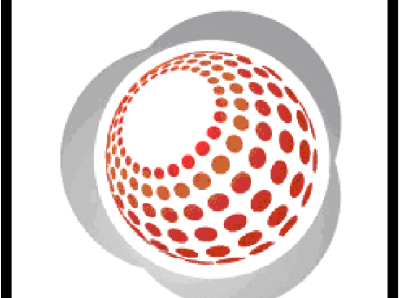




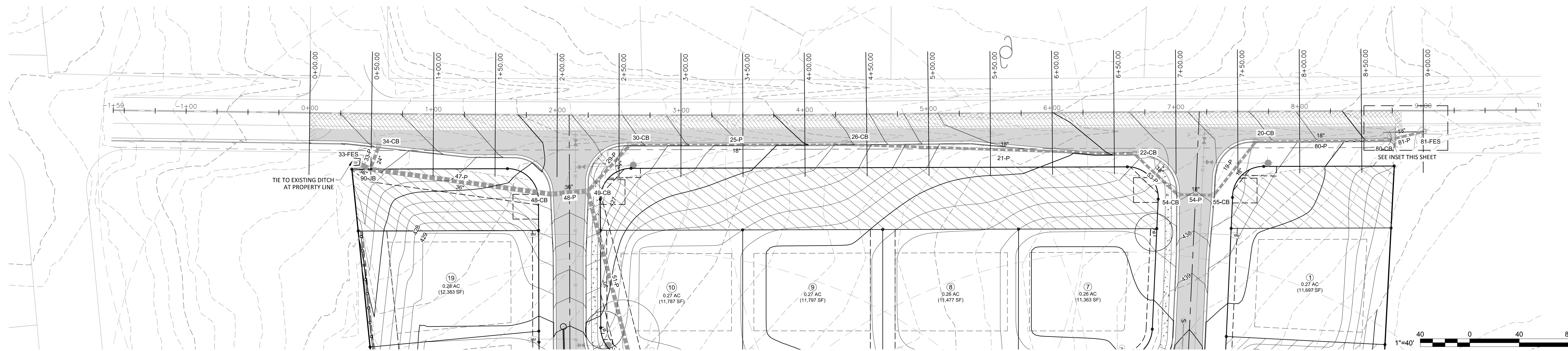
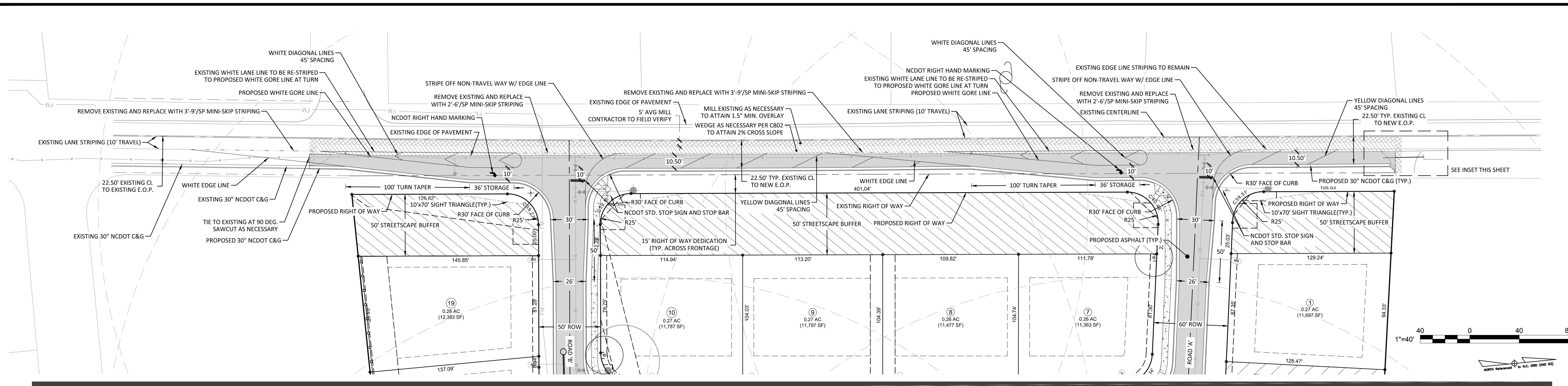
Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FIRM No. C-2378



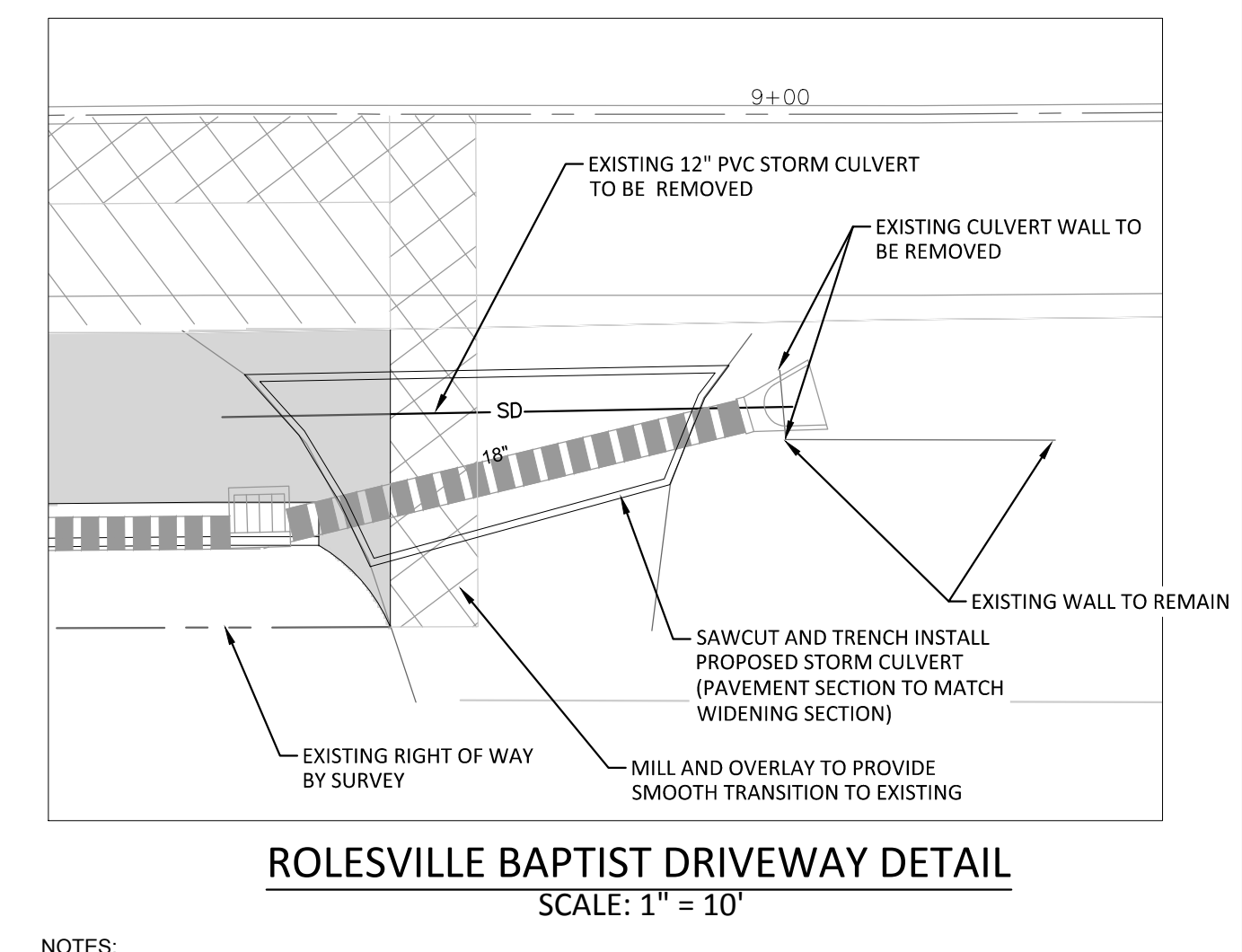
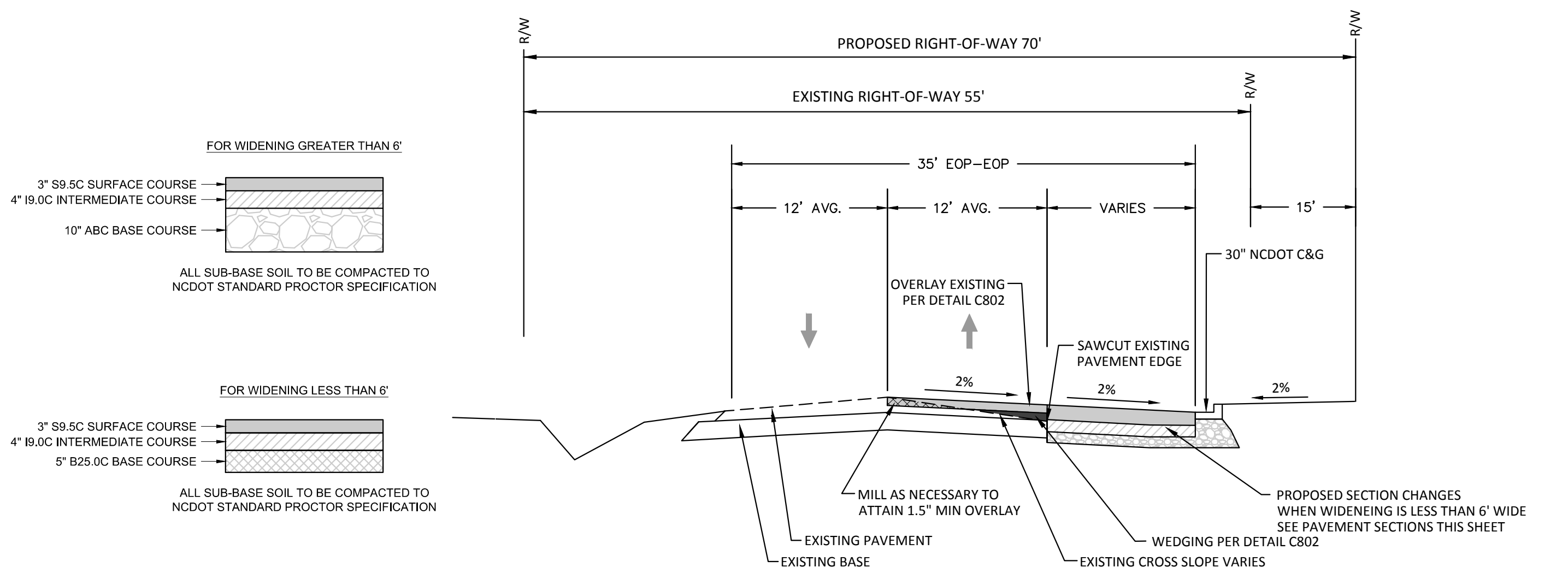
CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

ROAD WIDENING
W. YOUNG ST.

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	1" = 40'
Date:	09/08/2020
Project Number:	P170347
SHEET	
C800	



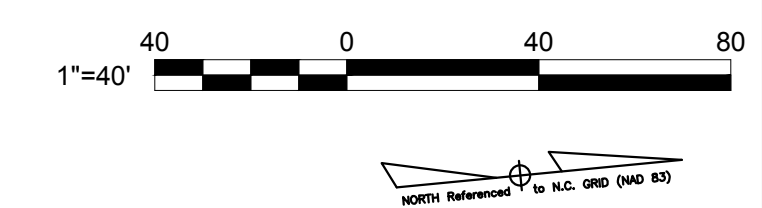
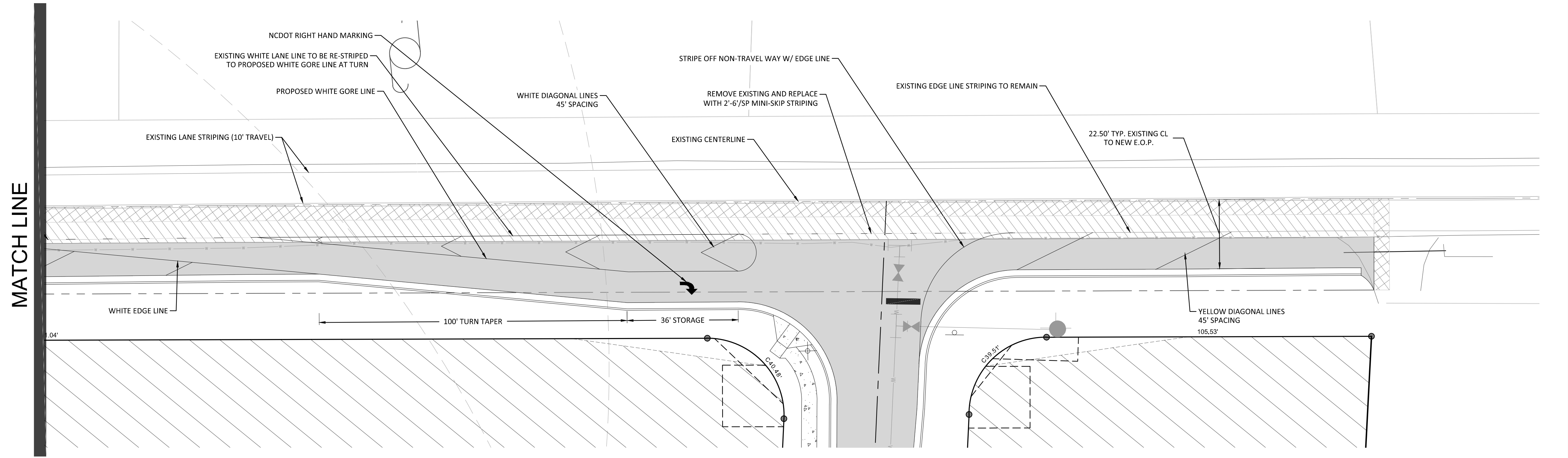
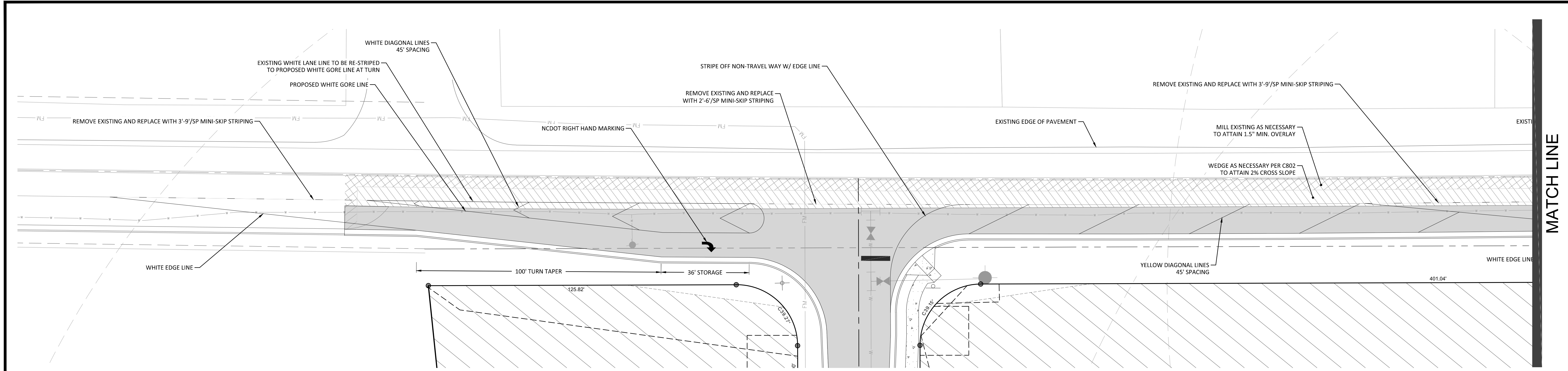
- SIGNAGE, STRIPING, AND MARKING NOTES:**
1. ALL INTERNAL SIGNAGE SHALL BE COORDINATED WITH OWNER FOR ACTUAL LOCATION AT TIME OF INSTALLATION. SIGNAGE LEADING ONTO PUBLIC THOROUGHFARE SHALL BE INSTALLED AT RIGHT OF WAY PER DOT STANDARDS
 2. ALL PAVEMENT STRIPING SHALL BE THERMOPLASTIC REFLECTIVE PAINT. MATERIALS AND DIMENSIONS SHALL CONFORM TO NCDOT STANDARDS AND SPECIFICATIONS.
- NOTES:**
1. ALL CONSTRUCTION IN THE RIGHT OF WAY SHALL BE IN ACCORDANCE WITH NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.
 2. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM THEIR ACTIVITIES. CONTRACTOR SHALL CALL UTILITY LOCATOR SERVICE 48 HOURS PRIOR TO BEGINNING CONSTRUCTION. NC ONE CALL 1-800-632-4949 PER NCGS 87-102.
 3. NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DRIVEWAY PERMIT IS REQUIRED BEFORE STARTING CONSTRUCTION.
 4. THE DEVELOPER IS RESPONSIBLE FOR THE FABRICATION AND INSTALLATION OF ALL REQUIRED SIGNS AND PAVEMENT MARKINGS WITHIN THE PUBLIC RIGHT OF WAY.
 5. CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING A TRAFFIC MAINTENANCE PLAN FOR REVIEW AND APPROVAL BY DOT PRIOR TO BEGINNING WORK WITHIN THE RIGHT OF WAY.
 6. CONTRACTOR SHALL MAINTAIN ACCESS DURING ALL TIMES OF CONSTRUCTION.
 7. CONTRACTOR SHALL CONTACT WAKE COUNTY SCHOOLS TO COORDINATE ROAD WORK SO IT WILL NOT ADVERSELY AFFECT THE SCHOOLS TRANSPORTATION SCHEDULE AND OR OPERATIONS.
 8. THERMOPLASTIC PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS SHALL BE INSTALLED WITHIN THE TURN LANE CONSTRUCTION LIMITS IN ACCORDANCE WITH THE STANDARD NCDOT STANDARDS AND SPECIFICATIONS.
 9. CONTRACTOR SHALL RE-ESTABLISH 2% CROSS SLOPE ON PROJECT SIDE OF W. YOUNG STREET. CONTRACTOR SHALL OVERLAY TO A MIN. OF 1.5" DEEP AND MILL EXISTING WHERE NECESSARY TO ATTAIN 1.5" MIN. OVERLAY. PROVIDE WEDGING PER C802 AS NECESSARY. TYP. FOR ENTIRE LENGTH OF W. YOUNG ST. AT LIMITS OF IMPROVEMENTS.
 10. CONTRACTOR SHALL ESTABLISH STRING LINE AND CONTACT PROJECT ENGINEER AND NCDOT FOR MEETING ON SITE BEFORE CONTINUING WORK.



- NOTES:**
1. CONTRACTOR TO COORDINATE INSTALL WITH ROLESVILLE BAPTIST REPRESENTATIVE BEFORE BEGINNING WORK.
 2. ROLESVILLE BAPTIST CEMETERY CURRENTLY HAS 3 AVAILABLE ENTRANCES ON W. YOUNG ST. 2 DRIVEWAYS WILL BE AVAILABLE FOR ACCESS DURING WORK AND FULL INTERNAL CIRCULATION WILL BE AVAILABLE.

P:\2017 Projects\170347 Chandlers Ridge\Eng\CADD\DWG\TP SHEET_P_170347_C800_AVERETTE.dwg

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE
	REVISIONS	



- SIGNAGE, STRIPING, AND MARKING NOTES:**
1. ALL INTERNAL SIGNAGE SHALL BE COORDINATED WITH OWNER FOR ACTUAL LOCATION AT TIME OF INSTALLATION. SIGNAGE LEADING ONTO PUBLIC THOROUGHFARE SHALL BE INSTALLED AT RIGHT OF WAY PER DOT STANDARDS
 2. ALL PAVEMENT STRIPING SHALL BE THERMOPLASTIC REFLECTIVE PAINT. MATERIALS AND DIMENSIONS SHALL CONFORM TO NCDOT STANDARDS AND SPECIFICATIONS.

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
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Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FIRM No. C-2378



CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

STRIPING PLAN
W. YOUNG ST.

Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS
 Scale: 1" = 40'
 Date: 09/08/2020
 Project Number: P170347

SHEET
C801

P:\2017 Projects\170347 Chandlers Ridge\Eng\CADD\DWG\TP SHEET\TP_170347_C801_AVERETTE.dwg



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 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FIRM No. C-2378

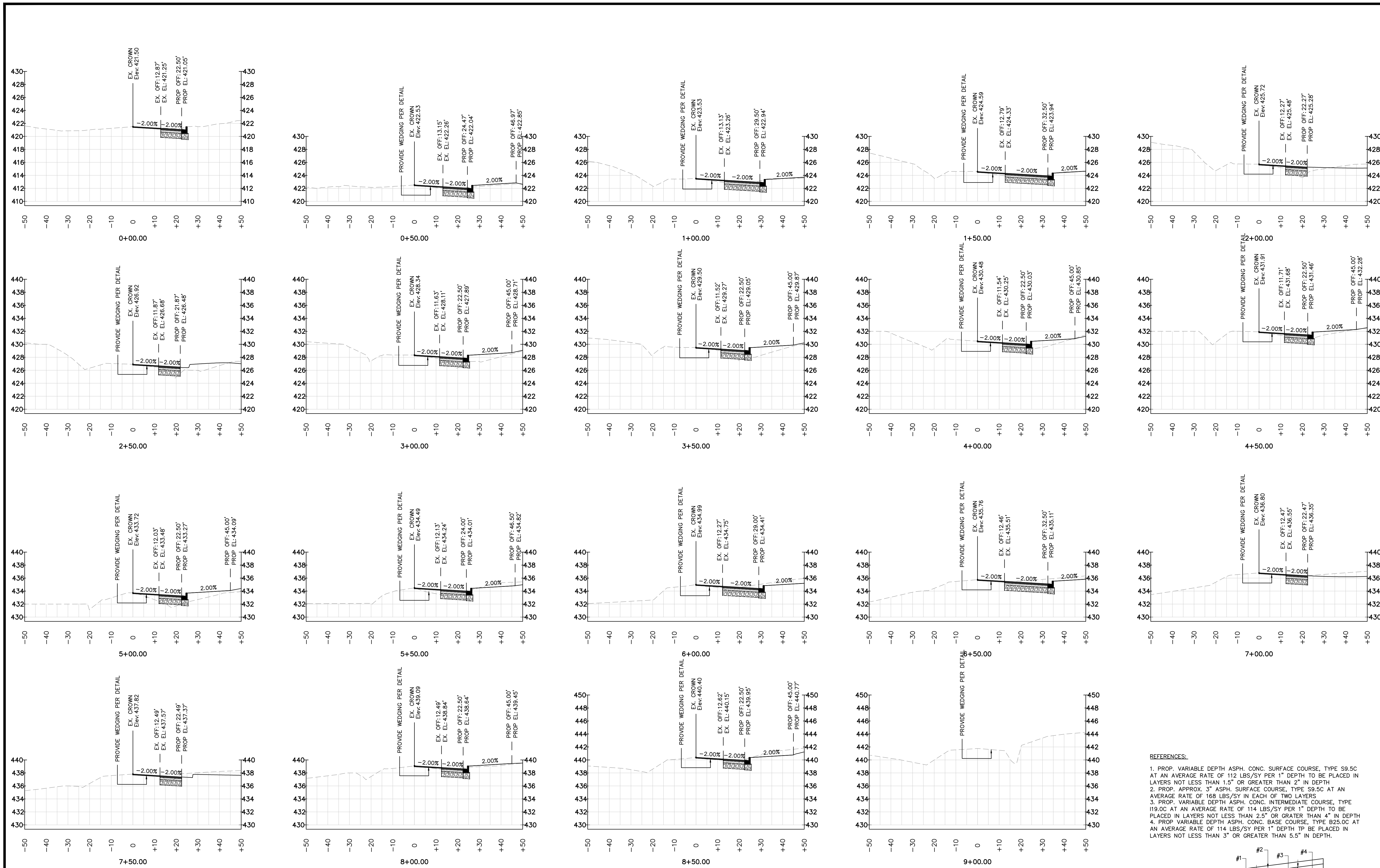


**CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION**

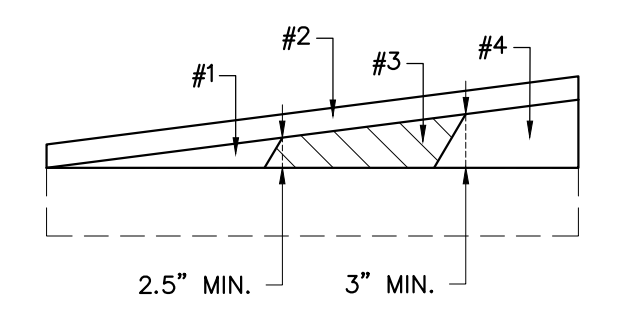
**ROAD WIDENING
 CROSS SECTIONS**

Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS
 Scale: 1" = 20'
 Date: 09/08/2020
 Project Number: P170347

SHEET
C802

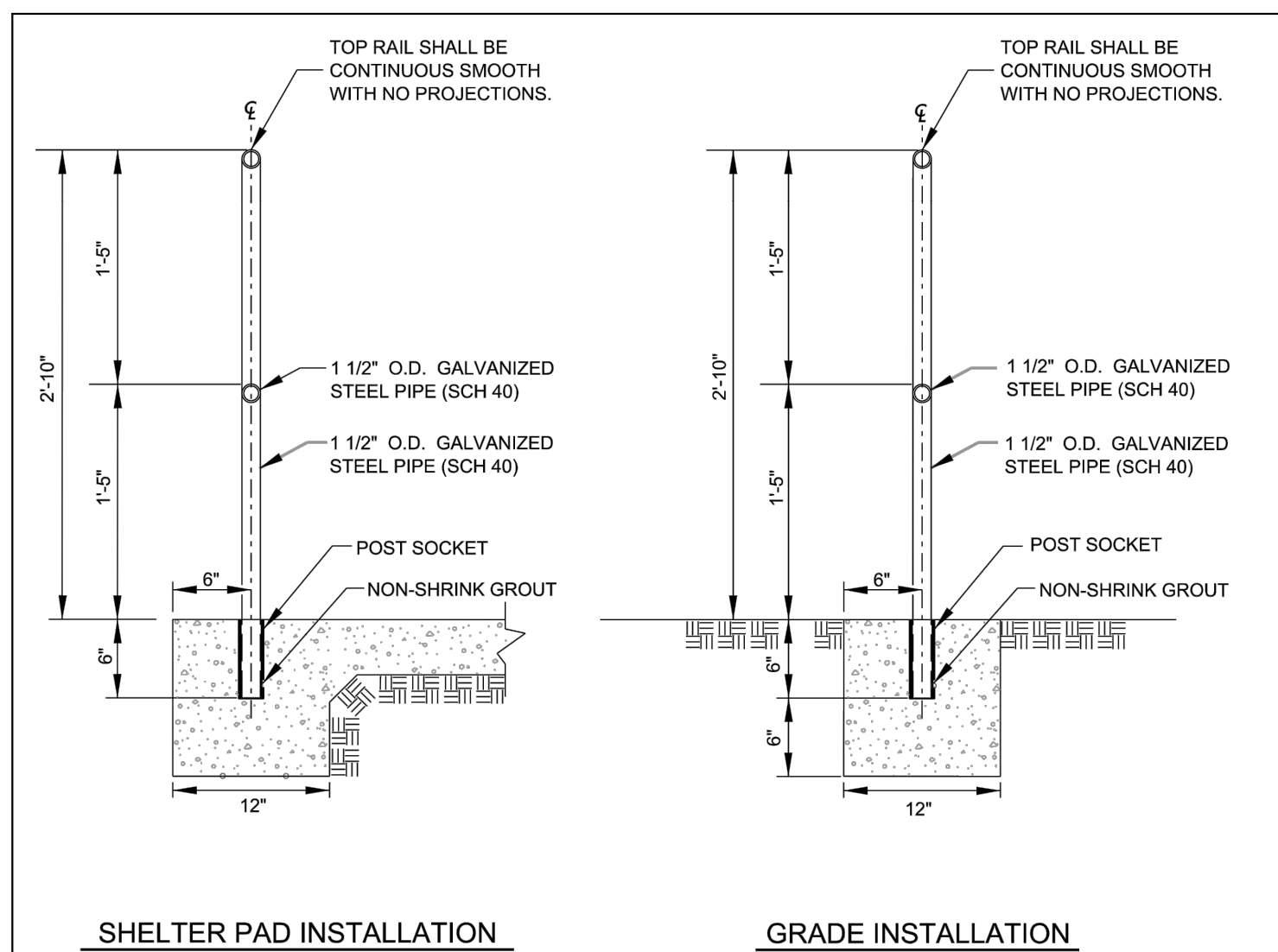


- REFERENCES:**
1. PROP. VARIABLE DEPTH ASPH. CONC. SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 112 LBS/SY PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2" IN DEPTH
 2. PROP. APPROX. 3" ASPH. SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS/SY IN EACH OF TWO LAYERS
 3. PROP. VARIABLE DEPTH ASPH. CONC. INTERMEDIATE COURSE, TYPE I19.0C AT AN AVERAGE RATE OF 114 LBS/SY PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" IN DEPTH
 4. PROP. VARIABLE DEPTH ASPH. CONC. BASE COURSE, TYPE B25.0C AT AN AVERAGE RATE OF 114 LBS/SY PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 3" OR GREATER THAN 5.5" IN DEPTH.



P:\2017 Projects\170347 Chandlers Ridge\CADD\DWG\TP SHEET\TP_170347_C802_AVERETTE.dwg

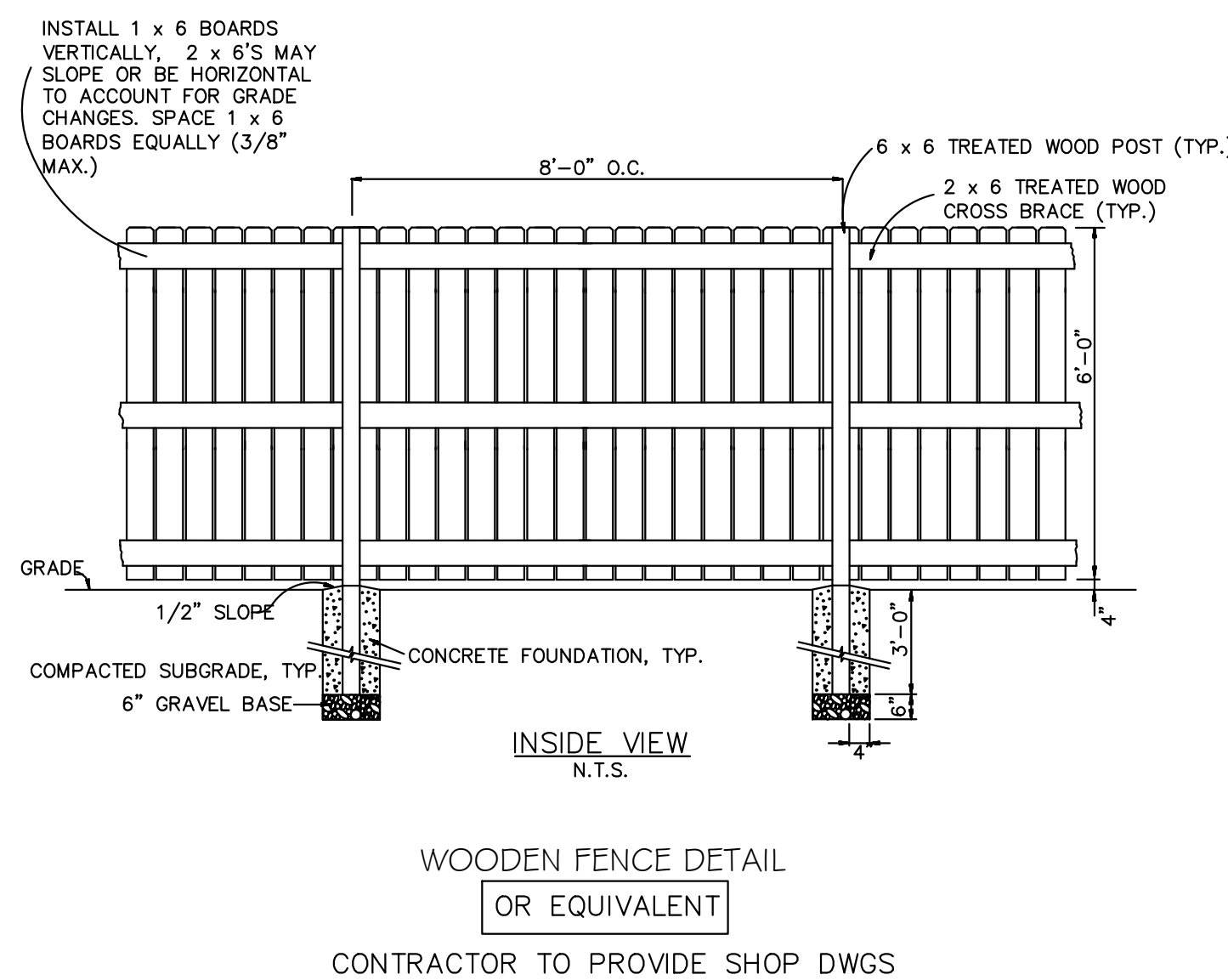
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03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
	DESCRIPTION	
	REVISIONS	



OR EQUIVALENT
 CONTRACTOR TO PROVIDE SHOP DWGS

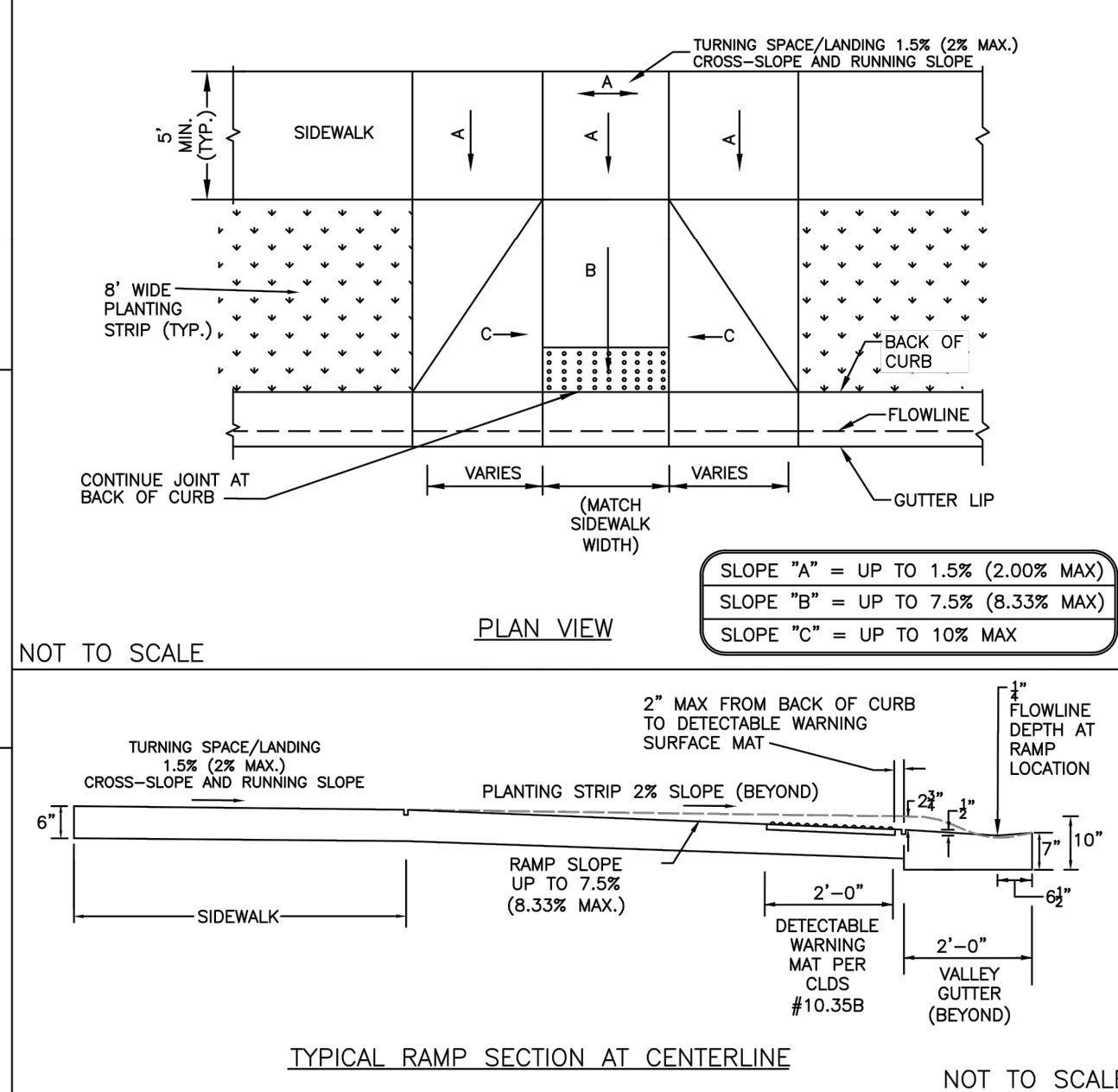
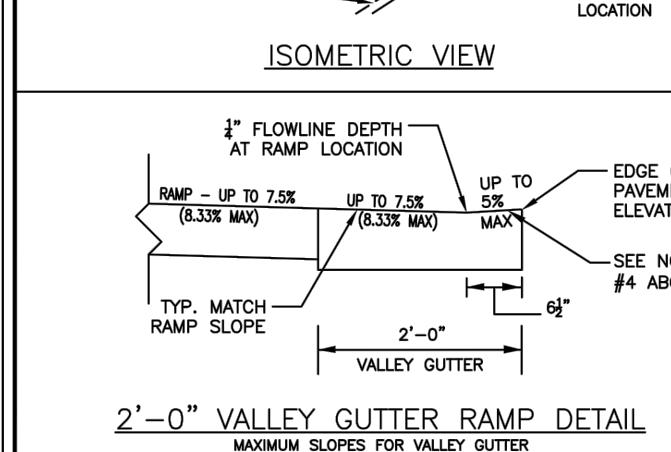
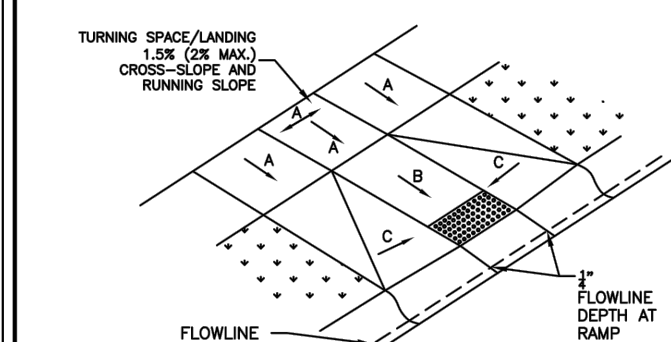
NOTES:
 CONTRACTOR TO PROVIDE FULL SHOP DRAWINGS FOR HANDRAIL PRIOR TO INSTALLING.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE	NOT TO SCALE
	8/17/18	
HANDRAIL INSTALLATION		
TT-07		



NOTES:

- ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
- TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
- MAINTAIN POSITIVE DRAINAGE ALONG THE LIP OF GUTTER IN RAMP. IN FLAT AREAS, ADDITIONAL CATCH BASINS MAY BE REQUIRED ON THE SIDES OF THE RAMP TO MINIMIZE STANDING WATER AT THE RAMP LOCATION.
- IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.3%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.3%.



Outdoor Lighting
Traditional LED

Light source: LED (integrated)
 Voltage: 120
 Lumens: 3,100
 Light pattern: ESM Type II (wide)
 ESM output classification: Semi-cutoff
 Color temperature: 4,000K
 Warmup and cool-down time: Instant on (no warm-up or cool-down time)

LED (light-emitting diode) 50-watt
 Mounting height: 12'
 Color: Black
 Poles: Cast-aluminum, Victorian concrete, Washington concrete
 Applications: Magnificent, Parks, Shopping centers, Streets

OR EQUIVALENT
 DUKE ENERGY TO PROVIDE FINAL DESIGN

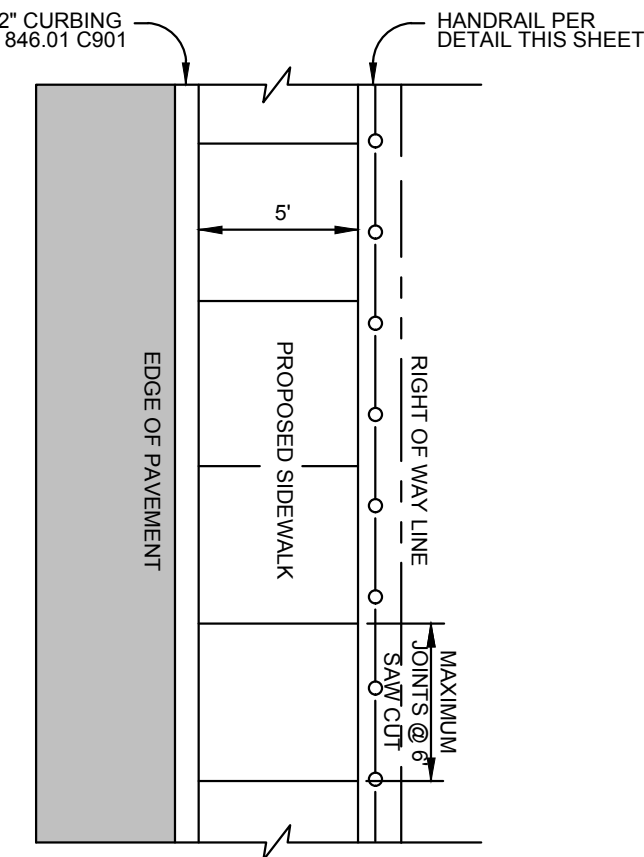
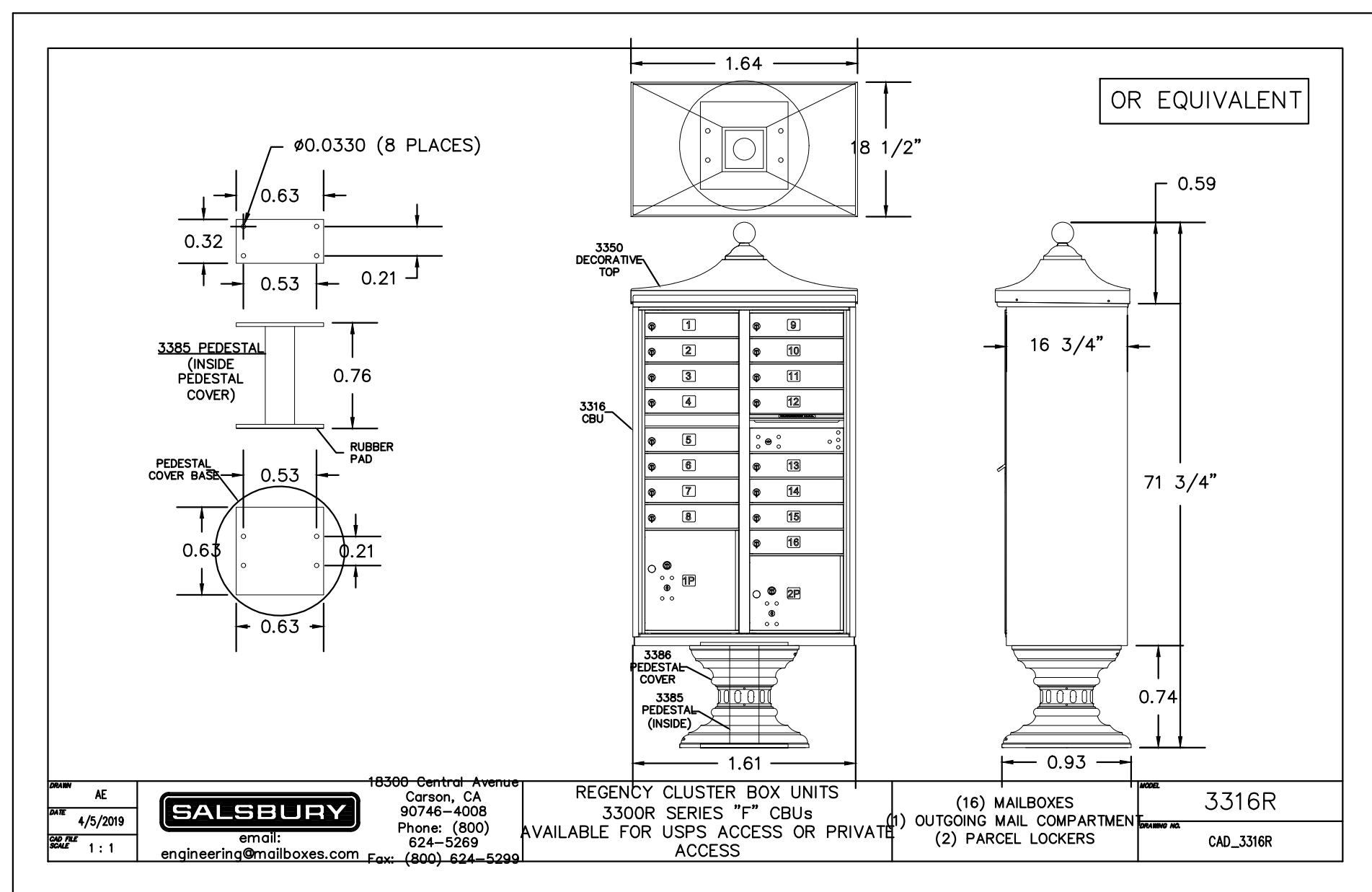
Outdoor Lighting
Traditional LED

Light source: LED (integrated)
 Voltage: 120
 Lumens: 3,100
 Light pattern: ESM Type II (wide)
 ESM output classification: Semi-cutoff
 Color temperature: 4,000K
 Warmup and cool-down time: Instant on (no warm-up or cool-down time)

Poles available:
 Color: Black, Gray-green, Black, Gray
 Mounting height: 12'
 Material: Cast-aluminum, Victorian concrete, Washington concrete

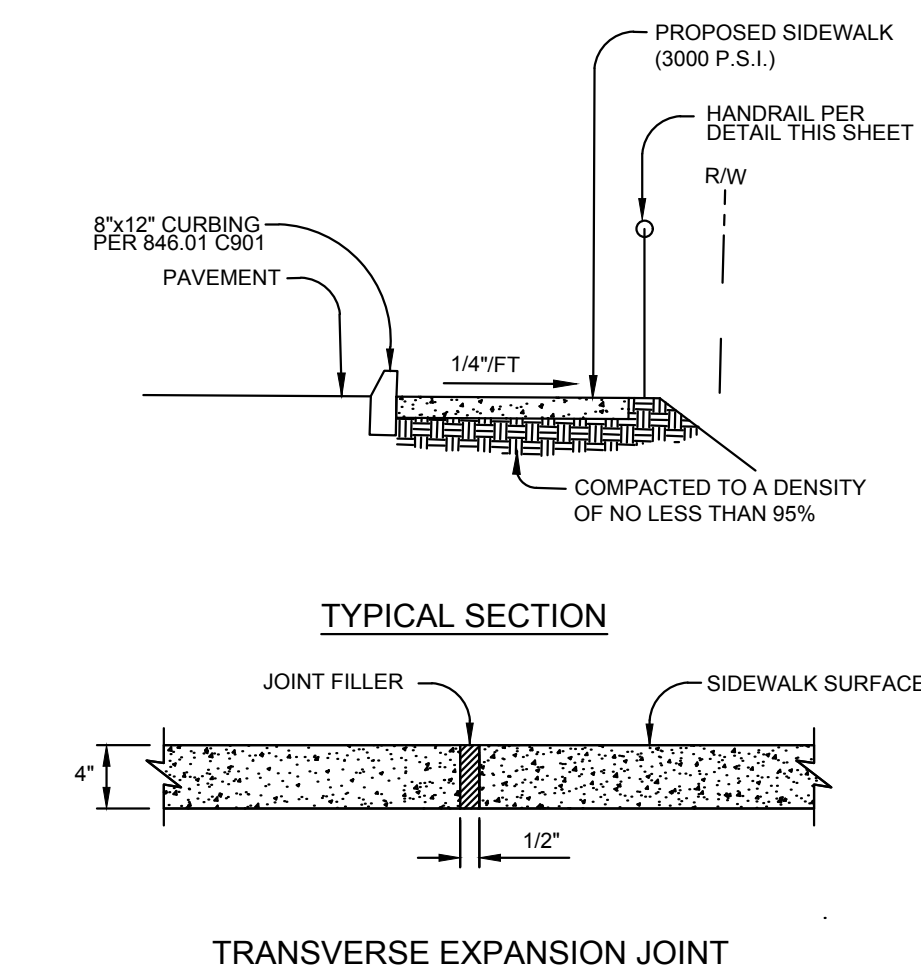
Features:
 Little or no installation cost
 Design services by lighting professionals included
 Maintenance included
 Electricity included
 Warranty included
 One low monthly cost on your electric bill
 Transfer available
 Backed by over 40 years of experience

Benefits:
 Saves up capital for other projects
 Meets industry standards and lighting ordinances
 Eliminates sign and unneeded repair bills
 Less expensive than incandescent service
 Worry-free
 Convenience and savings for you
 Provides hassle-free installation and service
 A name you can trust today ... and tomorrow

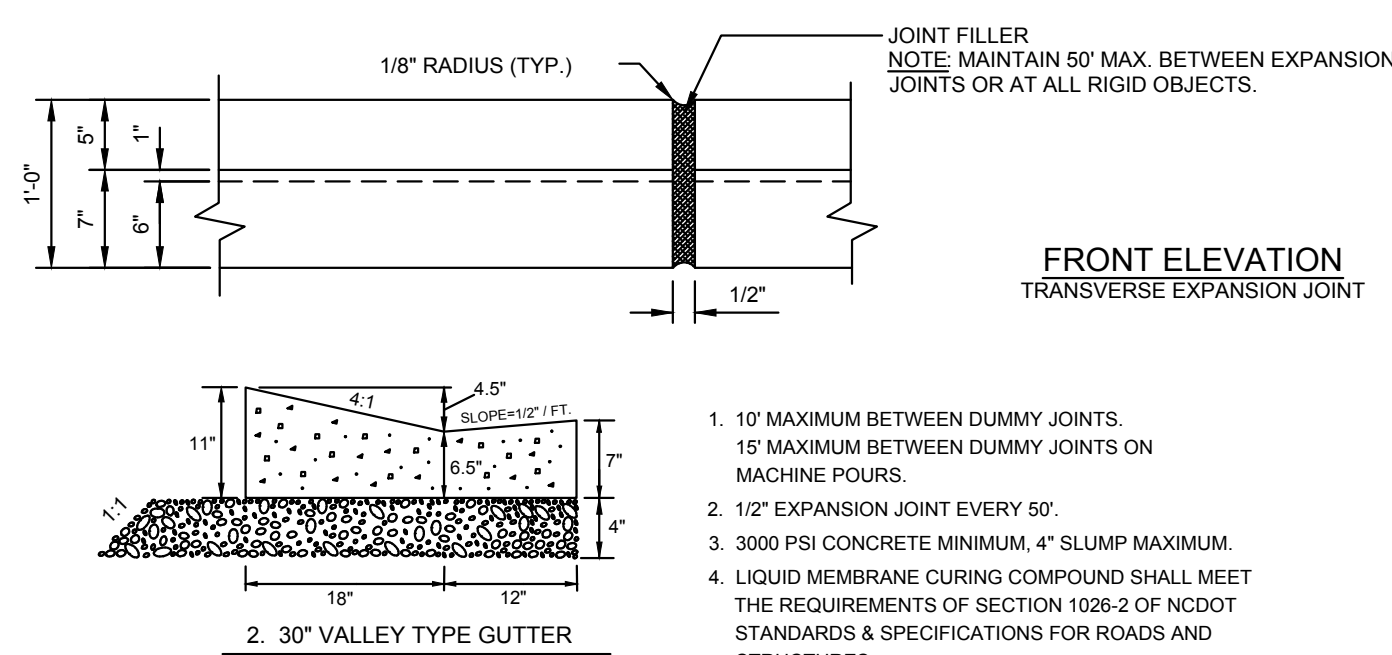


PLAN VIEW

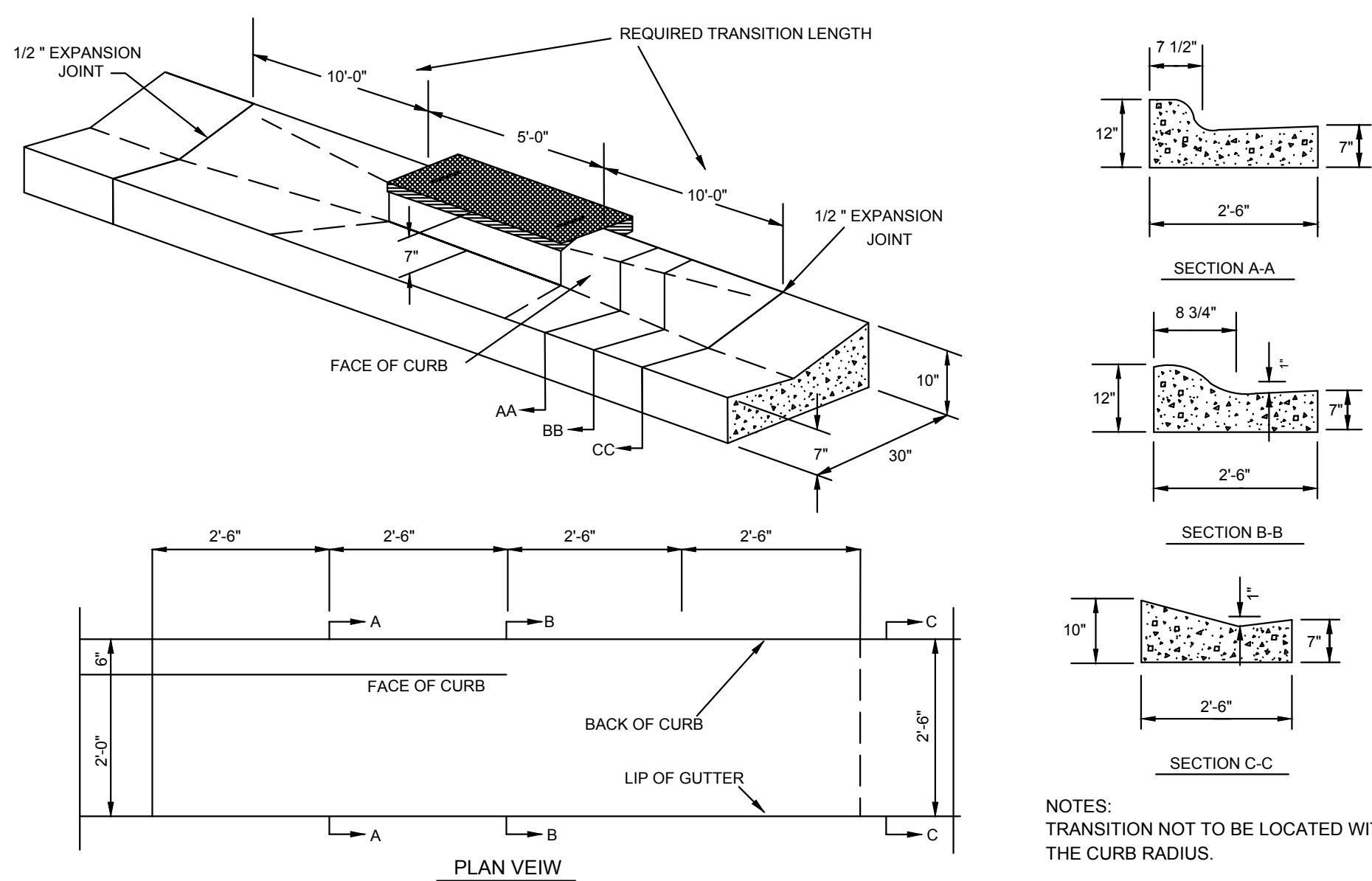
- NOTES:
- TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET.
 - ALL CONCRETE TO BE 3000 PSI AND FINISHED WITH CURING COMPOUND.
 - A 6 INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND IN THE HANDICAP RAMPS.
- T-30.01C (AT STREAM CROSSINGS)**



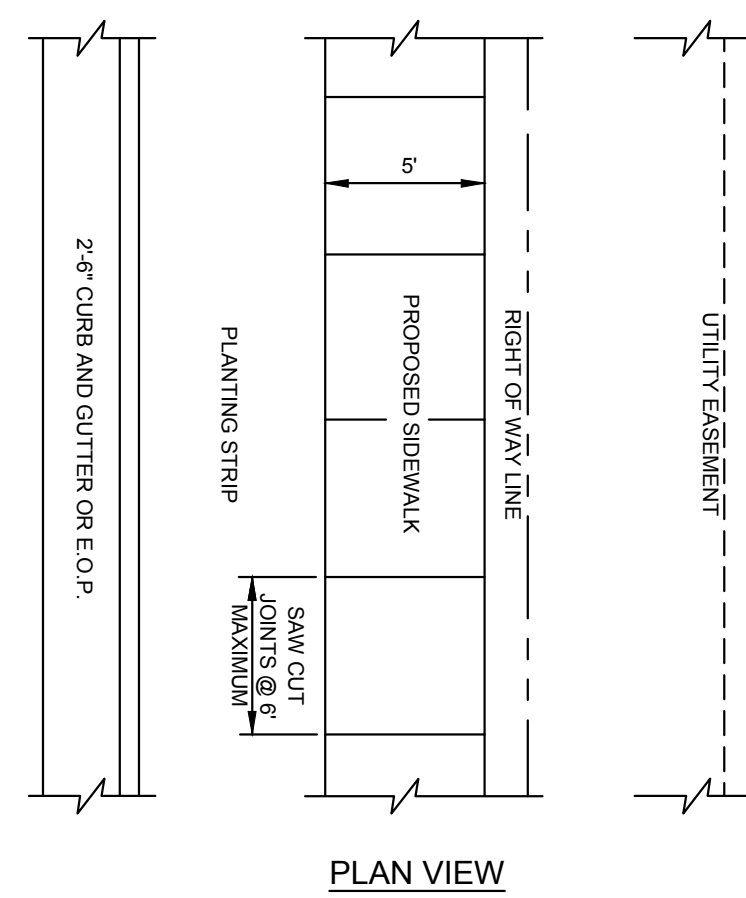
TRANSVERSE EXPANSION JOINT



CURB AND GUTTER
T-10.26.1
TOWN OF ROLESVILLE STREETS CURB



NOTES:
 TRANSITION NOT TO BE LOCATED WITHIN THE CURB RADIUS.



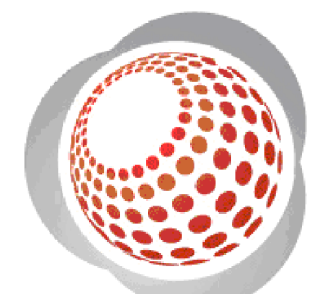
PLAN VIEW

- NOTES:
- TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET.
 - ALL CONCRETE TO BE 3000 PSI AND FINISHED WITH CURING COMPOUND.
 - A 6 INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND IN THE HANDICAP RAMPS.

