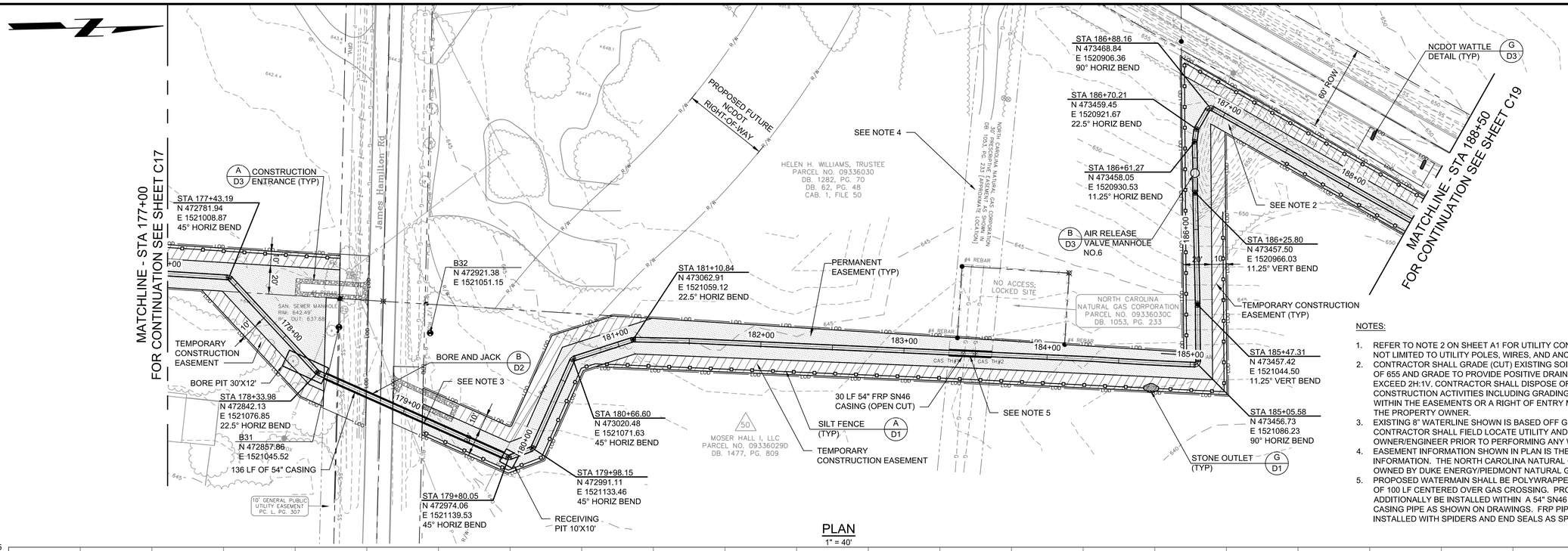
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

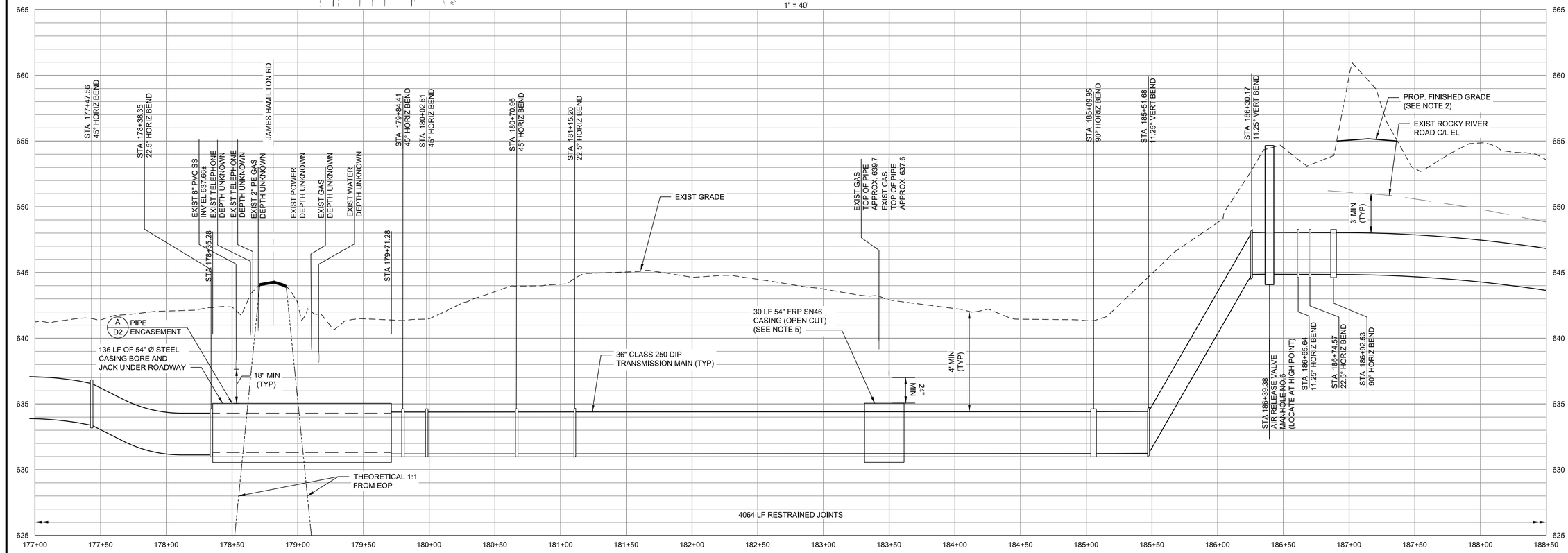
PROJECT NO.
186110

C17
SHEET
21 OF 42

FD7000_PW
D10000



PLAN
1" = 40'



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL GRADE (CUT) EXISTING SOIL MOUND TO AN ELEVATION OF 655 AND GRADE TO PROVIDE POSITIVE DRAINAGE. SLOPE SHALL NOT EXCEED 2H:1V. CONTRACTOR SHALL DISPOSE OF EXISTING SOILS. ALL CONSTRUCTION ACTIVITIES INCLUDING GRADING SHALL BE PERFORMED WITHIN THE EASEMENTS OR A RIGHT OF ENTRY MUST BE OBTAINED FROM THE PROPERTY OWNER.
3. EXISTING 8" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
4. EASEMENT INFORMATION SHOWN IN PLAN IS THE RECORDED EASEMENT INFORMATION. THE NORTH CAROLINA NATURAL GAS CORPORATION IS NOW OWNED BY DUKE ENERGY/PIEDMONT NATURAL GAS.
5. PROPOSED WATERMAIN SHALL BE POLYWRAPPED AS SPECIFIED A MINIMUM OF 100 LF CENTERED OVER GAS CROSSING. PROPOSED WATERMAIN SHALL ADDITIONALLY BE INSTALLED WITHIN A 54" SN46 FIBERGLASS REINFORCED CASING PIPE AS SHOWN ON DRAWINGS. FRP PIPE ENCASEMENT SHALL BE INSTALLED WITH SPIDERS AND END SEALS AS SPECIFIED.

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM PAUL SMITH
2021.01.25 14:37:44 -05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 177+00 TO STA 188+50

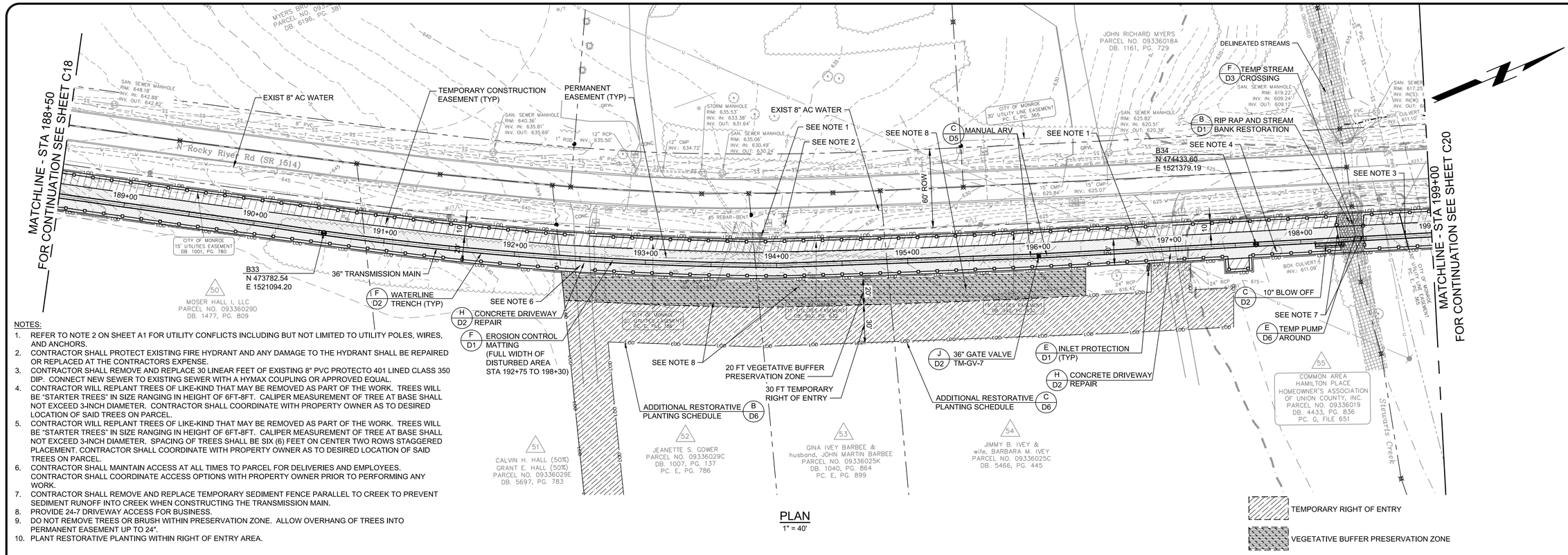
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C18
SHEET
22 OF 42

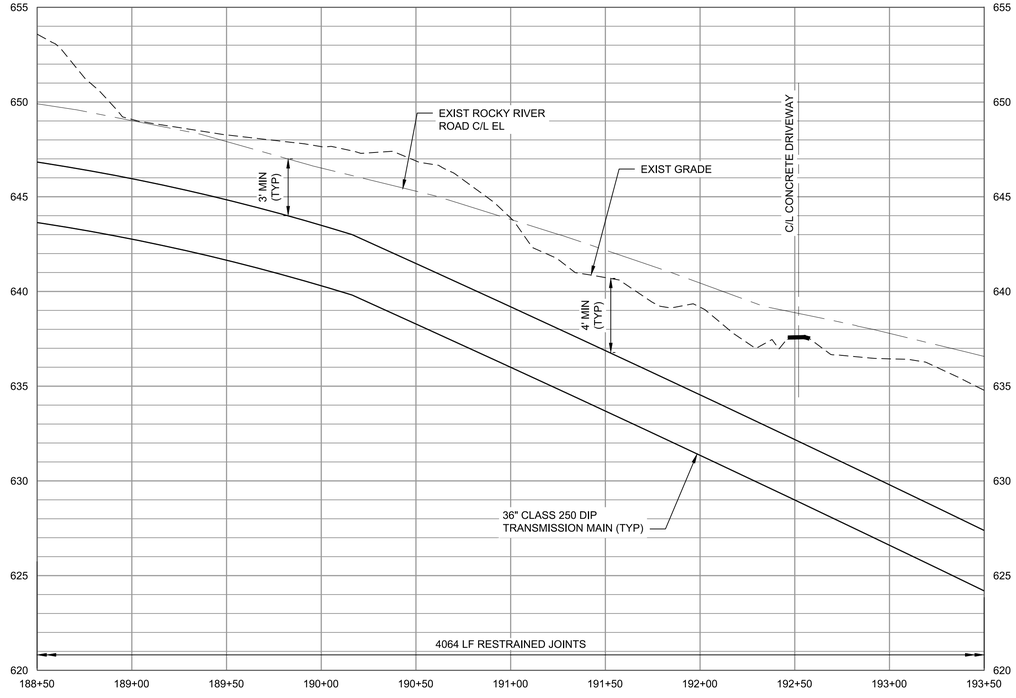
FD7000_PW
D10000



PLAN
1" = 40'

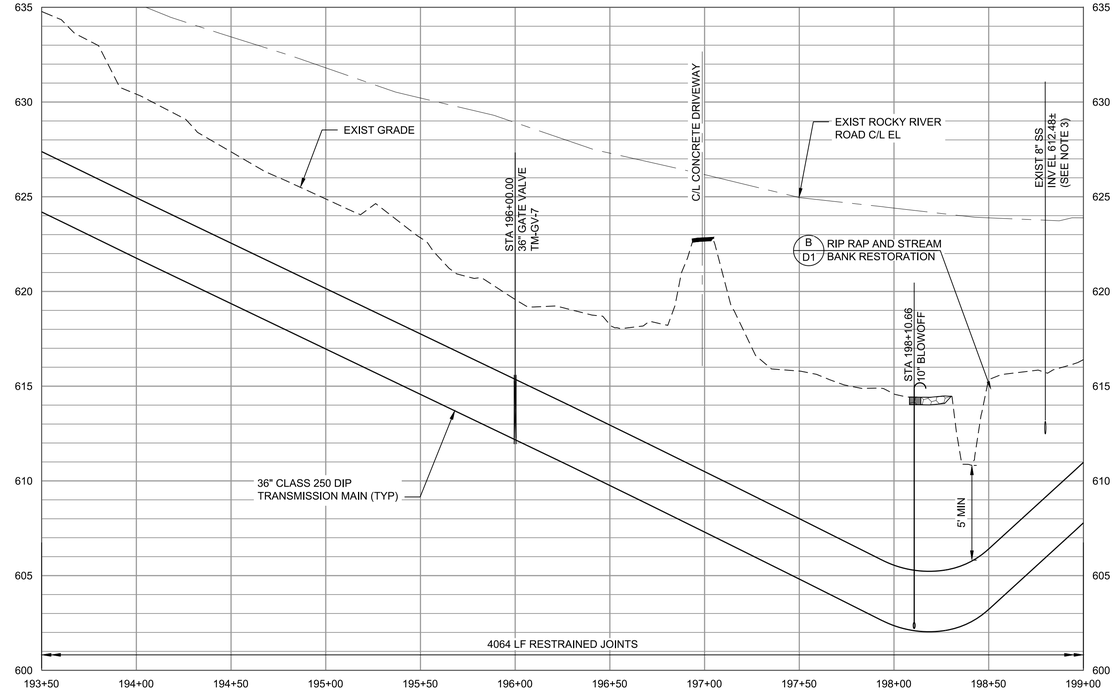
NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 30 LINEAR FEET OF EXISTING 8" PVC PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. SPACING OF TREES SHALL BE SIX (6) FEET ON CENTER TWO ROWS STAGGERED PLACEMENT. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
6. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES TO PARCEL FOR DELIVERIES AND EMPLOYEES. CONTRACTOR SHALL COORDINATE ACCESS OPTIONS WITH PROPERTY OWNER PRIOR TO PERFORMING ANY WORK.
7. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK TO PREVENT SEDIMENT RUNOFF INTO CREEK WHEN CONSTRUCTING THE TRANSMISSION MAIN.
8. PROVIDE 24-7 DRIVEWAY ACCESS FOR BUSINESS.
9. DO NOT REMOVE TREES OR BRUSH WITHIN PRESERVATION ZONE. ALLOW OVERHANG OF TREES INTO PERMANENT EASEMENT UP TO 24".
10. PLANT RESTORATIVE PLANTING WITHIN RIGHT OF ENTRY AREA.



40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

PROFILE



4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. MICHAEL SCOTT
2021.01.25 14:37:45-05'00'

BLACK & VEATCH

Black & Veatch International Company
Black & Veatch Building, USA
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 188+50 TO STA 199+00

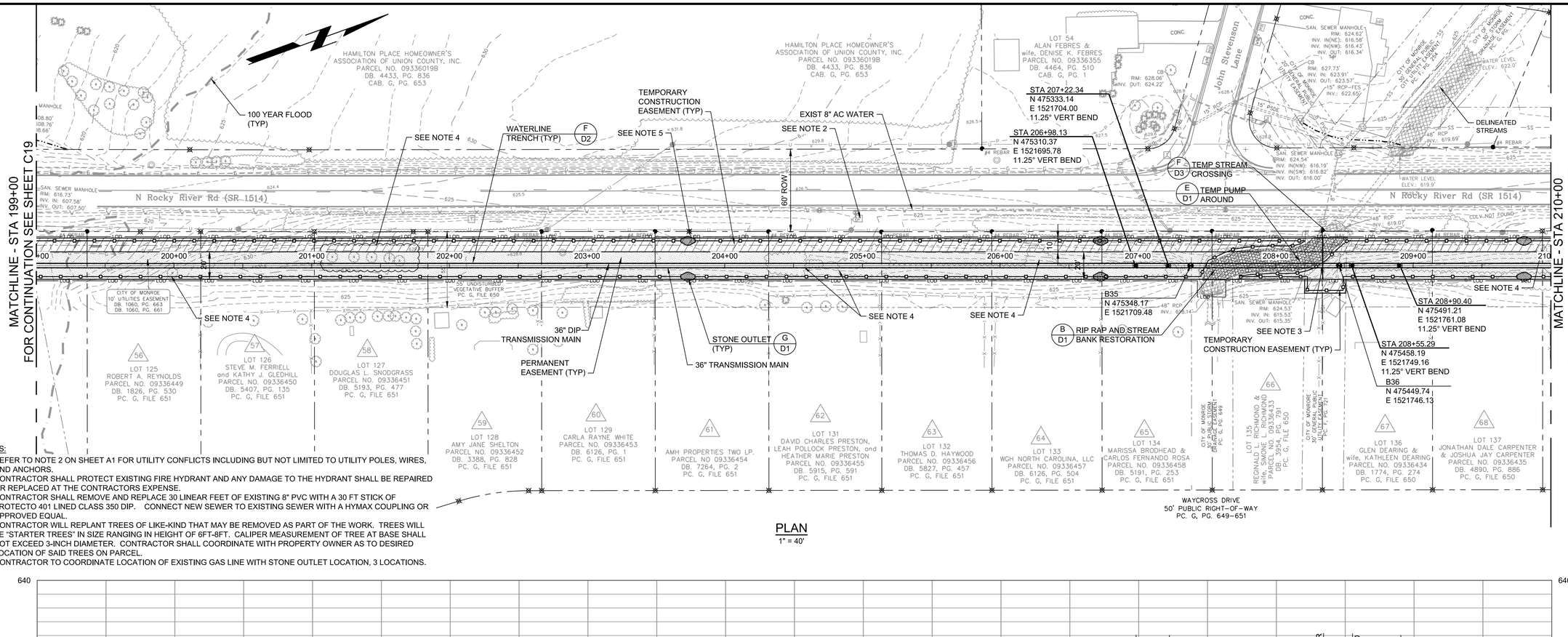
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C19
SHEET
23 OF 42

FD7000_PW
D10000



PLAN
1" = 40'

NOTES:
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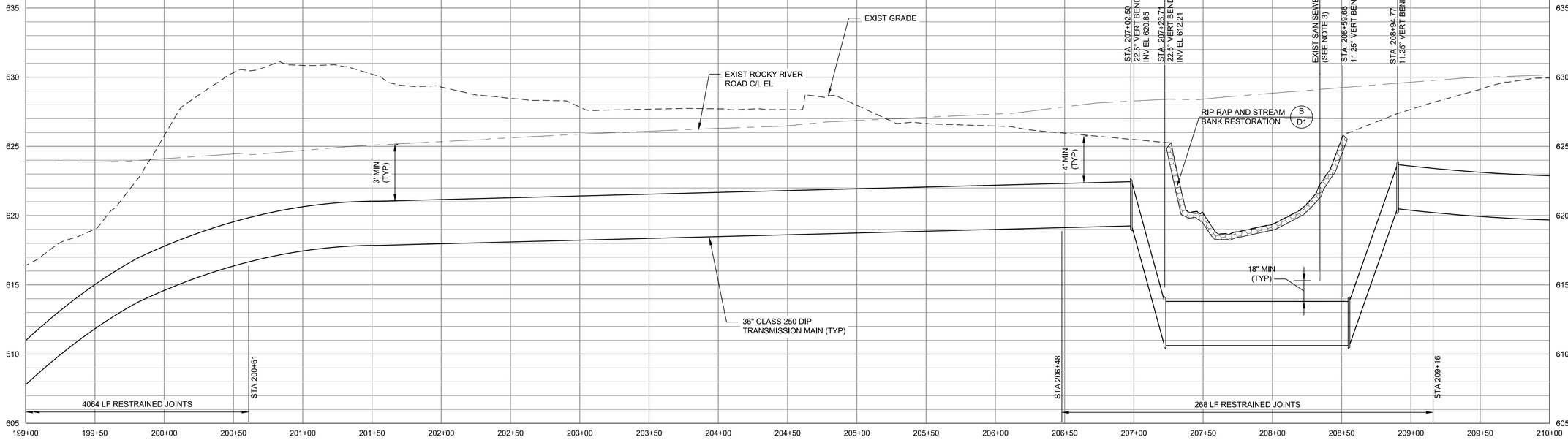
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 30 LINEAR FEET OF EXISTING 8" PVC WITH A 30 FT STICK OF PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR TO COORDINATE LOCATION OF EXISTING GAS LINE WITH STONE OUTLET LOCATION, 3 LOCATIONS.



