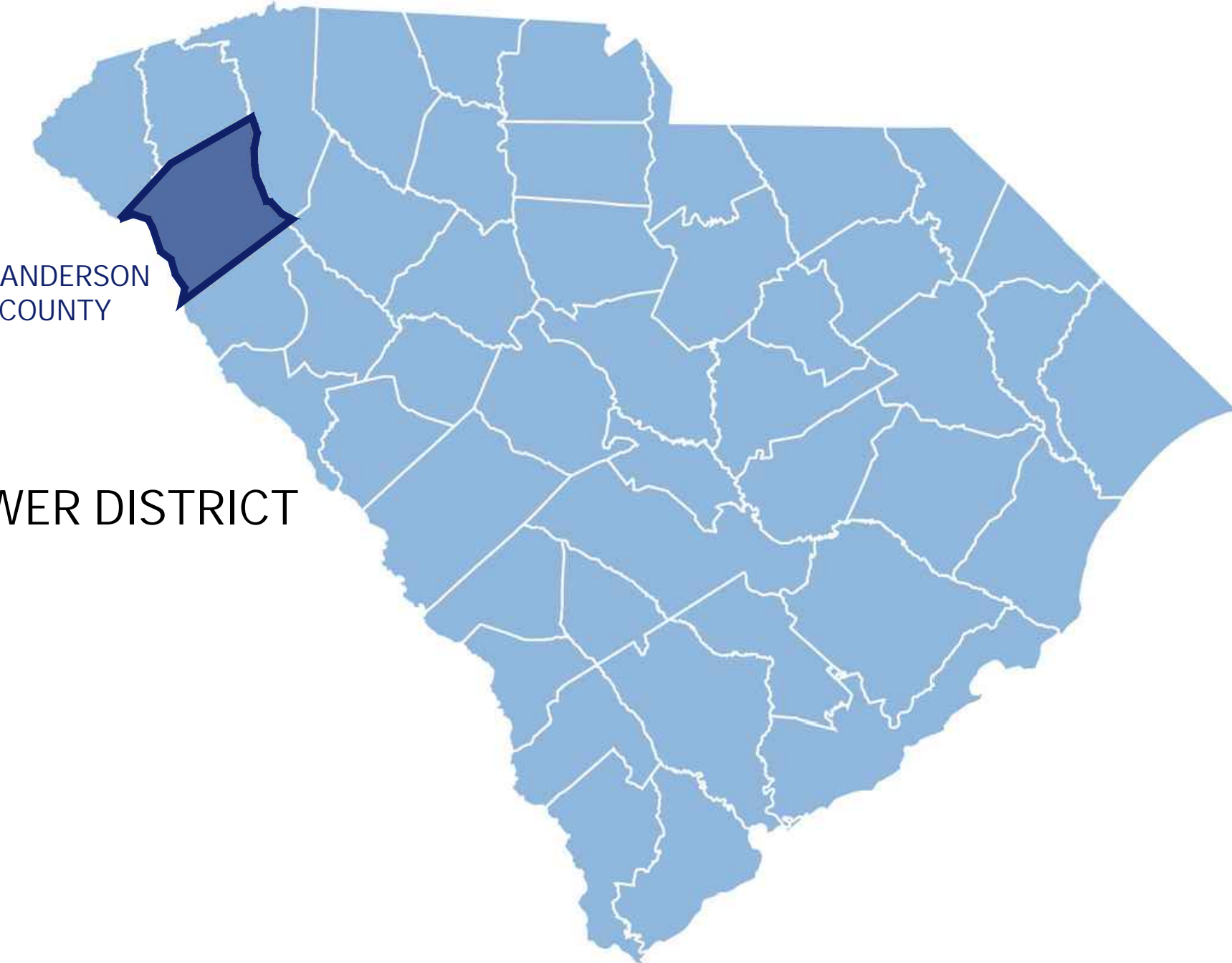


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HWY 28 AT HWY 413

WATERLINE EXTENSION

ANDERSON COUNTY, SC



STARR-IVA WATER & SEWER DISTRICT
104 ROY ARNOLD ROAD
STARR, SC 29684

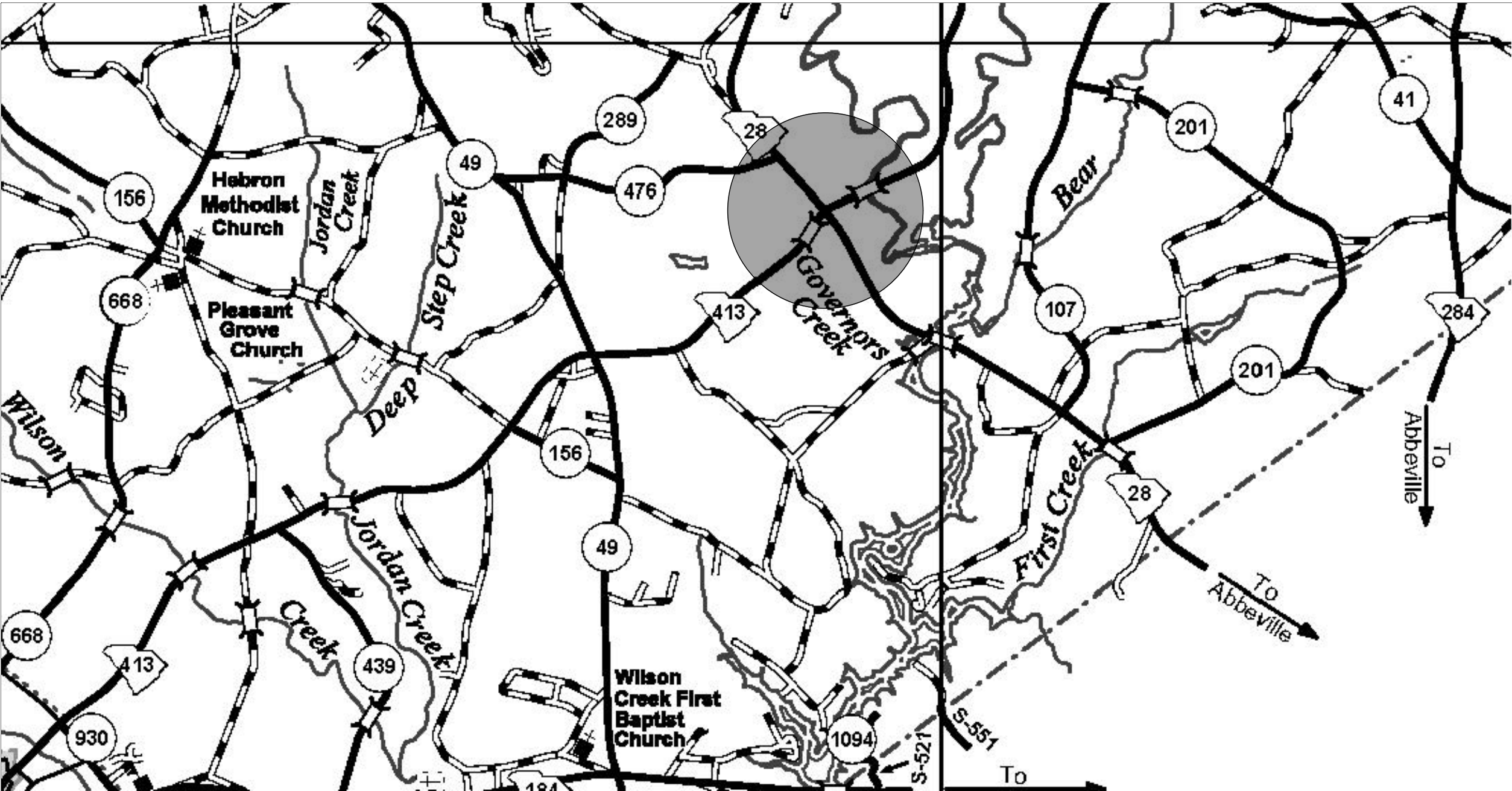
PH: (864) 352-6717

LIST OF SHEETS

- | | |
|----|---|
| 01 | COVER SHEET |
| 02 | PROJECT NOTES |
| 03 | WATERLINE PLAN SHEET |
| 04 | CONSTRUCTION DETAILS |
| 05 | EROSION & SEDIMENTATION CONTROL DETAILS |



APPROXIMATE LOCATION OF EXISTING UTILITIES SHOWN FOR CONTRACTOR'S REFERENCE AND SHOULD BE VERIFIED BY CONTRACTOR PRIOR TO STARTING CONSTRUCTION. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR CONTRACTOR'S NEGLIGENCE IN VERIFYING UTILITY LOCATIONS. ALL DAMAGES TO EXISTING UTILITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR. ENGINEER URGES CONTRACTOR TO UTILIZE SC811 AS PART OF HIS DUE DILIGENCE.



LOCATION MAP
N.T.S.

Approved for Construction

REVISIONS		
NO.	DATE	DESCRIPTION

Dunn & Shirley

—CONSULTING ENGINEERS—

D&S

Dunn & Shirley, LLC
823 Martin Road
Honea Path, SC 29654
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info@dunnshirley.com

SEAL

C.O.A.

HWY 28 AT
HWY 413
WATERLINE
EXTENSION

STARR-IVA WATER
& SEWER DISTRICT
104 ROY ARNOLD ROAD
STARR, SC 29684

ISSUED FOR PERMITS	
12-22-23	
PROJECT NO.	23018
SCALE:	N.T.S.
DRAWN BY:	CAS
DESIGNED BY:	CAS
CHECKED BY:	BKD

COVER SHEET

SHEET NO.
01

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GENERAL NOTES

- IN ADDITION TO THESE DRAWINGS, THE ASSOCIATED TECHNICAL SPECIFICATIONS AND CONTRACT DOCUMENTS FOUND IN THE PROJECT MANUAL DETAIL THE OWNER'S REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL APPROPRIATE DOCUMENTS PRIOR TO BIDDING AND DURING CONSTRUCTION TO ENSURE ADHERENCE TO THE OWNER'S REQUIREMENTS. IF THERE IS A CONFLICT OR AMBIGUITY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, THE STRICTER (OR HIGHER QUANTITY) OF THE TWO GOVERNS.
- ALL WORK IS TO BE COMPLETED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND/OR LOCAL LAWS, REGULATIONS, AND/OR REQUIREMENTS.
- THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE BASED ON AVAILABLE INFORMATION AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY FIELD CONDITIONS INCLUDING THE EXACT LOCATION AND ELEVATION OF UTILITIES PRIOR TO BEGINNING THE WORK. ANY DAMAGE TO EXISTING UTILITIES MUST BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- NOTIFY THE ENGINEER OF CONDITIONS THAT ARE DIFFERENT FROM THOSE SHOWN.
- WORK PERFORMED WITHIN STATE RIGHTS-OF-WAY AND/OR UTILITY EASEMENTS MUST ADHERE TO THE REQUIREMENTS OF THE RESPECTIVE PERMITTING AGENCY. IN CERTAIN CASES, SUPPLEMENTARY SPECIFICATIONS OR REQUIREMENTS WILL BE PROVIDED AS PART OF AN AGENCY-ISSUED PERMIT. IN THESE CASES, THE SUPPLEMENTAL SPECIFICATIONS WILL OVERRIDE THE PROJECT MANUAL UNLESS EXPRESSLY OTHERWISE STATED BY THE ENGINEER.
- THE CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, O.S.H.A COMPLIANCE, AND COMPLIANCE WITH ALL PERMITS AT ALL TIMES, REGARDLESS IF ENGINEER'S RESIDENT FIELD REPRESENTATIVE IS PRESENT. CONDITIONS OF THE JOB SITE AND SAFETY OF PEOPLE AND PROPERTY IS A CONTINUOUS REQUIREMENT, NOT LIMITED TO WORK HOURS.
- THE CONTRACTOR MUST PROTECT AND/OR RESTORE IMPROVEMENTS TO OWNER'S PROPERTY AND ALL ADJOINING PROPERTIES IN ACCORDANCE WITH THE PROJECT MANUAL.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION SURVEYING (LINES, STAKING, ETC.). IF NO BID ITEM IS PROVIDED FOR THIS, THE WORK IS CONSIDERED INCIDENTAL AND THE CONTRACTOR MUST MAKE PROVISIONS FOR THE WORK ELSEWHERE IN HIS BID.
- THE CONTRACTOR CANNOT BEGIN THE WORK UNTIL BONDS AND INSURANCE CERTIFICATES ARE PROVIDED AS DETAILED IN THE PROJECT MANUAL.
- THE CONTRACTOR CANNOT BEGIN ANY PORTION OF THE WORK UNTIL ALL APPLICABLE PERMITS ARE IN HAND FOR THAT PORTION OF THE WORK.
- THE CONTRACTOR CANNOT BEGIN THE WORK UNTIL AN APPROPRIATE PRE-CONSTRUCTION CONFERENCE IS HELD FOR THE PROJECT. TYPICALLY, THIS IS HELD AT LEAST 48 HOURS PRIOR TO THE START OF THE WORK AND INCLUDES ALL PARTIES TO THE CONTRACT (CONTRACTOR, OWNER, ENGINEER) AS WELL AS AGENCY REPRESENTATIVES AND LOCAL UTILITY REPRESENTATIVES. REFER TO TECHNICAL SPECIFICATIONS FOR MORE INFORMATION.
- COMPLY WITH SCDHEC "BMP HANDBOOK" AND "STORMWATER MANAGEMENT BMP FIELD MANUAL" FOR ALL LAND DISTURBING ACTIVITIES FOR THE DURATION OF THE PROJECT.
- DISPOSE OF ANY EXCESS EXCAVATION AND/OR UNSUITABLE MATERIALS, DEMOLITION DEBRIS (INCL. CLEARING & GRUBBING), AND SOLID WASTE OFFSITE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND/OR LOCAL REGULATIONS.
- CONCRETE WASHOUTS, STOCKPILES, MATERIAL STORAGE, EQUIPMENT, AND DEBRIS MUST BE LOCATED WITHIN THE LIMITS OF DISTURBANCE AT ALL TIMES. ADJACENT AREAS, OUTSIDE OF THE LIMITS OF DISTURBANCE, MUST BE KEPT CLEAN AND FREE FROM CONSTRUCTION IMPACTS.
- UNLESS PROVIDED IN THE PROJECT MANUAL AS PART OF AN APPROVED ENCROACHMENT PERMIT, PREPARATION AND APPROVAL OF TRAFFIC CONTROL PLANS ARE THE CONTRACTOR'S RESPONSIBILITY.
- THE CONTRACTOR MUST MAINTAIN ONE CLEAN SET OF DRAWINGS FOR USE IN CREATING "RECORD DRAWINGS" AS CONSTRUCTION PROGRESSES IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.