CONCRETE SIDEWALK R2 LOTS
T-30.01



Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FRM No. C-2378



CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION

410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

SITE / NCDOT
DETAILS

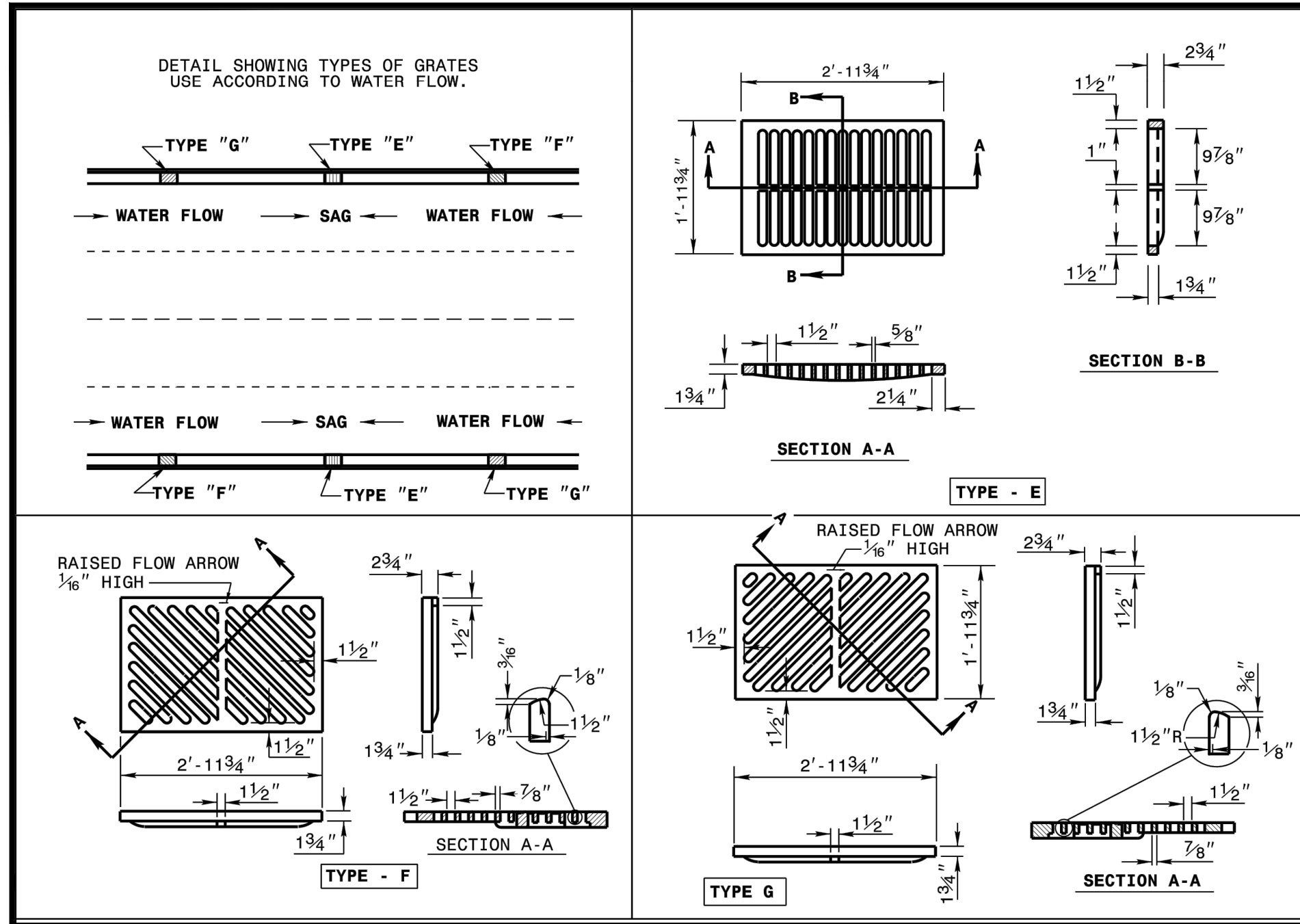
Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS
 Scale:

Date: 09/08/2020

Project Number: P170347

SHEET
C900

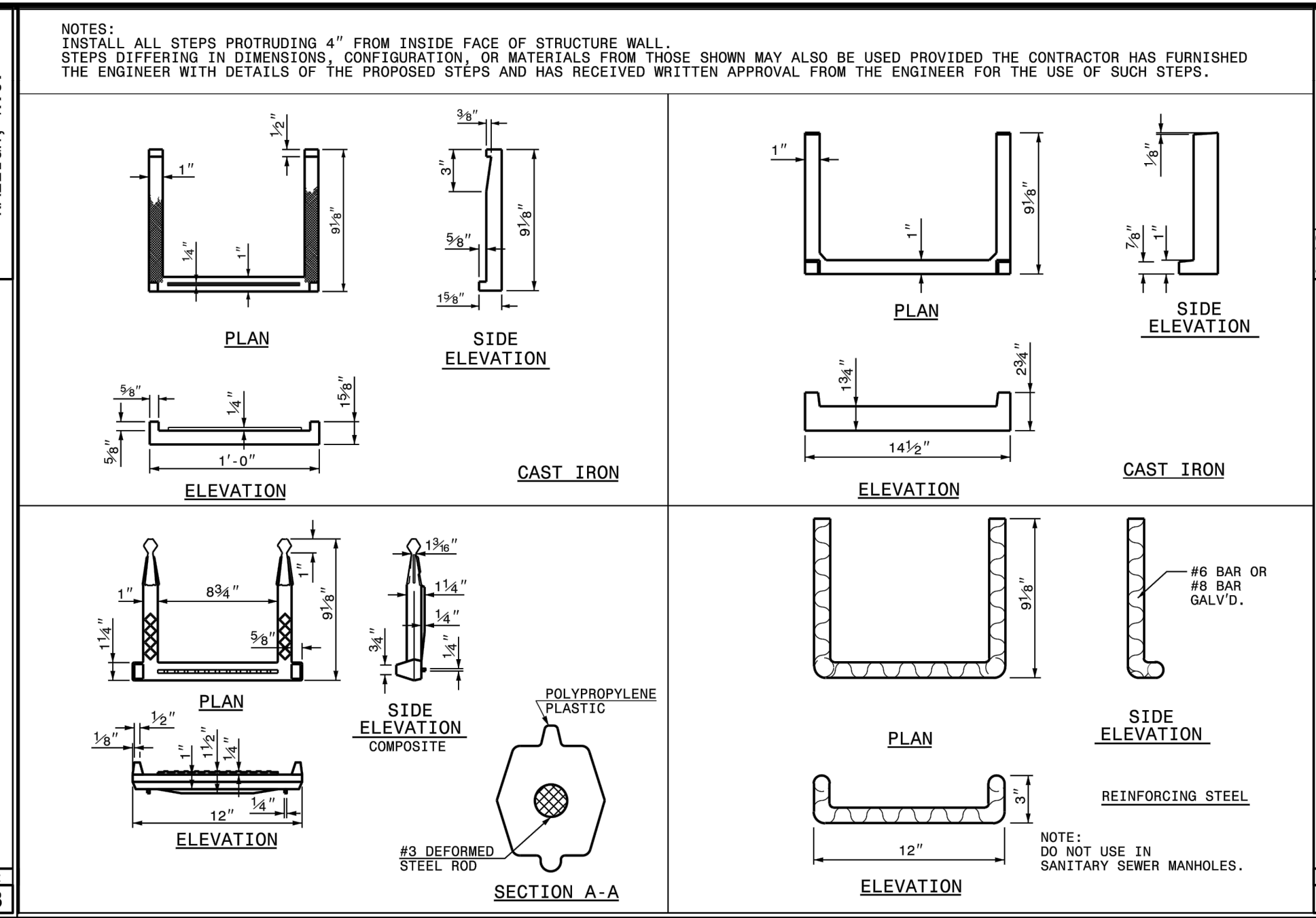
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02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE
REVISIONS		



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN

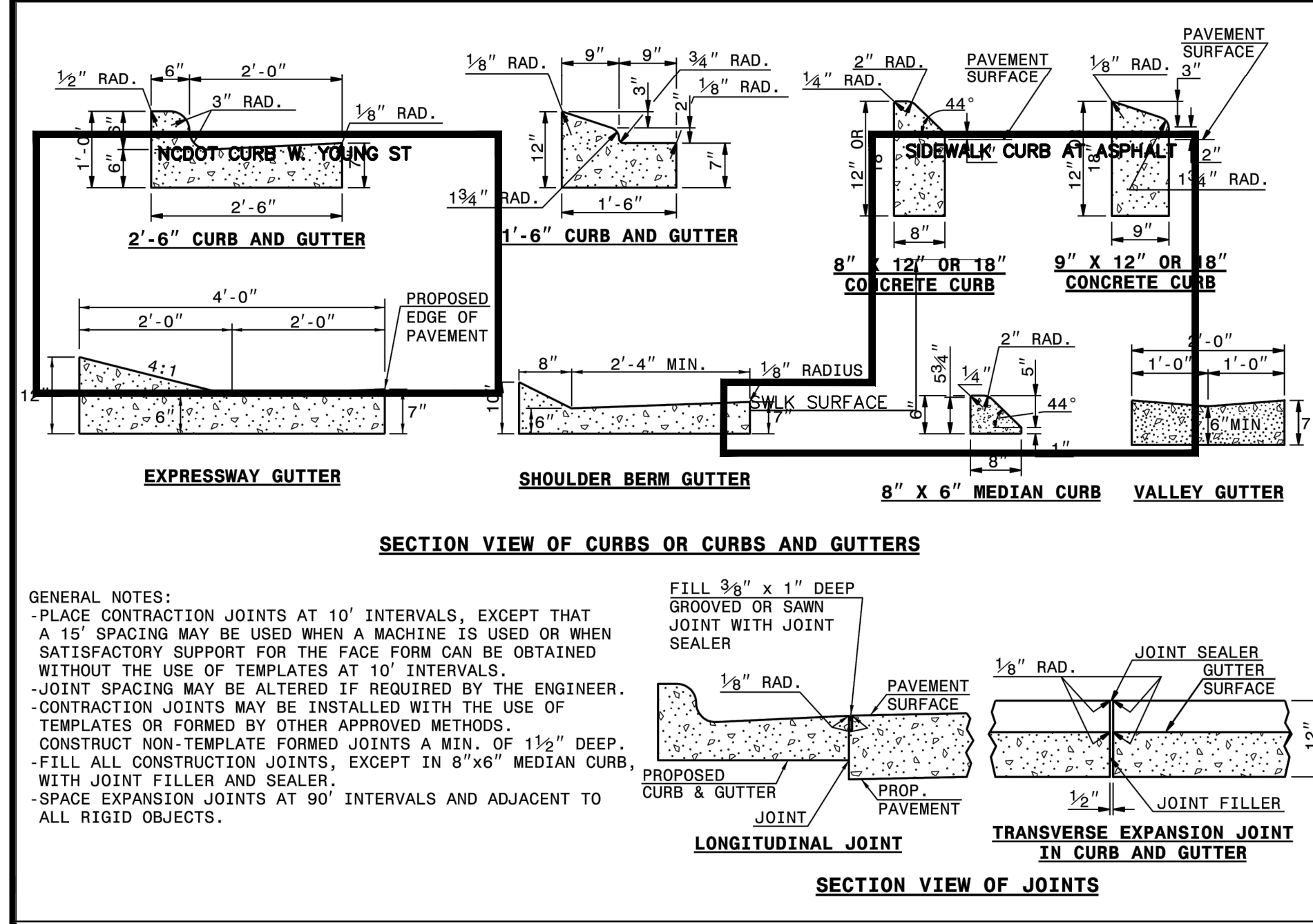
SHEET 2 OF 2
840.03



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
DRAINAGE STRUCTURE STEPS

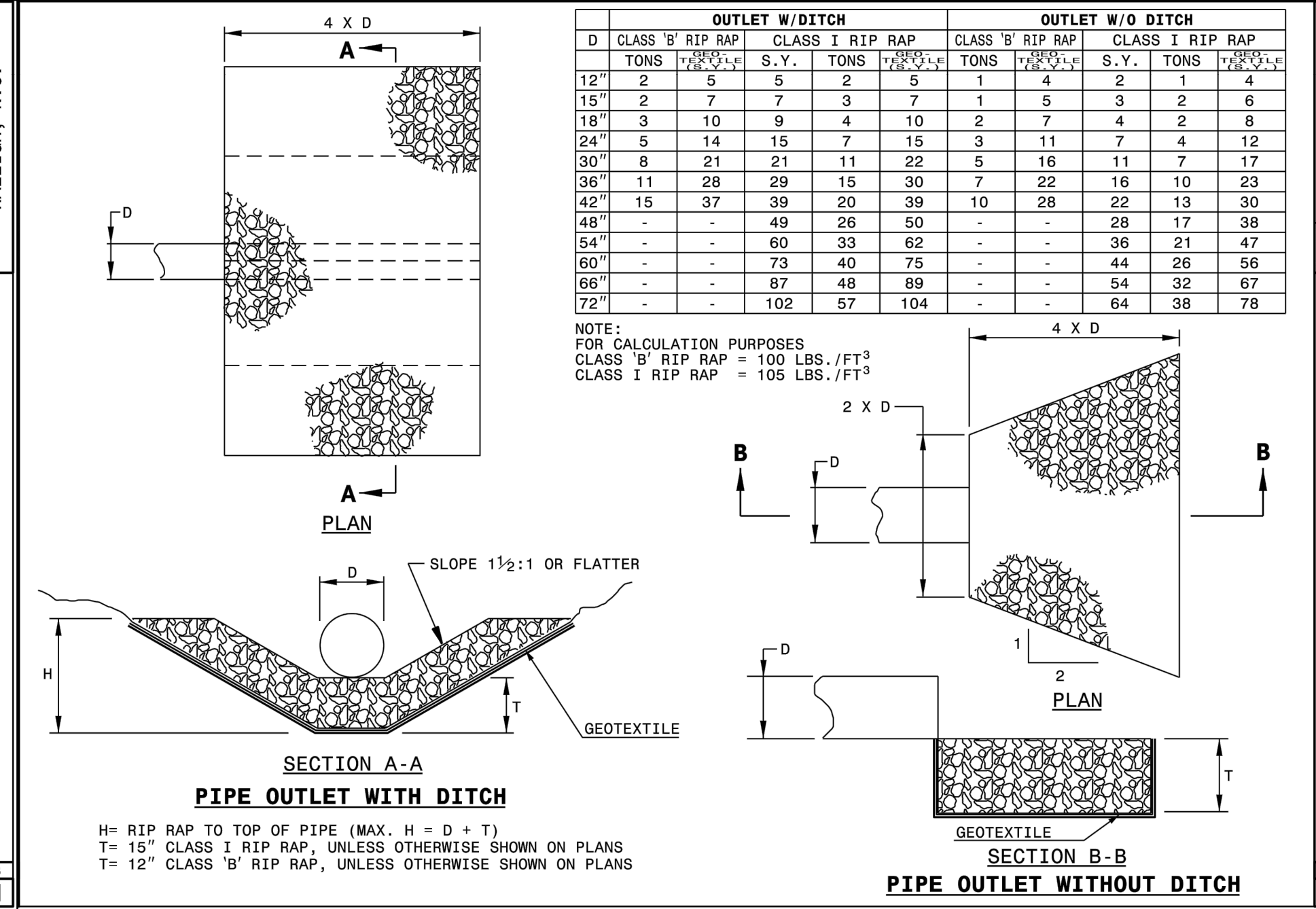
SHEET 1 OF 1
840.66



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CONCRETE CURB, GUTTER
AND CURB & GUTTER

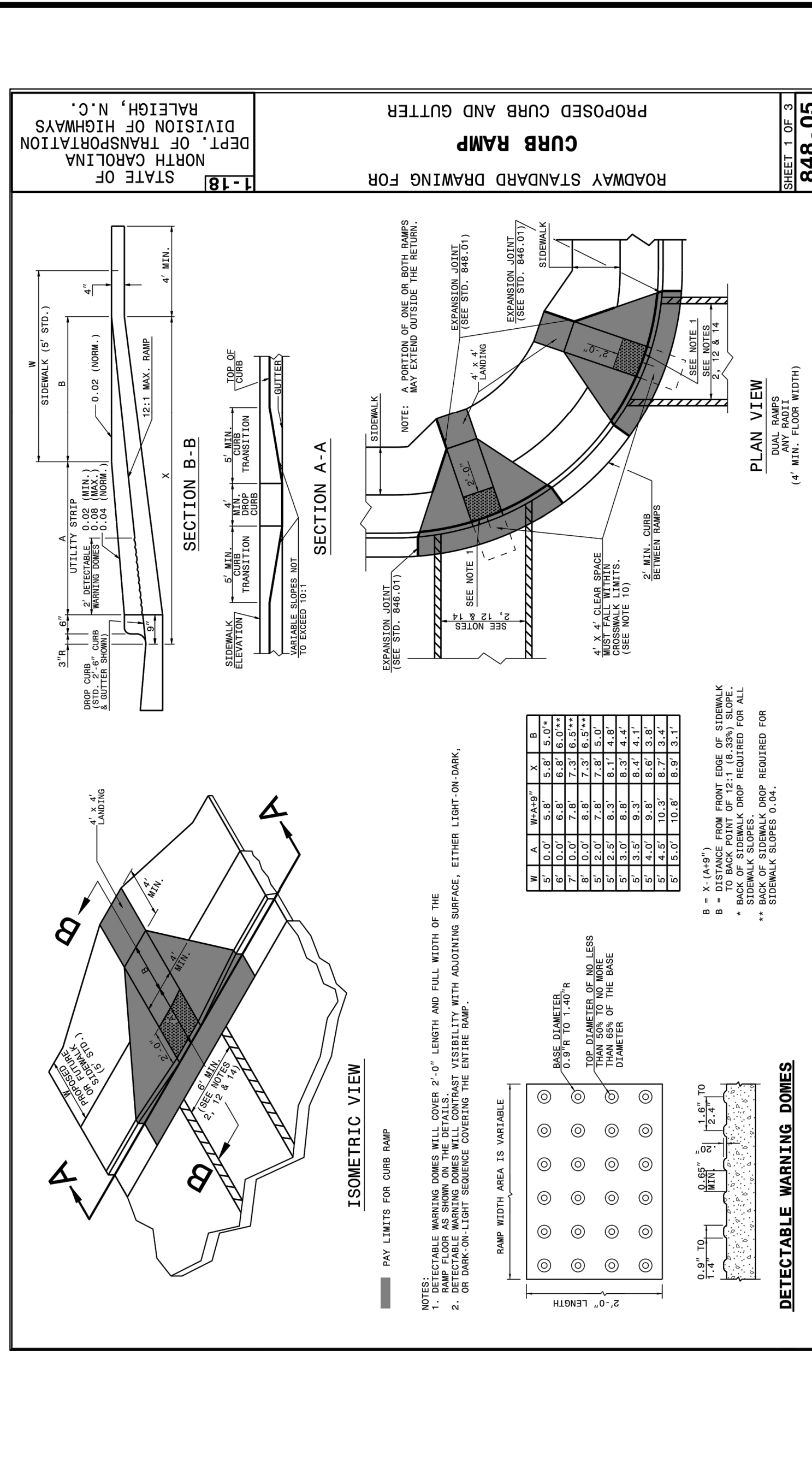
SHEET 1 OF 3
846.01



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
GUIDE FOR RIP RAP AT PIPE OUTLETS

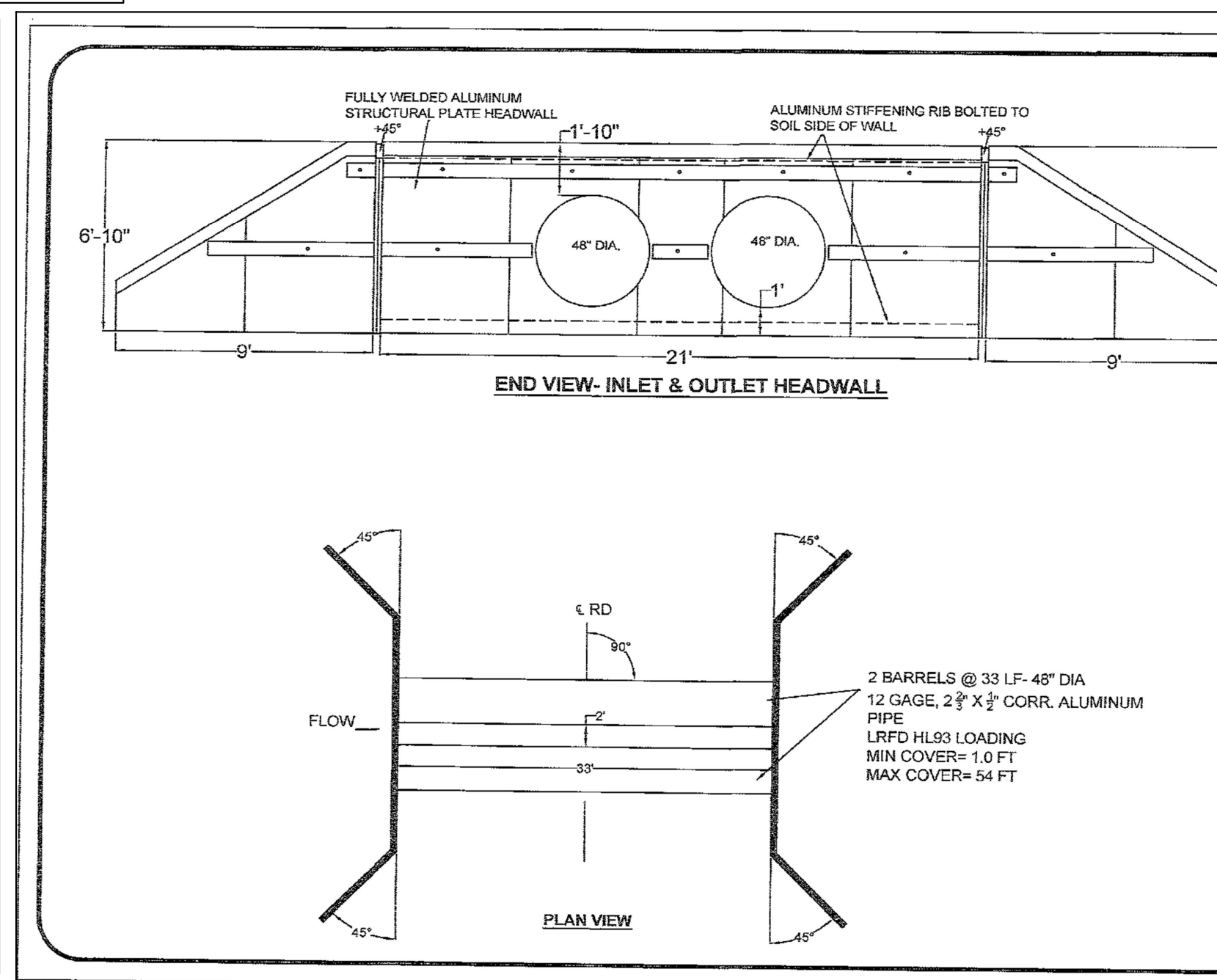
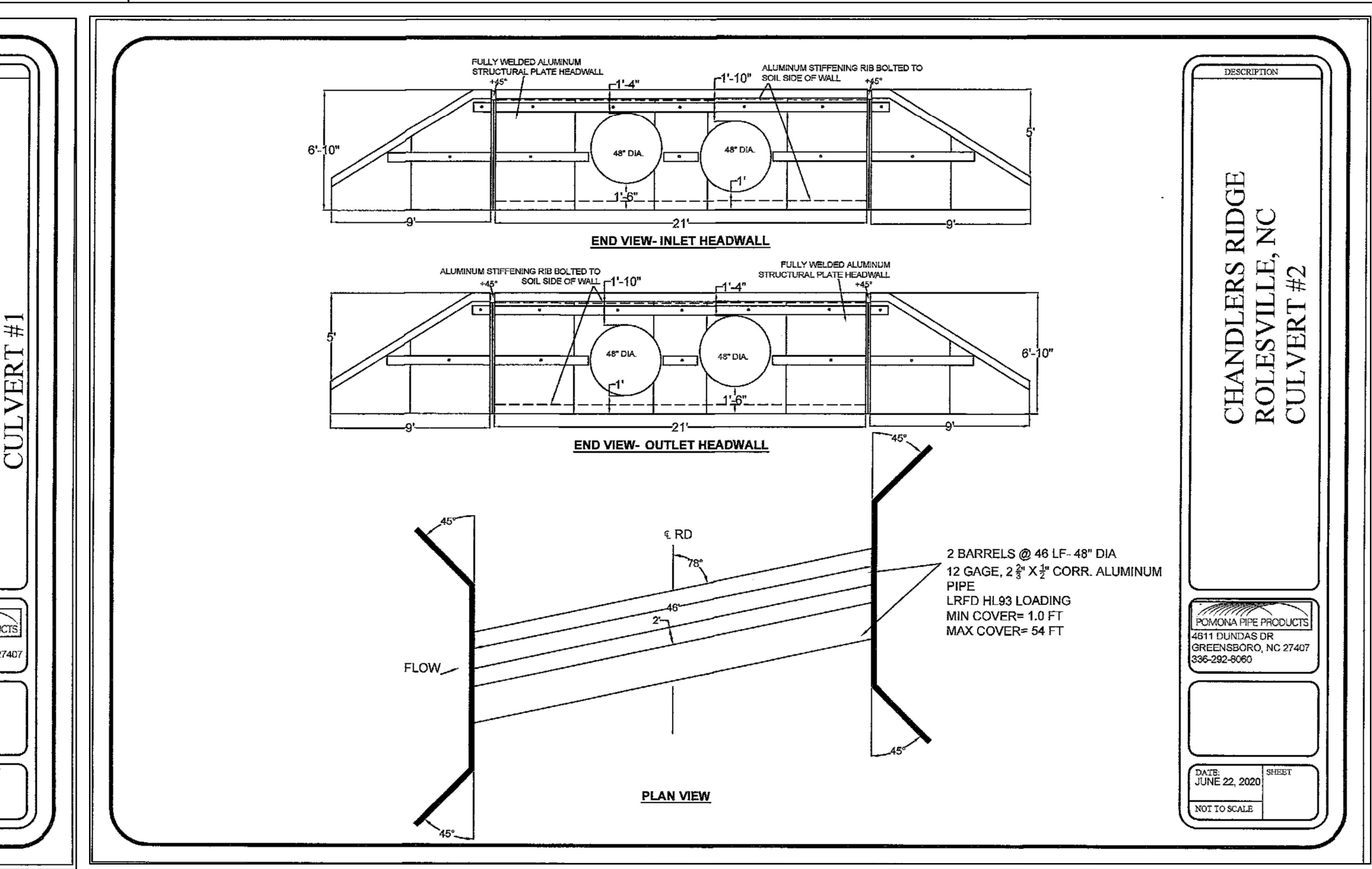
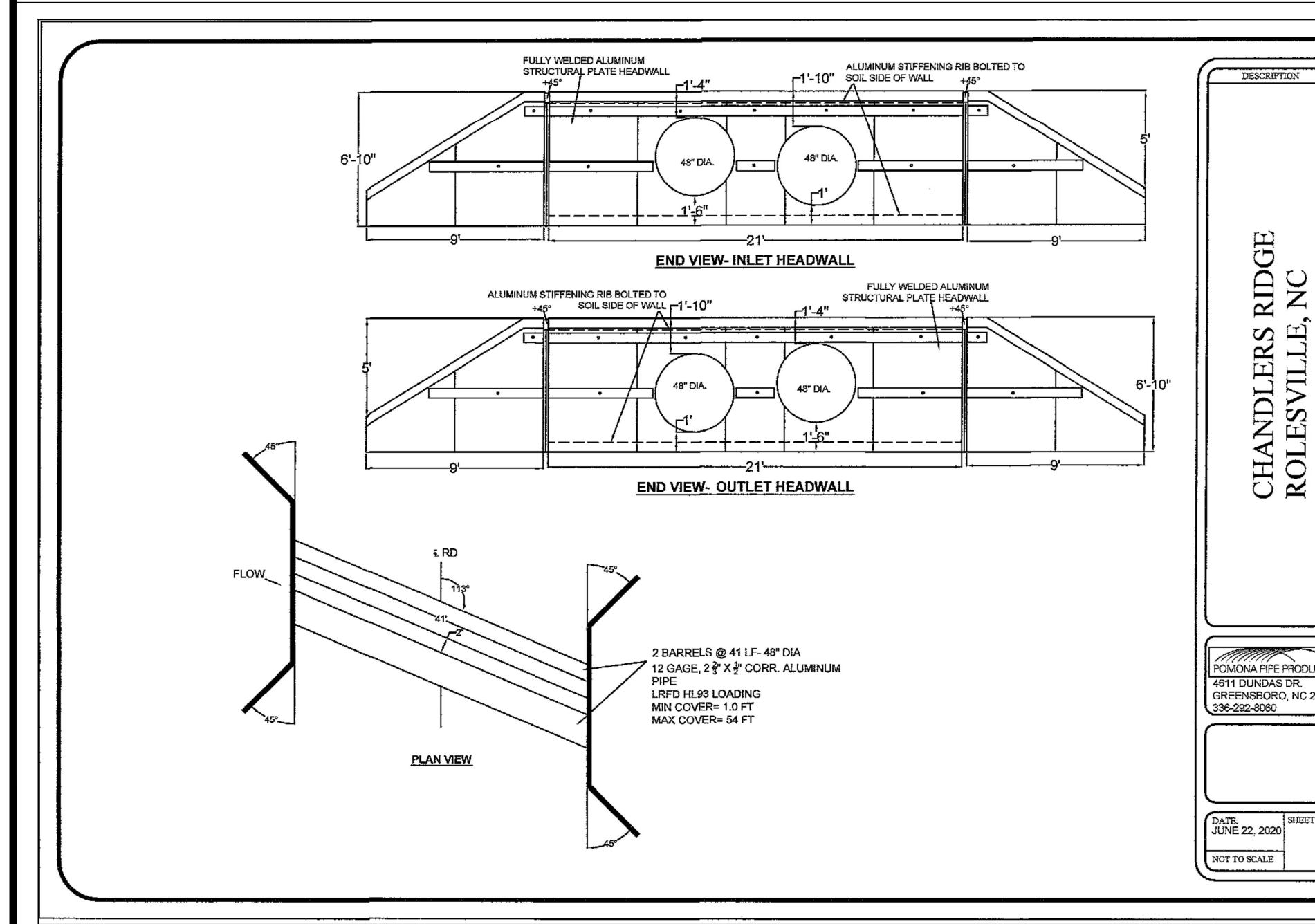
SHEET 1 OF 1
876.02



STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP

SHEET 1 OF 3
848.05



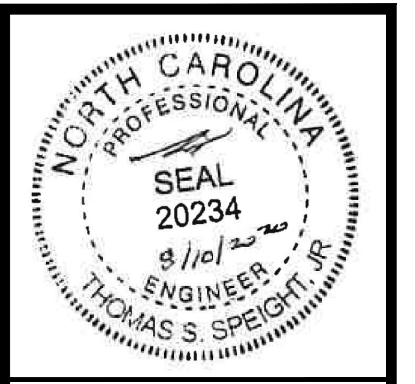
CHANDLERS RIDGE
ROLESVILLE, NC
CULVERT #3

DATE: 09/11/2020
BY: TSS
NOT TO SCALE

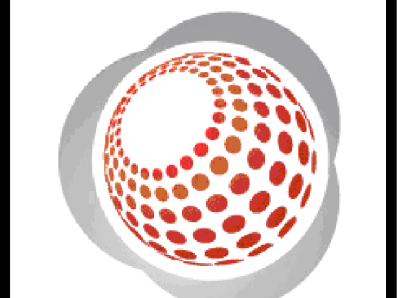
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02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE

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01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE

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01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE



Bateman Civil Survey Company
Engineers • Surveyors • Planners
2524 Reliance Avenue, Apex, North Carolina 27559
Phone: 919.577.1080 Fax: 919.577.1081
NCBLS FRM No. C-2378

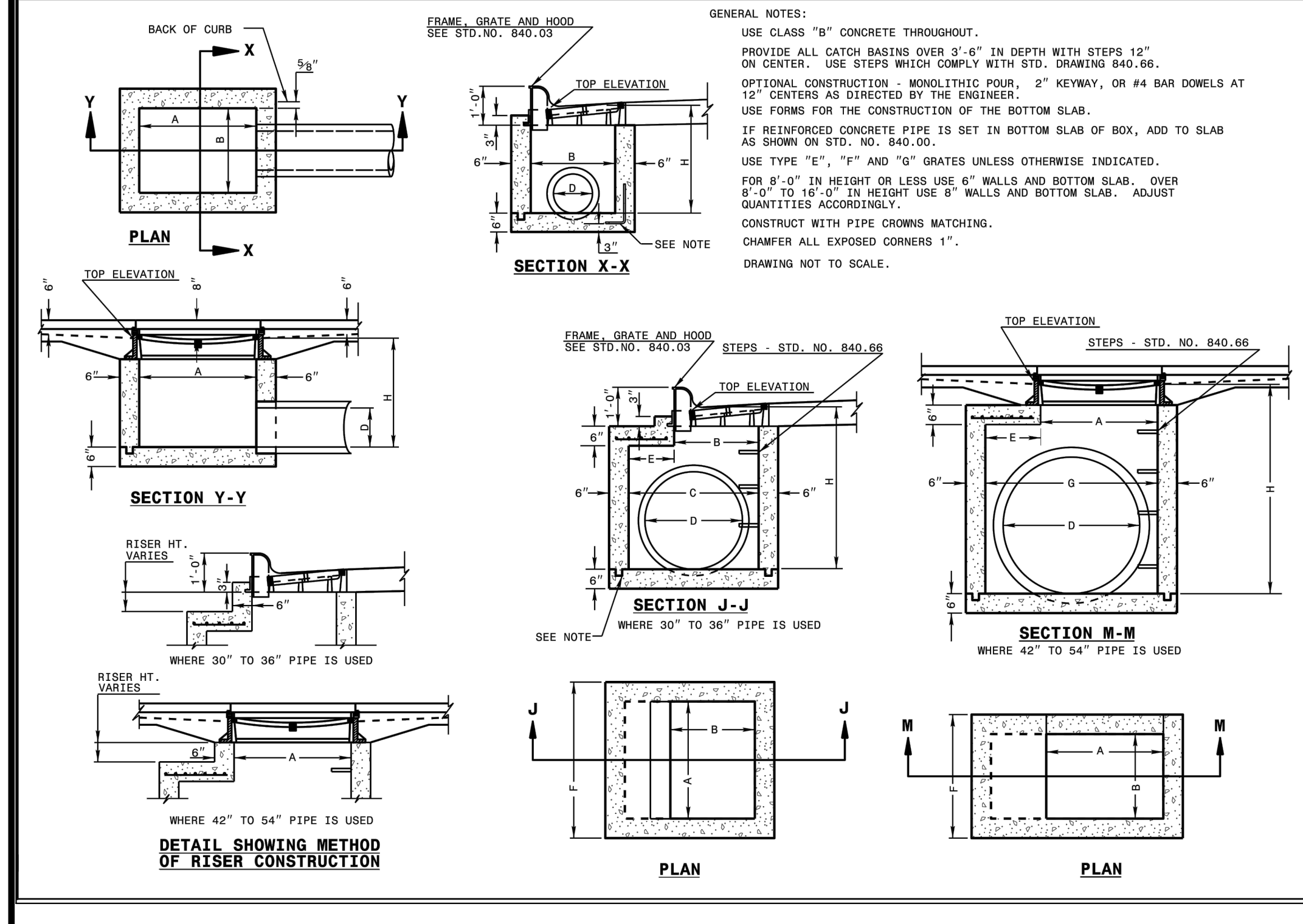


**CHANDLERS RIDGE
CONSERVATION DOCUMENTS
CONSERVATION SUBDIVISION**
410 W. YOUNG ST.
ROLESVILLE, NC
WAKE COUNTY

**NCDOT
DETAILS**

Project Engineer: TSS
Designed By: TEP
Drawn By: TEP
Checked By: TSS
Scale:
Date: 09/08/2020
Project Number: P170347
SHEET
C901

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
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01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE

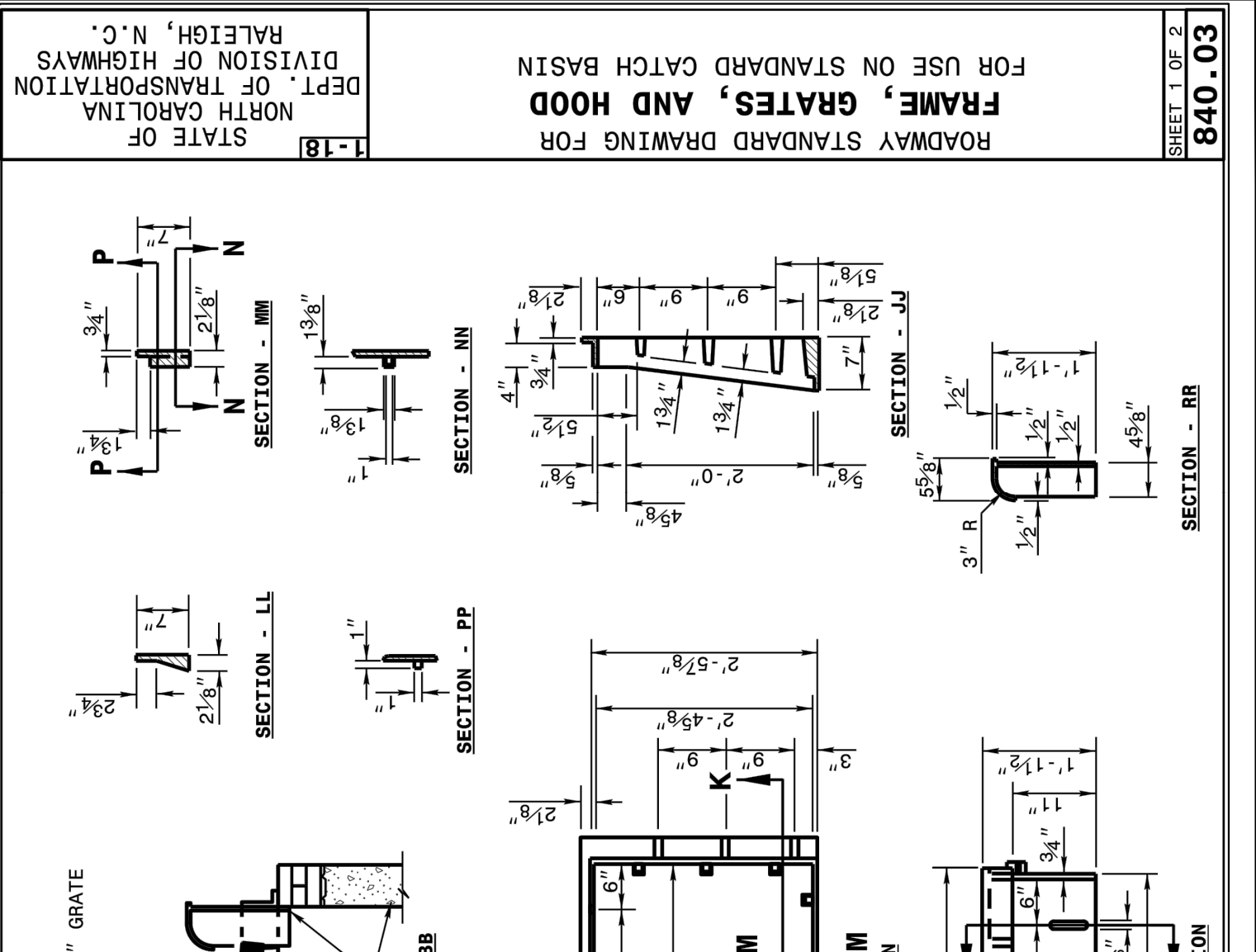
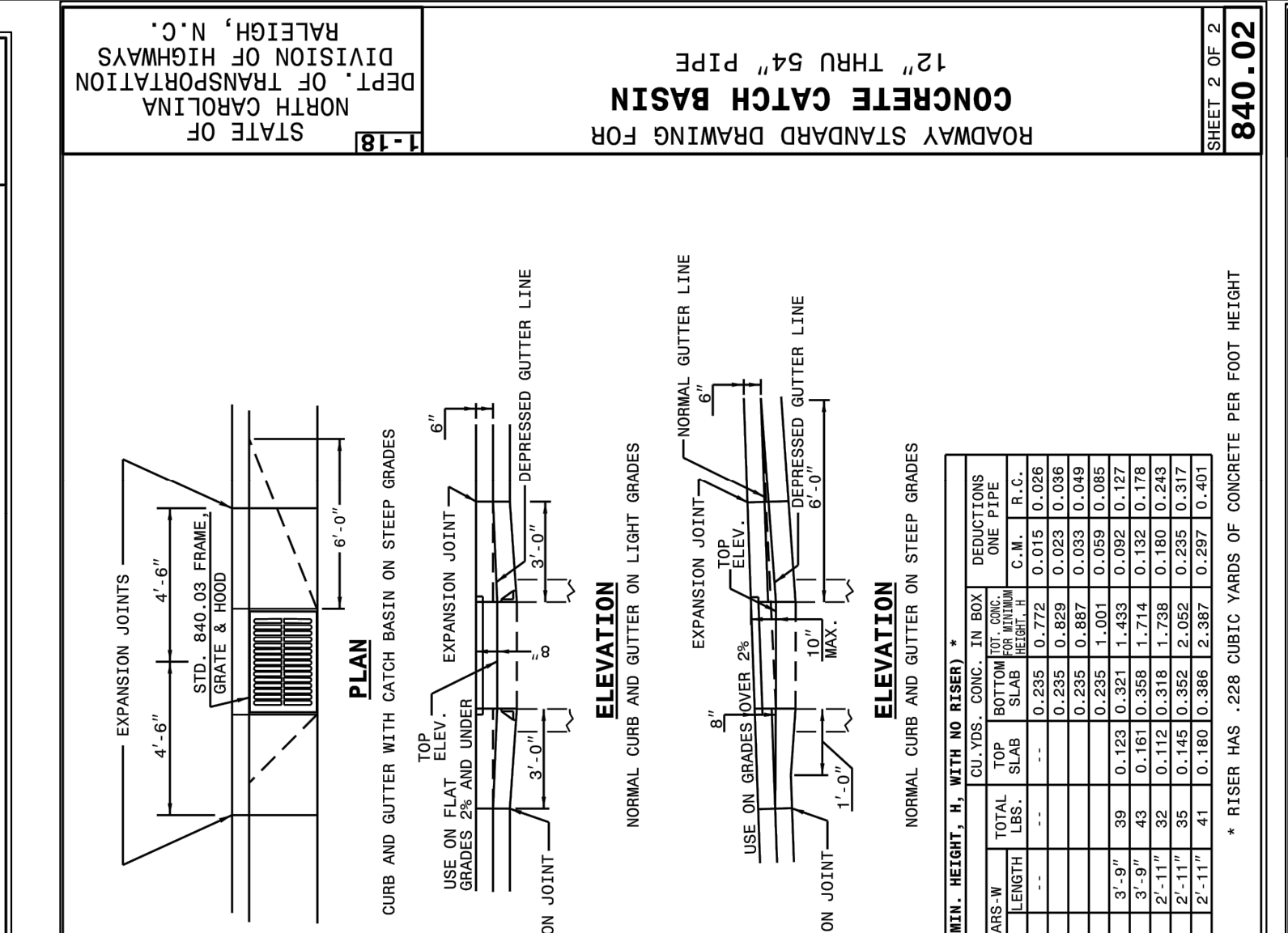
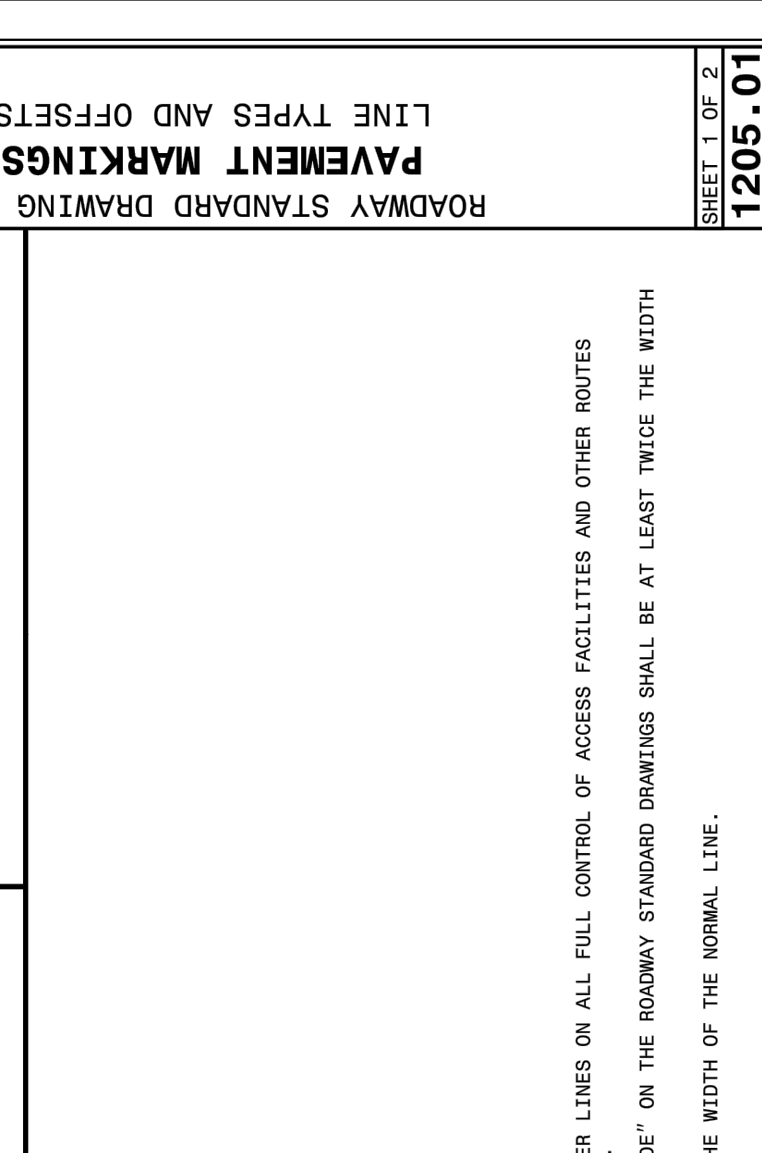
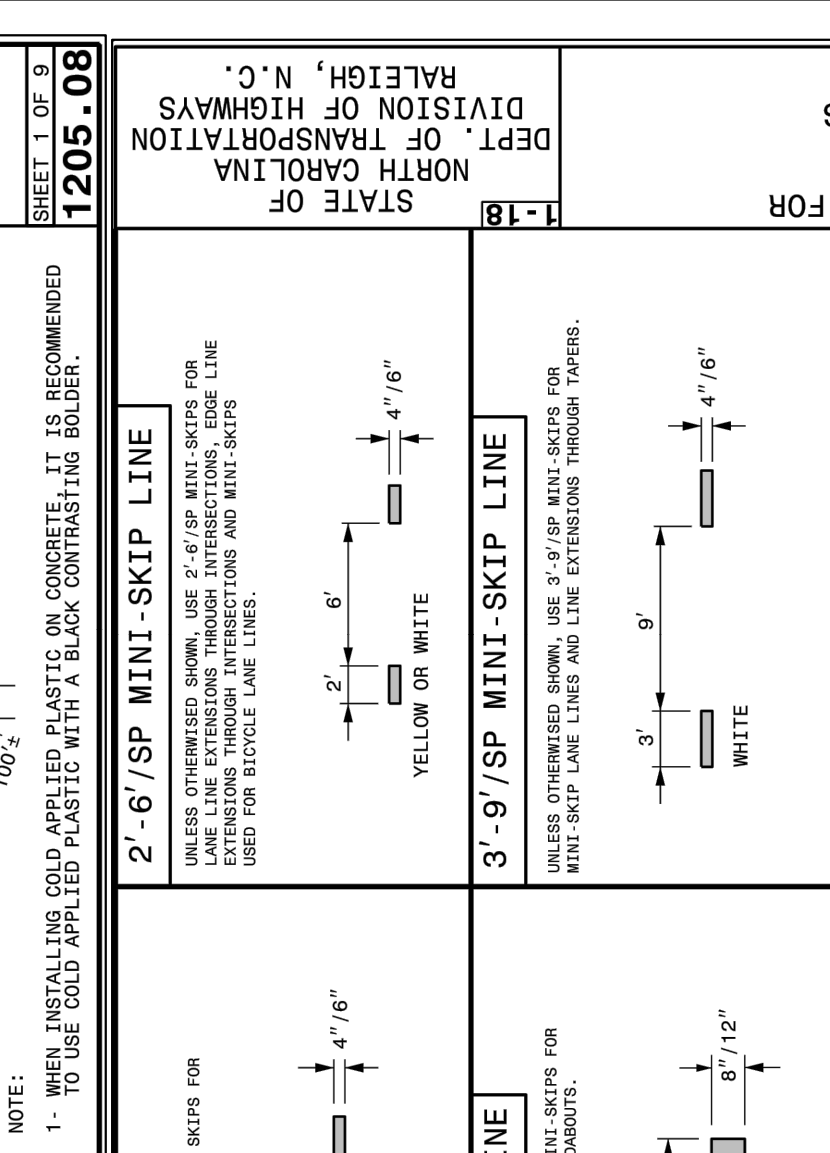
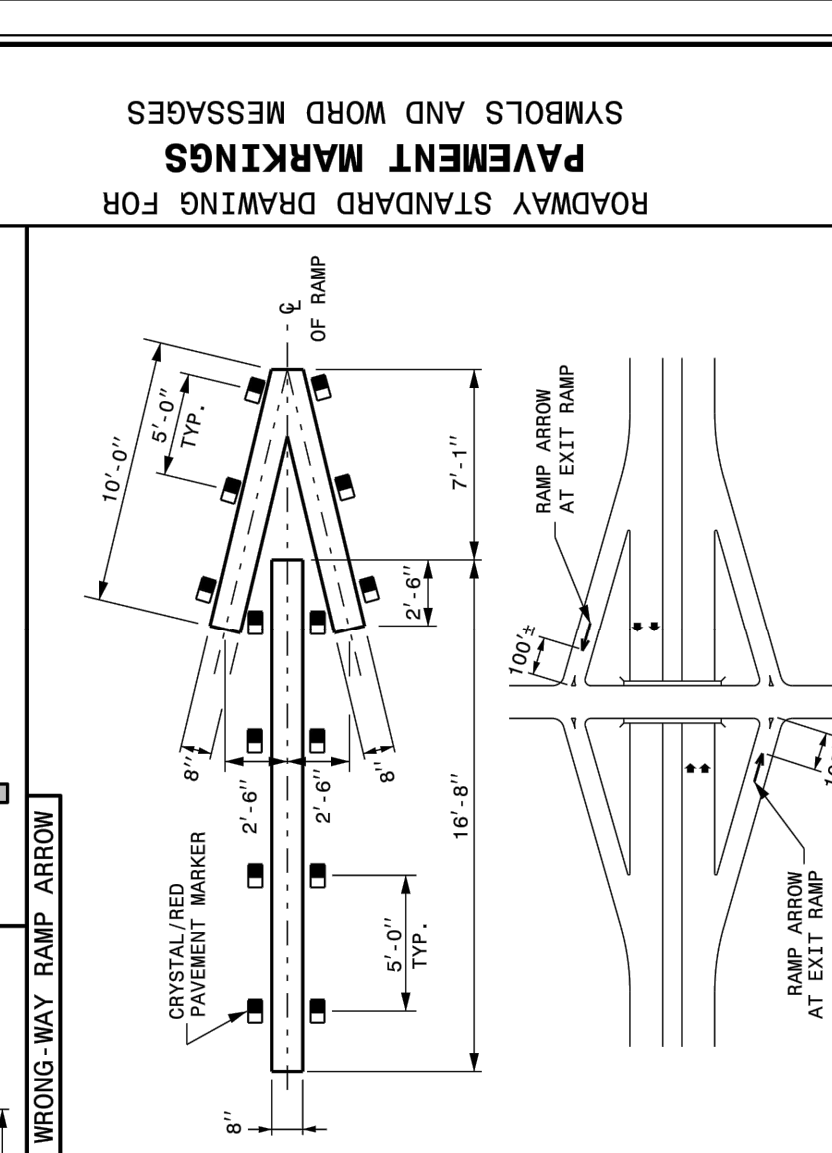
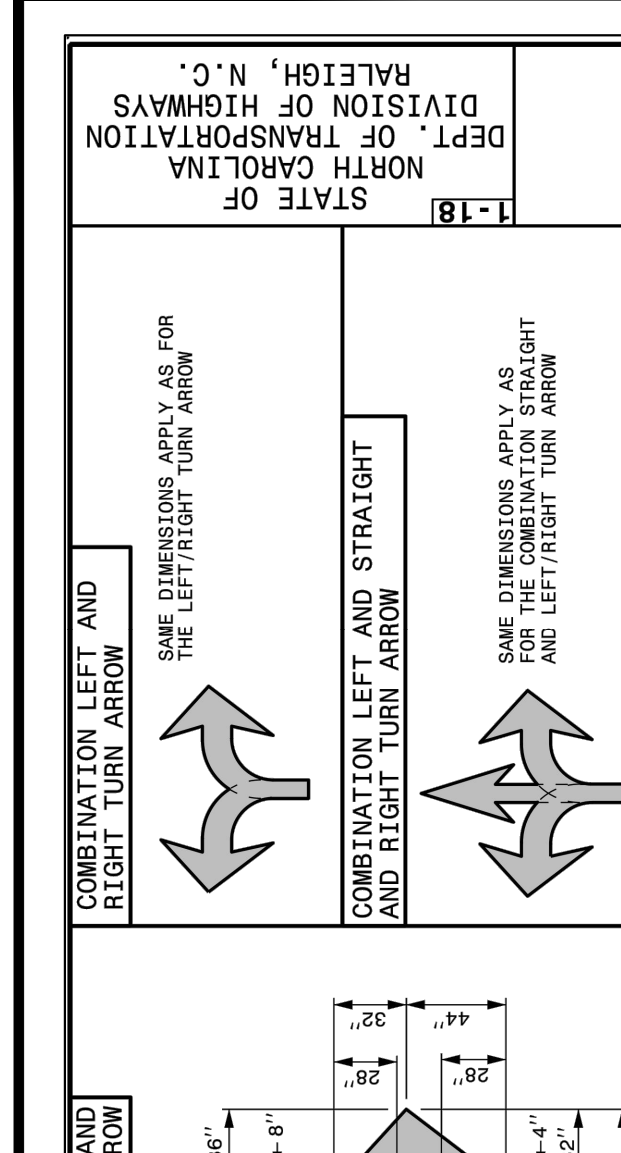
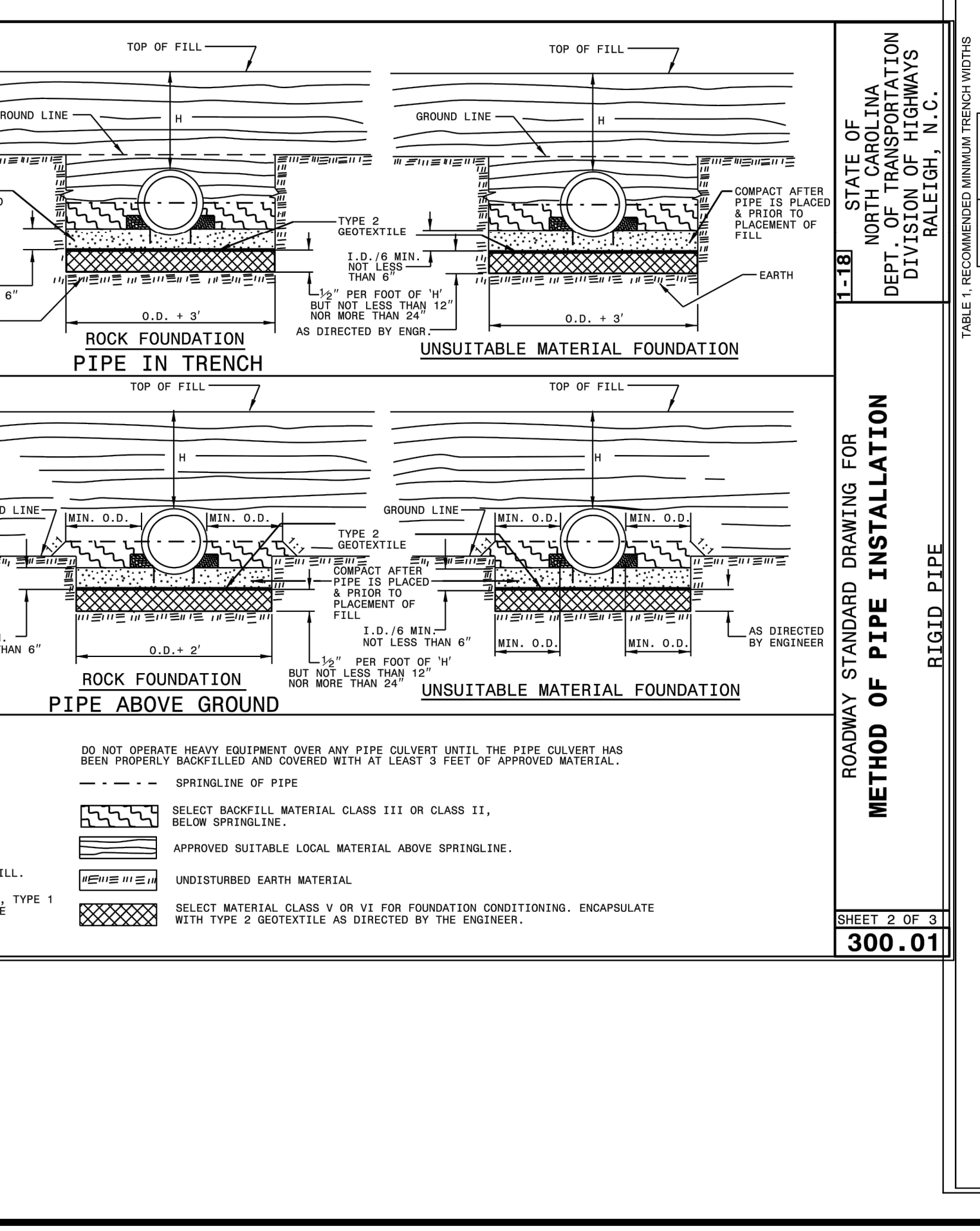
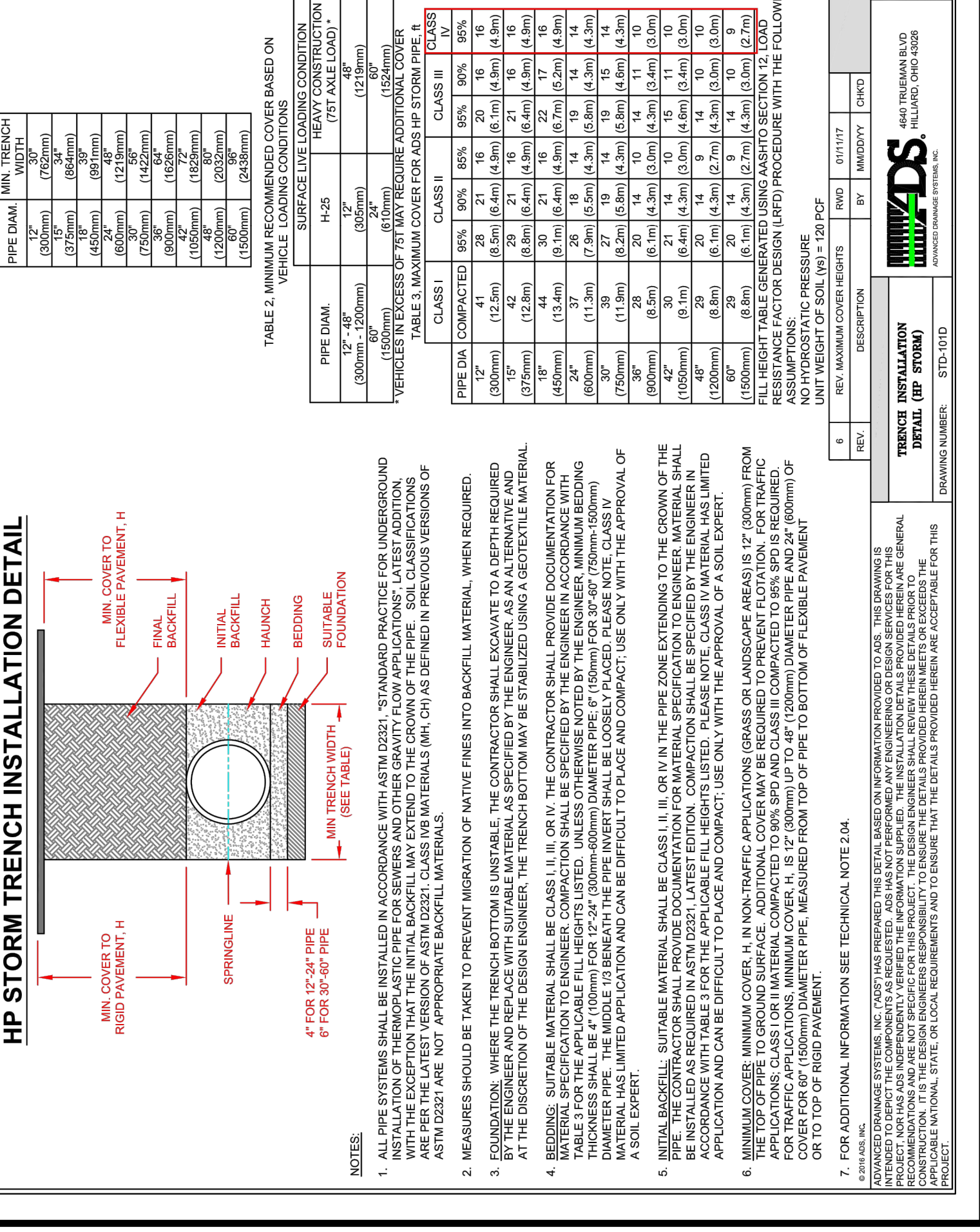
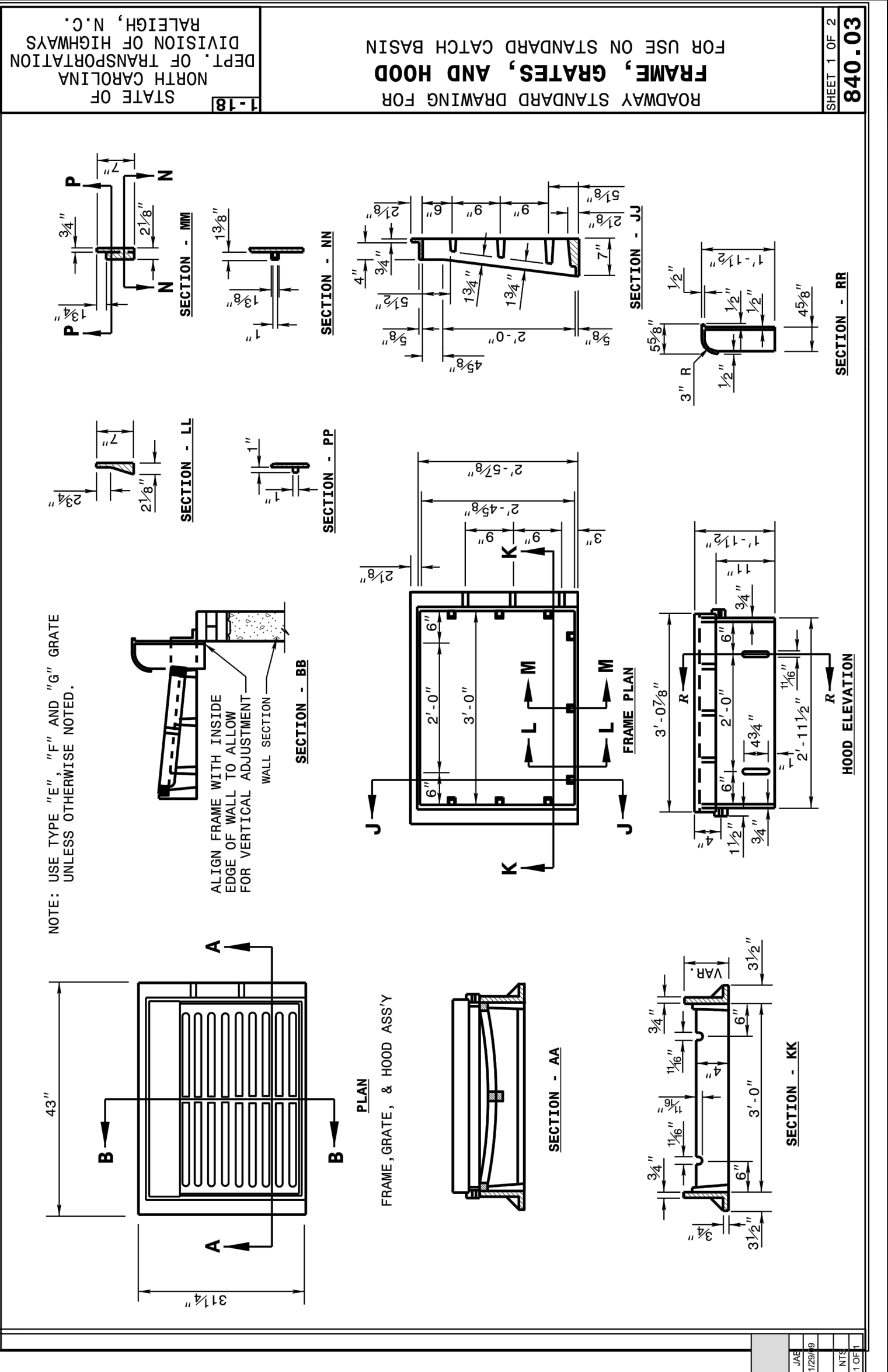
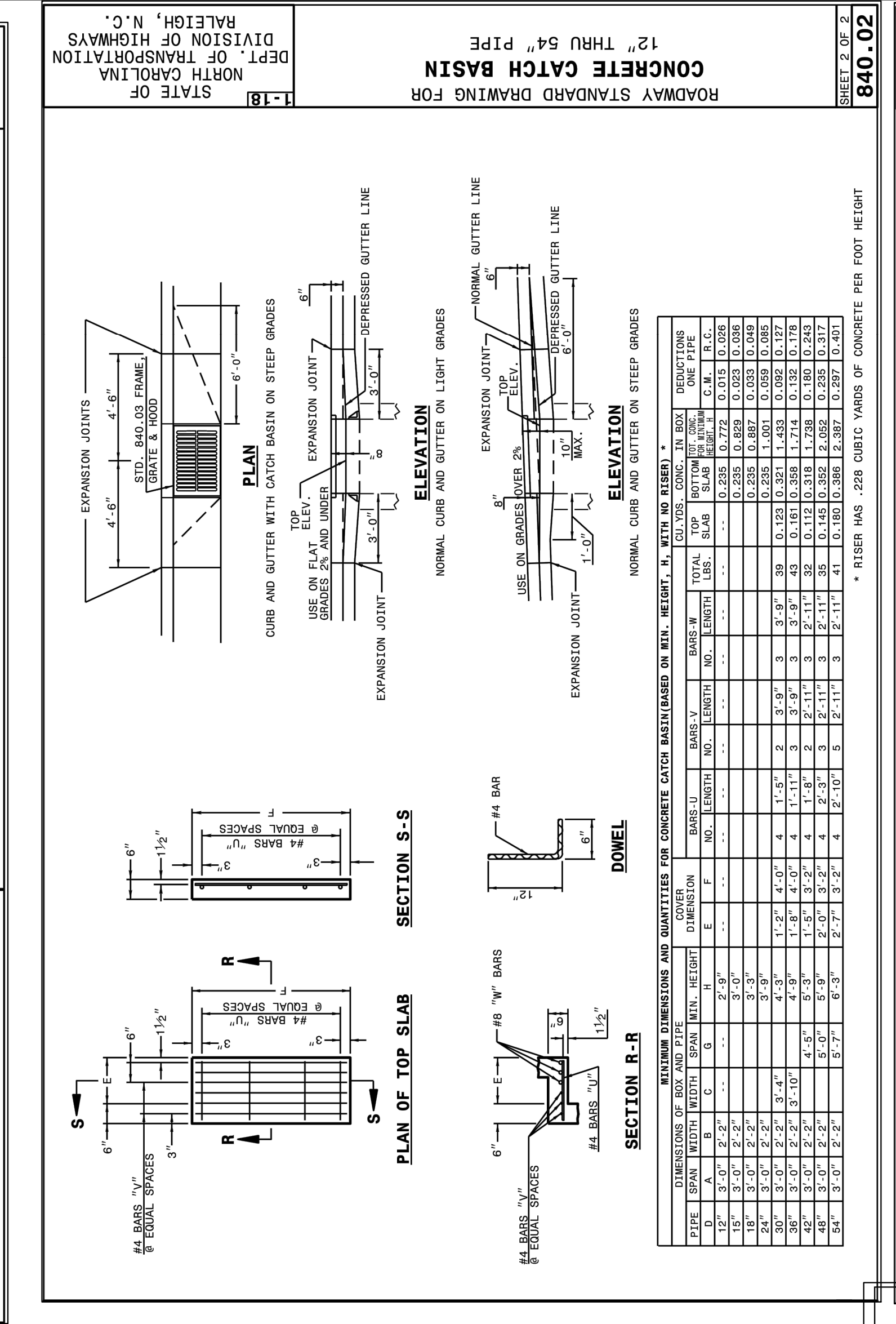
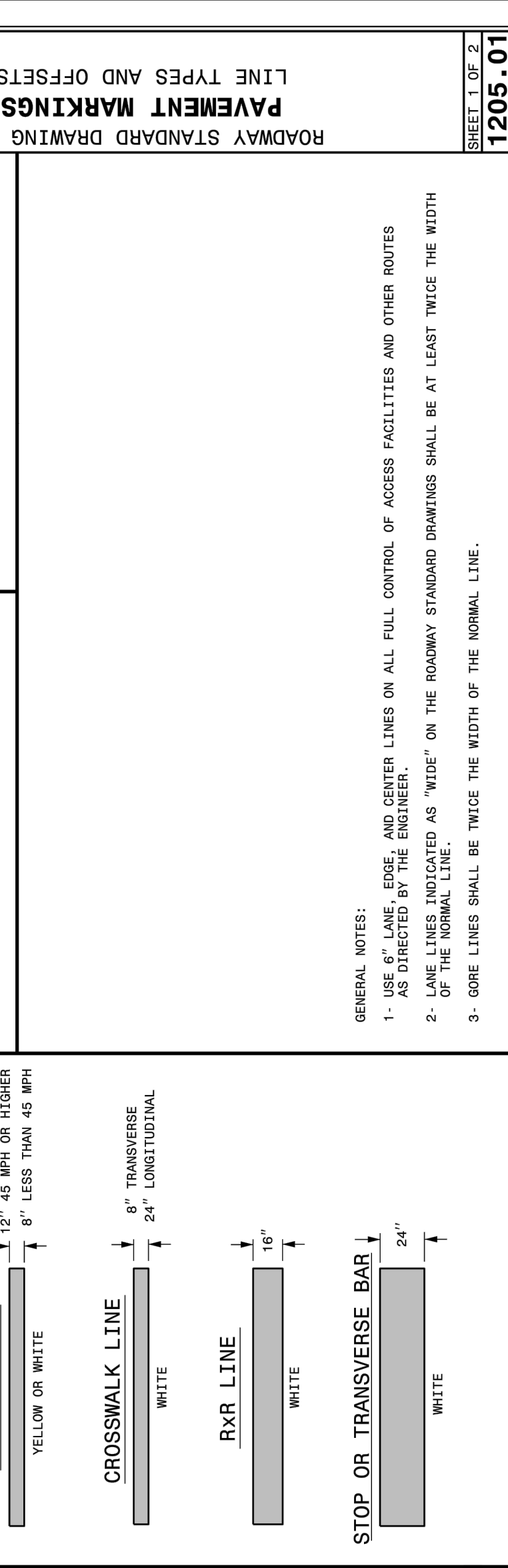
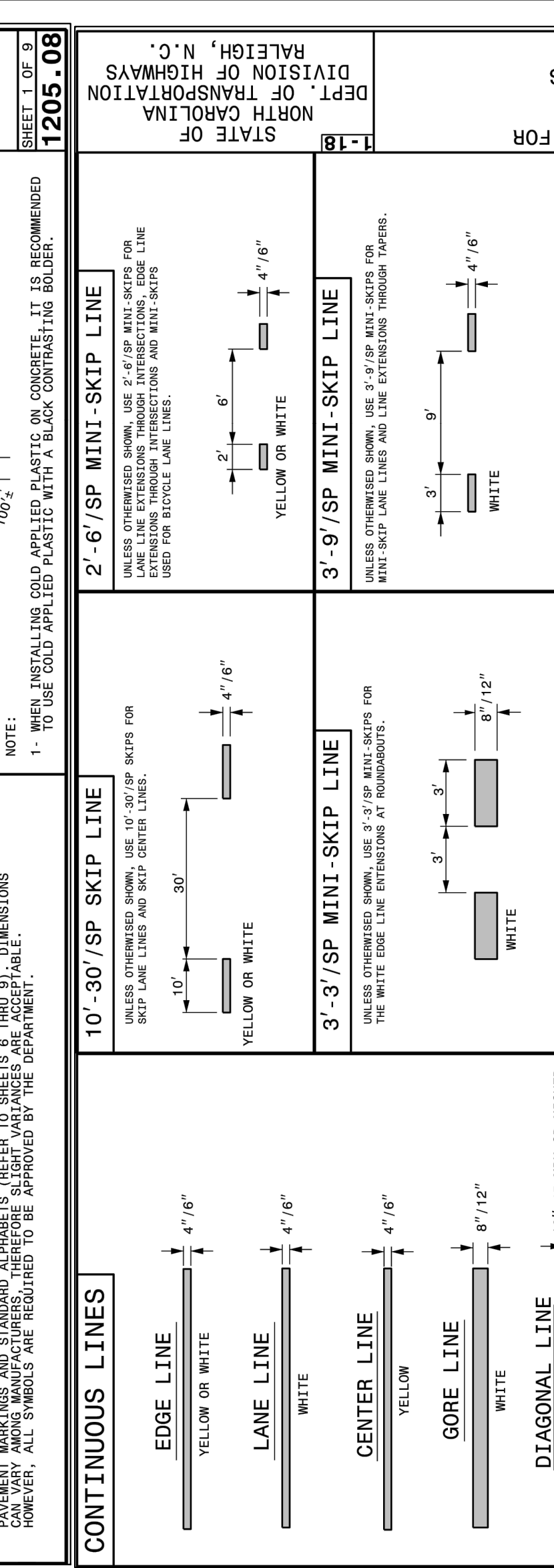
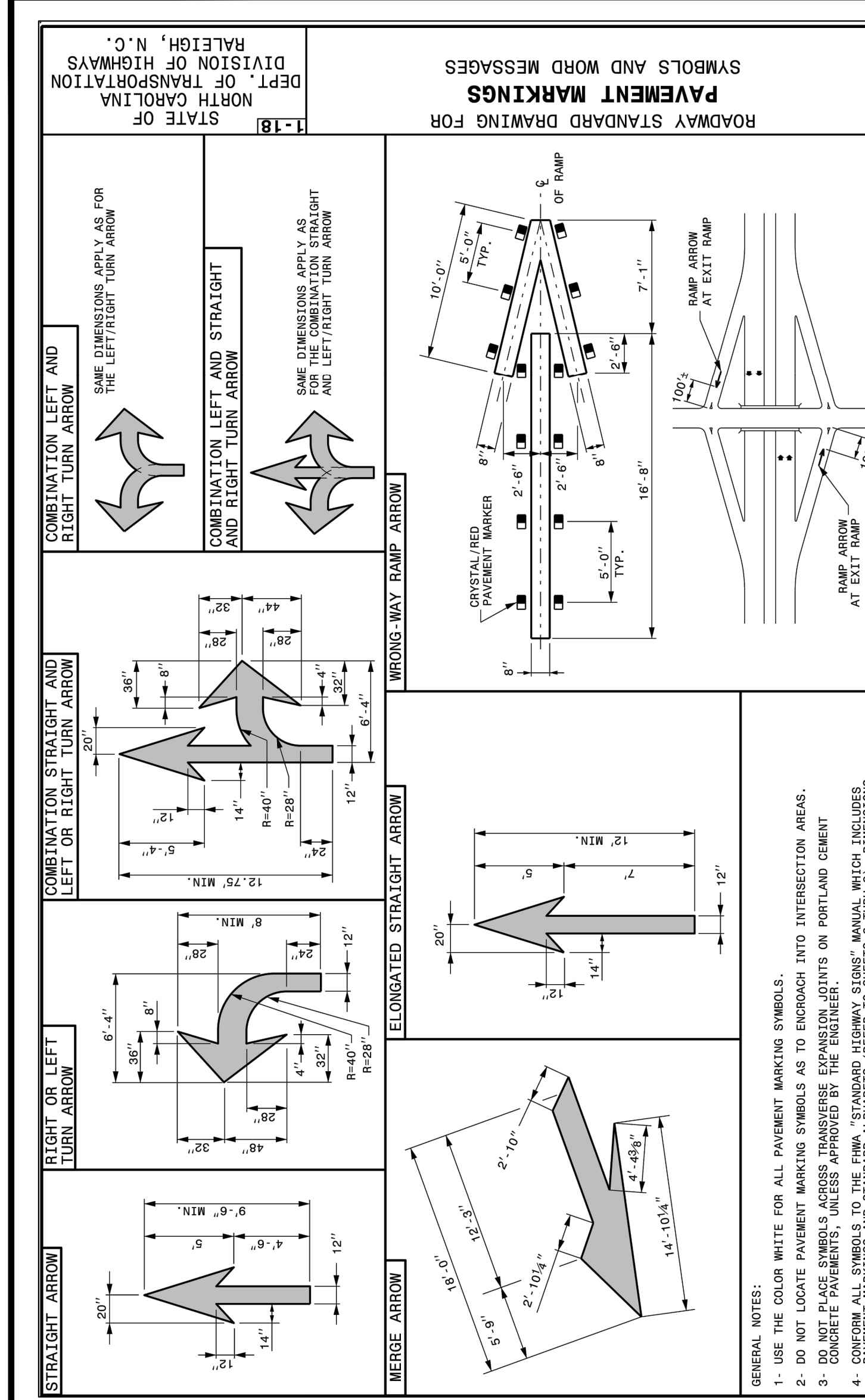