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCOTT
2021.01.25 14:37:46-05'00'

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Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 199+00 TO STA 210+00

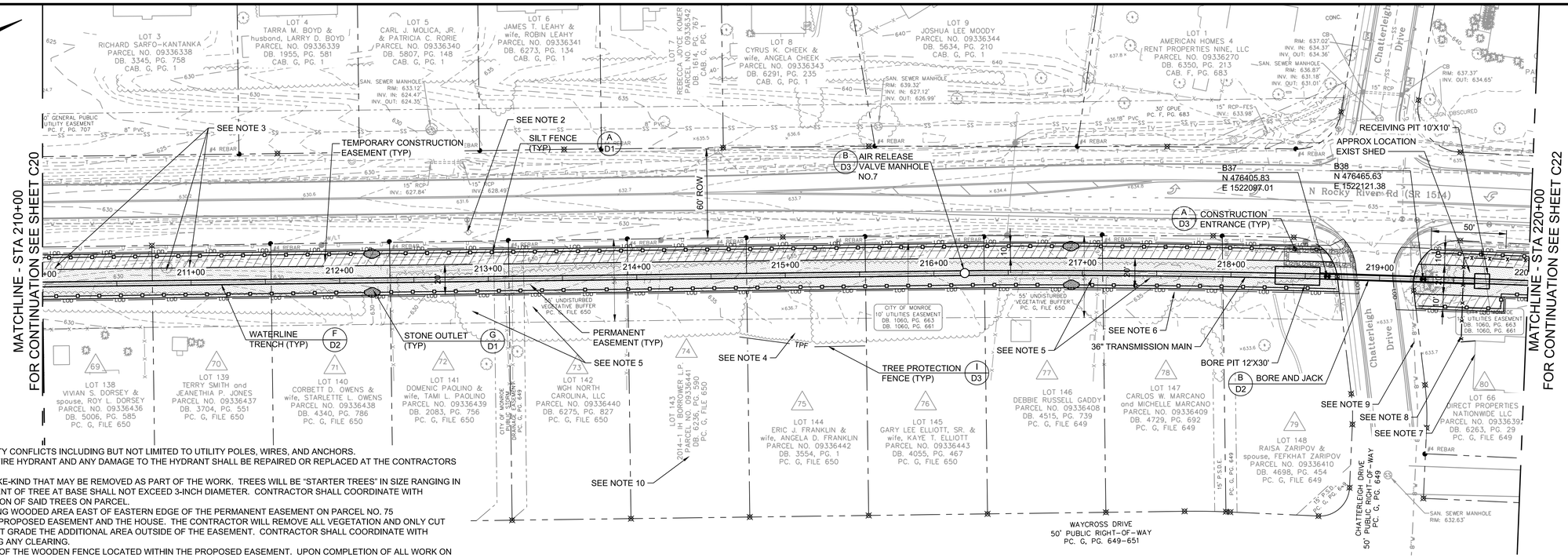
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C20
SHEET
24 OF 42

FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

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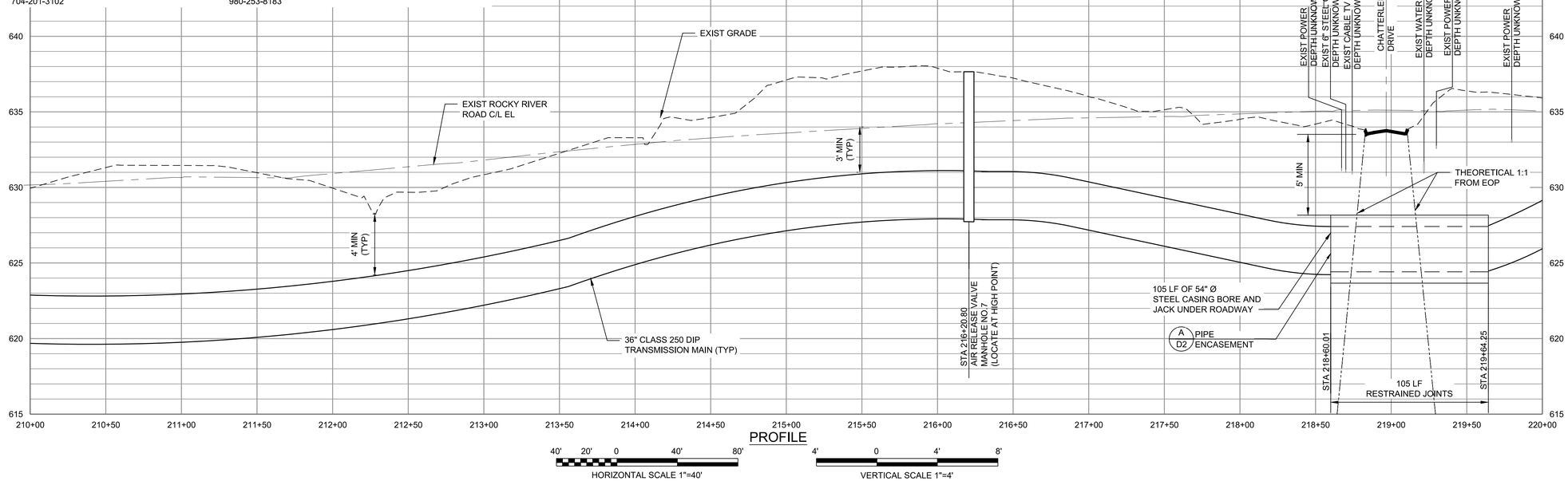
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
4. CONTRACTOR SHALL CLEAR THE REMAINING WOODED AREA EAST OF EASTERN EDGE OF THE PERMANENT EASEMENT ON PARCEL NO. 75 (APPROXIMATELY 25 FEET) BETWEEN THE PROPOSED EASEMENT AND THE HOUSE. THE CONTRACTOR WILL REMOVE ALL VEGETATION AND ONLY CUT TREES DOWN TO THE STUMP AND WILL NOT GRADE THE ADDITIONAL AREA OUTSIDE OF THE EASEMENT. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO PERFORMING ANY CLEARING.
5. CONTRACTOR SHALL REMOVE A PORTION OF THE WOODEN FENCE LOCATED WITHIN THE PROPOSED EASEMENT. UPON COMPLETION OF ALL WORK ON THIS PROPERTY THE FENCE SHALL BE PUT BACK IN ORIGINAL OR BETTER CONDITION AND LOCATION.
6. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. SPACING OF TREES SHALL BE SIX (6) FEET ON CENTER TWO ROWS STAGGERED PLACEMENT. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
7. CONTRACTOR WILL RELOCATE SHED AND DOG HOUSE TO JUST OUTSIDE PERMANENT EASEMENT AND CONNECT RELOCATED FENCE.
8. CONTRACTOR WILL REMOVE ANY PORTION OF THE WOODEN FENCE LOCATED WITHIN THE PROPOSED EASEMENTS AND UPON COMPLETION OF THE PROJECT, CONTRACTOR WILL REINSTALL THE FENCE BACK TO ITS ORIGINAL LOCATION AND EXTEND ADDITIONAL FENCING TO RELOCATED SHED TO PROVIDE COMPLETE ENCLOSURE OF FENCING FOR DOG. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY CONTAINMENT FENCING FOR DOG DURING CONSTRUCTION.
9. EXISTING 8" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER AND CITY OF MONROE PRIOR TO PERFORMING ANY WORK.
10. PRIOR TO WORKING ON PARCEL # 74, CONTRACTOR SHALL CONTACT THE PROPERTY OWNERS REPRESENTATIVES SO TENANTS CAN BE INFORMED OF THE WORK. THE CONTACT INFORMATION IS LISTED BELOW:

JEREMIAH APONTE
JAPONTE@INVITATIONHOMES.COM
704-774-0082

AMANDA BLACKMON
AMANDA.BLACKMON@INVITATIONHOMES.COM
704-201-3102

ANGELA DEAN
ANGELA.DEAN@INVITATIONHOMES.COM
980-253-8183



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MATTHEW T. LAIRD
2021.01.25 14:37:47-05'00'

BLACK & VEATCH

Black & Veatch International Company
Phone: 704.940.6900
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 210+00 TO STA 220+00

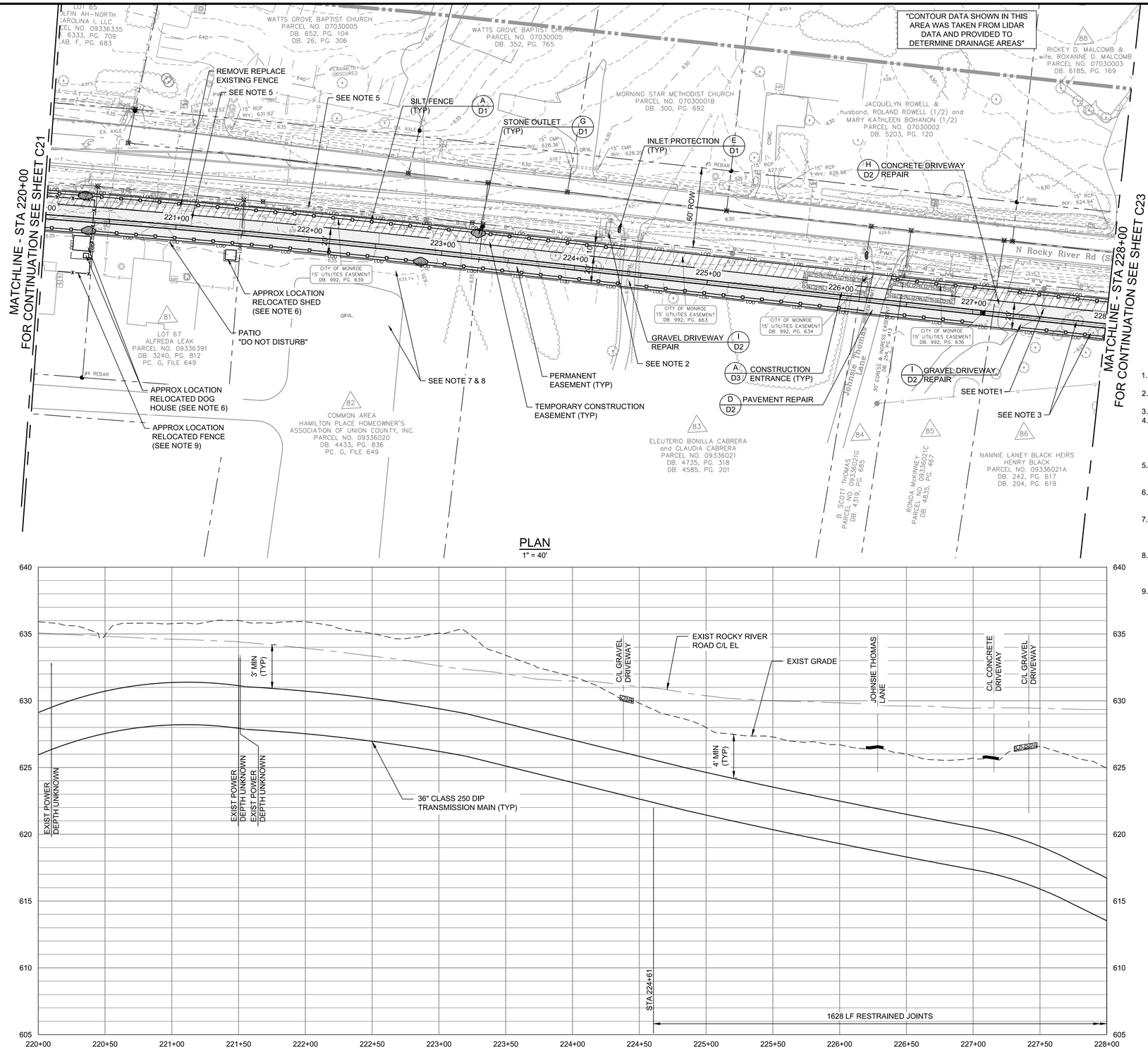
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C21
SHEET
25 OF 42

FD7000_PW
D10000



NOTES

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. NOTE NOT INCLUDED IN SET
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. EXISTING 8" WATERLINE SHOWN IS BASED ON GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
6. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO PERFORMING WORK TO RELOCATE EXISTING SHED AND DOG HOUSE TO OUTSIDE PROPOSED PERMANENT EASEMENT.
7. CONTRACTOR SHALL ATTEMPT TO LOCATE EXISTING IRRIGATION SYSTEM WITHIN THE PROPOSED EASEMENT AND PROTECT IRRIGATION SYSTEM FROM DAMAGE. THE EXISTING COMMUNITY SIGN SHALL NOT BE DISTURBED. ANY DAMAGE TO THE EXISTING SHALL BE REPAIRED TO LIKE OR NEWER CONDITION.
8. CONTRACTOR SHALL KEEP ALL MATERIALS AND EQUIPMENT WITHIN BOUNDARIES OF THE EASEMENT LIMITS AND SHALL NOT USE HAMILTON PLACE HOMEOWNER'S ASSOCIATION PROPERTY AS A STORAGE OR PARKING AREA WITHOUT WRITTEN CONSENT OF THE HOMEOWNER'S ASSOCIATION.
9. CONTRACTOR WILL REMOVE ANY PORTION OF THE WOODEN FENCE LOCAED WITHIN THE PROPOSED EASEMENTS AND UPON COMPLETION OF THE PROJECT, CONTRACTOR WILL REINSTALL THE FENCE BACK TO ITS ORIGINAL LOCATION AND EXTEND ADDITIONAL FENCING TO RELOCATED SHED TO PROVIDE COMPLETE ENCLOSURE OF FENCING FOR DOG. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY CONTAINMENT FENCING FOR DOG DURING CONSTRUCTION

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MATTHEW L. TERRY
2021.01.25 14:37:48-05'00'

BLACK & VEATCH

Black & Veatch International Company
Business Unit: Water
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 220+00 TO STA 228+00

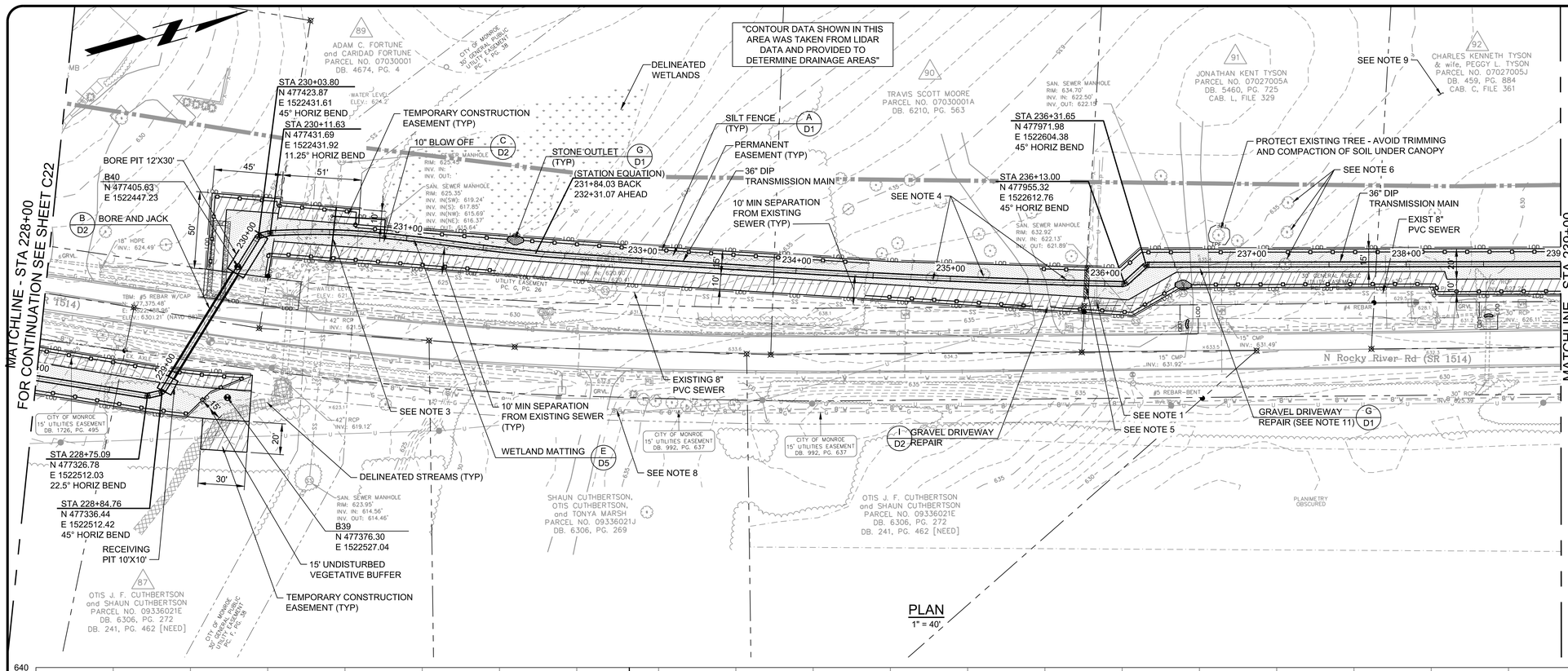
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

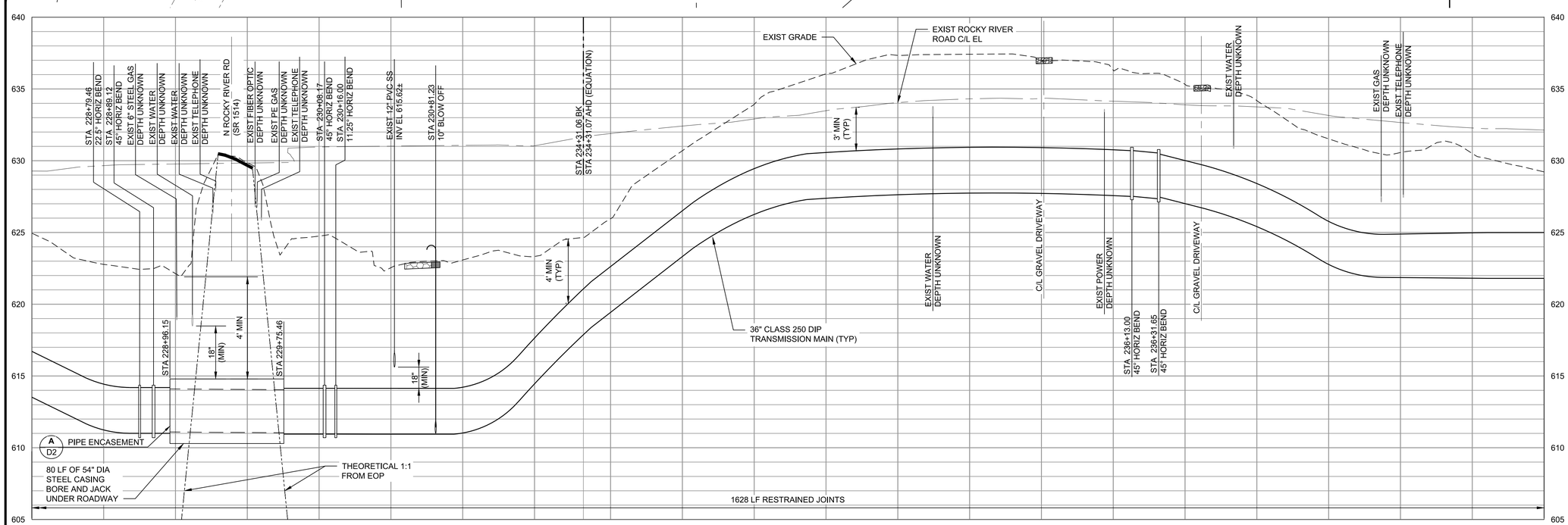
C22
SHEET
26 OF 42

FD7000_PW
D10000



NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL PROTECT EXISTING FIRE HYDRANT AND ANY DAMAGE TO THE HYDRANT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTORS EXPENSE.
3. CONTRACTOR SHALL REMOVE AND REPLACE 35 LINEAR FEET OF EXISTING 12" PVC PROTECTO 401 LINED CLASS 350 DIP. CONNECT NEW SEWER TO EXISTING SEWER WITH A HYMAX COUPLING OR APPROVED EQUAL.
4. CONTRACTOR WILL REPLANT TREES OF LIKE-KIND THAT MAY BE REMOVED AS PART OF THE WORK. TREES WILL BE "STARTER TREES" IN SIZE RANGING IN HEIGHT OF 6FT-8FT. CALIPER MEASUREMENT OF TREE AT BASE SHALL NOT EXCEED 3-INCH DIAMETER. CONTRACTOR SHALL COORDINATE WITH OWNER/ENGINEER AS TO DESIRED LOCATION OF SAID TREES ON PARCEL.
5. CONTRACTOR SHALL CAREFULLY REMOVE AND REPLACE EXISTING SPLIT RAIL FENCE TO EXISTING LOCATION UPON COMPLETION OF WORK. ANY DAMAGE TO THE EXISTING FENCE SHALL BE REPAIRED TO LIKE OR NEW CONDITION.
6. CONTRACTOR SHALL REMOVE EXISTING CREPE MYRTLE TREE AND REPLACE WITH 2 CREPE MYRTLE TREES 15 GAL SIZE. CONTRACTOR SHALL RELOCATE TO LOCATION ON PARCEL AS DETERMINED BY PROPERTY OWNER.
7. CONTRACTOR SHALL PROTECT EXISTING DECIDUOUS TREE LOCATED ALONG THE EXISTING DRIVEWAY AND ABUTTING THE PROPOSED EASEMENTS FROM PHYSICAL/ROOT DAMAGE. WITHIN THE ONE YEAR PERIOD THE TREE SHALL BE INSPECTED TO DETERMINE IF THE TREE HAS DIED. IF THE TREE HAS DIED A REPLACEMENT TREE SHALL BE INSTALLED AND SHALL BE 6 TO 8 FEET IN HEIGHT AND NO GREATER THAN 3-INCH DIAMETER AT THE BASE. CONTRACTOR SHALL FOLLOW TREE PROTECTION DETAIL AS SPECIFIED ON THE CONSTRICTION DRAWING DETAILS AND SPECIFICATIONS TO PROTECT THIS TREE.
8. EXISTING 8" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
9. CONTRACTOR SHALL STOCKPILE ALL TOPSOIL REMOVED DURING THE PIPELINE CONSTRUCTION AND ENSURE POSITIVE DRAINAGE AND NO PONDING ON PARCEL NO. 92.
10. CONTRACTOR SHALL CAREFULLY GRADE AND RESEED LAWN TO MATCH ON PARCEL NO. 91.
11. CONTRACTOR SHALL PROVIDE CONTINUOUS DRIVEWAY ACCESS AND PLATE IF NECESSARY DURING CONSTRUCTION. RESTORE AND GRADE DRIVEWAY TO PRE-EXISTING OR BETTER CONDITION ON PARCEL NO. 91.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL T. LOVE
2021.01.25 14:37:49-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 228+00 TO STA 239+00

