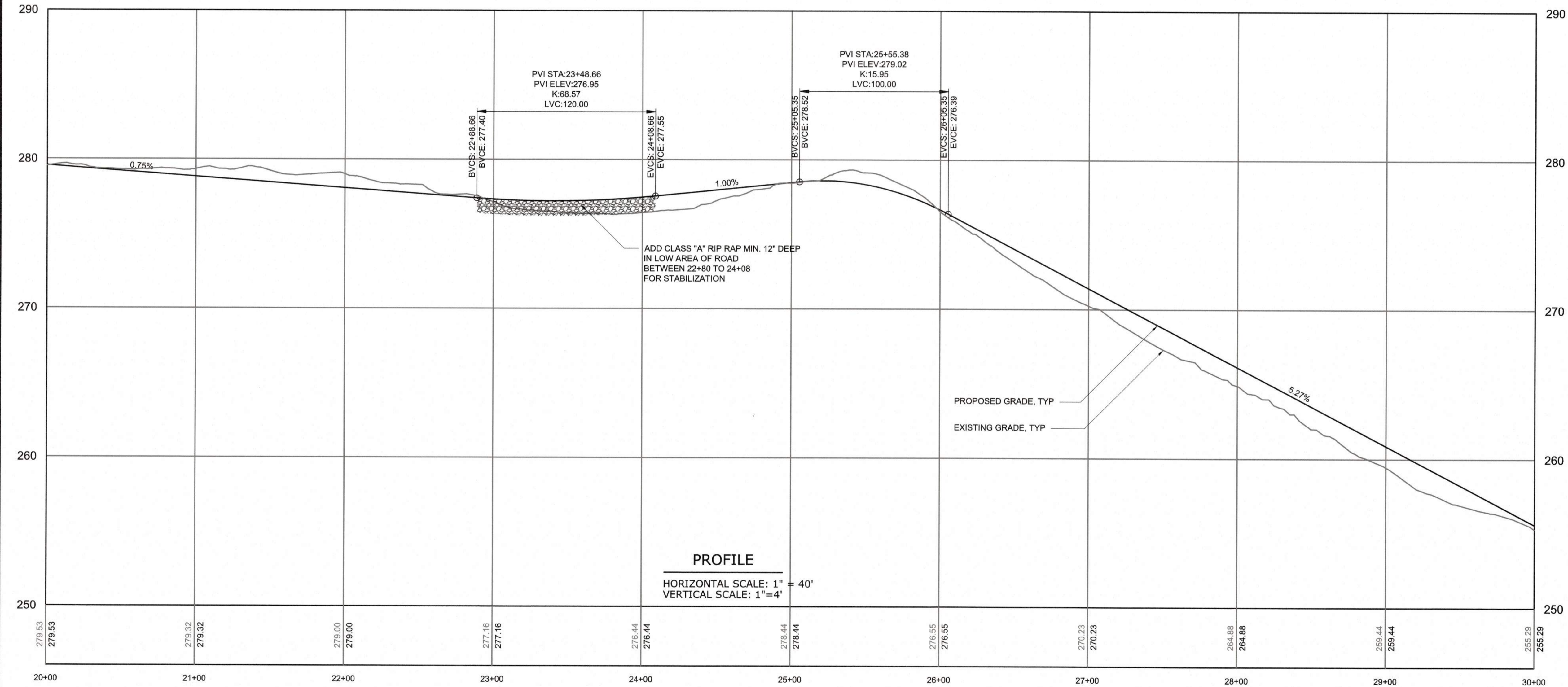


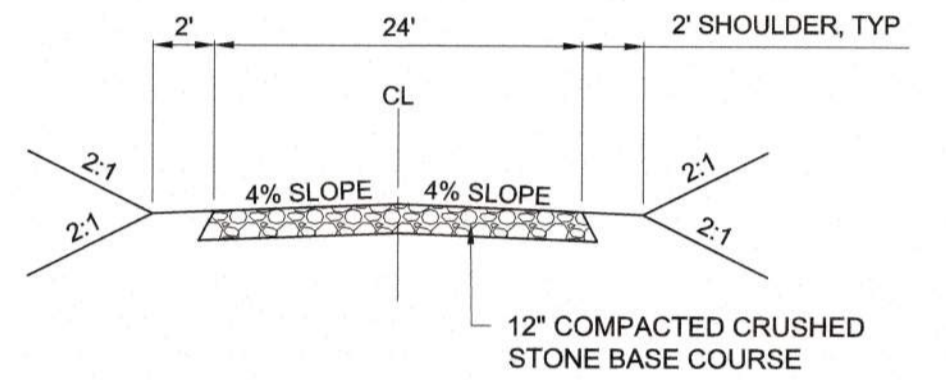
PLAN
SCALE: 1" = 40'



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

NOTES:

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TYPICAL CROSS SECTION
24' ACCESS ROAD
STATION 12+00 TO 37+50

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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City of Raleigh Development Approval _____



FINAL DESIGN

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR
	DATE
	BY



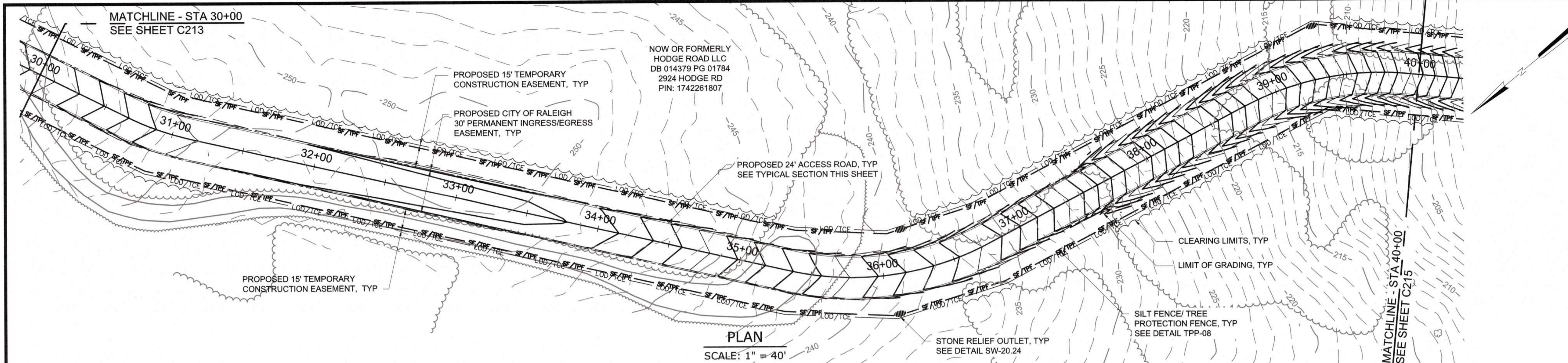
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

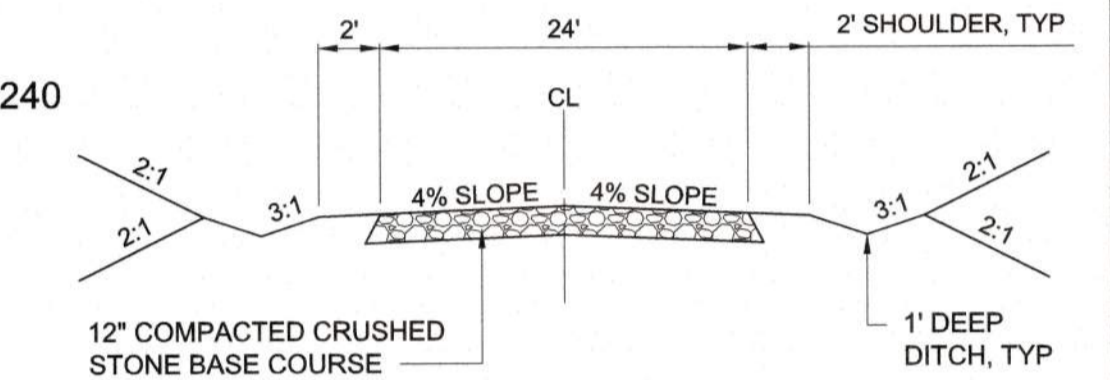
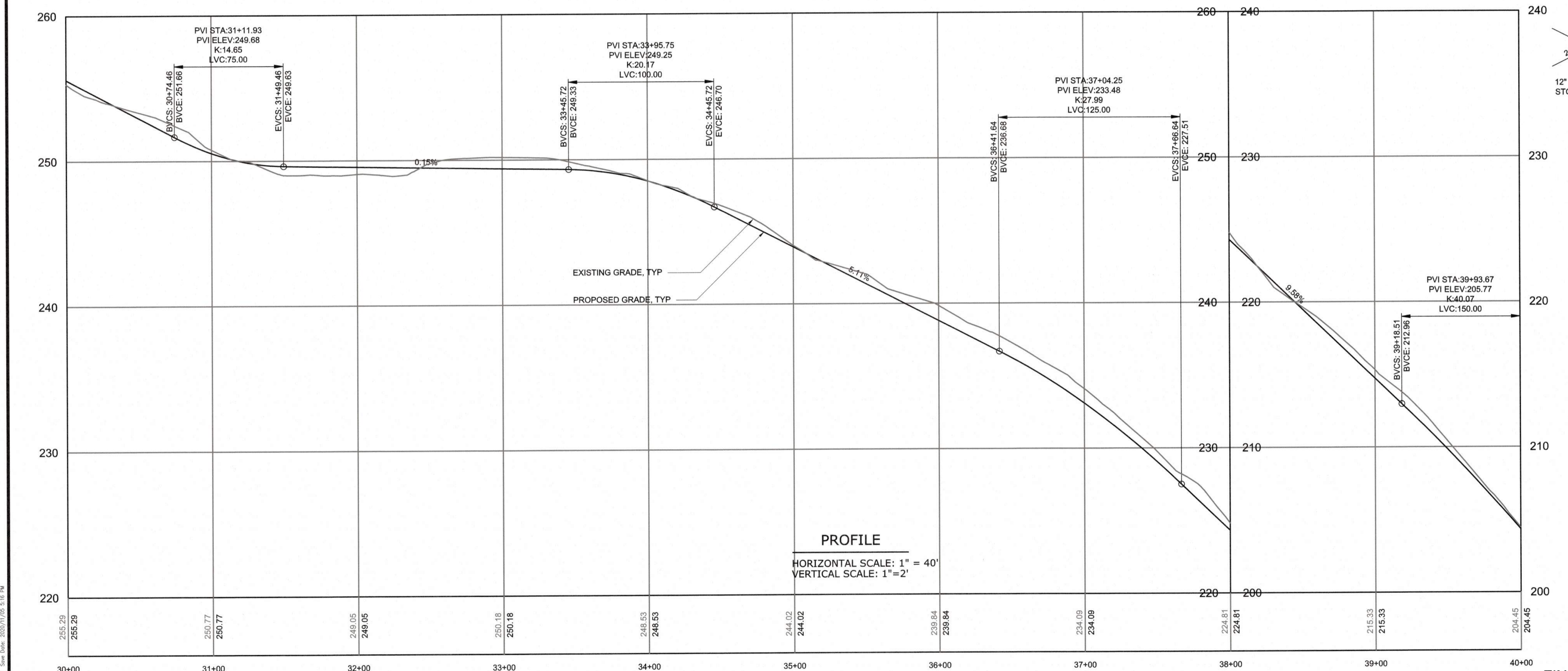
TEMPORARY CONSTRUCTION
ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 20+00 TO 30+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C213

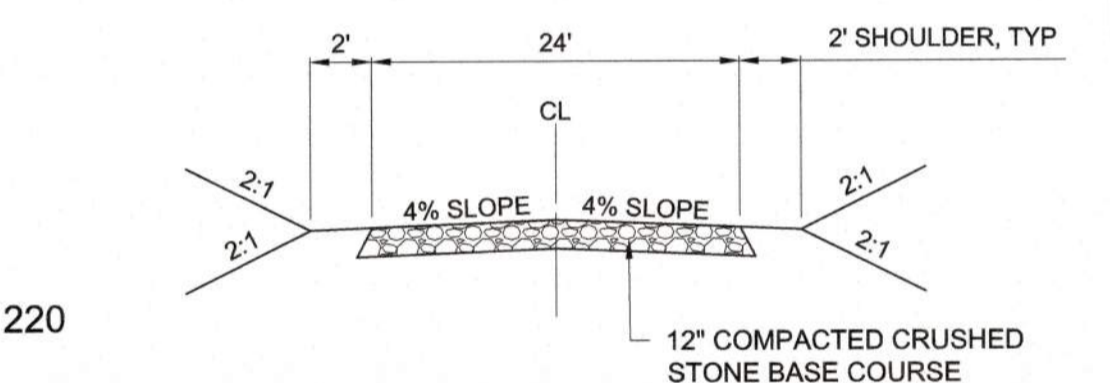


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**TYPICAL CROSS SECTION
24' ACCESS ROAD
STATION 10+00 TO 12+00
STATION 37+50 TO 43+61**



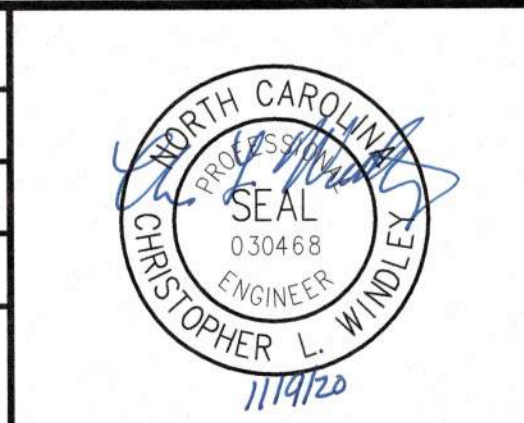
**TYPICAL CROSS SECTION
24' ACCESS ROAD
STATION 12+00 TO 37+50**

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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT



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 HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
 LICENSE NO. : C-0381

CJS
 Conveyance, PLLC
 320 S. ACADEMY STREET
 CARY, NC 27511
 LICENSE NO. : P-1611

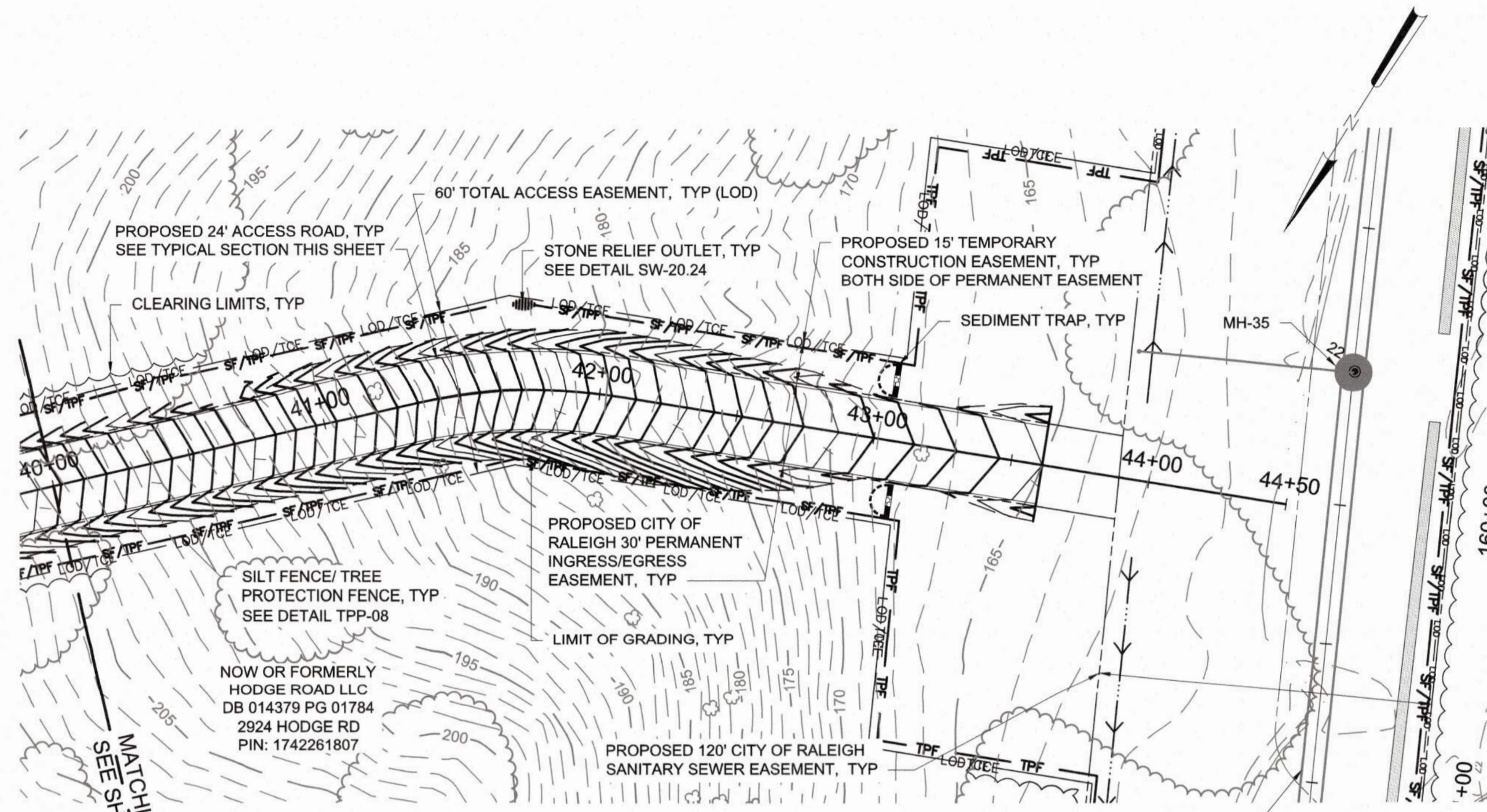
CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
 ACCESS ROAD NO. 4
 (HODGE RD)
 PLAN AND PROFILE
 STA 30+00 TO 40+00

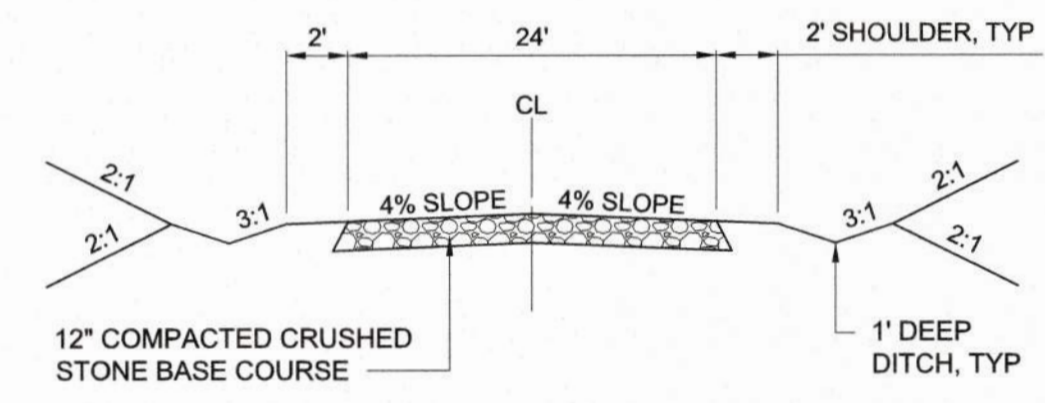
DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C214

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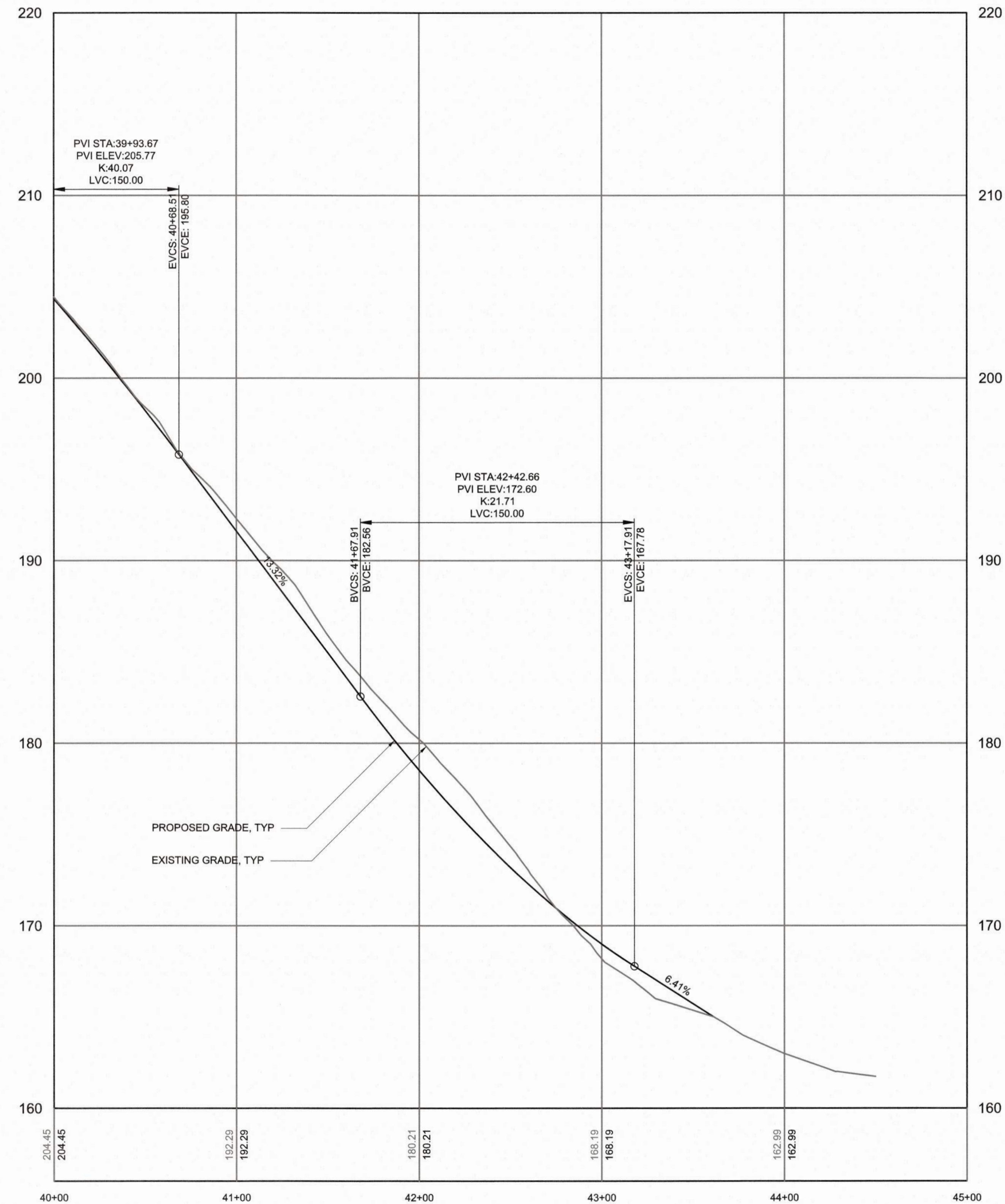
FINAL DESIGN



PLAN
SCALE: 1" = 40'



TYPICAL CROSS SECTION
24' ACCESS ROAD
STATION 37+50+00 TO 43+61



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BEFORE YOU DIG!
CONTACT ONE-CALL CENTER
CALL 811
OR
1-800-632-4949

FINAL DESIGN

PLOT DATE: 2020/11/06 7:18:19 PM BY: JCKY BALEY
FILE: C:\WORKSPACE\PROJECTS\2020\2020-07-05-15-24.Plot Date: 2020/11/06 5:24 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



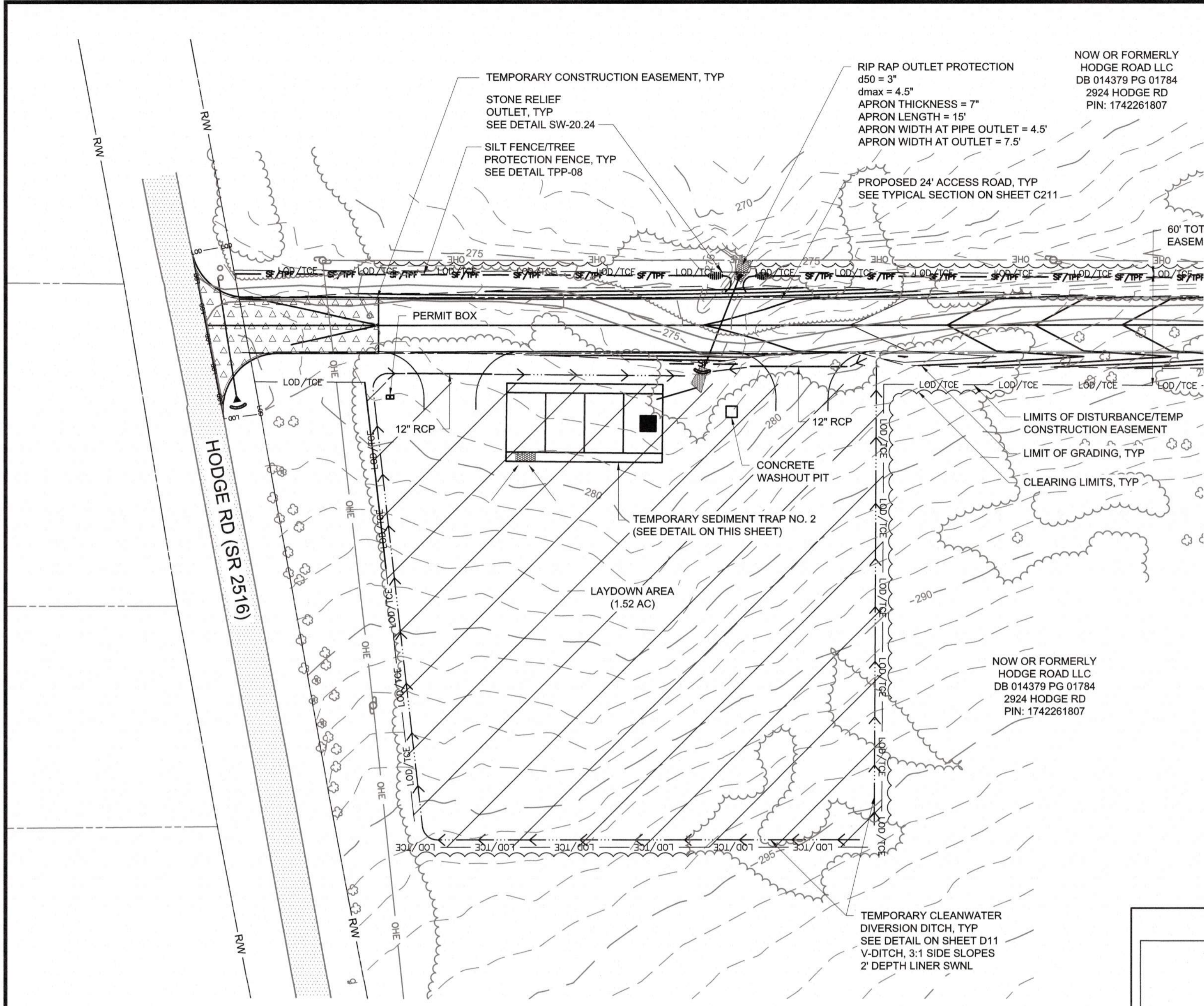
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

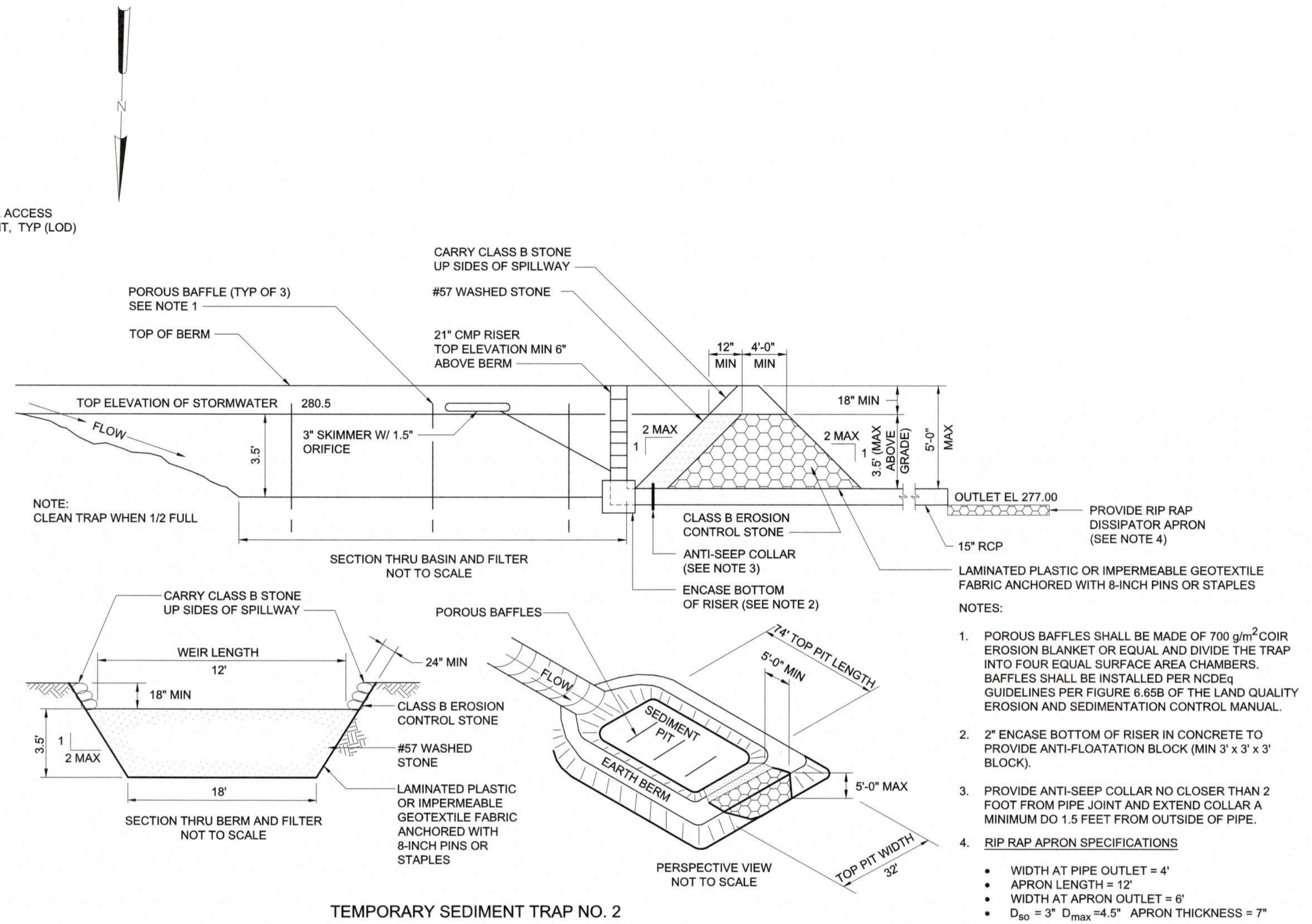
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 40+00 TO 43+61

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C215

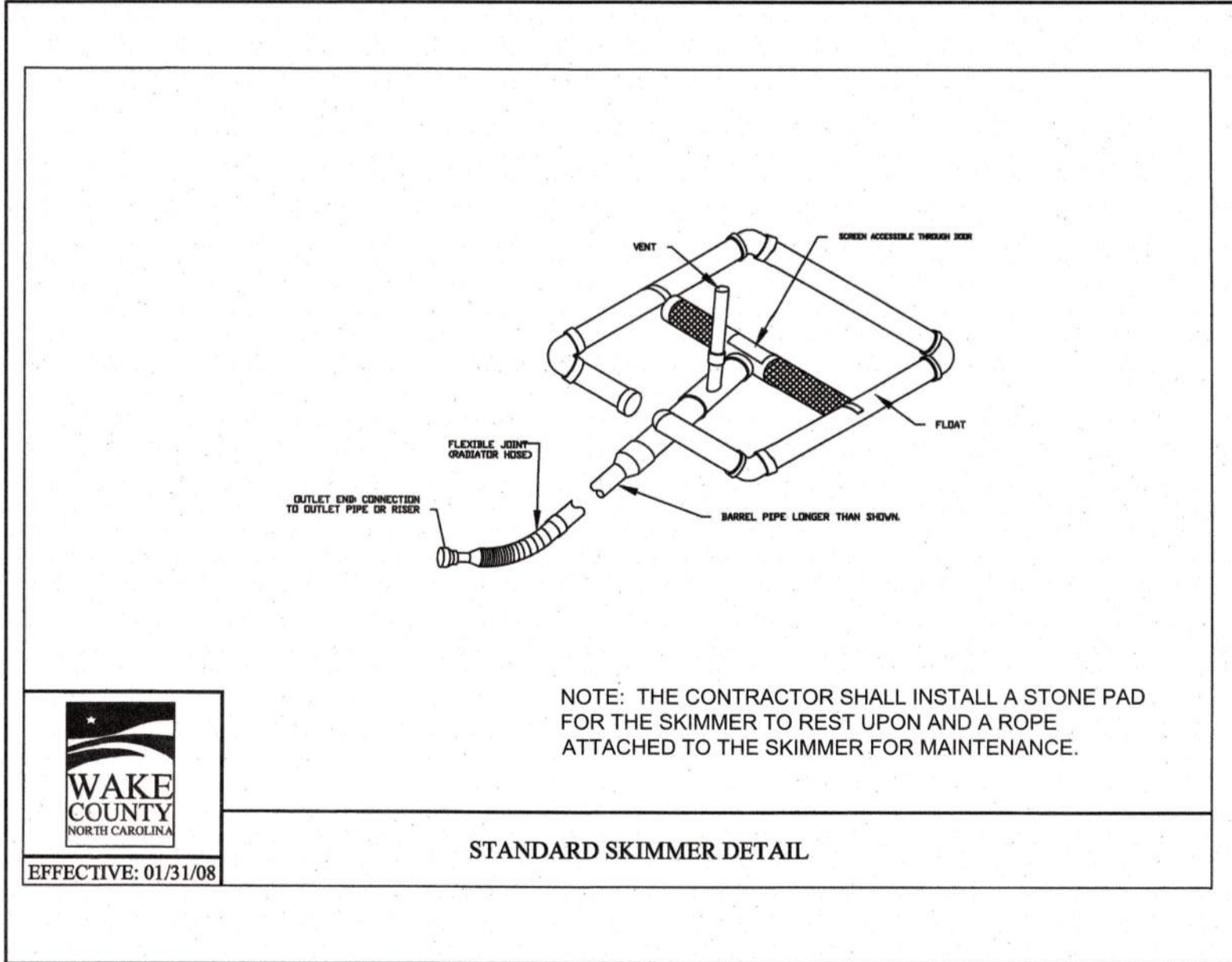


PLAN
SCALE: 1" = 40'



TEMPORARY SEDIMENT TRAP NO. 2

- NOTES:
- POROUS BAFFLES SHALL BE MADE OF 700 g/m² COIR EROSION BLANKET OR EQUAL AND DIVIDE THE TRAP INTO FOUR EQUAL SURFACE AREA CHAMBERS. BAFFLES SHALL BE INSTALLED PER NCDEQ GUIDELINES PER FIGURE 6.65B OF THE LAND QUALITY EROSION AND SEDIMENTATION CONTROL MANUAL.
 - 2" ENCASE BOTTOM OF RISER IN CONCRETE TO PROVIDE ANTI-FLOATATION BLOCK (MIN 3' x 3' x 3' BLOCK).
 - PROVIDE ANTI-SEEP COLLAR NO CLOSER THAN 2 FOOT FROM PIPE JOINT AND EXTEND COLLAR A MINIMUM DO 1.5 FEET FROM OUTSIDE OF PIPE.
 - RIP RAP APRON SPECIFICATIONS
 - WIDTH AT PIPE OUTLET = 4'
 - APRON LENGTH = 12'
 - WIDTH AT APRON OUTLET = 6'
 - D₅₀ = 3" D_{max} = 4.5" APRON THICKNESS = 7"
 - SEDIMENT TRAP DESIGN INFORMATION
 - SURFACE AREA = 2,370 SF (AT MAX WATER LEVEL)
 - DEPTH = 3.5 FEET (BELOW SPILLWAY)
 - SIDE SLOPES = 2:1 (H:V)
 - BOTTOM LENGTH = 60', BOTTOM WIDTH = 18'
 - FREEBOARD - 1.5 FEET (5 FEET MAX BASIN DEPTH)
 - EMBANKMENT WIDTH - 24 INCHES
 - SPILLWAY WEIR - 12 FEET
 - SPILLWAY LENGTH - 4 FEET
 - SKIMMER SIZE - 3-INCH WITH 1.5-INCH ORIFICE
 - SKIMMER DEWATERING RATE (OVER 3 DAYS) - 1,750 CFD (0.02 CFS)
 - 21" RISER WITH 15" OUTLET BARREL



STANDARD SKIMMER DETAIL

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City of Raleigh Development Approval _____



FINAL DESIGN

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 BY: JREY RALEY
 File: C:\WORK\2020\11\06\110615\110615.dwg
 Saved By: JREY RALEY
 Save Date: 2020/11/06 8:58:55 PM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	E. NG		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE			
REV	ISSUED FOR	DATE	BY



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC

320 S. ACADEMY STREET
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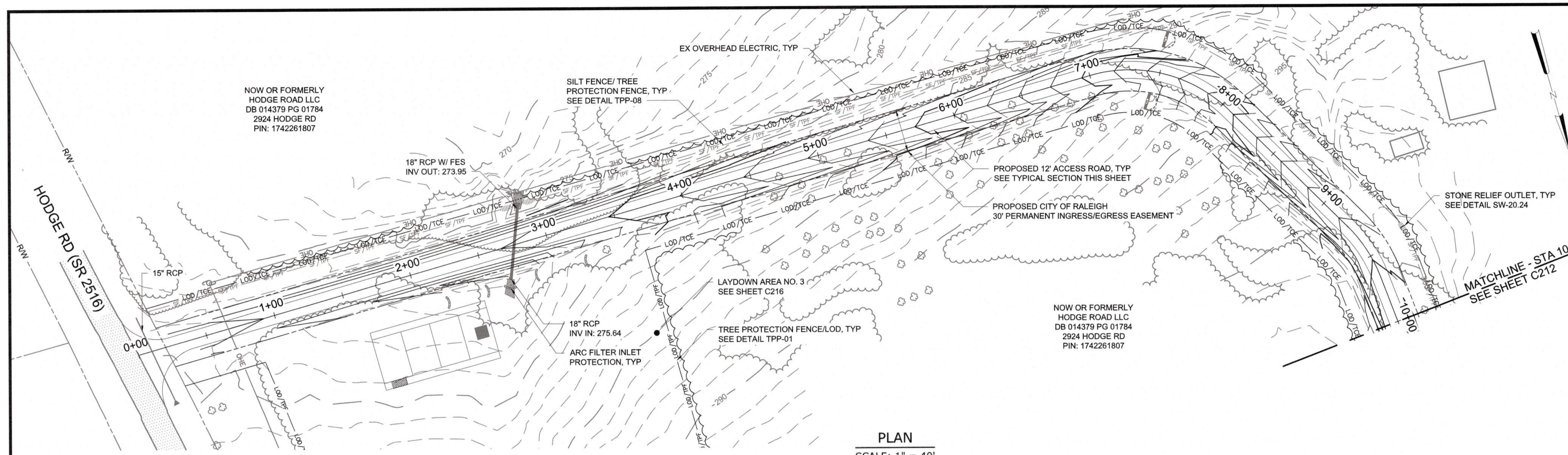
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

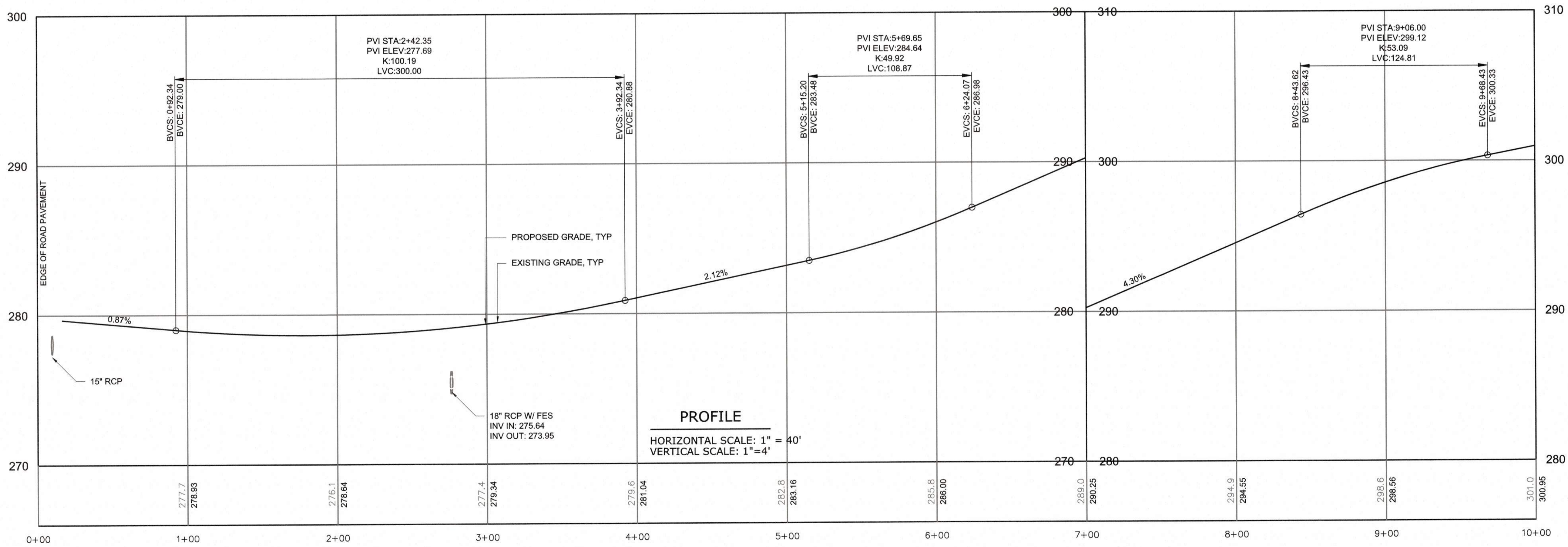
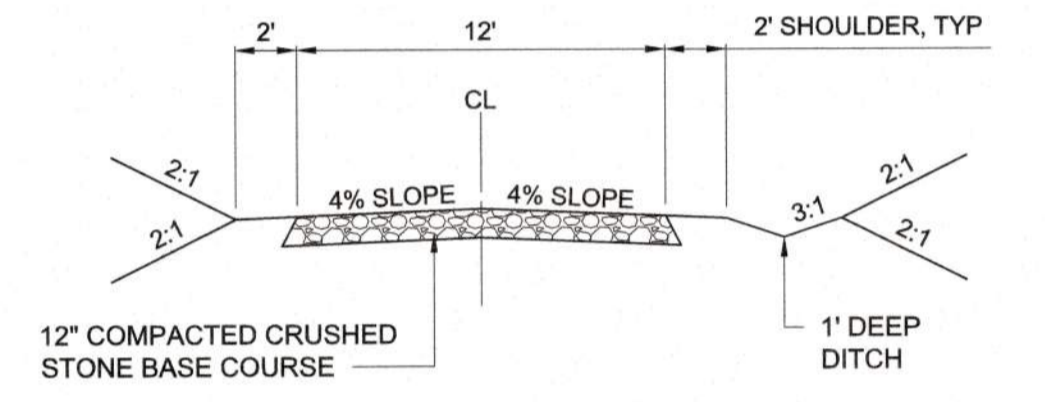
TEMPORARY CONSTRUCTION
ACCESS ROAD NO. 4 (HODGE RD)

LAYDOWN AREA NO. 3

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C216



- NOTES:**
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City of Raleigh Development Approval



REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

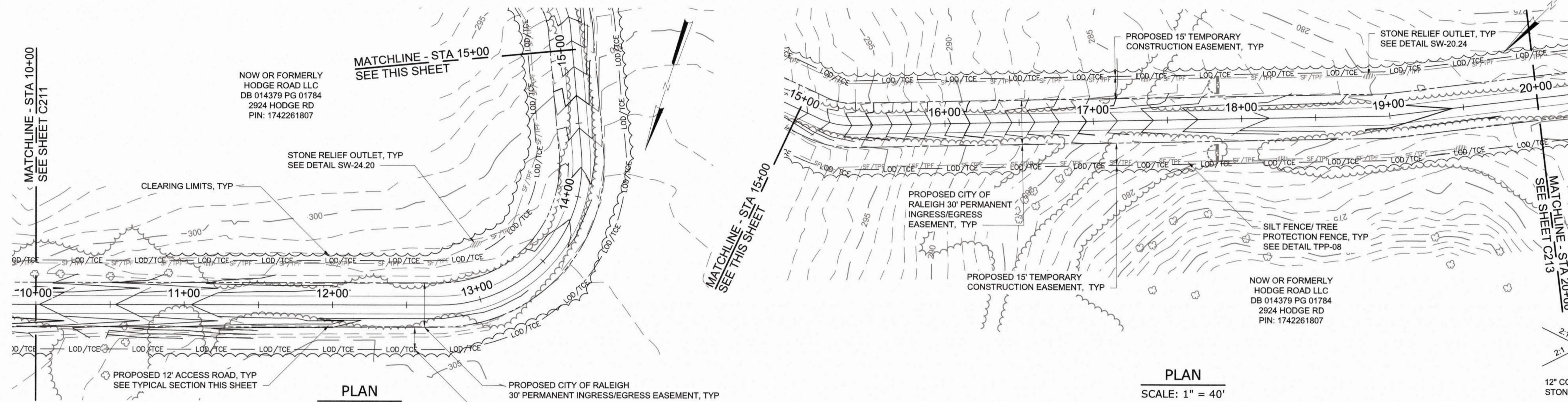
CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

PERMANENT ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 0+00 TO 10+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C211F

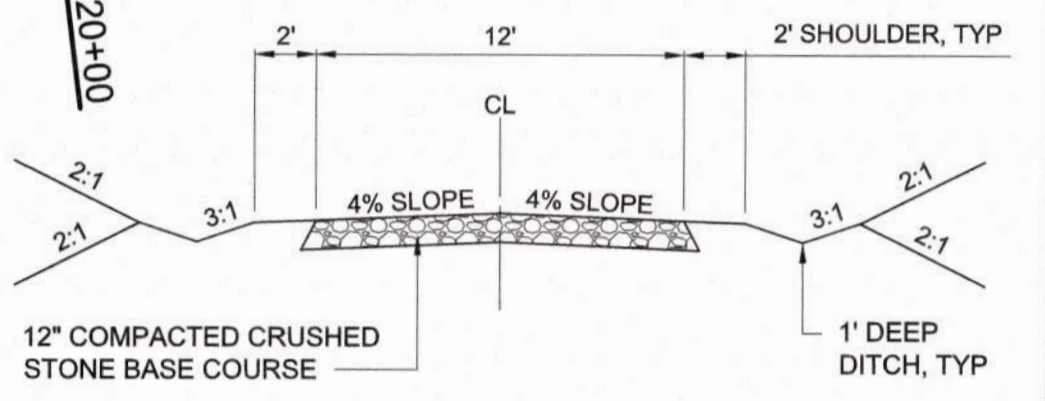
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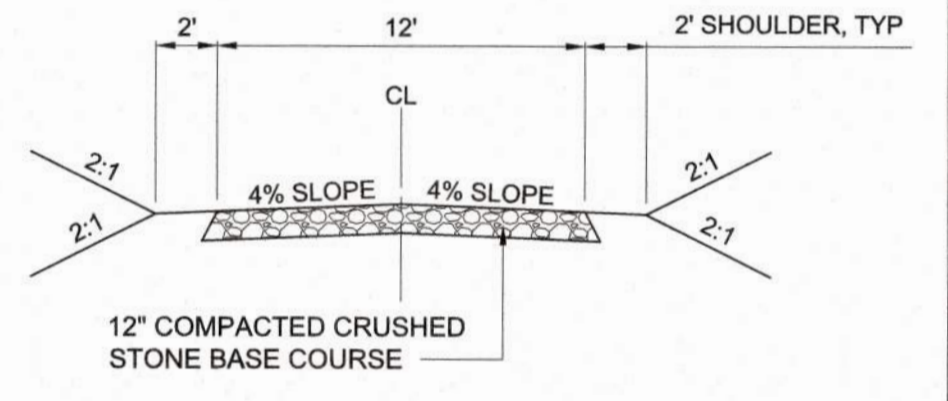
PLAN
SCALE: 1" = 40'

PLAN
SCALE: 1" = 40'

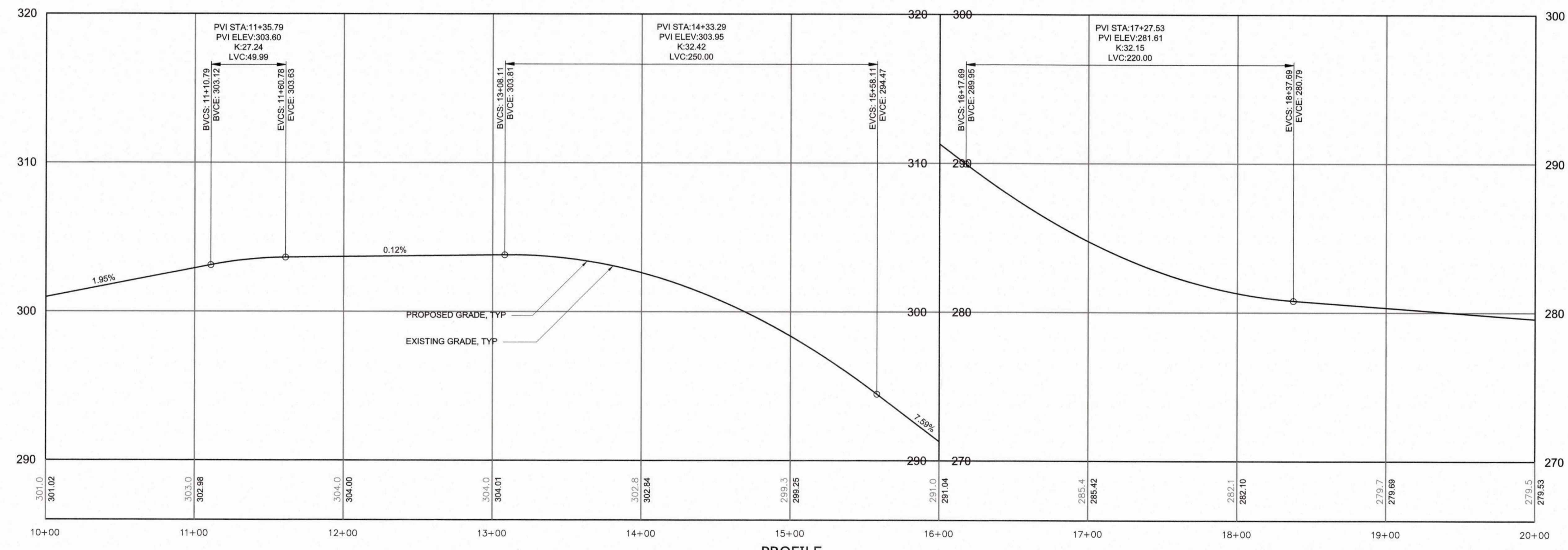
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TYPICAL CROSS SECTION
12' ACCESS ROAD
STATION 10+00 TO 12+00



TYPICAL CROSS SECTION
12' ACCESS ROAD
STATION 12+00 TO 37+50



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

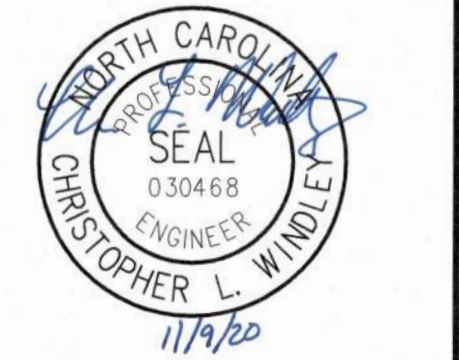
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FINAL DESIGN

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 File: C:\WORK\VALENTIN\PROJECTS\117\117_C212F.dwg
 Saved By: JOEY BAILEY
 Scale Date: 2020/11/05 9:04:45 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



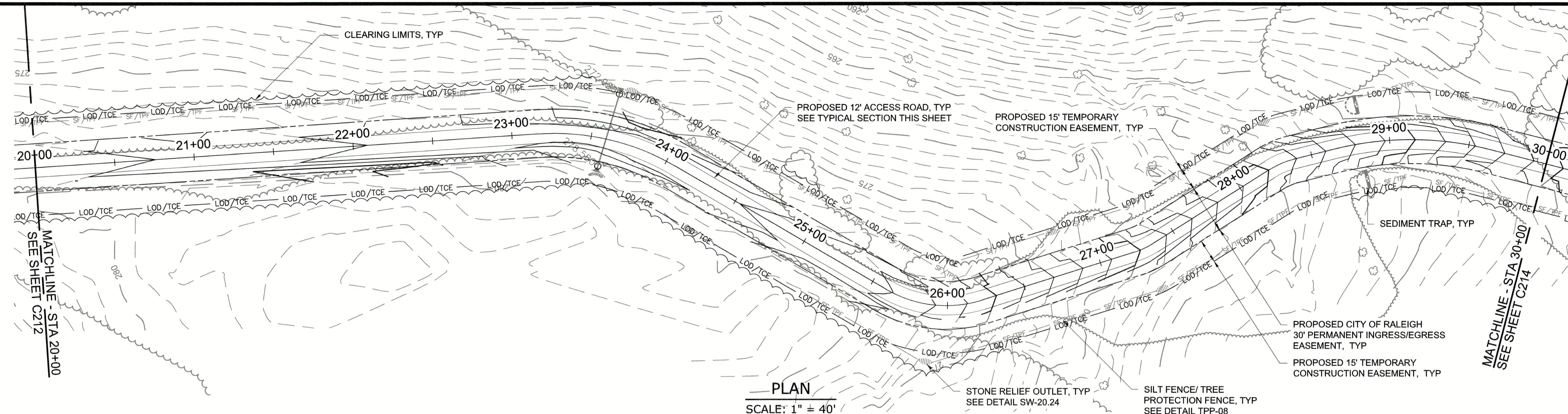
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

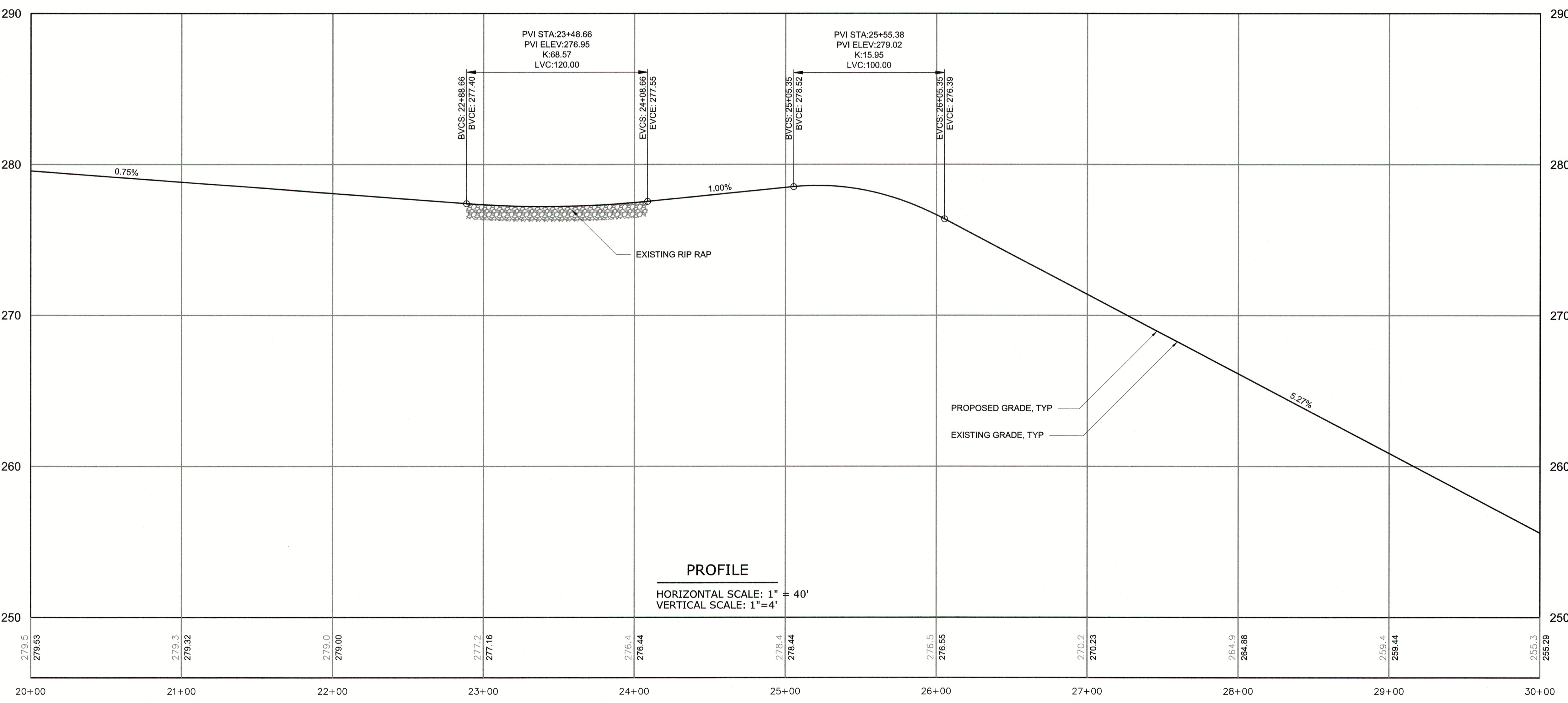
PERMANENT ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 10+00 TO 20+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C212F

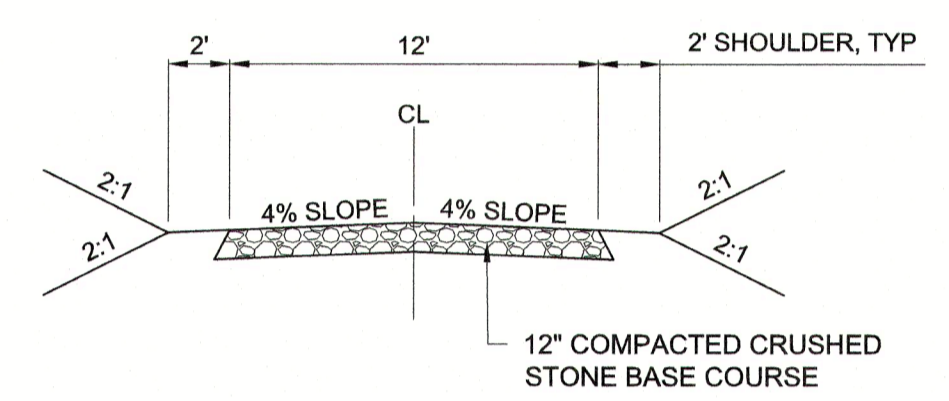


PLAN
SCALE: 1" = 40'

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



TYPICAL CROSS SECTION
12' ACCESS ROAD
STATION 12+00 TO 37+50

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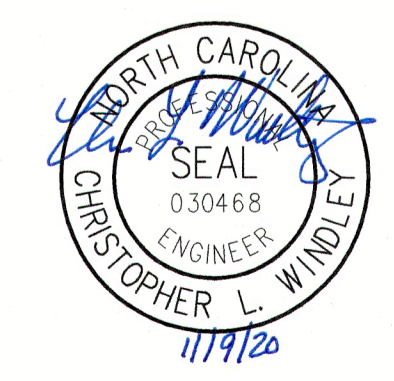


FINAL DESIGN

PLOT DATE: 2020/11/05 9:06:55 PM BY: JOEY BAILEY File: C:\WORK\HATCH\19\WMS\BRI\21313.dwg Saved By: JOEY BAILEY Date: 2020/11/05 5:11 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



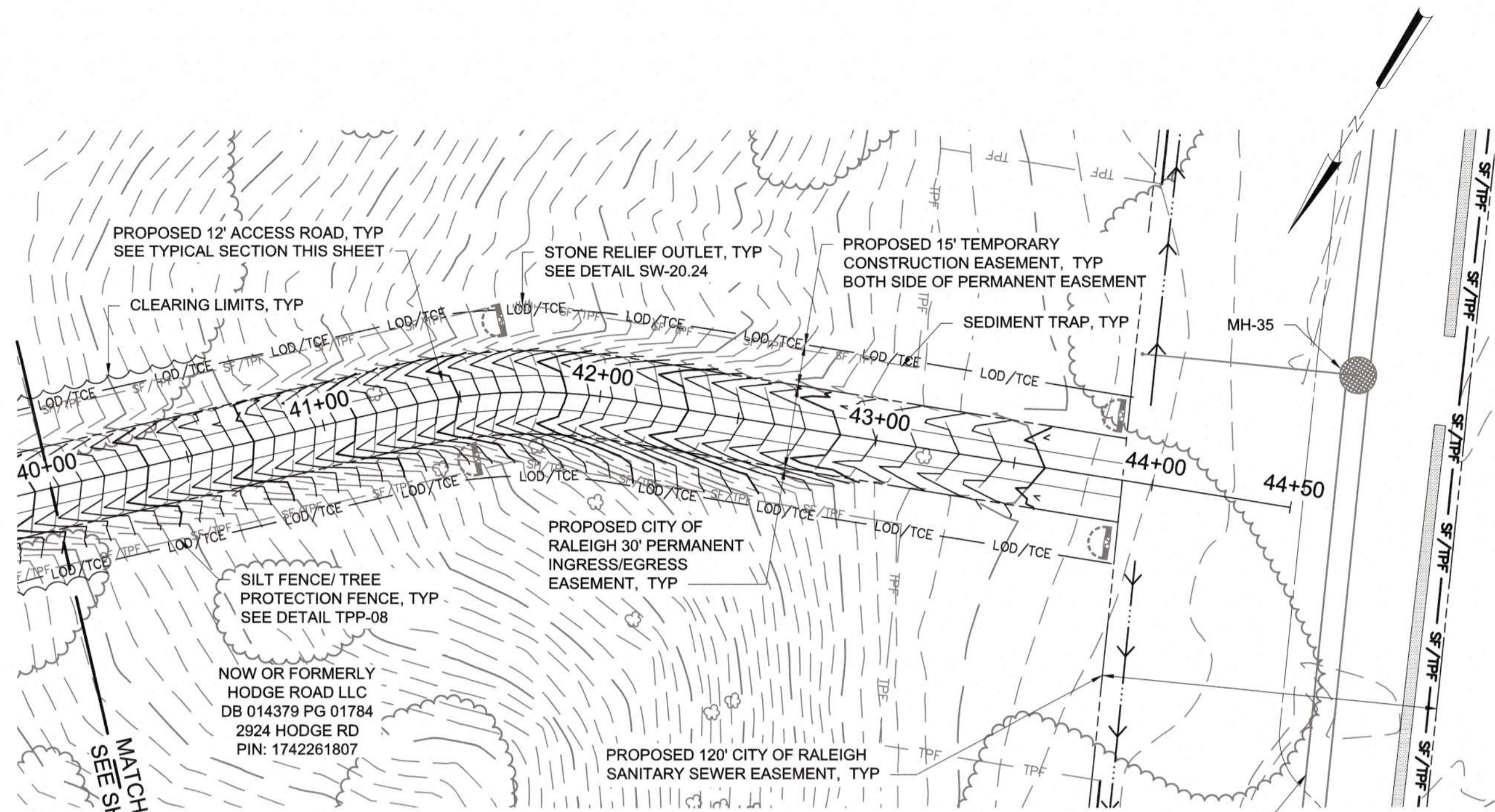
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

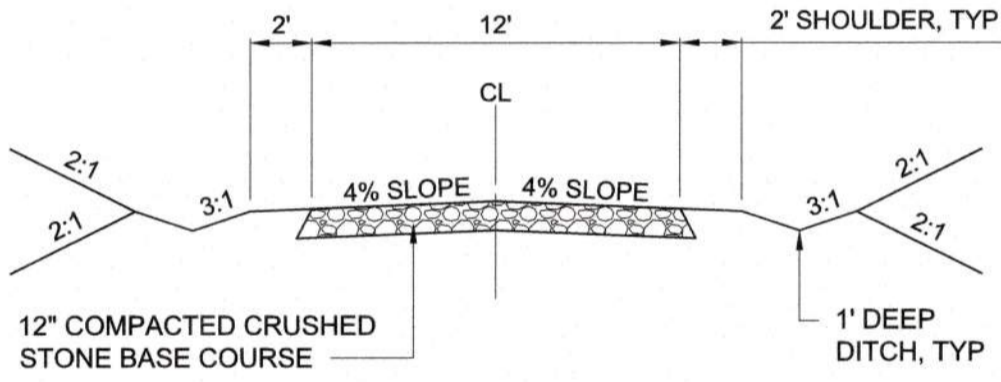
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

PERMANENT ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 20+00 TO 30+00

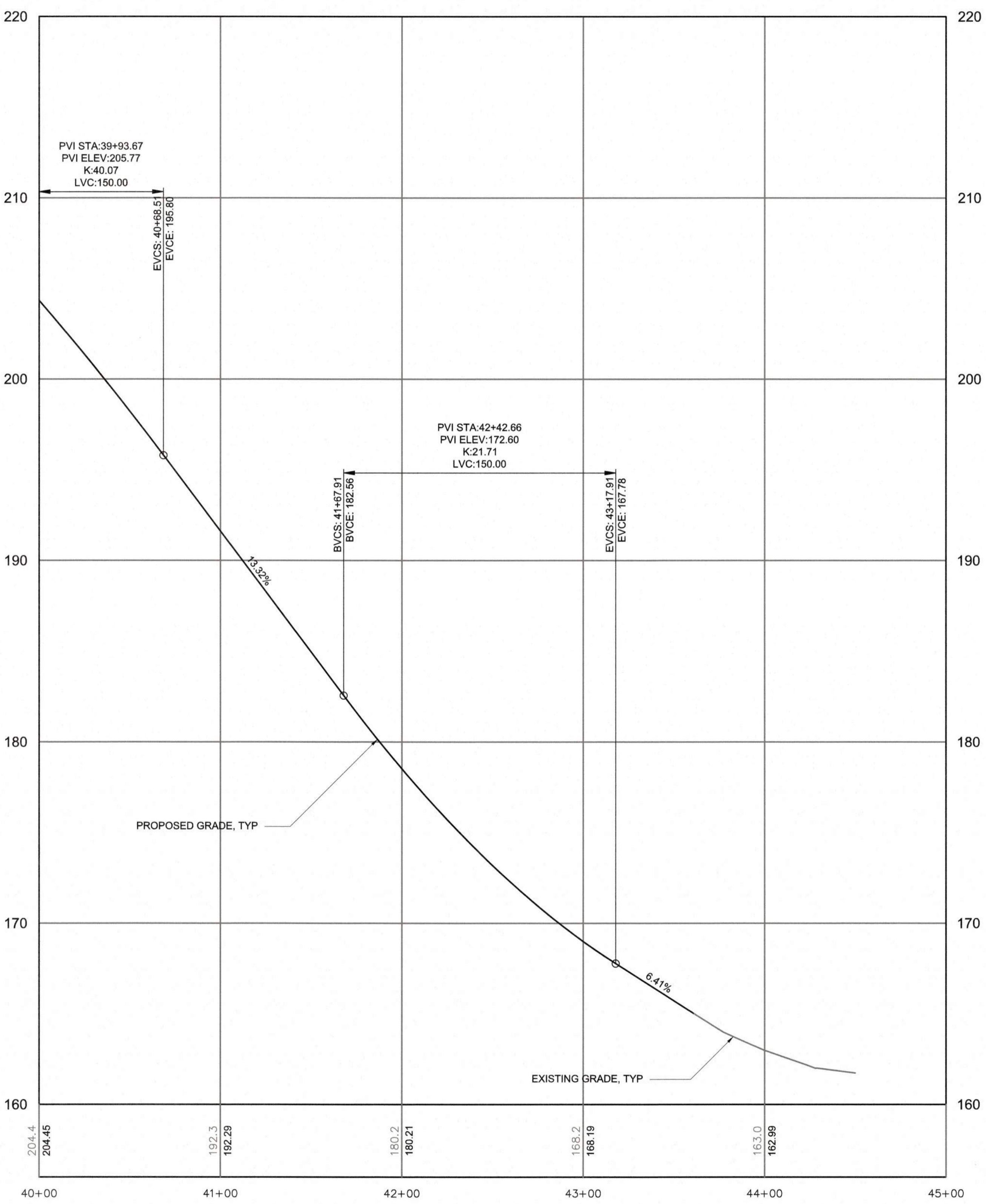
DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C213F



PLAN
SCALE: 1" = 40'



TYPICAL CROSS SECTION
12' ACCESS ROAD
STATION 37+50+00 TO 43+61



- NOTES:**
- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 4.
 - USE SYNTHETIC MATTING LINER IN DITCHES AND INSTALL A CHECK DAM AT THE OUTLET OF EACH DITCH.
 - 12" COMPACTED CRUSHED STONE BASE COURSE IN A MINIMUM SPECIFIED ROAD BASE MATERIAL AND DEPTH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SELECTION OF THE EXACT ROAD BASE STONE SIZE AND DEPTH NECESSARY TO SUPPORT THE CONTRACTOR'S VEHICULAR AND EQUIPMENT LOADS IMPOSED ON THE ACCESS ROAD. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND ANY NECESSARY REPAIRS OF THE ROAD.
 - ALL RCP STORM PIPE SHALL BE IN MINIMUM OF CLASS IV. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE COVER OR OTHER MEANS OF PROTECTION IS IN PLACE TO PREVENT EXCESSIVE LOADING OVER THE PIPE THAT COULD RESULT IN DAMAGE TO THE PIPE. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AND FOR MAINTENANCE AND NECESSARY REPAIRS OR REPLACEMENTS OF THE PIPE.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization before is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of the electronic document is only valid if the document has not been modified and the digital signature below is valid.
City of Raleigh Development Approval _____



FINAL DESIGN

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

PERMANENT ACCESS ROAD NO. 4
(HODGE RD)
PLAN AND PROFILE
STA 40+00 TO 43+61

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C215F

PLOT DATE: 2020/11/05 09:44 AM. PLOT BY: GUY BAILEY. Save Date: 2020/11/05 9:27 PM. File: C:\WORK\2020\20201105\20201105_215F.dwg

CONSTRUCTION ACCESS MUST BE MAINTAINED IN CONDITION WHICH WILL PREVENT TRACKING MUD ON TO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY. ANY MATERIAL WHICH MAKES IT INTO THE ROADWAY WILL NEED TO BE REMOVED IMMEDIATELY.