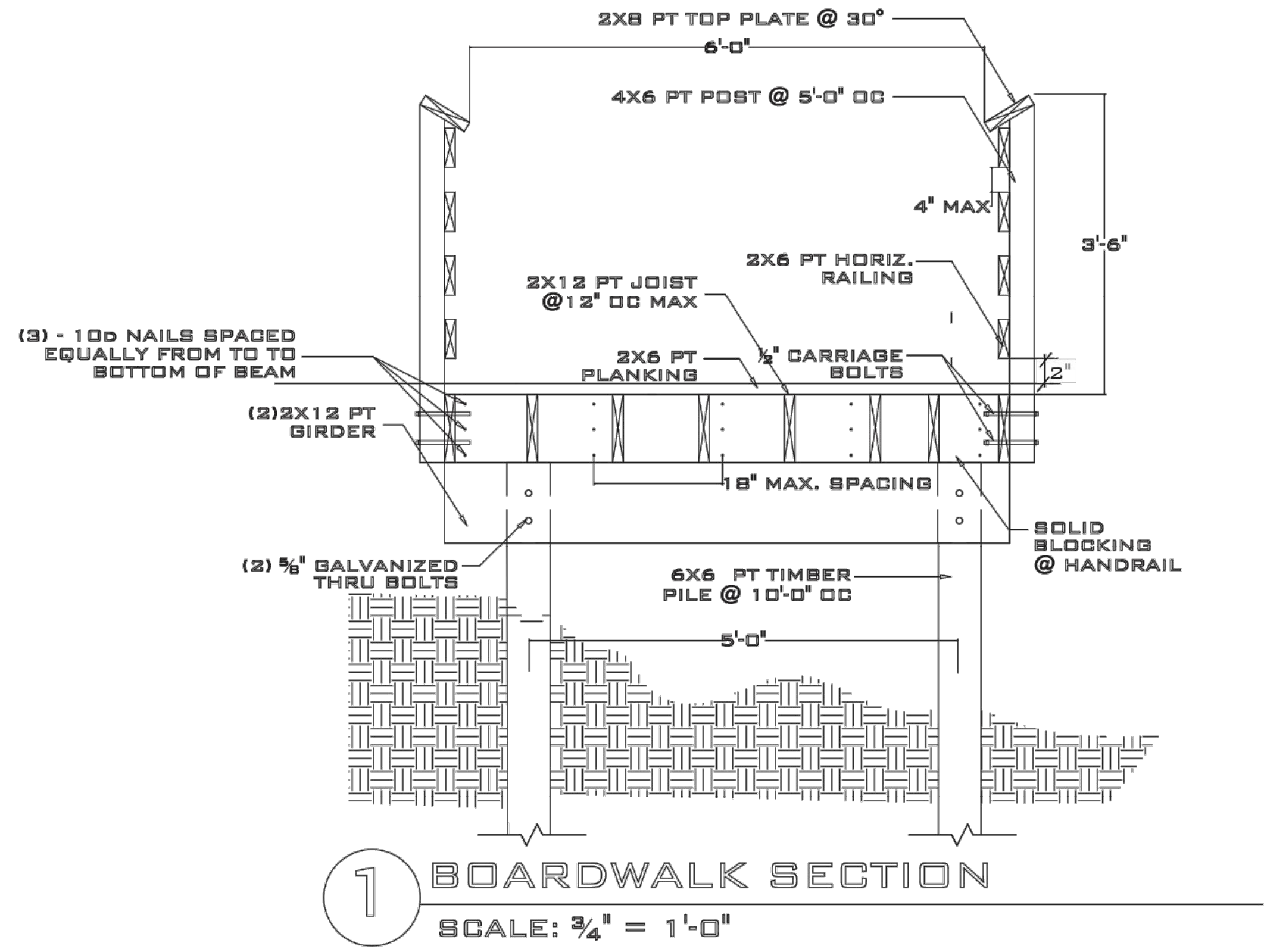
1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE

SHEET 1 OF 2

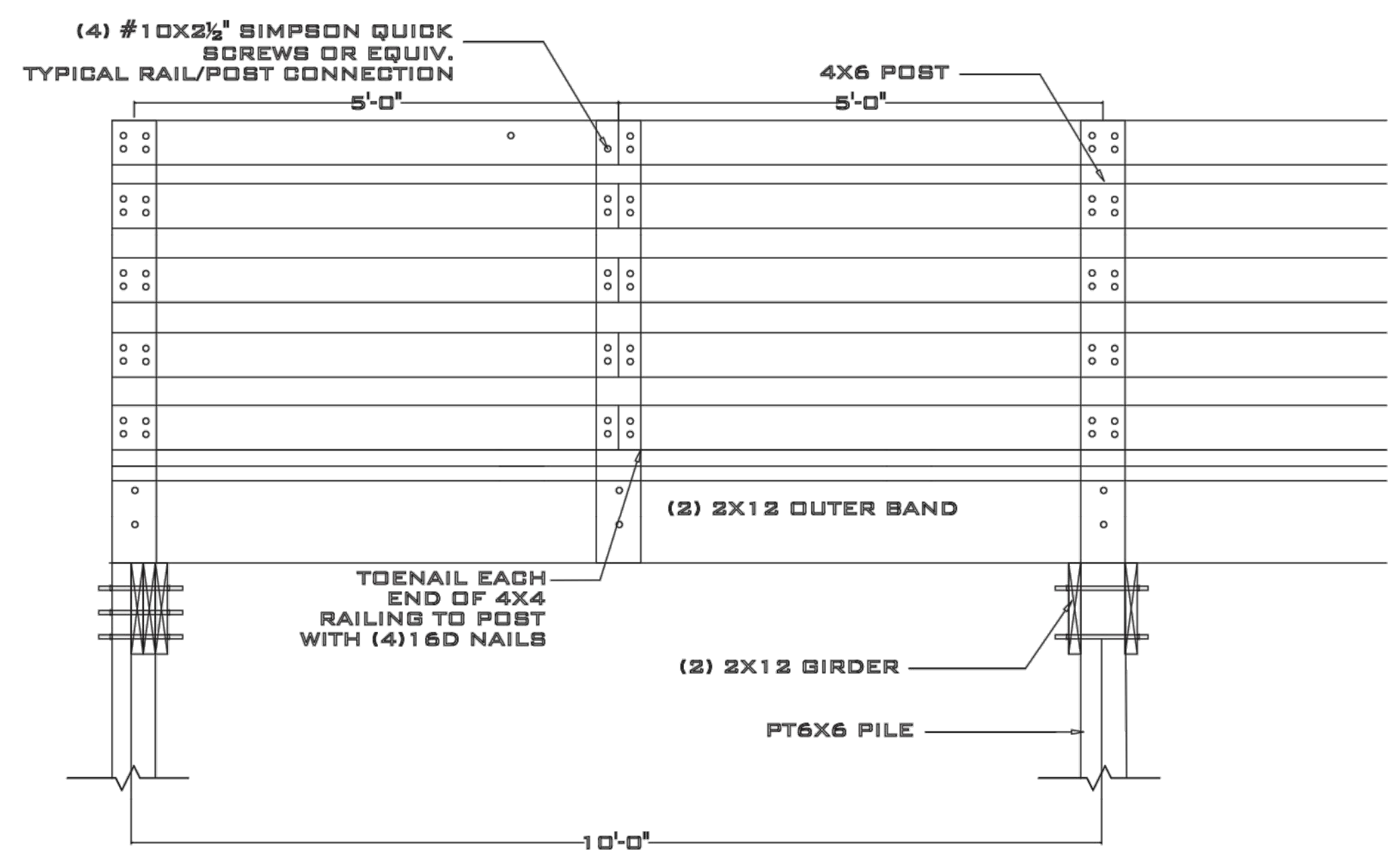
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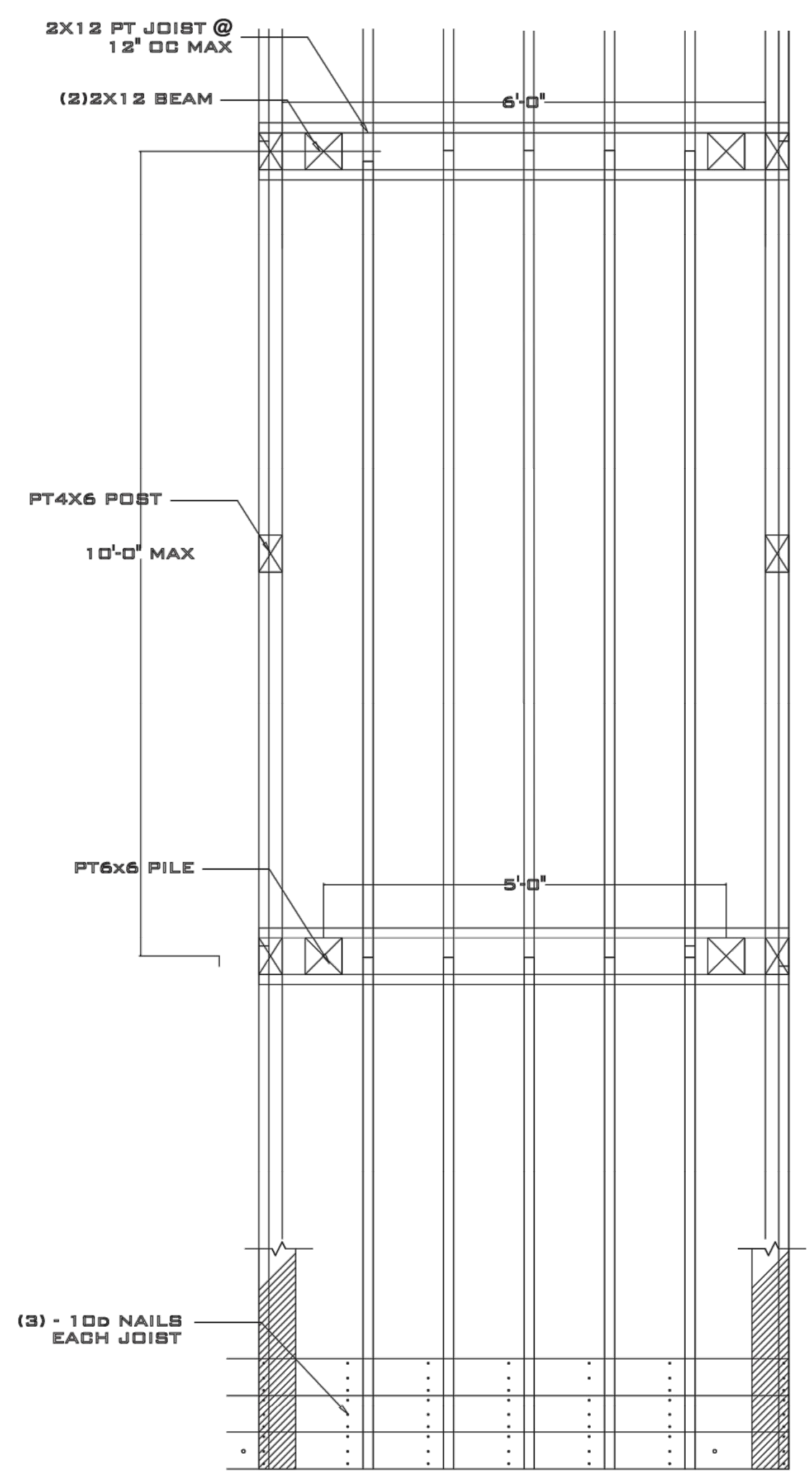
1 BOARDWALK SECTION
SCALE: 3/4" = 1'-0"

NOTE: PILES SHALL BE INSTALLED SUCH THAT THERE IS NO JURISDICTIONAL IMPACT TO THE EXISTING RIPARIAN STREAM AND ITS' BUFFERS.

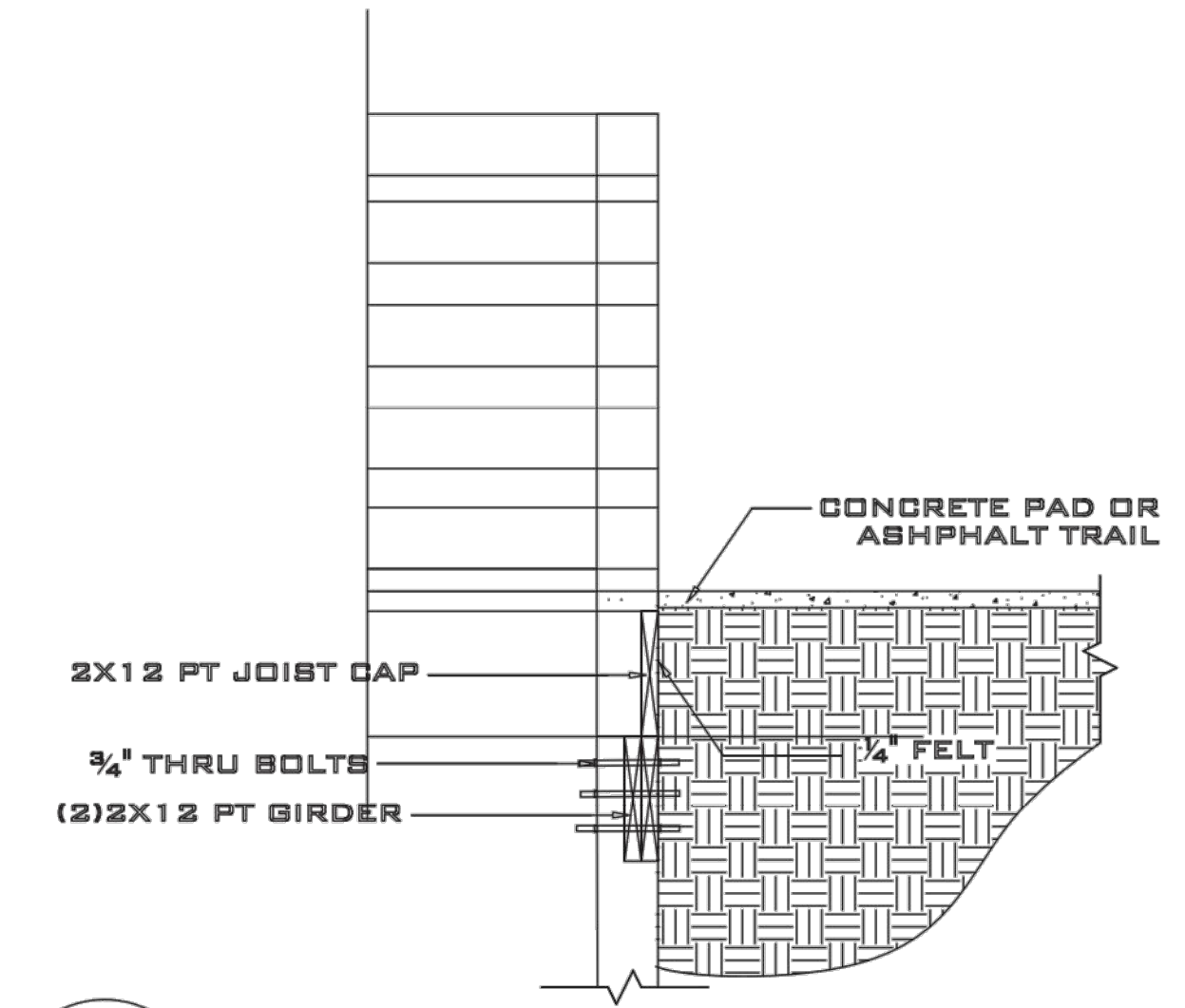


2 TYPICAL SECTION
SCALE: 3/4" = 1'-0"

NOTE: PILES SHALL BE INSTALLED SUCH THAT THERE IS NO JURISDICTIONAL IMPACT TO THE EXISTING RIPARIAN STREAM AND ITS' BUFFERS.



B PLAN VIEW
SCALE: 1/2" = 1'-0"



3 TYPICAL END SECTION
SCALE: 3/4" = 1'-0"

GENERAL NOTES:

GENERAL: ALL NOTES ARE FOR SUPPLEMENTING THE PLANS AND SPECIFICATIONS AND ARE IN NO WAY TO BE CONSIDERED AS EXCLUDING ANY ITEM IN THEM.

1. WOOD TO BE PRESSURE TREATED SOUTHERN YELLOW PINE (SYP)
- BEAMS: NO.1 OR HIGHER
2. PRESERVATIVE PRESSURE TREATMENT TO BE IN ACCORDANCE WITH AWPA STANDARD M4-06 & U1-07 AND MEET THE FOLLOWING REQUIREMENTS:
DECKING, HANDRAILS AND JOISTS: UC3B
POST & PILES: UC4A
3. ALL FASTENERS AND HANGERS TO BE HOT DIPPED GALVANIZED (AT A MINIMUM)
4. FASTEN JOIST HANGERS PER MANUFACTURER'S SPECIFICATIONS:
(4) 10d COMMON NAILS TO JOIST
(4) 10d COMMON NAILS TO BEAM
5. DESIGN CRITERIA PER AASHTO:
LIVE LOAD: 85 PSF
DEAD LOAD: 20 PSF
SNOW LOAD: 15 PSF
WIND SPEED: 100 MPH
HORIZONTAL WIND: 35 PSF
VEHICLE LOAD: 5000 LBS
6. PROVIDE SOLID BLOCKING BETWEEN JOISTS AT POST LOCATIONS
7. ECONOMIC SUBSTITUTES MUST BE APPROVED BY ENGINEER OF RECORD
8. MINIMUM PILE PENETRATION SHALL BE 10'. SIZE AND PENETRATION ARE SUBJECT TO MODIFICATION BASED ON RECOMMENDATION OF GEOTECHNICAL REPORT PER 1803.5.5.
9. SITE SOIL PROPERTIES ARE ASSUMED TO SUPPORT FOUNDATION LOADS. CONTRACTOR SHALL PROVIDE GEOTECHNICAL REPORT BY PROFESSIONAL ENGINEER INDICATING SOIL PROPERTIES ARE SUFFICIENT TO SUPPORT ALL LOADS.



Bateman Civil Survey Company
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NCBELS FRW No. C-2378



CHANDLER'S RIDGE
CONSTRUCTION DOCUMENTS
CONSERVATION SUBDIVISION
410 W. YOUNG ST.
ROLESVILLE, NC
WAKE COUNTY

PEDESTRIAN BOARDWALK
BRIDGE DETAILS

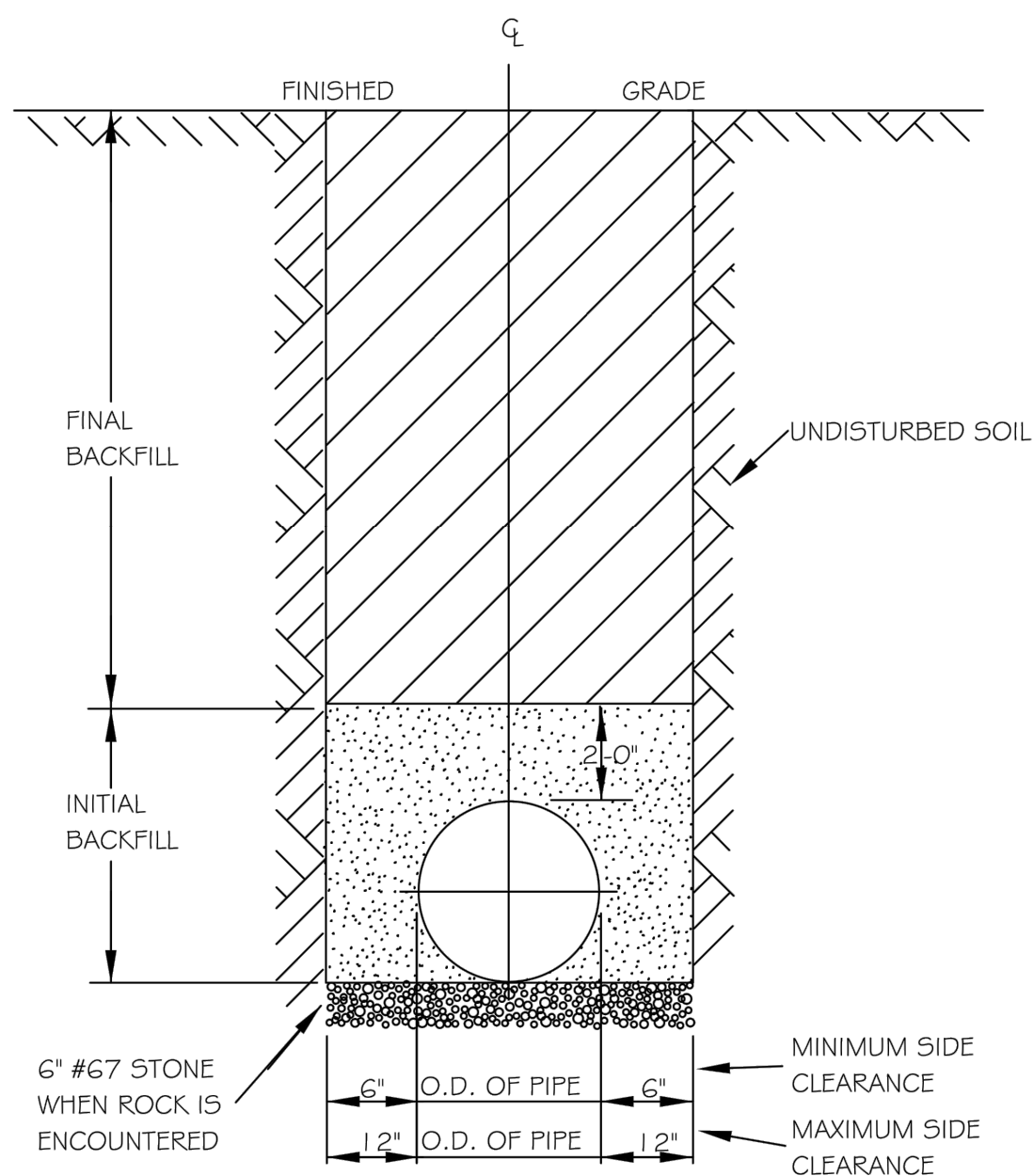
Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347

SHEET
C903

OR EQUIVALENT
CONTRACTOR TO PROVIDE SHOP DWGS

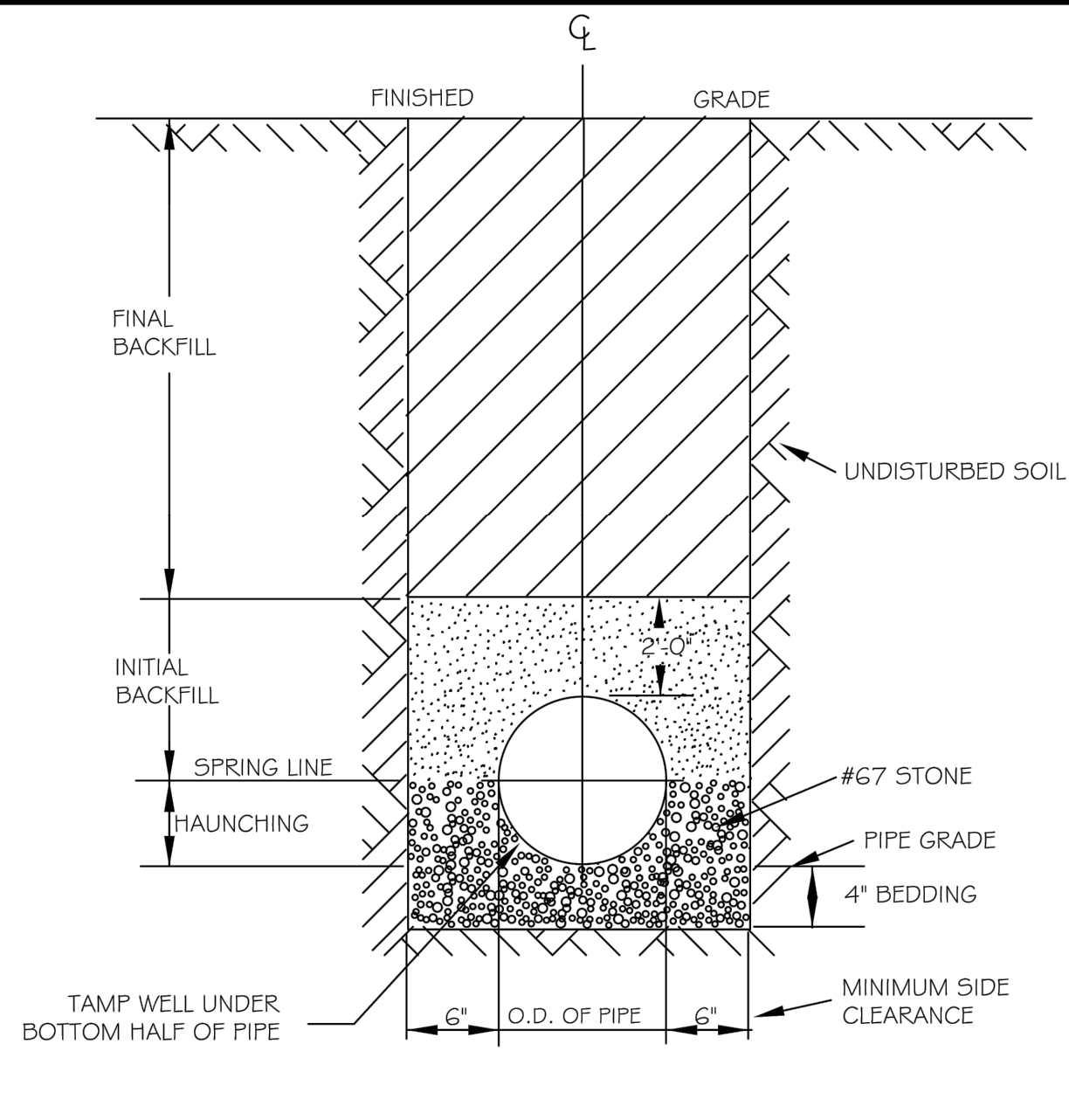
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REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
	DESCRIPTION	DATE
	REVISIONS	



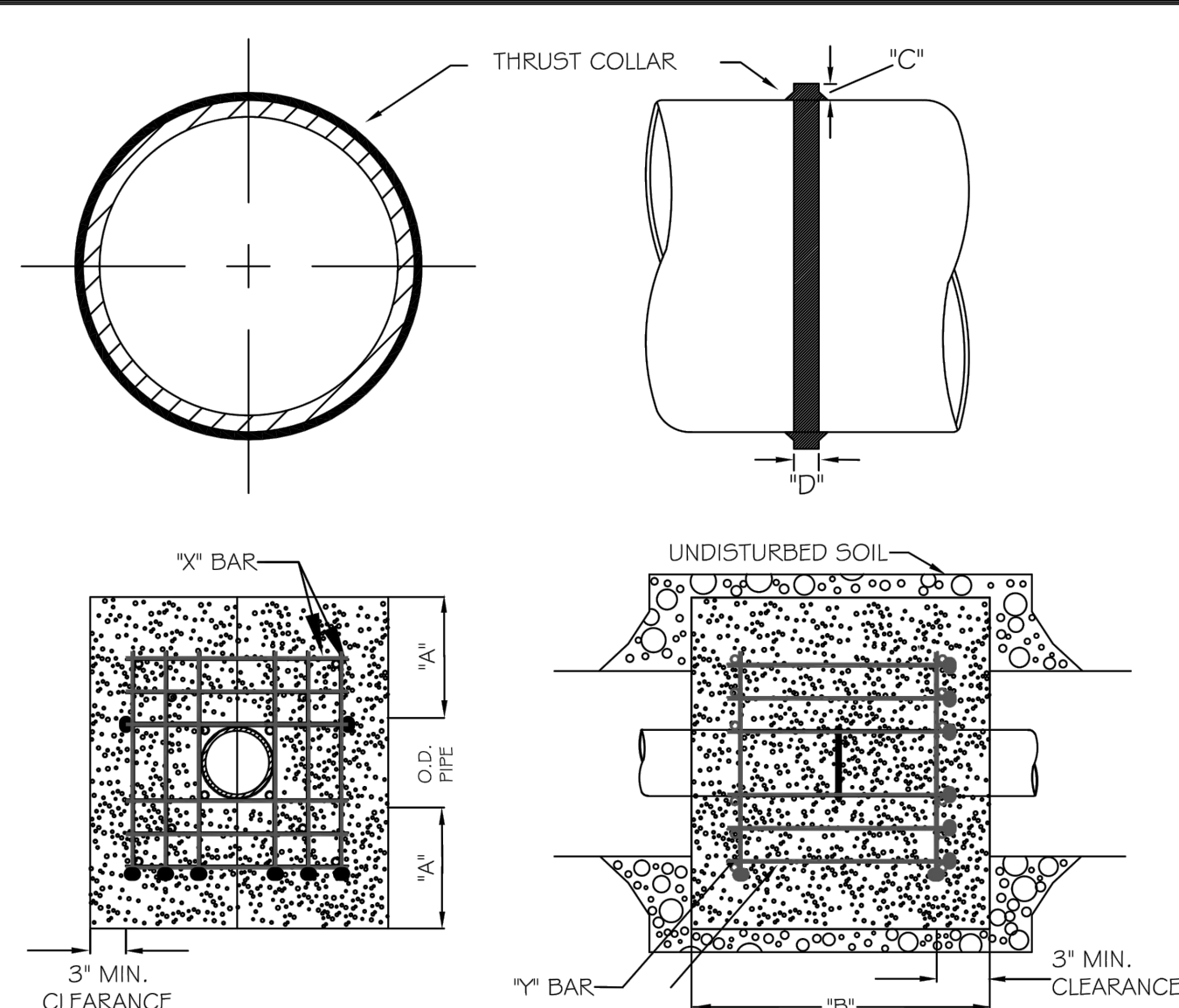
- NOTES:
- TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 - NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
 - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 - BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
 - ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
 - IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
 - NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-4	D.W.C.	9-3-99			
	RRH	3-30-00			



- NOTES:
- FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 - NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
 - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 - BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-5	TO NOTES	3-1-87	D.W.C.	9-3-99	
		7-2-82	RRH	3-30-00	

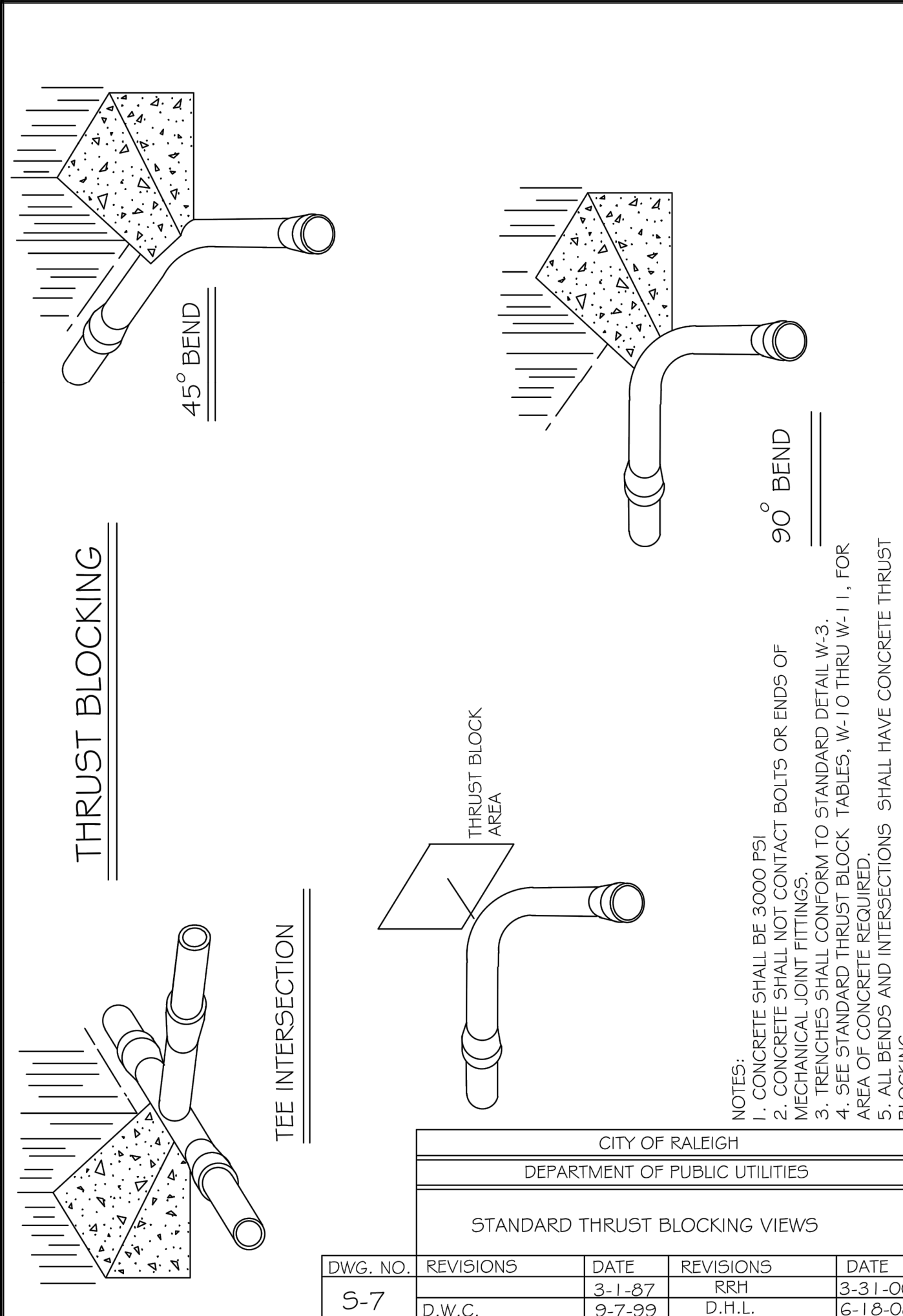


REINFORCING REQUIREMENTS					
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT
6" - 36"	#5	2'-2" O.D. PIPE	1,043 LBS/FT	1'-1"	1.1 LBS. EACH
48" & greater	#6	3'-0" O.D. PIPE	1,502 LBS/FT	1'-3"	1.9 LBS. EACH

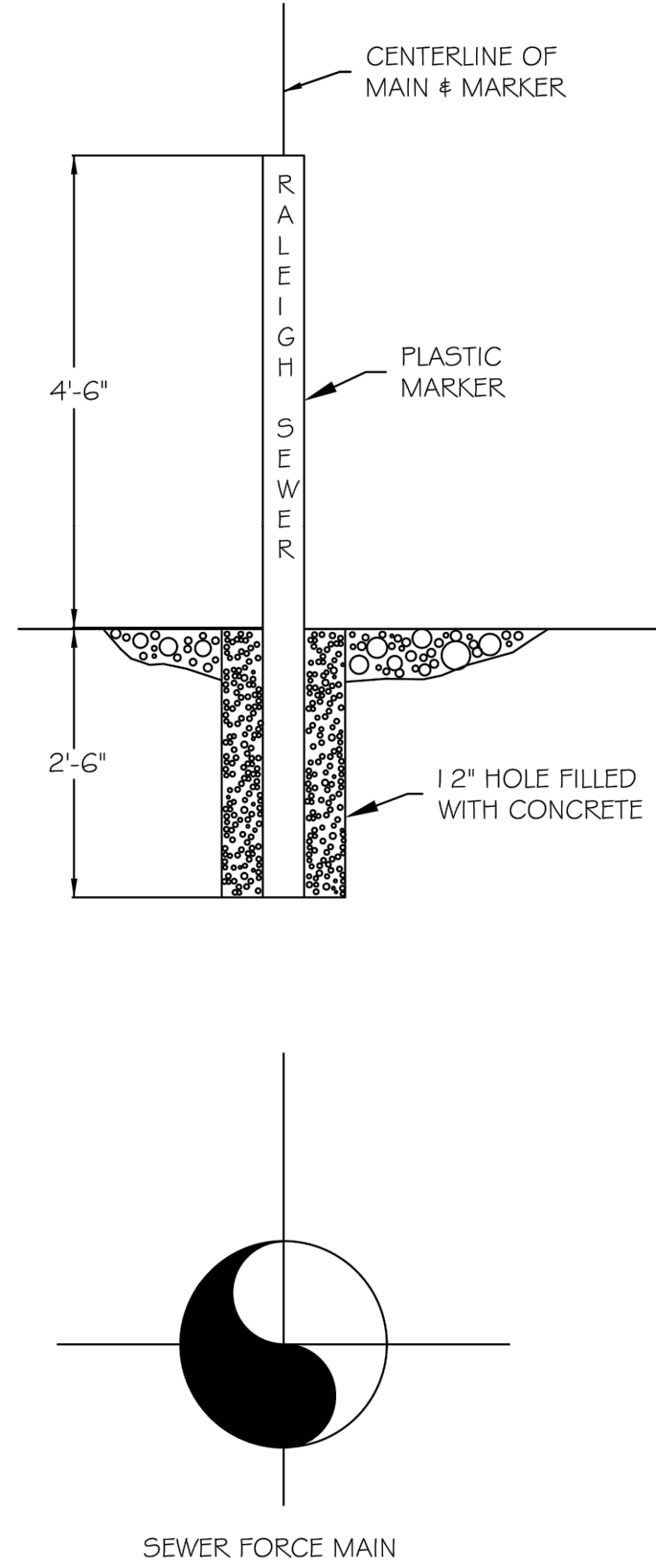
THRUST COLLAR AND THRUST SCHEDULE					
I.D. PIPE	"X" BAR	"Y" BAR	"Z" BAR	"W" BAR	"V" BAR
6" - 16"	1-1/4"	1-7/8"	2"	3/8"	
20" - 24"	1-1/4"	1-7/8"	3"	1/2"	
30" - 36"	1-1/4"	1-7/8"	4"	5/8"	
48" & greater	1-1/2"	1-5/8"	6"	7/8"	

- NOTES:
- CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
 - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
 - BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
 - THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
RESTRAINING COLLAR DESIGN DATA FOR SEWER FORCE MAIN					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-6	RRH	1-21-00			
	D.H.L.	6-18-08			

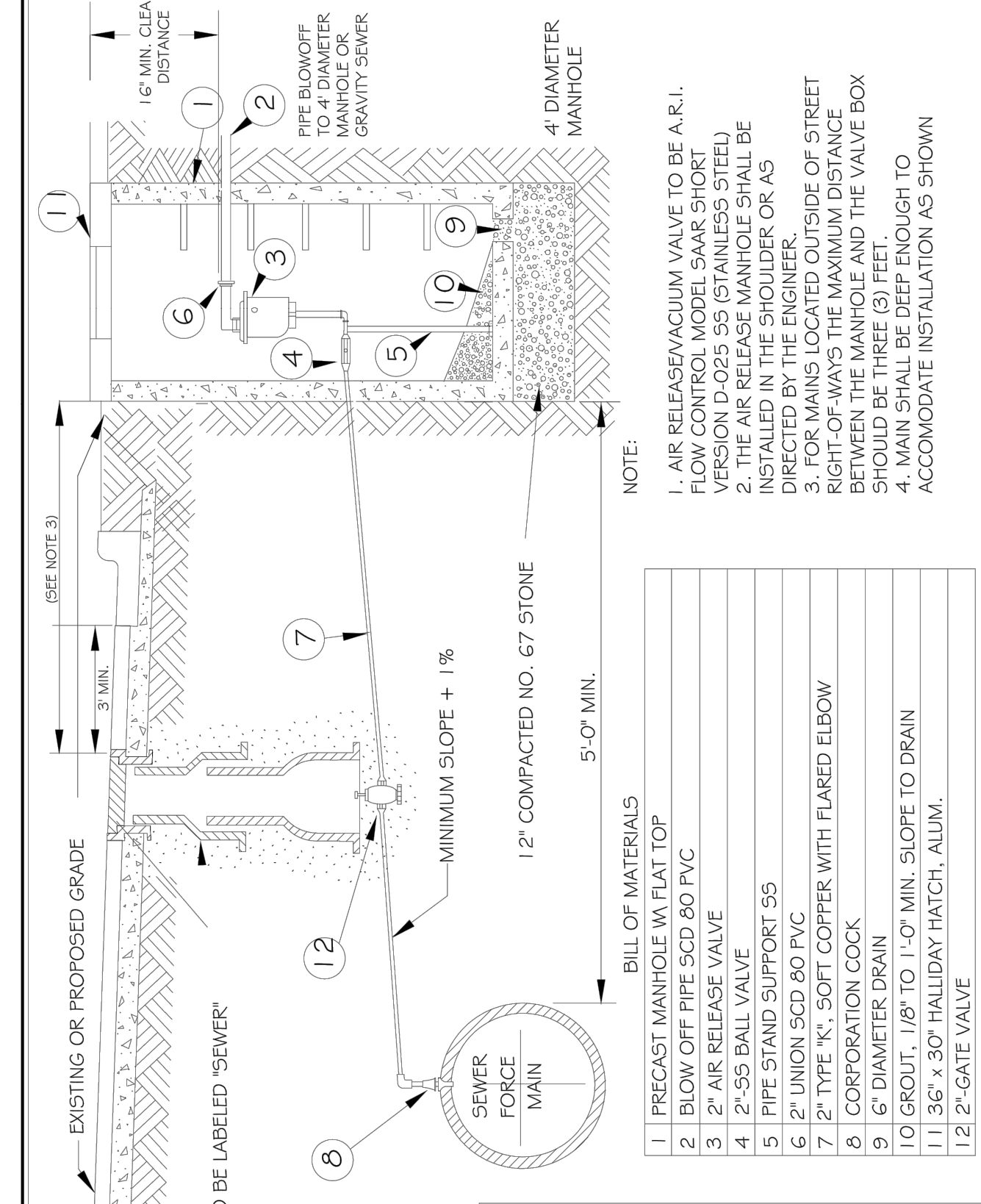


CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD THRUST BLOCKING VIEWS					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-7	D.W.C.	3-1-87	RRH	3-31-00	
		9-7-99	D.H.L.	6-18-08	



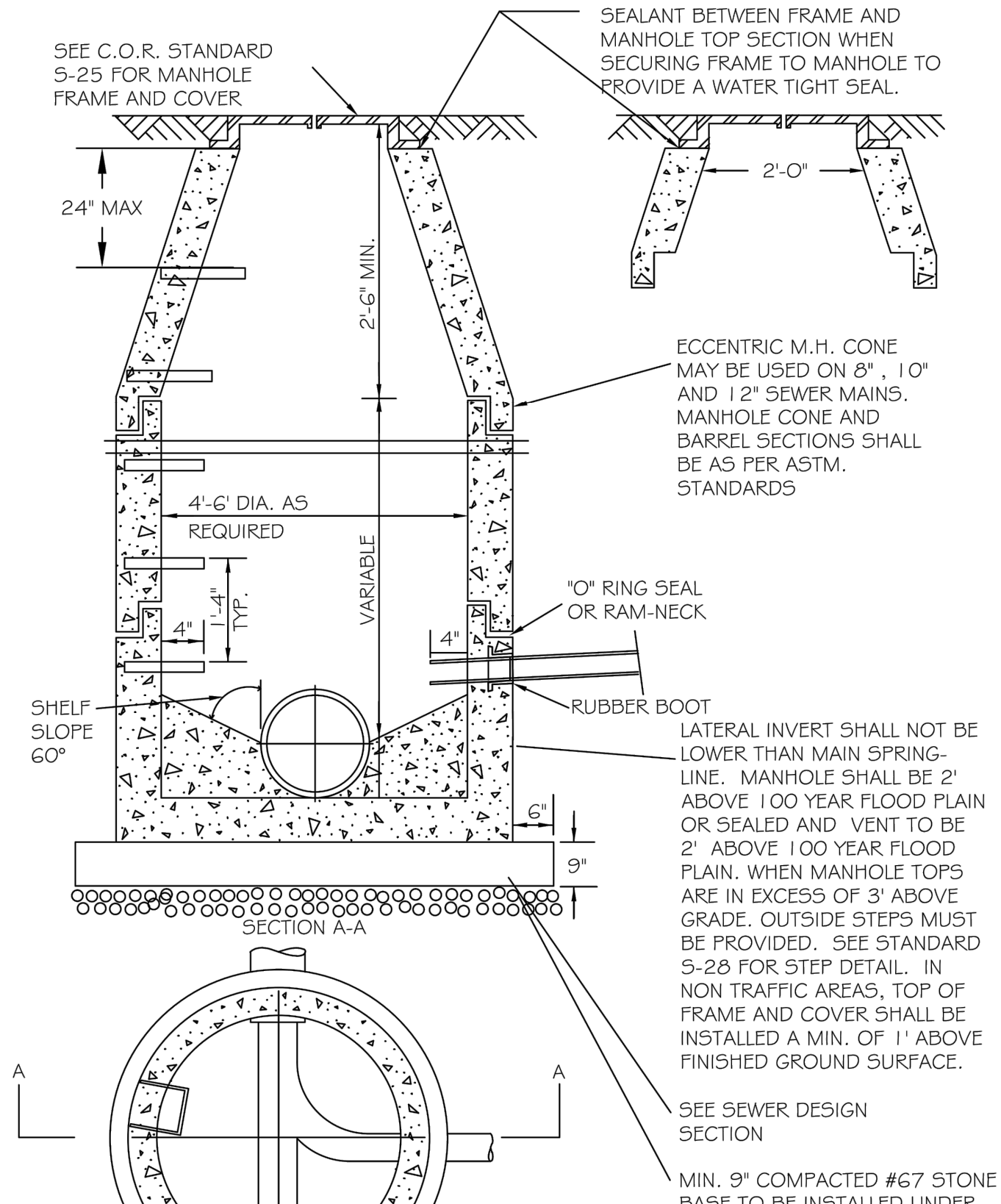
- NOTES:
- PLASTIC MARKER SHALL BE GREEN IN COLOR.
 - MARKERS SHALL BE LABELED "RALEIGH SEWER".
 - TO BE SPACED EVERY 300 FEET ON EACH SIDE OF ANY ROADWAY OR JUNCTION.
 - MARKERS SHALL BE ROUND 4" IN DIAMETER.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD MAIN MARKER FOR SEWER FORCE MAINS IN EASEMENTS					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-8					

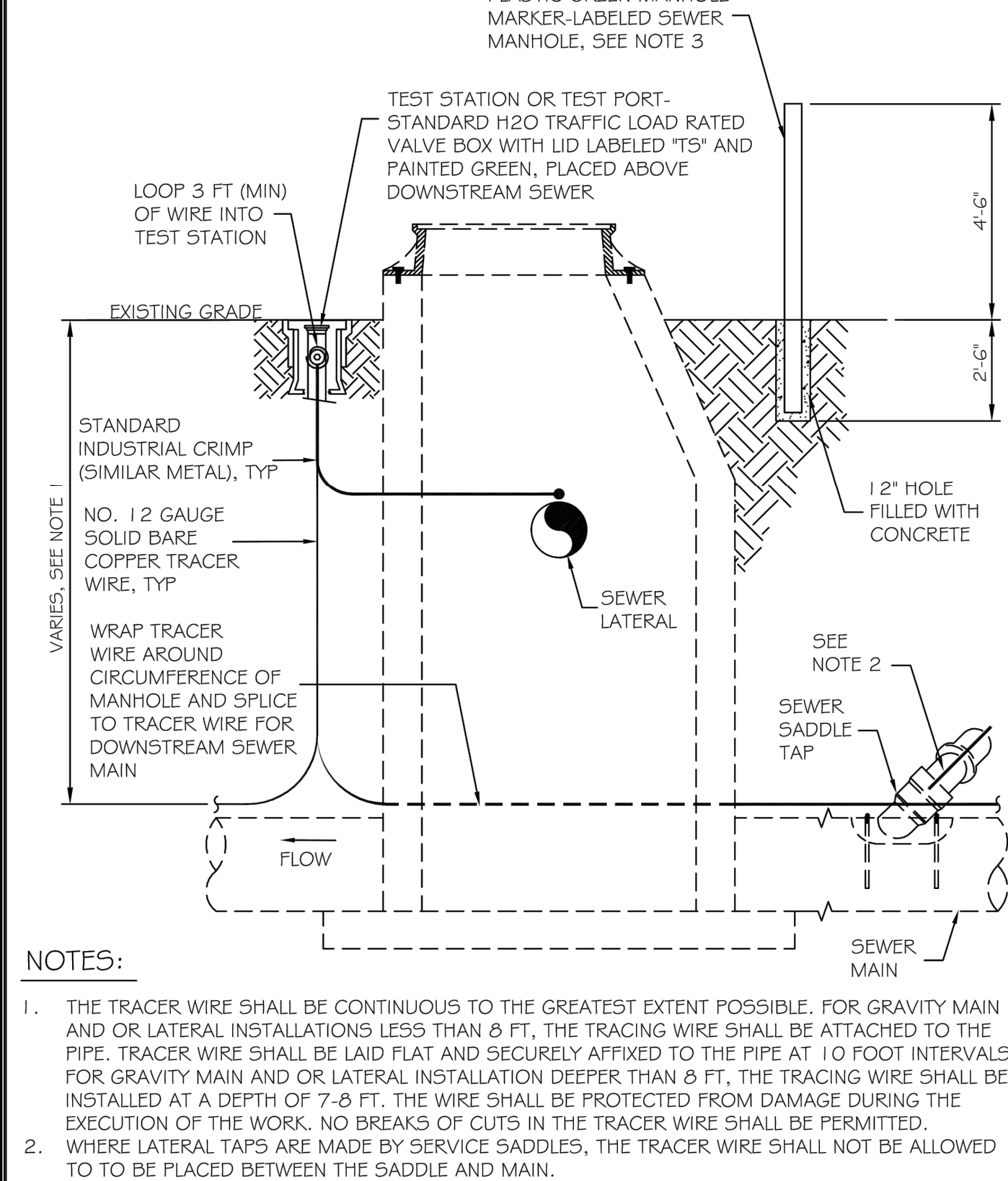


- NOTE:
- AIR RELEASE VALVE TO BE A.R.I.
 - BLOW OFF PIPE SCD 80 PVC
 - 2" AIR RELEASE VALVE
 - 2" x 55 BALL VALVE
 - PIPE STAND SUPPORT 55
 - 2" UNION SCD 80 PVC
 - 2" TYPE "K" SOFT COPPER WITH FLARED ELBOW
 - CORPORATION COCK
 - 6" DIAMETER DRAIN
 - 10' GROUT - 12" TO 1'-0" MIN. SLOPE TO DRAIN
 - 1 3/4" x 30' HALLIDAY HATCH, ALUM.
 - 2" GATE VALVE

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD SEWER FORCE MAIN AIR RELEASE VALVE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-9	LBN	7-14-82	RRH	12-31-91	
		9-30-04		3-30-00	



CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
STANDARD PRECAST SANITARY SEWER MANHOLE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-20	Y.C.A.	12-31-92	ABB	2-21-05	
	RRH	3-30-00	D.H.L.	6-18-08	

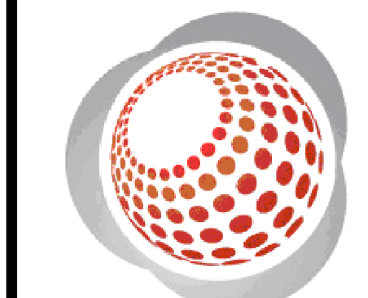


- NOTES:
- THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT, THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT, THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7-8 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OF CUTS IN THE TRACER WIRE SHALL BE PERMITTED.
 - WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
 - MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNER'S REPRESENTATIVE.

