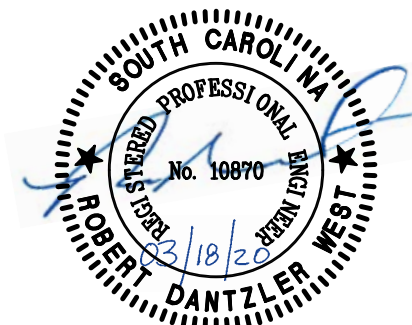
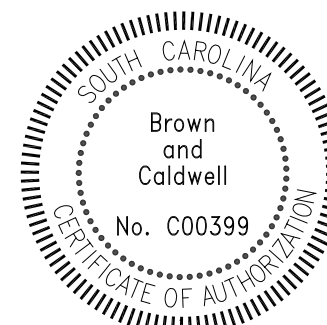


# BEAUFORT-JASPER WATER & SEWER AUTHORITY

## HIGHWAY 170 WATER MAIN EXTENSION

### Project No. 152589

### DWSRF Project #0720003-19



**MARCH 2020**

PREPARED BY:



*Environmental Engineering and Consulting*  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701



LOCATION MAP  
SCALE: NONE

**BJWSA CIP 1696**

GENERAL NOTES:

- ALIGNMENT OF THE WATER MAIN BOTH VERTICALLY AND HORIZONTALY SHALL BE ACCOMPLISHED BY UTILIZING ONE-HALF THE PIPE MANUFACTURER'S ALLOWABLE DEFLECTION IN THE PIPE JOINTS, FITTINGS, COUPLINGS, SPOOL PIECES, ETC. THE BENDS SHOWN ON THE DRAWINGS PROVIDE GENERAL INFORMATION REGARDING THE ALIGNMENT OF THE WATER MAIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTIMATING AND PROVIDING ANY AND ALL NECESSARY FITTINGS, COUPLINGS, SPOOL PIECES ETC. NECESSARY TO COMPLETE THE WATER MAIN AS ALIGNED ON THE PLANS, AT NO ADDITIONAL COST TO THE OWNER.
- PROVIDE SHORING, SHEETING AND BRACING, AS NEEDED, IN CONFORMANCE WITH THE APPLICABLE RULES AND REGULATIONS PROMULGATED BY THE DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), INCLUDING OSHA MANUAL 2226, "EXCAVATIONS". WHEN REQUIRED BY RULES AND REGULATIONS, THE CONTRACTOR SHALL PROVIDE DESIGNED SHORING SYSTEMS CERTIFICATIONS APPROVED BY A PROFESSIONAL ENGINEER TO THE OWNER AND ENGINEER FOR REFERENCE ONLY.
- COMPLY WITH THE GUIDELINES OF THE SCDHEC STORM WATER MANAGEMENT AND SEDIMENT AND EROSION CONTROL HANDBOOK FOR LAND DISTURBANCE ACTIVITIES DURING THE ENTIRE CONSTRUCTION PERIOD. SEDIMENT AND EROSION CONTROL PRACTICES SHALL INCLUDE, BUT NOT BE LIMITED TO, SILT FENCES, BERMS, SEDIMENT TUBES, CHECK DAMS, ETC. AS NEEDED OR AS DIRECTED BY THE ENGINEER.
- RESTORE ALL AREAS DISTURBED BY CONSTRUCTION TO ORIGINAL CONTOURS, UNLESS OTHERWISE NOTED.
- AREAS DISTURBED BY CONSTRUCTION SHALL BE GRASSED IN ACCORDANCE WITH THE APPROVED SEEDING SCHEDULE ON SHEET 000-C-03, UNLESS OTHERWISE NOTED.
- DRAINAGE PIPES DESTROYED DURING CONSTRUCTION ARE TO BE REPLACED WITH NEW CLASS III - WALL B REINFORCED CONCRETE PIPE COMPLYING WITH ASTM C76. SIZE AND INVERTS OF NEW PIPES SHALL MATCH EXISTING OR AS NEEDED TO PROVIDE PROPER DRAINAGE.
- NOTE THE PROXIMITY OF POWER POLES, GUY WIRES AND TRANSFORMER BOXES IN RELATIONSHIP TO THE PROJECT AND PROTECT DURING CONSTRUCTION. COORDINATE WITH UTILITY OWNER AS NEEDED TO PROTECT THE INTEGRITY OF ALL POWER POLES AND GUY WIRES DURING CONSTRUCTION.
- ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS DETERMINED FROM BEST AVAILABLE INFORMATION AND SITE SURVEYS. HOWEVER, PRIOR TO BEGINNING ANY EXCAVATION, CALL PALMETTO UTILITY PROTECTION SERVICE (PUPS) AT 1-888-721-7877 OR 811 TO LOCATE ALL EXISTING UTILITIES. CONTRACTOR WILL CONFIRM THESE LOCATIONS AND DEPTHS WITH THE PROPER UTILITY COMPANIES BEFORE CONSTRUCTION BEGINS.
- REPAIR OR REPLACE EXISTING FEATURES DISTURBED OR DESTROYED DURING CONSTRUCTION OF THIS PROJECT AT NO ADDITIONAL COST TO THE OWNER. THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO, FENCES, IRRIGATION SYSTEMS, SHRUBS, SMALL TREES, LANDSCAPING AND LANDSCAPING MATERIALS, CONCRETE CURBING, SIDEWALKS AND ROADWAYS OUTSIDE THE AREAS OF DISTURBANCE.
- ANY CONCRETE MONUMENT ENCOUNTERED DURING CONSTRUCTION WILL NEED TO REMAIN IN PLACE. IF MONUMENTS NEED TO BE REMOVED, THE CONTRACTOR SHALL COORDINATE WITH THE OWNER, ENGINEER AND SCDOT FOR REPLACEMENT OF THE MONUMENT.
- THE CONTRACTOR SHALL RESTORE ROAD RIGHT OF WAYS TO EXISTING OR BETTER CONDITION. ALL DITCHES AND SWALES SHALL BE RESTORED PER SCDOT STANDARD SPECIFICATIONS CONCERNING SLOPE AND GRADE. THE CONTRACTOR SHALL DETERMINE GRADES ON EXISTING STORM CULVERTS PRIOR TO REMOVAL TO ENSURE PROPER REPLACEMENT AT EXISTING GRADES AND ELEVATIONS.
- THE CONTRACTOR SHALL RESTORE DRIVES WITH THE SAME OR LIKE MATERIAL AS EXISTING DRIVES. CONCRETE DRIVES AND SIDEWALKS SHALL BE POURED WITH 3000 PSI FIBER FILLED CONCRETE A MINIMUM OF 4" THICK TO A NEWLY CUT STRAIGHT EDGE. ASPHALT DRIVES AND SIDEWALKS SHALL BE REPLACED WITH A TYPE I ASPHALT PER SCDOT REQUIREMENTS TO A MINIMUM THICKNESS OF 2 INCHES.
- THE WATER MAIN SHALL BE INSTALLED TO A DEPTH NECESSARY TO MAINTAIN A MINIMUM OF 4 FEET OF COVER AND MINIMIZE LOCAL HIGH POINTS TO THE MAXIMUM EXTENT POSSIBLE.
- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
- THE CONTRACTOR SHALL USE RESTRAINED JOINT PIPE AT ALL BENDS ALONG THE WATER MAIN AS INDICATED ON THE DRAWINGS. PIPE RESTRAINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND PIPE MANUFACTURER'S RECOMMENDATIONS. THE RESTRAINED JOINT LENGTHS SHOWN ON THE PLANS ARE THE MINIMUM LENGTHS REQUIRED - ACTUAL PIPE RESTRAINT LENGTHS WILL BE IN MULTIPLES OF THE LENGTH OF ONE PIECE OF PIPE (20' FOR DIP).
- MAINTAIN A HORIZONTAL SEPARATION OF 10-FEET AND VERTICAL SEPARATION OF 18-INCHES BETWEEN SEWER MAINS AND STORM MAINS.
- ALL FITTINGS SHALL BE DUCTILE IRON, COMPACT, MECHANICAL JOINT, MANUFACTURED IN ACCORDANCE WITH AWWA C153, AND PRESSURE RATED FOR 350 PSI. STANDARD AWWA C110 M.J. FITTINGS MAY BE SUBSTITUTED WITH NO ADDITIONAL COST TO THE OWNER FOR THE INCREASE IN WEIGHT.
- MECHANICAL JOINT RESTRAINT DEVICES SHALL BE PROVIDED FOR ALL FITTINGS AND VALVES, AND SHALL BE MEGALUG SERIES 1100 FOR DUCTILE IRON PIPE, OR SERIES 2000 FOR PVC PIPE.
- ALL RESTRAINED JOINT DIP PIPE AND ALL PVC PIPE BOTH RESTRAINED AND NON-RESTRAINED SHALL BE INSTALLED IN TYPE 3 BEDDING (AWWA C150 & C151) UNLESS OTHERWISE SHOWN.
- PUSH-ON DUCTILE IRON WATER MAIN (NON-RESTRAINED JOINT) SHALL BE INSTALLED IN TYPE 2 BEDDING (AWWA C150 & C151) UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- ALL CONNECTIONS TO THE EXISTING SYSTEM SHALL BE COORDINATED WITH THE OWNER.
- ALL TREES, SHRUBBERY, SPOILS, ROCK,, ETC. THAT IS REMOVED/EXCAVATED FOR CONSTRUCTION OF THE PROPOSED FACILITIES, AND NOT INCORPORATED INTO THE WORK (i.e. BACKFILL) SHALL BE HAULED OFF SITE AND DISPOSED OF BY THE CONTRACTOR.
- ANY FENCE REMOVED DUE TO WATER MAIN CONSTRUCTION MUST BE REPLACED. TEMPORARY FENCE WILL NEED TO BE INSTALLED AT THE END OF EACH WORK DAY OR WHILE NO CREWS ARE PRESENT AT THE WORK SITE. REPLACEMENT FENCE SHALL BE IN ACCORDANCE TO SCDOT STANDARDS.
- FOR THIS PROJECT, THE PROPOSED WATER FACILITIES ARE TO BE INSTALLED WITHIN ESTABLISHED SCDOT RIGHTS-OF-WAY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BECOME FAMILIAR WITH THE CONDITIONS, LOCATIONS AND REQUIREMENTS OF THE APPROVED PERMITS AND THEIR PROVISIONS.
- THE CONTRACTOR SHALL MAKE A PRACTICAL EFFORT TO MINIMIZE THE ENTRY OF DIRT, DEBRIS AND OTHER FOREIGN MATERIAL INTO THE PIPELINE DURING INSTALLATION.
- THE CONTRACTOR SHALL COMPLY WITH ALL SCDOT, COUNTY ENCROACHMENT PERMITS AND RAILROAD PERMITS OBTAINED BY THE OWNER. THE TRAFFIC CONTROL MEASURES SHOWN WITHIN THE PLAN SET AND SPECIFICATIONS ARE FOR DESIGNING AND MAINTAINING TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH THE SCDOT STANDARDS. THE CONTRACTOR SHALL BE AWARE OF AND PROVIDE FOR ANY SPECIAL PROVISIONS WITHIN THE OBTAINED PERMITS THAT MAY NOT BE SHOWN WITHIN THE PLANS OR SPECIFICATIONS. FOR THIS PROJECT, THERE ARE TO BE NO LANE CLOSURES BETWEEN THE TIMES OF 6:00 A.M. AND 7:00 P.M. EST.
- WHERE EXISTING UTILITY SERVICES (WATER, SEWER, TELEPHONE, ETC.) ARE CROSSED AND NEED TO BE TEMPORARILY INTERRUPTED, THE CONTRACTOR SHALL COORDINATE WITH THE PROPERTY OWNER AND UTILITY PROVIDER TO PROVIDE SUFFICIENT NOTICE TO THE CUSTOMER OF AN INTERRUPTION IN SERVICE. SERVICE SHALL BE RESTORED AS QUICKLY AS PRACTICAL.
- WHEN EXCAVATION IS WITHIN 30-FEET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).

SHEET INDEX		
SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
GENERAL		
1	000-G-00	Cover
2	000-G-01	Sheet Index, Legend, General Notes & Abbreviations
3	000-G-02	Overall Sheet Layout
CIVIL		
4	000-C-01	Civil Details 1
5	000-C-02	Civil Details 2
6	000-C-03	Erosion & Sediment Control Notes and Legend
7	000-C-04	Erosion & Sediment Control Details
8	000-C-05	Traffic Control Details
9	100-C-01	Plan & Profile Sta. 0+14 to Sta. 14+00
10	100-C-02	Plan & Profile Sta. 14+00 to Sta. 28+00
11	100-C-03	Plan & Profile Sta. 25+00 to Sta. 42+00
12	100-C-04	Plan & Profile Sta. 42+00 to Sta. 56+00
13	100-C-05	Plan & Profile Sta. 56+00 to Sta. 70+00
14	100-C-06	Plan & Profile Sta. 70+00 to Sta. 84+00
15	100-C-07	Plan & Profile Sta. 84+00 to Sta. 98+00
16	100-C-08	Plan & Profile Sta. 98+00 to Sta. 112+00
17	100-C-09	Plan & Profile Sta. 112+00 to Sta. 126+00
18	100-C-10	Plan & Profile Sta. 126+00 to Sta. 140+00
19	100-C-11	Plan & Profile Sta. 140+00 to Sta. 144+00
20	200-C-01	Tree Protection Plan 1
21	200-C-02	Tree Protection Plan 2
22	200-C-03	Tree Protection Plan 3
23	200-C-04	Tree Protection Plan 4
24	200-C-05	Tree Protection Plan 5
25	200-C-06	Tree Protection Plan 6

PLAN LEGEND

CIVIL ABBREVIATIONS

- EFF EFFLUENT FORCE MAIN
- CMP CORRUGATED METAL PIPE
- DIP DUCTILE IRON PIPE
- FH FIRE HYDRANT
- FM FORCE MAIN
- FOC FIBER OPTIC CABLE
- GUY GUY WIRE
- IE INVERT ELEVATION
- INV INVERT
- IPF IRON PIN FOUND
- LF LINEAR FEET
- LP LIGHT POLE
- MB MAIL BOX
- MJ MECHANICAL JOINT
- NF NOW OR FORMERLY
- OHE OVERHEAD ELECTRIC
- PP POWER POLE
- PVC POLYVINYL CHLORIDE
- RCP REINFORCED CONCRETE PIPE
- RJ RESTRAINED JOINT
- RJP RESTRAINED JOINT PIPE
- R/W RIGHT-OF-WAY
- SS SANITARY SEWER
- STA STATION
- TBM TEMPORARY BENCHMARK
- TBOX TELECOMMUNICATION BOX
- TPED TELEPHONE PEDESTAL
- UGTM UNDERGROUND TELEPHONE MARKER
- UGTC UNDERGROUND TELEPHONE
- MANHOLE
- UGCB UNDERGROUND CABLE BOX
- WM WATER MAIN
- WOS WATERS OF THE STATE
- CPP CORRUGATED PLASTIC PIPE
- RCW RECLAIMED WATER MAIN
- BMP BEST MANAGEMENT PRACTICES
- EX EXISTING
- ARV AIR RELEASE VALVE

CIVIL SYMBOLS

- PROPOSED FEATURES**
- NEW DIP WATER MAIN (SIZE LABELED)
  - NEW IN LINE VALVE
  - NEW AIR RELEASE VALVE
  - NEW FIRE HYDRANT
  - NEW BLOW-OFF
- EXISTING FEATURES**
- RIGHT-OF-WAY
  - PROPERTY LINE
  - UNDER GROUND FIBER OPTIC
  - UNDER GROUND ELECTRIC
  - WOODS / TREE LINE
  - EXISTING WATER MAIN
  - EXISTING UNKNOWN UTILITY
  - EXISTING FORCE MAIN
  - EXISTING OVERHEAD POWER LINE
  - EXISTING STORM RCP
  - PAVEMENT AREA
  - DIRT/GRAVEL (UNPAVED)
  - CONCRETE AREA
  - EXISTING GAS PIPELINE
  - EXISTING TELEPHONE CABLE (FIBER OPTIC CABLE)
  - WATER VALVE
  - FIRE HYDRANT
  - WATER METER
  - POWER POLE w/ GUY
  - UTILITY MARKER
  - MAILBOX
  - IRON PIN FOUND (IPF)
  - EXISTING TREE (SPECIFIC)
  - LIGHT POLE
  - SANITARY SEWER MH
  - SIGNS (SPECIFIC)
  - CONSTRUCTION BENCHMARK

**Survey Note:**  
 Survey data was compiled from property information obtained through Beaufort and Jasper Counties GIS Departments and field data provided by Construction Support Services, Inc., Columbia, SC. and Edisto Engineers and Surveyors, Inc., Orangeburg SC. All drawings reside within the South Carolina State Plane Coordinate System with a datum of NAD83/NGVD29.

**\*\*\*\*\*UTILITY WARNING:\*\*\*\*\***  
 The underground utilities shown have been located from field survey information and existing drawings. The engineer/surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. The engineer/surveyor further does not warrant that the underground utilities shown are in the exact location indicated although he does certify that they are located as accurately as possible from the information available. The engineer/surveyor have not physically located any underground utilities.

Mar 18, 2020 - 2:07pm  
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 AJumper  
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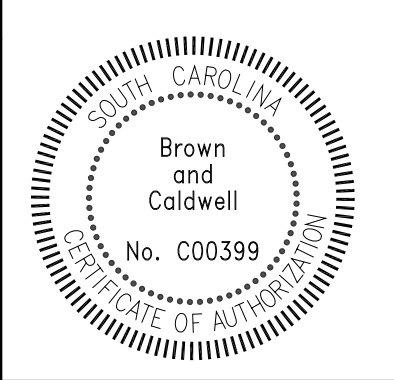
**Environmental Engineering and Consulting**  
 250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT MANAGER  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 BROWN AND CALDWELL

LINE IS 2 INCHES  
 AT FULL SIZE  
 (IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: R. WEST  
 DRAWN: A. JUMPER  
 CHECKED: R. WEST  
 CHECKED: P. WALL  
 APPROVED: R. WEST

EXTERNAL REFERENCES

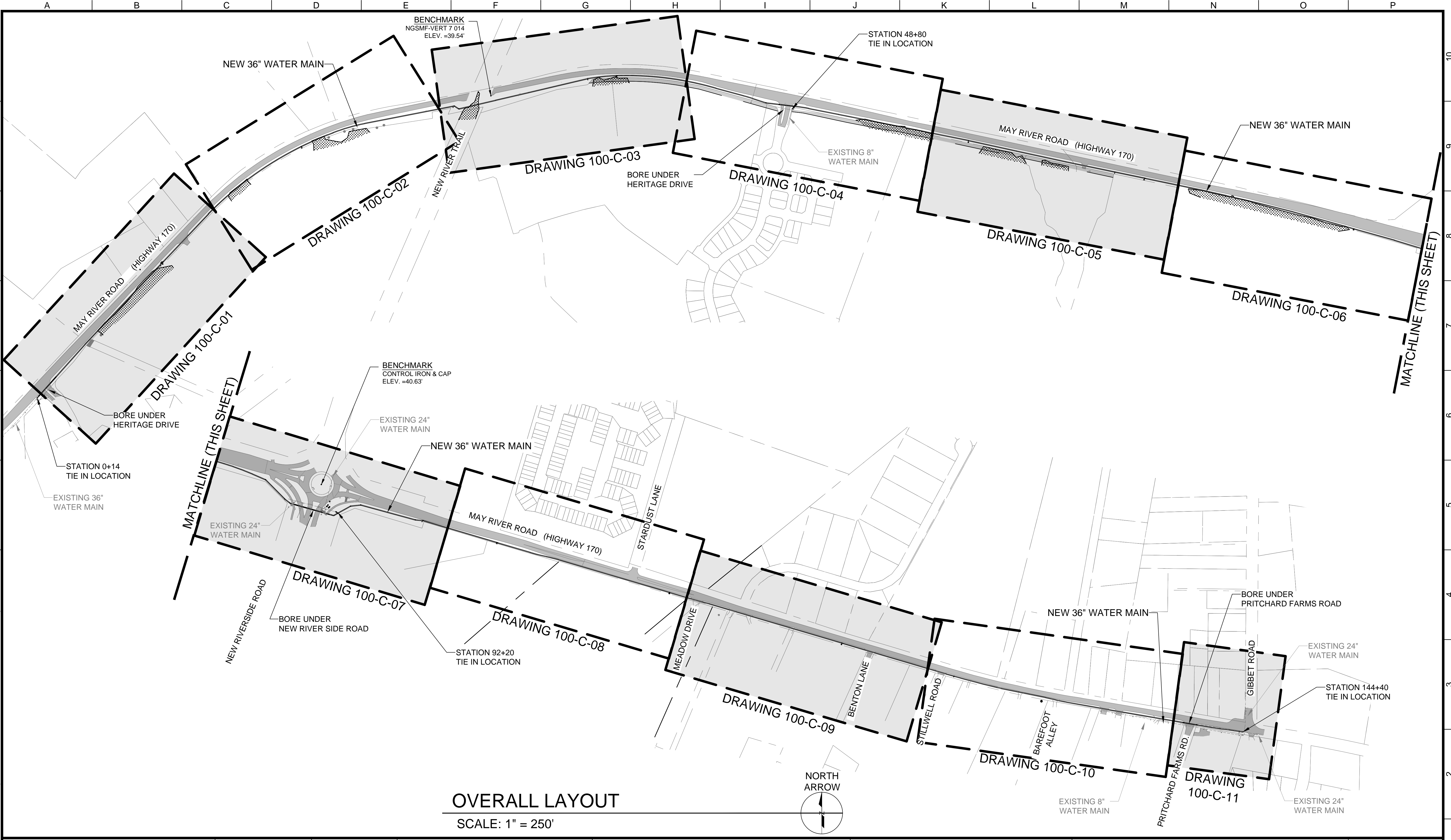


REVISIONS					
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	2	ISSUED FOR BID	AJ	3/18/20	RW



GENERAL  
**SHEET INDEX, LEGEND, GENERAL NOTES & ABBREVIATIONS**  
 (BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME  
 000-G-01.DWG  
 BC PROJECT NUMBER  
 152589  
 SCALE  
 AS SHOWN  
 DRAWING NUMBER  
**000-G-01**  
 SHEET NUMBER  
 2 OF 25



**OVERALL LAYOUT**

SCALE: 1" = 250'



Mar 18, 2020 - 2:12pm  
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 AJumper



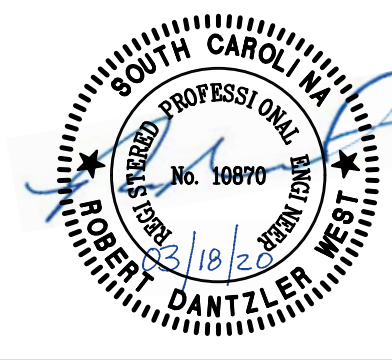
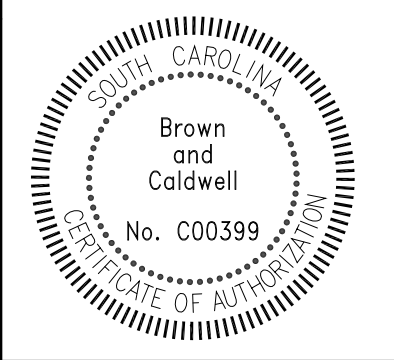
**Environmental Engineering and Consulting**  
 250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT MANAGER  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 BROWN AND CALDWELL

