

# CONSTRUCTION DRAWINGS FOR POPLAR CREEK VILLAGE PHASE IV

KNIGHTDALE, NC

AUGUST 14, 2020  
TOK PROJECT #ZMA-7-19

CONSTRUCTION DRAWINGS  
FOR: POPLAR CREEK VILLAGE PH IV  
WR PROJECT NO. 02190259

## PROJECT TIMELINE

PROJECTED SUBDIVISION COMPLETION DATE	NOVEMBER 2021
PROJECTED FIRST OCCUPANCY DATE	MARCH 2022
ANTICIPATED COMPLETION OF UNITS BY YEAR	2022: 30 2023: 25

## SITE DATA

KNIGHTDALE PROJECT NO.	ZMA-7-19
PARCEL PIN NO.	1743822316
PARCEL AREA (ACRES)	17.49
EXISTING ZONING	RT
PROPOSED ZONING	GR3-PUD
EXISTING USE	OPEN LAND
PROPOSED USE	SINGLE FAMILY
PROPOSED DENSITY (UNITS/ACRE)	3.14
PROPOSED NUMBER OF UNITS	55
<b>TYPICAL</b>	
LOT WIDTH (FRONT LOAD)	57 FT
LOT WIDTH (REAR LOAD)	n/a
<b>LOT AREAS</b>	
MINIMUM LOT AREA PROVIDED	6180 SF
MEDIAN LOT AREA PROVIDED	7438 SF
AVERAGE LOT AREA PROVIDED	8038 SF
<b>RECREATIONAL OPEN SPACE</b>	
ACTIVE	0.65 AC
PASSIVE	0.93 AC
<b>SETBACKS</b>	
FRONT	10
SIDE	20% LOT WIDTH
REAR	25

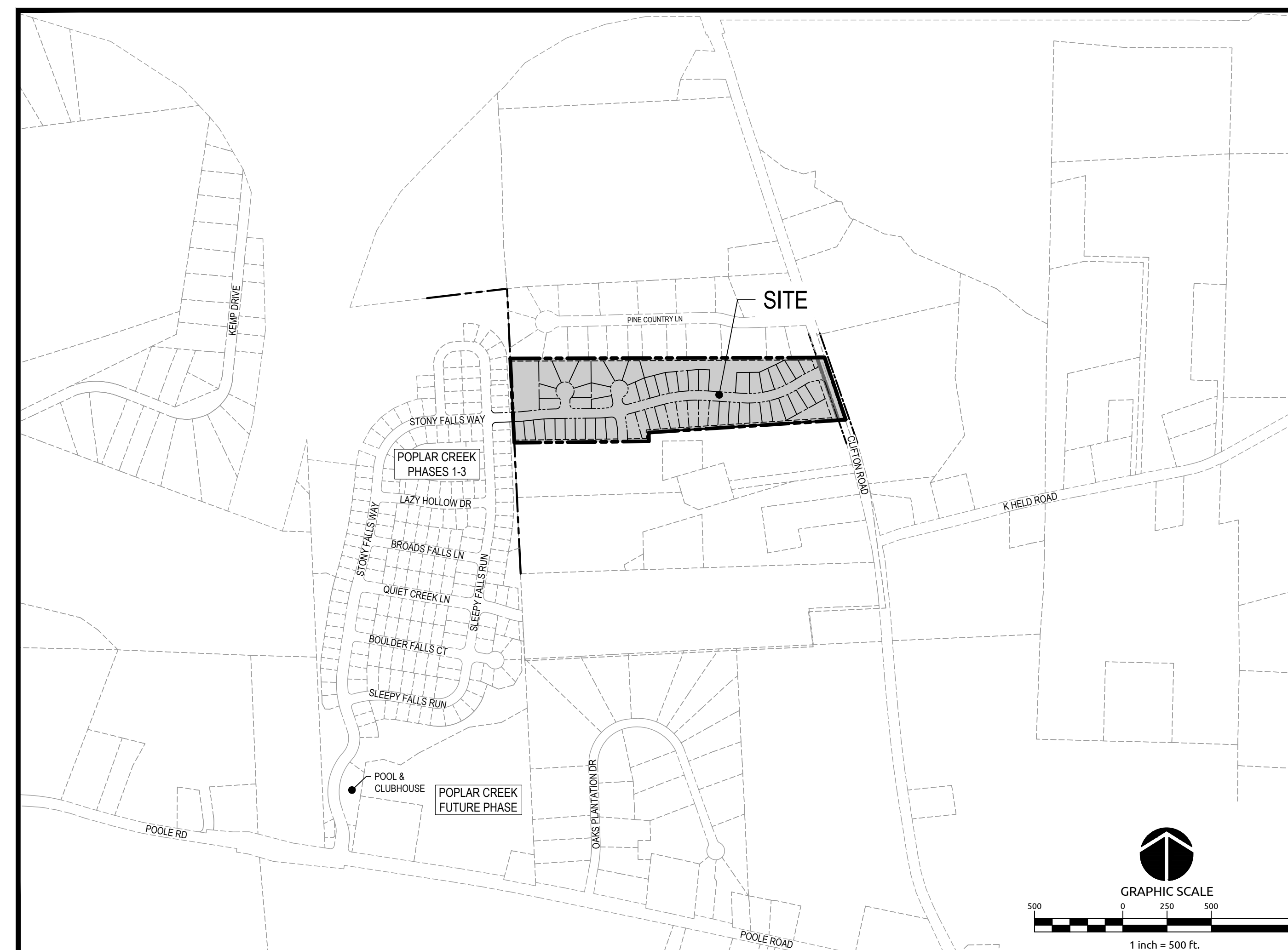
## INFRASTRUCTURE DATA

AREA [AC]	UNITS [TOTAL]	STREETS [LF]	30" CURB & GUTTER [LF]	SIDEWALK [LF]	6" WATER MAIN [LF]	8" WATER MAIN [LF]	12" WATER MAIN [LF]	STORM DRAINAGE [LF]	8" SEWER MAIN [LF]	SEWER FLOW [GPD]
17.83	55	2,416	5,065	5,130	-	2,787	-	3,066	2,267	13,750

## APPROVED ALTERNATIVE DESIGN STANDARDS

THIS PROJECT WAS APPROVED WITH THE FOLLOWING DEVIATIONS FROM THE TOWN OF KNIGHTDALE TYPICAL STANDARDS.

DESIGN ELEMENT	TYPICAL MINIMUM STANDARD	PROPOSED MINIMUM STANDARD	JUSTIFICATION / COMMENTS
MINIMUM LOT WIDTH FOR FRONT-LOAD DWELLINGS	80'	57'	THIS DEVIATION IS NEEDED IN ORDER TO MAINTAIN CONSISTENCY WITH THE EXISTING PHASES OF POPLAR CREEK VILLAGE.
CONNECTIVITY INDEX / RATIO	1.4	1.0	MINIMUM CONNECTIVITY INDEX REQUIREMENTS ARE INTENDED TO PROVIDE FOR GOOD INTERCONNECTIVITY AND REDUCE THE NUMBER OF DE-SACS. THIS PROJECT INCLUDES ONLY TWO (2) NEW SUBDIVISION STREETS, ONE OF WHICH HAS CONNECTIONS AT EACH END. A RATIO OF 1.4 IS DIFFICULT TO ACHIEVE ON SMALL-SCALE PROJECTS SUCH AS THIS ONE DUE TO THE FACT THAT THE REQUIRED NODES AT EACH EXTERNAL CONNECTION RESULT HAVE A MORE NEGATIVE IMPACT ON THE RATIO THAN WOULD A LARGER PROJECT. THIS DEVIATION IS NEEDED IN ORDER TO PROVIDE CONNECTIVITY TO THE EXTENT PRACTICAL GIVEN THE SIZE OF THE PROJECT.



## INDEX OF SHEETS

COVER	SHT 0.0
OVERALL EXISTING CONDITIONS	SHT 1.0
DEMOLITION PLAN	SHT 1.1
DEMOLITION PLAN	SHT 1.2
OVERALL SITE PLAN	SHT 2.0
SITE PLAN	SHT 2.1
SITE PLAN	SHT 2.2
PAVEMENT MARKING & SIGNAGE PLAN	SHT 2.3
PAVEMENT MARKING & SIGNAGE PLAN	SHT 2.4
OPEN SPACE & TREE CANOPY PLAN	SHT 2.5
OVERALL UTILITY PLAN	SHT 3.0
UTILITY PLAN	SHT 3.1
UTILITY PLAN	SHT 3.2
OVERALL STORM DRAINAGE PLAN	SHT 4.0
STORM DRAINAGE PLAN	SHT 4.1
STORM DRAINAGE PLAN	SHT 4.2
STORM DRAINAGE CHARTS	SHT 4.3
GRADING PLAN	SHT 5.0
GRADING PLAN	SHT 5.1
STAGE 1 - EROSION CONTROL PLAN	SHT 6.0
STAGE 2 - EROSION CONTROL PLAN	SHT 6.1
POND DRAINAGE PLAN	SHT 6.2
SCM PLAN & DETAILS	SHT 7.0
SCM RISER DETAILS	SHT 7.1
CULVERT PLAN & DETAILS	SHT 7.2
R001 PLAN & PROFILE	SHT 8.0
R001 & R002 PLAN & PROFILE	SHT 8.1
R003 PLAN & PROFILE	SHT 8.2
CLIFTON ROAD IMPROVEMENT PLAN	SHT 9.0
CLIFTON ROAD X-SECTIONS	SHT 9.1
ROADWAY DETAILS	SHT 10.1
WATER UTILITY DETAILS	SHT 10.2
SEWER UTILITY DETAILS	SHT 10.3
STORM DRAINAGE DETAILS	SHT 10.4
EROSION CONTROL DETAILS	SHT 10.5
NCDEQ NCG01 DETAILS	SHT 10.6
OVERALL LANDSCAPE PLAN	SHT L1.0
LANDSCAPE PLAN	SHT L1.1
LANDSCAPE PLAN	SHT L1.2
LANDSCAPE DETAILS	SHT L2.0
LIGHTING PLAN	SHT SL1.0

## ATTENTION CONTRACTORS

The Construction Contractor responsible for the extension of water, sewer, and/or reuse, as approved in these plans, is responsible for contacting the Public Utilities Department at (919) 996-4340 at least twenty-four hours prior to beginning any of their construction.

Failure to notify both City Departments in advance of beginning construction, will result in the issuance of monetary fines, and require reinstallation of any water or sewer facilities not inspected as a result of this notification failure.

Failure to call for inspection, install a Downstream Plug, have Permitted Plans on the Jobsite, or any other Violation of City of Raleigh Standards will result in a Fine and Possible Exclusion from future work in the City of Raleigh.

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

## Public Water Distribution / Extension System

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 # \_\_\_\_\_

Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

## Public Sewer Collection / Extension System

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 # \_\_\_\_\_

Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

PROFESSIONAL DESIGN ENGINEER CERTIFICATION. THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE. I, COLLEEN DUREVA, PE, CERTIFY THAT THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE HAVE BEEN THOROUGHLY CHECKED AND FOUND TO BE APPLICABLE TO THIS PROJECT. ALL EXCEPTIONS TO THE APPLICABLE TOWN STANDARDS HAVE BEEN PREVIOUSLY APPROVED BY THE TOWN OF KNIGHTDALE AND SAID EXCEPTIONS ARE SHOWN ON SHEET(S) \_\_\_\_\_ OF THESE DRAWINGS.

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

**PRELIMINARY**  
NOT APPROVED FOR CONSTRUCTION  
COLLEEN E. DUREVA, PE

## CONTACT LIST

PERSON TO CONTACT REGARDING STAFF COMMENTS OR QUESTIONS:  
BRAD HART, PROJECT MANAGER  
WITHERSRAVENEL, INC.  
115 MACKENAN DRIVE, CARY, NC 27511  
TELEPHONE: (919) 469-3340  
bhart@withersravenel.com

## DEVELOPER/OWNER

**BLACKRIDGE PROPERTIES, LLC**  
414 FORSYTH STREET  
RALEIGH, NC 27609

ATTN: STUART POULSEN  
TELEPHONE: (919) 624-5458  
EMAIL: stuartpoulsen@gmail.com

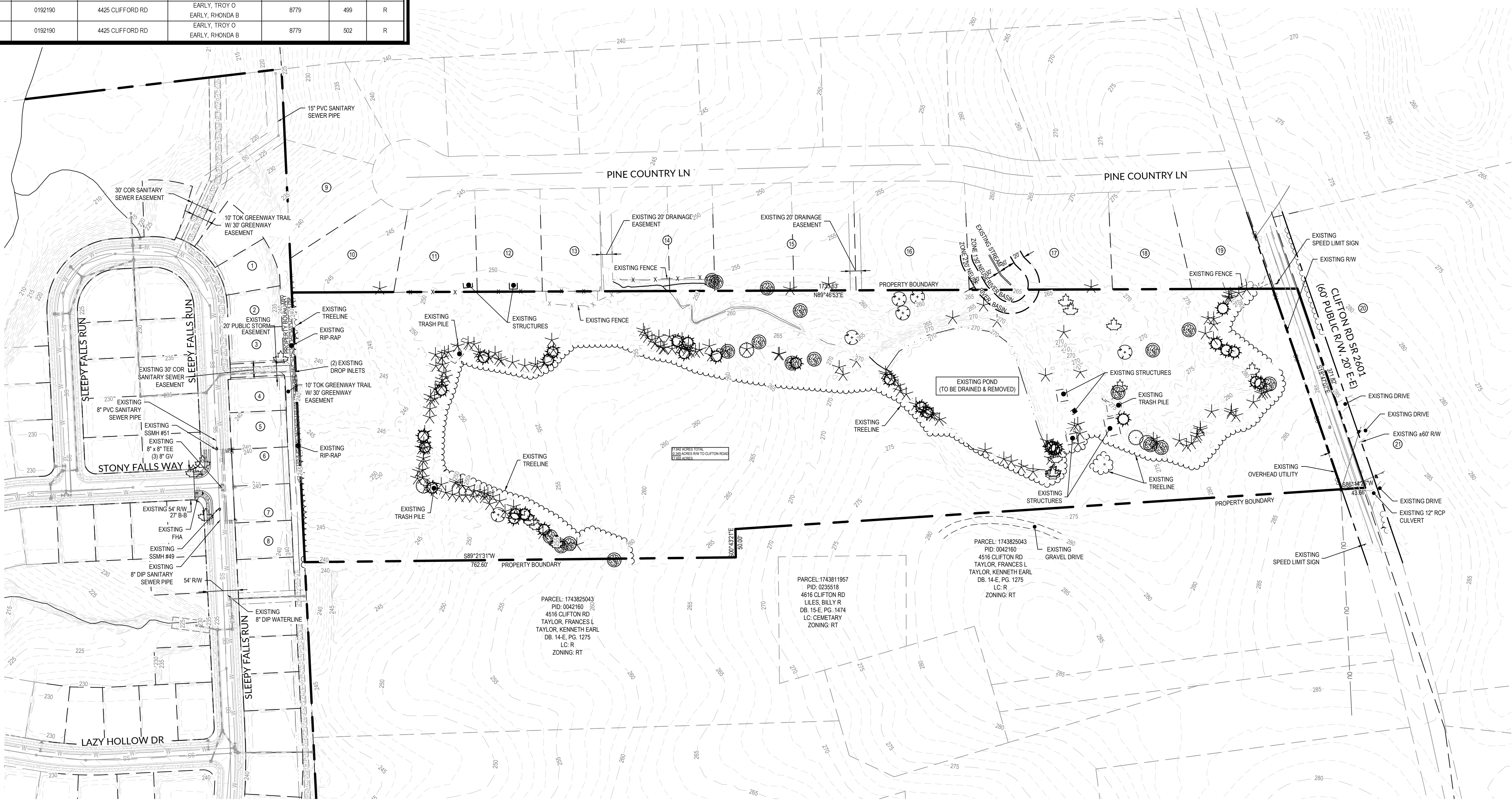
## PREPARED BY:

**WithersRavenel**  
Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

NUMBER	PARCEL	PID	MAILING ADDRESS	OWNER INFO	DB	PG	LC
1	1743721538	0498321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
2	1743721346	0498320	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
3	1743721445	0498319	4717 SLEEPY FALLS RUN	BROWN, WILLIAM R, JR BROWN, GWENDOLYN JACKSON	017459	1868	R
4	1743721346	0498318	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
5	1743626392	0498398	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
6	1743721157	0498316	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
7	1743721157	0498315	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
8	1743721160	0498314	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
9	1743722752	099969	120 PINE COUNTRY LANE	SAULT, CAROLYN	9165	138	R
10	1743723622	099970	119 PINE COUNTRY LANE	MAXWELL, MICHAEL	14957	1973	R
11	1743724662	099965	117 PINE COUNTRY LANE	MOLINA, SALVADOR MOLINA MARIA GUEVARA	9018	1822	R
12	1743725684	0099966	115 PINE COUNTRY LANE	CARONZO - DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	R
13	1743727604	0099967	113 PINE COUNTRY LANE	BRCH, HOWARD REGINALD III	12161	563	R
14	1743726644	0099963	111 PINE COUNTRY LANE	KEETER, JOHN	13521	705	R
15	1743820675	0099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	R
16	1743822685	0099959	202 MACKENAN DR.	AQUA NORTH CAROLINA INC.	13547	76	R
17	1743825614	0099956	105 PINE COUNTRY LANE	TEUSCHER, RICHARD DALE WRIGHT, GREGORY H WRIGHT, RAFFAELA M	5233	234	R
18	1743827605	0099958	103 PINE COUNTRY LANE	WRIGHT, GREGORY H WRIGHT, RAFFAELA M	7211	699	R
19	1743828644	0099992	4500 CLIFFORD RD	NIXON, DORIS LEWTER	8399	2701	R
20	1743922906	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	499	R
21	1743923384	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	502	R

- GENERAL NOTES:**
- PROJECT BOUNDARY INFORMATION SHOWN IS BASED ON A RECORDED PLAT BY WALLACE G. CLARK, JR. - REGISTERED LAND SURVEYOR TITLED, "SURVEY FOR MAMIE TODD LIES", DATED MARCH 26, 1997, AS RECORDED AT THE WAKE COUNTY REGISTER OF DEEDS, MAP BOOK 1997, PAGE 668.
  - SURROUNDING AND ADJACENT PARCEL INFORMATION IS BASED ON WAKE COUNTY GIS DATA.
  - LIMITS OF NEUSE RIPARIAN BUFFERS ARE BASED ON NCEOD-DWR BUFFER DETERMINATION LETTER, RRO #19-328 DATED AUGUST 5TH, 2019.
  - LIMITS OF JURISDICTIONAL STREAM AND WETLANDS ARE BASED ON FIELD DELINEATION BY WITHERSRAVENEL, INC. AND USACE CONFIRMATION OF JURISDICTIONAL DETERMINATION BASED ON SITE VISIT ON 07/26/19. REFERENCE USACE ACTION ID #SAW-2019-01418.
  - PROPERTY IS CURRENTLY NOT IN TOWN OF KNIGHTDALE ETJ.
  - BOUNDARY AND TOPOGRAPHIC INFORMATION BASED ON SURVEY BY WITHERSRAVENEL, INC.
  - THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720174300J WITH AN EFFECTIVE DATE OF MAY 2, 2006.



Job No. 02190259 Drawn By WR  
Date 07/08/20 Designer WR



Revisions


**CITY OF RALEIGH**  
ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES - N/A  
PUBLIC UTILITIES  
STORMWATER - N/A  
PLANNING - N/A  
FIRE - N/A  
URBAN FORESTRY - N/A

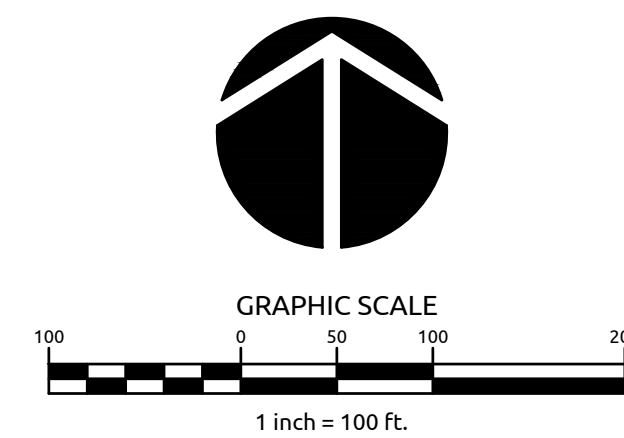
TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

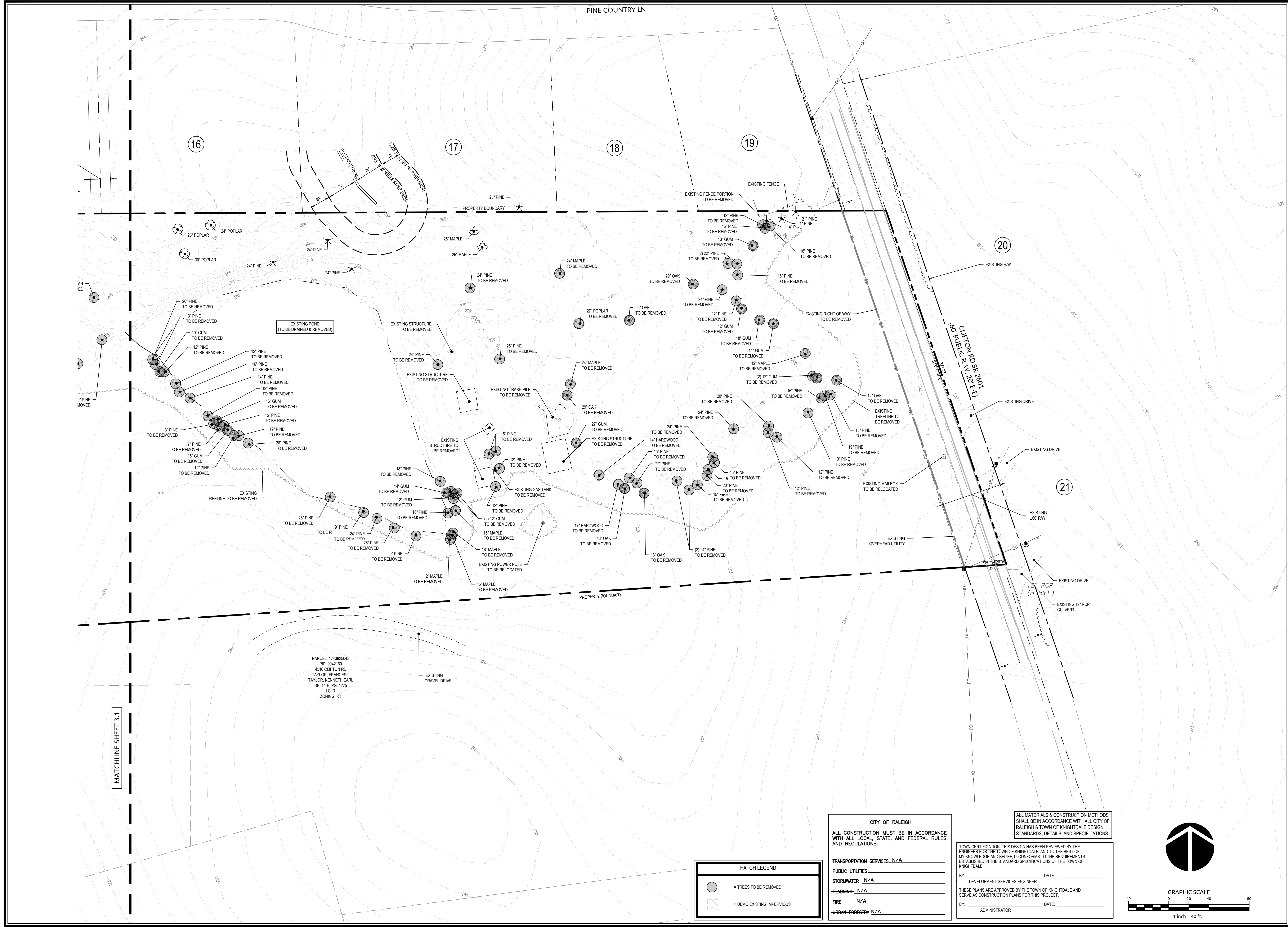
**DEMOLITION PLAN**

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**1.2**



MATCHLINE SHEET 3.1

PARCEL: 1743825043  
PID: 0042160  
4516 CLIFTON RD  
TAYLOR, FRANCES L  
TAYLOR, KENNETH EARL  
DB. 14-E, PG. 1275  
LC, R  
ZONING: RT

HATCH LEGEND	
	= TREES TO BE REMOVED
	= DEMO EXISTING IMPERVIOUS

**CITY OF RALEIGH**  
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TRANSPORTATION SERVICES: N/A  
PUBLIC UTILITIES: \_\_\_\_\_  
STORMWATER: N/A  
PLANNING: N/A  
FIRE: N/A  
URBAN FORESTRY: N/A

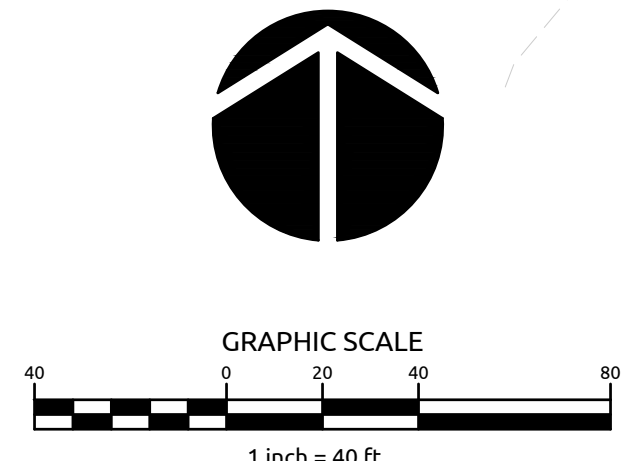
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR



K:\1743825043\02190259.dwg from road address\02190259\02190259.dwg: 07/08/20 11:05:57 AM - VORIC STEPHEN

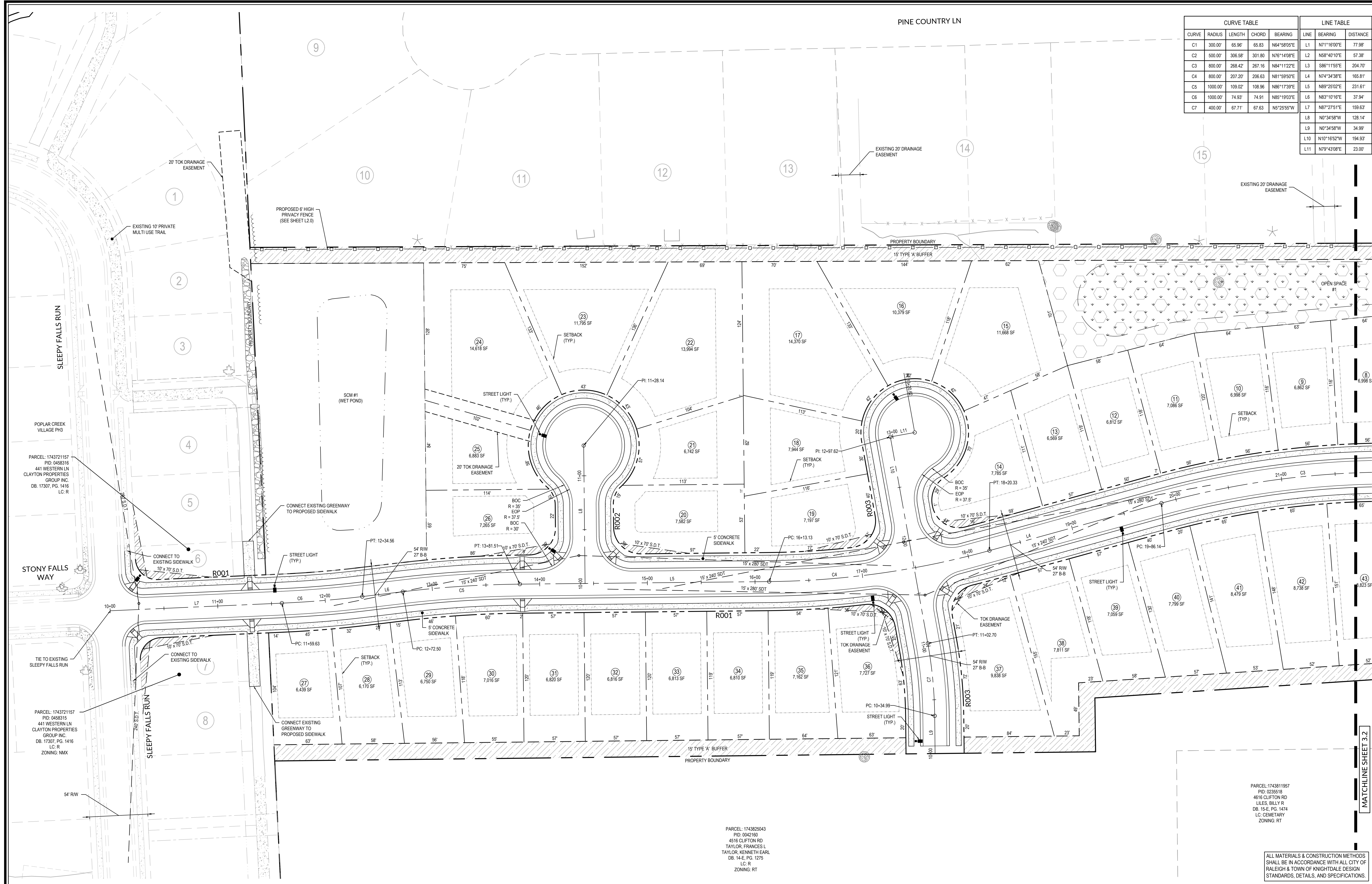


Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions	

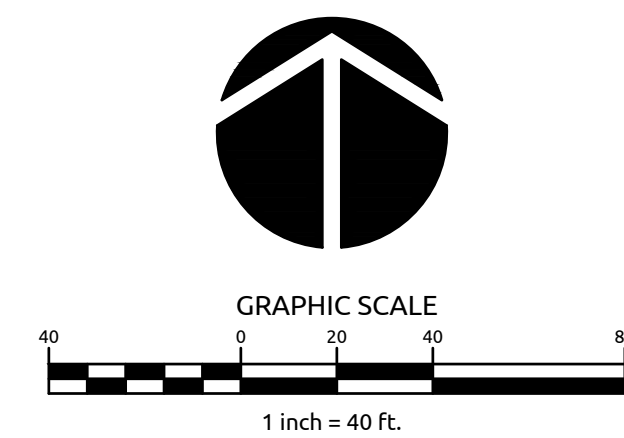
CURVE TABLE				LINE TABLE		
CURVE	RADIUS	LENGTH	CHORD	BEARING	LINE	DISTANCE
C1	300.00'	65.96'	65.63'	N64°58'05"E	L1	N71°16'00"E 77.98'
C2	500.00'	306.58'	301.80'	N76°14'08"E	L2	N58°40'10"E 57.38'
C3	800.00'	268.42'	267.16'	N84°11'22"E	L3	S86°11'55"E 204.70'
C4	800.00'	207.20'	206.63'	N81°59'50"E	L4	N74°34'38"E 165.81'
C5	1000.00'	109.02'	108.96'	N86°17'39"E	L5	N89°25'02"E 231.61'
C6	1000.00'	74.93'	74.91'	N85°19'03"E	L6	N83°10'16"E 37.94'
C7	400.00'	67.71'	67.63'	N5°25'55"W	L7	N87°27'51"E 159.63'
					L8	N0°34'58"W 128.14'
					L9	N0°34'58"W 34.99'
					L10	N10°16'52"W 194.93'
					L11	N79°43'08"E 23.00'