CITY OF RALEIGH					
DEPARTMENT OF PUBLIC UTILITIES					
GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-20A	WKD	09-14			



Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FRM No. C-2378



CHANDLER'S RIDGE
 CONSERVATION DOCUMENTS
 CONSERVATION SUBDIVISION

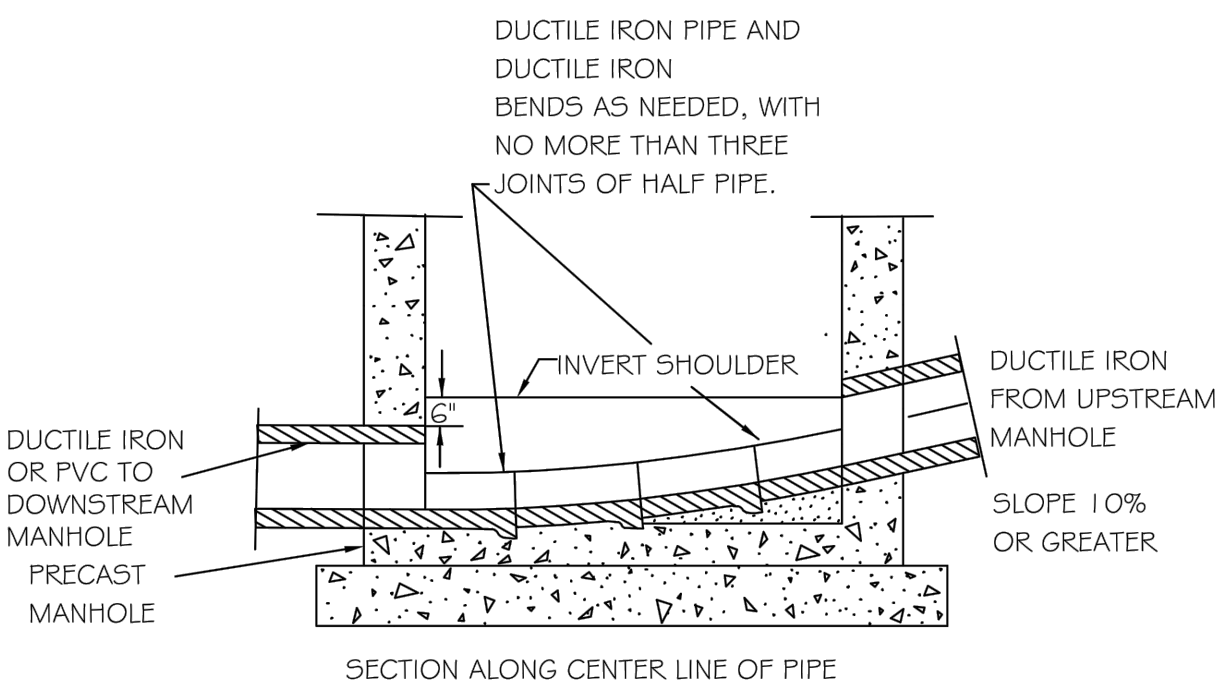
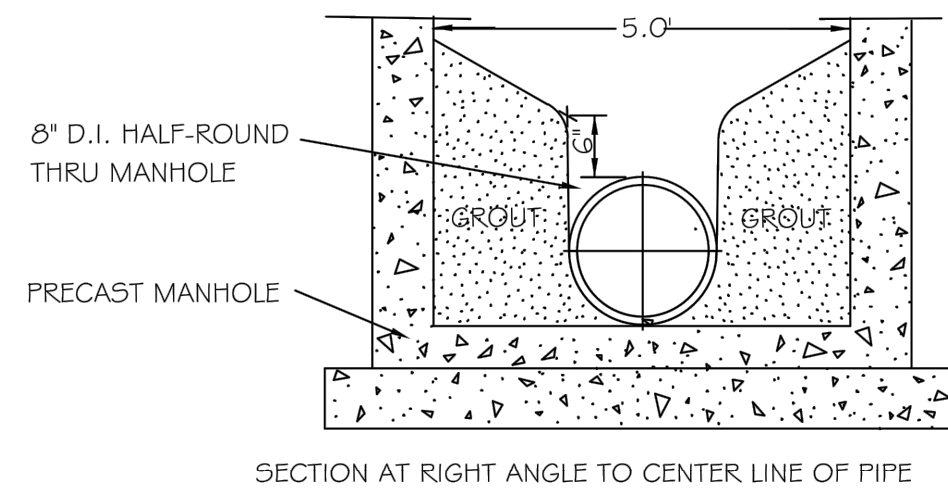
CITY OF RALEIGH SEWER & FORCE MAIN DETAILS

Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS

Scale:
 Date: 09/08/2020

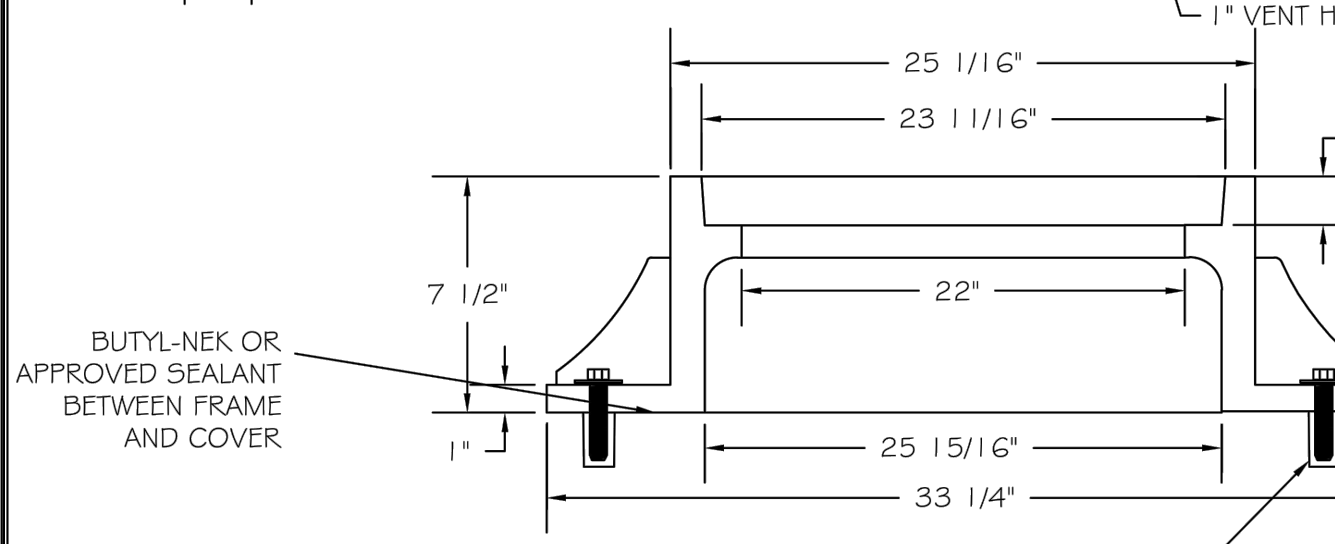
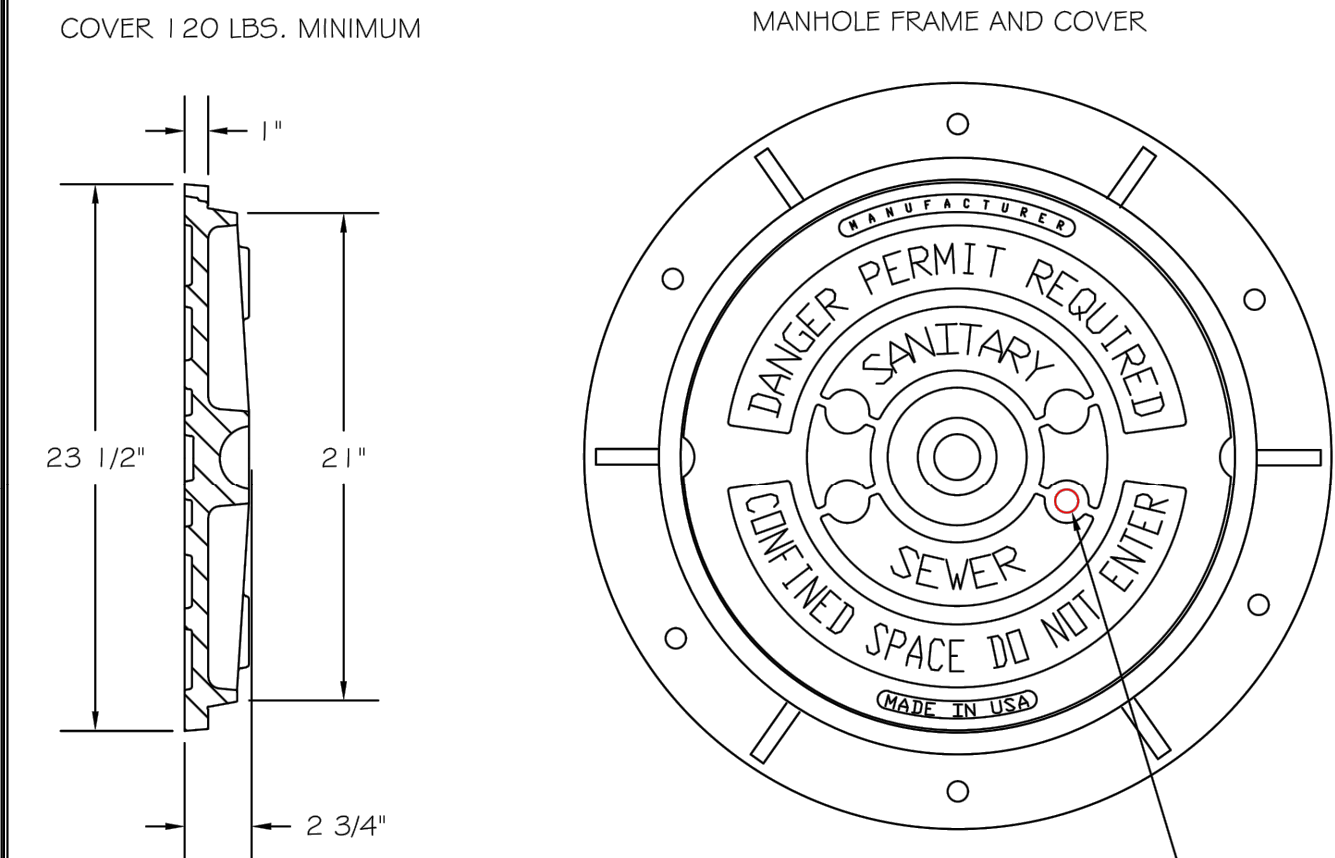
Project Number: P170347

SHEET
 C910



NOTE:
NO HORIZONTAL ALIGNMENT CHANGE CAN BE MADE WITH THIS MANHOLE TYPE. USE ON GRADES 1.0% OR GREATER.

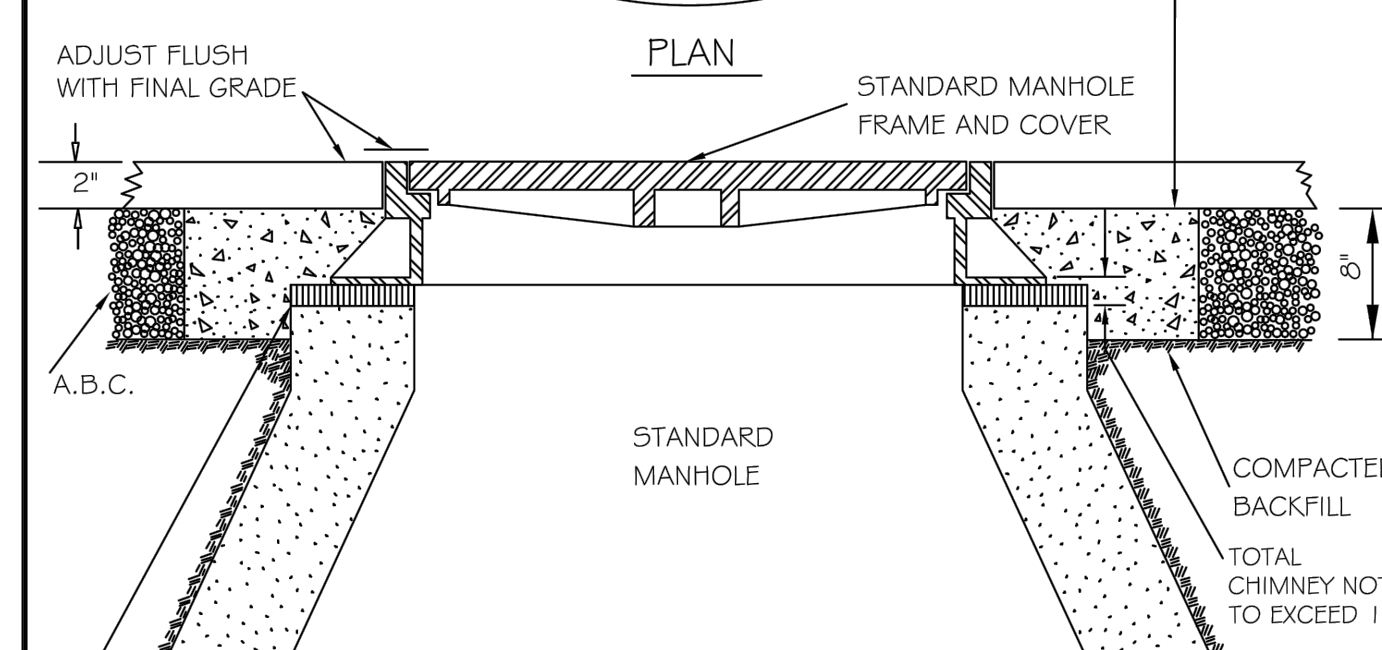
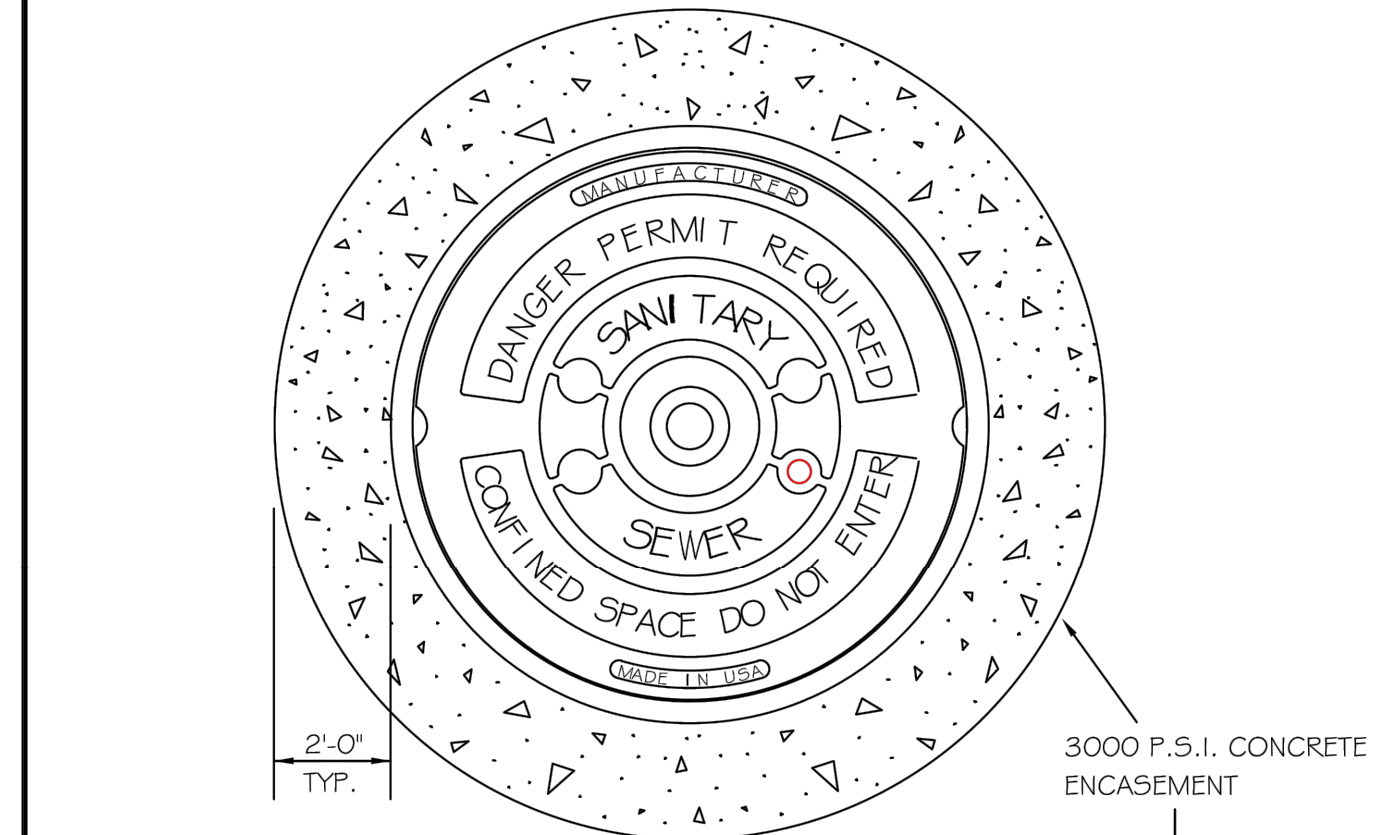
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD HIGH VELOCITY MANHOLE INVERT					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-23					
	Y.C.A.	12-31-91	RRH	3-30-00	



NOTES:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 162 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

5/8"x3" LAGS/HIELD IN HOLE DRILLED INTO CONE OR RING WITH ANCHOR SUNK TO DESIGN DEPTH, AND 3/8"x3" HOT DIPPED GALVANIZED LAG BOLT AND WASHER.

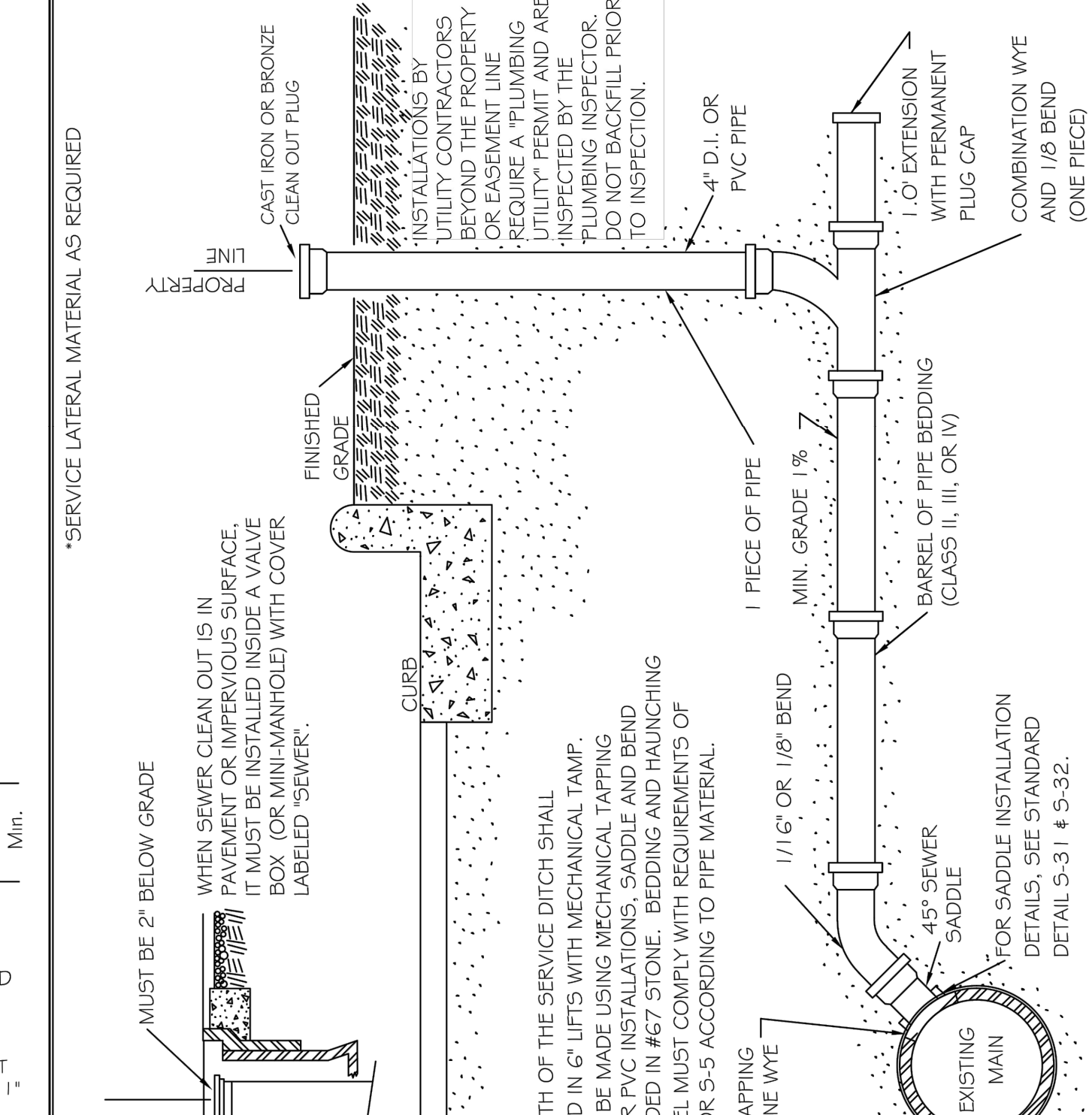
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD MANHOLE COVER					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-25					
	3-1-87	3-1-87	A.B.B.	2-9-05	
	RRH	3-30-00	D.H.L.	6-18-08	



ADJUST FLUSH WITH FINAL GRADE

PRECAST CONCRETE SPACER (DONUT RINGS) IN TRAFFIC AREAS ONLY. DONUT RINGS NOT ALLOWED IN EASEMENTS.

CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-29					
	Y.C.A.	12-31-91	ABB	9-20-04	
	RRH	3-30-00	DHL	1-29-07	

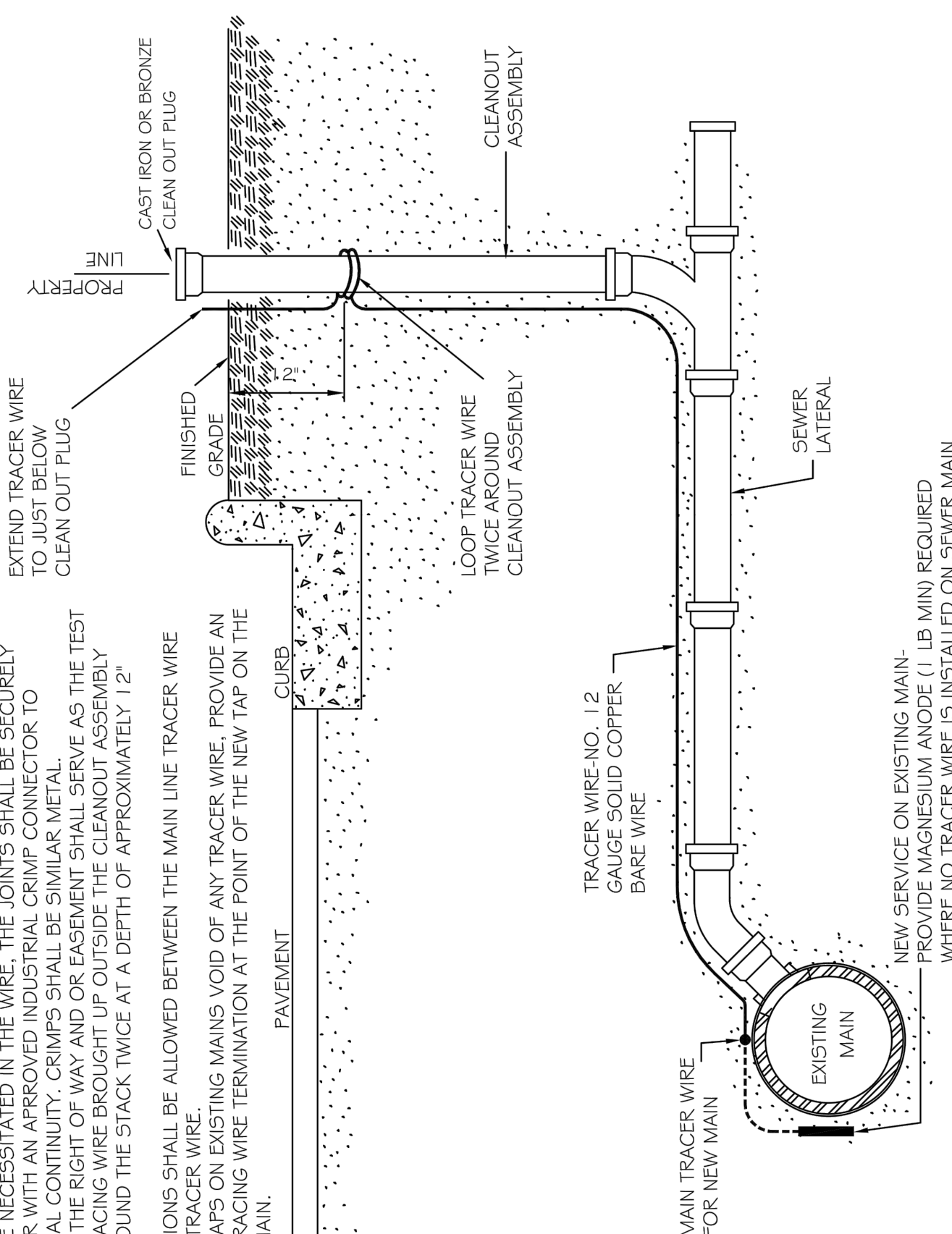


NOTE:
THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6" LIFTS WITH MECHANICAL TAMP. ALL CORNERS MUST BE MADE USING MECHANICAL TAMPING MACHINE. FOR PVC INSTALLATIONS, SADDLE AND BEND MUST BE BEDDED IN #67 STONE. BRIDGING AND HAUNCHING OF PIPE BARREL MUST COMPLY WITH REQUIREMENTS OF DETAILS S-4 OR S-5 ACCORDING TO PIPE MATERIAL.

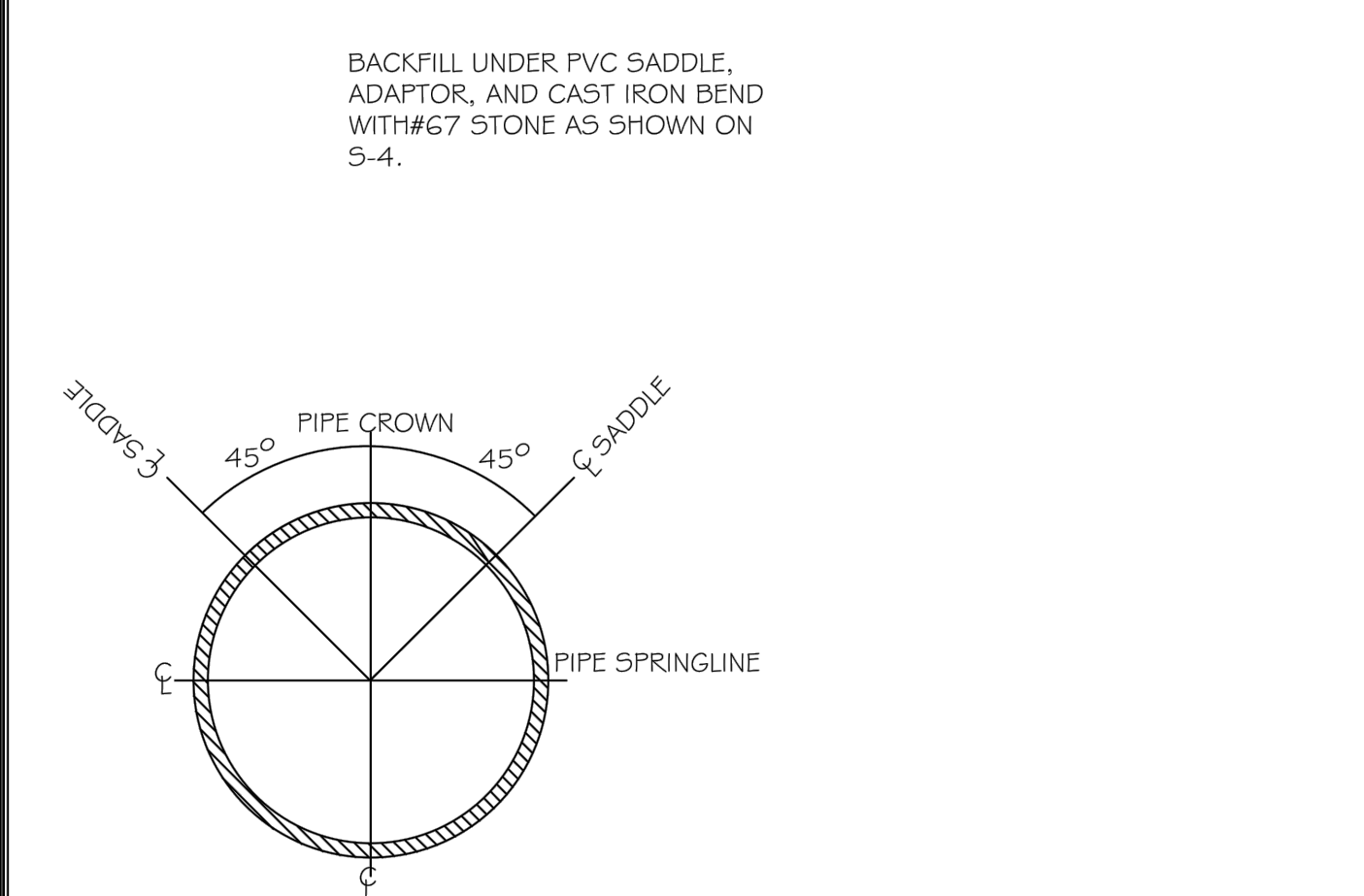
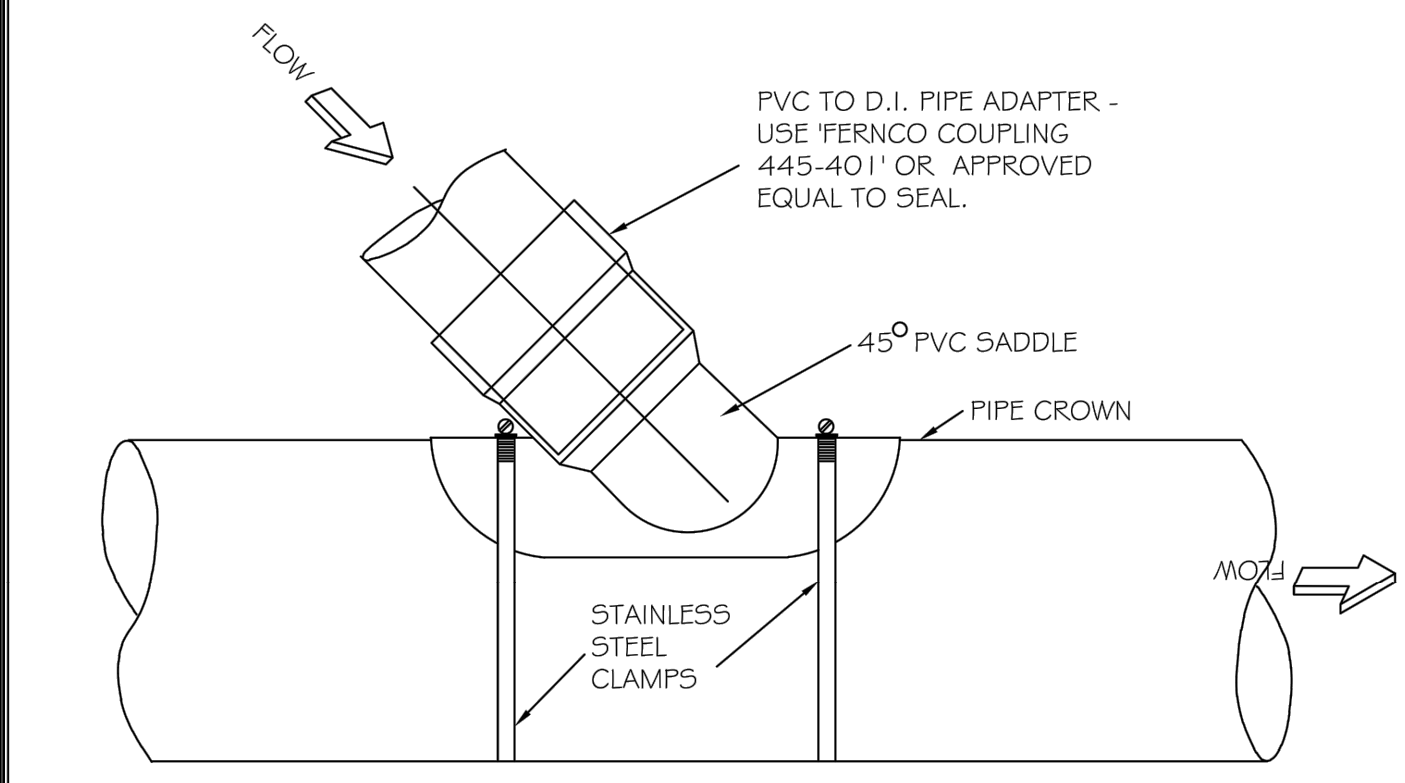
8" 1.0" OR 1.2" TAPPING SADDLE OR IN-LINE WYE

FOR SADDLE INSTALLATION DETAILS, SEE STANDARD DETAIL S-31 & S-32.

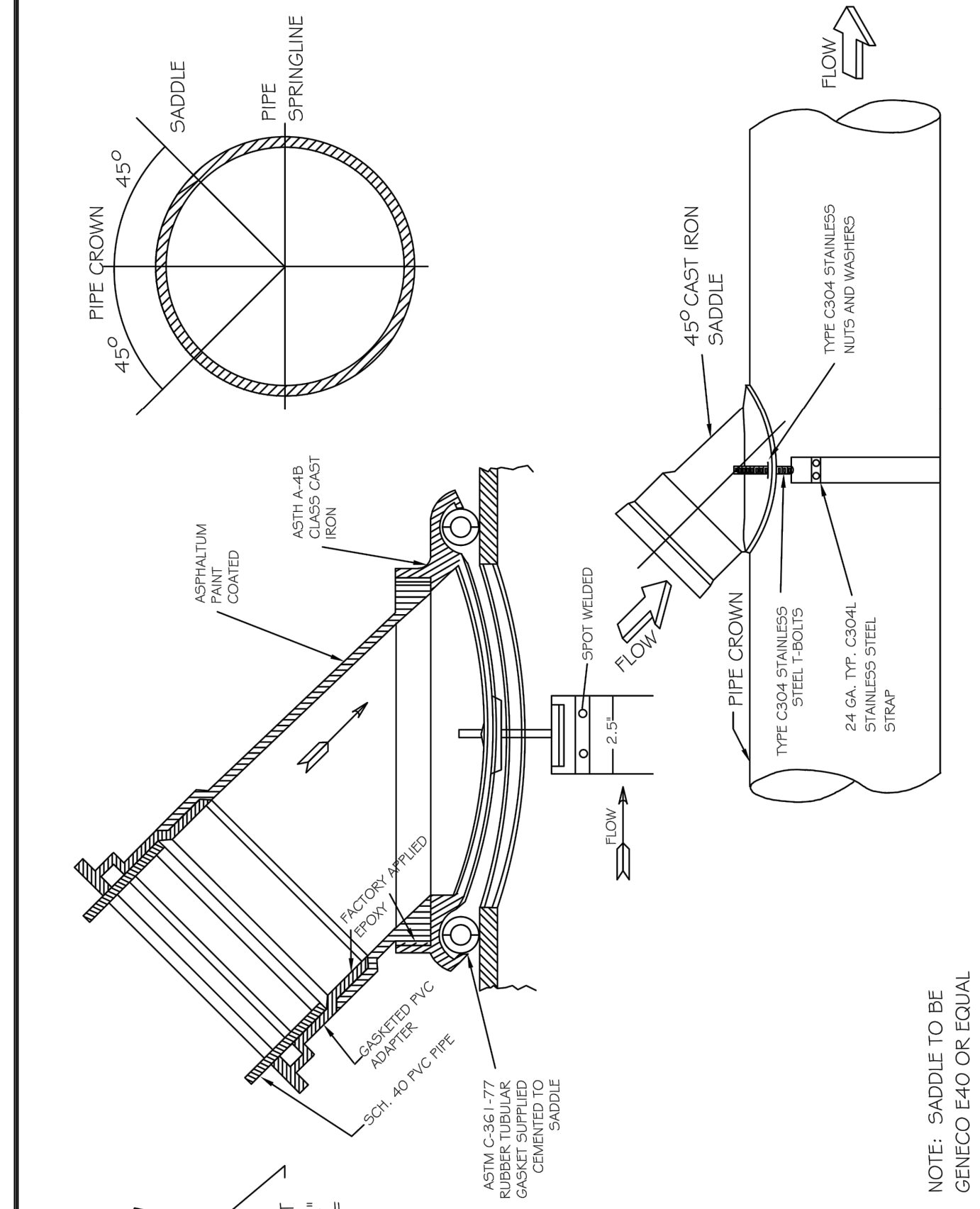
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES TYPICAL SANITARY SEWER LATERAL CONNECTION					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-30					
	Y.C.A.	6-92	A.B.B.	4-8-04	
	RRH	3-30-00	D.H.L.	6-18-08	



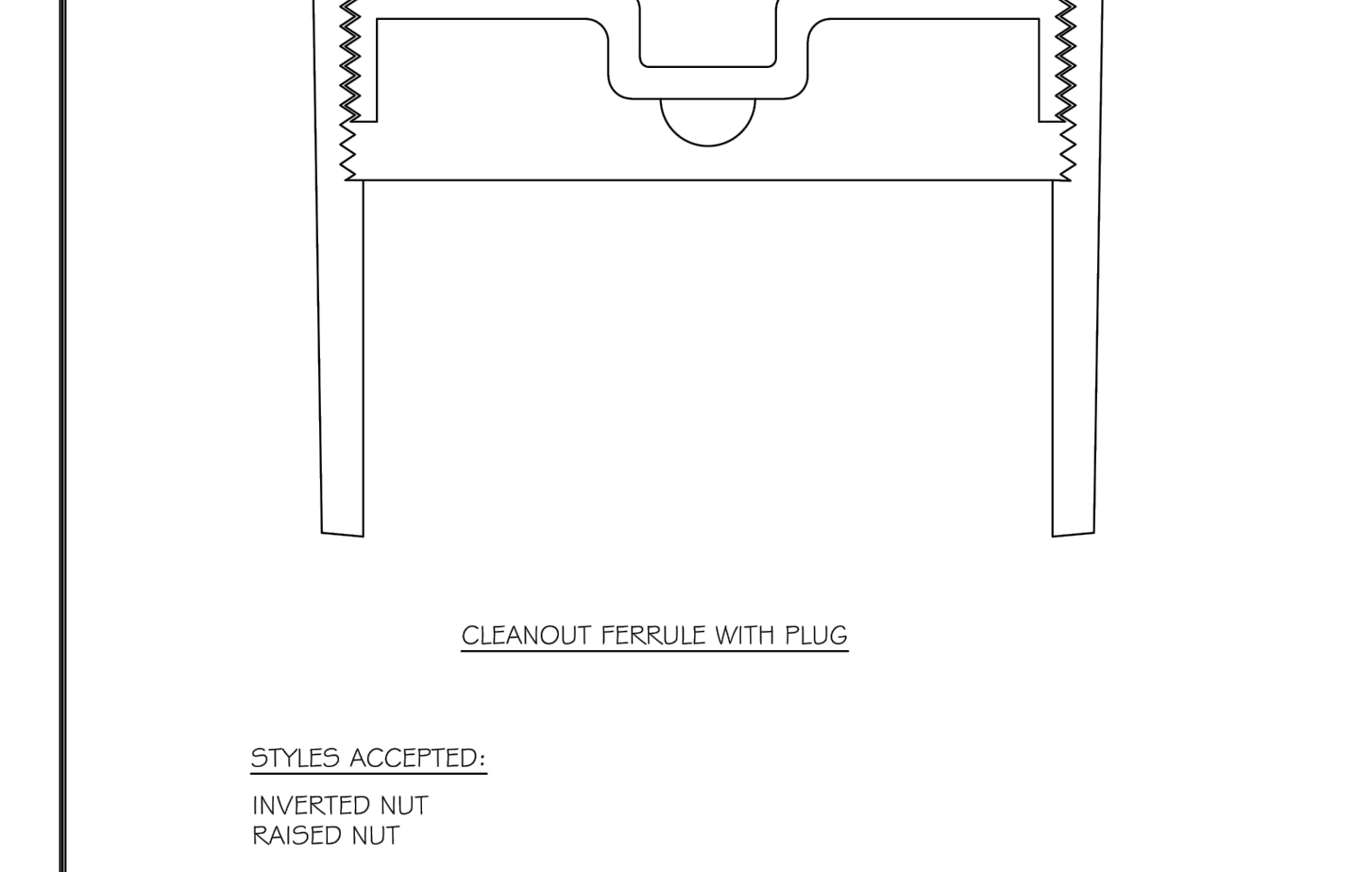
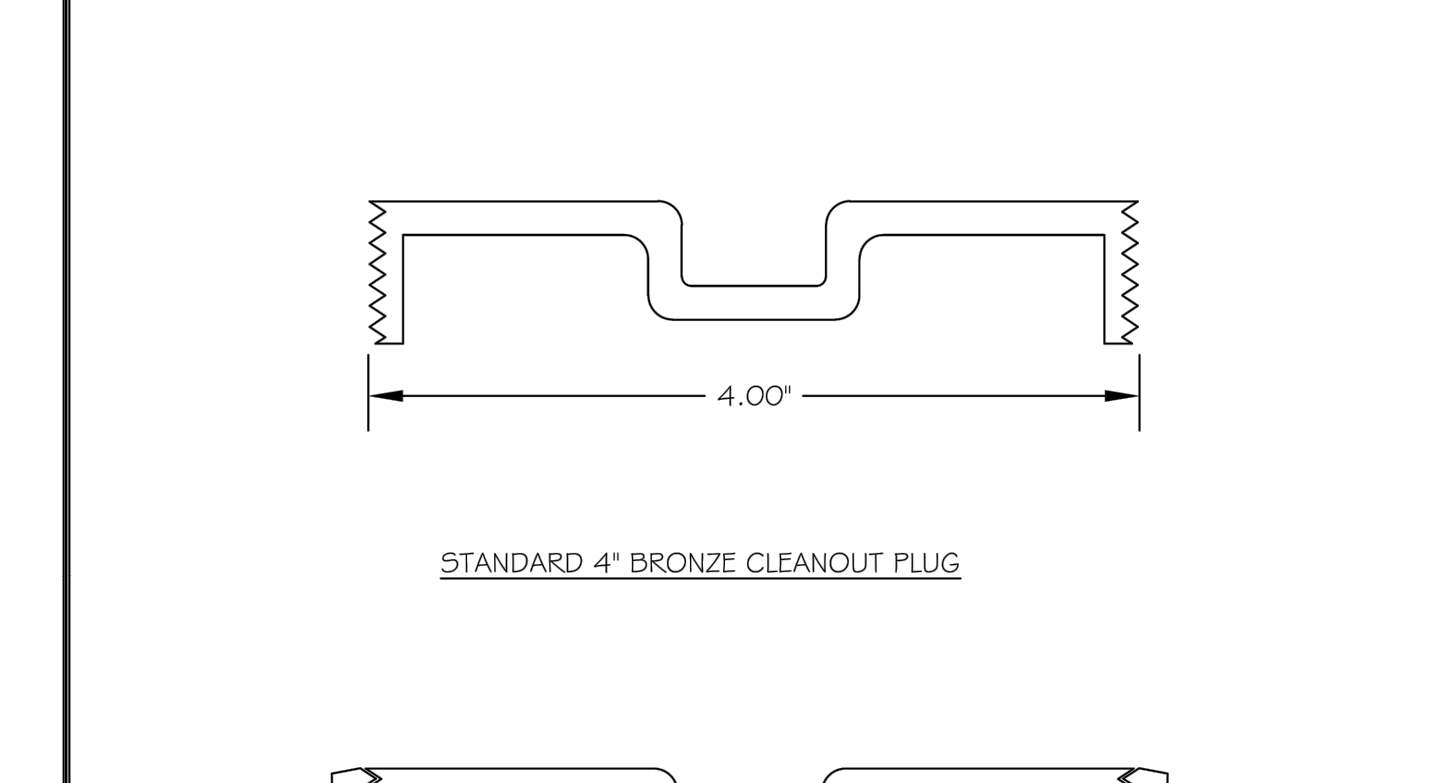
CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES TYPICAL SANITARY SEWER LATERAL TRACER WIRE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-30A					
	W.K.D.				



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-32					
	3-1-87	3-1-87			
	RRH	3-30-00			



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES LATERAL SADDLE INSTALLATION DETAIL FOR VCP AND DUCTILE IRON PIPE					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-32					
	3-1-87	3-1-87			
	RRH	3-30-00			



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES 4 inch CLEANOUT PLUG					
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	
S-34					
	D.W.C.	3-1-87	RRH	3-30-00	
		3-27-98			

NOTES:
1. TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE WHERE JOINTS ARE NECESSARY IN THE WIRE. JOINTS SHALL BE SECURELY BONDED TOGETHER WITH AN APPROVED INDUSTRIAL CRIMP CONNECTOR TO PROVIDE ELECTRICAL CONTINUITY. CRIMPS SHALL BE SIMILAR METAL.
2. THE CLEANOUT AT THE RIGHT OF WAY AND OR EASEMENT SHALL SERVE AS THE PORT WITH THE TRACING WIRE BROUGHT UP OUTSIDE THE CLEANOUT ASSEMBLY AND WRAPPED AROUND THE STACK TWICE AT A DEPTH OF APPROXIMATELY 12" BELOW GRADE.
3. SPLICED CONNECTIONS SHALL BE ALLOWED BETWEEN THE MAIN LINE TRACER WIRE FOR NEW SEWER TAPS ON EXISTING MAINS. VOID OF ANY TRACER WIRE. PROVIDE AN ANODE FOR THE TRACING WIRE TERMINATION AT THE POINT OF THE NEW TAP ON THE EXISTING SEWER MAIN.
4. TRACER WIRE NO. 12 BARE WIRE
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7. TRACER WIRE NO. 12 BARE WIRE
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99. TRACER WIRE NO. 12 BARE WIRE
100. TRACER WIRE NO. 12 BARE WIRE

SITE PERMITTING APPROVAL
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

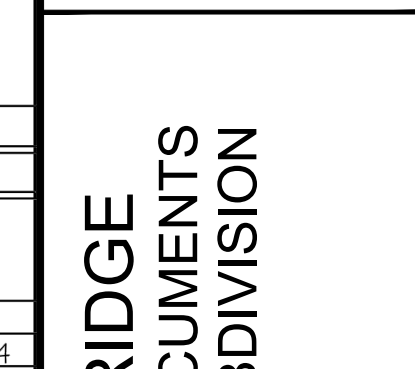
City of Raleigh Development Approval
Raleigh Water Review Officer

Project Engineer: TSS
Designed By: TEP
Drawn By: TEP
Checked By: TSS
Scale:
Date: 09/08/2020
Project Number: P170347

NO.	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE



Bateman Civil Survey Company
Engineers • Surveyors • Planners
2524 Reliance Avenue, Apex, North Carolina 27539
Phone: 919.577.1080 Fax: 919.577.1081
NCBLES FRM No. C-2378



**CHANDLER'S RIDGE
CONSTRUCTION DOCUMENTS
CONSERVATION SUBDIVISION**

**CITY OF RALEIGH
& FORCEMAIN DETAILS**

410 W. YOUNG ST.
ROLESVILLE, NC
WAKE COUNTY

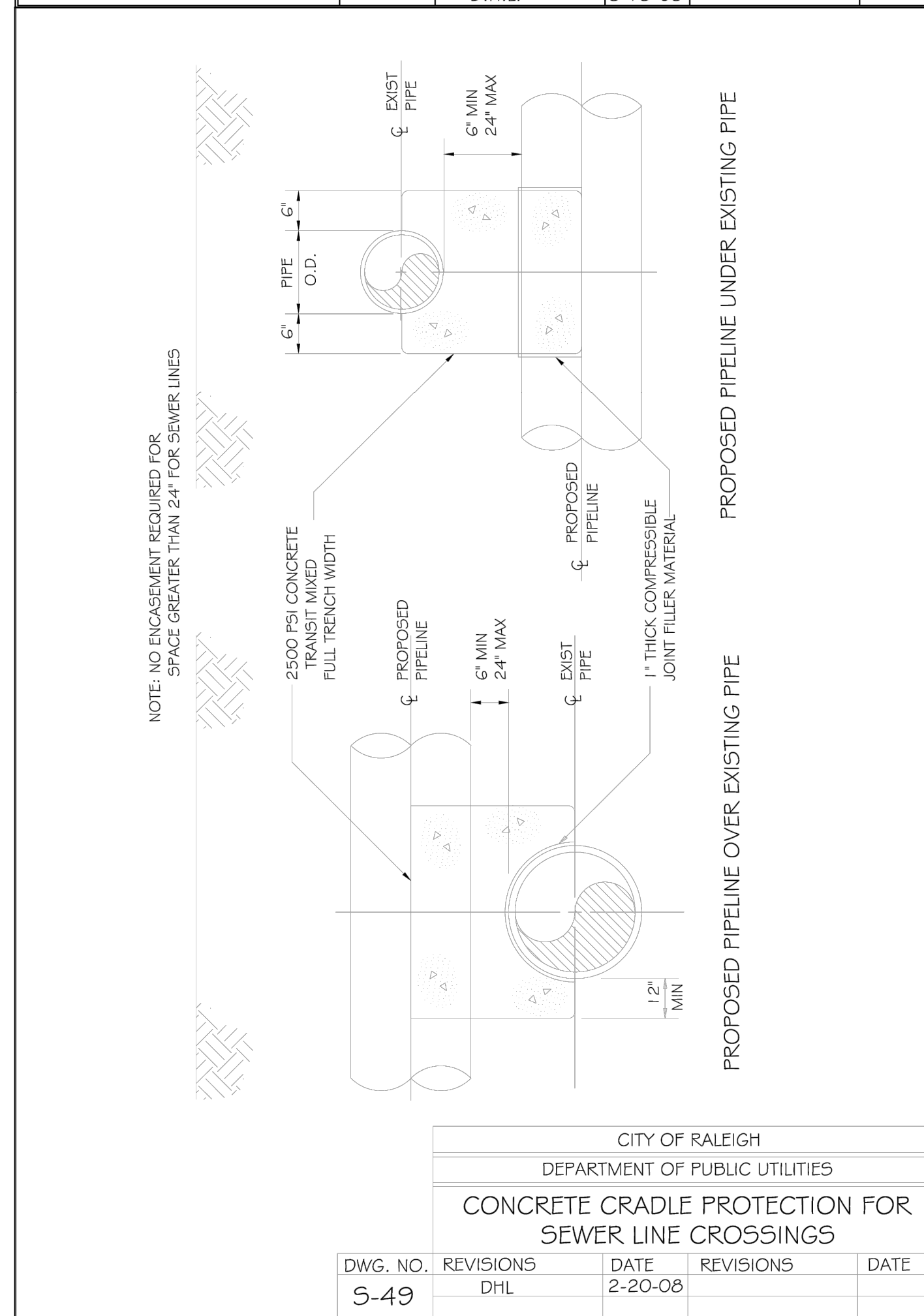
SHEET
C911

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020

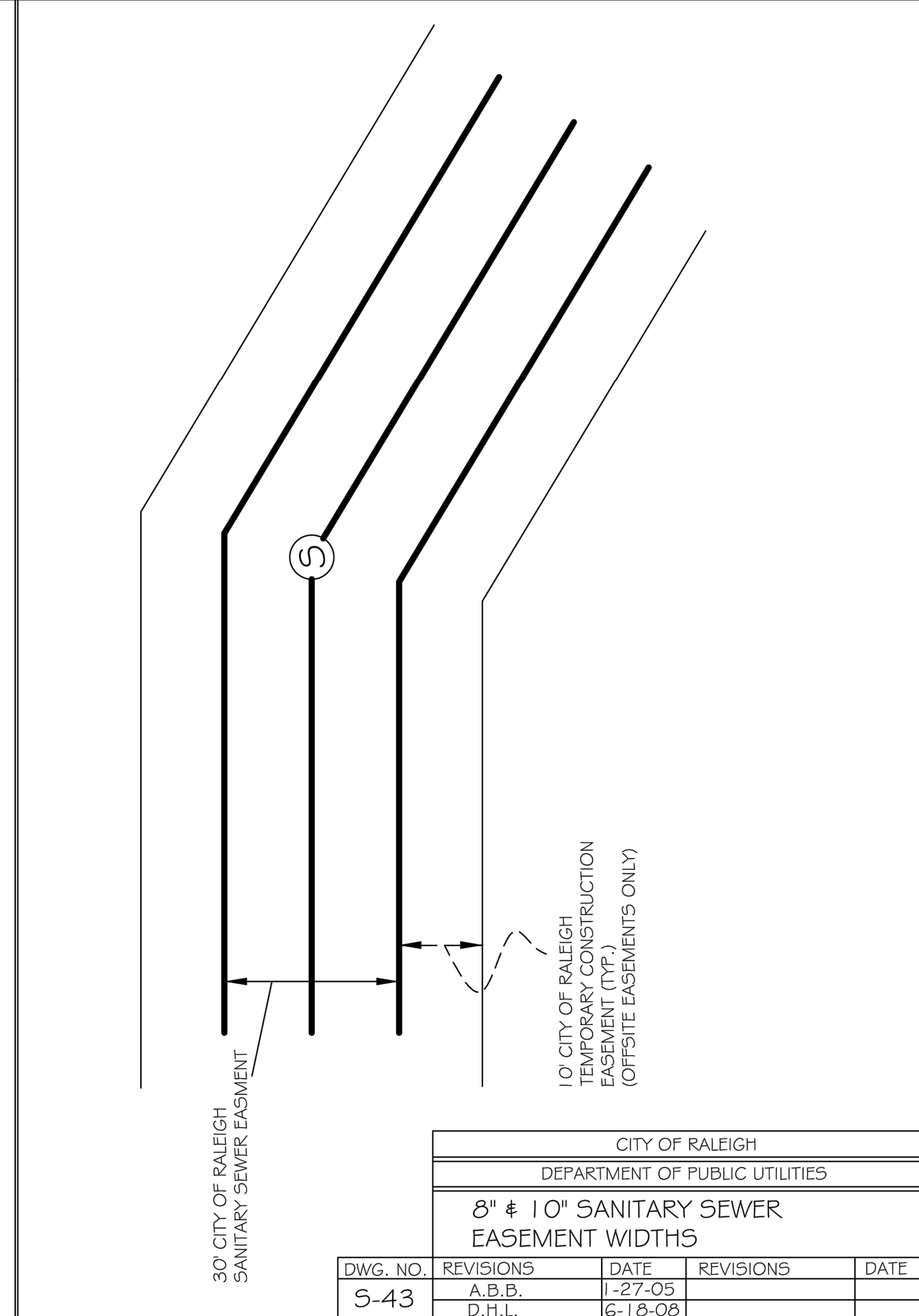
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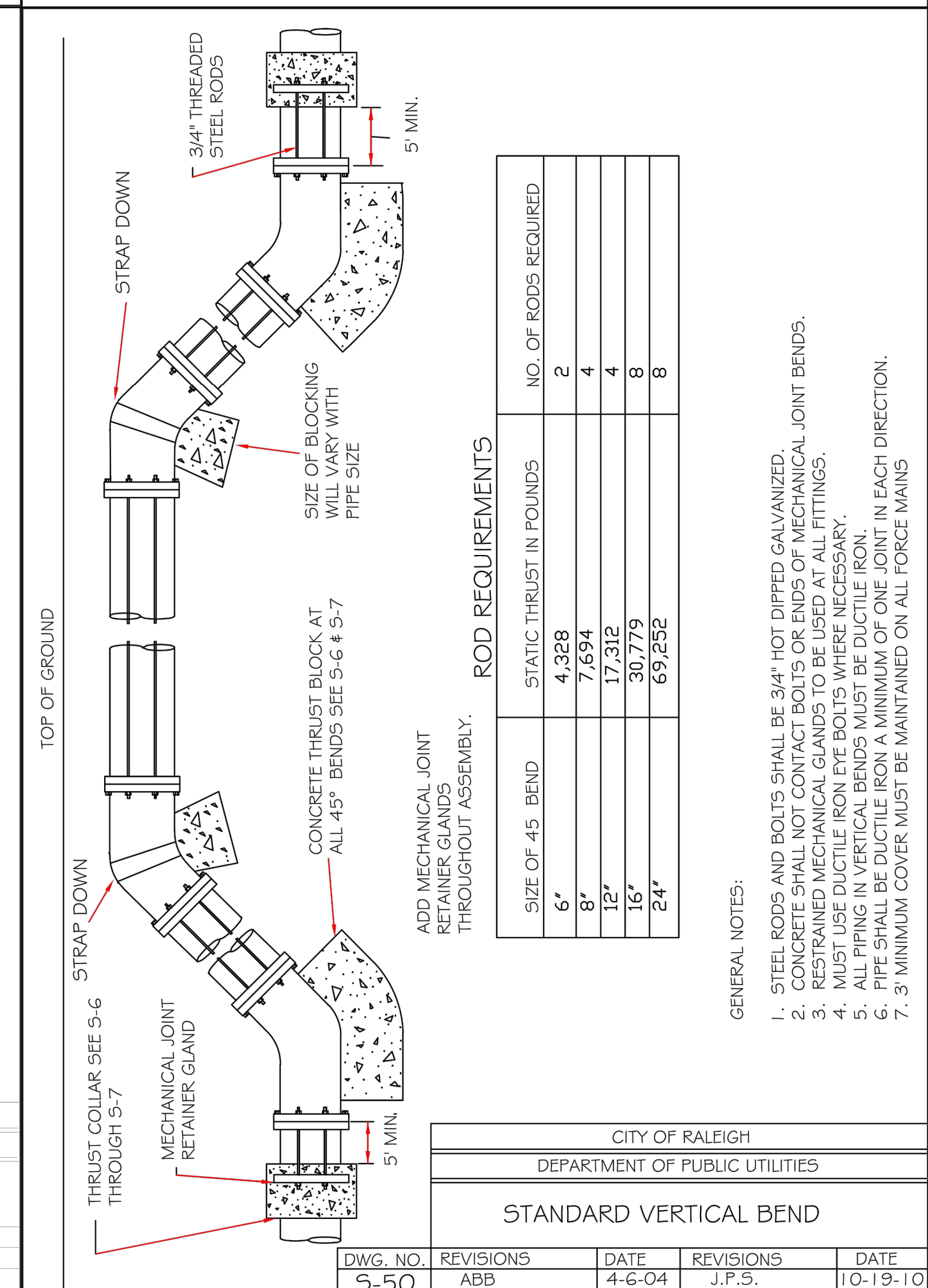
City of Raleigh Development Approval _____
 Raleigh Water Review Officer _____



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-49	D.H.L.	2-20-08		



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
8" & 10" SANITARY SEWER EASEMENT WIDTHS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-43	A.B.B.	1-27-05		
	D.H.L.	6-18-08		



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
STANDARD VERTICAL BEND				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-50	ABB	4-6-04	J.P.S.	10-19-10
	D.H.L.	6-18-08		

- GENERAL NOTES:
- STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
 - CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
 - RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
 - ALL PIPING IN VERTICAL BENDS MUST BE DUCTILE IRON.
 - PIPE SHALL BE DUCTILE IRON A MINIMUM OF ONE JOINT IN EACH DIRECTION.
 - 3" MINIMUM COVER MUST BE MAINTAINED ON ALL FORCE MAINS.

Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBSLS FRM No. C-2378

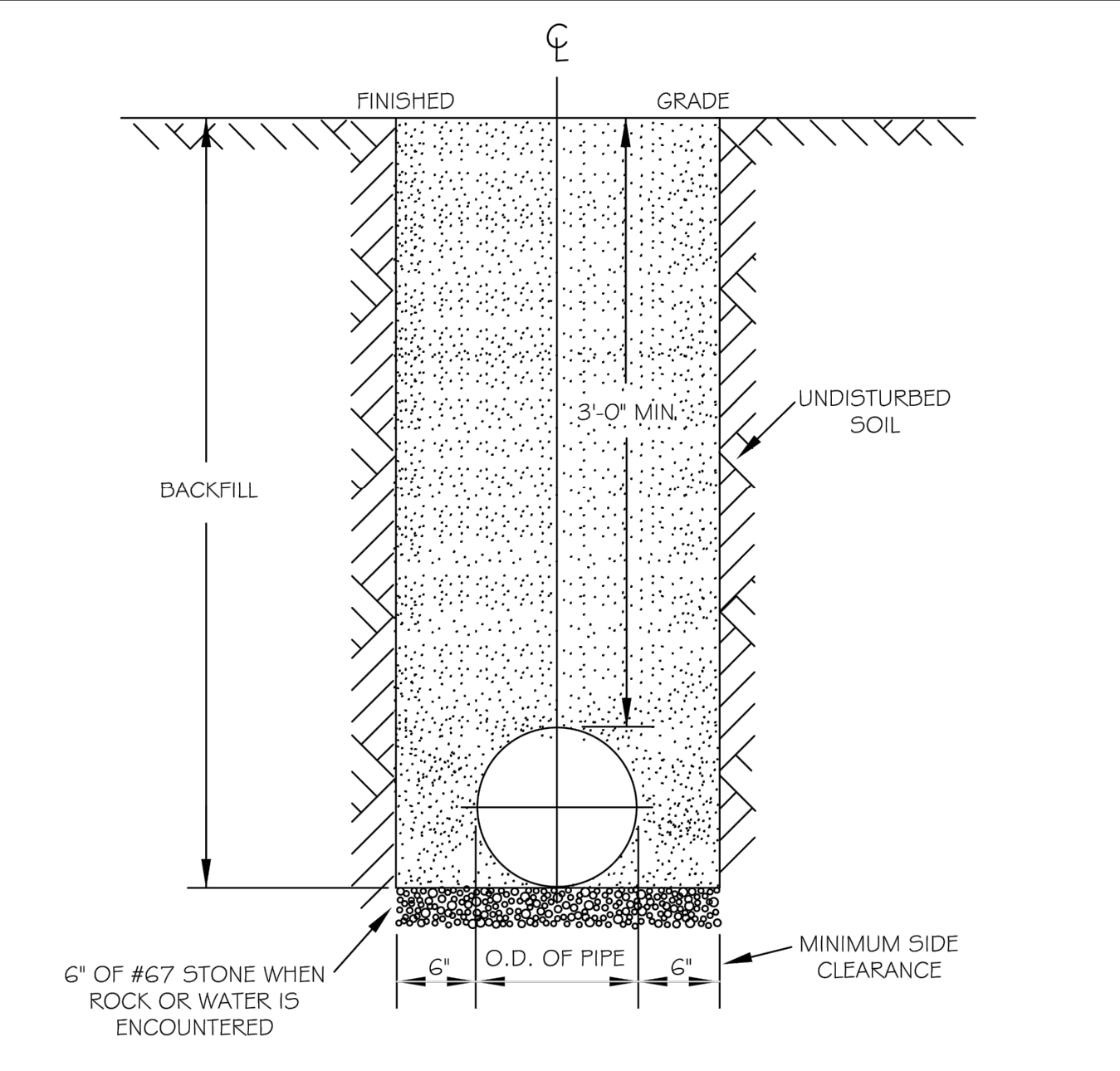
**CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION**

410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

**CITY OF RALEIGH SEWER
 & FORCEMAIN DETAILS**

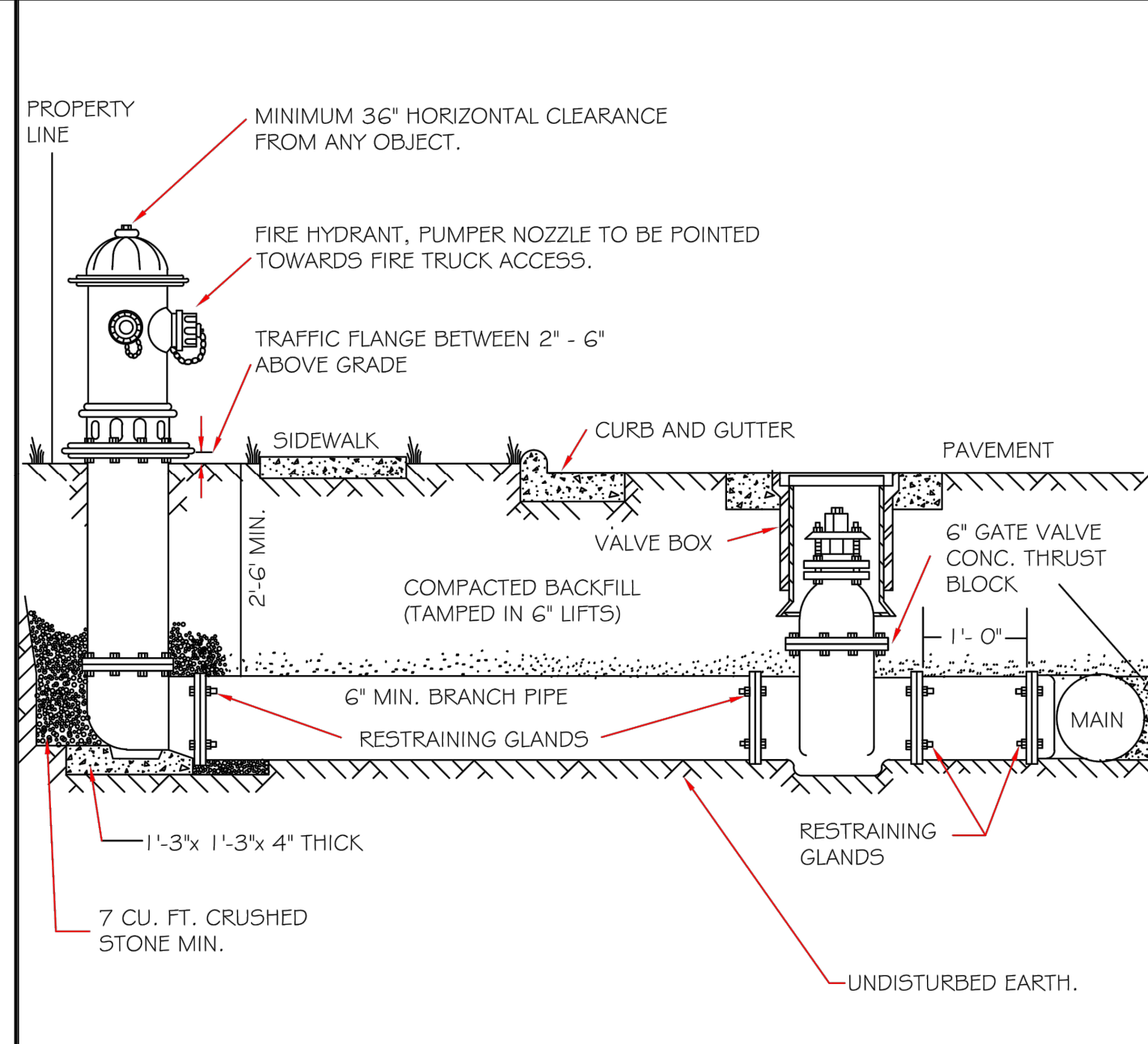
Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS
 Scale:
 Date: 09/08/2020
 Project Number: P170347

SHEET
C912



- NOTES:
- TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 - NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
 - ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 - BACKFILL SHALL BE TAMPED IN 6" LIFTS.
 - ACHIEVE 95% COMPACTION IN BACKFILL.

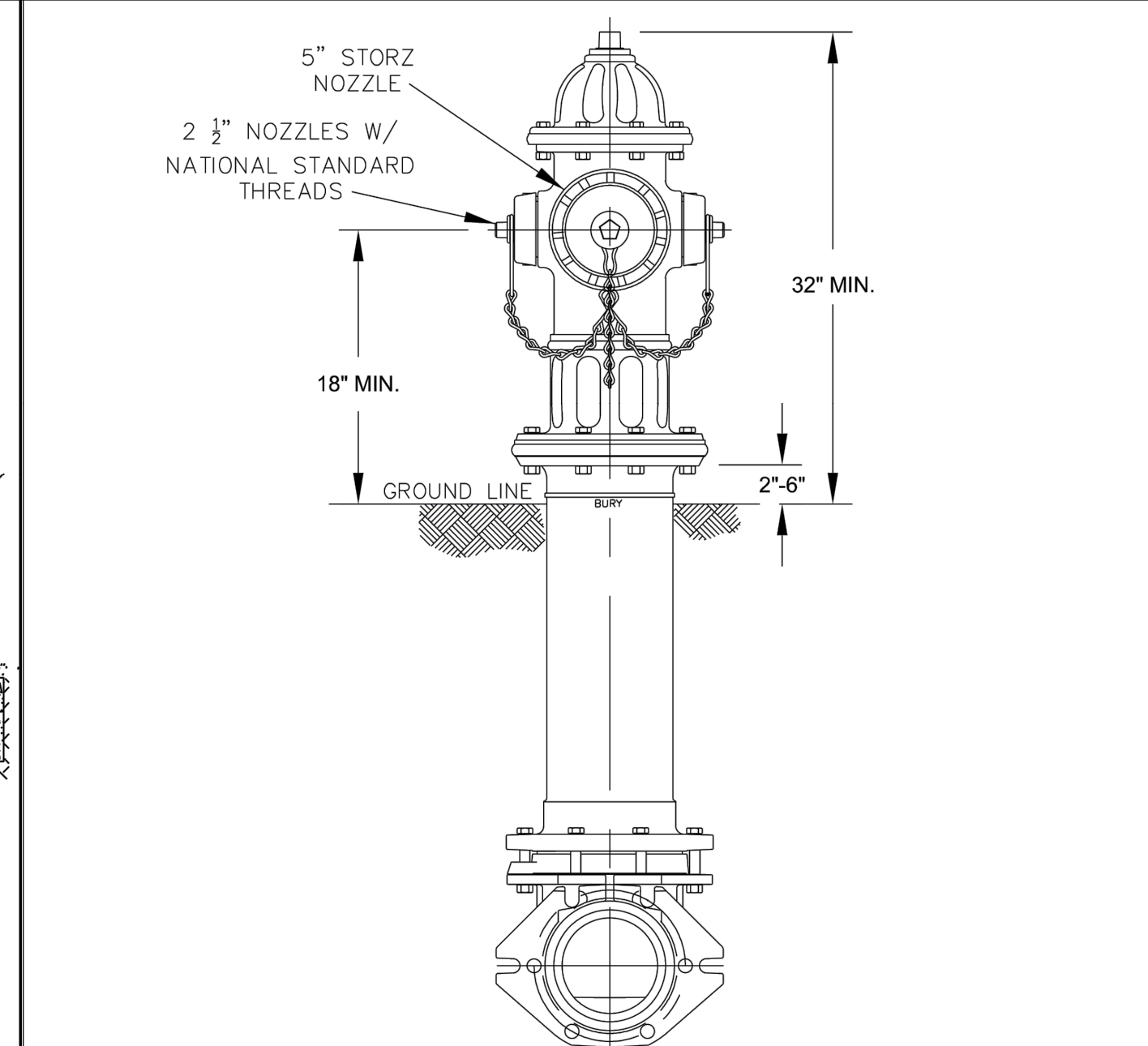
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	RRH	3-31-00	J.P.S.	10-29-10



- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M4H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 - BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
 - 6" GATE VALVE SHALL BE AWWA C500-96 OPEN LEFT
 - STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED
 - FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

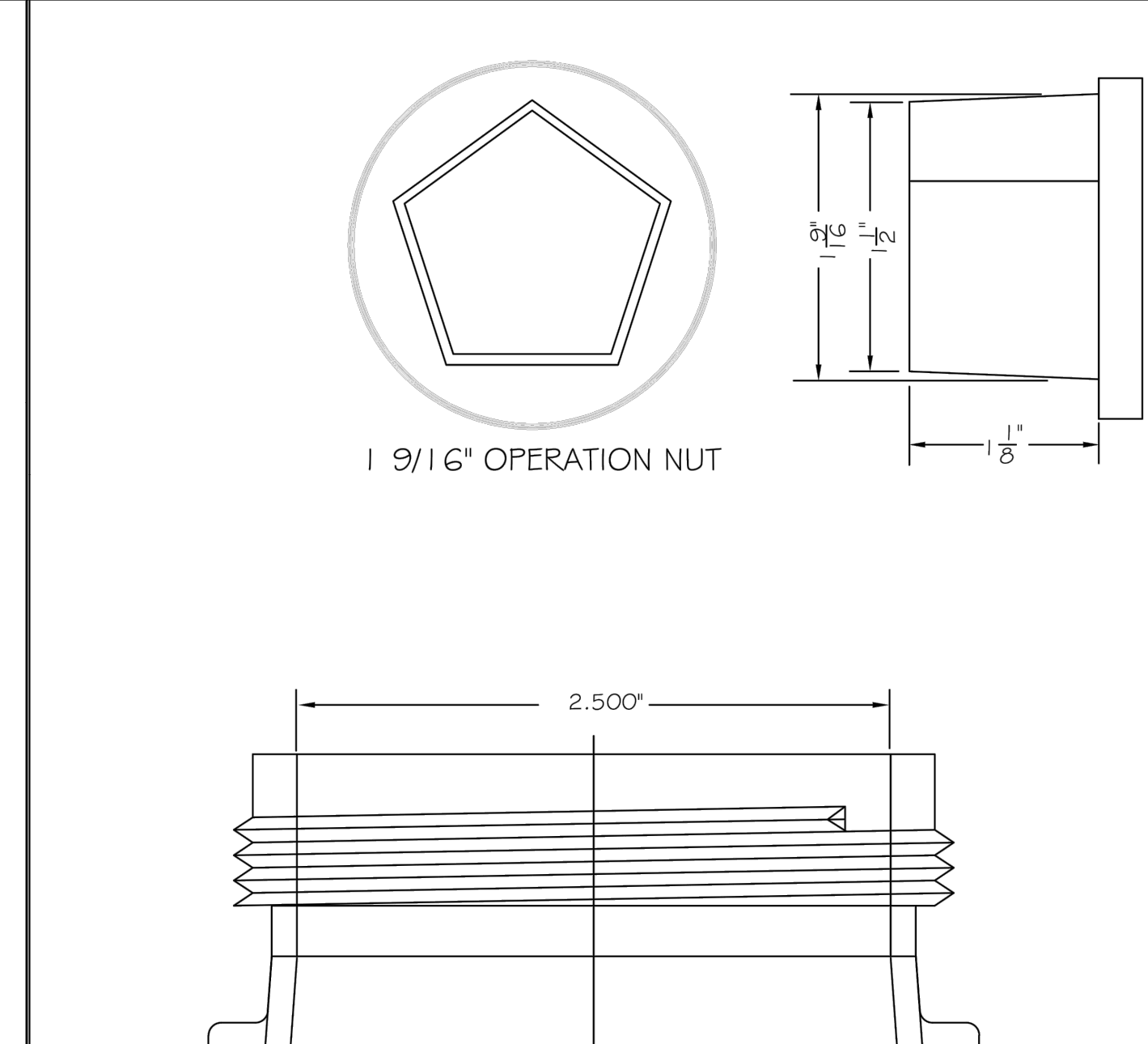
ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD FIRE HYDRANT INSTALLATION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	FAP	2/17/09
	DHL	2/14/08		

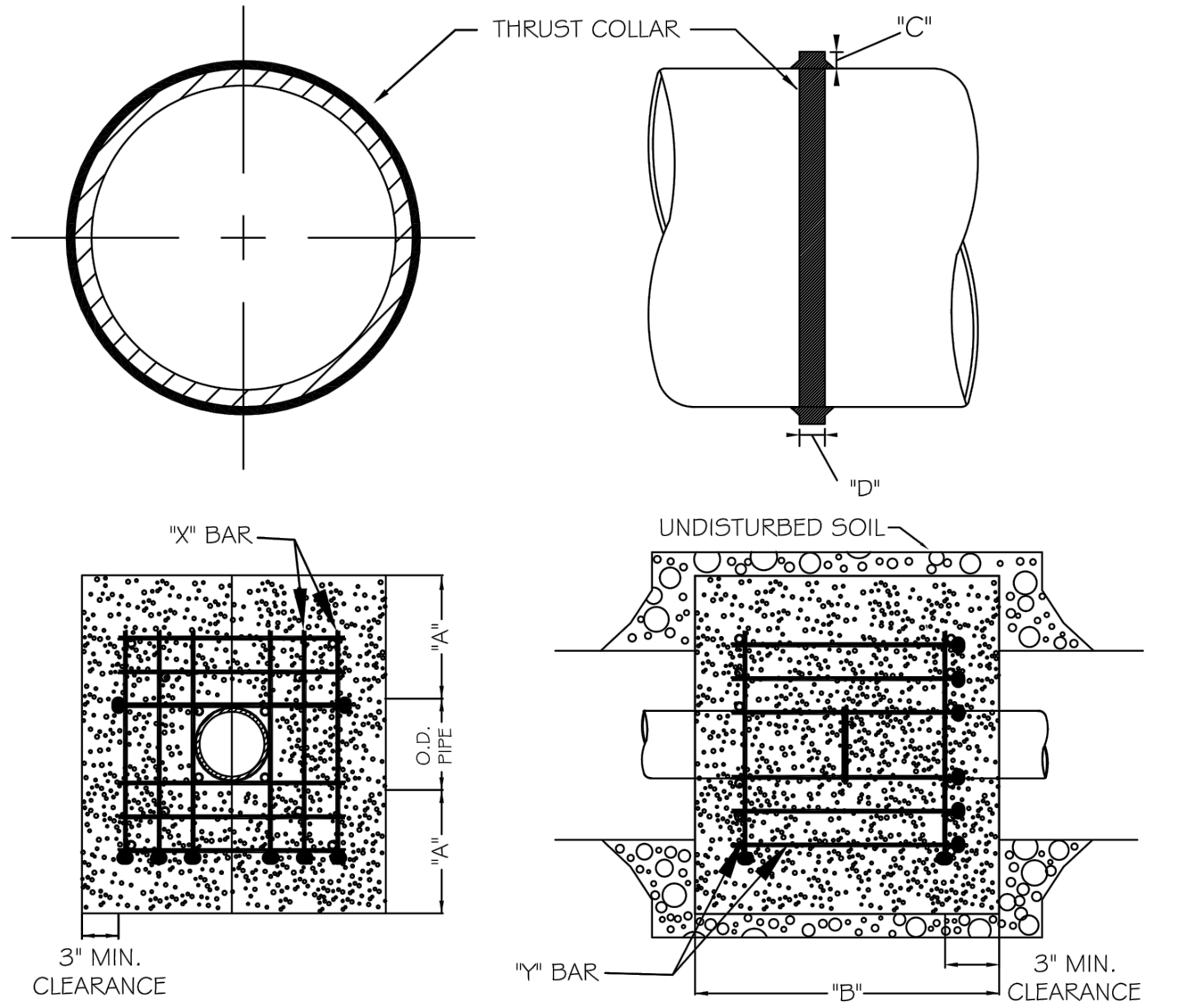


- NOTES:
- ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
 - ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	6-30-16		
	KAT	9-15-17		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
HYDRANT OPERATING NUT AND 2 1/2" OUTLET THREADS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-6	RRH	3-31-00	DHL	2-18-08
	A.B.B.	4-13-04	J.P.S.	11-1-10

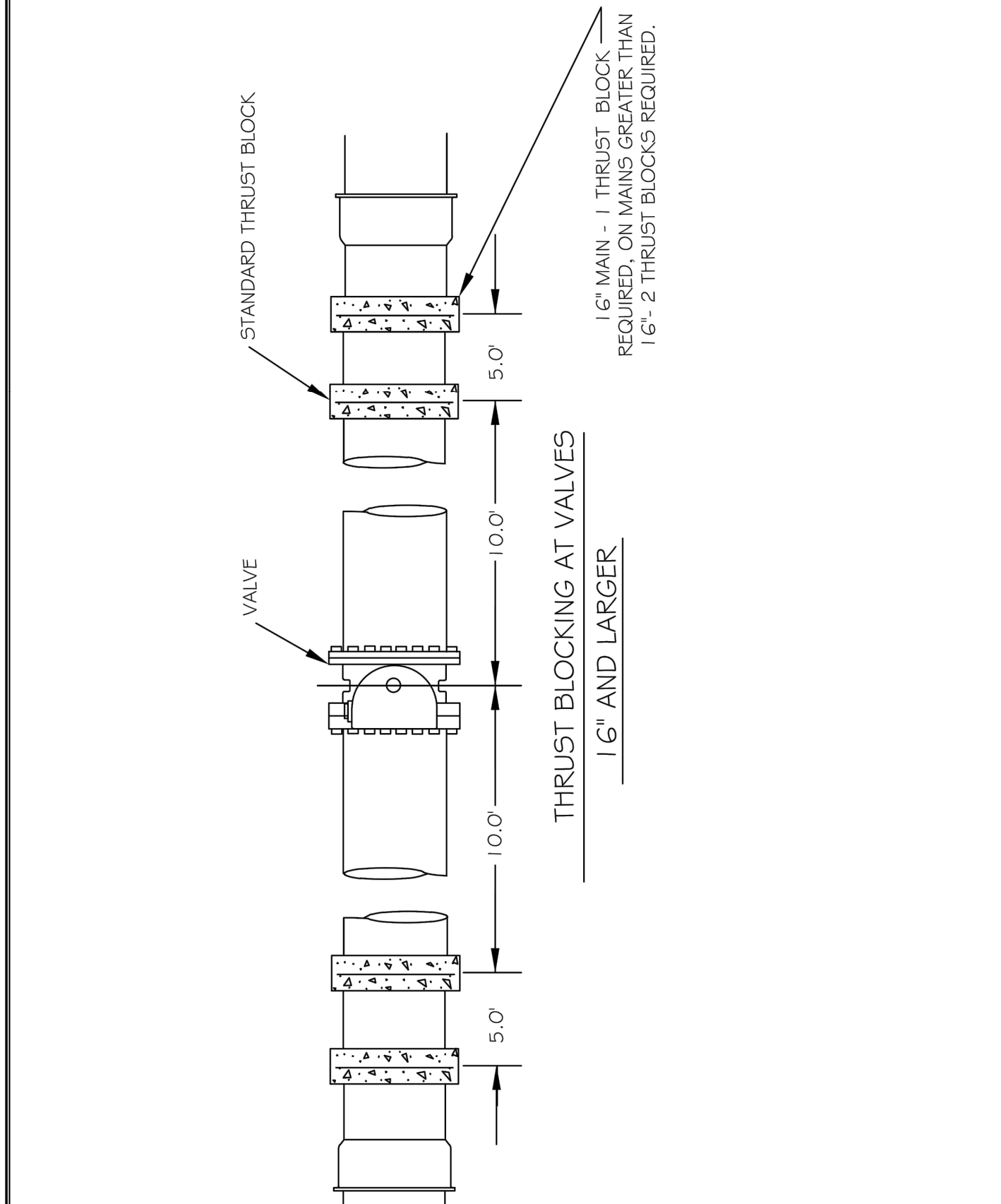


REINFORCING REQUIREMENTS						
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2" O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X-24, Y-12
48" & greater	#6	3'-0" O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X-24, Y-12

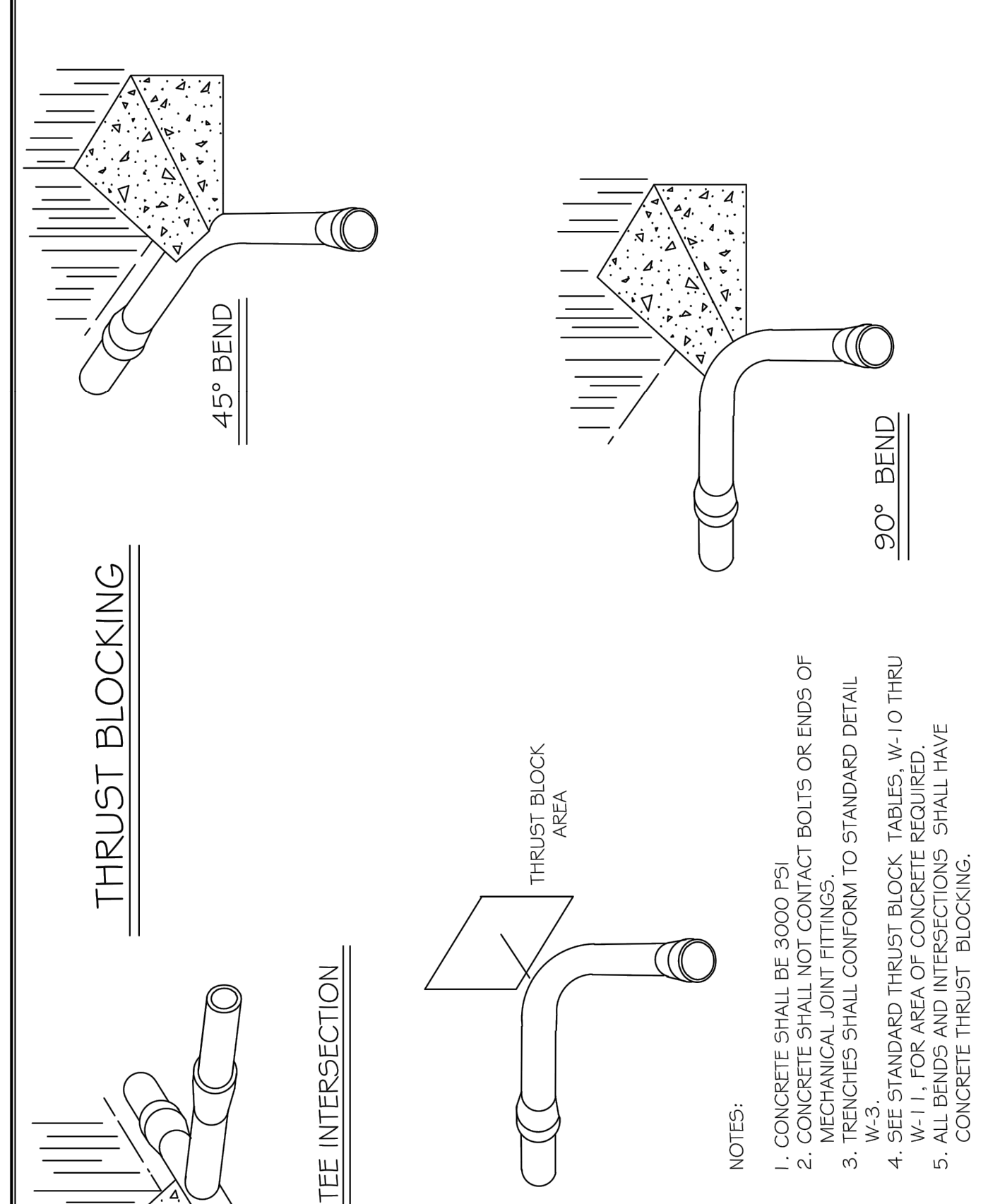
THRUST COLLAR, AND THRUST SCHEDULE				
I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	2"	3/8"
20" - 24"	1'-4"	1'-7"	3"	1/2"
30" - 36"	1'-4"	1'-7"	4"	5/8"
48" & greater	1'-8"	1'-9"	6"	7/8"

- NOTES:
- SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
 - CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
 - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
 - BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
 - THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

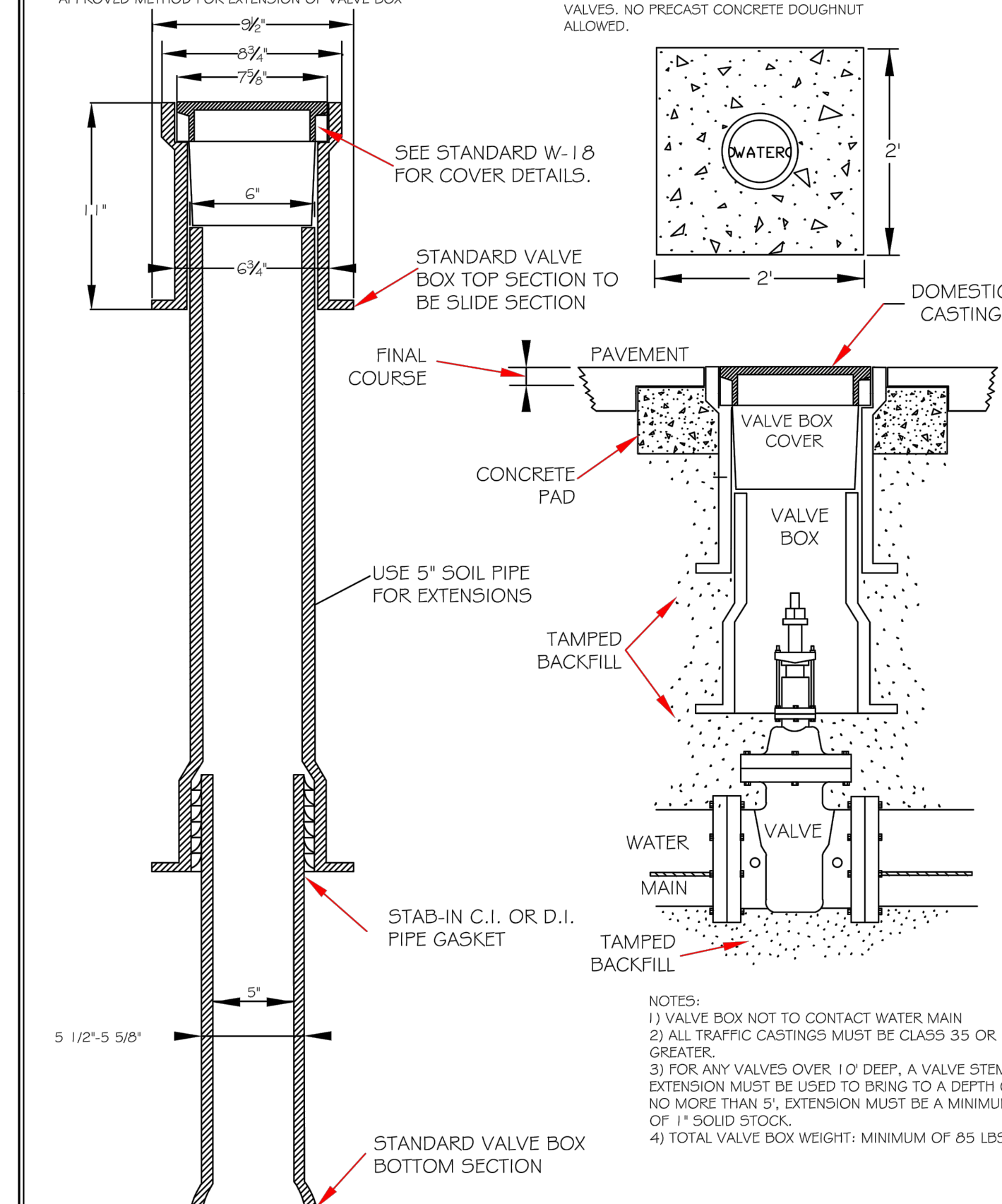
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
THRUST BLOCKING DESIGN DATA FOR WATER MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	4-12-90	D.W.C.	9-7-99
	D.H.L.	6-92	RRH	3-31-00



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-8	D.W.C.	4-12-90	RRH	9-7-99
	RRH	6-92	D.H.L.	3-31-00



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD THRUST BLOCKING VIEWS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-87	RRH	3-31-00
	D.H.L.	9-7-99	D.H.L.	6-18-08



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
VALVE BOX INSTALLATION AND EXTENSION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04
	RRH	3-31-00	DHL	8-16-07

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
VALVE BOX INSTALLATION AND EXTENSION DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04
	RRH	3-31-00	DHL	8-16-07



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CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

CITY OF RALEIGH
 WATER DETAILS

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347
SHEET	C913

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REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LB/SQ FT	SOFT CLAY 2000 LB/SQ FT	1/2" COARSE SAND 8000 LB/SQ FT	GRAVEL/COARSE SAND 16000 LB/SQ FT	GRAVEL/COARSE SAND ALWAYS DRY 24000 LB/SQ FT	SAND, COMPACT FIRM 8000 LB/SQ FT	SAND - CLEAN DRY 4000 LB/SQ FT	SOIL 1000 LB/SQ FT QUICK SAND - VERY POOR	ROCK - POOR 10,000 LB/SQ FT
6"										
11 1/4°	1,108	1	1	1	1	1	1	2	1	
22 1/2°	2,207	1	2	2	1	1	1	3	1	
45°	4,326	2	3	3	1	1	2	5	1	
90°	7,996	2	4	5	1	1	2	8	1	
PLUG	5,655	2	3	4	1	1	2	6	1	
8"										
11 1/4°	1,970	1	1	2	1	1	1	2	1	
22 1/2°	3,922	1	2	3	1	1	1	4	1	
45°	7,694	2	4	5	1	1	2	8	1	
90°	14,215	4	8	9	2	2	4	15	2	
PLUG	10,053	3	5	6	2	2	3	10	1	
12"										
11 1/4°	4,433	2	3	3	1	1	2	5	1	
22 1/2°	8,826	3	5	6	2	2	3	9	1	
45°	17,312	5	9	11	3	3	5	18	2	
90°	31,983	8	16	19	4	4	8	32	4	
PLUG	22,619	6	12	14	3	3	6	23	3	
16"										
11 1/4°	7,881	2	4	5	1	1	2	8	1	
22 1/2°	15,691	4	8	10	2	2	4	16	2	
45°	30,779	8	16	19	4	4	8	31	4	
90°	56,861	15	29	35	8	8	15	57	6	
PLUG	40,213	10	21	25	5	5	10	41	5	

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LB/SQ FT	SOFT CLAY 2000 LB/SQ FT	GRAVEL/COARSE SAND 16000 LB/SQ FT	GRAVEL/COARSE SAND ALWAYS DRY 24000 LB/SQ FT	SAND, COMPACT FIRM 8000 LB/SQ FT	SAND - CLEAN DRY 4000 LB/SQ FT	SOIL 1000 LB/SQ FT QUICK SAND - VERY POOR	ROCK - POOR 10,000 LB/SQ FT	
24"										
11 1/4°	17,734	5	9	11	3	3	5	18	2	
22 1/2°	35,305	9	18	22	5	5	9	36	4	
45°	69,252	18	35	42	9	9	18	70	7	
90°	127,936	32	64	77	16	16	32	128	13	
PLUG	90,478	23	46	55	12	12	23	91	10	
30"										
11 1/4°	27,709	7	14	17	4	4	7	2	3	
22 1/2°	55,163	14	28	34	7	7	14	56	6	
45°	108,206	28	55	65	14	14	28	109	11	
90°	199,900	50	100	120	25	25	50	200	20	
PLUG	141,372	36	71	85	18	18	36	142	15	
36"										
11 1/4°	39,901	10	20	24	5	5	10	40	4	
22 1/2°	79,439	20	40	48	10	10	20	80	8	
45°	155,816	39	78	94	20	20	39	156	16	
90°	287,655	72	144	172	36	36	72	288	29	
PLUG	203,575	51	102	122	26	26	51	204	21	
48"										
11 1/4°	70,935	18	36	43	9	9	18	71	8	
22 1/2°	141,218	36	71	85	18	18	36	142	15	
45°	277,007	70	139	166	35	35	70	277	28	
90°	511,742	128	256	320	64	64	128	512	52	
PLUG	361,911	91	181	217	46	46	91	362	37	

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN QUANTITY TABLE

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	6-23-99		

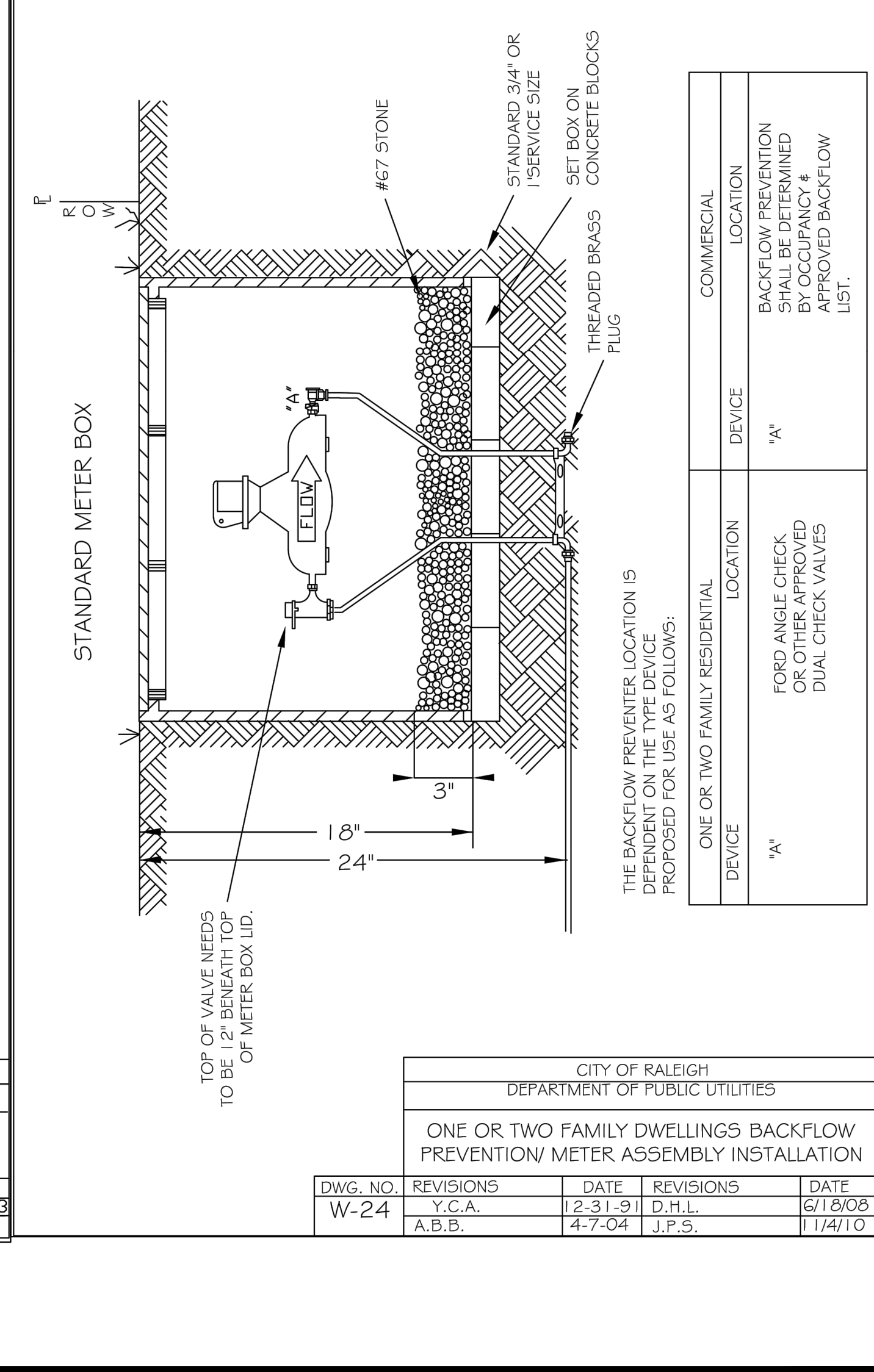
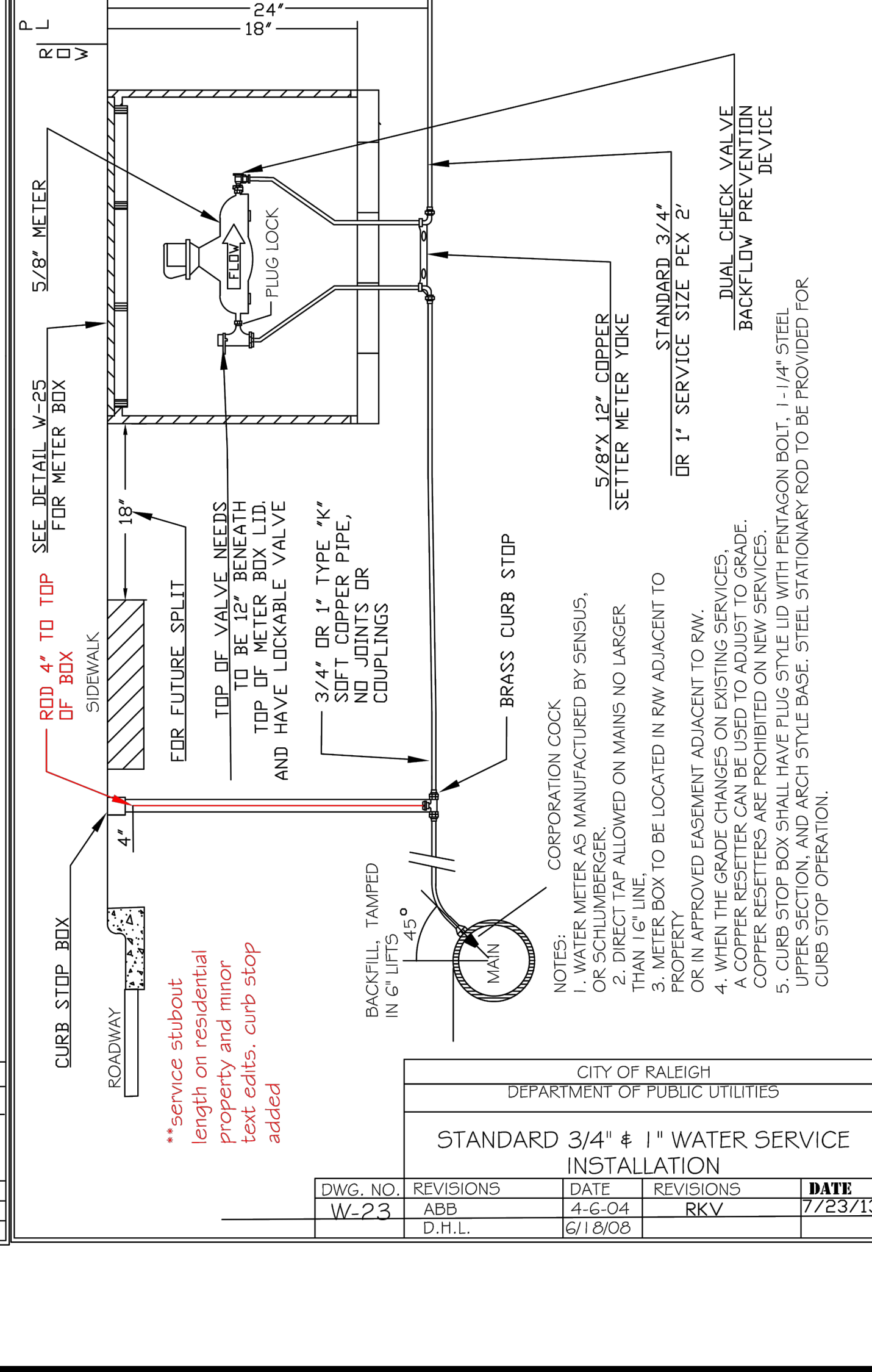
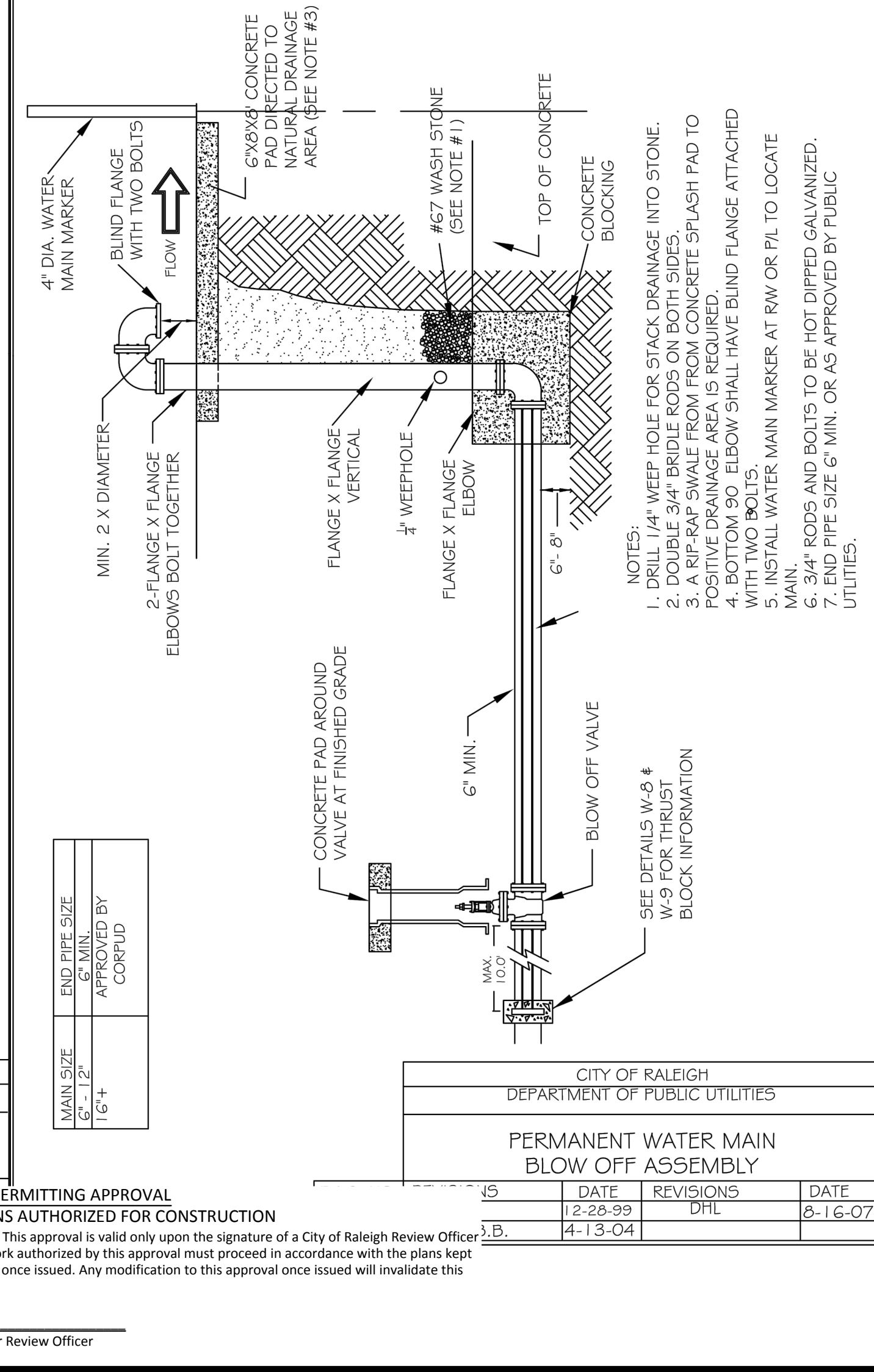
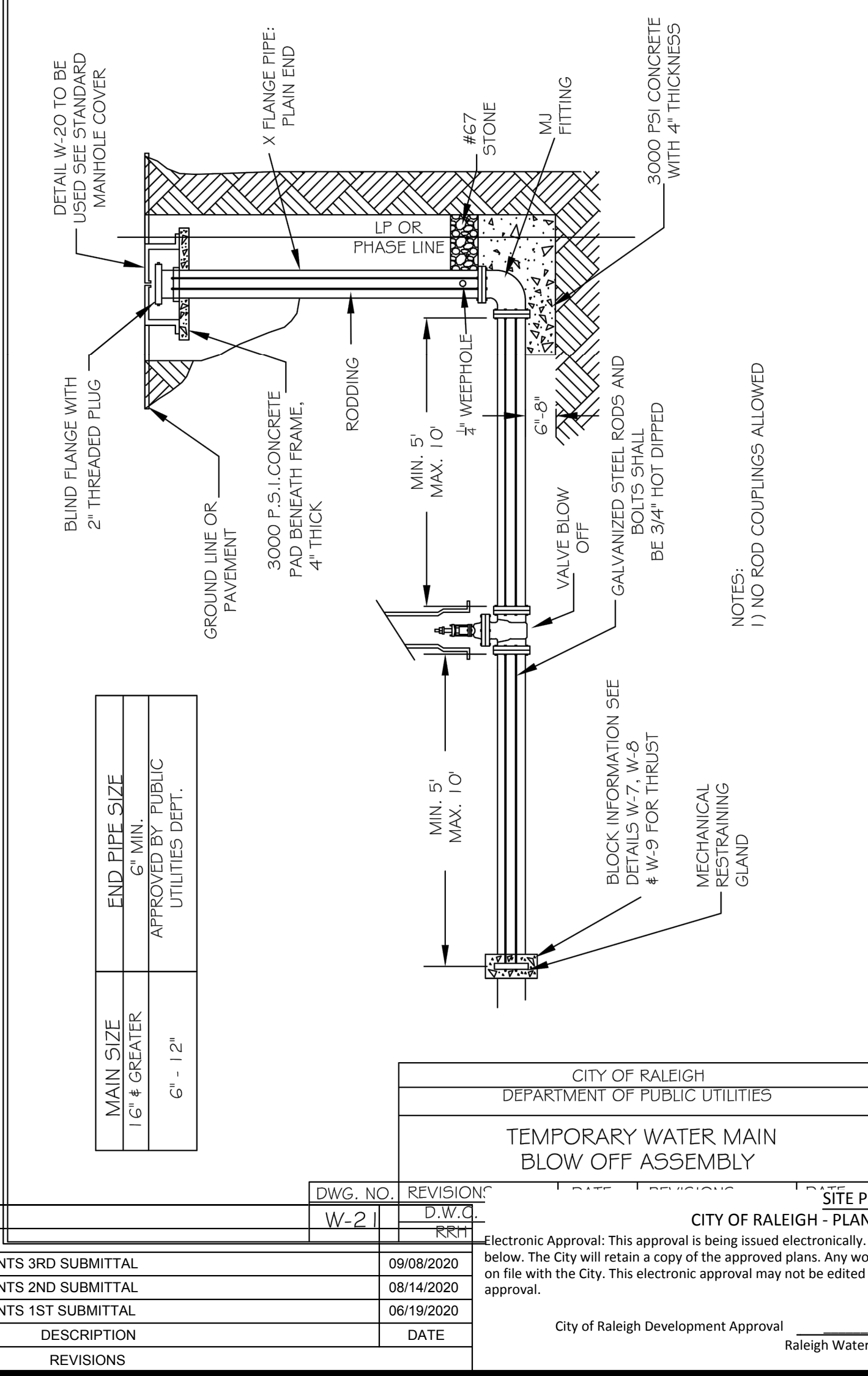
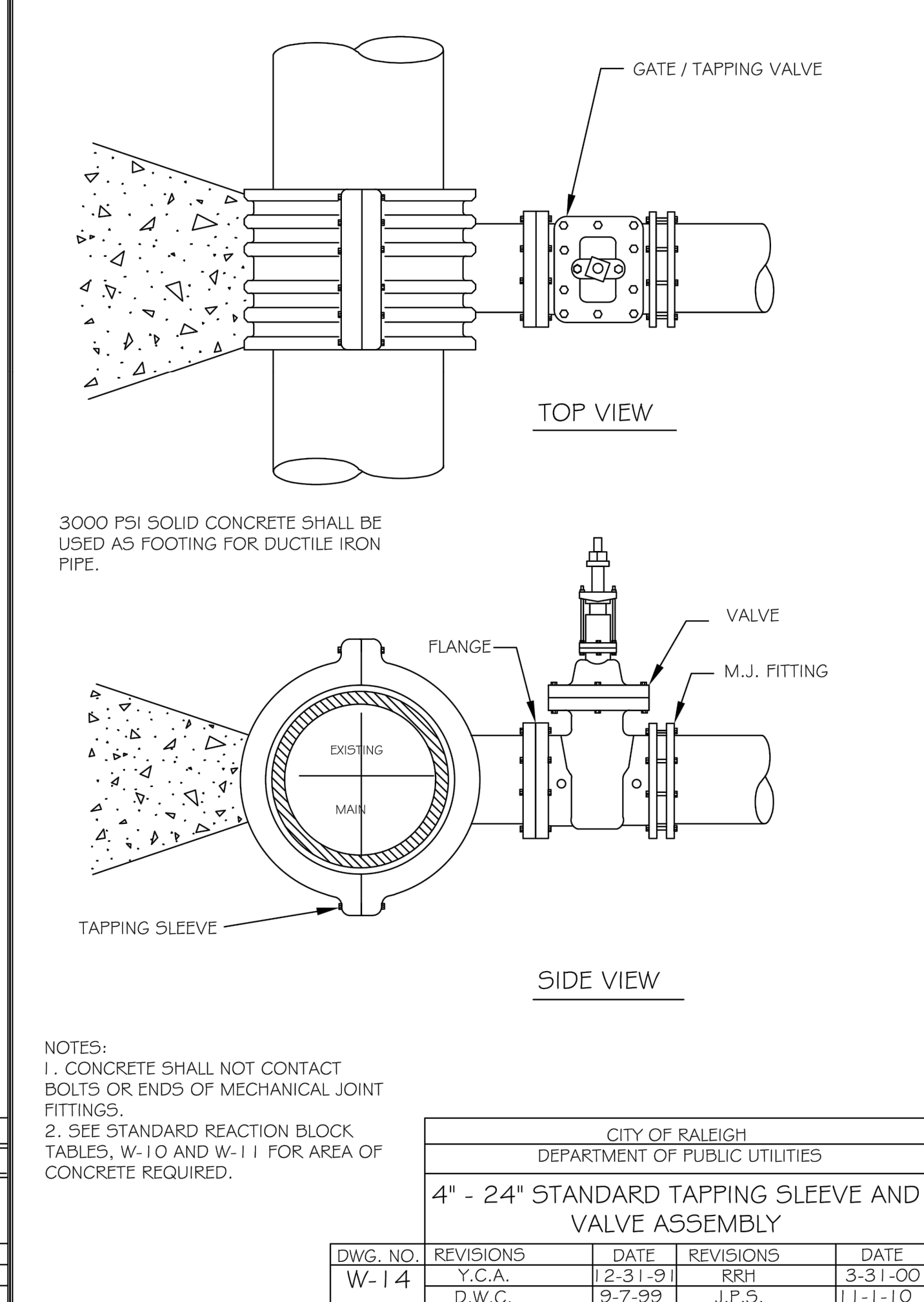
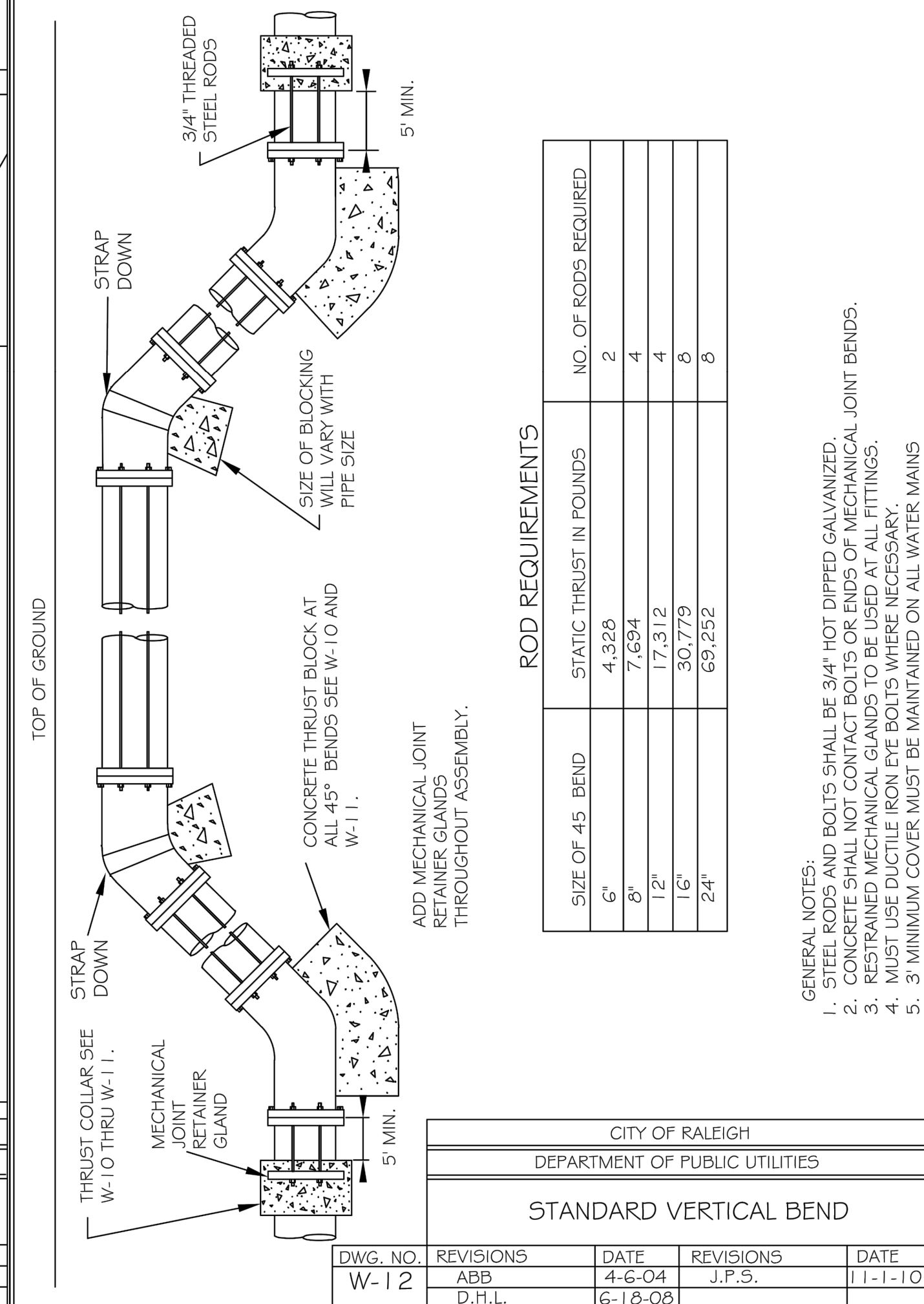
REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN QUANTITY TABLE