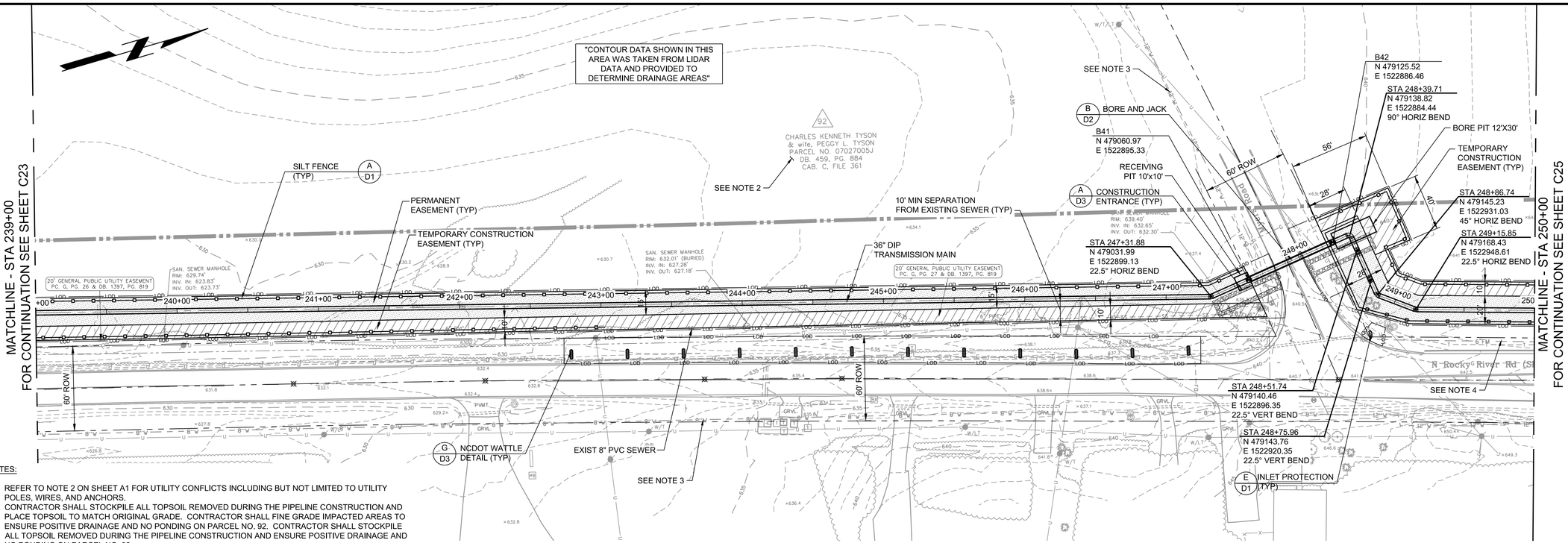
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C23
SHEET
27 OF 42

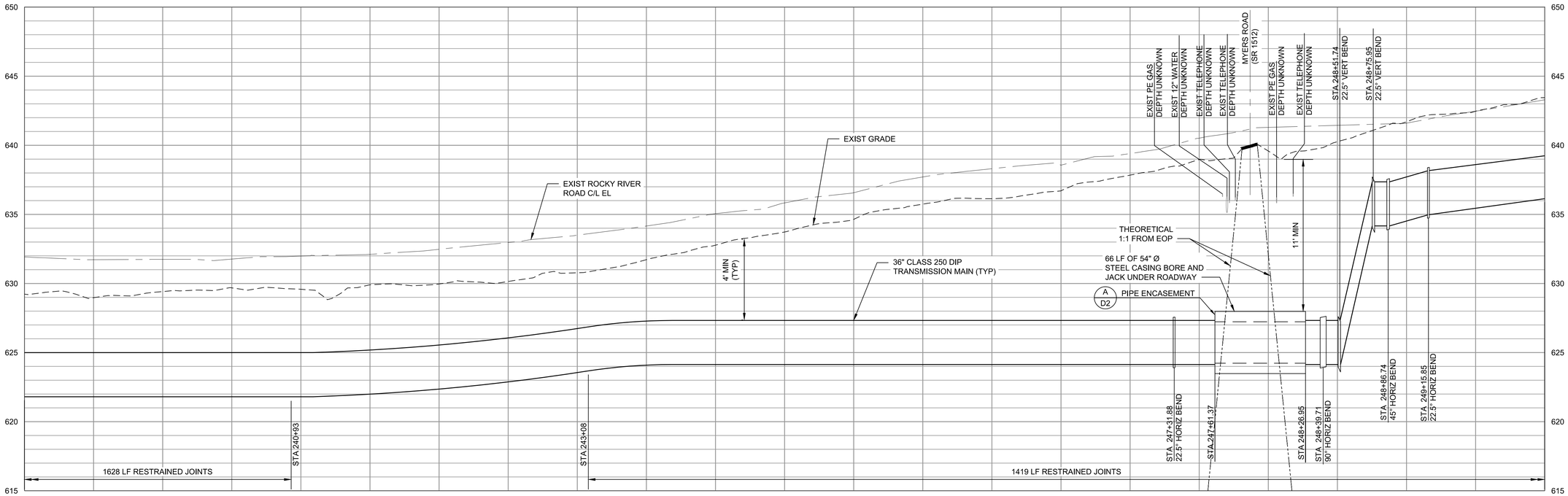
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. CONTRACTOR SHALL STOCKPILE ALL TOPSOIL REMOVED DURING THE PIPELINE CONSTRUCTION AND PLACE TOPSOIL TO MATCH ORIGINAL GRADE. CONTRACTOR SHALL FINE GRADE IMPACTED AREAS TO ENSURE POSITIVE DRAINAGE AND NO PONDING ON PARCEL NO. 92. CONTRACTOR SHALL STOCKPILE ALL TOPSOIL REMOVED DURING THE PIPELINE CONSTRUCTION AND ENSURE POSITIVE DRAINAGE AND NO PONDING ON PARCEL NO. 92.
3. EXISTING 8" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
4. EXISTING 6" FORCE MAIN SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

FD7000_PW
D10000

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL L. TAYLOR
2021.01.25 14:37:50-05'00'

BLACK & VEATCH

Black & Veatch International Company
Black & Veatch of North Carolina, P.C.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

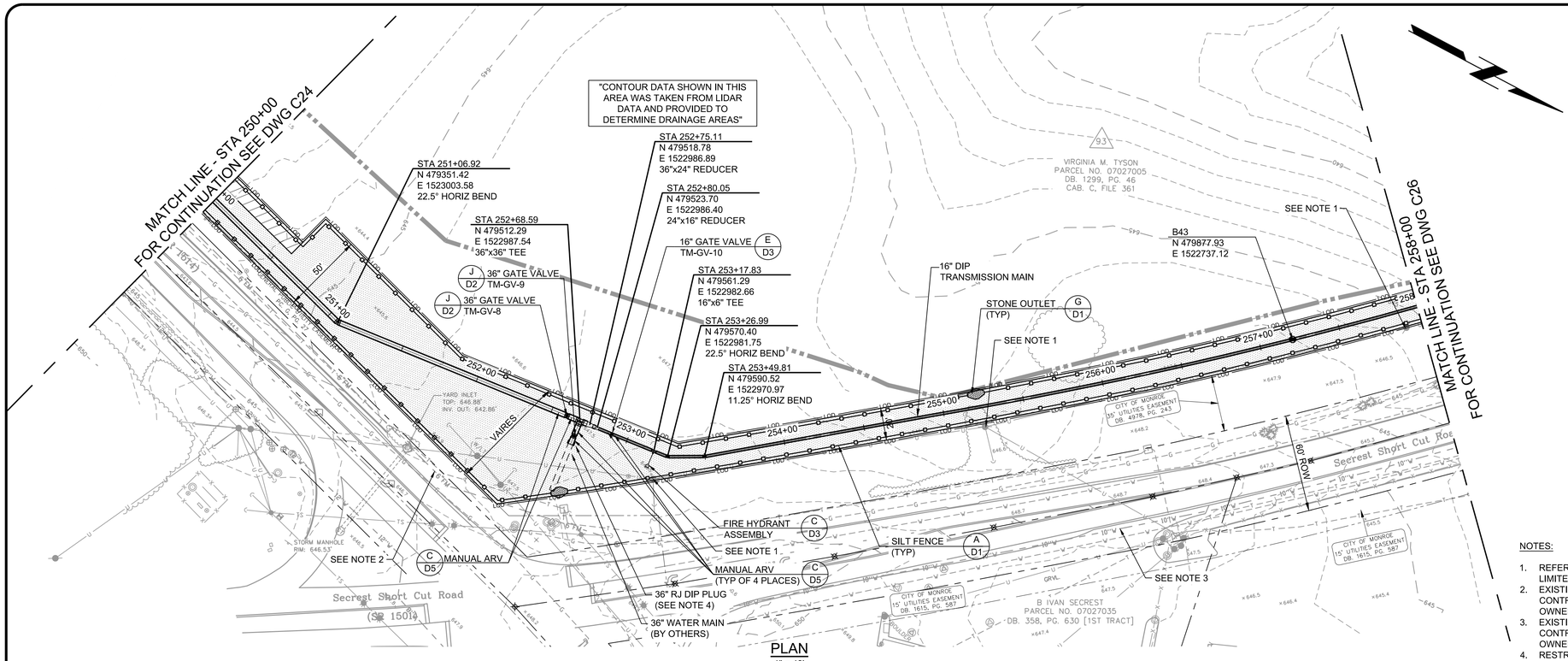
CIVIL
PLAN AND PROFILE
STA 239+00 TO STA 250+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

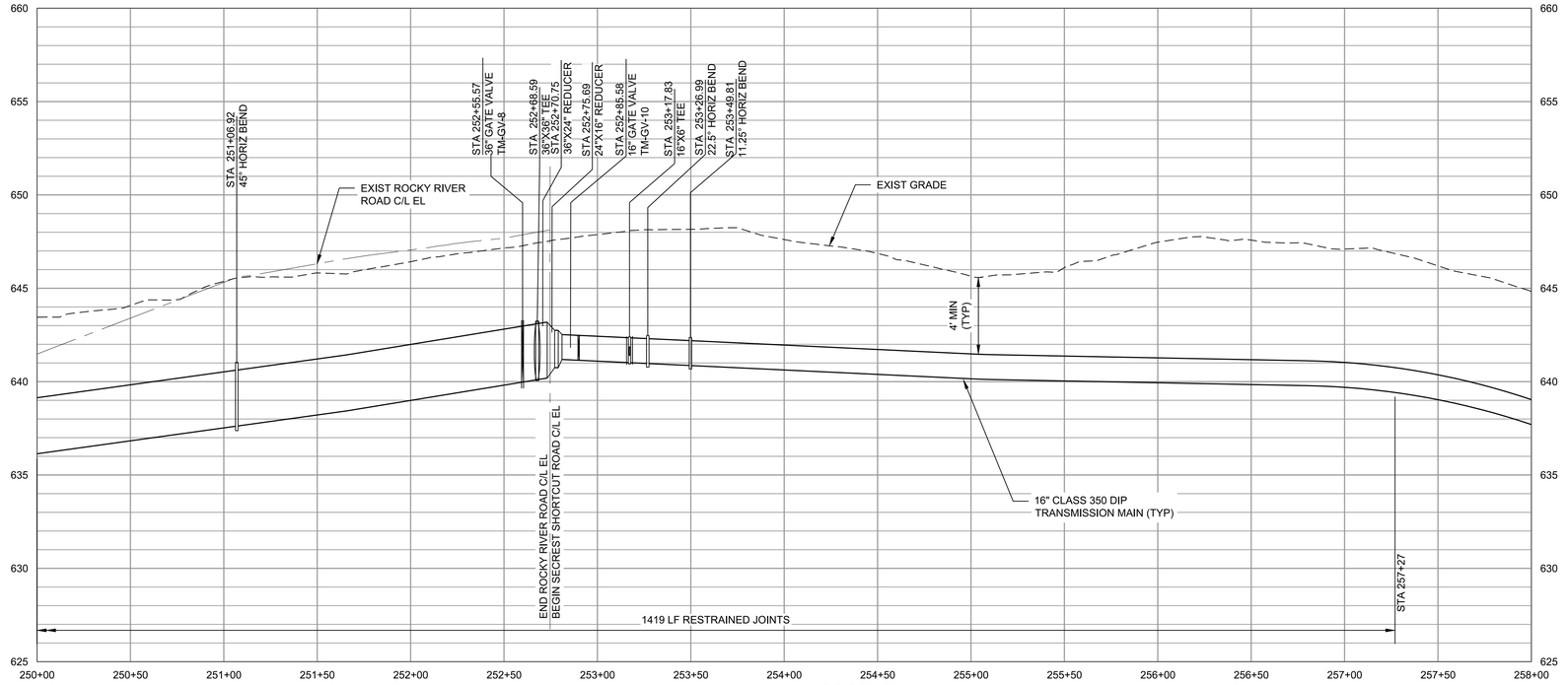
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C24
SHEET
28 OF 42



PLAN
1" = 40'



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. EXISTING 6" FORCEMAIN SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
3. EXISTING 10" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
4. RESTRAIN ALL PIPE FROM 36" PLUG TO 36"X36" TEE.

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCOTT
2021.01.25 14:37:50-05'00'

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Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 250+00 TO STA 258+00

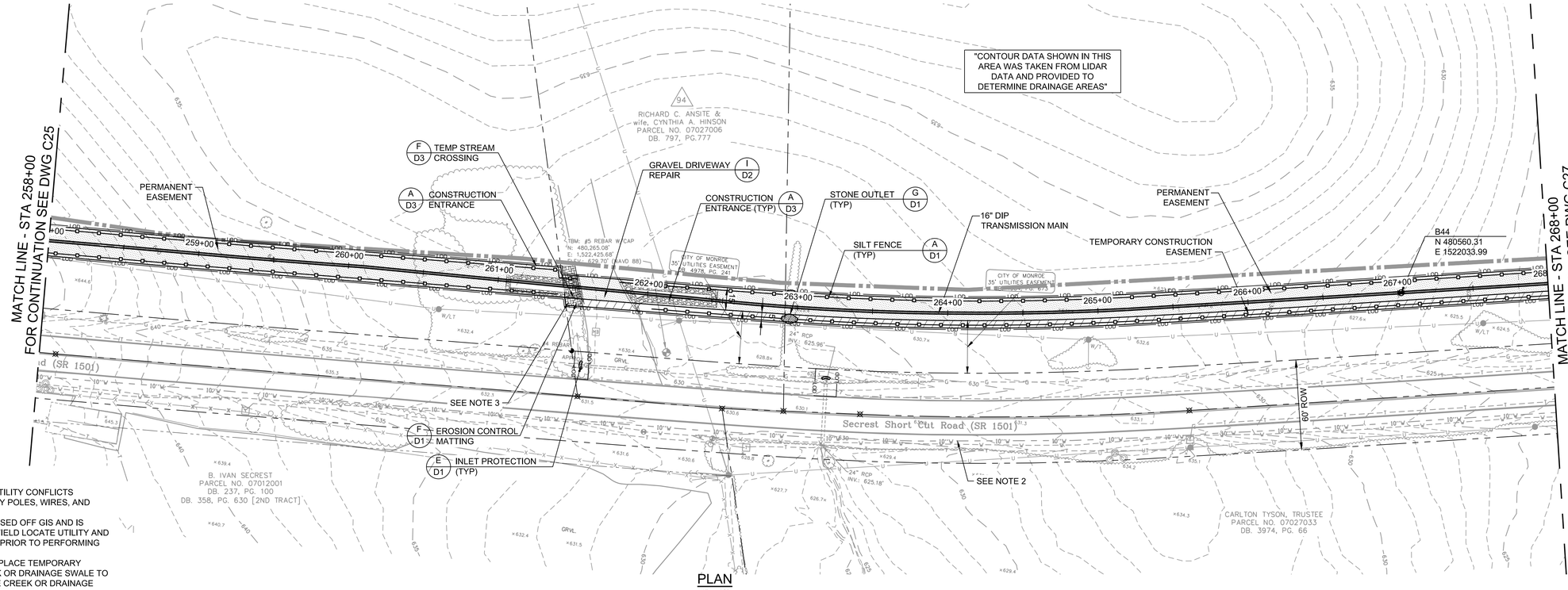
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C25
SHEET
29 OF 42

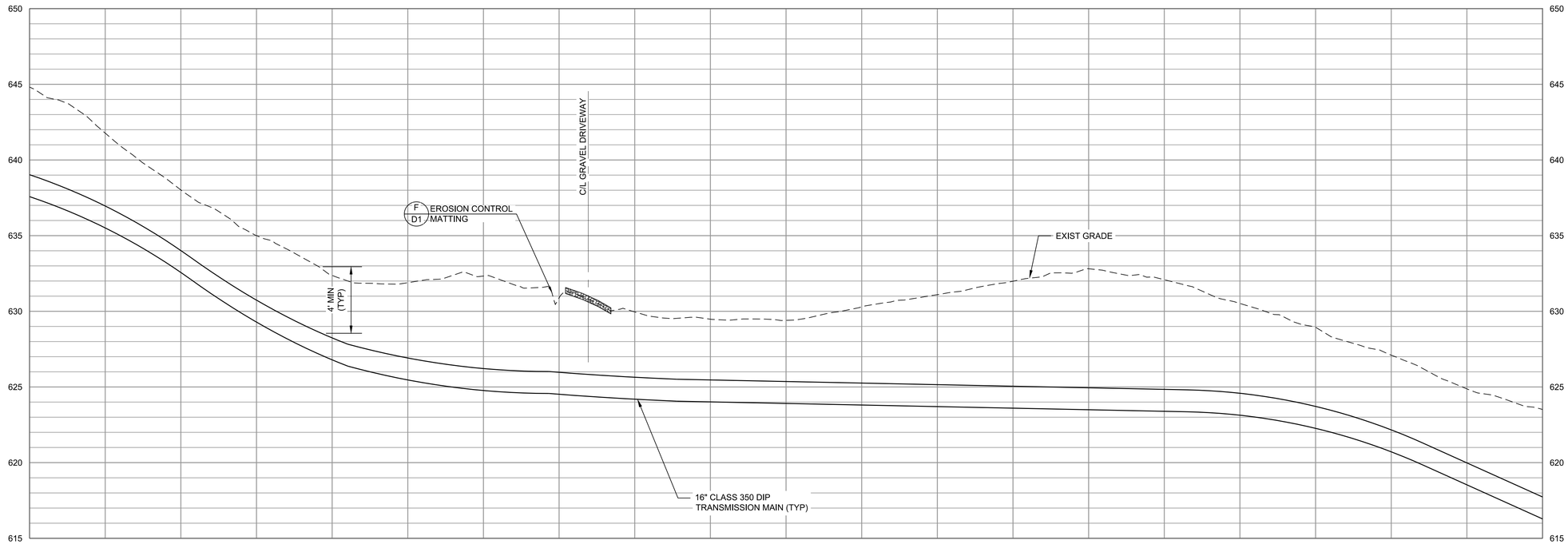
FD7000_PW
D10000



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. EXISTING 10" WATERLINE SHOWN IS BASED OFF GIS AND IS APPROXIMATE. CONTRACTOR SHALL FIELD LOCATE UTILITY AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
3. CONTRACTOR SHALL REMOVE AND REPLACE TEMPORARY SEDIMENT FENCE PARALLEL TO CREEK OR DRAINAGE SWALE TO PREVENT SEDIMENT RUNOFF INTO THE CREEK OR DRAINAGE SWALE WHEN CONSTRUCTING THE WATERLINE.