PARCEL: 174352043  
PID: 044260  
4516 CLIFTON RD  
TAYLOR, FRANCES L  
TAYLOR, KENNETH EARL  
DB: 14-E, PG. 1275  
LC: R  
ZONING: RT

PARCEL: 174381957  
PID: 0235518  
4616 CLIFTON RD  
LILES, BILLY R.  
DB: 15-E, PG. 1474  
LC: CEMETARY  
ZONING: RT

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



AASHTO SIGHT DISTANCE						Calculated	Calculated	Proposed	Proposed
Major Street Name (Through)	Minor Street Name (Stop)	Design Speed of Major Street (Through) (mph)	Approach Grade of Minor Street (Stop) (%)	Left Turn Time Gap (sec.)	Right Turn Time Gap (sec.)	Left Turn Sight Distance (ft)	Right Turn Sight Distance (ft)	Left Turn Sight Distance (ft)	Right Turn Sight Distance (ft)
CLIFTON ROAD	R001	25	2.08	7.50	6.50	276	239	280	240
SLEEPY FALLS RUN	R001	25	-4.14	7.50	6.50	276	239	280	240
	R002	25	-1.60	7.50	6.50	276	239	280	240
	R003	25	1.60	7.50	6.50	276	239	280	240
	R003	25	-4.50	7.50	6.50	276	239	280	240

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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

CITY OF RALEIGH  
ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES: N/A  
PUBLIC UTILITIES: \_\_\_\_\_  
STORMWATER: N/A  
PLANNING: N/A  
FIRE: N/A  
URBAN FORESTRY: N/A

K:\174352043\0259\Drawings\addendum\addendum.dwg (2020/07/08 11:22:27 AM) - YORC - 01/01/20

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**SITE PLAN**

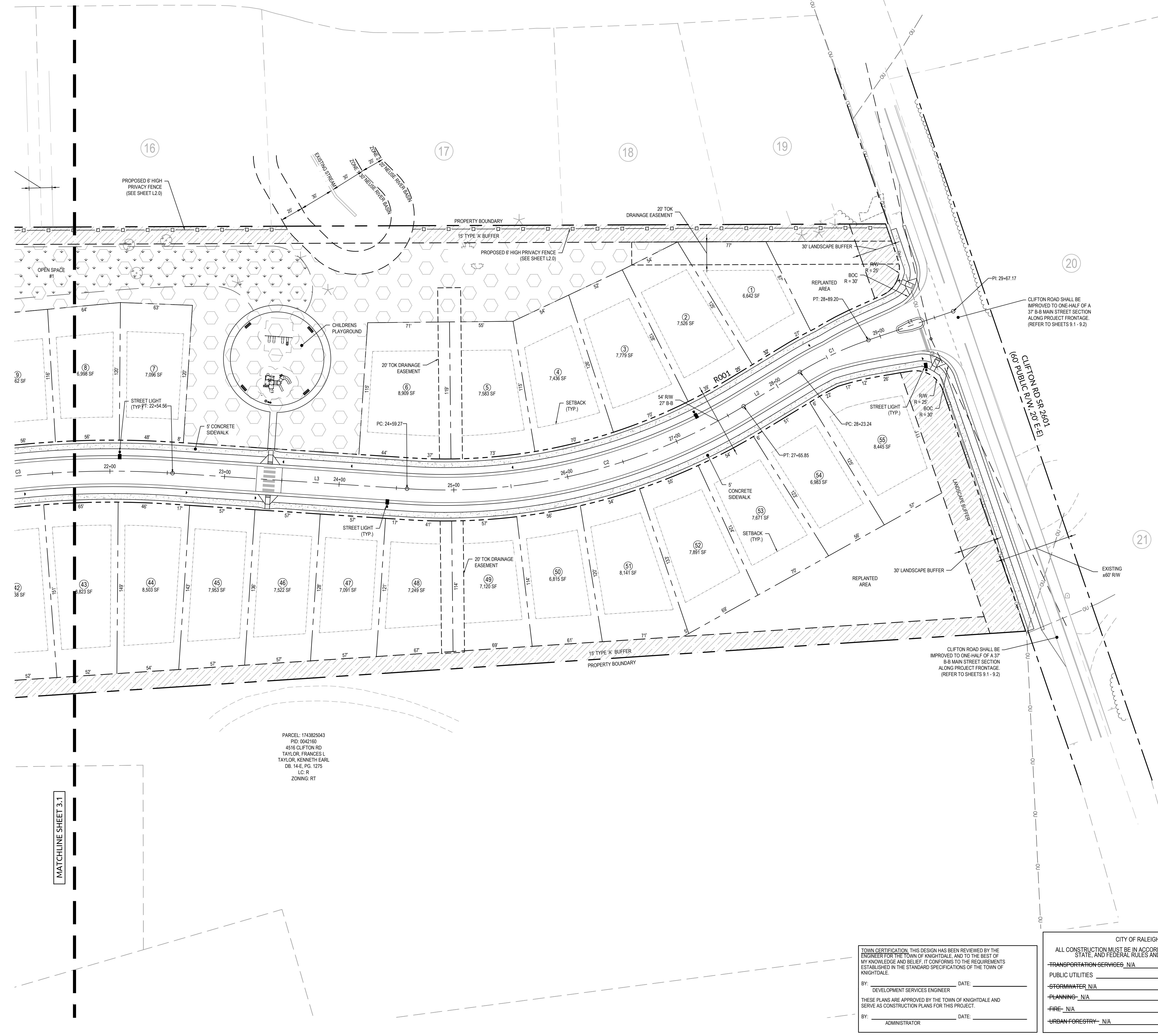
Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions	

Sheet No.  
**2.2**

CURVE TABLE				LINE TABLE	
CURVE	RADIUS	LENGTH	CHORD	BEARING	DISTANCE
C1	300.00'	65.98'	65.63	N64°50'00"E	77.98'
C2	500.00'	306.68'	301.80	N78°14'08"E	57.38'
C3	800.00'	268.42'	267.16	N84°11'22"E	204.70'
C4	800.00'	207.20'	206.63	N81°59'50"E	165.81'
C5	1000.00'	109.02'	108.96	N86°17'39"E	231.61'
C6	1000.00'	74.93'	74.91	N85°19'03"E	37.94'
C7	400.00'	67.71'	67.63	N5°25'55"W	159.63'
L1				N71°16'00"E	77.98'
L2				N58°40'10"E	57.38'
L3				S86°11'55"E	204.70'
L4				N74°34'38"E	165.81'
L5				N89°25'02"E	231.61'
L6				N83°10'16"E	37.94'
L7				N87°27'51"E	159.63'
L8				N0°34'58"W	128.14'
L9				N0°34'58"W	34.99'
L10				N10°16'52"W	194.93'
L11				N79°43'08"E	23.00'



PARCEL: 1743825043  
PID: 0042160  
4516 CLIFTON RD  
TAYLOR, FRANCES L  
TAYLOR, KENNETH EARL  
DB: 14-E, PG. 1275  
LC: R  
ZONING: RT

MATCHLINE SHEET 3.1

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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

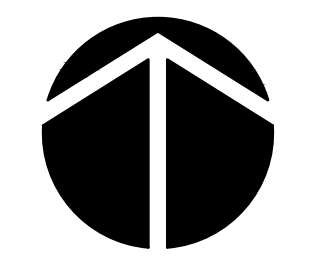
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

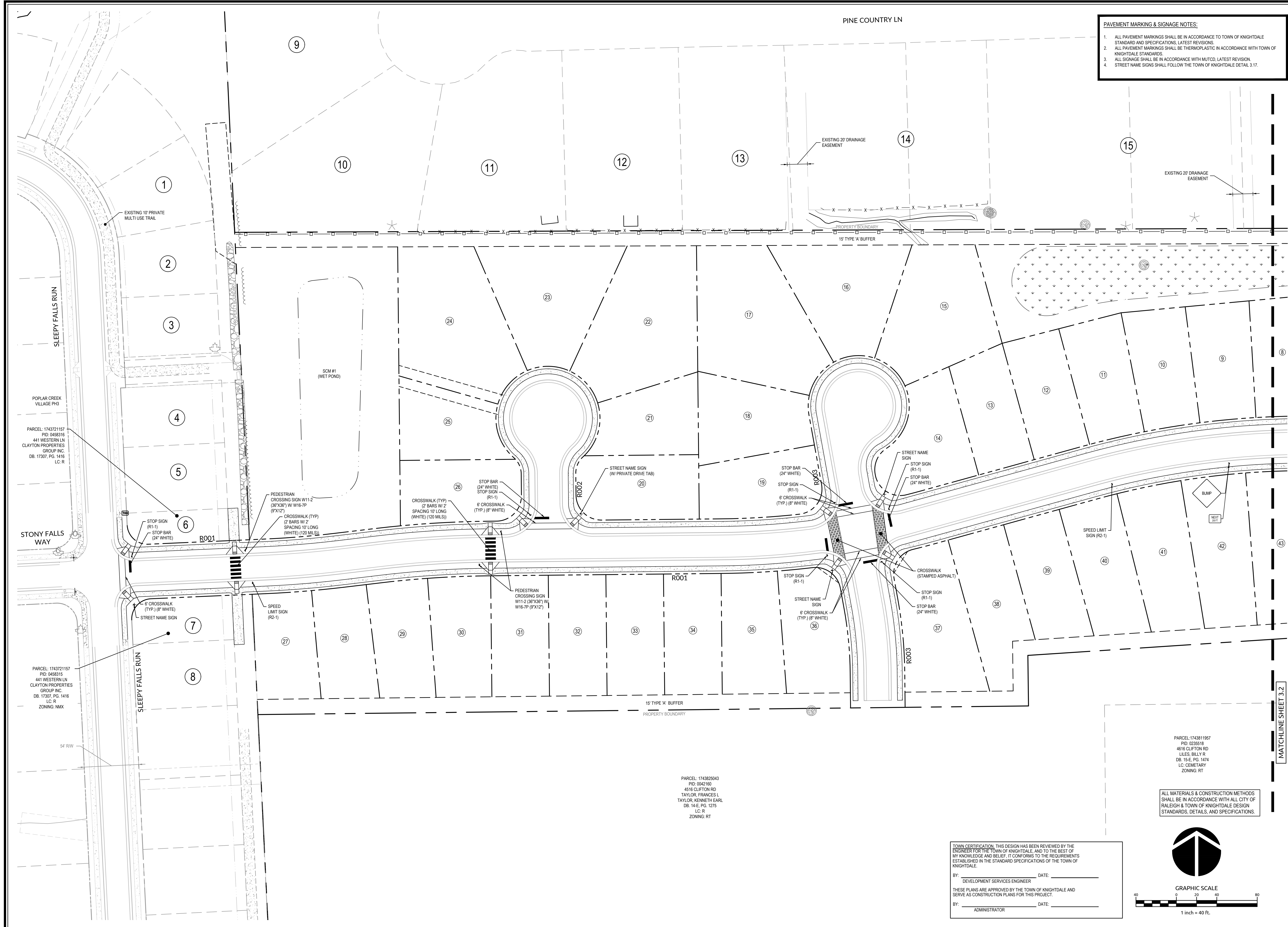
CITY OF RALEIGH  
ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES: N/A  
PUBLIC UTILITIES: \_\_\_\_\_  
STORMWATER: N/A  
PLANNING: N/A  
FIRE: N/A  
URBAN FORESTRY: N/A

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



GRAPHIC SCALE  
1 inch = 40 ft.



- PAVEMENT MARKING & SIGNAGE NOTES:**
1. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE TO TOWN OF KNIGHTDALE STANDARD AND SPECIFICATIONS, LATEST REVISIONS.
  2. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARDS.
  3. ALL SIGNAGE SHALL BE IN ACCORDANCE WITH MUTCD, LATEST REVISION.
  4. STREET NAME SIGNS SHALL FOLLOW THE TOWN OF KNIGHTDALE DETAIL 3.17.

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions


K:\17\1743721157\02190259\Drawings\DWG\PAVEMENT MARKING & SIGNAGE PLAN.dwg, August 11, 2020 11:13:12 AM, V:\CIC\STIPHEN

PARCEL: 1743721157  
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 CLAYTON PROPERTIES  
 GROUP INC.  
 DB. 17307, PG. 1416  
 LC: R

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 GROUP INC.  
 DB. 17307, PG. 1416  
 LC: R  
 ZONING: NMX

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 PID: 0235518  
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 TAYLOR, KENNETH EARL  
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 LC: R  
 ZONING: RT

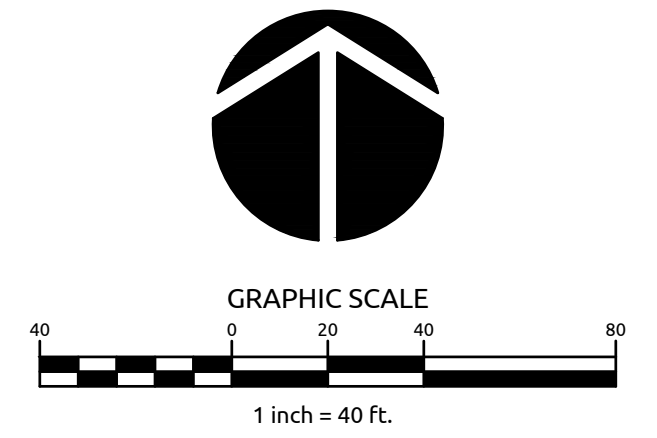
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 LILES, BILLY R.  
 DB. 15-E, PG. 1474  
 LC: CEMETARY  
 ZONING: RT

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: \_\_\_\_\_  
 DEVELOPMENT SERVICES 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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MATCHLINE SHEET 3.2

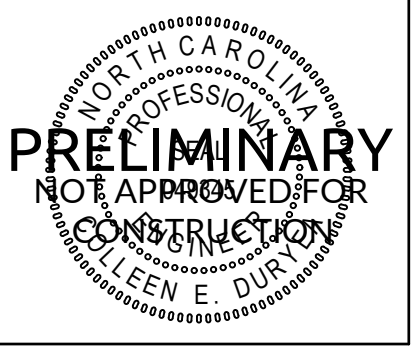


**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

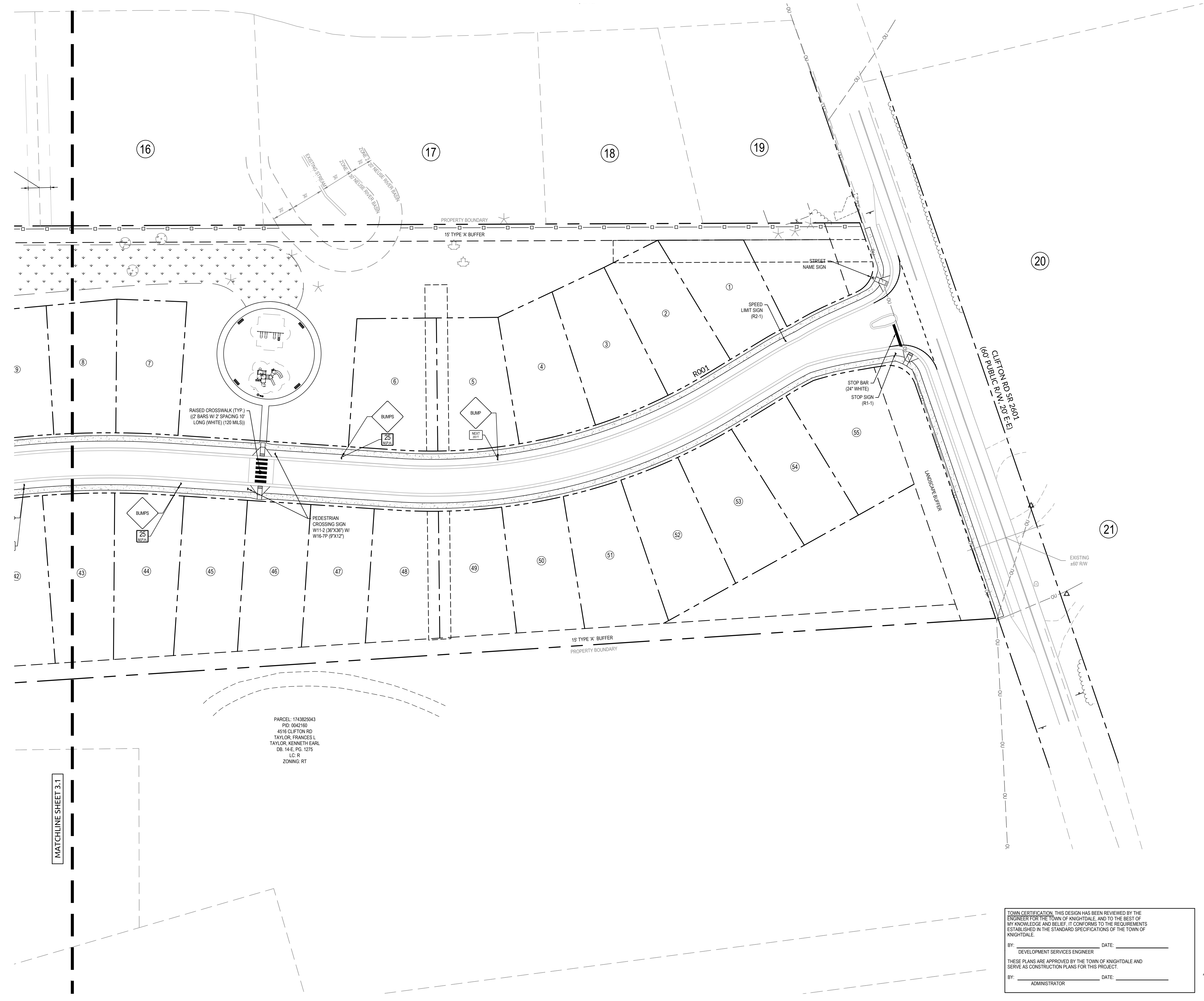
**PAVEMENT MARKING &  
SIGNAGE PLAN**

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

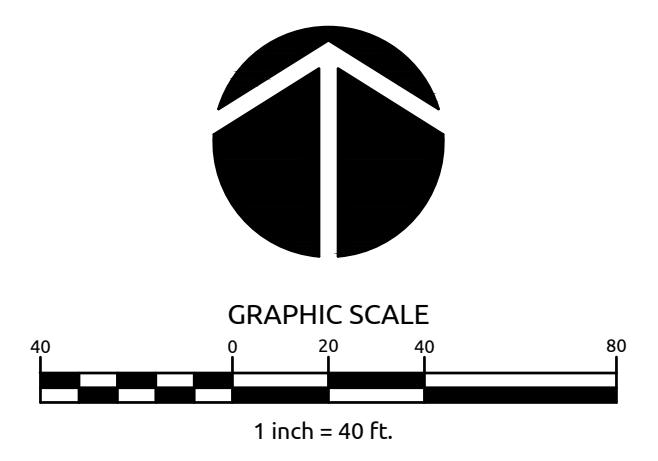
Sheet No.  
**2.4**



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TAYLOR, FRANCES L  
TAYLOR, KENNETH EARL  
DB: 14-E, PG: 1275  
LC: R  
ZONING: RT

MATCHLINE SHEET 3.1

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ADMINISTRATOR

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REQUIRED OPEN SPACE CALCULATIONS		
TOTAL AREA	17.49	AC
LOT COUNT	55.00	
TOTAL BEDROOMS (LOTS* 3.5)	192.50	BR
ACREAGE WITHIN 1/4 MILE OF PUBLIC OPEN SPACE	13.23	AC
ACREAGE WITHIN 1/2 - 1/4 MILE OF PUBLIC OPEN SPACE	4.26	AC
BEDROOMS WITHIN 1/4 MILE	146	BR
BEDROOMS WITHIN 1/4 - 1/2 MILE	47	BR
OPEN SPACE NEEDED (1/4 MILE) (280 SF/BR)	37859	SF
OPEN SPACE NEEDED (1/4 MILE - 1/2 MILE) (390 SF/BR)	18286	SF
<b>TOTAL RECREATIONAL OPEN SPACE</b>	<b>56145</b>	<b>SF</b>
	<b>1.29</b>	<b>AC</b>

OPEN SPACE CALCULATIONS		
REQUIRED OPEN SPACE	1.29	AC
D.S. #1	0.65	AC ACTIVE
D.S. #1	0.83	AC PASSIVE
D.S. #2	0.10	AC PASSIVE
<b>TOTAL OPEN SPACE</b>	<b>1.58</b>	<b>AC</b>

TREE CANOPY CALCULATIONS		
TOTAL AREA	17.49	AC
PERIMETER (P)	4475	LF
TREE CANOPY AREA (P * 20 LF)/43560	2.05	AC
TOTAL LOT AREA (< 10% max)	11.75	%
TREE CANOPY AREA REQUIRED (10 % AREA)	1.175	AC
NRB	0.07	AC
LANDSCAPE BUFFERS PROVIDED	1.38	AC
TREE CANOPY PROVIDED	1.45	AC
ADDITIONAL SPACE REQUIRED	0.30	AC
ADDITIONAL SPACE - MATURE FOREST	0.00	AC
ADDITIONAL SPACE - REPLANTED NEEDED	0.37	AC
ADDITIONAL SPACE - REPLANTED PROVIDED	0.38	AC
<b>TOTAL CANOPY AREA PROVIDED</b>	<b>1.83</b>	<b>AC</b>

REPLANTED AREAS NOTE:  
FOR REPLANTED AREAS, SEE SHEET L2.0 LANDSCAPE DETAILS FOR RE-PLANTING INSTRUCTIONS.

HATCH LEGEND	
	PERIMETER BUFFER
	OPEN SPACE
	TREE SAVE
	TREE CANOPY



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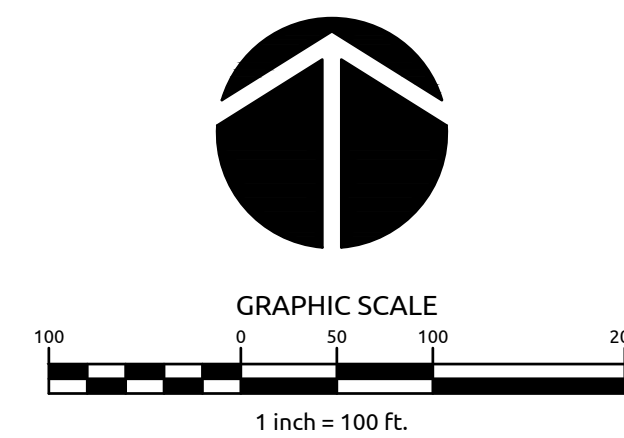
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

CITY OF RALEIGH

ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES - N/A  
PUBLIC UTILITIES - \_\_\_\_\_  
STORMWATER - N/A  
PLANNING - N/A  
FIRE - N/A  
URBAN FORESTRY - N/A

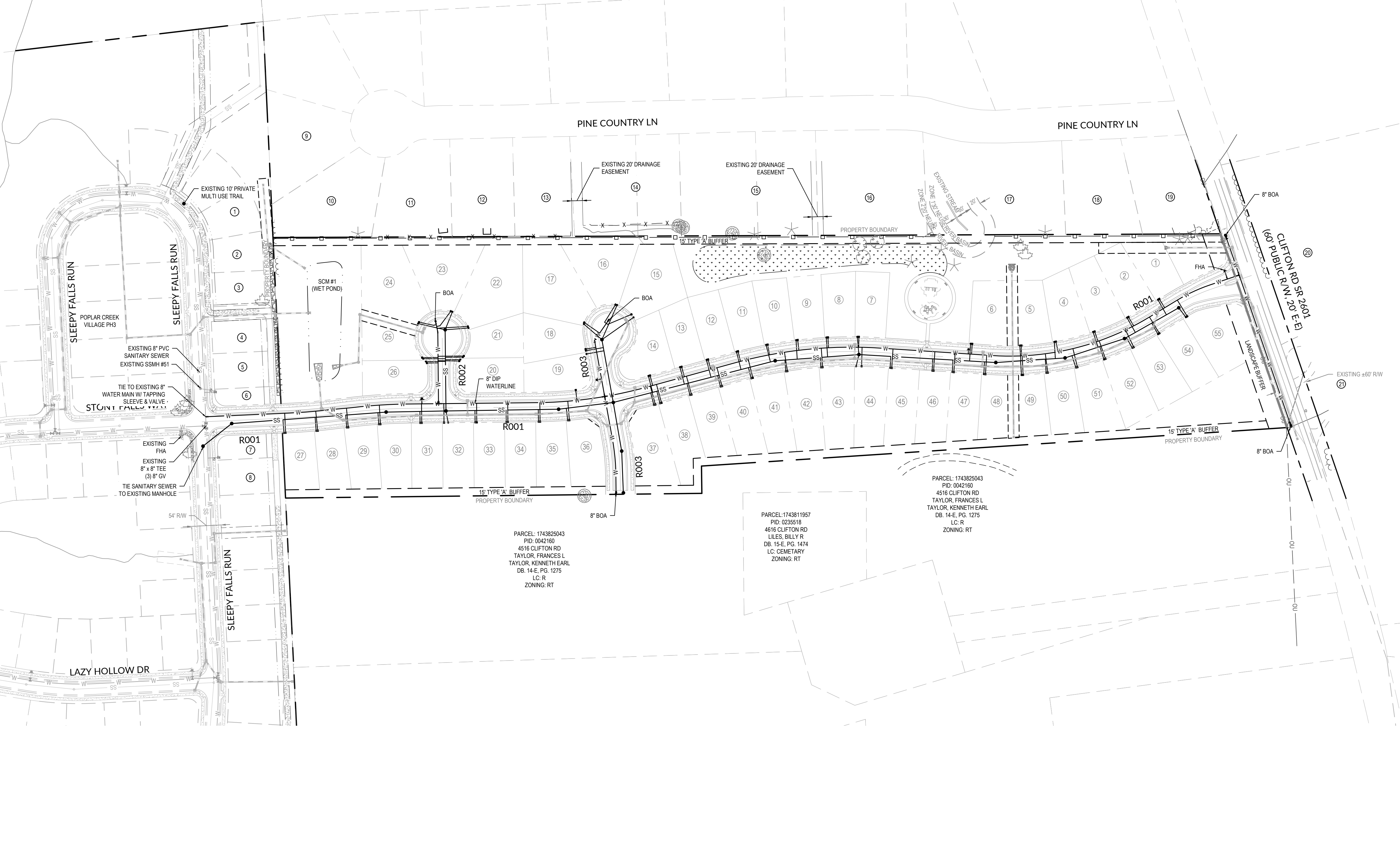


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NUMBER	PARCEL	PID	MAILING ADDRESS	OWNER INFO	DB	PG.	LC
1	1743721538	0458321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
2	1743721346	0458320	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
3	1743721445	0458319	4717 SLEEPY FALLS RUN	BROWN, WILLIAM R JR BROWN, GWENDOLYN JACKSON	017459	1868	R
4	1743721346	0458318	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
5	1743629392	0458398	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
6	1743721157	0458316	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
7	1743721157	0458315	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
8	1743721160	0458314	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
9	1743722752	099969	120 PINE COUNTRY LANE	SAULT, CAROLYN	9155	138	R
10	1743723622	099970	119 PINE COUNTRY LANE	MAXWELL, MICHAEL	14957	1973	R
11	1743724662	099965	117 PINE COUNTRY LANE	MOLINA, SALVADOR MOLINA MARIA GUEVARA	9018	1822	R
12	1743725684	0099966	115 PINE COUNTRY LANE	CARONZO DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	R
13	1743727604	0099967	113 PINE COUNTRY LANE	BIRCH, HOWARD REGINALD III	12161	563	R
14	1743728644	0099963	111 PINE COUNTRY LANE	KEETER, JOHN	13521	705	R
15	1743820675	0099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	R
16	1743822685	0099959	202 MACKENAN DR.	AQUA NORTH CAROLINA INC.	13547	76	R
17	1743825614	0099965	105 PINE COUNTRY LANE	TEUSCHER, RICHARD DALE	5233	234	R
18	1743827605	0099968	103 PINE COUNTRY LANE	WRIGHT, GREGORY H WRIGHT, RAFFAELA M	7211	699	R
19	1743828644	0099962	4500 CLIFFORD RD	NIXON, DORIS LEWTER	8399	2701	R
20	1743922906	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	499	R
21	1743923384	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	502	R

- UTILITY NOTES:**
- ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE CORPUD HANDBOOK, CURRENT EDITION).
  - UTILITY SEPARATION REQUIREMENTS:
    - A) A DISTANCE OF 10' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
    - B) WHEN INSTALLING WATER & OR SEWER MAINS, THE HORIZONTAL SEPARATION BETWEEN UTILITIES SHALL BE 10'. IF THIS SEPARATION CANNOT BE MAINTAINED DUE TO EXISTING CONDITIONS, THE VARIATION ALLOWED IF THE WATER MAIN IN A SEPARATE TRENCH WITH THE ELEVATION OF THE WATER MAIN AT LEAST 18" ABOVE THE TOP OF THE SEWER & MUST BE APPROVED BY THE PUBLIC UTILITIES DIRECTOR. ALL DISTANCES ARE MEASURED FROM OUTSIDE DIAMETER TO OUTSIDE DIAMETER.
    - C) WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASEMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
    - D) 5' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
    - E) MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS. MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49).
    - F) ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
  - ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN & OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
  - CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
  - 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCE MAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
  - IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
  - INSTALL 3/4" COPPER WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE.
  - INSTALL 4" PVC SEWER SERVICES @ 10% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
  - PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI. BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
  - ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDOW, USACE & OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND & OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
  - NCDOT / RAILROAD ENCRoACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
  - CROSS-CONNECTION CONTROL: PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

**WATER METER NOTE:**  
CLEANOUTS CAN BE ON THE PROPERTY LINE BUT WATER METERS MUST BE FULLY IN THE RIGHT OF WAY OR IN A 2'X2' CORWLE



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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

**Public Sewer Collection / Extension System**  
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 # \_\_\_\_\_  
Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

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GRAPHIC SCALE  
1 inch = 100 ft.