GENERAL WATER SYSTEM NOTES

- A PRE-CONSTRUCTION MEETING (PRE-CON) - AS DEFINED IN THE PROJECT MANUAL - MUST BE HELD AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION. THE ENGINEER WILL SCHEDULE THE PRE-CON AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE MEETING WHENEVER POSSIBLE. THOSE IN ATTENDANCE MUST INCLUDE: THE OWNER, ENGINEER, CONTRACTOR (INCL. SUPERINTENDENT, SUBCONTRACTORS, UTILITIES) AND APPLICABLE PERMITTING AGENCIES. THE CONTRACTOR MUST NOTIFY ANY UTILITIES THAT MAY BE AFFECTED BY CONSTRUCTION PRIOR TO THE PRE-CON TO ALLOW THEM AN OPPORTUNITY TO ATTEND THE PRE-CON.
- THE CONTRACTOR SHALL INSTALL THE WATER SYSTEM IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.
- AT LEAST ONE (1) SET OF APPROVED PLANS AND SPECIFICATIONS MUST BE KEPT AT THE SITE AT ALL TIMES. THE CONTRACTOR INSTALLING THE WATER SYSTEM IS RESPONSIBLE FOR KEEPING THESE PLANS AT THE SITE.
- THE CONTRACTOR MUST NOTIFY THE OWNER AND ENGINEER NOT LESS THAN 48 HOURS PRIOR TO: START OF CONSTRUCTION, ANY TESTING OF THE SYSTEM, READINESS FOR FINAL INSPECTION.
- FOR NEW INSTALLATIONS AUTHORIZED BY A SCDHEC CONSTRUCTION PERMIT, A CERTIFICATION WILL NOT BE ISSUED IF THE ENGINEER OR A REPRESENTATIVE OF THE ENGINEER IS NOT PRESENT DURING ALL TESTING AND FINAL INSPECTION. WITHOUT THIS ENGINEER'S CERTIFICATION, AN APPROVAL TO PLACE INTO OPERATION WILL NOT BE ISSUED BY SCDHEC.
- THE CONTRACTOR MUST SUBMIT A RECORD DRAWING SKETCH (OR REDLINE MARKUP) TO THE ENGINEER NO LATER THAN 48 HOURS AFTER FINAL COMPLETION.
- THE RECORD DRAWING SKETCH MUST BE SIGNED AND DATED BY THE CONTRACTOR AND MUST CONTAIN THE FOLLOWING PHRASE: "I HEREBY CERTIFY THAT THE WATER SYSTEM WAS INSTALLED AS SHOWN ON THIS PLAN". THE SKETCH SHOULD INCLUDE SUFFICIENT MEASUREMENTS AND INFORMATION TO PROPERLY LOCATE THE WATER SYSTEM FEATURES AS INSTALLED. FAILURE TO SUBMIT THE SKETCH OR TO PROVIDE SUFFICIENT DETAIL WILL RESULT IN THE ENGINEER REQUIRING AN AS-BUILT SURVEY TO BE COMPLETED BY A LICENSED SURVEYOR AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL MAINTAIN AND BACKFILL THE WATER LINE AS IT IS LAID. NO OPEN DITCHES WILL BE ALLOWED AT THE CLOSE OF THE DAYS WORK. STEEL PLATES SHALL BE USED AS NECESSARY TO COVER OPEN TRENCHES IN ROADS.
- BROADCAST TEMPORARY GRASS SEED AND STRAW DAILY AS TRENCH IS BACKFILLED. MAINTAIN GRASS DURING CONSTRUCTION AND RE-SEED AS OFTEN AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
- INSPECT ALL SEDIMENT AND EROSION CONTROLS ONCE EACH CALENDAR WEEK OR AFTER RAINFALL EVENTS EXCEEDING 0.5". AT MINIMUM, MAINTAIN THE CONTROLS IN GOOD WORKING ORDER DURING CONSTRUCTION UNTIL UPSTREAM AREAS ARE COMPLETELY STABILIZED. CERTAIN CONTROLS IN CRITICAL AREAS MAY REMAIN IN PLACE AT THE DIRECTION OF THE ENGINEER FOR THE DURATION OF THE PROJECT REGARDLESS OF STABILIZATION.

SCDHEC STANDARD NOTES

- 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.
- 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.
- ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY, OR INCORRECTLY, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.
- 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 SEDIMENT BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
- 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.
- 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.
- RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 ET SEQ. AND SCR100000.
- 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.
- 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'T 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.
- LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.
- A COPY OF THE SWPPP, INSPECTIONS RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.
- INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (2H:1V OR GREATER) WHERE LAND-DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS. STANDARD NOTES FEBRUARY 2017
- MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.
- MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.
- MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPS (SEDIMENT BASIN, FILTER BAG, ETC.).
- THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
 - WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL;
 - WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS;
 - FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE; AND
 - SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.
- AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.
- IF EXISTING BMPS NEED TO BE MODIFIED OR IF ADDITIONAL BMPS ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPS MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.
- A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

STARR-IVA WATER CONTACTS

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OR

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DATA SOURCES

STARR-IVA WATER SYSTEM MAP (ARCGIS)

ANDERSON COUNTY GIS

SCDOT "PLANS ONLINE"

LEGEND

EXISTING	PROPOSED	
BUILDINGS		
EASEMENTS (LABELED)		
CENTERLINE		
RIGHT-OF-WAY		
CURB & GUTTER		
CONTOURS (MAJOR)		
CONTOURS (MINOR)		
SPOT ELEVATION		
EMBANKMENT		
STREAM / CREEK		
TREE LINE		
CHAIN-LINK FENCE		
ORNAMENTAL FENCE		
ASPHALT PAVEMENT		
CONCRETE		
HD CONCRETE		
GRAVEL		
STORM DRAIN		
S.D. STRUCTURE		
SANITARY SEWER		
SEWER MANHOLE		
SEWER FORCE MAIN		
GAS LINE		
FIBER OPTIC CABLES		
OVERHEAD POWER LINE		
WATER LINE		
WATER METER		
WATER VALVE		
FIRE HYDRANT		
TO BE ABANDONED		