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

BID SET

FD7000_PW
D10000

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCOTT
2021.01.25 14:37:51-05'00'

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10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

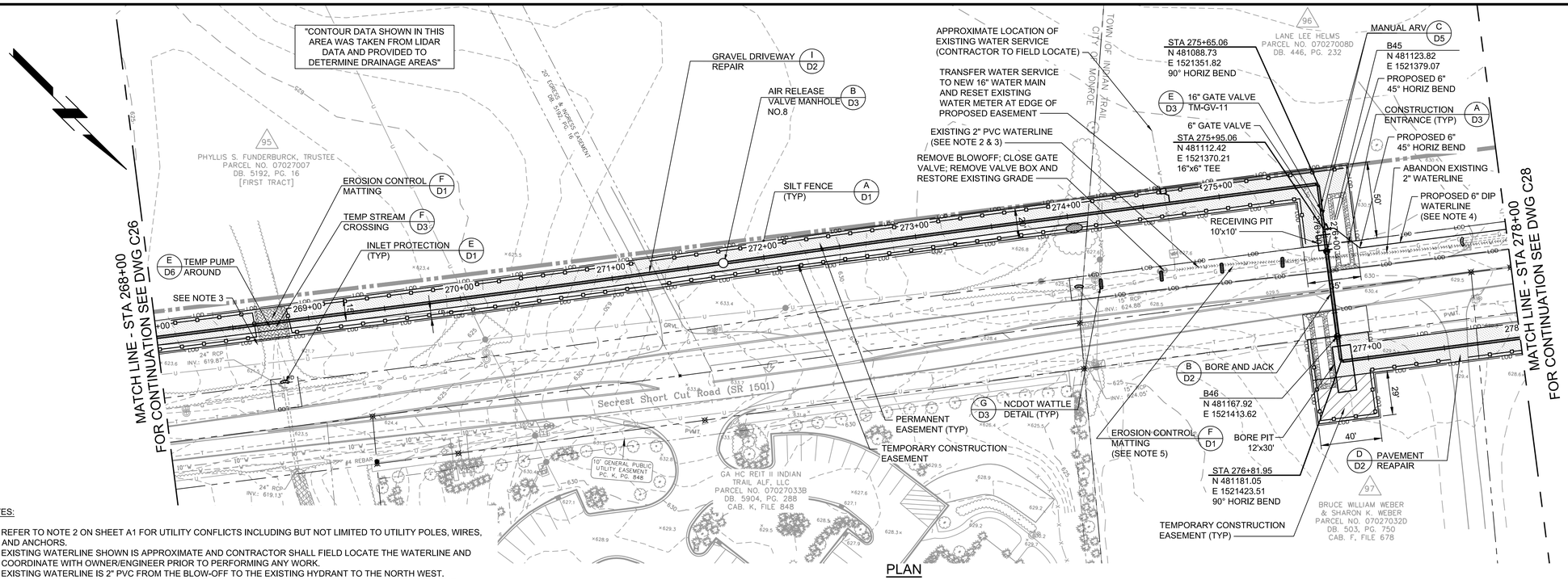
CIVIL
PLAN AND PROFILE
STA 258+00 TO STA 268+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

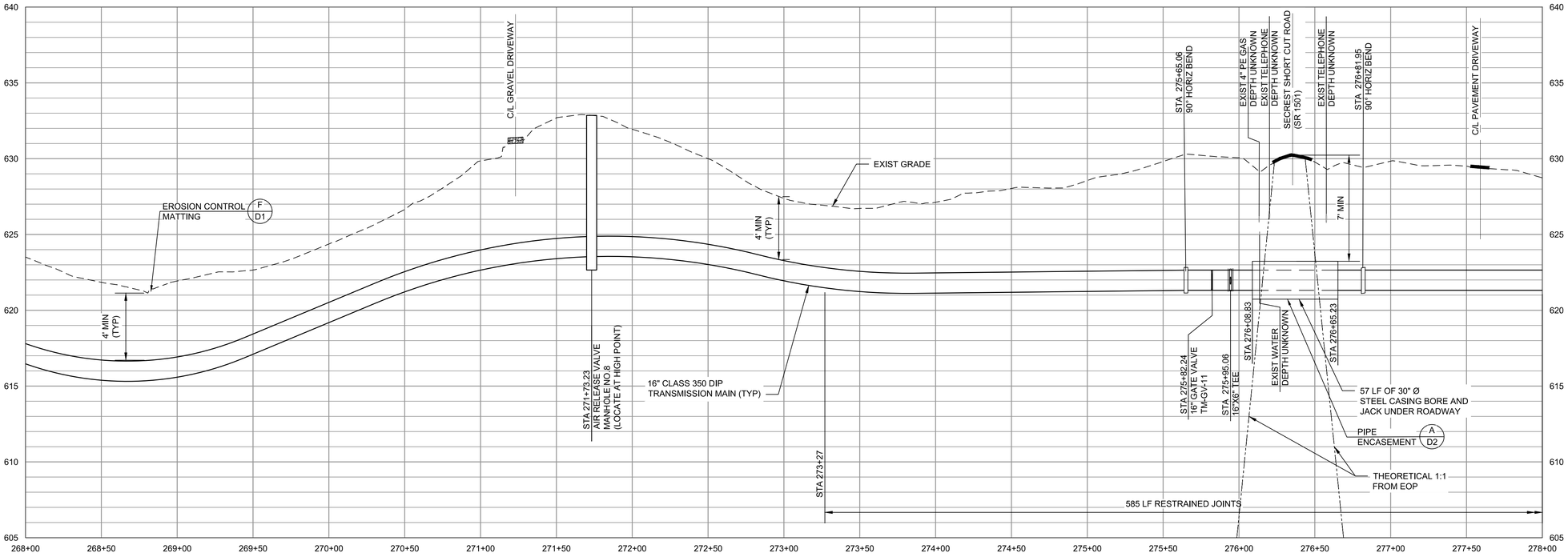
C26
SHEET
30 OF 42



PLAN
1" = 40'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. EXISTING WATERLINE SHOWN IS APPROXIMATE AND CONTRACTOR SHALL FIELD LOCATE THE WATERLINE AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
3. EXISTING WATERLINE IS 2" PVC FROM THE BLOW-OFF TO THE EXISTING HYDRANT TO THE NORTH WEST.
4. ALL 6" DIP SHALL BE RESTRAINED FROM 16"X6" TEE TO PLUG. PROVIDE A MINIMUM 3' OF COVER OVER THE PROPOSED PIPE AT EXISTING GRADE. CONTRACTOR SHALL INSTALL A THRUST BLOCK ON 16"X6" TEE PER UNION COUNTY STANDARD DETAILS AND SPECIFICATIONS (SEE DETAIL SHEETS).
5. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA WITHIN THE RIGHT OF WAY DUE TO THE INSTALLATION OF THE NEW 6" WATER LINE AND THE ABANDONMENT OF THE EXISTING WATER LINE



PROFILE

HORIZONTAL SCALE 1"=40'

VERTICAL SCALE 1"=4'

BID SET

FD7000_PW
D10000

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM P. SCHEID
2021.01.25 14:37:52-05'00'

BLACK & VEATCH
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10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

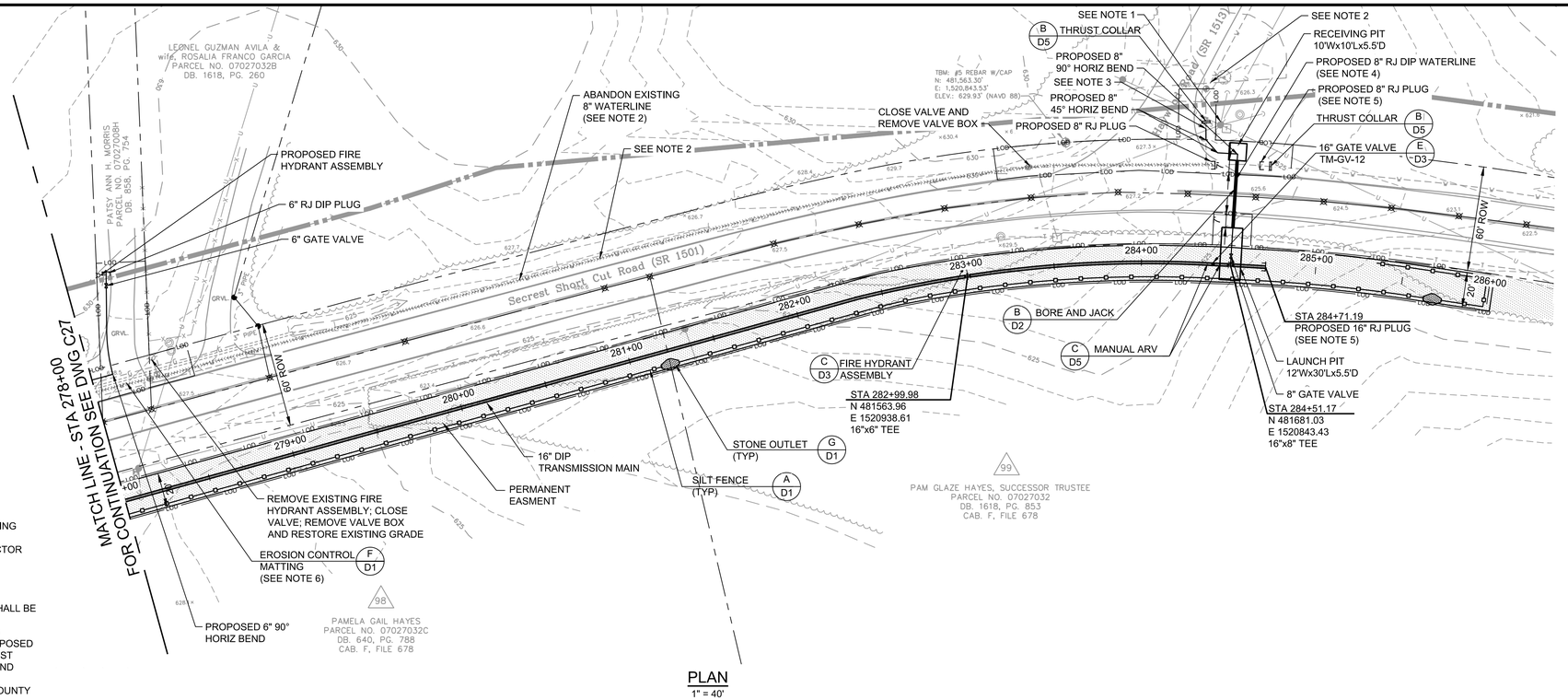
CIVIL
PLAN AND PROFILE
STA 268+00 TO STA 278+00

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

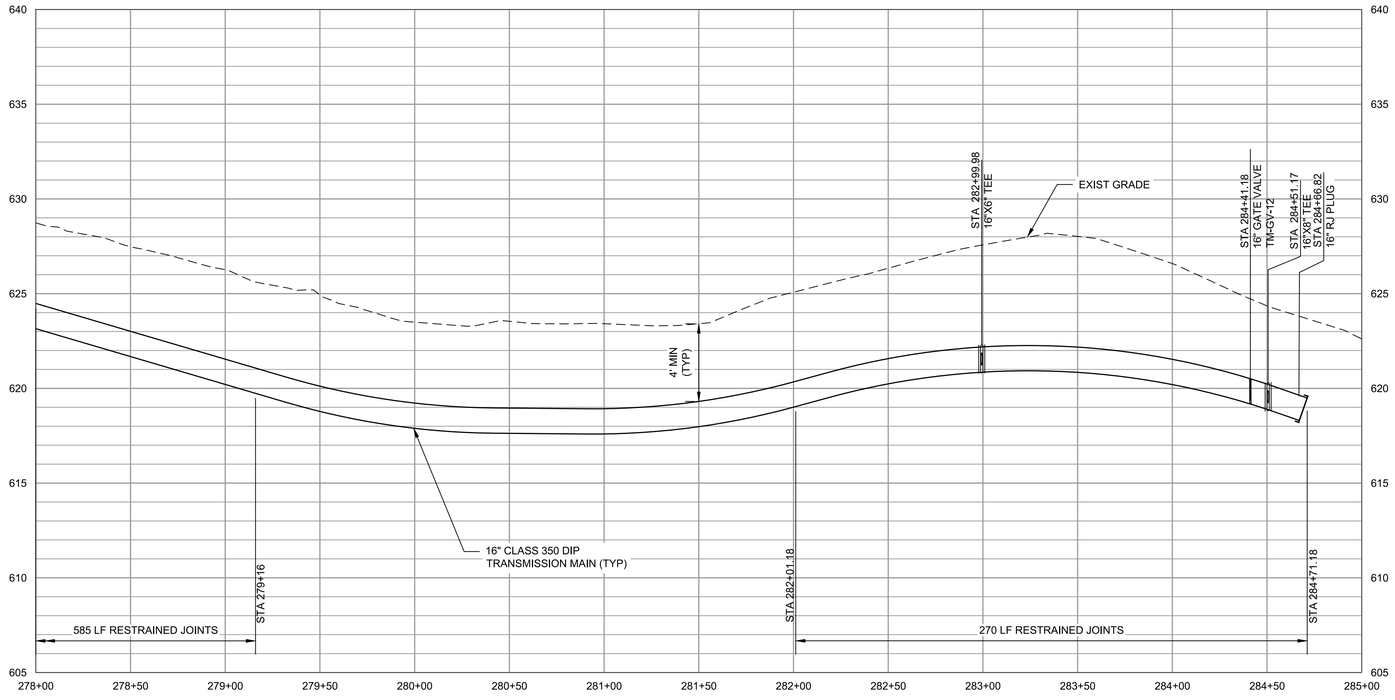
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C27
SHEET
31 OF 42



PLAN
1" = 40'



PROFILE

40' 20' 0 40' 80'
HORIZONTAL SCALE 1"=40'

4' 0 4' 8'
VERTICAL SCALE 1"=4'

NOTES:

1. REFER TO NOTE 2 ON SHEET A1 FOR UTILITY CONFLICTS INCLUDING BUT NOT LIMITED TO UTILITY POLES, WIRES, AND ANCHORS.
2. EXISTING 8" WATERLINE SHOWN IS APPROXIMATE AND CONTRACTOR SHALL FIELD LOCATE THE WATERLINE AND COORDINATE WITH OWNER/ENGINEER PRIOR TO PERFORMING ANY WORK.
3. CONTRACTOR SHALL CONNECT TO EXISTING 8" WATERLINE. CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION OF CONNECTION PRIOR TO MAKING CONNECTION. CONNECTION SHALL BE RESTRAINED.
4. ALL 8" DIP SHALL BE RESTRAINED FROM 16"X8" TEE TO EXISTING CONNECTION. PROVIDE A MINIMUM 3' OF COVER OVER THE PROPOSED PIPE AT EXISTING GRADE. CONTRACTOR SHALL INSTALL A THRUST BLOCK ON 16"X8" TEE PER UNION COUNTY STANDARD DETAILS AND SPECIFICATIONS (SEE DETAIL SHEETS).
5. PROPOSED RJ PLUGS SHALL BE IN ACCORDANCE WITH UNION COUNTY STD DETAIL 2A.
6. PROVIDE EROSION CONTROL MATTING FOR THE FULL WIDTH OF DISTURBED AREA WITHIN THE RIGHT OF WAY DUE TO THE INSTALLATION OF THE NEW 6" AND 8" WATER LINES AND THE ABANDONMENT OF THE EXISTING WATER LINE.
7. CONTRACTOR SHALL COORDINATE WITH ENGINEER/OWNER TO CLOSE VALVES ON EITHER SIDE OF CONNECTION TO REMOVE PRESSURE ON EXISTING WATER MAIN PRIOR TO MAKING CONNECTIONS.

DATE	REVISIONS AND RECORD OF USE	NO.	BY	CHK	APP

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL T. LOVE
2021.01.25 14:37:53-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CIVIL
PLAN AND PROFILE
STA 280+00 TO STA 284+71.19

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

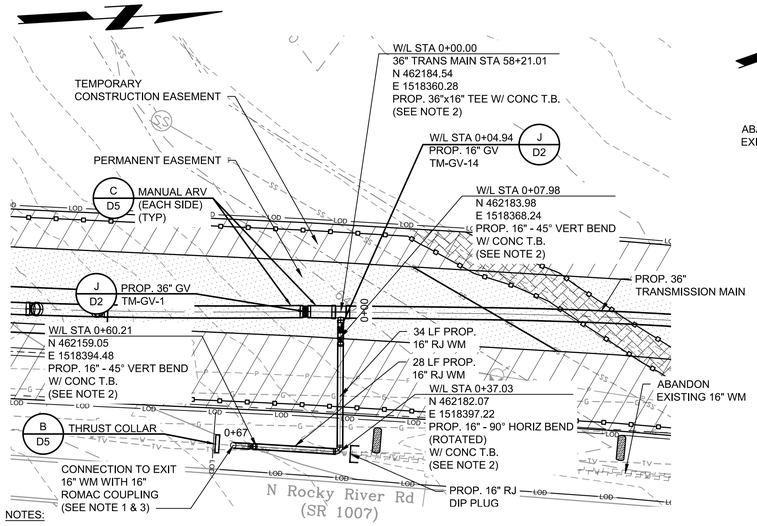
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C28
SHEET
32 OF 42

BID SET

FD7000_PW
D10000

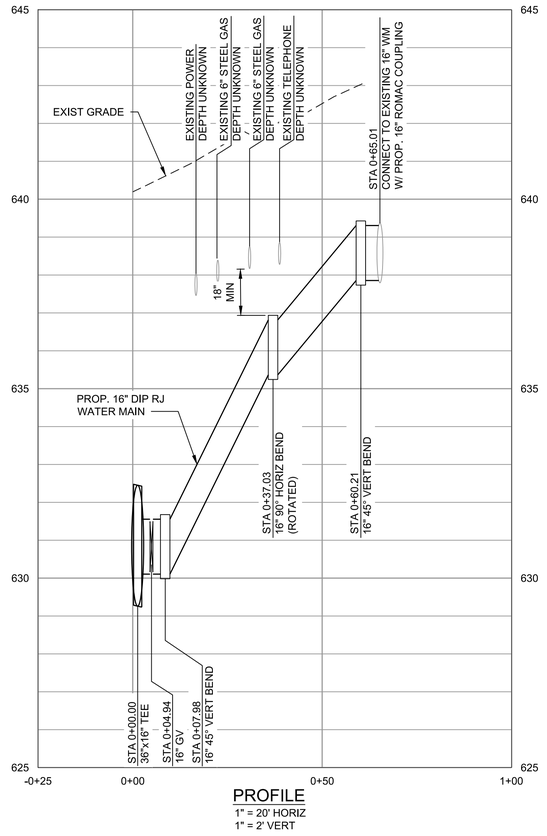


NOTES:

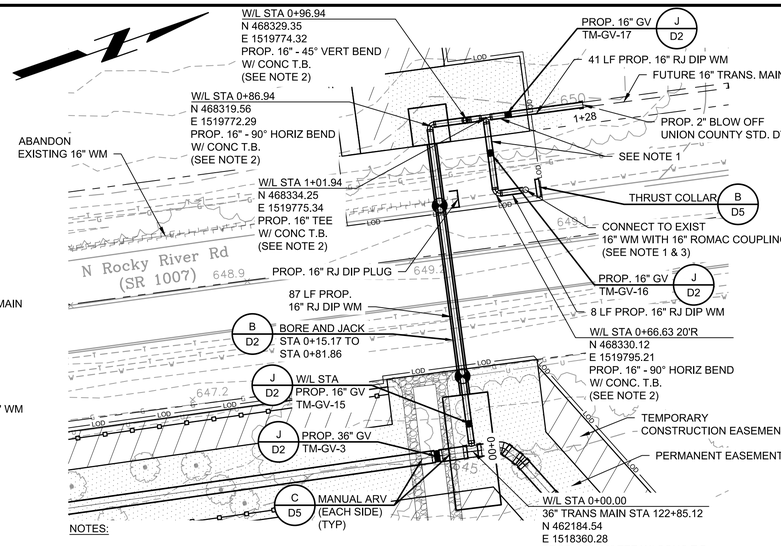
1. ALL PROPOSED 16" WATER MAIN FROM PROPOSED 36"X16" TEE TO PROPOSED CONNECTION AT EXISTING 16" WATER MAIN SHALL BE RESTRAINED.
2. INSTALL CONCRETE THRUST BLOCK PER DETAIL 16 ON DETAIL SHEET D4.
3. CONTRACTOR SHALL COORDINATE WITH ENGINEER/OWNER TO CLOSE VALVES ON EITHER SIDE OF CONNECTION TO REMOVE PRESSURE ON EXISTING 16" WATER MAIN PRIOR TO MAKING CONNECTION.

CONNECTION NO.1 ALONG N ROCKY RIVER RD (SR 1007)
(SHEET C5)

PLAN A
1" = 20'



PROFILE
1" = 20' HORIZ
1" = 2' VERT

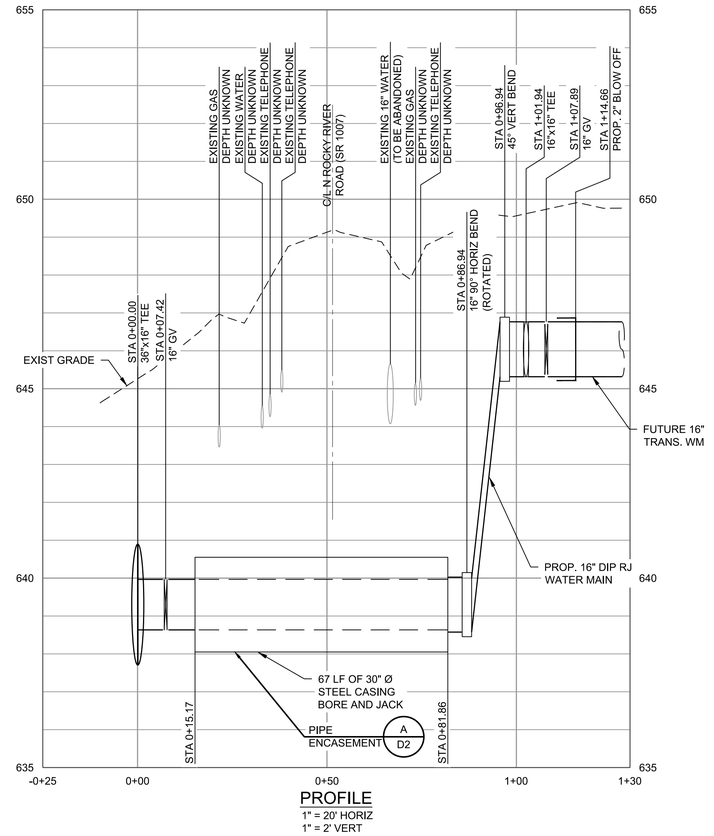


NOTES:

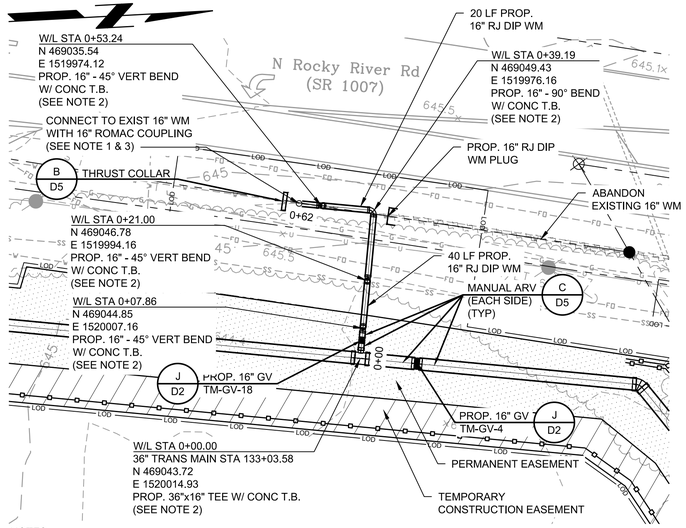
1. ALL PROPOSED 16" WATER MAIN FROM PROPOSED 36"X16" TEE TO PROPOSED CONNECTION AT EXISTING 16" WATER MAIN SHALL BE RESTRAINED.
2. INSTALL CONCRETE THRUST BLOCK PER DETAIL 16 ON DETAIL SHEET D4.
3. CONTRACTOR SHALL COORDINATE WITH ENGINEER/OWNER TO CLOSE VALVES ON EITHER SIDE OF CONNECTION TO REMOVE PRESSURE ON EXISTING 16" WATER MAIN PRIOR TO MAKING CONNECTION.