**WithersRavenel**  
Engineers | Planners | Surveyors

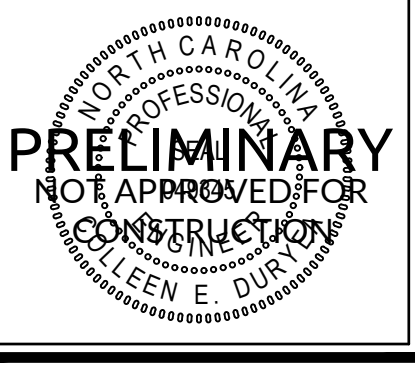
115 McKinnon Drive, Cary, NC 27511 | t: 919-469-3300 | license # C-6832 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL UTILITY PLAN**

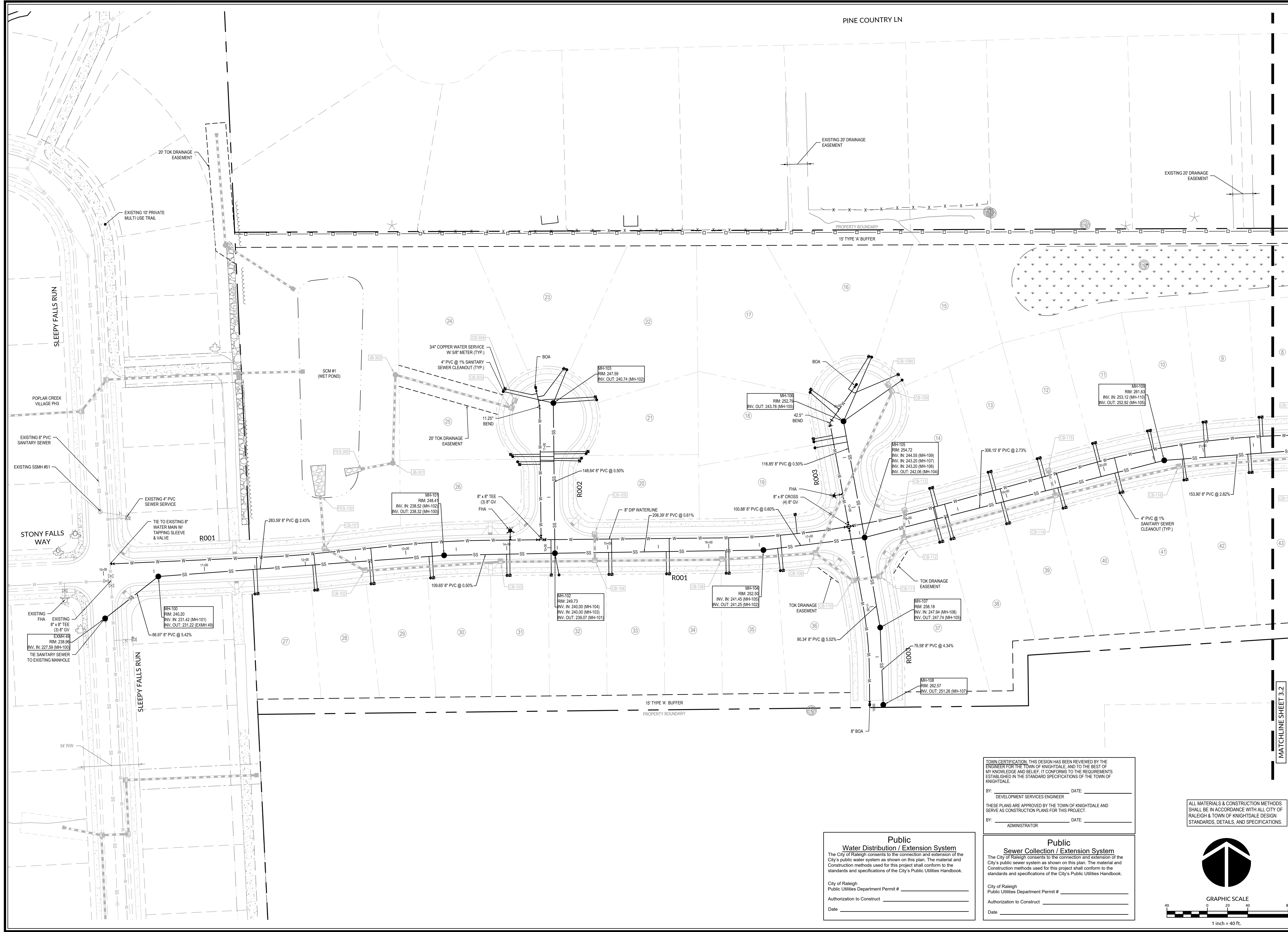
Job No. 02190259 Drawn By WR  
Date 07/08/20 Designer WR



Revisions

Sheet No.  
**3.0**

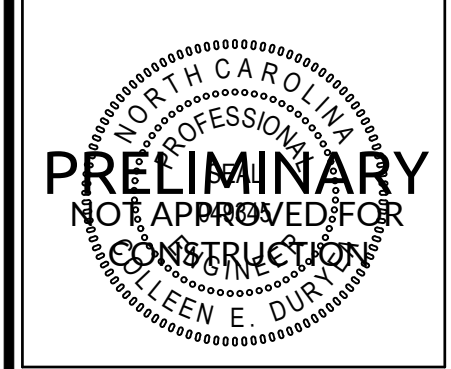
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115 McKinnon Drive, Cary, NC 27511 | 919-469-3900 | License # C-6832 | www.withersravenel.com

TOWN OF KNIGHTDALE, NORTH CAROLINA

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**3.1**

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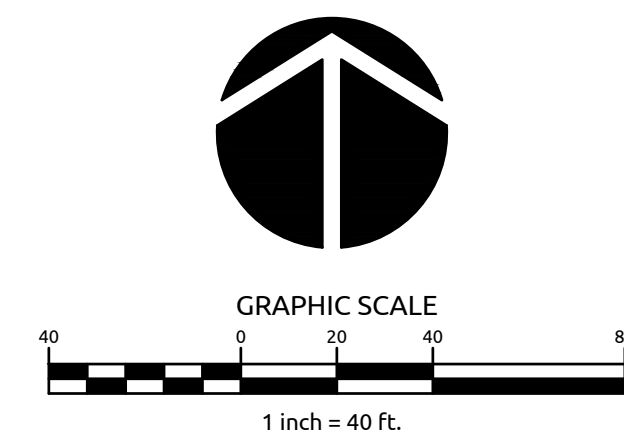
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MATCHLINE SHEET 3.2

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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

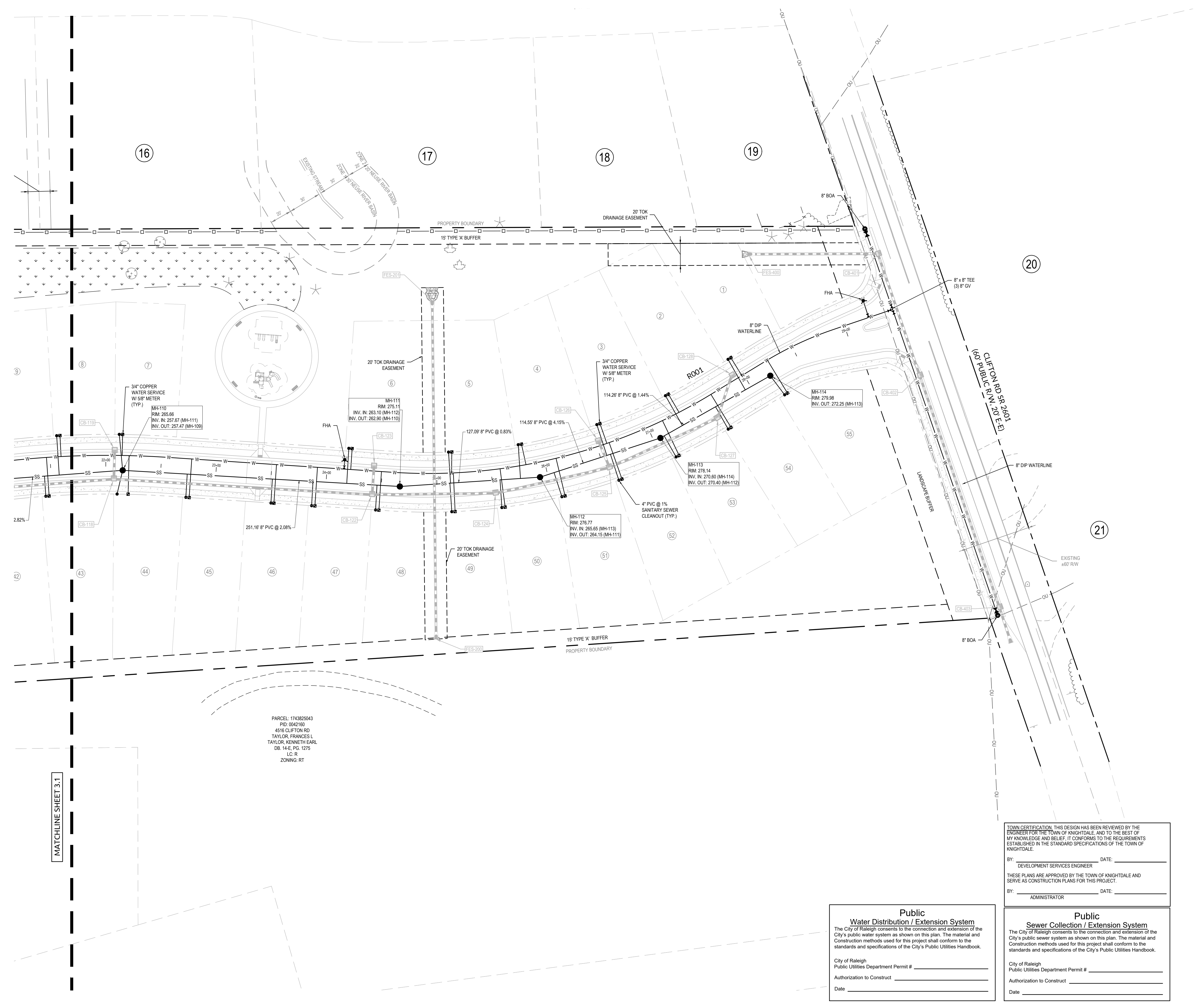
**UTILITY PLAN**

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**3.2**



PARCEL: 1743825043  
PID: 0042160  
4516 CLIFTON RD  
TAYLOR, FRANCES L  
TAYLOR, KENNETH EARL  
DB: 14-E, PG. 1275  
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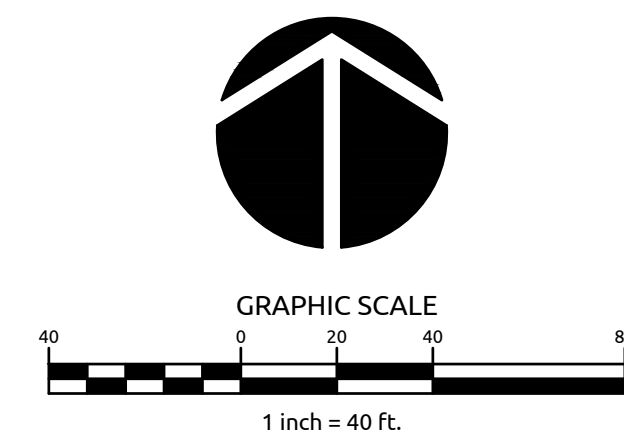
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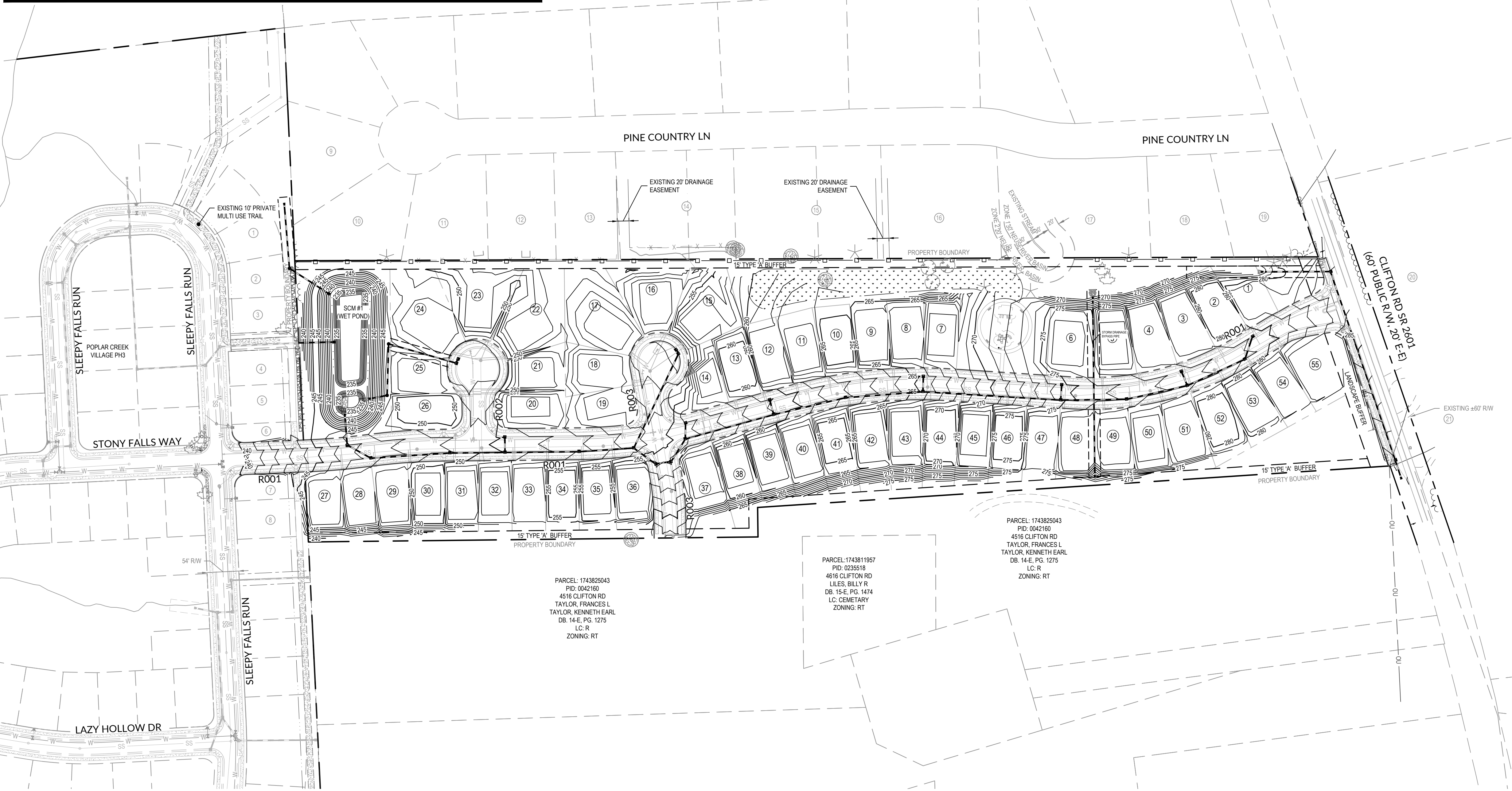


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NUMBER	PARCEL:	PID:	MAILING ADDRESS	OWNER INFO	DB	PG.	L.C.
1	1743721538	0456321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	R
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12	1743725684	099966	115 PINE COUNTRY LANE	CARONZO - DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	R
13	1743727604	099967	113 PINE COUNTRY LANE	BIRCH, HOWARD REGINALD III	12161	563	R
14	1743728644	099963	111 PINE COUNTRY LANE	KEETER, JOHN	13521	705	R
15	1743820675	099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	R
16	1743822685	099959	202 MACKENAN DR.	AQUA NORTH CAROLINA INC.	13547	76	R
17	1743825614	099956	105 PINE COUNTRY LANE	TEUSCHER, RICHARD DALE WRIGHT, GREGORY H WRIGHT, RAFFAELA M	5233	234	R
18	1743827605	099958	103 PINE COUNTRY LANE	WRIGHT, GREGORY H WRIGHT, RAFFAELA M	7211	699	R
19	1743828644	099962	4500 CLIFFORD RD	NIXON, DORIS LEWTER EARLY, TROY O EARLY, RHONDA B	8399	2701	R
20	1743922906	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	499	R
21	1743923384	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	502	R

- GRADING AND DRAINAGE NOTES:**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS & DETAILS.
  - PROJECT BOUNDARY INFORMATION SHOWN IS BASED ON A RECORDED PLAT BY WALLACE G. CLARK, JR. - REGISTERED LAND SURVEYOR TITLED, "SURVEY FOR MAMIE TODD LIES", DATED MARCH 26, 1997, AS RECORDED AT THE WAKE COUNTY REGISTER OF DEEDS, MAP BOOK 1997, PAGE 668.
  - SURROUNDING AND ADJACENT PARCEL INFORMATION IS BASED ON WAKE COUNTY GIS DATA.
  - EXISTING TOPOGRAPHY SHOWN ON THIS PLAN IS BASED ON GIS LIDAR DATA.
  - LIMITS OF NEUSE RIPARIAN BUFFERS ARE BASED ON NCDEQ DWR BUFFER DETERMINATION LETTER, RRO #19-328 DATED AUGUST 5TH, 2019.
  - LIMITS OF JURISDICTIONAL STREAM AND WETLANDS ARE BASED ON FIELD DELINEATION BY WITHERSRAVENEL, INC. AND USACE CONFIRMATION OF JURISDICTIONAL DETERMINATION BASED ON SITE VISIT ON 07/26/19. REFERENCE USACE ACTION ID #SAW-2019-01418. THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720174300J WITH AN EFFECTIVE DATE OF MAY 2, 2006.
  - RECEIVING WATERCOURSE: NEUSE RIVER BASIN.
  - THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLAN IS BASED ON THE BEST AVAILABLE INFORMATION. BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.
  - ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 2 FEET TO THE PIPE CROWN IN TRAFFIC, UNLESS APPROVED BY THE TOWN OF KNIGHTDALE.
  - ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 1 FOOT TO THE PIPE CROWN IN NON-TRAFFIC AREAS.
  - STORM SEWER PIPE ENDS SHALL BE FURNISHED WITH REINFORCED CONCRETE PIPE FLARED END SECTION UNLESS OTHERWISE SPECIFIED ON PLANS.
  - EACH DRAINAGE STRUCTURE SHALL HAVE A SHAPED INVERT CONSTRUCTED FROM CONCRETE PER TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS.
  - ENERGY DISSIPATORS SHALL BE INSTALLED AT ALL STORM SEWER DISCHARGE POINTS. A FABRIC OR WASHED STONE BARRIER SHALL BE INSTALLED BETWEEN THE DISSIPATOR PAD AND THE NATURAL GROUND.
  - STORM PIPE TRENCH EXCAVATION AND BACKFILLING SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS AND DETAILS. PLEASE CONTACT THE TOWN OF KNIGHTDALE DEVELOPMENT SERVICES ENGINEER PRIOR TO THE INSTALLATION OF ALL STORM DRAIN PIPE. STORMWATER CALCULATIONS ARE BASED ON A MAXIMUM 3,500 SF OF IMPERVIOUS AREA PER LOT.
  - ALL STORM DRAINAGE PIPE SHALL BE CLASS III REINFORCED CONCRETE PIPE (RCP) UNLESS NOTED OTHERWISE.
  - DISCHARGE BASED ON 10-YR STORM EVENT UNLESS NOTED OTHERWISE.
  - CB=CATCH BASIN; FES=FLARED END SECTION; JB=JUNCTION BOX; YI=YARD INLET; (TOK #5 03); DI=DROP INLET (TOK #5 04)
  - RIM ELEVATION GIVEN FOR CB IS TOP OF CURB, YI OPENING INVERT FOR SLAB TOP, DI IS TOP OF GRATE FOR GRATED INLET, JB IS TOP OF RIM.
  - TOK DRAINAGE EASEMENT-PUBLIC EASEMENT
  - ALL PUBLIC STORM DRAINAGE FRAMES, GRATES, & HOODS SHALL BE STAMPED W/ "DRAINS TO RIVER" IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARDS.
  - THE USE OF WAFFLE BOXES IS NOT PERMITTED WITHIN PUBLIC RIGHT OF WAY AND PUBLIC DRAINAGE EASEMENTS.
  - THE CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING STEPS IN THE STORM DRAINAGE BOXES GREATER THAN OR EQUAL TO 5.0 FEET DEPTH. THE STEPS SHALL BE INSTALLED ON 16 INCH CENTERS AND SECURED PER TOWN OF KNIGHTDALE SPECIFICATIONS.

**MASS GRADING COMPLIANCE STATEMENT:**  
 THIS PROJECT WILL BE MASS-GRADED INCLUDING THE RESIDENTIAL BUILDING LOTS. PER UDO SECTION 6.2.B.3.A RESIDENTIAL SUBDIVISIONS WITH LOTS LESS THAN 60' WIDE ARE EXEMPT FROM THE RESIDENTIAL CLEARING AND GRADING REQUIREMENTS OF SECTION 6.2.B. THIS PROJECT IS A RESIDENTIAL SUBDIVISION WITH LOTS LESS THAN 60' WIDE; THEREFORE, SECTION 6.2.B DOES NOT APPLY.



PARCEL: 1743825043  
 PID: 0042160  
 4516 CLIFTON RD  
 TAYLOR, FRANCES L  
 TAYLOR, KENNETH EARL  
 DB: 14-E, PG. 1275  
 LC: R  
 ZONING: RT

PARCEL: 1743811957  
 PID: 0225518  
 4616 CLIFTON RD  
 LILES, BILLY R  
 DB: 14-E, PG. 1474  
 LC: CEMETARY  
 ZONING: RT

PARCEL: 1743825043  
 PID: 0042160  
 4516 CLIFTON RD  
 TAYLOR, FRANCES L  
 TAYLOR, KENNETH EARL  
 DB: 14-E, PG. 1275  
 LC: R  
 ZONING: RT

**TEMPORARY SKIMMER BASIN DESIGN CHART**

NAME	PIPE SIZE (IN)	DISCHARGE 10-YR (CFS)	VELOCITY (FT/S)	LENGTH (FT)	WIDTH AT BEGINNING (FT)	WIDTH AT END (FT)	AVG DIA (IN)	THICKNESS (IN)	STONE CLASS
FES-100	36	29.3	17.26	30	9	15	23	22	1
FES-200	36	17.04	8.52	18	9	21	13	18	1
FES-300	15	4.9	10.63	16	3.75	7.65	13	18	1
FES-400	15	2.4	4	5	3.75	6.25	6	18	B

\*\*ALL DISSIPATORS SHALL HAVE FILTER FABRIC UNDERLINERS.

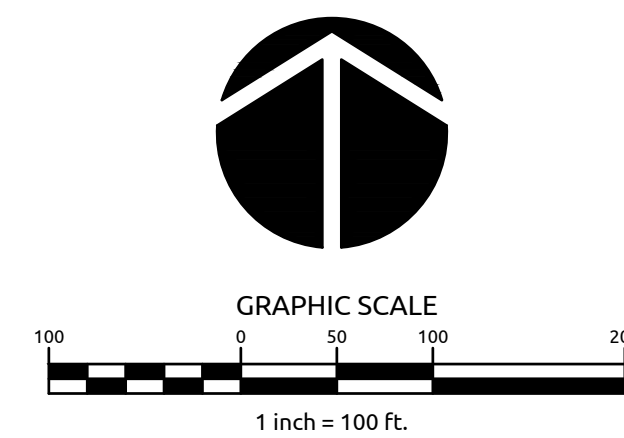
ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.

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: \_\_\_\_\_  
 DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ADMINISTRATOR



**WithersRavenel**  
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**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL STORM DRAINAGE  
 PLAN**

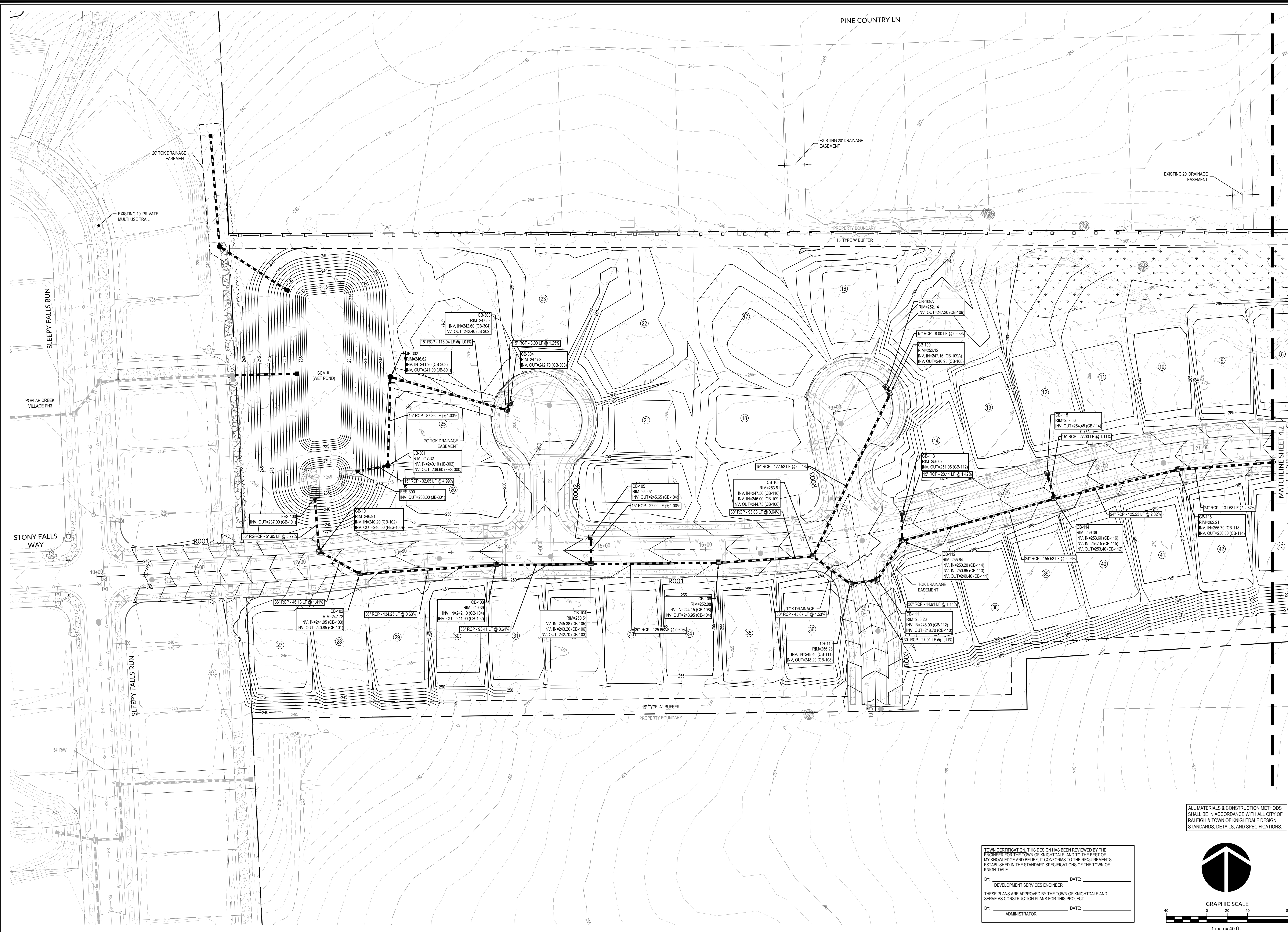
Job No. 02190259 Drawn By WR  
 Date 07/08/20 Designer WR



Revisions


Sheet No.  
**4.0**

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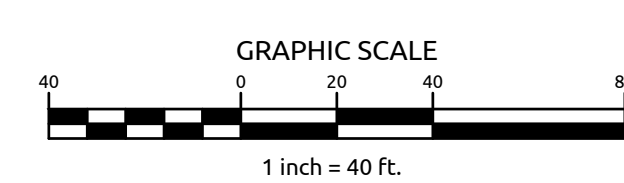
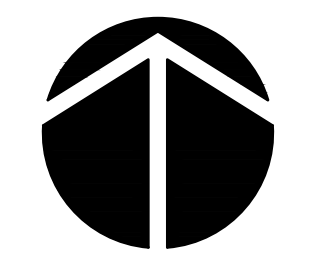


Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



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.