COMMON ABBREVIATIONS

A/C	ASBESTOS-CEMENT	IE(I)	INVERT ELEVATION IN
APPR	APPROXIMATE	IE(O)	INVERT ELEVATION OUT
ASS'Y	ASSEMBLY	INV	INVERT
BLDG	BUILDING	IRR	IRRIGATION
B.O.	BLOW-OFF	L.F.	LINEAR FEET
C.I.	CAST IRON	MH	MANHOLE
C.O.	CLEAN-OUT	M.J.	MECHANICAL JOINT
C.Y.	CUBIC YARDS	POLY	POLYETHYLENE
CONC	CONCRETE	PRV	PRESSURE REDUCING VALVE
DI	DUCTILE IRON	PVC	POLYVINYL CHLORIDE PIPE
DIP	DUCTILE IRON PIPE	R.J.	RESTRAINED JOINT
E.O.P.	EDGE OF PAVEMENT	S.Y.	SQUARE YARDS
FDC	FIRE DEPARTMENT CONNECTION	SL	SERVICE LATERAL (SEWER)
FH	FIRE HYDRANT	SS	SANITARY SEWER
FT.	FEET	SSMH	SANITARY SEWER MANHOLE
GALV	GALVANIZED	S/W	SIDEWALK
GV	GATE VALVE	THD	THREADED
HDD	HORIZONTAL DIRECTIONAL DRILL	U.S.	UPSTREAM
HDPE	HIGH DENSITY POLYETHYLENE PIPE	VCP	VITRIFIED CLAY PIPE
HYD	HYDRANT	W.L.	WATERLINE
I.C.V.	IRRIGATION CONTROL VALVE	WM	WATER METER

Approved for Construction

REVISIONS

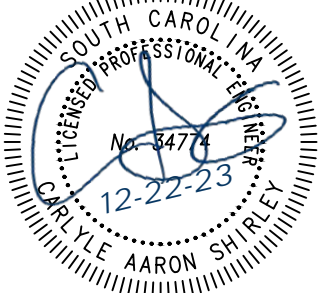
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Dunn & Shirley
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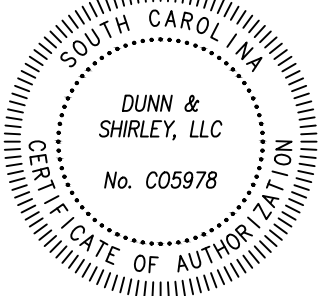


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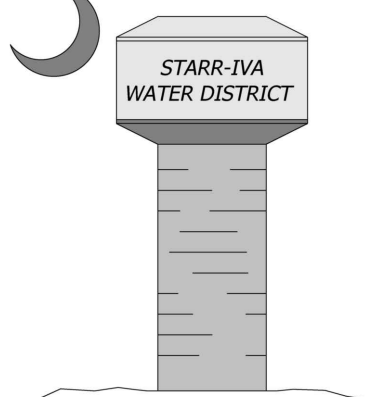
SEAL



C.O.A.



HWY 28 AT
HWY 413
WATERLINE
EXTENSION



STARR-IVA WATER
& SEWER DISTRICT
104 ROY ARNOLD ROAD
STARR, SC 29684

ISSUED FOR PERMITS

12-22-23

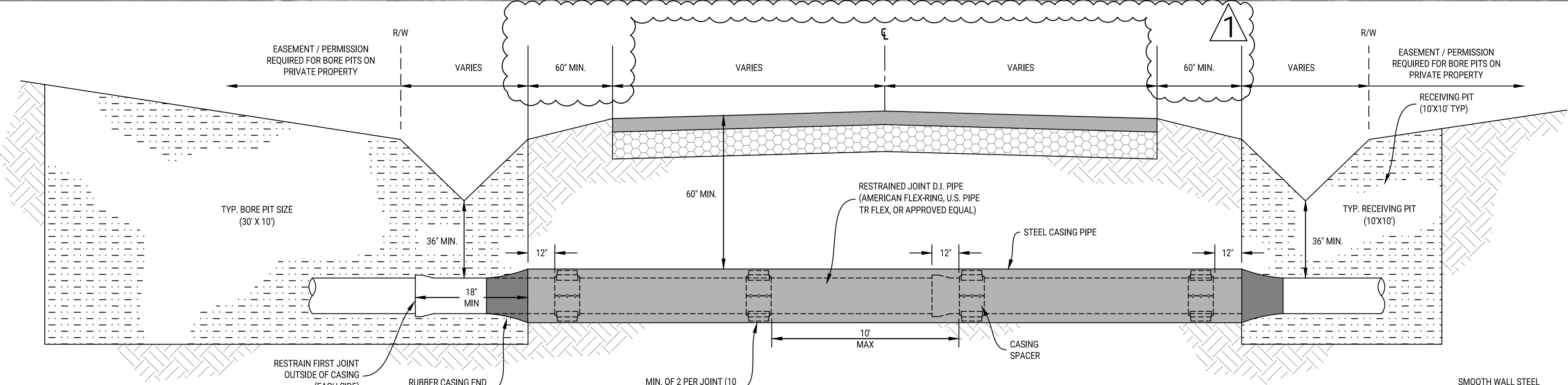
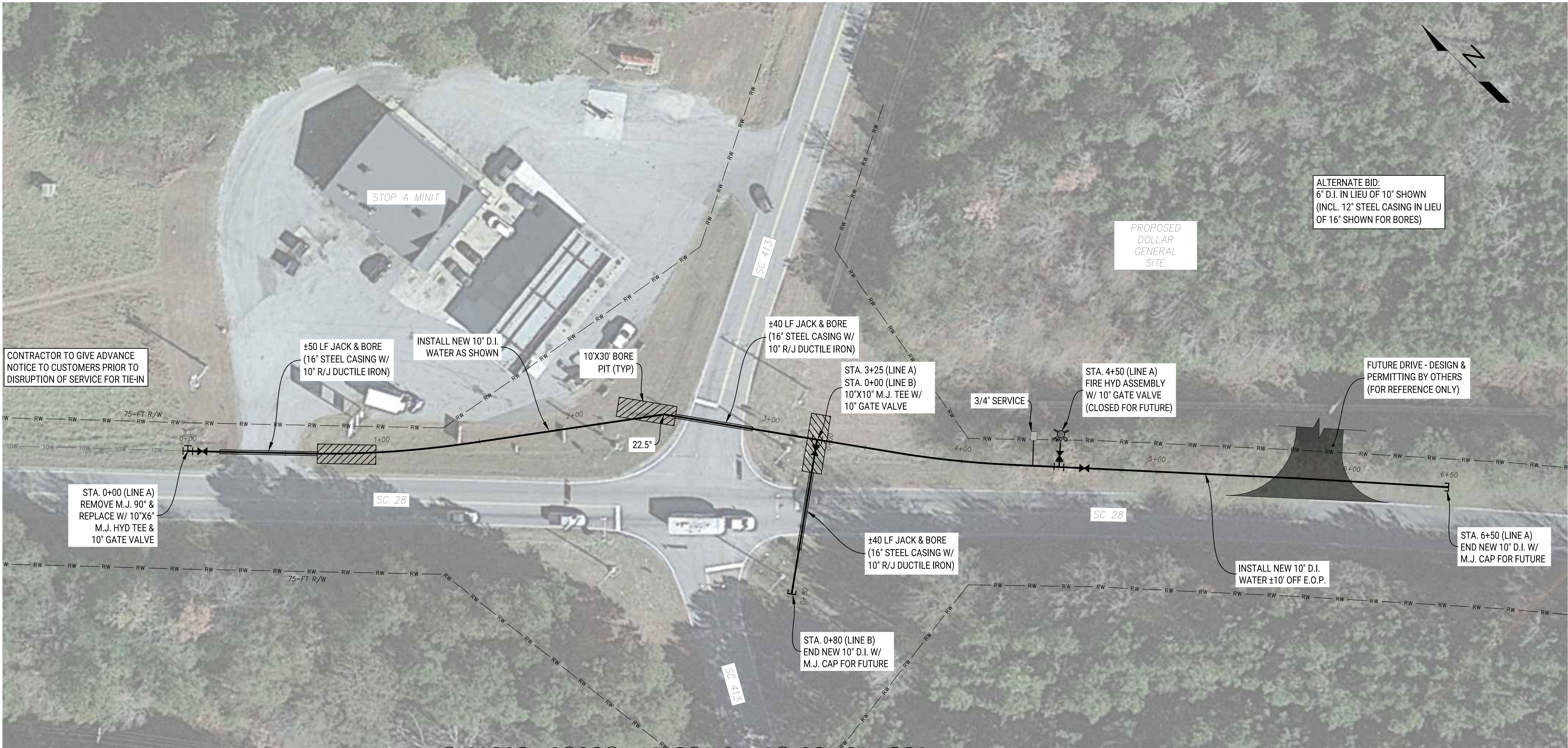
PROJECT NO.	23018
SCALE:	N.T.S.
DRAWN BY:	CAS
DESIGNED BY:	CAS
CHECKED BY:	BKD