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-11	D.W.C.	6-23-99		



Bateman Civil Survey Company
Engineers • Surveyors • Planners
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Phone: 919.577.1080 Fax: 919.577.1081
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CHANDLER'S RIDGE CONSTRUCTION DOCUMENTS CONSERVATION SUBDIVISION

410 W. YOUNG ST.
ROLESVILLE, NC
WAKE COUNTY

CITY OF RALEIGH WATER DETAILS

Project Engineer: TSS
Designed By: TEP
Drawn By: TEP
Checked By: TSS
Scale:
Date: 09/08/2020
Project Number: P170347
SHEET
C914

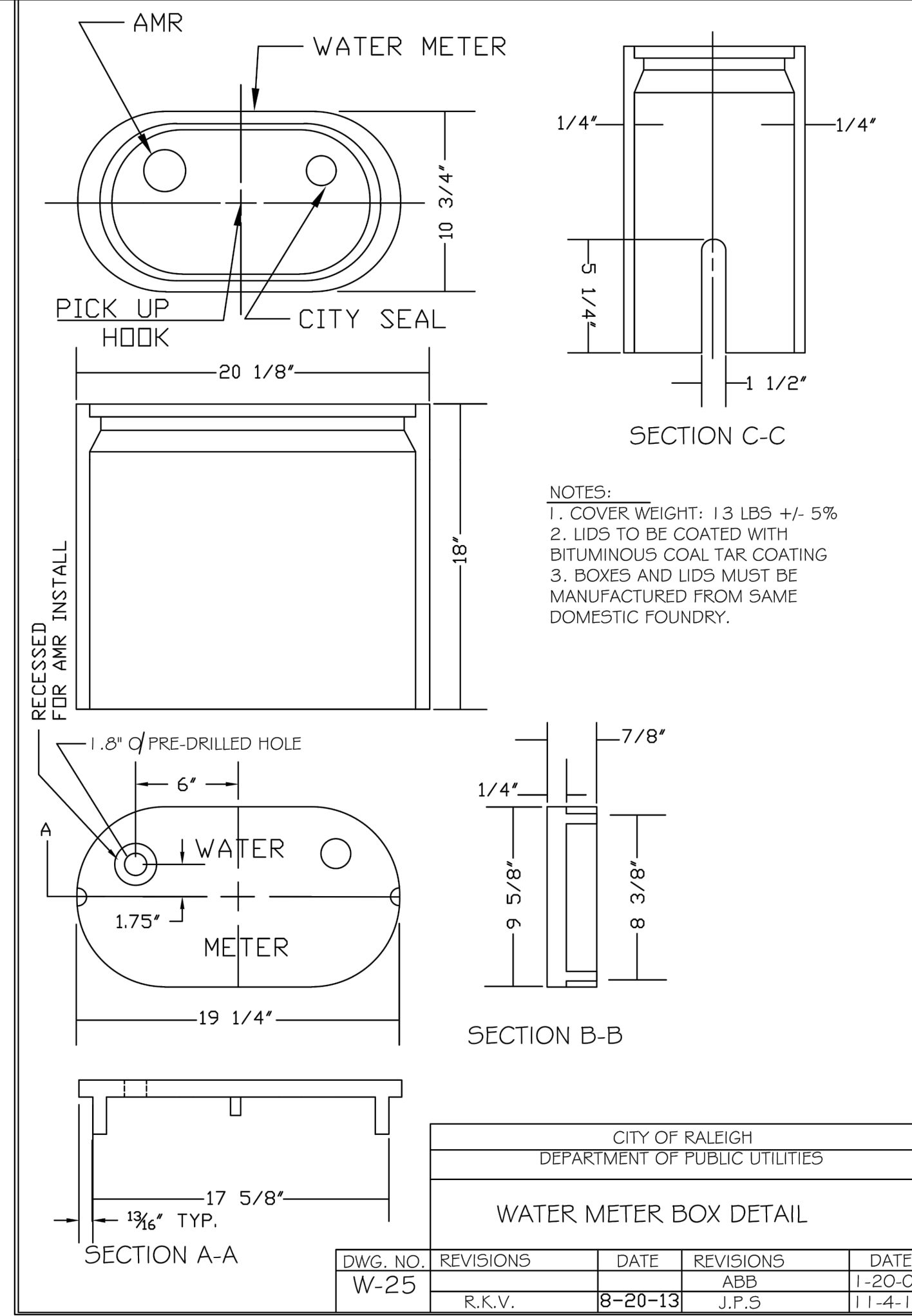
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REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE
	REVISIONS	

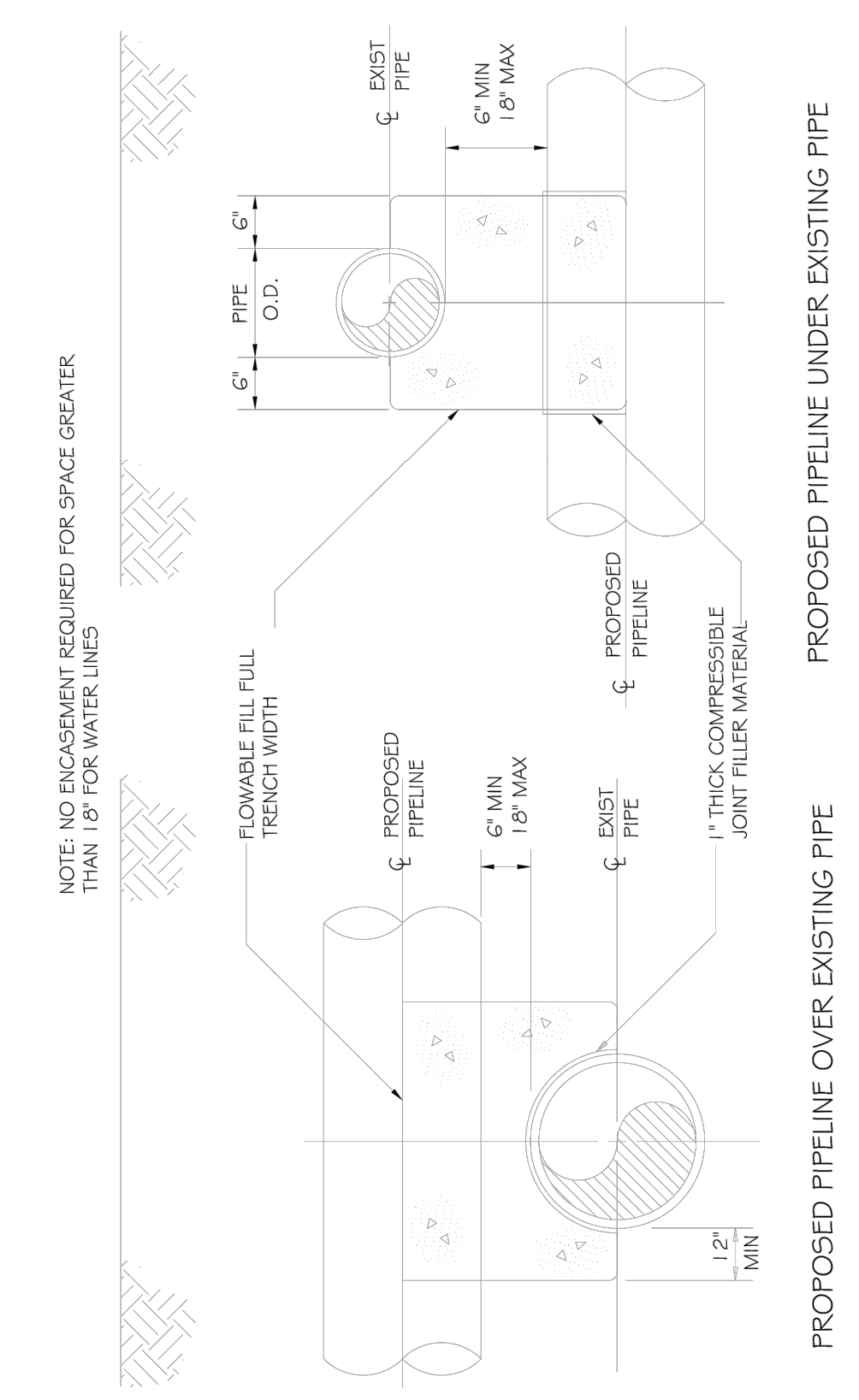
SITE PERMITTING APPROVAL
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____
Raleigh Water Review Officer



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES				
WATER METER BOX DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25			ABB	1-20-05
	R.K.V.	8-20-13	J.P.S	11-4-10



CITY OF RALEIGH DEPARTMENT OF PUBLIC UTILITIES			
CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS			
DWG. NO.	REVISIONS	DATE	REVISIONS
W-41	DHL	2-20-08	

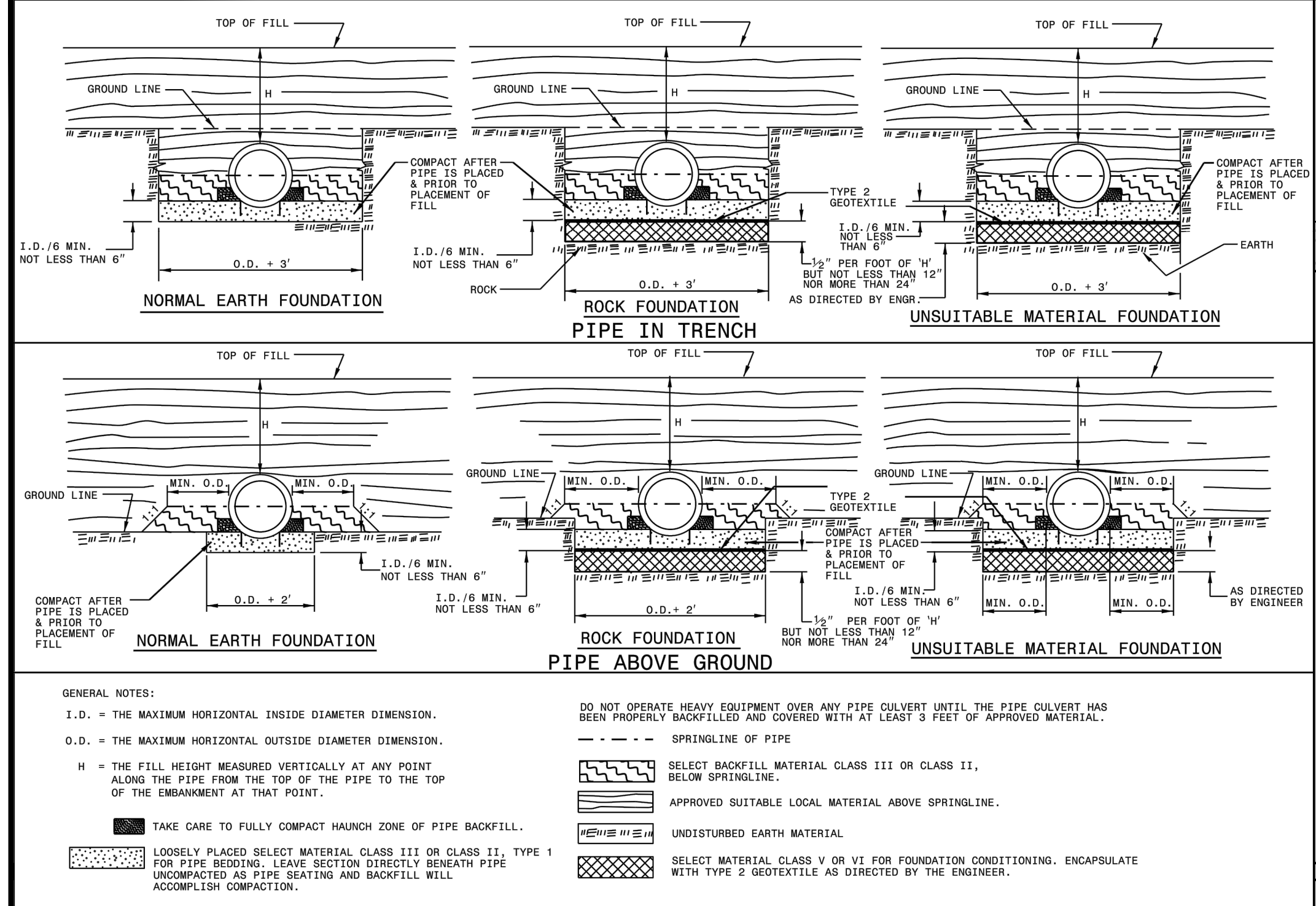


Bateman Civil Survey Company
Engineers • Surveyors • Planners
2524 Reliance Avenue, Apex, North Carolina 27539
Phone: 919.577.1080 Fax: 919.577.1081
NCBELS FIRM No. C-2378

**CHANDLER'S RIDGE
CONSTRUCTION DOCUMENTS
CONSERVATION SUBDIVISION**

**CITY OF RALEIGH
WATER DETAILS**

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347
SHEET	
C915	



FLEXIBLE PIPE

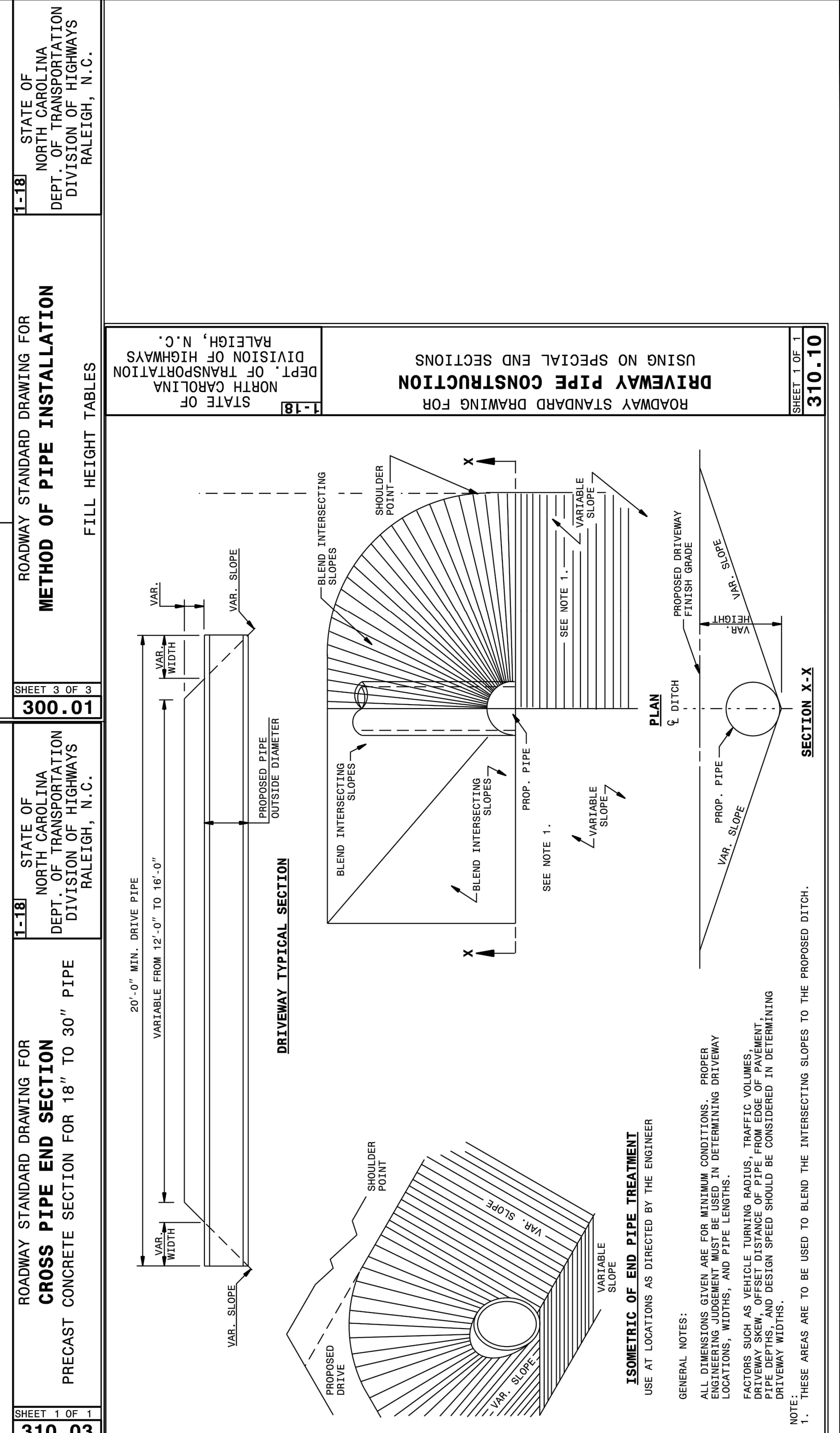
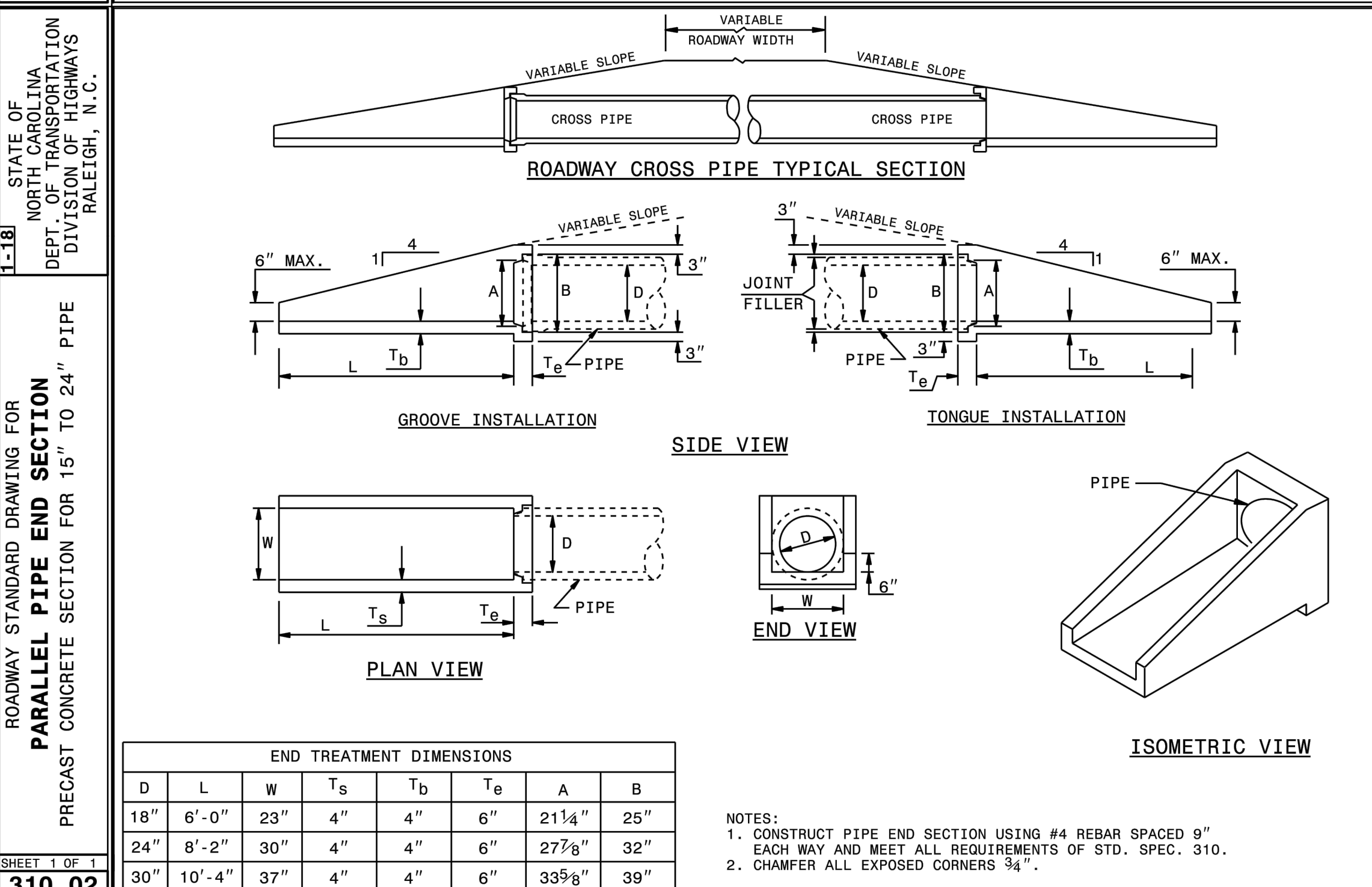
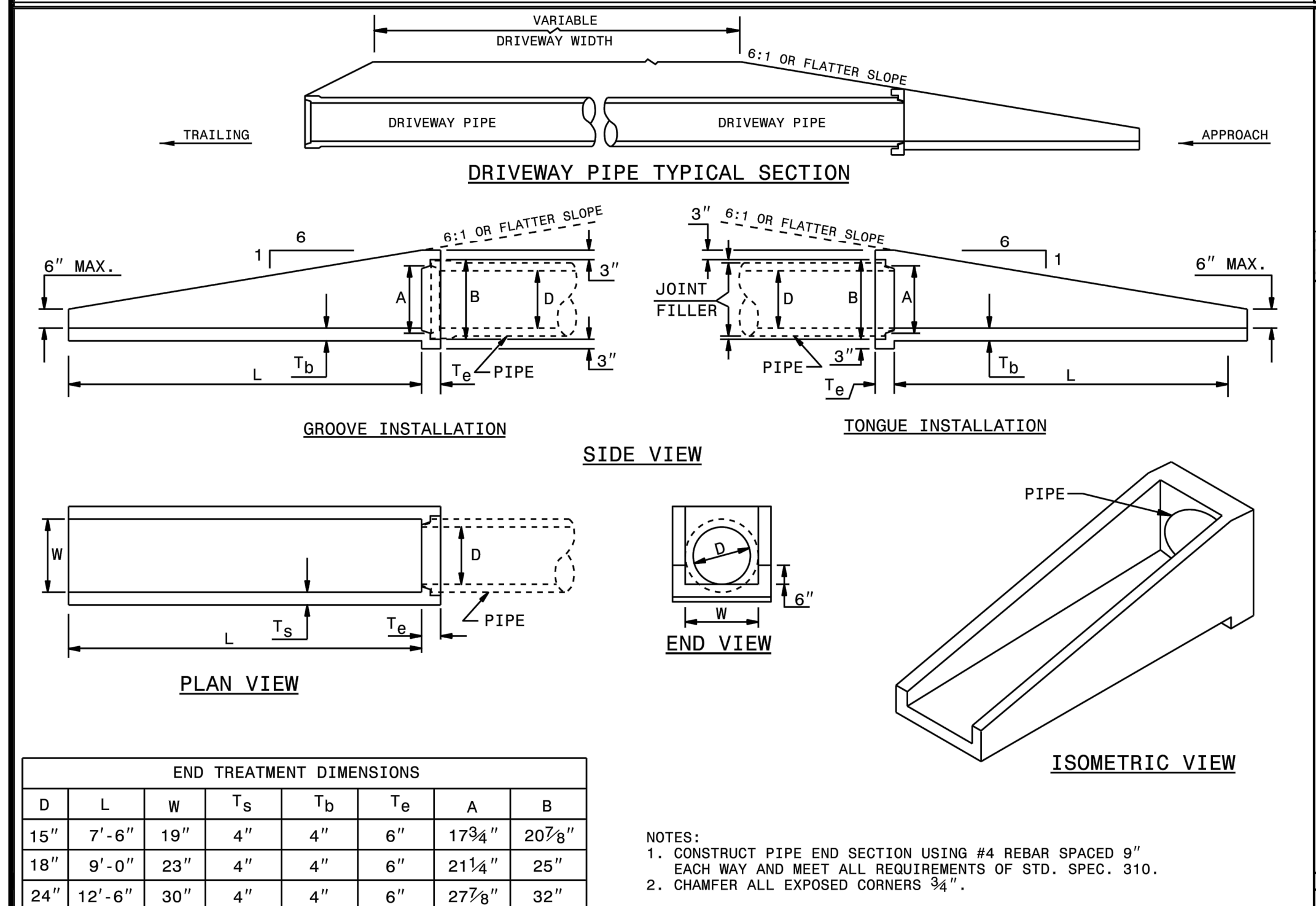
Round Corrugated Steel Pipe 2 2/3 x 1/2 corrugation **			Round Corrugated Aluminum Pipe 2 2/3 x 1/2 corrugation **		
Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)	Diameter (inches)	Minimum cover (inches)	Maximum Height of Cover (feet)
12	12	204	12	12	123
15	12	162	15	12	98
18	12	135	18	12	81
21	12	115	21	12	69
24	12	100	24	12	60
30	12	79	30	12	47
36	12	65	36	12	39
42	12	55	42	12	33
48	12	48	48	12	28
54	12	42	54	12	24
60	12	37	60	12	21
66	12	33	66	12	18
72	12	30	72	12	16
78	12	27	78	12	14
84	12	25	84	12	13

HOPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
 * (Maximum fill) 20' for pipe diameters ≥ 24" and ≤ 60"
 17' for pipe diameters ≥ 30" and ≤ 60"

PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
 * (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

RCF - * (Minimum fill) 1' for Class IV & Class V
 2' for Class III & Class II
 * (Maximum fill) 10' - Class II pipe
 20' - Class III pipe
 30' - Class IV pipe
 40' - Class V pipe

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
 1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS



NO.	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE



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 NCBELS FRM No. C-2378

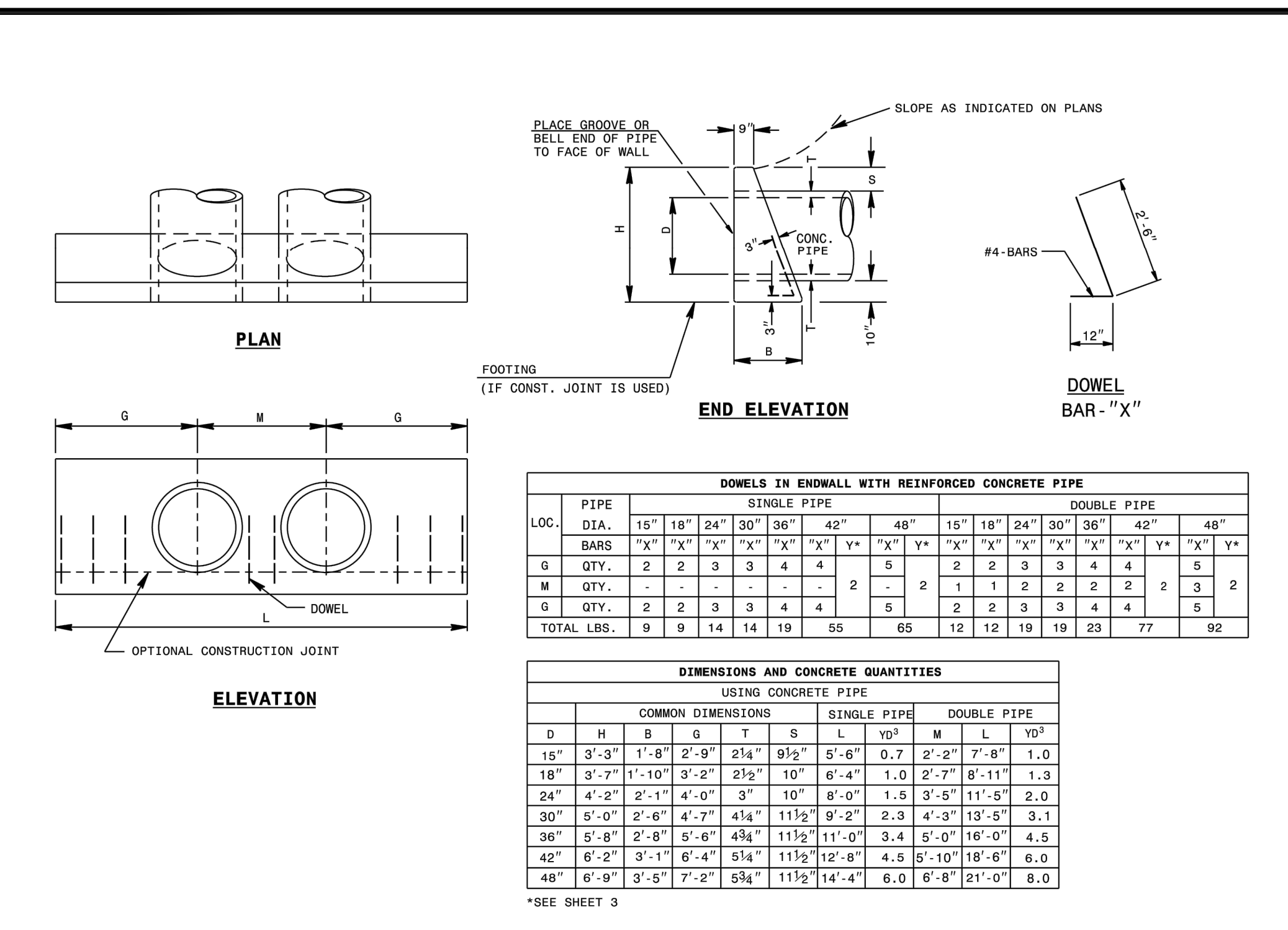


CHANDLER'S RIDGE CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION

410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

STORMWATER DETAILS

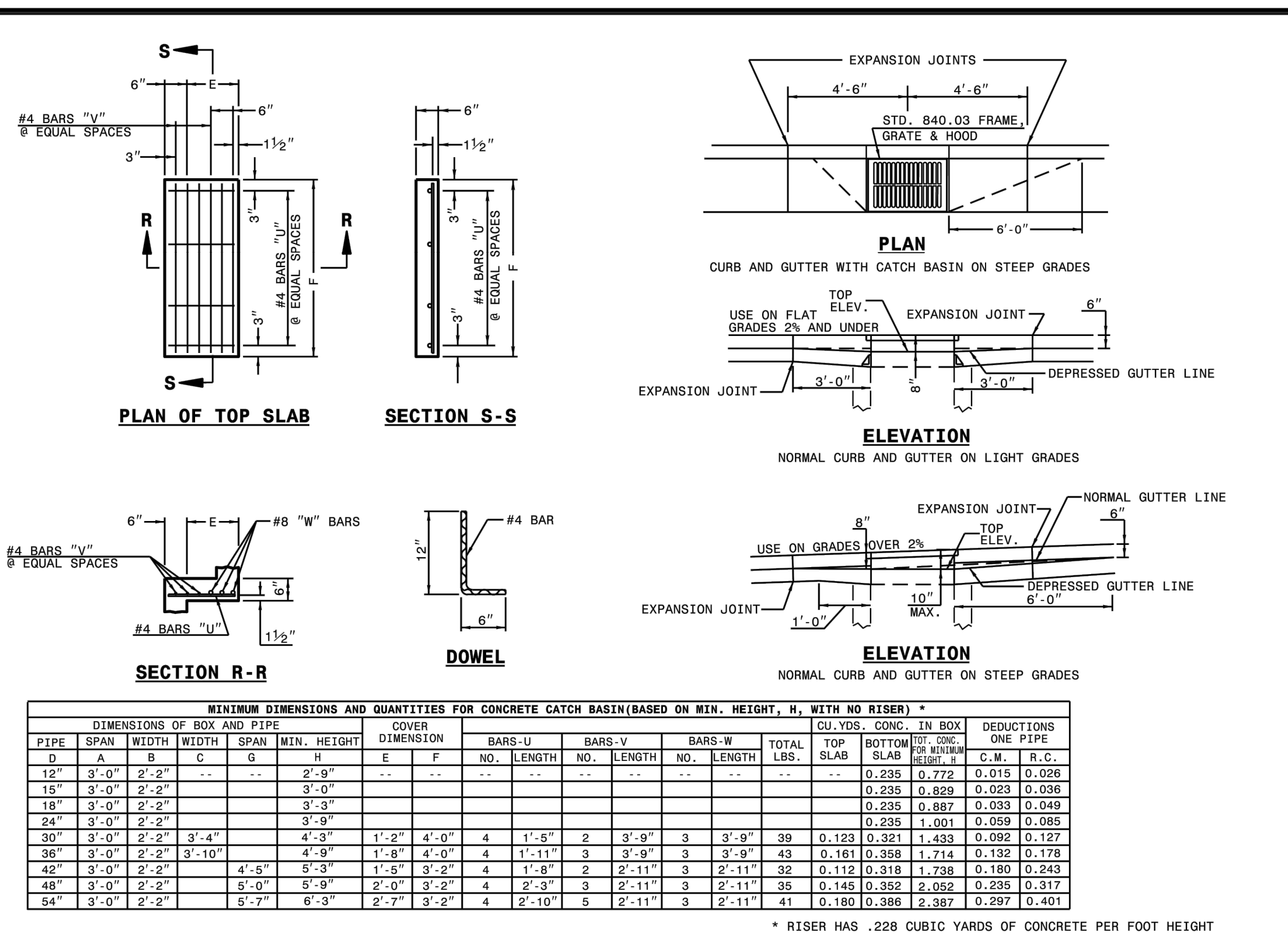
Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347
SHEET	
C920	



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 15" THRU 48" PIPE - 90° SKEW

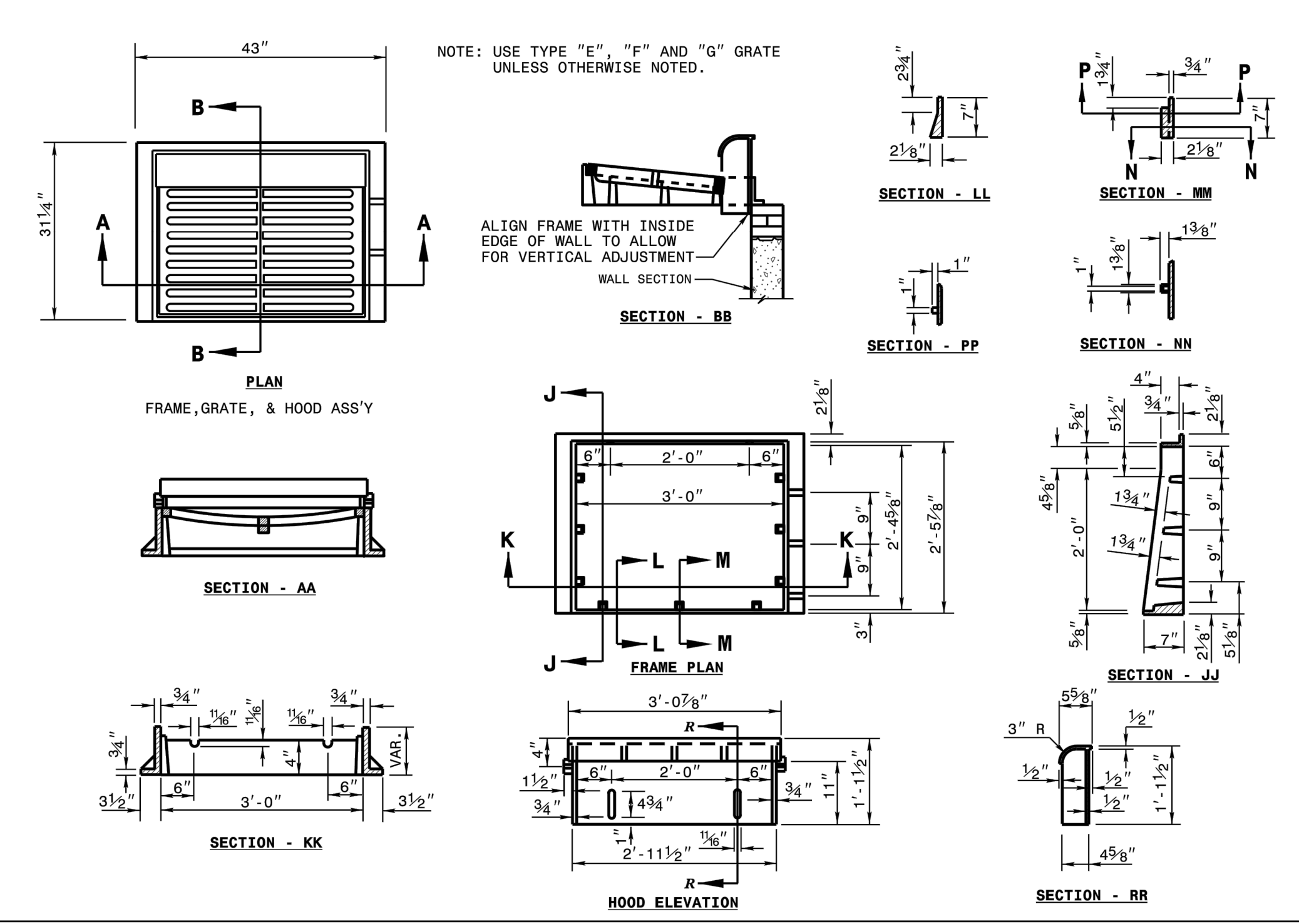
SHEET 1 OF 3
838.01



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE

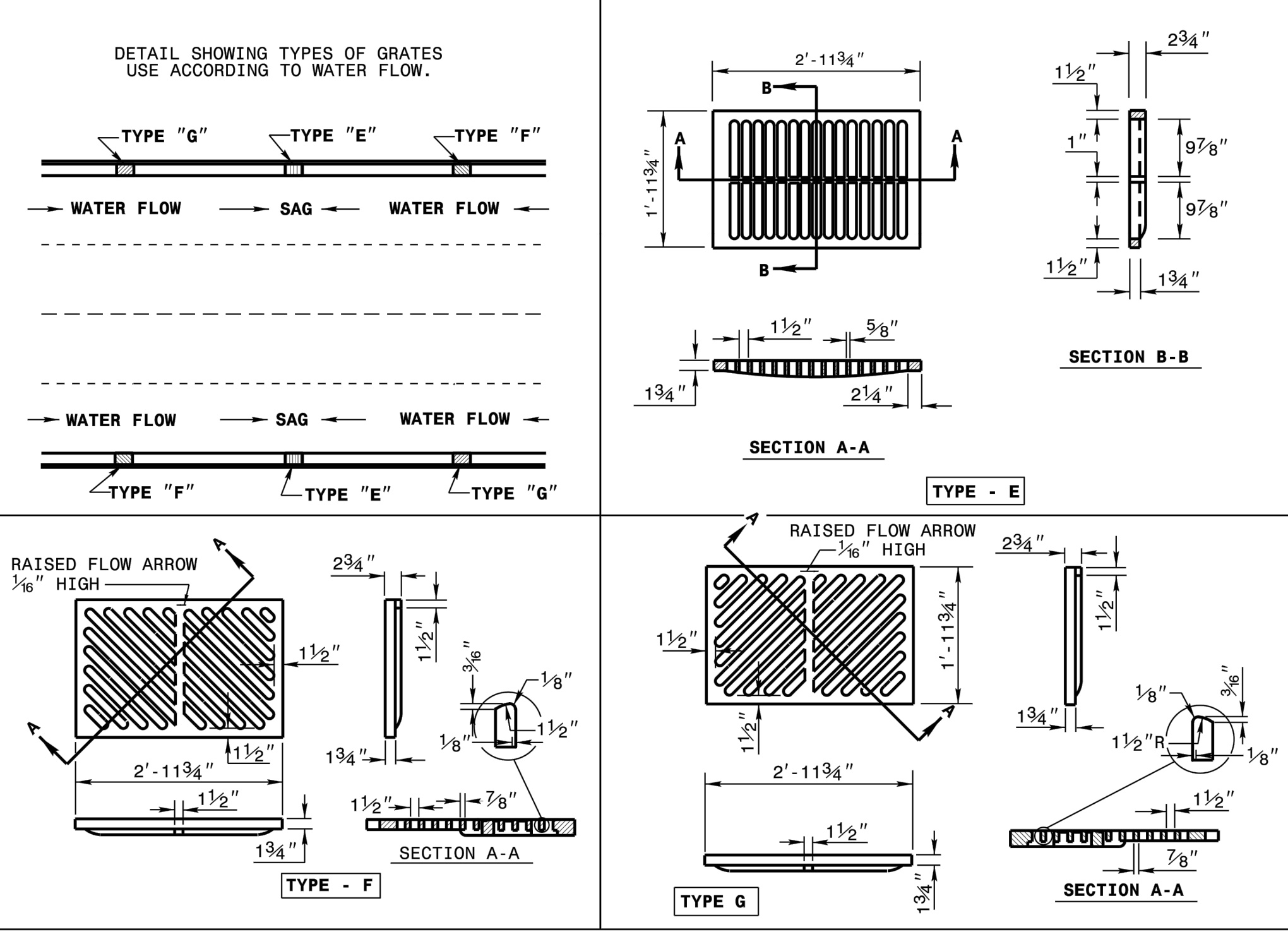
SHEET 2 OF 2
840.02



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN

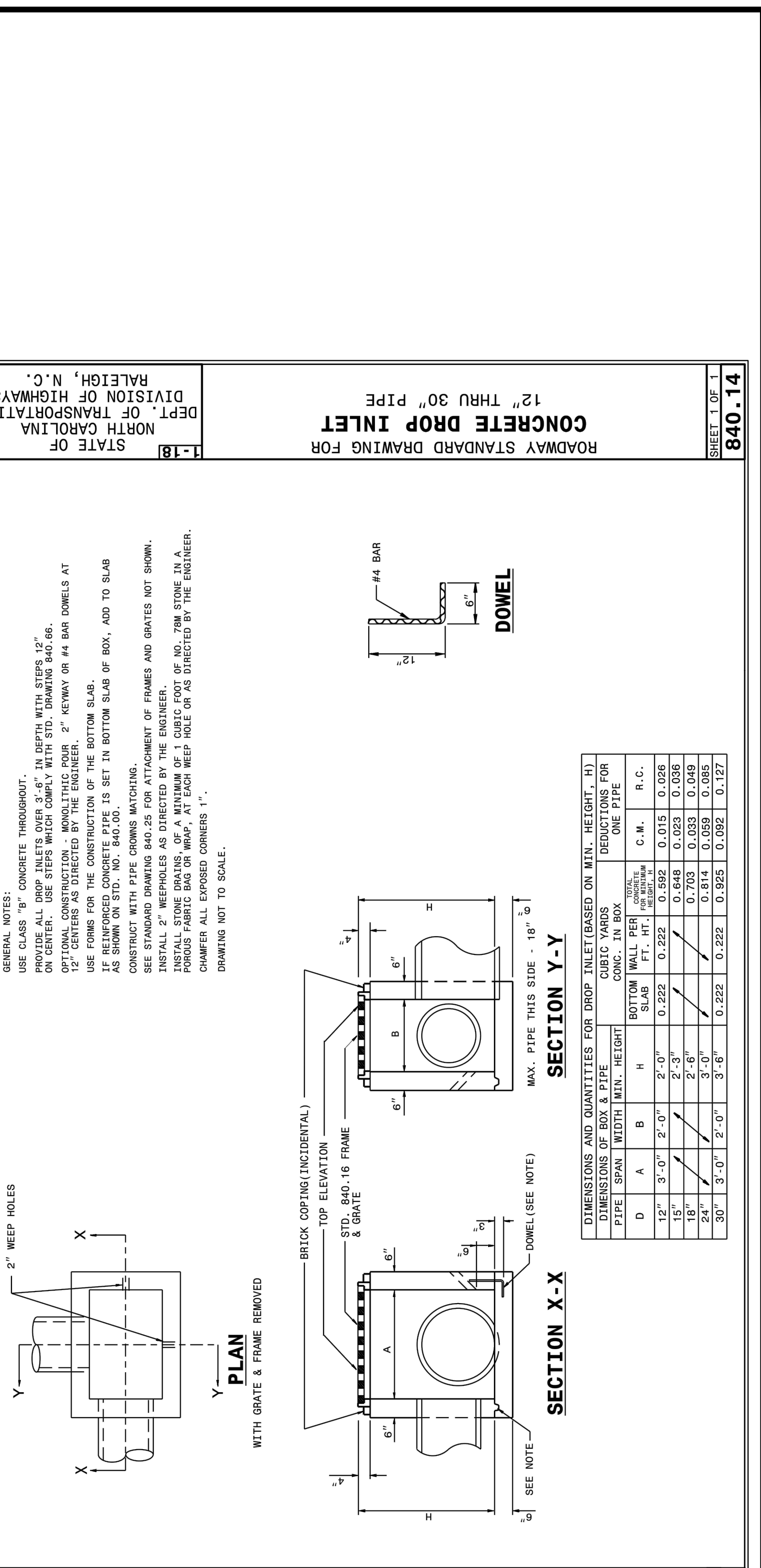
SHEET 1 OF 2
840.03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN

SHEET 2 OF 2
840.03



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR 12" THRU 30" PIPE

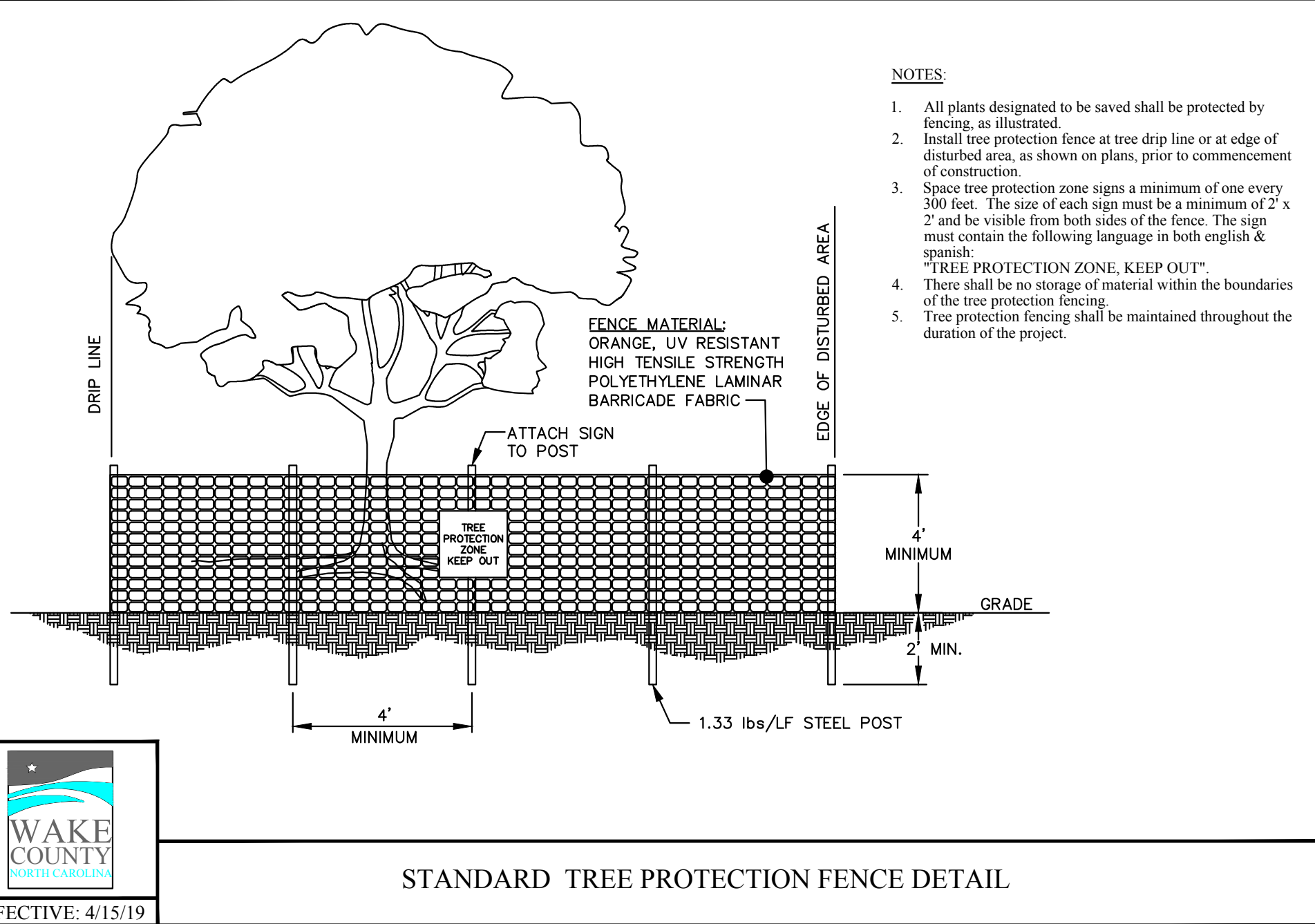
SHEET 1 OF 1
840.14

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2524 Reliance Avenue, Apex, North Carolina 27539
Phone: 919.577.1080 Fax: 919.577.1081
NCBELS FRM No. C-2378

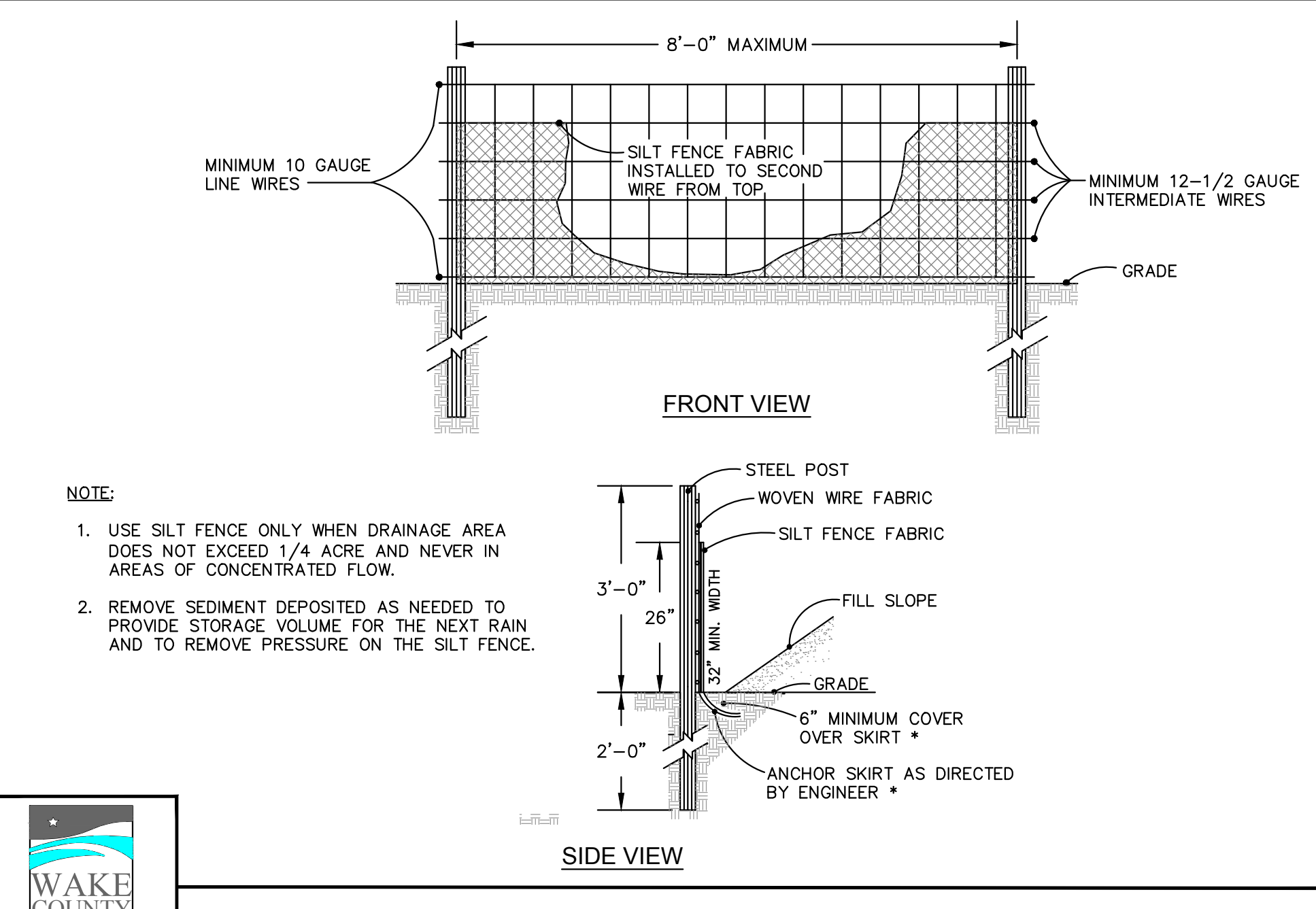
CHANDLER'S RIDGE CONSTRUCTION DOCUMENTS CONSERVATION SUBDIVISION
410 W. YOUNG ST.
ROLESVILLE, NC
WAKE COUNTY

NO.	DESCRIPTION	DATE
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02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE

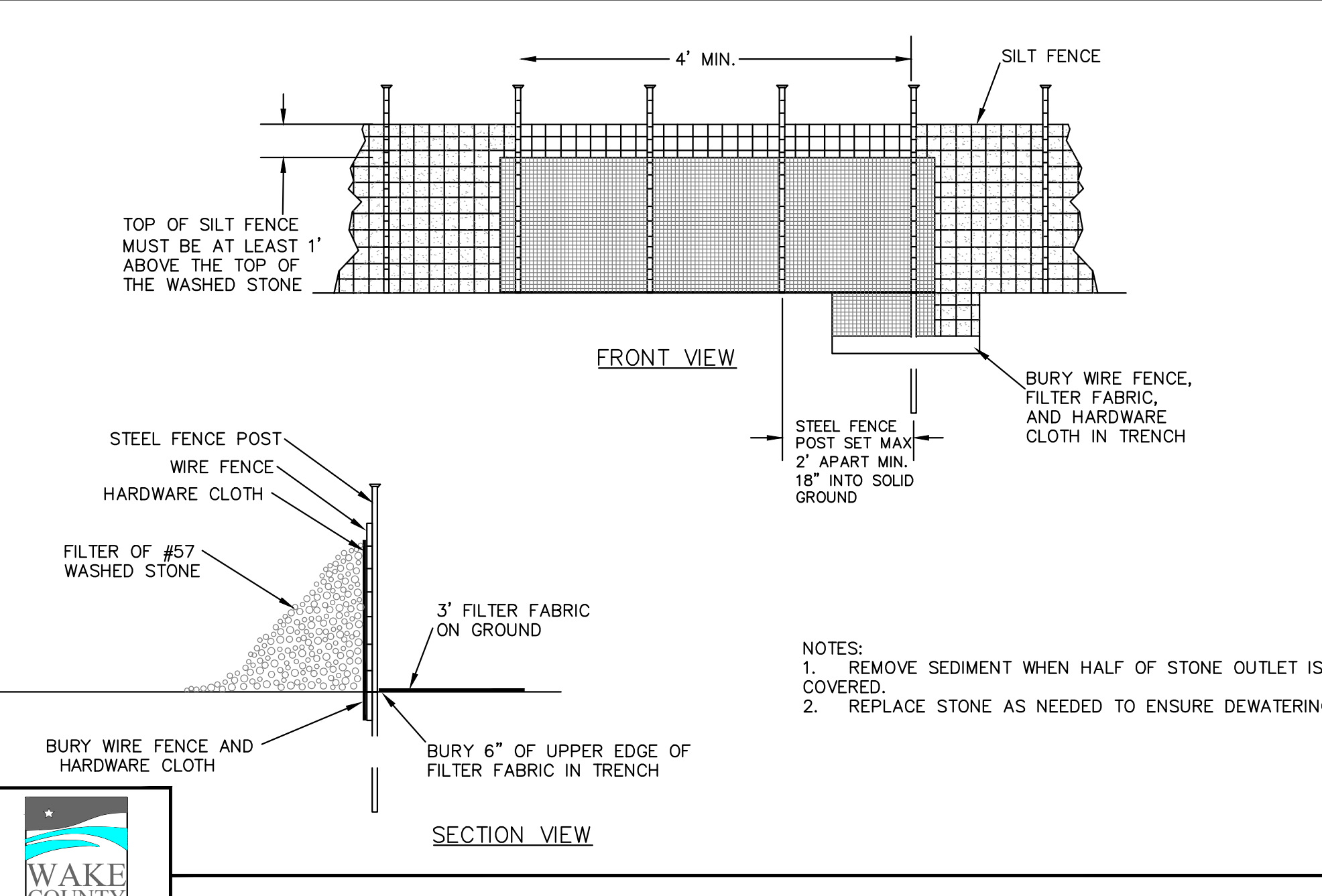
Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347
SHEET	
C921	