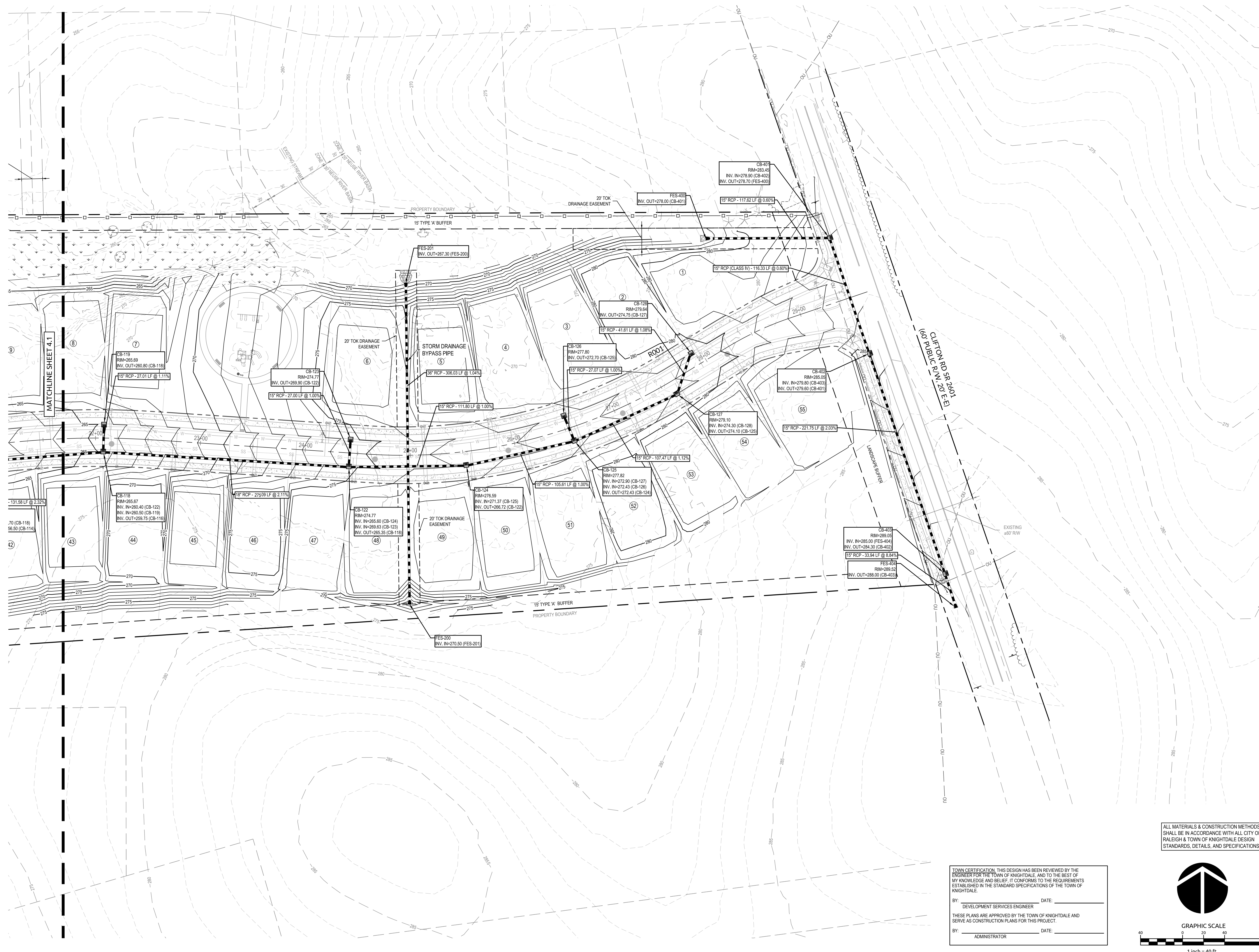
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ADMINISTRATOR

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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**STORM DRAINAGE PLAN**

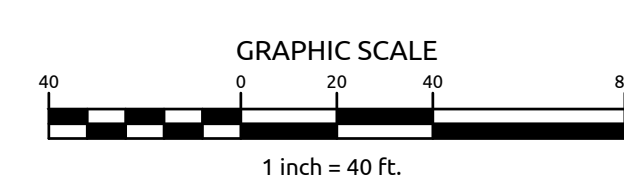
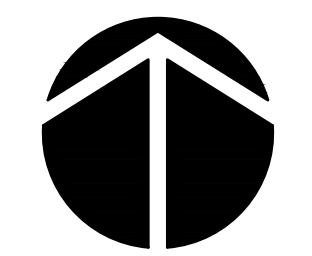
Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**4.2**

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

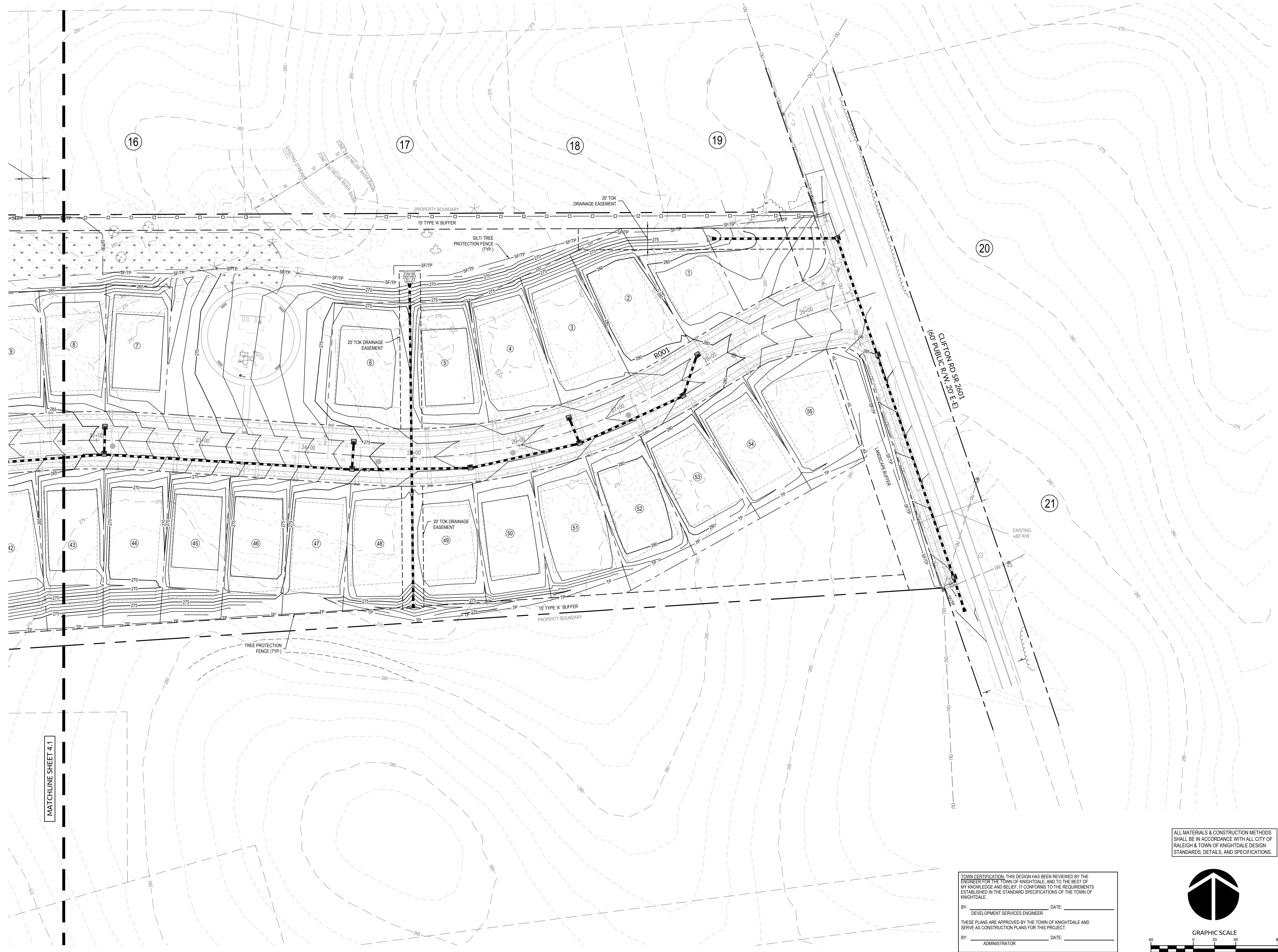
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ADMINISTRATOR







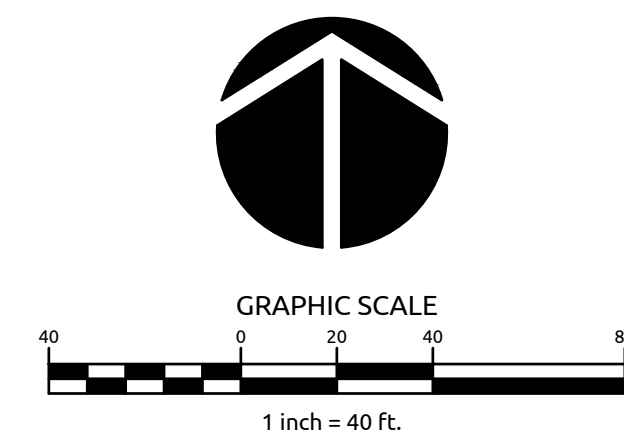
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MATCHLINE SHEET 4.1

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.

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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER  
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.  
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

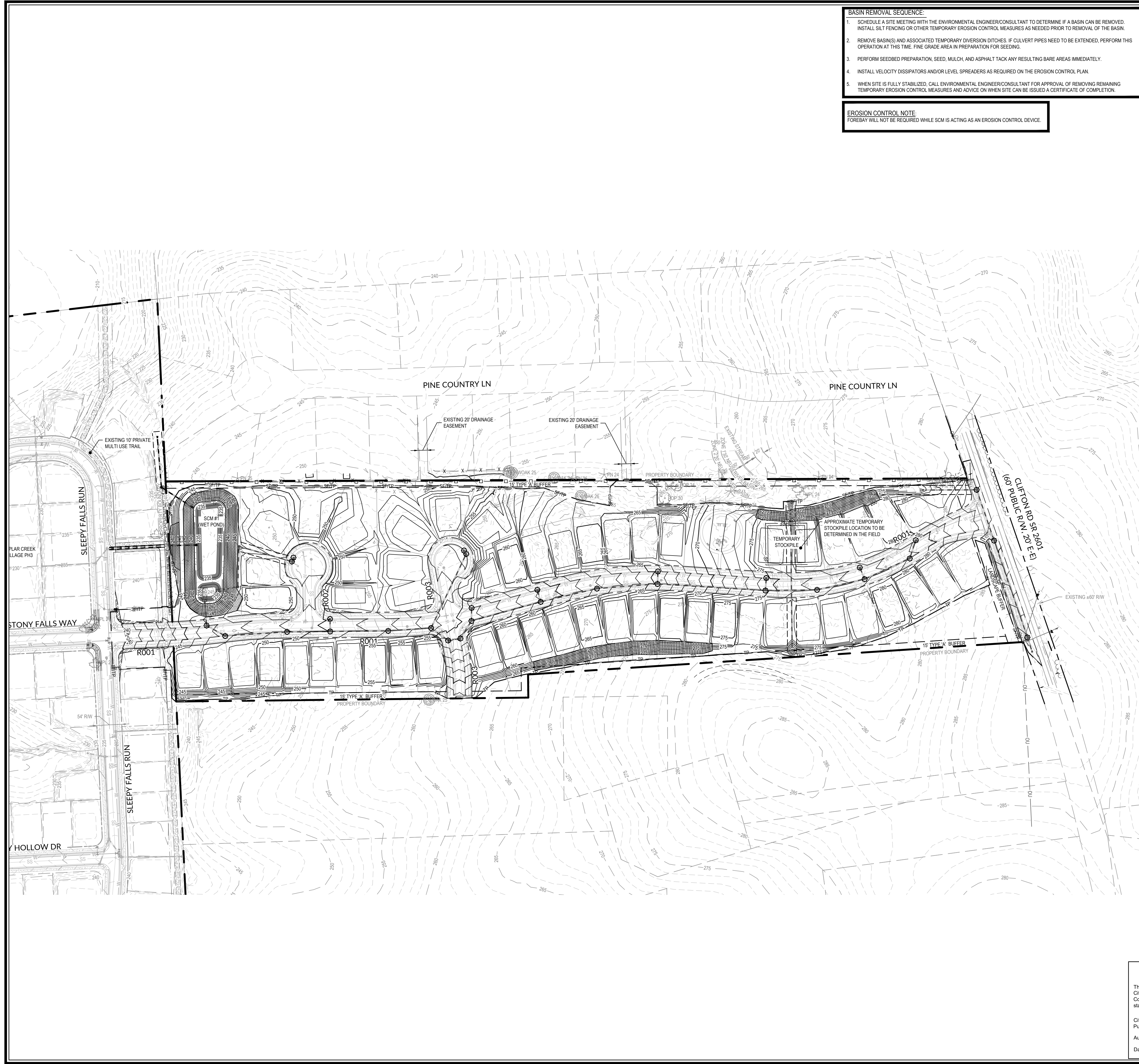


Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions





- BASIN REMOVAL SEQUENCE:**
- SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE IF A BASIN CAN BE REMOVED. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
  - REMOVE BASIN(S) AND ASSOCIATED TEMPORARY DIVERSION DITCHES. IF CULVERT PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
  - PERFORM SEEDBED PREPARATION, SEED, MULCH, AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
  - INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
  - WHEN SITE IS FULLY STABILIZED, CALL ENVIRONMENTAL ENGINEER/CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION.

**EROSION CONTROL NOTE:**  
FOREBAY WILL NOT BE REQUIRED WHILE SCM IS ACTING AS AN EROSION CONTROL DEVICE.

- EROSION CONTROL & STORM DRAINAGE NOTES:**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS & DETAILS.
  - BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY PERFORMED BY WITHERSRAVENEL, INC. OFFSITE TOPOGRAPHIC INFORMATION PROVIDED BY NC LIDAR.
  - LIMITS OF JURISDICTIONAL STREAM AND WETLANDS ARE BASED ON FIELD DELINEATION BY WITHERSRAVENEL, INC. AND USACE CONFIRMATION OF JURISDICTIONAL DETERMINATION BASED ON SITE VISIT ON 07/26/19. REFERENCE USACE ACTION ID #SAW-2019-01418.
  - THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720174300J WITH AN EFFECTIVE DATE OF MAY 2, 2006.
  - RECEIVING WATERCOURSE: UNNAMED TRIBUTARY IN THE NEUSE RIVER BASIN.
  - THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS IS BASED ON THE BEST AVAILABLE INFORMATION, BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.
  - ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 2 FEET TO THE PIPE CROWN IN TRAFFIC, UNLESS APPROVED BY THE TOWN OF KNIGHTDALE.
  - ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 1 FOOT TO THE PIPE CROWN IN NON-TRAFFIC AREAS.
  - STORM SEWER PIPE ENDS SHALL BE FURNISHED WITH REINFORCED CONCRETE PIPE FLARED END SECTION UNLESS OTHERWISE SPECIFIED ON PLANS.
  - EACH DRAINAGE STRUCTURE SHALL HAVE A SHAPED INVERT CONSTRUCTED FROM CONCRETE, AND A BENCH WITH A MAXIMUM 5:1 SLOPE. THE BENCH SHALL BEGIN AT A HEIGHT OF ONE-HALF THE PIPE DIAMETER FOR 12 TO 24 INCH PIPE, ONE-THIRD THE PIPE DIAMETER FOR 30-48 INCH PIPE, AND ONE-FOURTH THE DIAMETER FOR PIPE GREATER THAN 48 INCHES.
  - ENERGY DISSIPATORS SHALL BE INSTALLED AT ALL STORM SEWER DISCHARGE POINTS. A FABRIC OR WASHED STONE BARRIER SHALL BE INSTALLED BETWEEN THE DISSIPATION PAD AND THE NATURAL GROUND.
  - STORM PIPE TRENCH EXCAVATION AND BACKFILLING SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS AND DETAILS.
  - A PRECONSTRUCTION MEETING SHALL BE REQUIRED FOR THIS CONSTRUCTION.
  - GRAVEL CONSTRUCTION ENTRANCE PADS SHALL BE CONSTRUCTED AT EACH POINT OF CONSTRUCTION ACCESS TO EACH PROPERTY. NOTE: IT SHALL BE THE DEVELOPER'S RESPONSIBILITY TO SEE THAT THE CONSTRUCTION ENTRANCE PADS ARE PROPERLY MAINTAINED SO THAT MUD IS NOT TRACKED ONTO ADJACENT STREETS. IN THE EVENT THAT THE GRAVEL CONSTRUCTION ENTRANCES ARE NOT PROPERLY MAINTAINED, OR ARE OTHERWISE INEFFECTIVE, THE TOWN REPRESENTATIVE MAY ISSUE A STOP WORK ORDER OR ANY OTHER EQUITABLE REMEDY PROVIDED BY THE TOWN OF KNIGHTDALE UDO OR NC GENERAL STATUTES. THE STOP WORK ORDER SHALL REMAIN IN EFFECT UNTIL SUCH TIME AS THE PADS ARE RESTORED AND REPLENISHED AND UNTIL ANY RESULTING MUD AND DEBRIS HAS BEEN REMOVED FROM THE ADJACENT STREETS BY THE CONTRACTOR.
  - TO MINIMIZE DAMAGE TO EXISTING TREES NEAR THE INTERIOR EDGE OF BUFFERS AND STREETSCAPES, THE CONTRACTOR SHALL CUT MINIMUM 2' TRENCHES ALONG LIMITS OF DISTURBANCE, SO AS TO CUT, RATHER THAN TEAR, ROOTS.
  - THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION PRIOR TO THE CERTIFICATE OF OCCUPANCY (CO) IS SCHEDULED. THE FENCING SHALL BE REMOVED PRIOR TO FINAL SITE INSPECTION FOR THE CO.
  - THE PROJECT WILL MEET ALL THE REQUIREMENTS RELATIVE TO THE STORMWATER CONTROL MEASURES AND ENGINEERED STORMWATER CONTROL STRUCTURES AS OUTLINED IN THE TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS AND DETAILS MANUAL (CHAPTER 6 SECTION 6.3).
  - GRADING OF INDIVIDUAL LOTS WITHIN THE MAJOR SUBDIVISION SHALL NOT BEGIN WITHOUT FIRST OBTAINING A BUILDING PERMIT FROM THE ADMINISTRATOR AND SHALL BE LIMITED TO THOSE AREAS COMPRISING THE BUILDING FOOTPRINT, DRIVEWAY AND A MINIMAL AREA SURROUNDING THE BUILDING FOOTPRINT TO ACCOMMODATE CONSTRUCTION EQUIPMENT PER UDO SECTION 6.2(B).
  - CONTRACTOR SHALL INSTALL PROPER EROSION CONTROL MEASURES TO ENSURE THAT SEDIMENTATION DURING LOT CLEARING WILL BE MINIMIZED.
  - CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL STRUCTURES DURING THE LIFE OF THE PROJECT.
  - CONTRACTOR SHALL CONSTRUCT DIVERSION DITCHES AS NECESSARY TO ENSURE ALL SEDIMENT IS DIRECTED INTO EROSION CONTROL MEASURES.
  - CONTRACTOR SHALL INSTALL TEMPORARY SLOPE DRAINS PER DETAIL (SHEET 10.5) AT LOCATIONS WHERE TEMPORARY DIVERSION DITCHES DISCHARGE INTO A SKIMMER BASIN AS TO AVOID SLOPE EROSION.
  - TOPSOIL SHALL BE WASTED OFFSITE OR AT APPROVED STOCKPILE AREA ON SITE.
  - ALL STORM DRAINAGE PIPE SHALL BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH TOWN OF KNIGHTDALE DETAILS AND SPECIFICATIONS.
  - CONTRACTOR SHALL PROVIDE RIP RAP DISSIPATOR PADS AT STORM DRAINAGE PIPE DISCHARGE POINTS AS REQUIRED TO ENSURE POSITIVE DRAINAGE.
  - ALL CLEARING LIMITS SHALL BE CLEARLY IDENTIFIED AND STAKED PRIOR TO ANY CONSTRUCTION. THE TOWN SHALL BE GIVEN 24-HOUR NOTICE PRIOR TO BEGINNING CLEARING OPERATIONS.
  - ALL EARTHWORK SHALL BE COMPLETED IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS MANUAL (SECTION 2.05).
  - STABILIZATION SHALL BE IN ACCORDANCE WITH NPDES STORMWATER DISCHARGE PERMIT (SEE TABLE ON SHEET 8.3).
  - MASS GRADING IS NOT PERMITTED ON LOTS 60' & GREATER.

**MASS GRADING COMPLIANCE STATEMENT:**  
THIS PROJECT WILL BE MASS-GRADED INCLUDING THE RESIDENTIAL BUILDING LOTS. PER UDO SECTION 6.2.B.3.A RESIDENTIAL SUBDIVISIONS WITH LOTS LESS THAN 60' WIDE ARE EXEMPT FROM THE RESIDENTIAL CLEARING AND GRADING REQUIREMENTS OF SECTION 6.2.B. THIS PROJECT IS A RESIDENTIAL SUBDIVISION WITH LOTS LESS THAN 60' WIDE; THEREFORE, SECTION 6.2.B DOES NOT APPLY.

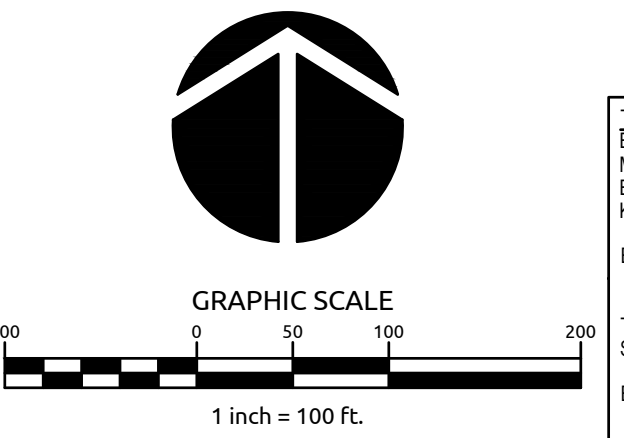
DEMUDED AREA = 16.10 AC

**EROSION CONTROL BLANKET NOTE:**  
PROVIDE EROSION CONTROL BLANKET. (SEE DETAIL SPT 10.3)

**EROSION CONTROL LEGEND**

---	LIMITS OF CONSTRUCTION
— TP —	TREE PROTECTION FENCE
— SPT —	SILT/TREE PROTECTION FENCE
— D —	TEMPORARY DIVERSION DITCH
— SD —	TEMPORARY SLOPE DRAIN
XX XX	SCM Baffles
○	INLET PROTECTION
	SILT FENCE OUTLET
▲	ROCK CHECK DAM
□	SKIMMER BASIN
▨	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
■	SILT BAG FOR DEWATERING BASINS
■	CONCRETE WASH OUT

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



**Public Sewer Collection / Extension System**  
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 # \_\_\_\_\_  
Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

**Public Water Distribution / Extension System**  
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 # \_\_\_\_\_  
Authorization to Construct \_\_\_\_\_  
Date \_\_\_\_\_

**WithersRavenel**  
Engineers | Planners | Surveyors

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**POPLAR CREEK VILLAGE PHASE IV**

**STAGE 2 EROSION CONTROL PLAN**

Job No. 02190259 Drawn By WR  
Date 07/08/20 Designer WR

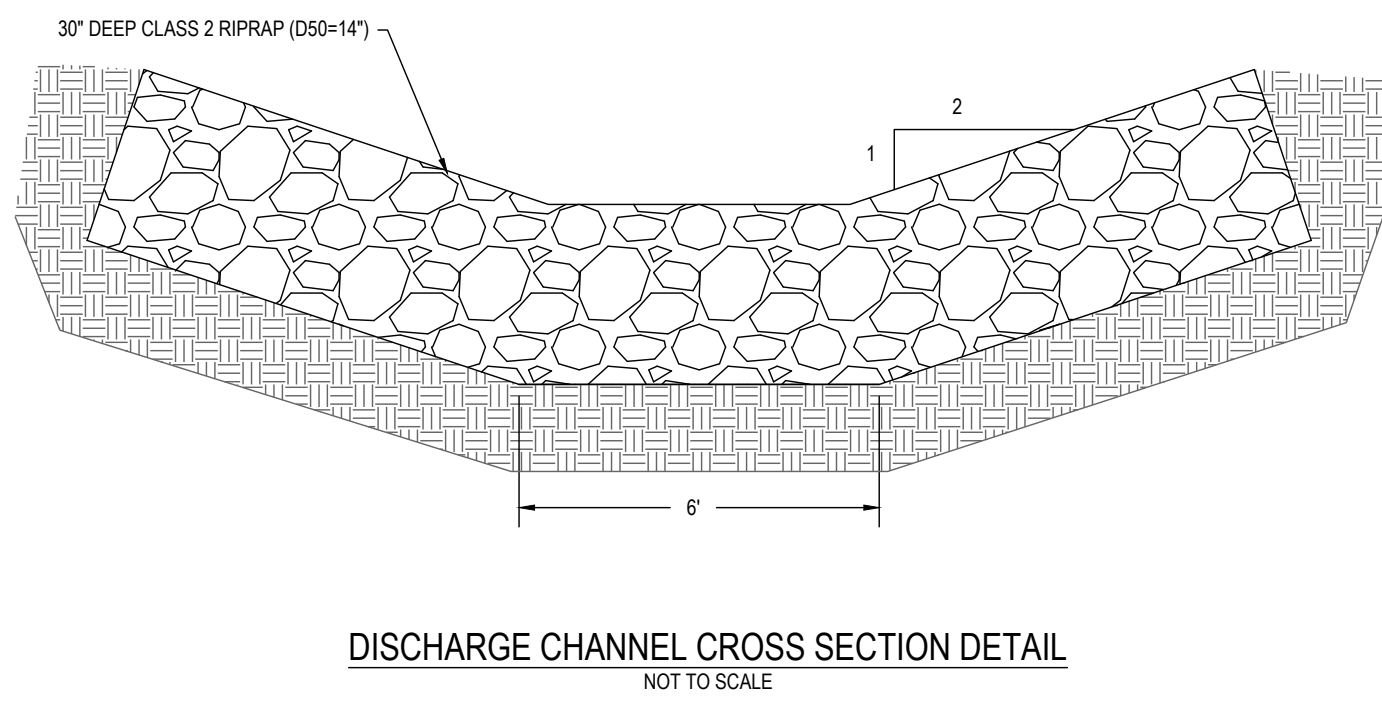
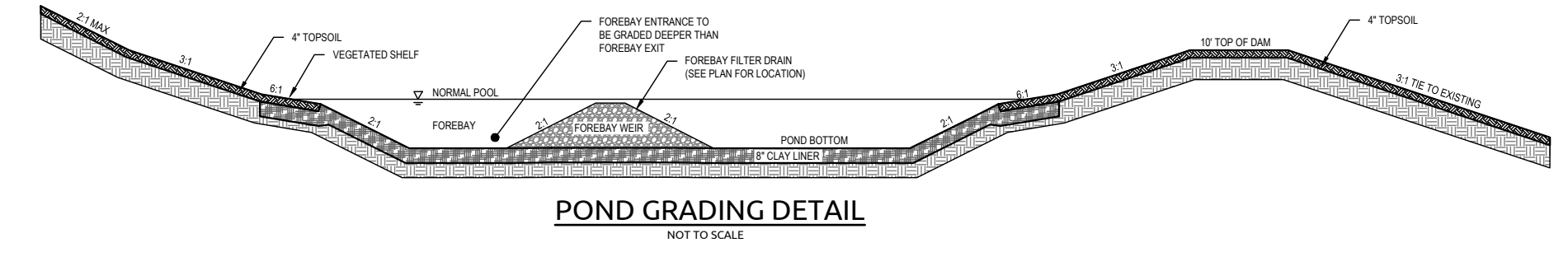
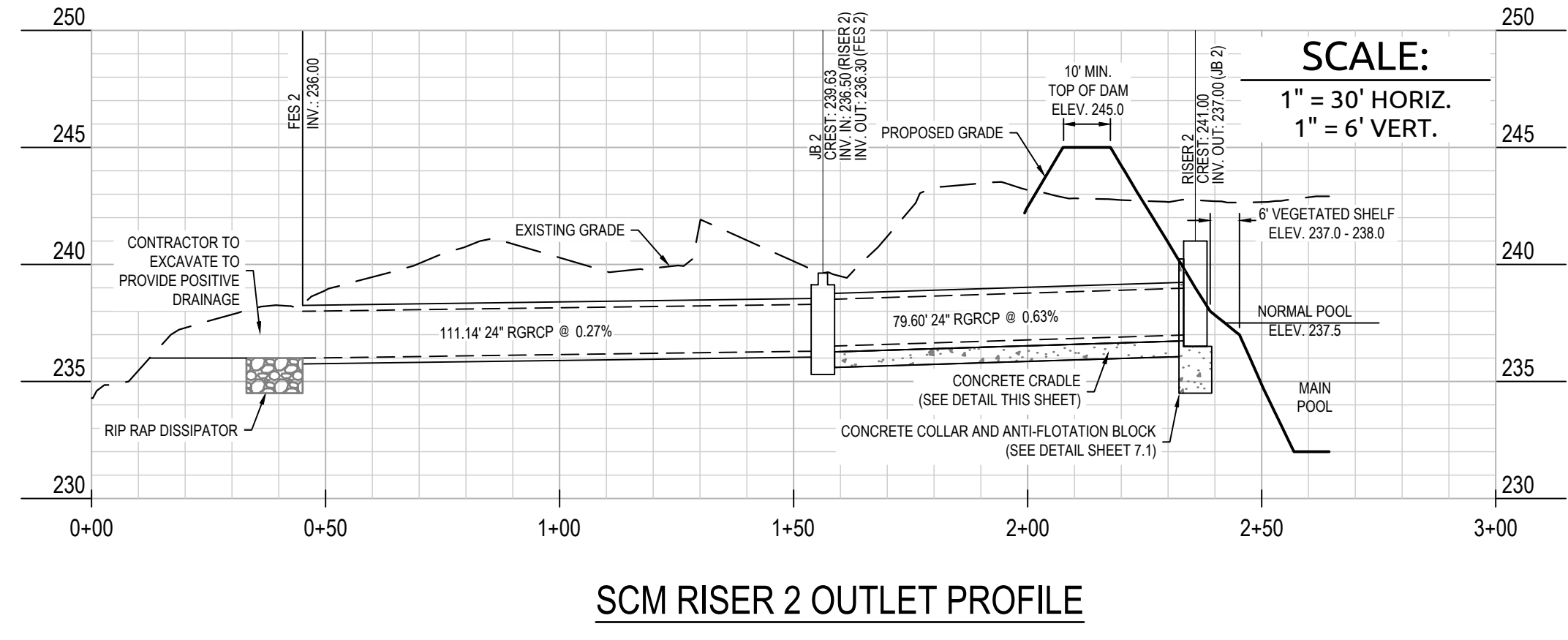
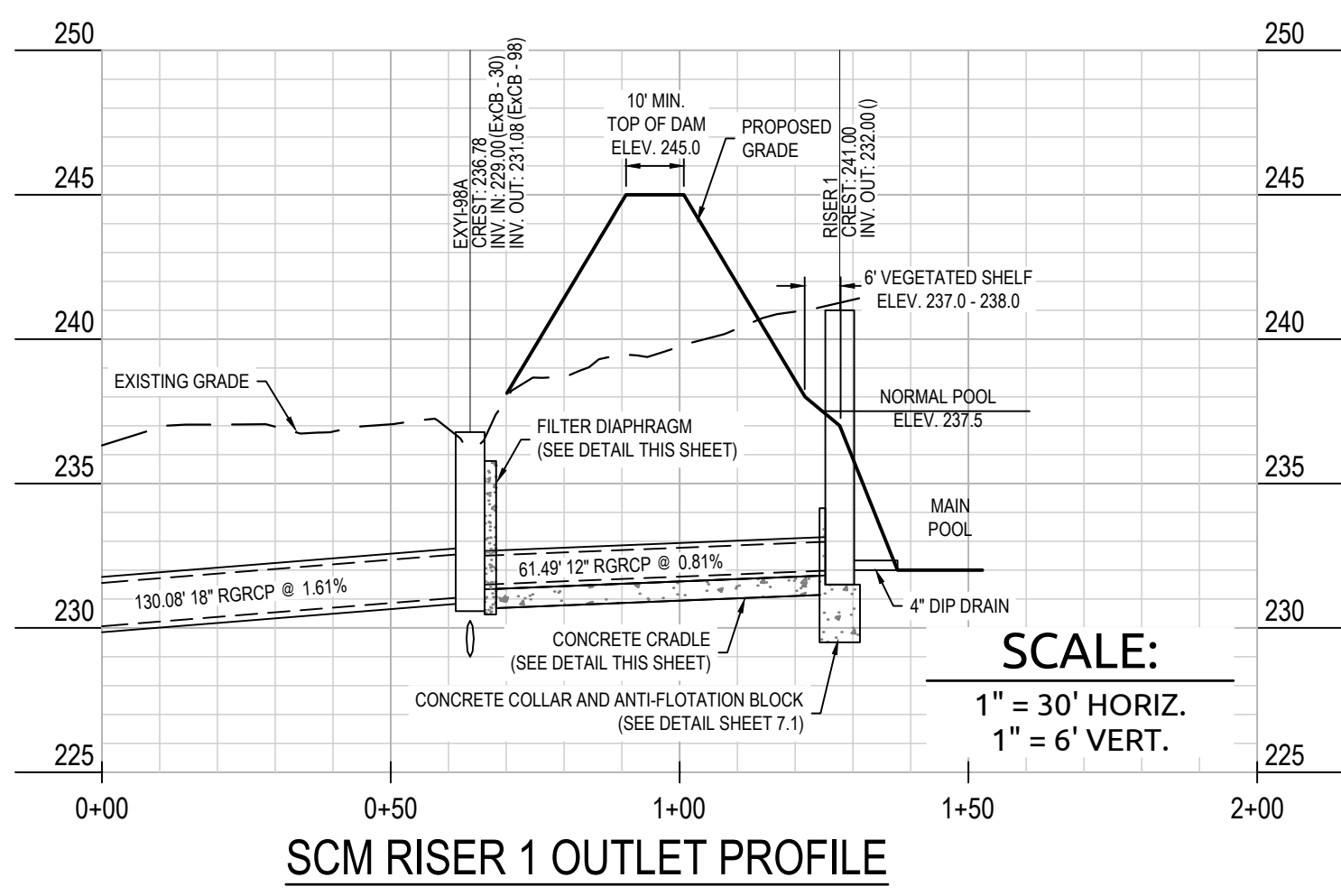
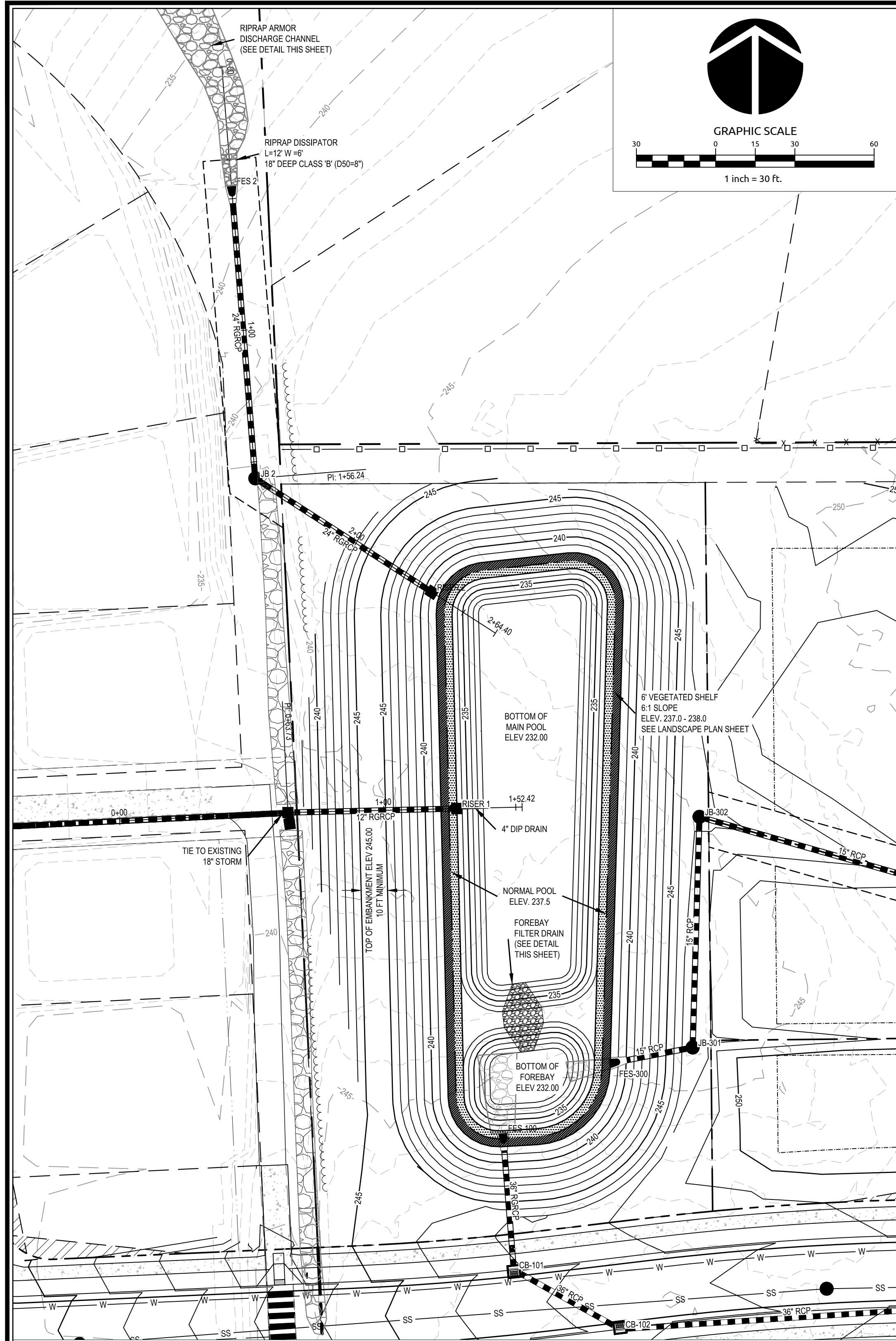
**PRELIMINARY NOT APPROVED FOR CONSTRUCTION**