PROJECT
NOTES

SHEET NO.

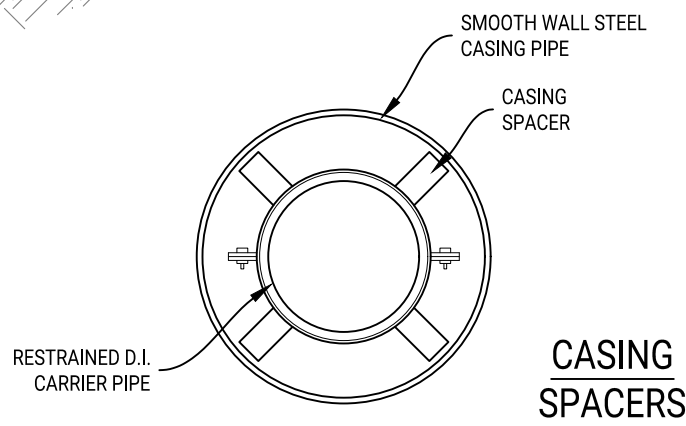
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- NOTES
- USE BORING MACHINE DESIGNED TO BORE AND JACK CASING IN A CONTINUOUS OPERATION. MATCH DIAMETER OF BORING AUGER TO O.D. OF CASING.
 - BUTT WELD EACH NEW SECTION OF STEEL CASING TO THE SECTION PREVIOUSLY JACKED INTO PLACE.
 - CASING SPACERS TO BE MANUFACTURED BY BWM OR APPROVED EQUAL.
 - ROAD CROSSINGS INSTALLED IN ACCORDANCE WITH LATEST SCDOT SPECIFICATIONS.

CARRIER PIPE DIAMETER	CASING DIAMETER	CASING WALL THICKNESS
6"	12"	0.250"
8"	16"	0.250"
10"	16"	0.250"
12"	18"	0.250"
16"	24"	0.312"



ENCASEMENT INSTALLATION BY JACK & BORE

Approved for Construction

REVISIONS		
NO.	DATE	DESCRIPTION
1	1/8/24	SCDOT COMMENTS

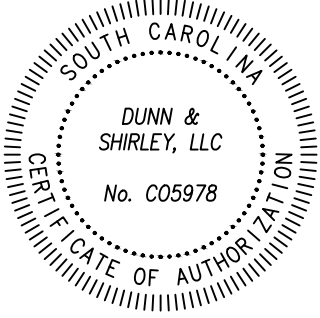
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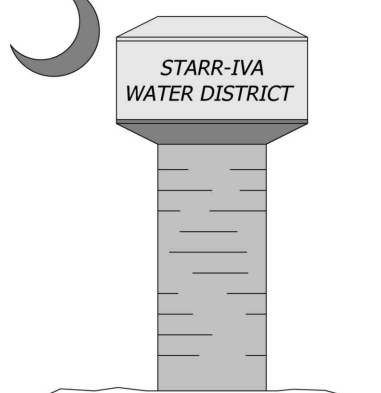
SEAL



C.O.A.