TEMP CONSTRUCTION ENTRANCE
SEE DETAIL SW-20.09

EX GRAVEL ROAD

AQUA INFLUENT PUMP STATION
(MAINTAIN ACCESS AT ALL TIMES)

SILT FENCE/TREE PROTECTION FENCE, TYP
SEE DETAIL TPP-08 (LIMITS OF DISTURBANCE)

SUPER SILT FENCE, TYP
SEE DETAIL SHEET D10

EX CULVERT

MAINTAIN ACCESS TO EX DRIVE

PROPOSED CITY OF RALEIGH 30' PERMANENT INGRESS/EGRESS EASEMENT LOD

EX MOBILE HOME, TYP

MISTY RIVER DRIVE (ASPHALT)

ACCESS ENTRANCE EXISTING ASPHALT DRIVE

PRIVATE DRIVES (DO NOT BLOCK)

CITY OF RALEIGH RIVERVIEW PUMP STATION (TO BE ABANDONED, SEE SHEET C29)

TEMPORARY CONSTRUCTION ACCESS SEE SHEET C29

STONE RELIEF OUTLET, TYP
SEE DETAIL SW-20.24

PROPOSED CITY OF RALEIGH 30' PERMANENT INGRESS/EGRESS EASEMENT LOD

EX WATER LINE

POOLE ROAD (SR 1007)

PROPOSED 8" SS
SEE SHEET C29

EX CULVERT

TEMPORARY ALTERNATE GRAVEL ACCESS ROAD

PROPOSED 96" SS, TYP
SEE SHEET C22

PROPOSED 84" SS, TYP
SEE SHEET C21
AQUA WWTP PACKAGE PLANT

PLAN

SCALE: 1" = 50'

NOTES:

- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 5.
- 12" COMPACTED CRUSHED STONE BASE COURSE IN A MINIMUM SPECIFIED ROAD BASE MATERIAL AND DEPTH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SELECTION OF THE EXACT ROAD BASE STONE SIZE AND DEPTH NECESSARY TO SUPPORT THE CONTRACTOR'S VEHICULAR AND EQUIPMENT LOADS IMPOSED ON THE ACCESS ROAD. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND ANY NECESSARY REPAIRS OF THE ROAD.
- ALL RCP STORM PIPE SHALL BE IN MINIMUM OF CLASS IV. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE COVER OR OTHER MEANS OF PROTECTION IS IN PLACE TO PREVENT EXCESSIVE LOADING OVER THE PIPE THAT COULD RESULT IN DAMAGE TO THE PIPE. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AND FOR MAINTENANCE AND NECESSARY REPAIRS OR REPLACEMENTS OF THE PIPE.
- CONTRACTOR SHALL INSTALL TEMPORARY ACCESS GRAVEL DRIVE TO PROVIDE CONTINUOUS ACCESS TO THE EXISTING AQUA PLANT DURING THE PERIOD WHEN THE EXISTING ACCESS DRIVE IS UNUSABLE. THE EXISTING ACCESS DRIVE SHALL BE RE-INSTALLED TO PRE-CONSTRUCTION CONDITION AS SOON AS POSSIBLE AND MADE AVAILABLE TO AQUA FOR USE PRIOR TO THE TEMPORARY ACCESS DRIVE BEING REMOVED.

a. Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all local requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/05 3:33 PM
 File: C:\WORK\HAZEN-PW\PROJECTS\C217 - Sheet by TANT\BAILEY - Save Date: 2020/11/05 3:33 PM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	P. SELISKER		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE			
REV	ISSUED FOR	DATE	BY



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381



320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

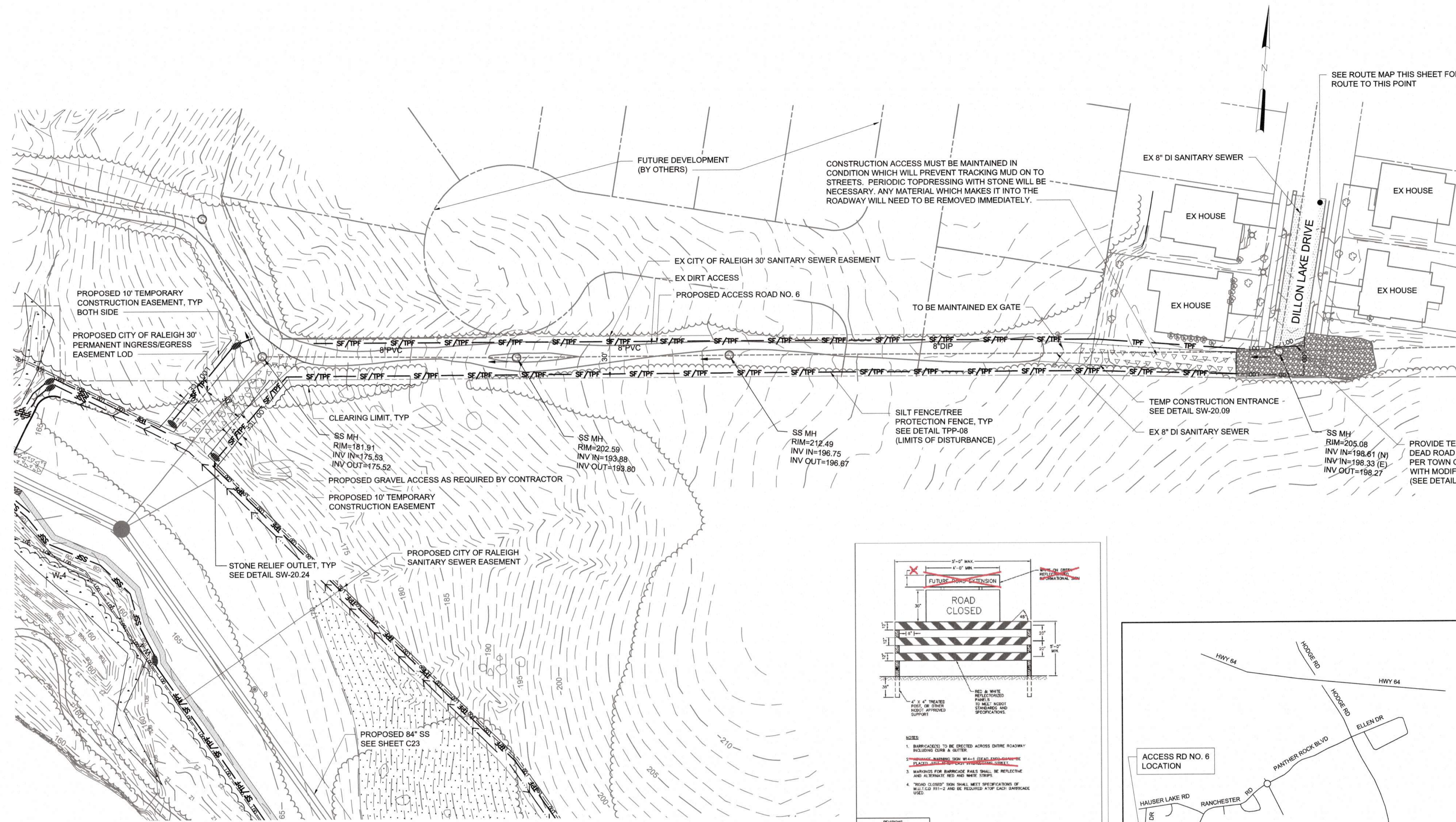
LIMITED

ACCESS ROAD NO. 5
(POOLE ROAD)

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C217

NOTES:

1. THIS ACCESS IS LIMITED TO 2-AXLE PASSENGER VEHICLES DURING CONSTRUCTION.
2. NO CONSTRUCTION VEHICLES OR OTHER HEAVY EQUIPMENT SHALL BE ALLOWED ALONG THIS ACCESS.
3. THE CONTRACTOR SHALL MAKE IMPROVEMENTS AS REQUIRED WITHIN THE EXISTING SANITARY SEWER EASEMENT TO UTILIZE ACCESS FOR ALLOWABLE USE.
4. UPON COMPLETION OF CONSTRUCTION AND/OR USE OF THIS ACCESS BY THE CONTRACTOR, THE CONTRACTOR SHALL RESTORE ACCESS TO A CONDITION USABLE BY THE CITY COMPLETE NECESSARY RESEEDING AND STABILIZATION OF DISTURBED AREA AND REMOVE EROSION CONTROL MEASURES.
5. CONTRACTOR SHALL PROTECT EXISTING SANITARY SEWER LINES AND MANHOLES AGAINST DAMAGE.



CONSTRUCTION ACCESS MUST BE MAINTAINED IN CONDITION WHICH WILL PREVENT TRACKING MUD ON TO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY. ANY MATERIAL WHICH MAKES IT INTO THE ROADWAY WILL NEED TO BE REMOVED IMMEDIATELY.

SEE ROUTE MAP THIS SHEET FOR ROUTE TO THIS POINT

EX 8" DI SANITARY SEWER

EX HOUSE

EX HOUSE

EX HOUSE

EX HOUSE

DILLON LAKE DRIVE

TEMP CONSTRUCTION ENTRANCE - SEE DETAIL SW-20.09

EX 8" DI SANITARY SEWER

SS MH RIM=205.08
INV IN=198.61 (N)
INV IN=198.33 (E)
INV OUT=198.27

PROVIDE TEMPORARY BARRICADE FOR DEAD ROAD AT END OF CONSTRUCTION PER TOWN OF KNIGHTDALE DETAIL 3.18 WITH MODIFICATIONS. (SEE DETAIL THIS SHEET)

CLEARING LIMIT, TYP

SS MH RIM=181.91
INV IN=176.53
INV OUT=175.52

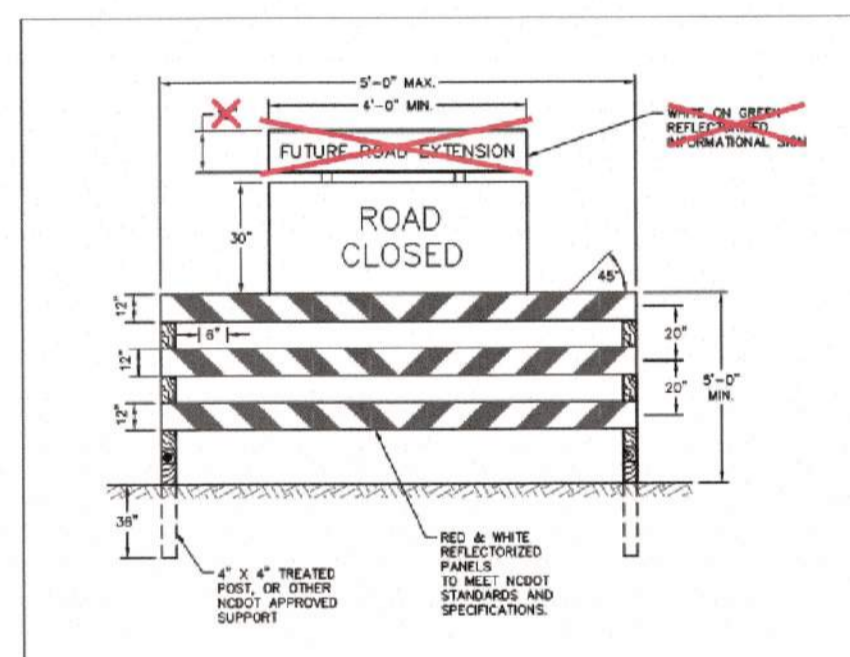
PROPOSED GRAVEL ACCESS AS REQUIRED BY CONTRACTOR

PROPOSED 10' TEMPORARY CONSTRUCTION EASEMENT

STONE RELIEF OUTLET, TYP SEE DETAIL SW-20.24

PROPOSED CITY OF RALEIGH SANITARY SEWER EASEMENT

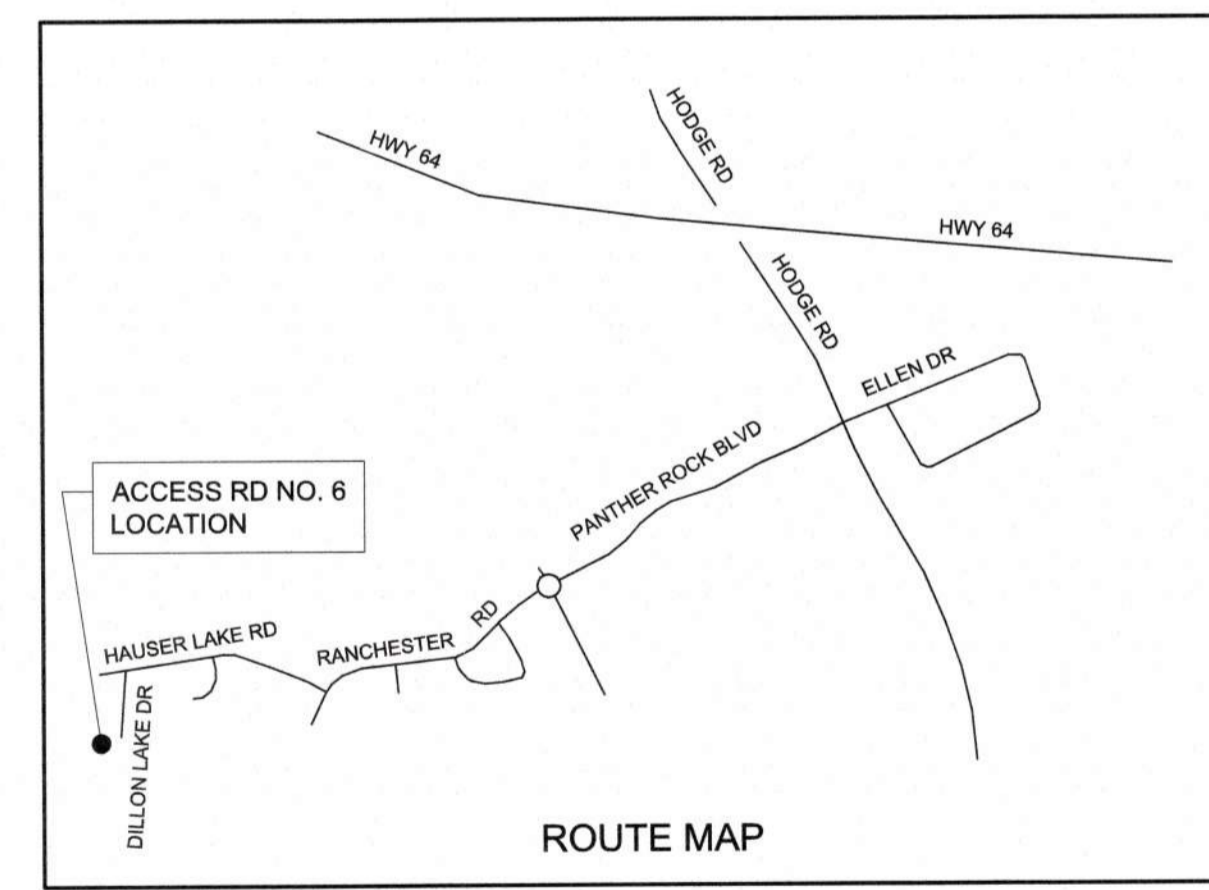
PROPOSED 84" SS SEE SHEET C23



- NOTES:**
1. BARRICADES TO BE SET ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
 2. BARRICADE MARKING SIGN W-1-1 (SEE DETAIL SW-20.09) TO BE SET AT 10' SPACING ALONG BARRICADE.
 3. MARKINGS FOR BARRICADE PILES SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
 4. ROAD TO BE OPEN SHALL MEET SPECIFICATIONS OF M.U.C.D. 101-2 AND BE REQUIRED AT TOP EACH BARRICADE USED.

REVISION	DATE	DESCRIPTION	STD. NO.
TOWN OF KNIGHTDALE STANDARD DETAILS		TEMPORARY BARRICADE FOR DEAD END ROADS	3.18

PLAN
SCALE: 1" = 40'



Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: _____ Date: _____
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultant, and contractor are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.

City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/09 9:38:40 PM BY: AJEY BAILEY File: C:\BAY\HAZEN\PROJECTS\RALEIGH\C218_Saved By: AJEY BAILEY.dwg Scale: 2020/11/09 5:35 PM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	P. SELISKER		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"		
REV	ISSUED FOR	DATE	BY



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC

320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

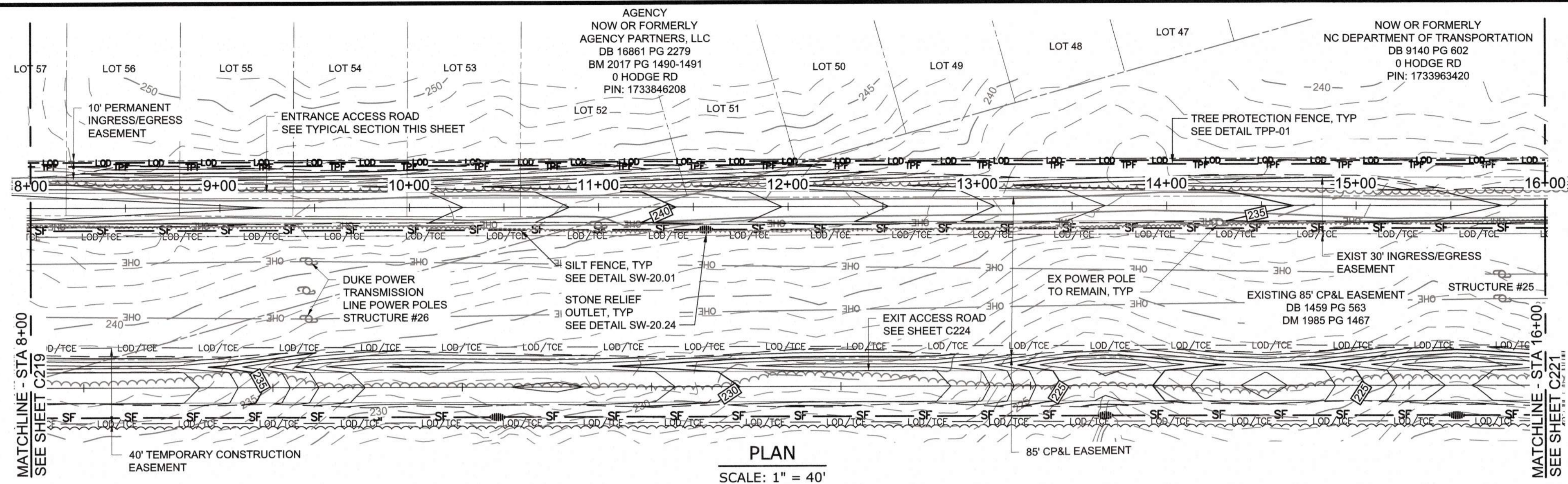
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

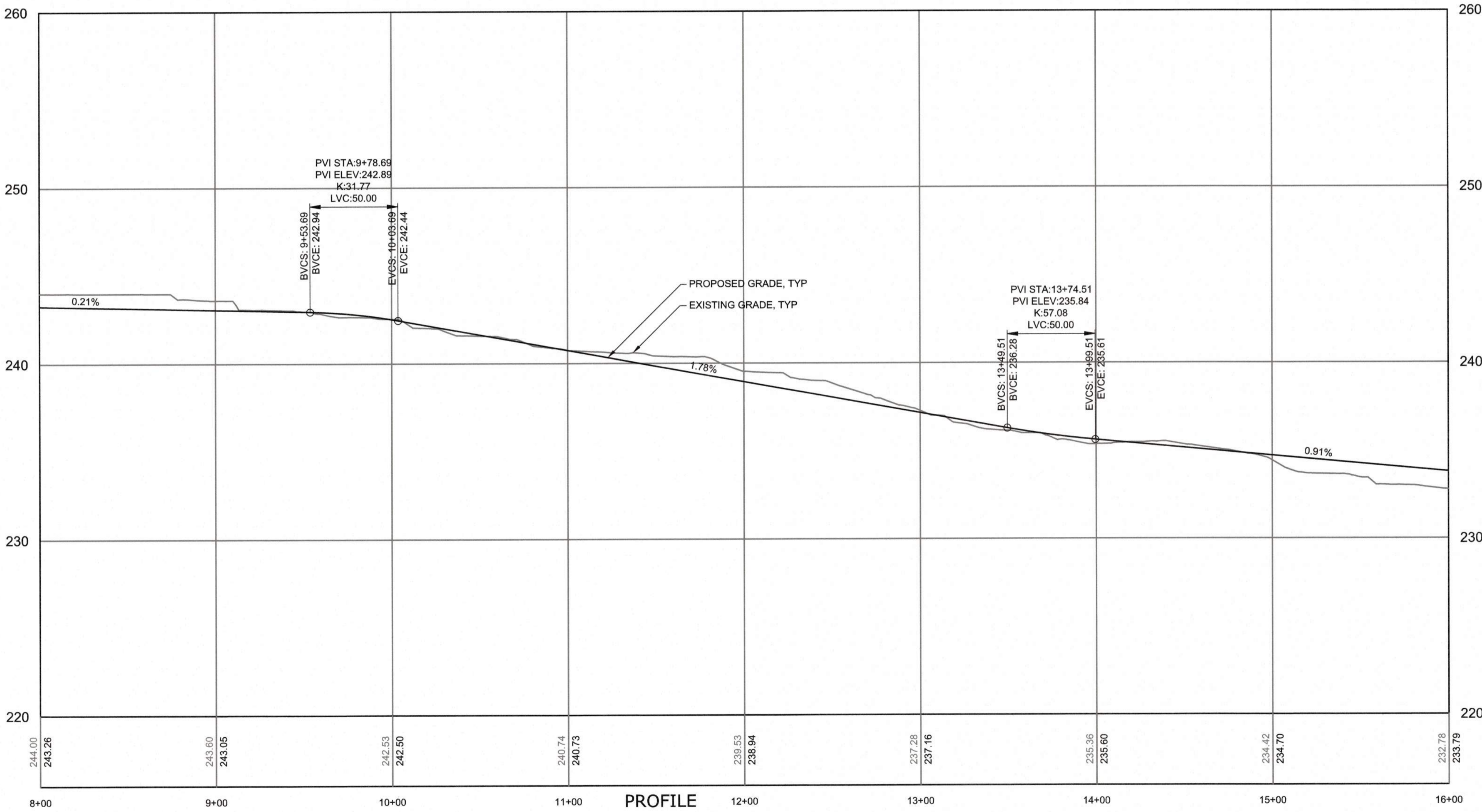
LIMITED

ACCESS ROAD NO. 6
(DILLON LAKE DRIVE)

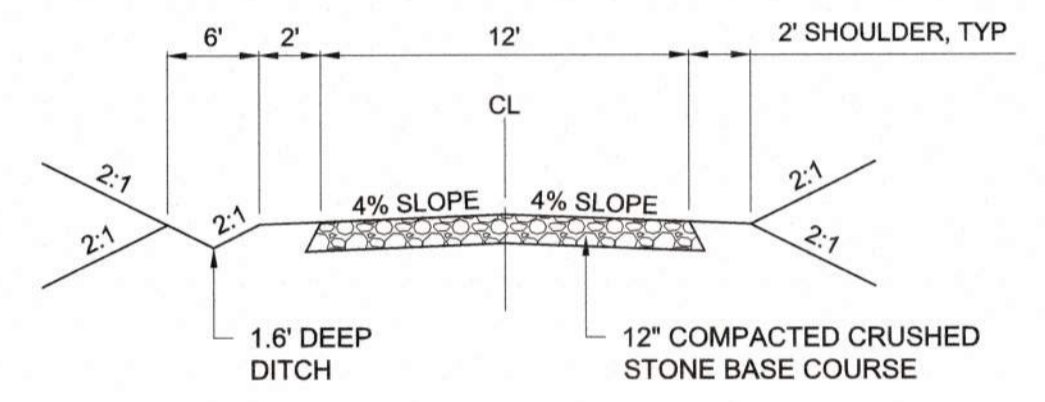
DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C218



PLAN
SCALE: 1" = 40'



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



TYPICAL CROSS SECTION
12' ACCESS ROAD

a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it confirms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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City of Raleigh Development Approval _____



**BEFORE YOU DIG!
CONTACT ONE-CALL CENTER
CALL 811
OR
1-800-632-4949**

FINAL DESIGN

PLOT DATE: 2020/11/20 9:48:25 PM BY: JET BAILEY
C:\projects\11-20-2020\11-20-2020\11-20-2020.dwg Scale Date: 2020/11/20 9:43 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"
REV	ISSUED FOR
	DATE
	BY



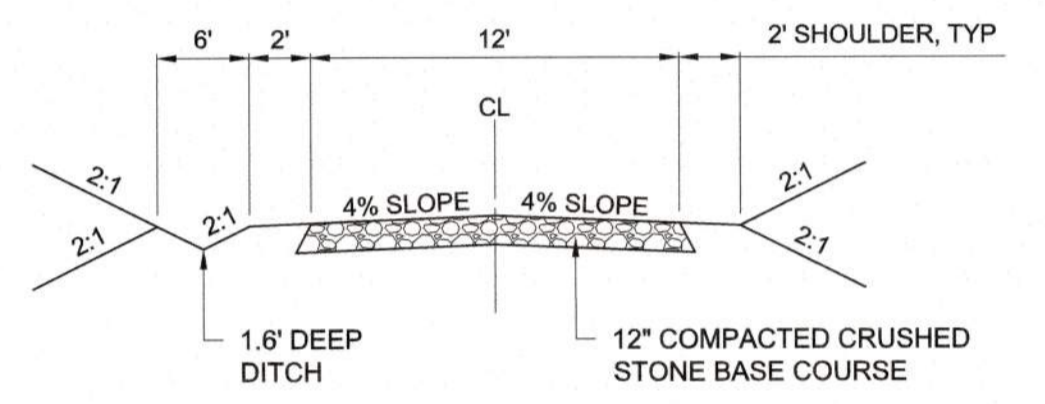
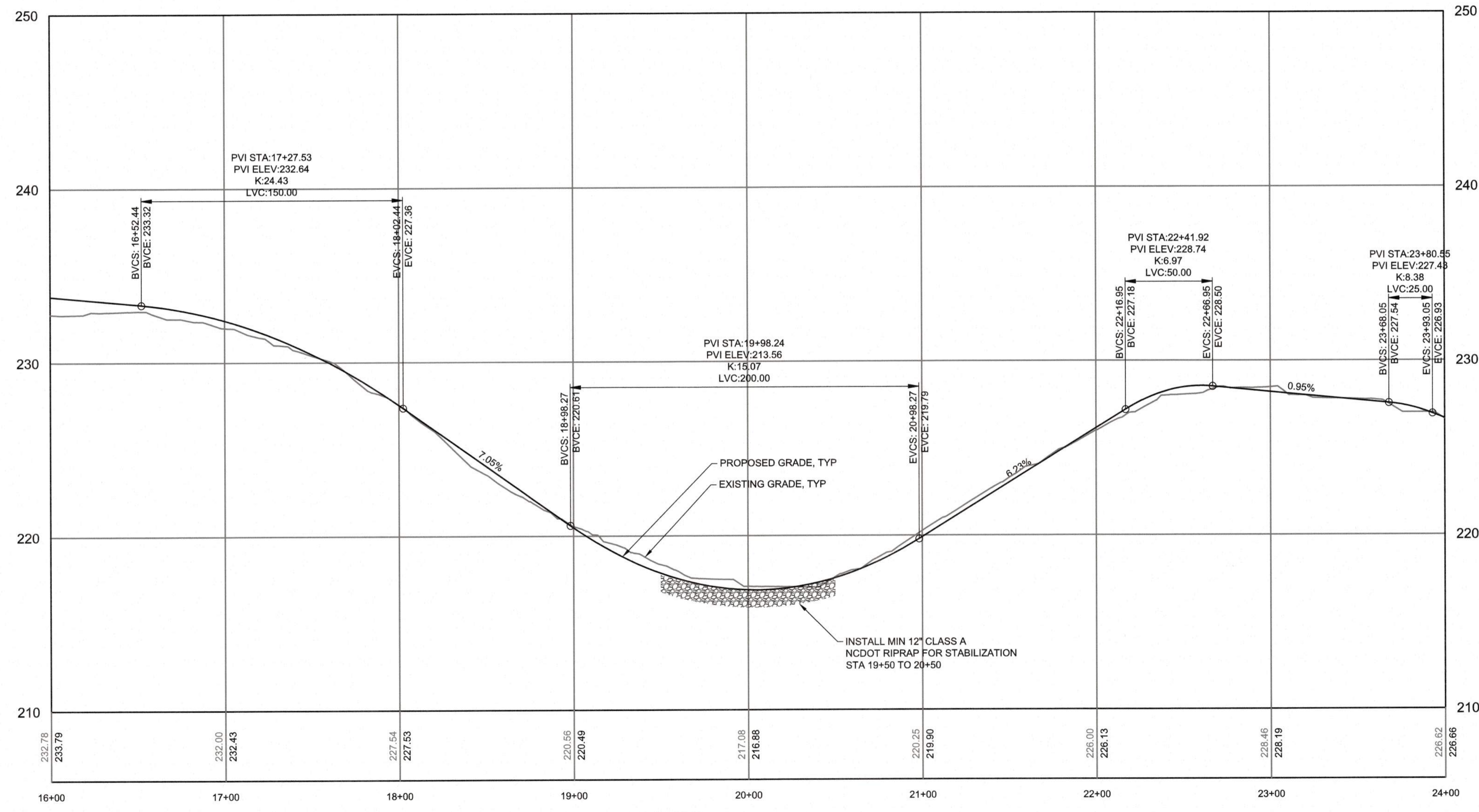
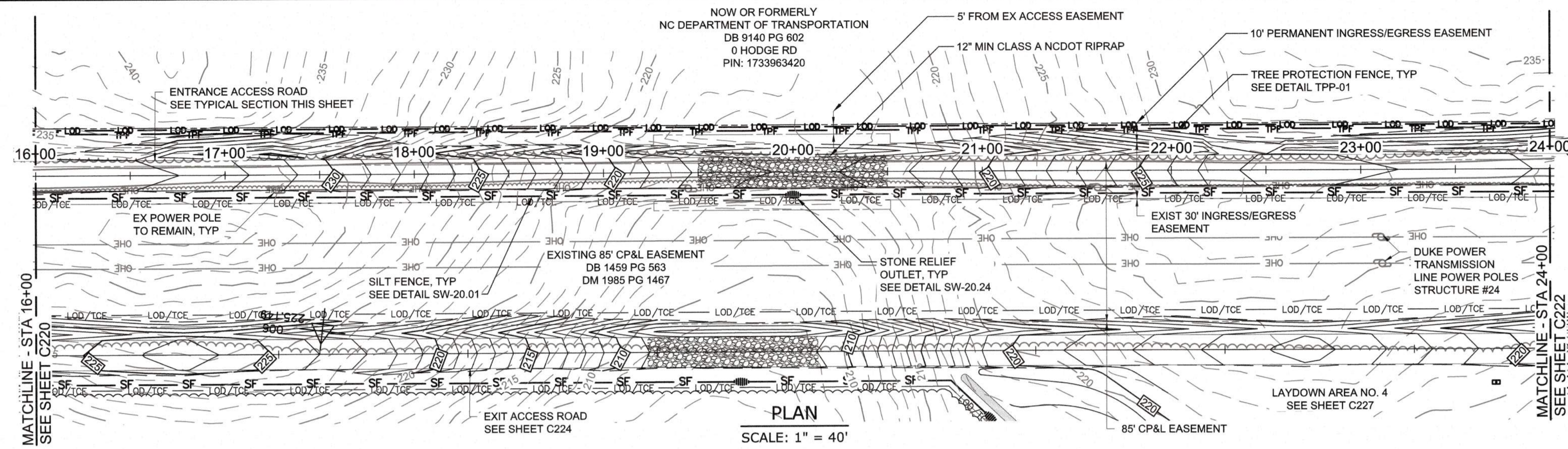
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
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320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS ENTRANCE ROAD NO. 7
(HODGE RD)
STATION 8+00 TO 16+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C220



TYPICAL CROSS SECTION
12' ACCESS ROAD

a. Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/26 9:53:15 PM BY: JET BAILEY
FILE: C:\Users\jbailey\OneDrive\Documents\C221 - Storm Drain Access Road.dwg Scale Date: 2020/11/26 4:48 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



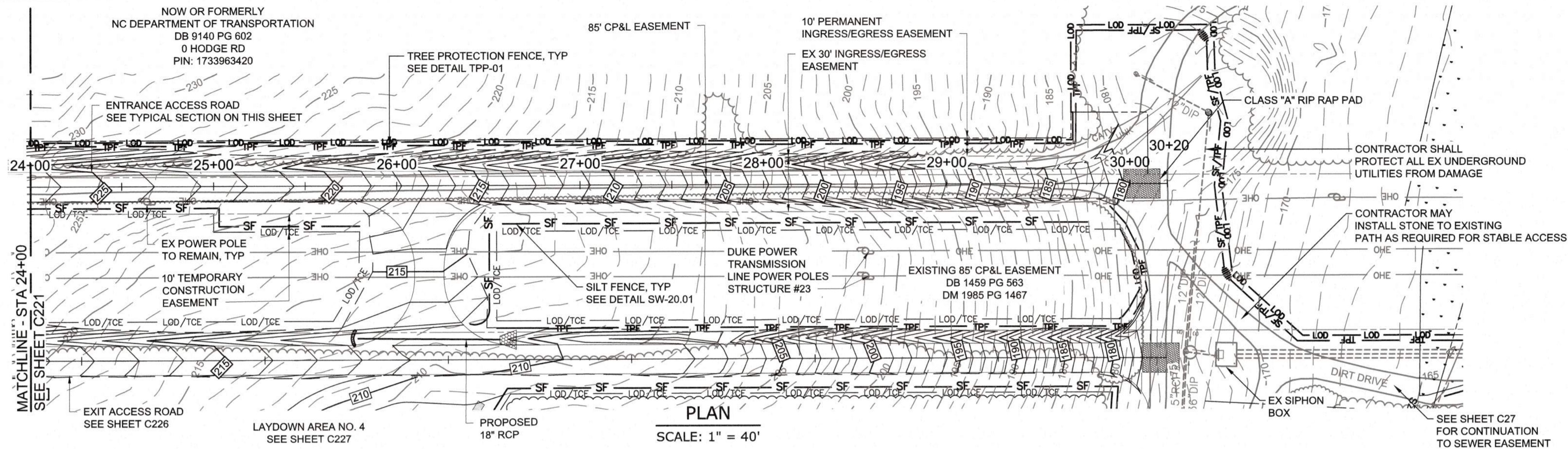
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

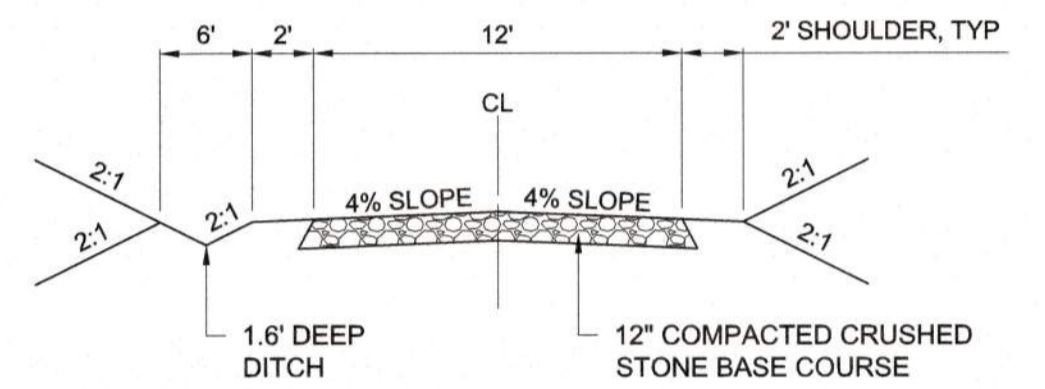
TEMPORARY CONSTRUCTION
ACCESS ENTRANCE ROAD NO. 7
(HODGE RD)
STATION 16+00 TO 24+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C221

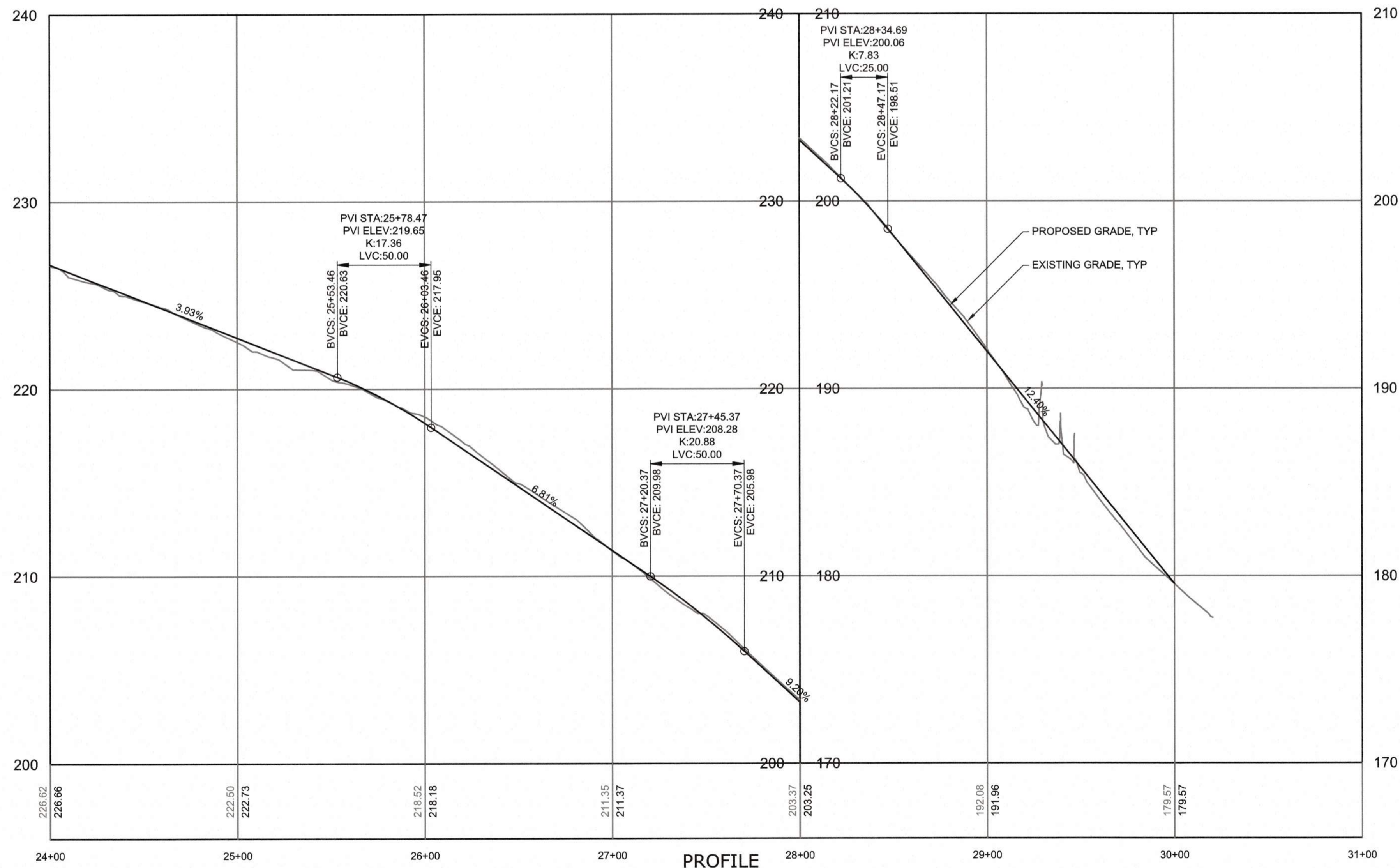


NOTES:

- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 7.
- LINE THE NORTHERN ACCESS ROAD (ENTRANCE) DITCHES WITH UNVEGETATED TURF REINFORCING MAT (TRM) AND THE SOUTHERN ACCESS ROAD (EXIT) DITCHES WITH SYNTHETIC MATTING (SM) AND INSTALL A CHECK DAM AT THE OUTLET OF EACH DITCH.
- 12" COMPACTED CRUSHED STONE BASE COURSE IN A MINIMUM SPECIFIED ROAD BASE MATERIAL AND DEPTH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SELECTION OF THE EXACT ROAD BASE STONE SIZE AND DEPTH NECESSARY TO SUPPORT THE CONTRACTOR'S VEHICULAR AND EQUIPMENT LOADS IMPOSED ON THE ACCESS ROAD. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND ANY NECESSARY REPAIRS OF THE ROAD.
- ALL RCP STORM PIPE SHALL BE IN MINIMUM OF CLASS IV. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE COVER OR OTHER MEANS OF PROTECTION IS IN PLACE TO PREVENT EXCESSIVE LOADING OVER THE PIPE THAT COULD RESULT IN DAMAGE TO THE PIPE. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AND FOR MAINTENANCE AND NECESSARY REPAIRS OR REPLACEMENTS OF THE PIPE.
- CONTRACTOR SHALL RETURN EXISTING ROAD AND CONNECTORS (THAT CONNECT ENTRANCE AND EXIT ROADS) TO PREVIOUS/PRE-CONSTRUCTION GRADE



**TYPICAL CROSS SECTION
12' ACCESS ROAD**



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

a. Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: _____ Date: _____
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: _____ Date: _____
Administrator

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City of Raleigh Development Approved _____



FINAL DESIGN

PLOT DATE: 2020/11/05 5:54 PM
 File: C:\MSW\RAZH\RA\04518167\C222_Synch.dwg
 User: J. BAILEY
 Date: 2020/11/05 5:54 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC

320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

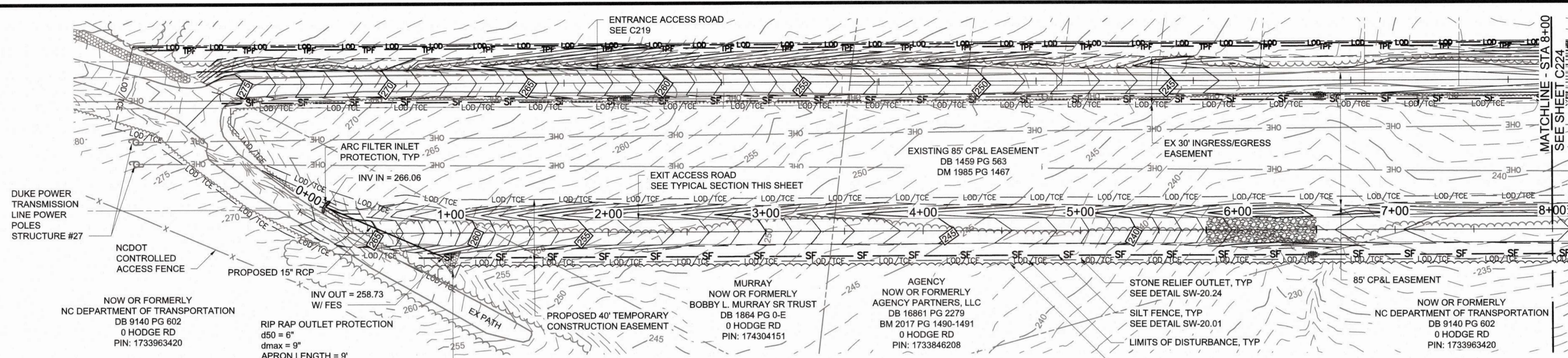
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

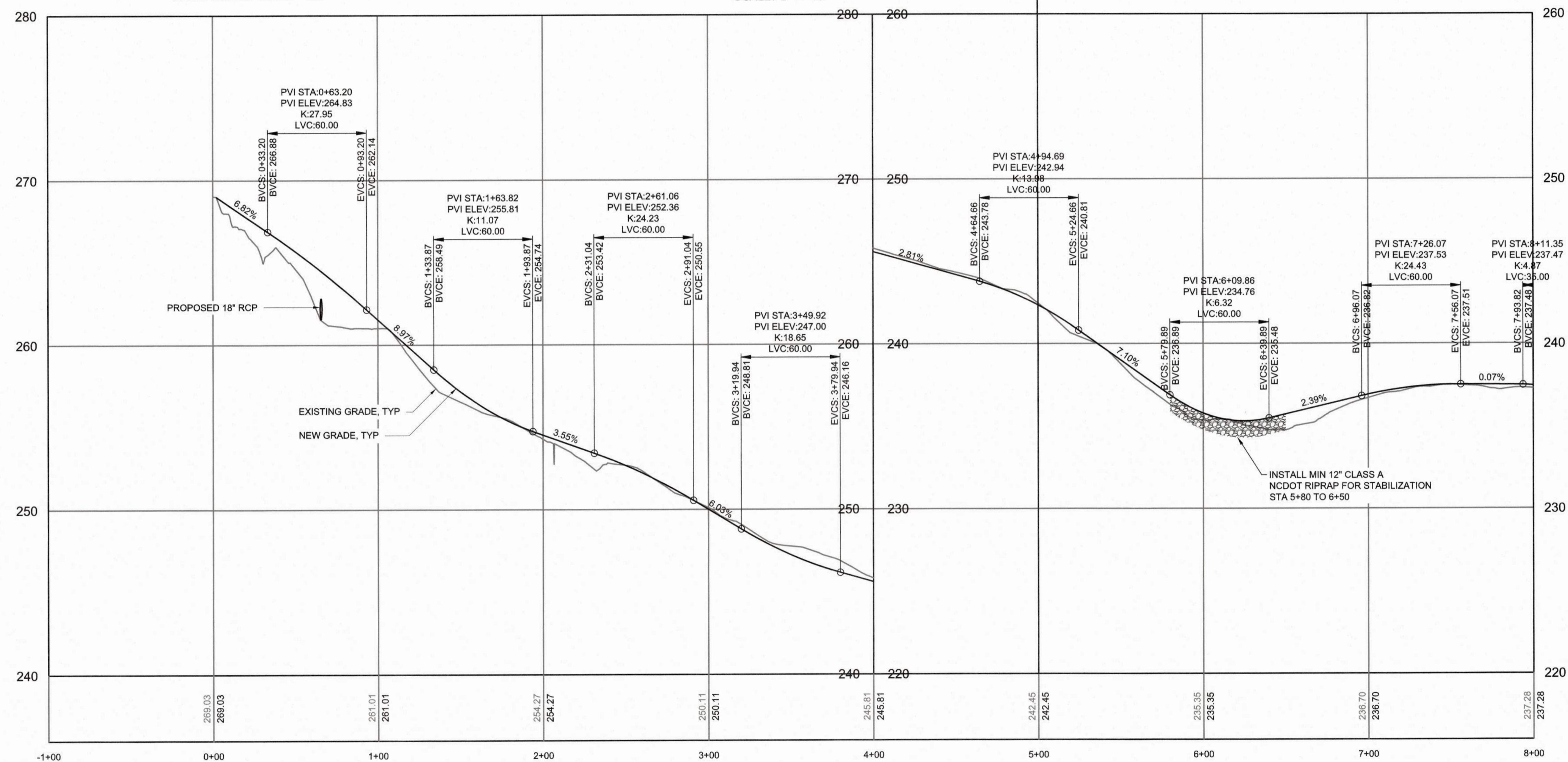
TEMPORARY CONSTRUCTION
ACCESS ENTRANCE ROAD NO. 7
(HODGE RD)

STATION 24+00 TO 30+20

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C222



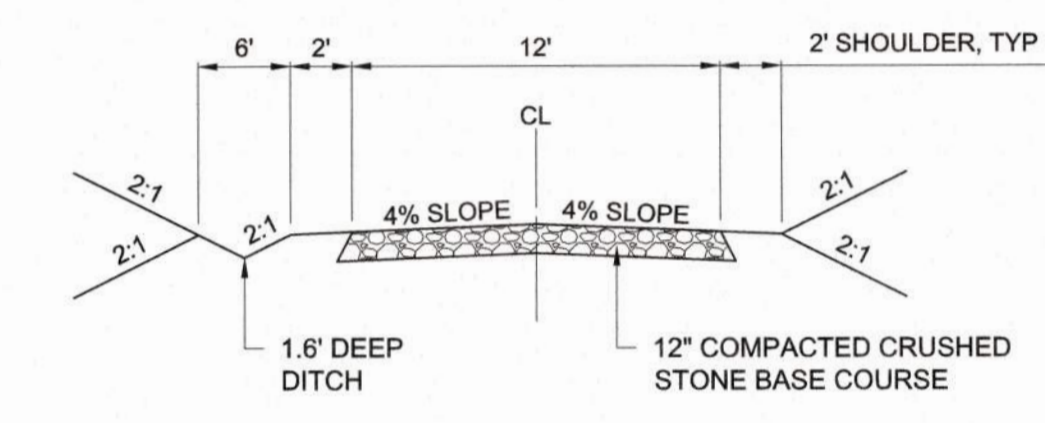
PLAN
SCALE: 1" = 40'



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

NOTES:

- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 7.
- LINE THE NORTHERN ACCESS ROAD (ENTRANCE) DITCHES WITH UNVEGETATED TURF REINFORCING MAT (TRM) AND THE SOUTHERN ACCESS ROAD (EXIT) DITCHES WITH SYNTHETIC MATTING (SM) AND INSTALL A CHECK DAM AT THE OUTLET OF EACH DITCH.
- 12" COMPACTED CRUSHED STONE BASE COURSE IN A MINIMUM SPECIFIED ROAD BASE MATERIAL AND DEPTH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SELECTION OF THE EXACT ROAD BASE STONE SIZE AND DEPTH NECESSARY TO SUPPORT THE CONTRACTOR'S VEHICULAR AND EQUIPMENT LOADS IMPOSED ON THE ACCESS ROAD. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND ANY NECESSARY REPAIRS OF THE ROAD.
- ALL RCP STORM PIPE SHALL BE IN MINIMUM OF CLASS IV. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE COVER OR OTHER MEANS OF PROTECTION IS IN PLACE TO PREVENT EXCESSIVE LOADING OVER THE PIPE THAT COULD RESULT IN DAMAGE TO THE PIPE. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AND FOR MAINTENANCE AND NECESSARY REPAIRS OR REPLACEMENTS OF THE PIPE.
- CONTRACTOR SHALL RETURN EXISTING ROAD AND CONNECTORS (THAT CONNECT ENTRANCE AND EXIT ROADS) TO PREVIOUS/PRE-CONSTRUCTION GRADE



TYPICAL CROSS SECTION
12' ACCESS ROAD

a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/06 10:03:01 PM BY: JET BAILEY
C:\Users\jet\OneDrive\Documents\C224 - Station 0+00 to 8+00.dwg Date: 2020/11/05 5:49 PM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	E. NG		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"		
REV	ISSUED FOR	DATE	BY



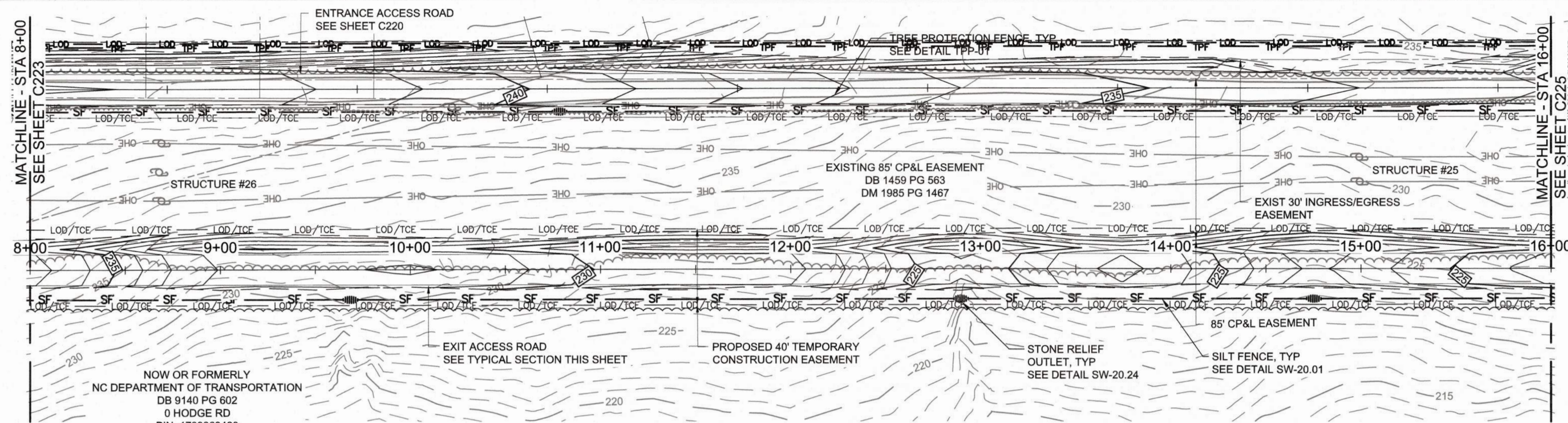
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

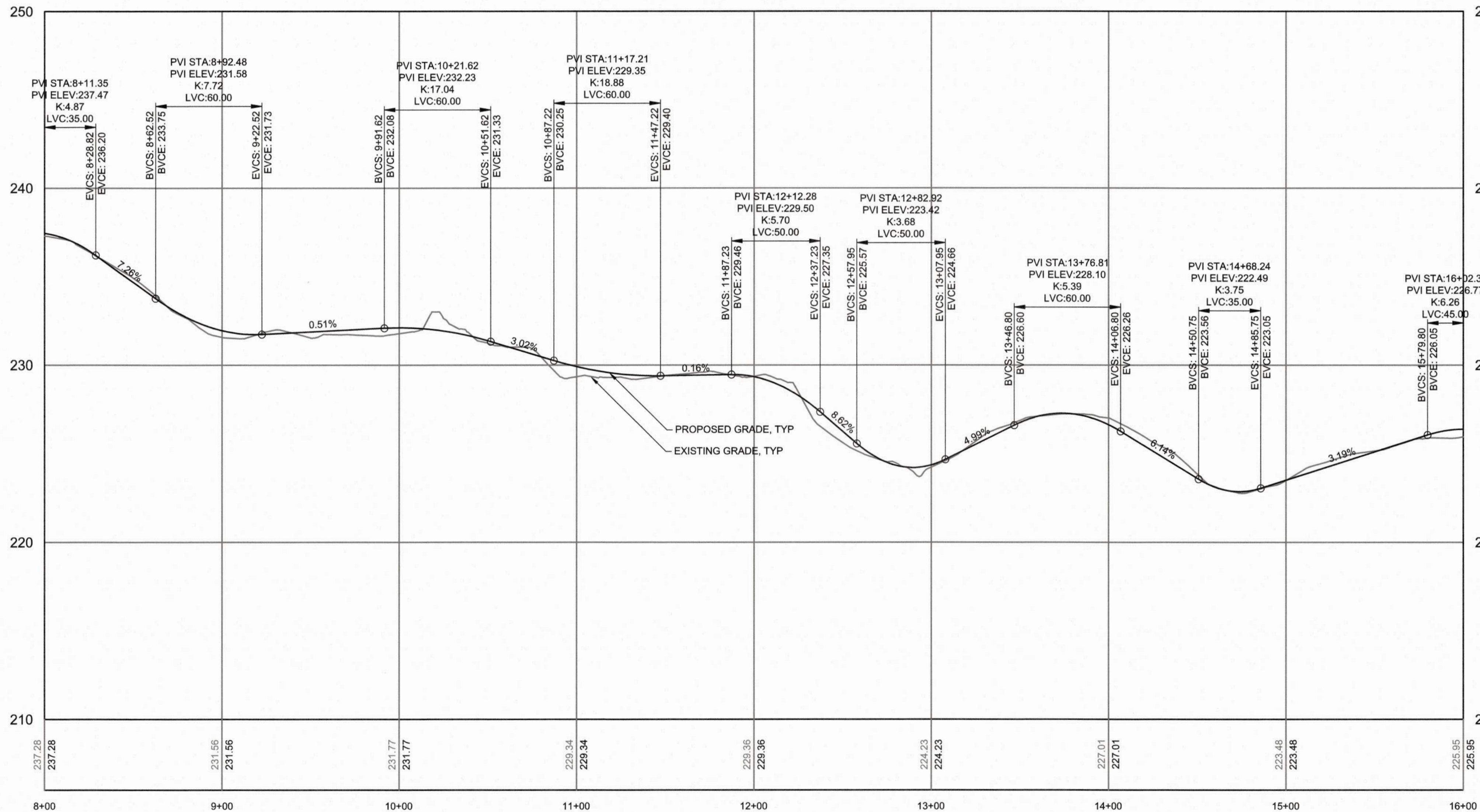
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS EXIT ROAD NO. 7
(HODGE RD)
STATION 0+00 TO 8+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C223



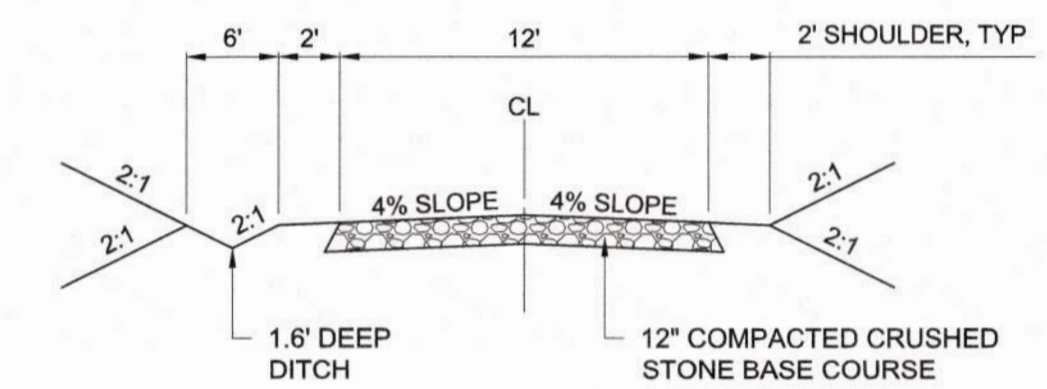
PLAN
SCALE: 1" = 40'



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

NOTES:

- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 7.
- LINE THE NORTHERN ACCESS ROAD (ENTRANCE) DITCHES WITH UNVEGETATED TURF REINFORCING MAT (TRM) AND THE SOUTHERN ACCESS ROAD (EXIT) DITCHES WITH SYNTHETIC MATTING (SM) AND INSTALL A CHECK DAM AT THE OUTLET OF EACH DITCH.
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- ALL RCP STORM PIPE SHALL BE IN MINIMUM OF CLASS IV. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE COVER OR OTHER MEANS OF PROTECTION IS IN PLACE TO PREVENT EXCESSIVE LOADING OVER THE PIPE THAT COULD RESULT IN DAMAGE TO THE PIPE. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE PIPE AND FOR MAINTENANCE AND NECESSARY REPAIRS OR REPLACEMENTS OF THE PIPE.
- CONTRACTOR SHALL RETURN EXISTING ROAD AND CONNECTORS (THAT CONNECT ENTRANCE AND EXIT ROADS) TO PREVIOUS/PRE-CONSTRUCTION GRADE



TYPICAL CROSS SECTION
12' ACCESS ROAD

a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
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By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/06 10:07:54 PM BY: JCEY BAILEY
FILE: C:\WORK\2020\11\06\10\07\54\1106100754.DWG Scale: 2020/11/05 8:03 PM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	E. NG		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE			
REV	ISSUED FOR	DATE	BY



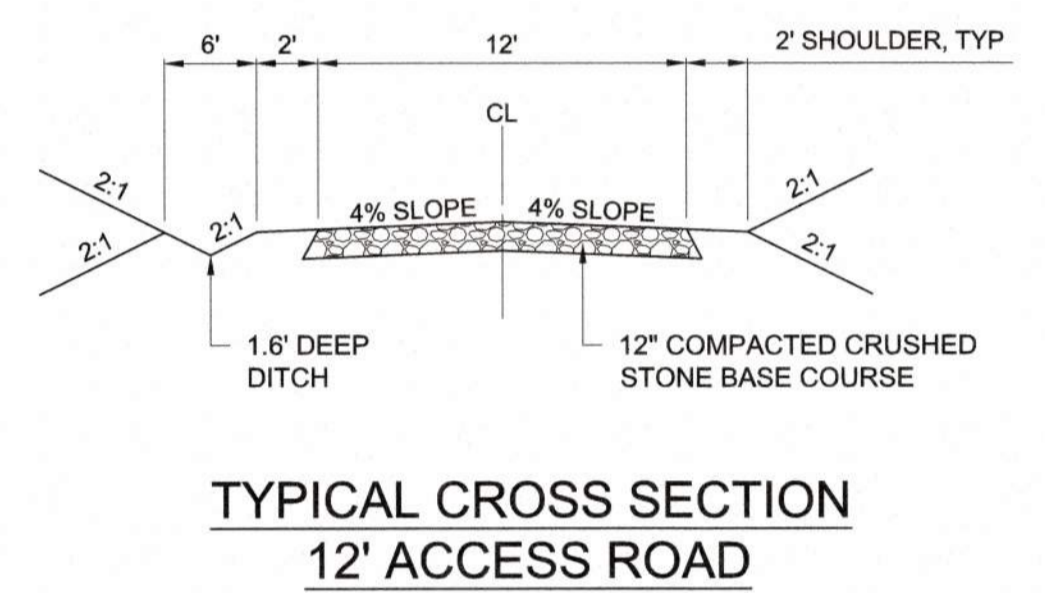
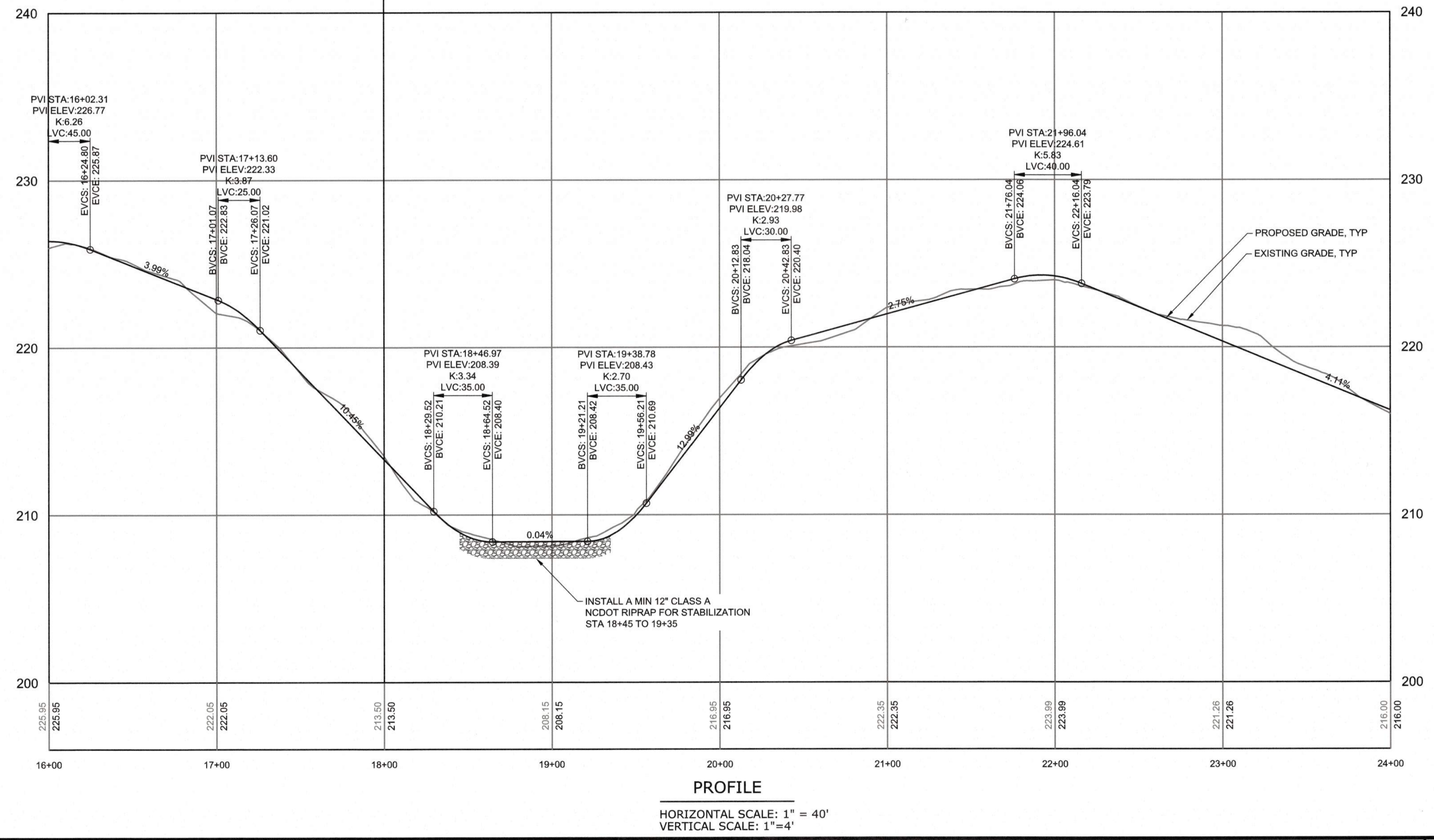
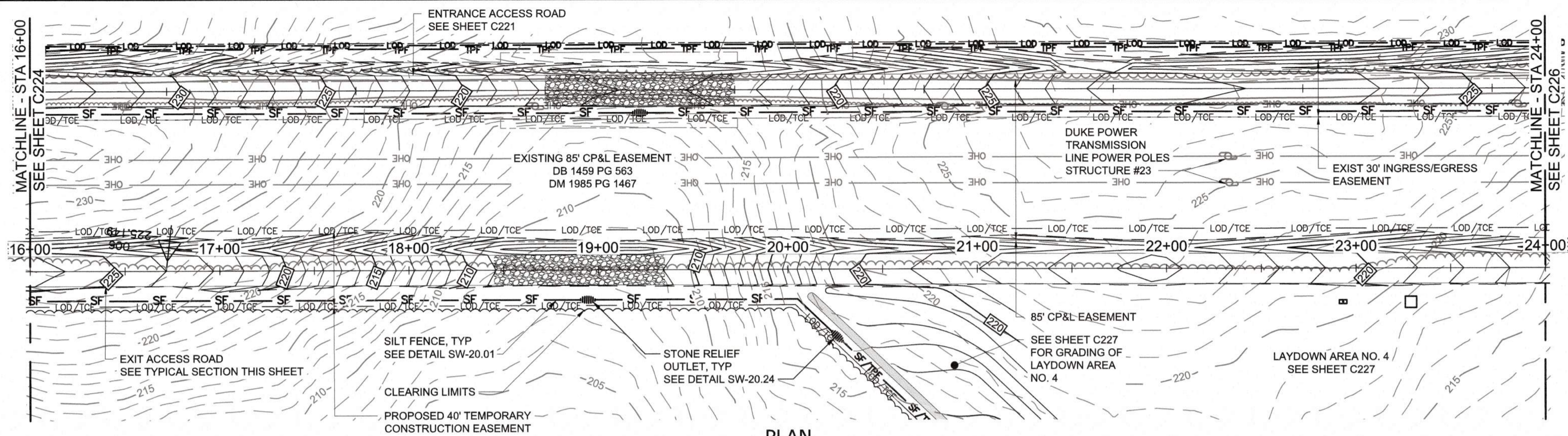
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS EXIT ROAD NO. 7
(HODGE RD)
STATION 8+00 TO 16+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C224



- NOTES:
- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 7.
 - LINE THE NORTHERN ACCESS ROAD (ENTRANCE) DITCHES WITH UNVEGETATED TURF REINFORCING MAT (TRM) AND THE SOUTHERN ACCESS ROAD (EXIT) DITCHES WITH SYNTHETIC MATTING (SM) AND INSTALL A CHECK DAM AT THE OUTLET OF EACH DITCH.
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By: _____ Date: _____
Town Engineer

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City of Raleigh Development Approval _____



FINAL DESIGN

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC

320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS EXIT ROAD NO. 7
(HODGE RD)

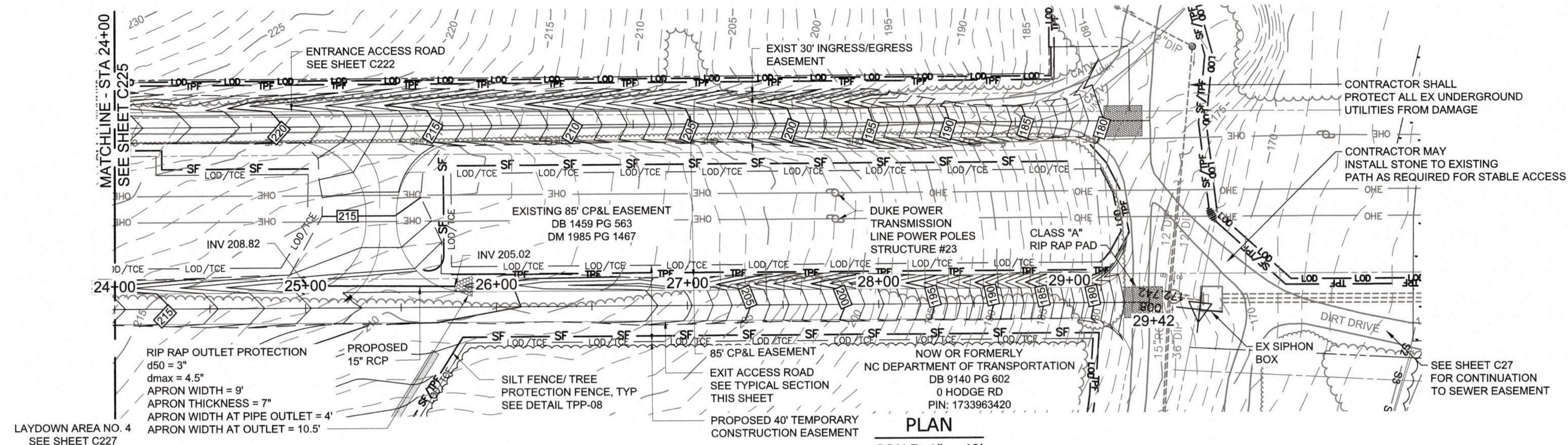
STATION 16+00 TO 24+00

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C225

PLOT DATE: 2020/11/05 08:56:56 PM, Plt: JEFF BAILEY, File: C:\WORK\2020\2020\11\05\08\56\56\225_Saved By JEFF BAILEY, Save Date: 2020/11/05 8:05 PM

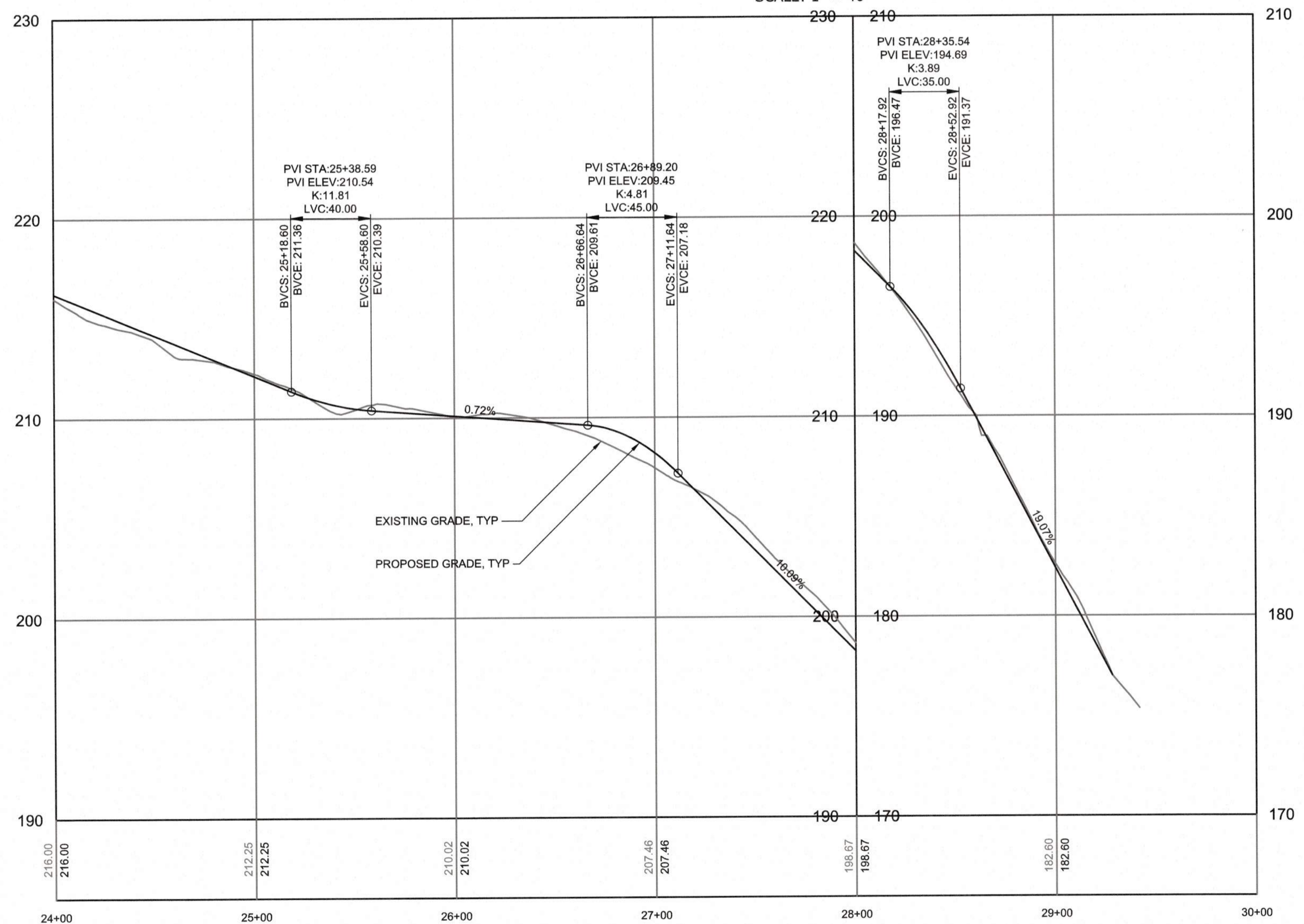
NOTES:

- CONTRACTOR SHALL ADHERE TO NCDOT ENCROACHMENT AGREEMENT CONDITIONS AND PROVISION FOR ACCESS ROAD NO. 7.
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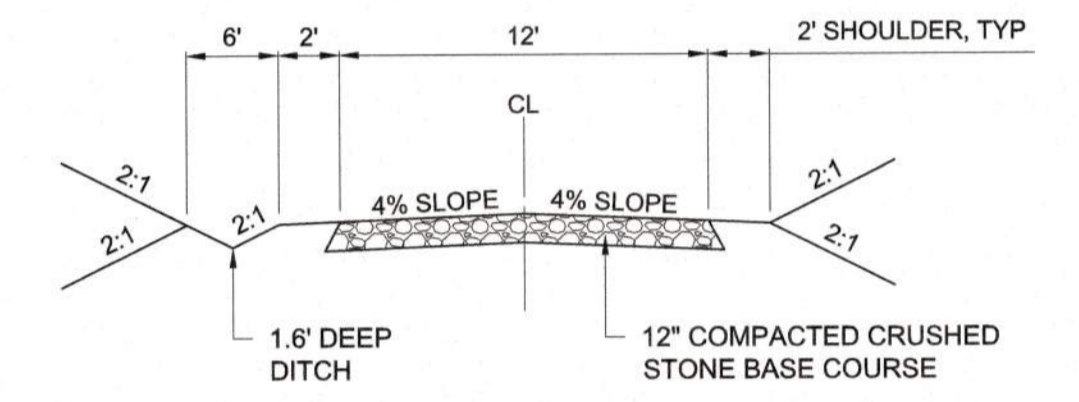


LAYDOWN AREA NO. 4
SEE SHEET C227

PLAN
SCALE: 1" = 40'



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



TYPICAL CROSS SECTION
12' ACCESS ROAD

a. Towns Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
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By: _____ Date: _____
Administrator

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City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 09/29/20 09:53:47 AM BY: JCK BAILEY
 FILE: C:\WORK\2020\11\05\1105_6226.dwg Saved By: JCK BAILEY

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

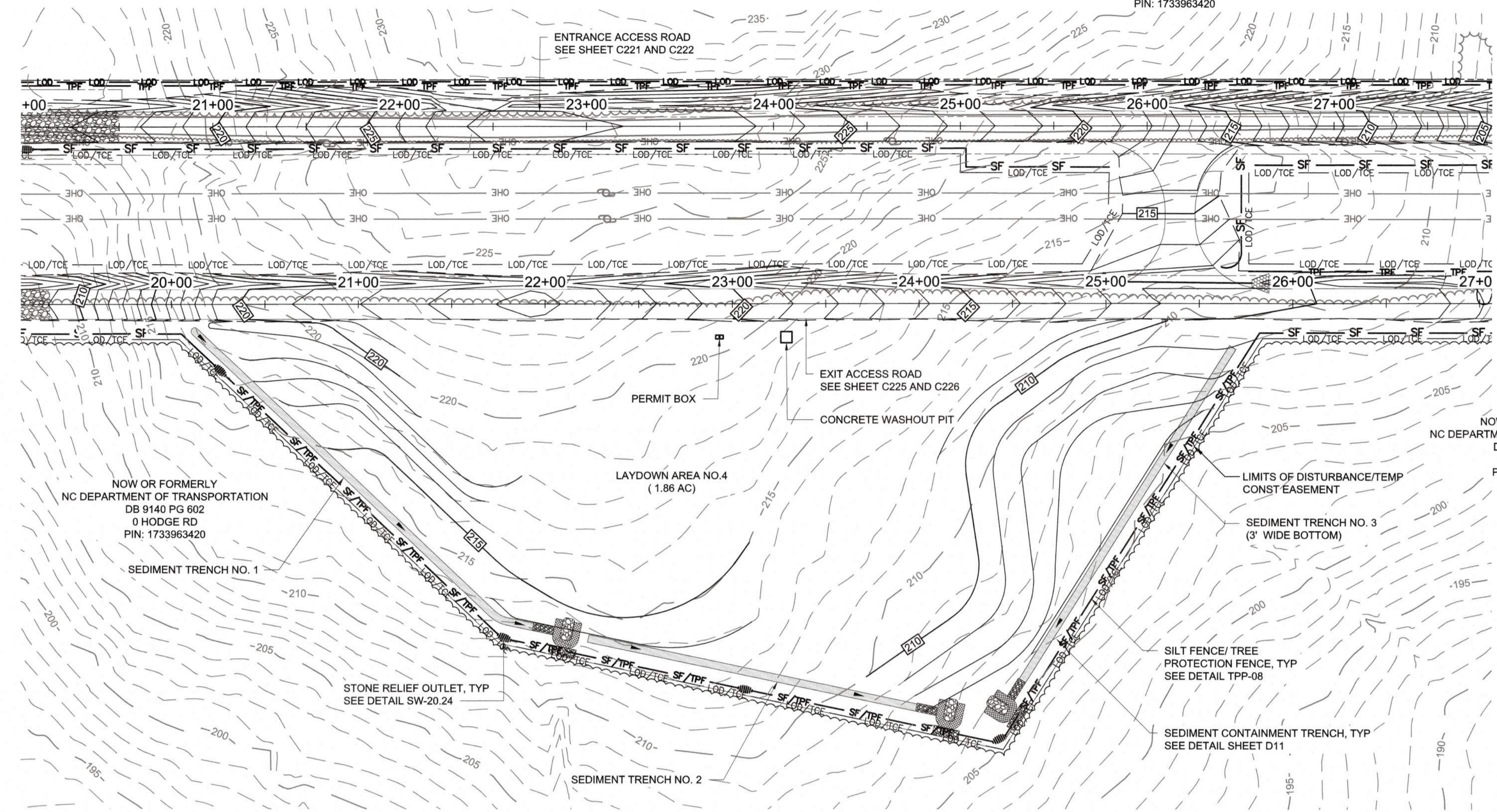
CJS Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

TEMPORARY CONSTRUCTION
ACCESS EXIT ROAD NO. 7
(HODGE RD)
STATION 24+00 TO 29+04

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C226

NOW OR FORMERLY
NC DEPARTMENT OF TRANSPORTATION
DB 9140 PG 602
0 HODGE RD
PIN: 1733963420



PLAN
SCALE: 1" = 40'

a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

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City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/06 10:20:58 PM BY: JOEY BAILEY
FILE: C:\MSW\ARCH\HW\PARALLEL\C227.dwg Saved By: JOEY BAILEY Date: 2020/11/06 8:59 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

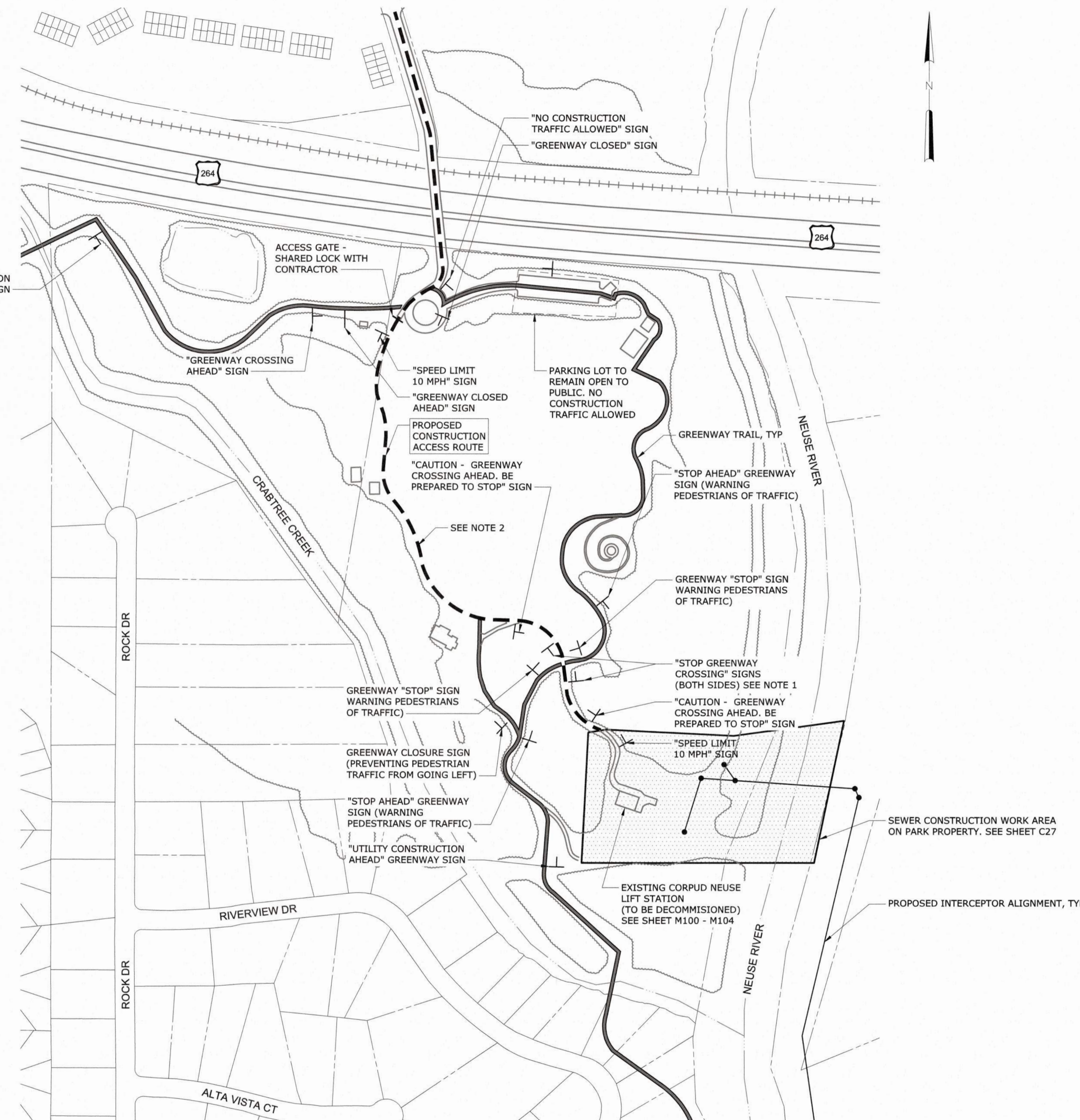
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

LAYDOWN AREA NO. 4 @ HODGE RD

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C227

NOTES:

1. THE CONTRACTOR SHALL PROVIDE FLAGGERS AT THE ENTRANCE TO THE PARK AND AT THE INTERSECTION OF THE CONSTRUCTION ACCESS ROUTE AND THE GREENWAY TRAIL WHEN CONSTRUCTION TRAFFIC IS BRINGING IN CONSTRUCTION SUPPLIES AND EQUIPMENT.
2. THE CONTRACTOR SHALL UTILIZE THE EXISTING ASPHALT ROAD/GREENWAY TRAIL AS SHOWN FOR THE SINGLE POINT OF INGRESS/EGRESS TO THE NEUSE LIFT STATION AND PROPOSED INTERCEPTOR WORK THROUGH THE ANDERSON POINT DARK PROPERTY.
3. THE CONTRACTOR SHALL NOTIFY THE CITY OF RALEIGH PARKS AND RECREATION DEPARTMENT AT LEAST 30 DAYS PRIOR TO REQUIRED ACCESS THROUGH THE PARK AND CONDUCT AN ONSITE PRE-CONSTRUCTION MEETING WITH THE CITY'S FIELD REPRESENTATIVE AND PARKS AND REC STAFF A MINIMUM OF 14 DAYS PRIOR TO INITIATING .
4. ALL WARNING SIGNS MUST BE MADE AND INSTALLED PER NCDOT STANDARDS (DIVISION 11 AND OTHER APPLICABLE DIVISIONS) FOR TRAFFIC AND PEDESTRIAN CONTROL. SIGNS SHALL BE OF STATIONARY TYPE OR MOUNTED ON TYPE III BARRICADES.