Revisions

Sheet No. **6.1**

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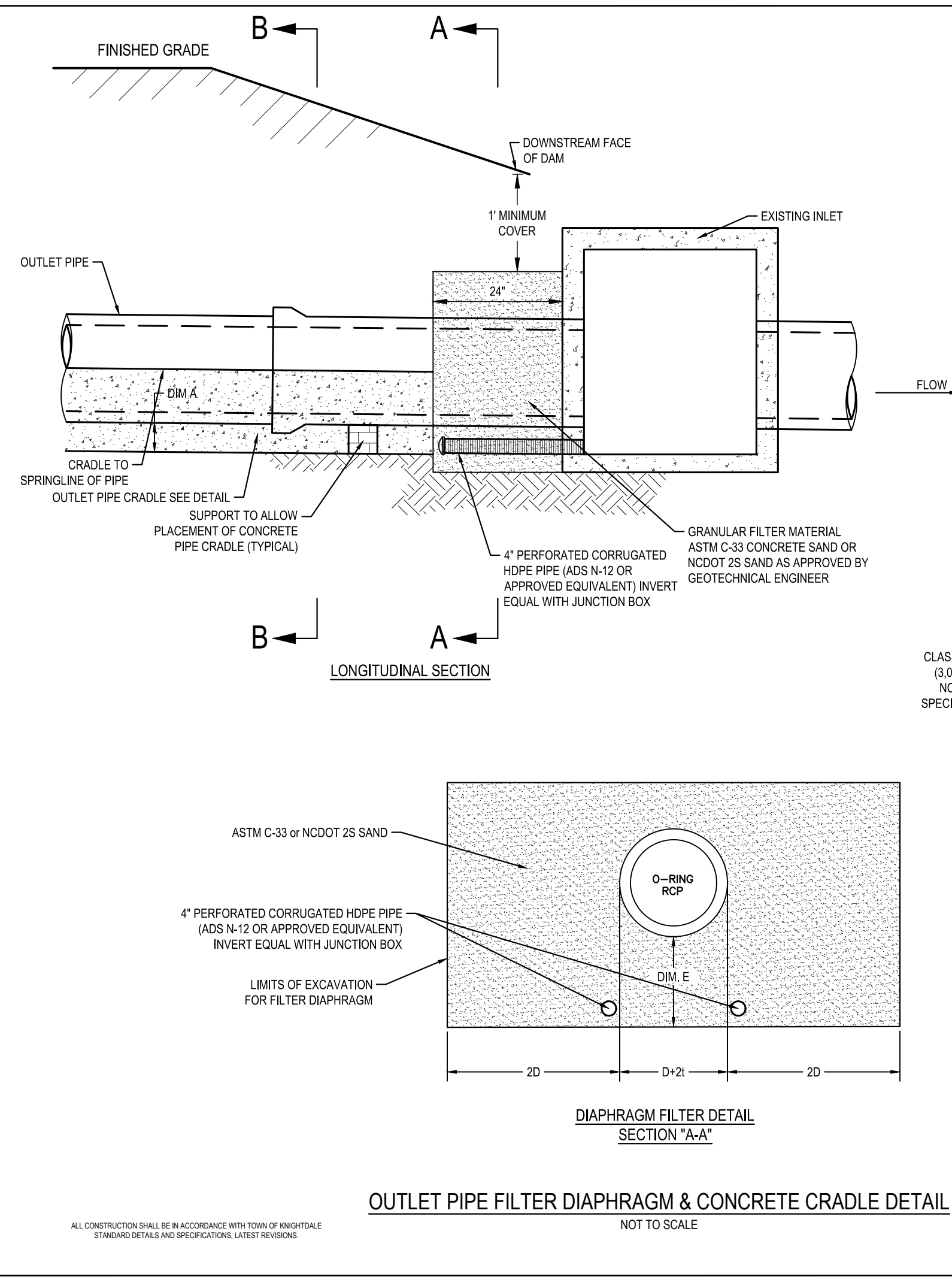
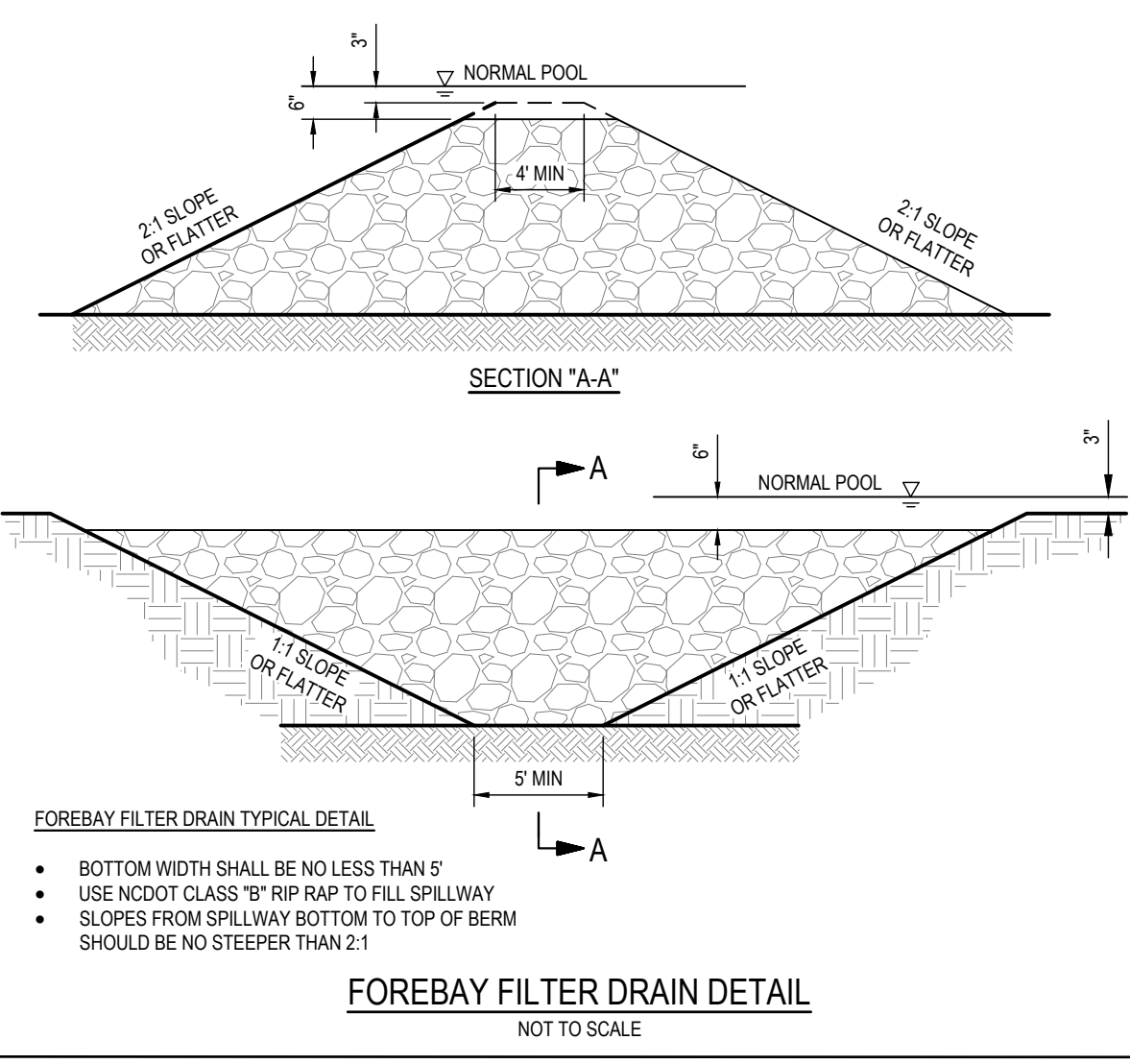


**STORMWATER CONTROL MEASURE (SCM) NOTES:**

- PRIOR TO BEGINNING CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE DESIGN ENGINEER FOR RESOLUTION.
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE (I.E. MINIMUM DESIGN CRITERIA), AND LOCAL STANDARDS AND SPECIFICATIONS HEREBY INCORPORATED BY REFERENCE.
- SCMS ON THE PROJECT MUST BE LOCATED ON COMMON OPEN SPACE, HAVE AN ACCESS AND MAINTENANCE EASEMENTS LOCATED AROUND THEM AND INCLUDE AN OPERATIONS AND MAINTENANCE MANUAL AND MAINTENANCE AGREEMENT.
- GEOTECHNICAL ENGINEER SHALL EVALUATE SOILS FOR SUITABILITY OF DAM CONSTRUCTION AND SLOPE STABILITY. PROFESSIONAL CERTIFICATION OF EMBANKMENT CONSTRUCTION IS REQUIRED FOR AS-BUILT CERTIFICATION.
- DAM TO BE CONSTRUCTED PER THE FOLLOWING SPECIFICATIONS UNLESS SUPERSEDED BY GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
  - BORROW MATERIALS FOR USE AS EMBANKMENT FILL SHALL BE FREE OF ORGANICS, ROOTS AND OTHER WOODY VEGETATION OR ORGANIC DEBRIS. MATERIALS SHALL CONSIST OF SOILS WHICH CLASSIFY AS SC, SM, CL, CL-CH AND ML IN ACCORDANCE WITH THE UNIFIED CLASSIFICATION SYSTEM OR AS APPROVED BY THE GEOTECHNICAL ENGINEER WITH A MAXIMUM PARTICLE SIZE SHALL OF 3" OR LESS IN MEAN DIAMETER.
  - FILL SHALL BE PLACED IN 8" (MAXIMUM) LOOSE LIFTS UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER. FILL SHALL BE BENCHMARKED TO THE EXISTING GRADE. THE MAXIMUM HEIGHT OF 2FT SHALL BE USED FOR EACH BENCH LIFT TAKING CARE TO REMOVE ROOT STRUCTURES AS THE FILL PROCEEDS. SURFACE OF EACH LIFT SHALL BE SCARIFIED PRIOR TO PLACEMENT OF THE NEXT LIFT IN ORDER TO EFFECTIVELY TIE THE LIFT TOGETHER.
  - ALL COMPACTION SHALL BE TESTED BY THE SAND CONE METHOD (ASTM D-1556) OR NUCLEAR METHOD (ASTM D-6938) AT A RATE OF AT LEAST ONE TEST PER 5,000 SF PER ONE FOOT OF COMPACTED FILL THICKNESS IN GENERAL. AREA FILLS AND ONE TEST PER 50 LINEAL FEET PER LIFT ALONG THE BARREL. THE MINIMUM COMPACTION SHOULD BE 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY (ASTM D-698) AT MOISTURE CONTENTS VARYING FROM 2 PERCENT BELOW TO 3 PERCENT ABOVE OPTIMUM MOISTURE CONTENT TO WITHIN 3FT OF THE FINAL GRADE.
- EMBANKMENT AND SIDE SLOPES OF THE BASIN SHALL BE STABILIZED PER SEEDING SCHEDULE ON EROSION CONTROL DETAILS SHEET OR SODDED. SEE LANDSCAPE PLAN FOR FURTHER PLANTING DETAILS.
- DURING CONSTRUCTION, THE SCM IS TO BE USED AS AN EROSION CONTROL DEVICE. THE FOREBAY SHALL NOT BE INSTALLED WHILE SCM IS ACTING AS AN EROSION CONTROL DEVICE.
- THE FOREBAY SHALL BE CONSTRUCTED PER THE SAME METHODS AS THE DAM (SEE NOTE 5).
- ALL PERMANENT STRUCTURES (I.E. WEIR WALLS, ETC) ARE TO BE INSTALLED WITH THE INITIAL DAM CONSTRUCTION.
- CONTRACTOR TO PROVIDE STRUCTURAL DRAWINGS TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- ONCE THE SITE HAS BEEN STABILIZED, CONTRACTOR SHALL OBTAIN APPROVAL BY EROSION CONTROL INSPECTOR IN ORDER TO REMOVE EROSION CONTROL DEVICES.

**CLAY LINER SPECIFICATIONS:**

- IF DURING CONSTRUCTION, THE SEASONAL HIGH WATER TABLE IS IDENTIFIED WITHIN 6 INCHES OF THE PROPOSED NORMAL POOL ELEVATION BY THE GEOTECHNICAL ENGINEER, THE INSTALLATION OF A CLAY LINER IS NOT NECESSARY. IF THE SEASONAL HIGH WATER TABLE IS IDENTIFIED OUTSIDE OF THE ABOVE LIMITS OR NOT ENCOUNTERED, IT IS RECOMMENDED THAT A CLAY LINER BE INSTALLED TO MAINTAIN NORMAL POOL ELEVATION, SUITABLE HABITAT FOR LITTORAL SHELF VEGETATION, AND DESIGN AESTHETICS. CONSULT ENGINEER AND OWNER REGARDING THE INSTALLATION OF A CLAY LINER PRIOR TO SCM CONVERSION.
- THE CLAY LINER FOR THE WET POND SHALL BE AT LEAST 8" THICK AND MEET THE FOLLOWING SPECIFICATIONS:
- UNIFIED SOIL CLASSIFICATION SYSTEM DESIGNATION OF CL, CH, ML, SC
  - MINIMUM OF 40% PASSING #200 SIEVE
  - MINIMUM PLASTICITY INDEX OF 12
  - MAXIMUM INFILTRATION RATE OF 0.01 IN/HR.
  - A MINIMUM OF 2 TESTS OF EACH ABOVE PARAMETER SHALL BE PROVIDED FROM AN APPROVED LABORATORY ON THE LINER MATERIAL AND PRESENTED TO THE ENGINEER FOR APPROVAL.
  - COMPACTION TO A MINIMUM OF 93% PER ASTM D698, AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT (1 COMPACTION DENSITY TEST PER 2500 SQ. FT.)
- THE CLAY LINER SHALL BE PLACED UNDER THE BOTTOM OF THE SCM PERMANENT POOL TO A THICKNESS OF 8 INCHES. A MINIMUM OF 4 INCHES OF TOPSOIL SHALL BE THE FINISHED GRADE AS SHOWN ON THE DRAWINGS AND/OR DETAILS. CARE SHALL BE TAKEN WHEN TRACKING FINE TOPSOIL TO NOT FRACTURE OR DAMAGE THE CLAY. A CLAYSOL, NO ORGANICS, MIXTURE MAY BE USED IF THE ABOVE SPECIFICATIONS ARE SATISFIED AND WITH WRITTEN APPROVAL BY THE ENGINEER.
- PRECAST CONCRETE MATERIALS NOTES:**
- ALL PRECAST CONCRETE STRUCTURES SHALL CONFORM TO ASTM C913 (RECTANGULAR) OR C478 (ROUND).
  - ALL REINFORCED CONCRETE PIPE SHALL CONFORM TO ASTM C76, CLASS III (UNLESS OTHERWISE NOTED).
  - O-RING JOINTS SHALL CONFORM TO ASTM C443 & ASTM C361.
  - NON O-RING JOINTS SHALL CONFORM TO ASTM C390.



NOTE: IF PIPE IS INSTALLED IN EXCAVATED TRENCH, THEN SIDE WALLS MAY CONFORM TO TRENCH (TRENCH MAY BE USED AS CRADLE FORM)

NOMINAL PIPE SIZE	DIM A* (1/3 D)	DIM B (1/2 D + 1)	DIM C (D + 2)	DIM D (PIPE ID)	DIM E (DIM A + 4")	DIM F (WALL)
12	8	8.5	17	12	12	2.5
24	8	15.0	30	24	12	3.0
36	10	18.5	37	30	14	3.5
42	12	22.0	44	36	16	4.0
48	14	25.5	51	42	18	4.5
48	16	29.0	58	48	20	5.0

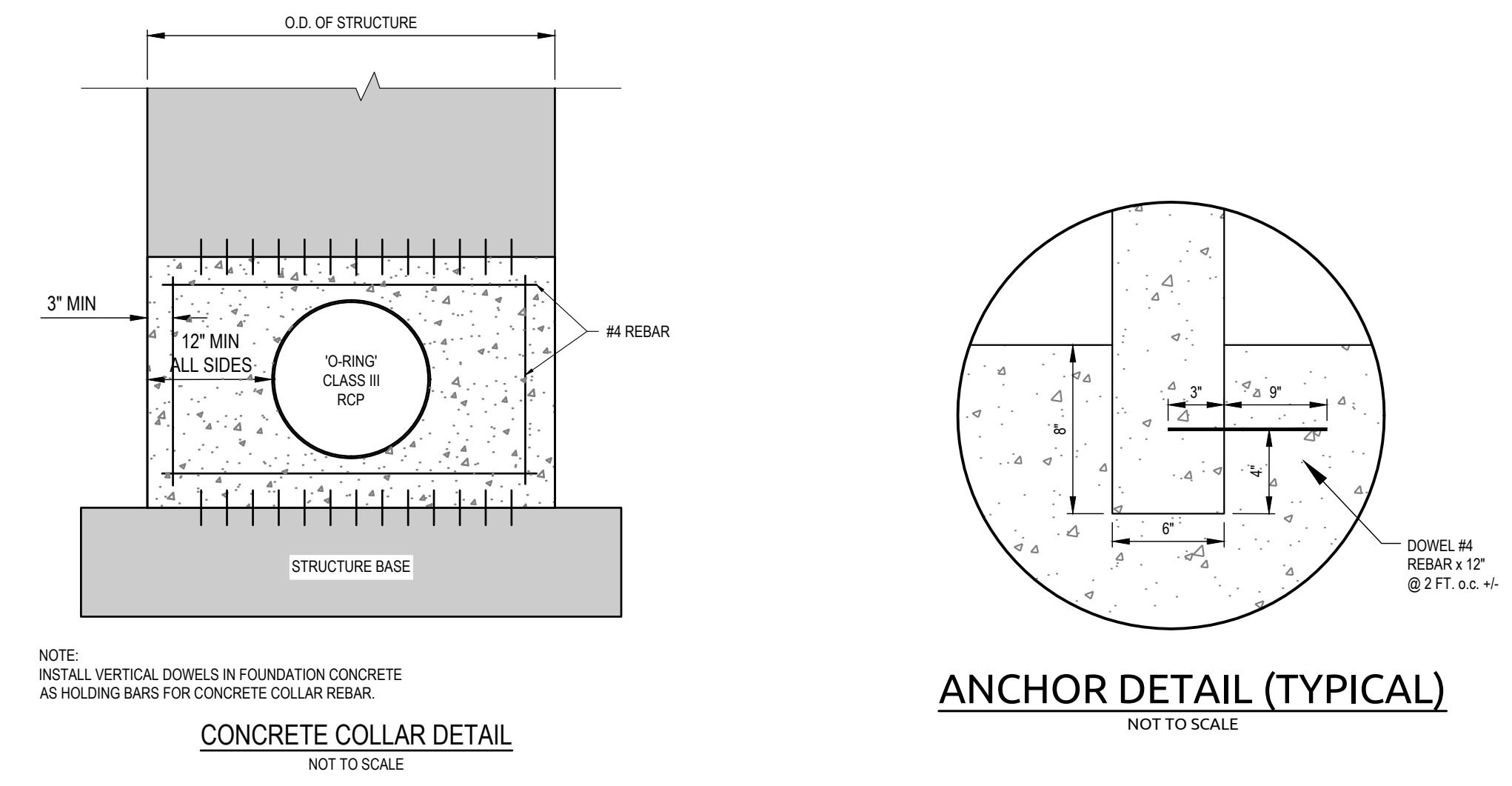
ALL DIMENSIONS IN INCHES  
DIM A - 8" MINIMUM