CONNECTION NO.2 ALONG N ROCKY RIVER RD (SR 1007)
(SHEET C12)

PLAN B
1" = 20'



PROFILE
1" = 20' HORIZ
1" = 2' VERT

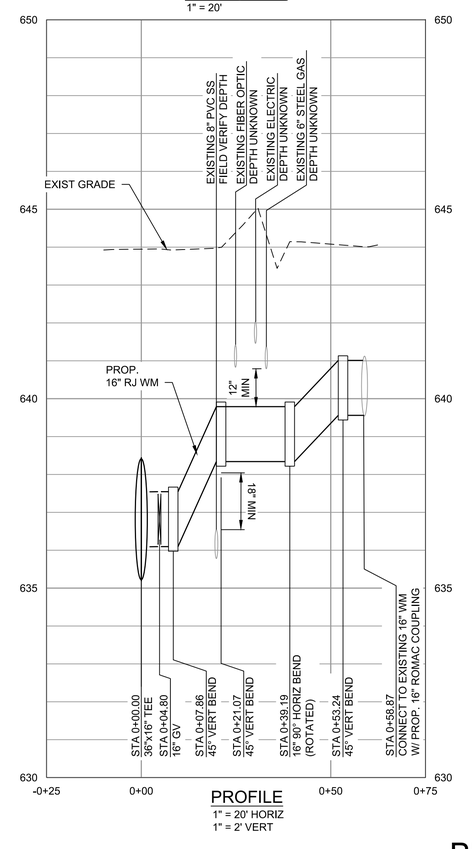


NOTES:

1. ALL PROPOSED 16" WATER MAIN FROM PROPOSED 36"X16" TEE TO PROPOSED CONNECTION AT EXISTING 16" WATER MAIN SHALL BE RESTRAINED.
2. INSTALL CONCRETE THRUST BLOCK PER DETAIL 16 ON DETAIL SHEET D4.
3. CONTRACTOR SHALL COORDINATE WITH ENGINEER/OWNER TO CLOSE VALVES ON EITHER SIDE OF CONNECTION TO REMOVE PRESSURE ON EXISTING 16" WATER MAIN PRIOR TO MAKING CONNECTION.

CONNECTION NO.3 ALONG N ROCKY RIVER RD (SR 1007)
(SHEET C13)

PLAN C
1" = 20'



PROFILE
1" = 20' HORIZ
1" = 2' VERT

BID SET

FD7000_PW
D10000

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL L. TOMLAND
2021.01.25 14:37:54-05'00'

BLACK & VEATCH

Black & Veatch International Company
Phone: 704.944.5500
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

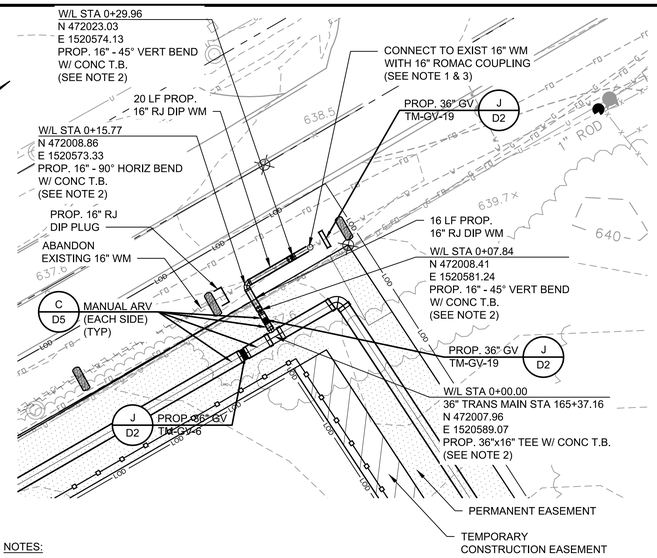
CONNECTION DETAILS 1 OF 2

DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C29
SHEET
33 OF 42

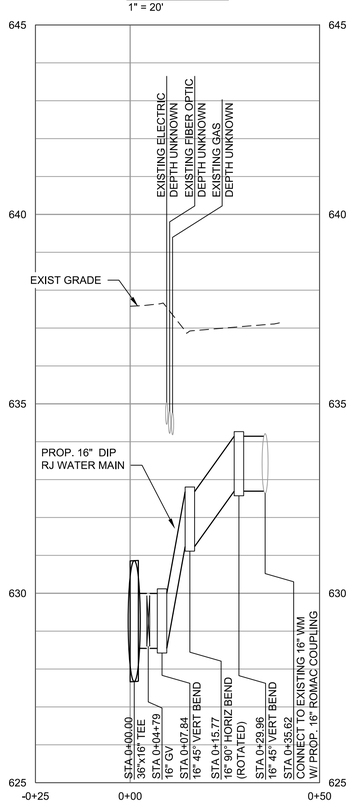


NOTES:

1. ALL PROPOSED 16" WATER MAIN FROM PROPOSED 36"X16" TEE TO PROPOSED CONNECTION AT EXISTING 16" WATER MAIN SHALL BE RESTRAINED.
2. INSTALL CONCRETE THRUST BLOCK PER DETAIL 16 ON DETAIL SHEET D4.
3. CONTRACTOR SHALL COORDINATE WITH ENGINEER/OWNER TO CLOSE VALVES ON EITHER SIDE OF CONNECTION TO REMOVE PRESSURE ON EXISTING 16" WATER MAIN PRIOR TO MAKING CONNECTION.

CONNECTION NO.4 ALONG N ROCKY RIVER RD (SR 1007)
(SHEET C16)

PLAN (A)
1" = 20'



PROFILE
1" = 20' HORIZ
1" = 2' VERT

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:55-05'00'

BLACK & VEATCH

Black & Veatch International Company
Black & Veatch Holding Company
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

CONNECTION DETAILS 2 OF 2

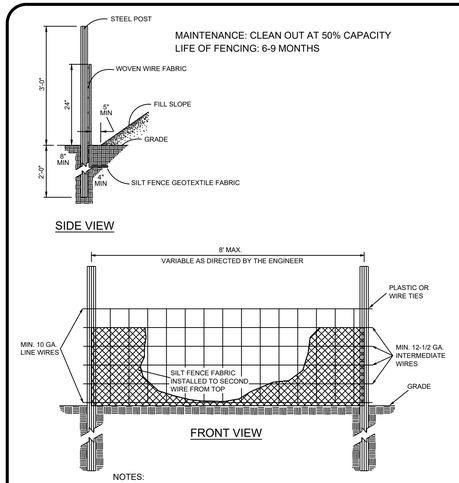
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

C30
SHEET
34 OF 42

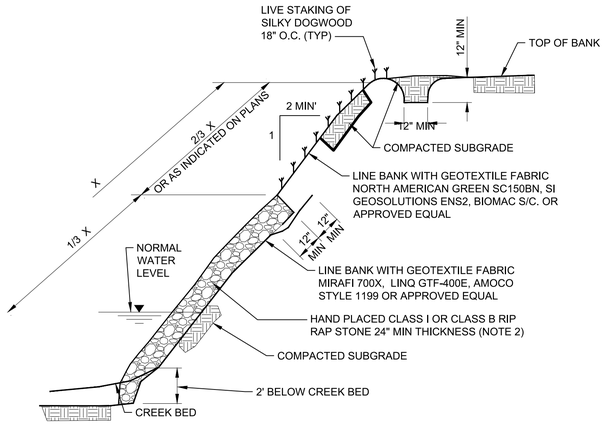
FD7000_PW
D10000



NOTES:

1. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
2. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.
3. SEE NC DEQ SEDIMENT DESIGN MANUAL FOR CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS.
4. SILT FENCE SHOULD NOT BE USED ALONE BELOW GRADED SLOPES GREATER THAN 10' IN HEIGHT.

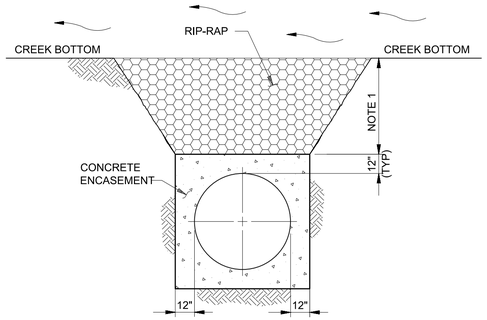
SILT FENCE (A)
NO SCALE



NOTES:

1. "X" IS DEFINED AS THE DISTANCE FROM THE NORMAL WATER LEVEL TO THE TOP OF BANK. CONTRACTOR SHALL DETERMINE THIS DISTANCE.
2. CLASS B RIPRAP SHALL BE INSTALLED FOR THE CROSSINGS ON PLAN SHEETS C6, C11, AND C14. CLASS 1 RIPRAP SHALL BE INSTALLED FOR THE CROSSINGS ON PLAN SHEETS C19 AND C20.

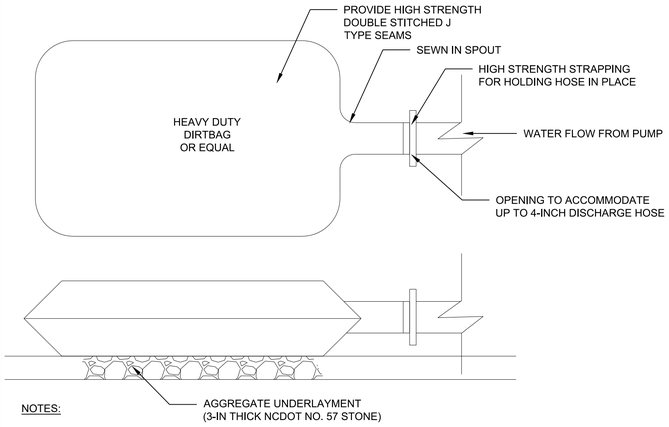
RIP RAP AND STREAM BANK RESTORATION (TYP BOTH SIDES) (B)
NTS



CONCRETE ENCASEMENT (H)
NO SCALE

NOTES:

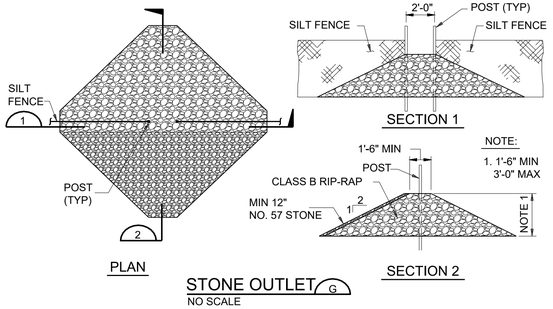
1. SEE CREEK AND DITCH STABILIZATION DETAIL B THIS SHEET FOR DETAILS.



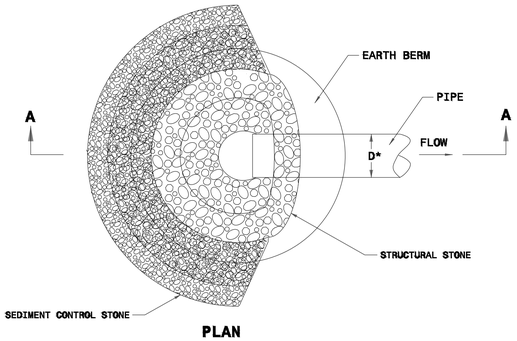
NOTES:

1. CONTRACTOR SHALL SIZE DEWATERING BAG BASED ON FLOW CONDITIONS AND IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
2. FLOW FROM THE DEWATERING BAG(S) SHALL NOT HAVE A TURBIDITY GREATER THAN 50 NTU.
3. THE DEWATERING BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MIN. SURFACE AREA OF 225 SQUARE FEET PER SIDE.
4. ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE HIGH STRENGTH THREAD.
5. THE SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
6. THE GEOTEXTILE FABRIC SHALL BE A 10 OZ NON-WOVEN FABRIC.
7. DISCHARGE FROM THE DEWATERING BAG SHALL BE DIRECTED SUCH THAT PRE-DISTURBANCE HYDROLOGY IS NOT CHANGED.
8. SECURE DEWATERING BAG IN PLACE OUTSIDE OF STREAM CHANNEL WITH STAKES AND ROPE TO AVOID ROLLING.

DEWATERING BAG DETAIL (D)
NO SCALE



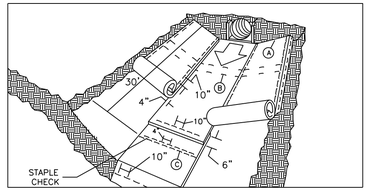
STONE OUTLET (G)
NO SCALE



NOTES:

1. USE CLASS B EROSION CONTROL STONE FOR STRUCTURAL STONE.
2. USE NO. 5 OR NO.57 STONE FOR SEDIMENT CONTROL STONE.
3. CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OF DIVERSION POINT.
4. PROVIDE A TOTAL SEDIMENT TRAP VOLUME OF 36--± CUBIC FEET PER ACRE OF DISTURBED AREA. SOME OF THE REQUIRED VOLUME MAY BE PROVIDED BY UP OR DOWNSTREAM CONTROLS.
5. DO NOT INSTALL WHEN DEVICE WILL BE WITHIN 30 FEET OF VEHICULAR TRAVEL LANE.

INLET PROTECTION (E)
NO SCALE



MATTING IN DITCHES

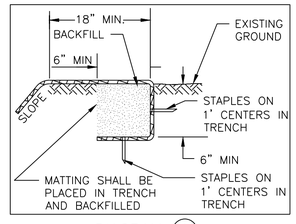
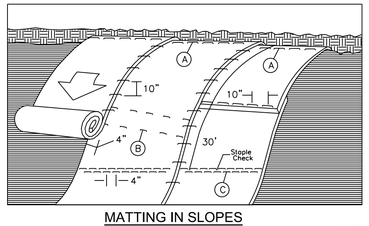


DIAGRAM (A)



MATTING IN SLOPES

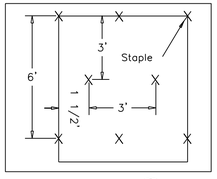


DIAGRAM (B)

Staple Check Pattern

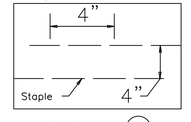


DIAGRAM (C)

NOTES:

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

EROSION CONTROL MATTING SHALL BE NORTH AMERICAN GREEN BIONET SC150BN WITH SHEER STRESS OF 2.1PSF OR APPROVED EQUAL.

EROSION CONTROL MATTING (F)
NO SCALE

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER W. MICHAEL SCOTT
2021.01.25 14:37:56-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

EROSION CONTROL DETAILS

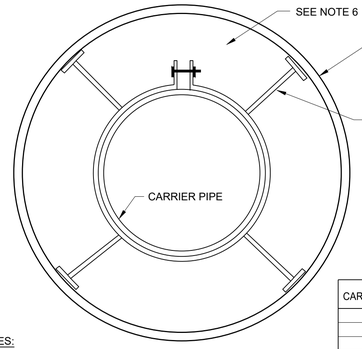
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

D1
SHEET
35 OF 42

FD9000A
D10000
PLOTTED: 1/25/2021 1:35 PM FILE: C:\pw_working\cngpw\d13062381D00.dwg



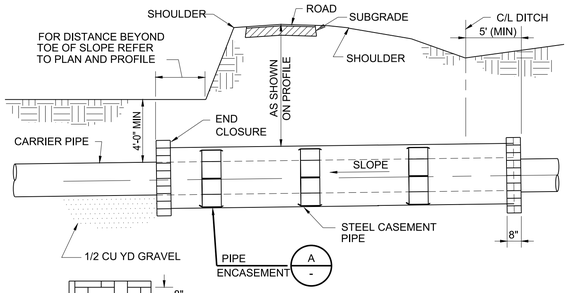
CONTRACTOR RESPONSIBLE FOR INSPECTING MATERIALS AND WELDS TO INSURE ALL SPIDERS WILL FUNCTION PROPERLY.

CARRIER PIPE	CASING PIPE ID	WALL THICKNESS STREET CROSSINGS	WALL THICKNESS RAILROAD CROSSINGS
4"	8"	0.188"	0.188"
6"	12"	0.188"	0.250"
8"	16"	0.250"	0.281"
10"	16"	0.250"	0.281"
12"	20"	0.281"	0.344"
16"	30"	0.344"	0.375"
24"	30"	0.406"	0.469"
30"	42"	0.500"	0.625"
36"	54"	0.500"	0.781"

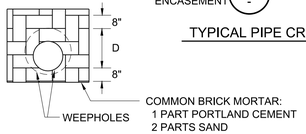
NOTES:

1. NO PIPE SHALL BE SUPPORTED BY BELL.
2. END SECTIONS LESS THAN 4' MAY BE UNSUPPORTED.
3. WALL THICKNESS AS PER TABLE UNLESS OTHERWISE SHOWN ON PLAN.
4. MASONRY SEAL AT ENDS -- 2" x 4" WEEP HOLE AT LOW END.
5. ALL PRESSURE PIPES TO HAVE TRACING WIRE IN ALL CASING BORES.
6. GROUT ANNULAR SPACE BETWEEN CARRIER PIPE AND CASING AS SPECIFIED PER NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

PIPE ENCASEMENT A
NO SCALE



TYPICAL PIPE CROSSING

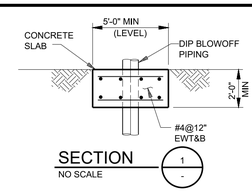


END CLOSURE SECTION

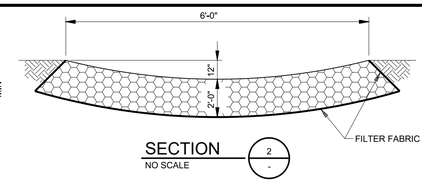
NOTES:

1. SEE DRAWINGS FOR LOCATION, SIZE AND LENGTH OF STEEL PIPE CASINGS.
2. INSTALL DRAINS EACH SIDE OF CARRIER PIPE IN DOWNHILL END WALL.

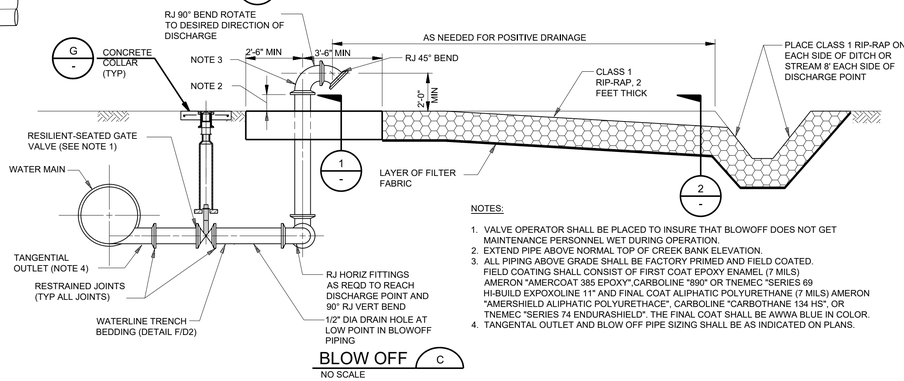
CASEMENT PIPE UNDER ROAD B
NO SCALE



SECTION 1
NO SCALE



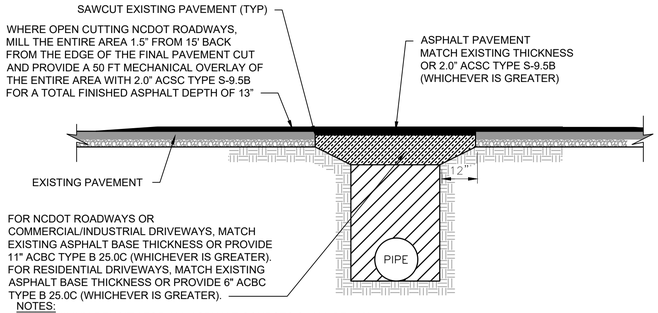
SECTION 2
NO SCALE



NOTES:

1. VALVE OPERATOR SHALL BE PLACED TO INSURE THAT BLOWOFF DOES NOT GET MAINTENANCE PERSONNEL WET DURING OPERATION.
2. EXTEND PIPE ABOVE NORMAL TOP OF CREEK BANK ELEVATION.
3. ALL PIPING ABOVE GRADE SHALL BE FACTORY PRIMED AND FIELD COATED. FIELD COATING SHALL CONSIST OF FIRST COAT EPOXY ENAMEL (7 MILS) AMERON "AMERCOAT 385 EPOXY",CARBOLINE "890" OR TNEMEC "SERIES 69 HI-BUILD EXPOXOLINE 11" AND FINAL COAT ALIPHATIC POLYURETHANE (7 MILS) AMERON "AMERSHIELD ALIPHATIC POLYURETHACE", CARBOLINE "CARBOTHANE 134 HS", OR TNEMEC "SERIES 74 ENDURASHIELD". THE FINAL COAT SHALL BE AWWA BLUE IN COLOR.
4. TANGENTAL OUTLET AND BLOW OFF PIPE SIZING SHALL BE AS INDICATED ON PLANS.