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 City of Raleigh Development Approval _____



FINAL DESIGN

PLOT DATE: 2020/11/06 10:32:41 PM. BY: JACOB BAILEY
 File: C:\WORK\VAZENA-FM\0451987\C228_Sched By: JACOB BAILEY. Save Date: 2020/11/06 6:30 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
 HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
 LICENSE NO. : C-0381

CJS
 Conveyance, PLLC
 320 S. ACADEMY STREET
 CARY, NC 27511
 LICENSE NO. : P-1611

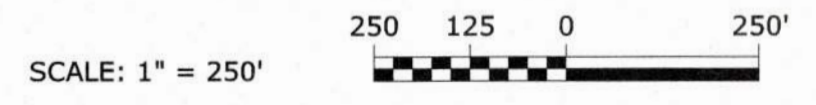
CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

ANDERSON POINT PARK TRAFFIC
 AND PEDESTRIAN CONTROL PLAN

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C228



CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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 City of Raleigh Development Approval _____



BEFORE YOU DIG!
 CONTACT ONE-CALL CENTER
 CALL 811
 OR
 1-800-632-4949

FINAL DESIGN

PLOT NAME: 2020/11/05 10:29:21 PM
 FILE: C:\WORKSPACE\PROJECTS\C229 - GREENWAY CLOSURE\DWG\C229 - GREENWAY CLOSURE.dwg
 User: JET WINDLEY
 Date: 2020/11/05 6:31 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
 HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
 LICENSE NO. : C-0381

CJS
 Conveyance, PLLC
 320 S. ACADEMY STREET
 CARY, NC 27511
 LICENSE NO. : P-1611

CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

GREENWAY CLOSURE PLAN

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C229

NOTE:
1. REFER TO BYPASS PUMPING TABLE ON SHEET G03.

 AREA TO BE STABILIZED WITHIN 7 DAYS

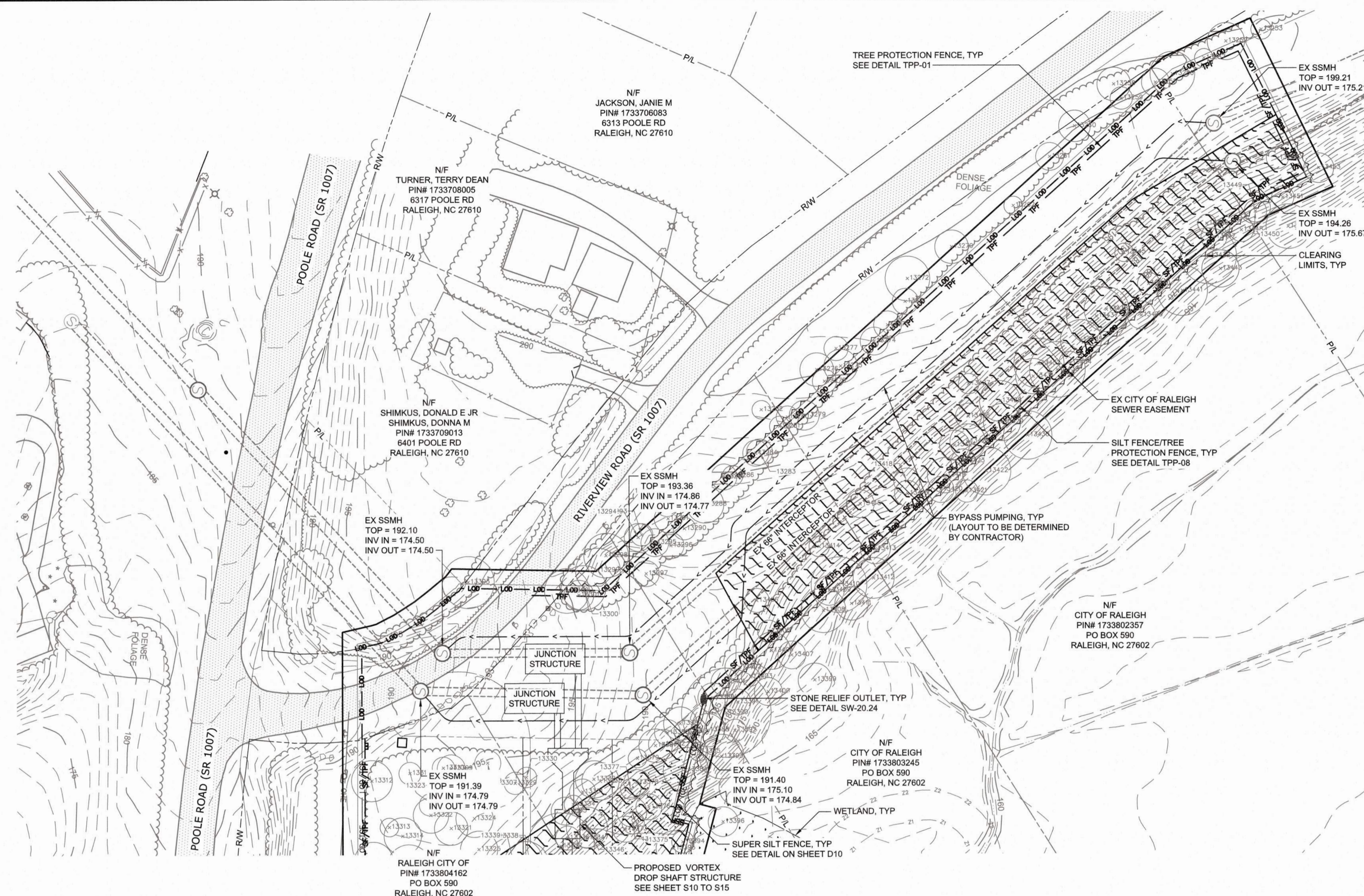
Tree Survey CRZ Impact Table				
Point #	Northing	Easting	Description	Percent
13252	730491.58	2137632.46	PINE 20I	37%
13253	730514.66	2137622.99	OAK 11I	0%
13255	730446.08	2137663.01	PINE 15I	43%
13258	730418.21	2137665.88	GUM 18I	0%
13259	730423.90	2137675.08	PINE 12I	0%
13260	730393.64	2137695.63	OAK 17I	0%
13261	730378.27	2137717.29	OAK 15I	0%
13262	730355.87	2137751.68	PINE 10I	14%
13270	730316.20	2137781.99	PINE 18I	0%
13271	730287.40	2137820.50	PINE 14I	17%
13272	730287.90	2137805.11	OAK 24I	0%
13273	730276.49	2137837.05	OAK 15I	43%
13275	730246.76	2137866.51	PINE 18I	40%
13276	730230.85	2137869.90	OAK 18I	0%
13277	730242.95	2137855.02	OAK 13I	0%
13278	730236.51	2137877.42	PINE 13I	38%
13282	730195.39	2137899.09	PINE 10I	0%
13289	730146.71	2137958.03	PINE 12I	0%
13291	730137.51	2137976.07	PINE 15I	27%
13292	730136.25	2137967.22	PINE 12I	0%
13293	730120.46	2137987.96	PINE 12I	0%
13294	730118.24	2137989.84	PINE 15I	5%
13298	730097.49	2138003.31	OAK 24I	3%
13299	730092.62	2138013.63	OAK 24I	18%
13303	730006.13	2138026.93	OAK 28I	41%
13317	729954.33	2138235.75	OAK 24I	10%
13318	729975.55	2138236.24	OAK 12I	0%
13319	729988.40	2138225.73	OAK 24I	39%
13327	730014.97	2138241.10	HICK 11I	0%
13328	730025.79	2138257.19	GUM 17	47%
13362	730123.21	2138371.49	GUM 13I	30%
13363	730163.40	2138343.20	GUM 48I	0%
13364	730133.70	2138312.04	MAP 17I	42%
13369	730141.54	2138275.97	OAK 28I	43%
13370	730162.33	2138296.60	GUM 12I	0%
13388	730172.69	2138116.31	GUM 18I	36%
13390	730184.54	2138103.94	OAK 48I	32%
13391	730191.76	2138096.19	GUM 14I	0%
13392	730191.02	2138115.32	PINE 12I	0%
13393	730183.22	2138133.50	GUM 24I	0%
13396	730186.84	2138177.13	MAP 16I	0%
13397	730195.20	2138153.52	MAP 20I	0%
13399	730242.51	2138078.18	POP 18I	0%
13400	730211.74	2138067.94	ELM 15I	0%
13403	730199.39	2138078.75	GUM 10I	0%
13404	730212.36	2138060.36	BEECH 20I	35%
13407	730228.07	2138062.44	GUM 15I	0%
13408	730245.40	2138031.17	PINE 24I	24%
13411	730263.96	2138025.44	PINE 18I	0%
13412	730277.69	2138007.37	POP 22I	1.2%
13421	730336.49	2137945.19	OAK 12I	0%
13422	730348.99	2137930.83	PINE 26	12%
13430	730375.15	2137905.13	POP 26I	10%
13439	730446.25	2137819.81	ELM 15I	33%
13441	730472.74	2137801.55	GUM 27I	18%
13442	730488.91	2137777.23	POP 30I	39%
13443	730497.34	2137785.28	GUM 20I	0%
13448	730509.81	2137758.36	GUM 13I	13%
13450	730518.39	2137745.25	GUM 12I	32%
13451	730536.23	2137734.81	GUM 12I	26%
13452	730541.10	2137754.08	GUM 24I	0%
13453	730559.16	2137713.53	MAP 16I	8%
13459	730129.25	2138396.86	IRONWOOD 12I	0%
13460	730116.43	2138425.57	GUM 18I	16%
13467	730109.01	2138485.49	MAP 11I	0%
13468	730105.51	2138498.11	ELM 19I	5%
13472	730024.12	2138508.56	POP 16I	36%
13473	730018.28	2138516.63	ELM 12I	4%
13474	730011.41	2138495.20	GUM 14I	0%
13478	730005.62	2138557.68	OAK 19I	2%
13485	730097.97	2138545.50	OAK 18I	0%
13486	730099.72	2138537.67	GUM 24I	6%
13497	729981.25	2138680.20	SYC 60I	19%
13498	729981.01	2138629.67	HICK 24I	0%

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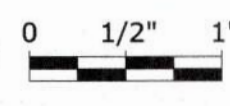
TREE 13497 ON SHEET C28 SHALL BE PROTECTED AND PRESERVED

FINAL DESIGN



PLAN - BYPASS PUMP AREA
SCALE: 1" = 40'

PRINT DATE: 2020/11/05 10:35:08 PM
 FILE: C:\WORK\VAZEM\PROJECTS\117\G230 - Sewer By: JEFF BAILEY
 Draw Date: 2020/11/05 8:32 PM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

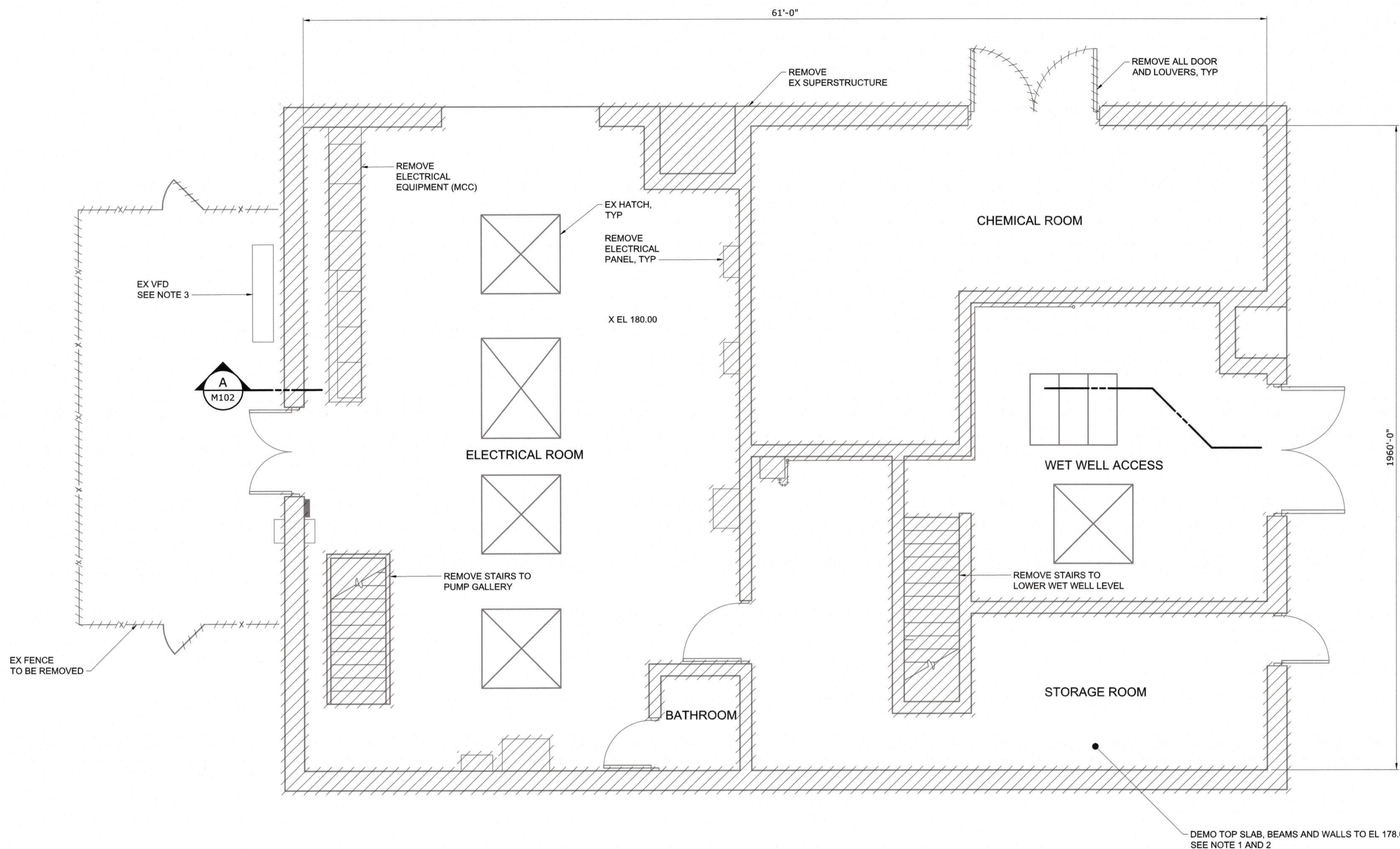
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	C230

NOTES:

- EXISTING SUPERSTRUCTURE AND ALL EQUIPMENT ABOVE EL 180.00 SHALL BE REMOVED IN THEIR ENTIRETY, UNLESS OTHERWISE NOTED, PRIOR TO SLAB DEMOLITION.
- PHASE I DEMOLITION SHALL BE COMPLETED PRIOR TO TOP SLAB DEMOLITION. ADDITIONALLY, CONTRACTOR SHALL FILL PUMP GALLERY AND WETWELLS WITH APPROVED BACKFILL MATERIAL TO EL 170.00 PRIOR TO TOP SLAB DEMOLITION. CONTRACTOR SHALL USE EXISTING SLAB OPENINGS TO TRANSPORT BACKFILL TO SUBSTRUCTURE CAVITY. IF ADDITIONAL OPENINGS ARE REQUIRED TO BACKFILL, CONTRACTOR SHALL SUBMIT PROPOSED OPENING PLAN WITH CALCULATIONS VERIFYING THE ADEQUACY OF THE DIAPHRAGM, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.
- EXISTING VFD ON WEST SIDE OF BUILDING SHALL BE REMOVED AND DELIVERED TO CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT AT A LOCATION OF THEIR CHOOSING. SEE PHOTO TITLED "VARIABLE FREQUENCY DRIVE" ON M103.



TOP PLAN - PHASE II DEMOLITION
SCALE: 1/4" = 1'-0"

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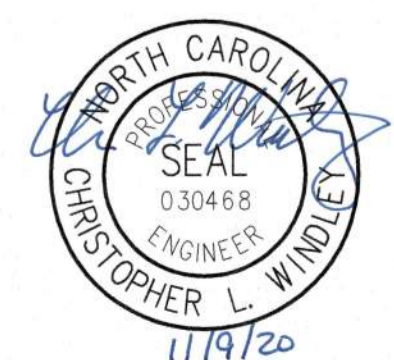


FINAL DESIGN

PLOT DATE: 2020/11/08 4:45:20 PM BY: JACEY BAILEY
FILE: C:\WORKSPACE\PROJECTS\2020\11\08\4_31\PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	S. LEITCH
DRAWN BY:	A. GOODWIN
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
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CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

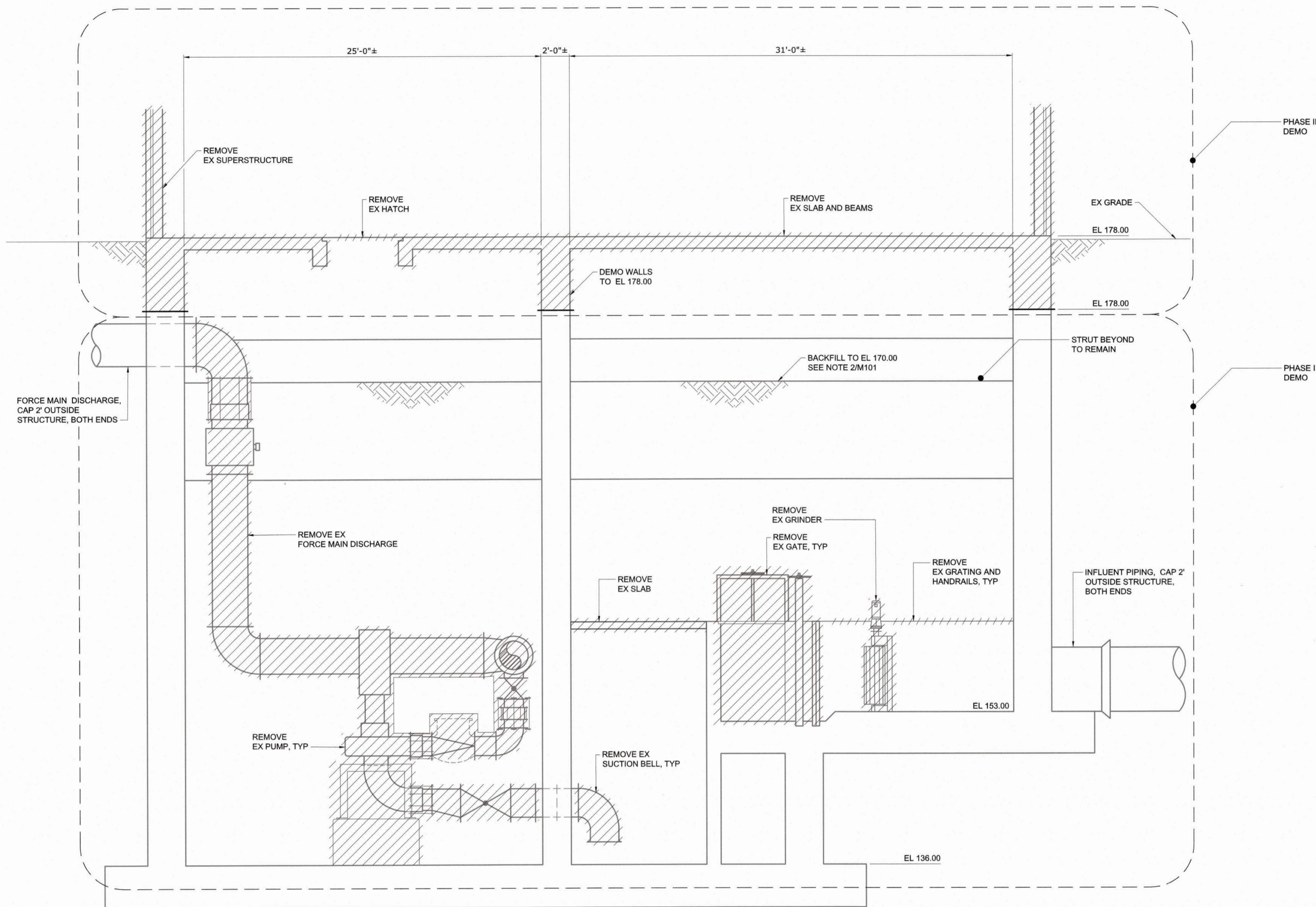
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

NEUSE RIVER PUMP STATION
MECHANICAL
TOP PLAN - DEMOLITION

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	M101

NOTES:

1. ALL ITEMS IN PHASE I DEMOLITION MUST BE COMPLETED BEFORE COMMENCEMENT OF PHASE II DEMOLITION.



SECTION A
SCALE: 1/4" = 1'-0" M100

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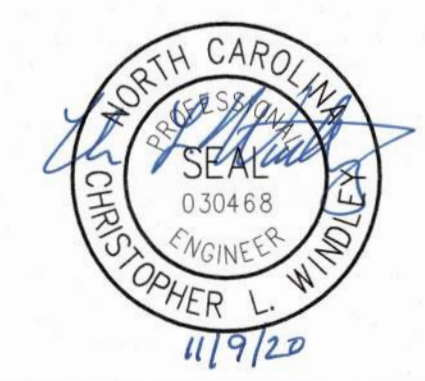
BEFORE YOU DIG!
CONTACT ONE-CALL CENTER
CALL 811
OR
1-800-632-4949

FINAL DESIGN

PLOT DATE: 2020/11/08 4:45:35 PM
 FILE: C:\BMS\HAZEN\PROJECTS\175\M102_Sched By JOEY BAILEY
 Date: 2020/11/08 4:35 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	S. LEITCH
DRAWN BY:	A. GOODWIN
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

NEUSE RIVER PUMP STATION
MECHANICAL
DEMOLITION SECTION

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	M102



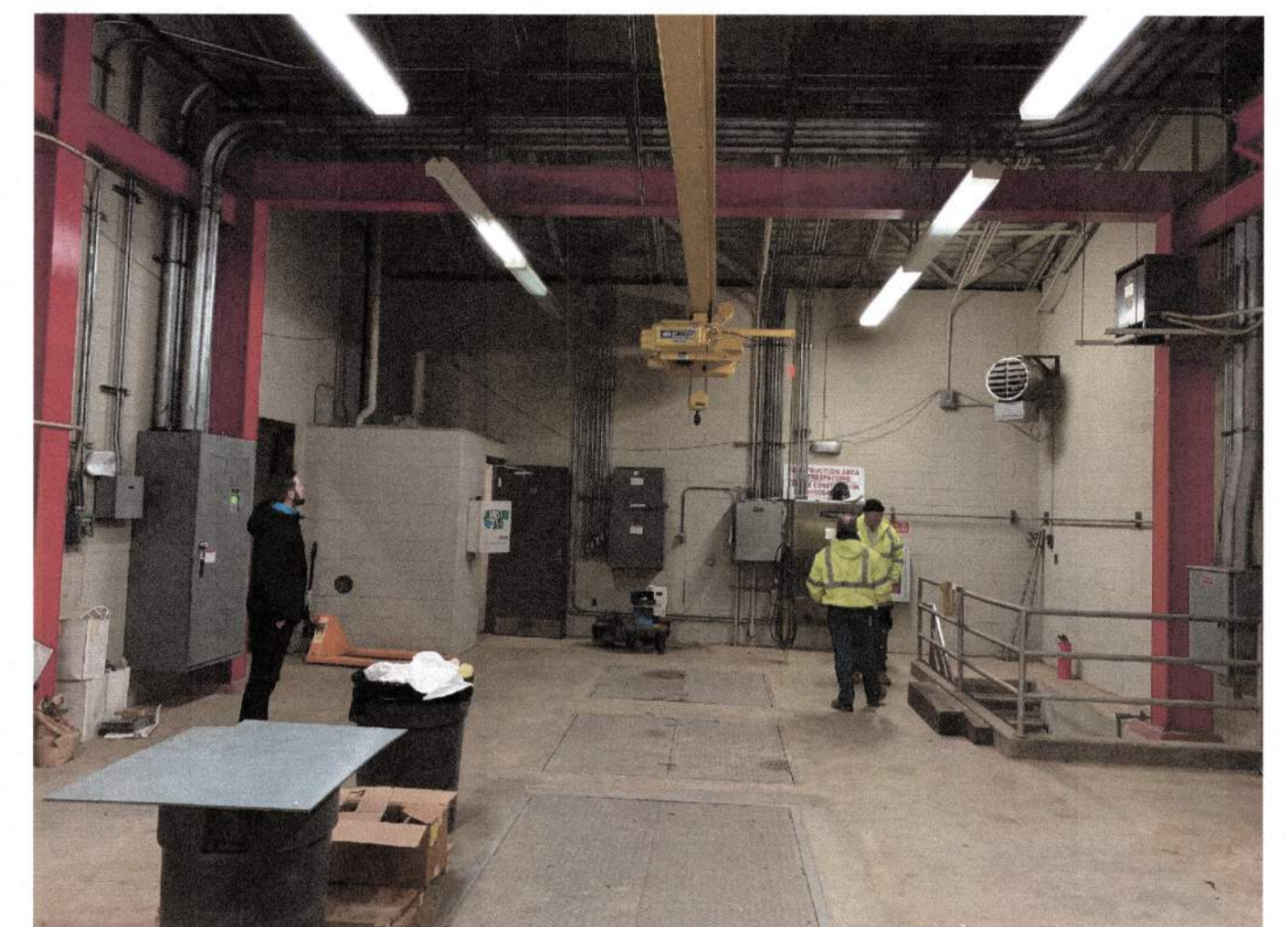
SUPERSTRUCTURE - SOUTH ELEVATION



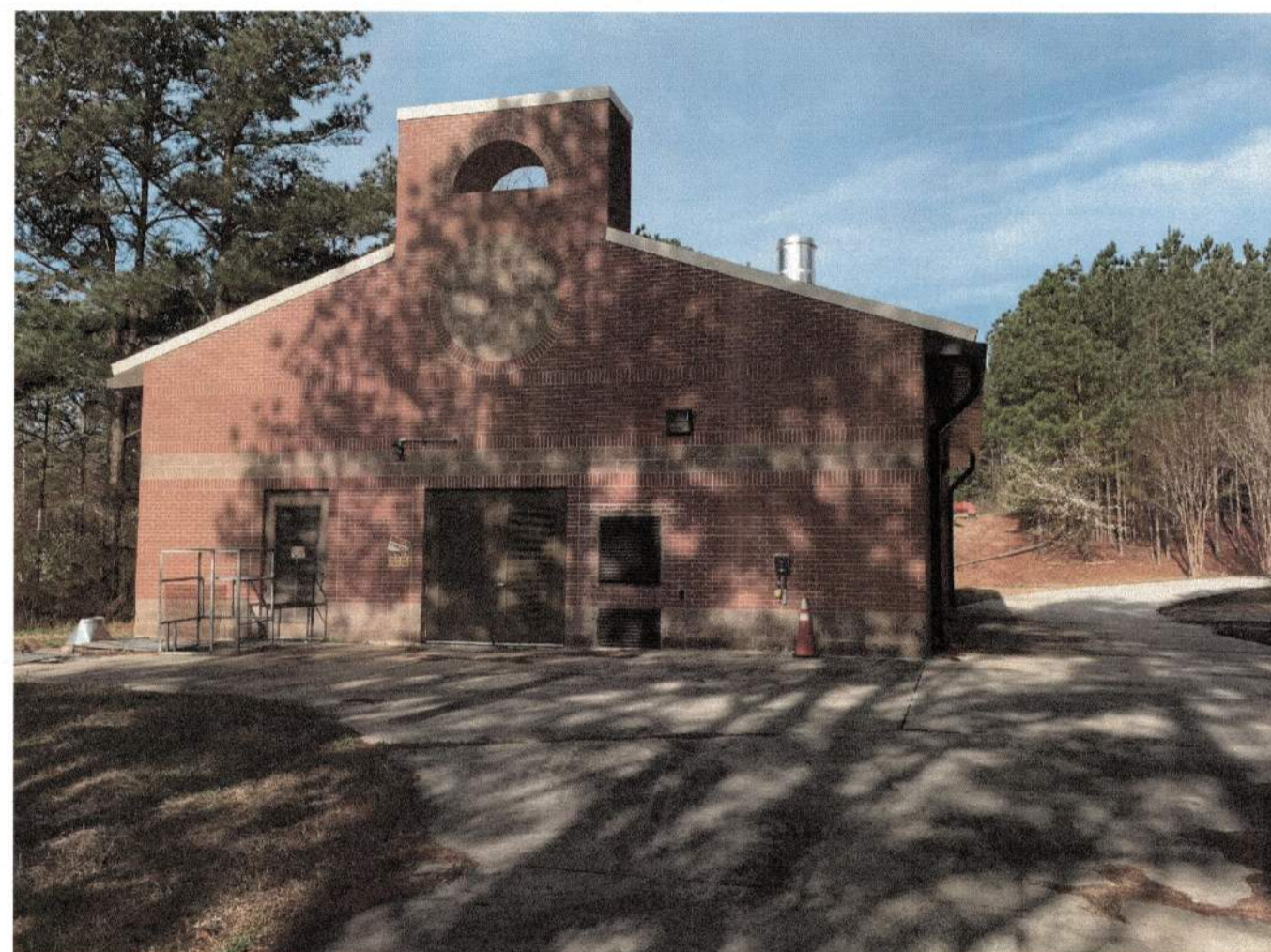
SUPERSTRUCTURE - WEST ELEVATION



ELECTRICAL ROOM - NORTH VIEW



ELECTRICAL ROOM - SOUTH VIEW



SUPERSTRUCTURE - EAST ELEVATION



SUPERSTRUCTURE - NORTH ELEVATION



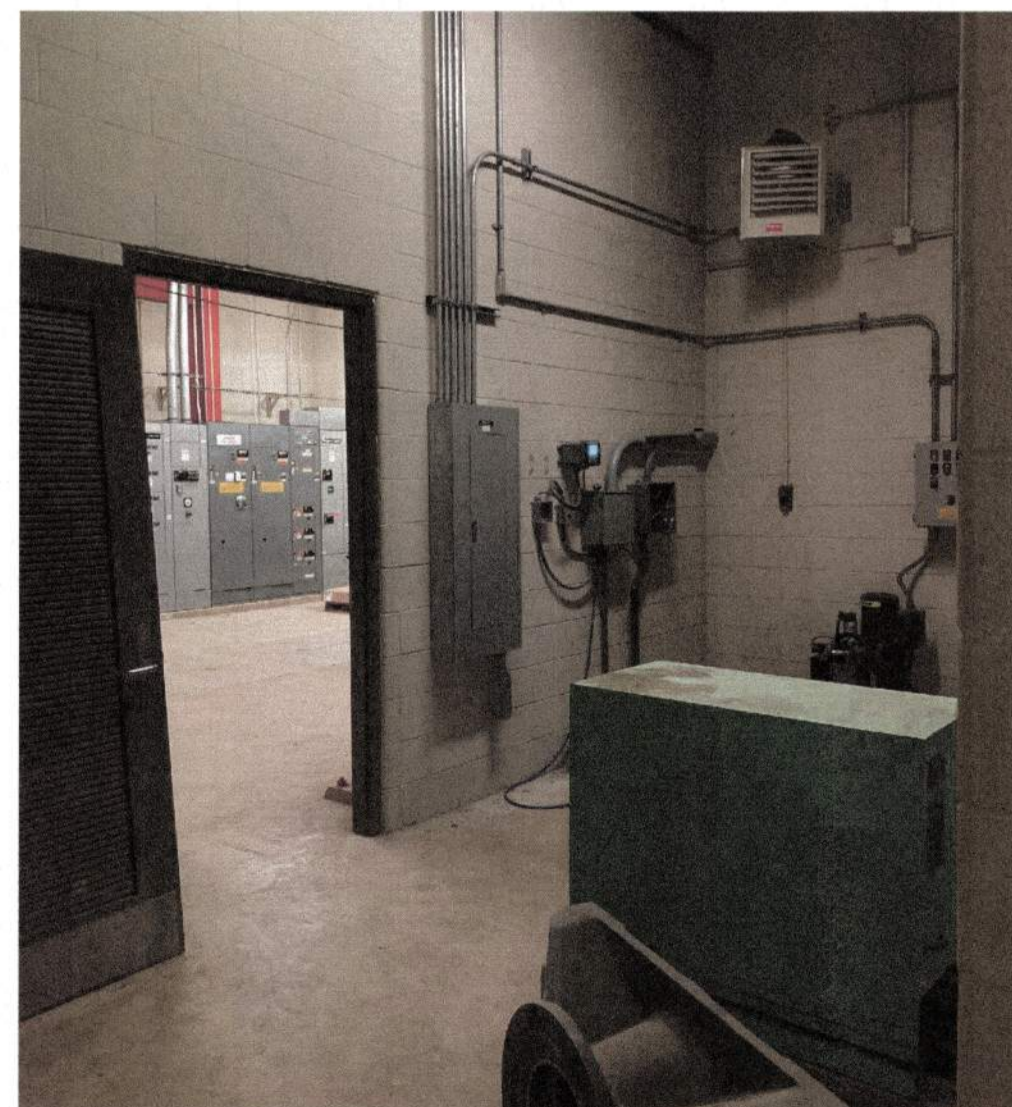
ELECTRICAL ROOM - EAST VIEW



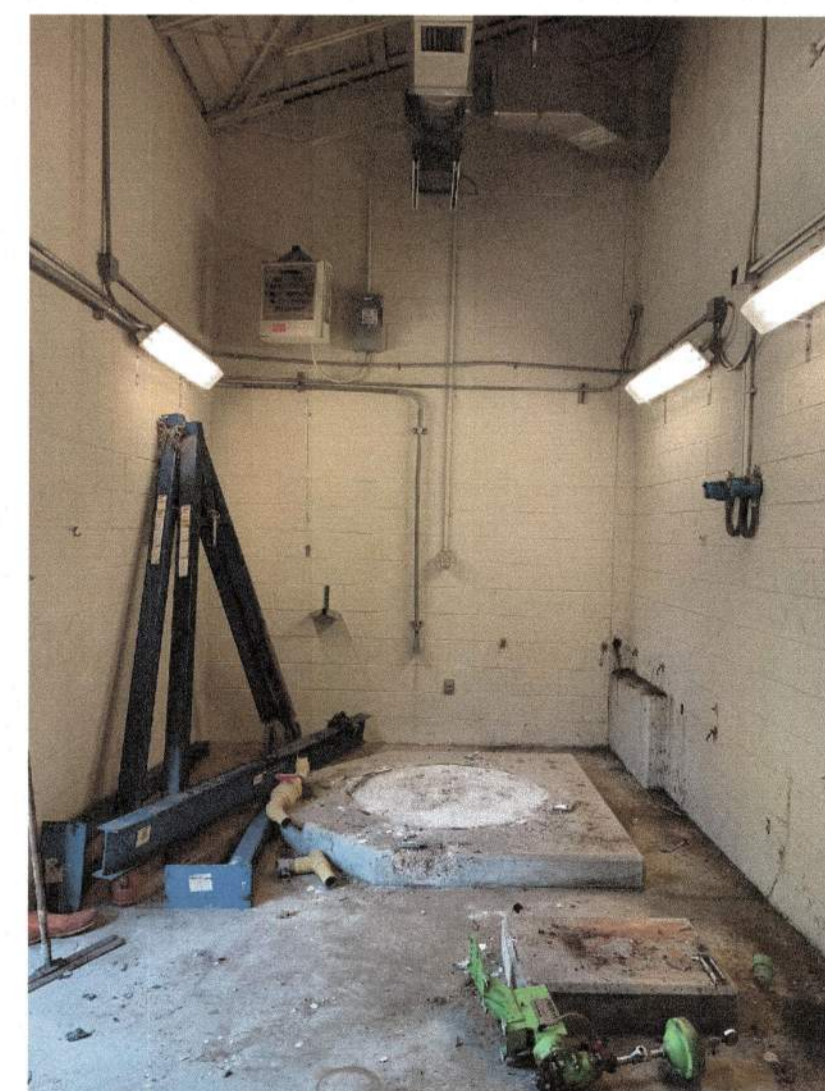
ELECTRICAL ROOM - WEST VIEW



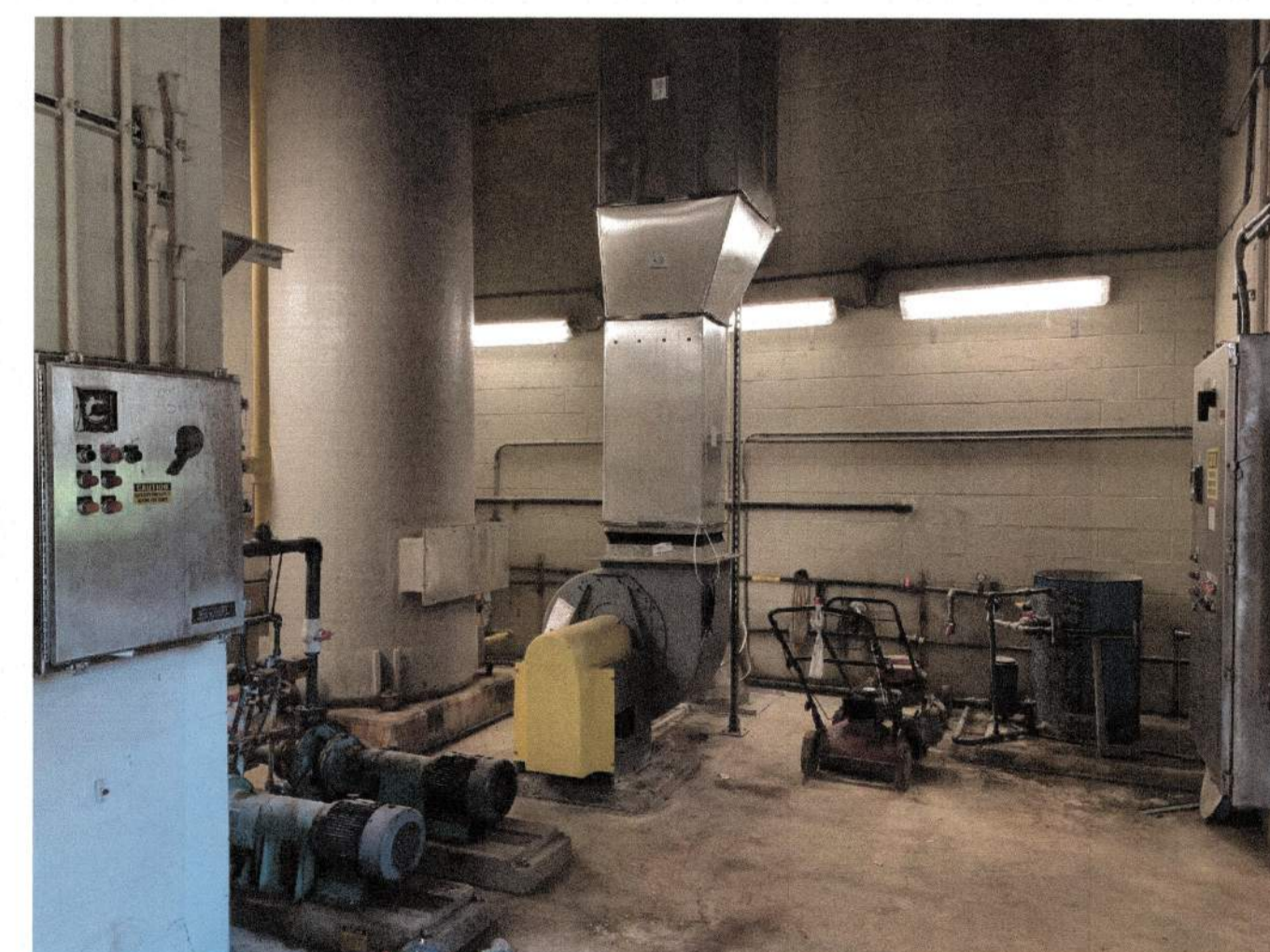
VARIABLE FREQUENCY DRIVE



STORAGE ROOM - EAST END



CHEMICAL ROOM - EAST END



CHEMICAL ROOM - WEST END

FINAL DESIGN

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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Plot Date: 2020/11/08 4:43:09 PM BY: JOEY BAILEY
 File: C:\MS\VALEN-P\PROJECTS\1703 - Saved By: JOEY BAILEY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	S. LEITCH
DRAWN BY:	P. SELISKER
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
0	1/2" 1"
REV	ISSUED FOR
	DATE
	BY



Hazen

HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
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 LICENSE NO. : C-0381

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 CARY, NC 27511
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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

NEUSE RIVER PUMP STATION
 DEMOLITION
 REPRESENTATIVE PHOTOS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	M103



PUMP GALLERY - NORTH VIEW



PUMP GALLERY - SOUTH VIEW



FORCE MAIN DISCHARGE - NORTH VIEW



PUMP GALLERY - CEILING



WET WELL - UPPER LEVEL



WET WELL - WEST END



WET WELL - EAST END



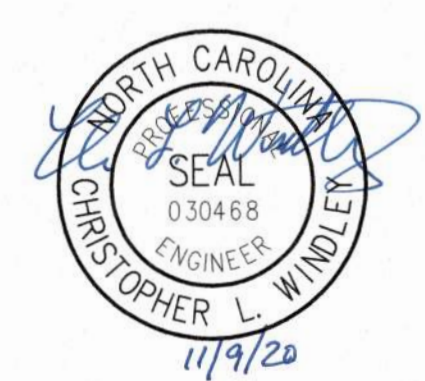
STORAGE ROOM - WEST END

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FINAL DESIGN

PLOT DATE: 2020/11/08 4:38:29 PM BY: JREY BAILEY
 File: C:\BVA\VEN\FWD\081120\1008_Saved By: JREY BAILEY.dwg

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	S. LEITCH
DRAWN BY:	P. SELISKER
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR
	DATE
	BY



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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

NEUSE RIVER PUMP STATION
 DEMOLITION
 REPRESENTATIVE PHOTOS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	M104

GENERAL STRUCTURAL NOTES

- G-1 THESE NOTES ARE GENERAL AND SUPPLEMENT THE SPECIFICATIONS. THESE NOTES APPLY TO THE ENTIRE PROJECT UNLESS MODIFIED OR NOTED OTHERWISE IN THE CONTRACT DOCUMENTS.
- G-2 STANDARD DETAILS SHALL BE USED WHEN REFERRED TO OR WHEN NO MORE RESTRICTIVE OR DIFFERENT DETAILS ARE SHOWN ON THE DRAWINGS.
- G-3 DESIGN IS IN ACCORDANCE WITH AND CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF THE NORTH CAROLINA BUILDING CODE. THE DESIGN LOADS AND OTHER DESIGN VALUES GIVEN IN NOTES G-4 THROUGH G-7 WERE USED FOR DESIGN OF STRUCTURES UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- G-4 LIVE LOADS:

STRUCTURE	LEVEL	ROOF	TOP / FIRST FLOOR	BOTTOM / GROUND FLOOR
DROPSHAFT STRUCTURE		N/A	AASHTO H-20	150 PSF
EAST WEIR		N/A	150 PSF	150 PSF
WEST WEIR		N/A	150 PSF	150 PSF

-ALL STAIRWAYS, LANDINGS AND PLATFORMS ARE DESIGNED FOR A LIVE LOAD = 100 PSF UNLESS NOTED OTHERWISE.

G-5 SNOW LOAD:

GROUND SNOW LOAD (Pg) = 15 PSF
 FLAT-ROOF SNOW LOAD (Pf) = 14 PSF
 SNOW EXPOSURE FACTOR (Ce) = 1.0
 SNOW LOAD IMPORTANCE FACTOR (Ib) = 1.1
 THERMAL FACTOR (Ct) = 1.2

G-6 WIND DESIGN CRITERIA:

ULTIMATE DESIGN WIND SPEED (Vult) = 120 MPH
 NOMINAL DESIGN WIND SPEED (Vasd) = 93 MPH
 RISK CATEGORY = III
 WIND IMPORTANCE FACTOR (Iw) = 1.0
 WIND EXPOSURE = C

STRUCTURE	PARAMETER	PRESSURE COEFFICIENT GCpi	WIND VELOCITY PRESSURE	COMPONENTS AND CLADDING	LATERAL LOAD RESISTING SYSTEM
DROPSHAFT STRUCTURE		±0.18	27.0 PSF	64 PSF	CONC SHEAR WALL
EAST WEIR		±0.18	27.0 PSF	64 PSF	CONC SHEAR WALL
WEST WEIR		±0.18	27.0 PSF	64 PSF	CONC SHEAR WALL

G-7 SEISMIC LOAD:

RISK CATEGORY = III
 SEISMIC IMPORTANCE FACTOR (Ib) = 1.25
 SITE CLASS = D
 MAPPED SPECTRAL RESPONSE ACCELERATIONS (Sa/S1) = 0.153/0.078
 SPECTRAL RESPONSE ACCELERATIONS (SMS/SM1) = 0.244/0.182
 SPECTRAL RESPONSE COEFFICIENTS (SDS/SD1) = 0.163/0.121
 SEISMIC DESIGN CATEGORY = B

STRUCTURE	PARAMETER	BASIC STRUCTURAL SYSTEM	DESIGN BASE SHEAR	SEISMIC RESPONSE COEFFICIENT Cs	RESPONSE MODIFICATION COEFFICIENT R	ANALYSIS PROCEDURE
DROPSHAFT STRUCTURE		CONC SHEAR WALL	99 K	.046	5	EQUIVALENT LATERAL FORCE
EAST WEIR		CONC SHEAR WALL	50 K	.046	5	EQUIVALENT LATERAL FORCE
WEST WEIR		CONC SHEAR WALL	50 K	.046	5	EQUIVALENT LATERAL FORCE

- G-8 ALL DIMENSIONS INDICATED FOR EXISTING STRUCTURES SHALL BE VERIFIED BY FIELD MEASUREMENT. ALL DIMENSIONS THAT ARE CONTROLLED BY OR RELATED TO EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR WITH THE MANUFACTURER SHOP DRAWINGS PRIOR TO CONSTRUCTION.
- G-9 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING INFORMATION IN THE FIELD AS REQUIRED FOR NEW WORK.
- G-10 IF A CONFLICT IS FOUND BETWEEN DIFFERENT PORTIONS OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. CONTINUED CONSTRUCTION OF THE AREA IN CONFLICT SHALL BE AT THE CONTRACTOR'S OWN RISK UNTIL THE CONFLICT IS RESOLVED.
- G-11 EQUIPMENT ANCHOR SIZES, TYPES, EMBEDMENT AND PATTERNS SHALL BE VERIFIED WITH THE MANUFACTURER. ALL ANCHOR PATTERNS SHALL BE TEMPLATED TO INSURE ACCURACY OF PLACEMENT.
- G-12 STRUCTURAL DRAWINGS SHALL BE USED IN COORDINATION WITH THE DRAWINGS OF ALL OTHER DISCIPLINES AND MANUFACTURER'S SHOP DRAWINGS.
- G-13 STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURE. DURING CONSTRUCTION, THE STRUCTURES SHALL BE PROTECTED BY BRACING AND TEMPORARY SUPPORTS WHEREVER EXCESSIVE CONSTRUCTION LOADS MAY OCCUR. OVERSTRESSING OF ANY STRUCTURAL ELEMENT IS PROHIBITED.
- G-14 IF CONTRACTOR DESIRES TO TEMPORARILY PLACE OR MOVE LOADS ON OR ADJACENT TO EXISTING STRUCTURES OR UTILITIES DURING CONSTRUCTION PROCESS, CONTRACTOR IS EXCLUSIVELY RESPONSIBLE FOR MAINTAINING STRUCTURAL INTEGRITY AND AVOIDING OVERSTRESSING AND DAMAGING EXISTING STRUCTURES AND UTILITIES. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS AND DRAWINGS VERIFYING PROPOSED CONSTRUCTION INCLUDING APPLICATION OF TEMPORARY CONSTRUCTION LOADS WILL NOT OVERSTRESS OR DAMAGE EXISTING STRUCTURES AND UTILITIES. DRAWINGS AND CALCULATIONS SHALL BE SEALED BY A PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF NORTH CAROLINA.
- G-15 NO BACKFILL SHALL BE PLACED AGAINST ANY SUBSTRUCTURE WALLS UNLESS ALL ADJACENT SUPPORTING ELEMENTS HAVE ACHIEVED DESIGN STRENGTH, OR WALLS HAVE BEEN PROPERLY BRACED, AND IN ANY CASE NOT SOONER THAN 28 DAYS AFTER THE PLACING OF CONCRETE UNLESS APPROVED BY THE ENGINEER. SUPPORTING ELEMENTS SHALL INCLUDE ADJACENT WALLS, SLABS, BEAMS AND COLUMNS.
- G-16 LEAKAGE TESTING OF HYDRAULIC STRUCTURES SHALL NOT BEGIN UNTIL ALL STRUCTURAL ELEMENTS HAVE REACHED THE SPECIFIED MINIMUM CONCRETE STRENGTH. BACKFILL SHALL NOT BE PLACED AROUND ANY HYDRAULIC STRUCTURE UNTIL THE LEAKAGE TEST HAS BEEN COMPLETED UNLESS APPROVED BY THE ENGINEER.

STRUCTURAL METALS

- M-1 DETAIL, FABRICATE, AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN, LATEST EDITION.
- M-2 STEEL MATERIAL:
 A) STRUCTURAL HSS: ASTM A500, GRADE C (46/50 KSI) OR A1085 (50 KSI)
 B) STRUCTURAL PIPE: ASTM A53, GRADE B (35 KSI)
 C) PLATES, BARS AND ANGLES: ASTM A36 UNO (36 KSI)
 D) STRUCTURAL W SHAPES: ASTM A992 (50 KSI)
 E) STRUCTURAL S, M, C & MC SHAPES: ASTM A36 (36 KSI)
 F) STRUCTURAL HP: ASTM A572 GRADE 50 (50 KSI)
 G) RODS: ASTM F1554 GRADE 36 (36 KSI)
- M-3 PROVIDE MINIMUM 3/4" DIAMETER ASTM A325 HIGH STRENGTH BOLTS WITH SNUG TIGHTENED TYPE N CONNECTIONS FOR STRUCTURAL STEEL UNLESS NOTED OTHERWISE. HOLES FOR BOLTS SHALL BE STANDARD SIZE UNLESS NOTED OTHERWISE.
- M-4 PROVIDE TYPICAL STEEL BEAM CONNECTIONS FOR A CAPACITY OF NOT LESS THAN THE TOTAL UNIFORM LOAD CAPACITY TABULATED IN THE AISC TABLES FOR ALLOWABLE LOADS OF BEAMS UNLESS NOTED OTHERWISE.
- M-5 DO NOT PAINT STEEL SURFACES WHICH ARE TO BE WELDED OR ARE TO BE ENCASED IN CONCRETE.
- M-6 ALL STAINLESS STEEL FABRICATIONS SHALL BE TYPE 316L.
- M-7 ALUMINUM SHALL BE ALLOY 6061-T6 UNLESS NOTED OTHERWISE.
- M-8 ALL BOLTS, ANCHORS, AND CONCRETE ANCHORS CONNECTING ALUMINUM SHALL BE STAINLESS STEEL TYPE 316 FOR UNDERWATER APPLICATIONS AND TYPE 304 FOR ALL OTHER APPLICATIONS.
- M-9 DETAIL, FABRICATE, AND ERECT ALUMINUM IN ACCORDANCE WITH THE LATEST EDITION OF THE ALUMINUM ASSOCIATION ALUMINUM DESIGN MANUAL.
- M-10 ALUMINUM SHALL BE ISOLATED FROM CONTACT WITH CONCRETE AND DISSIMILAR METALS.
- M-11 ALL GROOVE AND BUTT WELDS SHALL BE FULL PENETRATION.
- M-12 FILLET WELD SIZES SHALL NOT BE LESS THAN THE MINIMUM SIZE REQUIRED BY AISC CODE FOR PLATE SIZES TO BE CONNECTED AND SHALL BE APPLIED TO THE ENTIRE JOINT CONTACT LENGTH, AND NOT LESS THAN 3/16".
- M-13 BOTTOM SURFACES OF BASE PLATES SHALL BE GROUTED TO ENSURE FULL BEARING CONTACT WITH CONCRETE SLAB.
- M-14 WHENEVER ONE MEMBER IS FASTENED TO ANOTHER WITH FASTENINGS (BOLTS, WELDS, ETC.) SET AT A UNIFORM SPACING, THERE SHALL BE A MINIMUM OF TWO FASTENINGS PER PIECE CONNECTED AND THE FIRST AND LAST FASTENINGS SHALL BE LOCATED NOT TO EXCEED 0.25 OF FASTENER SPACING FROM EACH END.
- M-15 BOLTED CONNECTIONS FOR STRUCTURAL STEEL SHALL BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC (SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS).
- M-16 STRUCTURAL WELDED JOINTS SHALL CONFORM TO THE PROVISIONS OF AWS D1.1, STRUCTURAL WELDING CODE BY AMERICAN WELDING SOCIETY. PROOF OF WELDER CERTIFICATION SHALL BE AVAILABLE AT THE JOB SITE DURING TIMES OF INSPECTION.

FOUNDATIONS

- F-1 CONCRETE (CAST-IN-PLACE) NOTES APPLY TO FOUNDATIONS.
- F-2 ALLOWABLE SOIL BEARING PRESSURE

STRUCTURE	PARAMETER	ALLOWABLE SOIL BEARING PRESSURE
DROPSHAFT STRUCTURE		2000 PSF
EAST WEIR		2000 PSF
WEST WEIR		2000 PSF

- F-3 MINIMUM DEPTH FROM ADJACENT FINISHED GRADE TO BOTTOM OF FOUNDATION = 12 INCHES.
- F-4 STRUCTURES ARE DESIGNED FOR THE 100-YEAR FLOOD ELEVATION OF 174.00.

PRECAST CONCRETE

- PC-1 PRECAST VAULTS AND MANHOLES SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. STRUCTURAL DRAWINGS SHALL INDICATE DESIGN IS IN COMPLIANCE WITH THE NORTH CAROLINA BUILDING CODE.

NONSTRUCTURAL COMPONENT ANCHORAGE

- A-1 ALL ARCHITECTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS SHALL BE DESIGNED AND INSTALLED TO RESIST THE CONTROLLING CONDITION OF OPERATIONAL FORCES OR SEISMIC FORCES IN ACCORDANCE WITH THE GOVERNING BUILDING CODE. SEISMIC FORCES SHALL ALSO BE AS PER ASCE 7. COMPONENT SEISMIC ATTACHMENTS SHALL BE BOLTED, WELDED, OR OTHERWISE POSITIVELY FASTENED WITHOUT CONSIDERATION OF FRICTIONAL RESISTANCE PRODUCED BY THE EFFECTS OF GRAVITY. A CONTINUOUS LOAD PATH OF SUFFICIENT STRENGTH AND STIFFNESS BETWEEN THE COMPONENT AND THE SUPPORTING STRUCTURE SHALL BE PROVIDED. CONNECTIONS FOR BOTH ORTHOGONAL DIRECTIONS (TRANSVERSE AND LONGITUDINAL) SHALL BE DESIGNED BY THE CONTRACTOR'S ENGINEER CURRENTLY REGISTERED IN THE STATE OF NORTH CAROLINA.
- A-2 COMPONENT REACTION FORCES AT THE POINT OF ATTACHMENT TO THE STRUCTURE SHALL BE SUBMITTED TO AND COORDINATED WITH THE ENGINEER FOR CONFIRMATION SUPPORTING STRUCTURE CAN WITHSTAND REACTION FORCES.
- A-3 CONTRACTOR SHALL PROVIDE SPECIAL SEISMIC CERTIFICATION (SSC) FROM MANUFACTURER OF EQUIPMENT FOR ALL SYSTEMS DEEMED NECESSARY BY SPECIFICATIONS. SPECIAL SEISMIC CERTIFICATION SHALL BE IN COMPLIANCE WITH ASCE 7.

SPECIAL INSPECTIONS

- SI-1 SPECIAL PERIODIC AND CONTINUOUS INSPECTIONS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS AND THE NORTH CAROLINA BUILDING CODE.

CONCRETE (CAST-IN-PLACE)

- C-1 DESIGN OF CONCRETE ELEMENTS INCLUDING WALLS, FORMED SLABS, BEAMS, AND COLUMNS IS IN ACCORDANCE WITH ACI 318 (CODE REQUIREMENTS FOR STRUCTURAL CONCRETE) AND 350 (CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES).
- C-2 FOR CONCRETE MIX DESIGN SEE SPECIFICATION SECTION 03300.
- C-3 CONCRETE STRENGTH CLASSES (28-DAY COMPRESSIVE STRENGTH):
 A) CLASS A1 CONCRETE (4,500 PSI); NORMAL WEIGHT STRUCTURAL CONCRETE TO BE USED IN ALL STRUCTURES QUALIFYING AS ENVIRONMENTAL CONCRETE STRUCTURES THAT ARE DESIGNED IN ACCORDANCE WITH ACI 350 INCLUDING PUMP STATIONS, TANKS, BASINS, PROCESS STRUCTURES, AND ANY STRUCTURES CONTAINING FLUID OR PROCESS CHEMICALS OR OTHER MATERIALS USED IN TREATMENT PROCESS.
 B) CLASS A6 CONCRETE (4,500 PSI); NORMAL WEIGHT STRUCTURAL CONCRETE TO BE USED WHERE SPECIFICALLY CALLED FOR ON CONTRACT DRAWINGS OR AREAS WHERE SPECIFICALLY REQUESTED BY CONTRACTOR AND APPROVED BY ENGINEER. CLASS A6 CONCRETE IS IDENTICAL TO CLASS A1 CONCRETE EXCEPT THAT COARSE AGGREGATE SPECIFIED SHALL BE SIZE #8 IN ACCORDANCE WITH ASTM C33.
 C) CLASS B CONCRETE (3,000 PSI); NORMAL WEIGHT STRUCTURAL CONCRETE USED FOR DUCT BANK ENCASUREMENTS, CATCH BASINS, FENCE AND GUARD POST EMBEDMENT, CONCRETE FILL, AND OTHER AREAS WHERE SPECIFICALLY NOTED ON CONTRACT DRAWINGS.
- C-4 ALL BAR REINFORCING SHALL CONFORM TO ASTM A615, GRADE 60. WHERE REINFORCEMENT IS TO BE WELDED IN ACCORDANCE WITH AWS D1.4, ASTM A706 GRADE 60 SHALL BE USED. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- C-5 CONCRETE COVER FOR REINFORCING (UNLESS NOTED OTHERWISE ON THE DRAWINGS):
 A) CONCRETE DEPOSITED DIRECTLY AGAINST SOIL: 3"
 B) CONCRETE EXPOSED TO WEATHER (#5 OR SMALLER): 1 1/2"
 C) CONCRETE EXPOSED TO WEATHER (#8 OR LARGER): 2"
 D) SLABS:
 AT SURFACES CONTACTING FLUID: 1 1/2"
 BEAMS AND COLUMNS (TO MAIN REINFORCEMENT): 2"
 BEAMS AND COLUMNS (TO COLUMN TIES OR STIRRUPS): 1 1/2"
 E) WALLS 12" OR MORE: 2"
 WALLS LESS THAN 12" (#5 OR SMALLER): 1 1/2"
 WALLS LESS THAN 12" (#8 OR LARGER): 2"
 F) FOR SURFACES EXPOSED TO FLUID IN BEAMS, COLUMNS AND WALLS: ADD 1/2" TO ABOVE VALUES
- C-6 SPLICES SHALL BE CLASS "B" CONFORMING TO THE PROVISIONS OF ACI 318 UNLESS NOTED OTHERWISE. SPLICE LENGTH FOR TWO DIFFERENT SIZED BARS TO BE LAP SPICED TOGETHER SHALL BE THE LENGTH OF THE LARGER BAR UNLESS NOTED OTHERWISE.
- C-7 CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION JOINTS NOT SHOWN SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE APPROVAL OF THE ENGINEER PRIOR TO SUBMITTING REBAR SHOP DRAWINGS. VERTICAL CONSTRUCTION JOINTS IN WALLS AND HORIZONTAL JOINTS IN SLABS SHALL BE PROVIDED AT A SPACING NOT GREATER THAN 45 FEET ON CENTER. FOR EXPOSED WALLS WITH FLUID OR EARTH ON THE OPPOSITE SIDE, THE SPACING BETWEEN VERTICAL AND HORIZONTAL JOINTS SHALL BE A MAXIMUM OF 25 FEET.
- C-8 WHERE HORIZONTAL CONSTRUCTION JOINTS, LOCATED ABOVE THE FOUNDATION SLAB, EXTEND BEYOND WHERE NEEDED, THEY SHALL BE TERMINATED AT A VERTICAL CONSTRUCTION JOINT APPROVED BY THE ENGINEER.
- C-9 ALL JOINTS WHICH ARE IN MEMBERS IN CONTACT WITH LIQUID OR BELOW GRADE SHALL HAVE A WATERSTOP. CONSTRUCTION JOINTS SHALL HAVE A 6" PVC RIBBED WATERSTOP. EXPANSION JOINTS SHALL HAVE A 9" PVC CENTER BULB RIBBED WATERSTOP. IN VERTICAL JOINTS, WATERSTOPS SHALL TERMINATE NO LESS THAN 18" ABOVE THE MAXIMUM WATER SURFACE OR 18" ABOVE GRADE, WHICHEVER IS HIGHER.
- C-10 ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER.
- C-11 EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DOCUMENTS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.
- C-12 REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY METAL PIPE, PIPE FLANGE, METAL CONDUIT, OR OTHER METAL PARTS EMBEDDED IN CONCRETE. A MINIMUM CLEARANCE OF 2" SHALL BE PROVIDED.
- C-13 DOWELS, ANCHOR BOLTS, PIPES, WATERSTOPS AND OTHER EMBEDDED ITEMS SHALL BE HELD SECURELY IN POSITION WHILE CONCRETE IS BEING PLACED.
- C-14 CONDUITS AND OTHER SIMILAR ITEMS EMBEDDED IN OR PENETRATING THROUGH CONCRETE SHALL BE SPACED ON CENTER NOT LESS THAN 3 TIMES THEIR OUTSIDE DIMENSION, BUT NOT LESS THAN 2 1/2" CLEAR. WHEN SUCH ITEMS ARE EMBEDDED IN WALLS OR SLABS, THEY SHALL NOT OCCUPY MORE THAN 1/3 OF THE MEMBER THICKNESS.
- C-15 AT ALL TYPICAL CURBS, EQUIPMENT PADS, AND PIPE SUPPORT PIERS, REINFORCING DOWELS SHOWN MAY BE REPLACED WITH MATCHING DOWELS SET IN EPOXY IN DRILLED HOLES AS SPECIFIED. DOWELS LOCATED CLOSER THAN 3" FROM ANY EDGE OF CONCRETE SHALL NOT BE REPLACED WITH DRILLED DOWELS.
- C-16 DRILLED ADHESIVE DOWELS AND CONCRETE ANCHORS (WHERE DOWELS OR ANCHORS ARE SHOWN TO BE PLACED INTO HARDENED CONCRETE):
 A) THE HOLE DIAMETER SHALL BE NO LARGER THAN 1/8" GREATER THAN THE DIAMETER OF THE REINFORCING BAR AT THE DEFORMATIONS FOR DOWELS. THE HOLE DIAMETER SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS FOR ANCHORS.
 B) THE DEPTH OF EMBEDMENT SHALL BE 12 BAR DIAMETERS, UNLESS NOTED OTHERWISE.
 C) ADJUST THE DOWEL OR ANCHOR LOCATIONS AS NEEDED TO AVOID DRILLING THROUGH ANY REINFORCING BARS. IF THE LOCATION NEEDS TO BE MODIFIED, CONTACT THE ENGINEER. CONTRACTOR SHALL USE NON-DESTRUCTIVE MEANS TO FIELD LOCATE REINFORCEMENT PRIOR TO DRILLING HOLES FOR DOWELS OR ANCHORS.
- C-17 CLEAR DISTANCE FROM ANCHOR RODS TO ANY CONCRETE EDGE SHALL BE 4" MINIMUM UNLESS NOTED OTHERWISE.
- C-18 CONCRETE COMPRESSIVE STRENGTH TESTS SHALL BE AVAILABLE ON THE JOB SITE FOR REVIEW BY THE ENGINEER.