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



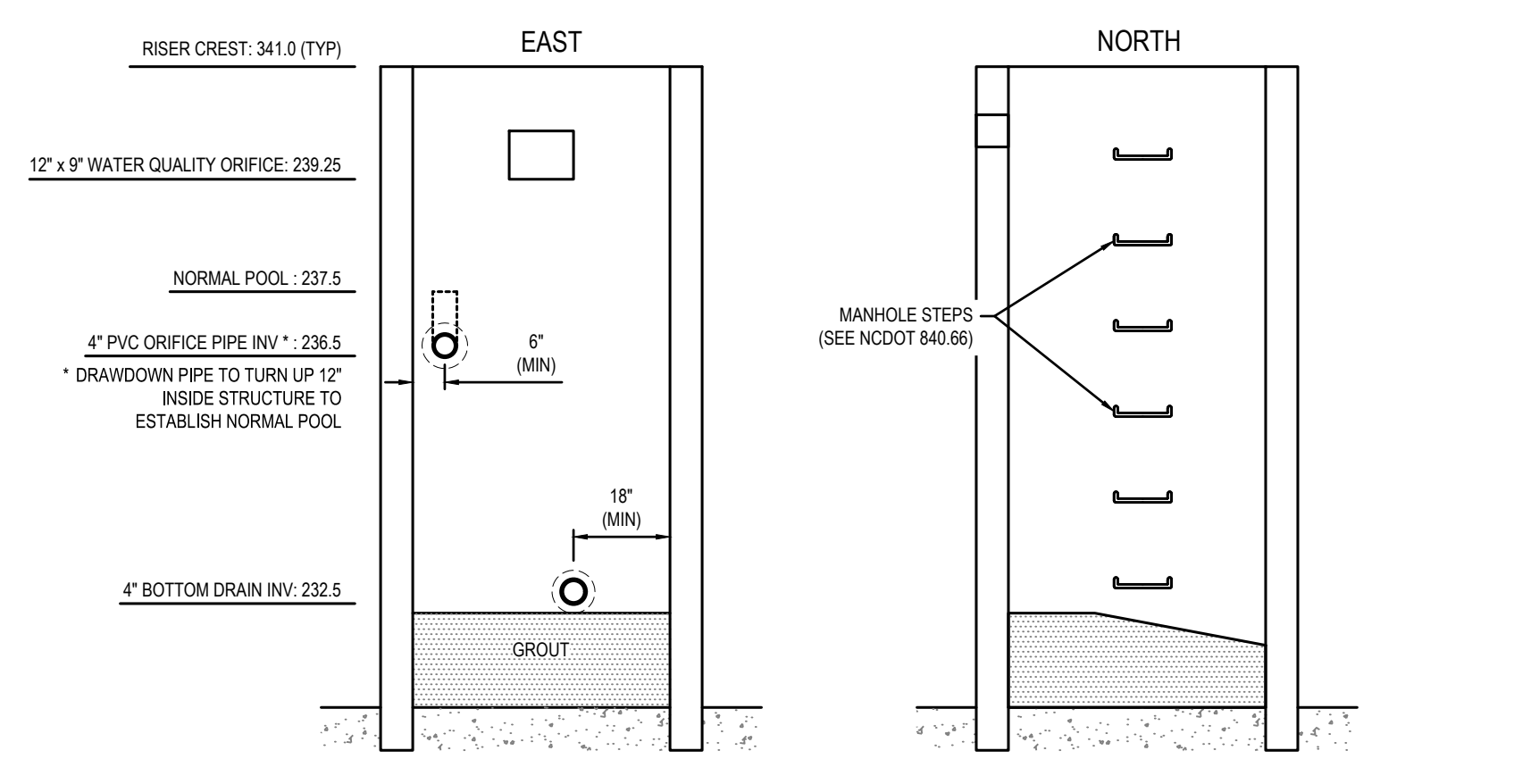
Revisions

NO.	DESCRIPTION

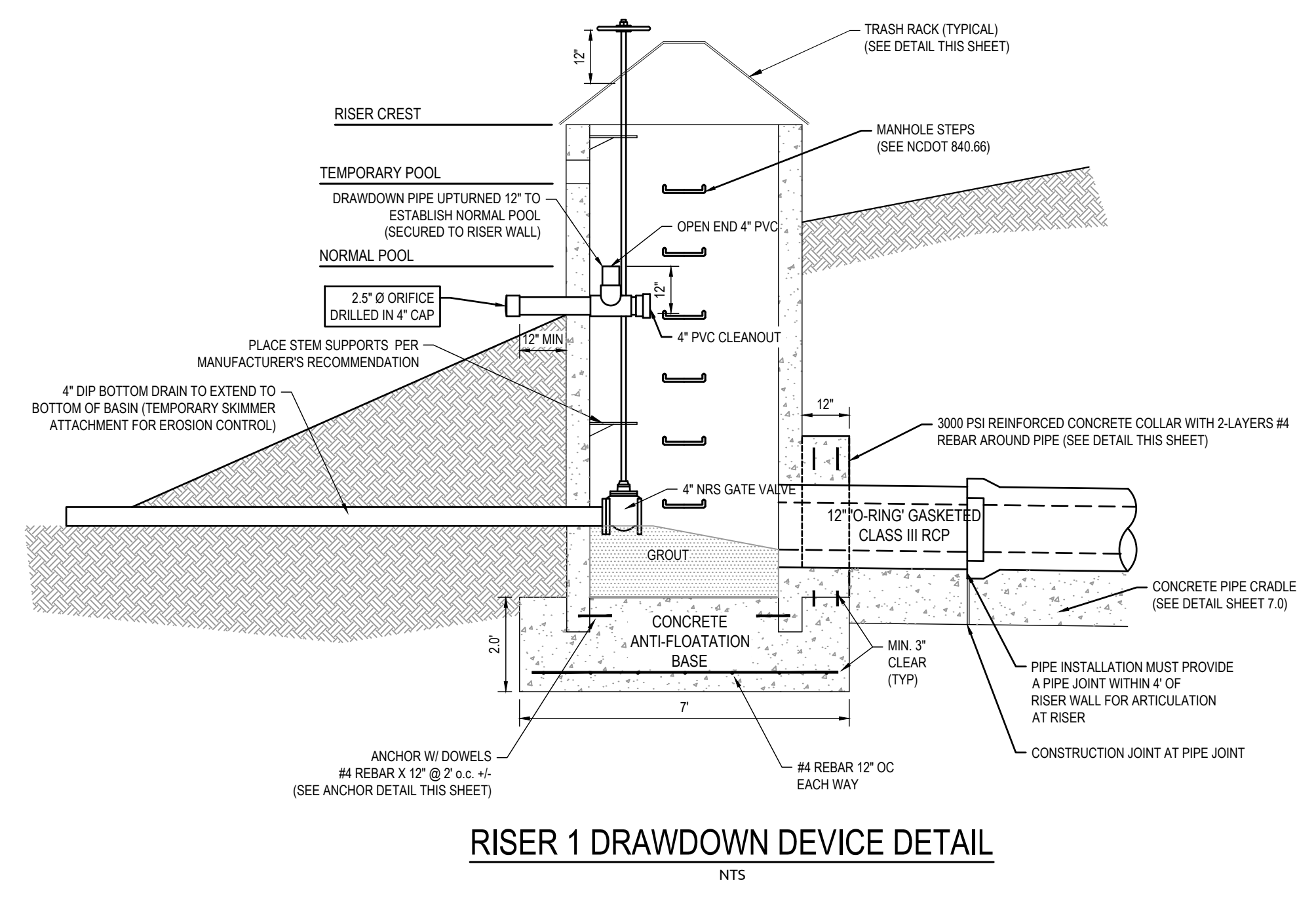


**ANCHOR DETAIL (TYPICAL)**  
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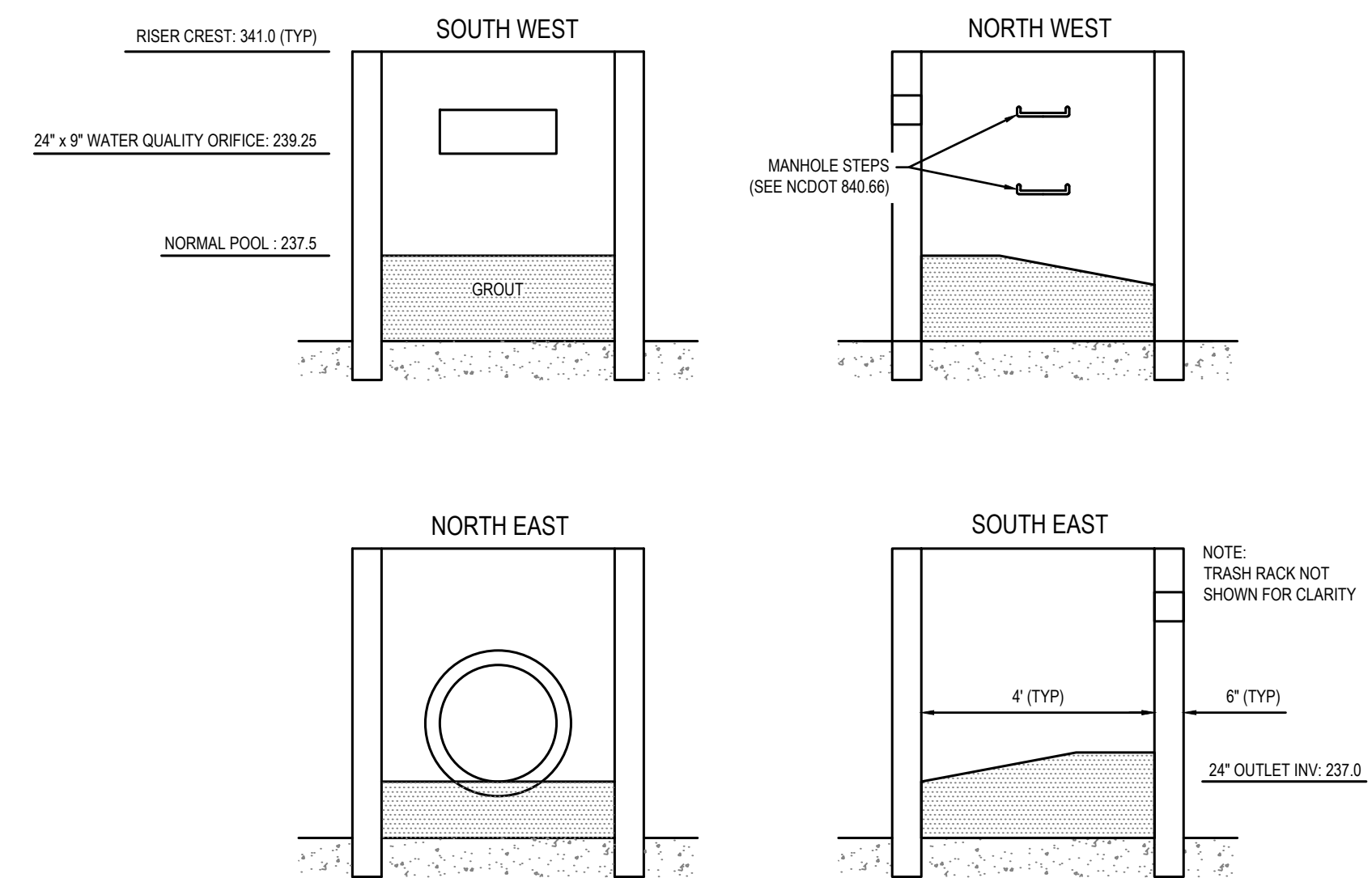
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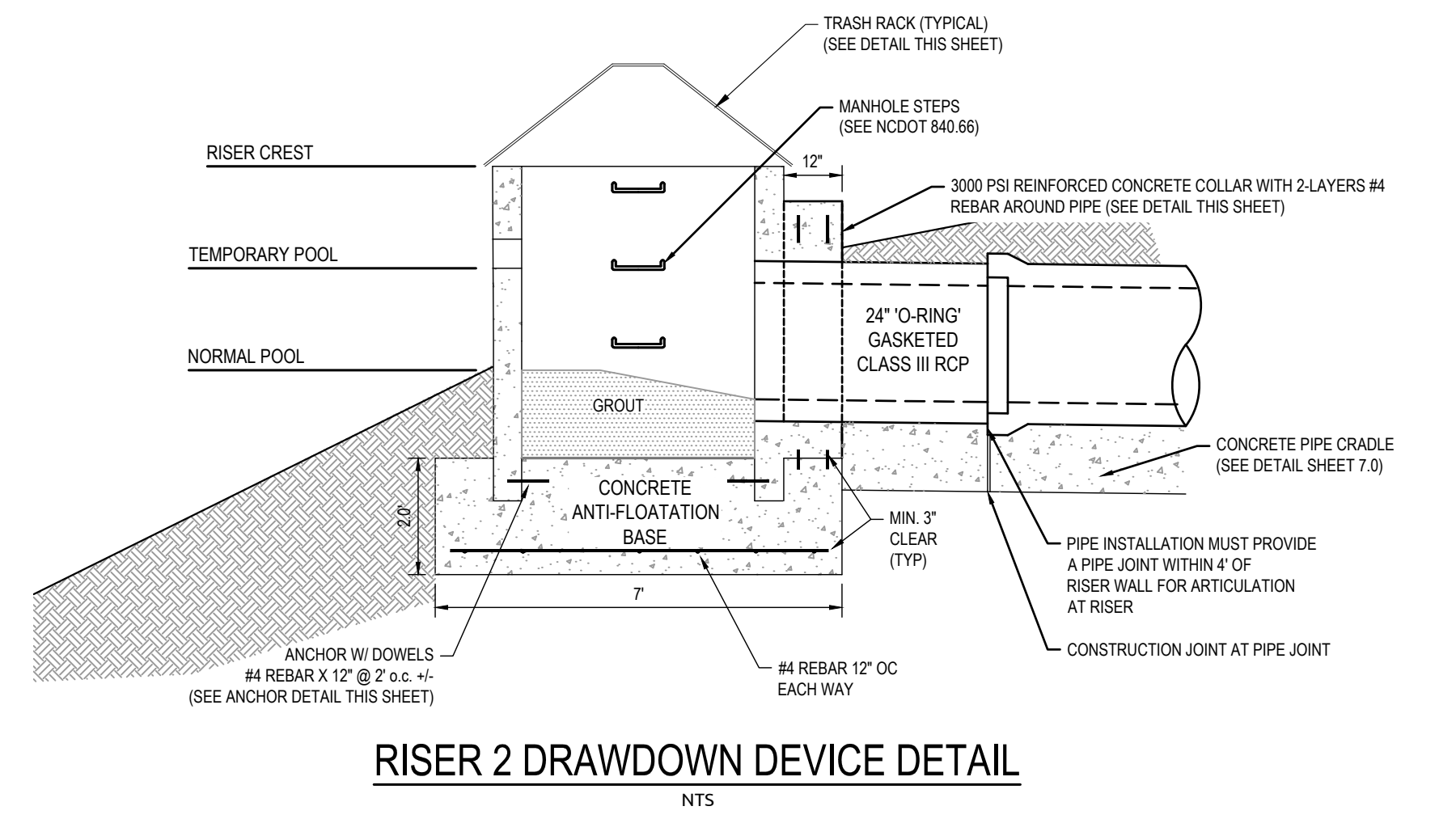
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NTS



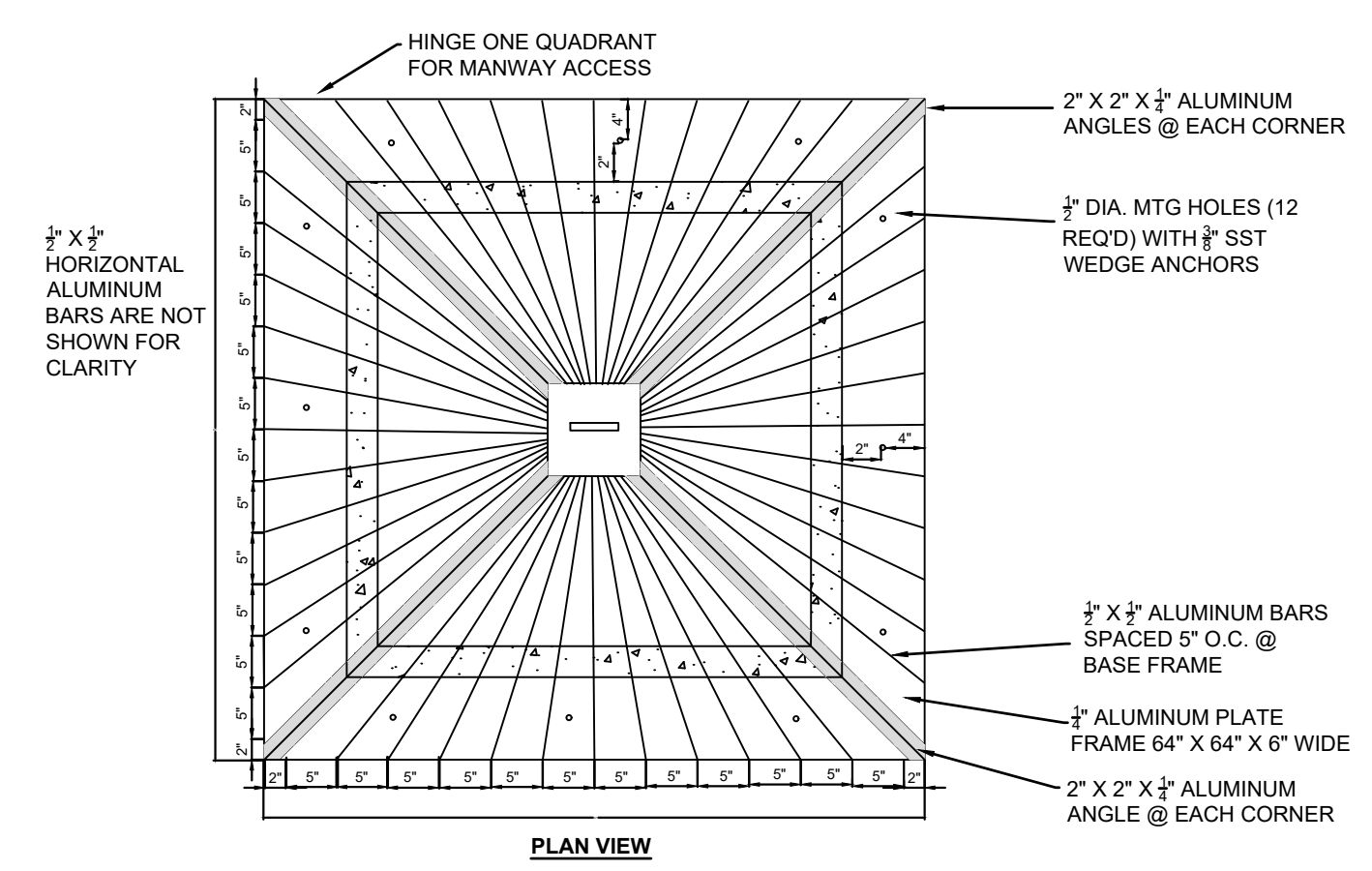
**RISER 1 DRAWDOWN DEVICE DETAIL**  
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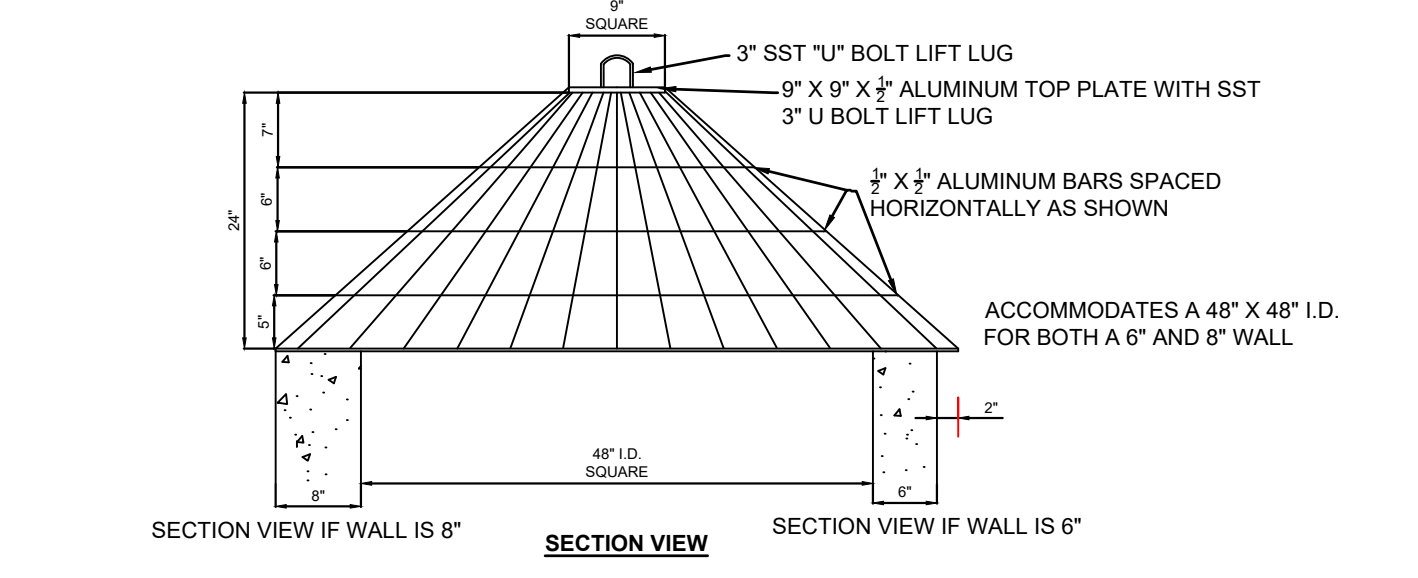
**RISER 2 WALL ELEVATIONS**  
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**RISER 2 DRAWDOWN DEVICE DETAIL**  
NTS



**PLAN VIEW**



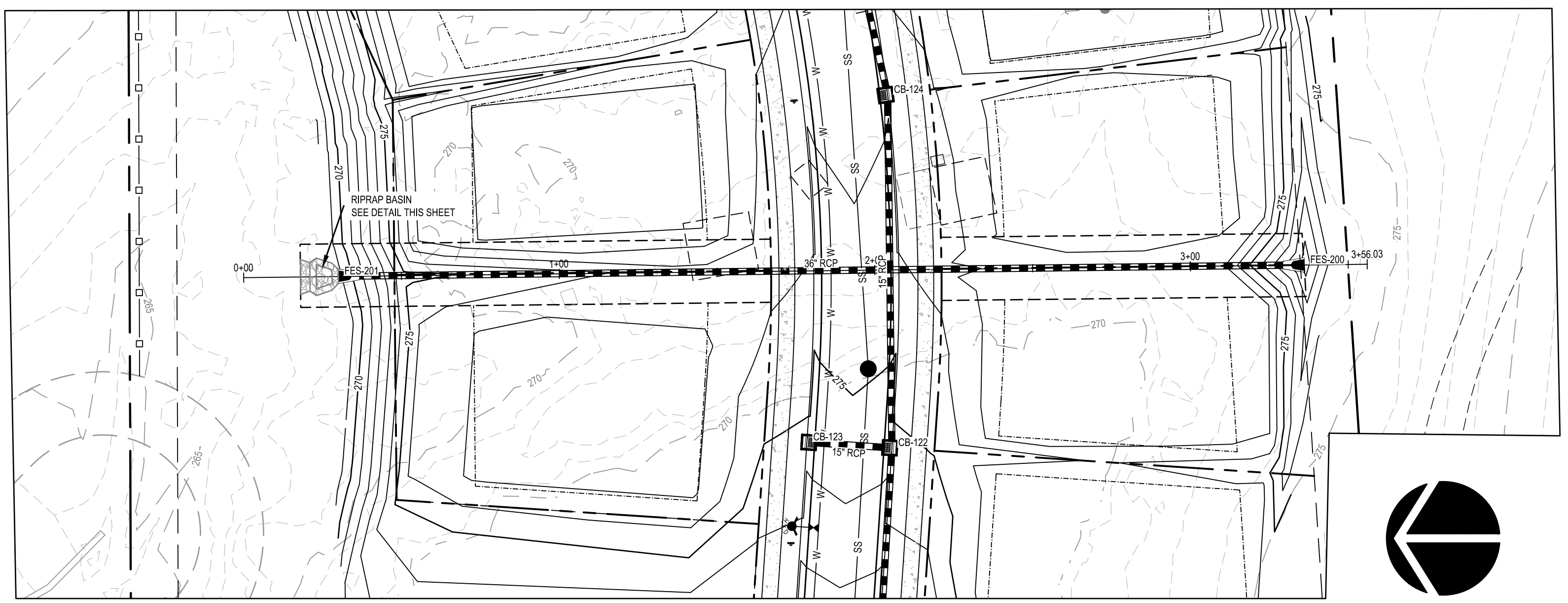
**SECTION VIEW**

- NOTES**
- TRASH RACK DETAIL BASED ON POMONA PIPE PRODUCTS "STANDARD ALUMINUM BAR & ANGLE PEAKED ROOF TRASH RACK WITH ONE QUADRANT HINGED FOR MANWAY ACCESS TO FIT 48\"/>
  - TRASH RACK TO BE POWDER-COATED BLACK.

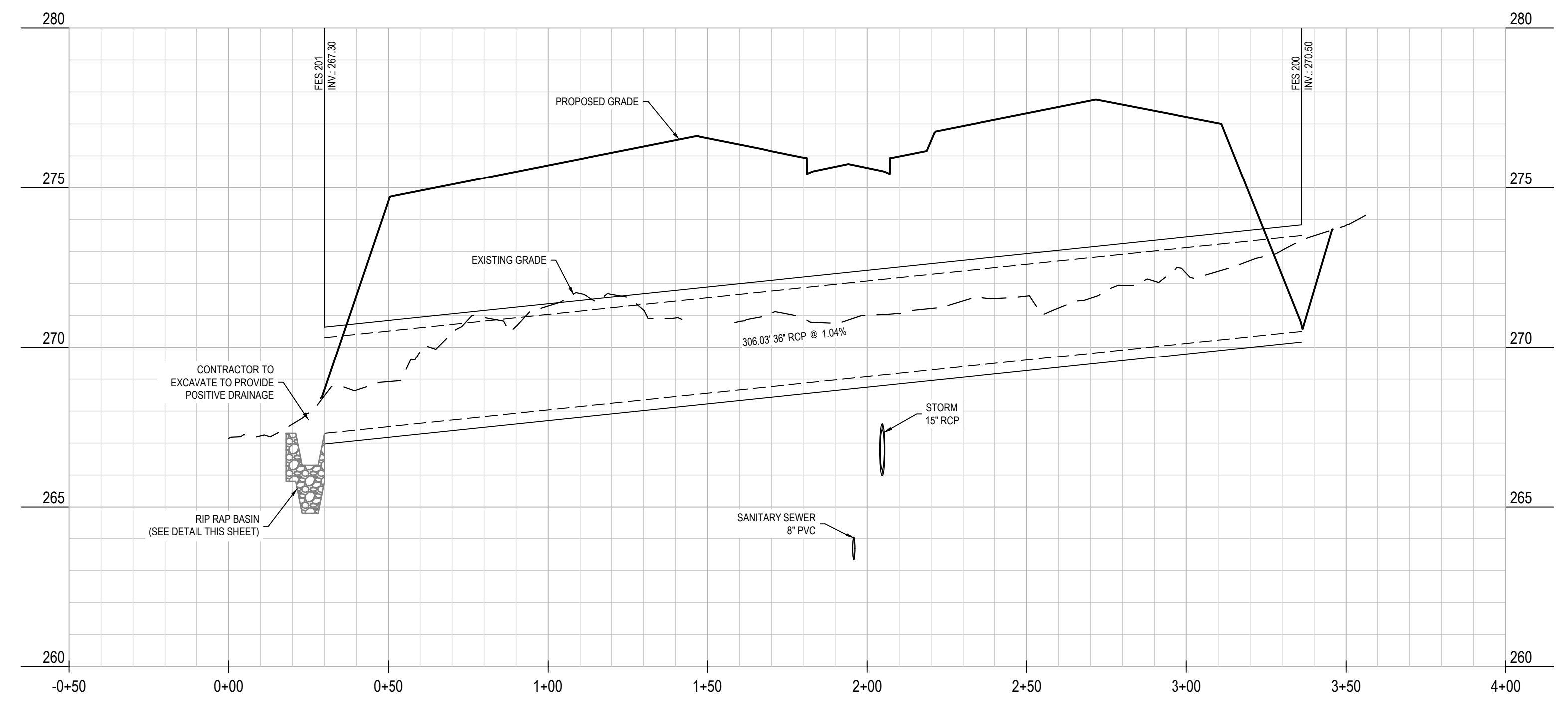
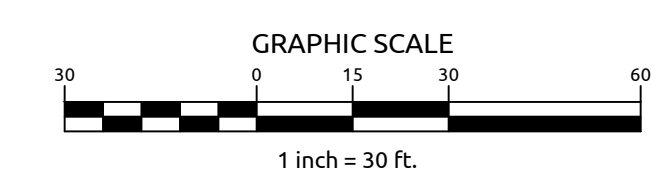
**TRASHRACK - 4'X4' RISER**  
NOT TO SCALE

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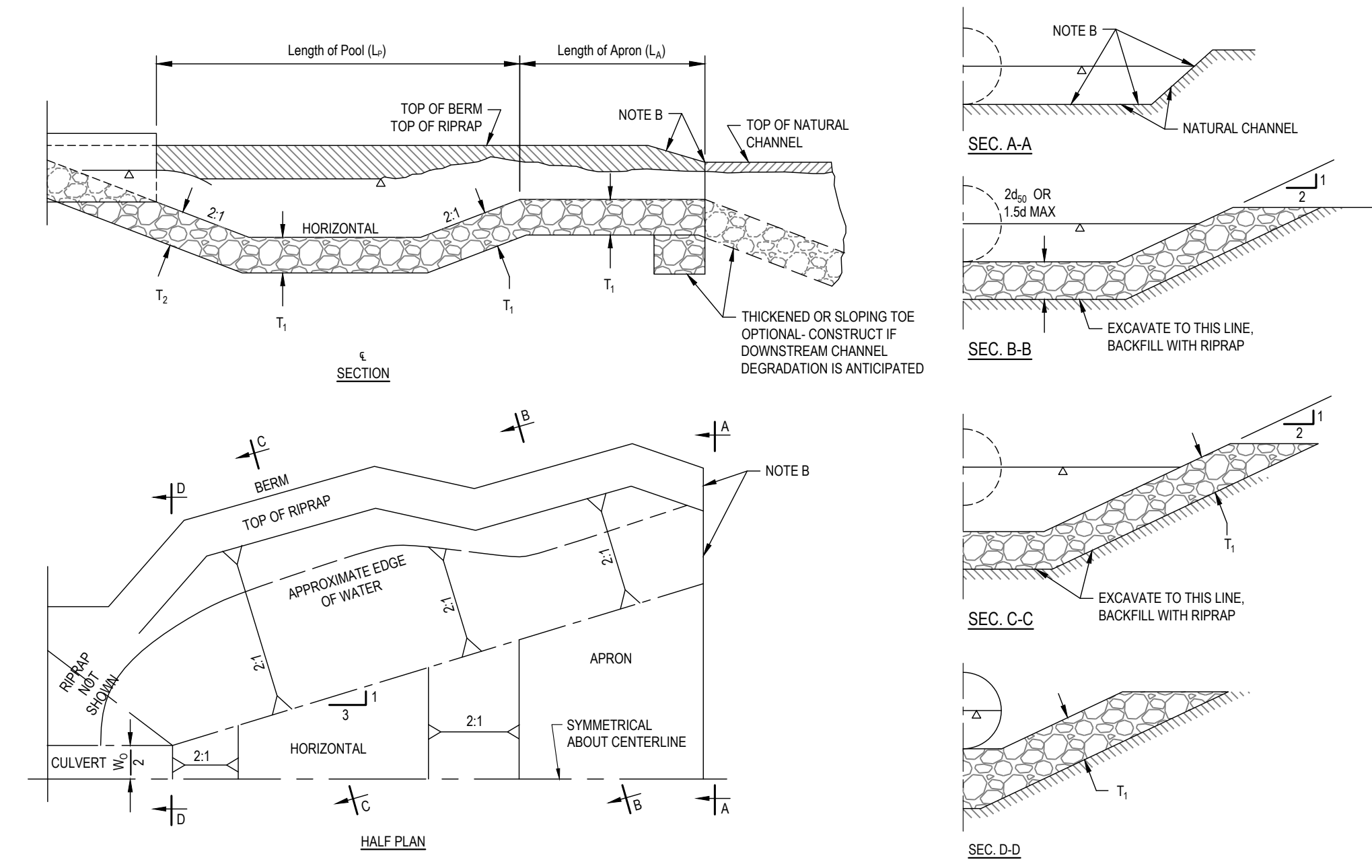




FES 200 - FES 201 PLAN



FES 200 - FES 201 PROFILE



NOTE A - IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS-SECTIONAL AREA AT SECTION A-A SUCH THAT  $Q_{out} < Q_{in}$  (CROSS SECTION AREA AT SEC. A-A) = SPECIFIED EXIT VELOCITY.

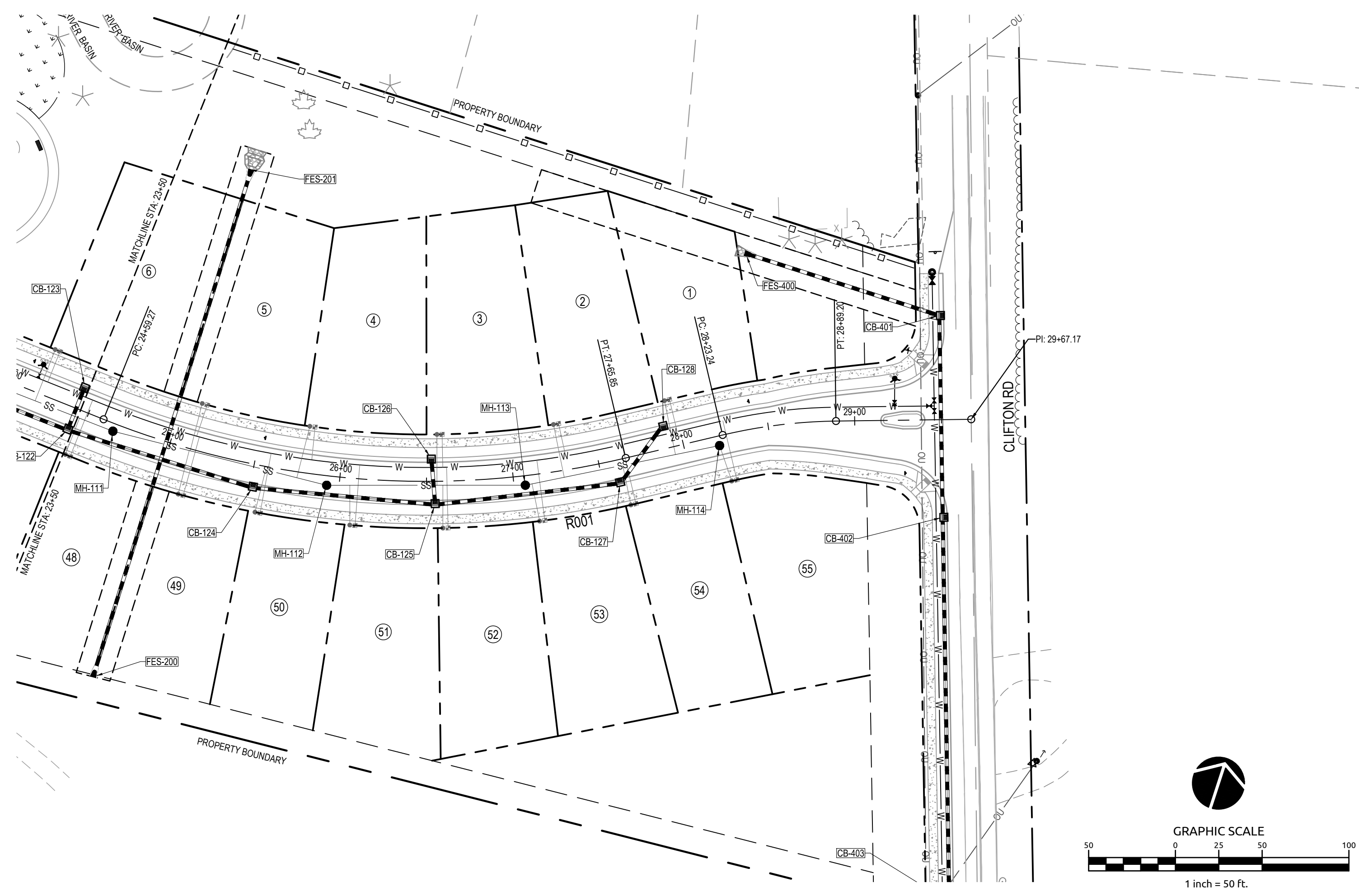
NOTE B - WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT THE SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A.