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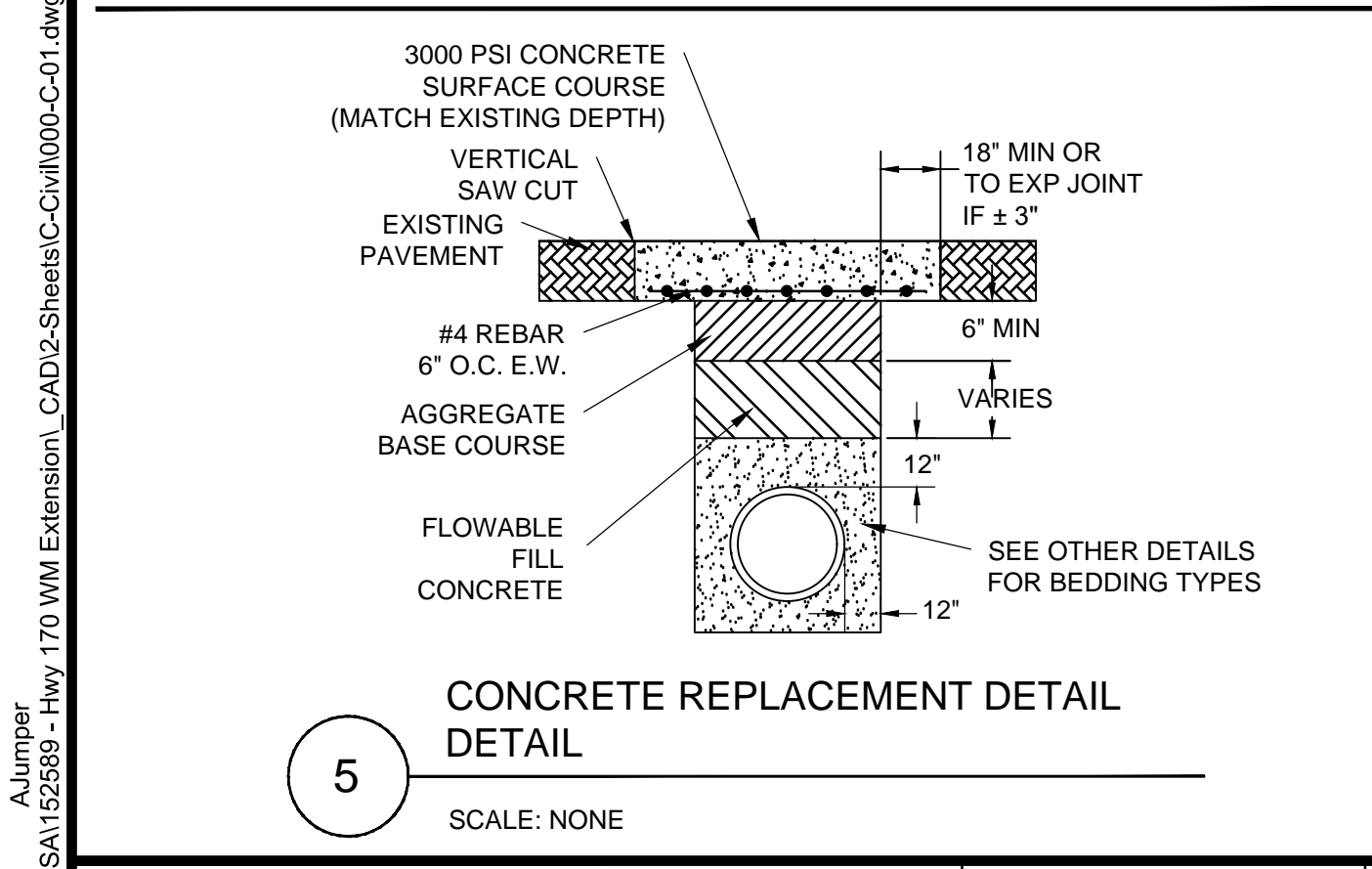
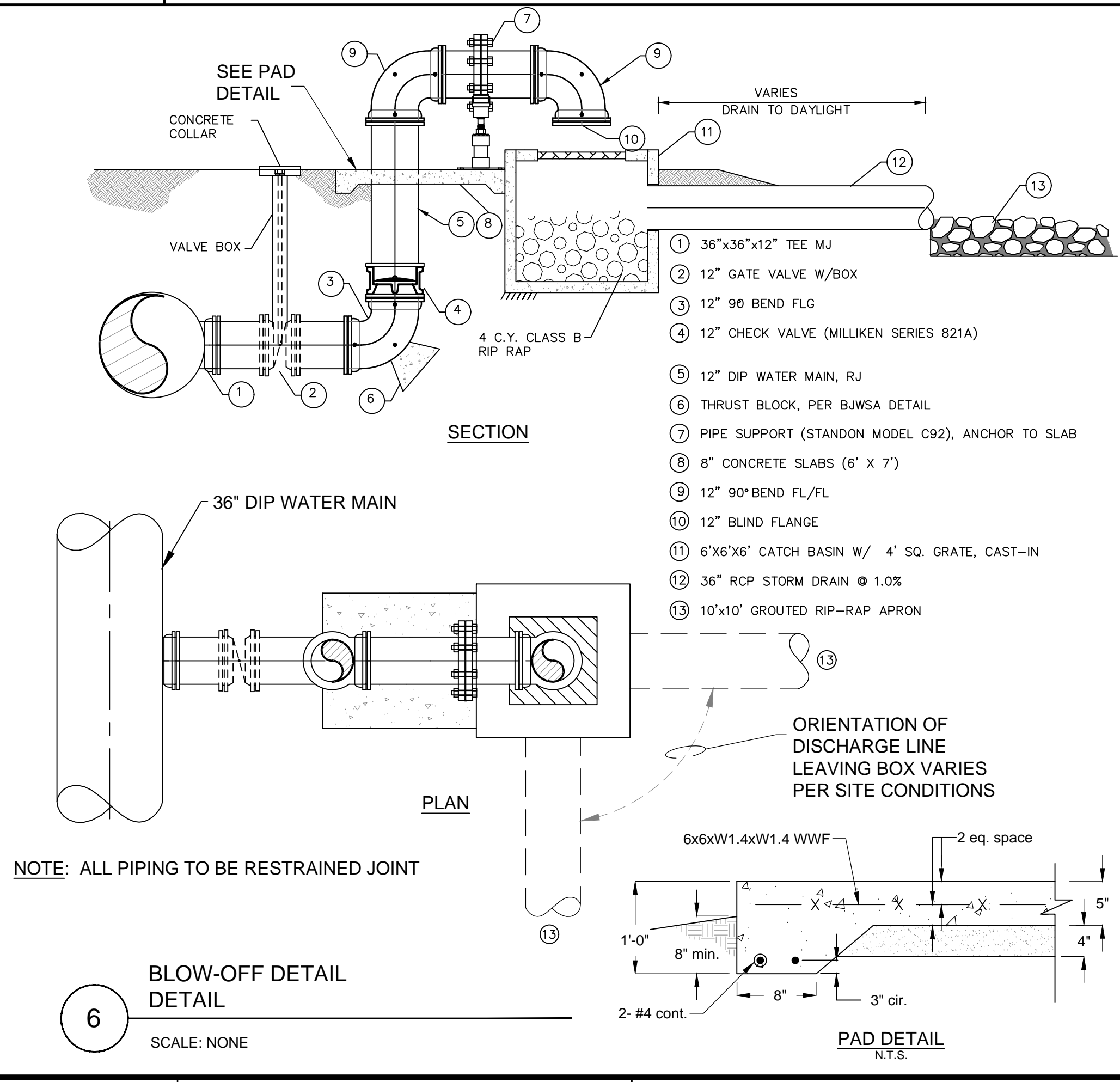
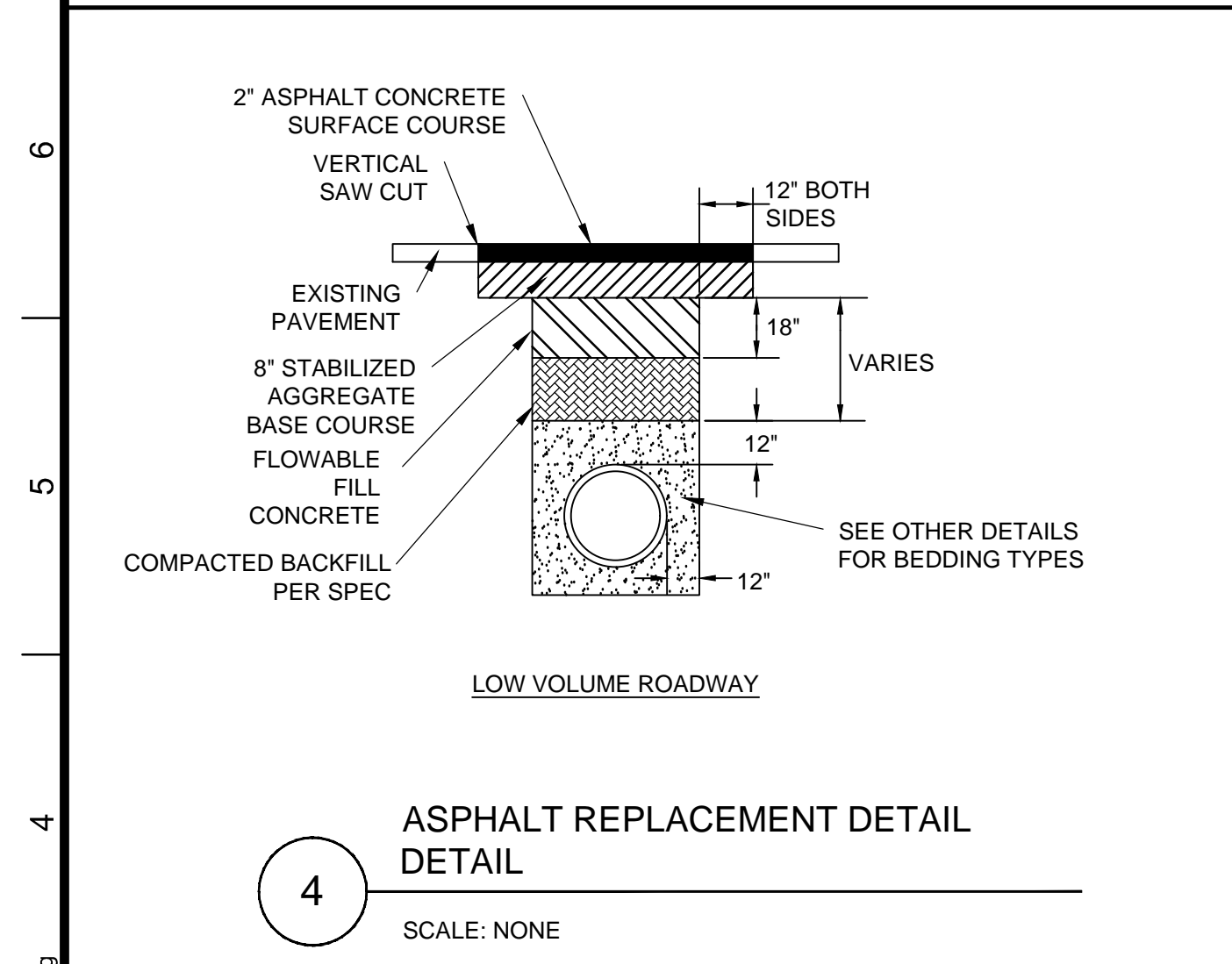
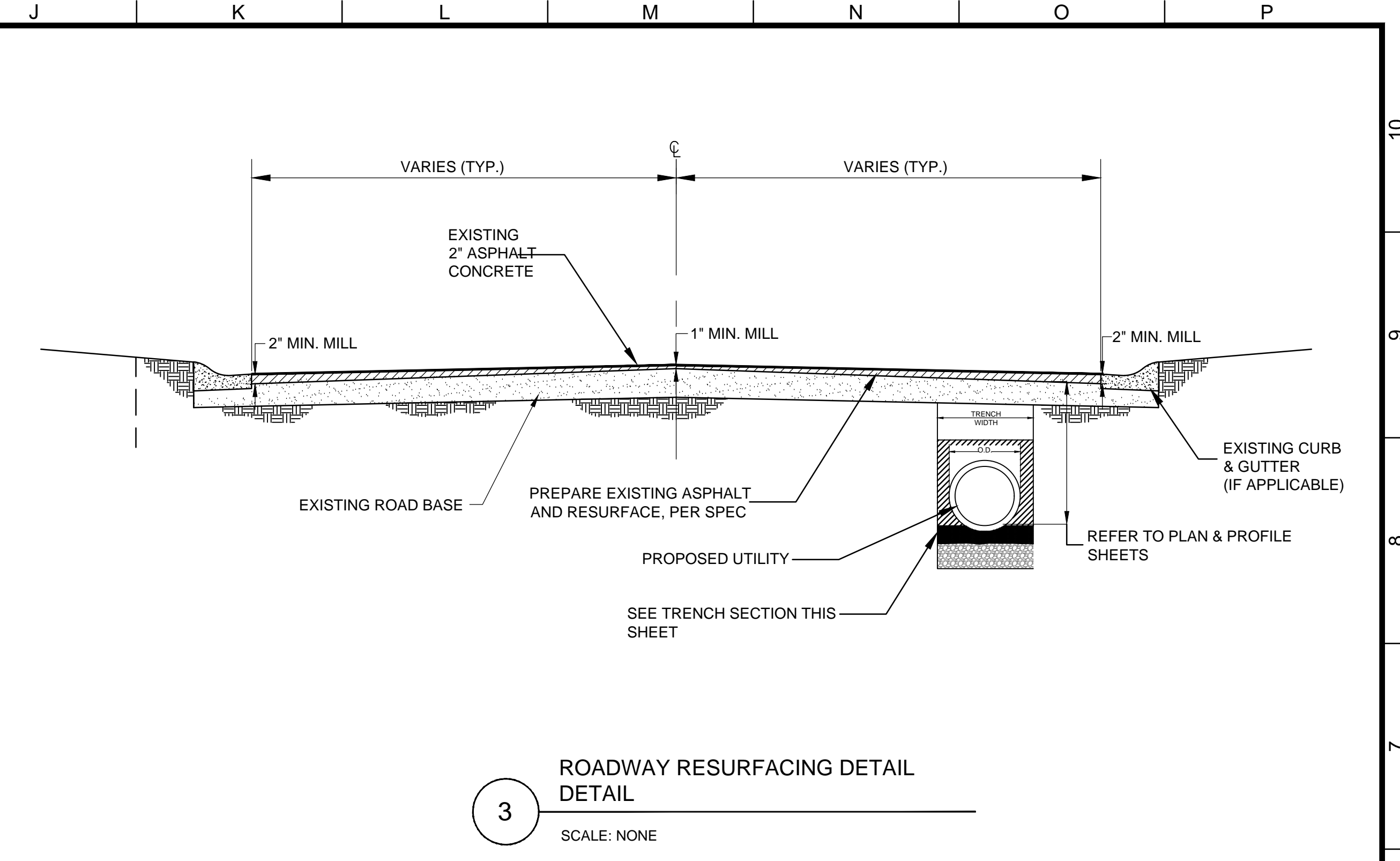
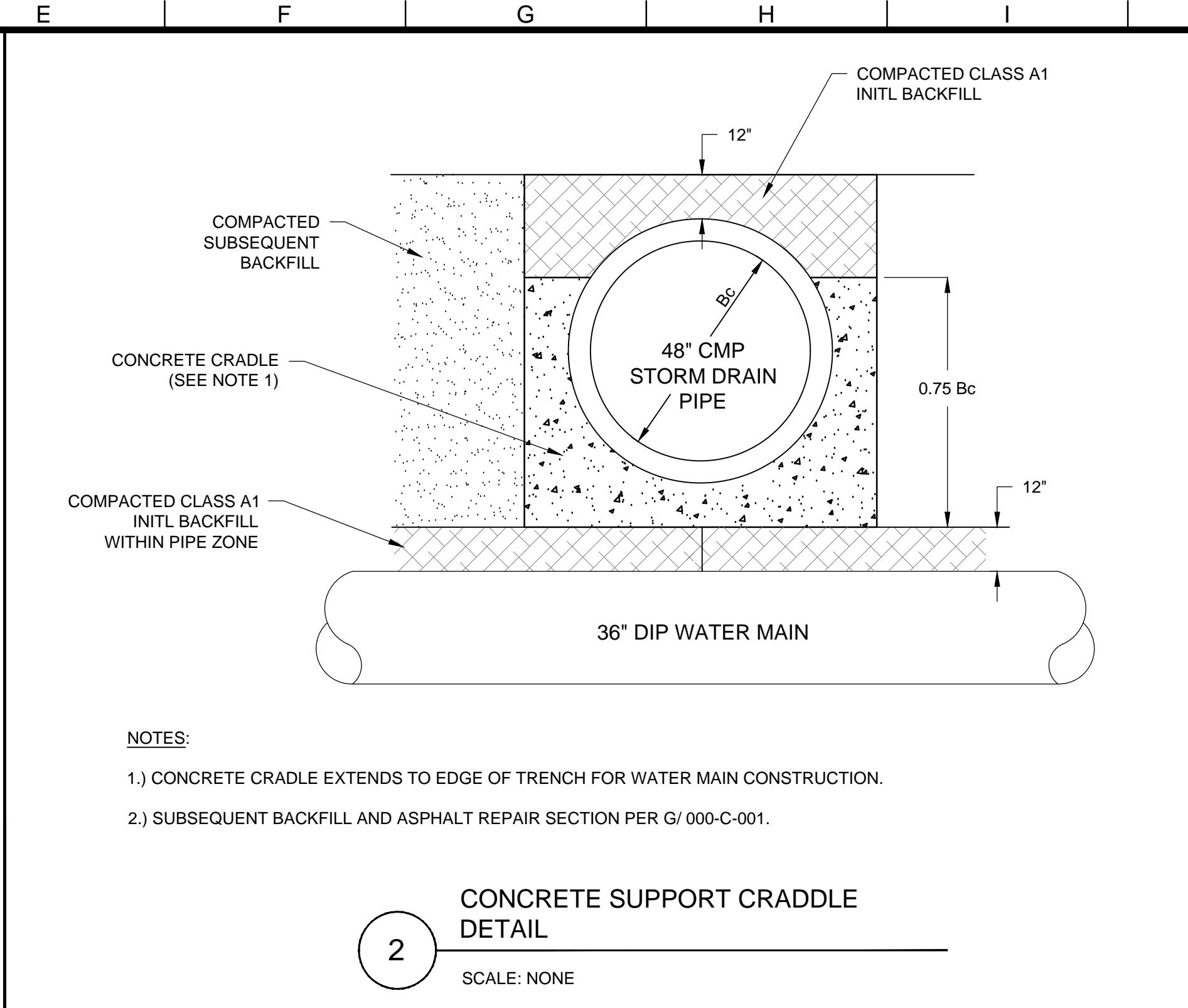
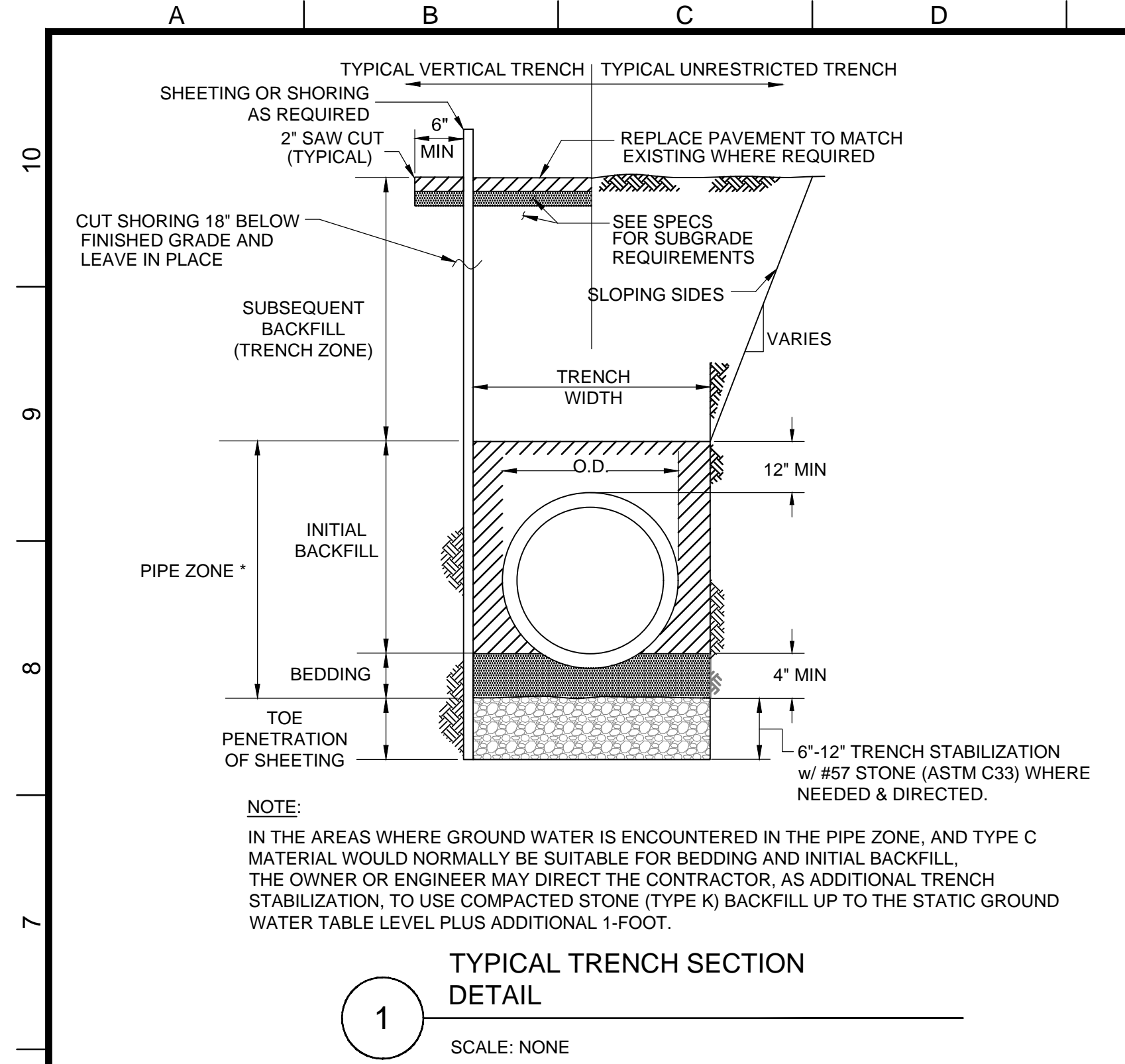


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	2	ISSUED FOR BID	AJ	3/18/20	RW	



GENERAL  
**OVERALL LAYOUT**  
 (BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME  
 000-G-02.DWG  
 BC PROJECT NUMBER  
 152589  
 SCALE  
 AS SHOWN  
 DRAWING NUMBER  
**000-G-02**  
 SHEET NUMBER  
 3 OF 25



**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

PROJECT MANAGER DATE:  
BROWN AND CALDWELL DATE:

EXTERNAL REFERENCES

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW

Professional Engineer Seal for Robert Dantzer, No. 10870, State of South Carolina.

REVISIONS

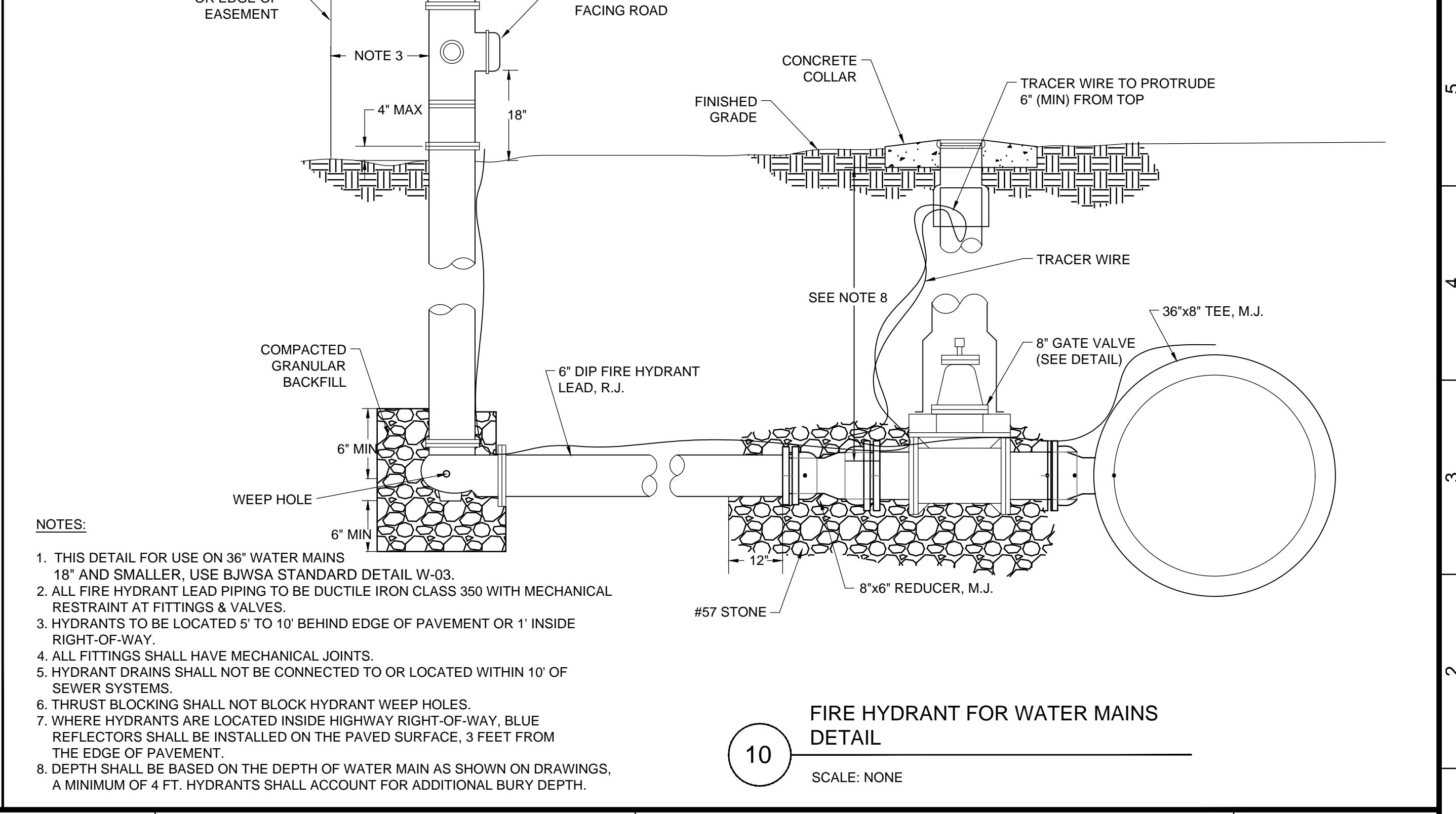
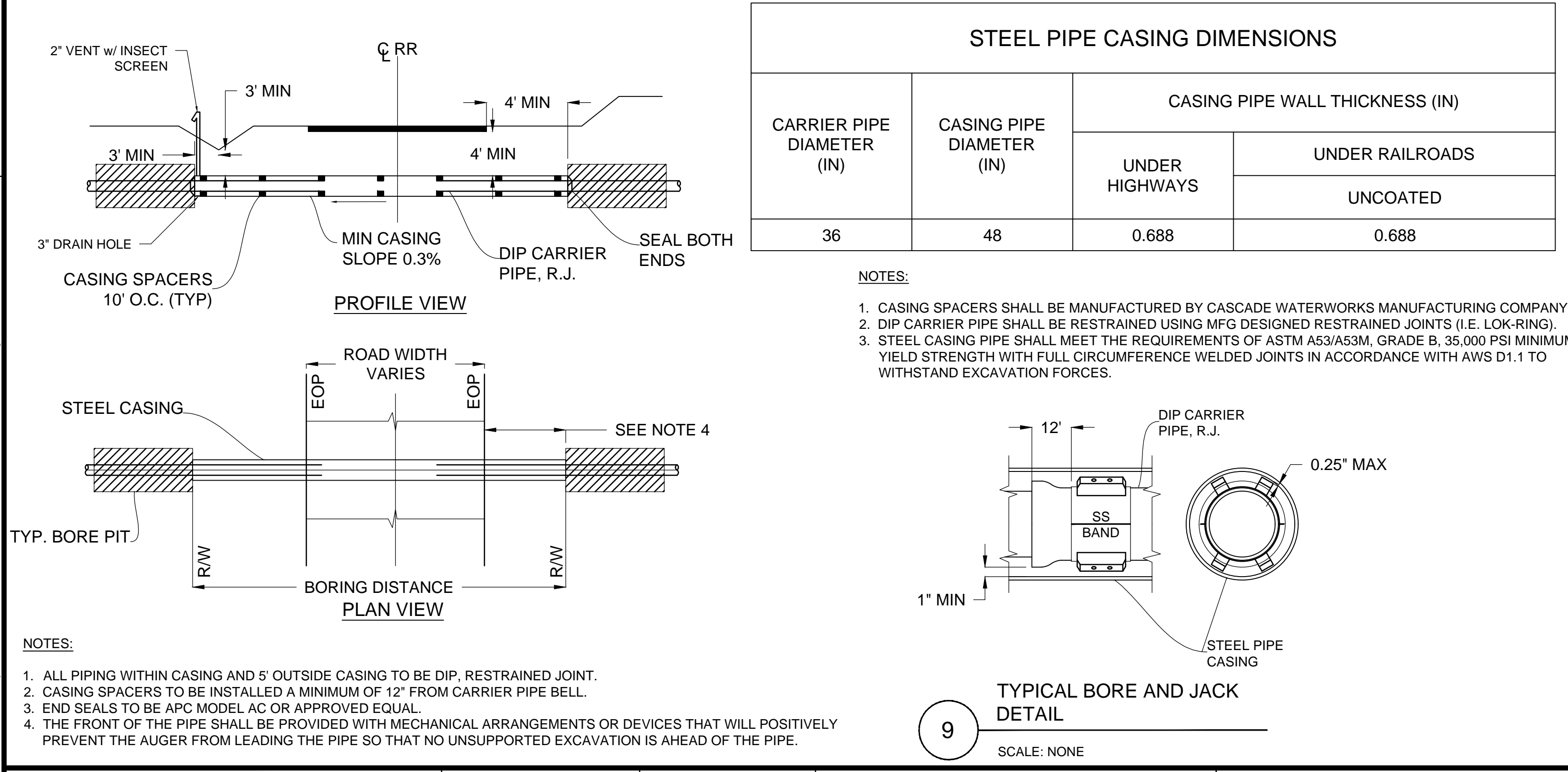
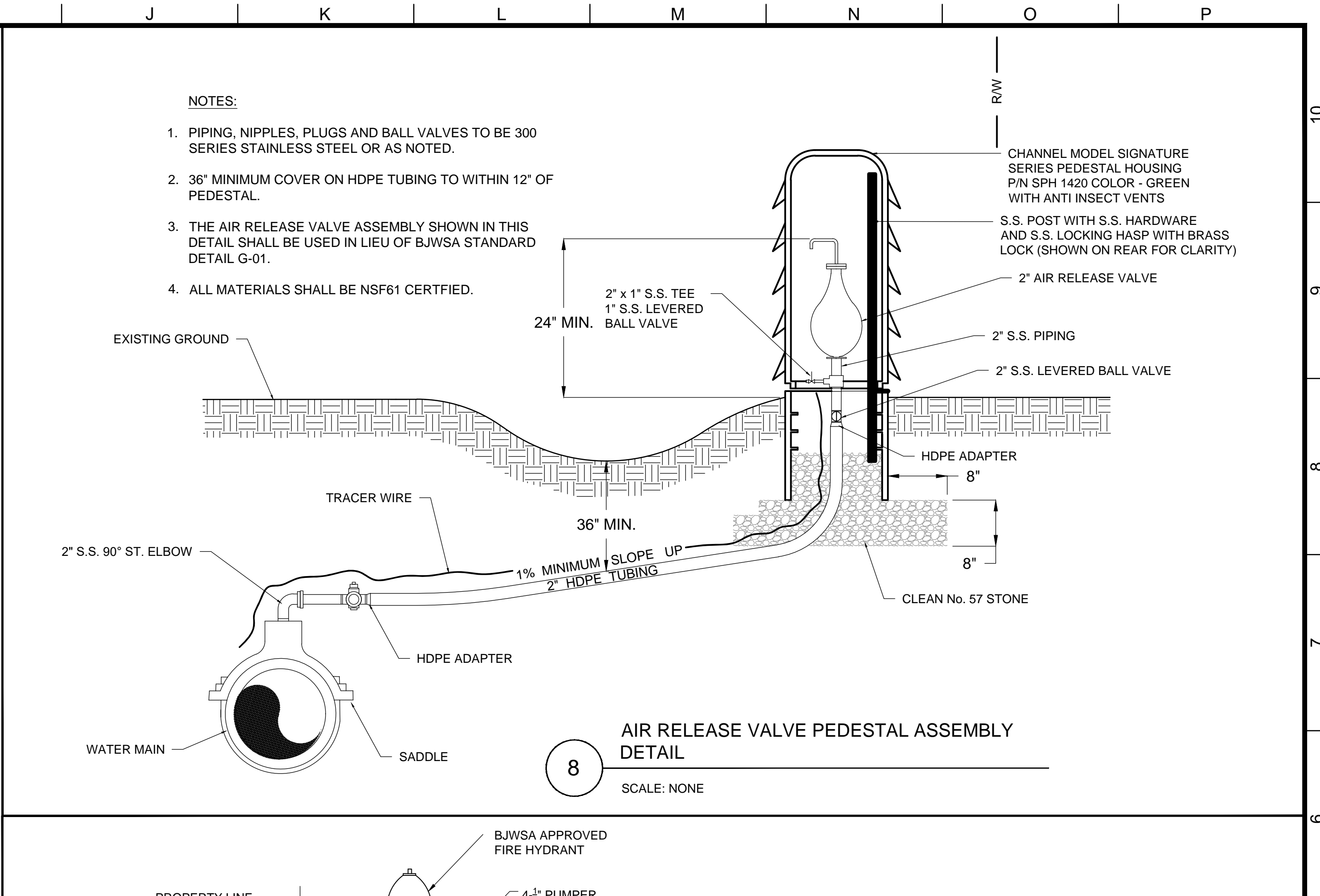
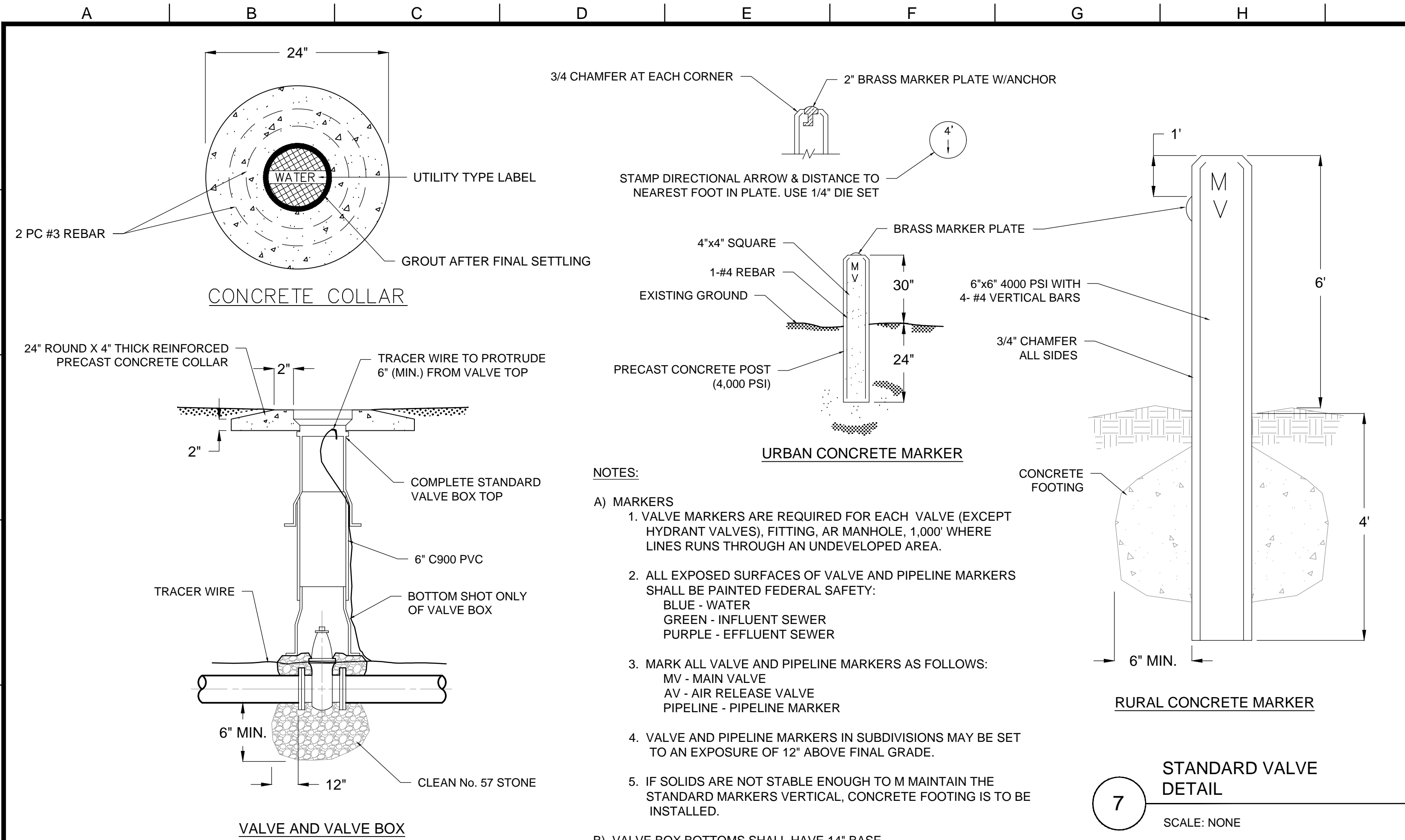
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	2	ISSUED FOR BID	AJ	3/18/20	RW