PLOT DATE: 2020/10/28 9:30:00 AM BY: YKELLINGHUSEN
 FILE: C:\UNIVERSITY\PROJECTS\2020\10\28\17151 - Parallel Interceptor.dwg Scale: 1/8" = 1'-0"

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen
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 CARY, NC 27511
 LICENSE NO. : P-1611

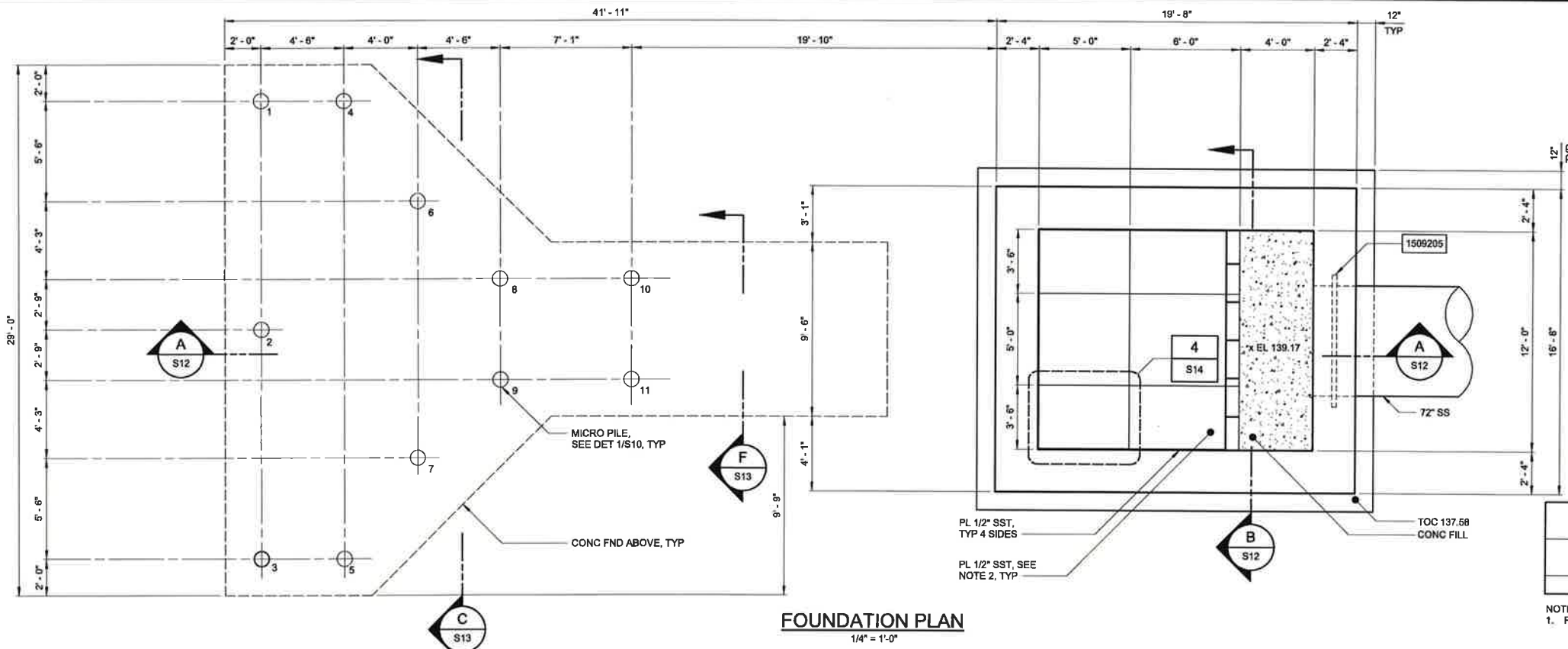
CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

**PARALLEL INTERCEPTOR
 GENERAL STRUCTURAL NOTES**

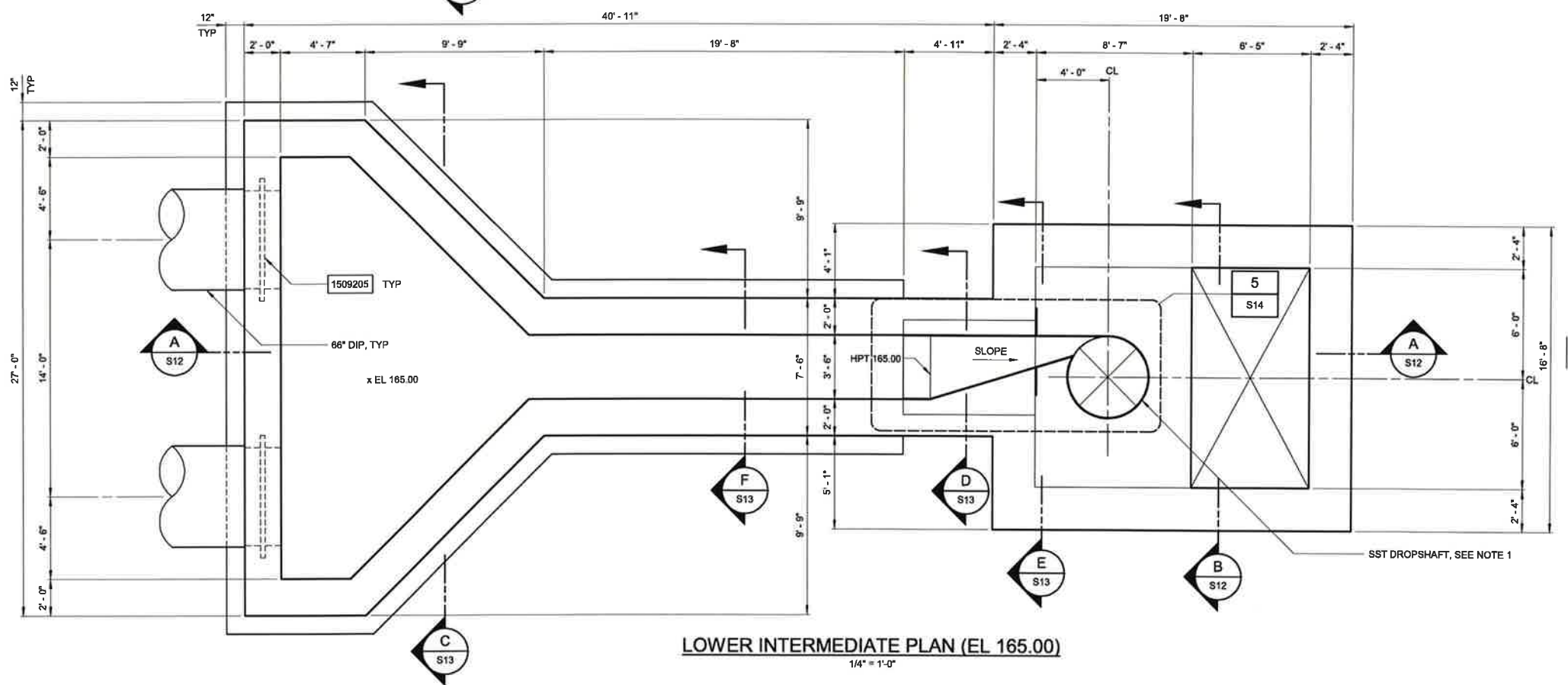


FINAL DESIGN

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S1



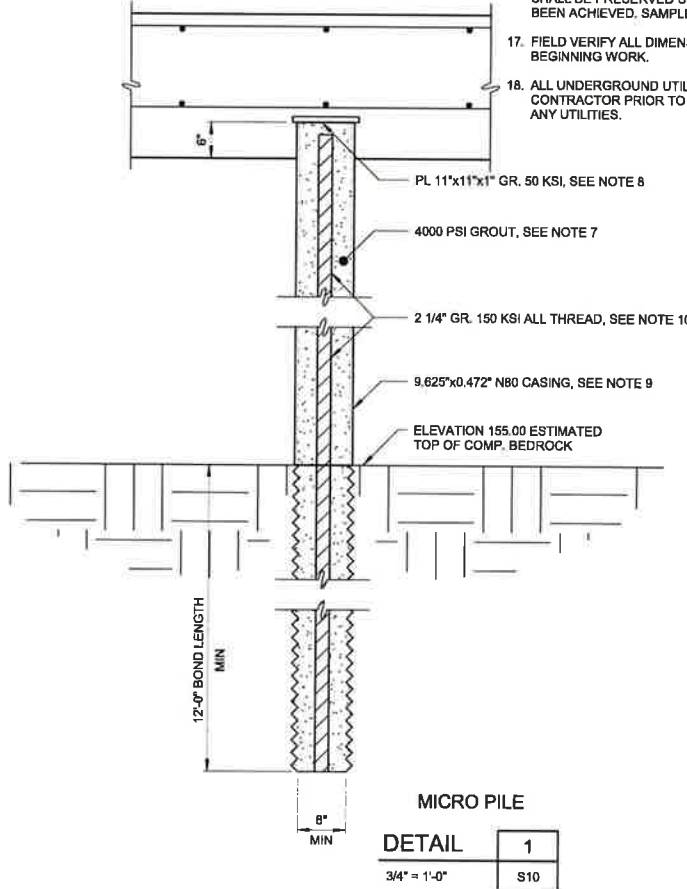
FOUNDATION PLAN
1/4" = 1'-0"



LOWER INTERMEDIATE PLAN (EL 165.00)
1/4" = 1'-0"

MICRO PILE SCHEDULE	
PILE NUMBER	VERTICAL CAPACITY (TONS)
1-11	100

NOTES:
1. FOR MICRO PILE DETAIL, SEE DET 1/S10



MICRO PILE DETAIL 1
3/4" = 1'-0"

- NOTES:**
- SEE DETAILS 14 AND 15/S16 FOR DROPSHAFT AND PLATE LINER PLAN. SEE DETAIL 5/S14 FOR CONCRETE FILL REINFORCEMENT PLAN.
 - SEE DETAIL 4/S-14 FOR SST PLATE LINER AT BOTTOM SLAB AND BAFFLE BOX.
 - THE MICROPILES HAVE BEEN DESIGNED IN GENERAL ACCORDANCE WITH IBC.
 - THE MICROPILE SYSTEM HAS BEEN DESIGNED USING THE GEOTECHNICAL REPORT PREPARED BY GEOTECHNOLOGIES, INC. DATED MAY 2, 2019.
 - AN ULTIMATE GROUT TO ROCK BOND OF 200 PSI HAS BEEN USED IN THE DESIGN OF THE PILES, WITH A FACTOR OF SAFETY OF 3.0.
 - LAYOUT OF THE PILES SHALL BE BY THE GENERAL CONTRACTOR. PILE LAYOUT IS BASED ON PILE LOCATION AT THE BOTTOM OF THE PILE CAP. GENERAL CONTRACTOR SHALL LAY OUT PILES BASED ON DRILLING ELEVATION SUCH THAT THE PILE LOCATION WILL BE AT THE PLANNED LOCATION AT THE BOTTOM OF THE PILE CAP.
 - PROVIDE A CEMENT GROUT THAT HAS A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF $f_c = 4000$ PSI. THE GROUT SHALL BE MADE WITH CEMENT THAT MEETS ASTM C150 TYP III OR II.
 - FOR MICROPILES PROVIDE STEEL PLATES THAT MEET ASTM A572 GRADE 50 KSI.
 - PROVIDE N80 CASING WITH A MINIMUM YIELD STRENGTH OF 80 KSI FOR ALL PILE TYPES.
 - ALL THREAD REINFORCEMENT SHALL MEET ASTM A722 150 KSI. REINFORCEMENT SHALL BE CENTERED IN MICROPILE.
 - ROTARY FLUSH CASING TO TOP OF ROCK USING AIR OR WATER AS FLUSHING MEDIUM.
 - USE ROTARY PERCUSSIVE DRILLING TO DRILL ROCK SOCKET TO REQUIRED DEPTH. THE BOND LENGTH CAN BE CUMULATIVE WITH SMALL DISCONTINUITIES SO LONG AS THE LAST 6'-0" IS CONTINUOUS.
 - PLACE GROUT FOR PILES BY TREMIE METHOD FROM BOTTOM OF THE HOLE.
 - INSTALL CENTER CORE REINFORCEMENT STEEL (STEEL MAY BE PLACED PRIOR TO OR IMMEDIATELY AFTER GROUTING).
 - CUT TOPS OF PILES TO FINAL ELEVATION.
 - A MINIMUM OF SIX (6) GROUT SAMPLES SHALL BE CAST DAILY DURING GROUTING OPERATIONS WITH A MINIMUM OF ONE TESTED AT THREE (3) AND SEVEN (7) DAYS. THE REMAINING GROUT SAMPLES SHALL BE PRESERVED UNTIL THE DESIGN GROUT STRENGTH HAS BEEN ACHIEVED. SAMPLES SHALL BE CAST IN 3x6 CYLINDERS.
 - FIELD VERIFY ALL DIMENSIONS AND JOB SITE CONDITIONS PRIOR TO BEGINNING WORK.
 - ALL UNDERGROUND UTILITIES SHALL BE LOCATED BY THE GENERAL CONTRACTOR PRIOR TO DRILLING. HAZEN SHALL BE NOTIFIED OF ANY UTILITIES.

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PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
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320 S. ACADEMY STREET
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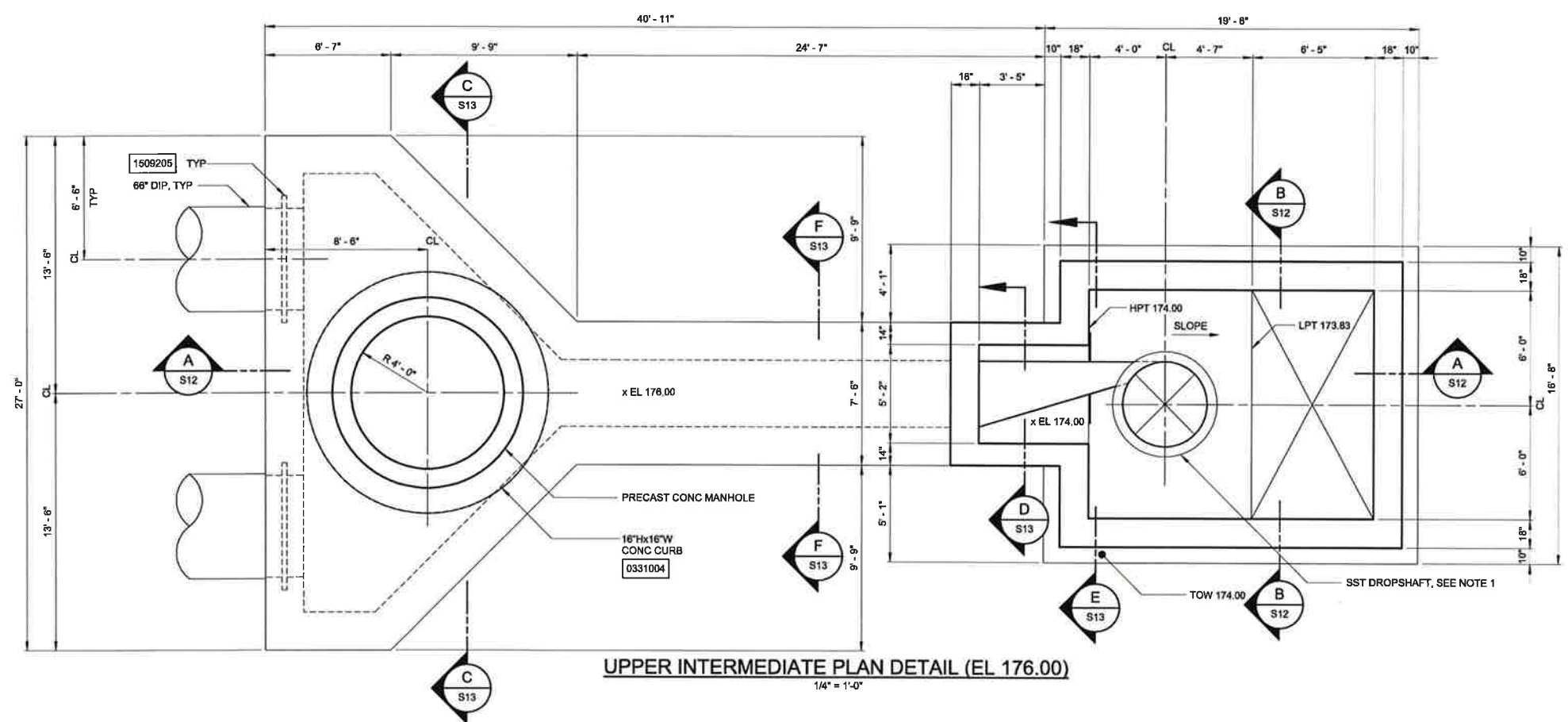
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PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

DROPSHAFT STRUCTURE
FOUNDATION AND LOWER
INTERMEDIATE PLANS

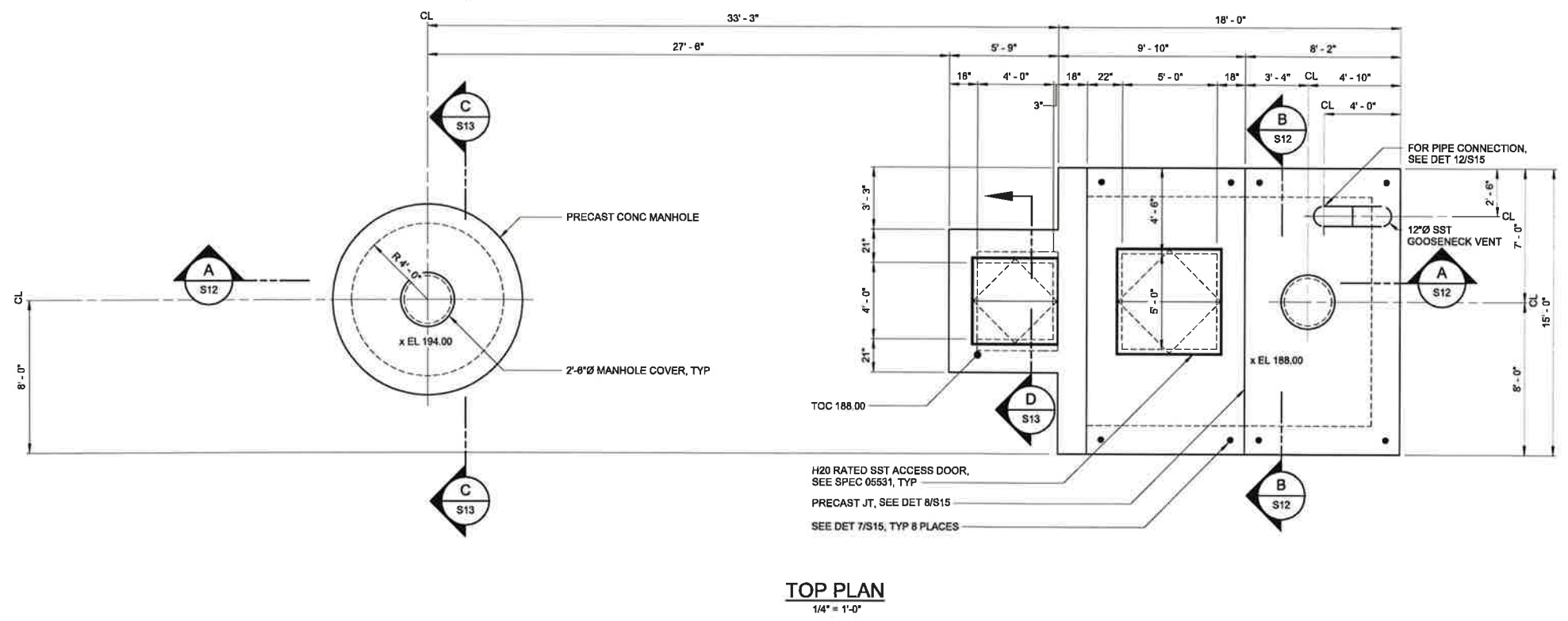


DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S10

- NOTES:
- SEE DETAILS 14 AND 15/S16 FOR DROPSHAFT AND PLATE LINER PLAN, SEE DETAIL 5/S14 FOR CONCRETE FILL REINFORCEMENT PLAN.



UPPER INTERMEDIATE PLAN DETAIL (EL 176.00)
1/4" = 1'-0"



TOP PLAN
1/4" = 1'-0"

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
City of Raleigh Development Approval _____



FINAL DESIGN

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DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE.	0 1/2" 1"



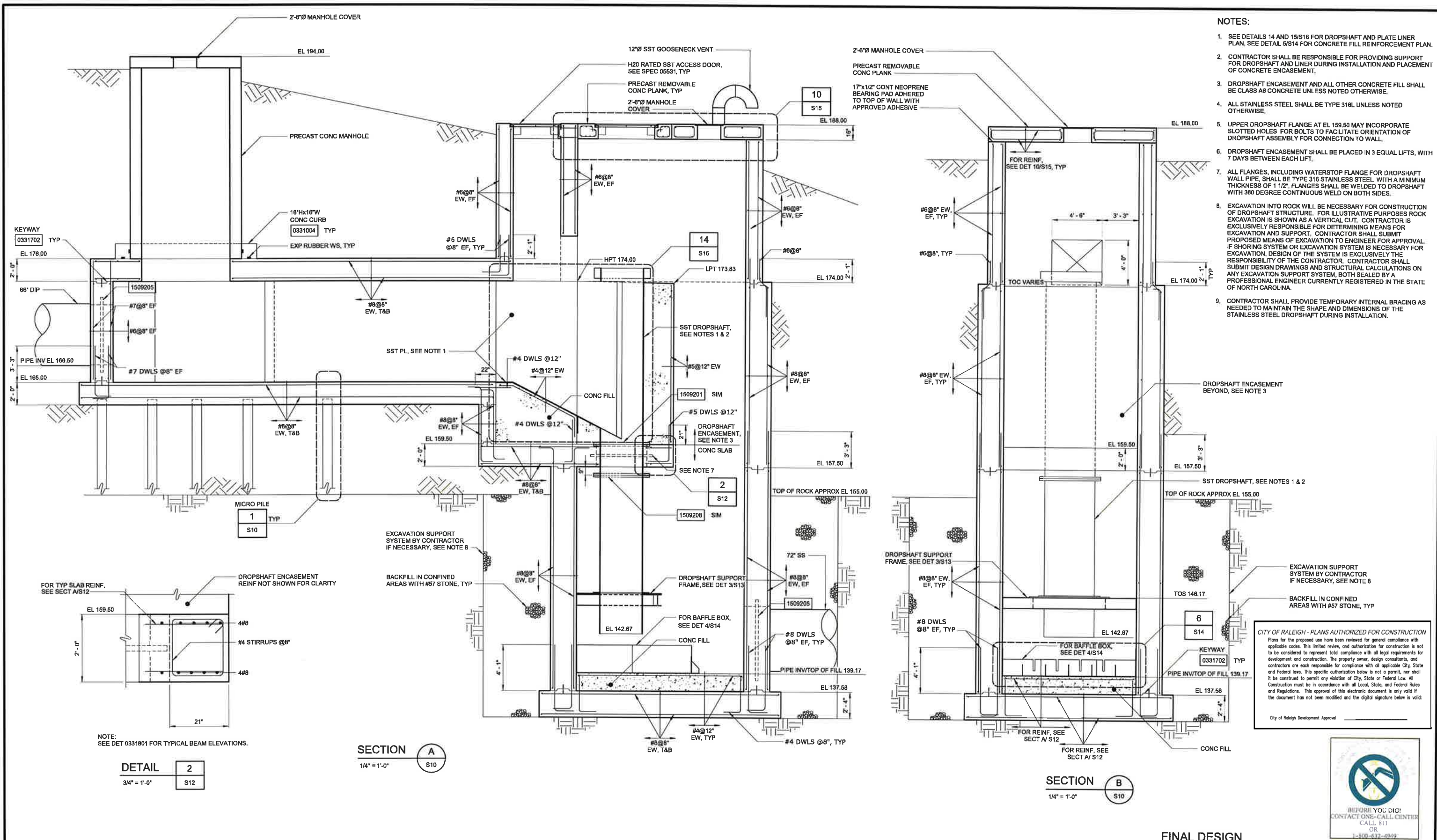
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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

DROPSHAFT STRUCTURE
STRUCTURAL
UPPER INTERMEDIATE AND TOP PLANS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S11



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PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



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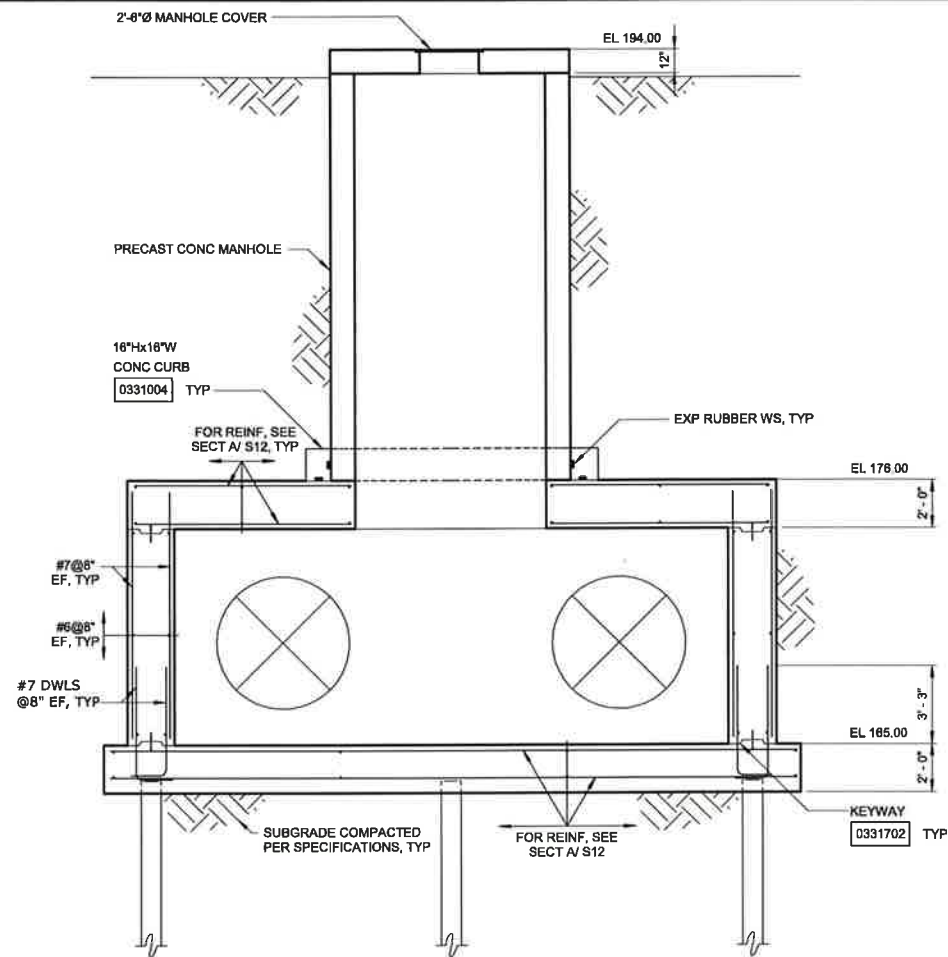
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PUBLIC UTILITIES DEPARTMENT
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PARALLEL INTERCEPTOR

DROPSHAFT STRUCTURE
STRUCTURAL
SECTIONS

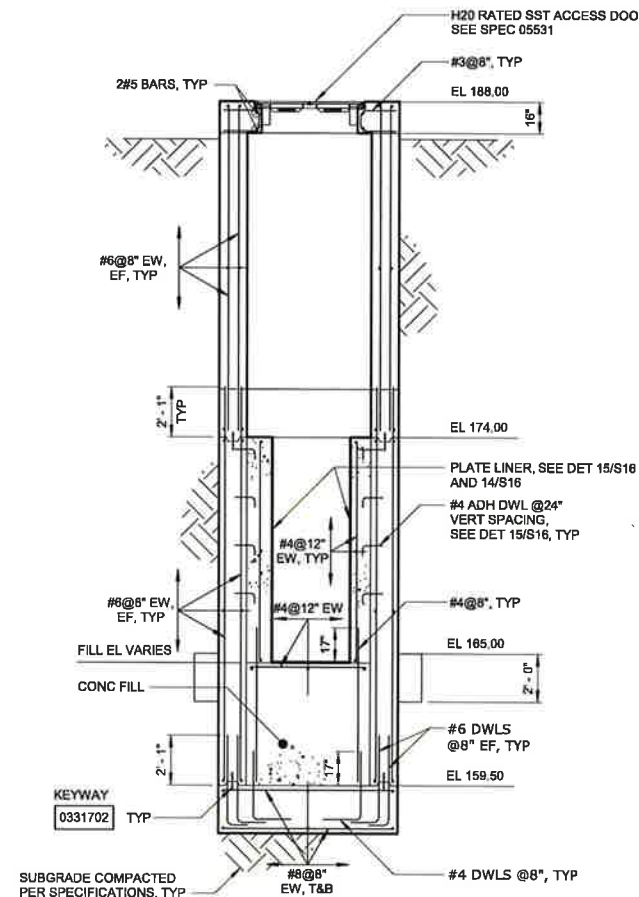
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HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S12



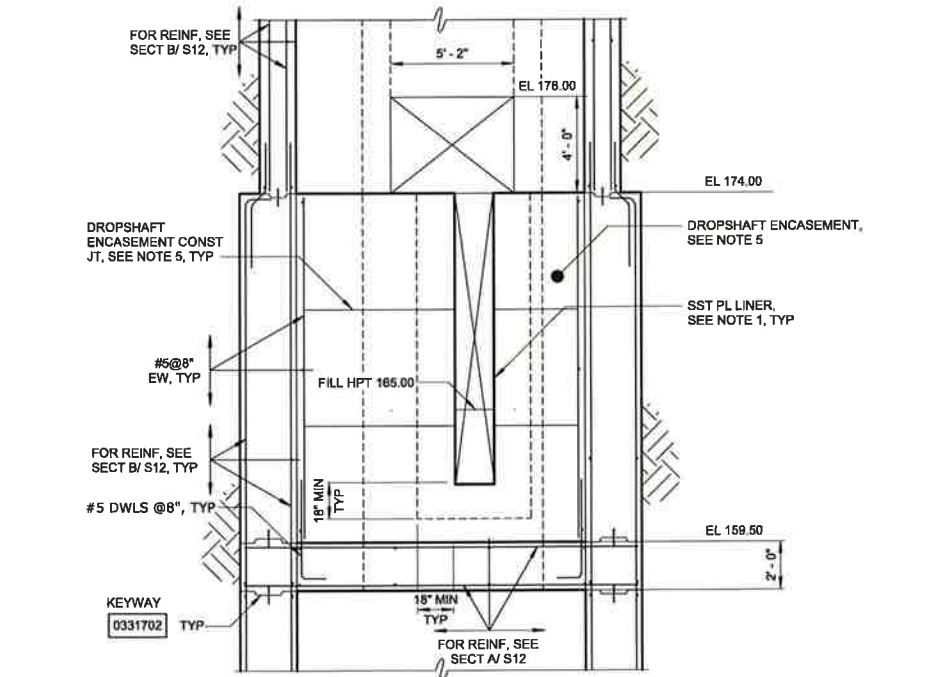
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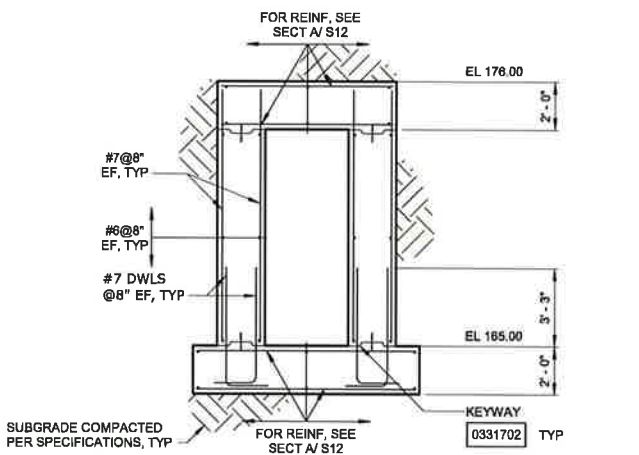
SECTION C
1/4" = 1'-0" S10



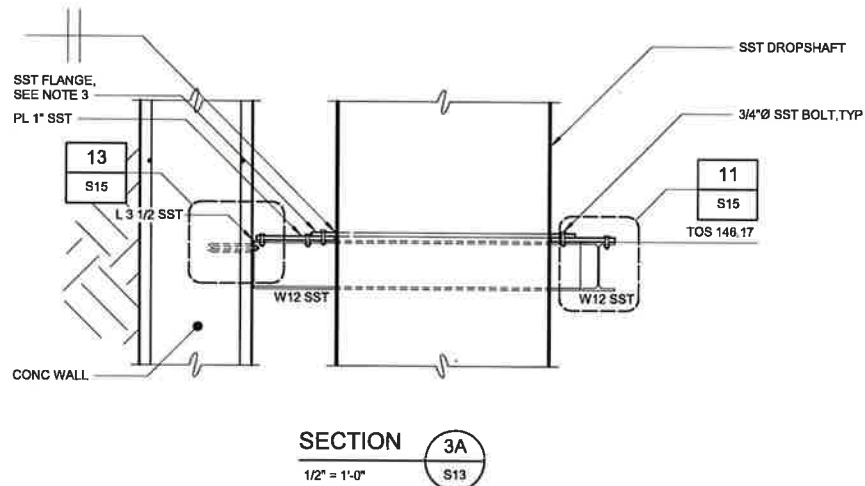
SECTION D
1/4" = 1'-0" S10



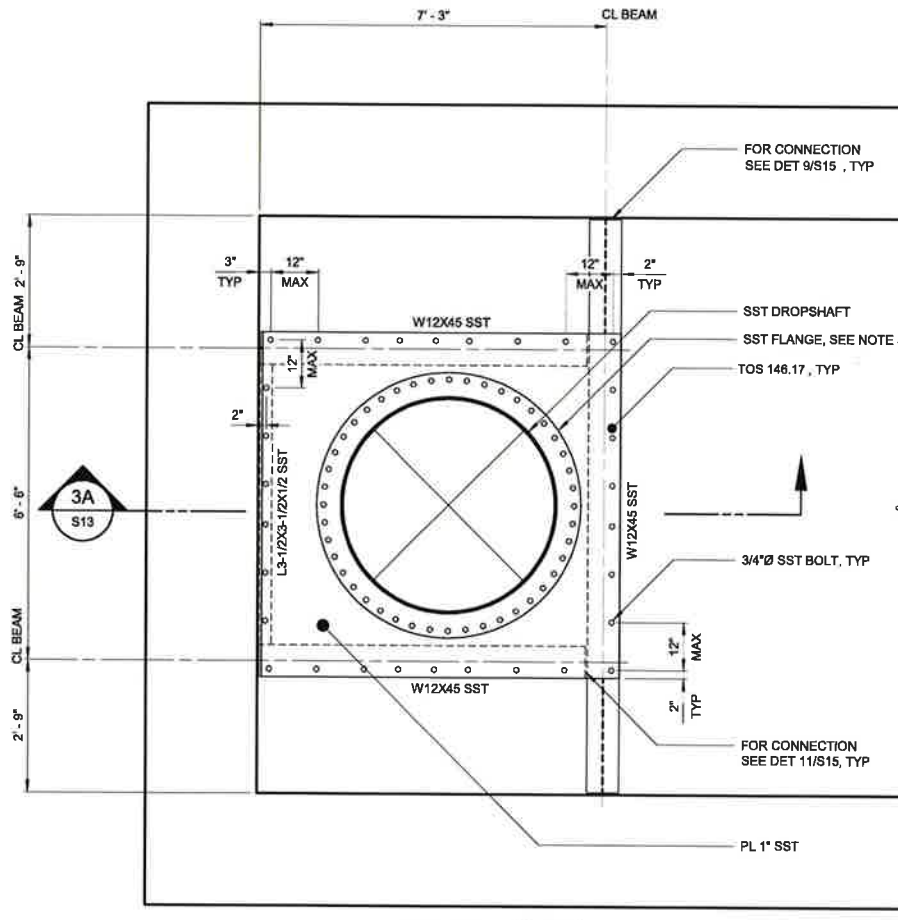
SECTION E
1/4" = 1'-0" S10



SECTION F
1/4" = 1'-0" S10



SECTION 3A
1/2" = 1'-0" S13



DETAIL 3
1/2" = 1'-0" S12

- NOTES:
- SEE DETAIL 14/S18 FOR DROPSHAFT AND PLATE LINER PLAN. SEE DETAIL 6/S14 FOR CONCRETE FILL REINFORCEMENT PLAN.
 - ALL STAINLESS STEEL SHALL BE TYPE 316L UNLESS NOTED OTHERWISE.
 - ALL FLANGES, INCLUDING WATERSTOP FLANGE FOR DROPSHAFT WALL PIPE, SHALL BE TYPE 316 STAINLESS STEEL WITH A MINIMUM THICKNESS OF 1 1/2". FLANGES SHALL BE WELDED TO DROPSHAFT WITH 380 DEGREE CONTINUOUS WELD ON BOTH SIDES.
 - DROPSHAFT ENCASMENT AND ALL OTHER CONCRETE FILL SHALL BE CLASS A8 CONCRETE UNLESS NOTED OTHERWISE.
 - DROPSHAFT ENCASMENT SHALL BE PLACED IN 3 EQUAL LIFTS, WITH 7 DAYS BETWEEN EACH LIFT.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid:

City of Raleigh Development Approval



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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen

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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

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PARALLEL INTERCEPTOR

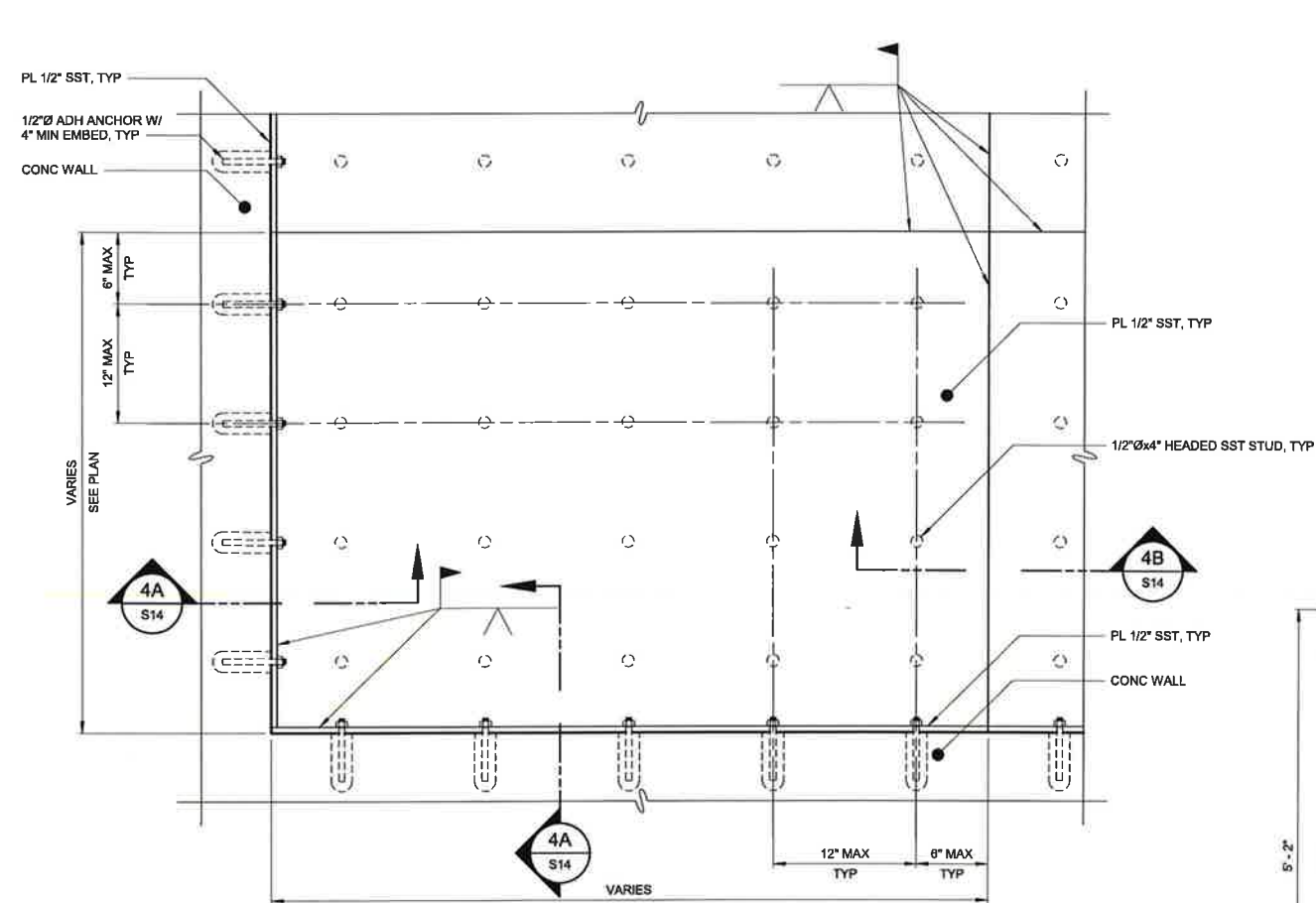
DATE: NOVEMBER 2020

HAZEN NO.: 32426-000

CONTRACT NO.: 1

DRAWING NUMBER: S13

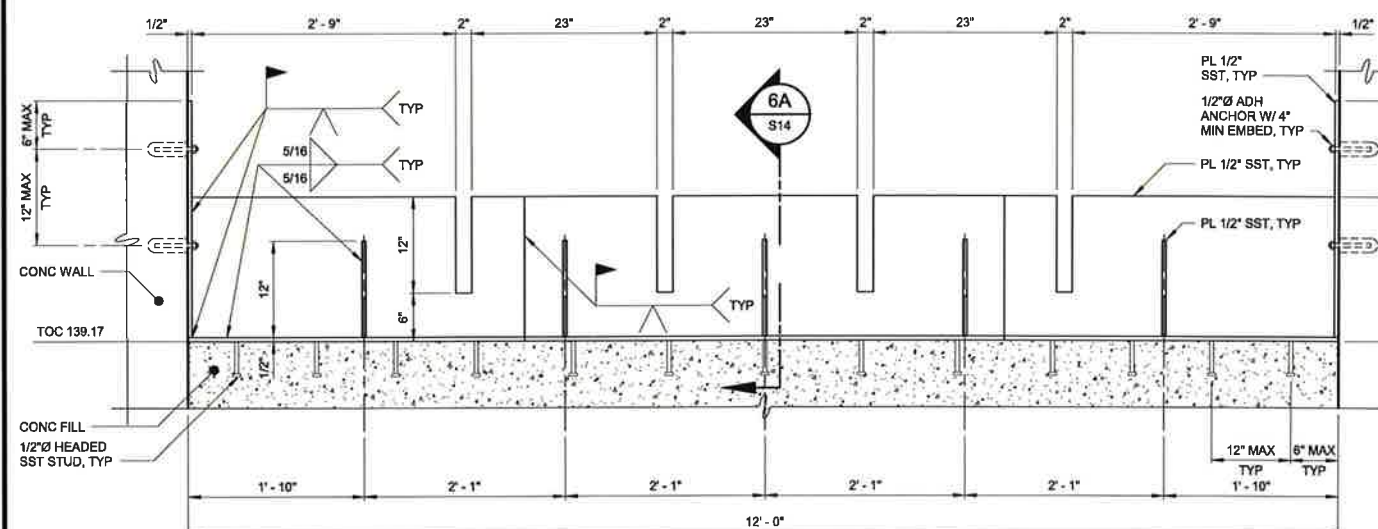
FINAL DESIGN



NOTE:
REINFORCING NOT SHOWN FOR CLARITY. SEE
FOUNDATION PLAN/S10 FOR PLATE OVERALL DIMENSIONS.

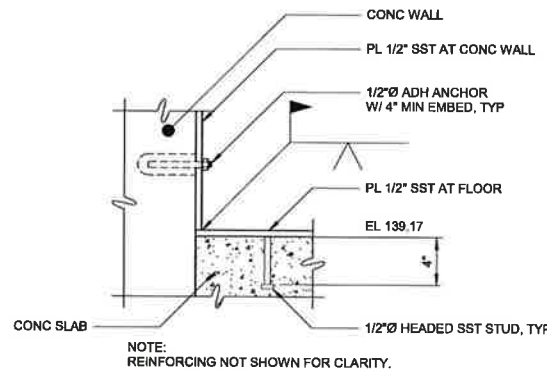
BAFFLE BOX PARTIAL PLAN

DETAIL	4
1 1/2" = 1'-0"	S10

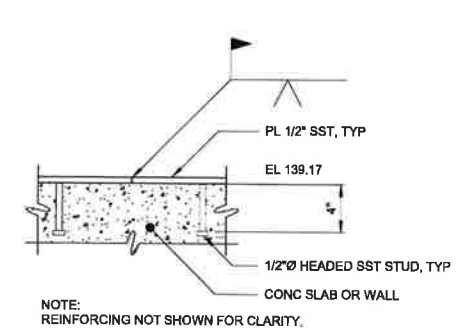


NOTE:
REINFORCING NOT SHOWN FOR CLARITY.

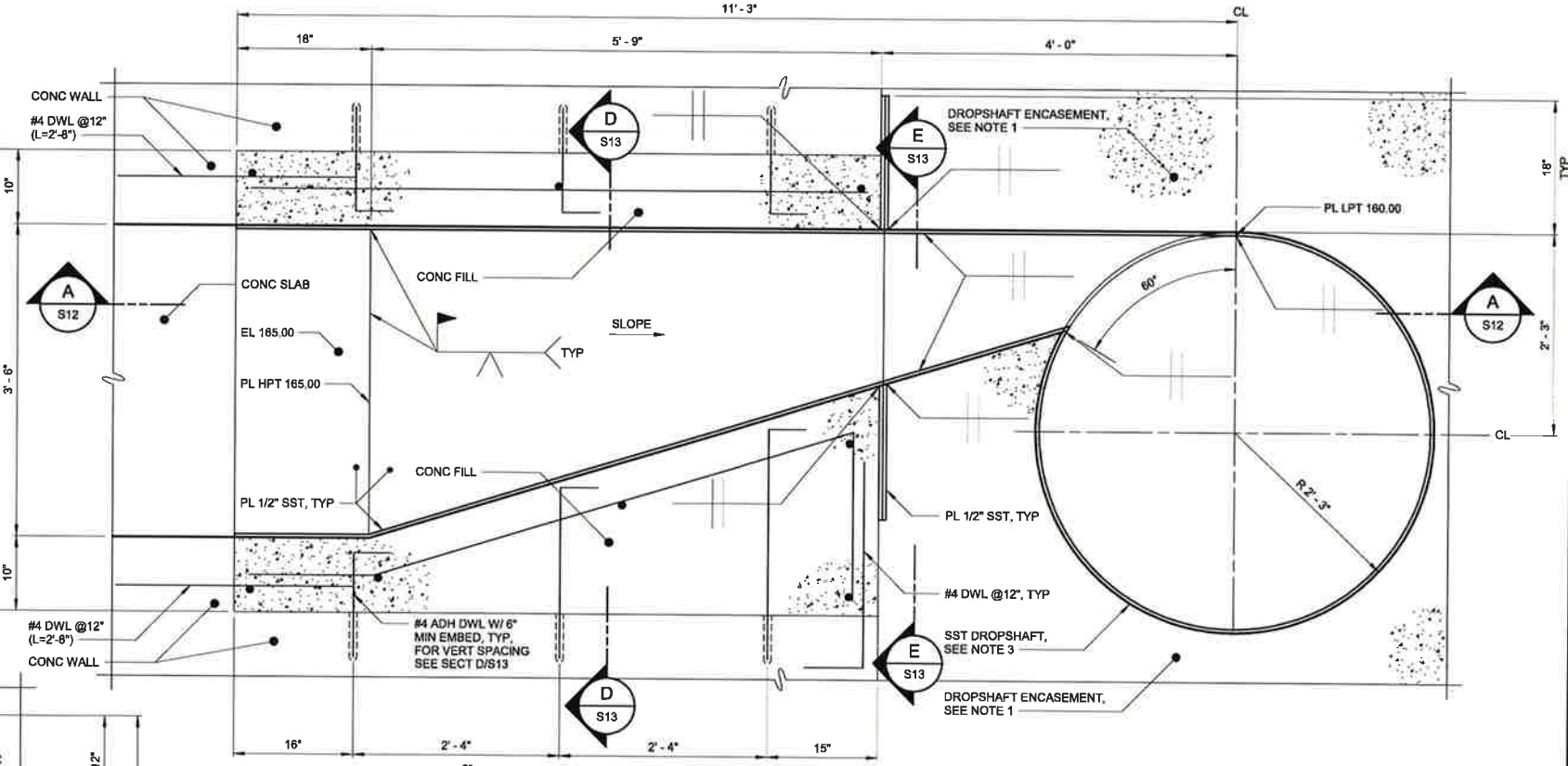
DETAIL	6
1" = 1'-0"	S12



SECTION 4A
1 1/2" = 1'-0"

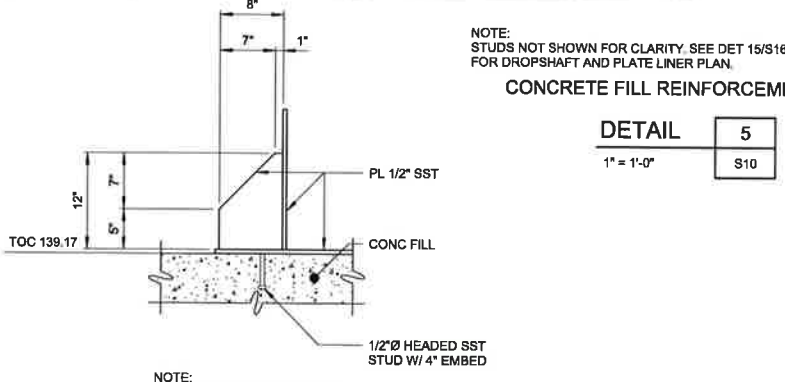


SECTION 4B
1 1/2" = 1'-0"



NOTE:
STUDS NOT SHOWN FOR CLARITY. SEE DET 15/S18
FOR DROPSHAFT AND PLATE LINER PLAN.

CONCRETE FILL REINFORCEMENT PLAN



DETAIL	5
1" = 1'-0"	S10

NOTE:
REINFORCING AND WELDS NOT SHOWN FOR CLARITY.

SECTION 6A
1" = 1'-0"

NOTES:

- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPORT FOR DROPSHAFT AND LINER DURING INSTALLATION AND PLACEMENT OF CONCRETE ENCASEMENT.
- DROPSHAFT ENCASEMENT AND ALL OTHER CONCRETE FILL SHALL BE CLASS AB CONCRETE UNLESS NOTED OTHERWISE.
- STAINLESS STEEL DROPSHAFT WALL THICKNESS SHALL BE 1/2" MINIMUM.
- ALL STAINLESS STEEL SHALL BE TYPE 316L UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL PROVIDE TEMPORARY INTERNAL BRACING AS NEEDED TO MAINTAIN THE SHAPE AND DIMENSIONS OF THE STAINLESS STEEL DROPSHAFT DURING INSTALLATION.

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
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City of Raleigh Development Approval



FINAL DESIGN

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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
P-1611

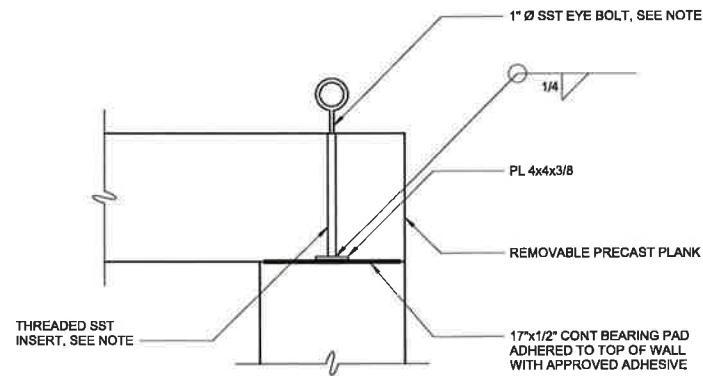
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

DROPSHAFT STRUCTURE
STRUCTURAL
SECTIONS AND DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S14

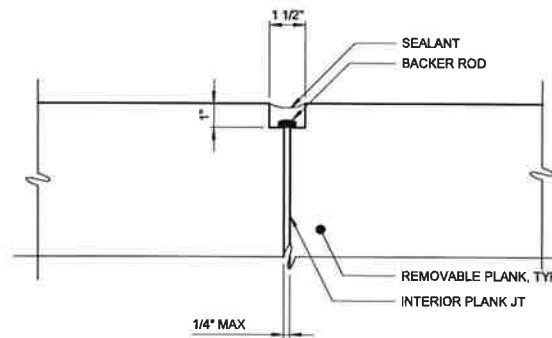
NOTES:

1. CONCRETE FILL SHALL BE CLASS A6 CONCRETE UNLESS NOTED OTHERWISE.
2. ALL STAINLESS STEEL SHALL BE TYPE 316L UNLESS NOTED OTHERWISE.

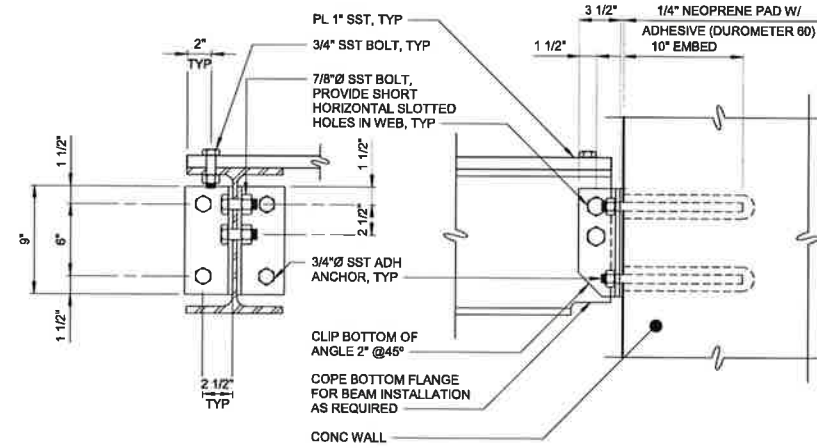


NOTE:
EYE BOLT AND INSERT SHALL HAVE A MINIMUM ALLOWABLE TENSILE CAPACITY OF 6000 LB AND A MINIMUM ALLOWABLE SHEAR CAPACITY OF 4000 LB. EYE BOLT SHALL BE REMOVED FROM INSERT WHEN NOT IN USE. PROVIDE 6 STAINLESS STEEL PLUGS TO BE PLACED IN INSERT WHEN EYE BOLT NOT IN USE.

DETAIL 7
1" = 1'-0" S15

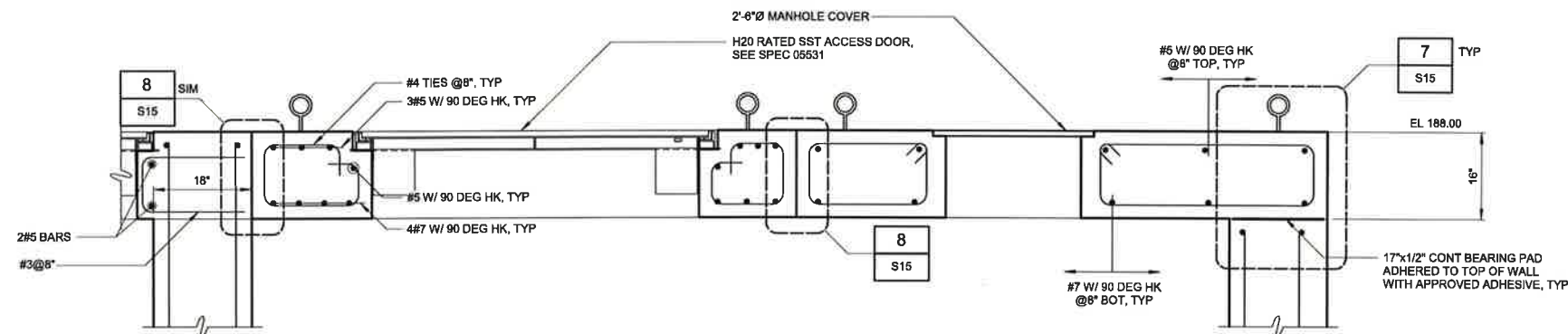


DETAIL 8
3" = 1'-0" S15

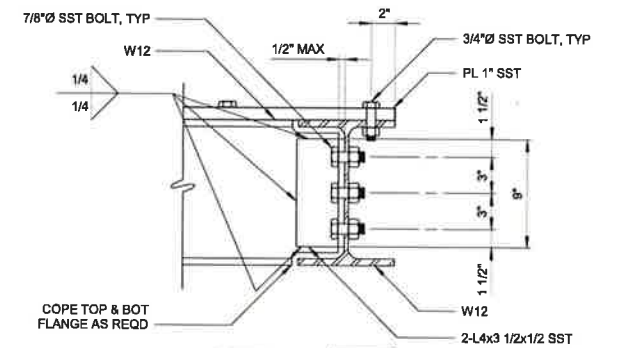


NOTE:
DURING INSTALLATION OF ADHESIVE ANCHORS WALL HORIZONTAL REINFORCEMENT SHALL NOT BE CUT. PRIOR TO FABRICATION FIELD LOCATE REINFORCEMENT AND LENGTHEN ANGLES AS REQUIRED LOWER ANCHORS TO CLEAR REINFORCEMENT.

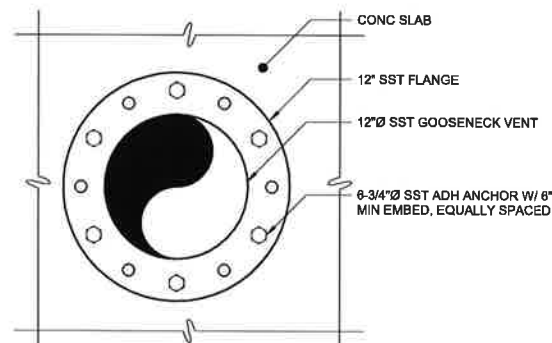
DETAIL 9
1 1/2" = 1'-0" S13



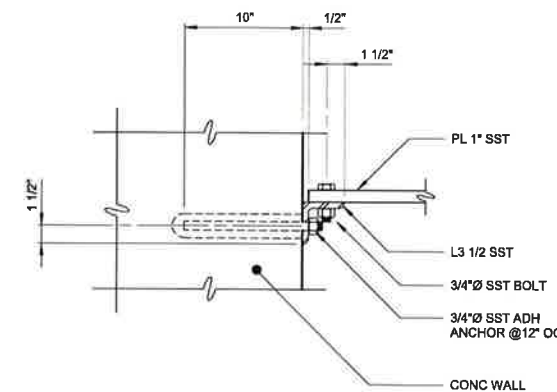
DETAIL 10
3/4" = 1'-0" S12



DETAIL 11
1 1/2" = 1'-0" S13



DETAIL 12
1 1/2" = 1'-0" S11



DETAIL 13
1 1/2" = 1'-0" S13

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FINAL DESIGN

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PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	A. THURSTON		
DRAWN BY:	Y. KELLINGHUSEN		
CHECKED BY:	C. PHILLIPS		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"		
REV	ISSUED FOR	DATE	BY



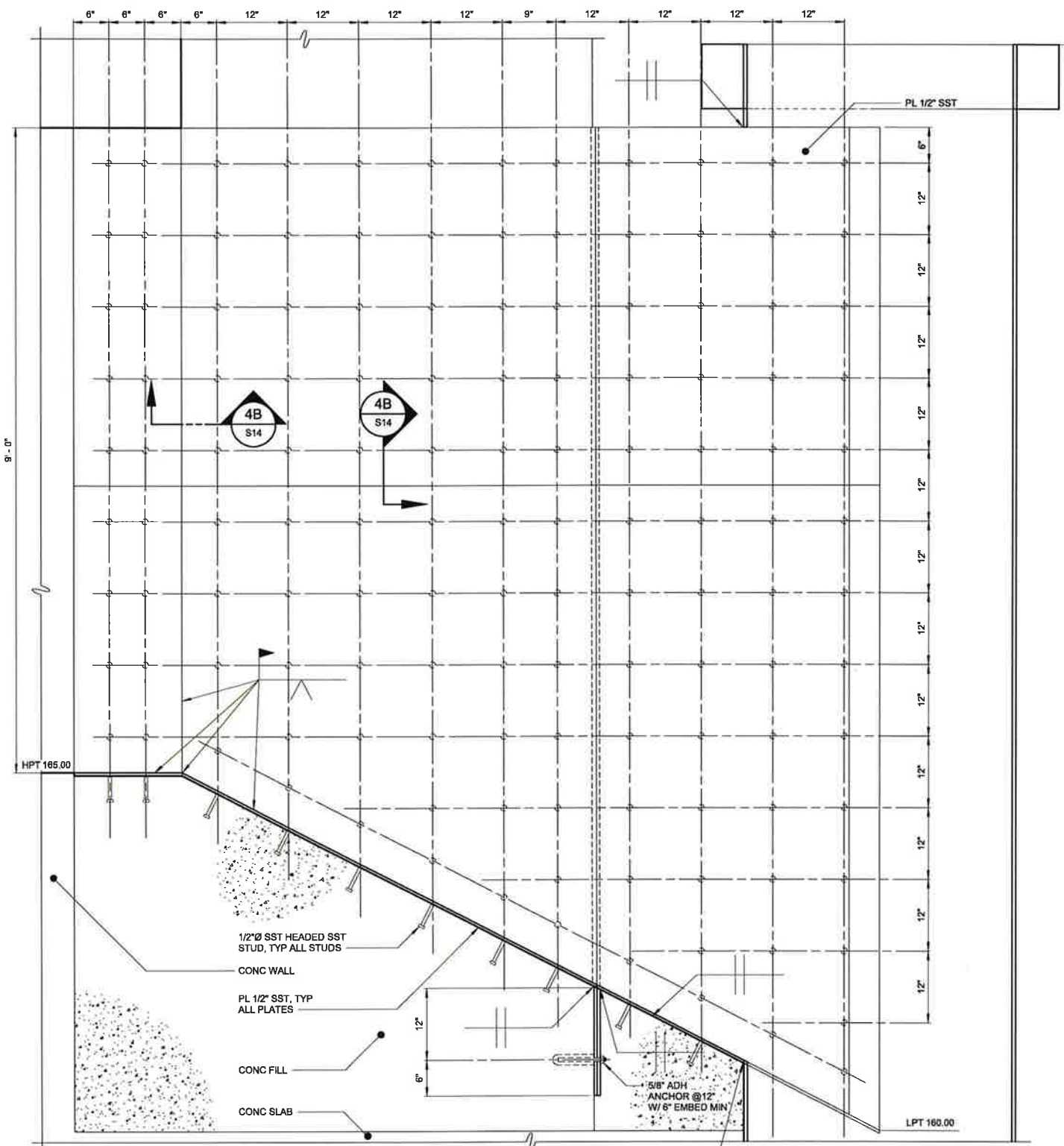
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

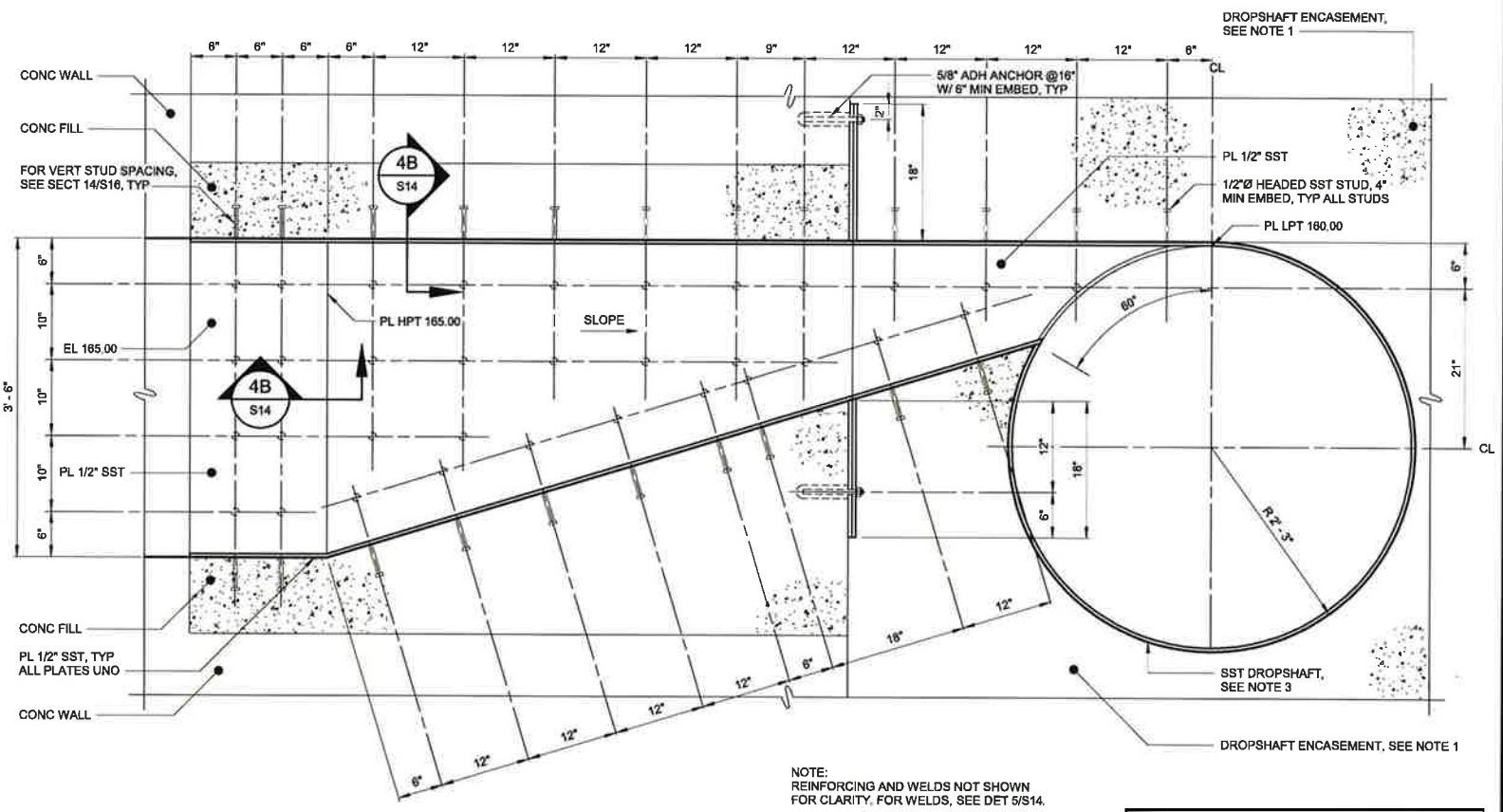
DROPSHAFT STRUCTURE
STRUCTURAL
DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S15



NOTE:
REBAR NOT SHOWN FOR CLARITY.

DETAIL 14
1" = 1'-0" S12



NOTE:
REINFORCING AND WELDS NOT SHOWN
FOR CLARITY. FOR WELDS, SEE DET 5/S14.

DROPSHAFT AND PLATE LINER PLAN
DETAIL 15
1" = 1'-0" S10

- NOTES:
1. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SUPPORT FOR DROPSHAFT DURING INSTALLATION AND PLACEMENT OF CONCRETE ENCASEMENT.
 2. DROPSHAFT ENCASEMENT AND ALL OTHER CONCRETE FILL SHALL BE CLASS A6 CONCRETE UNLESS NOTED OTHERWISE.
 3. STAINLESS STEEL DROPSHAFT WALL THICKNESS SHALL BE 1/4" MINIMUM.
 4. ALL STAINLESS STEEL SHALL BE TYPE 316L UNLESS NOTED OTHERWISE.
 5. CONTRACTOR SHALL PROVIDE TEMPORARY INTERNAL BRACING AS NEEDED TO MAINTAIN THE SHAPE AND DIMENSIONS OF THE STAINLESS STEEL DROPSHAFT DURING INSTALLATION.

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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE.	0 1/2" 1"



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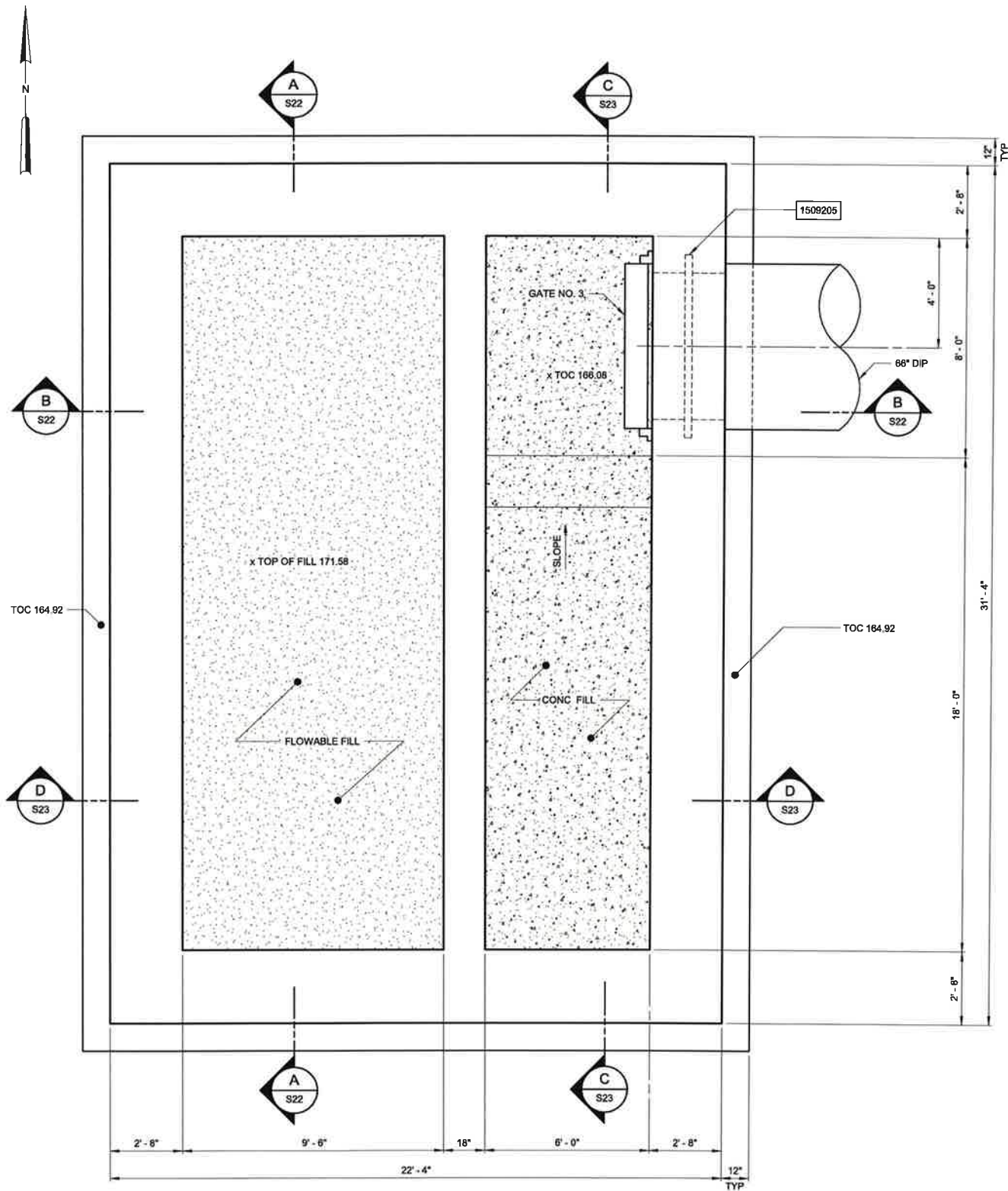
DROPSHAFT STRUCTURE
STRUCTURAL
DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S16

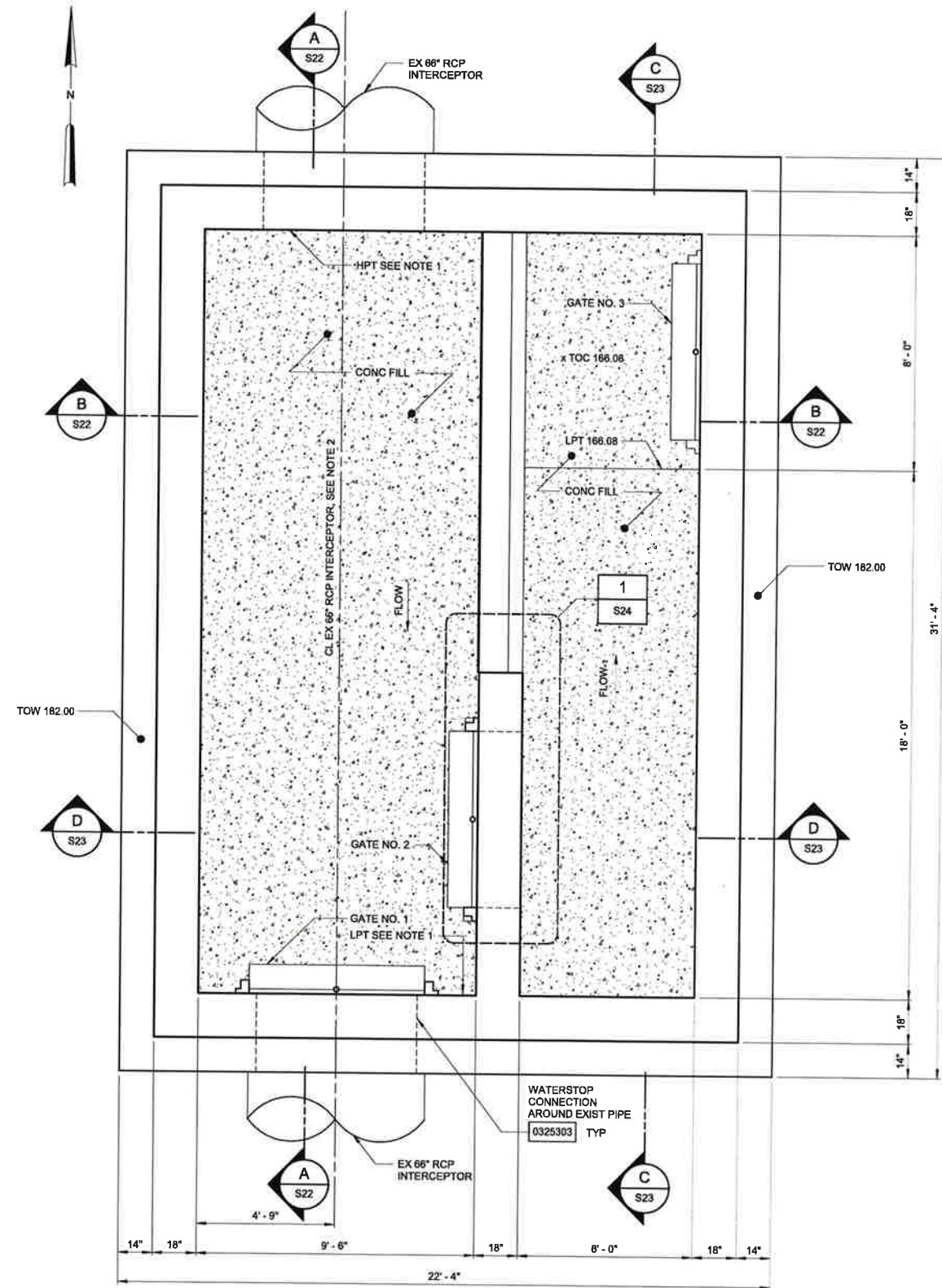
NOTES:

- CONCRETE FILL ELEVATION AT EACH END OF EACH WEIR SHALL MATCH INVERT OF EXISTING 66" DIAMETER RCP AT THAT LOCATION. PIPE INVERTS ARE AS FOLLOWS:

	NORTH INV EL (UPSTREAM)	SOUTH INV EL (DOWNSTREAM)
WEST WEIR	174.88±	174.63±
EAST WEIR	174.82±	174.81±
- CENTERLINE OF EXISTING 66" DIAMETER RCP SHOWN PARALLEL TO WEIR STRUCTURE. ACTUAL CENTERLINE MAY BE ROTATED SEVERAL DEGREES. ROTATION OF ACTUAL CENTERLINE OF EXISTING 66" DIAMETER RCP MAY VARY BETWEEN WEST WEIR AND EAST WEIR.
- CONCRETE FILL SHALL BE CLASS A6 CONCRETE UNLESS NOTED OTHERWISE.