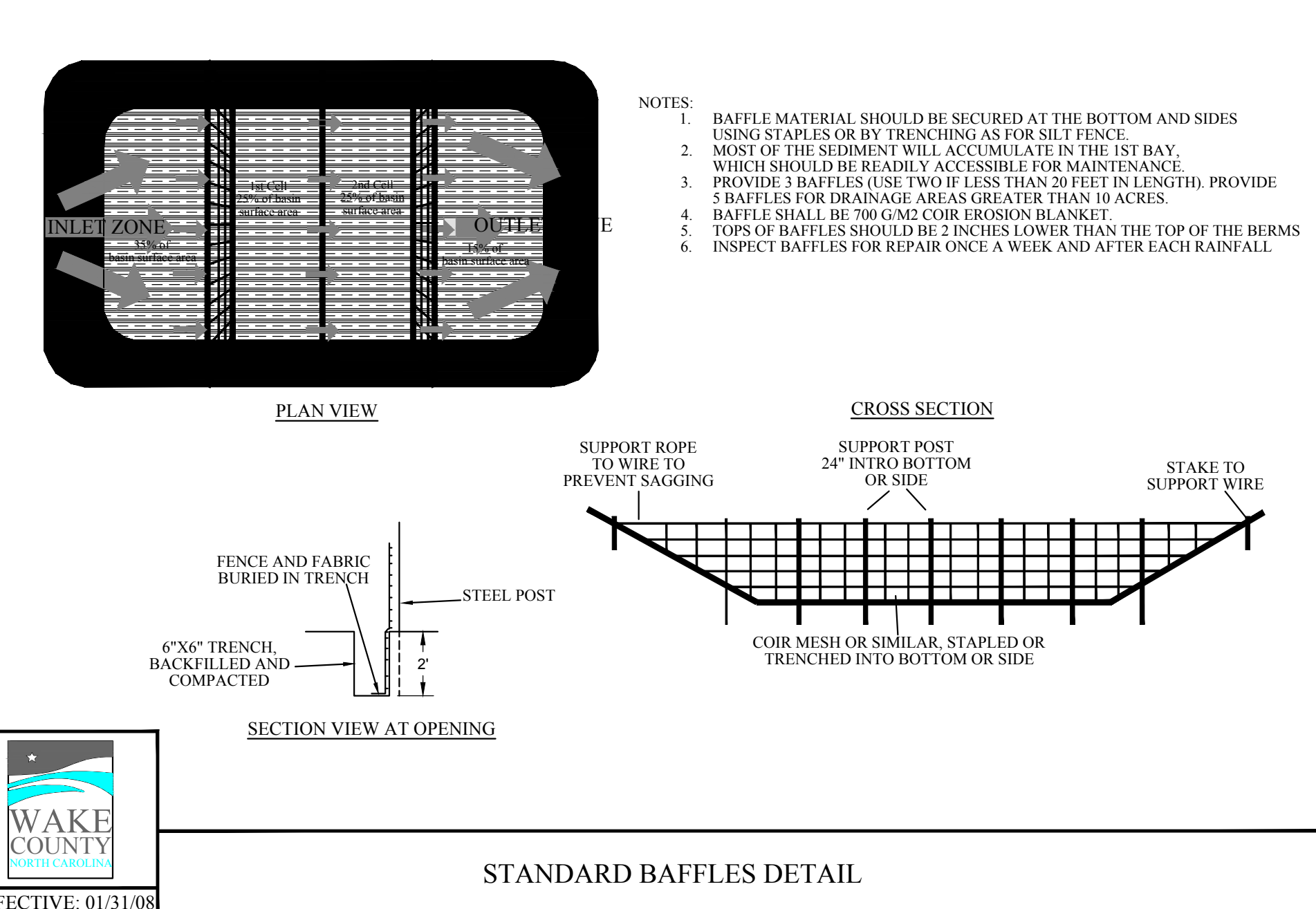
STANDARD TREE PROTECTION FENCE DETAIL



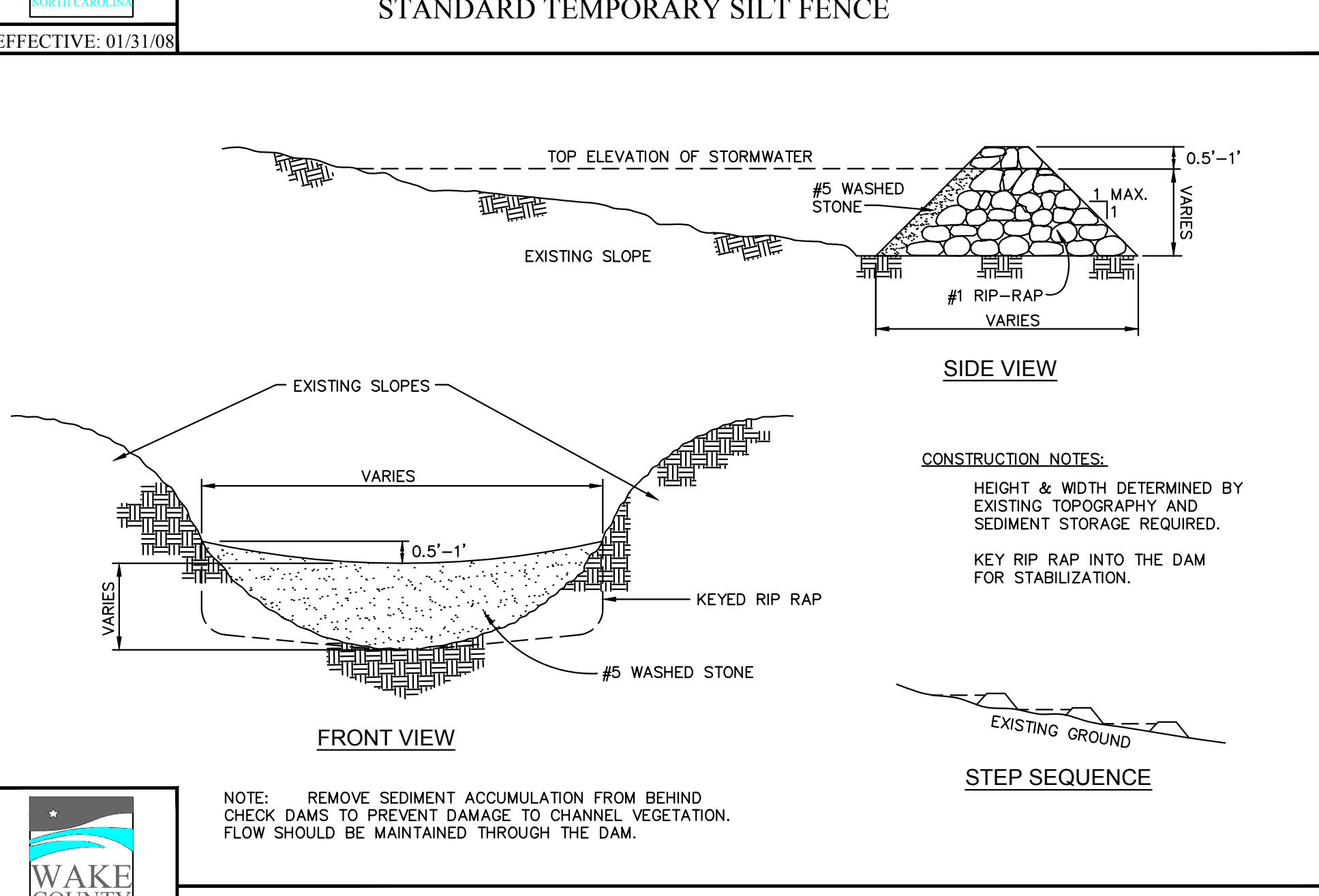
STANDARD TEMPORARY SILT FENCE



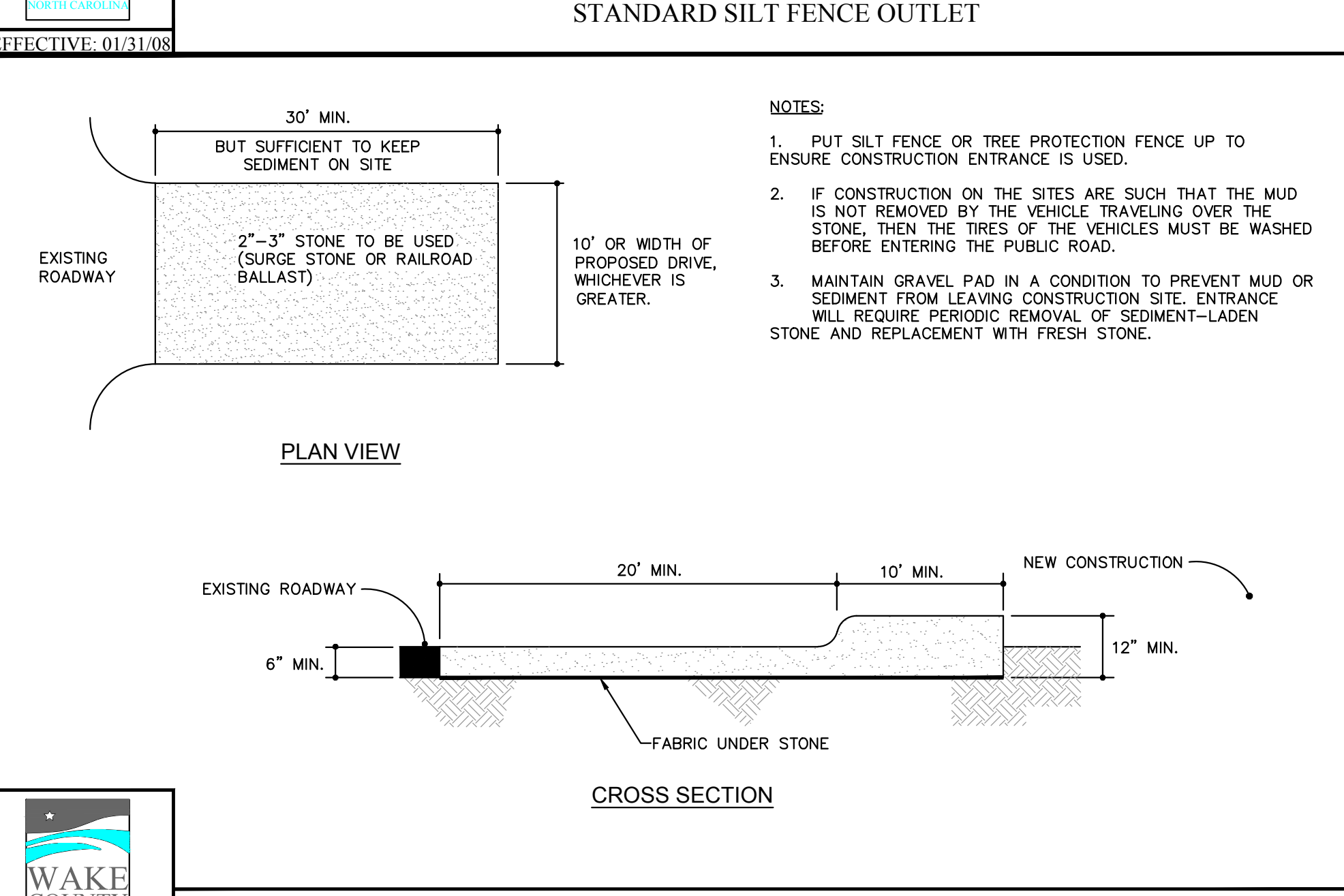
STANDARD SILT FENCE OUTLET



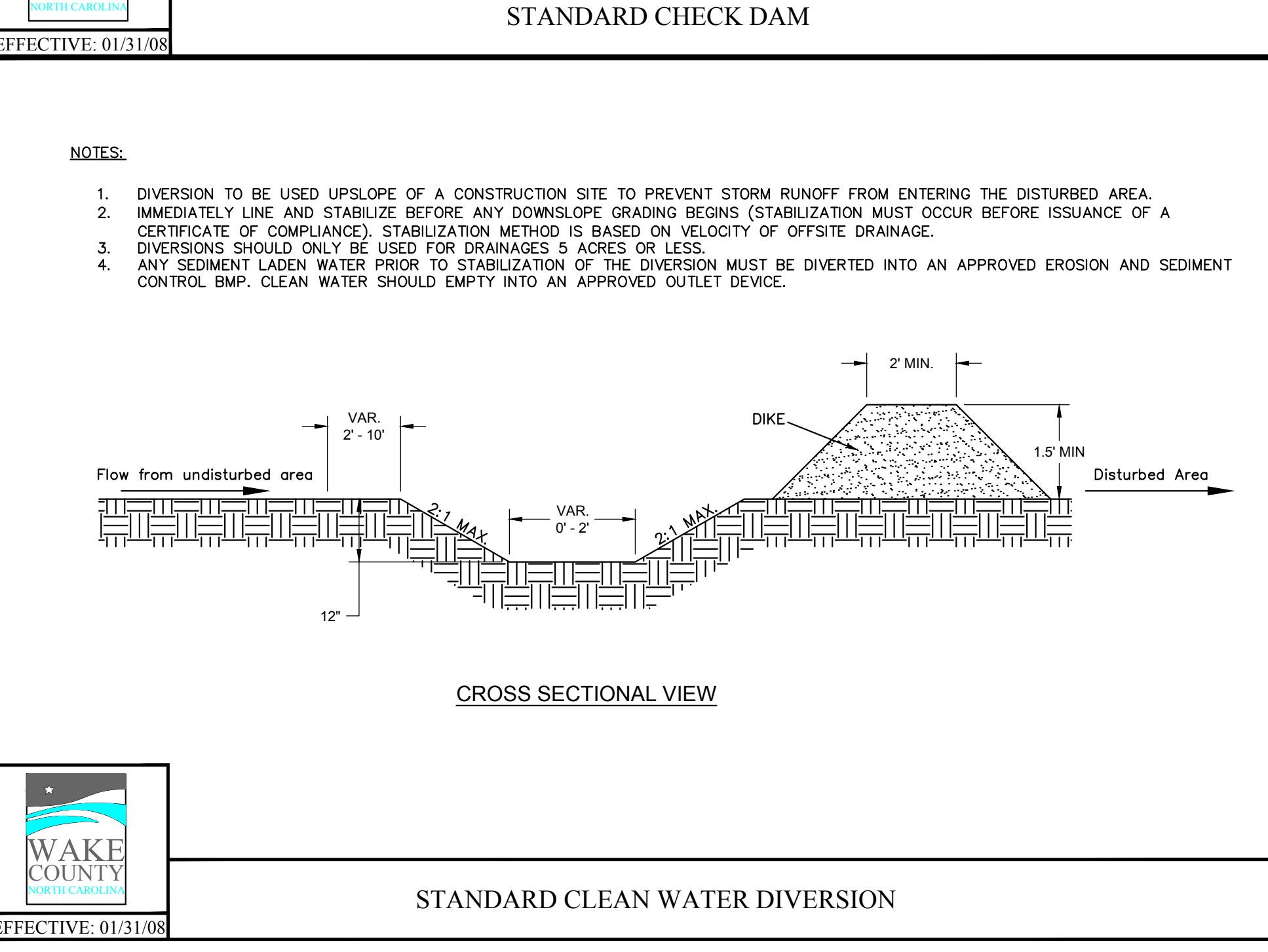
STANDARD BAFFLES DETAIL



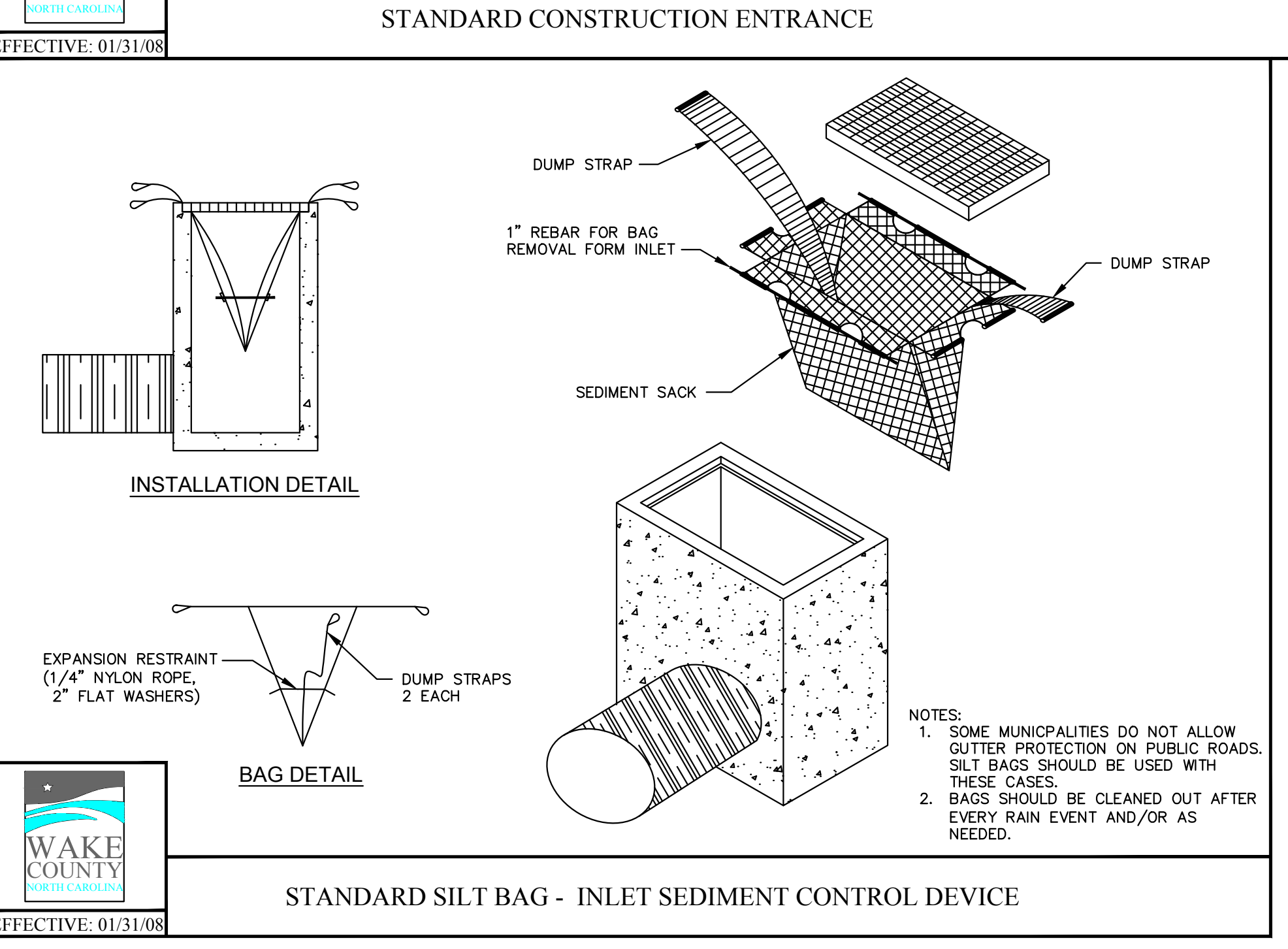
STANDARD CHECK DAM



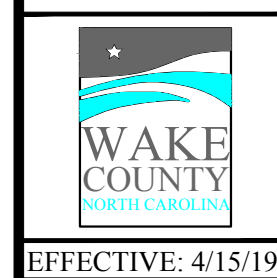
STANDARD CONSTRUCTION ENTRANCE



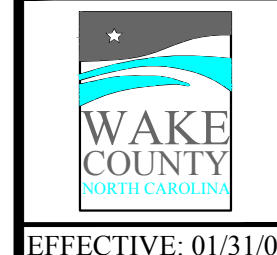
STANDARD CLEAN WATER DIVERSION



STANDARD SILT BAG - INLET SEDIMENT CONTROL DEVICE



EFFECTIVE: 4/15/19



EFFECTIVE: 01/31/08

P:\0017 Projects\170347 Chandlers Ridge\Eng\CADD\GTP SHEETS\170347_C920_EC_DETAILS.dwg

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE
	REVISIONS	



Bateman Civil Survey Company
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 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FRM No. C-2378



CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

EROSION CONTROL
 DETAILS

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347

SHEET
C923



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 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919.577.1080 Fax: 919.577.1081
 NCBELS FRM No. C-2378

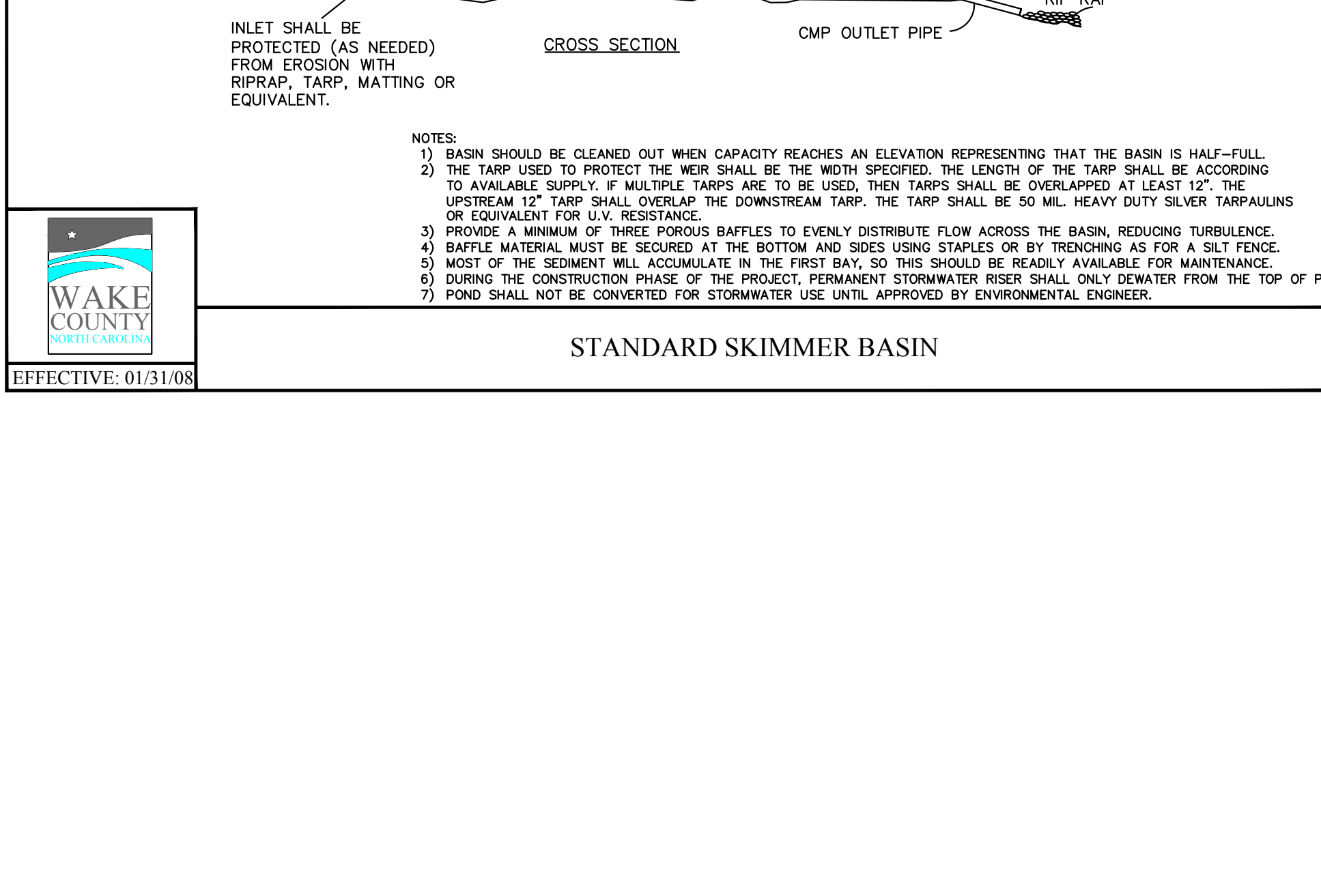
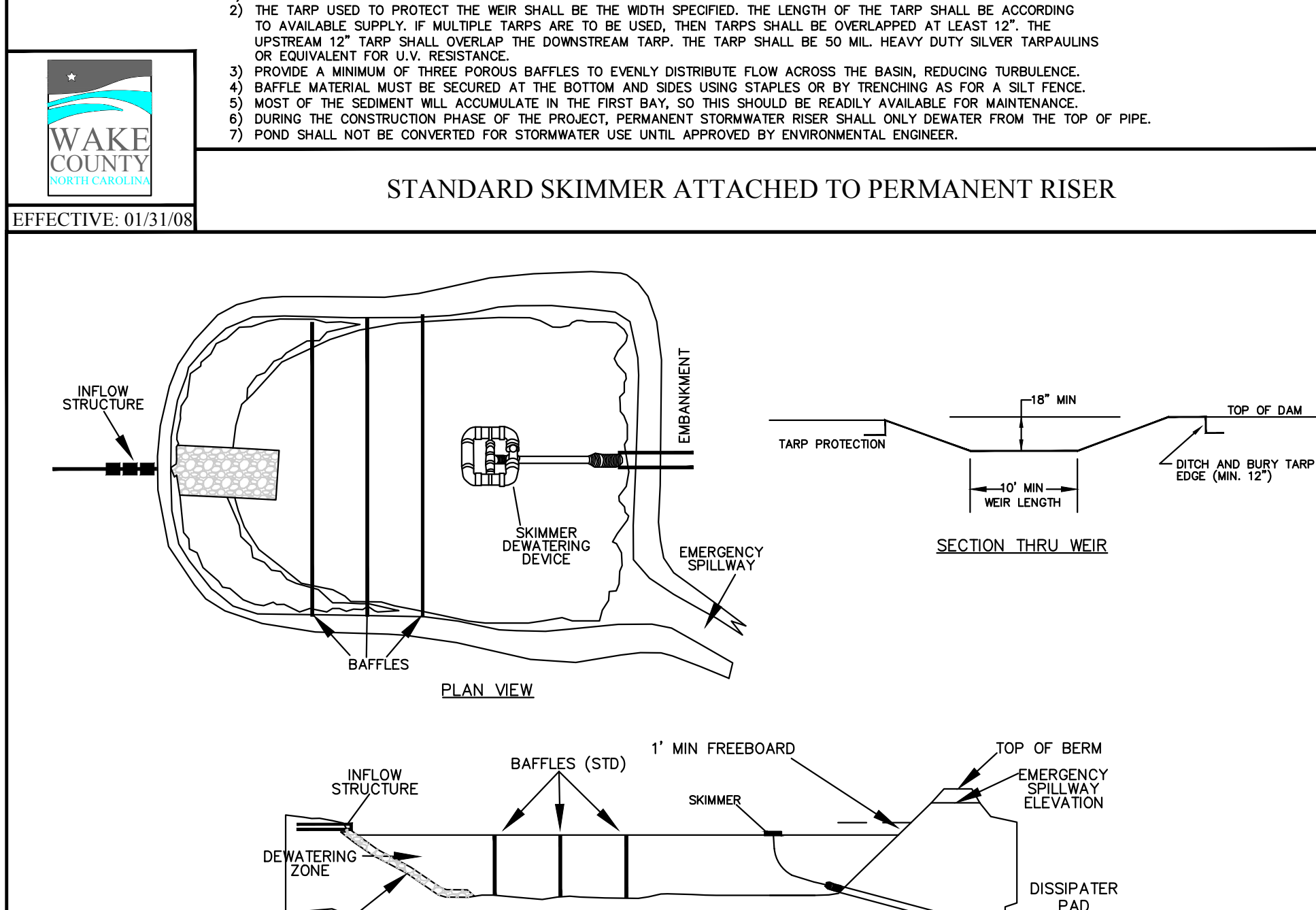
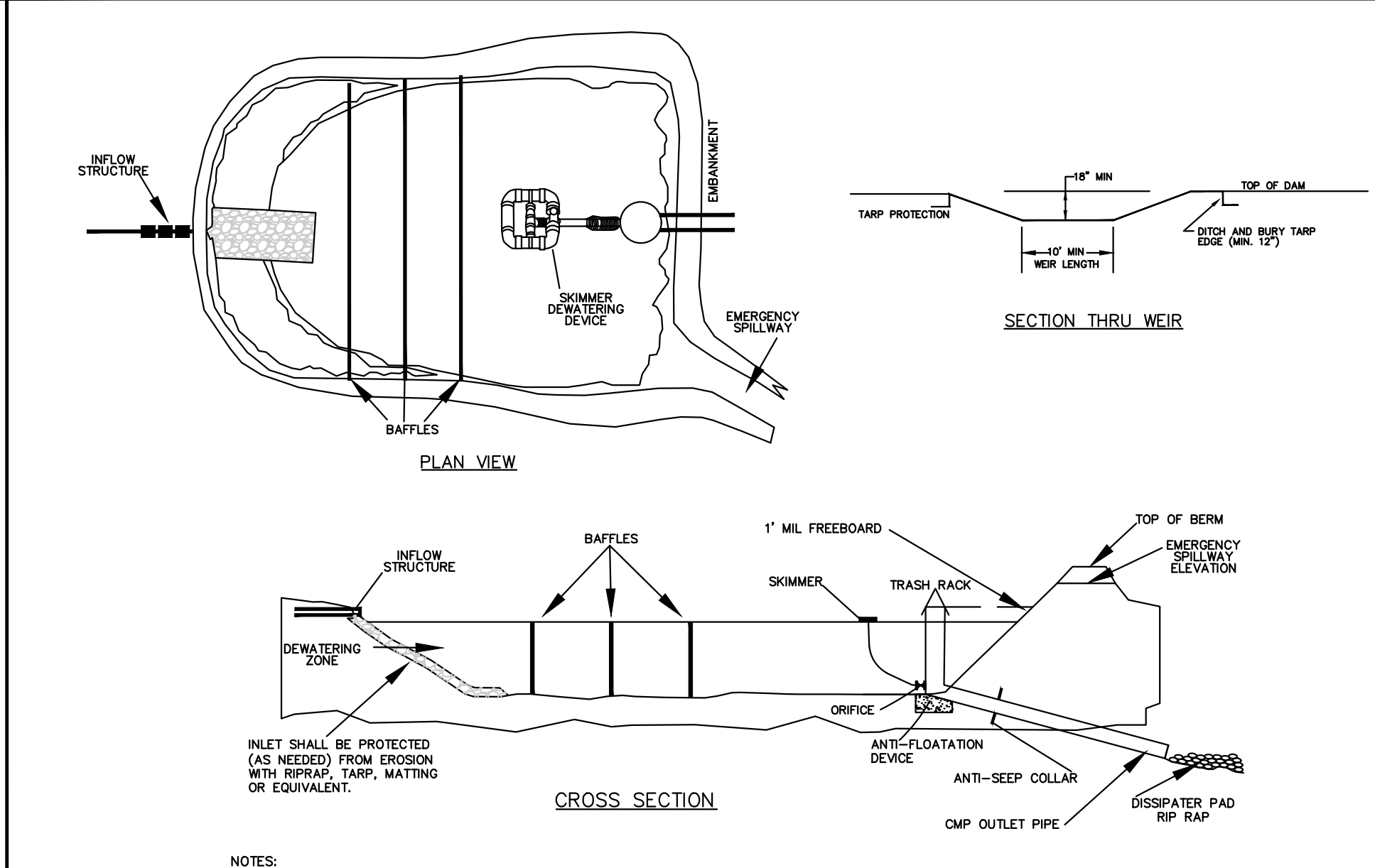
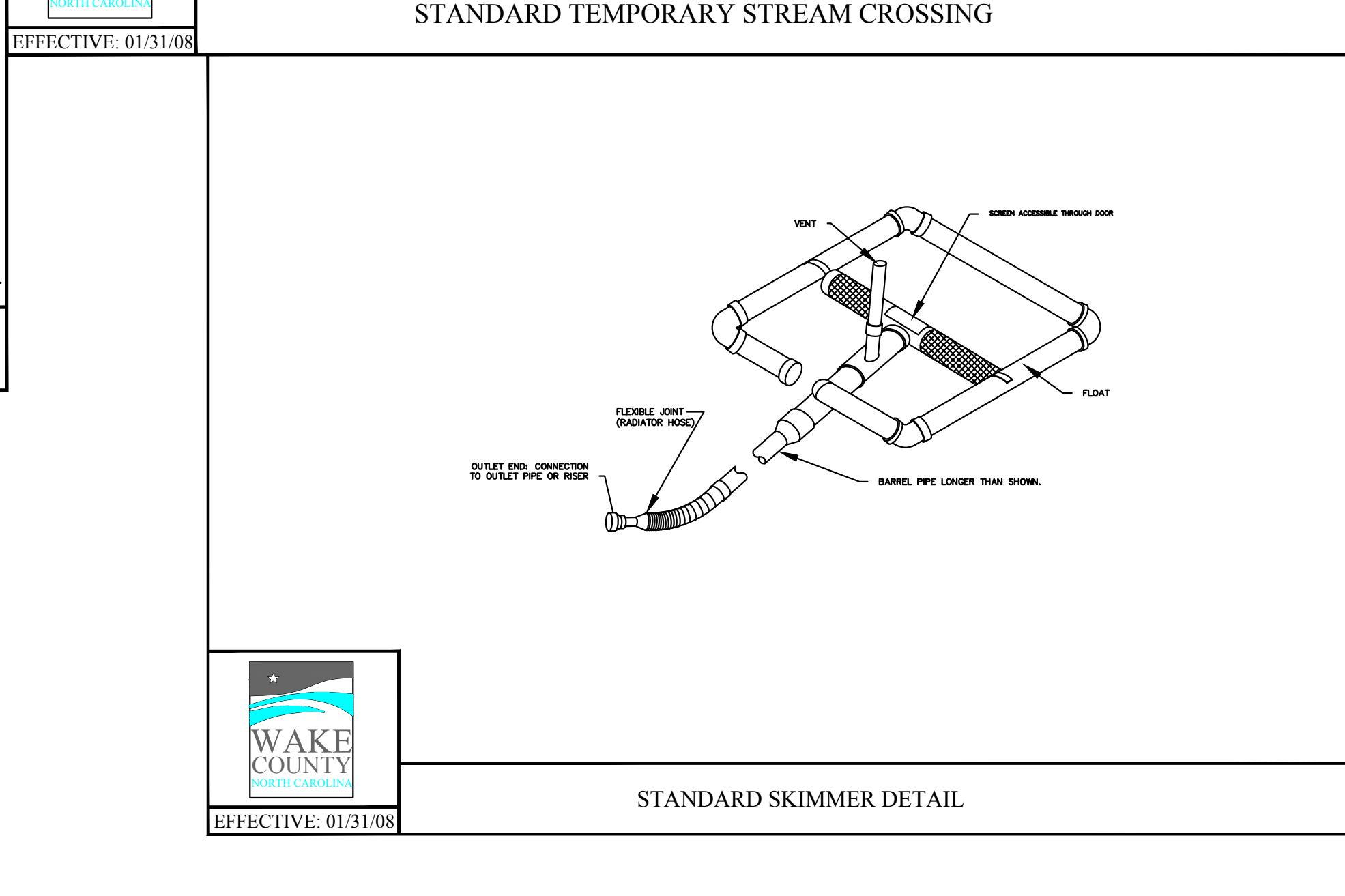
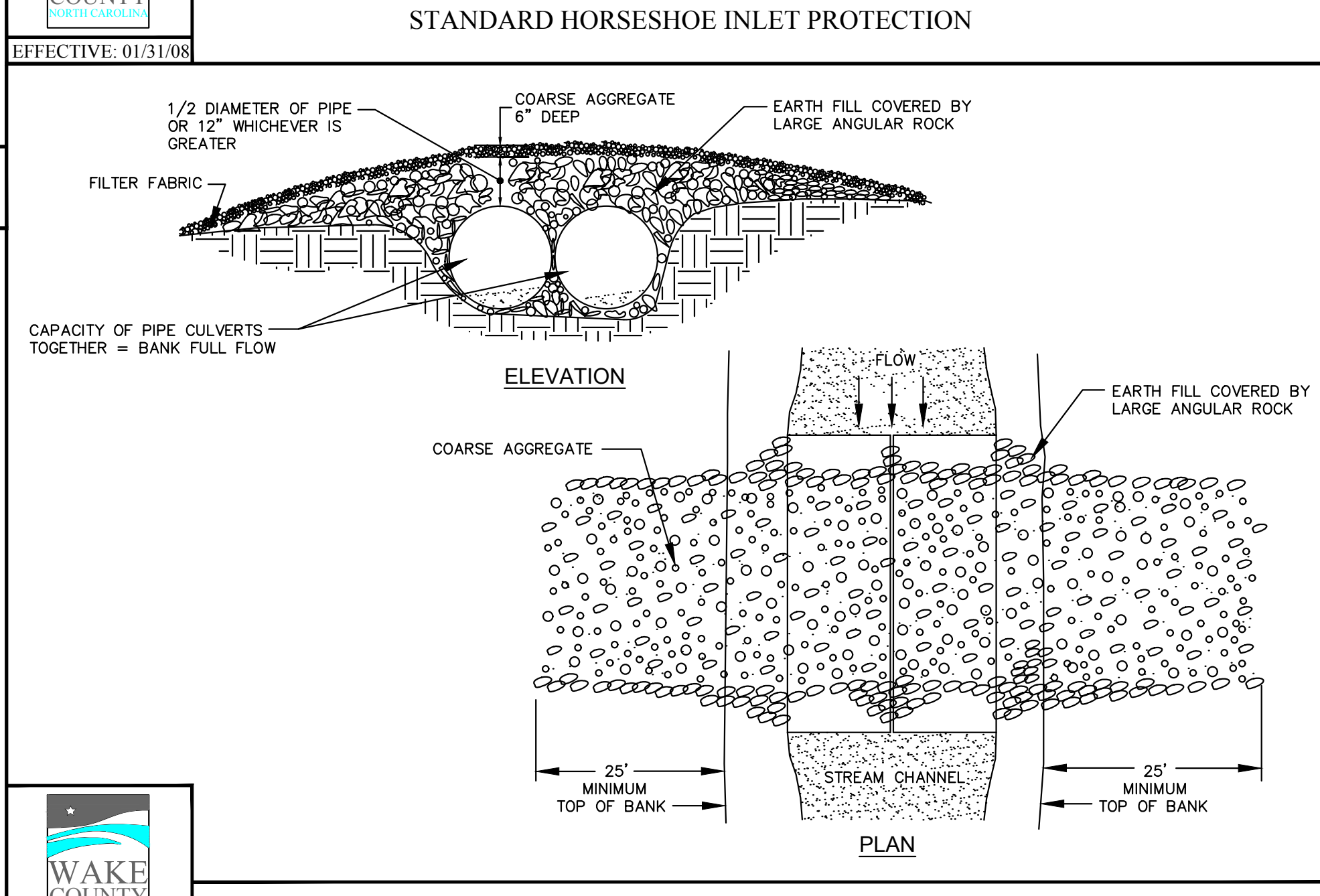
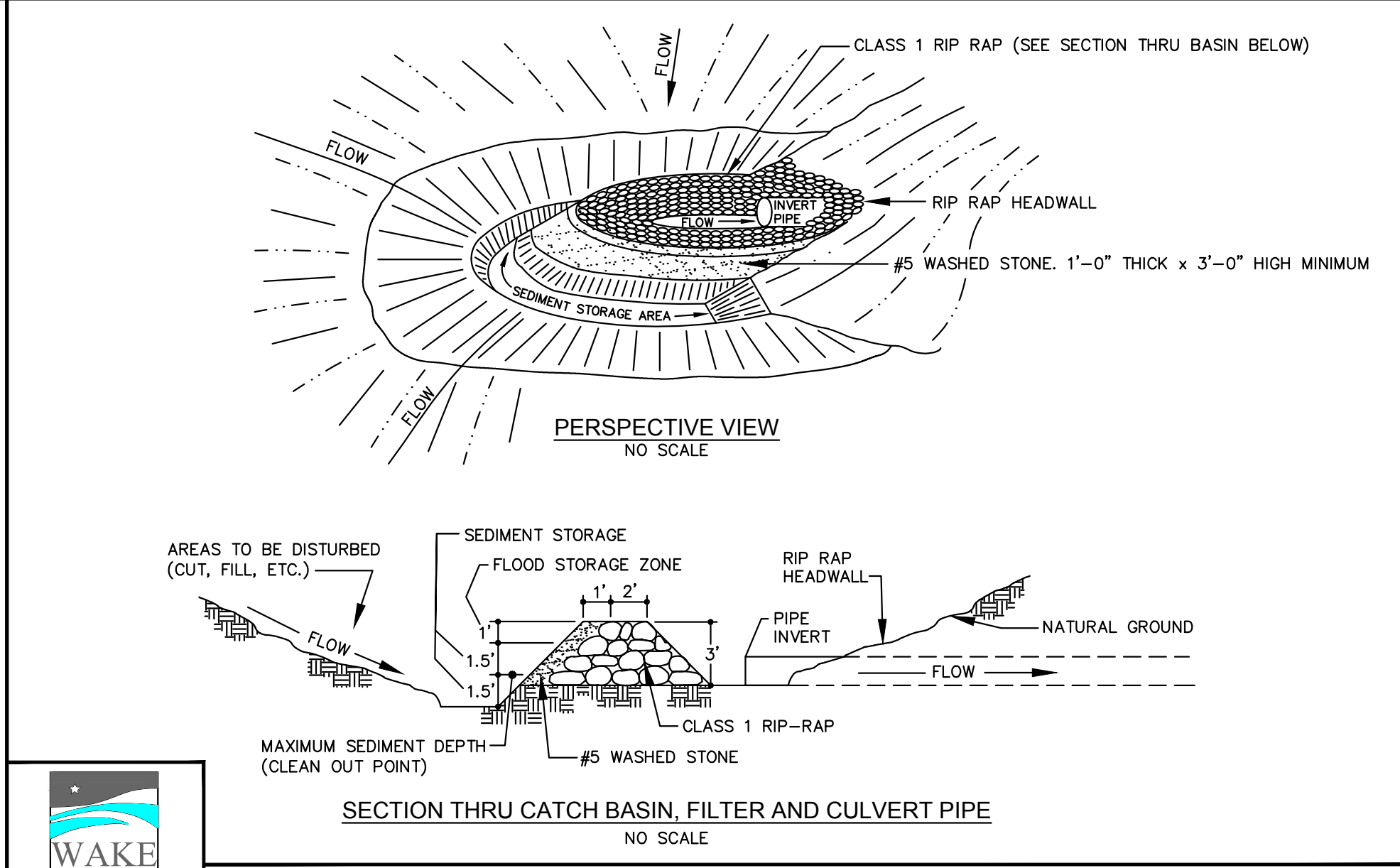
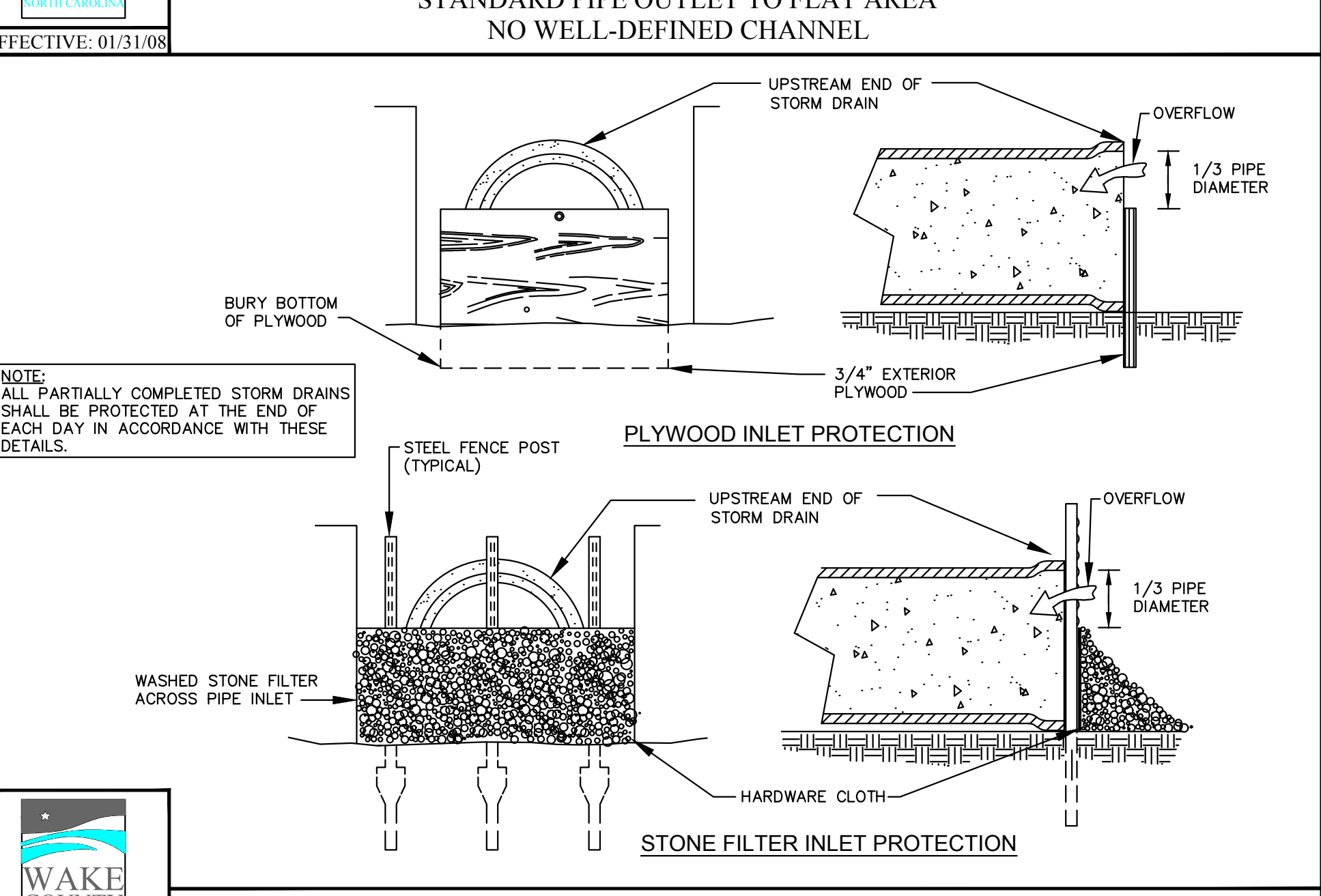
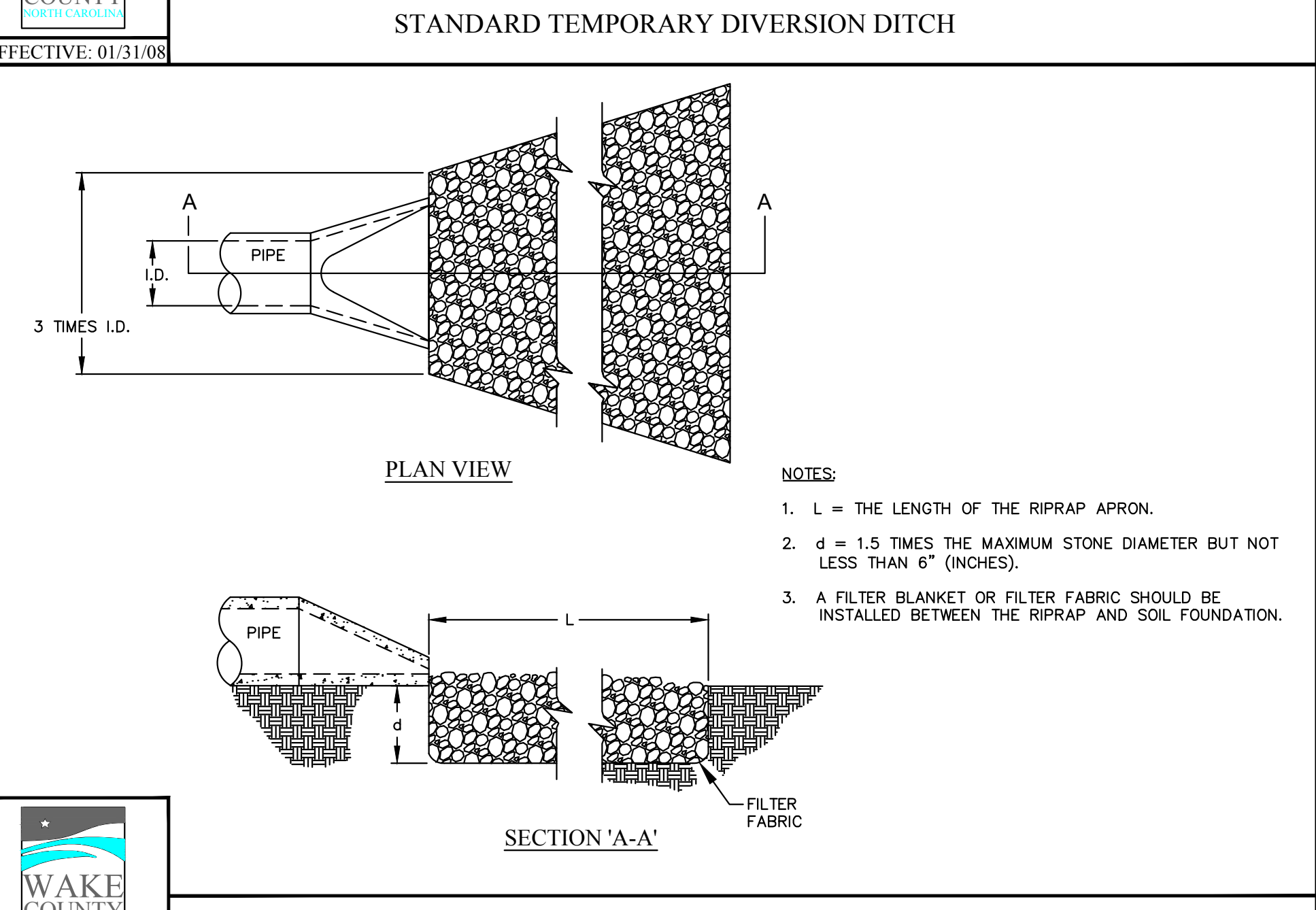
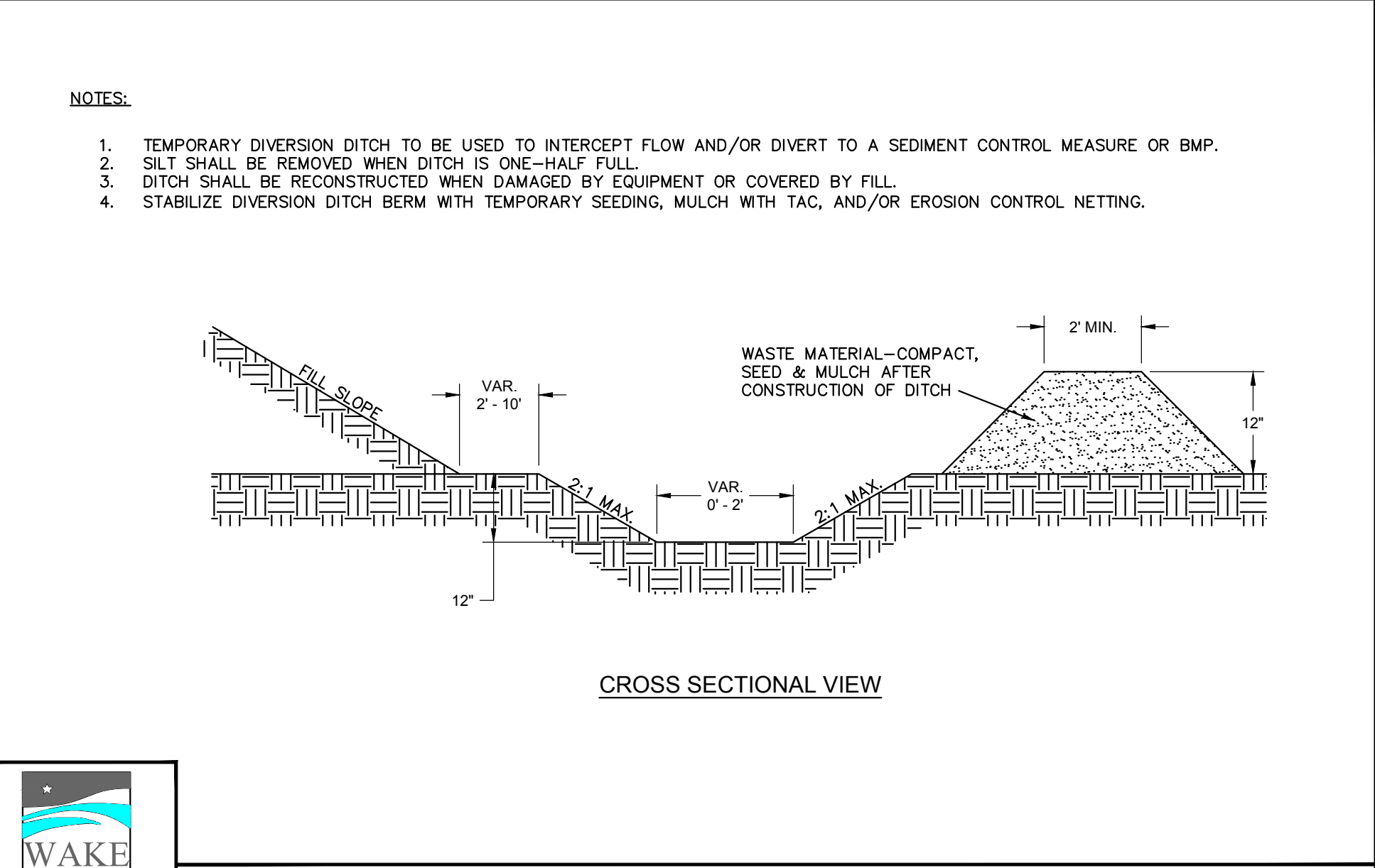


CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

EROSION CONTROL
 DETAILS

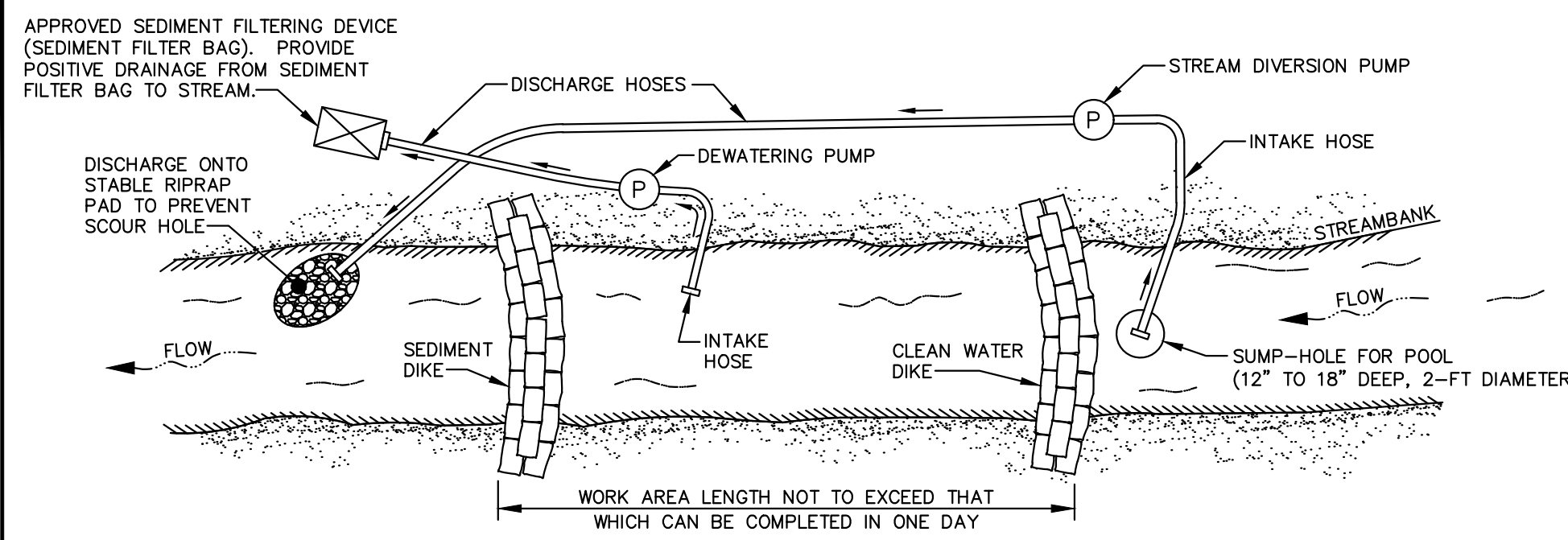
Project Engineer: TSS
 Designed By: TEP
 Drawn By: TEP
 Checked By: TSS
 Scale:
 Date: 09/08/2020
 Project Number: P170347

SHEET
C924



REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
01	CONSTRUCTION DOCUMENTS 1ST SUBMITTAL	06/19/2020
REV	DESCRIPTION	DATE

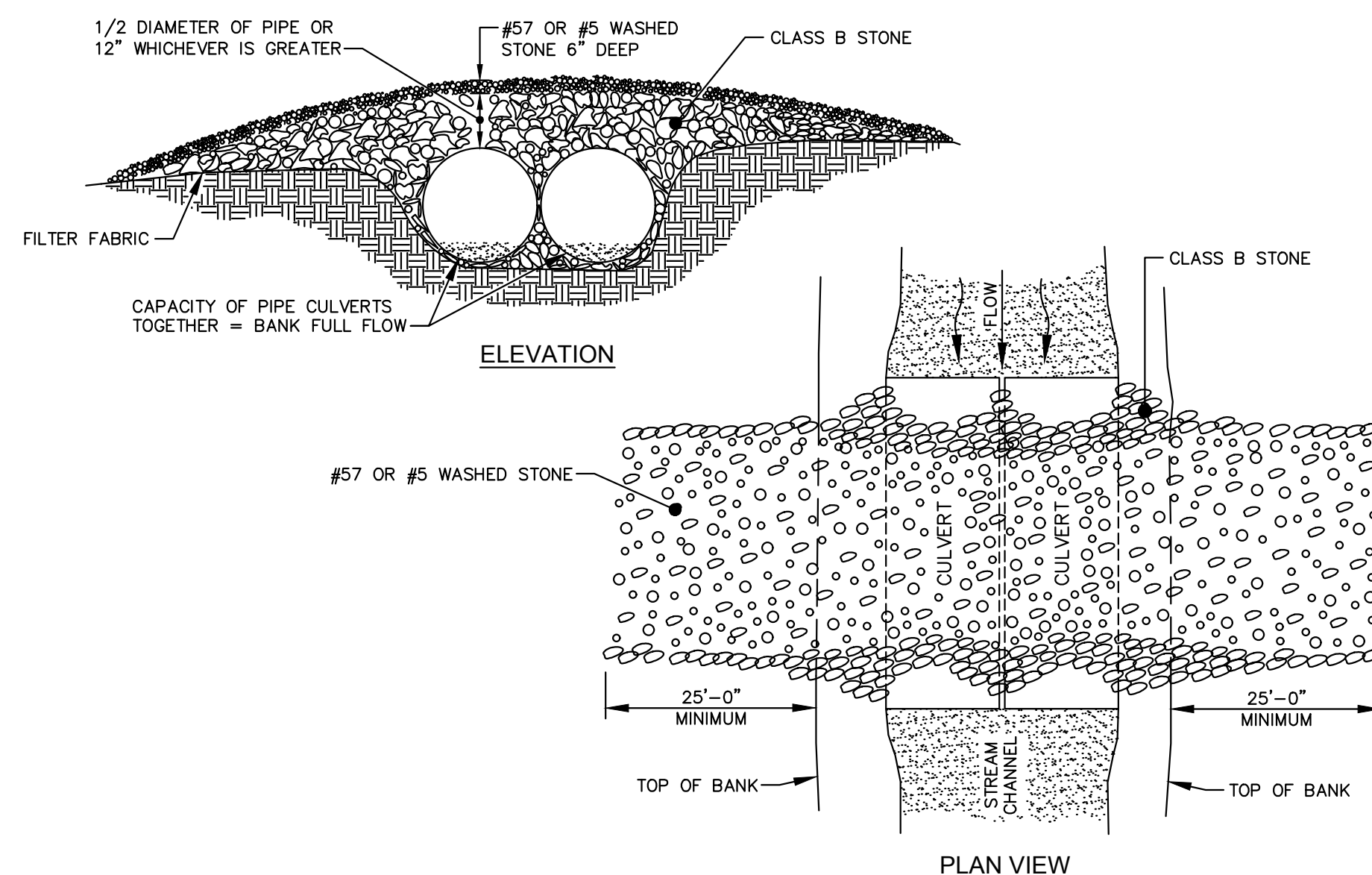
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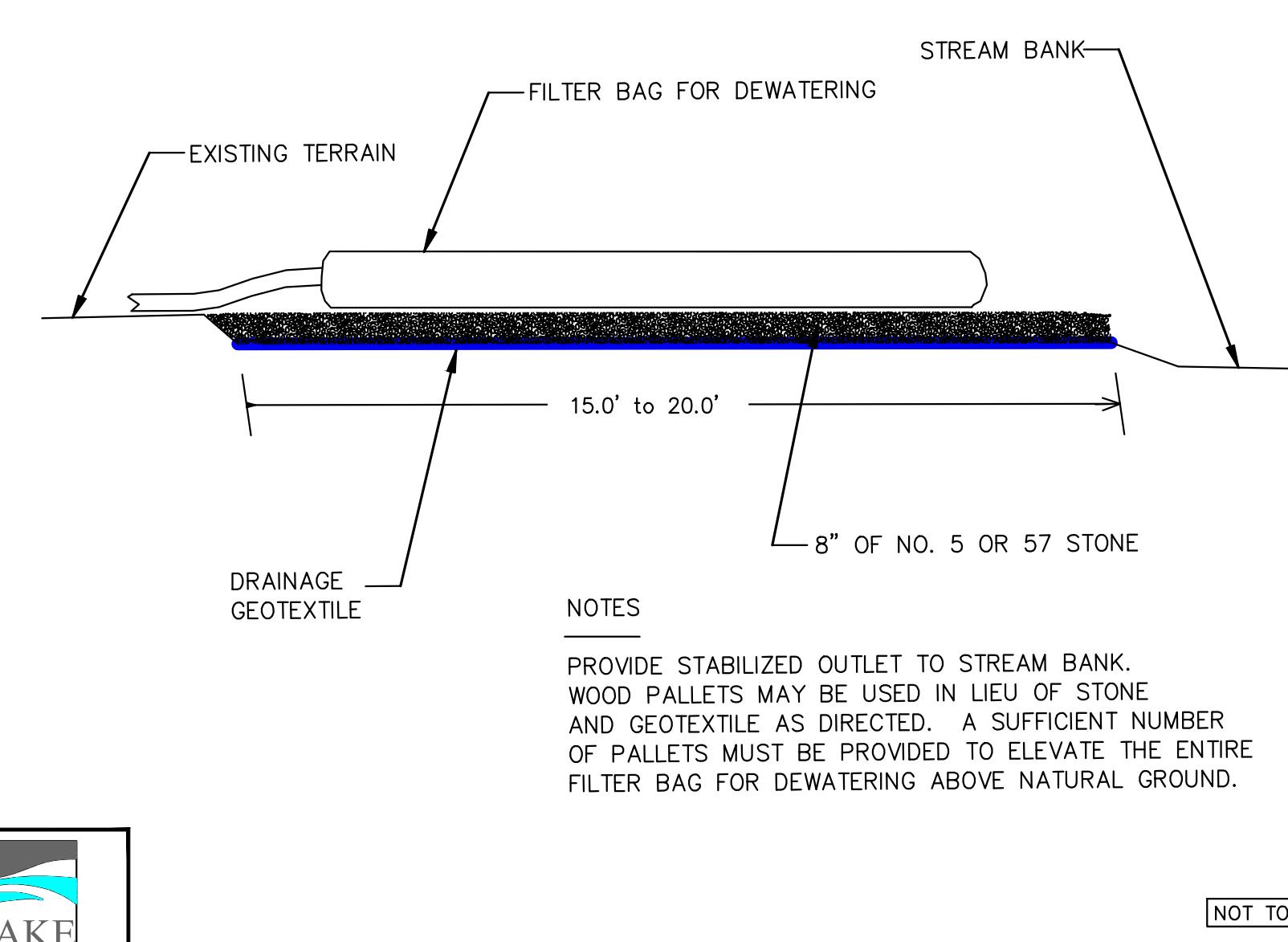
- TEMPORARY PUMP AROUND SEQUENCE**
1. SET UP PUMP WITH SUCTION AND DISCHARGE HOSE.
 2. INSTALL UP-STREAM SANDBAG DAM.
 3. INSTALL DOWN-STREAM SANDBAG DAM.
 4. THE PUMP MUST RUN CONTINUOUSLY WHILE WORKING IN THE STREAM.
 5. STREAMBANKS MUST BE STABILIZED AT THE END OF EACH DAY.