**BJWSA**

CIVIL  
**CIVIL DETAILS 1**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME: 000-C-01.DWG  
BC PROJECT NUMBER: 152589  
SCALE: AS SHOWN  
DRAWING NUMBER: 000-C-01  
SHEET NUMBER: 4 OF 25

A.Jumper  
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**Brown and Caldwell**

Environmental Engineering and Consulting

250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R/WEST

DRAWN: AASUMPER

CHECKED: R/WEST

CHECKED: P/WALL

APPROVED: R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

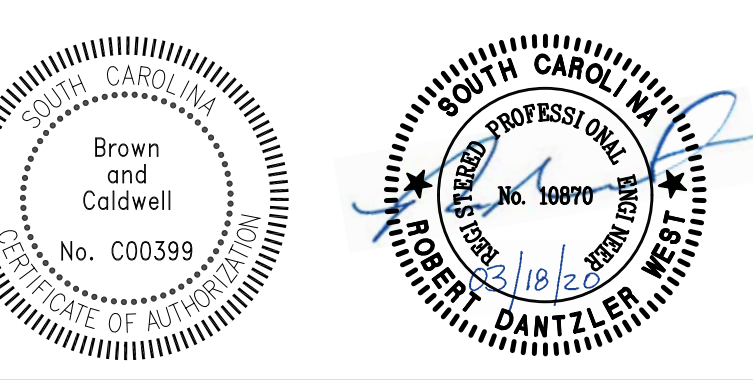
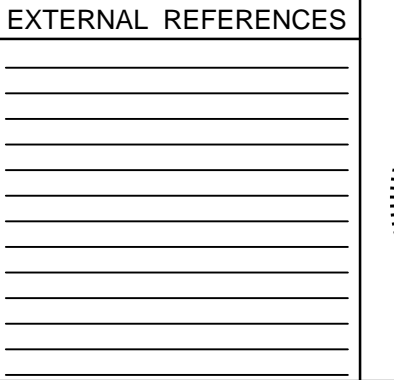
EXTERNAL REFERENCES

DATE: \_\_\_\_\_

PROJECT MANAGER

DATE: \_\_\_\_\_

BROWN AND CALDWELL



REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL LAYOUT1

(BJWSA CIP 1696)

HIGHWAY 170 WATER MAIN EXTENSION

FILENAME	000-C-02.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	000-C-02
SHEET NUMBER	5 OF 25

**SYMBOLS FOR EROSION AND SEDIMENT CONTROL PRACTICES**

**SITE PREPARATION**

- SURFACE ROUGHENING
- TOP SOILING
- TREE PRESERVATION AND PROTECTION
- TEMPORARY GRAVEL CONSTRUCTION ENTRY/EXIT

**SURFACE STABILIZATION**

- TEMPORARY SEEDING
- PERMANENT SEEDING
- RIP RAP

**TEMPORARY DIVERSIONS**

- TEMPORARY DIVERSIONS
- PERMANENT DIVERSIONS

**RUNOFF CONVEYANCE MEASURES**

- FABRIC-LINED SLOPES
- RIP RAP-LINED CHANNELS
- PAVED CHANNELS
- 6.32 TEMPORARY SLOPE DRAINS

**OUTLET PROTECTION**

- OUTLET STAB. STRUCTURE

**INLET PROTECTION**

- TEMPORARY FABRIC DROP INLET PROTECTION
- TEMPORARY BLOCK & GRAVEL INLET PROTECTION
- SOD DROP INLET PROTECTION
- SEDIMENT TUBE INLET PROTECTION
- TEMPORARY SEDIMENT TRAP
- SEDIMENT BASIN

- SEDIMENT FENCE (SILT FENCE) SINGLE ROW

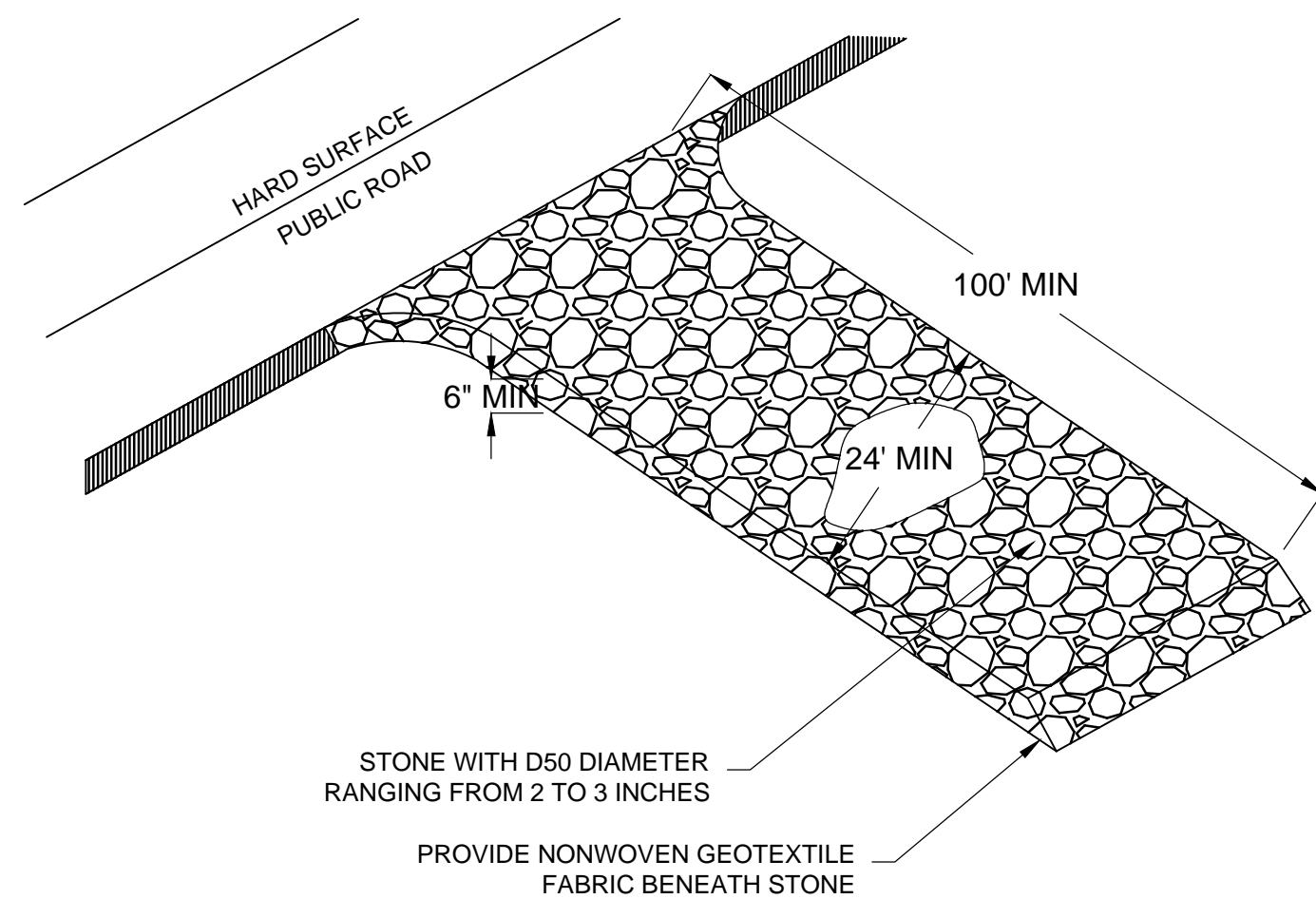
- SEDIMENT FENCE (SILT FENCE) DOUBLE ROW

- CHECK DAM

- SEDIMENT TUBE

**NOTES:**

1. ABOVE SYMBOLS AND NUMBERS DENOTE EROSION AND SEDIMENT CONTROL PRACTICES PER THE SOUTH CAROLINA DHEC STORM WATER MANAGEMENT BMP HANDBOOK, LATEST REVISION. THESE DETAILS ARE INCORPORATED BY REFERENCE.
2. THE ABOVE LISTING IS GENERAL IN NATURE. SOME PRACTICES MAY NOT BE REQUIRED ON THIS CONTRACT AND SOME PRACTICES NOT SHOWN MAY BE REQUIRED.



**CONSTRUCTION ENTRANCE DETAIL**

11

SCALE: NONE

**SEEDING SCHEDULE**

SEEDING SCHEDULE FOR AREAS IN THE LOWER STATE OF SOUTH CAROLINA

PERMANENT VEGETATION SCHEDULE (PER ACRE)

FROM MARCH 1 - AUGUST 14	FROM AUGUST 15 - FEBRUARY 28
30 LBS. COMMON BEREMUDA (HULLED)	40 LBS. COMMON BEREMUDA (UNHULLED)
10 LBS. WEEPING LOVEGRASS	10 LBS. WEEPING LOVEGRASS
10 LBS. SWITCHGRASS	10 LBS. VIRGINIA WILD RYE
	20 LBS. RESEEDING CRIMSON CLOVER
	20 LBS. RYE GRAIN

TEMPORARY VEGETATION SCHEDULE (PER ACRE)

ANNUAL SUDAN GRASS	APRIL 1 - AUGUST 15
BROWN TOP MILLET	50 LBS. APRIL 1 - AUGUST 15
RYE GRAIN	55 LBS. AUGUST 16 - MARCH 31

IF HYDROSEEDING USE 13 LBS. PER 1000 SQ. FT. OF LOW SALT FORMULATION OF 19-19-19 INSTEAD 10-10-10 TO GIVE LONG TERM FERTILIZATION BENEFITS.

LIQUID LIME IS NOT A SUBSTITUTE FOR AGRICULTURAL LIME. A FEW GALLONS OF LIQUID LIME RAISES SOIL pH ONE POINT, BUT THIS EFFECT IS VERY TEMPORARY - USUALLY 45-50 WEEKS. LIQUID LIME MAY BE USED WITH AGRICULTURAL LIME TO GIVE QUICK RESULTS TOGETHER WITH THE LONG TERM BENEFITS OF AGRICULTURAL LIME.

GRAIN STRAW MULCH IS THE MOST IMPORTANT INGREDIENT IN THESE SEEDING RECOMMENDATIONS AND IS 90% OF THE REASON FOR SUCCESS. PAPER AND OTHER SYNTHETIC MULCHES MAY BE SUBSTITUTED FOR GRAIN STRAW WHEN A HYDROSEEDER IS USED, BUT NOT ON STEEP AREAS. AREAS WITH CONCENTRATED WATER RUNOFF, OR ON DEEP SANDY SOILS, (ALL SLOPES STEEPER THAN 2:1 MUST BE HYDROSEEDED AND MULCHED WITH GRAIN STRAW USING AN APPROVED ANCHORING METHOD SUCH AS GLUE TACKIFIER OR TRACTOR AND STRAIGHT DISK HOLLOW).

**CONSTRUCTION SEQUENCE AND MAINTENANCE PLAN**

1. NO GROUND DISTURBING ACTIVITIES MAY BE PERFORMED ON THE SITE WITHOUT AN APPROVED SEDIMENT AND EROSION CONTROL PLAN.
2. ONE WEEK PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION CONFERENCE WITH THE ENGINEER. THE PURPOSE OF THIS MEETING WILL BE TO REVIEW THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN.
3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY CLEARING, EXCAVATION, OR FILLING, EXCEPT THOSE OPERATIONS NEEDED TO INSTALL SUCH MEASURES.
4. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED ACCORDING TO THE "STORM WATER MANAGEMENT BMP HANDBOOK," PUBLISHED BY THE SOUTH CAROLINA DHEC, PUBLISHED AUGUST 2005.
5. EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AT NO ADDITIONAL COST TO THE OWNER IF DEEMED NECESSARY BY THE ENGINEER OR SCDHEC INSPECTOR.
6. GRASSING FOR DISTURBED AREA STABILIZATION WILL BE PERFORMED AS NOTED IN THE "STORM WATER MANAGEMENT BMP HANDBOOK," PUBLISHED BY THE SOUTH CAROLINA DHEC. GRASSING FOR TEMPORARY AND PERMANENT SEEDING SHALL BE AS SPECIFIED ACCORDING TO PAGES 8-10 AND 25-27 RESPECTIVELY OF THE ABOVE REFERENCED MANUAL. UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. ALL TEMPORARY AND PERMANENT DIVERSIONS SHALL BE SEEDDED, FERTILIZED AND LINED WITH FIBER FABRIC IMMEDIATELY UPON COMPLETION OF THE CHANNEL. WITH THE EXCEPTION OF TEMPORARY AND PERMANENT DIVERSIONS, ALL DISTURBED AREAS EXPOSED FOR MORE THAN 30 DAYS SHALL BE SEEDDED AND MULCHED.
8. ALL EROSION CONTROL MEASURES SHALL BE INSPECTED AT THE INTERVAL SPECIFIED IN THE SOIL EROSION AND SEDIMENTATION CONTROL NOTES. ANY NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN PROPER FUNCTION OF ALL MEASURES.
9. SEDIMENT SHALL BE REMOVED FROM SEDIMENT TRAPS AND BLOCK AND GRAVEL INLET PROTECTION DEVICES WHEN STORAGE CAPACITY HAS REACHED 50%. GRAVEL SHALL BE REPLACED WHEN THE DEVICE NO LONGER DRAINS PROPERLY.
10. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE ONCE IT HAS ACCUMULATED TO A DEPTH OF 0.5 FT AT THE FENCE. SILT FENCE SHALL BE REPAIRED OR REPLACED AS NECESSARY TO MAINTAIN A BARRIER.
11. TEMPORARY AND FINAL SEEDING SHALL BE APPLIED, RE-APPLIED AS NECESSARY, CONTROL DEVICES, ANY RESULTING EXPOSED AREAS SHALL BE STABILIZED.
12. AFTER EARTH DISTURBING ACTIVITIES HAVE CEASED AND ALL EXPOSED SOIL HAS BEEN STABILIZED WITH A VEGETATIVE COVER, THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MAY BE REMOVED. FOLLOWING REMOVAL OF THE TEMPORARY EROSION CONTROL DEVICES, ANY RESULTING EXPOSED AREAS SHALL BE STABILIZED.
13. SEE SECTION 02270 FOR ADDITIONAL EROSION AND SEDIMENT CONTROL SPECIFICATIONS.

**WATERS OF THE STATE / WETLANDS NOTES**

1. NO WORK MAY BEGIN IN AREAS LABELED AS WATERS OF THE STATE OR WETLANDS UNTIL ALL NECESSARY USACOE PERMITS AND SCDHEC 401 CERTIFICATIONS HAVE BEEN OBTAINED.
2. A DOUBLE ROW OF SILT FENCING SHALL BE PROVIDED IN ALL AREAS WHERE A FIFTY FOOT UNDISTURBED BUFFER CANNOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND THE WATERS OF THE STATE.
3. A MINIMUM TEN FOOT BUFFER SHALL BE PROVIDED BETWEEN THE LAST ROW OF SILT FENCE AND THE WATERS OF THE STATE; OR, IF BUFFER CANNOT BE PROVIDED, THEN A STATEMENT FROM THE P.E. SHALL BE MADE ON PLANS INDICATING HOW SILT FENCE WILL BE INSTALLED AND MAINTAINED.

**CERTIFICATION**

"I CERTIFY BY MY SIGNATURE BELOW THAT: a) FOR SITES THAT DISTURB 10 OR MORE ACRES, I PARTICIPATED IN A PRE-CONSTRUCTION CONFERENCE ONSITE OR, WHEN ALLOWED, OFFSITE WITH THE INDIVIDUAL WHO IS RESPONSIBLE FOR THE OPERATIONAL CONTROL OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP); AND b) I ACCEPT THE TERMS AND CONDITIONS OF SWPPP AS REQUIRED BY THE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES PERMIT NUMBER SCR100000) ISSUED TO THE OWNER / OPERATOR OF THE CONSTRUCTION ACTIVITY FOR WHICH I HAVE BEEN CONTRACTED TO PERFORM CONSTRUCTION RELATED PROFESSIONAL SERVICES. FURTHER, BY MY SIGNATURE BELOW, I UNDERSTAND THAT I AM BECOMING A CO-PERMITTEE WITH THE OWNER / OPERATOR AND OTHER CONTRACTORS THAT HAVE BECOME CO-PERMITTEES TO THE GENERAL NPDES PERMIT ISSUED TO THE OWNER / OPERATOR OF THE FACILITY FOR WHICH I HAVE BEEN CONTRACTED TO PERFORM PROFESSIONAL CONSTRUCTION SERVICES. AS A CO-PERMITTEE, I UNDERSTAND THAT I, AND MY COMPANY, AS THE CASE MAY BE, AM LEGALLY ACCOUNTABLE TO THE SC DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL (DHEC), UNDER THE AUTHORITIES OF THE CWA AND THE SC POLLUTION CONTROL ACT, TO ENSURE COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE SWPPP. I ALSO UNDERSTAND THAT DHEC ENFORCEMENT ACTIONS MAY BE TAKEN AGAINST ANY SPECIFIC CO-PERMITTEE OR COMBINATION OF CO-PERMITTEES IF THE TERMS AND CONDITIONS OF THE SWPPP ARE NOT MET. THEREFORE, HAVING UNDERSTOOD THE ABOVE INFORMATION, I AM SIGNING THIS CERTIFICATION AND AM RECEIVING CO-PERMITTEE STATUS TO THE AFOREMENTIONED GENERAL NPDES PERMIT."

SIGNATURE & DATE

PRINTED NAME

COMPANY NAME

**SOIL EROSION AND SEDIMENTATION CONTROL NOTES**

1. IF NECESSARY, SLOPES, WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS. IN ADDITION TO HYDROSEEDING, IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW:
  - WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
  - WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER. IF SITE INSPECTIONS IDENTIFY BMP'S THAT ARE DAMAGED OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
7. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
8. ALL WATERS OF THE STATE (WOS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN NOT BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WOS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WOS.
9. ALL EQUIPMENT STORAGE, LAYDOWN OR STOCKPILES AREAS THAT MAY INCLUDE BUT ARE NOT LIMITED TO CONSTRUCTION MATERIALS, CONSTRUCTION DEBRIS, FUELS, CONSTRUCTION CHEMICALS, RECYCLE MATERIALS (E.G. PAPER, WOOD, CONCRETE, OILS), BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER), TRASH OR BULK WASTE-COLLECTION AREAS SHALL ALL BE CONTAINED THRU BMP'S SUCH AS SILT FENCING, DIKES OR BERMS TO ENSURE THERE IS NO CONTAMINATED RUNOFF OR DISCHARGES.
10. WASTE-COLLECTION AREAS (DUMPSTERS, AND SUCH) ARE OFTEN BEST LOCATED NEAR CONSTRUCTION SITE ENTRANCES TO MINIMIZE TRAFFIC ON DISTURBED SOILS. CONSIDER SECONDARY CONTAINMENT AROUND WASTE COLLECTION AREAS TO FURTHER MINIMIZE THE LIKELIHOOD OF CONTAMINATED DISCHARGES.
11. ALL ON-SITE RESTROOM FACILITIES (E.G. PORTA-JOHN'S) SHALL BE MAINTAINED, CLEANED AND EMPTIED ON A REGULARLY BASIS. THESE FACILITIES SHALL BE LOCATED AWAY FROM GUTTERS, WATER COURSES AND STORM DRAINS AND WITHIN SILT FENCED AREAS. SECONDARY CONTAINMENT PANS SHALL BE USED UNDER PORTA-JOHN'S ON-SITE ALONG WITH TIE-DOWNS OR STAKE DOWNS IN HIGH WIND AREAS. UNDER NO CIRCUMSTANCES ARE RESTROOM FACILITIES ALLOWED TO DISCHARGE OR BURY WASTEWATER ON CONSTRUCTION SITES.