HWY 28 AT HWY 413 WATERLINE EXTENSION



STARR-IVA WATER
& SEWER DISTRICT
104 ROY ARNOLD ROAD
STARR, SC 29684

ISSUED FOR PERMITS

12-22-23

PROJECT NO.	23018
SCALE:	1" = 30"
DRAWN BY:	CAS
DESIGNED BY:	CAS
CHECKED BY:	BKD

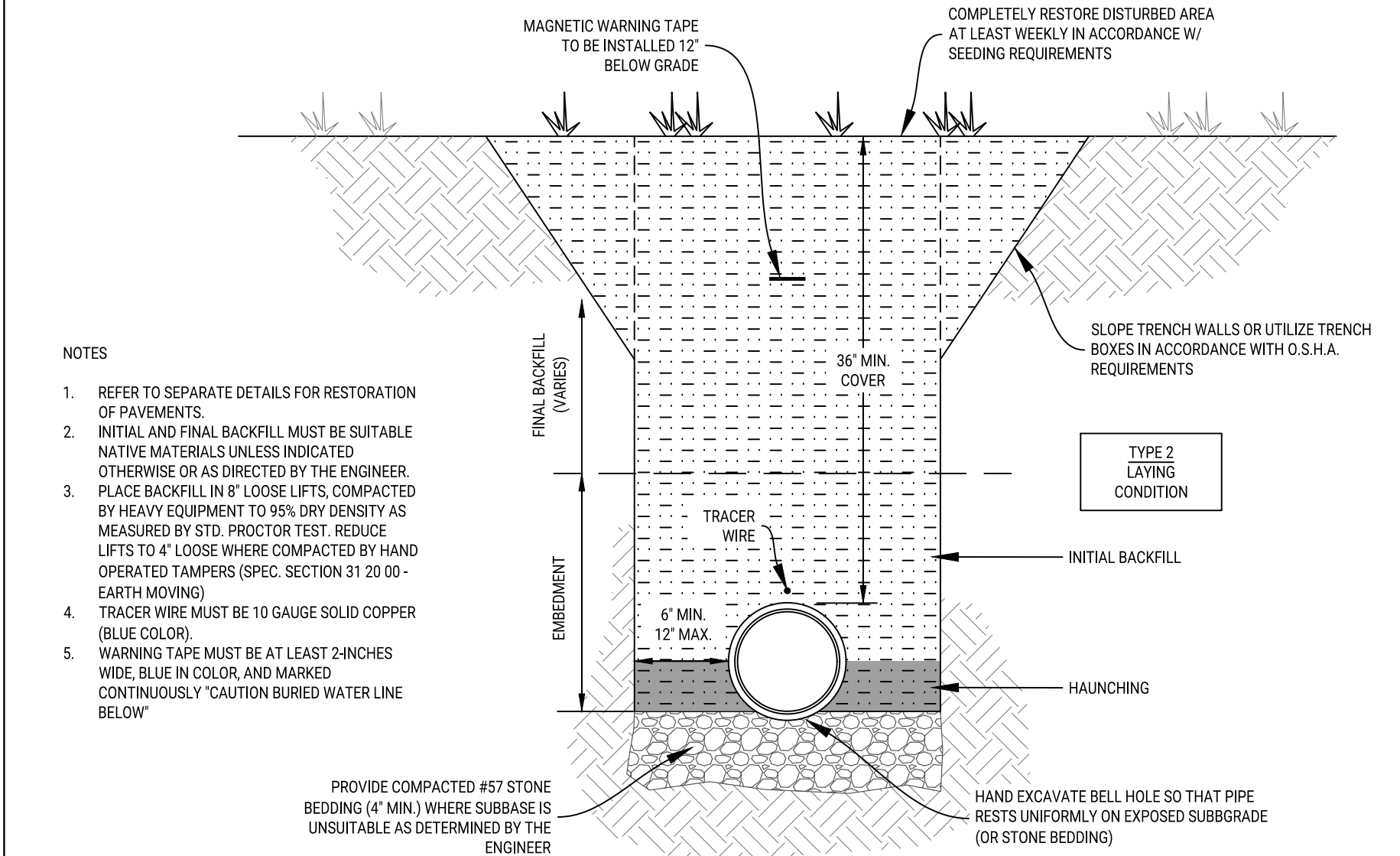
WATERLINE PLAN SHEET

SHEET NO.