RIPRAP BASIN DIMENSION TABLE							
OUTLET ID	$L_p$	$L_a$	$H_b$	$T_1$	$T_2$	$W_0$	CLASS
STREET A1 CULVERT	9.0	3.0	1.0	1.5	2.0	3	NCDOT "B"

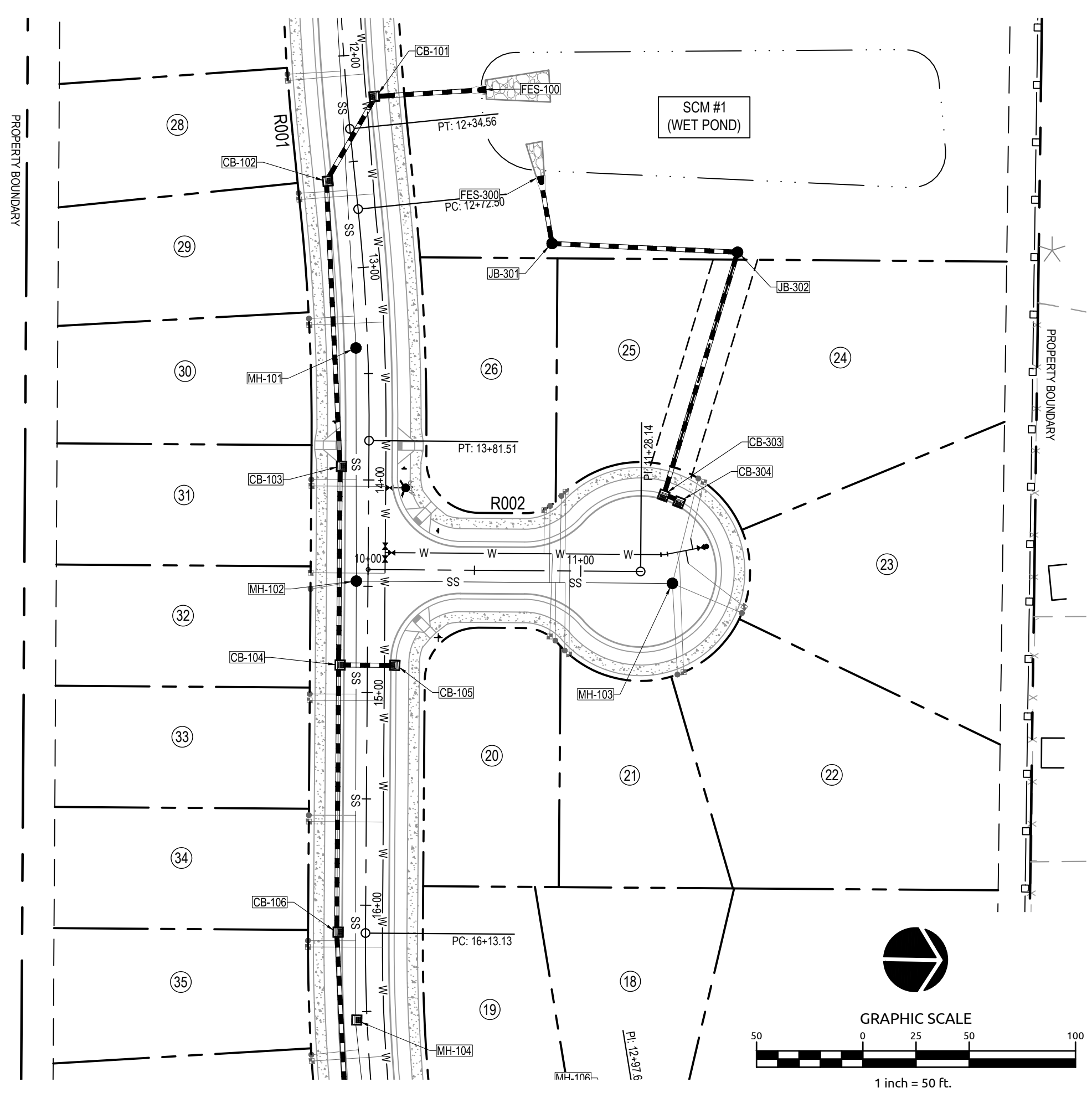
RIP RAP STILLING BASIN DETAIL  
NOT TO SCALE

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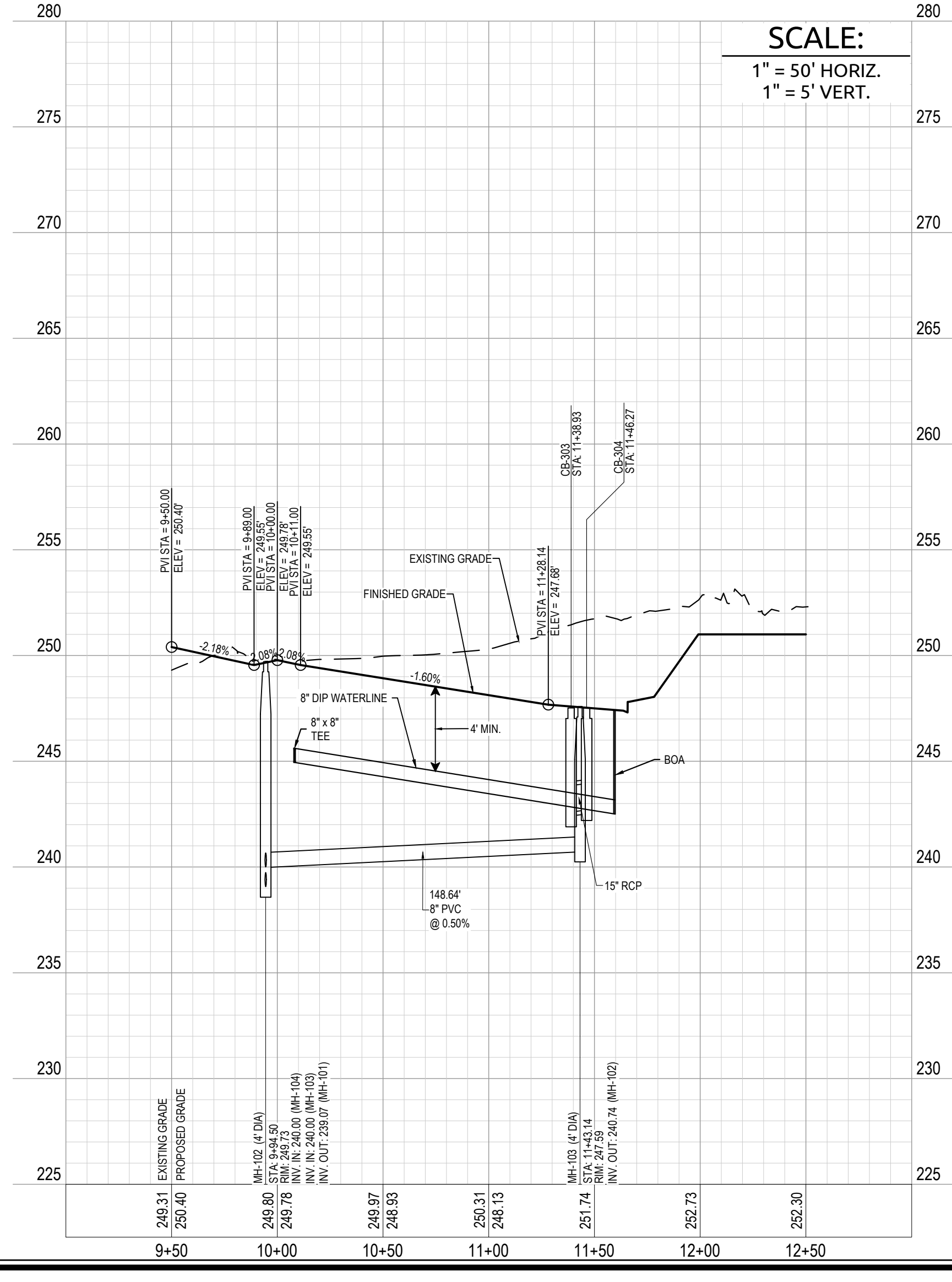
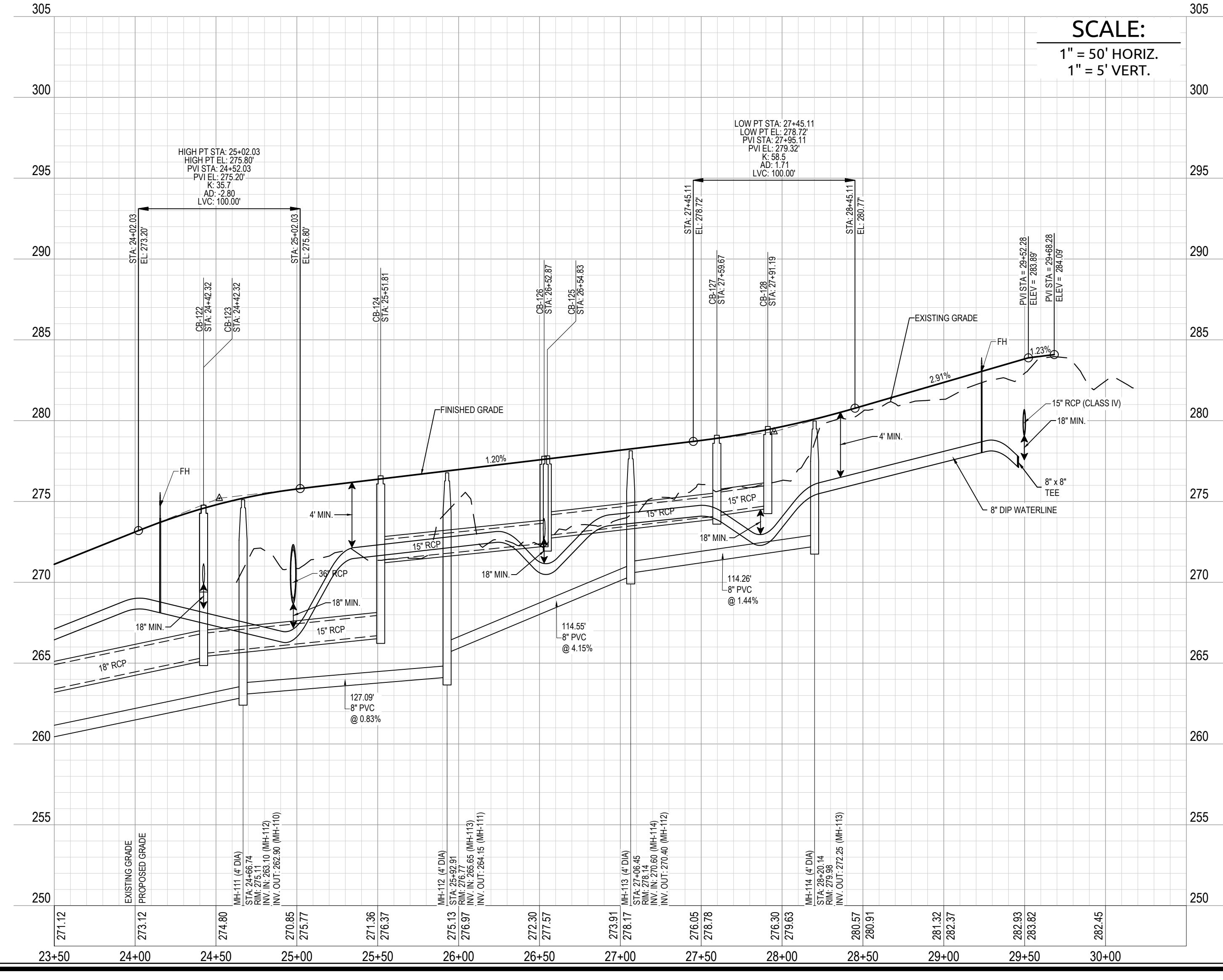




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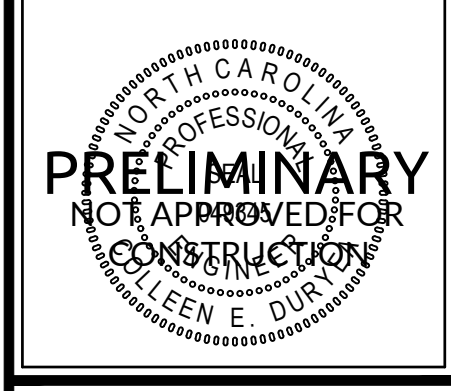


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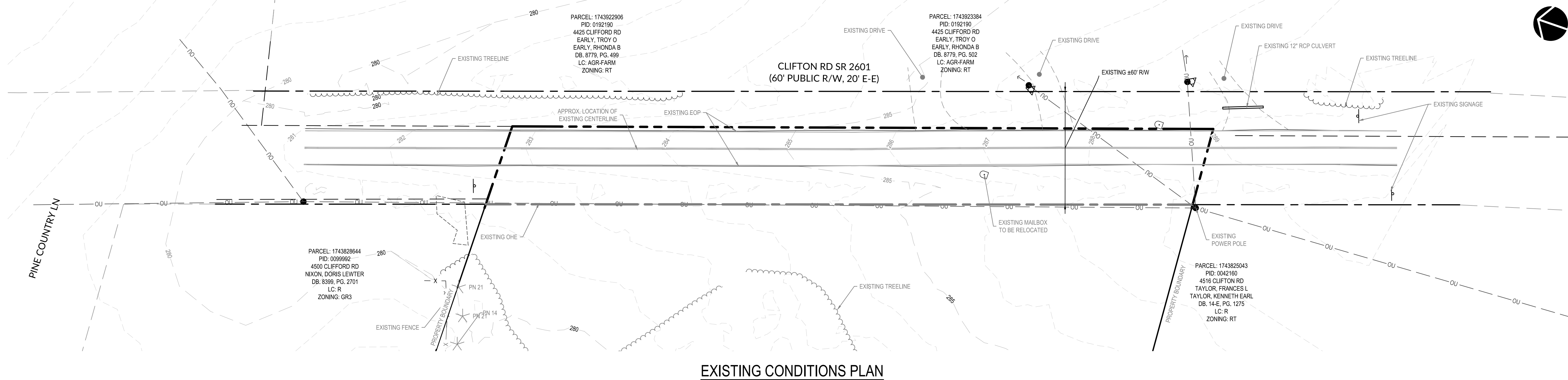
Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions



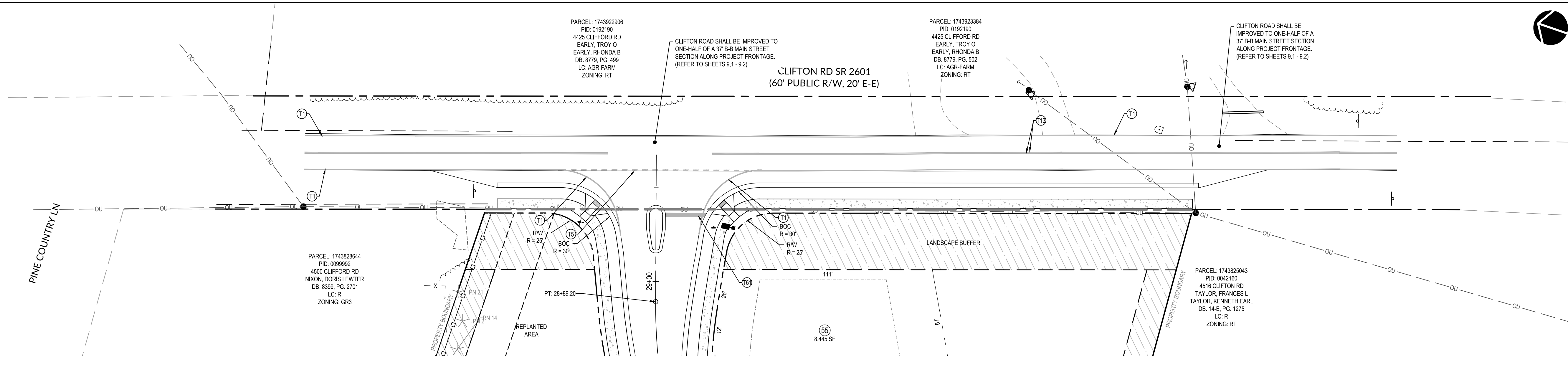
- NOTES:**
1. WIDENING SHALL VARY AS SHOWN.
  2. PAVEMENT MARKING PLAN TO BE PROVIDED TO NCDOT.
  3. CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
  4. EXISTING CROSS SLOPE SHALL BE HELD AND SHOULD BE ADJUSTED AS NECESSARY.
  5. CALCULATIONS BASED ON NCDOT POLICY ON STREET AND DRIVEWAY ACCESS TO NORTH CAROLINA HIGHWAYS.
  6. DESIGN SPEED IS 40 MPH.



**EXISTING CONDITIONS PLAN**

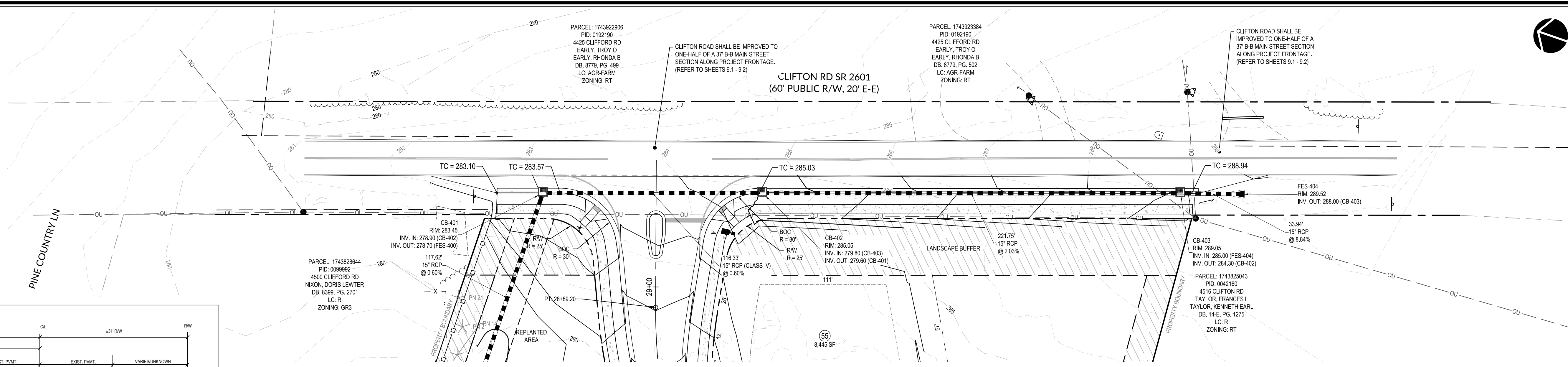
- PAVEMENT MARKING/SIGNAGE NOTES:**
1. PERMANENT MARKINGS SHALL BE THERMOPLASTIC AND INSTALLED AFTER FINAL OVERLAY IS COMPLETE.
  2. ALL PAVEMENT MARKINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NCDOT STANDARDS AND SPECIFICATIONS.
  3. PREMARKINGS SHALL BE APPROVED BY ENGINEER (919)372-7448 & NCDOT TRAFFIC DIVISION ENGINEER (919) 560-6856 PRIOR TO COMPLETION.
  4. MONOLITHIC ISLANDS ARE REQUIRED TO HAVE A MINIMUM 6" OFFSET FROM ANY STRIPING.
  5. ALL SIGNAGE SHALL BE IN ACCORDANCE WITH MUTCD STANDARDS & SPECIFICATIONS.

PAVEMENT STRIPING LEGEND	
SYMBOL	DESCRIPTION
(T1)	WHITE EDGE LINE (4", 90 MIL)
(T2)	WHITE SOLID LANE LINE (4", 90 MIL)
(T3)	3 FT. - 9 FT./SP WHITE MINISKIP (4", 90 MIL)
(T4)	2 FT. - 6 FT./SP WHITE MINISKIP (4", 90 MIL)
(T5)	YELLOW SINGLE CENTER (4", 90 MIL)
(T6)	10 FT. YELLOW SKIP (4", 90 MIL)
(T7)	YELLOW DOUBLE CENTER LINE (4", 90 MIL)
(T8)	2 FT. - 6 FT./SP YELLOW MINISKIP (4", 90 MIL)
(T9)	YELLOW DIAGONAL (8", 90 MIL)
(T10)	WHITE CROSSWALK LINE (8", 90 MIL)
(T11)	WHITE LINE R/RX (16", 90 MIL)
(T12)	WHITE STOPBAR (24", 90 MIL)

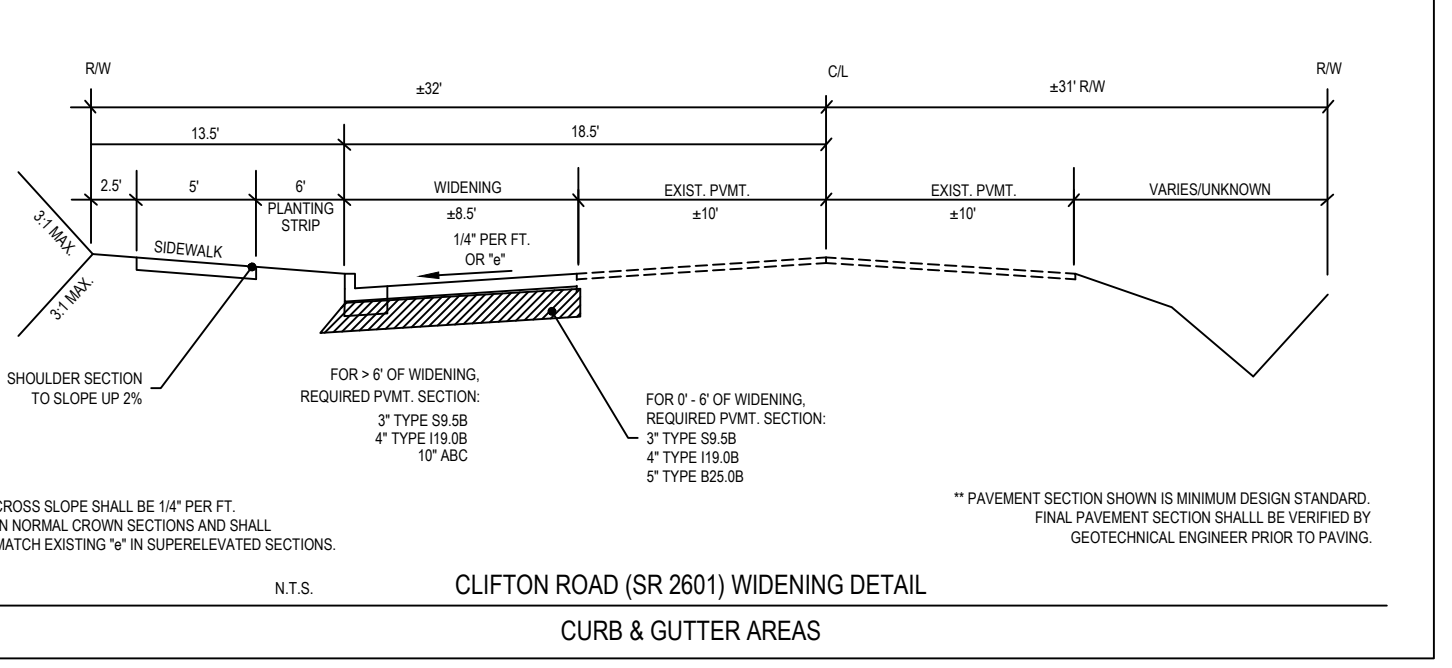


**STRIPING PLAN**

**NOTE:** ALL PAVEMENT MARKINGS SHALL BE THERMO PLASTIC AND SHALL FOLLOW THE LATEST NCDOT STANDARDS AND SPECIFICATIONS FOR PAVEMENT MARKINGS.



**GRADING PLAN**



**CLIFTON ROAD (SR 2601) WIDENING DETAIL**  
CURB & GUTTER AREAS

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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

CITY OF RALEIGH

ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES: N/A

PUBLIC UTILITIES: \_\_\_\_\_

STORMWATER: N/A

PLANNING: N/A

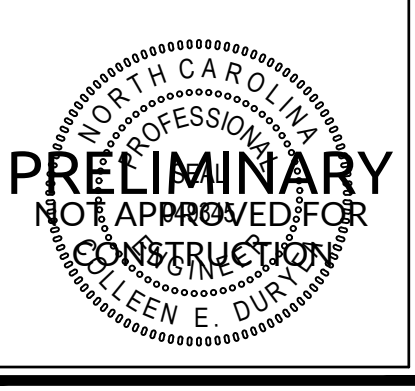
FIRE: N/A

URBAN FORESTRY: N/A

ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.

GRAPHIC SCALE  
1 inch = 30 ft.