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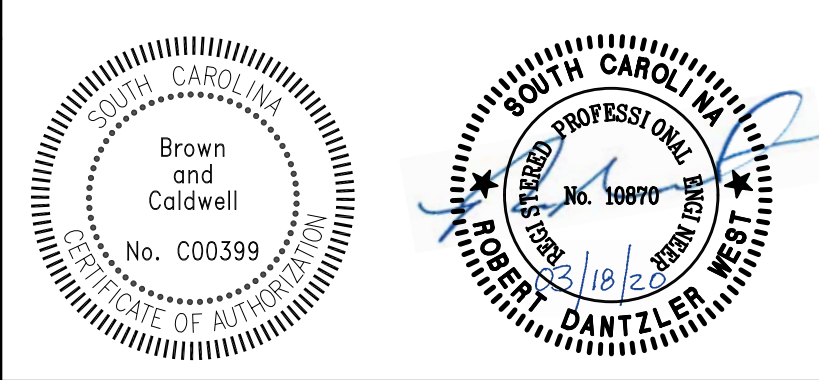


Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: PROJECT MANAGER DATE:   
 APPROVED: BROWN AND CALDWELL DATE:   
 2/27/2020

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)  
DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

EXTERNAL REFERENCES



REVISIONS				
ZONE	REV.	DESCRIPTION	BY	DATE
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	2	ISSUED FOR BID	AJ	3/18/20

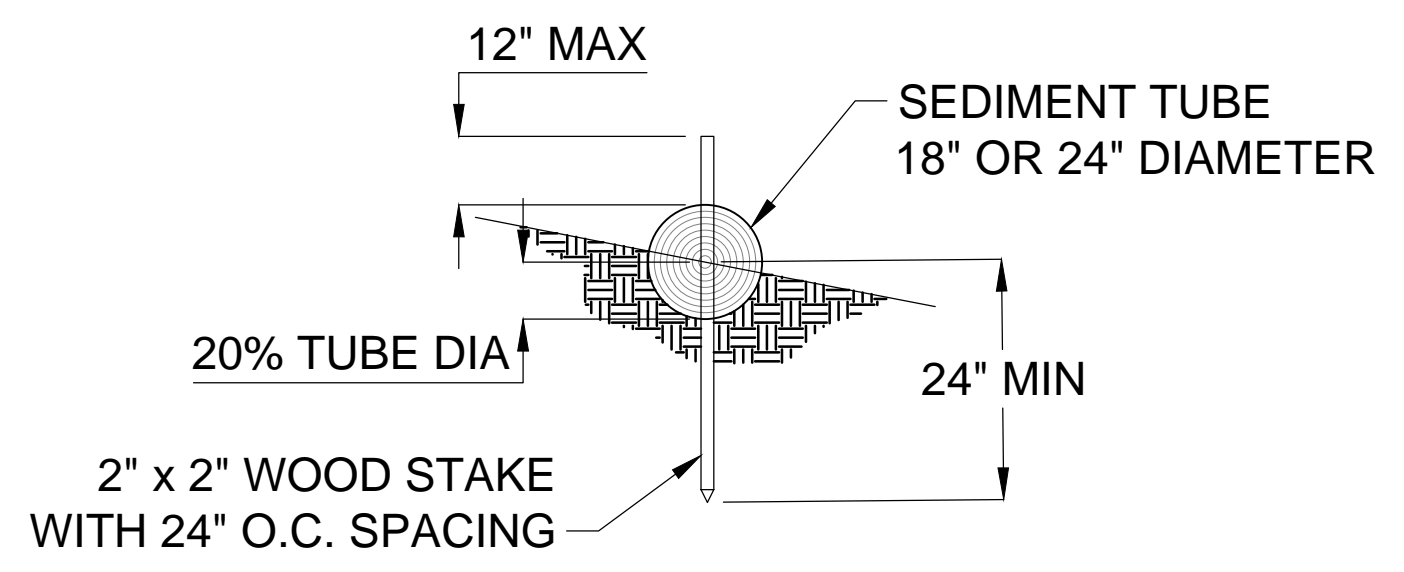
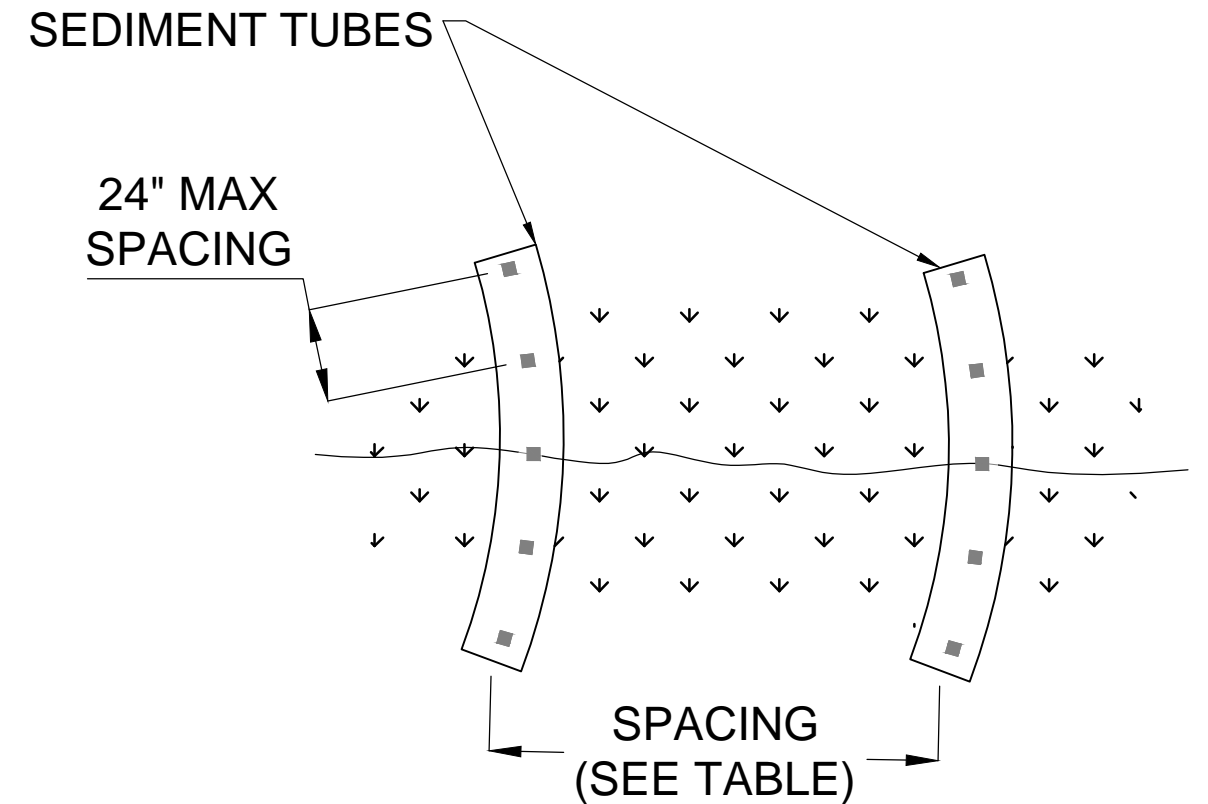


CIVIL  
**EROSION & SEDIMENT CONTROL**  
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(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME	000-C-03.DWG
BC PROJECT NUMBER	152589
SCALE	---
AS SHOWN DRAWING NUMBER	000-C-03
SHEET NUMBER	6
TOTAL SHEETS	25

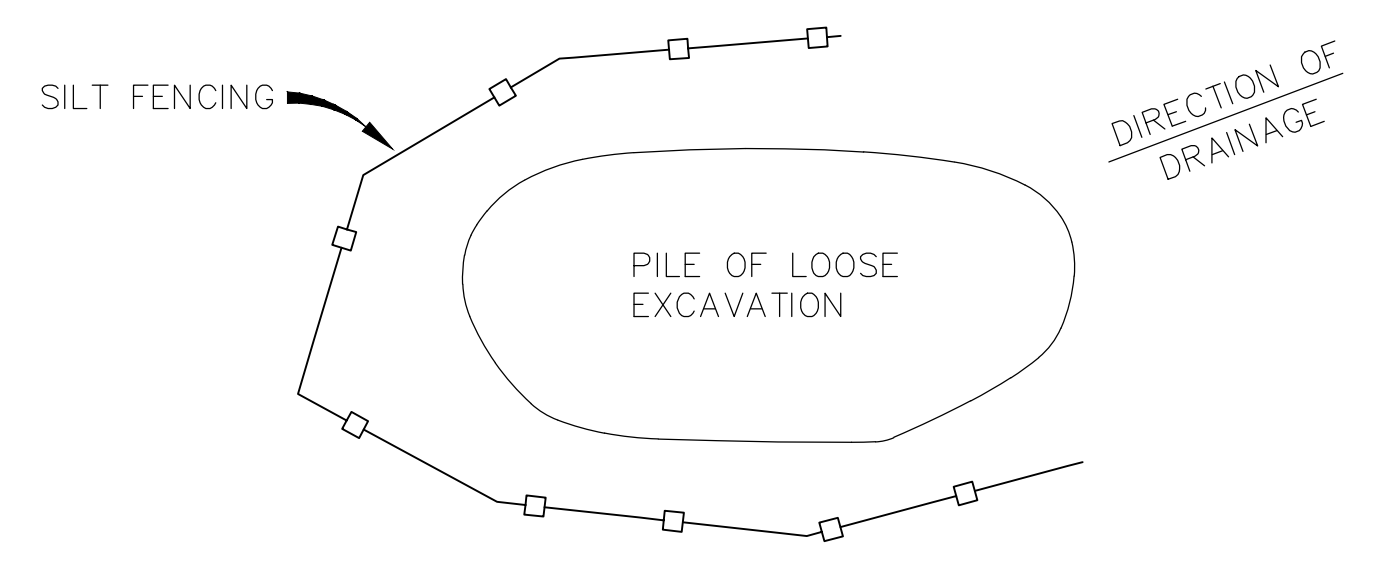
**NOTES**

1. SEDIMENT TUBES SHALL BE OF THE TYPE AND MATERIAL AS SPECIFIED IN THE SOUTH CAROLINA DHEC STORM WATER MANAGEMENT BMP HANDBOOK.
2. ALL ROCKS, CLODS, VEGETATION OR OTHER OBSTRUCTIONS SHALL BE REMOVED SO INSTALLED SEDIMENT TUBES HAVE DIRECT CONTACT WITH THE UNDERLYING SURFACE.
3. SEDIMENT TUBES SHALL BE INSTALLED BY LAYING THEM FLAT ON THE GROUND. A SMALL TRENCH SHALL BE CONSTRUCTED TO A DEPTH THAT IS 20% OF THE SEDIMENT TUBE DIAMETER. THE SEDIMENT TUBE SHALL BE LAID IN THE TRENCH AND THE UPSTREAM SEDIMENT TUBE SOIL INTERFACE COMPACTED. DO NOT COMPLETELY BURY SEDIMENT TUBES DURING INSTALLATION.
4. LAP THE ENDS OF ADJACENT SEDIMENT TUBES A MINIMUM OF 6-INCHES TO PREVENT FLOW AND SEDIMENT FROM PASSING THROUGH THE FIELD JOINT. NEVER STACK SEDIMENT TUBES ON TOP OF ONE ANOTHER.
5. AVOID DAMAGE TO SEDIMENT TUBES DURING INSTALLATION. SHOULD THE SEDIMENT TUBE BECOME DAMAGED DURING INSTALLATION, PLACE A STAKE ON BOTH SIDES OF THE DAMAGED AREA TERMINATING THE TUBE SEGMENT AND INSTALL A NEW TUBE SEGMENT. PERFORM FIELD MONITORING TO VERIFY THAT INSTALLATION PROCEDURES DO NOT DAMAGE SEDIMENT TUBES. REPLACE ALL DAMAGED SEDIMENT TUBES DAMAGED DURING INSTALLATION.
6. INSTALL SEDIMENT TUBES IN SWALES OR DRAINAGE DITCHES PERPENDICULAR TO THE WATER FLOW AND EXTEND THEM UP THE SIDE SLOPES A MINIMUM OF 1-FOOT ABOVE THE DESIGN FLOW DEPTH. SPACE SEDIMENT TUBES ACCORDING TO THE TABLE.
7. SELECT THE SEDIMENT TUBE LENGTH TO MINIMIZE THE NUMBER OF SEDIMENT TUBES NEEDED TO SPAN THE WIDTH OF THE DRAINAGE CONVEYANCE. IF THE REQUIRED LENGTH (PERPENDICULAR TO THE WATER FLOW) IS 15-FEET, THEN ONE 15-FOOT SEDIMENT TUBE IS PREFERRED COMPARED TO TWO OVERLAPPING 10-FOOT SEDIMENT TUBES.
8. INSTALL SEDIMENT TUBES FOR DITCH CHECKS OVER BARE SOIL, MULCHED AREAS, OR EROSION CONTROL BLANKETS. KEEP SEDIMENT TUBES FOR DITCH CHECKS IN PLACE UNTIL FULLY ESTABLISHED VEGETATION AND ROOT SYSTEMS HAVE COMPLETELY DEVELOPED AND CAN SURVIVE ON THEIR OWN.
9. INSPECTION AND MAINTENANCE OF TUBES SHALL BE AS FOLLOWS:
  - INSPECT SEDIMENT TUBES AFTER INSTALLATION FOR GAPS UNDER THE SEDIMENT TUBES AND FOR GAPS BETWEEN THE JOINTS OF ADJACENT ENDS OF SEDIMENT TUBES.
  - INSPECT EVERY 7-DAYS AND WITHIN 24-HOURS OF A RAINFALL EVENT OF 0.5-INCHES OR GREATER.
  - REPAIR ALL RILLS, GULLIES, AND UNDERCUTTING NEAR SEDIMENT TUBES.
  - REMOVE ALL SEDIMENT DEPOSITS THAT IMPAIR THE FILTRATION CAPABILITY OF SEDIMENT TUBES WHEN THE SEDIMENT REACHES 1/3 THE HEIGHT OF THE EXPOSED SEDIMENT TUBE.
  - REMOVE AND/OR REPLACE INSTALLED SEDIMENT TUBES AS REQUIRED TO ADAPT TO CHANGING CONSTRUCTION SITE CONDITIONS.
  - REMOVE SEDIMENT TUBES FROM THE SITE WHEN THE FUNCTIONAL LONGEVITY IS EXCEEDED AS DETERMINED BY THE ENGINEER, INSPECTOR OR MANUFACTURER'S REPRESENTATIVE. GATHER SEDIMENT TUBES AND DISPOSE OF THEM IN REGULAR MEANS AS NON-HAZARDOUS, INERT MATERIAL.
  - PRIOR TO FINAL STABILIZATION, BACKFILL ALL TRENCHES, DEPRESSIONS AND OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF SEDIMENT TUBES.



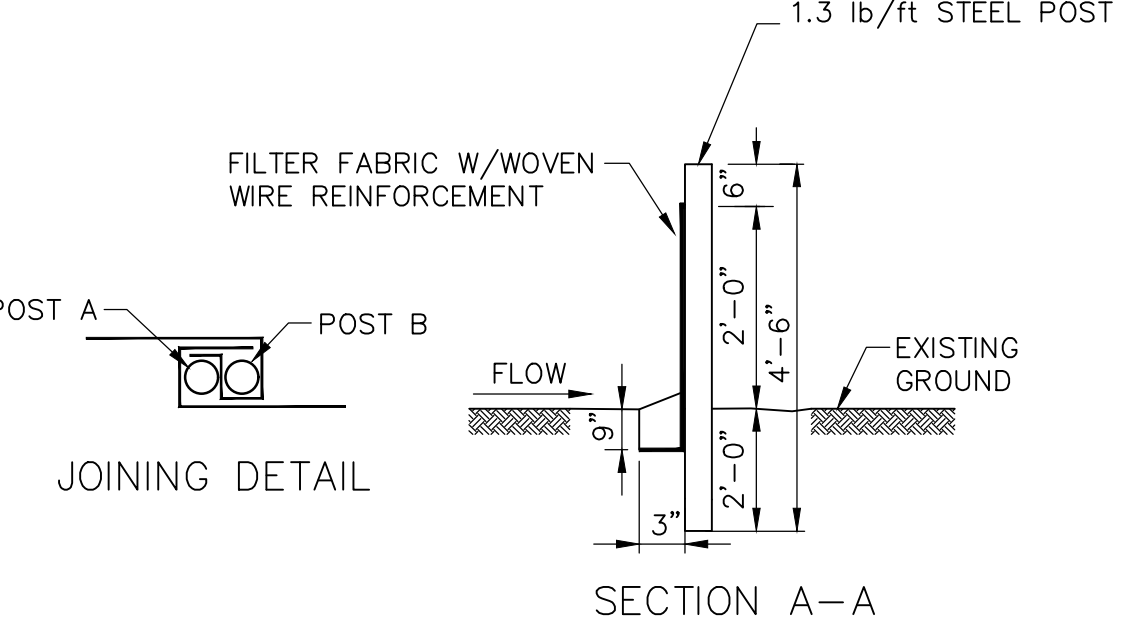
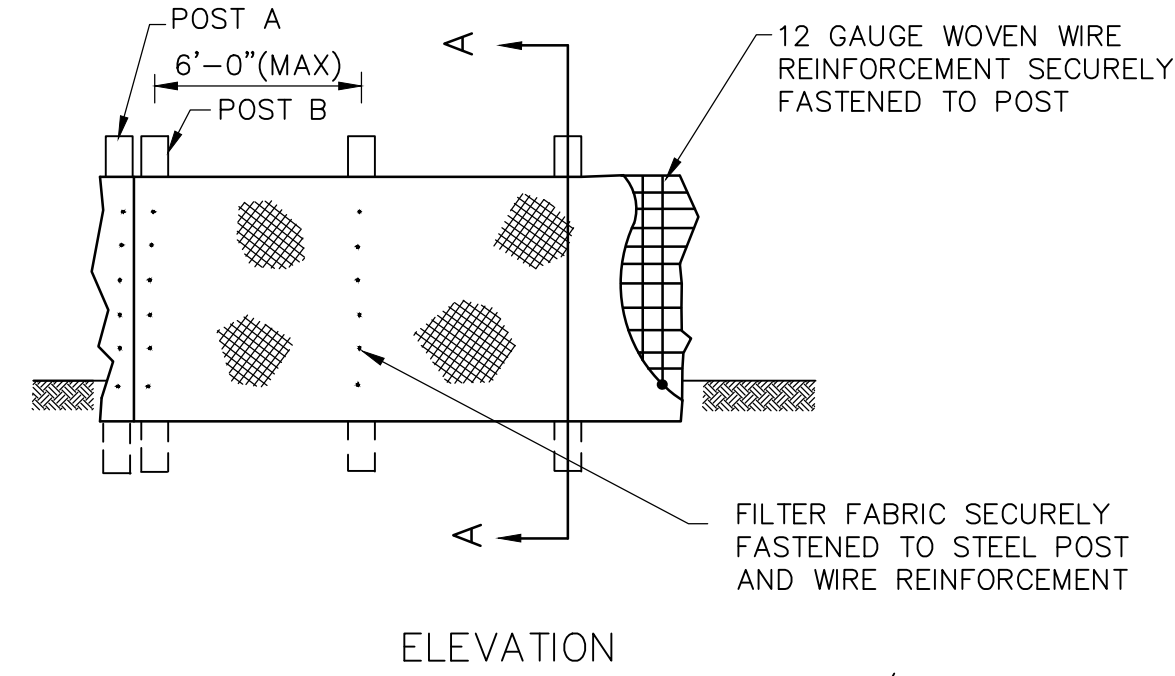
SEDIMENT TUBE SPACING TABLE	
SLOPE	MAXIMUM SEDIMENT TUBE SPACING
LESS THAN 2%	150-FEET
2%	100-FEET
3%	75-FEET
4%	50-FEET
5%	40-FEET
6%	30-FEET
GREATER THAN 6%	25-FEET

**SEDIMENT TUBE DETAIL**  
N.T.S.

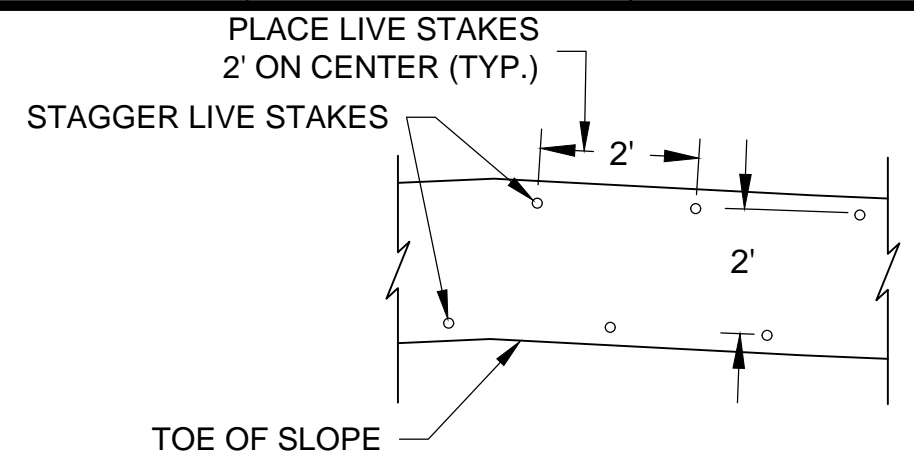
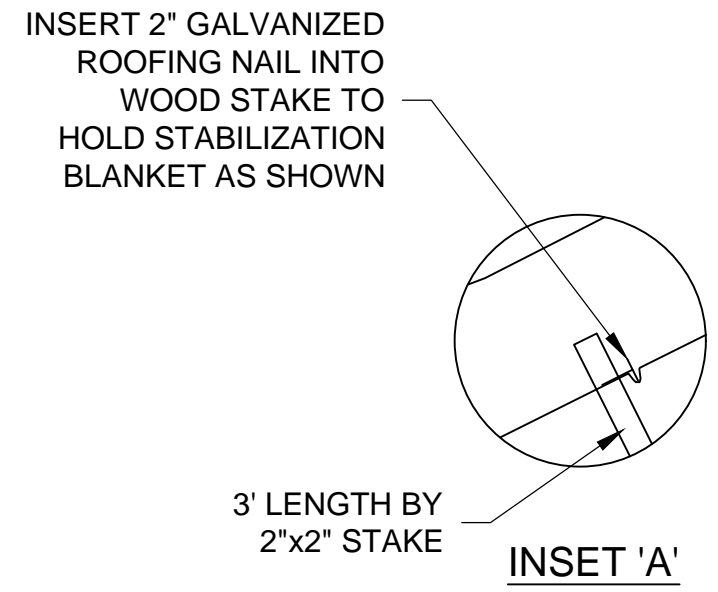


- NOTE:
- (1) PROVIDE SILT FENCING AROUND ALL PILE OF LOOSE EXCAVATED MATERIALS FROM UTILITY DITCHES AS SHOWN ON THIS DRAWING.
  - (2) PROVIDE TEMPORARY GRASSING IN ACCORDANCE WITH TABLE SHOWN ON THIS SHEET. PROVIDE TEMPORARY GRASSING IMMEDIATELY AFTER INSTALLATION OF PIPING.

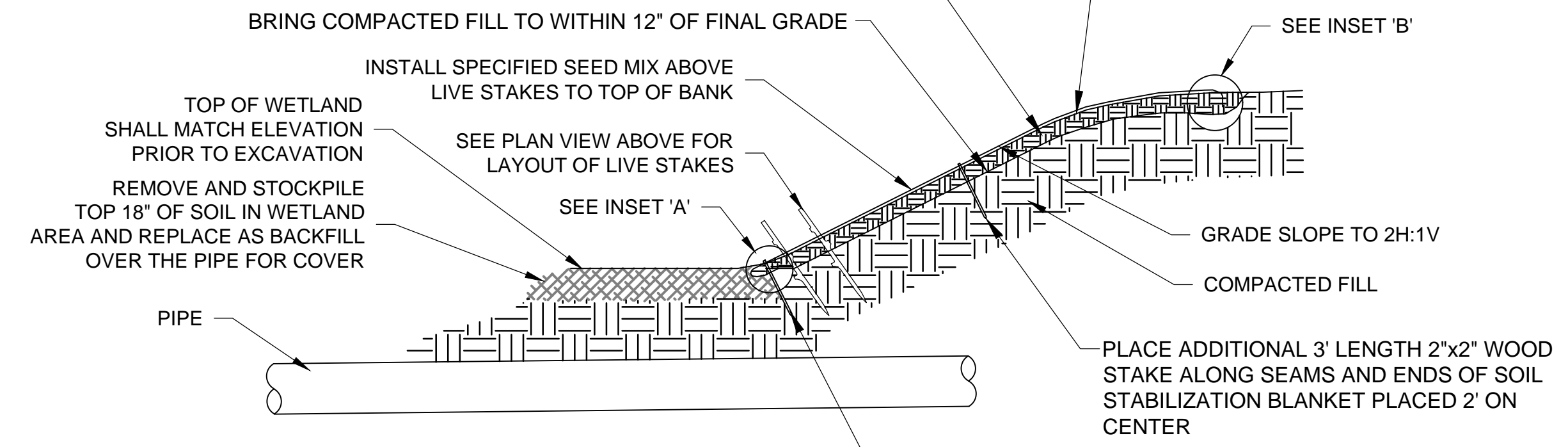
**EROSION CONTROL FOR EXCAVATED MATERIALS**  
N.T.S.



**REINFORCED SILT FENCE DETAIL**  
N.T.S.



FINAL 12" OF FILL TO CONSIST OF SALVAGED OR IMPORTED TOPSOIL. COMPACT THE TOP 12" TO 85% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 TO OBTAIN FIRMNESS AND FINAL GRADES.



**LIVE STAKE SCHEDULE**  
CORNUS AMOMUM (SILKY DOGWOOD)  
SAMBUCUS CANADENSIS (COMMON ELDERBERRY)

INSTALL 3' LENGTH 2"x2" WOOD STAKE ALONG TOE OF BANK PLACED 2' ON CENTER

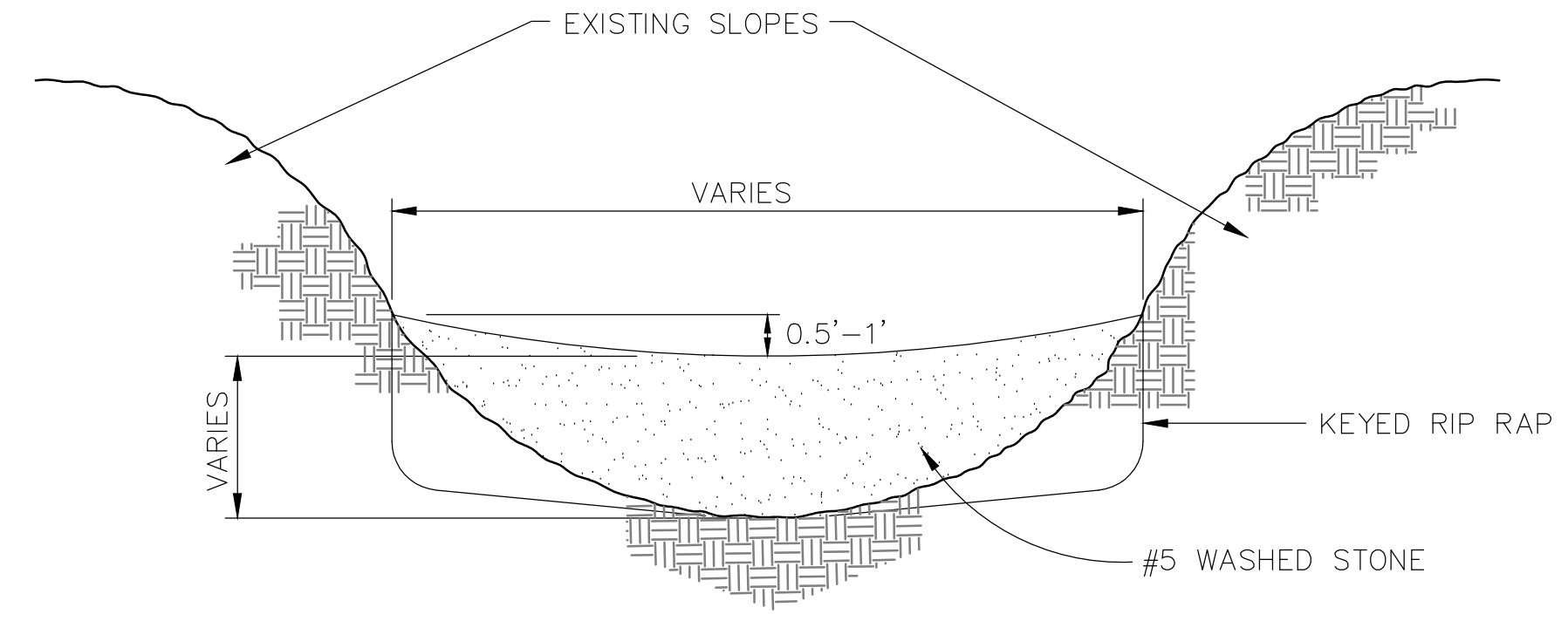
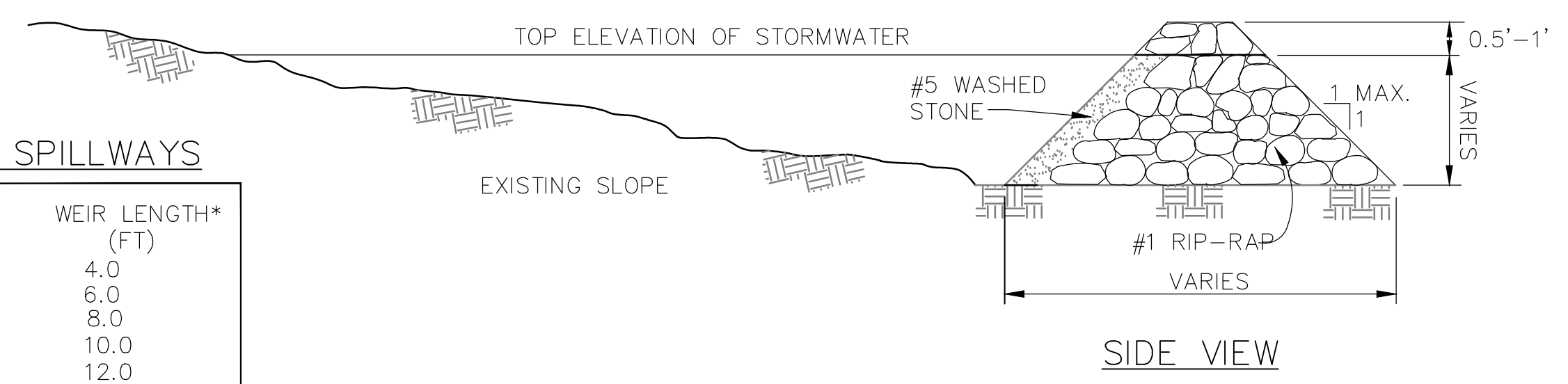
NOTE:  
SPACINGS ARE NOTED ON THE DETAIL AND QUANTITIES SHOULD BE DETERMINED BY THE CONTRACTOR AT THE TIME OF STABILIZATION.