BLOW OFF C
NO SCALE

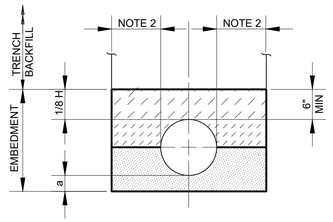


NOTES:

1. MINIMUM DENSITY FOR ALL ASPHALT COURSES SHALL BE 92%.
2. ASPHALT CONCRETE SURFACE COURSE (ACSC) SHALL BE PLACED & COMPACTED IN MAXIMUM OF 1.5" LIFTS.
3. ASPHALT CONCRETE INTERMEDIATE COURSE (ACIC) SHALL BE PLACED AND COMPACTED IN MAXIMUM OF 4.0" LIFTS.
4. ASPHALT CONCRETE BASE COURSE (ACBC) SHALL BE PLACED & COMPACTED IN MAXIMUM OF 4.0" LIFTS.
5. SAW CUT EDGES OF CUT TO PROVIDE A SMOOTH, EVEN EDGE FOR THE PATCH, & PREVENT DAMAGE TO THE EXISTING ASPHALT WHICH WILL REMAIN IN PLACE.
6. ONLY HALF OF THE ROAD WIDTH SHALL BE OPENED AT ONE TIME IN ORDER TO MAINTAIN TRAFFIC. NO TRENCH SHALL BE LEFT OPEN OVERNIGHT.
7. TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE FHWA'S MUTCD.
8. BACKFILL TO BE FREE OF ROCKS, FOREIGN MATERIAL OR FROZEN EARTH.
9. BACKFILL COMPACTED TO:
   A. 95% MAXIMUM DRY DENSITY UNDER ROADS, DRIVEWAYS, SIDEWALKS OR IN AREAS WHERE RESTRAINED JOINTS ARE USED.
   B. 95% MAXIMUM DRY DENSITY IN NCDOT RIGHT OF WAY. REFER TO SPECIFICATIONS AND NCDOT ENCROACHMENT AGREEMENTS FOR ADDITIONAL REQUIREMENTS.
10. BACKFILL COMPACTED IN MAXIMUM OF 8" LIFTS OVER PIPE & MAXIMUM OF 6" LIFTS AROUND PIPE.
11. PATCHES & OVERLAYS:
   A. ALL OPEN CUTS IN NCDOT ROADWAYS SHALL BE BACKFILLED, PAVED AND TRAVERSABLE PRIOR TO REMOVING LANE CLOSURE. IN ALL OTHER AREAS, OPEN CUTS SHALL BE PATCHED WITHIN 7 DAYS OF COMPLETION OF THAT PARTICULAR CUT.
   B. ALL OPEN CUTS OF NCDOT ROADWAYS SHALL BE OVERLAID 30 DAYS AFTER PAVEMENT REPAIR.
   C. WHERE OPEN CUTS RUN ACROSS THE ROADWAY CENTERLINE, THE OVERLAY SHALL BE FROM THE EDGE OF PAVEMENT TO THE EDGE OF PAVEMENT.
   D. WHERE OPEN CUTS DO NOT CROSS THE ROADWAY CENTERLINE, THE OVERLAY SHALL BE FROM THE EDGE OF PAVEMENT TO THE ROADWAY CENTERLINE, UNLESS THE ROADWAY CROWN POINT WOULD DICTATE OTHERWISE.
   E. REFER TO SPECIFICATIONS AND NCDOT ENCROACHMENT AGREEMENTS FOR ADDITIONAL REQUIREMENTS.
12. IF PAVEMENT SETTLEMENT OCCURS, THE CONTRACTOR SHALL REPATCH AT NO ADDITIONAL EXPENSE TO THE OWNERS.
13. FOR CITY STREETS, ANY REQUIREMENTS FROM CITY STREET CUT PERMIT SHALL BE FOLLOWED AND MAY SUPERSEDE THIS DETAIL, IF MORE STRINGENT.
14. ALL PAVEMENT MARKINGS DISTURBED DURING THE EXECUTION OF THE WORK SHALL BE REPLACED IN ACCORDANCE WITH NCDOT SPECIFICATIONS.

*REFERENCE TO DENSITY BASED ON STANDARD PROCTOR AS DETERMINED BY AASHTO T99 (ASTM D-698).

PAVEMENT REPAIR D
NO SCALE



LEGEND

Bc	OUTSIDE DIAMETER OF PIPE
H	COVER ABOVE TOP OF PIPE
D	NOMINAL PIPE SIZE
a	EMBEDMENT BELOW PIPE (SEE TABLE)

HAND PLACED EMBEDMENT *

COMPACTED EMBEDMENT *

GRANULAR EMBEDMENT *

CONCRETE

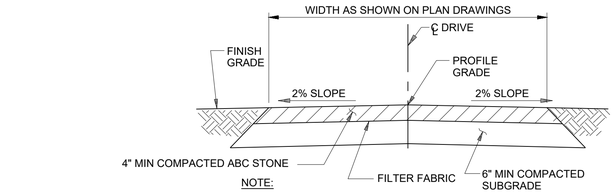
EMBEDMENT DEPTHS BELOW PIPE				
D	a MIN SOIL		a MIN ROCK	
	in	mm	in	mm
27" (675 mm) & SMALLER	3	75	6	150
30" (750 mm) TO 60" (1500 mm)	4	100	9	225
66" (1650 mm) & LARGER	6	150	12	300

NOTES:

1. MINIMUM COVER IS 48".
2. SIDEWALL CLEARANCE IS AS NOTED IN MINIMUM TRENCH WIDTH TABLE.
3. REFER TO SPECIFICATION SECTION 02202 FOR TRENCHING AND BACKFILL REQUIREMENTS.

MINIMUM TRENCH WIDTHS		
NOMINAL PIPE SIZE	MINIMUM TRENCH WIDTH	CLEARANCE
LESS THAN 27 in.	PIPE OD PLUS 24 in.	12 in.
27 in. THROUGH 60 in.	PIPE OD PLUS NOMINAL PIE SIZE	ID/2
GREATER THAN 60 in.	PIPE OD PLUS 70 iN .	30 in.
CLEARANCE = MINIMUM SIDEWALL CLEARANCE; OD = OUTSIDE DIAMETER (OR SPAN) OF CONDUIT; ID = INSIDE DIAMETER (OR SPAN) OF CONDUIT.		

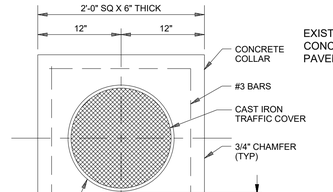
WATERLINE TRENCH F
NO SCALE



NOTE:

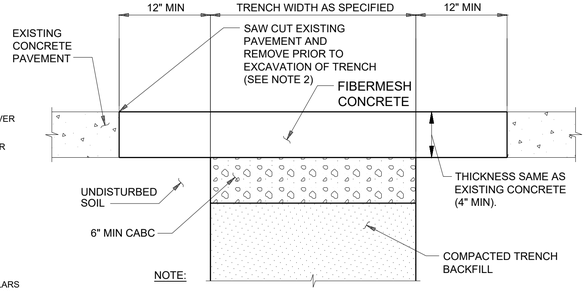
1. CONTRACTOR SHALL COMPACT SUB-GRADE TO 100%.

GRAVEL DRIVEWAY REPAIR I
NO SCALE



NOTE:
PRECAST CONC COLLARS W/ STAMPED VALVE NOS. ARE NOT ACCEPTABLE

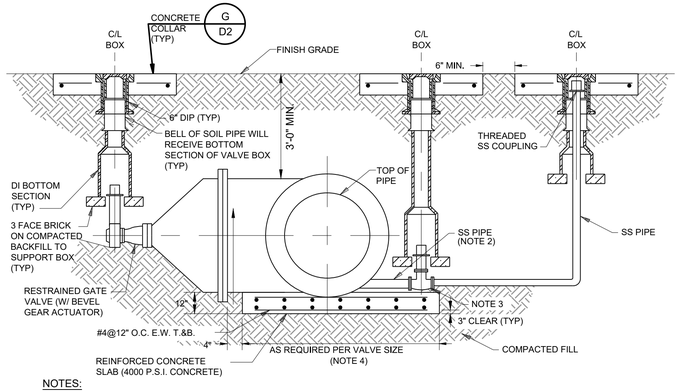
CONCRETE COLLAR G
NO SCALE



NOTE:

1. CONTRACTOR SHALL COMPACT SUB-GRADE TO 100%.
2. CONTRACTOR SHALL TO THE NEXT EXPANSION JOINT OR A MINIMUM 5 FEET FROM OUTSIDE TRENCH WALL.

CONCRETE DRIVEWAY REPAIR H
NO SCALE



NOTES:

1. THE FLUSHING VALVE PORT DIAMETER SHALL BE SIZED ACCORDING TO THE VALVE SIZE.
2. EXTEND SS PIPE AS NEEDED TO ALLOW FOR VALVE BOX RISER. SS PIPE SHALL BE SIZED ACCORDING TO FLUSHING PORT DIAMETER.
3. 200 PSI RATED SS BALL VALVE SIZED ACCORDING TO FLUSHING PORT DIAMETER.
4. EXTEND SUPPORT SLAB 6" BEYOND OUTSIDE SS FLUSHING VALVE END CONNECTION.

BURIED 36" GATE VALVE J
NO SCALE

BID SET

REVISIONS AND RECORD OF USE

NO.	DATE	BY	CHK	APP

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:57-05'00'

BLACK & VEATCH

Black & Veatch International Company
Building a World of Difference
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

MISCELLANEOUS DETAILS

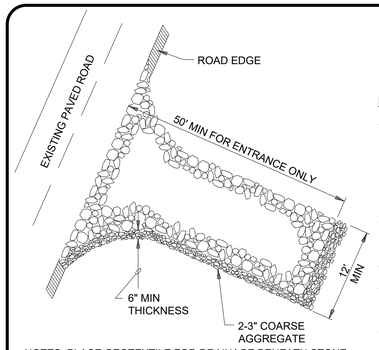
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

D2
SHEET
36 OF 42

FD9000A
D10000
PLOTTED: 1/25/2021 1:35 PM FILE: C:\pw_working\cngpw\d13062381D00.dwg

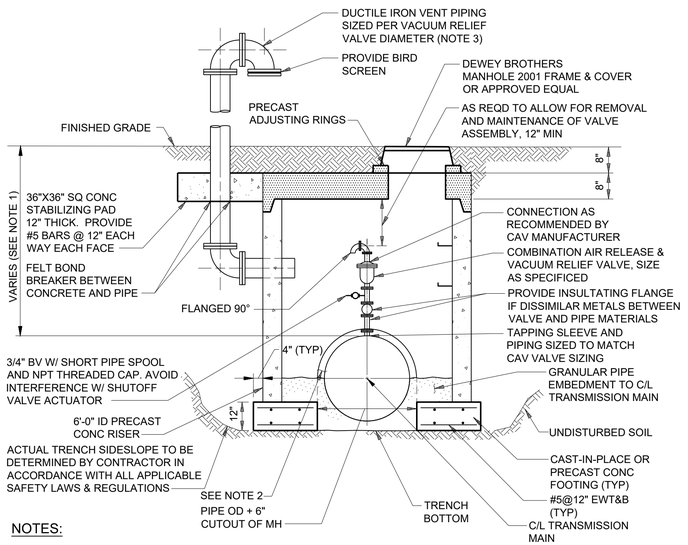


NOTES: PLACE GEOTEXTILE FOR DRAINAGE BENEATH STONE.

CONSTRUCTION ENTRANCE (A)
NO SCALE

NOTES:

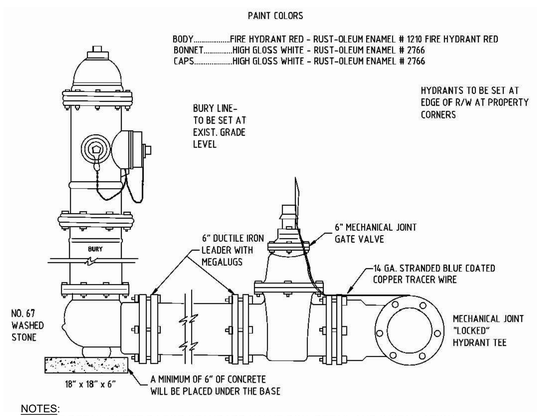
1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCES TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. USE 2-3" COARSE AGGREGATE STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.
7. INSTALL CONSTRUCTION ENTRANCES IN A WAY TO PREVENT VEHICLES FROM BYPASSING CONSTRUCTION ENTRANCE LEAVING PROJECT SITE.
8. INSTALL TEMPORARY DRAINAGE CULVERT TO MAINTAIN EXISTING DRAINAGE DITCH FLOW AND PREVENT SURCHARGING ONTO THE EXISTING ROADWAY.



NOTES:

1. SEE PLAN AND PROFILE SHEETS FOR APPROXIMATE LOCATION OF MANHOLE. AIR RELEASE MH ASSEMBLY TO BE INSTALLED AT HIGH POINT OF TRANSMISSION MAIN. PRECISE LOCATION AND ORIENTATION OF MANHOLE TO BE DETERMINED IN THE FIELD BY THE ENGINEER BASED UPON THE CONDITIONS ENCOUNTERED. CONTRACTOR TO VERIFY AND COORDINATE MIN COVER AS REQUIRED BASED ON INTERIOR PIPING AND VALVE SIZE AND CONFIGURATION. TRANSMISSION MAIN TO SLOPE DOWN AWAY FROM EITHER SIDE OF MANHOLE AS INDICATED ON THE DRAWINGS.
2. PLUG THE ANNULAR SPACE BETWEEN THE TRANSMISSION MAIN AND THE PRECAST CONCRETE RISER ABOVE THE GRANULAR PIPE EMBEDMENT TO PREVENT BACKFILL MATERIALS FROM ENTERING INTO THE MANHOLE. THE MATERIAL AND METHOD FOR PLUGGING THE ANNULAR SPACE IS TO BE ACCEPTABLE TO ENGINEER (TYP).
3. EXTEND VENT PIPING 18" ABOVE GRADE MEASURED FROM THE BOTTOM OF THE BIRD SCREEN TO ALLOW FOR MAINTENANCE.

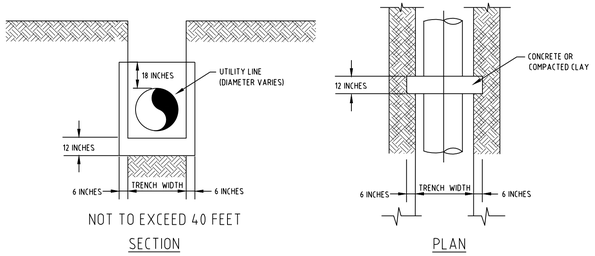
AIR RELEASE MANHOLE (B)
NO SCALE



NOTES:

1. SEE DETAIL SHEET D4 FOR STANDARD VALVE BOX DETAIL AND INSTALLATION.

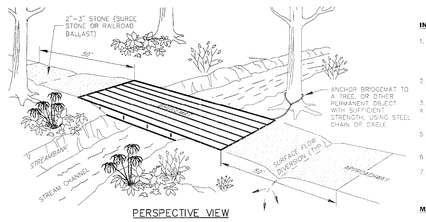
FIRE HYDRANT INSTALLATION (C)
NO SCALE



ANTI-SEEP COLLARS MAY BE CONSTRUCTED WITH CLASS B CONCRETE OR COMPACTED CLAY. THE COMPACTED CLAY SHALL HAVE A SPECIFIC DISCHARGE OF 1x10-5CM/SEC OR LESS. THE FOLLOWING SPECIFICATIONS APPLY TO CLASS B CONCRETE:

A. MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ROUNDED COURSE AGGREGATE 5.0
B. MINIMUM CEMENT CONTENT, SACKS PER CUBIC YARD WITH ANGULAR COURSE AGGREGATE 5.5
C. MAXIMUM WATER-CEMENT RATIO GALLONS PER SACK 6.8
D. SLUMP RANGE 2" TO 4"
E. MINIMUM STRENGTH - 28 DAY PSI 2,500

ANTI-SEEP COLLAR (D)
NO SCALE



INSTALLATION NOTES:

1. REFER TO "NORTH CAROLINA DIVISION OF FOREST RESOURCES" LITERATURE, INSTALLATION MAINTENANCE GUIDELINES, & "NORTH CAROLINA FORESTRY BMP MANUAL- 2006".
2. USE A BULLDOZER, KNUCKLEBOOM LOADER, OR SKIDDER TO INSTALL & REMOVE DRAGLINE MATS.
3. KEEP HEAVY EQUIPMENT OUT OF STREAM.
4. INSTALL WATER DIVERSION DEVICES (WATER BARS, TURNOUTS, BRUSH-BASED DIPS, ETC.) ON BOTH SIDES OF THE MATS.
5. STABILIZE EXPOSED MINERAL SOIL WITH TREE TOPS OR BRUSH DURING MAT INSTALLATION, AND SEEDING/MULCH AFTER MAT REMOVAL.
6. INSTALL MATS TO CREATE A MINIMUM TEN FOOT BRIDGE WIDTH.
7. MATS SHALL BE INSTALLED SUCH THAT THERE ARE NO GAPS BETWEEN THE MATS AND NO GAPS BETWEEN THE END OF THE MATS AND STONE APPROACHES.

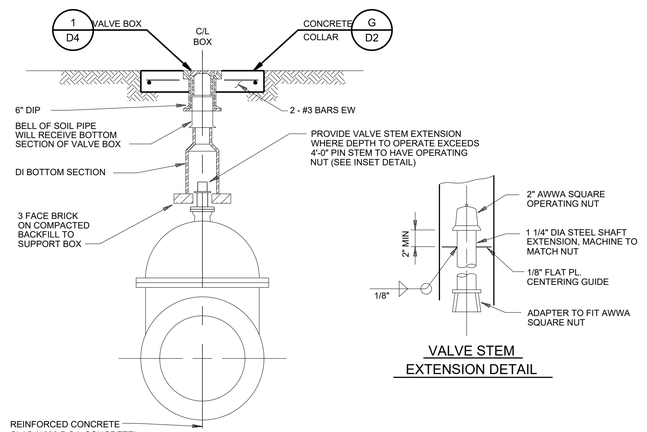
MAINTENANCE NOTES:

1. KEEP MATS SURFACE FREE OF MINERAL SOIL AND DEBRIS THAT COULD ENTER STREAM.
2. PERIODICALLY CHECK MAT HARDWARE; RETIGHTEN NUTS & CABLE CLAMPS AS NECESSARY TO MAINTAIN BRIDGE STRENGTH AND INTEGRITY.
3. IMMEDIATELY REMOVE ANY DEBRIS WHICH ENTERS THE STREAM AT THE CROSSING LOCATION.

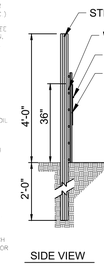
REMOVAL NOTES:

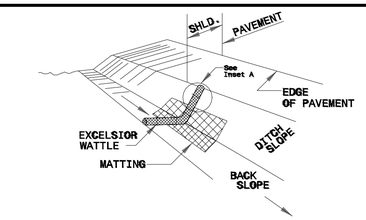
1. CLEAN OFF BRIDGE SURFACE.
2. REMOVE MATS BY USING MAT CABLE LOOP OR SKIDDER GRAPPLE.
3. PERMANENTLY STABILIZE DISTURBED PORTIONS OF STREAM BANK AND APPROACH ROADS WITH PERENNIAL GRASSES/MULCH (OR WETLAND MIX WHEN APPLICABLE).
4. LEAVE APPROPRIATE WATER DIVERSION STRUCTURES IN PLACE ON BOTH SIDES OF STREAM.

TEMPORARY STREAM CROSSING (F)
NO SCALE



GATE VALVE INSTALLATION 16" DIA AND SMALLER (E)
NO SCALE





ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

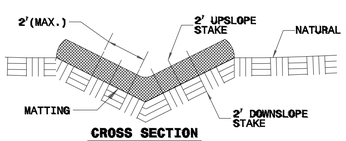
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

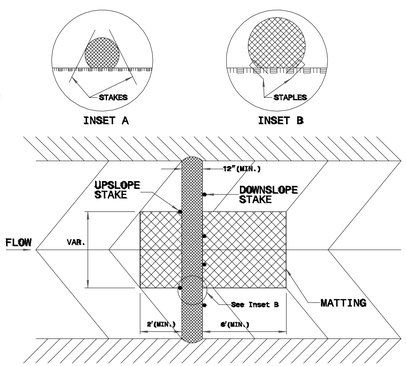
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

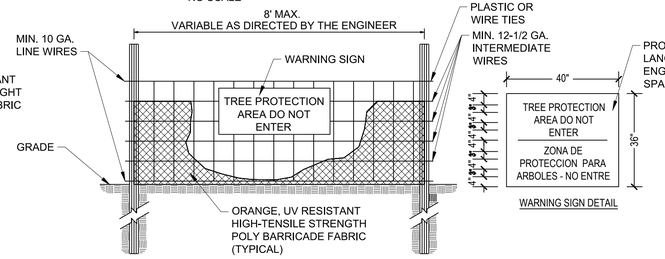
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

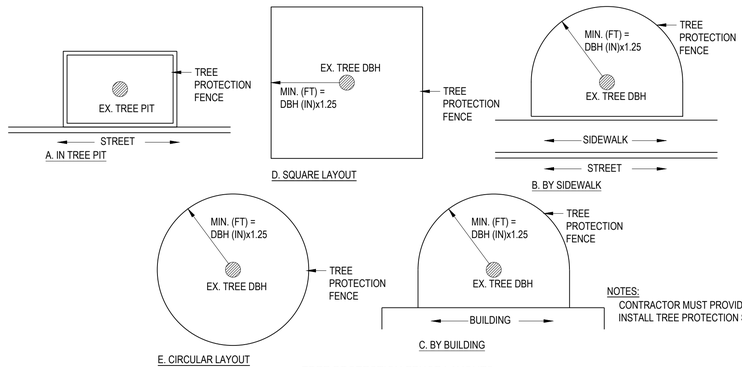
INSTALL MATTING IN ACCORDANCE WITH SPECIFICATIONS.