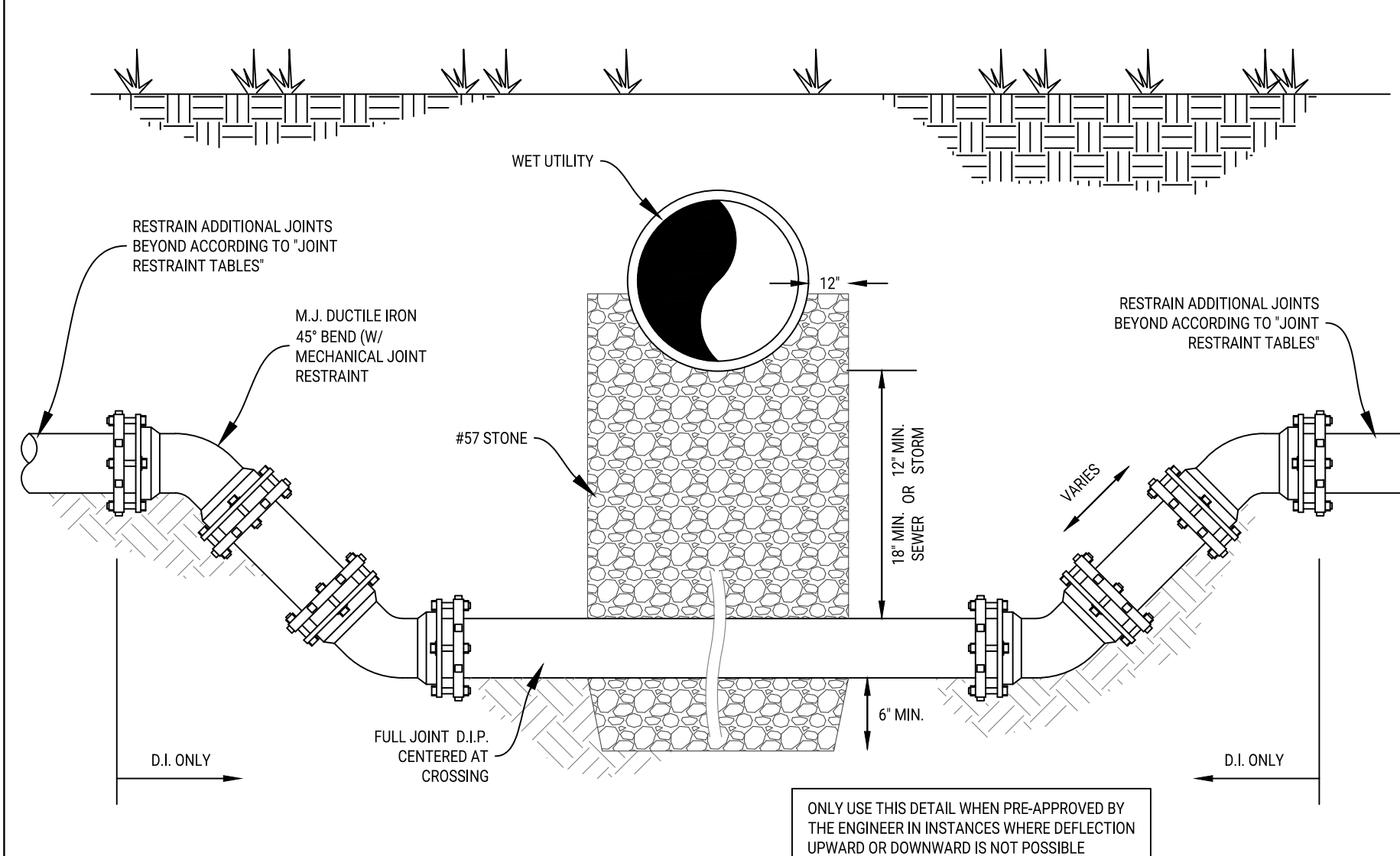
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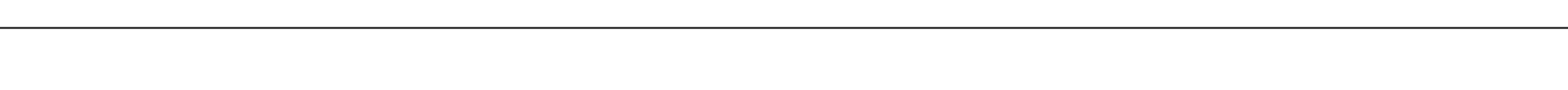
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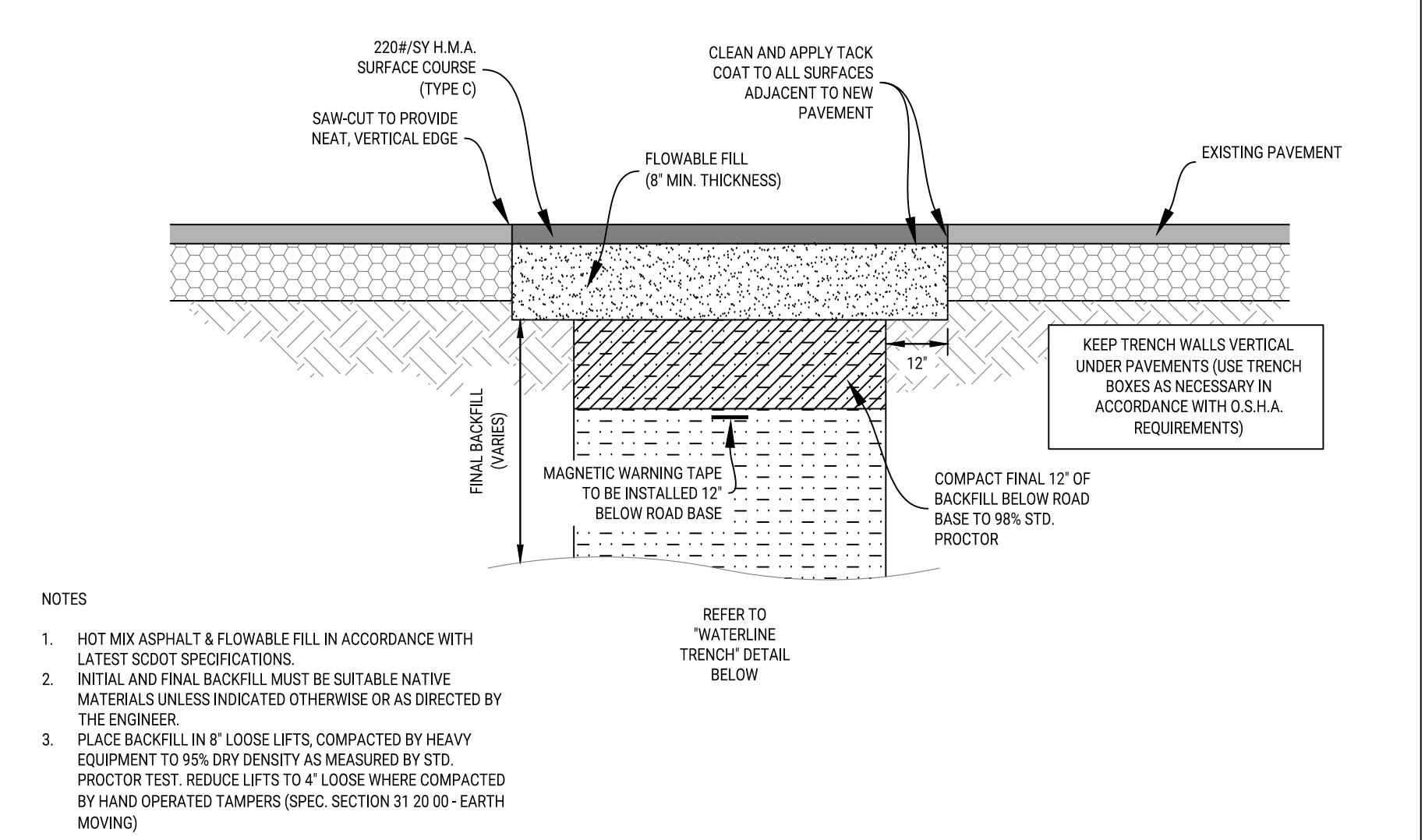
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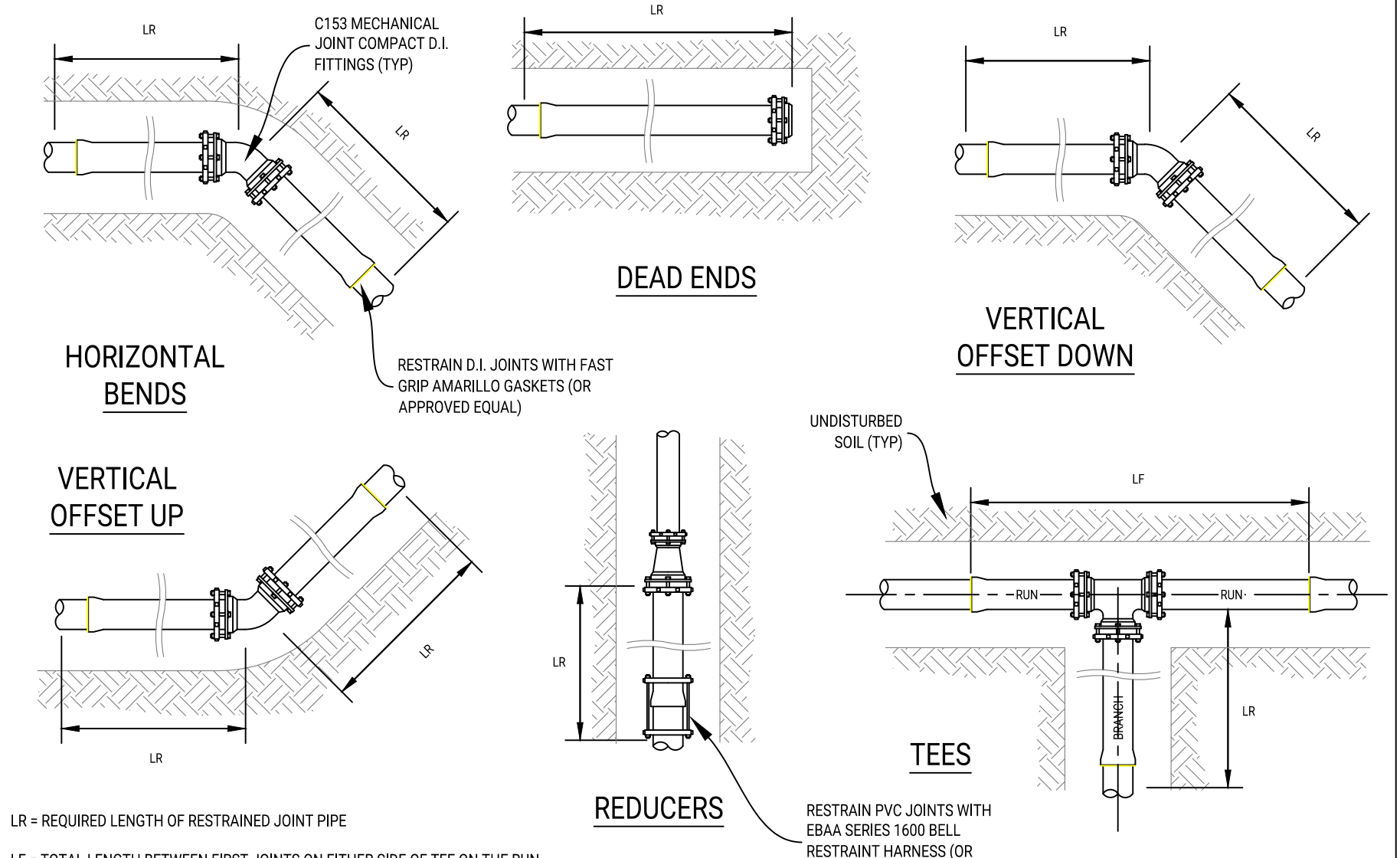
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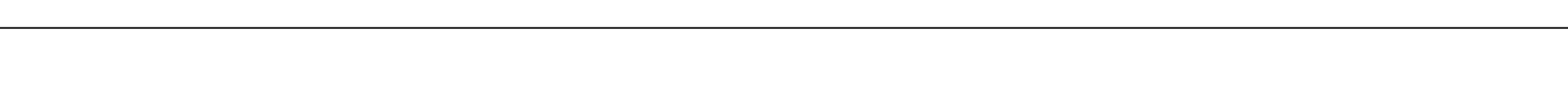
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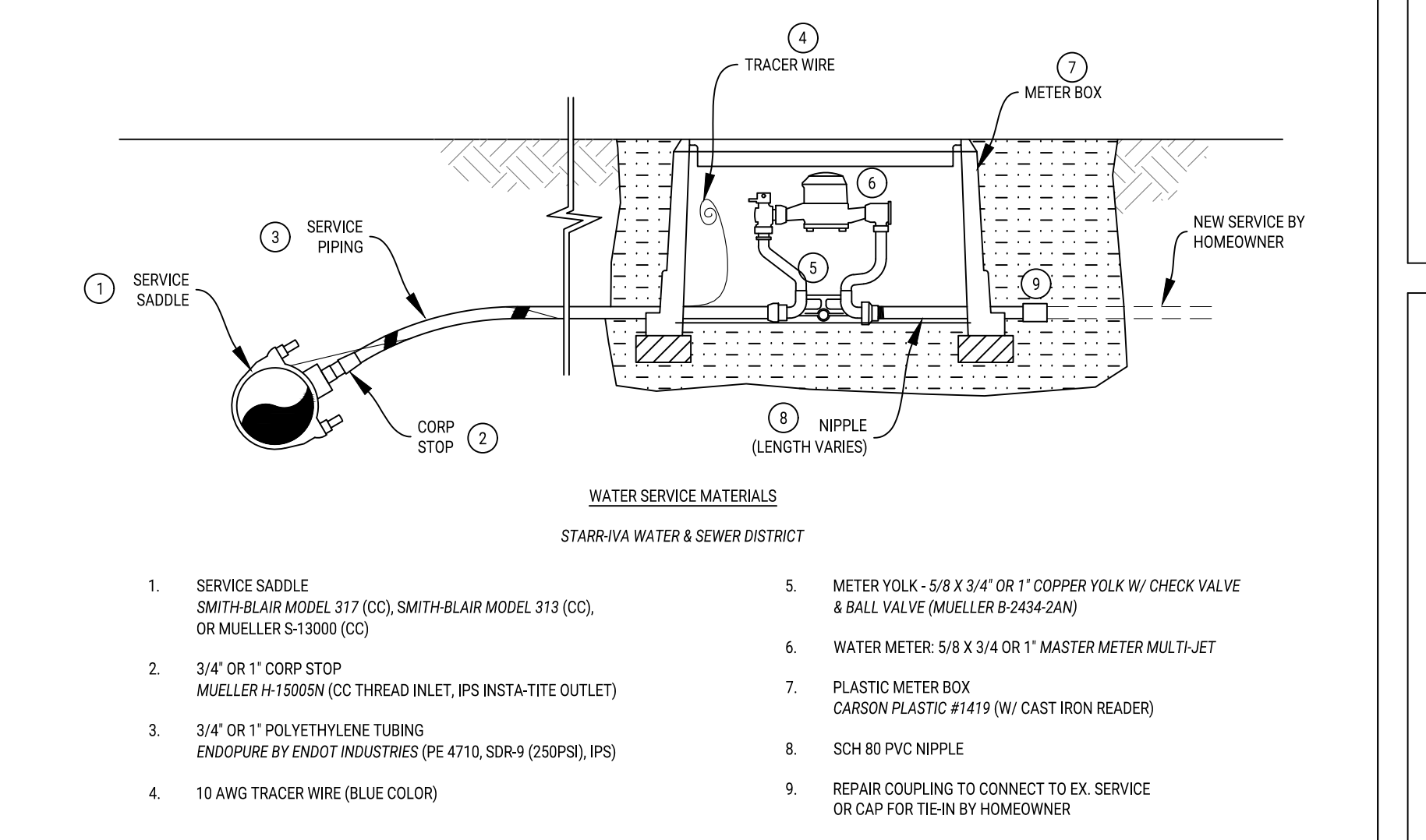
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6	3/ (N.
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RESTRAINED LENGTH FOR POLYETHYLENE WRAPPED DUCTILE IRON PIPE AND PVC PIPE															
PIPE SIZE	HORIZONTAL BENDS				VERTICAL OFFSET				TEES		DEAD END	REDUCING TO			
	11.25"	22.5"	45"	90"	22.5" UP	22.5" DN	45" UP	45" DN	LF+0	LF+10'		4"	6"	8"	10"
4"	3'	6'	12'	29'	5'	16'	10'	33'	53'	5'	53'				
6"	4'	8'	17'	41'	7'	23'	13'	47'	75'	27'	75'	39'			
8"	6'	11'	22'	53'	9'	30'	17'	62'	99'	51'	99'	51'	42'		
10"	7'	12'	27'	64'	10'	36'	21'	76'	119'	71'	119'	97'	76'	40'	
12"	8'	15'	31'	75'	12'	43'	25'	89'	142'	93'	142'	123'	103'	76'	42'