**BANK STABILIZATION DETAIL**  
N.T.S.

**DESIGN OF SPILLWAYS**

DRAINAGE AREA (ACRES)	WEIR LENGTH* (FT)
1	4.0
2	6.0
3	8.0
4	10.0
5	12.0

\* DIMENSIONS SHOWN ARE MINIMUM



NOTE:  
HEIGHT & WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.  
KEY RIP RAP INTO THE DAM FOR STABILIZATION.

**CHECK DAM DETAIL**  
N.T.S.

**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES

Professional Engineer Seal for Robert Dantzer, No. 10870, State of South Carolina.

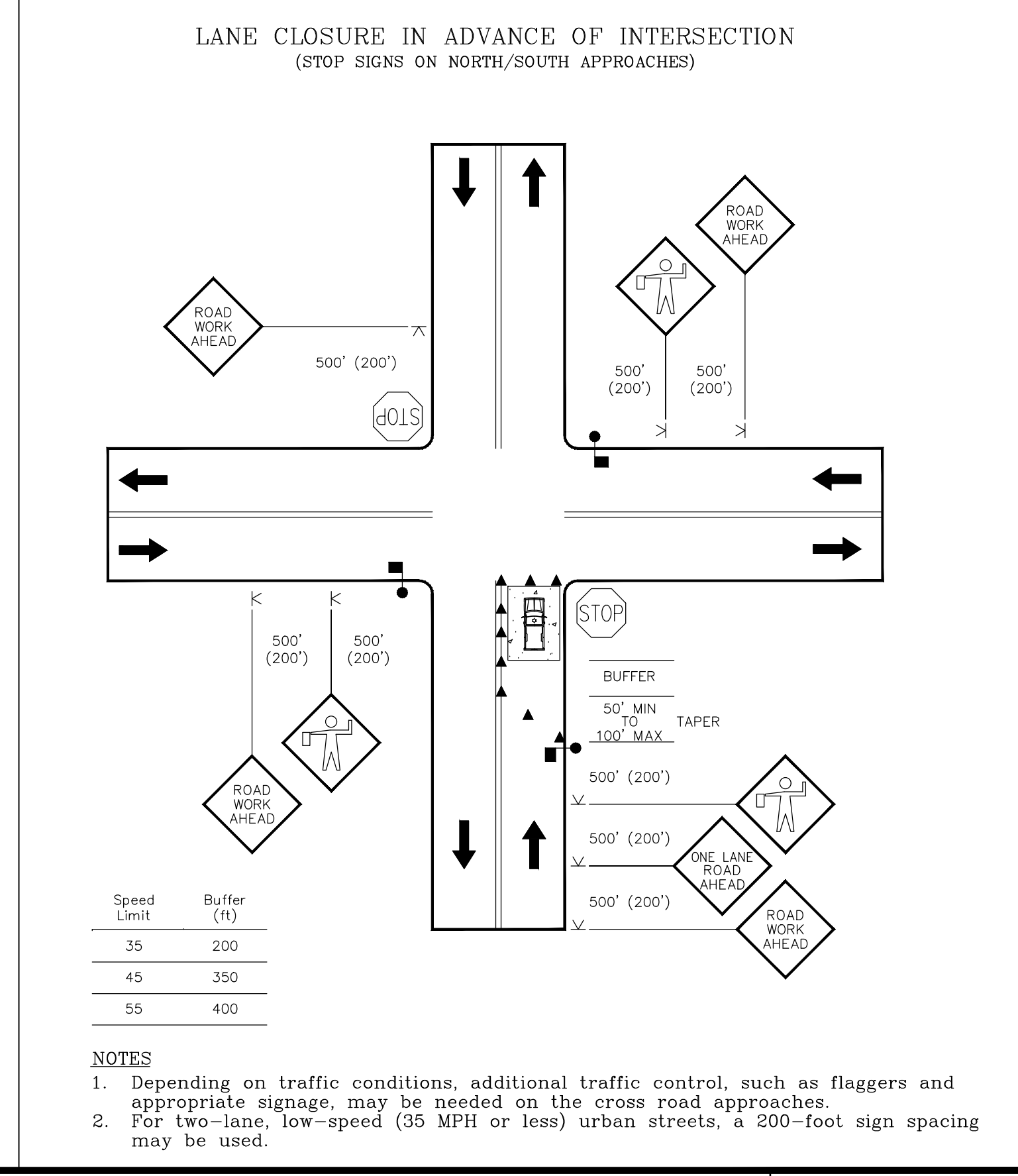
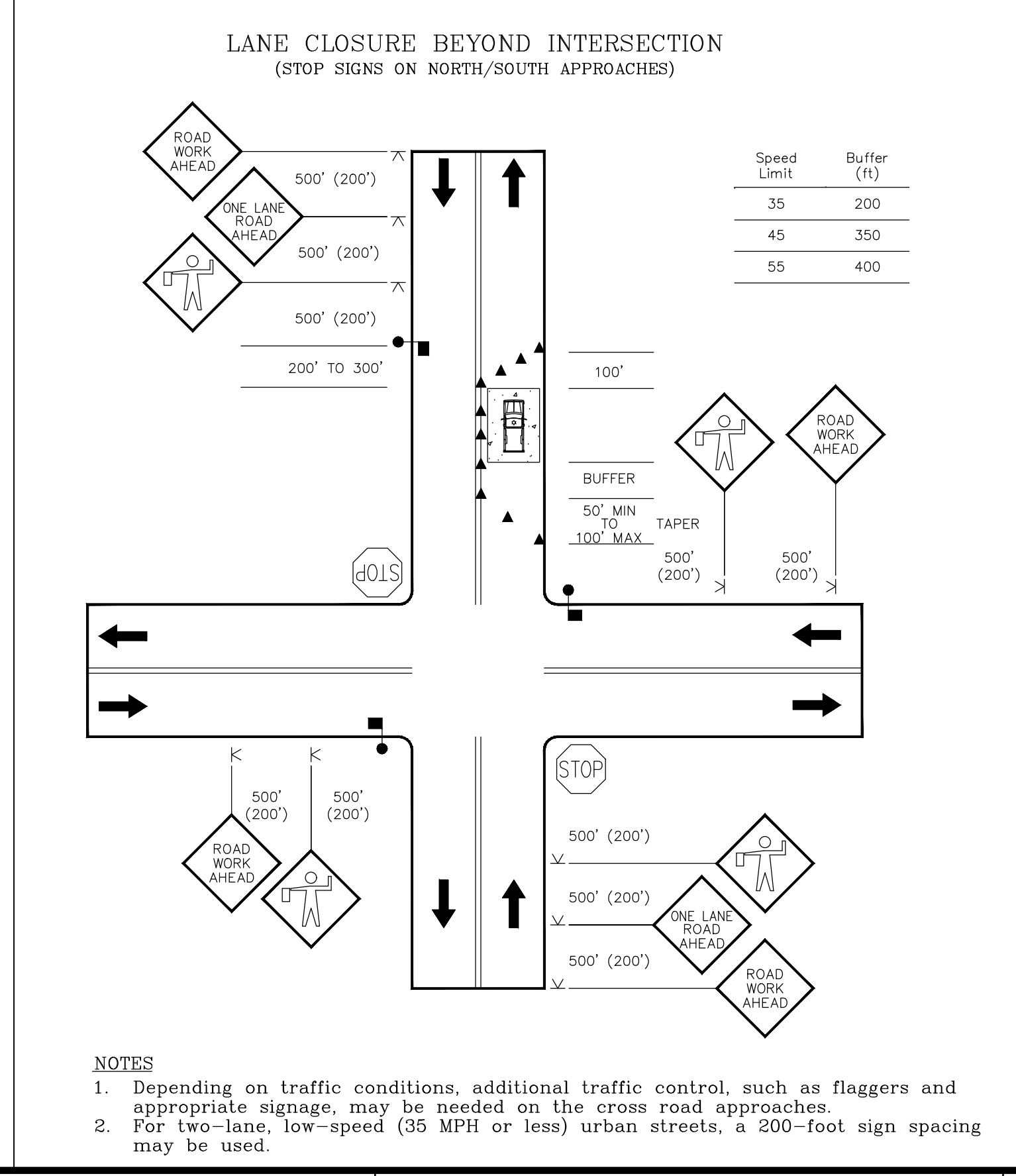
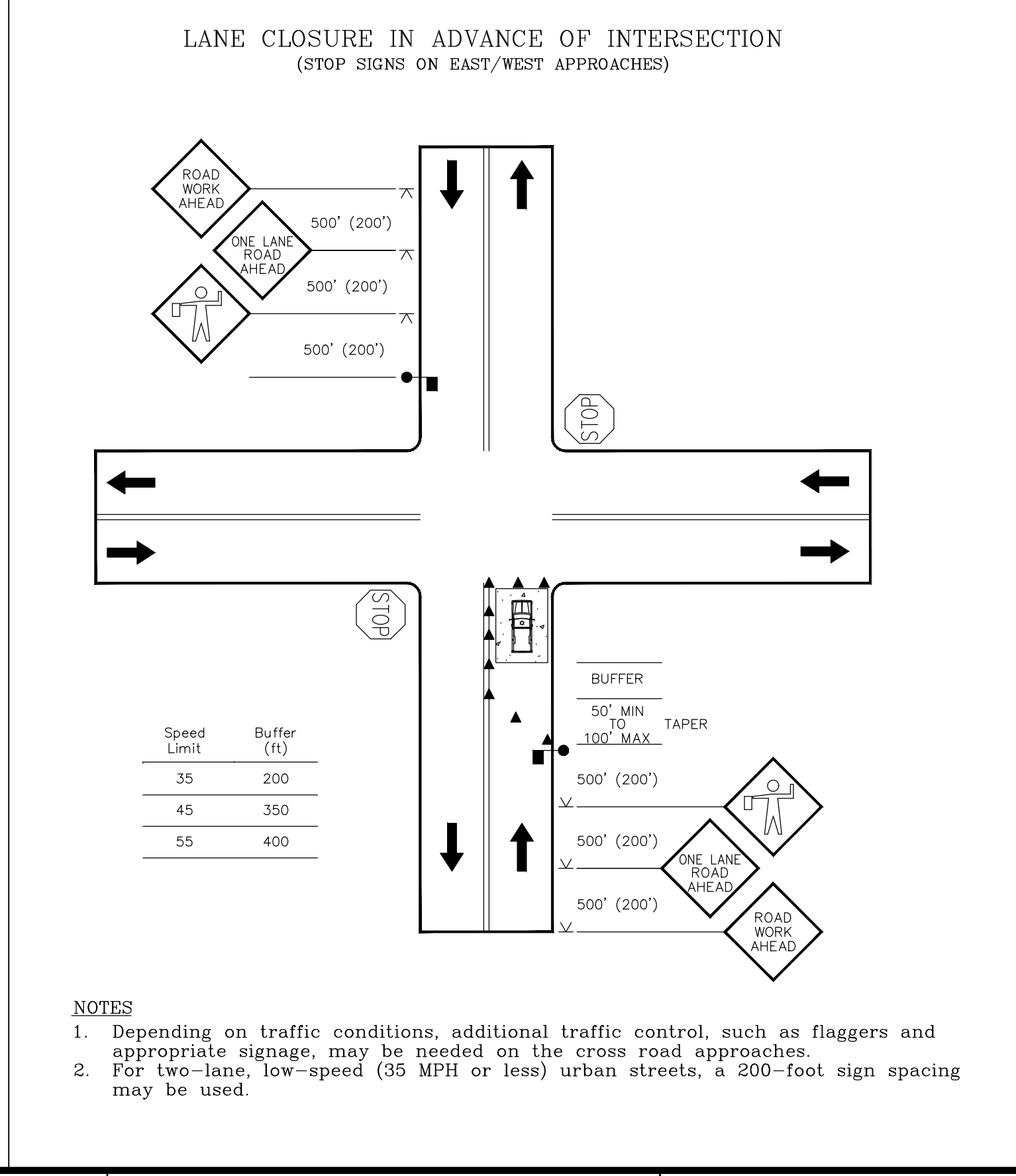
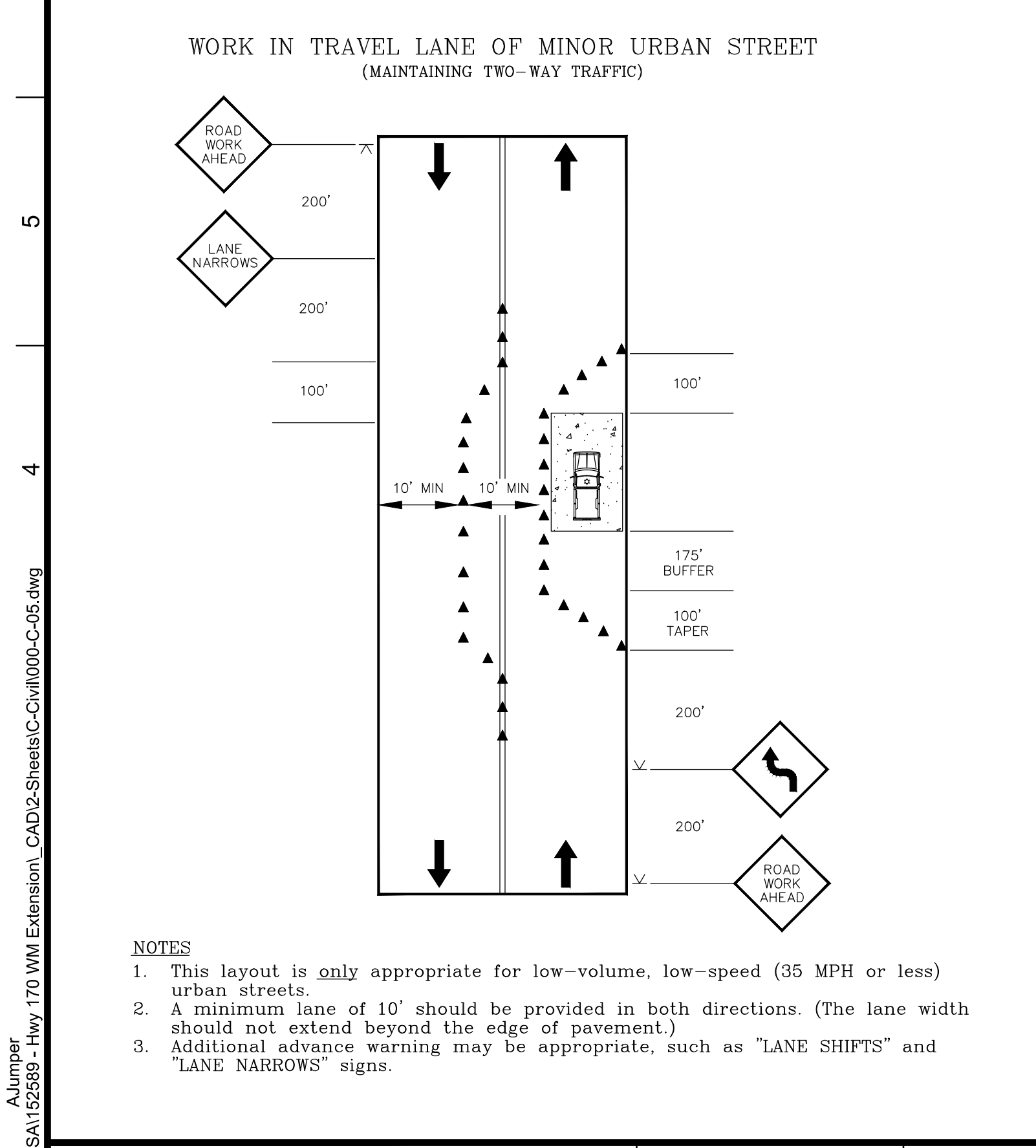
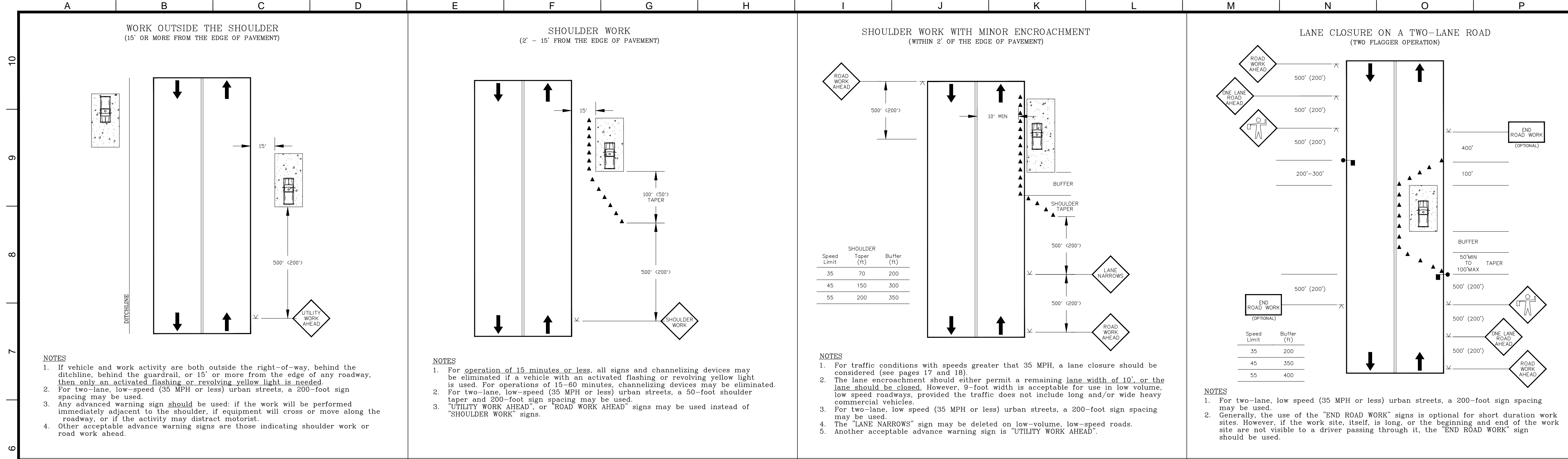
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	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**EROSION & SEDIMENT CONTROL DETAILS**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME 000-C-04.DWG
BC PROJECT NUMBER 152589
SCALE AS SHOWN
DRAWING NUMBER <b>000-C-04</b>
SHEET NUMBER 7 OF 25

Mar 18, 2020 - 2:15pm  
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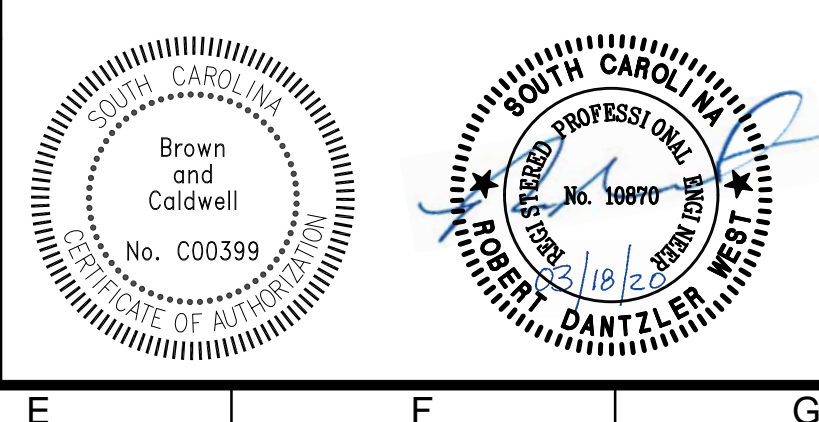


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ZONE	REV.	DESCRIPTION	BY	DATE
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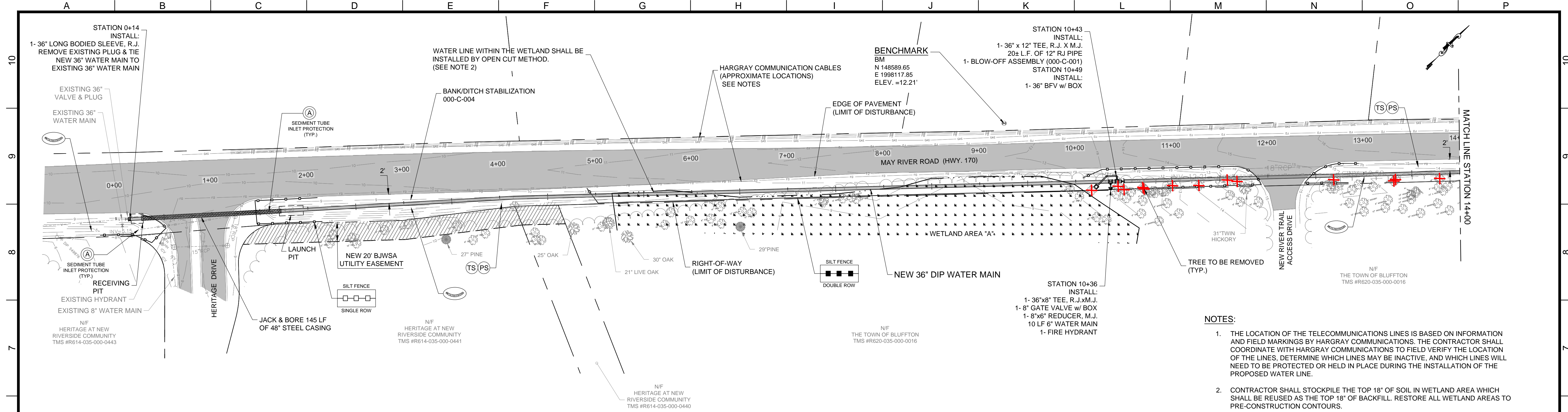


CIVIL  
**TRAFFIC CONTROL**  
---  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

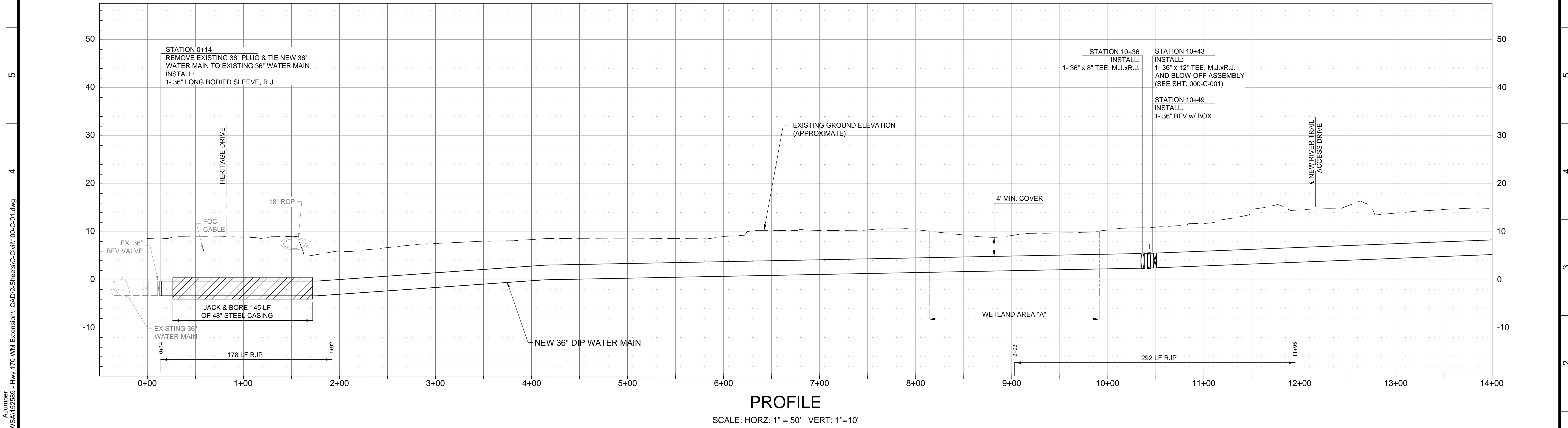
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SCALE: AS SHOWN  
DRAWING NUMBER: 000-C-05  
SHEET NUMBER: 8 OF 25

Mar 18, 2020 - 2:14pm A:Jumper 1:\projects\clients\BWSA\152589 - Hwy 170 WM Extension\CAD\2-Sheets\Civil\000-C-05.dwg





- NOTES:**
1. THE LOCATION OF THE TELECOMMUNICATIONS LINES IS BASED ON INFORMATION AND FIELD MARKINGS BY HARGRAY COMMUNICATIONS. THE CONTRACTOR SHALL COORDINATE WITH HARGRAY COMMUNICATIONS TO FIELD VERIFY THE LOCATION OF THE LINES, DETERMINE WHICH LINES MAY BE INACTIVE, AND WHICH LINES WILL NEED TO BE PROTECTED OR HELD IN PLACE DURING THE INSTALLATION OF THE PROPOSED WATER LINE.
  2. CONTRACTOR SHALL STOCKPILE THE TOP 18" OF SOIL IN WETLAND AREA WHICH SHALL BE REUSED AS THE TOP 18" OF BACKFILL. RESTORE ALL WETLAND AREAS TO PRE-CONSTRUCTION CONTOURS.
  3. EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THIS DRAWINGS MAY NOT ENCOMPASS ALL MEASURES NEEDED FOR CERTAIN SITE CONDITIONS AT TIME OF CONSTRUCTION. CONTRACTOR SHALL REFER TO DRAWING 000-C-08 AND THE S.C. DHEC STORM WATER MANAGEMENT BMP HANDBOOK, LATEST REVISION FOR ADDITIONAL CONTROL MEASURES.