WATTLE DETAIL (G)
NO SCALE





TREE PROTECTION FENCE LAYOUTS

NOTES:

1. IN ADDITION TO TREE PROTECTION CONTRACTOR SHALL UTILIZE TREE PROTECTION FENCING TO DELINEATE THE LIMITS OF CONSTRUCTION
2. TREE PROTECTION FENCING MUST BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE EXCEPT WHERE SILT FENCE IS SPECIFIED IN THE PLANS. CONTRACTOR (SEE DETAIL THIS SHEET) SHALL NOT INSTALL SIGNS WHEN FENCING IS USED TO DELINEATE LIMITS
3. THE TREE PROTECTION FENCING MUST REMAIN IN PLACE FOR THE DURATION OF THE PROJECT UNLESS OTHERWISE APPROVED BY ENGINEER/OWNER. OF CONSTRUCTION.
4. APPROVED IMPACT PROTECTION DEVICES MUST BE REMOVED AFTER CONSTRUCTION WHEN APPLICABLE.
5. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER FOR THE REMAINDER.
6. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTED AREA.
7. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
8. ADDITIONAL SIGNS MAY BE REQUIRED BY OWNER/ENGINEER ON ACTUAL FIELD CONDITIONS.
9. SIGNS ARE TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL WITH LETTERS A MINIMUM OF 3" HIGH, CLEARLY LEGIBLE AND SPACED AS SHOWN.

CONSTRUCTION/TREE PROTECTION FENCE (I)
NO SCALE

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER WILLIAM L. POOLE
2021.01.25 14:37:58-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building One Services
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

EROSION CONTROL DETAILS AND MISCELLANEOUS DETAILS

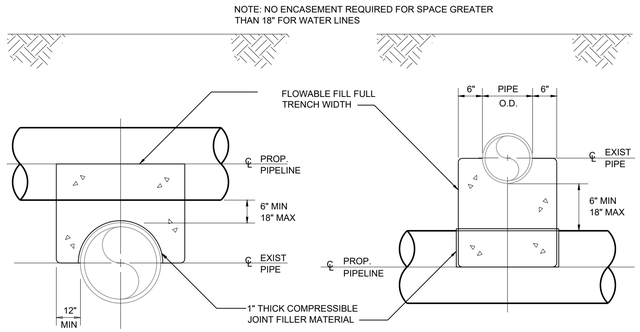
DESIGNED:	MLT, WPS
DETAILED:	KTH
CHECKED:	CES
APPROVED:	SLT
DATE:	JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 186110

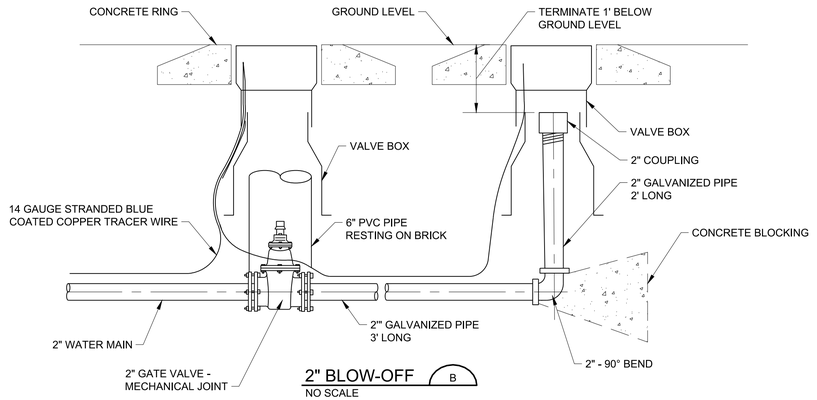
D3
SHEET 37 OF 42

FD0000A
D10000
PLOTTED: 1/25/2021 1:36 PM FILE: C:\pw_working\cngpw\d1306238\D00.dwg



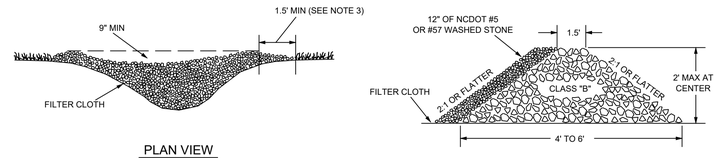
CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS — A

NO SCALE



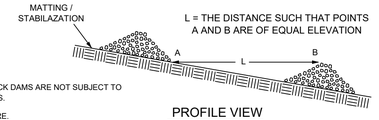
2" BLOW-OFF — B

NO SCALE



MAINTENANCE:
CLEAN OUT SEDIMENT AND DEBRIS AND REPAIR WASH OUTS.

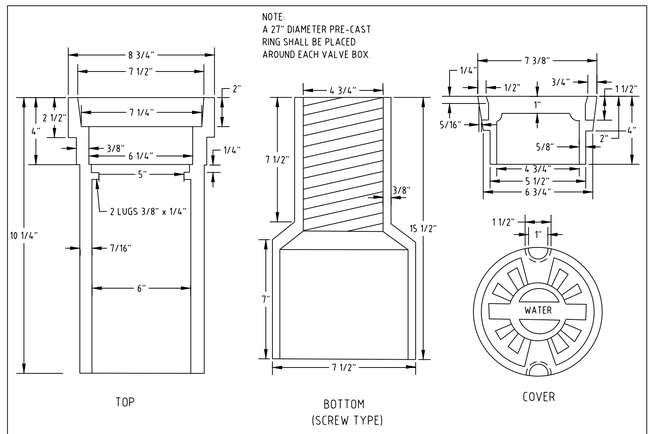
SEE N.C. DEQ EROSION and SEDIMENT CONTROL PLANNING and DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES; PLANNING CONSIDERATION & DESIGN CRITERIA.



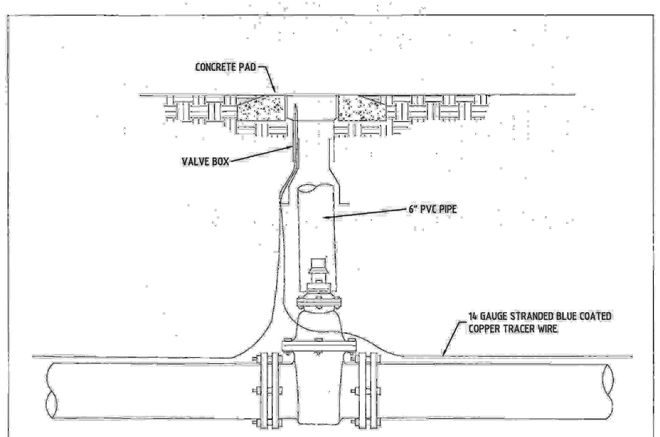
NOTES:
1. ENSURE THAT CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONES.
2. THE DRAINAGE AREA IS LIMITED TO ONE HALF ACRE.
3. KEY THE STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 1.5 FEET TO AVOID WASHOUT FROM OVERFLOW AROUND THE DAM.

CHECK DAM — C

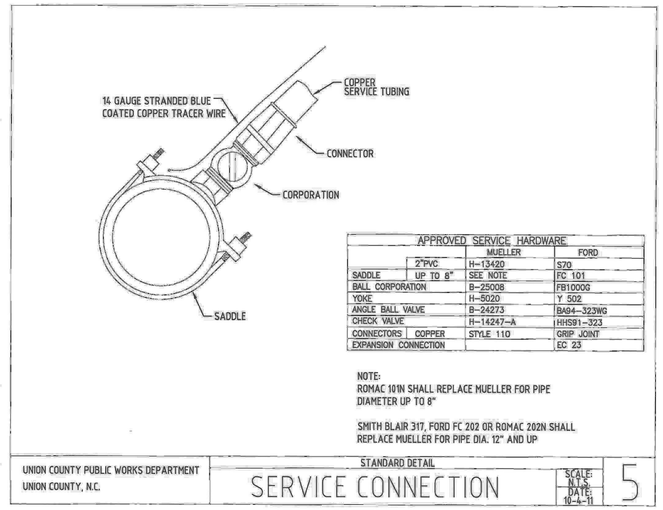
NO SCALE



UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL VALVE BOX	SCALE: N.T.S. DATE: 11-17-06 1



UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL VALVE BOX INSTALLATION	SCALE: N.T.S. DATE: 10-4-11 1A



APPROVED SERVICE HARDWARE			
		MUELLER	FORD
	2"PVC	H-13420	S70
SADDLE	UP TO 8"	SEE NOTE	FC 101
BALL CORPORATION		B-25008	FB11000
YOKE		H-5020	Y 502
ANGLE BALL VALVE		B-24273	B404-323WG
CHECK VALVE		H-14247-A	HHS91-323
CONNECTORS	COPPER	STYLE 110	GRIP JOINT
EXPANSION CONNECTION			EC 23

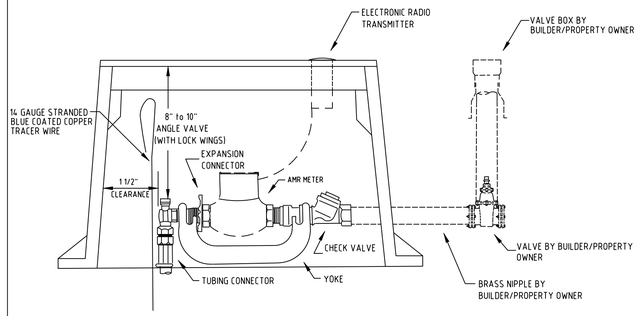
NOTE:
ROMAC 101N SHALL REPLACE MUELLER FOR PIPE DIAMETER UP TO 8"

SMITH BLAIR 317, FORD FC 202 OR ROMAC 202N SHALL REPLACE MUELLER FOR PIPE DIA. 12" AND UP

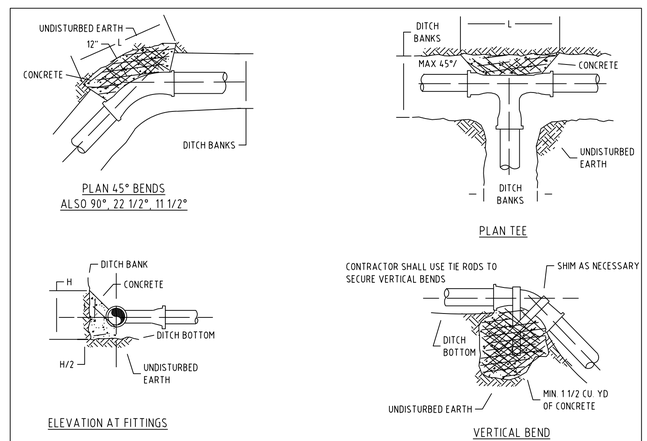
UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL SERVICE CONNECTION	SCALE: N.T.S. DATE: 10-4-11 5

GENERAL NOTES:

1) METER BOX LID TO HAVE AMR LOCATOR (ALLIANCE 1200 OR EQUAL FOR 50W ERT, STANDARD LID FOR 60W ERT)
2) BUILDER/PROPERTY OWNER TO INSTALL NIPPLE, VALVE AND VALVE BOX BEFORE METER WILL BE SET.
3) METER AND ERT BY UNION COUNTY @ PREVAILING RATE



UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL METER INSTALLATION FOR AMR METERS	SCALE: N.T.S. DATE: 1-2-14 6



UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL THRUST BLOCK	SCALE: N.T.S. DATE: 11-17-06 16

ANCHORAGE SCHEDULE

PIPE SIZE	11 1/4º BEND L	11 1/4º BEND H	22 1/2º BEND L	22 1/2º BEND H	45º BEND L	45º BEND H	90º BEND L	90º BEND H	TEE L	TEE H	TEST PRESSURE (P.S.I.)
6"	1'3"	1'0"	2'3"	1'0"	2'6"	1'6"	2'9"	1'6"	2'0"	1'6"	200
	1'6"	1'3"	2'3"	1'6"	3'0"	1'6"	4'0"	1'6"	3'0"	1'6"	300
8"	1'6"	1'6"	2'6"	1'9"	3'0"	2'0"	3'9"	2'0"	2'6"	2'0"	200
	2'0"	1'6"	3'0"	2'0"	3'9"	2'3"	4'6"	2'6"	3'6"	2'3"	300
12"	2'6"	1'9"	4'0"	2'3"	4'3"	3'0"	5'0"	3'3"	4'0"	3'0"	200
	3'6"	2'0"	5'3"	2'6"	6'0"	3'3"	7'0"	3'6"	5'0"	3'6"	300
14"	3'0"	1'0"	4'0"	3'0"	4'6"	3'9"	6'0"	3'9"	4'6"	3'6"	200
	4'0"	2'6"	5'3"	3'6"	6'0"	4'3"	6'6"	5'0"	5'0"	5'0"	300
16"	3'0"	2'9"	4'6"	3'6"	5'0"	4'6"	7'0"	4'3"	5'0"	4'0"	200
	4'0"	3'0"	6'3"	3'9"	6'5"	5'3"	8'0"	5'3"	7'6"	4'0"	300

THRUST BLOCK DIMENSIONS BASED ON SOIL BEARING CAPACITY OF 2000 P.S.F. AND A WATER TEST PRESSURE OF 150 P.S.I. SIZES OF THRUST BLOCKS MAY BE REVISED BY THE ENGINEER WHERE BEARING CAPACITY OF SOIL VARIES.

PROVIDE TAR PAPER JOINT BETWEEN CONCRETE THRUST BLOCK AND PORTION OF PIPE BEING ANCHORED.

ALL CONCRETE THRUST BLOCKS SHALL BE 2500 P.S.I. CONCRETE.

MAXIMUM VERTICAL DEFLECTION SHALL BE 22 1/2°.

JOINTS SHALL REMAIN FREE OF CONCRETE FOR INSPECTION, REPAIR OR REPLACEMENT OF JOINTS.

UNION COUNTY PUBLIC WORKS DEPARTMENT UNION COUNTY, N.C.	STANDARD DETAIL THRUST BLOCK SPECIFICATIONS	SCALE: N/A DATE: 11-17-06 17

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER
2021.01.25 14:37:59-05'00'

BLACK & VEATCH
Black & Veatch International Company
Building One Strength.
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

MISCELLANEOUS DETAILS
AND UNION COUNTY STANDARD DETAILS

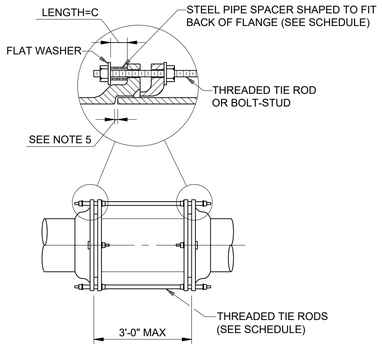
DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

D4
SHEET
38 OF 42

FD9000A
D10000
PLOTTED: 1/25/2021 1:36 PM FILE: C:\pw_working\cngpw\d1306238\D00.dwg



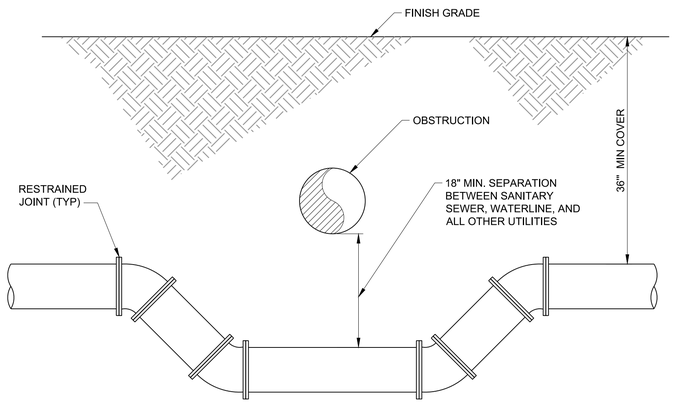
NOTES:

1. PRESSURE SHALL BE THE PRESSURE AT WHICH THE PIPE IS HYDROSTATICALLY TESTED, OR IF THERE IS NO HYDROSTATIC FIELD TEST, IT SHALL BE THE SPECIFIED SHOP TEST PRESSURE.
2. UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
3. EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE TEE HEAD BOLTS.
4. FOR PIPING FLEXIBILITY, PROVIDE GAP LARGE ENOUGH TO FACILITATE PIPE ASSEMBLY AND DISASSEMBLY AT ASSOCIATED FLANGED PIPE JOINTS.

MECHANICAL TIE ROD SCHEDULE

PIPE SIZE (INCHES)	MINIMUM PRESSURE (PSI) (NOTE 1)	TIE RODS		PIPE SPACERS		
		NO. OF RODS (NOTE 2)	DIA OF RODS (INCHES)	DIA OF SPACERS (INCHES)	LENGTH=C (INCHES)	PIPE SCHEDULE
16	150 OR LESS 250 350	4 6 8	3/4	1	3 1/2	80
36	100 OR LESS 150 200 250	8 12 18 22	1	1 1/4	4	80

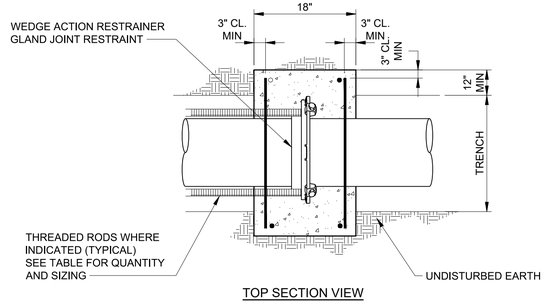
DIP MECHANICAL JOINT COUPLING WITH TIE RODS (A)
NO SCALE



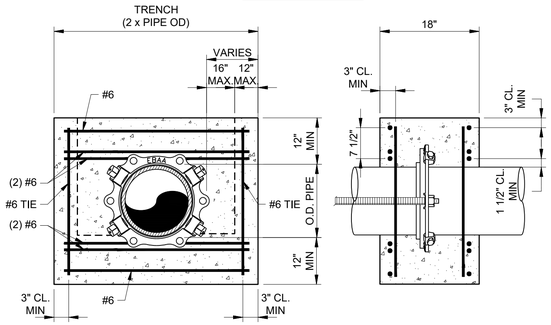
STANDARD WATER AND SEWER SEPARATION REQUIREMENTS:

1. LATERAL SEPARATION OF SEWERS AND WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWERS, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION - IN WHICH CASE:
   A. THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH HE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER; OR
   B. THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH, AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
2. CROSSING A WATER MAIN OVER A SEWER. WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION - IN WHICH CASE BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
3. CROSSING A WATER MAIN UNDER A SEWER. WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER, BOTH THE WATER MAIN AND THE SEWER SHALL BE CONSTRUCTED OF FERROUS MATERIALS AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
4. A VERTICAL DISTANCE OF 18 INCHES SHALL BE MAINTAINED FOR ALL OTHER UTILITY CROSSINGS.

UTILITY CROSSING (D)
NO SCALE



TOP SECTION VIEW



ELEVATION VIEW SIDE SECTION VIEW

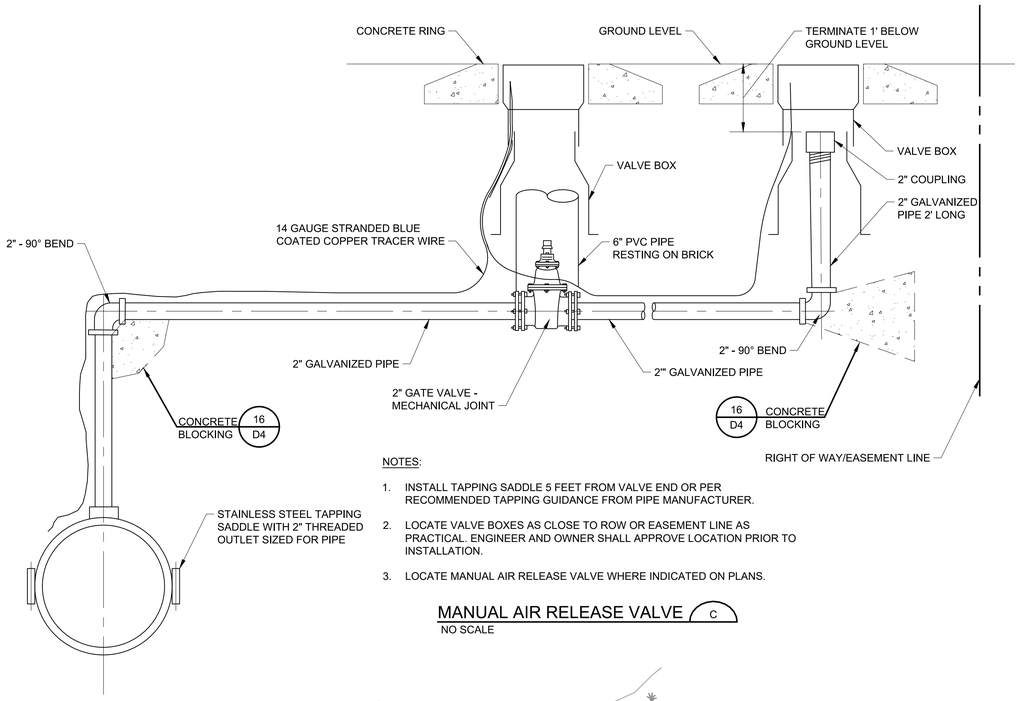
NOTES:

1. CONCRETE SHALL 3000 P.S.I.
2. REINFORCING BARS SHALL BE DEFORMED BARS, AND TIED TOGETHER.
3. BACKFILL AND COMPACT IN 6" LAYERS.
4. PLACE THRUST COLLAR ON ONE FULL JOINT OF PIPE.
5. PLACE WEDGE ACTION RESTRAINER GLAND JOINT RESTRAINT 4 FEET FROM PLUG AND END OF PIPE.
6. 6. ASTM A307 CADIUM COATED TIE RODS.