BOTTOM PLAN
3/8" = 1'-0"



INTERMEDIATE PLAN
3/8" = 1'-0"

FINAL DESIGN

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REV	ISSUED FOR	DATE	BY

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CHECKED BY:	C. PHILLIPS
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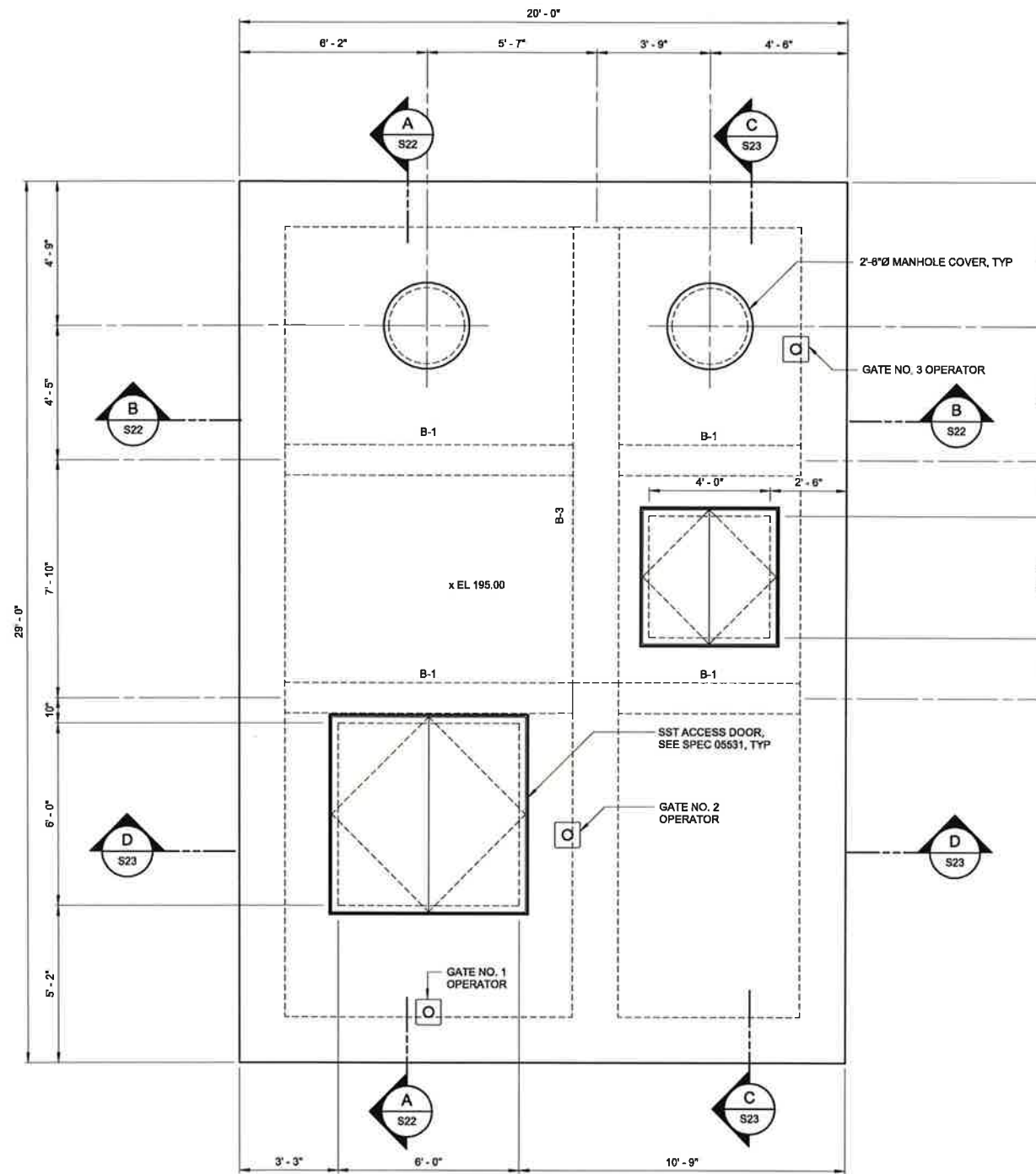
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HAZEN AND SAWYER
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RALEIGH, NORTH CAROLINA 27607
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CJS
Conveyance, PLLC
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CARY, NC 27511
P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

WEIR STRUCTURE
STRUCTURAL
BOTTOM AND INTERMEDIATE PLANS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S20



TOP PLAN
3/8" = 1'-0"

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FINAL DESIGN

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PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	A. THURSTON		
DRAWN BY:	Y. KELLINGHUSEN		
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REV	ISSUED FOR	DATE	BY



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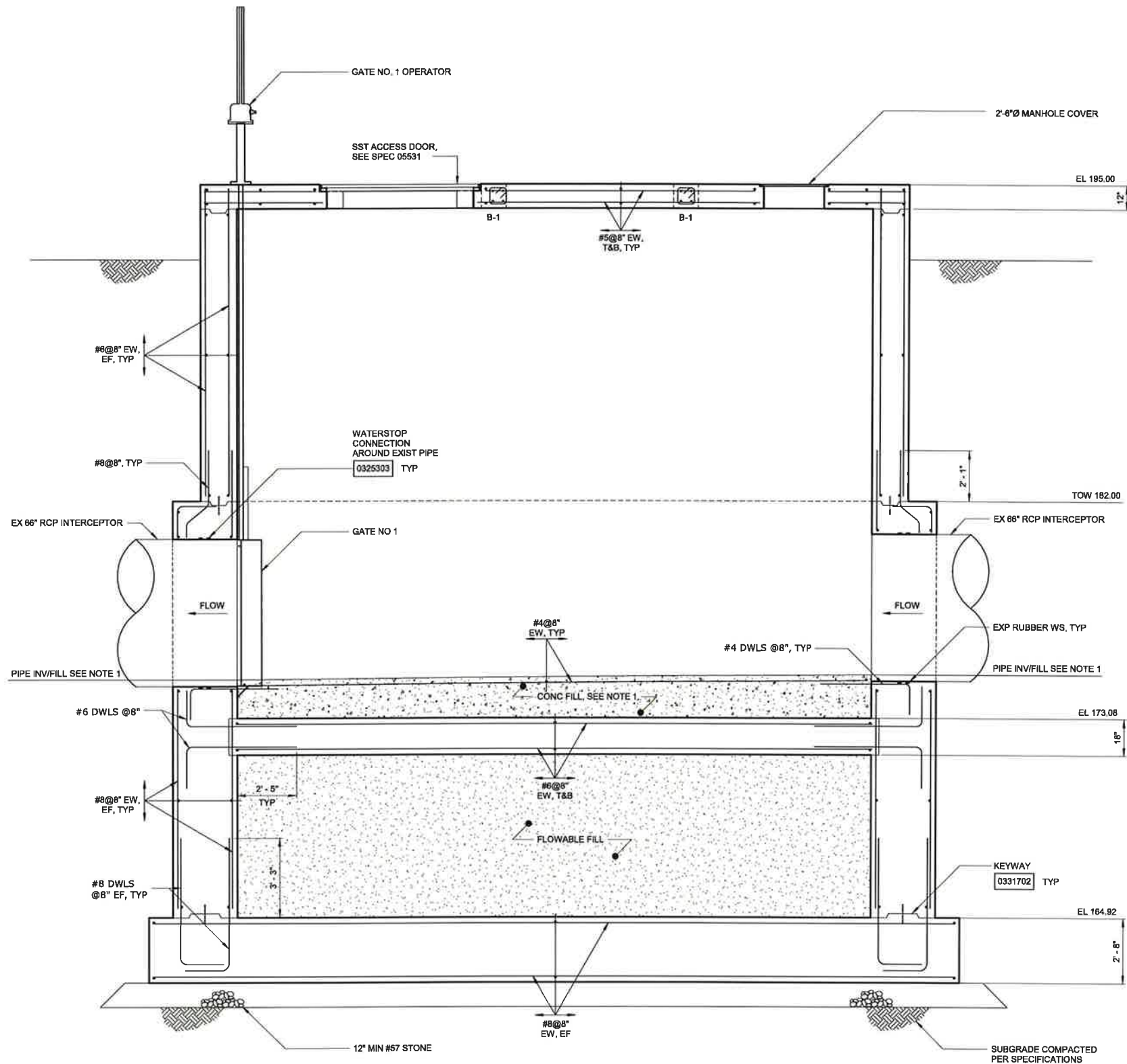
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

WEIR STRUCTURE
STRUCTURAL
TOP PLAN

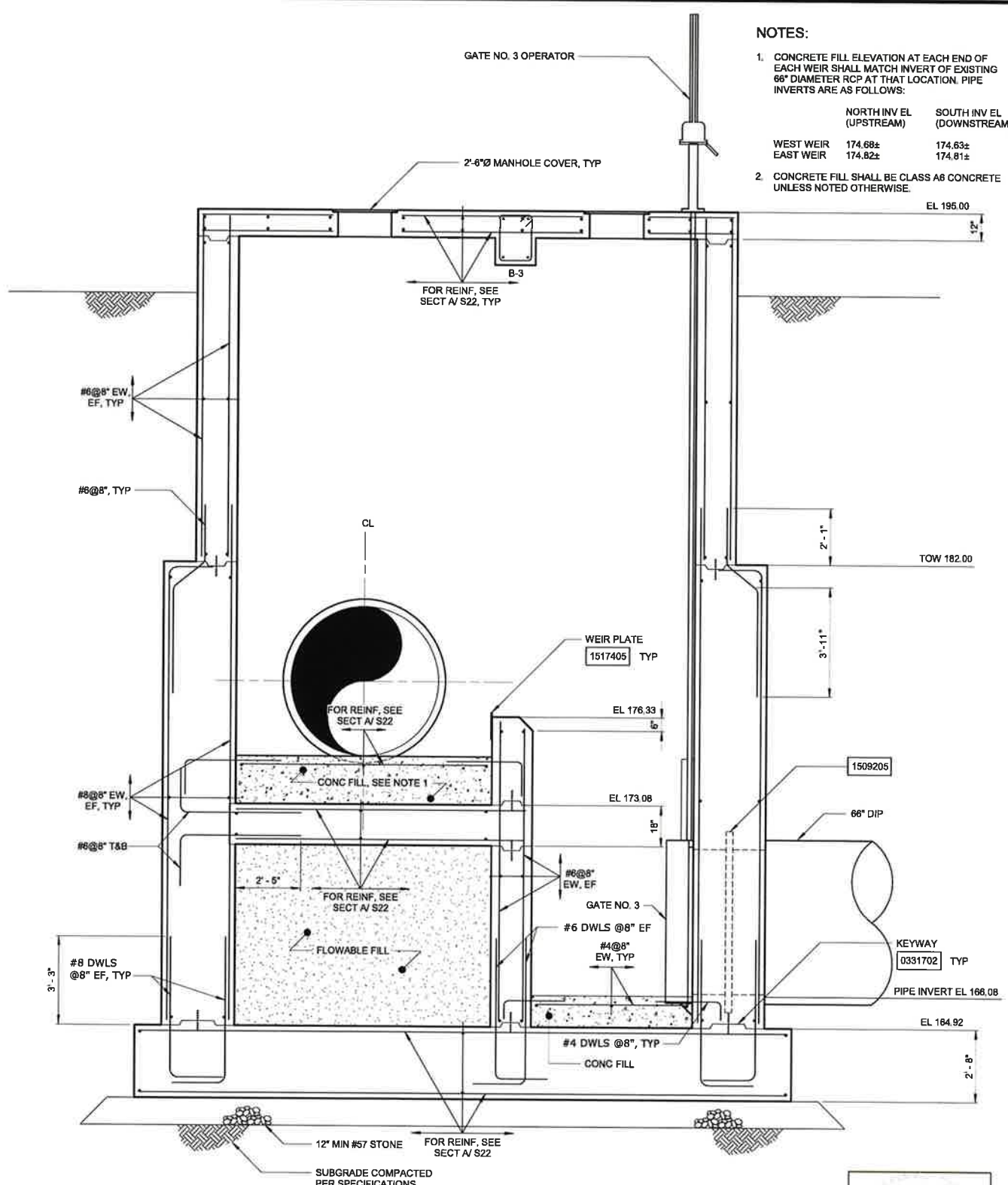
DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S21

- NOTES:**
- CONCRETE FILL ELEVATION AT EACH END OF EACH WEIR SHALL MATCH INVERT OF EXISTING 66" DIAMETER RCP AT THAT LOCATION. PIPE INVERTS ARE AS FOLLOWS:

	NORTH INV EL (UPSTREAM)	SOUTH INV EL (DOWNSTREAM)
WEST WEIR	174.68±	174.63±
EAST WEIR	174.82±	174.81±
 - CONCRETE FILL SHALL BE CLASS A6 CONCRETE UNLESS NOTED OTHERWISE.



SECTION A
3/8" = 1'-0"



SECTION B
3/8" = 1'-0"



FINAL DESIGN

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PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
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RALEIGH, NORTH CAROLINA 27607
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CJS
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320 S. ACADEMY STREET
CARY, NC 27511
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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

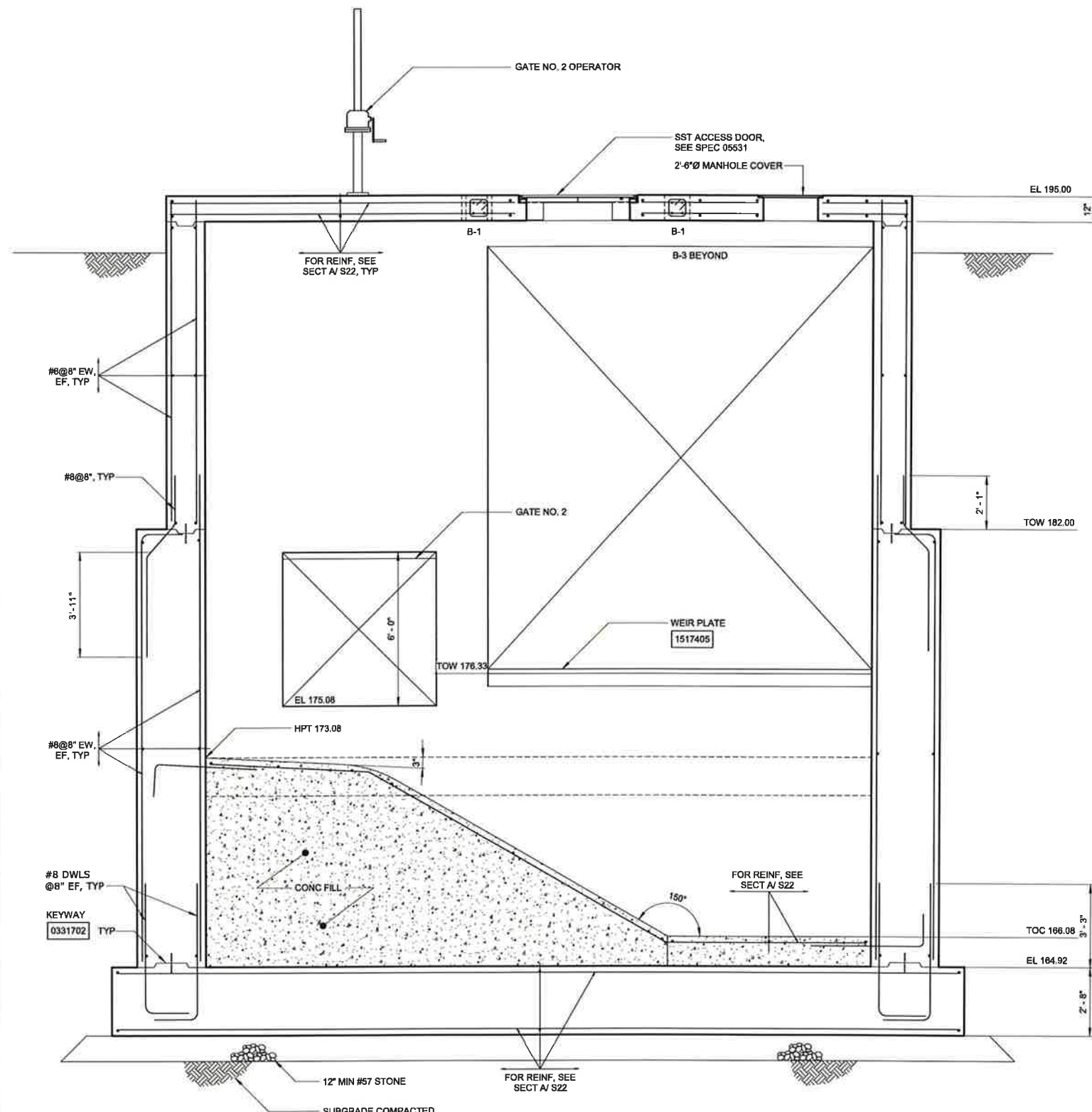
WEIR STRUCTURE
STRUCTURAL
SECTION

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S22

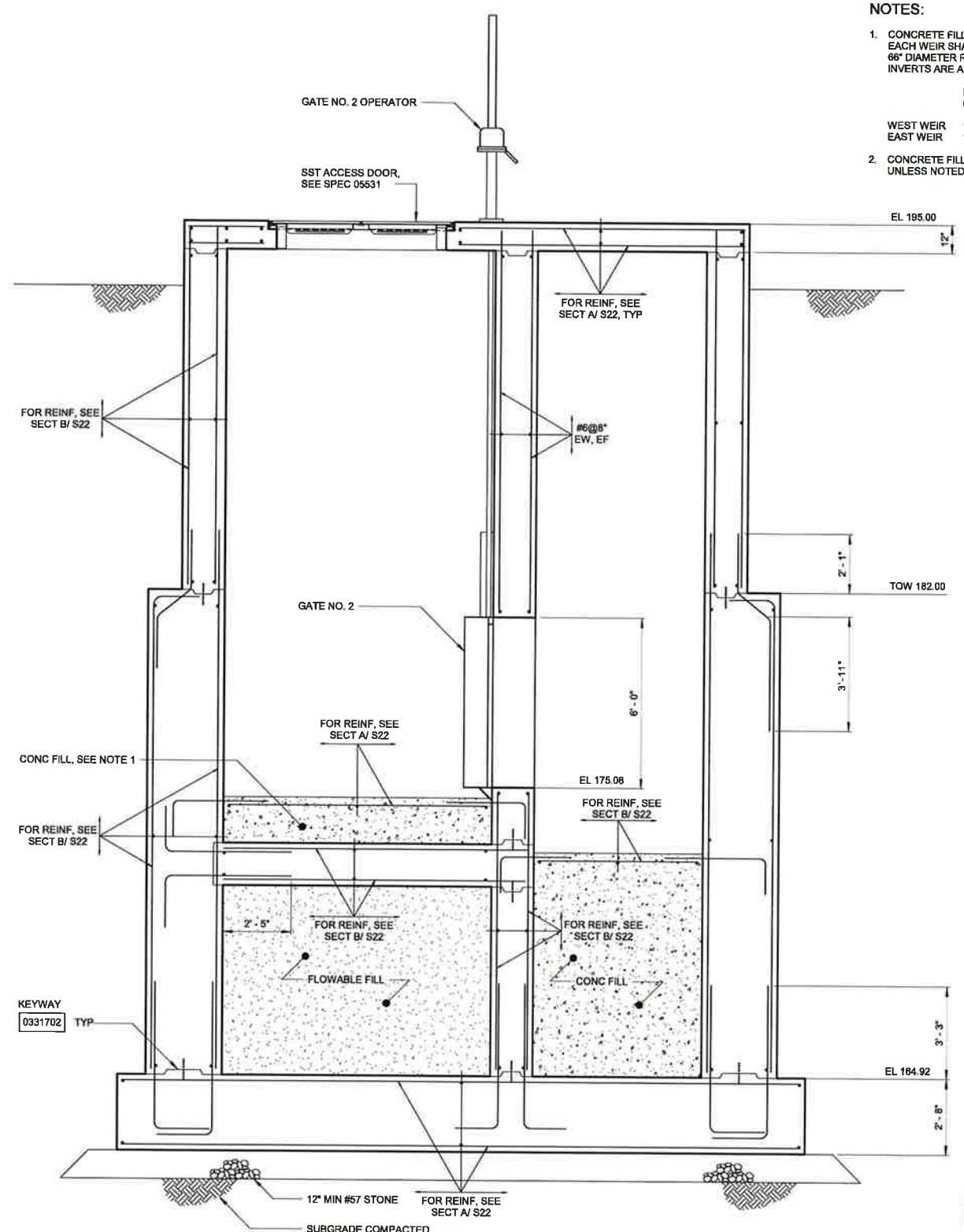
NOTES:

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WEST WEIR	174.88±	174.63±
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- CONCRETE FILL SHALL BE CLASS A6 CONCRETE UNLESS NOTED OTHERWISE.



SECTION C
3/8" = 1'-0" S20



SECTION D
3/8" = 1'-0" S20

FINAL DESIGN



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REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



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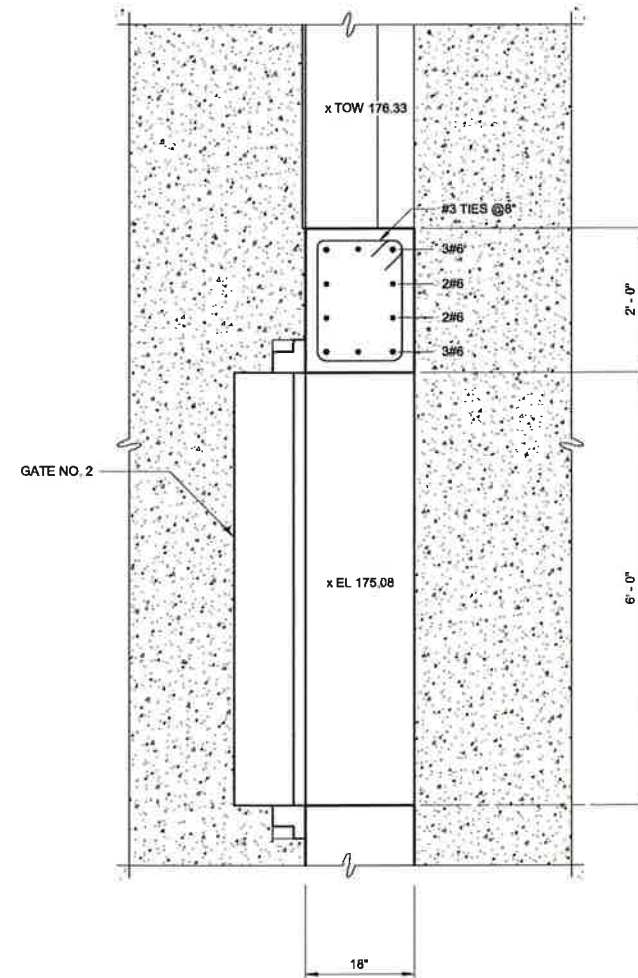
CITY OF RALEIGH
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NEUSE RIVER EAST
PARALLEL INTERCEPTOR

WEIR STRUCTURE
STRUCTURAL
SECTION

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S23

BEAM SCHEDULE																
MARK	COUNT	SPAN TYPE	SIZE		TOP ELEV	MAIN REINF			ADD REINF			S1 STIRRUPS		S2 STIRRUPS		REMARKS
			W"	D"		TOP	BOT	A	B	C	SIZE	SPACING	SIZE	SPACING		
B-1	4	END	12"	12"	195.00	2#5	2#5					#3	4"	#3	4"	
B-3	1	SIMP	18"	24"	195.00	3#6	3#6					#3	8"	#3	8"	

NOTE:
SEE STANDARD DETAIL 0331801 FOR TYPICAL BEAM ELEVATIONS.



DETAIL	1
3/4" = 1'-0"	S20

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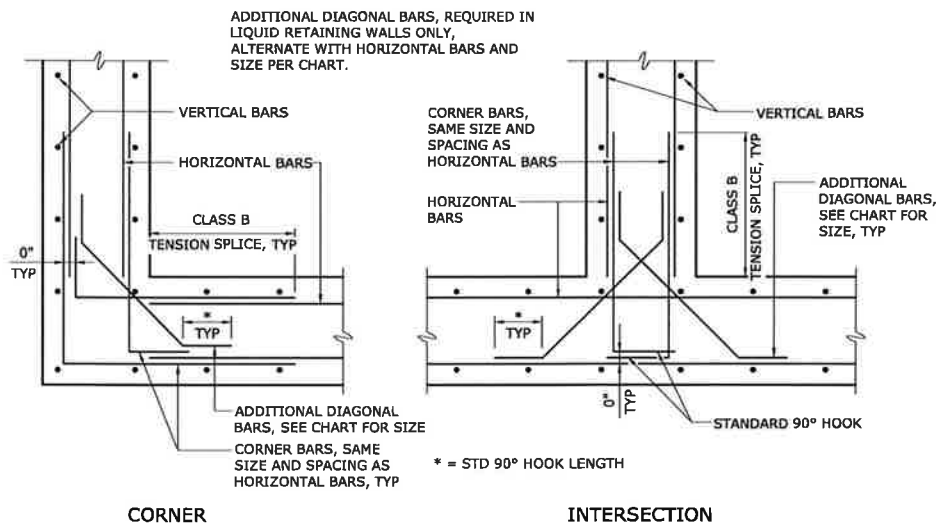
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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

WEIR STRUCTURE
STRUCTURAL
DETAILS

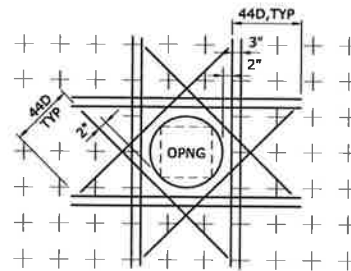
DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	S24



CORNER
INTERSECTION
TYPICAL WALL REINFORCING
0331700

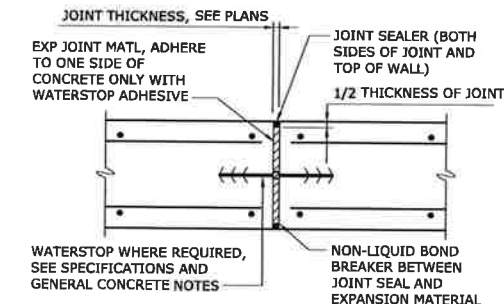
DIAGONAL BAR SIZE CHART	
BAR SIZE - HORIZONTAL REINFORCEMENT	BAR SIZE - DIAGONAL REINFORCEMENT
# 3	# 3
# 4	# 3
# 5	# 4
# 6	# 5
# 7	# 5
# 8	# 6
# 9	# 7
# 10	# 8
# 11	# 9

AT LOCATIONS WHERE DIFFERENT SIZE HORIZONTAL BARS CONVERGE, THE LARGER BAR SIZE SHALL CONTROL

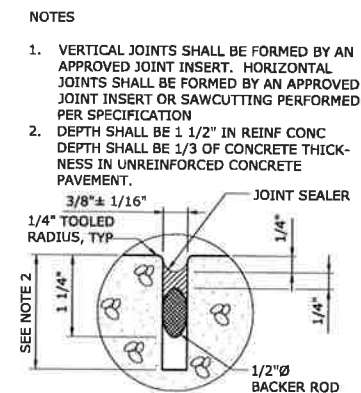


- NOTES:**
- THIS DETAIL APPLIES FOR OPENINGS 8"Ø AND LARGER. FOR SMALLER OPENINGS, BEND BARS OR ADJUST SPACING OF REINFORCEMENT TO AVOID OPENING.
 - PLACE EXTRA BARS OF THE SAME SIZE AS THE INTERRUPTED BARS AT EACH SIDE OF OPENING. QUANTITY OF EXTRA BARS AT EACH SIDE SHALL EQUAL HALF THE QUANTITY OF INTERRUPTED BARS EXCEPT WHERE NOTED OTHERWISE.
 - PROVIDE ONE DIAGONAL BAR EACH SIDE OF OPENING WITH SIZE EQUAL TO MAIN REINFORCEMENT, TYPICAL EACH FACE.
 - WHERE INVERT OF OPENING IN WALL IS LESS THAN 44 BAR DIAMETERS FROM TOP OF SLAB, EXTRA REINFORCEMENT ON EACH SIDE SHALL INCLUDE DOWELS EMBEDDED INTO SLAB WITH STANDARD 90 DEGREE HOOKS TO SPLICE WITH EXTRA VERTICAL REINFORCEMENT. DOWELS SHALL ALSO STILL BE PROVIDED BELOW OPENING.
 - WHERE INVERT OF OPENING IN WALL OR SLAB IS CLOSER THAN 44 BAR DIAMETERS TO EDGE OF SLAB OR BOTTOM OF WALL, EXTRA DIAGONAL BARS MAY BE TERMINATED TWO INCHES FROM EDGE OF SLAB OR BOTTOM OF WALL. DOWELS DO NOT HAVE TO BE PROVIDED TO SPLICE WITH DIAGONAL BARS.

TYPICAL REINFORCING AT OPENINGS
0331703



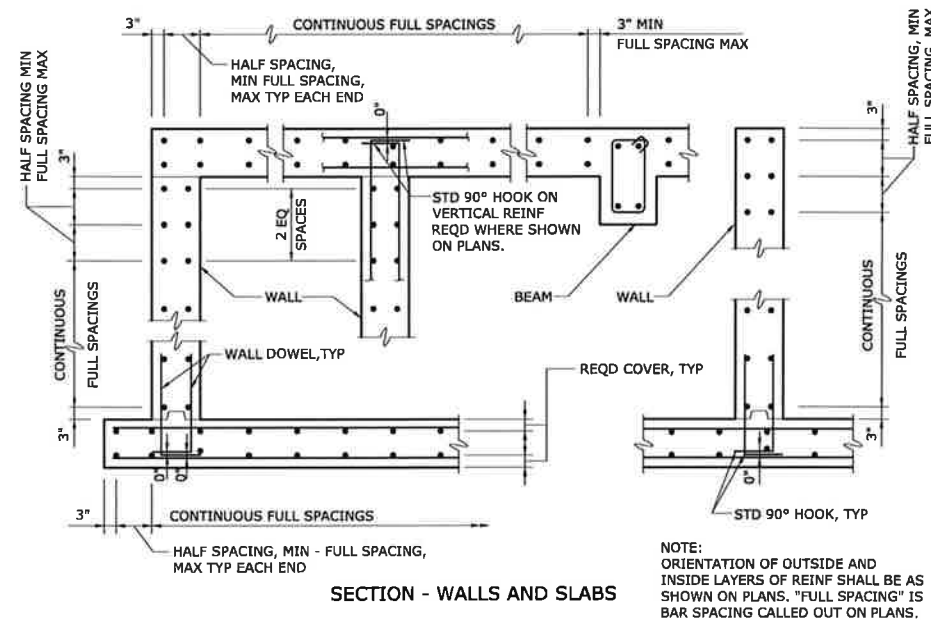
TYPICAL EXPANSION JOINT
0325100



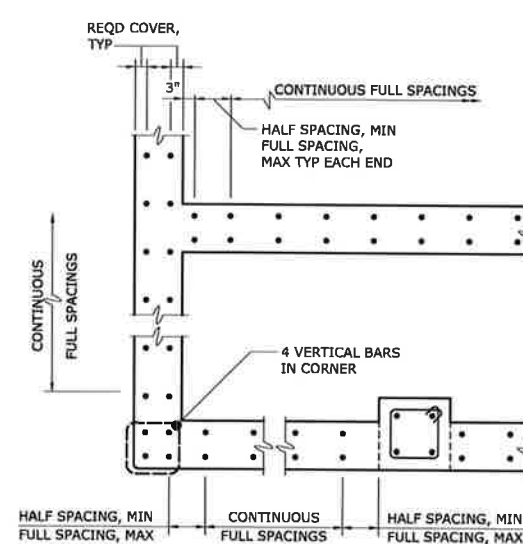
TYPICAL SEALED JOINT
0325101

DEVELOPMENT LENGTH OF STANDARD HOOKS		
FOR UNCOATED BARS IN TENSION		
BAR SIZE	DEVELOPMENT LENGTH, l_{dh}	
	BASIC	W/ CONC COVER *
#3	8"	8"
#4	10"	7"
#5	1'-0"	9"
#6	1'-3"	11"
#7	1'-5"	1'-0"
#8	1'-7"	1'-2"
#9	1'-10"	1'-4"
#10	2'-1"	1'-6"
#11	2'-3"	1'-7"

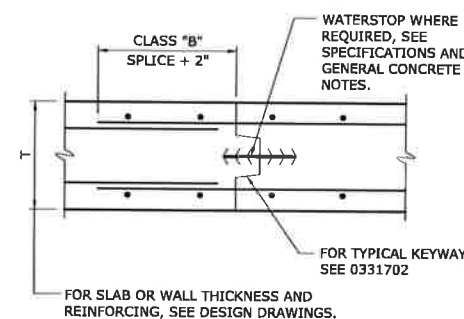
* SIDE COVER NORMAL TO PLANE OF HOOK AT LEAST 2 1/2"; AND FOR 90° HOOK, END COVER BEYOND OUTSIDE END OF HOOK AT LEAST 2".



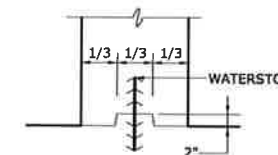
SECTION - WALLS AND SLABS
TYPICAL BAR PLACEMENT
0331704



PLAN - WALLS



TYPICAL CONSTRUCTION JOINT
0331701



TYPICAL KEYWAY
0331702

BASIC DEVELOPMENT LENGTH AND SPLICE LENGTH					
FOR UNCOATED BARS IN TENSION					
** BASED ON MATERIALS AND CONDITIONS AS FOLLOWS:					
$f_y = 60,000$ psi		$f_y = 60,000$ psi		$f_c = 4000$ psi OR GREATER	
CLEAR COVER ≥ 1.5 INCHES		CLEAR COVER ≥ 1.5 INCHES		NORMAL WEIGHT CONCRETE	
BASIC DEVELOPMENT LENGTH		CLASS B SPLICE LENGTH		$1.3 \times l_{dh}$	
l_d		$1.3 \times l_{dh}$			
CLEAR SPACING $\geq 3"$	CLEAR SPACING $< 3"$	CLEAR SPACING $\geq 3"$	CLEAR SPACING $< 3"$	BAR SIZE	
BASIC	TOP *	BASIC	TOP *		
1'-0"	1'-0"	1'-0"	1'-4"	# 3	1'-0"
1'-0"	1'-3"	1'-7"	2'-1"	# 4	1'-3"
1'-3"	1'-7"	2'-4"	3'-0"	# 5	1'-7"
1'-8"	1'-11"	3'-1"	4'-0"	# 6	1'-11"
2'-5"	3'-1"	4'-11"	6'-4"	# 7	3'-1"
3'-0"	3'-11"	6'-0"	7'-9"	# 8	3'-11"
3'-8"	4'-9"	6'-9"	8'-9"	# 8	4'-9"
4'-8"	5'-10"	7'-7"	9'-10"	# 10	5'-10"
5'-5"	7'-0"	8'-8"	10'-11"	# 11	7'-0"

* TOP REINFORCEMENT IS ANY HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE REINFORCEMENT.

** FOR MATERIALS OR CONDITIONS DIFFERENT FROM THOSE STATED, LENGTHS SHOWN IN CHART SHALL BE MODIFIED TO CONFORM TO THE PROVISIONS OF ACI 318, SECTION 12.2.

FINAL DESIGN



PLOT DATE: 2020/11/08 7:56:48 PM
 BY: YKELLINGHUSEN
 FILE: C:\WORK\1108-11\DWG\1108110811.DWG
 Scale Date: 2020/11/08 7:52:37 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



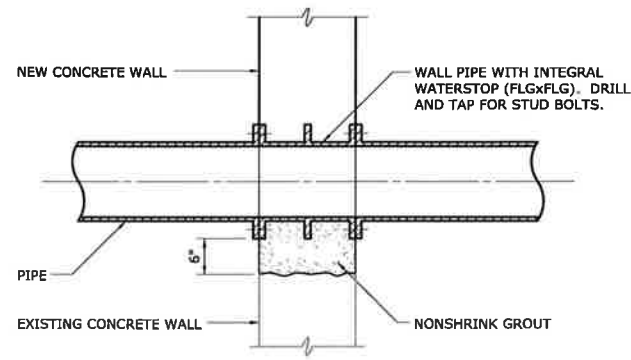
Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

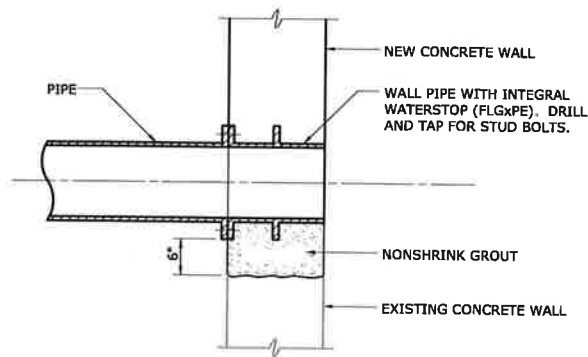
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

PARALLEL INTERCEPTOR
STRUCTURAL
STANDARD DETAILS SHEET 1

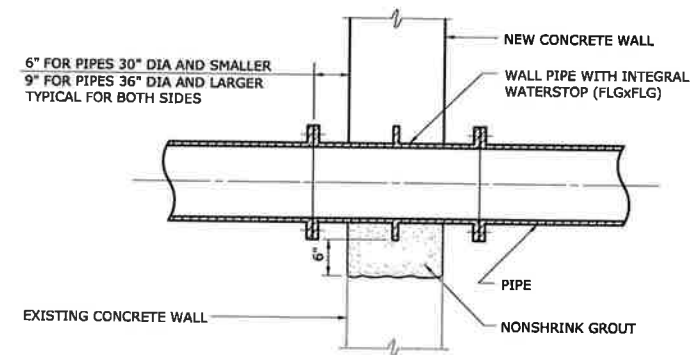
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HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	SD1



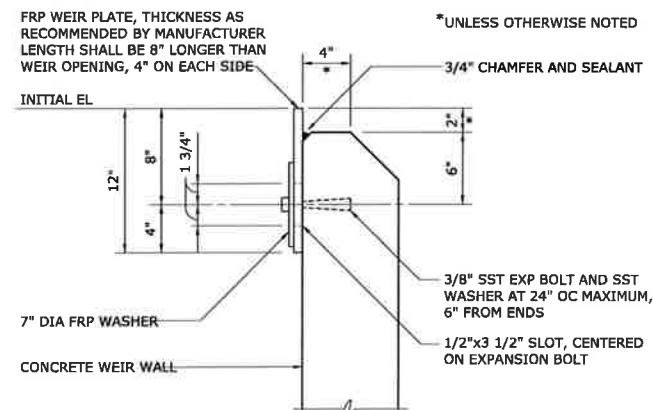
1509201



1509205



1509208



WEIR PLATE
1517405

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid:

City of Raleigh Development Approval _____



FINAL DESIGN

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 File: C:\Users\WELLDINGHUSEN\OneDrive\Documents\1517405.dwg Saved By: WELLDINGHUSEN Date: 2020/11/04 7:37:04 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	A. THURSTON
DRAWN BY:	Y. KELLINGHUSEN
CHECKED BY:	C. PHILLIPS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	



Hazen

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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

PARALLEL INTERCEPTOR
 STRUCTURAL
 STANDARD DETAILS SHEET 3

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	SD3

ABBREVIATIONS

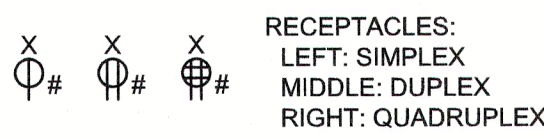
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
BKR	BREAKER
(L/V)CP	(LOCAL/VENDOR) CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
DB	DUCTBANK
DSW	DISCONNECT SWITCH
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFCT	GROUND FAULT CURRENT TRANSFORMER
GND	GROUND
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
ISO	INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
(*)JB	JUNCTION BOX*
LCS	LOCAL CONTROL STATION
LP	LIGHTING PANEL
LT	LEVEL TRANSMITTER
MFR	MULTI-FUNCTION RELAY
MOG	MOTOR OPERATED GATE
MPR	MOTOR PROTECTION RELAY
MTD	MOUNTED
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSN
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	OUTPUT CONTACTOR
OL	OVERLOAD
(*)PB	PULLBOX*
PP	POWER PANEL
PT	POTENTIAL TRANSFORMER
RCS	REMOTE CONTROL STATION
RECP	RECEPTACLE
RTU	REMOTE TELEMETRY UNIT
S.E.	SERVICE ENTRANCE
SP	C. SPARE CONDUIT
SPD	SURGE PROTECTIVE DEVICE
SST	STAINLESS STEEL
TB	TEST BLOCK
TC	TIMED CLOSE
TO	TIMED OPEN
TSH	TWISTED SHIELDED
TX	TRANSFORMER
TYP	TYPICAL
WPCR	WEATHER PROOF CORROSION RESISTANT

*DESIGNATED ABBREVIATIONS CAN HAVE THE FOLLOWING PREFIXES:

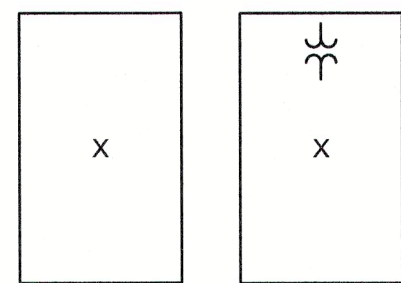
E	ELECTRIC
P	POWER
C	CONTROL
I	INSTRUMENTATION
F	FIBER

RECEPTACLES:

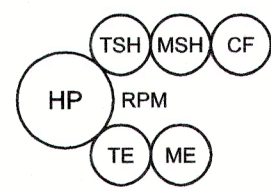
X DENOTES RECEPTACLE TYPE (TYP.);
 GFCI DENOTES GROUND FAULT CIRCUIT INTERRUPT
 UPS DENOTES UNINTERRUPTIBLE POWER SUPPLY
 WPCR DENOTES WEATHERPROOF CORROSION RESISTANT
 # DENOTES CIRCUIT NUMBER (TYP.)



SINGLE-LINE DIAGRAMS



LEFT: PANELBOARD
 RIGHT: COMBINATION POWER UNIT
 X DENOTES PANEL ID



MOTOR AND TYPICAL ADDITIONAL DEVICES:
 TSH: TEMPERATURE SWITCH
 MSH: MOTOR SPACE HEATER
 CF: COOLING FAN
 TE: TEMPERATURE ELEMENT
 ME: MOISTURE DETECTOR

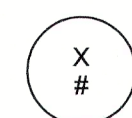


SURGE PROTECTIVE DEVICE

MISC PLAN VIEW SYMBOLS

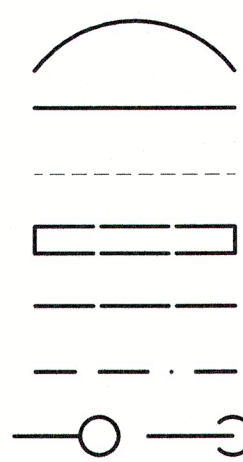


EQUIPMENT CONNECTION

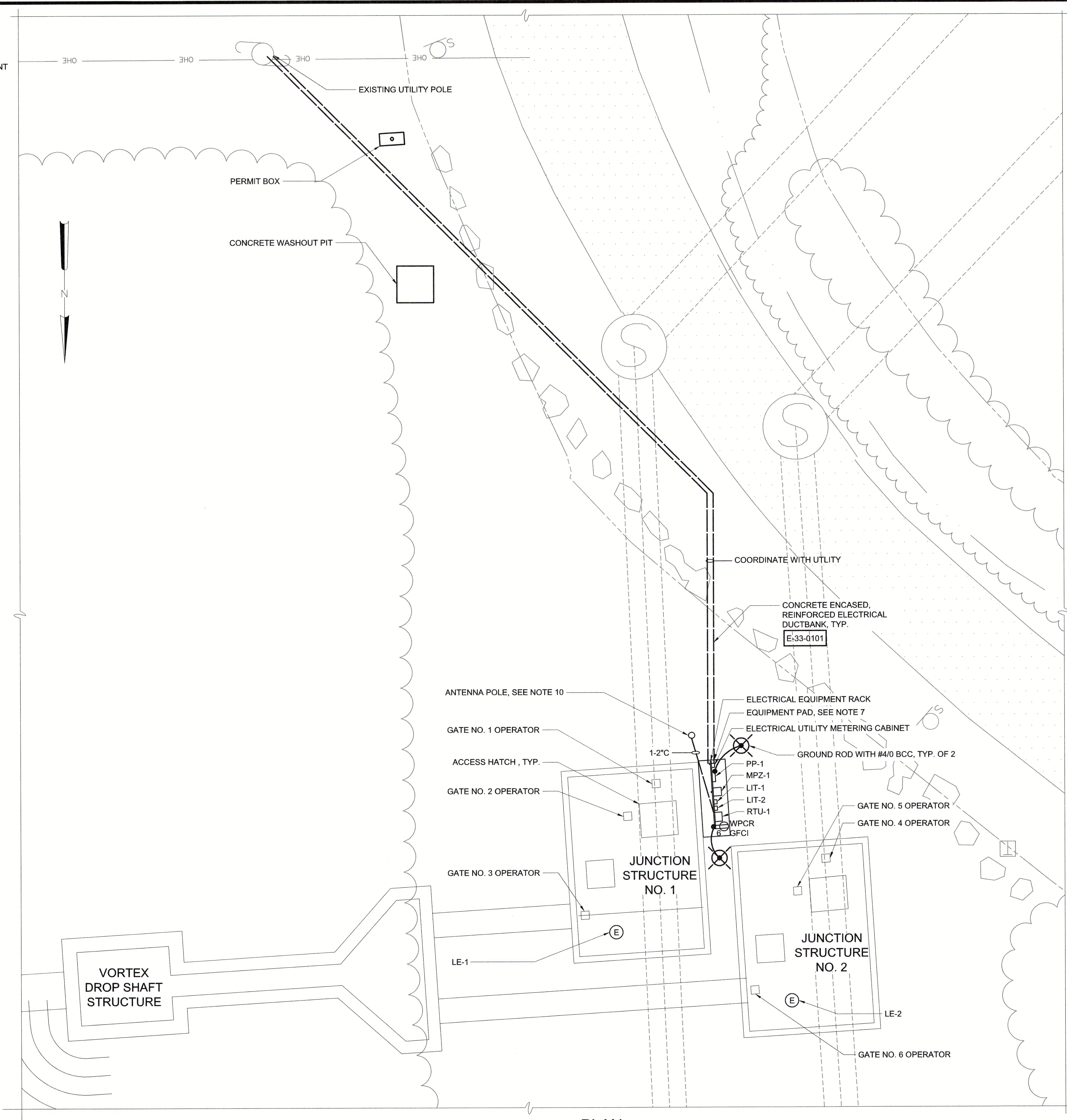


INSTRUMENT TAG:
 X DENOTES INSTRUMENT TYPE
 # DENOTES INSTRUMENT NUMBER
 SEE DRAWING I1 FOR INSTRUMENT ABBREVIATIONS

WIRING



FLEXIBLE CONDUIT
 CONDUIT EXPOSED
 CONDUIT CONCEALED
 CONCRETE ENCASED DUCTBANK
 CONCRETE ENCASED CONDUIT
 DIRECT BURIED CONDUIT
 LEFT: CONDUIT RISE (TURN UP)
 RIGHT: CONDUIT DROP (TURN DOWN)



- NOTES:**
- UNLESS SPECIFICALLY NOTED OTHERWISE, ALL UNDERGROUND CONCRETE ENCASED ELECTRICAL CONDUITS SHALL BE PER STANDARD DETAIL E-33-0101.
 - UNLESS OTHERWISE SPECIFIED OR NOTED, ALL WALL MOUNTED ELECTRICAL PANELS, ENCLOSURES, AND SIMILAR EQUIPMENT SHALL BE MOUNTED 6'-6" (MAX) FROM THE TOP OF THE PANEL TO FINISHED FLOOR OR GRADE.
 - A SEPARATE EQUIPMENT GROUNDING CONDUCTOR SHALL BE PROVIDED FOR EACH CIRCUIT (SEPARATE CONDUCTOR IN THE CONDUIT). THE CONDUCTOR SHALL BE TERMINATED AT THE PROPER DEVICE, TERMINAL, OR LUG AT THE POWER SOURCE (MCC GROUND BUS, PANELBOARD GROUND BUS, ETC.). GROUND CONDUCTOR SIZE SHALL BE PER THE LATEST EDITION OF THE NEC.
 - ELECTRICAL SYSTEMS INSTALLED IN HAZARDOUS LOCATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CHAPTER 5, ART. 500 OF THE LATEST EDITION OF THE NEC. CONTRACTOR SHALL SEAL ALL CONDUITS LEAVING HAZARDOUS AREAS. WALL AND FLOOR OPENINGS SHALL BE SEALED WITH FIREPROOF COMPOUND.
 - ALL EQUIPMENT LOCATED IN HAZARDOUS AREAS SHALL BE SUITABLE FOR THE CLASS, DIVISION, AND GROUP RATING OF THE LOCATION.
 - CONDUIT HOMERUNS ARE NOT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL REFER TO CONDUIT AND WIRE SCHEDULES, RISER DIAGRAMS, SINGLE LINE DIAGRAMS, AND OTHER DRAWINGS FOR CONDUIT AND WIRE REQUIREMENTS.
 - CONTRACTOR SHALL PROVIDE CONCRETE PAD FOR ELECTRICAL EQUIPMENT RACK. REFER TO SPECIFICATION SECTION 16000.
 - JUNCTION STRUCTURES ARE DESIGNATED AS CLASS I DIVISION 1 IN ENCLOSED SPACE. SPACE CLASSIFIED PER NFPA-820-2016 EDITION, TABLE 4.2.2, ROW 29a. ALL EQUIPMENT, ELECTRICAL MATERIALS, AND WIRING METHODS IN THE CLASSIFIED AREAS SHALL BE IN ACCORDANCE WITH THE LATEST NEC.
 - CONTRACTOR SHALL FURNISH AND INSTALL NEW CONCRETE ENCASED REINFORCED ELECTRICAL DUCTBANK AS INDICATED. ACTUAL ROUTING OF THE DUCTBANK SHALL BE COORDINATED WITH EXISTING UNDERGROUND INFRASTRUCTURE AND ADJUSTED AS NECESSARY TO AVOID CONFLICTS.
 - CONTRACTOR SHALL FURNISH AND INSTALL METALLIC CONDUIT FROM RTU-1 PANEL TO ANTENNA POLE AS INDICATED. CONDUIT SHALL EXTEND AT LEAST 8 FEET ABOVE THE GROUND AT THE POLE. ANTENNA POLE TO BE PROVIDED AND INSTALLED BY OTHERS.

SITE PERMITTING APPROVAL

WATER AND SEWER PERMITS (IF APPLICABLE)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook, City of Raleigh Public Utilities Department Permit # .

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook, City of Raleigh Public Utilities Department Permit # .

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook, City of Raleigh Public Utilities Department Permit # .

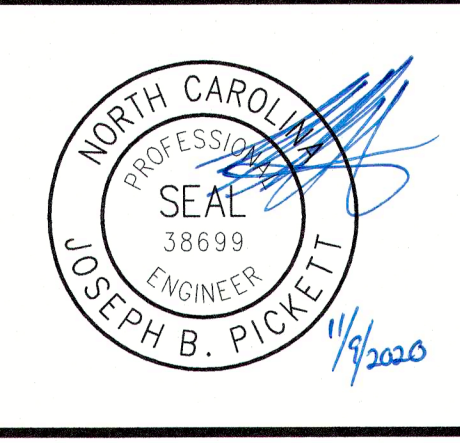
ALL CONSTRUCTION MUST CONFORM TO THE UNDERGROUND UTILITY PROTECTION ACT

**BEFORE YOU DIG!
 CONTACT ONE-CALL CENTER
 CALL 811
 OR
 1-800-632-4949**

PLAN
 #####
FINAL DESIGN

PLOT DATE: 2020/11/09 9:47:32 AM BY: ENC
 FILE: C:\Users\jwicks\OneDrive\Documents\2020\11\09\1109_01.dwg - Saved By: ENC - Save Date: 2020/11/09 10:59 AM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	B. PICKETT		
DRAWN BY:	T. RAHLAN		
CHECKED BY:	B. PICKETT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"		
REV	ISSUED FOR	DATE	BY



Hazen

HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
 LICENSE NO. : C-0381

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320 S. ACADEMY STREET
 CARY, NC 27511
 LICENSE NO. : P-1611

CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT

**NEUSE RIVER EAST
 PARALLEL INTERCEPTOR**

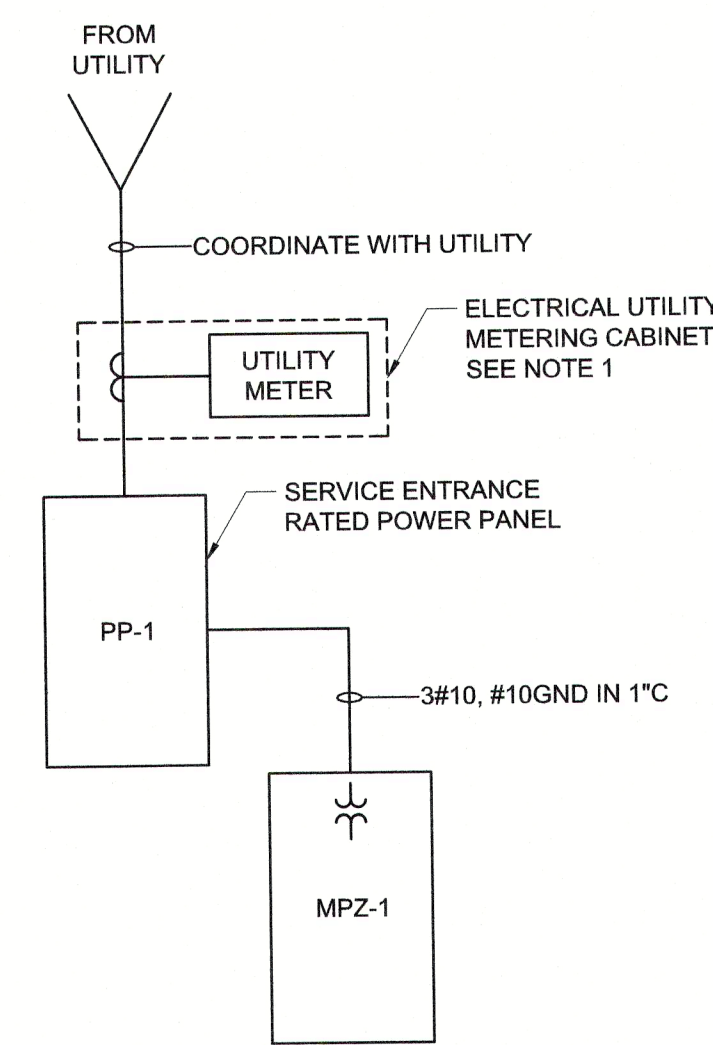
**ELECTRICAL
 LEGEND, SYMBOLS, GENERAL
 NOTES, AND PLAN**

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	E01

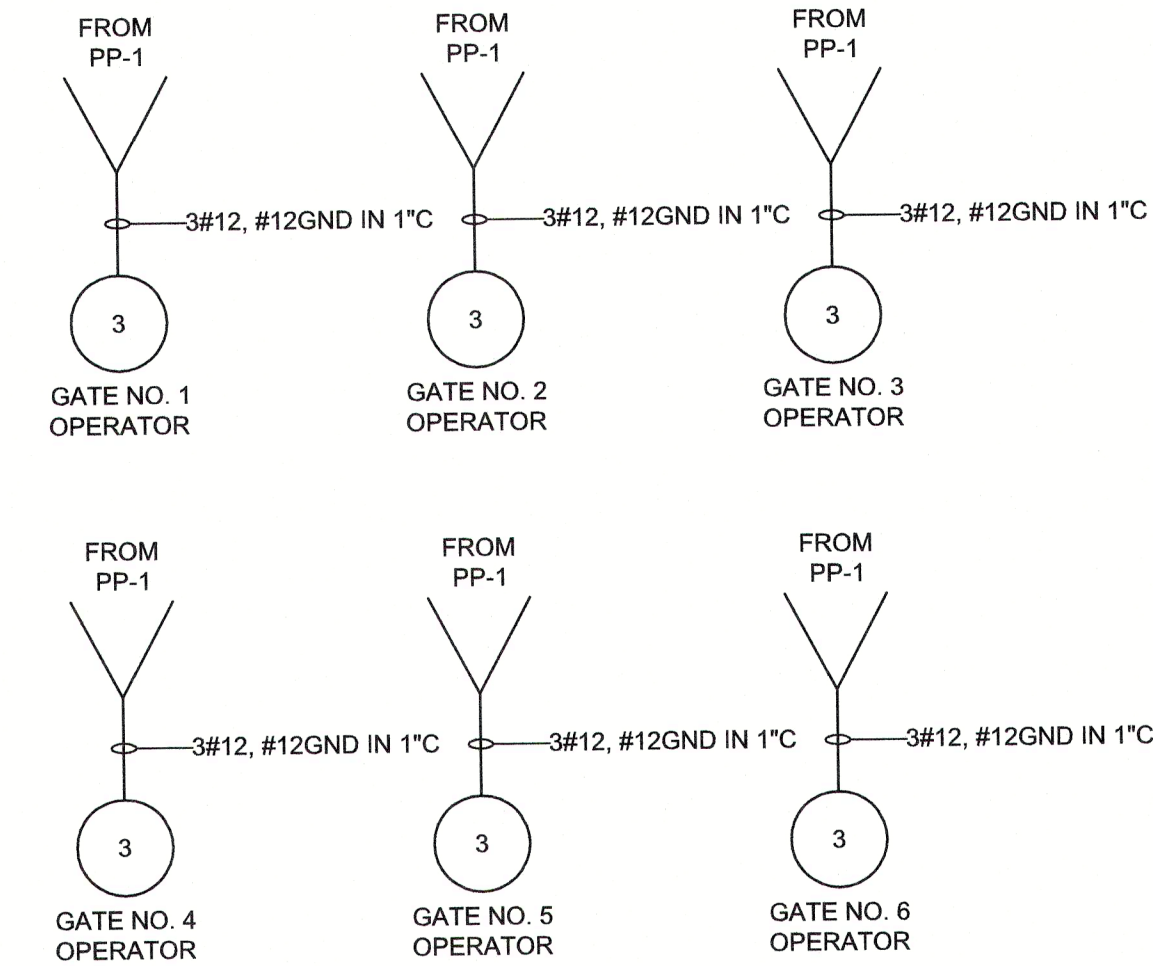
480/277 VOLTS 3 PHASE, 4 WIRE										PP-1 MAIN BREAKER 100A 3P			TYPE: NEMA 3R MOUNT: SURFACE		
MODS	DESCRIPTION	WIRE	TRIP	POLE	No.	VOLT-AMPERES			No.	POLE	TRIP	WIRE	DESCRIPTION	MODS	
						A	B	C							
-	GATE NO. 1 OPERATOR	SEE RISER	20	3	1	1,000			2	3	20	SEE RISER	GATE NO. 4 OPERATOR	-	
					3		1,000		4						
					5			1,000	6						
-	GATE NO. 2 OPERATOR	SEE RISER	20	3	7	1,000			8	3	20	SEE RISER	GATE NO. 5 OPERATOR	-	
					9		1,000		10						
					11			1,000	12						
-	GATE NO. 3 OPERATOR	SEE RISER	20	3	13	1,000			14	3	20	SEE RISER	GATE NO. 6 OPERATOR	-	
					15		1,000		16						
					17			1,000	18						
-	SPARE		20	3	19	-	-	-	20	3	20		SPARE	-	
					21				22						
					23				24						
-	SPARE		20	3	25	-	-	-	26	3	30	SEE RISER	MPZ-1	-	
					27				28						
					29				30						
TOTAL						3,000	3,000	3,000	6,333	6,333	6,333	TOTAL			
PHASE TOTAL						9,333	9,333	9,333	TOTAL LOAD (VA)			27,999			
						TOTAL LOAD (A)			34						

MODIFICATION (MODS) LEGEND:
 EPD - GROUND FAULT CIRCUIT INTERRUPTER (30mA)
 GFCI - GROUND FAULT CIRCUIT INTERRUPTER (5mA)
 LOD - LOCK-ON DEVICE
 LFD - LOCK-OFF DEVICE

NOTES:
 65K AIC
 100kA SPD INTEGRAL



POWER DISTRIBUTION
RISER DIAGRAM



GATES OPERATOR
RISER DIAGRAMS

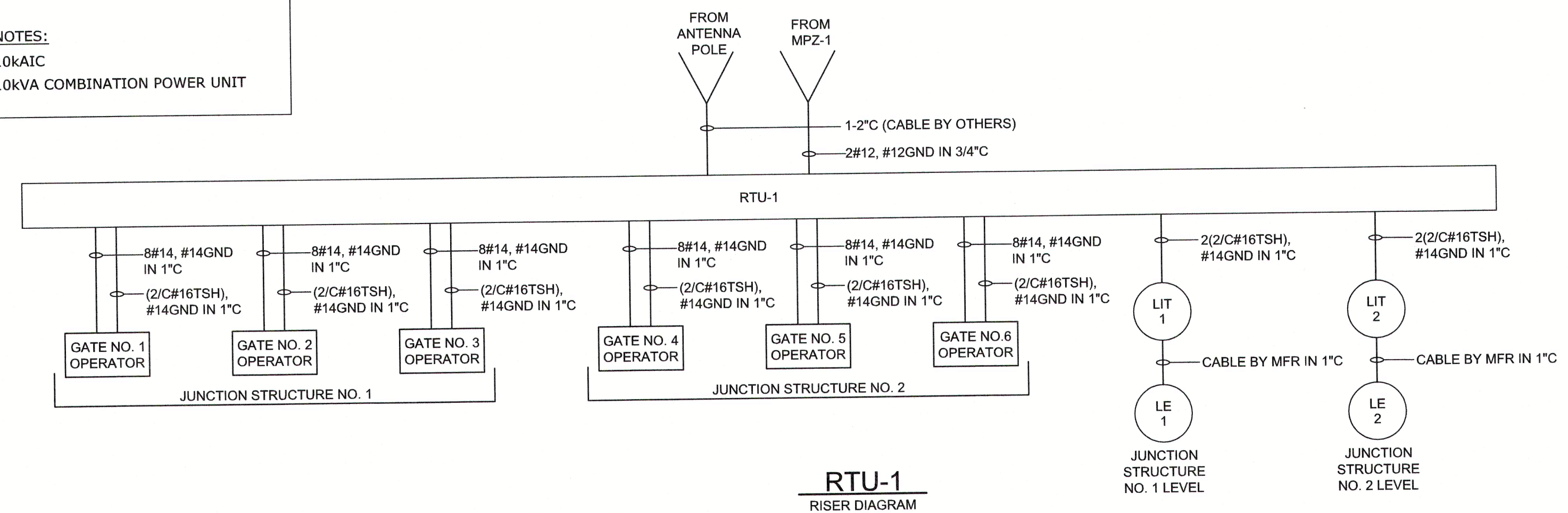
NOTES:

- CONTRACTOR SHALL COORDINATE WITH ELECTRIC UTILITY FOR ALL UTILITY CONNECTIONS AND EQUIPMENT. CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO THE UTILITY REQUIREMENTS.
- CONTRACTOR SHALL FURNISH AND INSTALL 2#12, #12GND IN 3/4" CONDUIT UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PROVIDE, THROUGH THE SERVICES OF CITI, LLC INSTRUMENTATION AND CONTROL SYSTEM SUPPLIER, THE FOLLOWING ITEMS AS LISTED BELOW. CONTRACTOR SHALL INCLUDE IN HIS BID A CASH ALLOWANCE THE AMOUNT SHOWN IN THE SCOPE PROPOSAL FROM CITI, LLC.
 - ONE RTU PANEL RATED NEMA 4X, STAINLESS STEEL, WALL/RACK MOUNTED
 - 45-FOOT CLASS 3 CCA TREATED WOODEN UTILITY POLE FOR SUPPORT OF RADIO ANTENNA INCLUDING INSTALLATION OF THE POLE.
 - A YAGI DIRECTIONAL ANTENNA COMPLETE WITH ANTENNA MOUNTING HARDWARE, ANTENNA MAST, ANTENNA COAXIAL CABLE HANGERS, AND GROUNDING KIT.
 - TWO ULTRASONIC LEVEL INSTRUMENTS AS MANUFACTURED BY SIEMENS, P/N SITRANS LUT420 WITH ECHOMAX XPS-15F LEVEL SENSOR SUITABLE FOR INSTALLATION IN A CLASS 1, DIVISION 1 HAZARDOUS AREA WITH 10 METERS CABLE.
 - INSTRUMENT SUNSHADE FOR THE LEVEL TRANSMITTERS.
 - COMPUTERIZED AND PHYSICAL SITE RADIO PATH SURVEY/EVALUATION BETWEEN THE RTU AT THIS SITE TO THE NEAREST SUBMASTER/MASTER RADIO SITES.
 - RTU PROGRAMMING AND SCADA CONFIGURATION AT THE CENTRAL TELEMETRY SCADA SYSTEM FOR MONITORING AND CONTROL FUNCTIONS FOR THE EQUIPMENT PROVIDED UNDER THIS CONTRACT.
 - THE FOLLOWING I/O POINTS SHALL BE PROVIDED FOR EACH MOTOR-OPERATED GATE ACTUATOR: "IN REMOTE" STATUS, GATE OPEN COMMAND, GATE CLOSE COMMAND, GATE FAILURE ALARM, AND GATE POSITION FEEDBACK 4-20 mA SIGNAL.
- CONTRACTOR SHALL PROVIDE A SUNSHADE FOR THE RTU PANEL.