**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

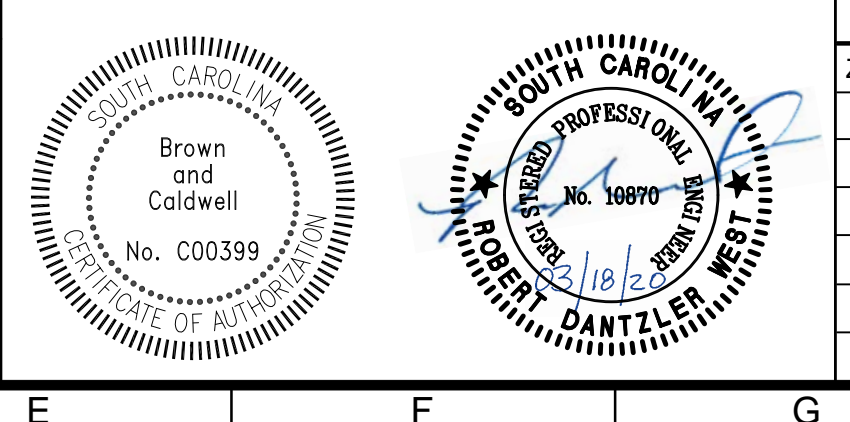
SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
PROJECT MANAGER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

EXTERNAL REFERENCES



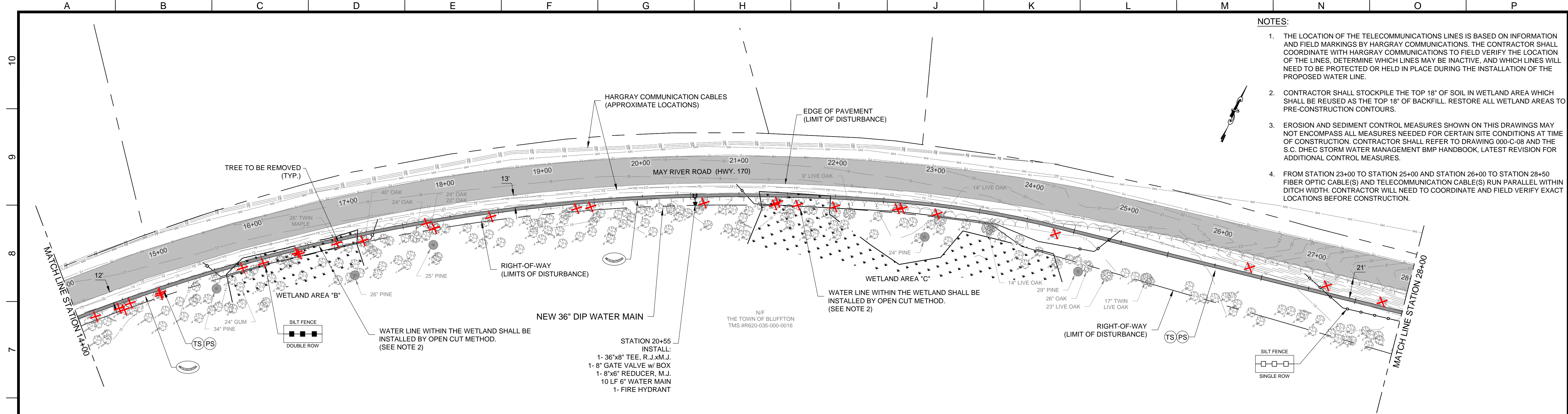
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ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**PLAN & PROFILE**  
STATION 0+14 TO 14+00  
(BJWSA CIP 1696)  
HIGHWAY 170 WATER MAIN EXTENSION

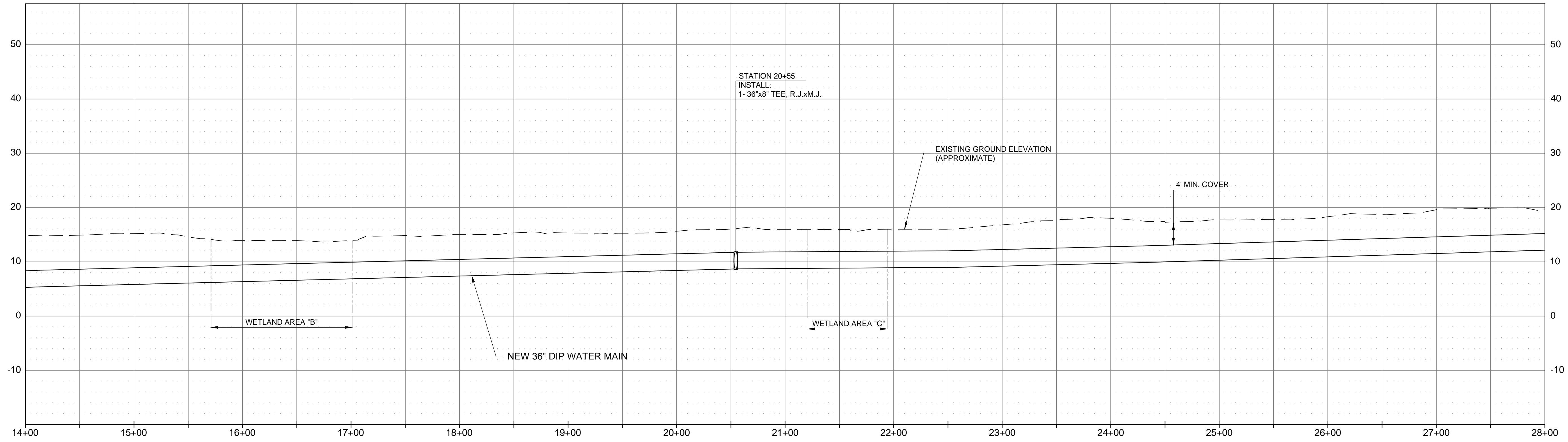
FILENAME 100-C-01.DWG
BC PROJECT NUMBER 152589
SCALE AS SHOWN
DRAWING NUMBER <b>100-C-01</b>
SHEET NUMBER 9 OF 25

Mar 17, 2020 - 4:26pm  
 A:\Jumper  
 \Projects\Clients\B\W\SA\152589 - Hwy 170 WM Extension\CAD\2-Sheets\Civil\100-C-01.dwg



- NOTES:**
1. THE LOCATION OF THE TELECOMMUNICATIONS LINES IS BASED ON INFORMATION AND FIELD MARKINGS BY HARGRAY COMMUNICATIONS. THE CONTRACTOR SHALL COORDINATE WITH HARGRAY COMMUNICATIONS TO FIELD VERIFY THE LOCATION OF THE LINES. DETERMINE WHICH LINES MAY BE INACTIVE, AND WHICH LINES WILL NEED TO BE PROTECTED OR HELD IN PLACE DURING THE INSTALLATION OF THE PROPOSED WATER LINE.
  2. CONTRACTOR SHALL STOCKPILE THE TOP 18" OF SOIL IN WETLAND AREA WHICH SHALL BE REUSED AS THE TOP 18" OF BACKFILL. RESTORE ALL WETLAND AREAS TO PRE-CONSTRUCTION CONTOURS.
  3. EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THIS DRAWINGS MAY NOT ENCOMPASS ALL MEASURES NEEDED FOR CERTAIN SITE CONDITIONS AT TIME OF CONSTRUCTION. CONTRACTOR SHALL REFER TO DRAWING 000-C-08 AND THE S.C. DHEC STORM WATER MANAGEMENT BMP HANDBOOK, LATEST REVISION FOR ADDITIONAL CONTROL MEASURES.
  4. FROM STATION 23+00 TO STATION 25+00 AND STATION 26+00 TO STATION 28+50 FIBER OPTIC CABLE(S) AND TELECOMMUNICATION CABLE(S) RUN PARALLEL WITHIN DITCH WIDTH. CONTRACTOR WILL NEED TO COORDINATE AND FIELD VERIFY EXACT LOCATIONS BEFORE CONSTRUCTION.

**PLAN**  
SCALE: 1" = 50'



**PROFILE**  
SCALE: HORZ: 1" = 50' VERT: 1"=10'

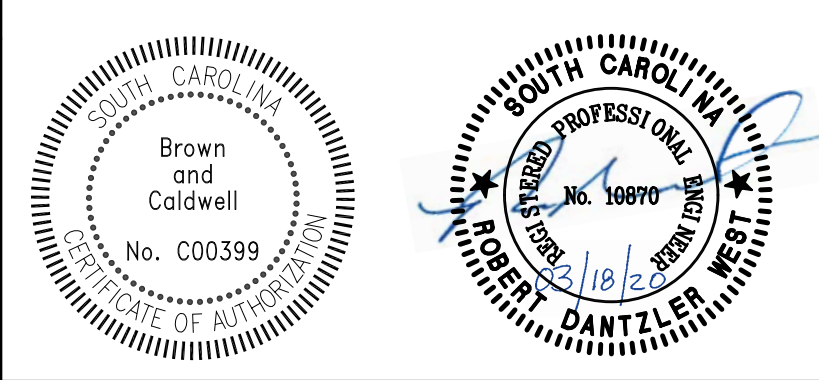
**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

PROJECT MANAGER DATE:  
BROWN AND CALDWELL DATE:

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
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	2	ISSUED FOR BID	AJ	3/19/20	RW

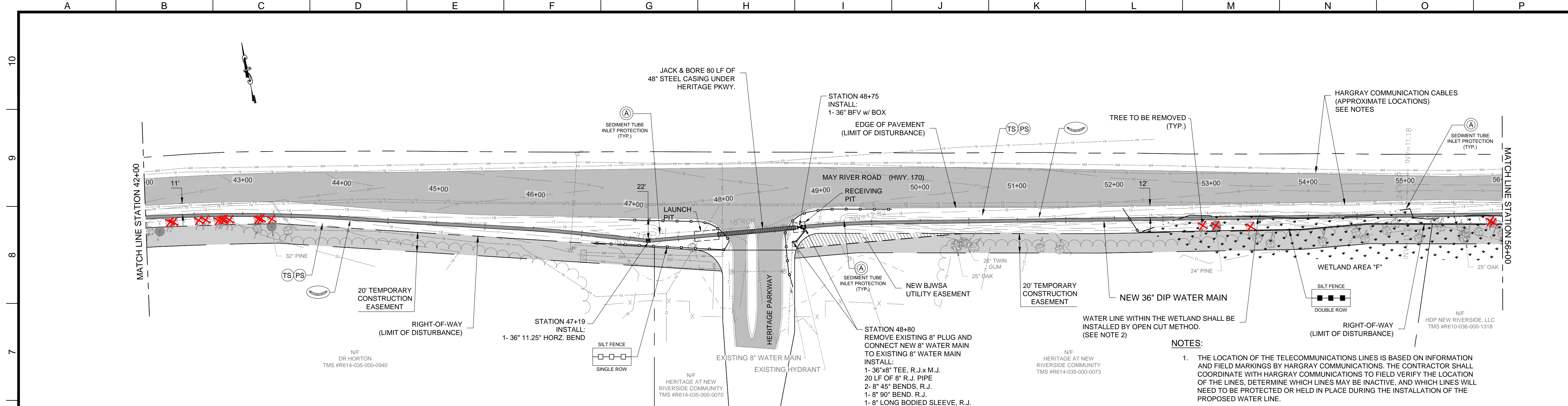


CIVIL  
**PLAN & PROFILE**  
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(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

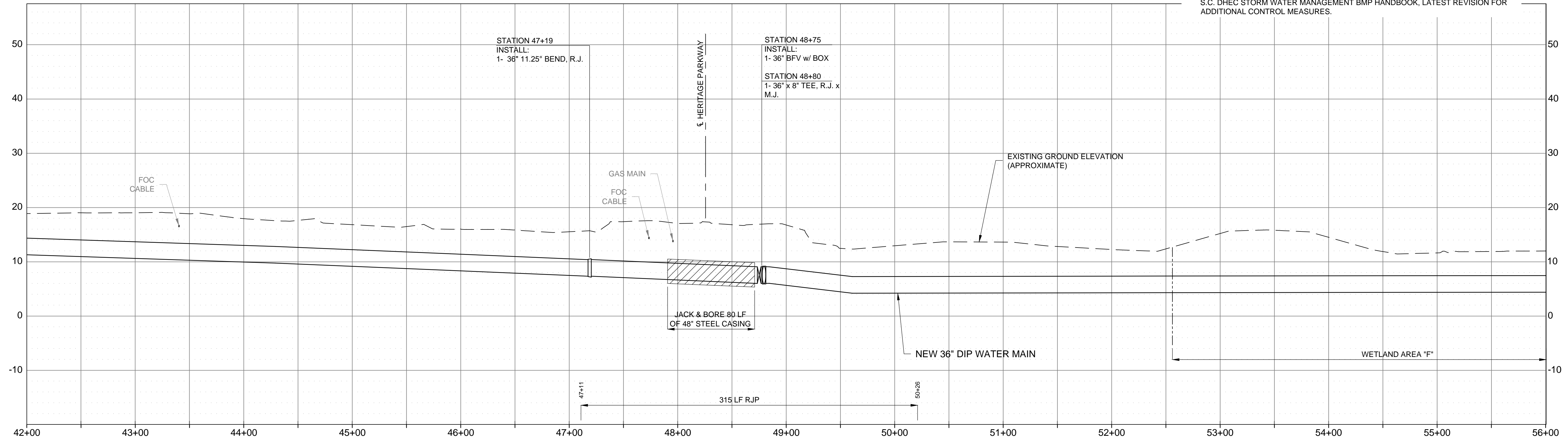
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BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	100-C-02
SHEET NUMBER	10
OF	25

Mar 18, 2020 - 2:33pm  
A:Jumper  
C:\Projects\100-C-02\100-C-02.dwg





- NOTES:**
1. THE LOCATION OF THE TELECOMMUNICATIONS LINES IS BASED ON INFORMATION AND FIELD MARKINGS BY HARGRAY COMMUNICATIONS. THE CONTRACTOR SHALL COORDINATE WITH HARGRAY COMMUNICATIONS TO FIELD VERIFY THE LOCATION OF THE LINES, DETERMINE WHICH LINES MAY BE INACTIVE, AND WHICH LINES WILL NEED TO BE PROTECTED OR HELD IN PLACE DURING THE INSTALLATION OF THE PROPOSED WATER LINE.
  2. CONTRACTOR SHALL STOCKPILE THE TOP 18" OF SOIL IN WETLAND AREA WHICH SHALL BE REUSED AS THE TOP 18" OF BACKFILL. RESTORE ALL WETLAND AREAS TO PRE-CONSTRUCTION CONTOURS.
  3. EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THIS DRAWINGS MAY NOT ENCOMPASS ALL MEASURES NEEDED FOR CERTAIN SITE CONDITIONS AT TIME OF CONSTRUCTION. CONTRACTOR SHALL REFER TO DRAWING 000-C-08 AND THE S.C. DHEC STORM WATER MANAGEMENT BMP HANDBOOK, LATEST REVISION FOR ADDITIONAL CONTROL MEASURES.

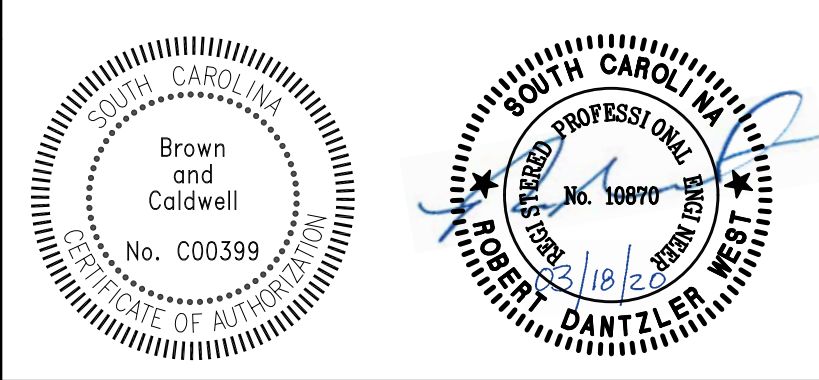


**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES



ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**PLAN & PROFILE**  
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(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME	100-C-04.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	100-C-04
SHEET NUMBER	12
OF	25

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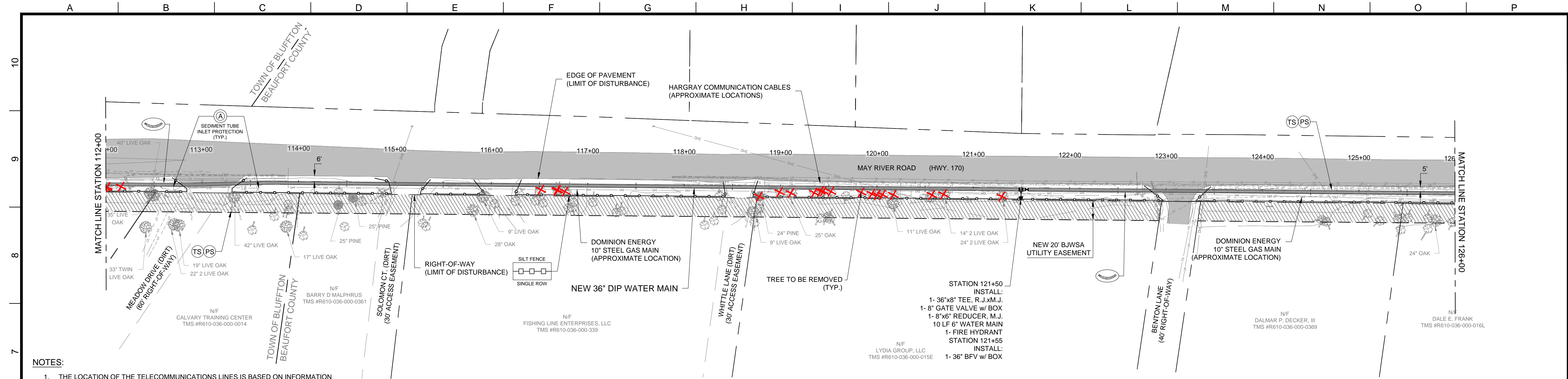






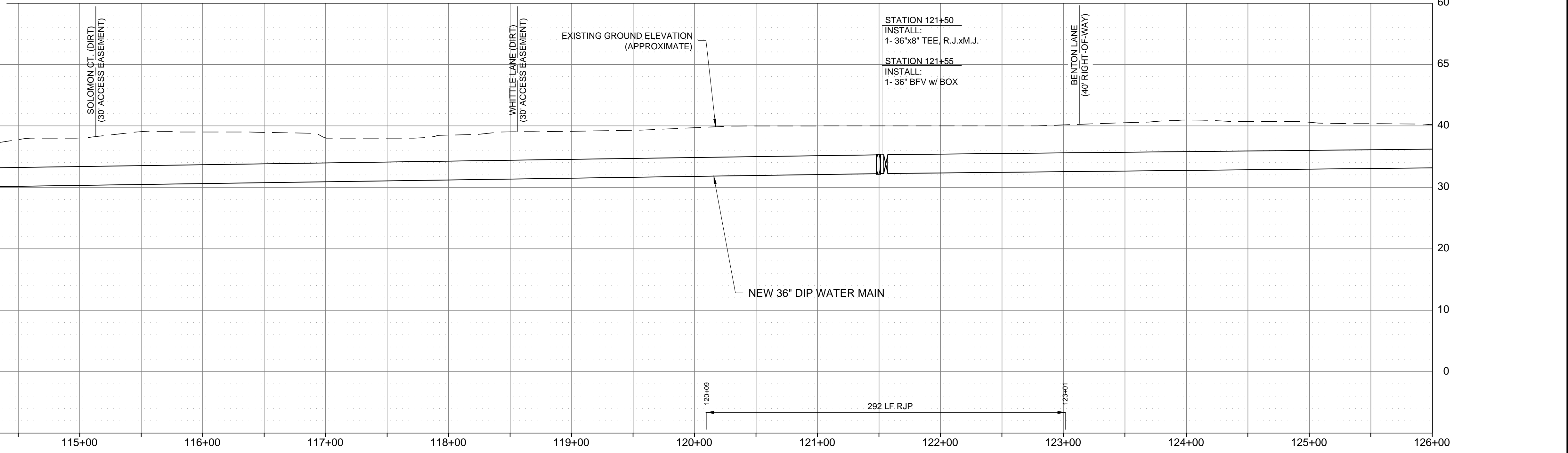






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  4. FROM STATION 112+00 TO STATION 126+00 FIBER OPTIC CABLE(S), TELECOMMUNICATION CABLE(S) AND GAS RUN PARALLEL WITHIN DITCH WIDTH. CONTRACTOR WILL NEED TO COORDINATE AND FIELD VERIFY EXACT LOCATIONS BEFORE CONSTRUCTION.

**PLAN**  
SCALE: 1" = 50'



**PROFILE**  
SCALE: HORZ: 1" = 50' VERT: 1"=10'

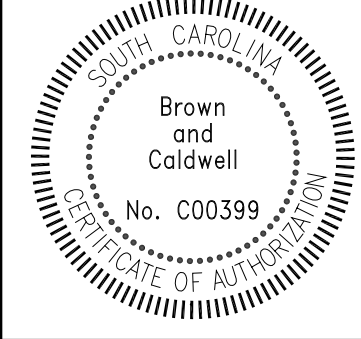
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 2/27/2020



SUBMITTED: \_\_\_\_\_ PROJECT MANAGER DATE: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_ BROWN AND CALDWELL DATE: \_\_\_\_\_

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)  
 DESIGNED: R. WEST  
 DRAWN: A. JUMPER  
 CHECKED: R. WEST  
 CHECKED: P. WALL  
 APPROVED: R. WEST

EXTERNAL REFERENCES

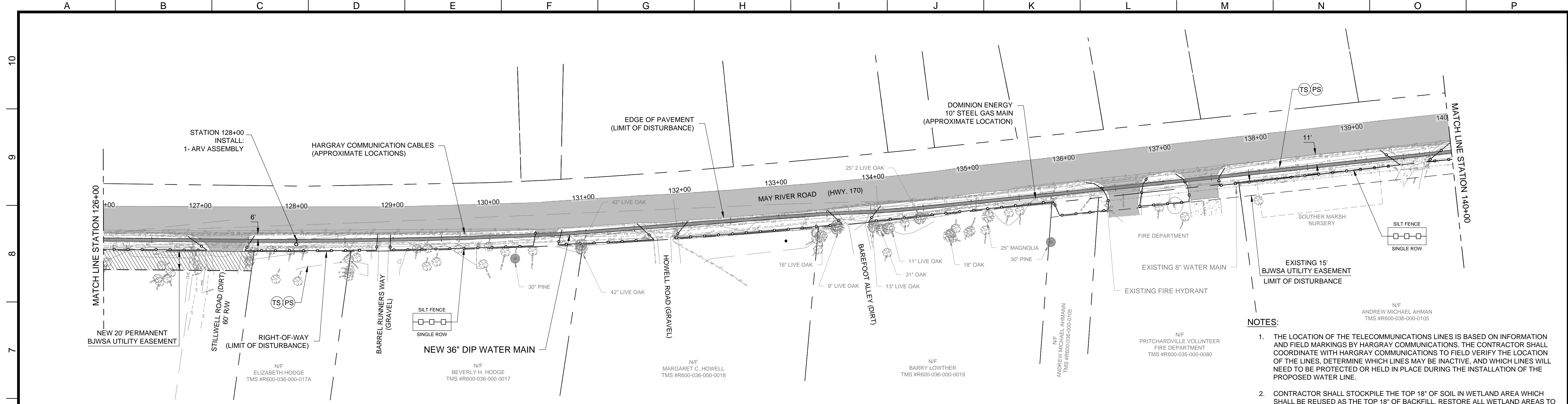


REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
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	2	ISSUED FOR BID	AJ	3/18/20	RW



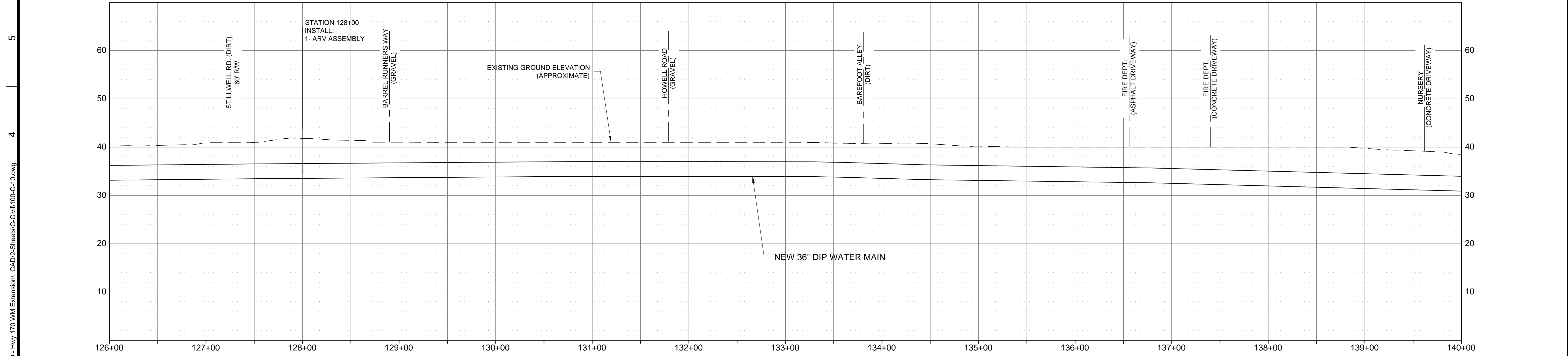
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**PLAN & PROFILE**  
**STATION 112+00 TO STATION 126+00**  
**(BJWSA CIP 1696)**  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME	100-C-09.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	100-C-09
SHEET NUMBER	17
OF	25



**PLAN**  
SCALE: 1" = 50'

- NOTES:**
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  4. FROM STATION 126+00 TO STATION 140+00 FIBER OPTIC CABLE(S), TELECOMMUNICATION CABLE(S) AND GAS RUN PARALLEL WITHIN DITCH WIDTH. CONTRACTOR WILL NEED TO COORDINATE AND FIELD VERIFY EXACT LOCATIONS BEFORE CONSTRUCTION.



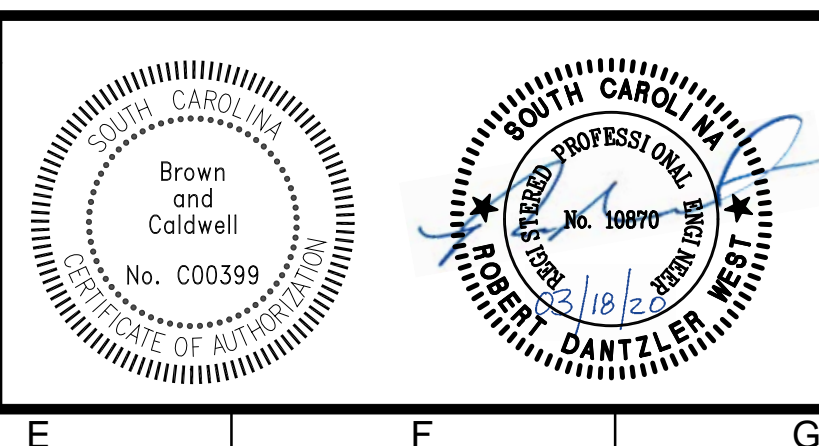
**PROFILE**  
SCALE: HORZ: 1" = 50' VERT: 1"=10'

**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R:WVST  
DRAWN: A:ASUMPER  
CHECKED: R:WVST  
CHECKED: P:WALL  
APPROVED: R:-WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES



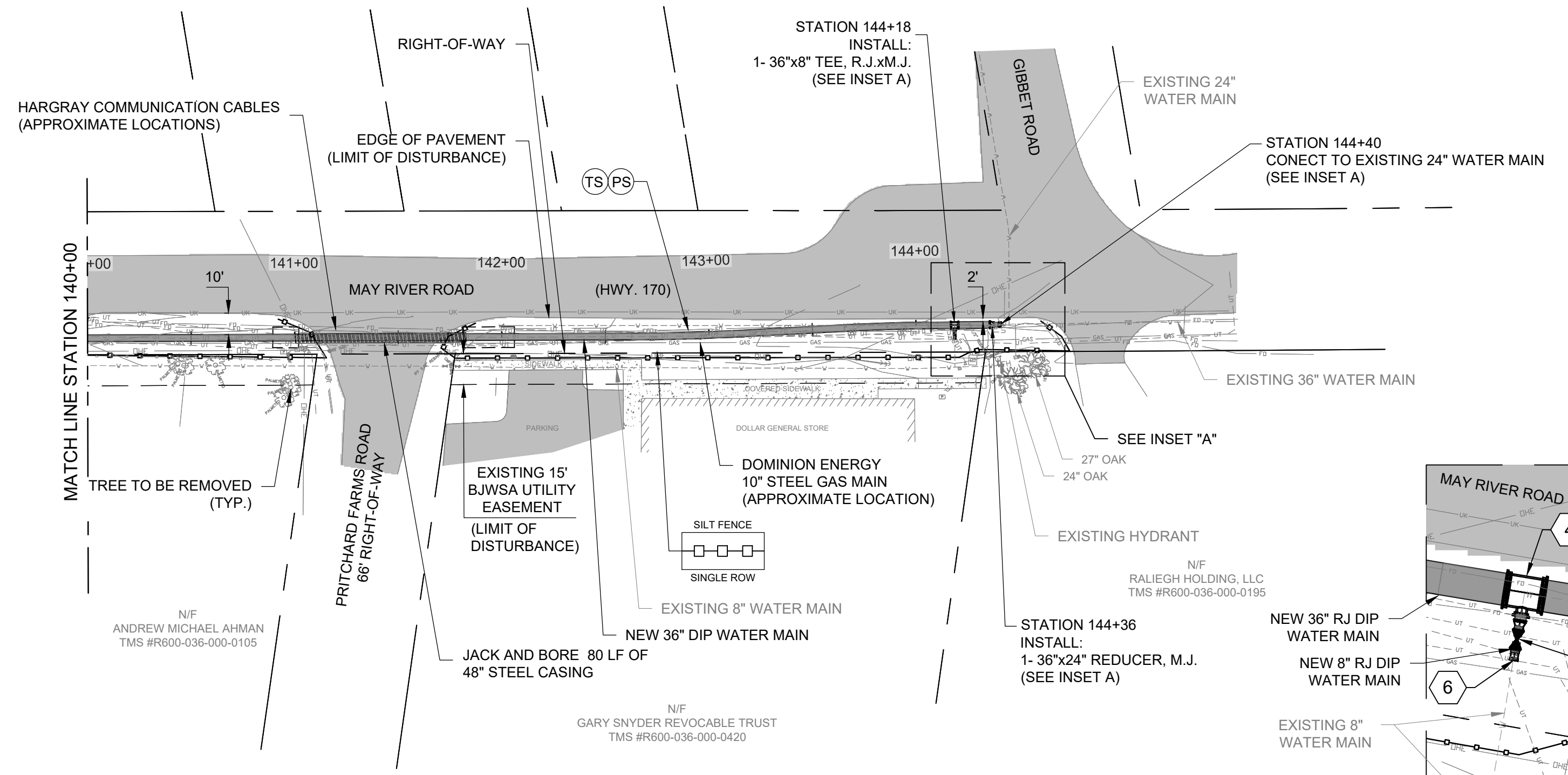
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**PLAN & PROFILE**  
STATION 126+00 TO STATION 140+00  
(BJWSA CIP 1696)  
HIGHWAY 170 WATER MAIN EXTENSION