TIE ROD ANCHORS DATUM

PIPE SIZE (INCHES)	ROD DIAMETER	NO. OF A307 RODS REQUIRED
8	3/4"	4
16	3/4"	12

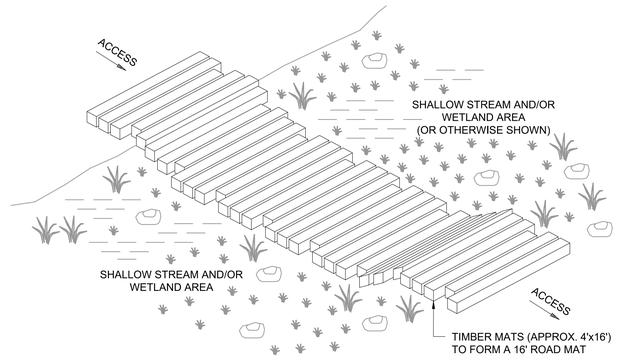
THRUST COLLAR (B)
NO SCALE



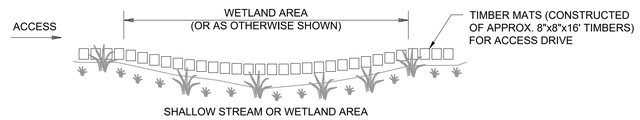
NOTES:

1. INSTALL TAPPING SADDLE 5 FEET FROM VALVE END OR PER RECOMMENDED TAPPING GUIDANCE FROM PIPE MANUFACTURER.
2. LOCATE VALVE BOXES AS CLOSE TO ROW OR EASEMENT LINE AS PRACTICAL. ENGINEER AND OWNER SHALL APPROVE LOCATION PRIOR TO INSTALLATION.
3. LOCATE MANUAL AIR RELEASE VALVE WHERE INDICATED ON PLANS.

MANUAL AIR RELEASE VALVE (C)
NO SCALE



PERSPECTIVE VIEW



SECTION VIEW

WETLAND MATTING (E)
NTS

BID SET

NO.	BY	CHK	APP	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL L. THOMPSON
2021.01.25 14:37:59-05'00'

BLACK & VEATCH

Black & Veatch International Company
Black & Veatch Holding Company
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

MISCELLANEOUS DETAILS

DESIGNED: MLT
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

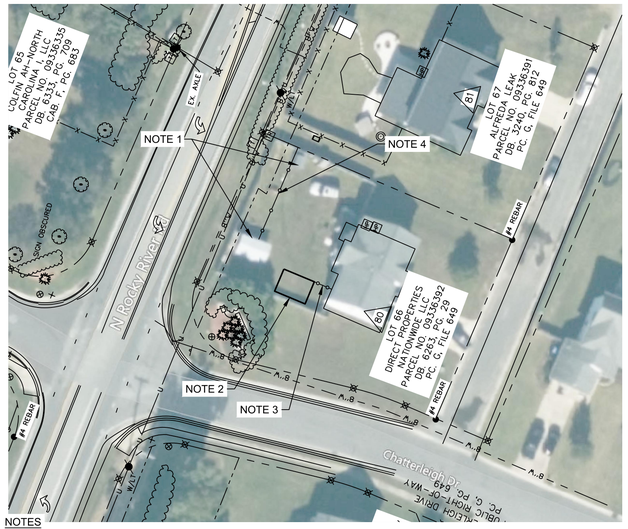
PROJECT NO. 186110

D5
SHEET 39 OF 42

FD9000A
D10000
PLOTTED: 1/25/2021 1:36 PM FILE: C:\pw_working\cngpw\d13062381D00.dwg

RESTORATIVE PLANTING SCHEDULE		
NO.	SIZE	COMMON NAME
15	15 GAL	MAGNOLIA " BETTY"
11	5 GAL	CRYPTOMERIA JAPONICA
37	5 GAL	NELLY R STEVENS HOLLY

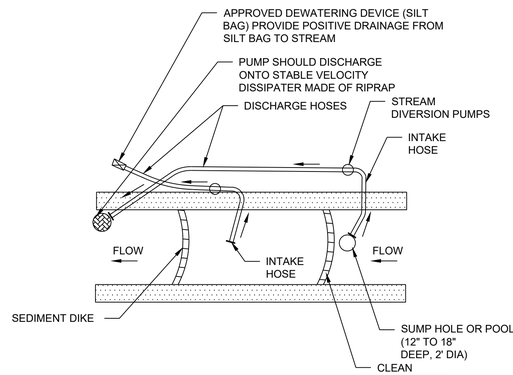
LOT # 36 PLANTING SCHEDULE (A)
NO SCALE



NOTES

1. TEMPORARILY RELOCATE EXISTING BUILDINGS AND RESET AS SHOWN.
2. TEMPORARY RELOCATION SITE FOR LARGER BUILDING.
3. INSTALL TEMPORARY DOG FENCING AT THIS LOCATION.
4. INSTALL PERMANENT 6 FT DOG-RUN FENCING WITH GATE AT THIS LOCATION.
5. REMOVE AND RESET WOOD PERIMETER FENCE IN EXISTING LOCATION. REPLACE WITH NEW MATERIAL IF DAMAGE.

LOT # 80 RELOCATION PLAN (D)
1"=40'



NOTES:

1. SANDBAG DIKES SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER CONSTRUCTED OF RIP RAP OR SANDBAGS.
2. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A SEDIMENT BAG OR OTHER APPROVED DEVICE. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE WITHOUT CAUSING FURTHER EROSION BETWEEN THE SILT BAG AND STREAM. CONTRACTOR SHALL KEEP AN EXTRA SILT BAG ON SITE AT ALL TIMES DURING CONSTRUCTION.
3. CONTRACTOR SHALL MINIMIZE CREEK BANK DISTURBANCE, CLEARING AND GRUBBING WITHIN CREEK BANKS SHALL BE LIMITED TO THAT REQUIRED BY CONTRACTOR FOR INSTALLATION OF THE PIPELINE.

TEMPORARY PUMP AROUND (E)
NTS

RESTORATIVE PLANTING SCHEDULE			
NO.	SIZE	COMMON NAME	BOTANICAL NAME
25	15 GAL	CREPE MYRTLE	LAGERSTROEMIA INDICA
5	15 GAL	WHITE OAK	QUERCUS ALBA
5	15 GAL	RED MAPLE	ACER RUBRUM
5	15 GAL	BLACK GUM	NYSSA SYLVATCA
5	15 GAL	AMERICAN ELM	ULMUS AMERICANA
0	15 GAL	WILLOW OAK	QUERCUS PHELLOS
5	15 GAL	SHAGBARK HICKORY	CARYA OVATE

LOT # 52 PLANTING SCHEDULE (B)
NO SCALE

SEEDING & SEEDBED PREPARATION REQUIREMENTS

DURING CONSTRUCTION THE CONTRACTOR SHALL BE REQUIRED TO CONTROL EROSION ON ALL DISTURBED SLOPES BEFORE THE ESTABLISHMENT OF PERMANENT VEGETATION. TEMPORARY AND PERMANENT SEEDING SHALL BE AS SPECIFIED IN SECTION 02920 OF THE CONTRACT DOCUMENTS AND AS INDICATED BELOW. THE CONTRACTOR SHALL PERFORM MAINTENANCE AS NECESSARY TO KEEP PERMANENT SEEDED AREAS IN A SATISFACTORY CONDITION UNTIL TURNED OVER TO THE CARE OF THE OWNER'S PERSONNEL.

PREPARATION OF SUBSOIL

A. COMPLETE OPERATIONS IN THE AREA TO BE SEEDED AND PREPARE SUBSOIL TO ELIMINATE UNEVEN AREAS AND LOW SPOTS. BRING SURFACE TO THE APPROXIMATE DESIGN CONTOURS.
B. SCARIFY SUBSOIL TO A DEPTH OF 3 INCHES. REMOVE WEEDS, ROOTS, STONES AND FOREIGN MATERIALS 1-1/2 INCHES IN DIAMETER AND LARGER.

PLACING TOPSOIL

MATERIALS: FERTILE, AGRICULTURAL SOIL, TYPICAL FOR LOCALITY, CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH, TAKEN FROM DRAINED SITE; FREE OF SUBSOIL, CLAY OR IMPURITIES, PLANTS, WEEDS, AND ROOTS; PH VALUE OF MINIMUM 5.4 AND MAXIMUM OF 7.0.

A. PLACE TOPSOIL DURING DRY WEATHER AND ON DRY UNFROZEN SUBSOIL WHERE INDICATED ON DRAWINGS.
B. SPREAD TOPSOIL TO A MINIMUM DEPTH OF 4 INCHES. REMOVE VEGETABLE MATTER AND FOREIGN NON-ORGANIC MATERIAL FROM TOPSOIL WHILE SPREADING. GRADE SURFACE TO PROVIDE POSITIVE DRAINAGE AND PREVENT WATER PONDING. LIGHTLY COMPACT TOPSOIL WITH AT LEAST ONE PASS OF A CULTIPACKER OR SIMILAR EQUIPMENT
C. MAINTAIN THE FINISHED SURFACES BY PROTECTING, AND REPLACING TOPSOIL AND SUBSOIL AS NECESSARY UNTIL THE AREA IS ACCEPTED UNDER THE CONTRACT.

APPLICATION OF LIME

MATERIALS: GROUND DOLOMITIC AGRICULTURAL LIMESTONE, NOT LESS THAN 85 PERCENT TOTAL CARBONATES, GROUND SO THAT 50 PERCENT PASSES 100 MESH SIEVE AND 90 PERCENT PASSES 30 MESH SIEVE. COARSER MATERIAL WILL BE ACCEPTABLE, PROVIDED THE SPECIFIED RATES OF APPLICATION ARE INCREASED PROPORTIONATELY ON THE BASIS OF QUANTITIES PASSING NO. 100 MESH SIEVE.

A. LIMING SHALL BE DONE IMMEDIATELY AFTER GRADING HAS REACHED THE FINE GRADING STAGE, EVEN THOUGH ACTUAL SEEDING MAY NOT BE DONE UNTIL SEVERAL MONTHS LATER.
B. SPREAD LIME EVENLY BY MEANS OF A MECHANICAL DISTRIBUTOR.
C. WHEN LIME IS DISTRIBUTED BY COMMERCIAL LIMING DEALERS, SALES SLIPS SHOWING THE TONNAGE DELIVERED SHALL BE FILED WITH THE ENGINEER AND SHALL SHOW THE FULL TONNAGE REQUIRED FOR THE ACRES TREATED.
D. INCORPORATE LIME IN THE TOP 2 TO 3 INCHES OF SOIL BY HARROWING, DISKING, OR OTHER APPROVED MEANS. LIME SHALL BE APPLIED AT A MINIMUM OF 2 TONS PER ACRE WITH 3 TONS PER ACRE IN CLAY SOILS OR PER SOILS TEST.

APPLICATION OF FERTILIZER

MATERIALS: FERTILIZER: MIXED, COMMERCIAL, FERTILIZER CONTAINING 10-10-10 PERCENTAGES OF AVAILABLE NITROGEN, PHOSPHORIC ACID, AND POTASH RESPECTIVELY, PLUS SUPERPHOSPHATE WITH 20 PERCENT P2O5 CONTENT. FERTILIZER SHALL BE DRY, IN GRANULAR (PELLET) FORM, SHALL BE DELIVERED TO THE SITE IN THE MANUFACTURER'S ORIGINAL BAG OR CONTAINER WHICH SHALL BE PLAINLY MARKED AS TO FORMULA.

A. SPREAD FERTILIZER NOT MORE THAN 2 WEEKS IN ADVANCE OF SEEDING.
B. TO VERIFY APPLICATION RATE, DETERMINE ACREAGE TO BE FERTILIZED AND PROVIDE ENGINEER WITH TOTAL WEIGHT OF FERTILIZER APPLIED TO THE AREA.
C. PROVIDE MECHANICAL SPREADER FOR EVEN DISTRIBUTION AND SPREAD HALF OF THE RATE IN ONE DIRECTION, AND THE OTHER HALF AT RIGHT ANGLES TO THE FIRST. MIX THOROUGHLY INTO UPPER 2 TO 3 INCHES OF SOIL BY DISKING, HARROWING OR OTHER APPROVED METHODS.

SEEDING

MATERIALS:
SEED: FRESH SEED GUARANTEED 95 PERCENT PURE WITH A MINIMUM GERMINATION RATE OF 85 PERCENT WITHIN ONE YEAR OF TESTS. PROVIDE THE FOLLOWING SEED MIXTURES WITH LIME AND FERTILIZER IN DISTURBED AREAS INCLUDING NCDOT RIGHTS-OF-WAY:

1. TEMPORARY SEEDING

TEMPORARY SEEDING		
PLANTING DATES	GRASS TYPE	POUNDS/ACRE
JAN 1 - MAY 1	RYE (GRAIN)	120
MAY 1 - AUG 15	GERMAN MILLET	50
AUG 15 - DEC 30	RYE (GRAIN)	120
LIME		2,000
FERTILIZER (JAN 1 - AUG 15)	10-10-10	750
FERTILIZER (AUG 15 - DEC 30)	10-10-10	1,000
MULCH	STRAW	4,000

2. PERMANENT SEEDING (MAXIMUM SLOPE 3:1)

PERMANENT SEEDING (MAXIMUM SLOPE 3:1)		
PLANTING DATES	GRASS TYPE	POUNDS/ACRE
AUG. 15 - NOV. 1	TALL FESCUE	300
NOV. 1 - MAR. 1	TALL FESCUE	300
&	ABRUZZI RYE	25
MAR. 1 - APR 15	TALL FESCUE	300
APR. 15 - JUN. 30	HULLED COMMON	25
	BERMUDA GRASS	
JUL. 1 - AUG. 15	TALL FESCUE	120
&	BROWNTOP MILLET	35
&	SORGHUM-SUDAN HYBRIDS	30
LIME		4,000
FERTILIZER	10-10-10	1,000
MULCH	STRAW	4,000

RESTORATIVE PLANTING SCHEDULE			
NO.	SIZE	COMMON NAME	BOTANICAL NAME
11	15 GAL	RED MAPLE	ACER RUBRUM
10	15 GAL	WHITE OAK	QUERCUS ALBA
4	15 GAL	OKAME CHERRY	PRUNUS X INCAM
3	15 GAL	JAPANESE RED MAPLE	ACER PALMATUM
2	15 GAL	NATCHEZ CREPE MYRTLE	LAGERSTROEMIA NATCHEZ

LOT # 53/54 PLANTING SCHEDULE (C)
NO SCALE

SEEDING & SEEDBED PREPARATION REQUIREMENTS (CON'T)

3. PERMANENT SEEDING (MAXIMUM SLOPE 3:1 TO 2:1)

PERMANENT SEEDING (MAXIMUM SLOPE 3:1 TO 2:1)		
PLANTING DATES	GRASS TYPE	POUNDS/ACRE
MAR. 1 - JUN. 1	SERICEA LESPEDEZA	50
	&	
MAR. 1 - APR. 15	ADD TALL FESCUE	120
MAR. 1 - JUN 30 OR	ADD HULLED COMMON	25
	BERMUDAGRASS	
JUL. 1 - SEPT. 1	TALL FESCUE	120
&	BROWNTOP MILLET	35
&	SORGHUM-SUDAN HYBRIDS	30
SEPT. 1 - MAR. 1	SERICEA LESPEDEZA	70
	UNHULLED-UNSCARIFIED)	
&	TALL FESCUE	120
	&	
NOV. 1 - MAR. 1	ADD ABRUZZI RYE	25
LIME		4,000
FERTILIZER	10-10-10	1,000
MULCH	STRAW	4,000

4. THE CONTRACTOR SHALL PROVIDE SEEDING AND FOLLOW FERTILIZING METHODS AS REQUIRED BY THE U.S. ARMY CORPS OF ENGINEERS TO REESTABLISH DISTURBED AREAS IN DESIGNATED WETLANDS.

A. ACCOMPLISH SEEDING BY MEANS OF AN APPROVED POWER-DRAWN SEED DRILL, COMBINATION CORRUGATED ROLLER-SEEDER, APPROVED HAND OPERATED MECHANICAL SEEDER, OR OTHER APPROVED METHODS TO PROVIDE EVEN DISTRIBUTION OF SEED.
B. DO NOT SEED WHEN GROUND IS EXCESSIVELY WET OR EXCESSIVELY DRY. AFTER SEEDING, ROLL AREA WITH A ROLLER, NOT LESS THAN 18 INCHES IN DIAMETER AND WEIGHING NOT MORE THAN 210 POUNDS PER FOOT OF WIDTH. UPON COMPLETION OF ROLLING, WATER AREA WITH A FINE SPRAY.
C. IMMEDIATELY FOLLOWING SEEDING APPLY MULCH OR MATTING AS LISTED BELOW. DO NOT SEED AREAS IN EXCESS OF THAT WHICH CAN BE MULCHED ON SAME DAY.
D. APPLY WATER WITH A FINE SPRAY IMMEDIATELY AFTER EACH AREA HAS BEEN MULCHED. SATURATE TO 4 INCHES OF SOIL DEPTH.
E. WETLAND SEEDING.

WETLAND SEEDING		
PLANTING DATES	GRASS TYPE	POUNDS/ACRE
AUG 15 - APR 15	RYE (GRAIN)	40
MAY 1 - AUG 15	GERMAN MILLET	10
DEC 1 - APR 1	SWEET WOODREED	2.5
DEC 1 - APR 1	RICE CUTGRASS	6.0
DEC 1 - MAY 15 & SEPT 1 - NOV 1	SOFT RUSH	2.5
DEC 1 - MAY 15 & SEPT 1 - NOV 1	SHALLOW SEDGE	2.5
LIME		PER SOIL TEST
FERTILIZER	10-10-10	PER SOIL TEST
MULCH	STRAW	4,000

MULCHING AND MATTING

MATERIALS: MATTING / EROSION CONTROL FABRIC (RECP): MATTING AND RECP SHALL BE AS NOTED ON DETAIL F ON SHEET D1. MATTING SHALL BE FULLY DEGRADABLE BUT SUITABLE UNTIL VEGETATION HAS BEEN ESTABLISHED.
MATERIALS: MULCH: THRESHED STRAW OF OATS, WHEAT, OR RYE; FREE FROM SEED OF OBNOXIOUS WEEDS; OR CLEAN SALT HAY. STRAW WHICH IS FRESH AND EXCESSIVELY BRITTLE OR STRAW WHICH IS IN SUCH AN ADVANCED STAGE OF DECOMPOSITION AS TO SMOTHER OR RETARD GROWTH OF GRASS WILL NOT BE ACCEPTABLE.

A. APPLY MULCH OR MATTING AS REQUIRED TO RETAIN SOIL AND GRASS, BUT NO LESS THEN THE FOLLOWING:
   1. SLOPES FROM 0 TO 20 PERCENT BY SPREADING A LIGHT COVER OF MULCH OVER SEEDED AREA AT THE RATE OF NOT LESS THAN 85 LBS. PER 1000 SQ. FT. USE TACK TO PREVENT DISRUPTION OF MULCH.
   2. SLOPES GREATER THAN 20 PERCENT MULCH WITH MATTING. PIN MATTING TO THE GROUND WITH WIRE STAPLES AT 5 FOOT INTERVALS, IMMEDIATELY AFTER SEEDING.
B. FOR TACK USE AN ASPHALT TIE-DOWN OF EMULSIFIED ASPHALT GRADE AE-3 OR CUT-BACK ASPHALT GRADE RC-2 OR OTHER APPROVED EQUAL. THE APPLICATION RATE SHALL BE 0.10 GAL/SY (11 GAL / 1000 SQ FT). AN APPROVED JUTE MESH OR NET MAY BE USED IN LIEU OF TACKING STRAW MULCH.
C. OTHER TYPES OF MULCH AND ANCHORING METHODS MAY BE USED UPON APPROVAL BY THE ENGINEER.

BID SET

NO.	BY	CHK	APP'D	DATE	REVISIONS AND RECORD OF USE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER William T. Scott
2021.01.25 14:38:00-05'00'

BLACK & VEATCH
Black & Veatch International Company
Phone: 704.944.5500
10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

RESTORATIVE PLANTING
DETAILS AND SCHEDULES

DESIGNED: MLT
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
186110

D6
SHEET
40 OF 42

FD9000A
D10000
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PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

Item to Document	Documentation Requirements
(a) Each E&SC Measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC Plan.	Initial and date each E&SC Measure on a copy of the approved E&SC Plan or complete, date and sign an inspection report that lists each E&SC Measure shown on the approved E&SC Plan. This documentation is required upon the initial installation of the E&SC Measures or if the E&SC Measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC Plan.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC Measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC Measures.	Initial and date a copy of the approved E&SC Plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation

In addition to the E&SC Plan documents above, the following items shall be kept on the site and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This general permit as well as the certificate of coverage, after it is received.

(b) Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

(c) All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(a) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(b) Anticipated bypasses and unanticipated bypasses.

(c) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

BID SET

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REVISIONS AND RECORD OF USE

DATE

NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER MICHAEL L. TAYLOR
2021.01.25 14:38:01-05'00'

BLACK & VEATCH

Black & Veatch International Company
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10925 David Taylor Drive, Suite 280
Charlotte, North Carolina 28262

UNION COUNTY PUBLIC WORKS
853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

DESIGNED: MLT, WPS
DETAILED: KTH
CHECKED: CES
APPROVED: SLT
DATE: JANUARY 2021

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PROJECT NO.
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SHEET
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GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

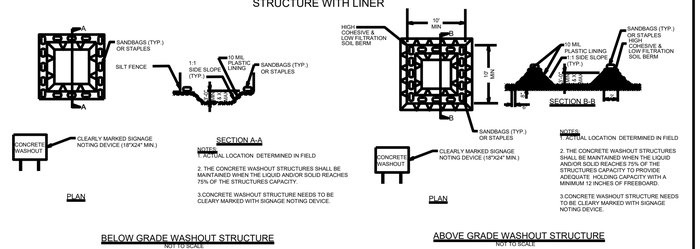
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

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NORTH CAROLINA PROFESSIONAL SEAL 039150 ENGINEER William P. Stout

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853W ZONE IMPROVEMENTS
PHASE I TRANSMISSION MAINS

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

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DATE:	JANUARY 2021

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SHEET 42 OF 42

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