208/120 VOLTS 3 PHASE, 4 WIRE										MPZ-1 30A PRIMARY MAIN BREAKER (480V) 50A SECONDARY MAIN BREAKER (208V)			TYPE: NEMA 3R MOUNT: SURFACE		
MODS	DESCRIPTION	WIRE	TRIP	POLE	No.	VOLT-AMPERES			No.	POLE	TRIP	WIRE	DESCRIPTION	MODS	
						A	B	C							
-	RTU-1	SEE RISER	20	1	1	500			2	1	20	SEE NOTE 2	LIT-1	-	
-	SPARE		20	1	3				4	1	20	SEE NOTE 2	LIT-2	-	
-	SPARE		20	1	5				6	1	20	SEE NOTE 2	RECEPTACLE	-	
-	SPARE		20	1	7				8	1	20		SPARE	-	
-	SPARE		20	1	9				10	1	20		SPARE	-	
-	SPARE		20	1	11				12	1	20		SPARE	-	
-	SPARE		20	1	13				14	1	20		SPARE	-	
-	SPARE		20	1	15				16	1	20		SPARE	-	
-	SPARE		20	1	17				18	1	20		SPARE	-	
TOTAL						500	0	0	100	100	180	TOTAL			
PHASE TOTAL						600	100	180	TOTAL LOAD (VA)			880			
						TOTAL LOAD (A)			2						

MODIFICATION (MODS) LEGEND:
 EPD - GROUND FAULT CIRCUIT INTERRUPTER (30mA)
 GFCI - GROUND FAULT CIRCUIT INTERRUPTER (5mA)
 LOD - LOCK-ON DEVICE
 LFD - LOCK-OFF DEVICE

NOTES:
 10kAIC
 10kVA COMBINATION POWER UNIT



RTU-1
RISER DIAGRAM

SITE PERMITTING APPROVAL
 WATER AND SEWER PERMITS (IF APPLICABLE)
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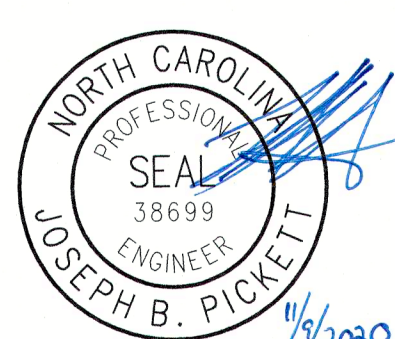


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FINAL DESIGN

PLOT DATE: 2020/11/09 9:46:07 AM
 BY: ENG
 FILE: C:\WORK\2020\11\09\11091001.dwg
 Scale: 1:1
 Date: 2020/11/09 10:49 AM

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	B. PICKETT
DRAWN BY:	T. RAHLAN
CHECKED BY:	B. PICKETT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



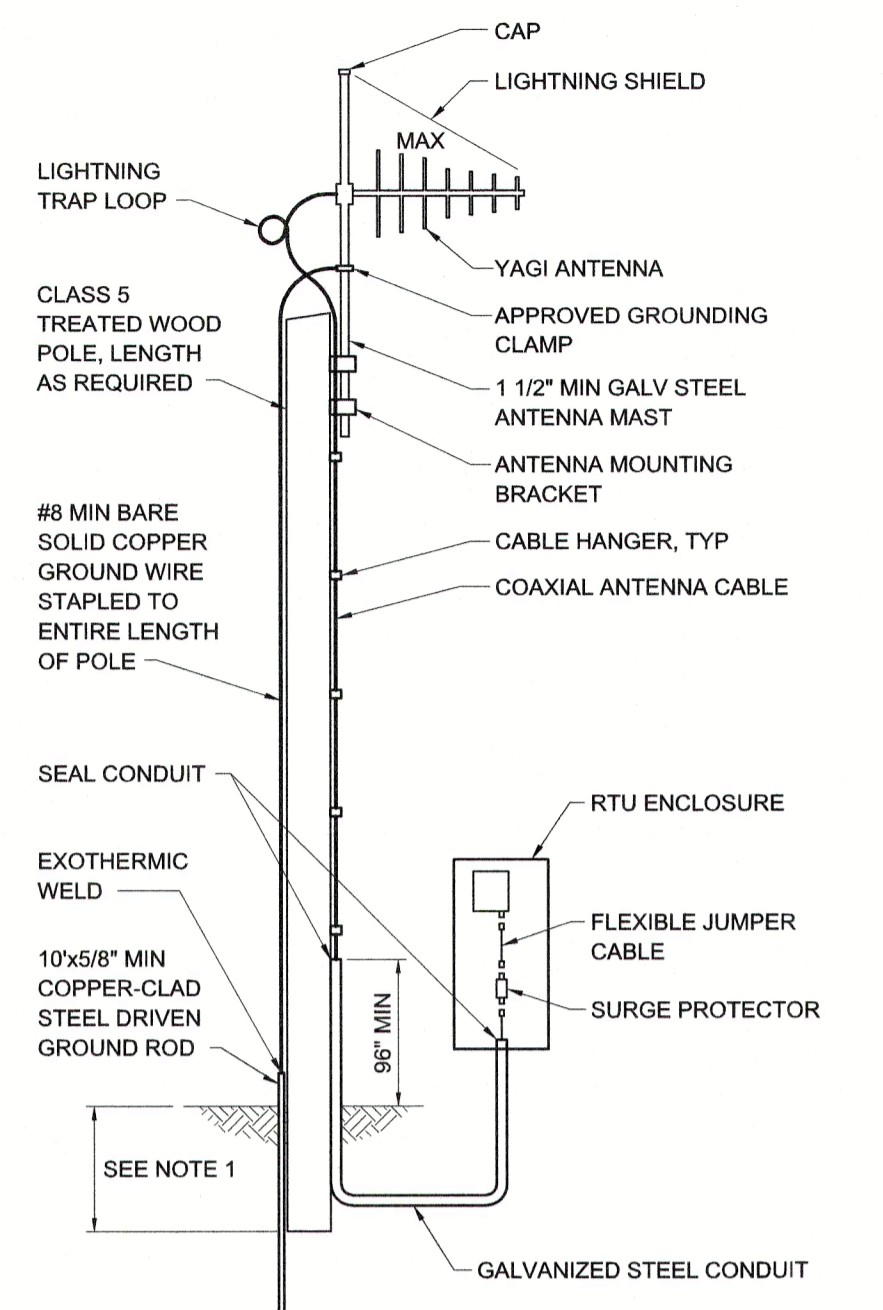
Hazen
 HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
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 320 S. ACADEMY STREET
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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

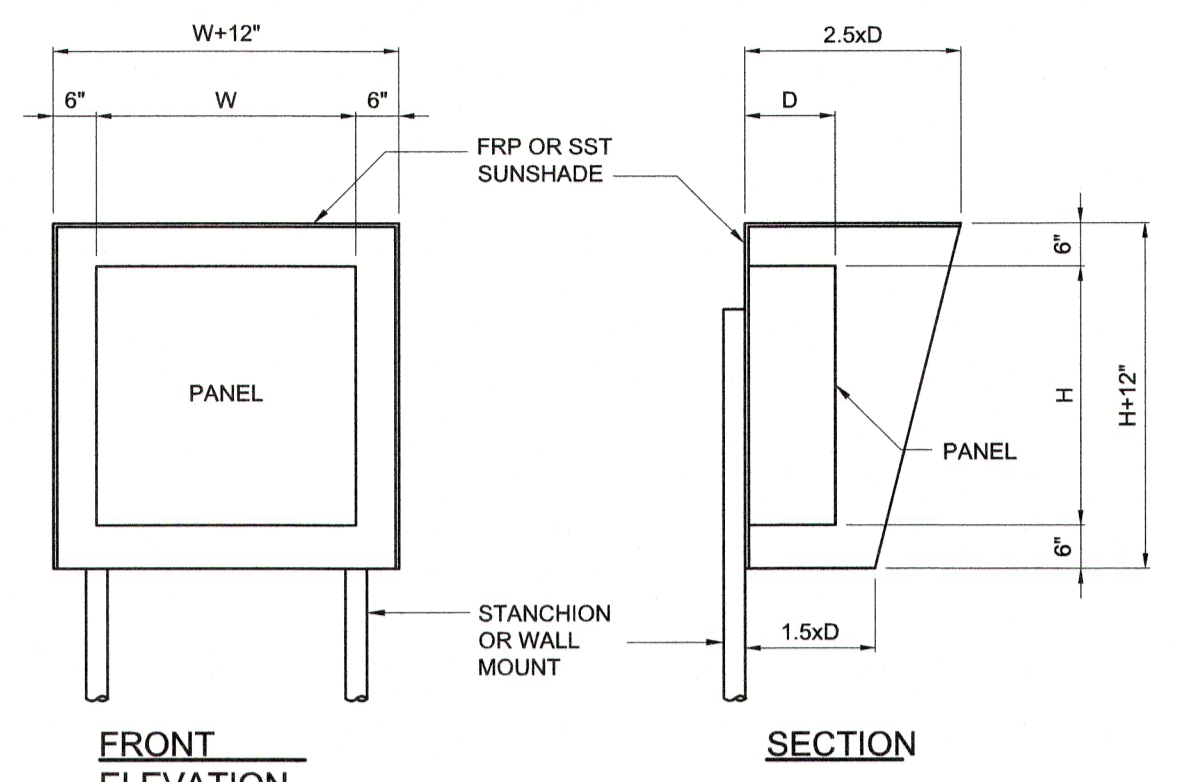
ELECTRICAL
 PANEL SCHEDULES AND RISER
 DIAGRAMS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	E02



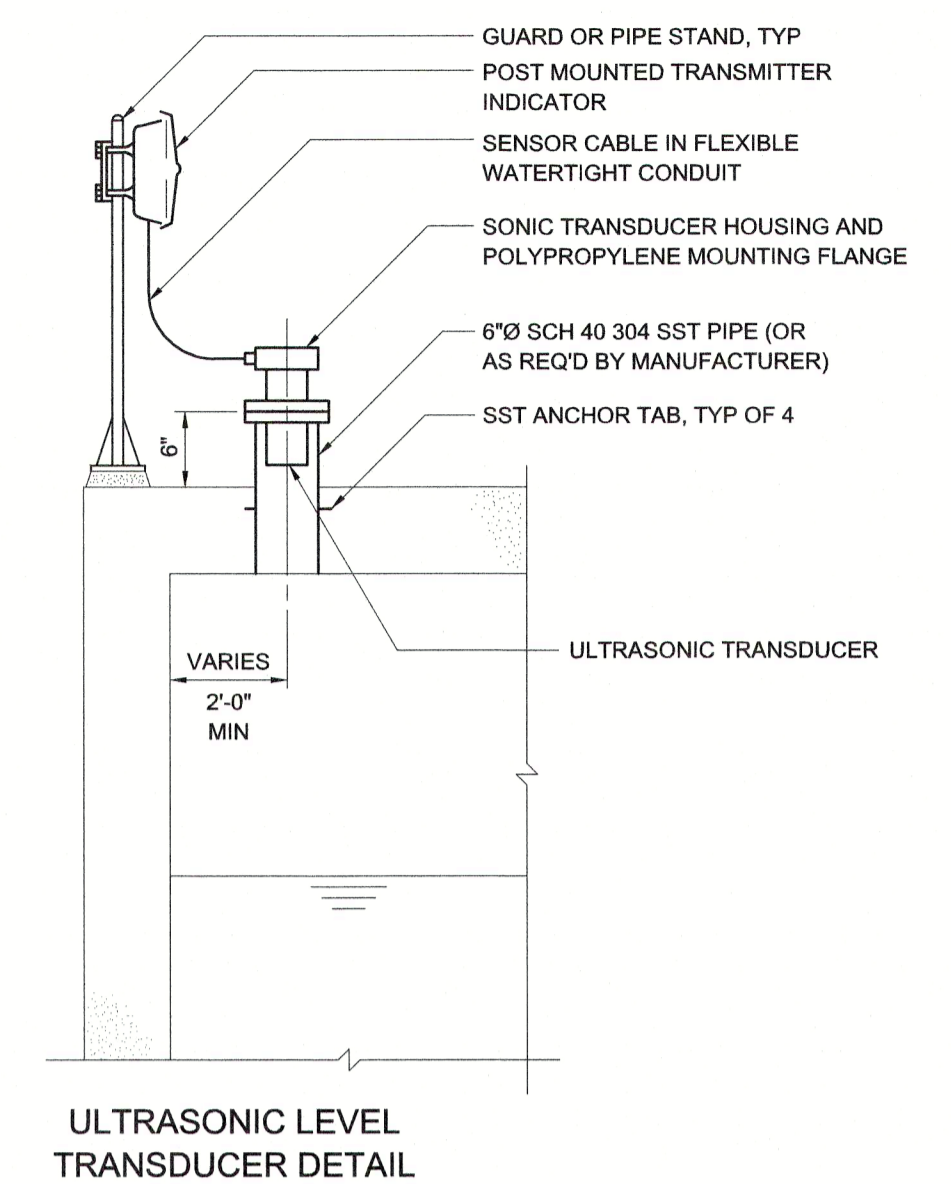
- NOTES:
1. ALTERNATE ANTENNA MOUNTING METHODS (EG, GALVANIZED METAL POLE, BUILDING WALL, TRIPLEX METAL TOWER, ETC) MAY BE USED SUBJECT TO ACCEPTANCE BY ENGINEER.
 2. ANTENNA MOUNTING INSTALLATIONS SHALL MEET ALL LOCAL BUILDING CODES.

RADIO ANTENNA MOUNTING
I-40-1001

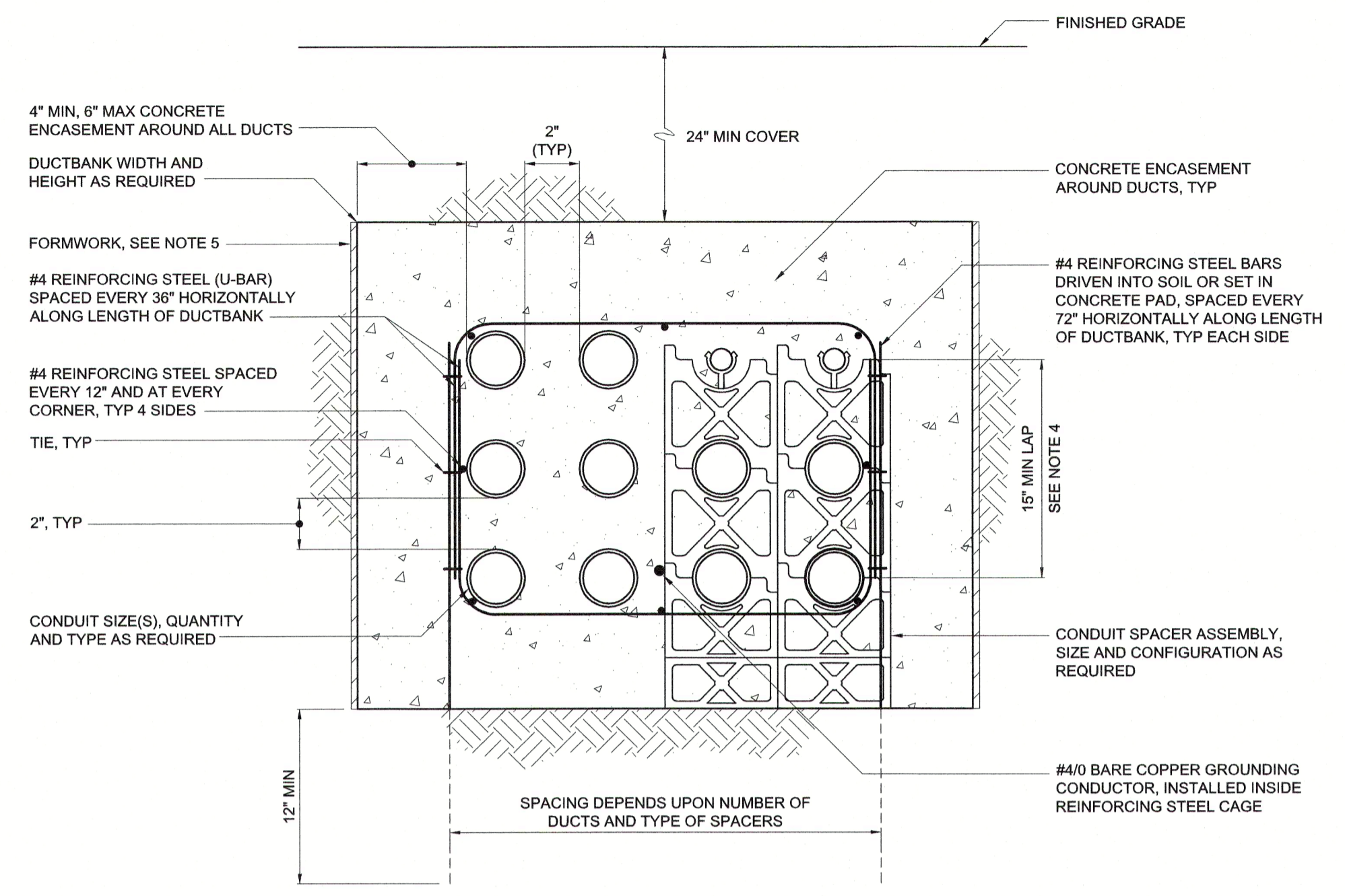


- NOTES:
1. PANELS SHALL BE PROVIDED WITH SUNSHADES AS SPECIFIED OR AS SHOWN ON THE DRAWINGS.
 2. SUNSHADES SHALL BE FRP, STYRE E AS MANUFACTURED BY O'BRIEN CORPORATION, OR EQUAL, OR FABRICATED FROM 10 GAUGE TYPE 304 STAINLESS STEEL. WHERE PRACTICAL, PANELS AND INSTRUMENTS SHALL BE MOUNTED IN A NORTH FACING DIRECTION.
 3. CONTRACTOR SHALL VERIFY PANEL SIZE BEFORE CONSTRUCTION OF SUNSHADE AND MODIFY AS REQUIRED TO PROTECT PANELS FROM THE EFFECTS OF SOLAR HEAT GAIN.
 4. SUNSHADES SHALL BE SUITABLE FOR WALL OR STAND MOUNTING.

SUNSHADE FOR OUTDOOR PANELS
I-40-1003



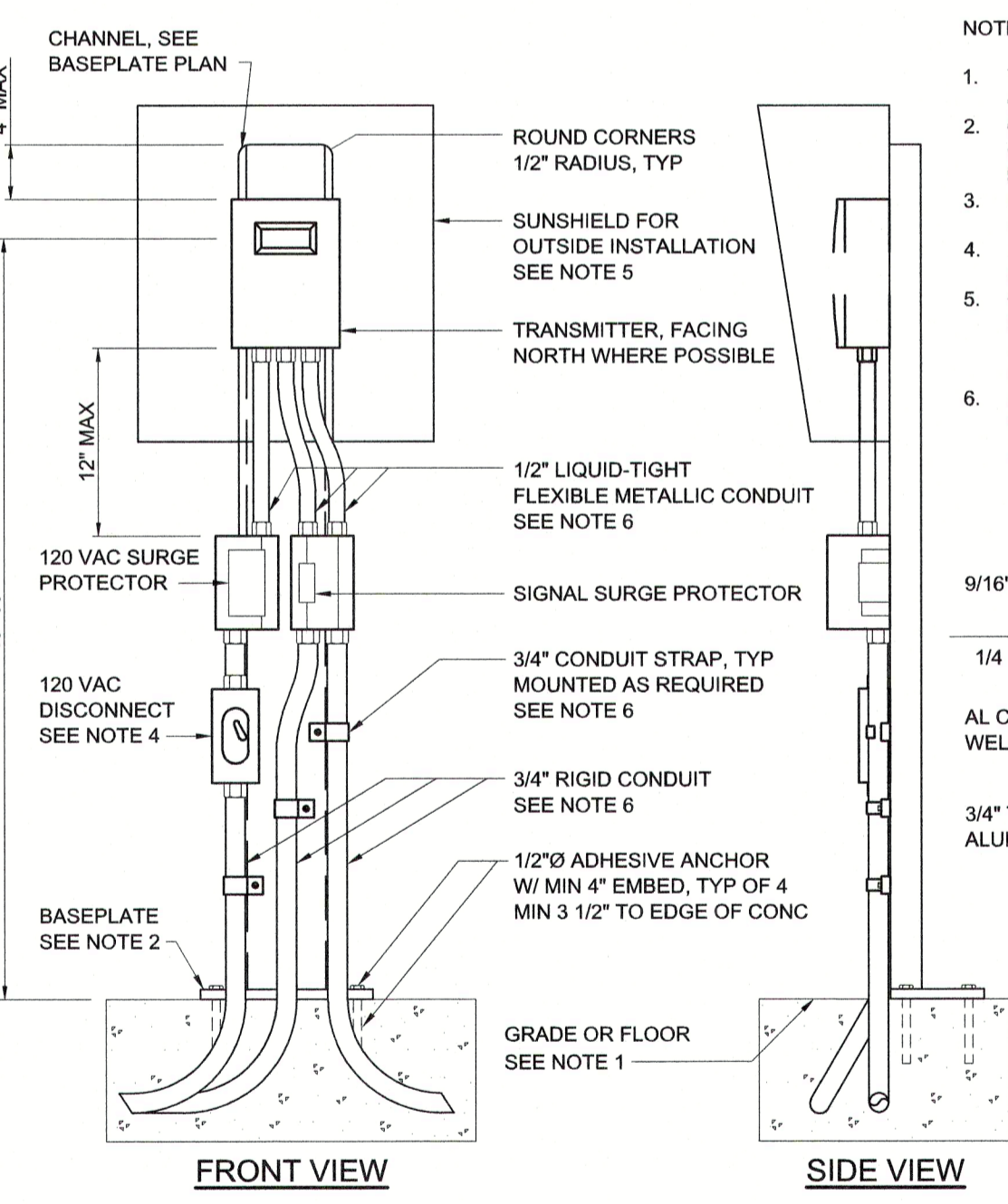
ULTRASONIC LEVEL TRANSDUCER DETAIL
I-40-0211



- NOTES:
1. CONCRETE SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 03 30 00.
 2. REINFORCING STEEL AND TIES SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH SPECIFICATION SECTION 03 21 00. OVERLAP FOR REINFORCING STEEL SPLICES ALONG THE DUCTBANK LENGTH SHALL BE 15\", MINIMUM.
 3. CONDUIT SPACERS ARE REQUIRED IN ACCORDANCE WITH SPECIFICATION SECTION 33 71 19. HORIZONTAL SPACING OF CONDUIT SPACER ASSEMBLIES ALONG LENGTH OF DUCTBANK SHALL BE AS SHOWN IN THE TABLE.
 4. FOR DUCTBANKS LESS THAN 15\"/>

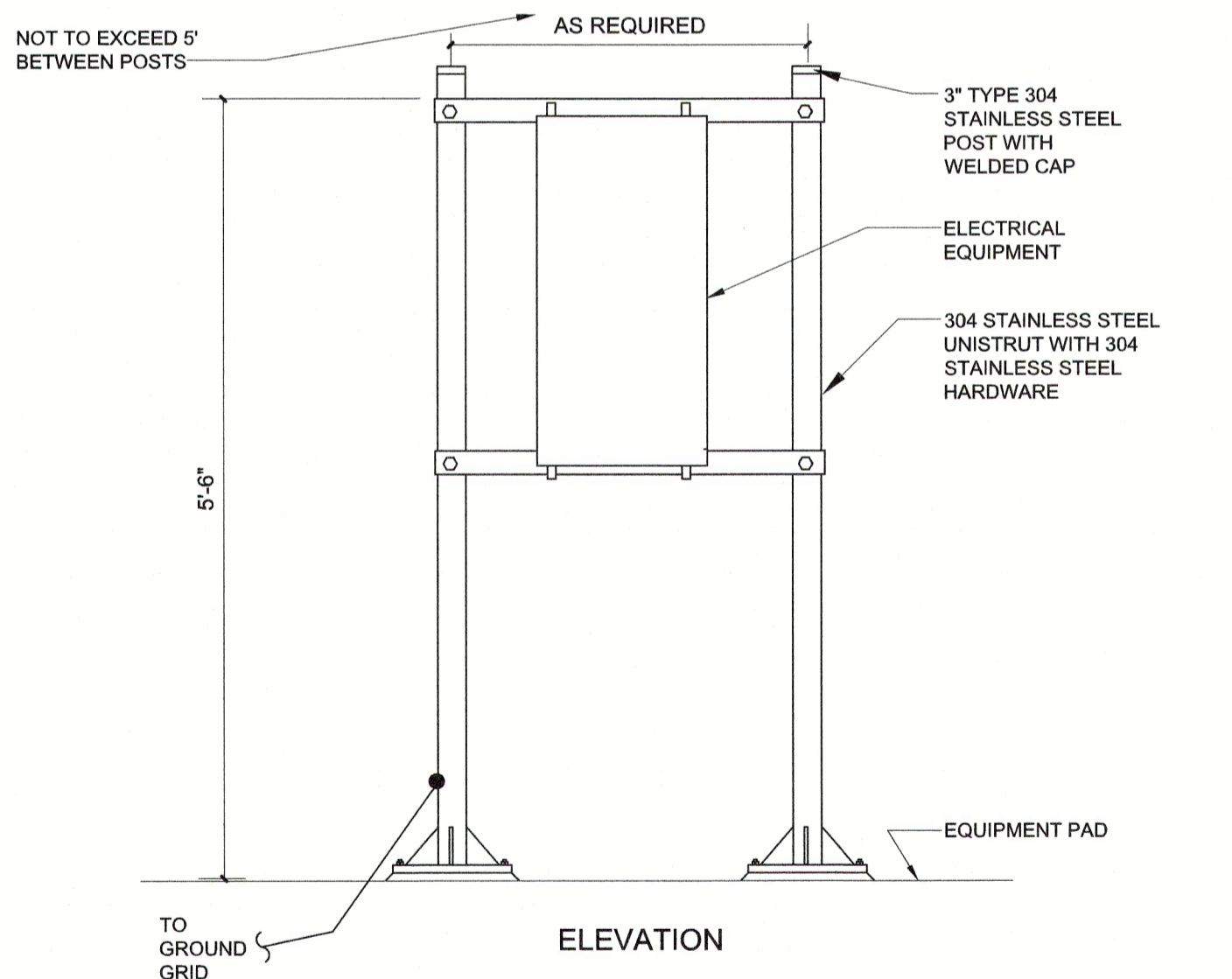
MAX SPACING BETWEEN CONDUIT SPACER ASSEMBLIES	
CONDUIT SIZE	SPACING
1"	3 FT
1 1/4-2"	5 FT
2 1/2-3"	6 FT
3 1/2-5"	7 FT
6"	8 FT

TYPICAL DUCTBANK SECTION
E-33-0101



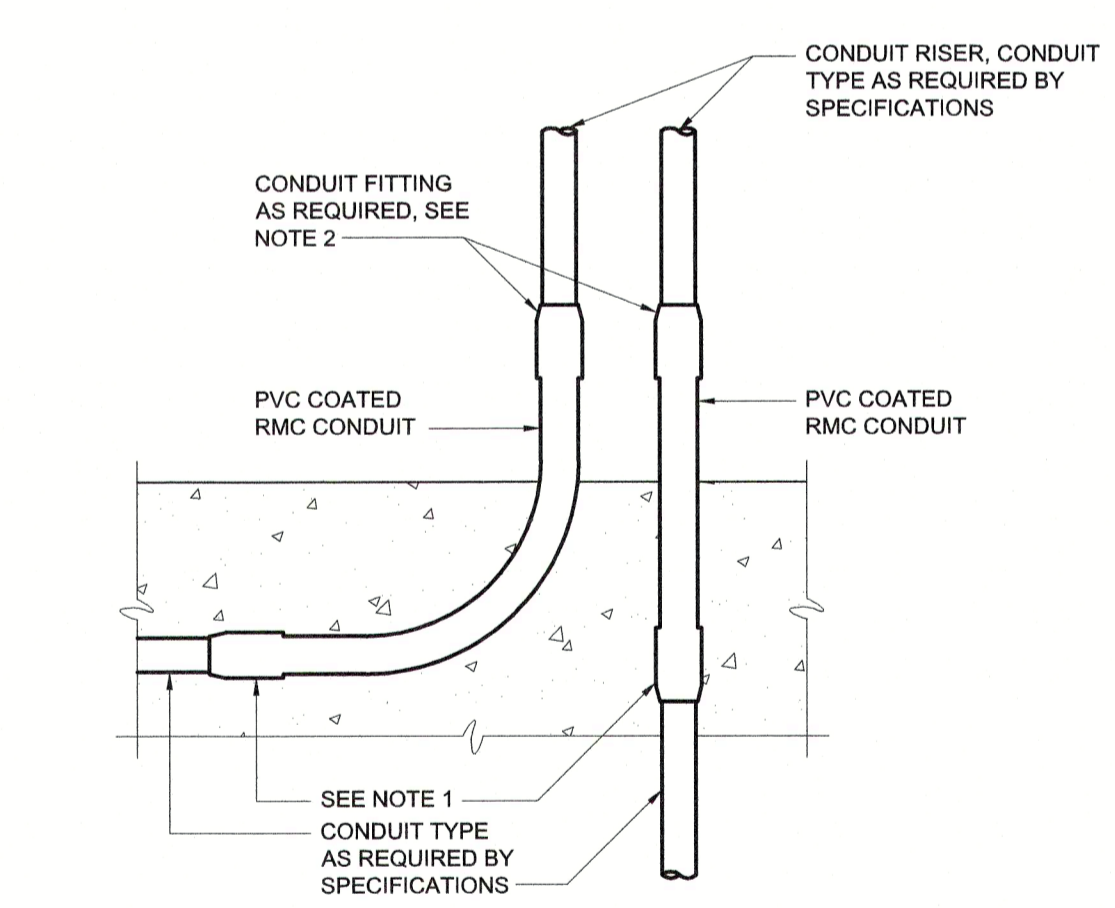
- NOTES:
1. WHEN NO CONCRETE IS AVAILABLE, POUR CLASS \"B\" CONCRETE SLAB, 30\"/>

4-WIRE TRANSMITTER MOUNTED IN CONCRETE SLAB
I-40-0901



- NOTES:
1. ADJUST THE NUMBER OF SUPPORT POSTS TO ACCOMMODATE THE EQUIPMENT TO BE INSTALLED.

TYPICAL EQUIPMENT RACK ON GRADE
E-26-0404



- NOTES:
1. FOR ENCASED PVC CONDUIT USE PVC TERMINAL ADAPTER. FOR ALL OTHER CONDUIT TYPES, USE PVC COATED RMC COUPLINGS.
 2. IF ANY THREADS OF THE PVC COATED RMC CONDUIT ARE EXPOSED AFTER INSTALLATION OF THE CONDUIT FITTING, THE CONDUIT FITTING SHALL BE PVC COATED TYPE WITH APPROPRIATE PVC SKIRTS. IF THE THREADS OF THE PVC COATED RMC CONDUIT ARE PROPERLY CUT SO THAT THEY ARE NOT EXPOSED AFTER INSTALLATION OF THE CONDUIT FITTING, THE CONDUIT MATERIAL SHALL BE AS REQUIRED BY THE SPECIFICATIONS, BASED ON THE MATERIAL OF THE CONDUIT RISER.

CONDUIT EXITING CONCRETE ENCASEMENT
E-26-0102

SITE PERMITTING APPROVAL

WATER AND SEWER PERMITS (IF APPLICABLE)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # _____

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

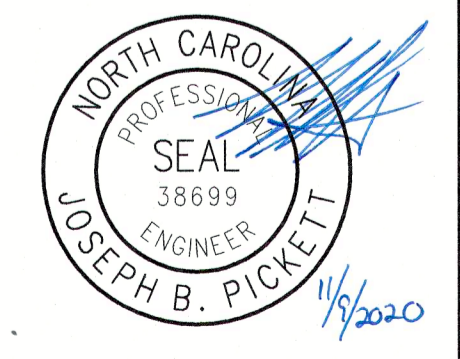
ALL CONSTRUCTION MUST CONFORM TO THE UNDERGROUND UTILITY PROTECT (U) ACT

BEFORE YOU DIG! CONTACT ONE-CALL CENTER CALL 811 OR 1-800-632-4949

FINAL DESIGN

PLOT DATE: 2020/11/09 10:51:31 AM BY: EDC
 FILE: C:\GIS\PROJECTS\2020\11\09\10-49-AM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	B. PICKETT		
DRAWN BY:	T. RAHLAN		
CHECKED BY:	B. PICKETT		
IF THIS BAR DOES NOT MEASURE 1\"/>			
REV	ISSUED FOR	DATE	BY



Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC

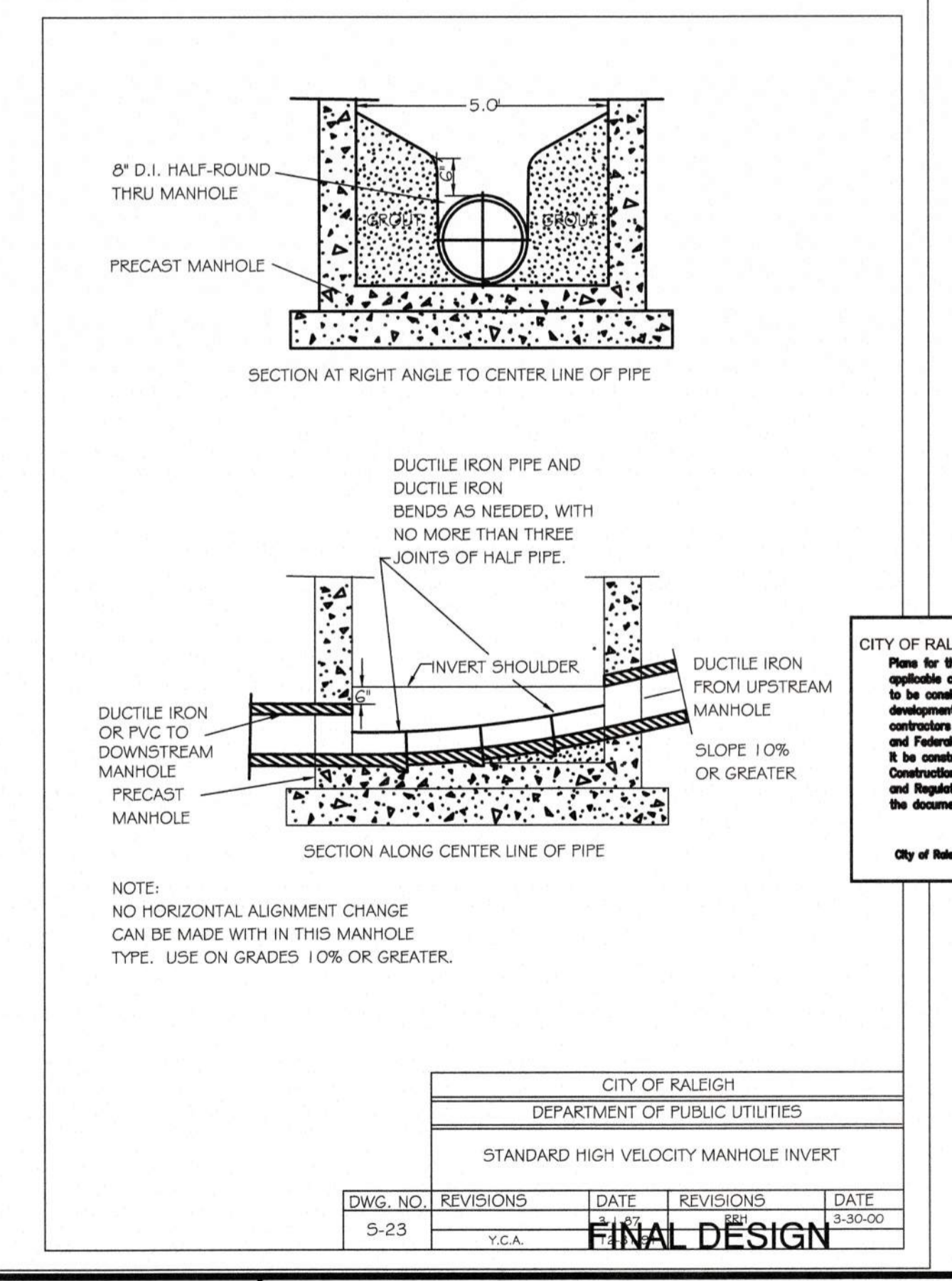
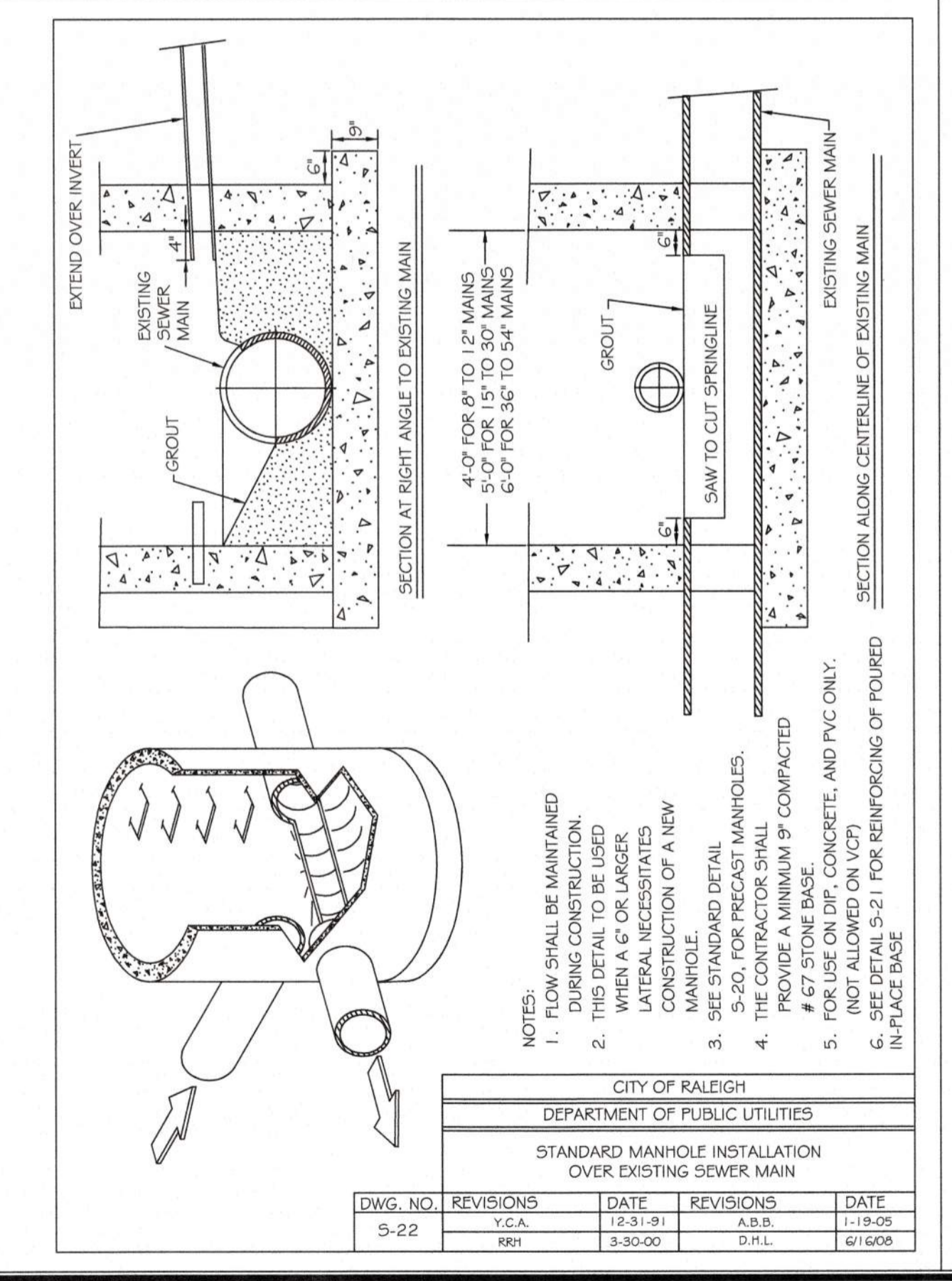
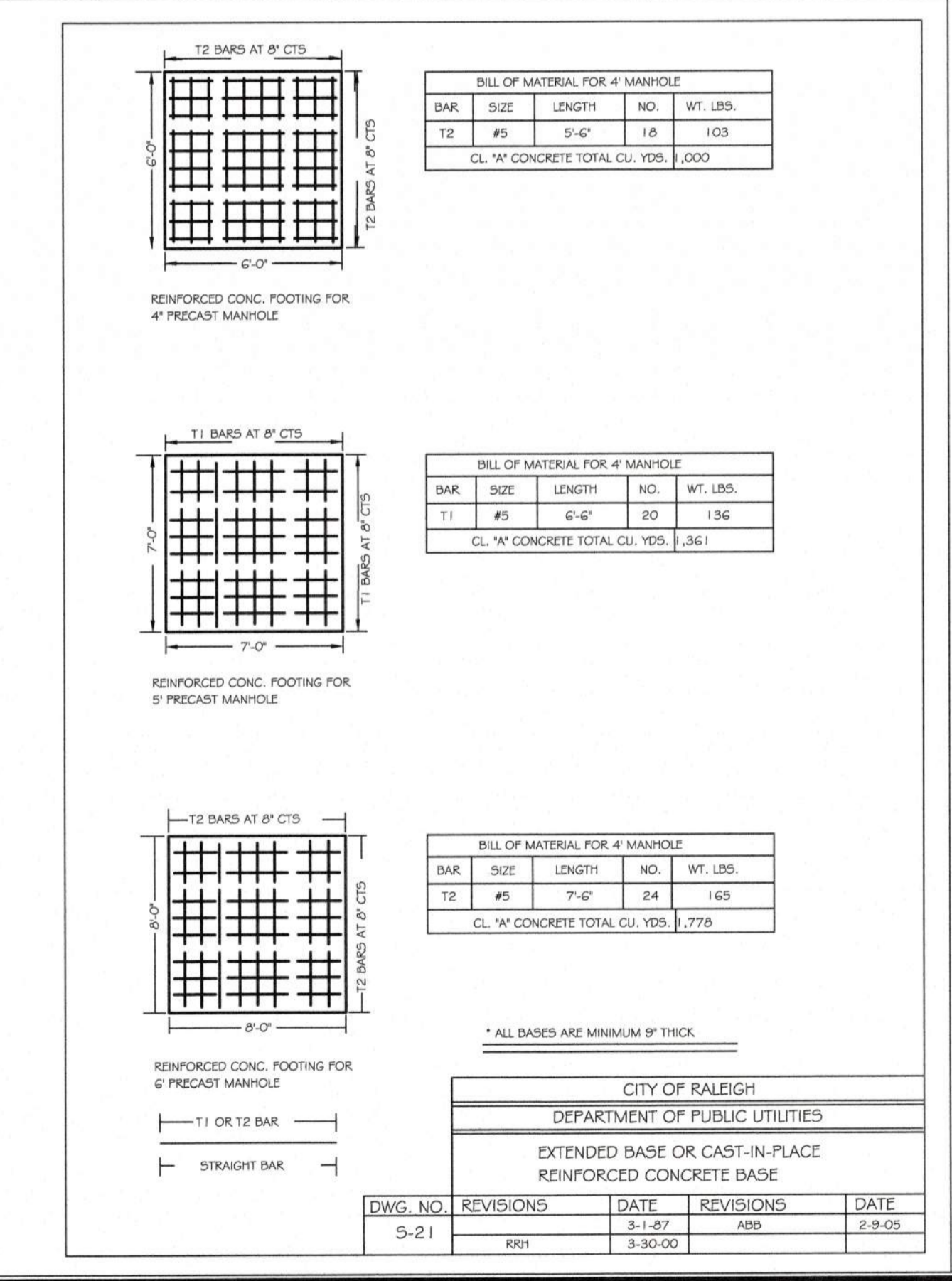
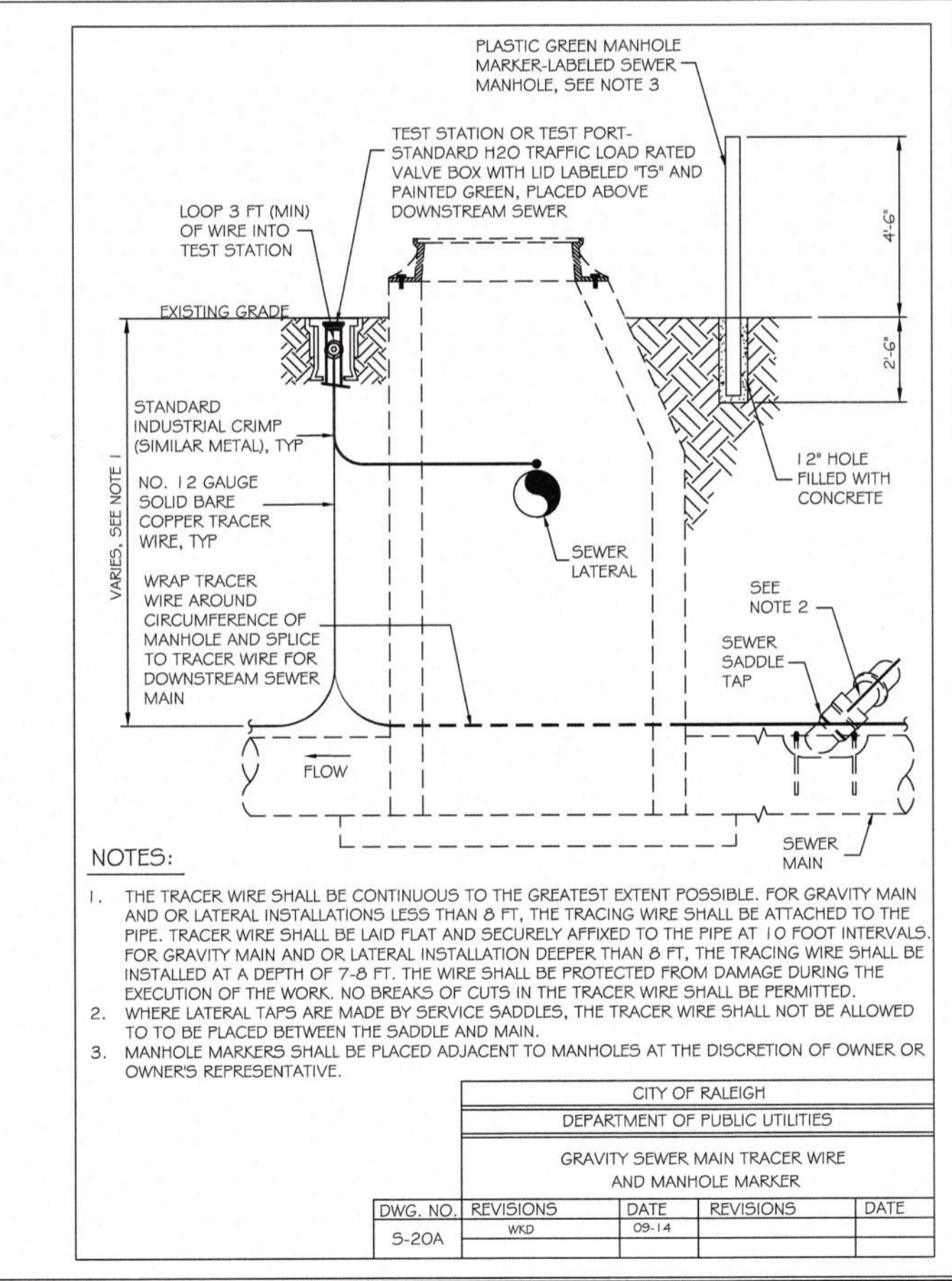
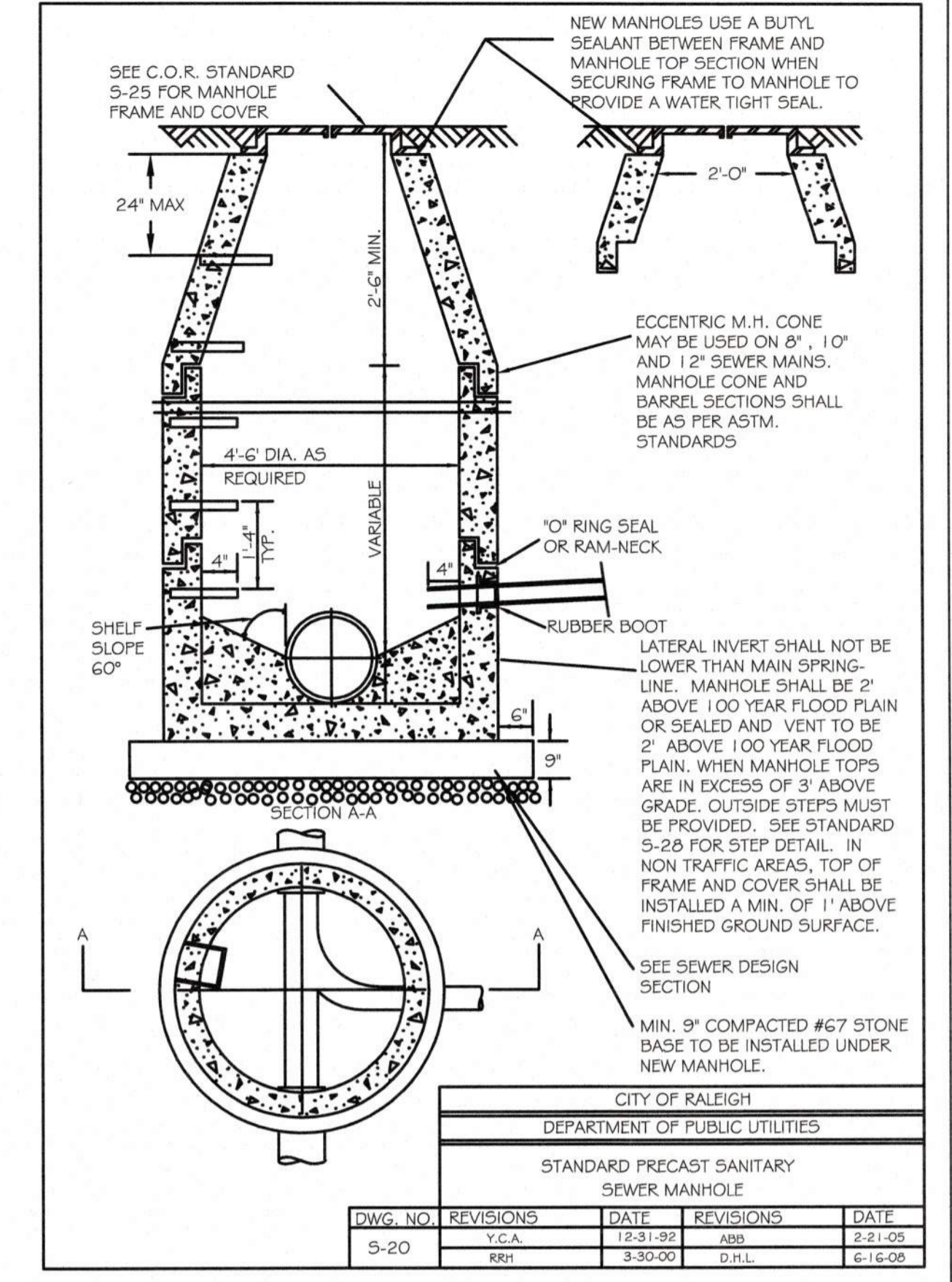
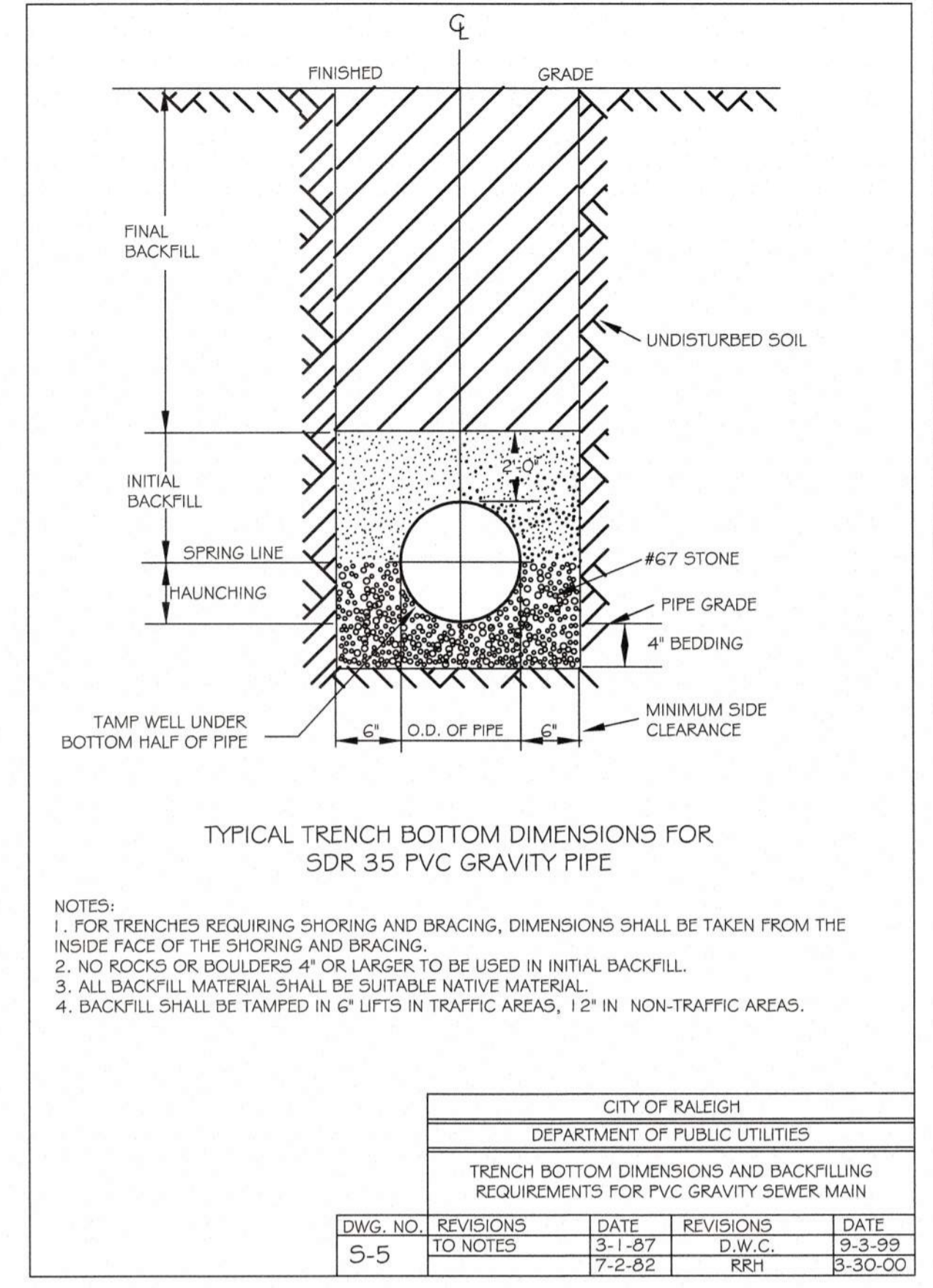
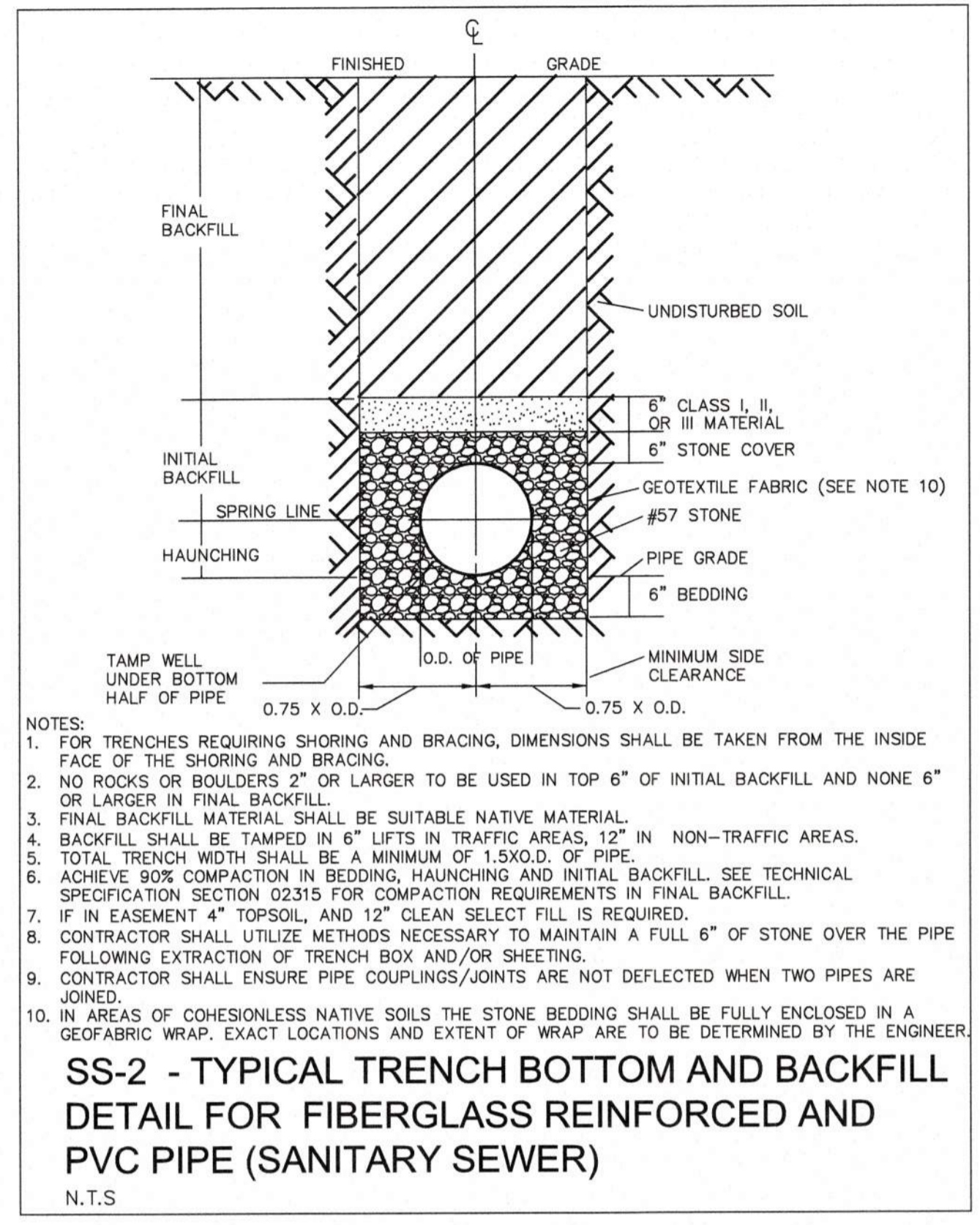
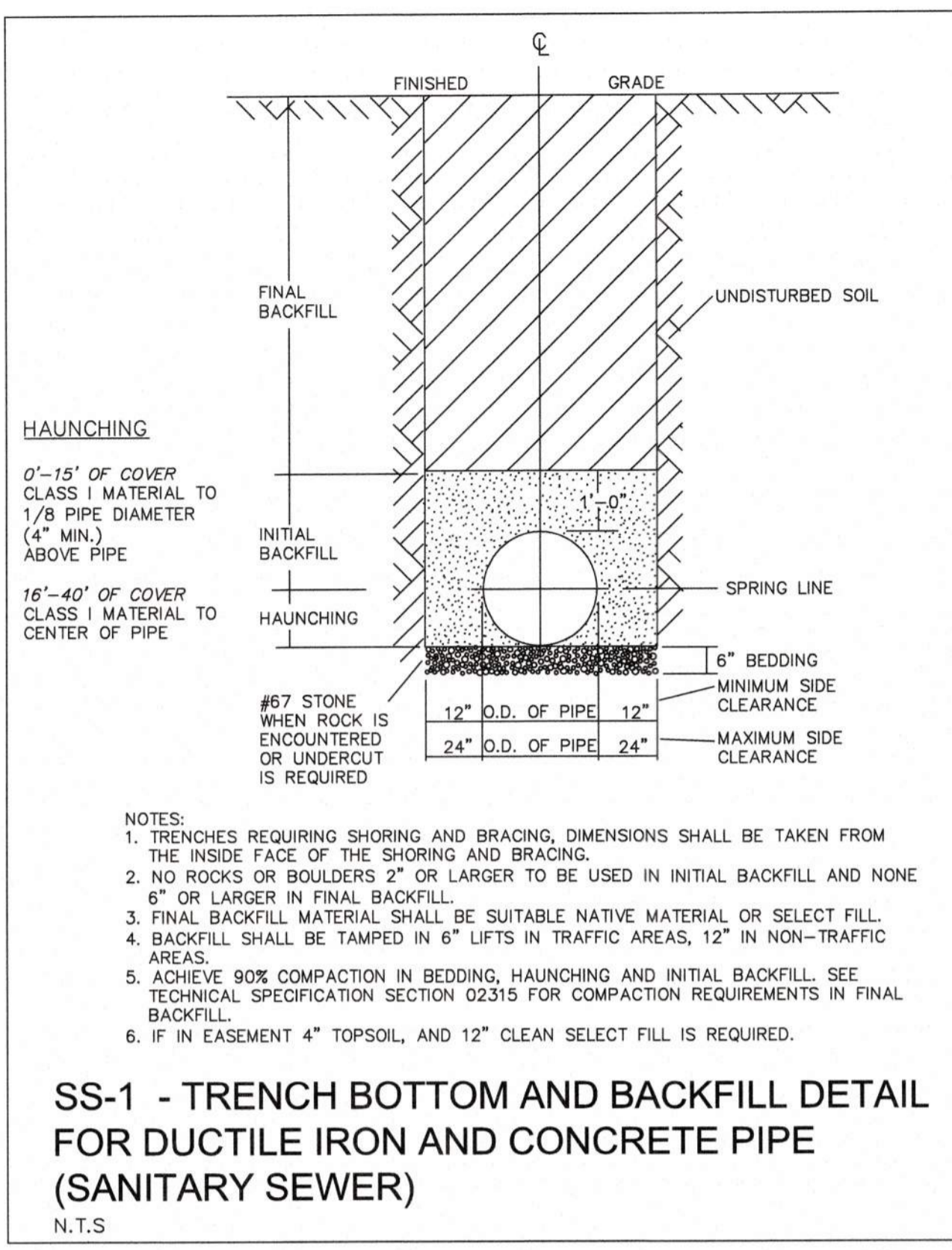
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

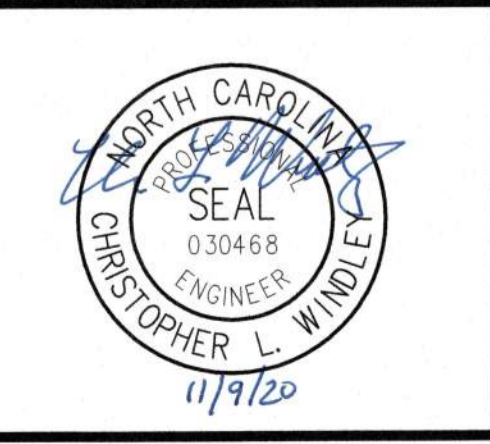
ELECTRICAL
STANDARD DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	E03



PLOT DATE: 08/01/20 10:56:53 AM BY: J67 B.C.B. DATE: 2020/07/08 5:47 PM
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PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	E. NG		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"		
REV	ISSUED FOR	DATE	BY



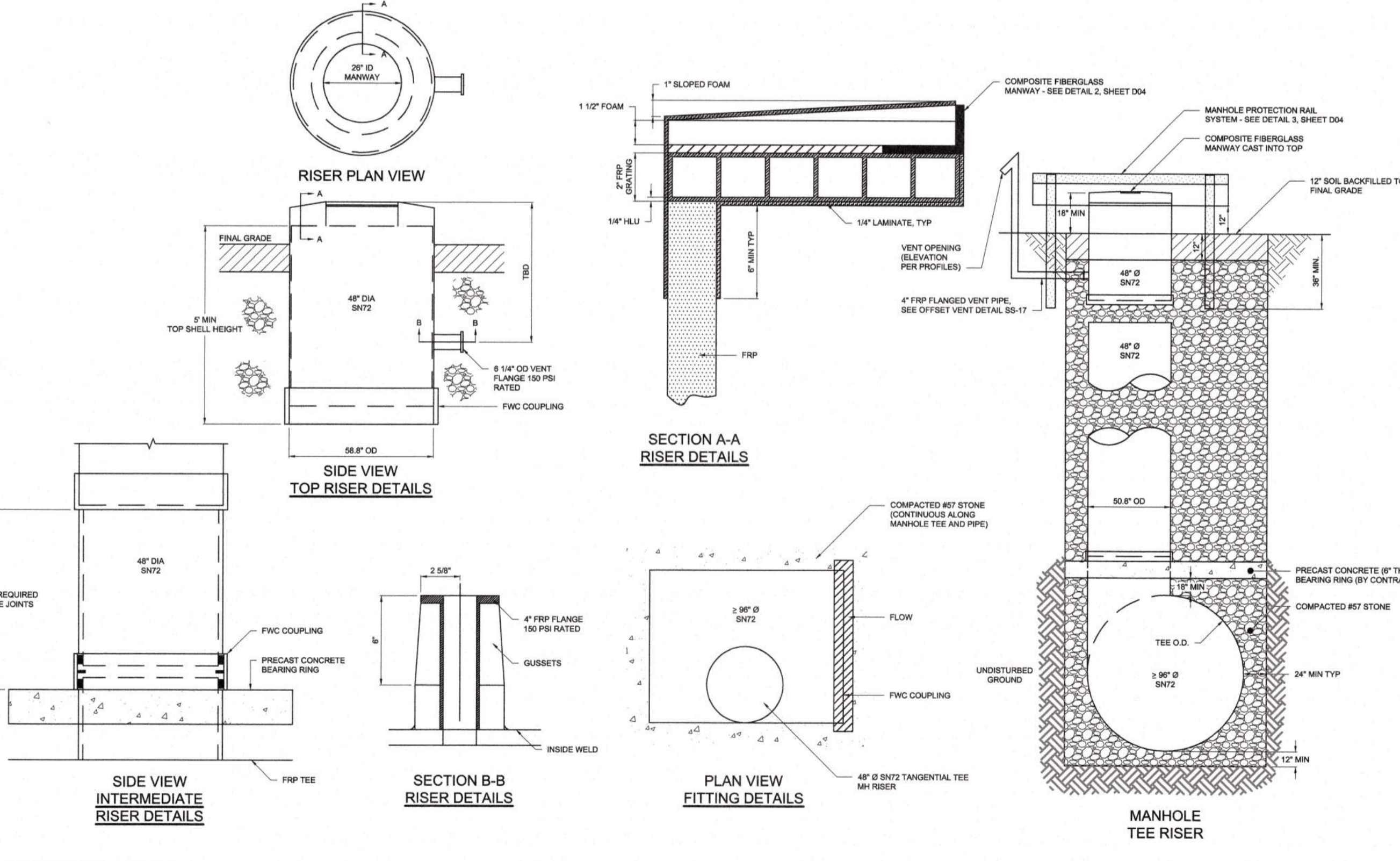
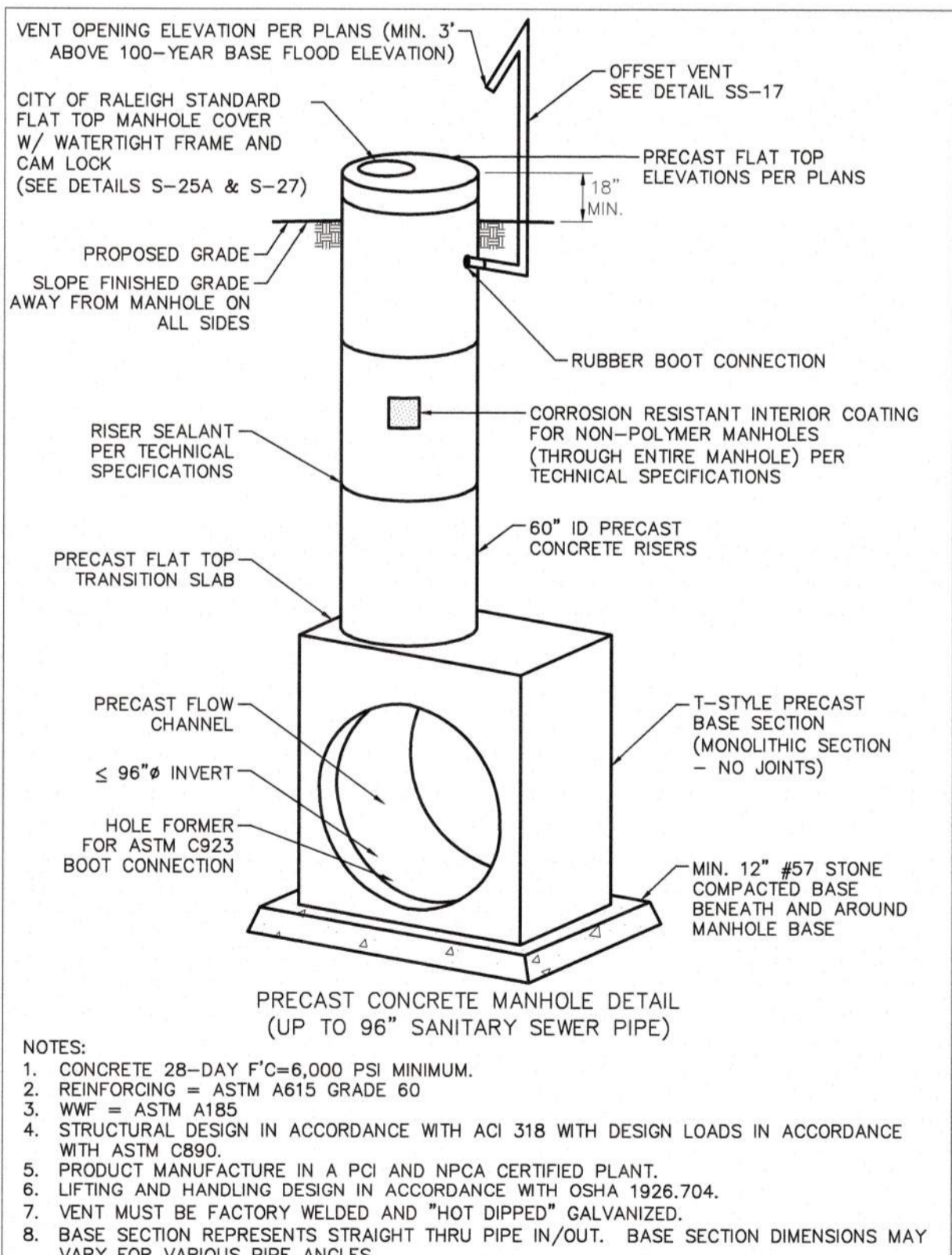
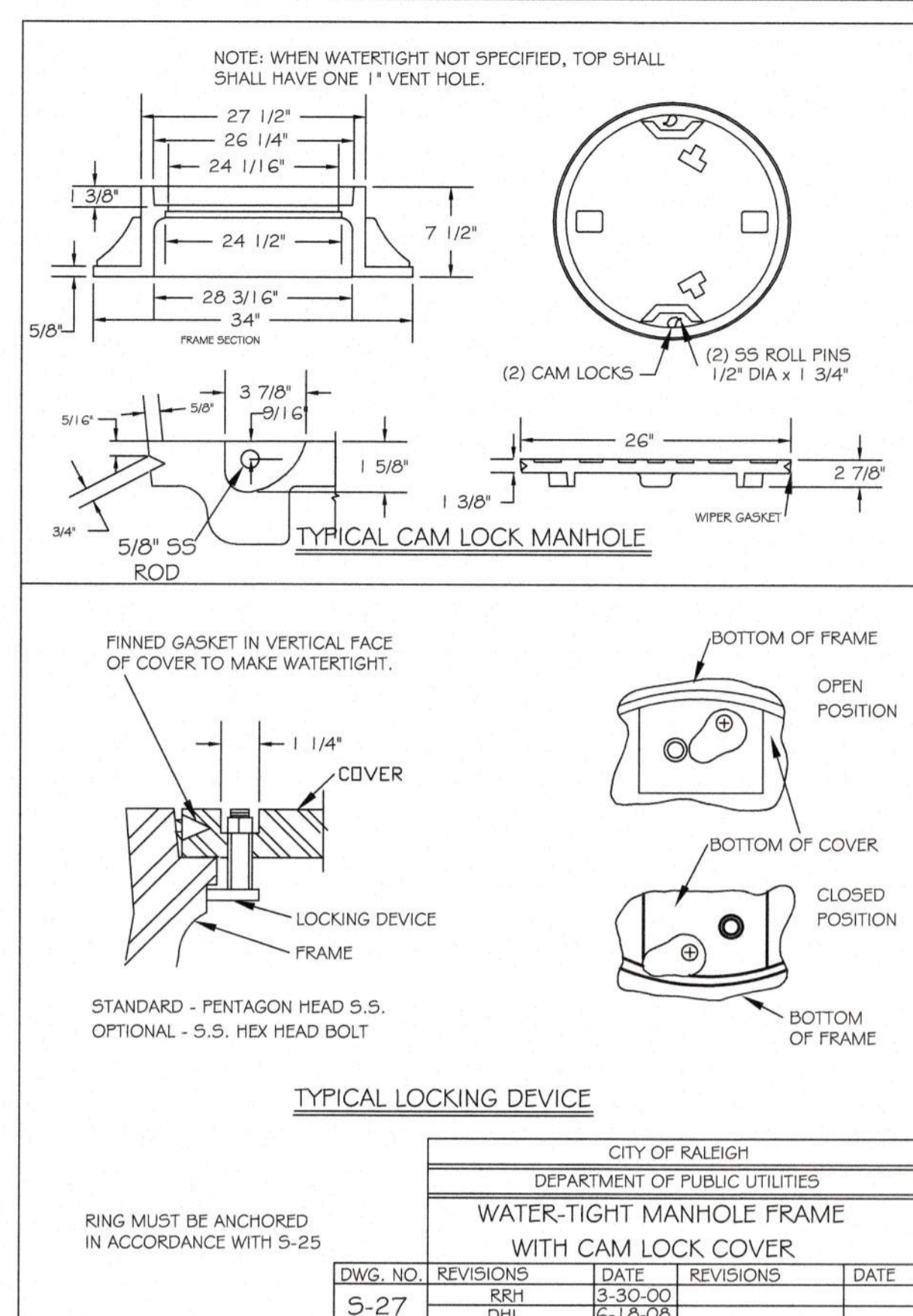
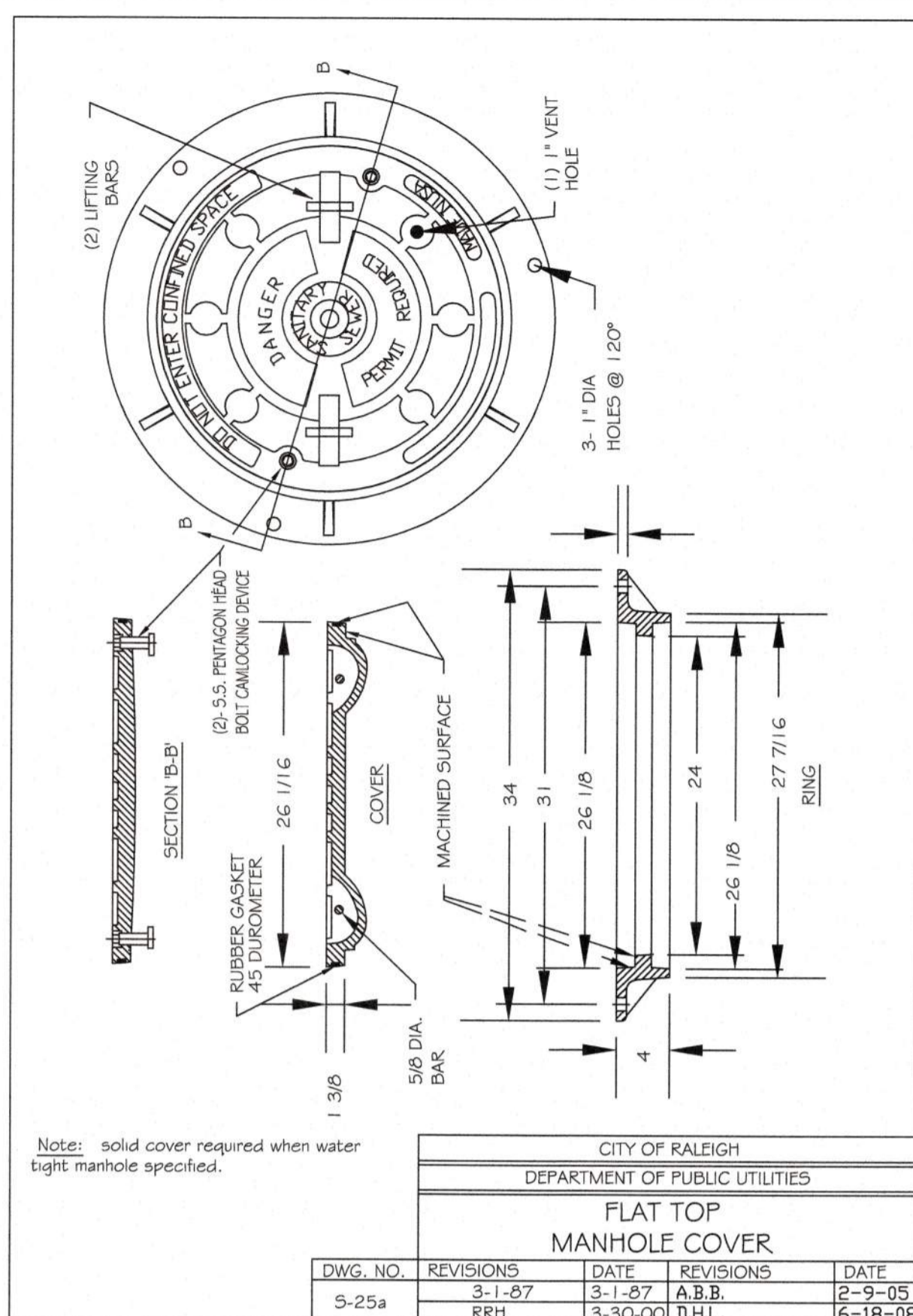
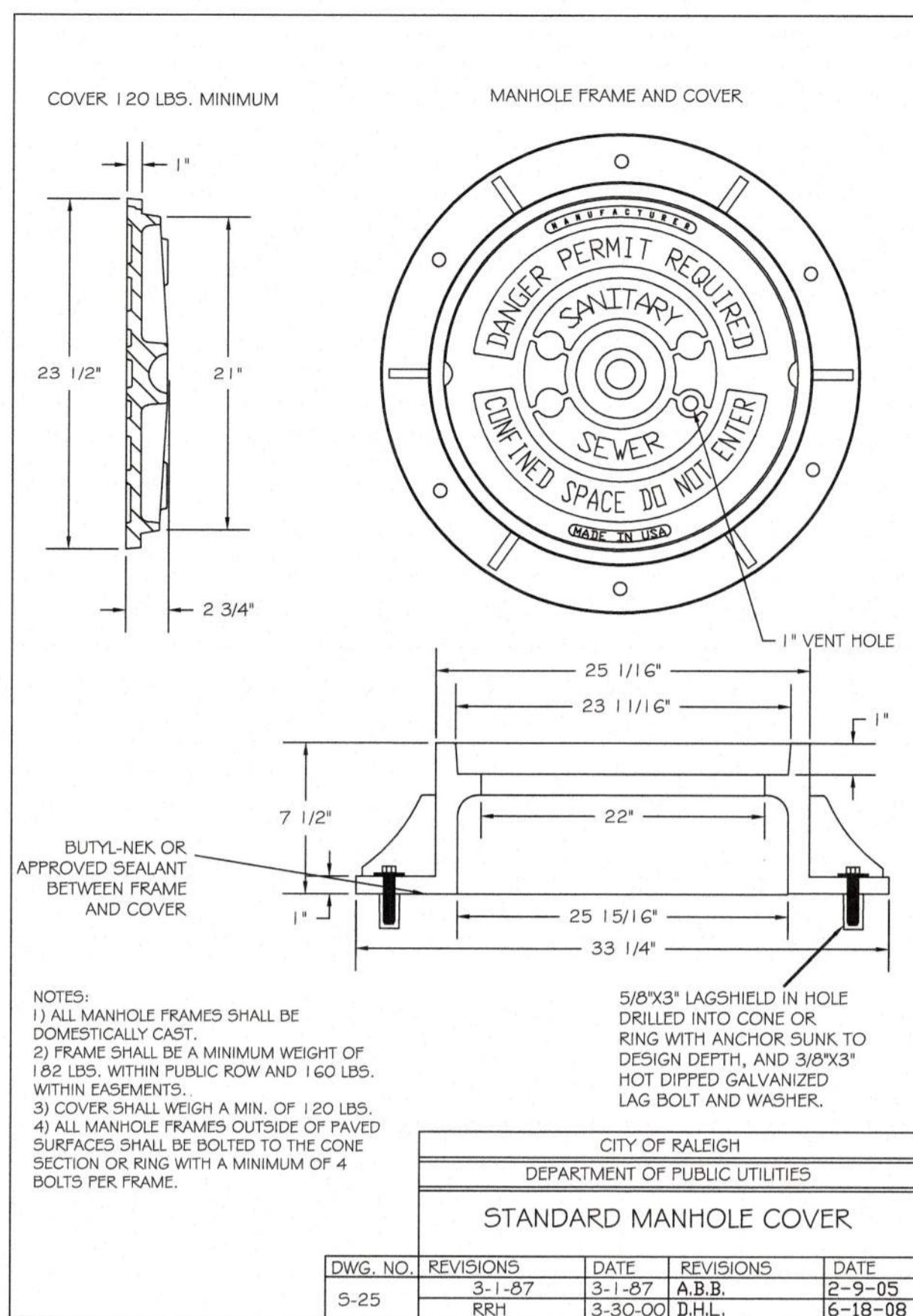
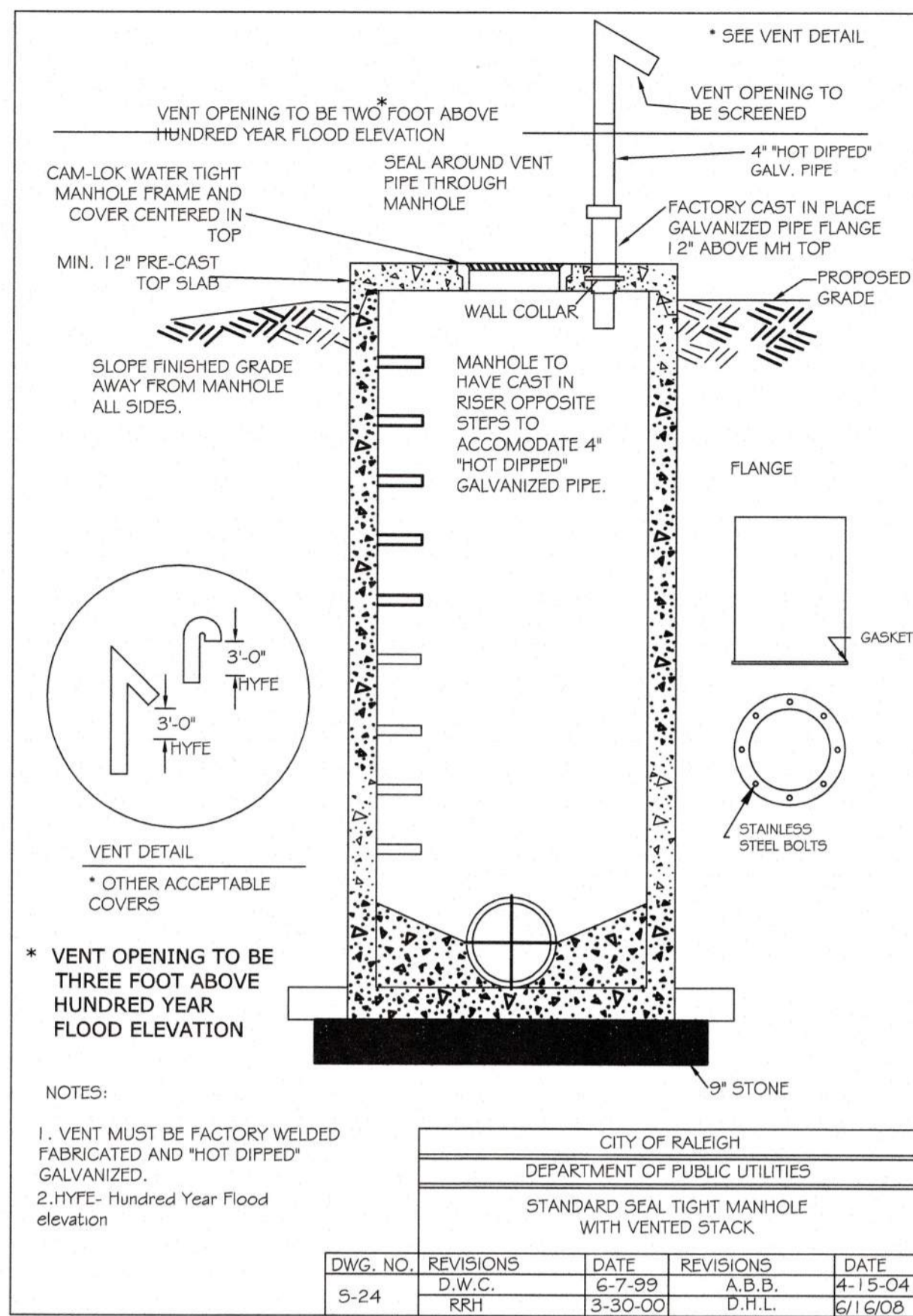
Hazen
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 RALEIGH, NORTH CAROLINA 27607
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CJS
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 CARY, NC 27511
 LICENSE NO. : P-1611

CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

STANDARDS DETAILS
 ENTER DISCIPLINE HERE
 SANITARY SEWER
 DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	D01



Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it confirms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: _____ Date: _____
 Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: _____ Date: _____
 Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.