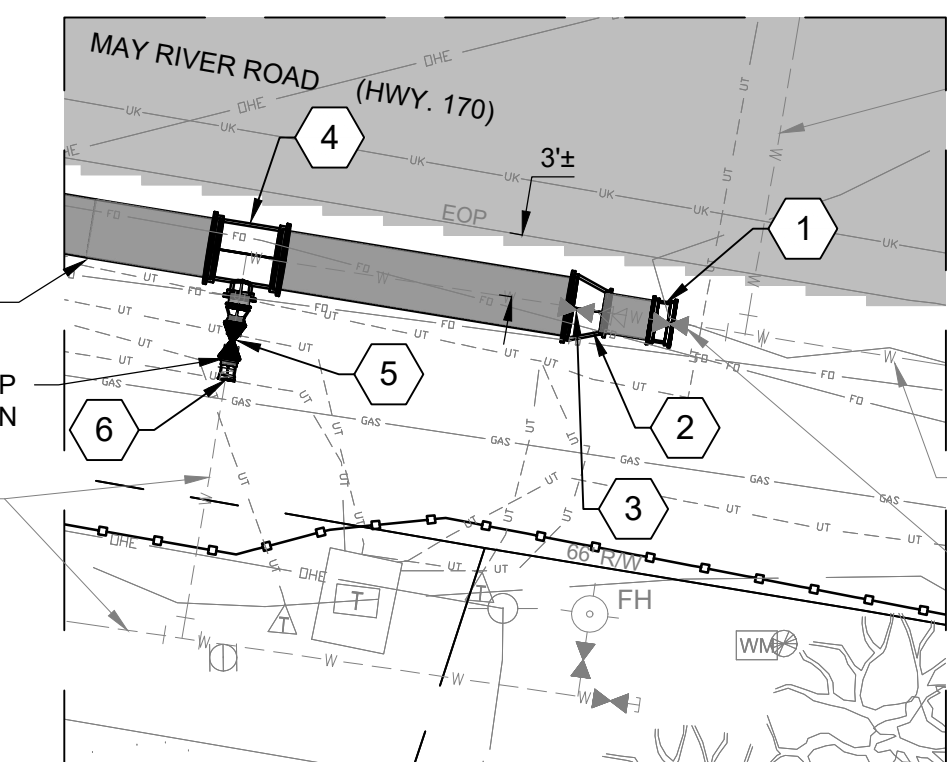
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BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	100-C-10
SHEET NUMBER	18
OF	25

Mar 18, 2020 - 1:34pm  
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 2/27/2020



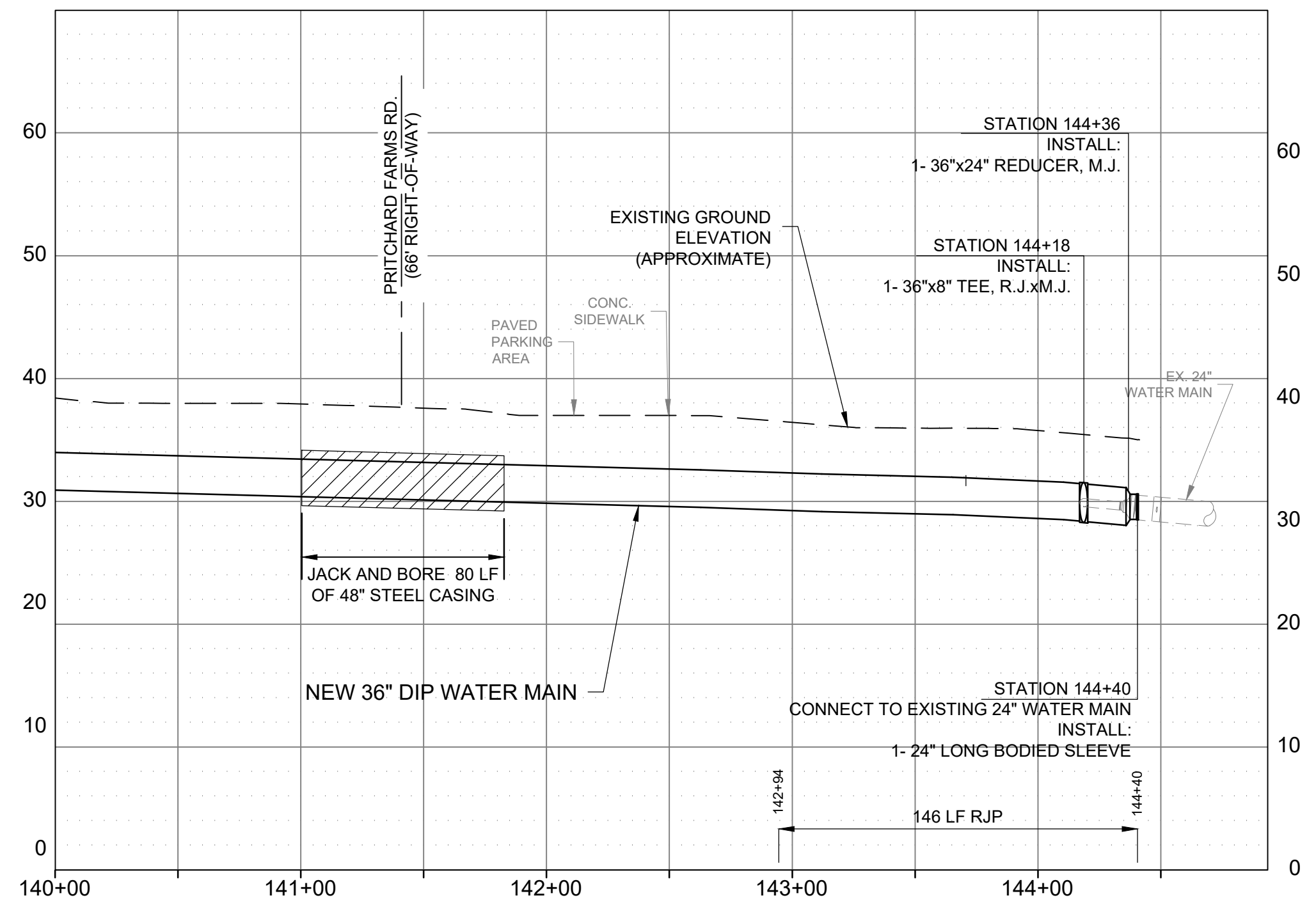
- NOTES:**
1. THE LOCATION OF THE TELECOMMUNICATIONS LINES IS BASED ON INFORMATION AND FIELD MARKINGS BY HARGRAY COMMUNICATIONS. THE CONTRACTOR SHALL COORDINATE WITH HARGRAY COMMUNICATIONS TO FIELD VERIFY THE LOCATION OF THE LINES, DETERMINE WHICH LINES MAY BE INACTIVE, AND WHICH LINES WILL NEED TO BE PROTECTED OR HELD IN PLACE DURING THE INSTALLATION OF THE PROPOSED WATER LINE.
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  4. FROM STATION 140+00 TO STATION 144+40 FIBER OPTIC CABLE(S), TELECOMMUNICATION CABLE(S) AND GAS ALL RUN PARALLEL WITHIN DITCH WIDTH. CONTRACTOR WILL NEED TO COORDINATE AND FIELD VERIFY EXACT LOCATIONS BEFORE CONSTRUCTION.

**PLAN**  
SCALE: 1" = 50'



- 1 CONNECT NEW 36" WATER MAIN TO EXISTING 24" WATER MAIN. EXISTING VALVE TO REMAIN. (STA. 144+40)
- 2 REMOVE EXISTING REDUCERS AND INSTALL NEW 36"x24" REDUCER. (STA. 144+36) RETURN EXISTING FITTINGS TO OWNER.
- 3 RELOCATE EXISTING 8" VALVE.
- 4 INSTALL NEW 36"x8" TEE, R.J. (STA. 144+18)
- 5 APPROXIMATE LOCATION OF RELOCATED 8" VALVE.
- 6 CONNECTING NEW 8" WATER MAIN TO EXISTING WITH A LONG BODIED SLEEVE.

**INSET "A"**  
SCALE: 1" = 10'



**PROFILE**  
SCALE: HORIZ: 1" = 50' VERT: 1"=10'

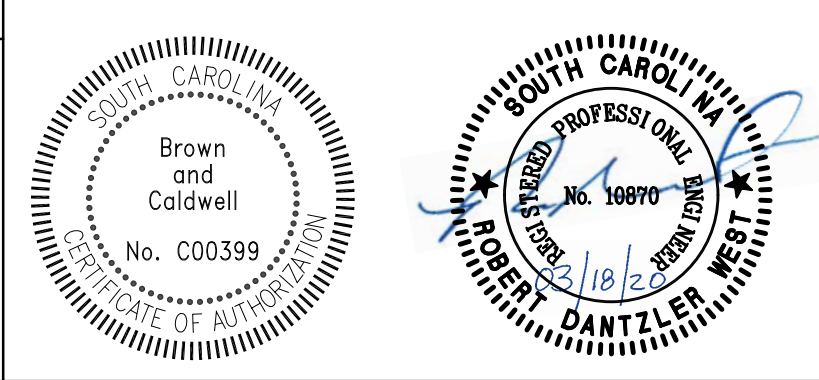
Mar 18, 2020 - 1:26pm  
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LINE IS 2 INCHES  
AT FULL SIZE  
(IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

EXTERNAL REFERENCES



REVISIONS						
ZONE	REV.	DESCRIPTION	BY	DATE	APP.	
	1	PERMITTING	AJ	2/18/20	RW	
	2	ISSUED FOR BID	AJ	3/18/20	RW	



CIVIL  
**PLAN & PROFILE**  
STATION 140+00 TO STATION 143+96  
(BJWSA CIP 1696)  
HIGHWAY 170 WATER MAIN EXTENSION

FILENAME  
100-C-11.DWG  
BC PROJECT NUMBER  
152589  
SCALE  
AS SHOWN  
DRAWING NUMBER  
**100-C-11**  
SHEET NUMBER  
19 OF 25

TREE REMOVAL INVENTORY (STA. 00+00 TO 14+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
10+16.29	Gum	15	None	11+57.83	Gum	11	None
10+43.86	Gum	13	None	11+67.84	Gum	9	None
10+49.93	Gum	11	None	12+68.62	Hickory	17	None
10+69.94	Gum	8	None	13+30.90	Pine	12	None
10+70.83	Oak	9	None	13+32.76	Oak	22	None
11+00.62	Gum	14	None	13+78.97	Oak	18	None
11+28.08	Gum	14	Twin				

TREE REMOVAL INVENTORY (STA. 14+00 TO 28+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
14+17.46	Hickory	17	None	18+41.76	Oak	18	None
14+43.43	Hickory	18	None	19+31.07	Oak	22	None
14+48.14	Hickory	16	None	19+45.88	Gum	12	None
14+56.00	Hickory	14	None	20+63.76	Gum	9	None
14+88.39	Oak	16	None	21+37.04	Gum	11	None
14+89.59	Gum	10	None	21+40.31	Gum	12	None
15+78.16	Maple	9	None	21+61.20	Oak	14	None
16+00.47	Gum	14	None	21+99.66	Live Oak	17	None
16+37.13	Gum	13	None	22+64.65	Gum	10	None
16+39.10	Gum	13	Twin	22+69.78	Oak	15	None
16+79.29	Maple	26	Triple	23+06.56	Gum	9	None
17+06.68	Oak	40	None	24+32.02	Pine	10	None
17+74.52	Maple	20	None	26+35.53	Gum	9	None
17+81.60	Oak	24	None	27+17.41	Oak	12	None
17+82.22	Oak	22	None	27+77.29	Pine	13	None

**TREE PROTECTION NOTES:**

- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
- WHEN EXCAVATION IS WITHIN 30-FEET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).
- ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
- THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.

1 TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)

2 TREE PROTECTION FENCING WITH ROOT POSSIBLE PRUNING (SEE DETAIL, DRAWING 200-C-06)

**PLAN**

SCALE: 1" = 50'

**PLAN**

SCALE: 1" = 50'

Mar 18, 2020 - 1:43pm  
 A:\Jumper\Projects\Clients\B\JWSA\152589 - Hwy 170 WM Extension\CAD\2-Sheets\C-Civil\200-C-01.dwg

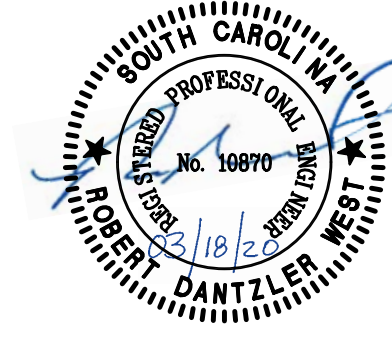
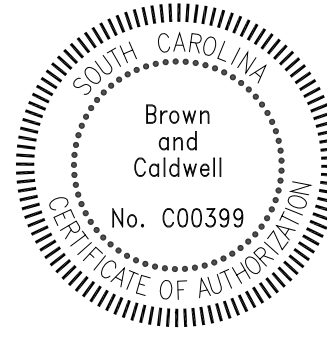


Environmental Engineering and Consulting  
 250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT MANAGER  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)  
 DESIGNED: R. WEST  
 DRAWN: A. JUMPER  
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 APPROVED: R. WEST

EXTERNAL REFERENCES



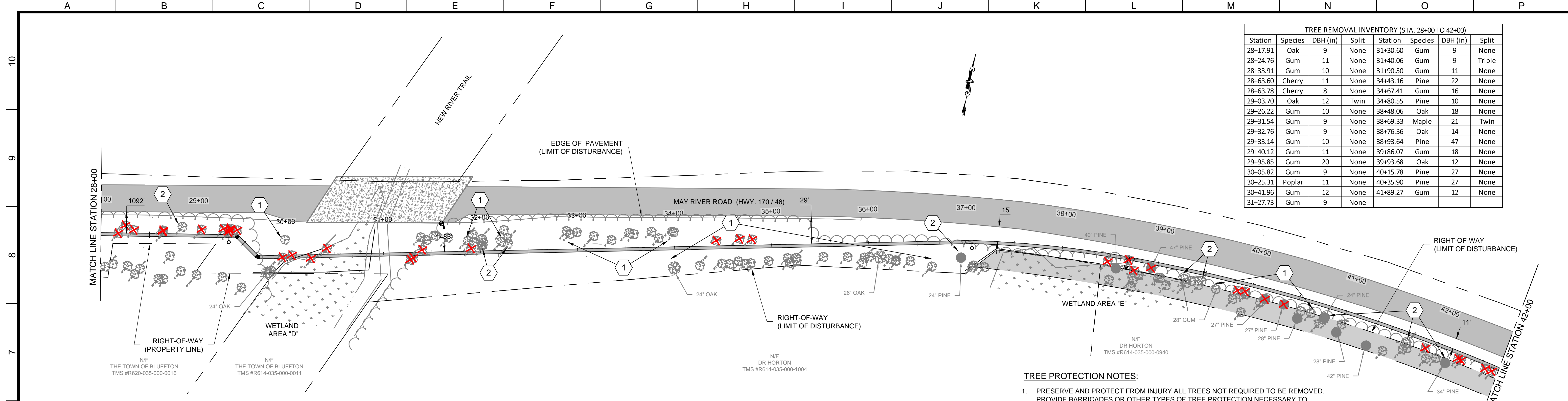
REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**TREE PROTECTION**  
**PLAN 1**  
 (BJWSA CIP 1696)  
 HIGHWAY 170 WATER MAIN EXTENSION

FILENAME	200-C-01.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	200-C-01
SHEET NUMBER	20
OF	25



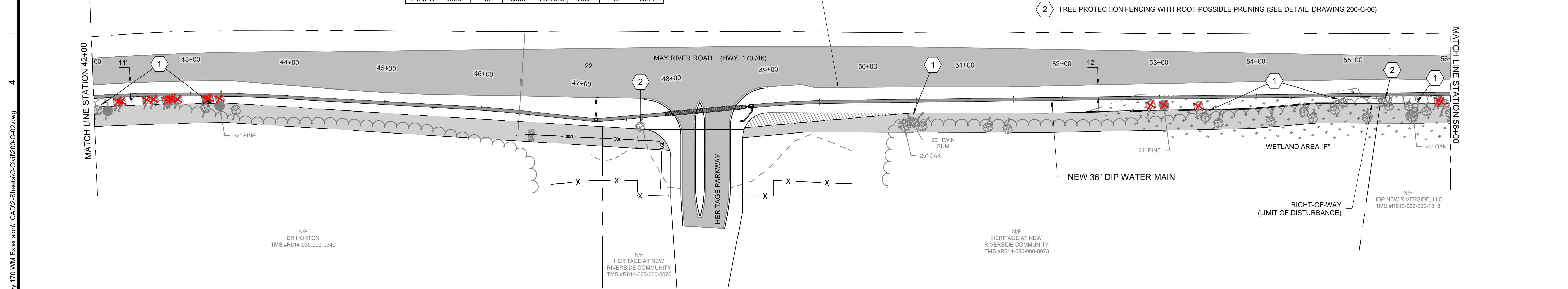
TREE REMOVAL INVENTORY (STA. 28+00 TO 42+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
28+17.91	Oak	9	None	31+30.60	Gum	9	None
28+24.76	Gum	11	None	31+40.06	Gum	9	Triple
28+33.91	Gum	10	None	31+90.50	Gum	11	None
28+63.60	Cherry	11	None	34+43.16	Pine	22	None
28+63.78	Cherry	8	None	34+67.41	Gum	16	None
29+03.70	Oak	12	Twin	34+80.55	Pine	10	None
29+26.22	Gum	10	None	38+48.06	Oak	18	None
29+31.54	Gum	9	None	38+69.33	Maple	21	Twin
29+32.76	Gum	9	None	38+76.36	Oak	14	None
29+33.14	Gum	10	None	38+93.64	Pine	47	None
29+40.12	Gum	11	None	39+86.07	Gum	18	None
29+95.85	Gum	20	None	39+93.68	Oak	12	None
30+05.82	Gum	9	None	40+15.78	Pine	27	None
30+25.31	Poplar	11	None	40+35.90	Pine	27	None
30+41.96	Gum	12	None	41+89.27	Gum	12	None
31+27.73	Gum	9	None				

**PLAN**  
SCALE: 1" = 50'

TREE REMOVAL INVENTORY (STA. 42+00 TO 56+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
42+24.73	Gum	10	None	43+16.13	Gum	15	None
42+28.43	Gum	9	None	43+18.84	Gum	12	None
42+54.66	Gum	10	None	43+29.63	Gum	11	None
42+61.80	Gum	20	None	52+90.93	Gum	20	Twin
42+74.94	Gum	17	None	53+04.58	Pine	24	None
42+78.38	Gum	17	None	53+40.03	Gum	23	None
42+80.88	Gum	14	None	55+87.55	Gum	17	None
42+86.41	Gum	16	None	55+89.93	Oak	16	None

- TREE PROTECTION NOTES:**
- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
  - WHEN EXCAVATION IS WITHIN 30- FEET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).
  - ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
  - THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.

- 1 TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)
- 2 TREE PROTECTION FENCING WITH ROOT POSSIBLE PRUNING (SEE DETAIL, DRAWING 200-C-06)



**PLAN**  
SCALE: 1" = 50'

**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES

**REVISIONS**

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW

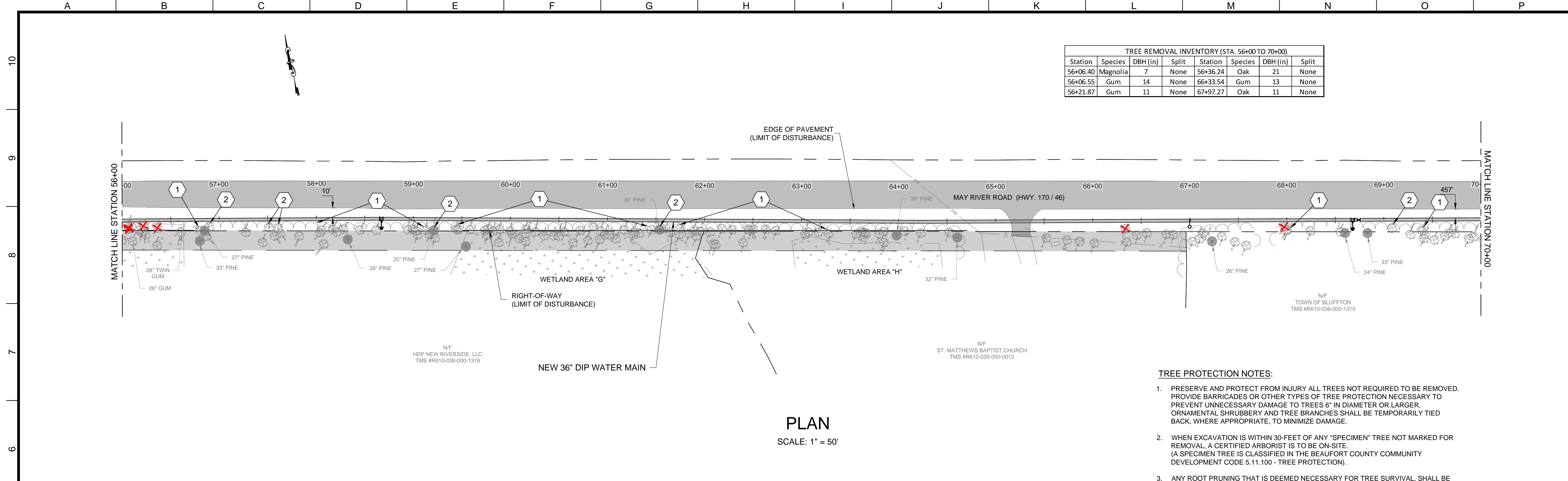
**Professional Engineer Seal**  
ROBERT DANTZLER  
No. 10870



CIVIL  
**TREE PROTECTION PLAN 2**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME: 200-C-02.DWG  
BC PROJECT NUMBER: 152589  
SCALE: AS SHOWN  
DRAWING NUMBER: 200-C-02  
SHEET NUMBER: 21 OF 25

Mar 18, 2020 - 11:51 am  
A:\Jumper\Projects\Clients\BWSA\152589 - Hwy 170 WM Extension\CAD\2-Sheets\Civil\200-C-02.dwg

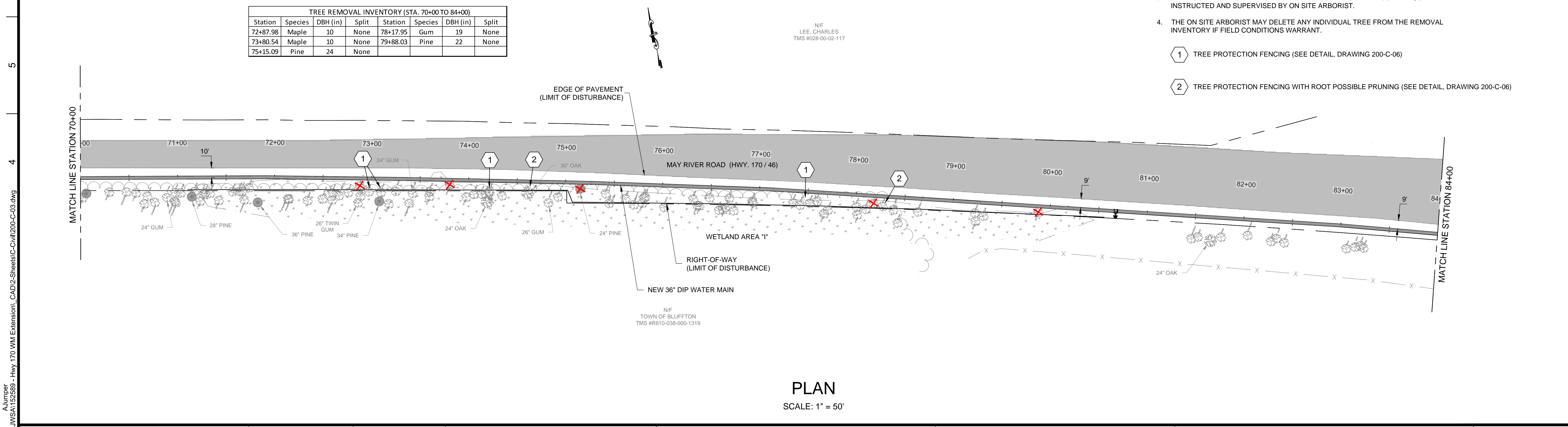


TREE REMOVAL INVENTORY (STA. 56+00 TO 70+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
56+06.40	Magnolia	7	None	56+36.24	Oak	21	None
56+06.55	Gum	14	None	66+33.54	Gum	13	None
56+21.87	Gum	11	None	67+97.27	Oak	11	None

TREE REMOVAL INVENTORY (STA. 70+00 TO 84+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
72+87.98	Maple	10	None	78+17.95	Gum	19	None
73+80.54	Maple	10	None	79+88.03	Pine	22	None
75+15.09	Pine	24	None				

- TREE PROTECTION NOTES:**
- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
  - WHEN EXCAVATION IS WITHIN 30-FOET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).
  - ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
  - THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.

- ① TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)
- ② TREE PROTECTION FENCING WITH ROOT POSSIBLE PRUNING (SEE DETAIL, DRAWING 200-C-06)



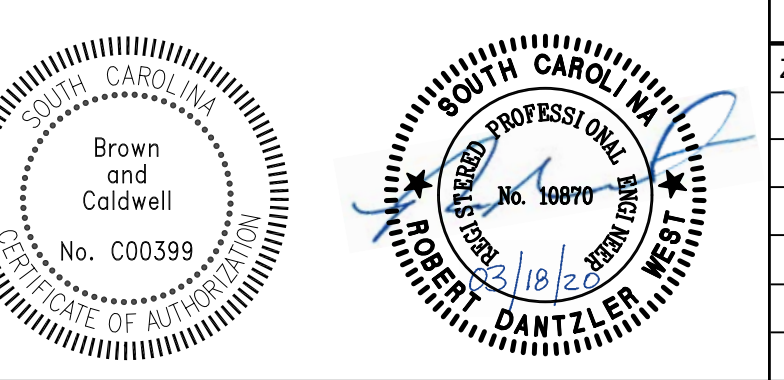
**Brown and Caldwell**  
 Environmental Engineering and Consulting  
 250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

DESIGNED: R. WEST  
 DRAWN: A. JUMPER  
 CHECKED: R. WEST  
 CHECKED: P. WALL  
 APPROVED: R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

EXTERNAL REFERENCES

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
1	1	PERMITTING	AJ	2/18/20	RW
1	2	ISSUED FOR BID	AJ	3/18/20	RW



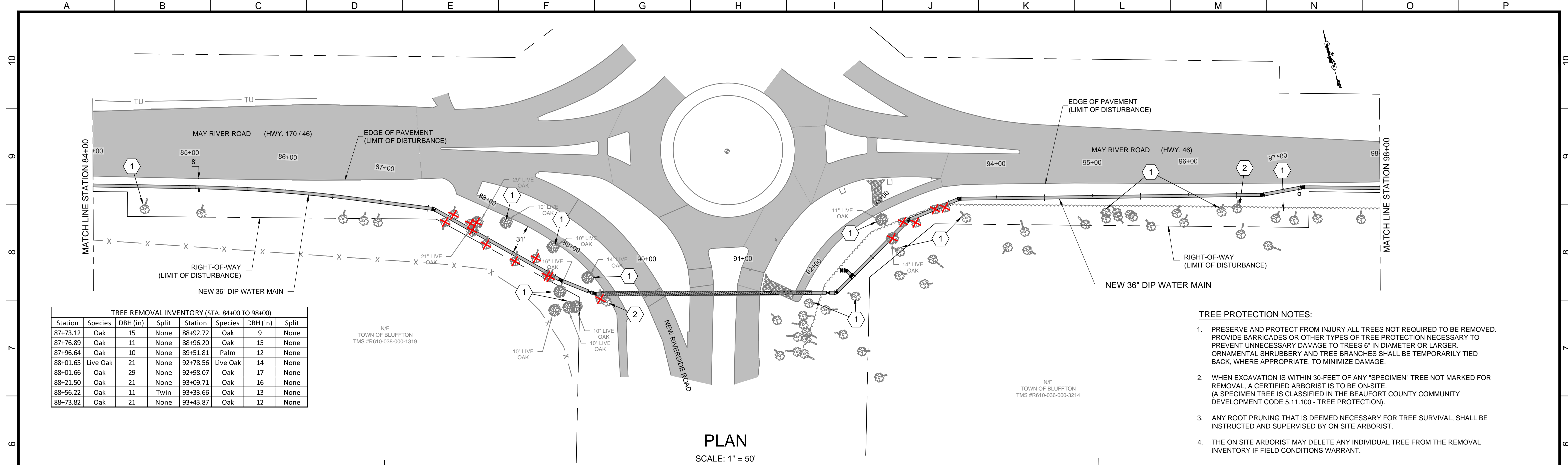
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1	1	PERMITTING	AJ	2/18/20	RW
1	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**TREE PROTECTION PLAN 3**  
 (BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME	200-C-03.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	200-C-03
SHEET NUMBER	22 OF 25

Mar 18, 2020 - 1:46pm  
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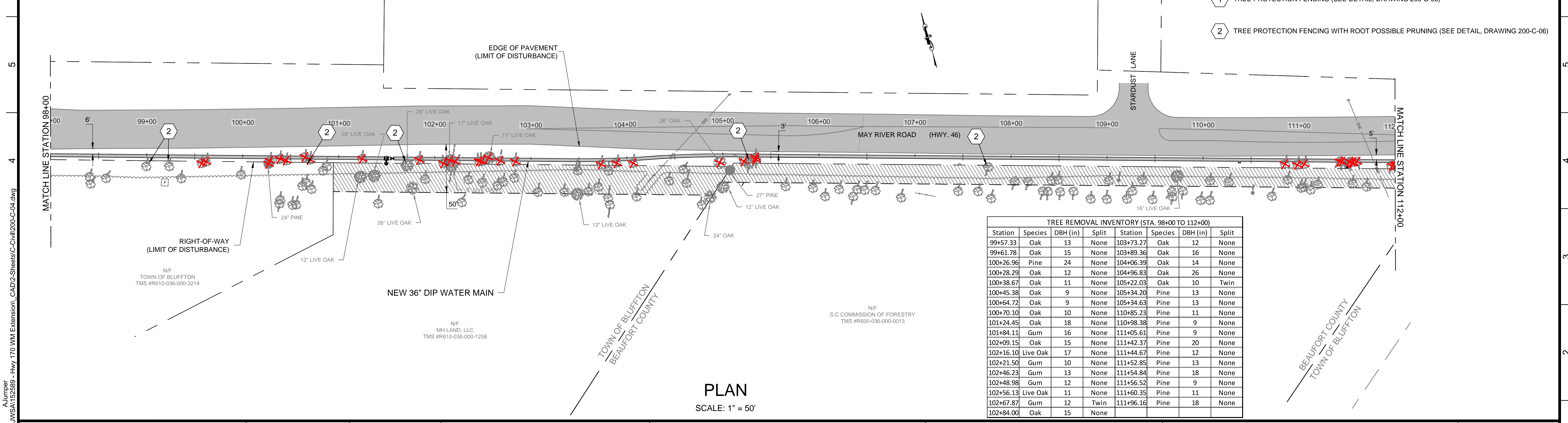


**TREE REMOVAL INVENTORY (STA. 84+00 TO 98+00)**

Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
87+73.12	Oak	15	None	88+92.72	Oak	9	None
87+76.89	Oak	11	None	88+96.20	Oak	15	None
87+96.64	Oak	10	None	89+51.81	Palm	12	None
88+01.65	Live Oak	21	None	92+78.56	Live Oak	14	None
88+01.66	Oak	29	None	92+98.07	Oak	17	None
88+21.50	Oak	21	None	93+09.71	Oak	16	None
88+56.22	Oak	11	Twin	93+33.66	Oak	13	None
88+73.82	Oak	21	None	93+43.87	Oak	12	None

**PLAN**  
SCALE: 1" = 50'

- TREE PROTECTION NOTES:**
- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
  - WHEN EXCAVATION IS WITHIN 30-FEET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).
  - ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
  - THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.
- 1 TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)  
 2 TREE PROTECTION FENCING WITH ROOT POSSIBLE PRUNING (SEE DETAIL, DRAWING 200-C-06)



**TREE REMOVAL INVENTORY (STA. 98+00 TO 112+00)**

Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
99+57.33	Oak	13	None	103+73.27	Oak	12	None
99+61.78	Oak	15	None	103+89.36	Oak	16	None
100+26.96	Pine	24	None	104+06.39	Oak	14	None
100+28.29	Oak	12	None	104+96.83	Oak	26	None
100+38.67	Oak	11	None	105+22.03	Oak	10	Twin
100+45.38	Oak	9	None	105+34.20	Pine	13	None
100+64.72	Oak	9	None	105+34.63	Pine	13	None
100+70.10	Oak	10	None	110+85.23	Pine	11	None
101+24.45	Oak	18	None	110+98.38	Pine	9	None
101+84.11	Gum	16	None	111+05.61	Pine	9	None
102+09.15	Oak	15	None	111+42.37	Pine	20	None
102+16.10	Live Oak	17	None	111+44.67	Pine	12	None
102+21.50	Gum	10	None	111+52.85	Pine	13	None
102+46.23	Gum	13	None	111+54.84	Pine	18	None
102+48.98	Gum	12	None	111+56.52	Pine	9	None
102+56.13	Live Oak	11	None	111+60.35	Pine	11	None
102+67.87	Gum	12	Twin	111+96.16	Pine	18	None
102+84.00	Oak	15	None				

**PLAN**  
SCALE: 1" = 50'

**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 PROJECT MANAGER  
 APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
 BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

EXTERNAL REFERENCES

REVISIONS

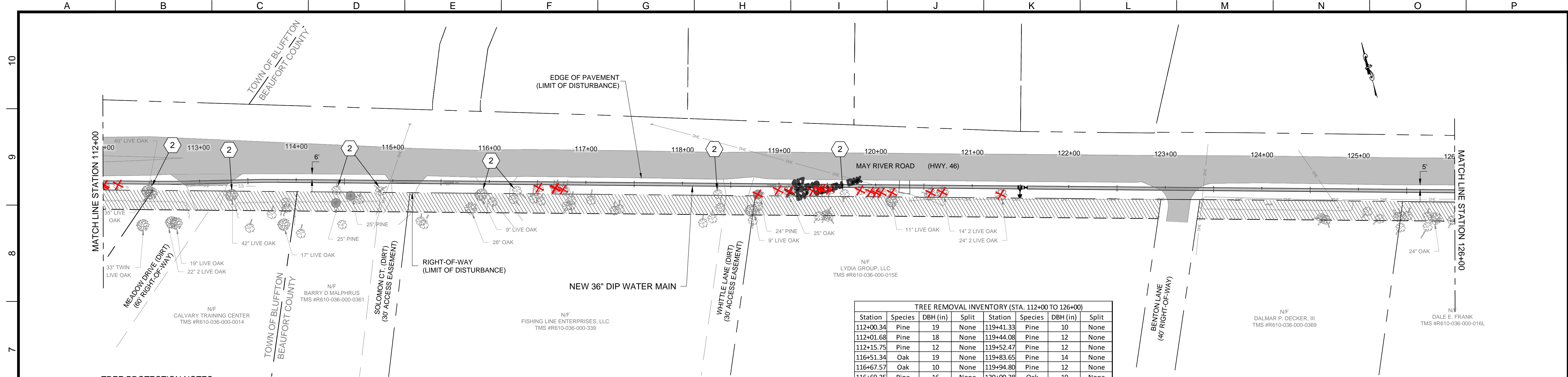
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	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**TREE PROTECTION PLAN 4**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME: 200-C-04.DWG  
 BC PROJECT NUMBER: 152589  
 SCALE:  
 DRAWING NUMBER: **200-C-04**  
 SHEET NUMBER: 23 OF 25

Mar 18, 2020 - 12:00pm  
 A:Jumper  
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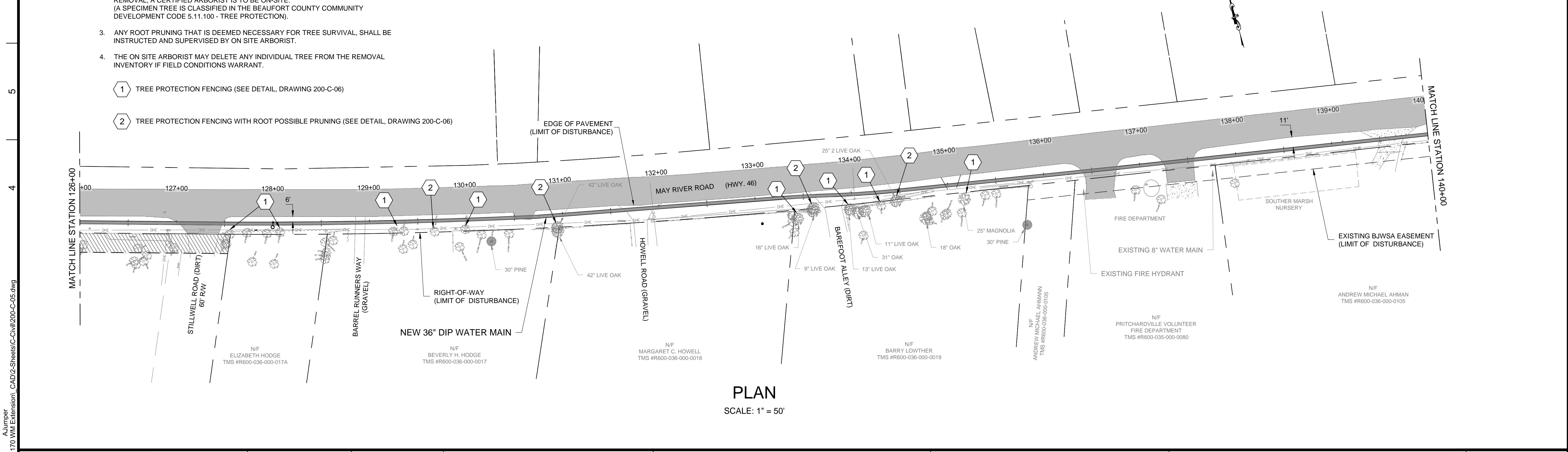
PLAN  
SCALE: 1" = 50'

TREE REMOVAL INVENTORY (STA. 112+00 TO 126+00)							
Station	Species	DBH (in)	Split	Station	Species	DBH (in)	Split
112+00.34	Pine	19	None	119+41.33	Pine	10	None
112+01.68	Pine	18	None	119+44.08	Pine	12	None
112+15.75	Pine	12	None	119+52.47	Pine	12	None
116+51.34	Oak	19	None	119+83.65	Pine	14	None
116+67.57	Oak	10	None	119+94.80	Pine	12	None
116+69.25	Pine	16	None	120+00.38	Oak	19	None
116+76.20	Oak	12	None	120+05.55	Pine	16	None
118+78.24	Pine	24	None	120+17.15	Oak	17	None
118+98.69	Oak	13	None	120+57.07	Oak	15	None
119+10.92	Oak	25	None	120+69.02	Live Oak	14	Twin
119+34.93	Pine	10	None	121+29.74	Oak	24	Twin

**TREE PROTECTION NOTES:**

- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
- WHEN EXCAVATION IS WITHIN 30- FEET OF ANY "SPECIMEN" TREE NOT MARKED FOR REMOVAL, A CERTIFIED ARBORIST IS TO BE ON-SITE. (A SPECIMEN TREE IS CLASSIFIED IN THE BEAUFORT COUNTY COMMUNITY DEVELOPMENT CODE 5.11.100 - TREE PROTECTION).
- ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
- THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.

- 1 TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)
- 2 TREE PROTECTION FENCING WITH ROOT POSSIBLE PRUNING (SEE DETAIL, DRAWING 200-C-06)



PLAN  
SCALE: 1" = 50'



Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

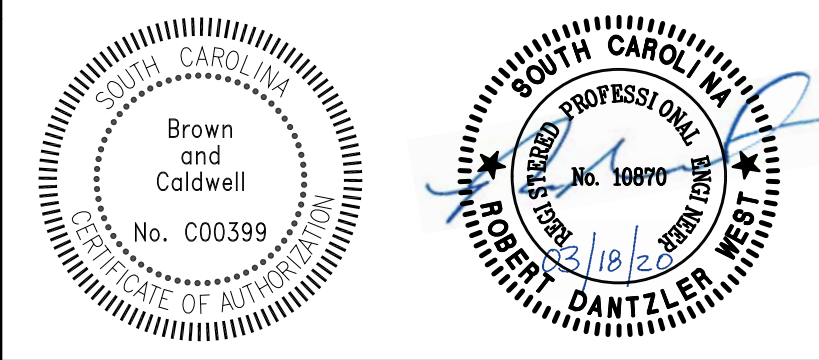
SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
PROJECT MANAGER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

DESIGNED: R. WEST  
DRAWN: A. JUMPER  
CHECKED: R. WEST  
CHECKED: P. WALL  
APPROVED: R. WEST

EXTERNAL REFERENCES

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/19/20	RW

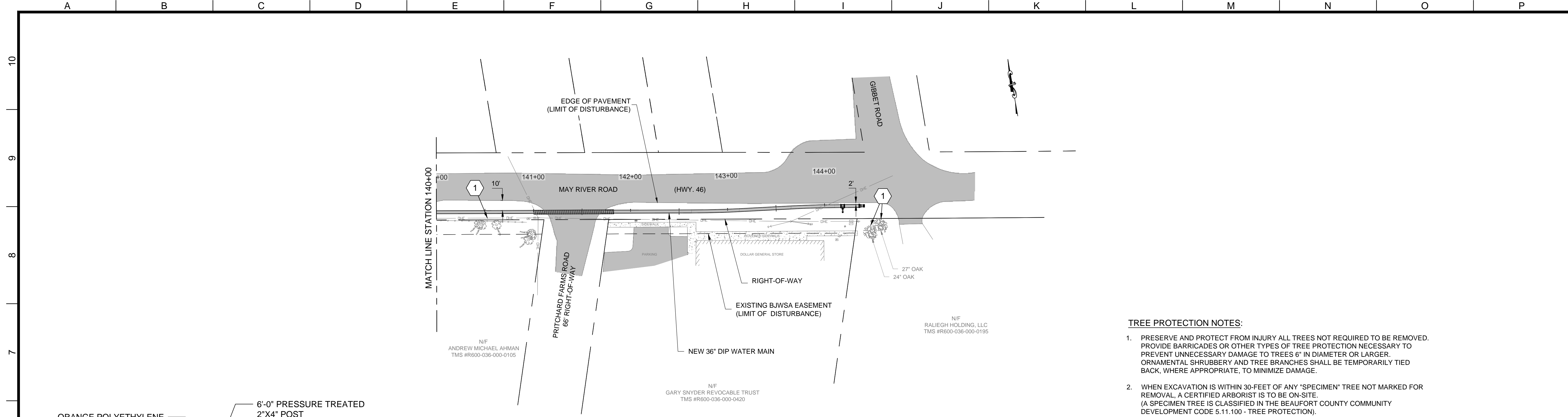


CIVIL  
**TREE PROTECTION PLAN 5**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME: 200-C-05.DWG  
BC PROJECT NUMBER: 152589  
SCALE: AS SHOWN  
DRAWING NUMBER: 200-C-05  
SHEET NUMBER: 24 OF 25

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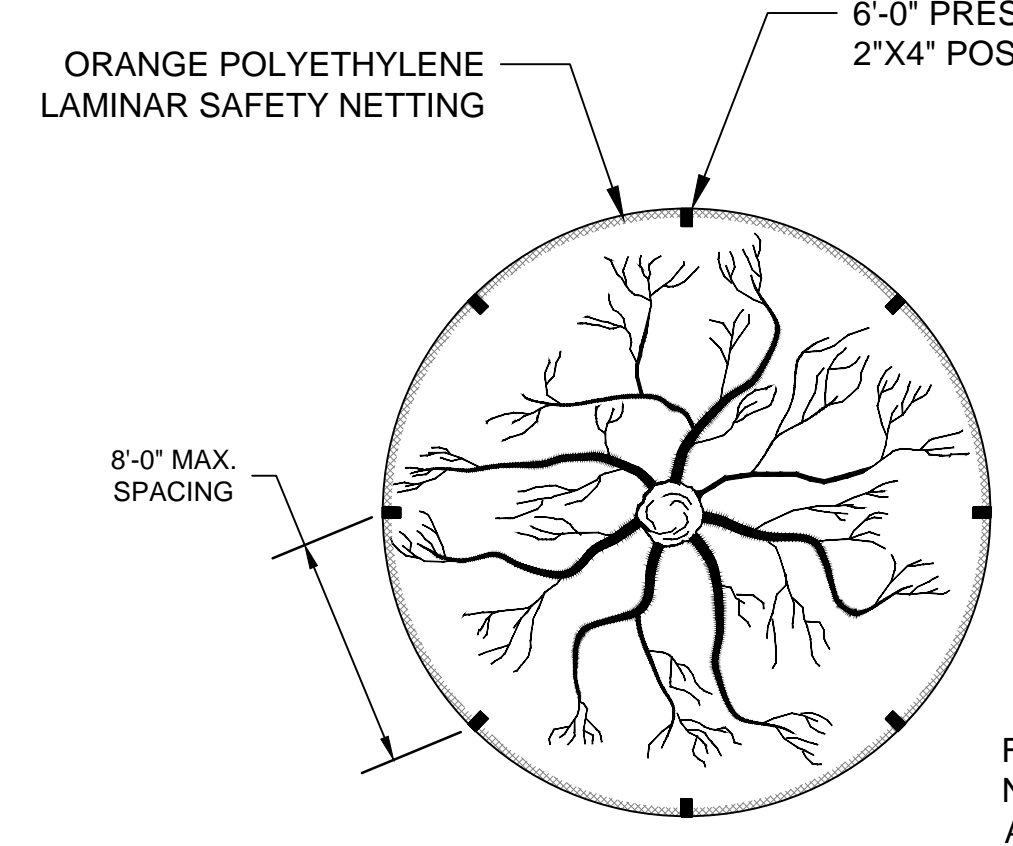




**PLAN**  
SCALE: 1" = 50'

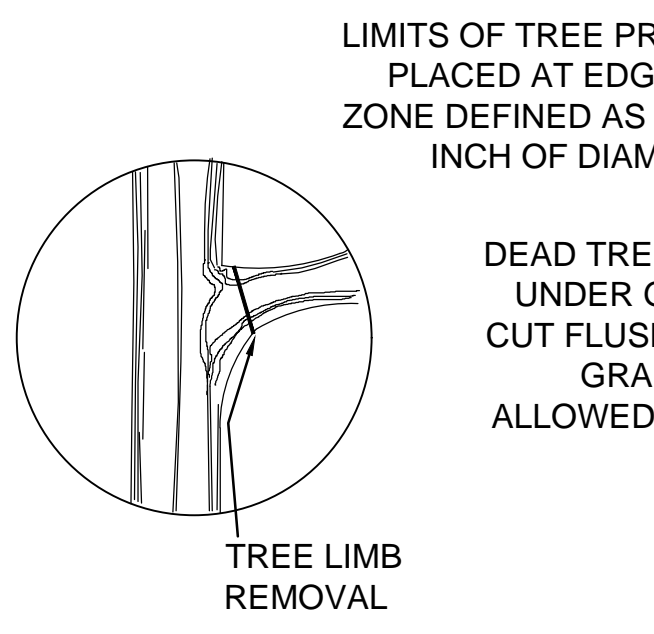
- TREE PROTECTION NOTES:**
- PRESERVE AND PROTECT FROM INJURY ALL TREES NOT REQUIRED TO BE REMOVED. PROVIDE BARRICADES OR OTHER TYPES OF TREE PROTECTION NECESSARY TO PREVENT UNNECESSARY DAMAGE TO TREES 6" IN DIAMETER OR LARGER. ORNAMENTAL SHRUBBERY AND TREE BRANCHES SHALL BE TEMPORARILY TIED BACK, WHERE APPROPRIATE, TO MINIMIZE DAMAGE.
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  - ANY ROOT PRUNING THAT IS DEEMED NECESSARY FOR TREE SURVIVAL, SHALL BE INSTRUCTED AND SUPERVISED BY ON SITE ARBORIST.
  - THE ON SITE ARBORIST MAY DELETE ANY INDIVIDUAL TREE FROM THE REMOVAL INVENTORY IF FIELD CONDITIONS WARRANT.

(1) TREE PROTECTION FENCING (SEE DETAIL, DRAWING 200-C-06)

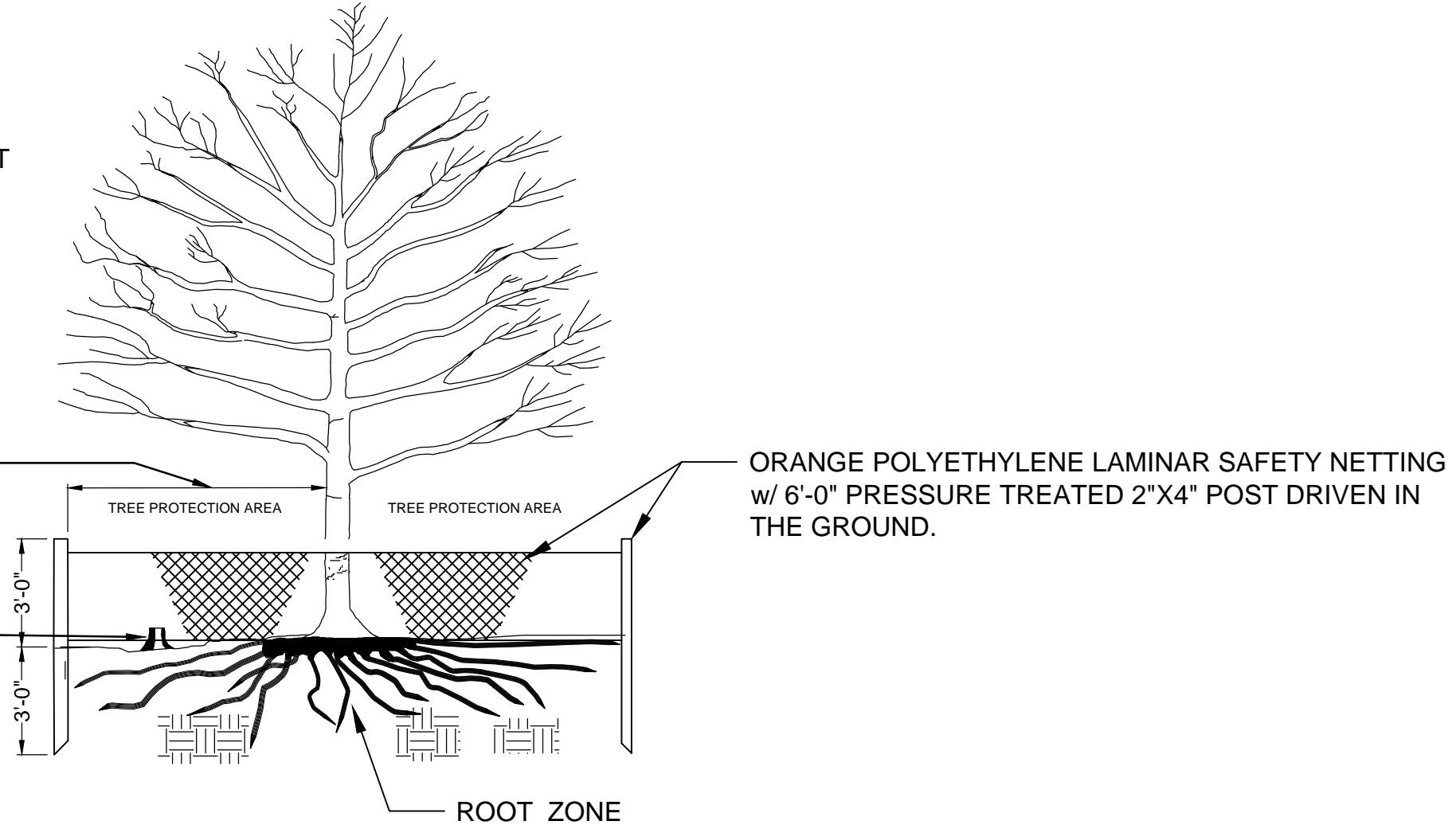


- NOTES:**
- REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
  - TREE PROTECTION PLANS SHALL SHOW THE LOCATIONS OF ALL TREE PROTECTION FENCE AREAS.
  - REFER TO SPECIFICATION SECTION 02900 FOR GENERAL SPECIFICATION REGARDING TREE PROTECTION.

PLAN VIEW OF TREE PROTECTION



LIMITS OF TREE PROTECTION SHALL BE PLACED AT EDGE OF CRITICAL ROOT ZONE DEFINED AS 1 FOOT FOR EVERY 1 INCH OF DIAMETER MEASURED AT BREST HEIGHT. DEAD TREES AND SCRUB OR UNDER GROWTH SHALL BE CUT FLUSH WITH ADJACENT GRADE. NO GRUBBING ALLOWED UNDER DRIP LINE.



**12** TREE PROTECTION DETAIL  
SCALE: NONE

Mar 18, 2020 - 1:56pm  
A:\Jumper  
C:\Users\AJumper\Documents\Projects\Bjwsa\152589 - Hwy 170 WM Extension\CAD\Civil\200-C-06.dwg

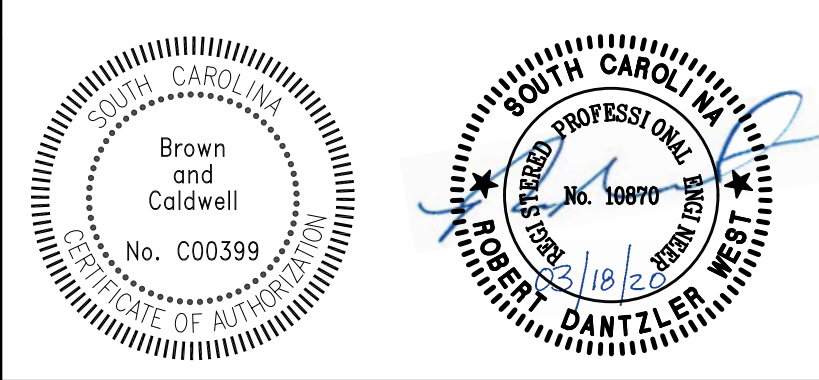
**Brown and Caldwell**  
Environmental Engineering and Consulting  
250 Berryhill Road, Suite 104, Columbia, SC 29210 803-873-9701

SUBMITTED: \_\_\_\_\_ DATE: \_\_\_\_\_  
PROJECT MANAGER

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_  
BROWN AND CALDWELL

DESIGNED:	R. WEST
DRAWN:	A. JUMPER
CHECKED:	R. WEST
CHECKED:	P. WALL
APPROVED:	R. WEST

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)	EXTERNAL REFERENCES



REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	PERMITTING	AJ	2/18/20	RW
	2	ISSUED FOR BID	AJ	3/18/20	RW



CIVIL  
**TREE PROTECTION PLAN 6**  
(BJWSA CIP 1696)  
**HIGHWAY 170 WATER MAIN EXTENSION**

FILENAME	200-C-06.DWG
BC PROJECT NUMBER	152589
SCALE	AS SHOWN
DRAWING NUMBER	<b>200-C-06</b>
SHEET NUMBER	25
OF	25