- NOTES:**
1. SANDBAG DIKES SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA, AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE INTO A STABLE VELOCITY DISSIPATER CONSTRUCTED OF RIPRAP OR SANDBAGS.
 2. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A SEDIMENT BAG OR OTHER APPROVED DEVICE. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE WITHOUT CAUSING FURTHER EROSION BETWEEN THE SEDIMENT FILTER BAG AND THE STREAMBANK.

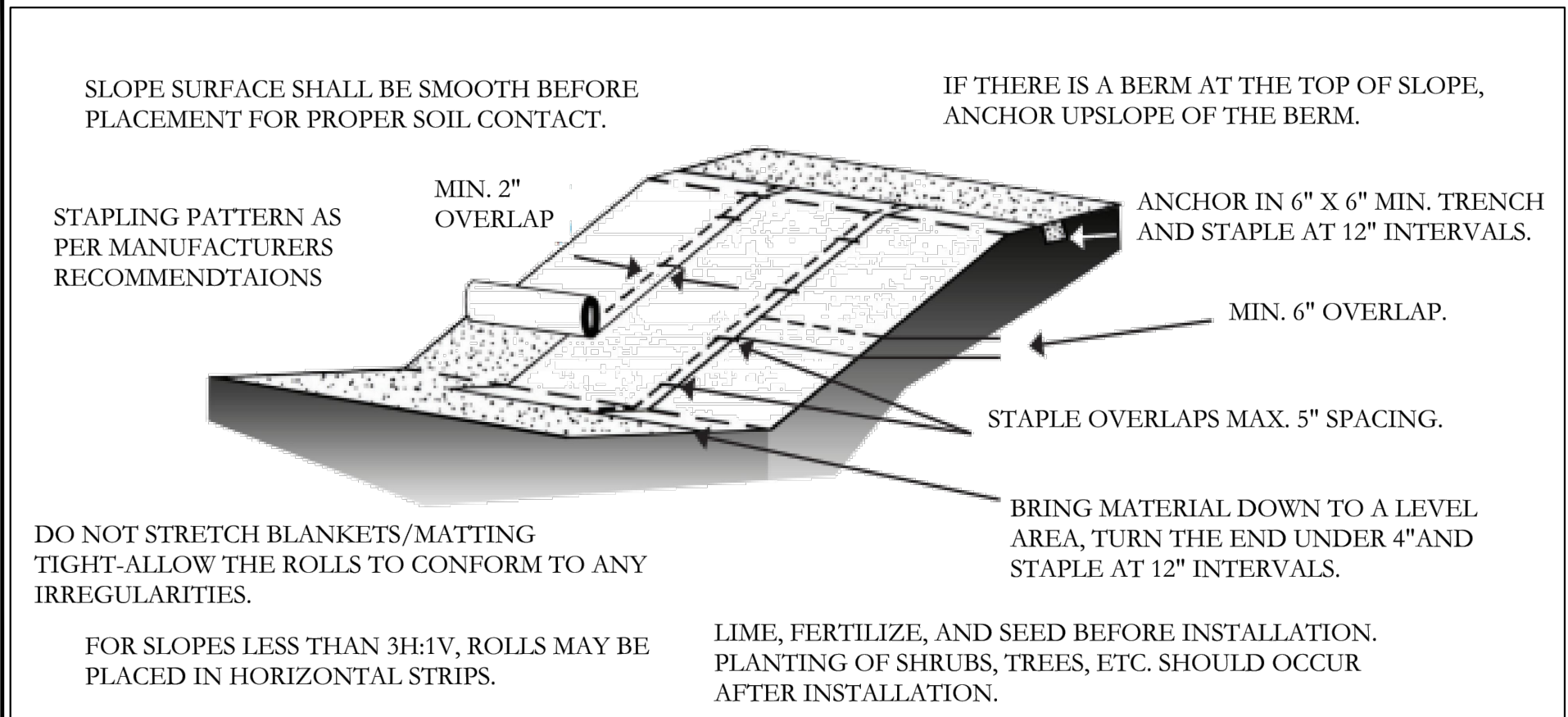
TEMPORARY PUMP AROUND



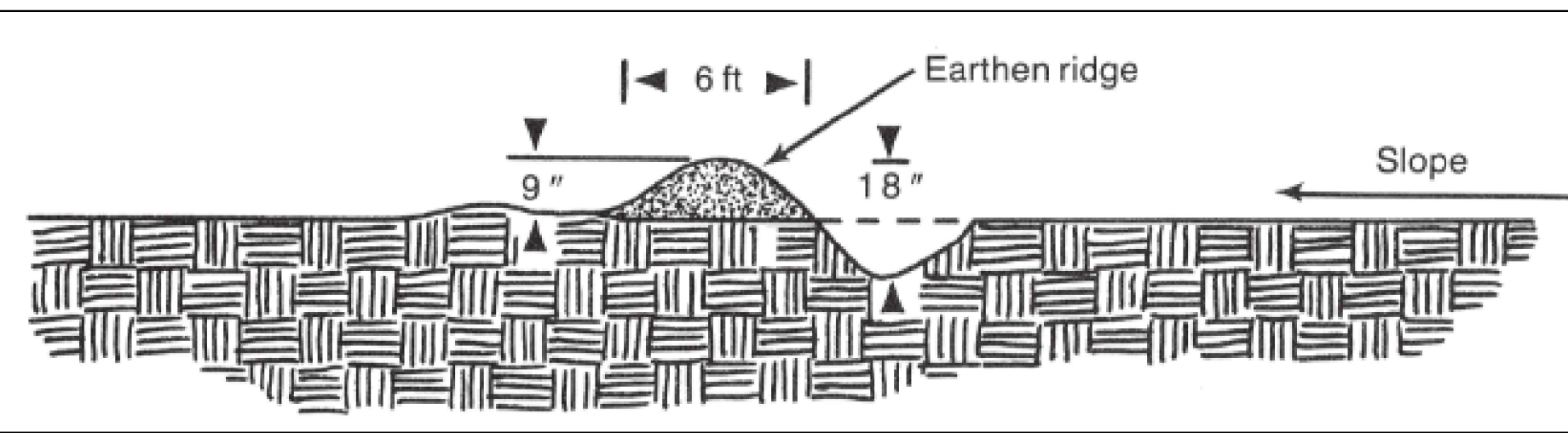
STANDARD TEMPORARY STREAM CROSSING



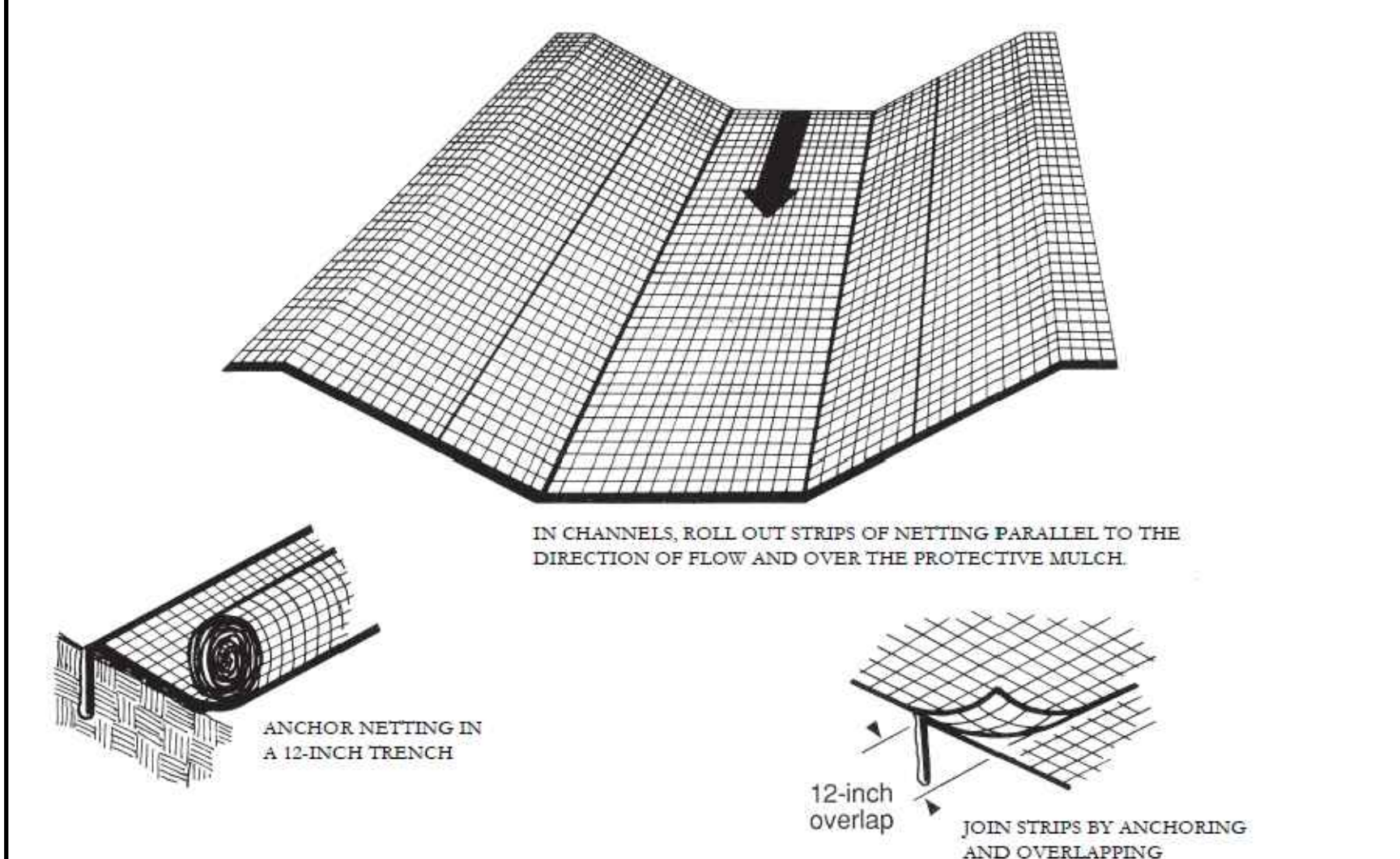
STANDARD FILTER BAG FOR DEWATERING ACTIVITIES



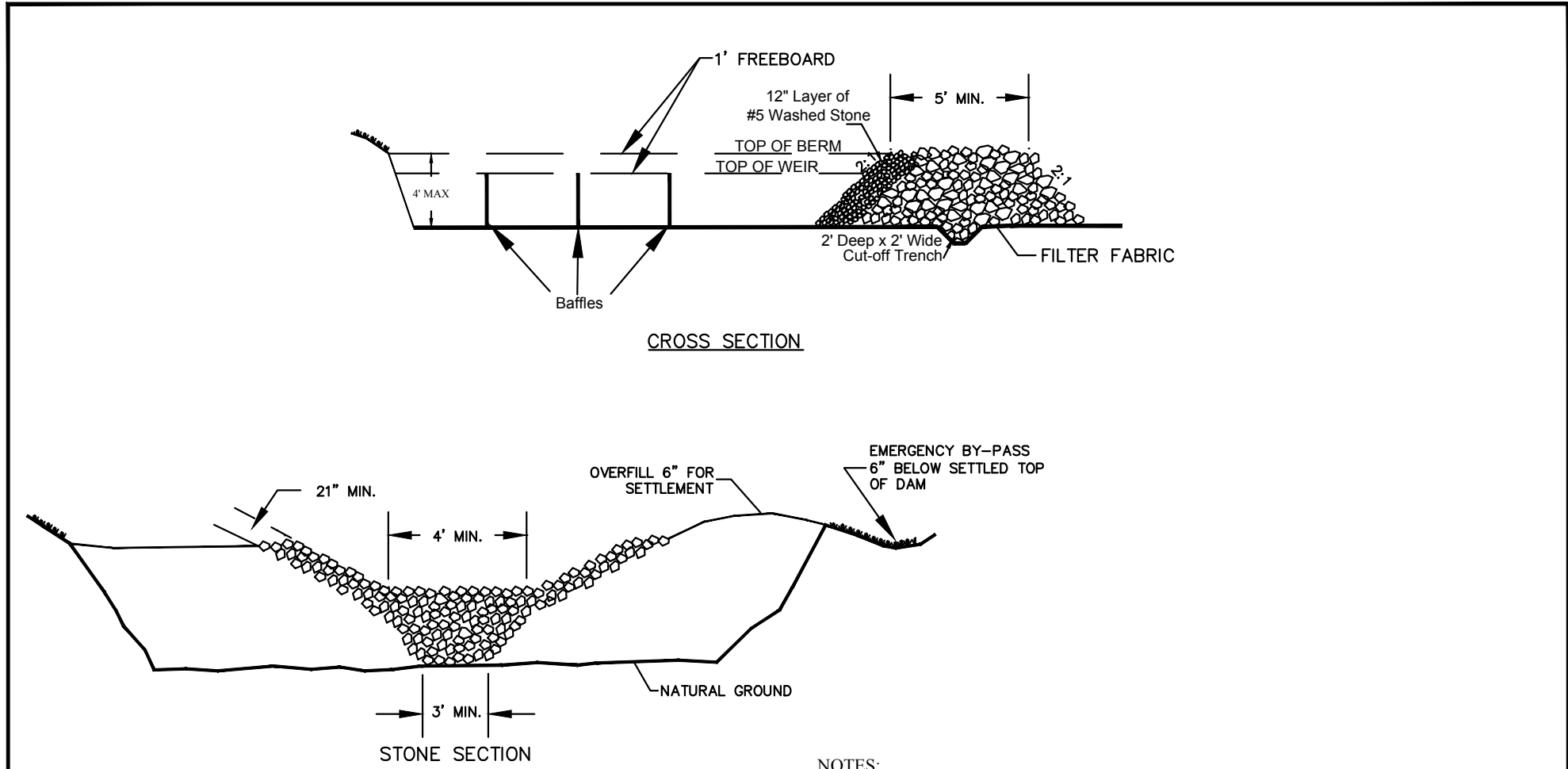
EROSION CONTROL MATTING ON SLOPES



STANDARD WATER BAR

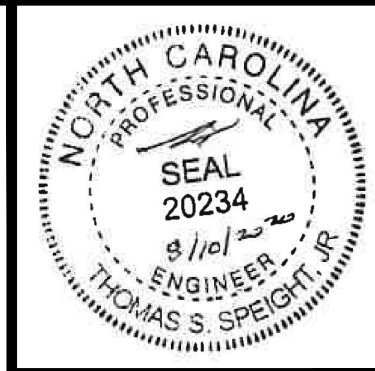


EROSION CONTROL MATTING IN CHANNEL



- NOTES:**
1. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH).
 2. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
 3. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
 4. BAFFLE SHALL BE 700 G/M2 COIR EROSION BLANKET.
 5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS.
 6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL.
 7. BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF-FULL.

STANDARD ROCK DAM SEDIMENT BASIN (SEDIMENT TRAP)



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 NCBELS FIRM No. C-2378



CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION
 410 W. YOUNG ST.
 ROLESVILLE, NC
 WAKE COUNTY

EROSION CONTROL
 DETAILS

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347

SHEET
C925

REV	DESCRIPTION	DATE
03	CONSTRUCTION DOCUMENTS 3RD SUBMITTAL	09/08/2020
02	CONSTRUCTION DOCUMENTS 2ND SUBMITTAL	08/14/2020
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REVISIONS		

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RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.0)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: CHANDLER'S RIDGE 01-P
DATE: 8/14/2000

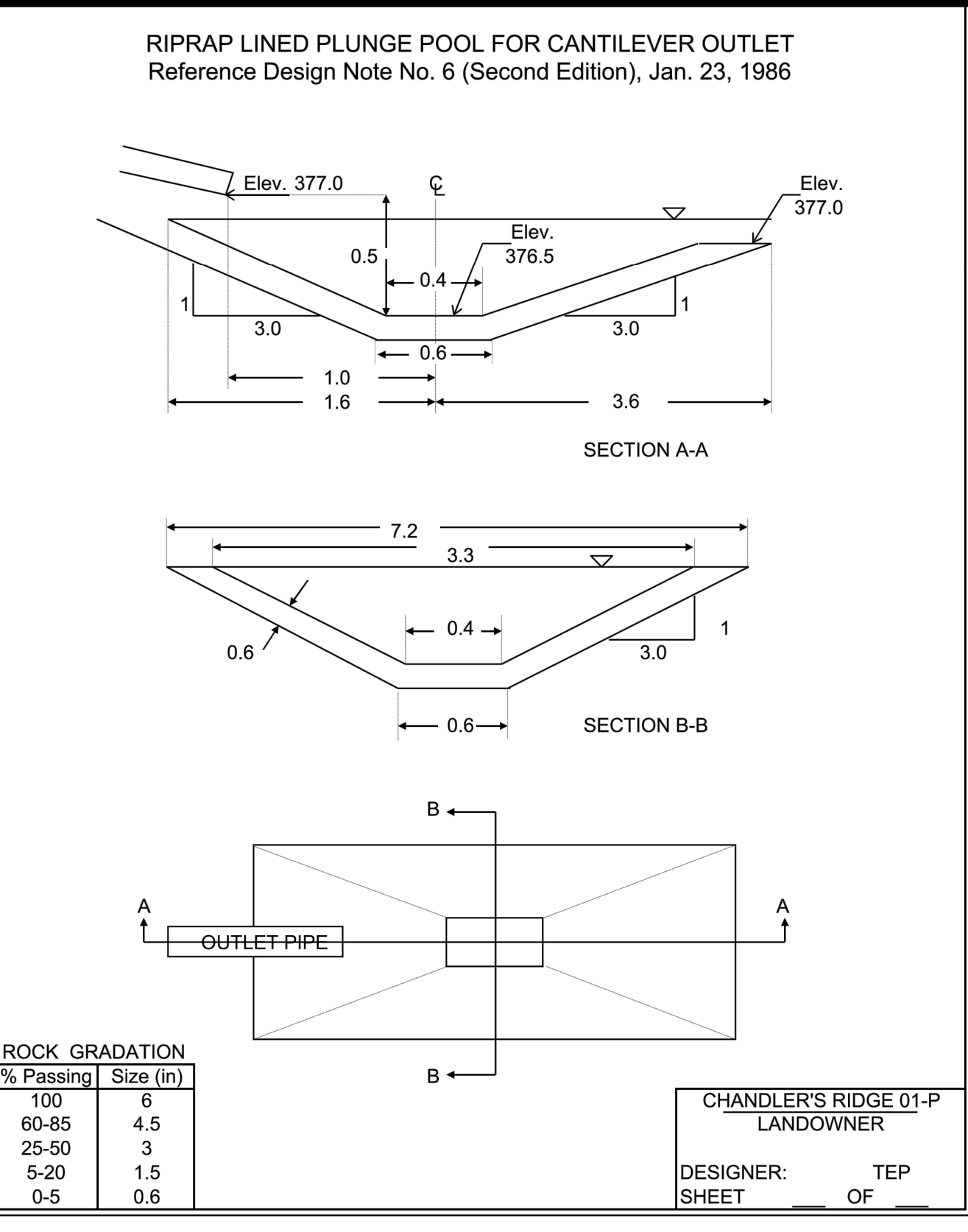
INPUT DATA:
 Cantilever Diameter: D = 1.50 ft
 Cantilever Discharge: Q = 0.00 cfs
 Cantilever Slope at Outlet: S = 0.01 ft/ft
 Cantilever End Elevation: EL TO = 377.00 ft
 Outlet Channel Invert Elevation: EL CO = 377.00 ft

Water Density: RWD = 1.90
 Riprap Porosity: PPS = 2.64
 50 Riprap Size: RS = 0.75 ft
 Bedding Thickness: BT = 0.01 ft
 Slope Ratio: SR = 3.00 ft/ft
 Upstream End Slope Ratio: ZU = 3.00 ft/ft
 Downstream End Slope Ratio: ZD = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Vert. Dist. from Tailwater to Control Invert: EL TO = 377.00 ft
 Pool Depth at C/L Below Control Invert: Zp = 0.00 ft
 Pool Bottom Elevation: EL PB = 377.00 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom surface of bedding): V_{exc} = 0.00 cu yd
 Volume of Rock Riprap: V_{rr} = 0.00 cu yd
 Volume of Bedding: V_b = 0.00 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 190
 Spreadsheet modified by B. Deschamps, Elm, Clava TC, Ws, 398
 Design Note No. 6 (Second Edition), Jan. 23, 1986
 "Riprap Lined Plunge Pool for Cantilever Outlet"
 Natural Resources Conservation Service
 Engineering Division



RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.0)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: CHANDLER'S RIDGE 03-P
DATE: 8/14/2000

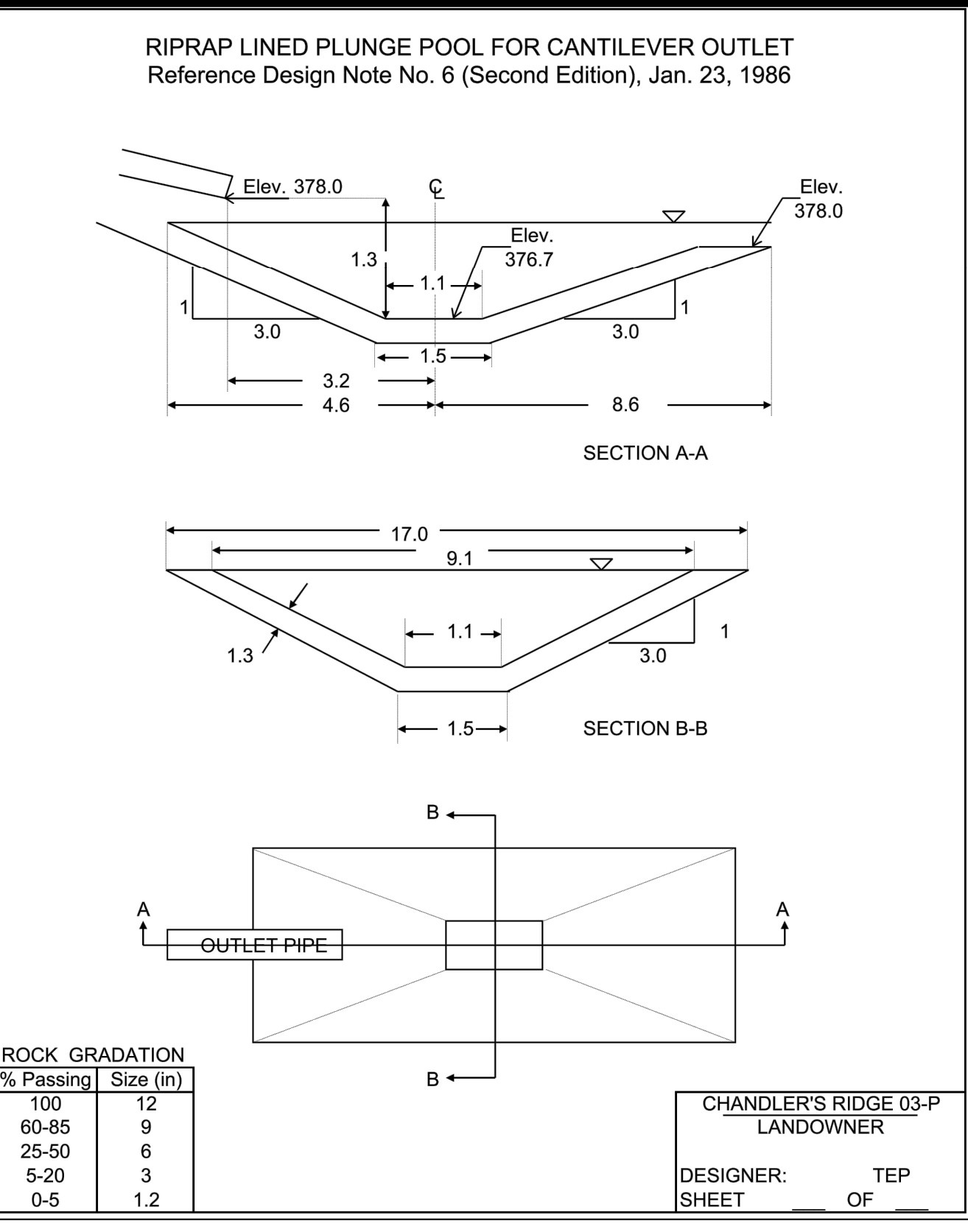
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 Cantilever Diameter: D = 3.00 ft
 Cantilever Discharge: Q = 0.00 cfs
 Cantilever Slope at Outlet: S = 0.01 ft/ft
 Cantilever End Elevation: EL TO = 377.00 ft
 Outlet Channel Invert Elevation: EL CO = 377.00 ft

Water Density: RWD = 1.90
 Riprap Porosity: PPS = 2.64
 50 Riprap Size: RS = 0.75 ft
 Bedding Thickness: BT = 0.01 ft
 Slope Ratio: SR = 3.00 ft/ft
 Upstream End Slope Ratio: ZU = 3.00 ft/ft
 Downstream End Slope Ratio: ZD = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Vert. Dist. from Tailwater to Control Invert: EL TO = 377.00 ft
 Pool Depth at C/L Below Control Invert: Zp = 0.00 ft
 Pool Bottom Elevation: EL PB = 377.00 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom surface of bedding): V_{exc} = 16.91 cu yd
 Volume of Rock Riprap: V_{rr} = 8.71 cu yd
 Volume of Bedding: V_b = 8.71 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 190
 Spreadsheet modified by B. Deschamps, Elm, Clava TC, Ws, 398
 Design Note No. 6 (Second Edition), Jan. 23, 1986
 "Riprap Lined Plunge Pool for Cantilever Outlet"
 Natural Resources Conservation Service
 Engineering Division



RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.0)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: CHANDLER'S RIDGE 13-P
DATE: 8/14/2000

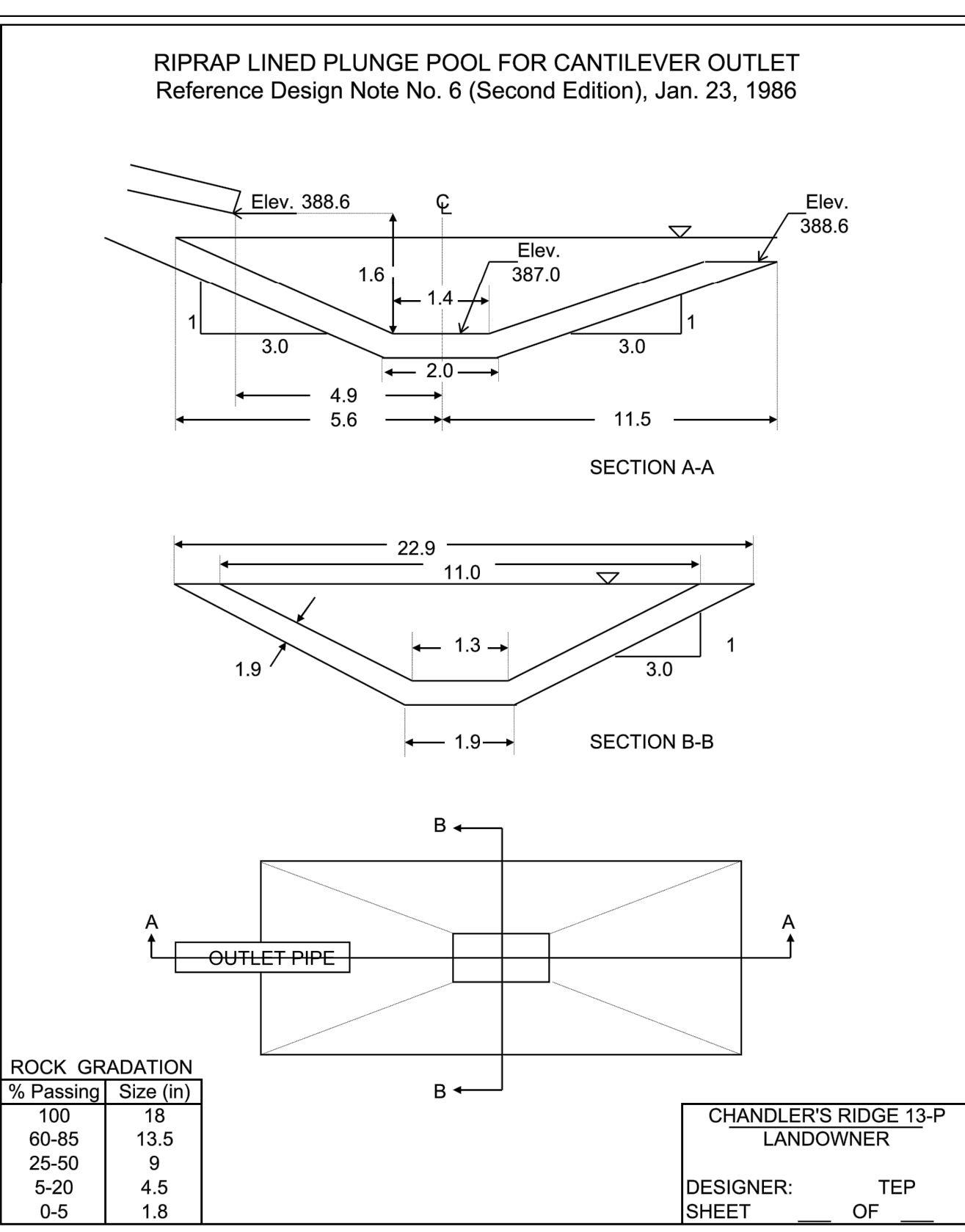
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 Cantilever Discharge: Q = 60.00 cfs
 Cantilever Slope at Outlet: S = 0.01 ft/ft
 Cantilever End Elevation: EL TO = 380.00 ft
 Outlet Channel Invert Elevation: EL CO = 380.00 ft

Water Density: RWD = 1.90
 Riprap Porosity: PPS = 2.64
 50 Riprap Size: RS = 0.75 ft
 Bedding Thickness: BT = 0.01 ft
 Slope Ratio: SR = 3.00 ft/ft
 Upstream End Slope Ratio: ZU = 3.00 ft/ft
 Downstream End Slope Ratio: ZD = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Vert. Dist. from Tailwater to Control Invert: EL TO = 380.00 ft
 Pool Depth at C/L Below Control Invert: Zp = 0.00 ft
 Pool Bottom Elevation: EL PB = 380.00 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom surface of bedding): V_{exc} = 36.41 cu yd
 Volume of Rock Riprap: V_{rr} = 22.41 cu yd
 Volume of Bedding: V_b = 11.41 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 190
 Spreadsheet modified by B. Deschamps, Elm, Clava TC, Ws, 398
 Design Note No. 6 (Second Edition), Jan. 23, 1986
 "Riprap Lined Plunge Pool for Cantilever Outlet"
 Natural Resources Conservation Service
 Engineering Division



RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.0)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: CHANDLER'S RIDGE 15AB-P
DATE: 8/14/2000

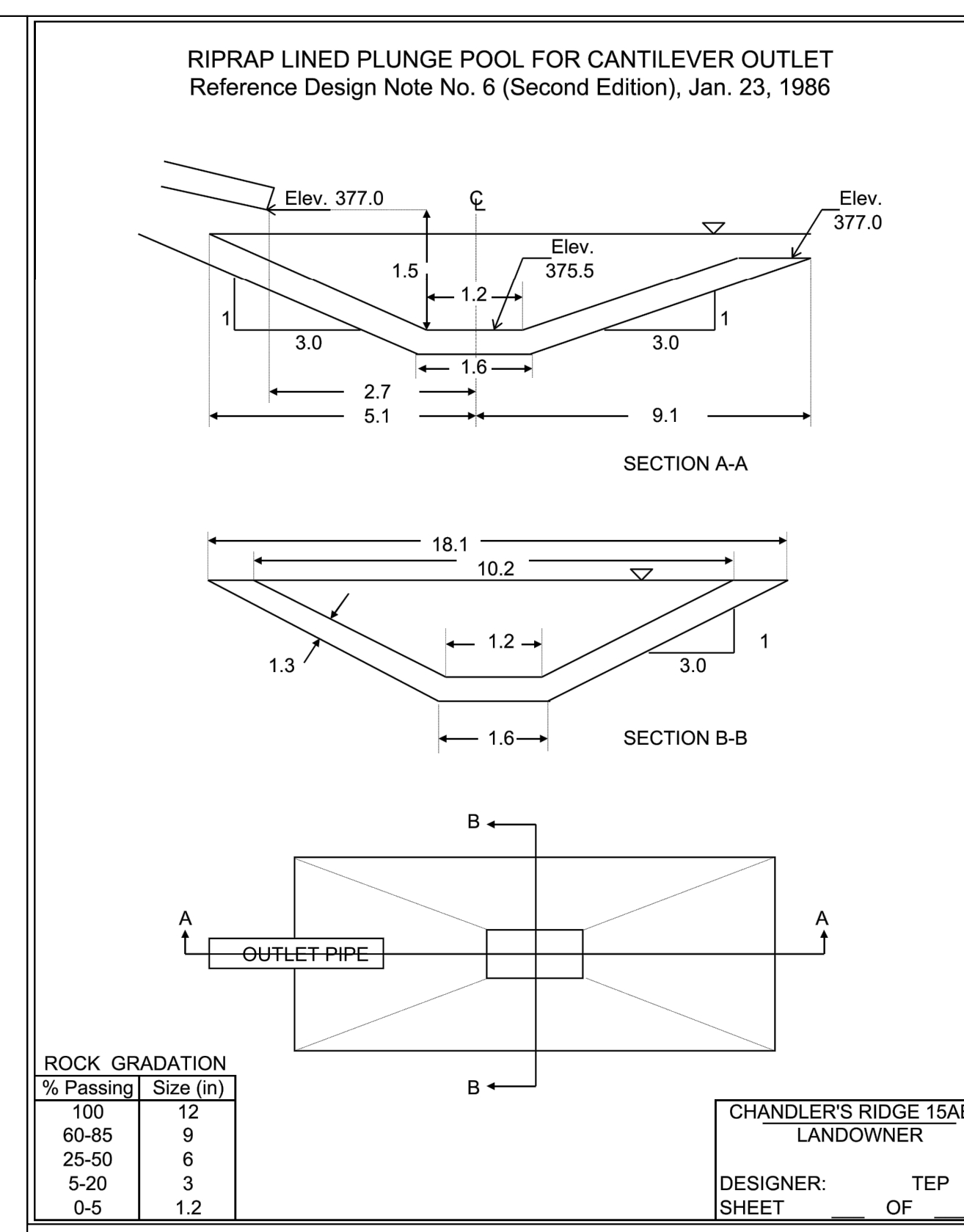
INPUT DATA:
 Cantilever Diameter: D = 3.00 ft
 Cantilever Discharge: Q = 120.00 cfs
 Cantilever Slope at Outlet: S = 0.01 ft/ft
 Cantilever End Elevation: EL TO = 377.00 ft
 Outlet Channel Invert Elevation: EL CO = 377.00 ft

Water Density: RWD = 1.90
 Riprap Porosity: PPS = 2.64
 50 Riprap Size: RS = 0.75 ft
 Bedding Thickness: BT = 0.01 ft
 Slope Ratio: SR = 3.00 ft/ft
 Upstream End Slope Ratio: ZU = 3.00 ft/ft
 Downstream End Slope Ratio: ZD = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Vert. Dist. from Tailwater to Control Invert: EL TO = 377.00 ft
 Pool Depth at C/L Below Control Invert: Zp = 0.00 ft
 Pool Bottom Elevation: EL PB = 377.00 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom surface of bedding): V_{exc} = 19.81 cu yd
 Volume of Rock Riprap: V_{rr} = 10.11 cu yd
 Volume of Bedding: V_b = 7.81 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 190
 Spreadsheet modified by B. Deschamps, Elm, Clava TC, Ws, 398
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Bateman Civil Survey Company
 Engineers • Surveyors • Planners
 2524 Reliance Avenue, Apex, North Carolina 27539
 Phone: 919/577-1080 Fax: 919/577-1081
 NCBEELS FIRM No. C-2378



CHANDLER'S RIDGE
 CONSTRUCTION DOCUMENTS
 CONSERVATION SUBDIVISION

EROSION CONTROL
 DETAILS

Project Engineer:	TSS
Designed By:	TEP
Drawn By:	TEP
Checked By:	TSS
Scale:	
Date:	09/08/2020
Project Number:	P170347
SHEET	
C926	

RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.9)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: TSS
CHECKER: TSS

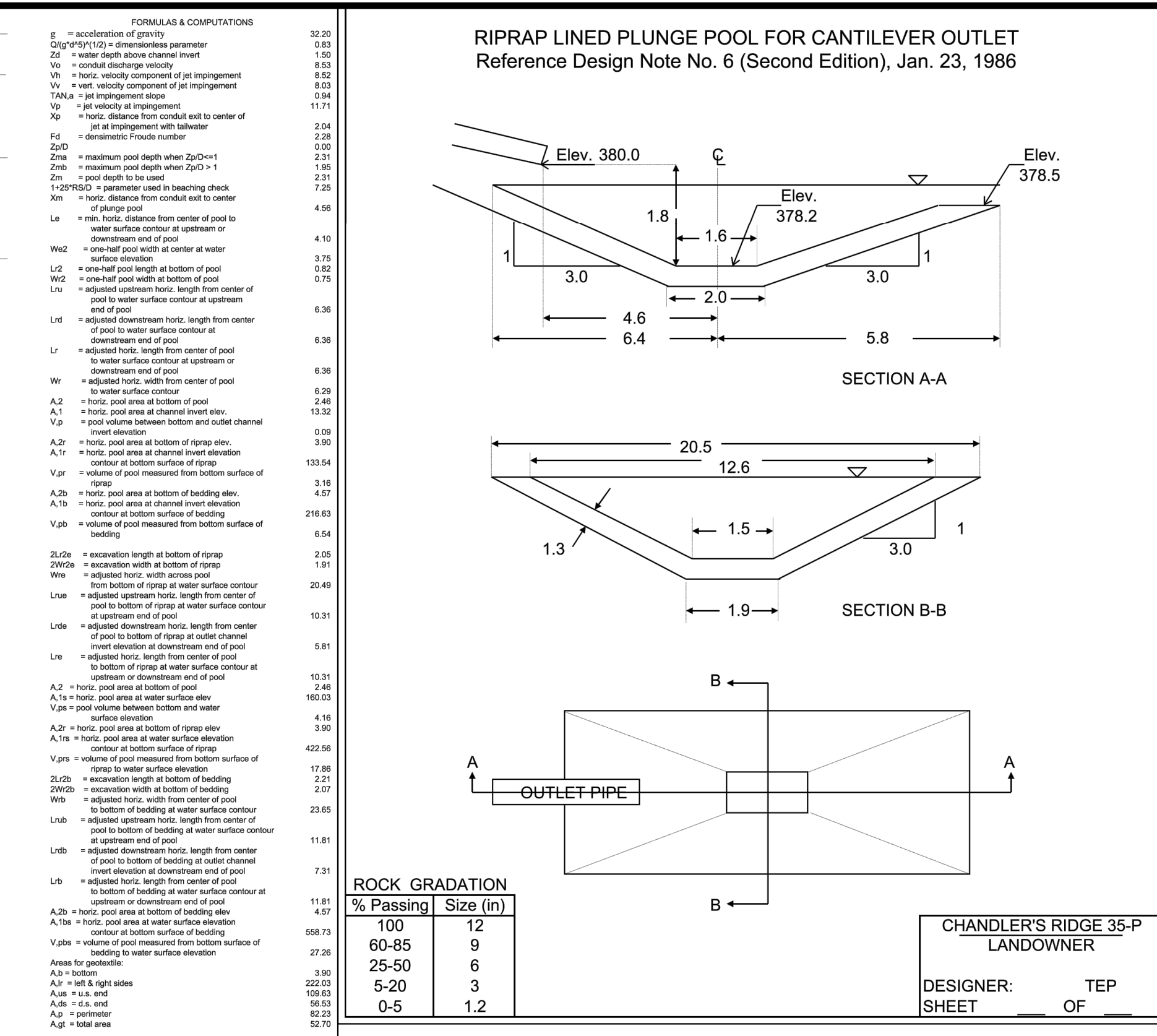
INPUT DATA:
 Control Diameter: D = 2.00 ft
 Control Discharge: Q = 30.00 cfs
 Control Slope at Outlet: S = 0.00 ft/ft
 Control Outlet Invert Elevation: EL TO = 300.00 ft
 Tailwater Elevation: EL TW = 300.00 ft
 Outlet Channel Invert Elevation: EL OC = 378.50 ft

Water Density: RH20 = 1.92
Bed/Riprap Particle Density (Default 2.64): RH26 = 2.64
D 50 Riprap Size: RS = 0.00 ft
Riprap Thickness (D 50, 50 recommended): RT = 1.00 ft
Bedding Thickness (8 inch min. max. 1.5 ft): BT = 0.00 ft
Side Slope Ratio: Z = 3.00 ft/ft
Downstream End Slope Ratio: Z1 = 3.00 ft/ft
Combined End Slope Ratio: Z12 = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Max. Dist. from Tailwater to Control Invert: X = 4.86 ft
 Submergence Check: (If Z1 < 0, Use Z1 = 0)
 Bedding Check: (If Z1 < 0, Use Z1 = 0)
 "Beeding Condition":
 Distance from Control Exit to C/L Pool: Z1 = 0.00 ft
 Pool Bottom Elev.: EL PB = 378.50 ft
 Pool Bottom Length: L = 1.61 ft
 Pool Bottom Width: W = 1.00 ft
 Downstream Pool Length at Tailwater Elev.: L1 = 6.36 ft
 Downstream Pool Length at Tailwater Elev.: L2 = 12.88 ft
 Pool Bottom Width: W1 = 1.00 ft
 Check Min. End Slope Ratio: (L1 & L2 = L1)
 "End Slope Ratio C/L": O.K.
 "End Slope Ratio C/L": O.K.
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 378.50 ft
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 378.50 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom of bedding): V1 = 13.74 cu yd
 Volume of Rock Riprap: V2 = 4.80 cu yd
 Volume of Bedding: V3 = 4.80 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 1990
 Spreadsheet modified by J. Desautels, Eau Claire TC, Wis., 2008
 Design Note No. 6 (Second Edition), Jan. 23, 1986
 "Riprap Lined Plunge Pool for Cantilever Outlet"
 Natural Resources Conservation Service
 Engineering Division



RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.9)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: TSS
CHECKER: TSS

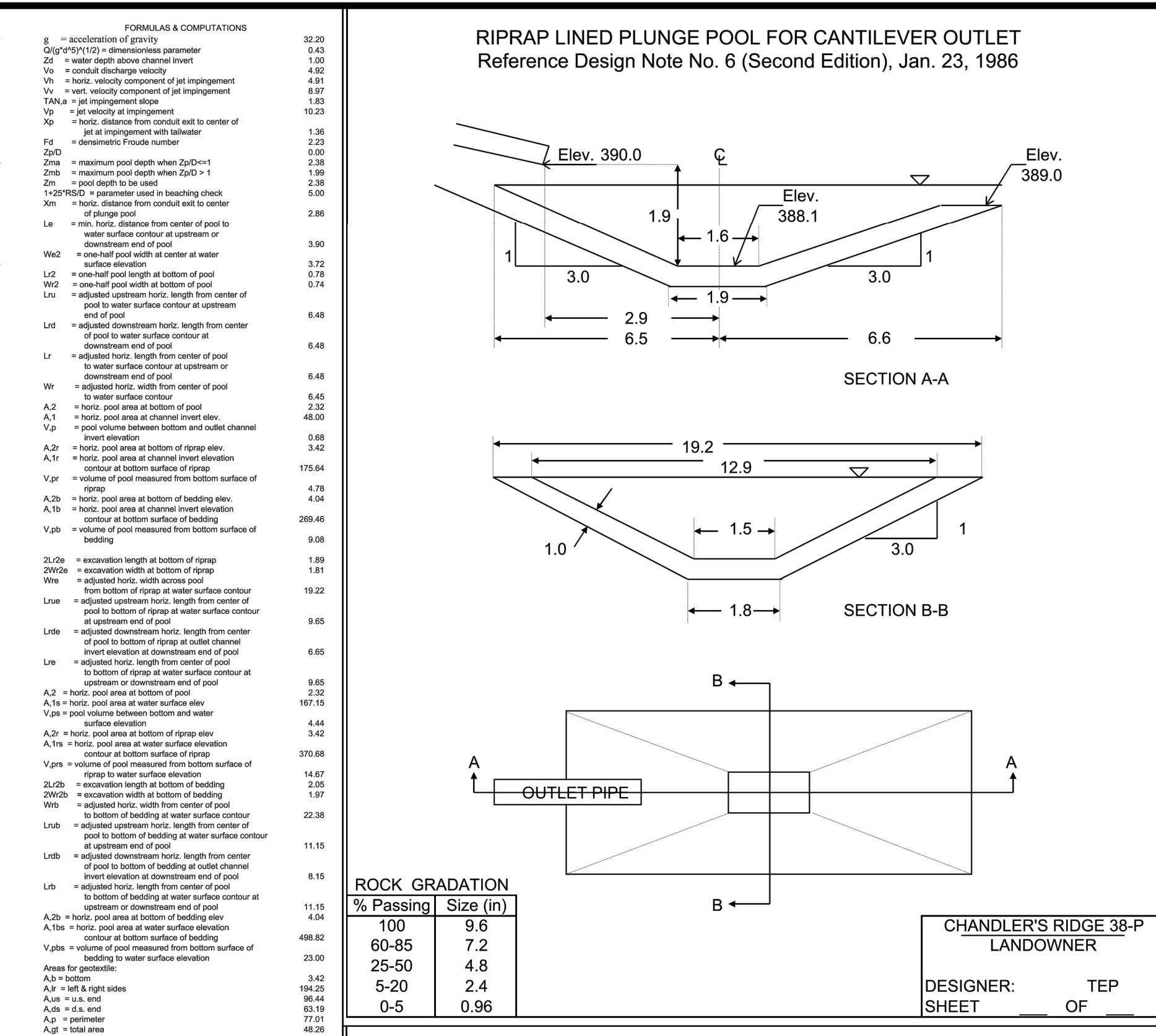
INPUT DATA:
 Control Diameter: D = 2.00 ft
 Control Discharge: Q = 30.00 cfs
 Control Slope at Outlet: S = 0.00 ft/ft
 Control Outlet Invert Elevation: EL TO = 390.00 ft
 Tailwater Elevation: EL TW = 390.00 ft
 Outlet Channel Invert Elevation: EL OC = 388.10 ft

Water Density: RH20 = 1.92
Bed/Riprap Particle Density (Default 2.64): RH26 = 2.64
D 50 Riprap Size: RS = 0.00 ft
Riprap Thickness (D 50, 50 recommended): RT = 1.00 ft
Bedding Thickness (8 inch min. max. 1.5 ft): BT = 0.00 ft
Side Slope Ratio: Z = 3.00 ft/ft
Downstream End Slope Ratio: Z1 = 3.00 ft/ft
Combined End Slope Ratio: Z12 = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Max. Dist. from Tailwater to Control Invert: X = 4.86 ft
 Submergence Check: (If Z1 < 0, Use Z1 = 0)
 Bedding Check: (If Z1 < 0, Use Z1 = 0)
 "Beeding Condition":
 Distance from Control Exit to C/L Pool: Z1 = 0.00 ft
 Pool Bottom Elev.: EL PB = 388.10 ft
 Pool Bottom Length: L = 1.61 ft
 Pool Bottom Width: W = 1.00 ft
 Downstream Pool Length at Tailwater Elev.: L1 = 6.48 ft
 Downstream Pool Length at Tailwater Elev.: L2 = 12.88 ft
 Pool Bottom Width: W1 = 1.00 ft
 Check Min. End Slope Ratio: (L1 & L2 = L1)
 "End Slope Ratio C/L": O.K.
 "End Slope Ratio C/L": O.K.
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 388.10 ft
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 388.10 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom of bedding): V1 = 13.74 cu yd
 Volume of Rock Riprap: V2 = 4.80 cu yd
 Volume of Bedding: V3 = 4.80 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 1990
 Spreadsheet modified by J. Desautels, Eau Claire TC, Wis., 2008
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 Engineering Division



RIPRAP LINED PLUNGE POOL FOR CANTILEVER OUTLET (Version 8.9)
Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: TSS
CHECKER: TSS

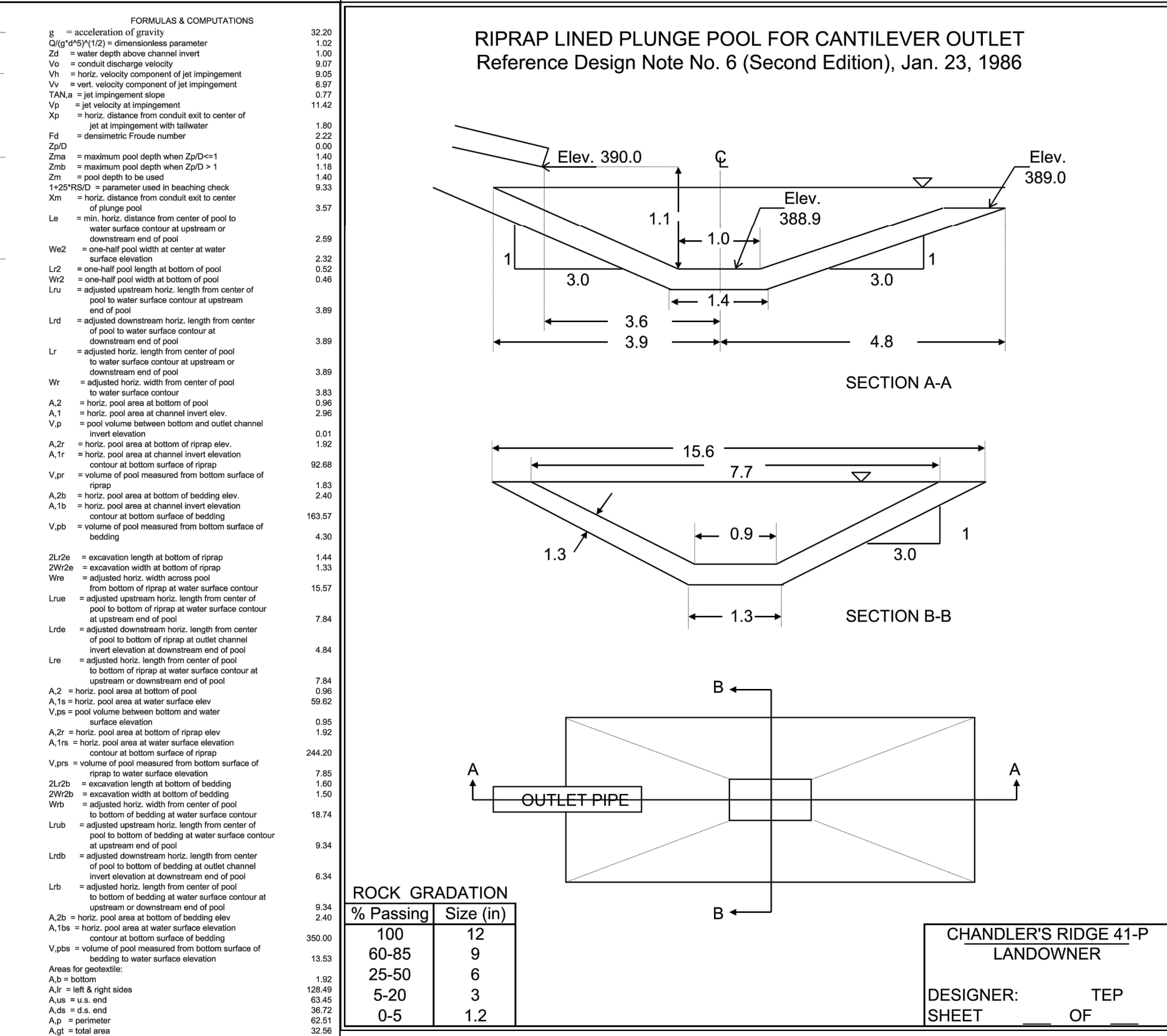
INPUT DATA:
 Control Diameter: D = 1.50 ft
 Control Discharge: Q = 10.00 cfs
 Control Slope at Outlet: S = 0.00 ft/ft
 Control Outlet Invert Elevation: EL TO = 407.00 ft
 Tailwater Elevation: EL TW = 407.00 ft
 Outlet Channel Invert Elevation: EL OC = 406.70 ft

Water Density: RH20 = 1.92
Bed/Riprap Particle Density (Default 2.64): RH26 = 2.64
D 50 Riprap Size: RS = 0.00 ft
Riprap Thickness (D 50, 50 recommended): RT = 1.00 ft
Bedding Thickness (8 inch min. max. 1.5 ft): BT = 0.00 ft
Side Slope Ratio: Z = 3.00 ft/ft
Downstream End Slope Ratio: Z1 = 3.00 ft/ft
Combined End Slope Ratio: Z12 = 3.00 ft/ft

OUTPUT - POOL LOCATION AND DIMENSIONS:
 Max. Dist. from Tailwater to Control Invert: X = 3.97 ft
 Submergence Check: (If Z1 < 0, Use Z1 = 0)
 Bedding Check: (If Z1 < 0, Use Z1 = 0)
 "Beeding Condition":
 Distance from Control Exit to C/L Pool: Z1 = 0.00 ft
 Pool Bottom Elev.: EL PB = 406.70 ft
 Pool Bottom Length: L = 1.00 ft
 Pool Bottom Width: W = 1.00 ft
 Downstream Pool Length at Tailwater Elev.: L1 = 3.89 ft
 Downstream Pool Length at Tailwater Elev.: L2 = 7.78 ft
 Pool Bottom Width: W1 = 1.00 ft
 Check Min. End Slope Ratio: (L1 & L2 = L1)
 "End Slope Ratio C/L": O.K.
 "End Slope Ratio C/L": O.K.
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 406.70 ft
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 406.70 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom of bedding): V1 = 1.50 cu yd
 Volume of Rock Riprap: V2 = 0.50 cu yd
 Volume of Bedding: V3 = 0.50 cu yd

Spreadsheet developed by D. Hartz, Midwest NTC, 1990
 Spreadsheet modified by J. Desautels, Eau Claire TC, Wis., 2008
 Design Note No. 6 (Second Edition), Jan. 23, 1986
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 Natural Resources Conservation Service
 Engineering Division



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Reference Design Note No. 6 (Second Edition), Jan. 23, 1986

DESIGNER: TSS
CHECKER: TSS

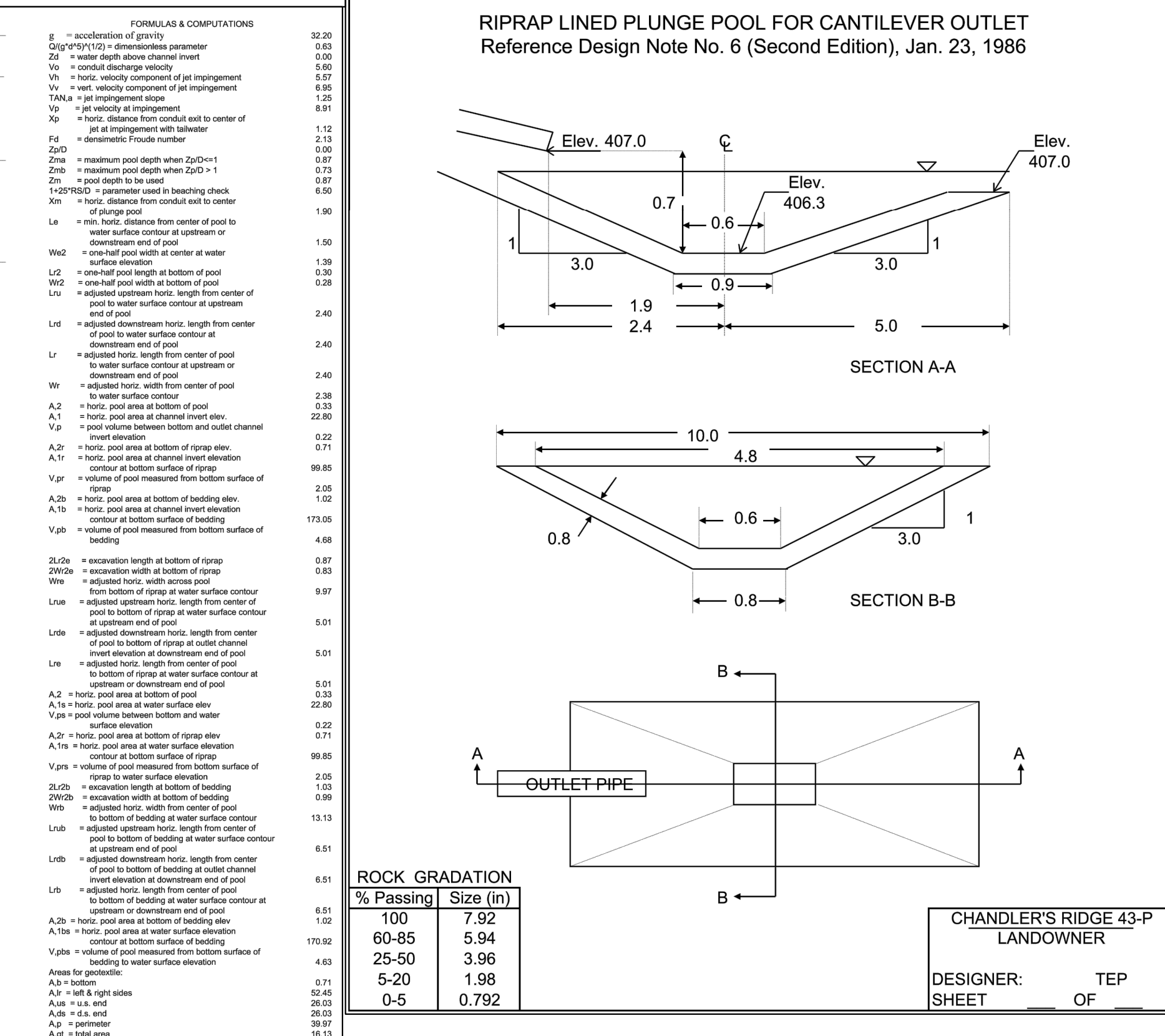
INPUT DATA:
 Control Diameter: D = 1.50 ft
 Control Discharge: Q = 10.00 cfs
 Control Slope at Outlet: S = 0.00 ft/ft
 Control Outlet Invert Elevation: EL TO = 407.00 ft
 Tailwater Elevation: EL TW = 407.00 ft
 Outlet Channel Invert Elevation: EL OC = 406.70 ft

Water Density: RH20 = 1.92
Bed/Riprap Particle Density (Default 2.64): RH26 = 2.64
D 50 Riprap Size: RS = 0.00 ft
Riprap Thickness (D 50, 50 recommended): RT = 1.00 ft
Bedding Thickness (8 inch min. max. 1.5 ft): BT = 0.00 ft
Side Slope Ratio: Z = 3.00 ft/ft
Downstream End Slope Ratio: Z1 = 3.00 ft/ft
Combined End Slope Ratio: Z12 = 3.00 ft/ft

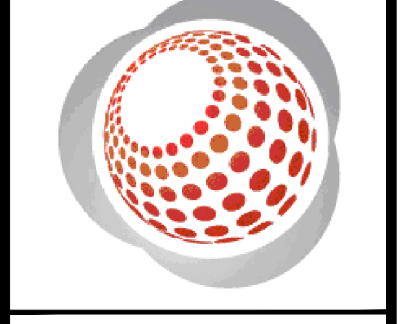
OUTPUT - POOL LOCATION AND DIMENSIONS:
 Max. Dist. from Tailwater to Control Invert: X = 3.97 ft
 Submergence Check: (If Z1 < 0, Use Z1 = 0)
 Bedding Check: (If Z1 < 0, Use Z1 = 0)
 "Beeding Condition":
 Distance from Control Exit to C/L Pool: Z1 = 0.00 ft
 Pool Bottom Elev.: EL PB = 406.70 ft
 Pool Bottom Length: L = 1.00 ft
 Pool Bottom Width: W = 1.00 ft
 Downstream Pool Length at Tailwater Elev.: L1 = 3.89 ft
 Downstream Pool Length at Tailwater Elev.: L2 = 7.78 ft
 Pool Bottom Width: W1 = 1.00 ft
 Check Min. End Slope Ratio: (L1 & L2 = L1)
 "End Slope Ratio C/L": O.K.
 "End Slope Ratio C/L": O.K.
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 406.70 ft
 Pool Bottom Elev. at Bottom of Bedding: EL BB = 406.70 ft

OUTPUT - VOLUMES BELOW WATER SURFACE ELEVATION:
 Volume of Excavation (measured from bottom of bedding): V1 = 1.50 cu yd
 Volume of Rock Riprap: V2 = 0.50 cu yd
 Volume of Bedding: V3 = 0.50 cu yd

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 NCEBLES/FRW No. C-2378



CHANDLER'S RIDGE CONSTRUCTION DOCUMENTS CONSERVATION SUBDIVISION

EROSION CONTROL DETAILS

Project Engineer: TSS
 Designed By: TSS
 Drawn By: TSS
 Checked By: TSS
 Scale:

Date: 09/08/2020
 Project Number: P170347

SHEET
C927