City of Raleigh Development Approval _____



PLOT DATE: 2020/11/09 5:56:55 PM - BY: AET BAILEY
 File: C:\WORK\KAZEN\PROJECTS\000 - Saved By: AET BAILEY Date: 2020/11/09 5:42:12 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen

HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
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 CARY, NC 27511
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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	D02

- THE INTENT OF THE CONSTRUCTION SEQUENCE IS TO PROVIDE THE CONTRACTOR WITH A GENERAL GUIDE FOR CONSTRUCTION PURPOSES. THIS SEQUENCE IS NOT INTENDED TO OUTLINE ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.
- EROSION AND SEDIMENT CONTROL (E&SC) PERMIT AND A CERTIFICATE OF COVERAGE (COC) MUST BE OBTAINED BEFORE ANY LAND DISTURBING ACTIVITIES OCCUR. THE COC CAN BE OBTAINED BY FILING OUT THE ELECTRONIC NOTICE OF INTENT (E-NOI) FORM AT DEQ.NC.GOV/NCGOI. PLEASE NOTE, THE E-NOI FORM MAY ONLY BE FILLED OUT ONCE THE PLANS HAVE BEEN APPROVED, A COPY OF THE E&SC PERMIT, THE COC, AND A HARD COPY OF THE PLAN MUST BE KEPT ON SITE, PREFERABLE IN A PERMITS BOX, AND ACCESSIBLE DURING INSPECTION.
- CONTACT THE DEMLR RALEIGH REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO COMMENCING THE LAND-DISTURBING ACTIVITY. THE CONTACT NUMBER IS 919-791-4200.
- CONTRACTOR SHALL ARRANGE PRE-CONSTRUCTION MEETING WITH THE OWNER'S REPRESENTATIVE, ENGINEER, CITY OF RALEIGH AND NCDEQ-LAND QUALITY SECTION REPRESENTATIVE PRIOR TO ANY LAND DISTURBING ACTIVITY ON SITE.
- ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NORTH CAROLINA EROSION AND SEDIMENTATION CONTROL PLANNING AND DESIGN MANUAL.
- ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER RAINFALL EVENTS. NEEDED REPAIRS SHALL BE MADE IMMEDIATELY.
- IF IT IS DETERMINED DURING CONSTRUCTION THAT SIGNIFICANT SEDIMENT IS LEAVING THE SITE, DESPITE PROPER IMPLEMENTATION AND MAINTENANCE, THE CONTRACTOR IS OBLIGATED TO TAKE ADDITIONAL CORRECTIVE ACTION. CONTACT OWNER'S REPRESENTATIVE AND ENGINEER WITH ANY ADDITIONAL MEASURES NEEDED.
- CONTRACTOR SHALL ESTABLISH GROUND COVER ON DISTURBED AREAS WITHIN DAYS SPECIFIED BY THE NPDES GENERAL PERMIT STABILIZATION REQUIREMENTS AFTER COMPLETION OF ANY PHASE OF GRADING. SEEDING SHALL BE IN ACCORDANCE WITH EC-3 AND EC-4. PER THE NPDES PERMIT, GROUND STABILIZATION WILL BE APPLIED WITHIN 14 CALENDAR DAYS FROM LAST LAND DISTURBING ACTIVITY. FOR STEEP SLOPES, THAT AREA MUST BE STABILIZED WITHIN 7 CALENDAR DAYS. FOR CRITICAL AREAS, BARE SOILS ARE TO BE STABILIZED AT THE END OF THE DAY. PERMANENT GROUND COVER SHALL BE ESTABLISHED IN 15 WORKING DAYS OR 90 CALENDAR DAYS, WHICHEVER IS SHORTER. HOWEVER, NPDES GROUND COVER REQUIREMENTS TAKE PRECEDENCE. SEE SHEET D06 FOR NC001 GROUND STABILIZATION REQUIREMENTS.
- MAINTAIN A COPY OF THE LETTER OF PLAN APPROVAL ON SITE FOR SEDIMENTATION AND EROSION CONTROL FROM NCDEQ-LAND QUALITY SECTION AS WELL THE PREVIOUS 30 DAYS OF SELF INSPECTION RECORDS, RAIN GAUGE, APPROVAL CERTIFICATE/LETTER, APPROVED PLAN, AND NPDES PERMIT. THESE ITEMS SHOULD BE LOCATED NEAR THE MAIN CONSTRUCTION ENTRANCE. COORDINATE WITH THE INSPECTOR IF AN ALTERNATIVE LOCATION IS PREFERRED. ADDITIONAL INFORMATION AND A LINK TO THE NC001 COMBINED SELF-MONITORING FORM CAN BE FOUND AT: <https://deq.nc.gov/about/divisions/energy-mineral-land-permits/stormwater-permits/construction-sw>
- THE SEDIMENTATION POLLUTION CONTROL ACT WAS AMENDED IN 2006 TO REQUIRE THAT PERSONS RESPONSIBLE FOR LAND-DISTURBING ACTIVITIES INSPECT A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. RULES DETAILING THE DOCUMENTATION OF THESE INSPECTIONS TOOK EFFECT OCTOBER 1, 2010. THE SELF-INSPECTION PROGRAM IS SEPARATE FROM THE WEEKLY SELF-MONITORING PROGRAM OF THE NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES. THE FOCUS OF THE SELF-MONITORING REPORT IS THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL MEASURES ACCORDANCE WITH NCGS 13A-54.1 AND 15A NCAC 4B.0131. THE SELF-INSPECTION REPORT FORM IS AVAILABLE AS AN EXCEL SPREADSHEET FROM THE WEBSITE PROVIDED IN NOTE 9. IF YOU HAVE ANY QUESTIONS OR CANNOT ACCESS THE FORM, PLEASE CONTACT THE NCDEQ OFFICE AT (919) 791-4200. THESE INSPECTION REPORTS ARE TO BE EMAILED, FAXED OR MAILED AT LEAST MONTHLY TO THE NCDEQ OFFICE. FAX: (919) 571-4718.
- CONTRACTOR TO POST CITY GRADING PERMIT PROMINENTLY ON SITE AT ALL TIMES.
- CONTRACTOR TO VERIFY LOCATION AND DEPTH OF EXISTING UTILITIES TO AVOID CONFLICT DURING INSTALLATION OF EROSION CONTROL MEASURES, STORM SEWER PIPES AND UNDERGROUND UTILITY LINES. CONTRACTOR IS TO CALL 1-800-632-4949 FOR "NC ONE CALL" OR "811" TO HAVE EXISTING UTILITIES LOCATED.
- CONTRACTOR TO HAVE A PROFESSIONAL LAND SURVEYOR FLAG PROPERTY LINES, EASEMENTS, STREAM BUFFERS, TREE PROTECTION AREAS AND LIMITS OF DISTURBANCE PRIOR TO LAND DISTURBING ACTIVITIES.
- INSTALL TEMPORARY SILT FENCE/TREE PROTECTION FENCE AND OTHER MEASURES AS SHOWN ON PLANS. SILT FENCE SHOULD BE INSTALLED ON ALL DOWNSLOPE PORTIONS OF THE DISTURBED AREA. SILT FENCE SHOULD NOT BE INSTALLED ON THE HIGH SIDE OF THE DISTURBANCE AREA (TREE PROTECTION FENCING IS AN ACCEPTABLE ALTERNATIVE IF DESIRED). SILT FENCE OUTLETS SHOULD BE INSTALLED AT ALL LOW SPOTS AND ANYWHERE WATER IS POOLING. SILT FENCE AND OUTLET LOCATIONS MAY VARY FROM THE APPROVED PLANS PER SITE CONDITIONS.
- INSTALL TEMPORARY GRAVEL CONSTRUCTION ENTRANCES WHERE REQUIRED TO ACCESS WORK AREA. INSTALL INLET PROTECTION FOR STORM DRAIN INLETS LOCATED IN FIELD.
- INSTALL TEMPORARY ARC FILTER INLET PROTECTION AND CHECK DAMS AS SHOWN ON PLANS.
- OPEN TRENCH, INSTALL SANITARY SEWER AND BACKFILL TRENCH DAILY. SPOIL PLACEMENT SHALL BE ON THE UPSTREAM SIDE OF THE TRENCH.
- STABILIZE SITE AS TRENCH IS RESTORED TO ORIGINAL GRADE WITH VEGETATION AND/OR PAVING AS SHOWN ON PLANS.
- PERFORM SEEDING AND MULCHING AS REQUIRED IN ACCORDANCE WITH THE EROSION CONTROL (EC) DETAILS AND TECHNICAL SPECIFICATIONS.
- REMOVE TEMPORARY CONSTRUCTION ENTRANCES WHEN WORK IS COMPLETE IN AN AREA.
- ONCE ALL GROUND COVER HAS BEEN ESTABLISHED, AND OTHER CONSTRUCTION IS COMPLETE, CONTACT NCDEQ-LAND QUALITY SECTION AND ENGINEER FOR SITE INSPECTION BEFORE REMOVING ANY TEMPORARY EROSION CONTROL MEASURES.
- PERIMETER MEASURES MUST BE LEFT IN PLACE UNTIL ALL UPLAND AREAS ARE PERMANENTLY STABILIZED. AFTER SITE IS PERMANENTLY STABILIZED, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND PROVIDE PERMANENT SEEDING WHERE TEMPORARY MEASURES HAVE BEEN REMOVED AND GROUND COVER IS NOT ADEQUATE. SEDIMENT BASINS MAY NOT BE REMOVED OR CONVERTED TO PERMANENT BMPS UNTIL ALL UPLAND AREAS ARE PERMANENTLY STABILIZED.
- AFTER SITE IS COMPLETELY STABILIZED, CONTRACTOR SHALL REQUEST PERMISSION FROM ENGINEER TO REMOVE ALL TEMPORARY MEASURES. ONCE APPROVAL IS GIVEN, REMOVE ALL TEMPORARY MEASURES AND INSTALL PERMANENT VEGETATION AS REQUIRED AND ON ANY RESULTING BARE AREAS. REPAIR ANY AREAS DISTURBED DURING REMOVAL.
- WHEN THE PROJECT IS COMPLETE, THE PERMITTEE SHALL CONTACT DEM LR TO CLOSE OUT THE E&SC PLAN. AFTER DEMLR INFORMS THE PERMITTEE OF THE PROJECT CLOSE OUT, VIA INSPECTION REPORT, THE PERMITTEE SHALL VISIT DEQ.NC.GOV/NCGOI TO SUBMIT AN ELECTRONIC NOTICE OF TERMINATION (E-NOT). A \$100 ANNUAL GENERAL PERMIT FEE WILL BE CHARGED UNTIL THE E-NOT HAS BEEN FILLED OUT.

EC-1.1 - EROSION CONTROL CONSTRUCTION SEQUENCE

N.T.S

- ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE NORTH CAROLINA EROSION AND SEDIMENTATION CONTROL PLANNING AND DESIGN MANUAL.
- SELF-INSPECTIONS FOR EROSION AND SEDIMENTATION CONTROL MEASURES ARE TO BE PERFORMED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF EVERY RAIN EVENT OF GREATER THAN 1 INCH. ANY NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN MEASURES AS DESIGNED. ALL ESC MEASURES SHALL BE MAINTAINED AS SPECIFIED IN THE CONSTRUCTION DETAILS ON THIS PLAN. A RAIN GAUGE SHALL BE INSTALLED AT THE PROJECT SITE FOR MONITORING.
- ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY NEED TO BE INSTALLED IF DEEMED NECESSARY BY EITHER THE ENGINEER OR ENVIRONMENTAL INSPECTOR.
- TEMPORARY SEDIMENT CONTROL MEASURES (SILT FENCE, CONSTRUCTION ENTRANCE, ETC.) SHALL BE MAINTAINED UNTIL ALL CONTRIBUTING AREAS ARE GRADED AND STABILIZED.
- DUST ON SITE SHALL BE MINIMIZED BY SPRAYING WATER ON DRY AREAS OF THE SITE. THE USE OF OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION IS STRICTLY PROHIBITED.
- IF THE MAJORITY OF MUD OR DIRT IS NOT REMOVED FROM CONSTRUCTION TRAFFIC BY CONSTRUCTION ENTRANCES, CONTRACTOR SHALL CONSTRUCT VEHICLE WASH AREAS AT CONSTRUCTION TRAFFIC EXIT POINTS. MUD AND DIRT SHALL BE INTERCEPTED AND TRAPPED BEFORE WASH WATER IS ALLOWED TO BE DISCHARGED OFFSITE. RINSE-OFF WILL NOT BE ALLOWED OUTSIDE THE PROJECT CONSTRUCTION LIMITS.
- SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT REACHES 1-FOOT IN DEEP.
- MAXIMUM GRADED SLOPE SHALL NOT EXCEED 3:1.
- NO CONCRETE OR CEMENT SLURRY SHALL BE DISCHARGED FROM THE SITE. ANY HARDENED CONCRETE RESIDUE WILL BE DISPOSED OF, OR RECYCLED OFF SITE, IN ACCORDANCE WITH LOCAL AND STATE SOLID WASTE REGULATIONS.
- ALL SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
- REFER TO EROSION CONTROL DETAILS FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A PERMIT FOR ANY BORROW AND/OR SPOIL AREAS OR DISTURBED AREAS NOT SHOWN ON THESE PLANS. THIS SHALL INCLUDE ALL COST ASSOCIATED WITH OBTAINING PERMIT.
- CONTRACTOR SHALL FOLLOW EROSION CONTROL CONSTRUCTION SEQUENCE UNLESS GIVEN WRITTEN APPROVAL FROM ENGINEER FOR VARIANCE.
- IF RIP-RAP IS NOT REQUIRED AND STRAW WITH TACK LINER IS TO BE USED, WATER COURSE SHALL BE SEEDED PER SIDE DITCH SEEDING SCHEDULE DETAIL USING SEEDBED PREPARATION SCHEDULE DETAIL.
- TOTAL DISTURBED AREA IS 115 ACRES.
- IF RIP-RAP IS REQUIRED, THE FOLLOWING IS REQUIRED.
 - EACH RIP RAP PLACEMENT SHALL BE BEDDED IN EITHER A 6 INCH LAYER OF STABILIZATION STONE ON A NON-BIODEGRADABLE FILTER FABRIC. PLACEMENT OF RIP-RAP SHALL IMMEDIATELY FOLLOW THE PLACEMENT OF THIS LAYER. KEEP VOIDS TO A MINIMUM AND FORM A DENSE WELL GRADED MASS OF STONE. DO NOT DISLODGE THE UNDERLYING BASE OF STONE OR DRAINAGE FABRIC WHEN PLACING STONE. COST OF THE STONE BASE OR FABRIC SHALL BE INCLUDED IN THE COST OF THE PLACING OF RIP-RAP.
 - MAXIMUM STONE SIZE WHEN USING 8 INCH D50 WILL BE 12 INCHES AND THE MINIMUM THICKNESS OF THE RIP-RAP LAYER SHALL BE 18 INCHES.
 - MAXIMUM SLOPE OF THE CHANNEL BANK SHALL NOT EXCEED 2.0 HORIZONTAL TO 1.0 VERTICAL. FINISHED GRADE OF THE RIP-RAP IS TO BLEND WITH THE SURROUNDING AREA.
 - INSPECT RIP-RAP PERIODICALLY FOR SCOUR OR DISLODGED STONES (ESPECIALLY AFTER SEVERE STORMS) AND REMOVE BRUSH GROWTH BETWEEN STONES.
- A 1/4" LAYER OF FINES/SCREENINGS SHOULD BE PLACED IN AREAS WHERE TRENCH MATERIAL IS TO BE STOCKPILED ON ASPHALT DURING CONSTRUCTION.

EC-1.2 - EROSION CONTROL NOTES

N.T.S

- CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, WHERE REQUIRED.
- RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
- REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
- APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE EC-4).
- CONTINUE TILLAGE UNTIL A WELL - PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
- SEE EC-4 FOR PERMANENT SEEDING SCHEDULE.
- SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
- MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
- INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
- CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

EC-2 - SEEDBED PREPARATION

N.T.S

RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE SPECIES	RATE (lb/acre)
RYE (GRAIN)	120
ANNUAL LESPEDEZA (KOBÉ IN PIEDMONT & COASTAL PLAIN, KOREAN IN MOUNTAINS)	50

OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE

SEEDING DATES:
MOUNTAINS (ABOVE 2,500'): FEB. 15 - MAY 15
(BELOW 2,500'): FEB. 1 - MAY 1
PIEDMONT: JAN. 1 - MAY 1
COASTAL PLAIN: DEC. 1 - APR. 15

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 750 lb/acre 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 lb/acre STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

RECOMMENDATIONS FOR FALL

SEEDING MIXTURE SPECIES	RATE (lb/acre)
RYE (GRAIN)	120

SEEDING DATES:
MOUNTAINS: AUG. 15 - DEC. 15
COASTAL PLAIN AND PIEDMONT: AUG. 15 - DEC. 30

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 750 lb/acre 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 lb/acre STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 lb/acre OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 lb/acre KOBÉ (PIEDMONT AND COASTAL PLAIN) OR KOREAN (MOUNTAINS) LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE SPECIES	RATE (lb/acre)
GERMAN MILLET	40

IN THE PIEDMONT AND MOUNTAINS, A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 lb/acre.

SEEDING DATES:
MOUNTAINS: MAY 15 - AUG. 15
PIEDMONT: MAY 1 - AUG. 15
COASTAL PLAIN: APR. 15 - AUG. 15

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 750 lb/acre 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 lb/acre STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

EC-3 - TEMPORARY SEEDING SCHEDULE

N.T.S

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for this proposed work have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.

City of Raleigh Development Approval _____

RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE SPECIES	RATE (lb/acre)
TALL FESCUE	80
SWITCHGRASS (PANICUM VIRGATUM) OR SPLITBEARD BLUESTEM (ANDROPOGON TERNARIUS)	40

NURSE PLANTS:
BETWEEN MAY 1 AND AUG. 15, ADD 10 lb/acre GERMAN MILLET OR 15 lb/acre SUDANGRASS. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 lb/acre RYE (GRAIN)

SEEDING DATES:
BEST: AUG. 15 - SEPT. 15
LATE WINTER: FEB. 15 - MAR. 21
POSSIBLE: AUG. 20 - OCT. 25
FEB. - APR. 15

FALL IS BEST FOR TALL FESCUE AND LATER WINTER FOR SWITCHGRASS (PANICUM VIRGATUM) OR SPLITBEARD BLUESTEM (ANDROPOGON TERNARIUS). OVERSEEDING OF SWITCHGRASS (PANICUM VIRGATUM) OR SPLITBEARD BLUESTEM (ANDROPOGON TERNARIUS) OVER FALL-SEEDED TALL FESCUE IS VERY EFFECTIVE.

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 750 lb/acre 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 lb/acre STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REFERTILIZE IN THE SECOND YEAR UNLESS GROWTH IS FULLY ADEQUATE. MAY BE MOWED ONCE OR TWICE A YEAR, BUT MOWING IS NOT NECESSARY. RESEED, FERTILIZE AND MULCH DAMAGED AREAS IMMEDIATELY.

RECOMMENDATIONS FOR GRASS-LINED CHANNELS

SEEDING MIXTURE SPECIES	RATE (lb/acre)
TALL FESCUE	200

NURSE PLANTS:
BETWEEN MAY 1 AND AUG. 15, ADD 10 lb/acre SUDANGRASS OR 15 lb/acre GERMAN MILLET. PRIOR TO MAY 1 OR AFTER AUG. 15, ADD 40 lb/acre RYE (GRAIN)

SEEDING DATES:
BEST: AUG. 25 - OCT.
POSSIBLE: FEB. - APR. 15

AVOID SEEDING FROM NOV. TO JAN. IF SEEDING MUST BE DONE AT THIS TIME, ADD 40 lb/acre RYE GRAIN AND USE A CHANNEL LINING THAT OFFERS MAXIMUM PROTECTION

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 4,000 lb/acre GROUND AGRICULTURAL LIMESTONE AND 1,000 lb/acre 10-10-10 FERTILIZER

MULCH:
USE ROLLED EROSION CONTROL PRODUCT TO COVER THE BOTTOM OF THE CHANNELS AND DITCHES, AND STAPLE SECURELY. THE LINING SHOULD EXTEND ABOVE THE HIGHEST CALCULATED DEPTH OF FLOW. ON CHANNEL SIDE SLOPES ABOVE THIS HEIGHT, AND IN DRAINAGES NOT REQUIRING TEMPORARY LININGS, APPLY 4,000 lb/acre GRAIN STRAW, AND ANCHOR STRAW BY STAPLING NETTING OVER THE TOP.

MULCH AND ANCHORING MATERIALS MUST NOT BE ALLOWED TO WASH DOWN SLOPES WHERE THEY CAN CLOG DRAINAGE DEVICES.

MAINTENANCE:
INSPECT AND REPAIR MULCH FREQUENTLY. REFERTILIZE IN LATE WINTER OF THE FOLLOWING YEAR; USE SOIL TESTS OR APPLY 150 lb/acre 10-10-10. MOW REGULARLY TO A HEIGHT OF 2-4 INCHES.

NOTE:
SEE NCDEQ'S EROSION AND SEDIMENT CONTROL PLANNING DESIGN MANUAL SECTION 6.11 FOR ADDITIONAL PERMANENT SEEDING OPTIONS.

FOR SEEDING WITHIN NCDOT R/W, UTILIZE THE SEEDING SCHEDULE PROVIDED IN THE APPROVED ENCROACHMENT AGREEMENTS AND DRIVEWAY PERMITS.

RECOMMENDATIONS FOR RIPARIAN BUFFERS AND WETLANDS

SEEDING MIXTURE SPECIES	COMMON NAME	PERCENT
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	15
PANICUM VIRGATUM	SWITCHGRASS	15
AGROSTIS STOLONIFERA	CREeping BENTGRASS	10
RUDBECKIA HIRTA	BLACK-EYED SUSAN	10
COREOPSIS LANCEOLATA	COREOPSIS	10
PANICUM CLANDESTINUM	DEER TONGUE	10
ANDROPOGON GERARDII	BIG BLUESTEM	5
JUNCUS EFUSUS	SOFT RUSH	5
ECHINOCHLOA MURICATA	AWNED BARNYARD GRASS	5
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	5
SORGHASTRUM NUTANS	INDIAN GRASS	5
TRIPSACUM DACTYLOIDES	GAMMA	5

RECOMMENDED APPLICATION RATE: 20-25 LBS. PER ACRE

AS SPECIFIED BY MELLOW MARSH IN SILER CITY OR APPROVED EQUAL.

SEEDING DATES:
BEST: MAR. 1 - MAY 1
POSSIBLE: OCT. - FEB.

NO SEEDING FROM JUNE TO SEPTEMBER.

SOIL AMENDMENTS:
CONTRACTOR TO WORK COMPOST INTO THE SOILS SURFACE AT A MINIMUM OF 2 INCHES. FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 1,500 lb/acre GROUND AGRICULTURAL LIMESTONE.

MAINTENANCE:
INSPECT AND REPAIR MULCH FREQUENTLY. MOWING IN AUGUST - SEPTEMBER ONLY TO HELP DISPERSE SEEDS.

EC-4 - PERMANENT SEEDING SCHEDULE

N.T.S

PLOT DATE: 2020/07/08 10:57:34 PM BY: JACET BAILEY
C:\p\1914120\1914120.dwg 2020/07/08 10:16:04 AM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

EROSION CONTROL AND STORMWATER DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	D05



a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it confirms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

FINAL DESIGN

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

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

SECTION E: GROUND STABILIZATION

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

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

GROUND STABILIZATION SPECIFICATION

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

Temporary Stabilization	Permanent Stabilization
<ul style="list-style-type: none"> Temporary grass seed covered with straw or other mulches and tackifiers Hydroseeding Rolled erosion control products with or without temporary grass seed Appropriately applied straw or other mulch Plastic sheeting 	<ul style="list-style-type: none"> Permanent grass seed covered with straw or other mulches and tackifiers Geotextile fabrics such as permanent soil reinforcement matting Hydroseeding Shrubs or other permanent plantings covered with mulch Uniform and evenly distributed ground cover sufficient to restrain erosion Structural methods such as concrete, asphalt or retaining walls Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

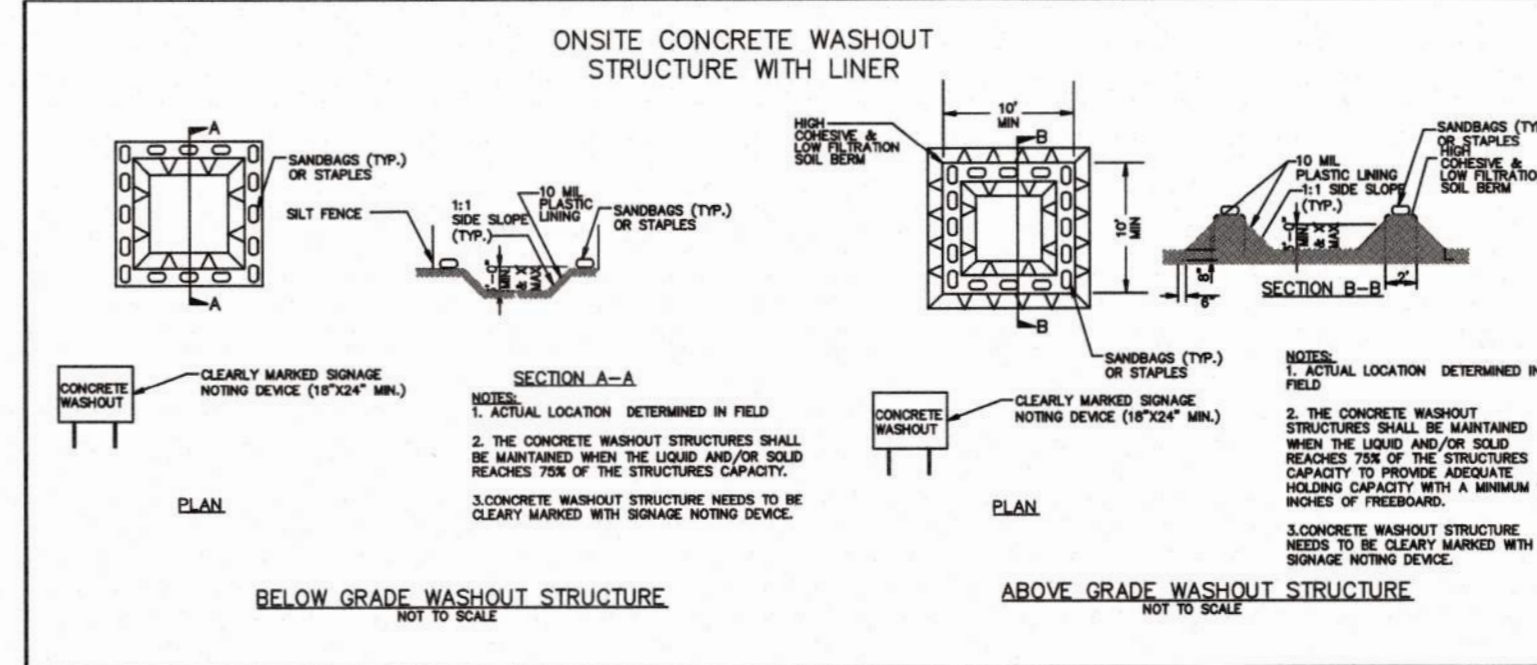
- Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled,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

PORTABLE TOILETS

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

EARTHEN STOCKPILE MANAGEMENT

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



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review, and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultant, and contractor are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.

City of Raleigh Development Approval _____



NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

PLOT DATE: 2020/01/08 5:57:46 PM By: JECY BAILEY
 File: C:\Users\VAZIN-F\OneDrive\Projects\NCG01\Drawings\NCG01-GS-01.dwg Saved By: JECY BAILEY Date: 2020/01/08 5:19 PM

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"



Hazen

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LICENSE NO. : C-0381



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CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

EROSION CONTROL AND
STORMWATER DETAILS

DATE: NOVEMBER 2020

HAZEN NO.: 32426-000

CONTRACT NO.: 1

DRAWING NUMBER:

D06

**PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING**

SECTION A: SELF-INSPECTION

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

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

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

**PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT**

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

- The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
- The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
- Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
- Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
- Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
- Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

**PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING**

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

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

2. Additional Documentation to be Kept on Site

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

- This General Permit as well as the Certificate of Coverage, after it is received.
- Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

**PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING**

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

- Visible sediment deposition in a stream or wetland.
- Oil spills if:
 - They are 25 gallons or more,
 - They are less than 25 gallons but cannot be cleaned up within 24 hours,
 - They cause sheen on surface waters (regardless of volume), or
 - They are within 100 feet of surface waters (regardless of volume).
- Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
- Anticipated bypasses and unanticipated bypasses.
- Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

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

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	<ul style="list-style-type: none"> A report at least ten days before the date of the bypass, if possible. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(l)(7)]	<ul style="list-style-type: none"> Within 24 hours, an oral or electronic notification. Within 7 calendar days, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6)]. Division staff may waive the requirement for a written report on a case-by-case basis.

a. Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it confirms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: _____ Date: _____
Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Plans and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
City of Raleigh Development Approval _____



NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

FINAL DESIGN

PROJECT ENGINEER:	T. TANT
DESIGNED BY:	C. WINDLEY
DRAWN BY:	E. NG
CHECKED BY:	T. TANT
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	0 1/2" 1"
REV	ISSUED FOR DATE BY



Hazen
HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

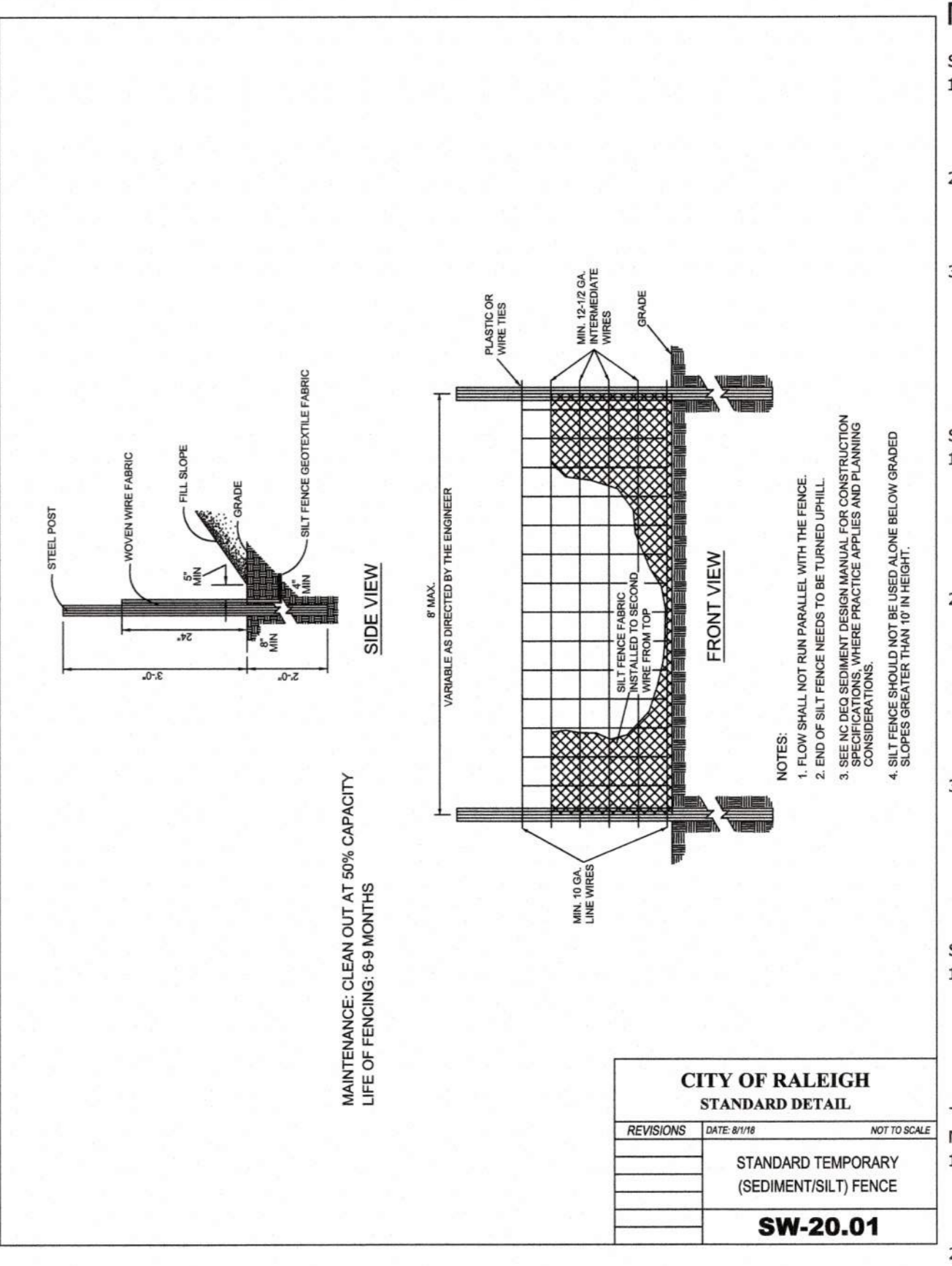
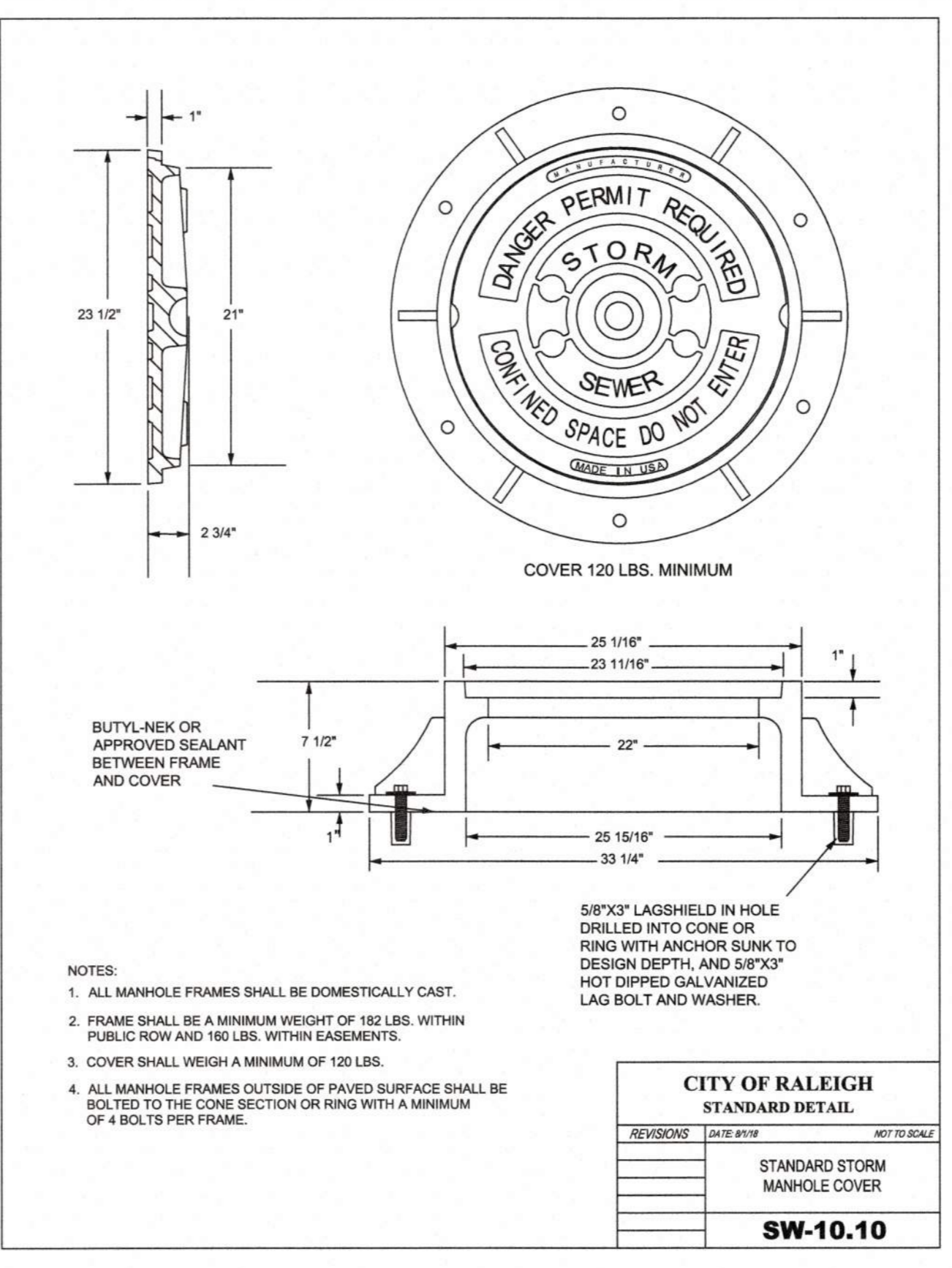
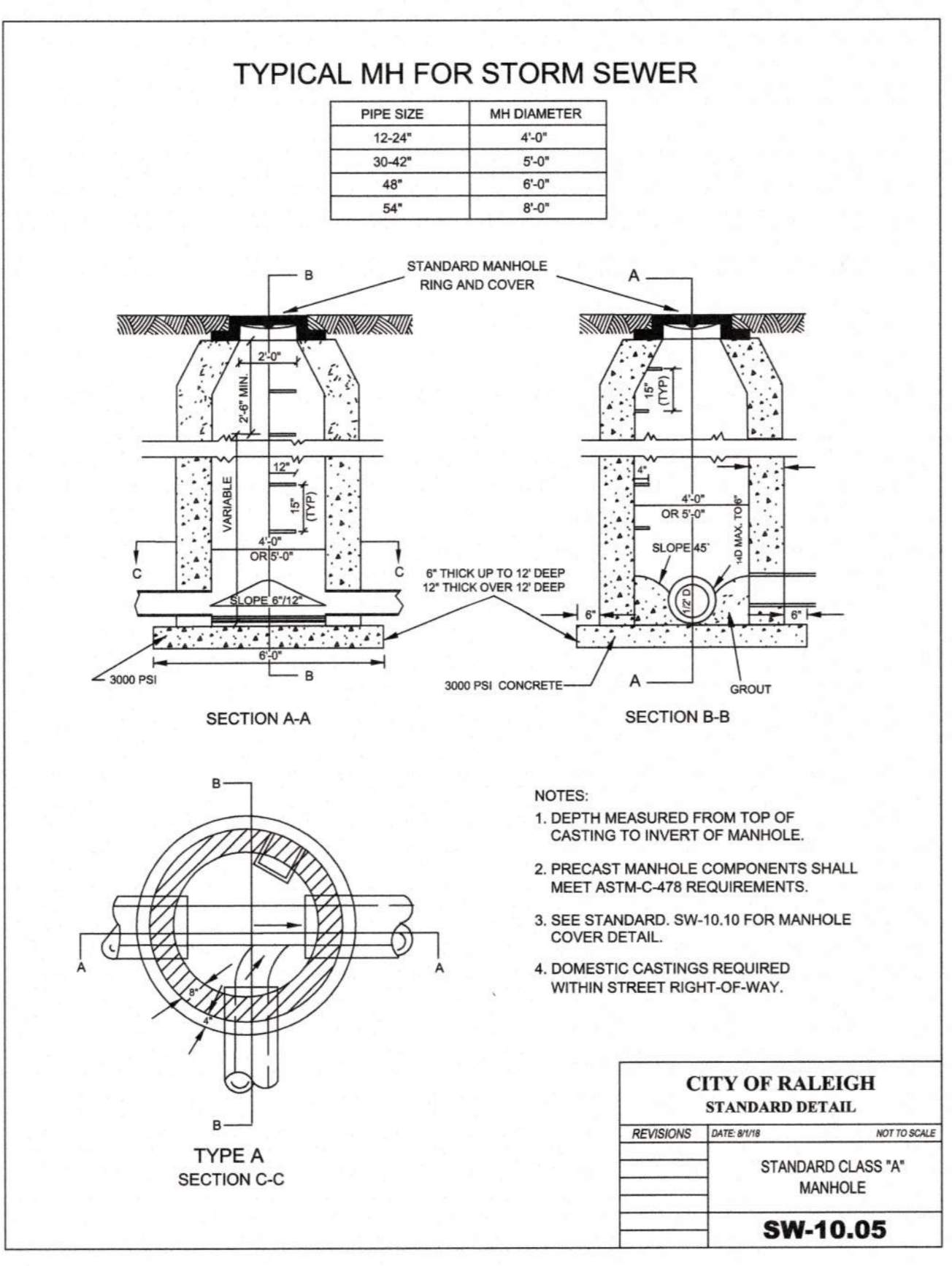
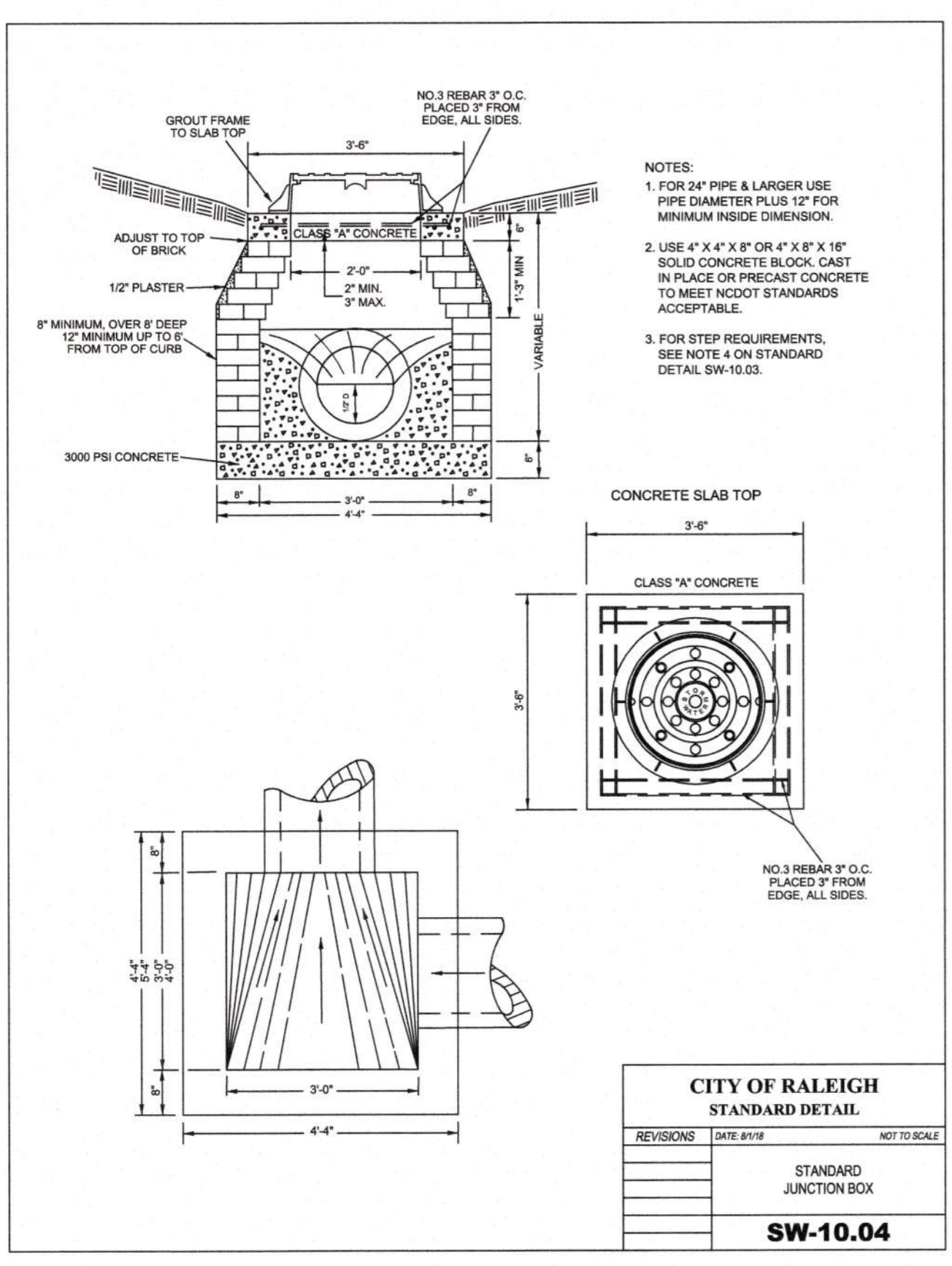
CJS
Conveyance, PLLC
320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT
NEUSE RIVER EAST
PARALLEL INTERCEPTOR

EROSION CONTROL AND
STORMWATER DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	D07

PLOT DATE: 2020/11/08 5:48:22 PM BY: JCKY BAILEY
FILE: C:\MS\HAZEN-PW\MS\BTR\007_Sched B.dwg JCKY BAILEY Show Date: 2020/11/08 5:20 PM



NOTES:

SILT/TREE PROTECTION FENCE MAINTENANCE NOTES:

- FILTER BARRIERS SHALL BE INSPECTED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
- SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
- SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THE DEPOSITS REACH 1-FOOT IN HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

STONE CHECK DAM MAINTENANCE NOTES:

- INSPECT CHECK DAMS AND CHANNELS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. CLEAN OUT SEDIMENT, STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED.
- ANTICIPATE THE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, ADDITIONAL MEASURES CAN BE TAKEN SUCH AS INSTALLING A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL (PRACTICE 6.31), RIPRAP- LINED AND PAVED CHANNELS)
- REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

STONE RELIEF OUTLET MAINTENANCE NOTES:

- INSPECT OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE WATTLE HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

TEMPORARY CONSTRUCTION ENTRANCE MAINTENANCE NOTES:

- MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE.
- AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. ROADWAYS.
- IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

STRAW WITH NET LINING MAINTENANCE NOTES:

- INSPECT ROLLED EROSION CONTROL PRODUCTS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 IN OR GREATER) RAIN FALL EVENT REPAIR IMMEDIATELY. GOOD CONTACT WITH THE GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE RECP.
- ANY AREAS OF THE RECP THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
- IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.
- MONITOR AND REPAIR THE RECP AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

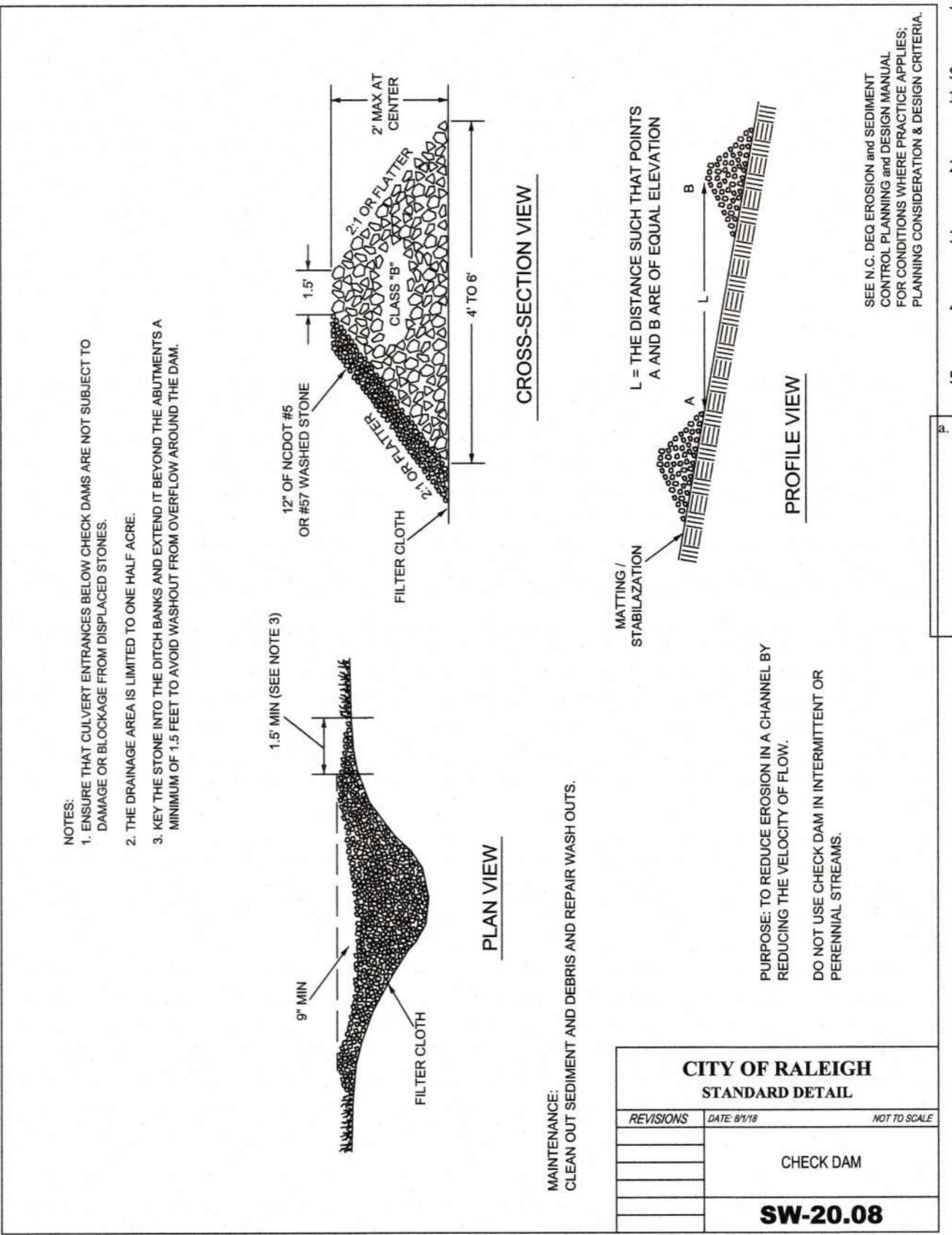
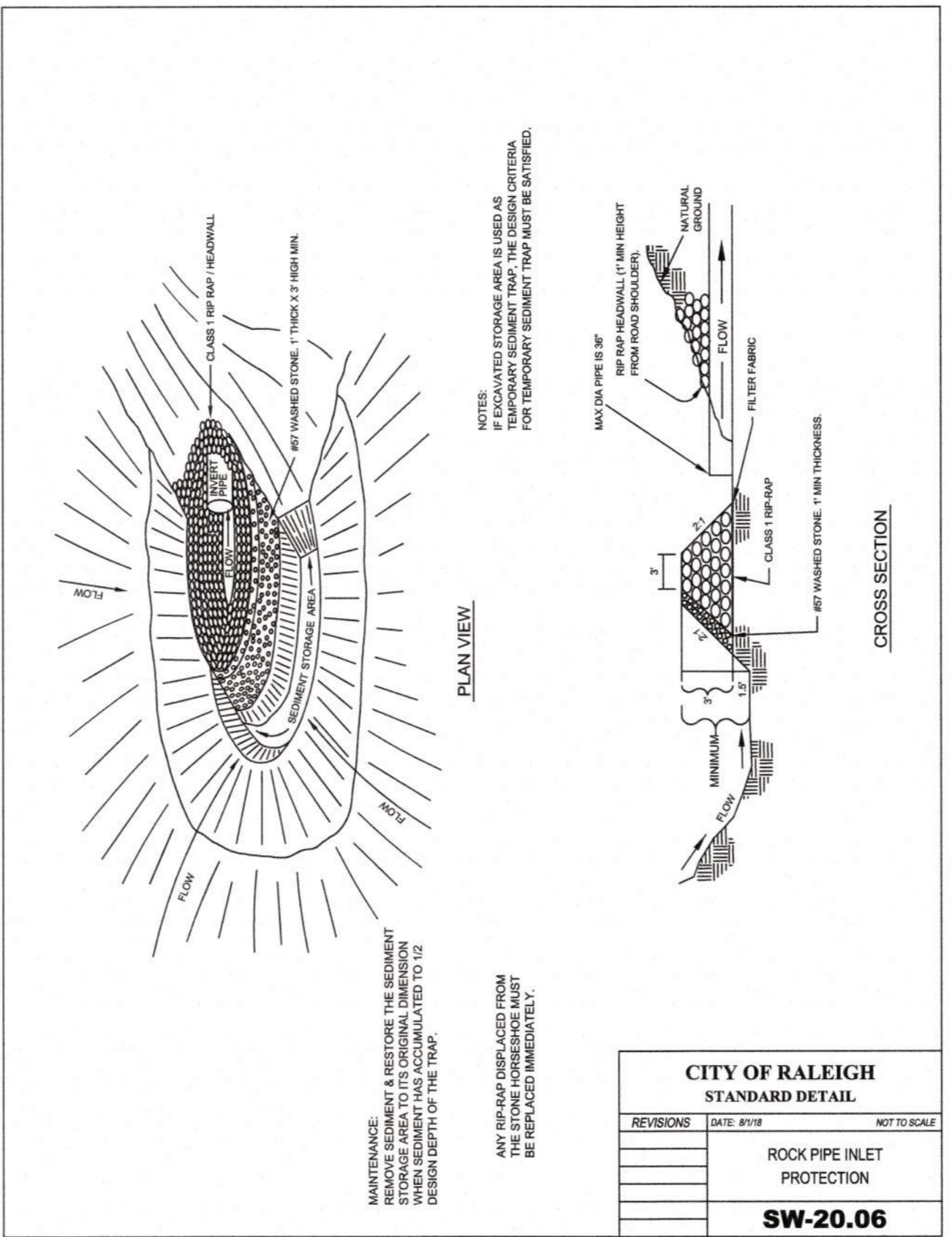
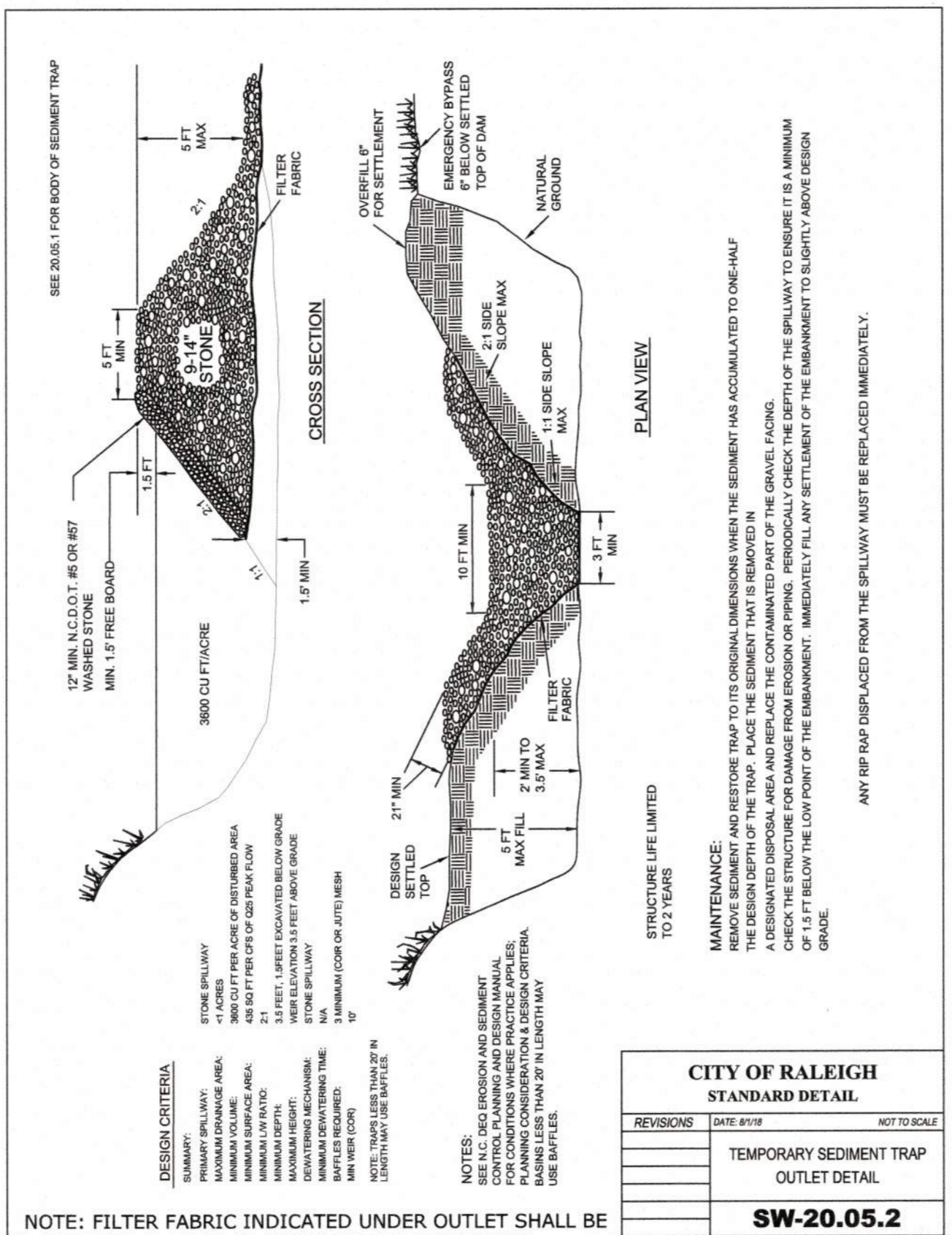
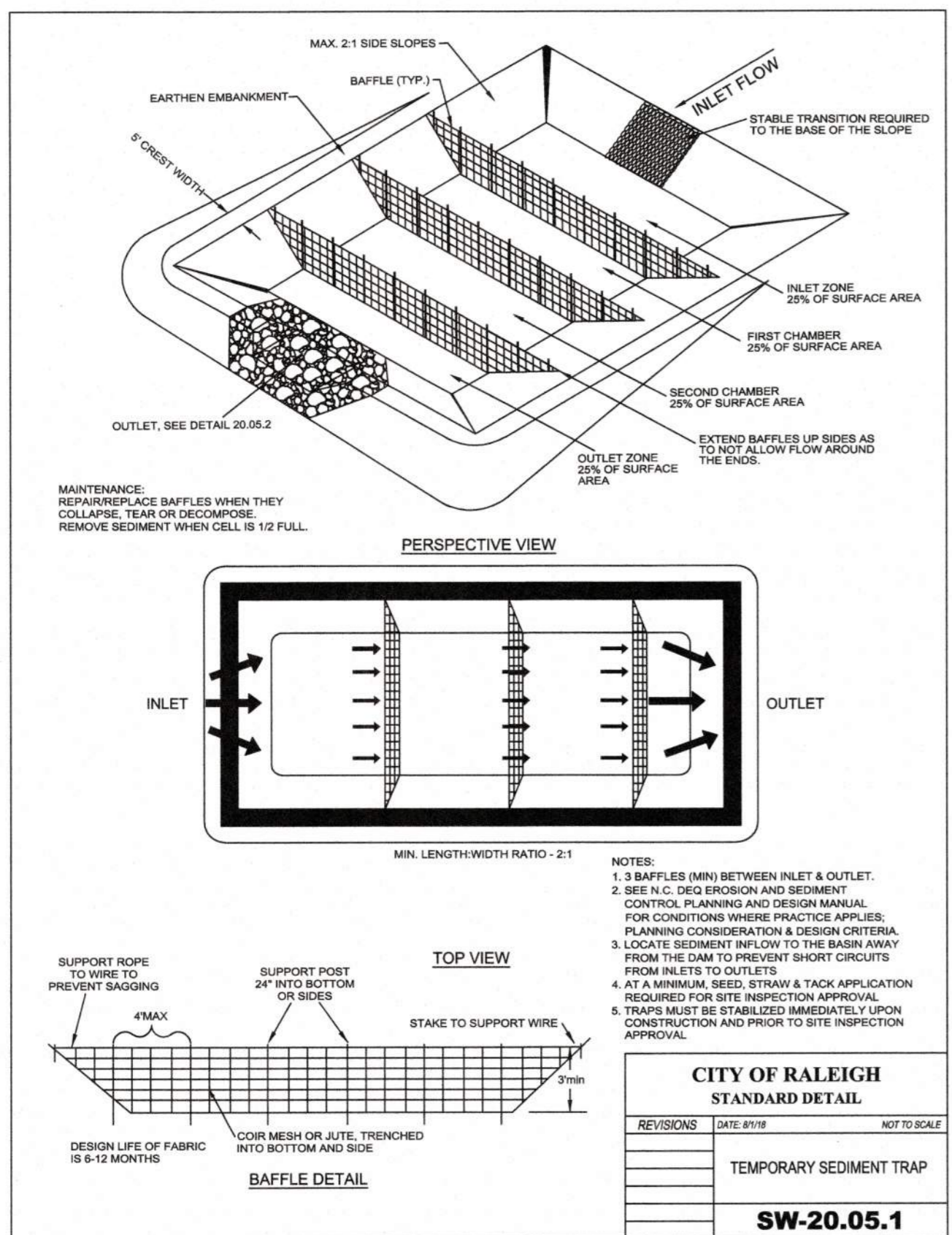
Town Certification:

I, **Town Engineer**, certify that these plans have been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: _____ Date: _____

By: _____ Date: _____

Administrator



NOTES:

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

DESIGN CRITERIA:

- DESIGN LIFE OF FABRIC IS 6-12 MONTHS.
- DESIGN LIFE OF FABRIC IS 6-12 MONTHS.
- DESIGN LIFE OF FABRIC IS 6-12 MONTHS.
- DESIGN LIFE OF FABRIC IS 6-12 MONTHS.

MAINTENANCE:

CLEAN OUT SEDIMENT AND DEBRIS AND REPAIR WASH OUTS.

CITY OF RALEIGH STANDARD DETAIL SW-20.08

REV	ISSUED FOR	DATE	BY

PROJECT ENGINEER: T. TANT

DESIGNED BY: C. WINDLEY

DRAWN BY: E. NG

CHECKED BY: T. TANT

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

0 1/2" = 1"

Hazen

HAZEN AND SAWYER
4011 WESTCHASE BOULEVARD, SUITE 500
RALEIGH, NORTH CAROLINA 27607
LICENSE NO. : C-0381

CJS
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320 S. ACADEMY STREET
CARY, NC 27511
LICENSE NO. : P-1611

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT

NEUSE RIVER EAST
PARALLEL INTERCEPTOR

EROSION CONTROL AND STORMWATER DETAILS

DATE: NOVEMBER 2020

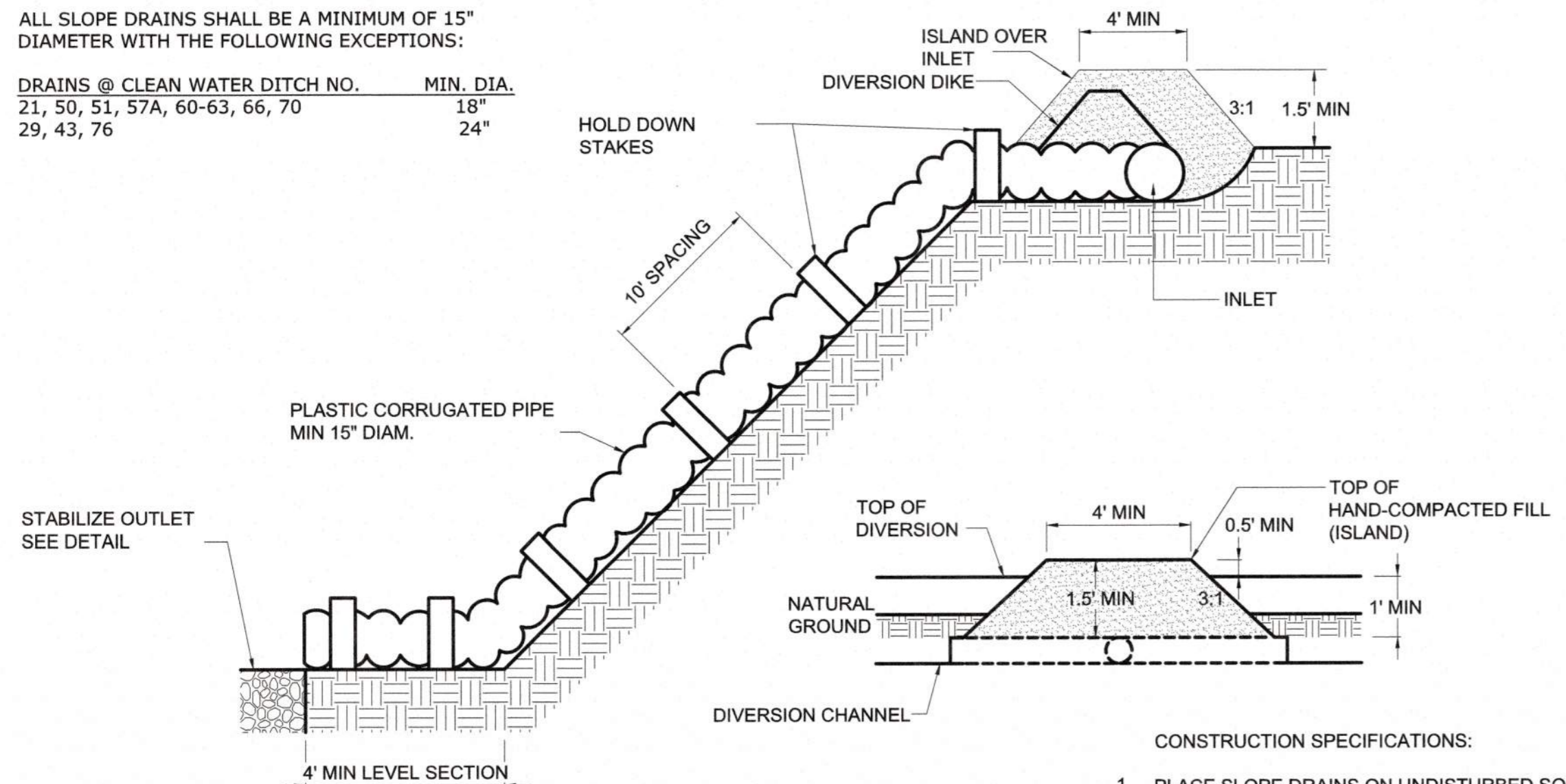
HAZEN NO.: 32426-000

CONTRACT NO.: 1

DRAWING NUMBER: D08

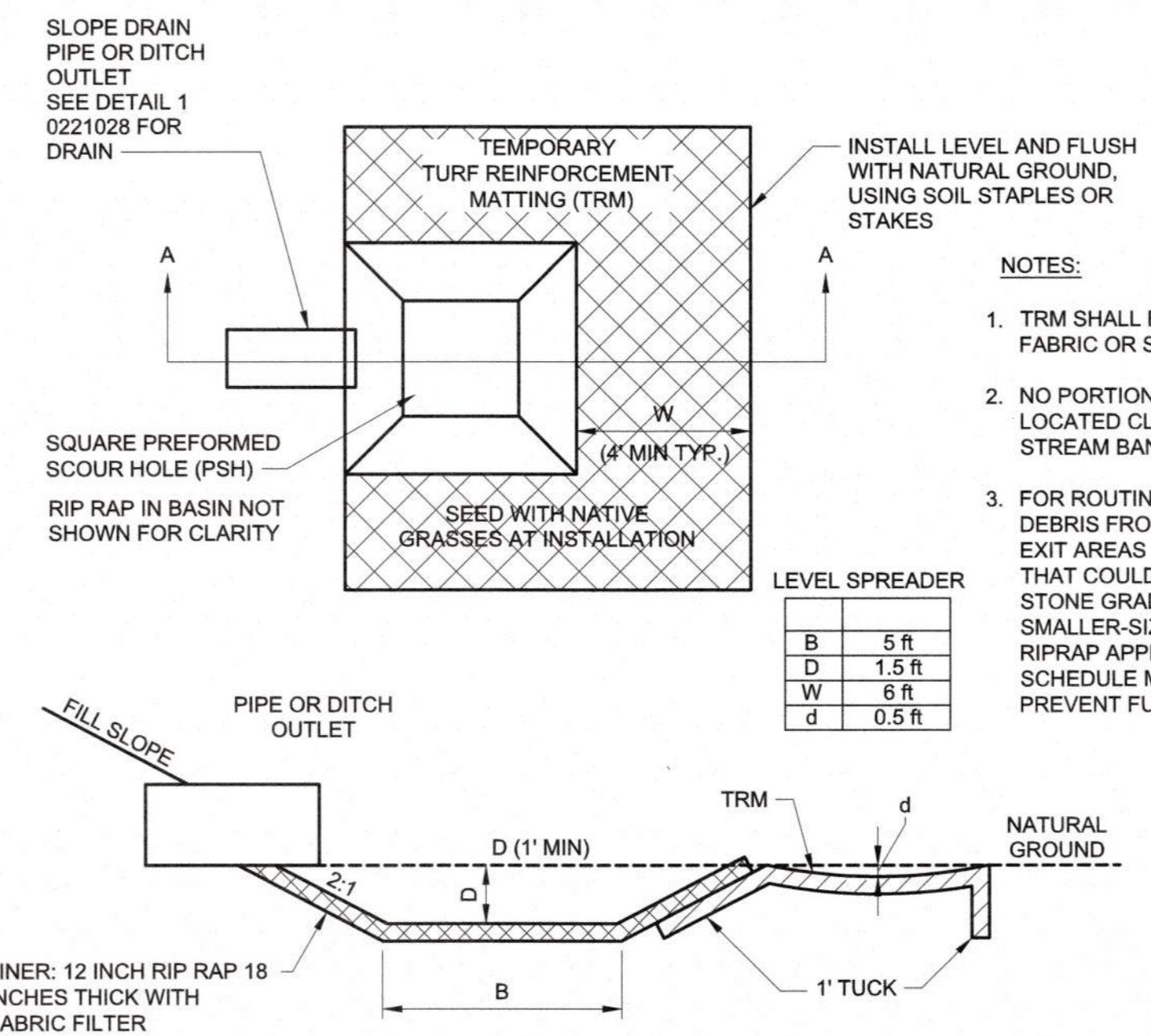
PLT DATE: 2020/11/08 5:56:54 PM BY: JACY BAILEY
FILE: C:\WORK\HAZEN-FW\DWG\STW08

ALL SLOPE DRAINS SHALL BE A MINIMUM OF 15" DIAMETER WITH THE FOLLOWING EXCEPTIONS:
 DRAINS @ CLEAN WATER DITCH NO. MIN. DIA.
 21, 50, 51, 57A, 60-63, 66, 70 18"
 29, 43, 76 24"



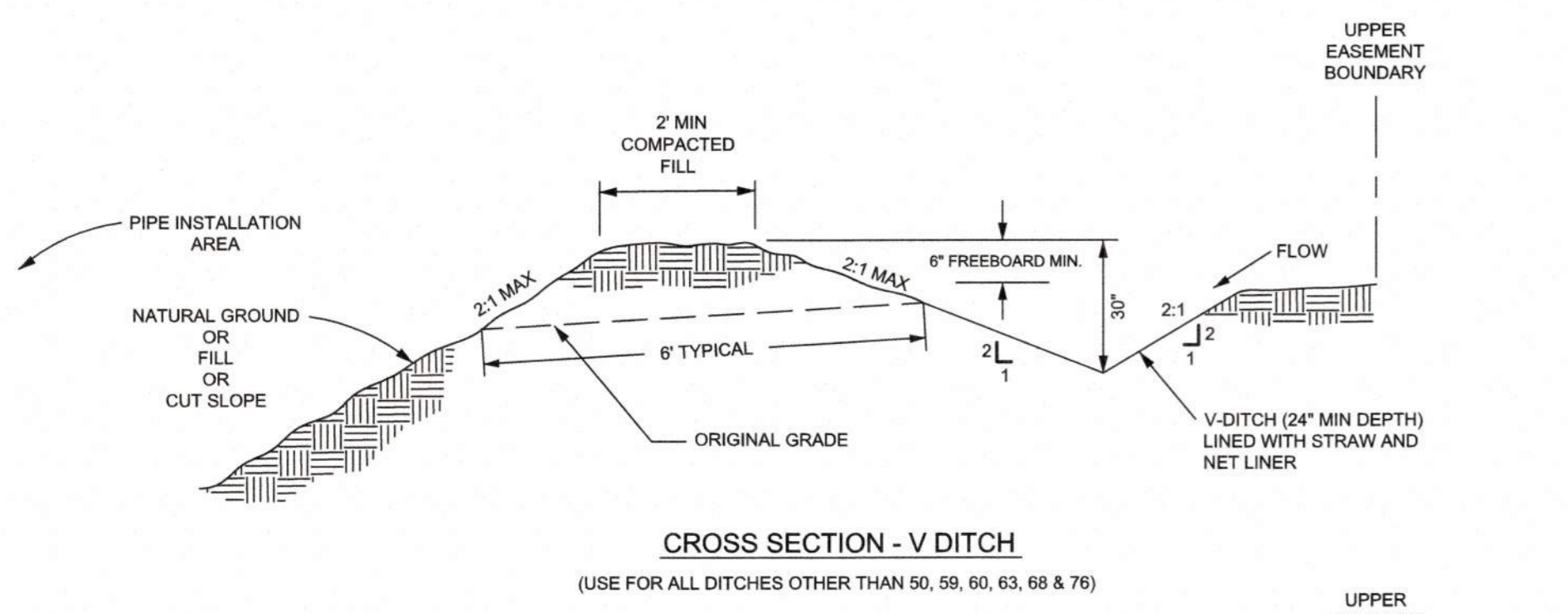
TEMPORARY SLOPE DRAIN
0227028

- CONSTRUCTION SPECIFICATIONS:
1. PLACE SLOPE DRAINS ON UNDISTURBED SOIL OR WELL COMPACTED FILL AT LOCATIONS AND ELEVATIONS SHOWN ON PLANS.
 2. SLIGHTLY SLOPE THE SECTION OF PIPE UNDER THE DIKE TOWARD ITS OUTLET.
 3. HAND TAMP THE SOIL UNDER AND AROUND THE ENTRANCE SECTION IN LIFTS NOT TO EXCEED 6 INCHES.