RESTRAINED LENGTH FOR DUCTILE IRON PIPE															
PIPE SIZE	HORIZONTAL BENDS				VERTICAL OFFSET				TEES		DEAD END	REDUCING TO			
	11.25"	22.5"	45"	90"	22.5" UP	22.5" DN	45" UP	45" DN	LF+0	LF+10'		4"	6"	8"	10"
4"	6'	12'	24'	56'	12'	16'	32'	24'	39'	37'	39'				
6"	8'	16'	33'	80'	16'	22'	46'	33'	55'	53'	55'	29'			
8"	11'	21'	44'	106'	21'	29'	61'	44'	73'	71'	73'	53'	31'		
10"	12'	26'	53'	128'	26'	36'	74'	53'	89'	87'	89'	72'	55'	30'	
12"	15'	31'	63'	152'	31'	42'	88'	63'	106'	104'	106'	92'	77'	56'	31'

NOTES

1. SEE ALSO "JOINT RESTRAINT DIAGRAMS" DETAIL.
2. FOR D.I.P., RESTRAINED LENGTH CALCULATED USING 'THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE' CALCULATOR FROM DIPRA.ORG.
3. FOR PVC, RESTRAINED LENGTH CALCULATED USING 'RESTRAINT LENGTH CALCULATOR' FROM EBAA.COM

MINIMUM DESIGN CRITERIA

LAYING CONDITION:	TYPE 2
SOIL DESIGNATION:	CLAY 1
DEPTH OF COVER:	3.0 FT
DESIGN PRESSURE:	200 PSI
SAFETY FACTOR:	2.0


Approved for Construction

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REVISONS		
NO.	DATE	DESCRIPTION

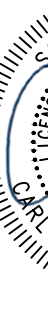
Dunn & Shirley

— CONSULTING ENGINEERS —




Dunn & Shirley, LLC
823 Martin Road
Honea Path, SC 29654
(864) 245-0569
info@dunnshirley.com



SEAL



C.O.A.



HWY 28 AT HWY 413 WATERLINE EXTENSION



STARR-IVA WATER
& SEWER DISTRICT
104 ROY ARNOLD ROAD
STARR, SC 29684

ISSUED FOR PERMITS	
12-22-23	
PROJECT NO.	23018
SCALE:	N.T.S.
DRAWN BY:	CAS
DESIGNED BY:	CAS
CHECKED BY:	BKD

CONSTRUCTION
DETAILS

SHEET NO.

04