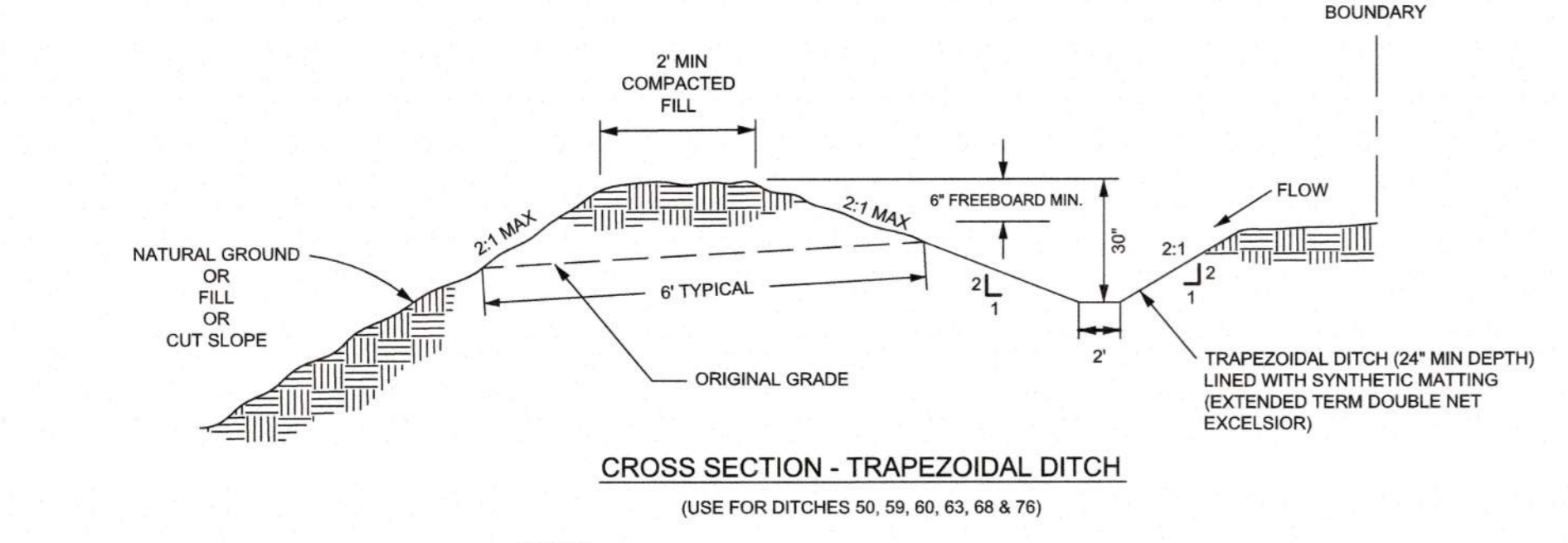


TEMPORARY LEVEL SPREADER
0227031

- NOTES:
1. TRM SHALL BE REINFORCED COCONUT FIBER FABRIC OR STRONGER.
 2. NO PORTION OF THE LEVEL SPREADER SHALL BE LOCATED CLOSER THAN 30' TO THE TOP OF STREAM BANK.
 3. FOR ROUTINE MAINTENANCE ITEMS, REMOVE ANY DEBRIS FROM THE SCOUR HOLE AND CHECK THE EXIT AREAS FOR ANY POTENTIAL OBSTRUCTIONS THAT COULD HINDER DIFFUSE FLOW. IF THE STONE GRADATION SEEMS INADEQUATE USE THE SMALLER-SIZED STONES TO FILL VOIDS. IF THE RIPRAP APPEAR MOVED OR EROSION IS VISIBLE, SCHEDULE MAINTENANCE TO MAKE REPAIRS AND PREVENT FURTHER DAMAGE.



CROSS SECTION - V-DITCH
(USE FOR ALL DITCHES OTHER THAN 50, 59, 60, 63, 68 & 76)



CROSS SECTION - TRAPEZOIDAL DITCH
(USE FOR DITCHES 50, 59, 60, 63, 68 & 76)

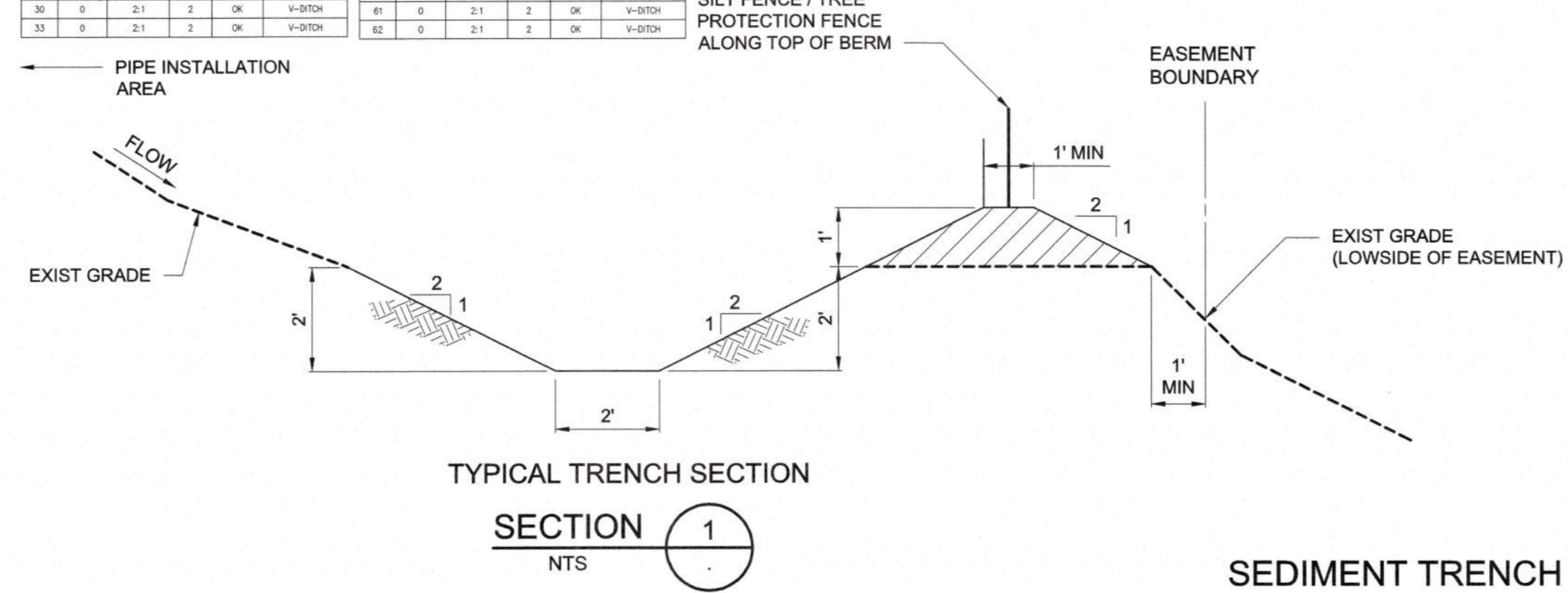
- NOTES:
1. STABILIZE IMMEDIATELY WITH SEED AND MULCH UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.
 2. MAXIMUM 5 ACRE DRAINAGE AREA TO TEMPORARY DIVERSION.
 3. DIVERSIONS SHALL EMPTY INTO TEMP SLOPE DRAINS (SEE DETAIL 0227028)
 4. INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGE CAREFULLY CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE RIDGE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APPROPRIATELY STABILIZE IT.
 5. FOR ACCESS ROAD AND LAYDOWN AREA DIVERSION DITCH SIZING AND LINER REQUIREMENTS REFER TO INDIVIDUAL LAYDOWN AREA PLAN SHEETS.

CLEAN WATER DIVERSION DITCHES DETAIL

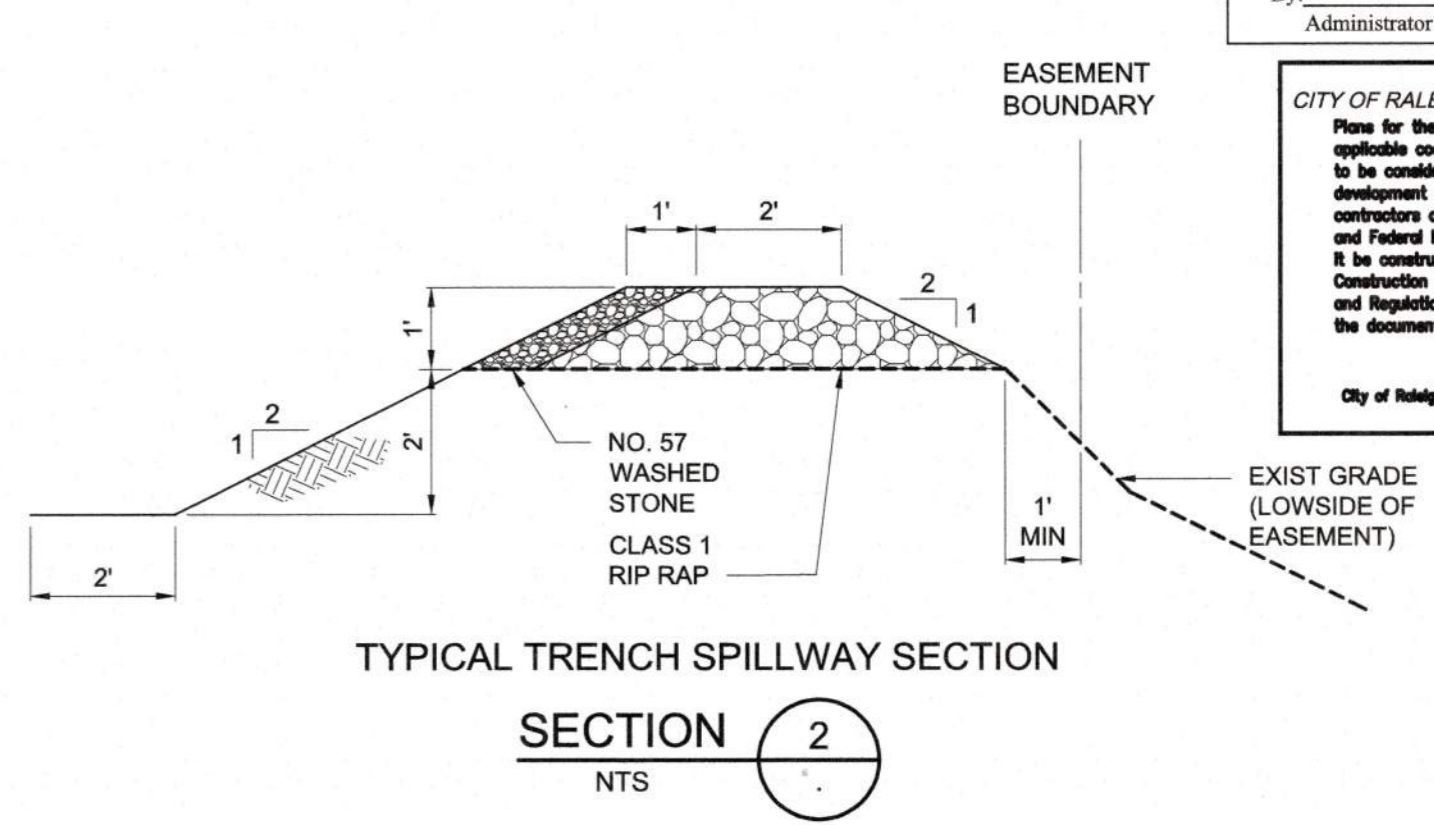
SANITARY SEWER EASEMENT CLEAN WATER DIVERSION DITCH SCHEDULE

DIVERSION DITCH TABLE 1 OF 3					DIVERSION DITCH TABLE 2 OF 3					DIVERSION DITCH TABLE 3 OF 3							
DITCH #	BOTTOM WIDTH	CHANNEL SIDE SLOPE	DESIGN DEPTH	CROSS SECTION	DITCH #	BOTTOM WIDTH	CHANNEL SIDE SLOPE	DESIGN DEPTH	CROSS SECTION	DITCH #	BOTTOM WIDTH	CHANNEL SIDE SLOPE	DESIGN DEPTH	CROSS SECTION			
1	0	2:1	2	SM	V-DITCH	34	0	2:1	2	OK	V-DITCH	62	0	2:1	2	SM	V-DITCH
2	0	2:1	2	OK	V-DITCH	35	0	2:1	2	OK	V-DITCH	63	2	2:1	1	SM	TRAPEZOIDAL DITCH
3	0	2:1	2	SM	V-DITCH	36	0	2:1	2	SM	V-DITCH	64	0	2:1	2	SM	V-DITCH
4	0	2:1	2	SM	V-DITCH	37	0	2:1	2	SM	V-DITCH	65	0	2:00	2	SM	V-DITCH
5	0	2:1	2	SM	V-DITCH	38	0	2:1	2	SM	V-DITCH	66	0	2:1	2	SM	V-DITCH
6	0	2:1	2	SM	V-DITCH	39	0	2:1	2	SM	V-DITCH	67	0	2:1	2	SM	V-DITCH
7	0	2:1	2	SM	V-DITCH	40	0	2:1	2	SM	V-DITCH	68	2	2:1	1	SM	TRAPEZOIDAL DITCH
8	0	2:1	2	OK	V-DITCH	41	0	2:1	2	SM	V-DITCH	69	0	2:1	2	OK	V-DITCH
9	0	2:1	2	SM	V-DITCH	42	0	2:1	2	OK	V-DITCH	70	0	2:1	2	SM	V-DITCH
10	0	2:1	2	SM	V-DITCH	43	0	2:1	2	SM	V-DITCH	71	0	2:1	2	OK	V-DITCH
11	0	2:1	2	OK	V-DITCH	44	0	2:1	2	OK	V-DITCH	72	0	2:1	2	OK	V-DITCH
12	0	2:1	2	OK	V-DITCH	45	0	2:1	2	OK	V-DITCH	73	0	2:1	2	OK	V-DITCH
13	0	2:1	2	SM	V-DITCH	46	0	2:1	2	OK	V-DITCH	74	0	2:1	2	OK	V-DITCH
14	0	2:1	2	OK	V-DITCH	47	0	2:1	2	OK	V-DITCH	75	0	2:1	2	OK	V-DITCH
15	0	2:1	2	OK	V-DITCH	48	0	2:1	2	OK	V-DITCH	76	2	2:1	2	OK	V-DITCH
16	0	2:1	2	OK	V-DITCH	49	0	2:1	2	SM	V-DITCH	77	0	2:1	2	OK	V-DITCH
17	0	2:1	2	OK	V-DITCH	50	2	2:1	1	SM	TRAPEZOIDAL DITCH	78	2	2:1	2	OK	V-DITCH
18	0	2:1	2	SM	V-DITCH	51	0	2:1	2	SM	V-DITCH	79	0	2:1	2	OK	V-DITCH
19	0	2:1	2	OK	V-DITCH	52	0	2:1	2	SM	V-DITCH	80	2	2:1	1	SM	TRAPEZOIDAL DITCH
20	0	2:1	2	SM	V-DITCH	53	0	2:1	2	SM	V-DITCH	81	0	2:1	2	OK	V-DITCH
21	0	2:1	2	SM	V-DITCH	54	0	2:1	2	OK	V-DITCH	82	0	2:1	2	OK	V-DITCH
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29	0	2:1	2	OK	V-DITCH	62	0	2:1	2	OK	V-DITCH						
30	0	2:1	2	OK	V-DITCH												
31	0	2:1	2	OK	V-DITCH												
32	0	2:1	2	OK	V-DITCH												
33	0	2:1	2	OK	V-DITCH												

- NOTES:
1. CLEAN WATER DIVERSION DITCHES AND ALL OTHER DITCHES SHALL BE IMMEDIATELY STABILIZED TO PREVENT OFF-SITE SEDIMENTATION.
 2. A CHECK DAM SHALL BE INSTALLED AT THE OUTLET OF EACH DIVERSION DITCH.



TYPICAL TRENCH SECTION
SECTION 1
NTS



TYPICAL TRENCH SPILLWAY SECTION
SECTION 2
NTS

SEDIMENT TRENCH
DETAIL 1
NTS

- NOTES:
1. ALL SEDIMENT TRENCHES SHALL HAVE A 2-FOOT BOTTOM WIDTH AS SHOWN IN THE DETAIL WITH EXCEPTION TO THE SEDIMENT TRENCHES SPECIFIED BELOW:

- a. TRENCHES WITHIN PERMANENT EASEMENT WITH A TOTAL WIDTH OF 150 TO 160 FEET (TRENCH BOTTOMS SHALL BE 3 FEET WIDE).
- b. TRENCHES WITHIN PERMANENT EASEMENT WITH A TOTAL WIDTH OF 170 TO 180 FEET (TRENCH BOTTOMS SHALL BE 4 FEET WIDE).
- c. SEDIMENT TRENCH NO. 3 AT LAYDOWN AREA NO. 4 ON SHEET C227

TEMPORARY SEDIMENT TRENCH PLAN

Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
 By: _____ Date: _____
 Town Engineer
 These plans are approved by the Town of Knightdale and serve as construction plans for this project.
 By: _____ Date: _____
 Administrator

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
 Plans for the proposed use have been reviewed for general compliance with applicable codes. This limited review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Law. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
 City of Raleigh Development Approval

ALL CONSTRUCTION MUST CONFORM TO THE UNDERGROUND UTILITY PROTECTION ACT
 BEFORE YOU DIG! CONTACT ONE-CALL CENTER CALL 811 OR 1-800-632-4949

PLOT DATE: 02/07/2020 10:06:03 AM BY: JBT/BAW
 FILE: C:\WORK\2020\02\07\0202001\0202001.dwg SCALE: 1/8"=1'-0" DATE: 2/7/2020 10:06:03 AM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	C. WINDLEY		
DRAWN BY:	E. NG		
CHECKED BY:	T. TANT		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE			
REV	ISSUED FOR	DATE	BY



Hazen
 HAZEN AND SAWYER
 4011 WESTCHASE BOULEVARD, SUITE 500
 RALEIGH, NORTH CAROLINA 27607
 LICENSE NO. : C-0381

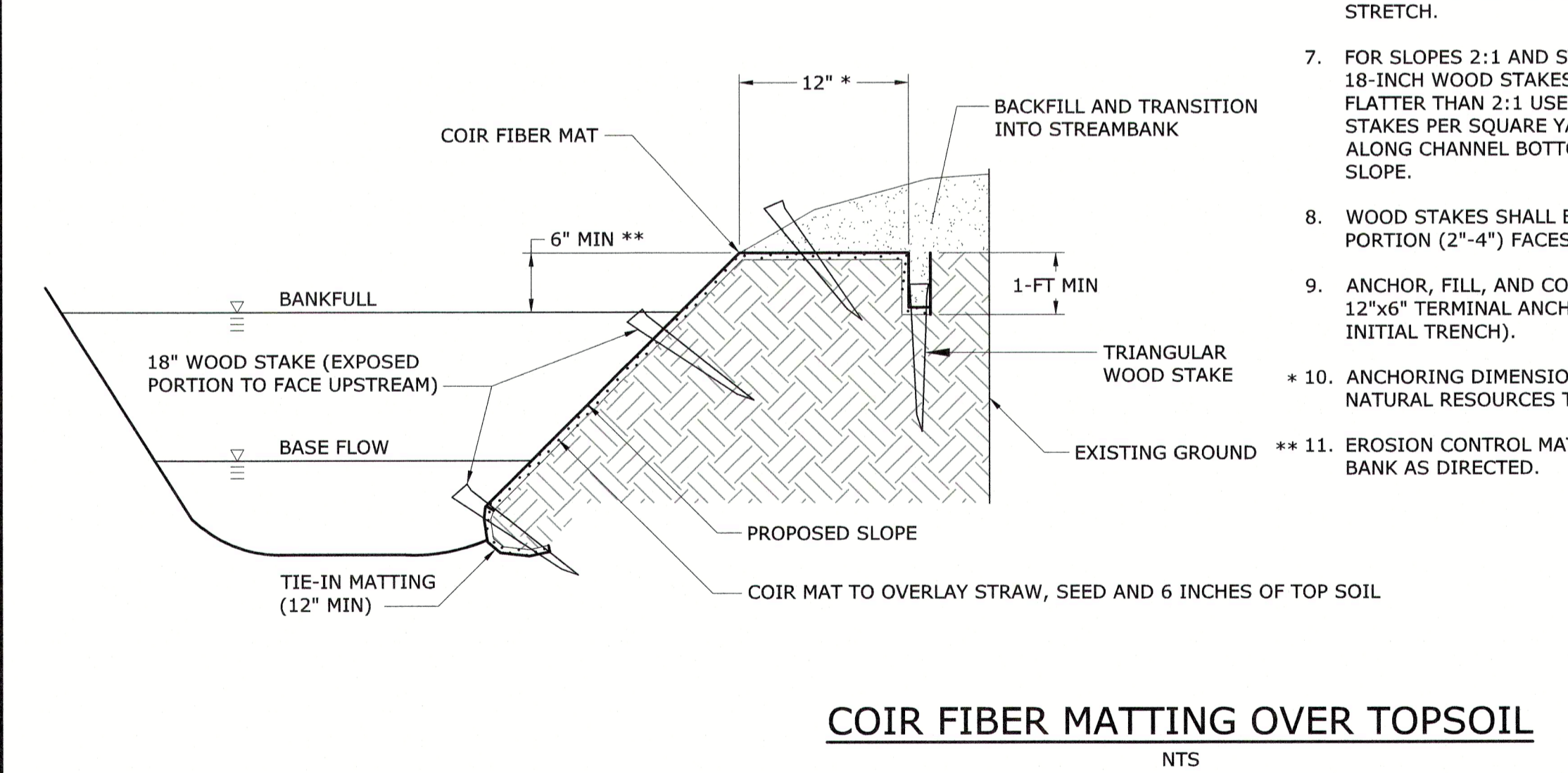
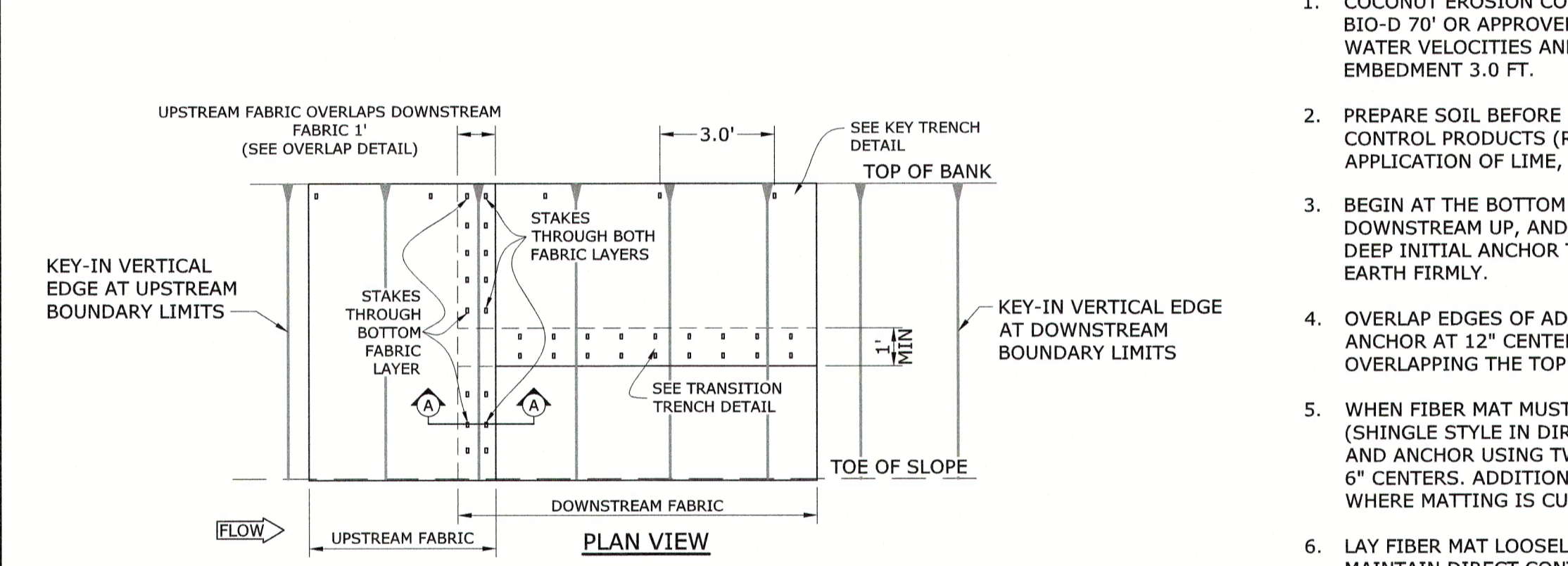
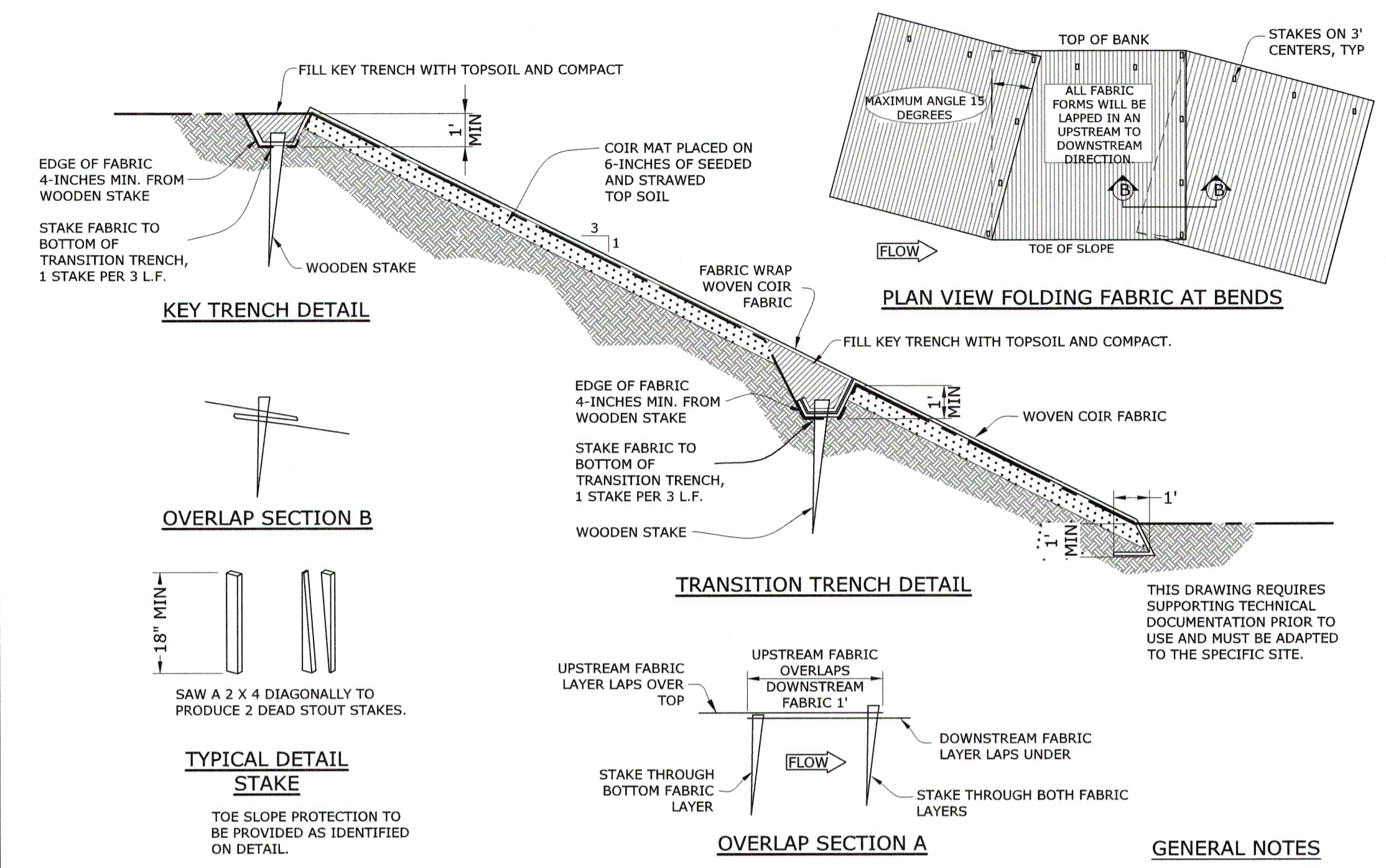
CJS
 Conveyance, PLLC
 320 S. ACADEMY STREET
 CARY, NC 27511
 LICENSE NO. : P-1611

CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

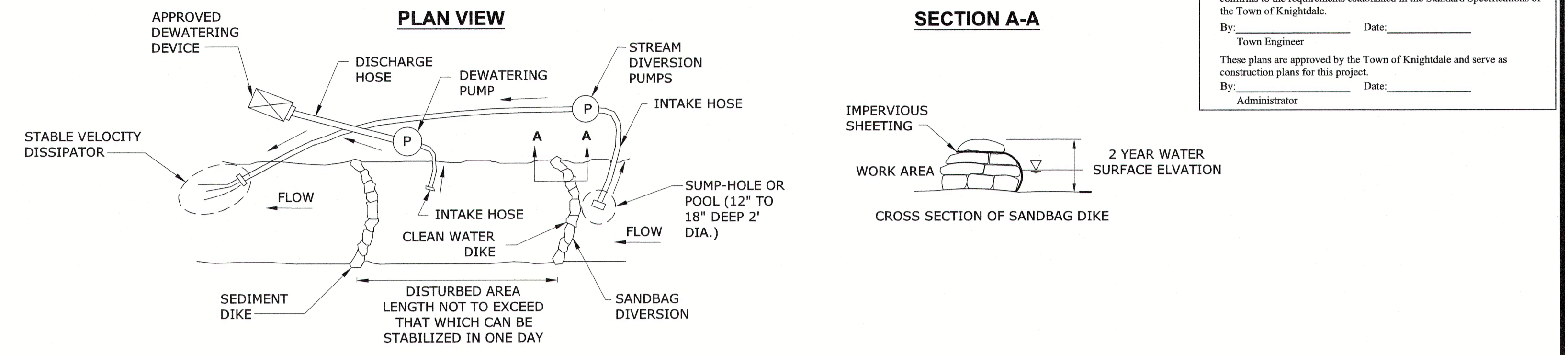
EROSION CONTROL AND
 STORMWATER DETAILS

DATE: NOVEMBER 2020
 HAZEN NO.: 32426-000
 CONTRACT NO.: 1
 DRAWING NUMBER:
 D11

a. Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
 By: _____ Date: _____
 Town Engineer
 These plans are approved by the Town of Knightdale and serve as construction plans for this project.
 By: _____ Date: _____
 Administrator



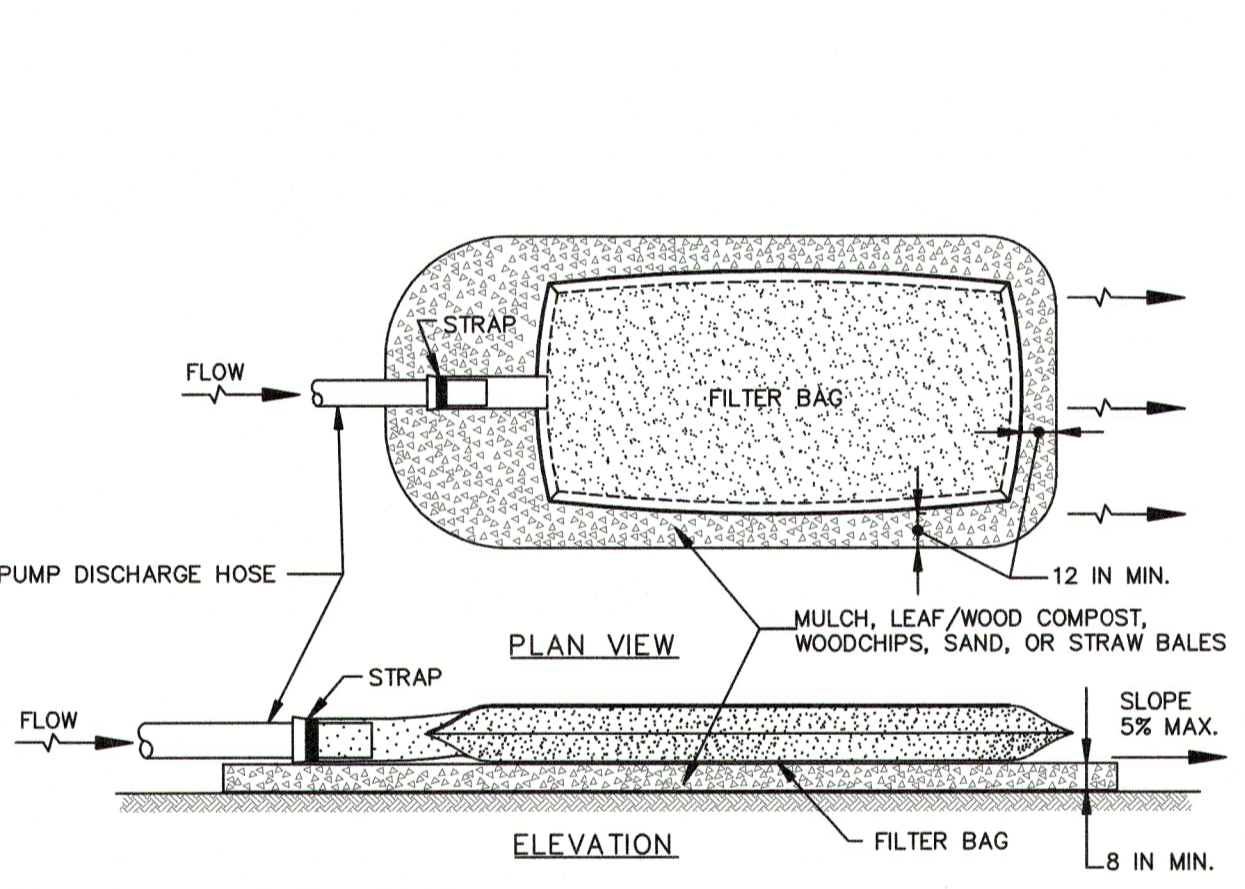
- GENERAL NOTES**
- COCONUT EROSION CONTROL BLANKET SHALL BE 'ROLANKA BIO-D 70' OR APPROVED EQUAL, ABLE TO WITHSTAND 12 FPS WATER VELOCITIES AND 4.5 PSF SHEAR STRESS. FABRIC EMBEDMENT 3.0 FT.
 - PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
 - BEGIN AT THE BOTTOM OF THE SLOPE, WORKING FROM DOWNSTREAM UP, AND ANCHOR FIBER MATTING IN A 12" DEEP INITIAL ANCHOR TRENCH. BACKFILL TRENCH AND TAMP EARTH FIRMLY.
 - OVERLAP EDGES OF ADJACENT PARALLEL ROLLS 12" AND ANCHOR AT 12" CENTERS WITH THE UPPER ROLL OVERLAPPING THE TOP OF THE LOWER ROLL.
 - WHEN FIBER MAT MUST BE SPICED, PLACE END OVER END (SHINGLE STYLE IN DIRECTION OF FLOW) WITH 12" OVERLAP AND ANCHOR USING TWO STAGGERED ROWS OF STAKES AT 6" CENTERS. ADDITIONAL FASTENING MAY BE REQUIRED WHERE MATTING IS CUT TO INSTALL PLANTINGS.
 - LAY FIBER MAT LOOSELY AND ANCHOR SUFFICIENTLY TO MAINTAIN DIRECT CONTACT WITH THE SOIL - DO NOT STRETCH.
 - FOR SLOPES 2:1 AND STEEPER USE A MINIMUM OF (3) 18-INCH WOOD STAKES PER SQUARE YARD AND FOR SLOPES FLATTER THAN 2:1 USE A MINIMUM OF (2) 18-INCH WOOD STAKES PER SQUARE YARD. PROVIDE ADDITIONAL STAKING ALONG CHANNEL BOTTOM WHERE COIR MAT FORMS TOE OF SLOPE.
 - WOOD STAKES SHALL BE ANGLED SUCH THAT EXPOSED PORTION (2"-4") FACES UPSTREAM.
 - ANCHOR, FILL, AND COMPACT END OF FIBER MATTING IN 12"x6" TERMINAL ANCHOR TRENCH (MIRROR IMAGE OF INITIAL TRENCH).
 - ANCHORING DIMENSIONS TO BE REDUCED IN AREAS OF NATURAL RESOURCES TO BE PROTECTED.
 - EROSION CONTROL MATTING MAY BE EXTENDED UP STREAM BANK AS DIRECTED.



DESCRIPTION:
 THE WORK SHOULD CONSIST OF INSTALLING A TEMPORARY PUMP AROUND AND SUPPORTING MEASURES TO DIVERT FLOW AROUND THE WORK AREA AND DEWATER WORK AREA.

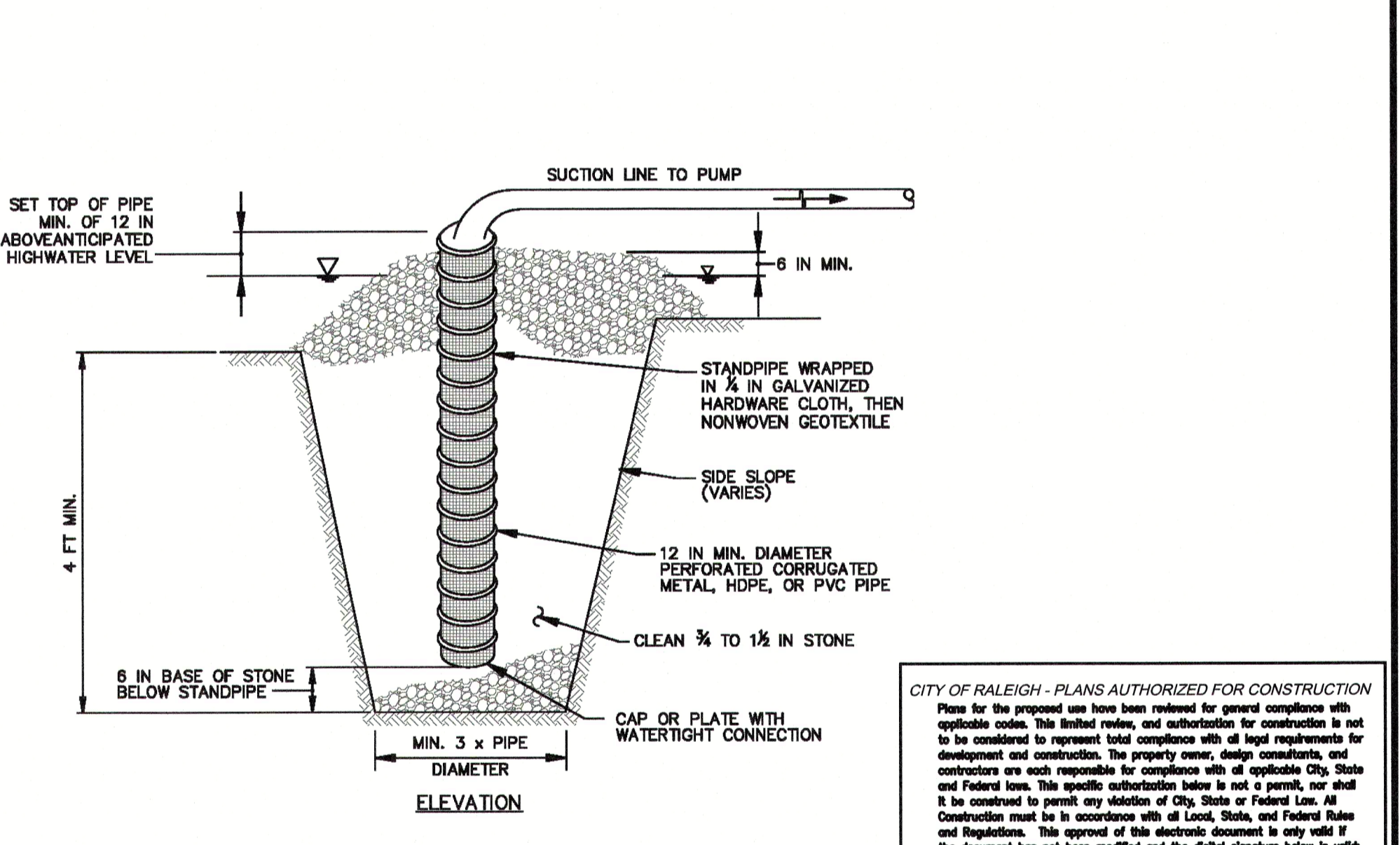
- NOTES:**
- THE CONTRACTOR SHOULD STAY WITHIN THE LIMITS OF THE DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.
 - THE CONTRACTOR SHOULD ONLY BEGIN WORK IN AN AREA WHICH CAN BE COMPLETED BY THE END OF THE DAY. AT THE END OF EACH WORK DAY, THE WORK AREA MUST BE STABILIZED AND THE PUMP AROUND REMOVED.
 - SANDBAG DIKES SHOULD BE SITUATED AT THE ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND CLEAN STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANDBAGS.
 - WATER FROM THE WORK AREA SHOULD BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN, SEDIMENT BAG, OR OTHER APPROVED SOURCE. THE MEASURE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS DOWNSTREAM OF THE WORK AREA.
 - FOR STREAMWORK REPAIR PROJECTS LONGER THAN 400 LINEAR FEET, MULTIPLE WORK AREAS SHALL BE ESTABLISHED IN SUCCESSION. ONCE AN AREA IS COMPLETED AND STABILIZED, THE CLEAN WATER DIKE SHOULD BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE WOULD BE ESTABLISHED FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHOULD BE REMOVED.
 - A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STORM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHOULD BE ACCOMPLISHED BY LOCATING A SANDBAG DIKE AT THE DOWNSTREAM END OF THE TRIBUTARY OR STORM DRAIN OUTFALL AND PUMPING THE STREAM FLOW AROUND THE WORK AREA. THIS WATER SHOULD DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.
 - ALL SANDBAG DIVERSIONS TO BE BUILT TO EXISTING TOP OF BANK.

PUMP AROUND DETAIL
 NTS



- CONSTRUCTION SPECIFICATIONS**
- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
 - PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
 - CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
 - REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
 - USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:
- | | | |
|-----------------------------------|----------------------------|-------------|
| GRAB TENSILE | 250 LB | ASTM D-4632 |
| PUNCTURE | 150 LB | ASTM D-4833 |
| FLOW RATE | 70 GAL/MIN/FT ² | ASTM D-4491 |
| PERMITTIVITY (SEC ⁻¹) | 1.2 SEC ⁻¹ | ASTM D-4491 |
| UV RESISTANCE | 70% STRENGTH @ 500 HOURS | ASTM D-4355 |
| APPARENT OPENING SIZE (AOS) | 0.15-0.18 MM | ASTM D-4751 |
| SEAM STRENGTH | 90% | ASTM D-4632 |
- REPLACE FILTER BAG IF BAG CLOSURES OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

FILTER BAG



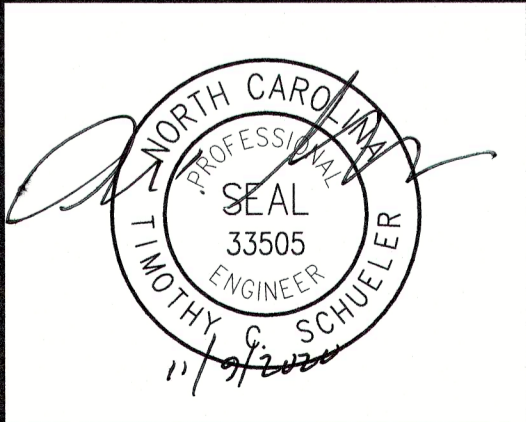
- CONSTRUCTION SPECIFICATIONS**
- USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
 - WRAP PIPE WITH 1/4 INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
 - EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE 3/4 TO 1 1/2 INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
 - SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
 - BACKFILL PIT AROUND THE PIPE WITH 3/4 TO 1 1/2 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
 - DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
 - A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

DEWATERING SUMP

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION
 Plans for the proposed use have been reviewed for general compliance with applicable codes. This initial review and authorization for construction is not to be considered to represent total compliance with all legal requirements for development and construction. The property owner, design consultants, and contractors are each responsible for compliance with all applicable City, State and Federal laws. This specific authorization below is not a permit, nor shall it be construed to permit any violation of City, State or Federal Laws. All Construction must be in accordance with all Local, State, and Federal Rules and Regulations. This approval of this electronic document is only valid if the document has not been modified and the digital signature below is valid.
 City of Raleigh Development Approval



PROJECT ENGINEER:	T. TANT
DESIGNED BY:	BRT
DRAWN BY:	BRT
CHECKED BY:	TCS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
REV	ISSUED FOR
DATE	BY



Hazen
 HAZEN AND SAWYER
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 LICENSE NO. : C-0381

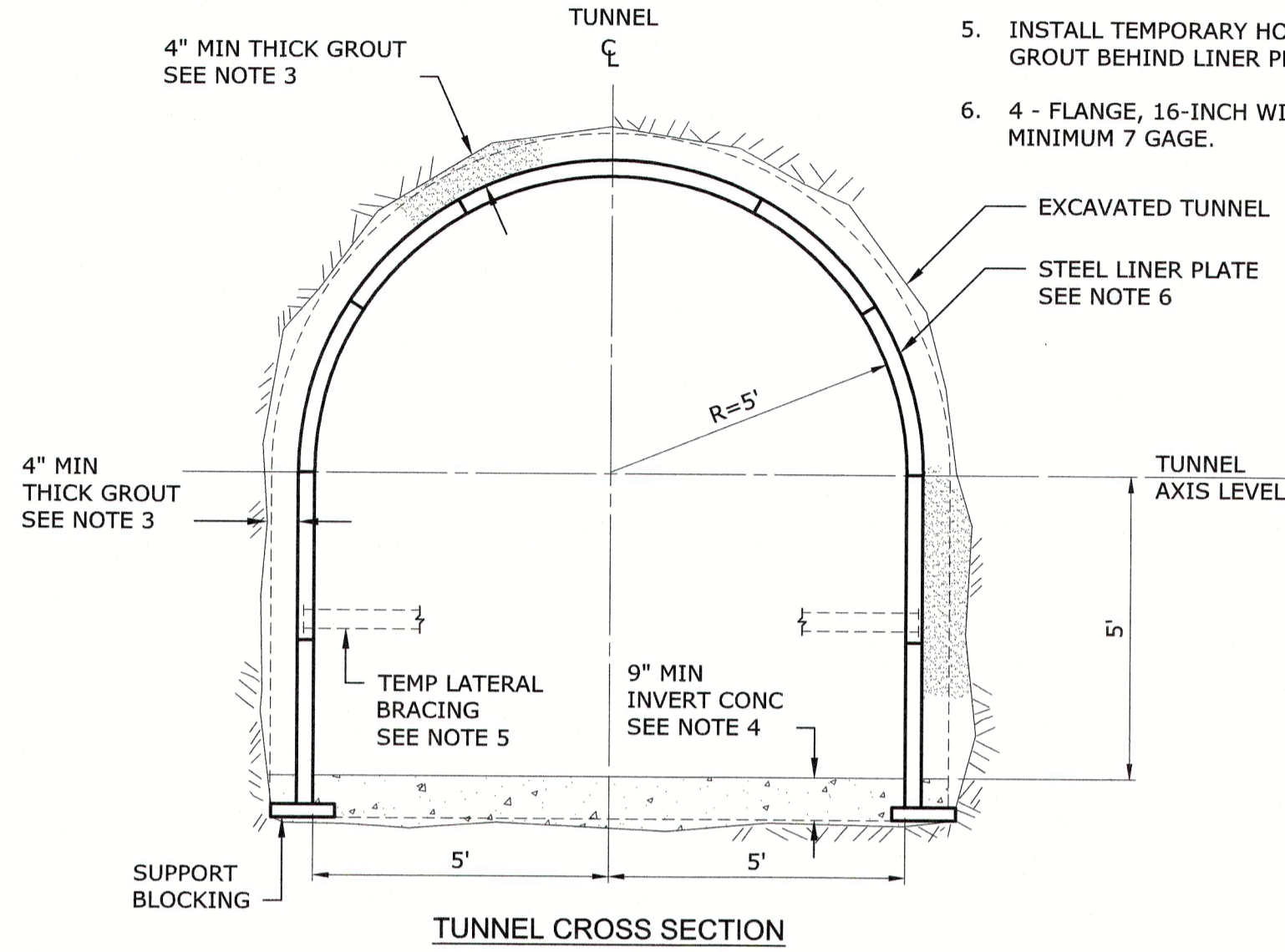
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CITY OF RALEIGH
 PUBLIC UTILITIES DEPARTMENT
 NEUSE RIVER EAST
 PARALLEL INTERCEPTOR

STREAM STABILIZATION AND PUMP AROUND DETAILS
 DATE: NOVEMBER 2020
 HAZEN NO.: 32426-000
 CONTRACT NO.: 1
 DRAWING NUMBER:
 D13

NOTES:

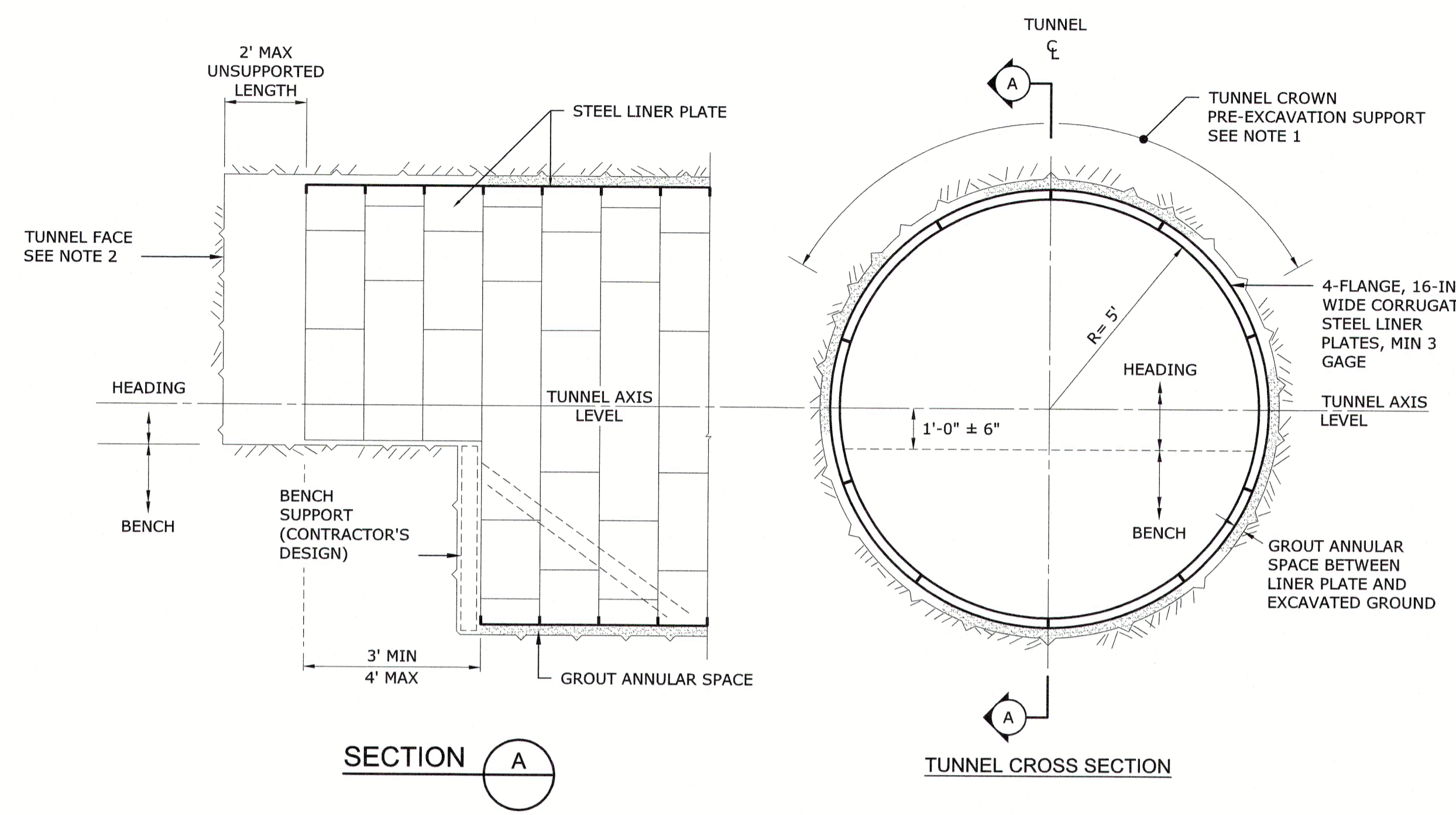
1. MAXIMUM DRILL AND BLAST ROUND LENGTH 6 FT.
2. INSTALL LINER PLATES, PLACE INVERT CONCRETE AND GROUT THE ANNULAR SPACE BETWEEN LINER PLATES AND EXCAVATED TUNNEL. MAXIMUM UNSUPPORTED SPAN LENGTH BETWEEN THE ADVANCING TUNNEL FACE AND THE INSTALLATION OF LINER PLATES TO BE DETERMINED BY CONTRACTOR BASED ON PREVAILING GROUND CONDITIONS, BUT SHALL NOT EXCEED 10 FT UNDER ANY GROUND CONDITIONS ENCOUNTERED.
3. GROUT MINIMUM COMPRESSIVE STRENGTH 6000 PSI AT 28 DAYS.
4. INVERT CONCRETE MINIMUM STRENGTH 4000 PSI AT 28 DAYS.
5. INSTALL TEMPORARY HORIZONTAL BRACING PRIOR TO PLACING GROUT BEHIND LINER PLATES.
6. 4 - FLANGE, 16-INCH WIDE, CORRUGATED STEEL LINER PLATE MINIMUM 7 GAGE.



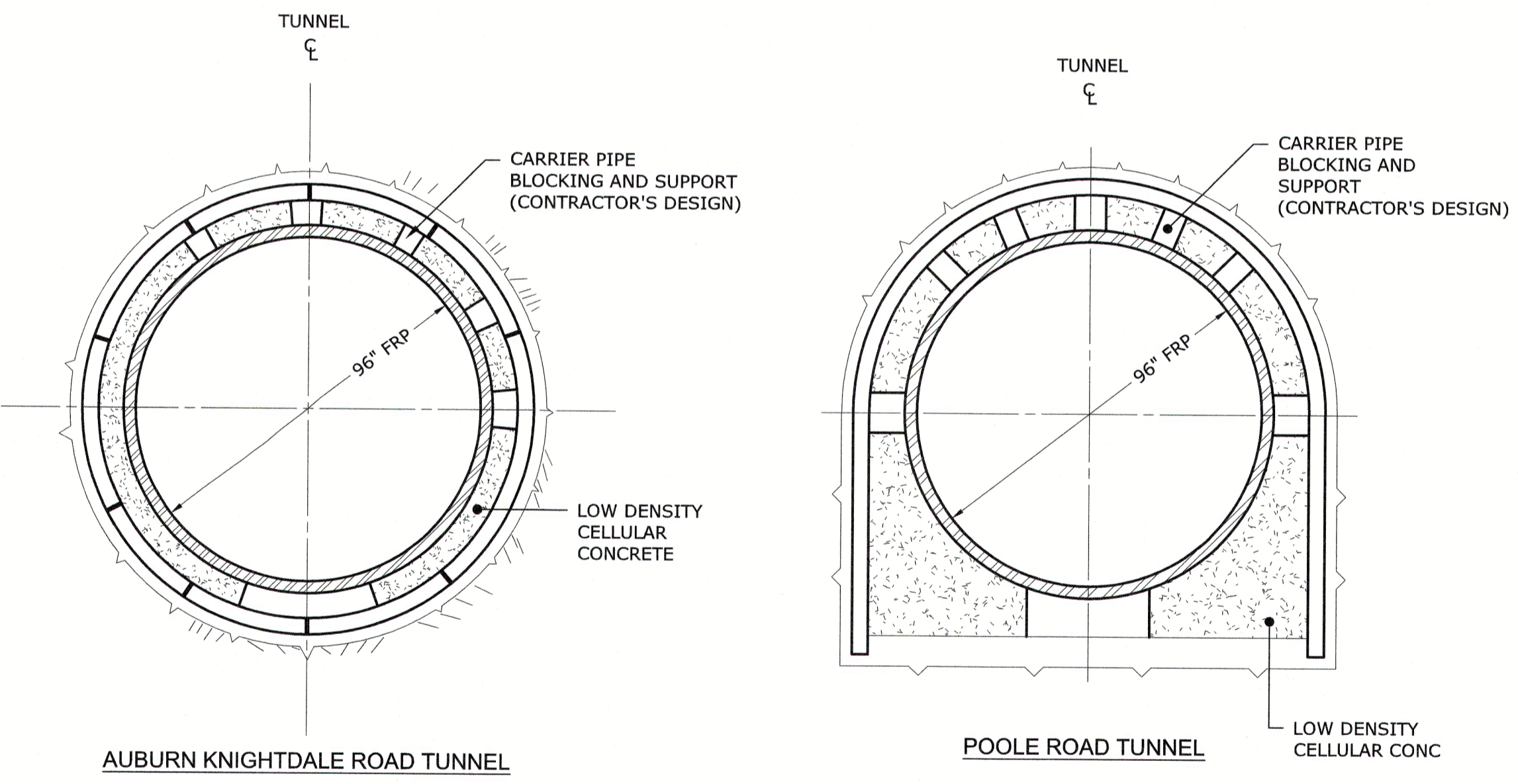
POOLE ROAD TUNNEL INITIAL GROUND SUPPORT

NOTES:

1. BORINGS B-425-1, B-542, B-42N-1 AND B-42N IDENTIFIED SAND LAYERS IN THE CROWN AREA OF THE TUNNEL THAT COULD COLLAPSE IMMEDIATELY UPON EXCAVATING. THE CONTRACTOR SHALL STABILIZE THE CROWN AREA BY PERMEATION GROUTING, INSTALLATION OF CANOPY PIPES, FOREPOLING OR OTHER PRE-SUPPORT METHODS PRIOR TO EXCAVATING THE TUNNEL HEADING AS DETERMINED BY THE CONTRACTOR BASED ON THE PREVAILING GROUND CONDITIONS.
2. CONTRACTOR TO PROVIDE ADEQUATE SUPPORT TO THE HEADING FACE TO PREVENT SUDDEN LOSS OF GROUND.
3. SUPPORT METHODS SHOWN BASED ON DEWATERED CONDITION.
4. INSTALL LINER PLATES, PLACE INVERT CONCRETE AND GROUT THE ANNULAR SPACE BETWEEN LINER PLATES AND EXCAVATED TUNNEL. MAXIMUM UNSUPPORTED SPAN LENGTH BETWEEN THE ADVANCING TUNNEL FACE AND THE INSTALLATION OF LINER PLATES TO BE DETERMINED BY CONTRACTOR BASED ON PREVAILING GROUND CONDITIONS, BUT SHALL NOT EXCEED 2 FT UNDER ANY GROUND CONDITIONS ENCOUNTERED.
5. BENCH EXCAVATION HEIGHT AND MEANS OF SUPPORT TO BE DETERMINED BY THE CONTRACTOR BASED ON PREVAILING GROUND CONDITIONS.



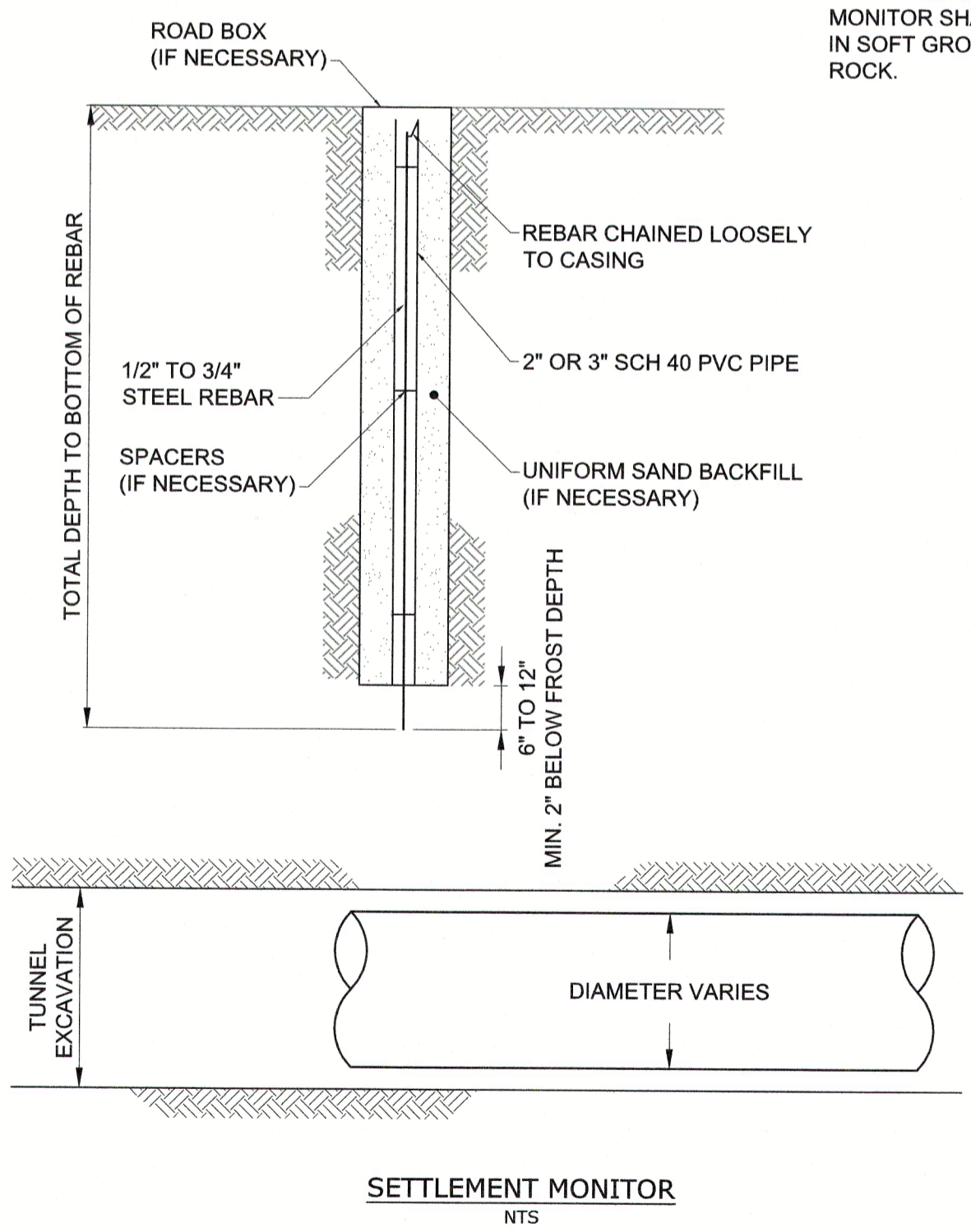
AUBURN KNIGHTDALE ROAD TUNNEL - INITIAL GROUND SUPPORT



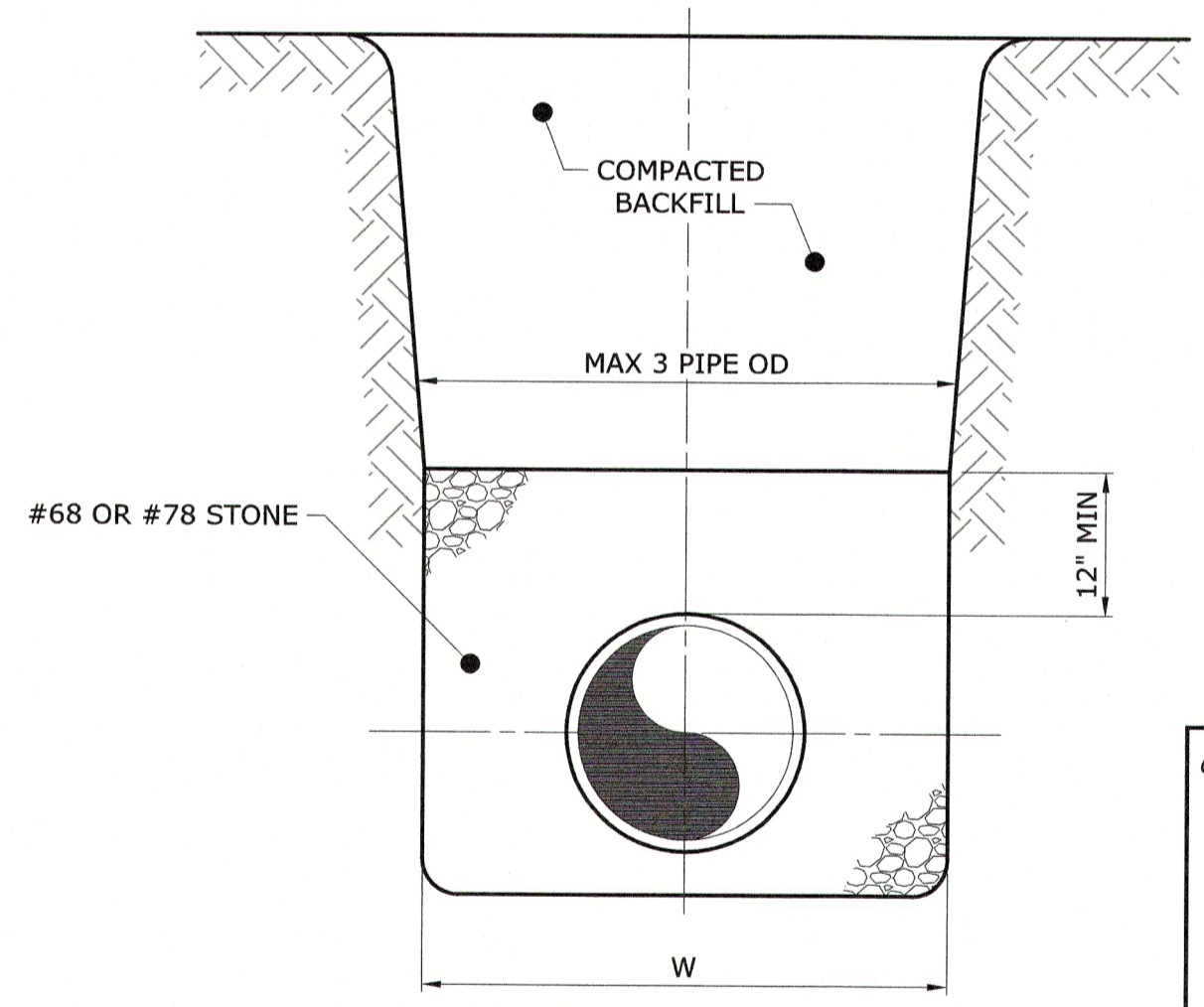
TUNNEL BACKFILL

NOTES:

1. STEEL REBAR SETTLEMENT MONITOR SHALL TERMINATE A MINIMUM OF 2' BELOW FROST DEPTH
2. STEEL REBAR SETTLEMENT MONITOR SHALL TERMINATE IN SOFT GROUND ABOVE ROCK.



SETTLEMENT MONITOR NTS



NOTE:
WHEN W IS GREATER THAN THREE (3) PIPE OD, CONTRACTOR SHALL BACKFILL SHAFT AND CONTRACT PER CONTRACT DOCUMENTS TO A DEPTH NOT LESS THAN 12\"/>

PIPE CONNECTION IN TUNNEL SHAFTS

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City of Raleigh Development Approval



FINAL DESIGN

PLOT DATE: 2020/11/09 11:33:36 PM BY: ENG 4: 03/20/2020 11:09:10:54 AM

PROJECT ENGINEER:	T. TANT		
DESIGNED BY:	K. DRUMHELLER		
DRAWN BY:	E. NG		
CHECKED BY:	J. FARMER		
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE			
REV	ISSUED FOR	DATE	BY



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TUNNEL DETAILS

DATE:	NOVEMBER 2020
HAZEN NO.:	32426-000
CONTRACT NO.:	1
DRAWING NUMBER:	D14