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



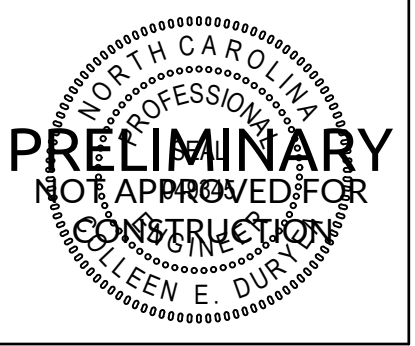
Revisions


**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

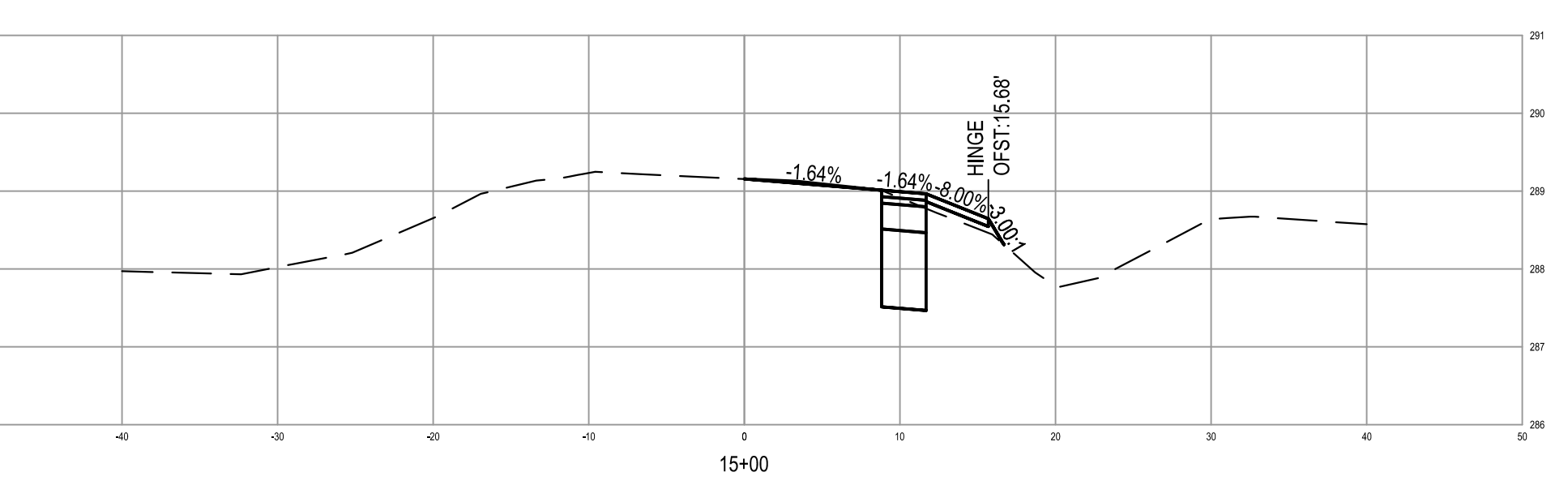
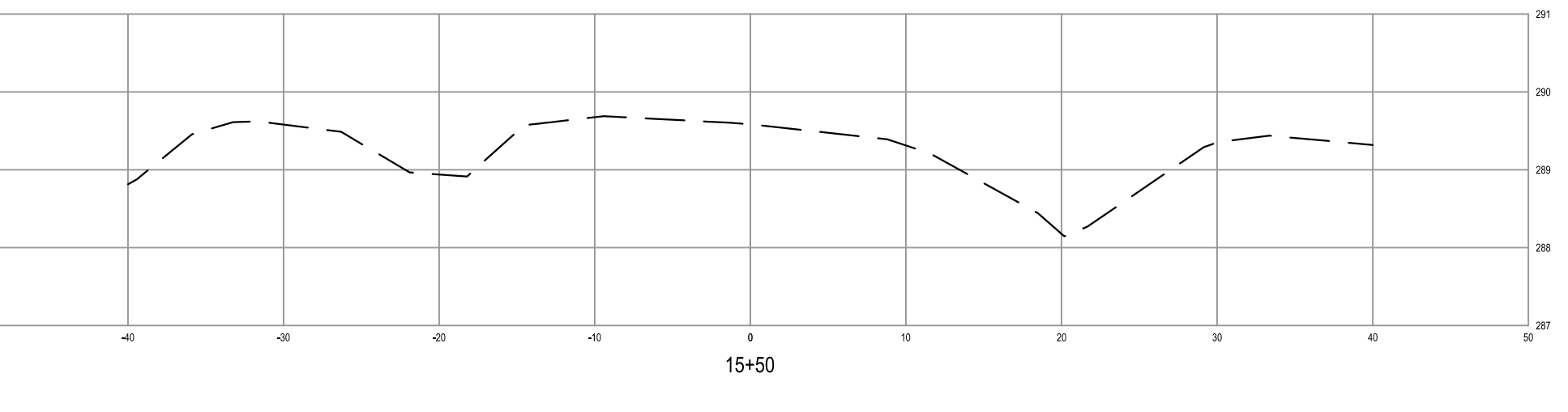
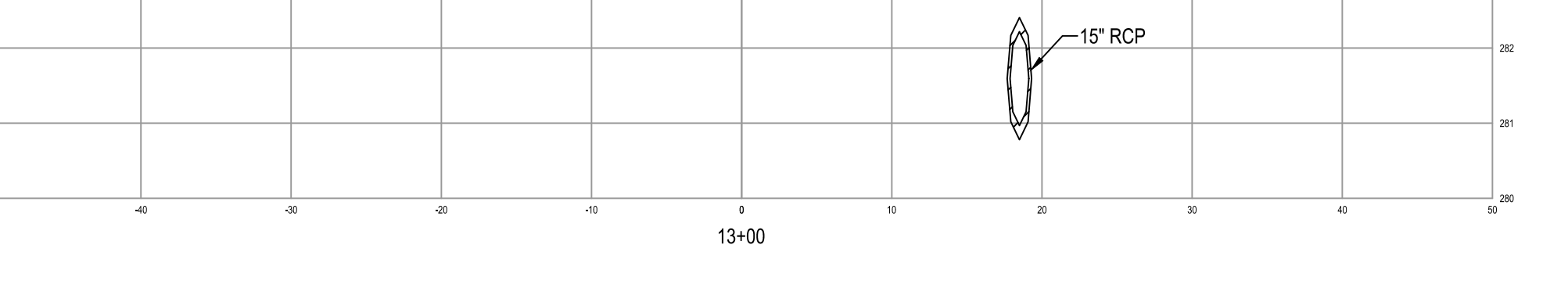
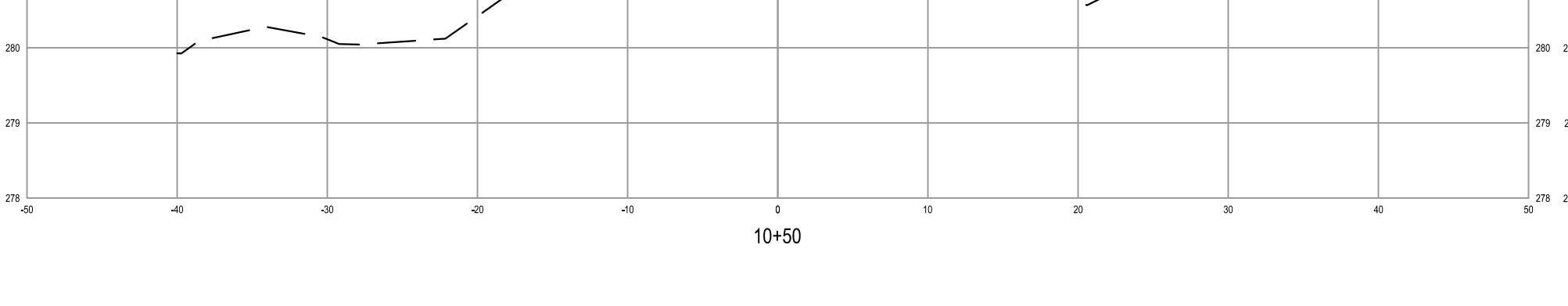
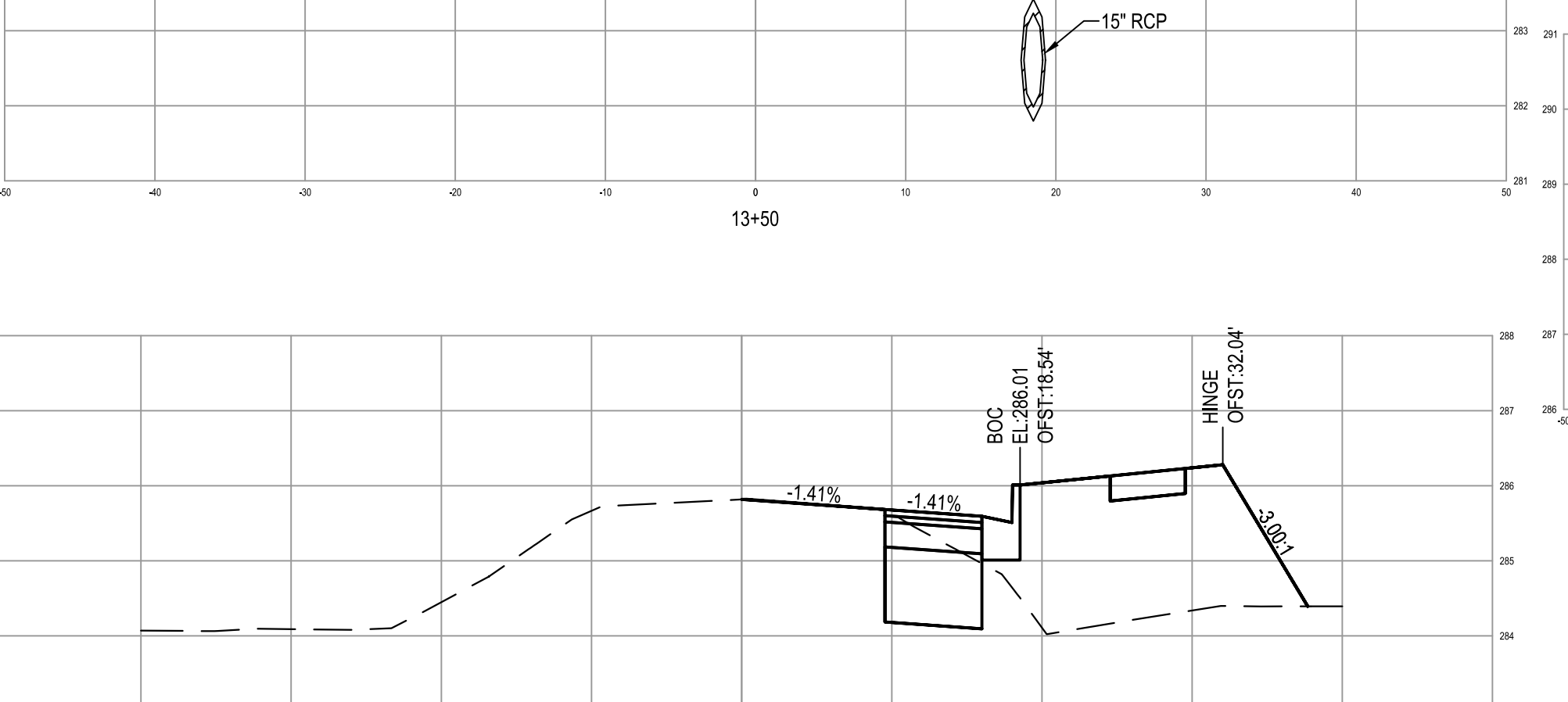
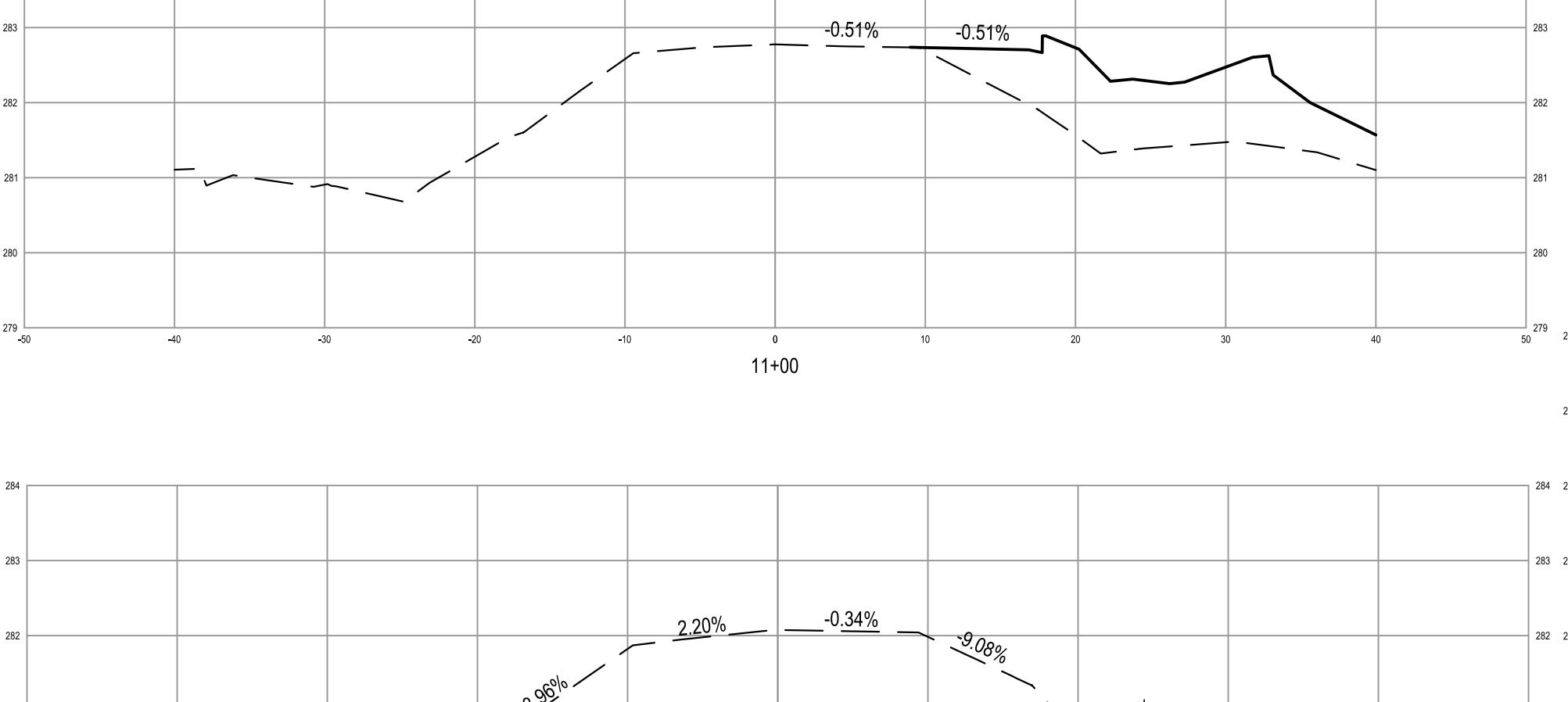
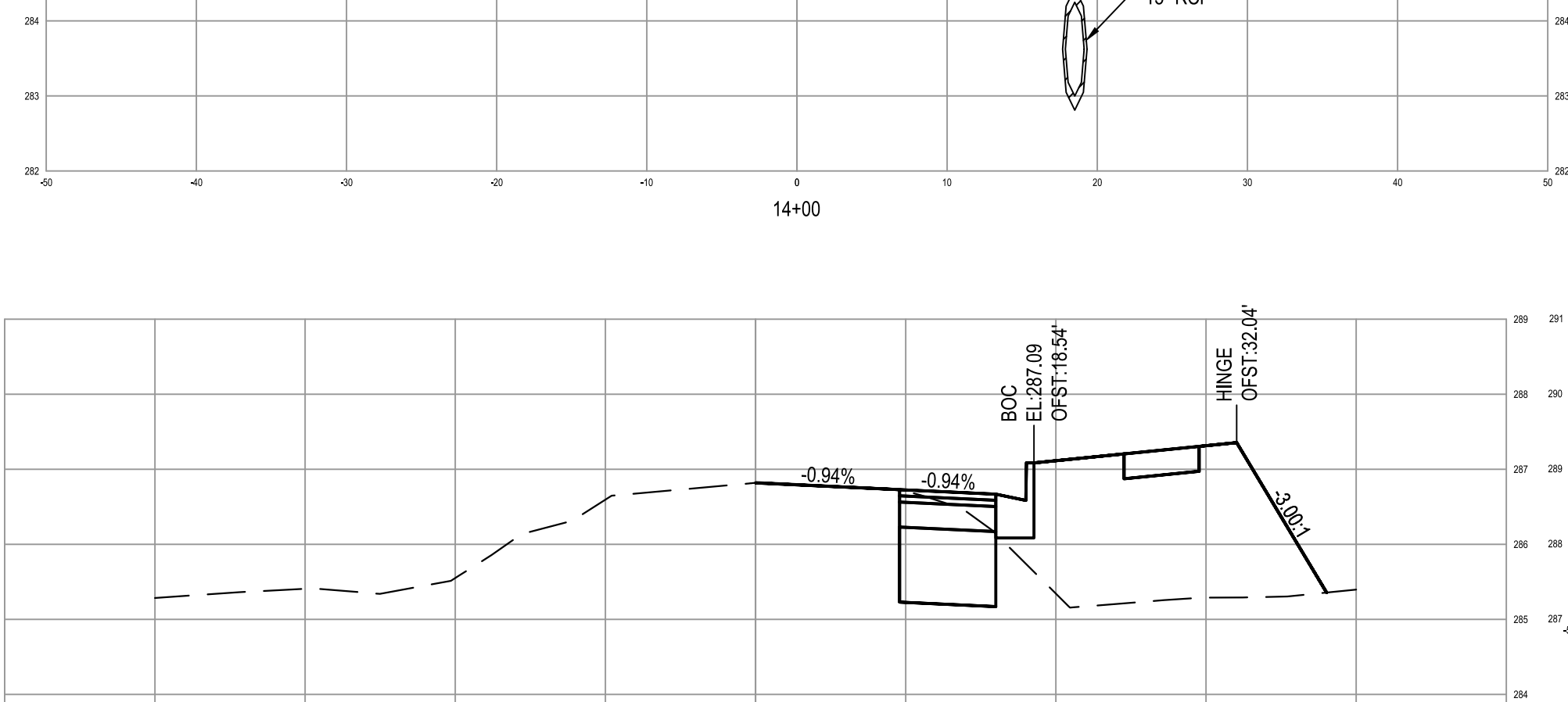
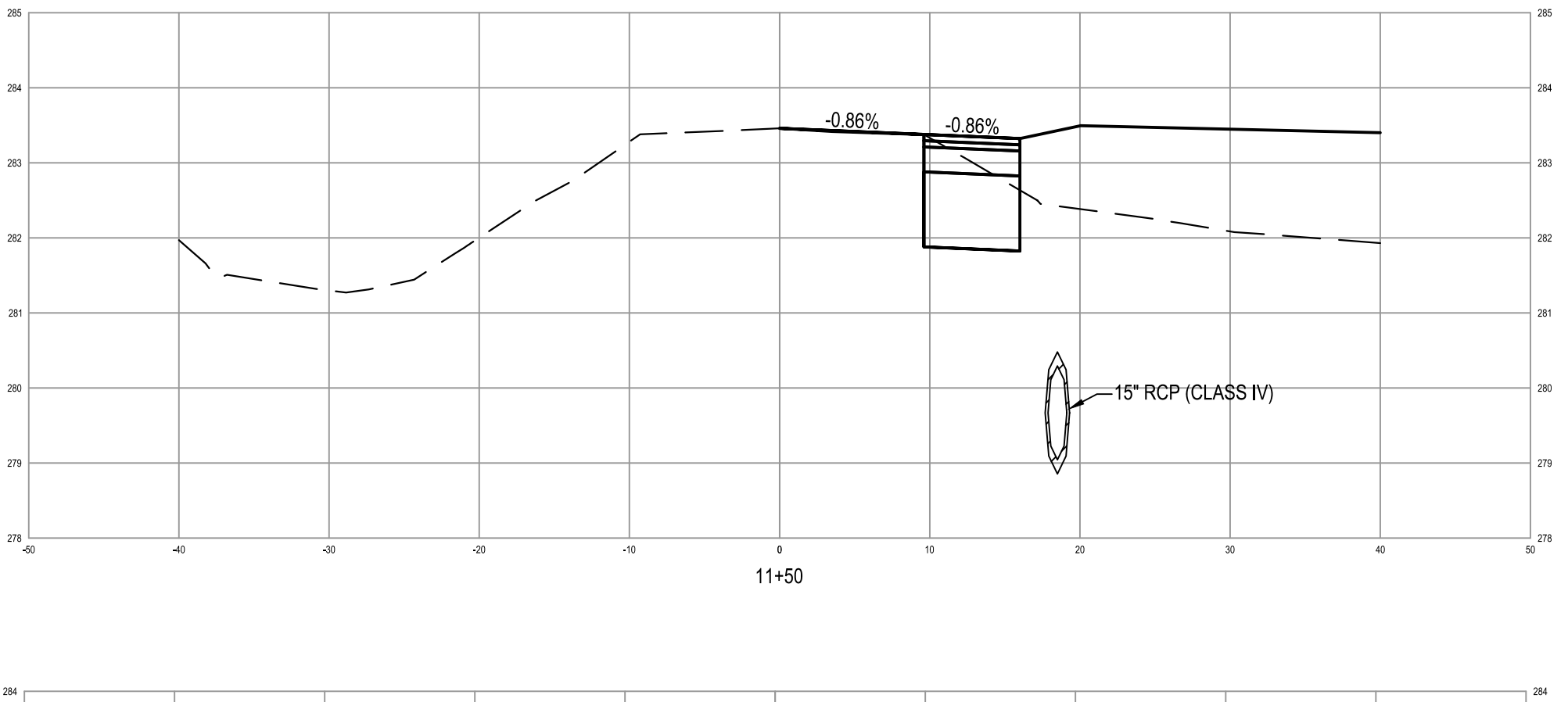
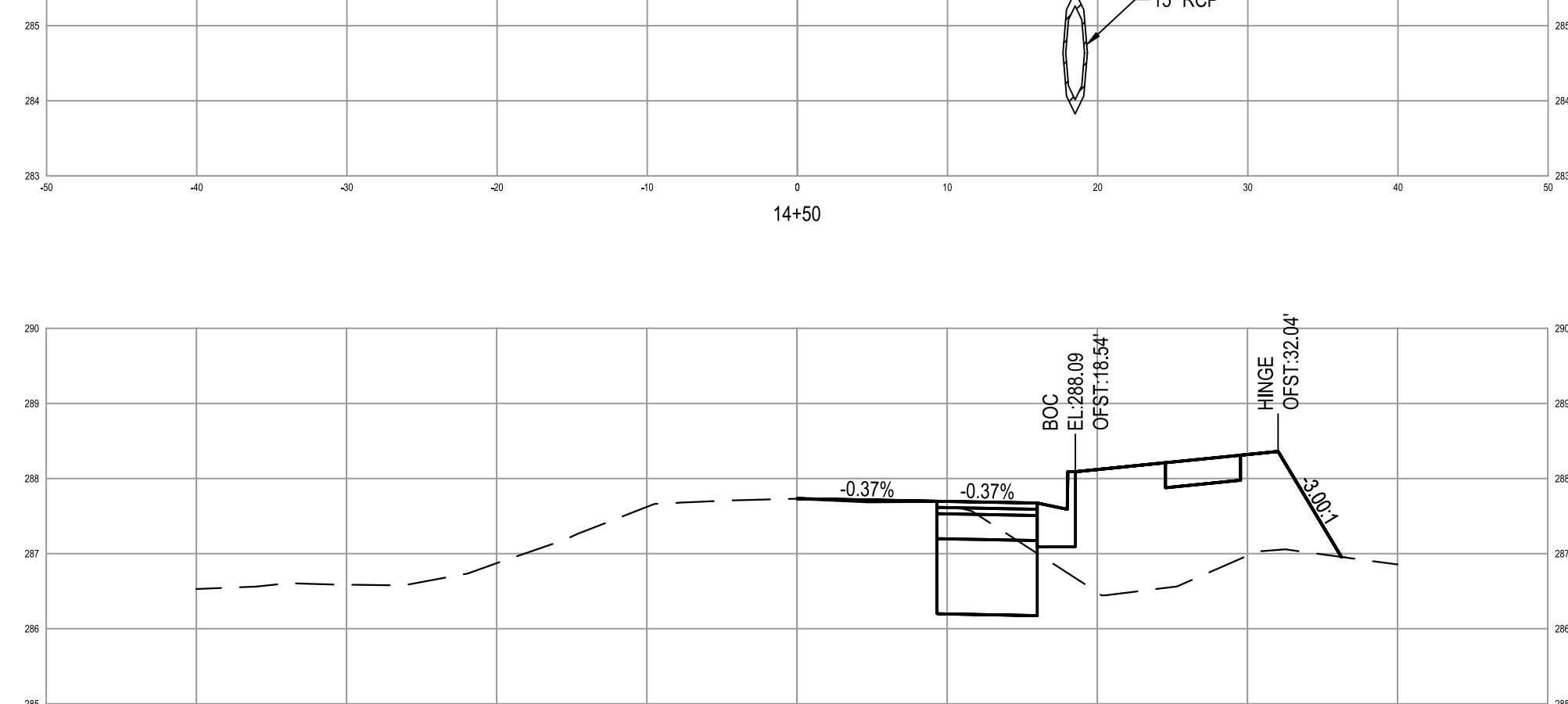
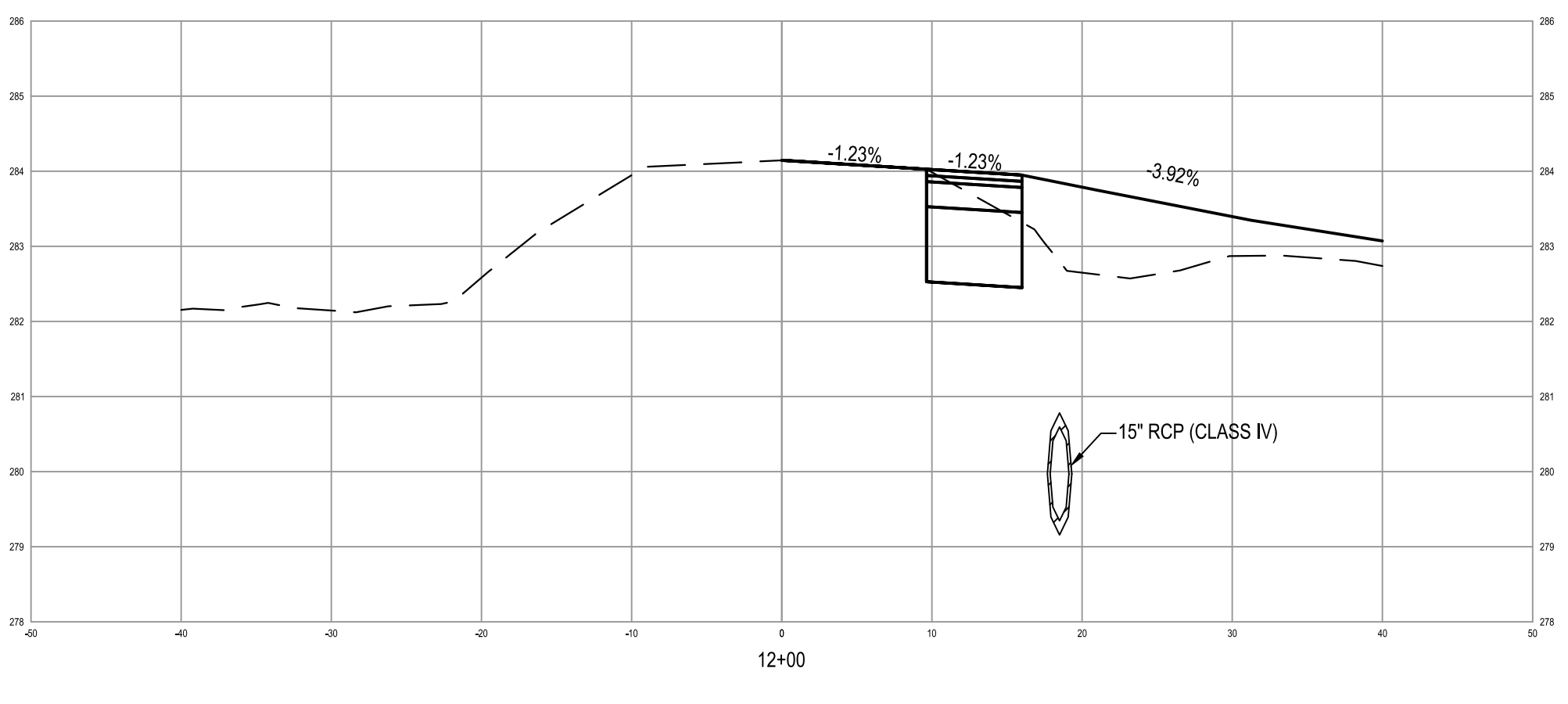
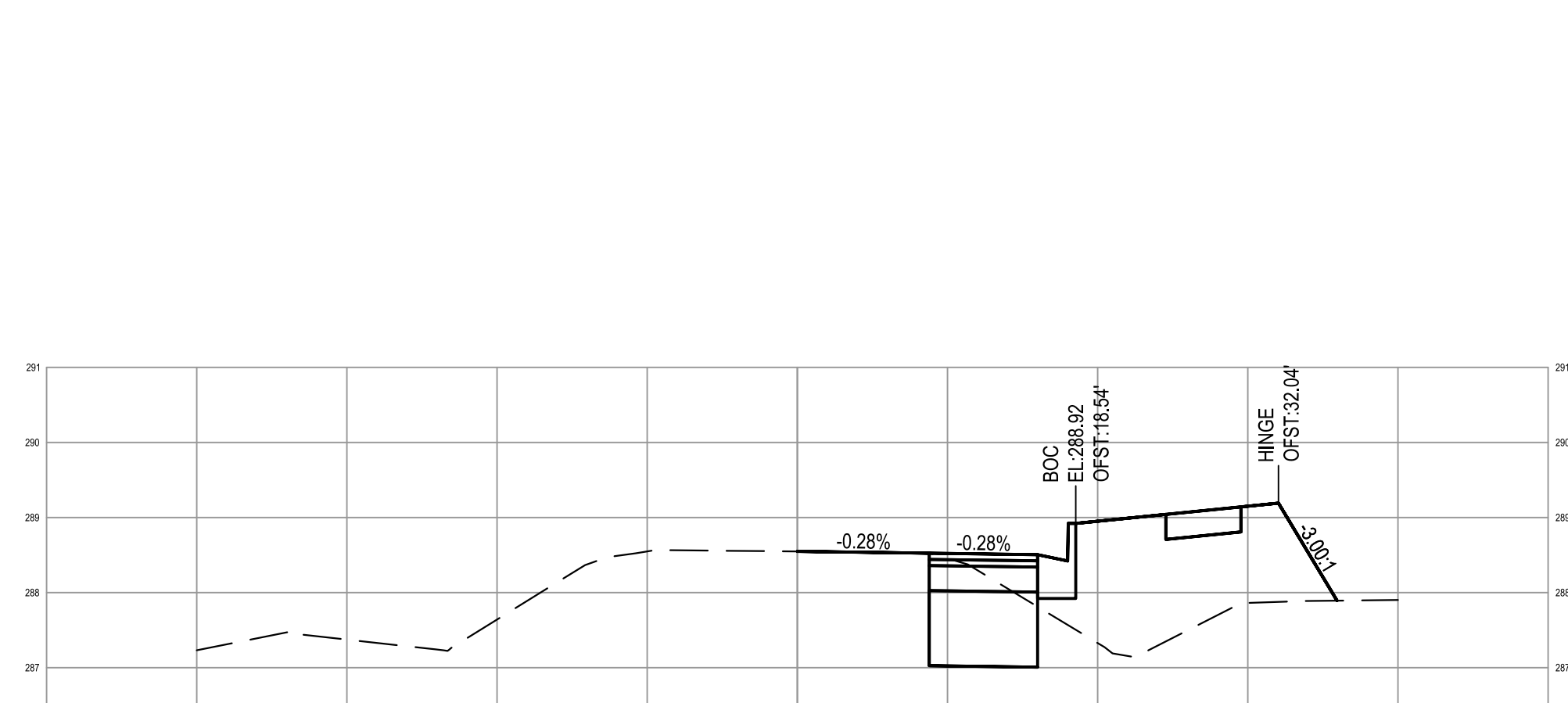
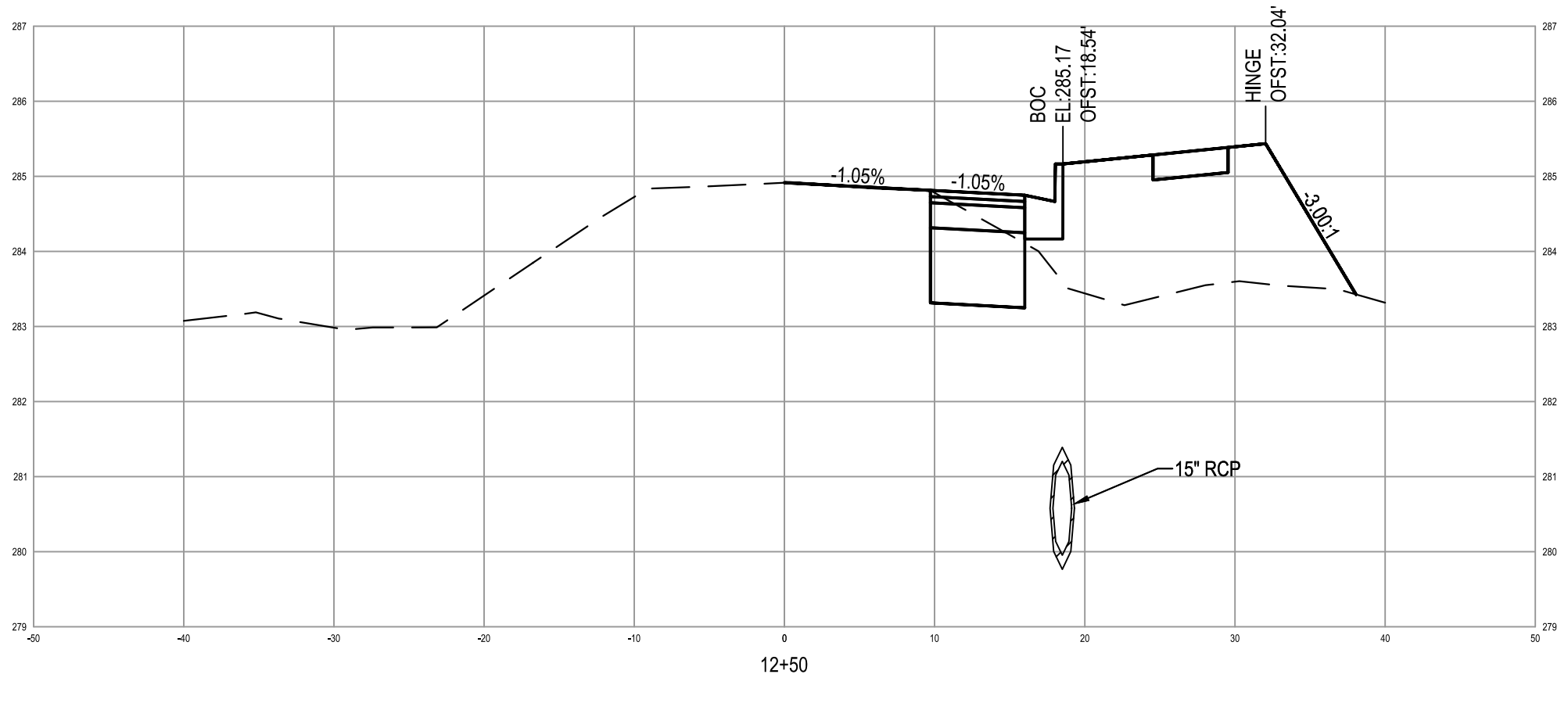
**CLIFTON ROAD  
X-SECTIONS**

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**9.1**



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: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

CITY OF RALEIGH

ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES: N/A

PUBLIC UTILITIES: \_\_\_\_\_

STORMWATER: N/A

PLANNING: N/A

FIRE: N/A

URBAN FORESTRY: N/A

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

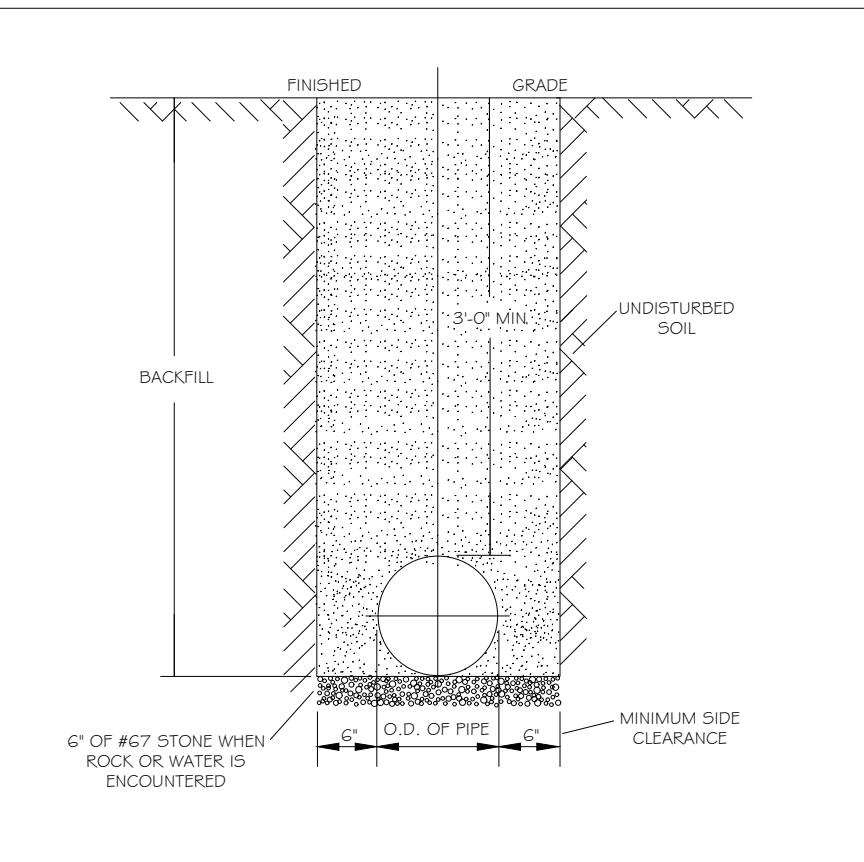
ALL AREAS GIVEN IN SQUARE FEET

PIPE SIZE	90° BEND	45° BEND	30° BEND	15° BEND	10° BEND	5° BEND	2 1/2° BEND
6"	1.108	1.1	1.1	1.1	1.1	1.1	1.1
8"	1.207	1.2	1.2	1.2	1.2	1.2	1.2
10"	1.306	1.3	1.3	1.3	1.3	1.3	1.3
12"	1.405	1.4	1.4	1.4	1.4	1.4	1.4
14"	1.504	1.5	1.5	1.5	1.5	1.5	1.5
16"	1.603	1.6	1.6	1.6	1.6	1.6	1.6
18"	1.702	1.7	1.7	1.7	1.7	1.7	1.7
20"	1.801	1.8	1.8	1.8	1.8	1.8	1.8
22"	1.900	1.9	1.9	1.9	1.9	1.9	1.9
24"	1.999	2.0	2.0	2.0	2.0	2.0	2.0
26"	2.098	2.1	2.1	2.1	2.1	2.1	2.1
28"	2.197	2.2	2.2	2.2	2.2	2.2	2.2
30"	2.296	2.3	2.3	2.3	2.3	2.3	2.3
32"	2.395	2.4	2.4	2.4	2.4	2.4	2.4
34"	2.494	2.5	2.5	2.5	2.5	2.5	2.5
36"	2.593	2.6	2.6	2.6	2.6	2.6	2.6
38"	2.692	2.7	2.7	2.7	2.7	2.7	2.7
40"	2.791	2.8	2.8	2.8	2.8	2.8	2.8
42"	2.890	2.9	2.9	2.9	2.9	2.9	2.9
44"	2.989	3.0	3.0	3.0	3.0	3.0	3.0
46"	3.088	3.1	3.1	3.1	3.1	3.1	3.1
48"	3.187	3.2	3.2	3.2	3.2	3.2	3.2
50"	3.286	3.3	3.3	3.3	3.3	3.3	3.3
52"	3.385	3.4	3.4	3.4	3.4	3.4	3.4
54"	3.484	3.5	3.5	3.5	3.5	3.5	3.5
56"	3.583	3.6	3.6	3.6	3.6	3.6	3.6
58"	3.682	3.7	3.7	3.7	3.7	3.7	3.7
60"	3.781	3.8	3.8	3.8	3.8	3.8	3.8

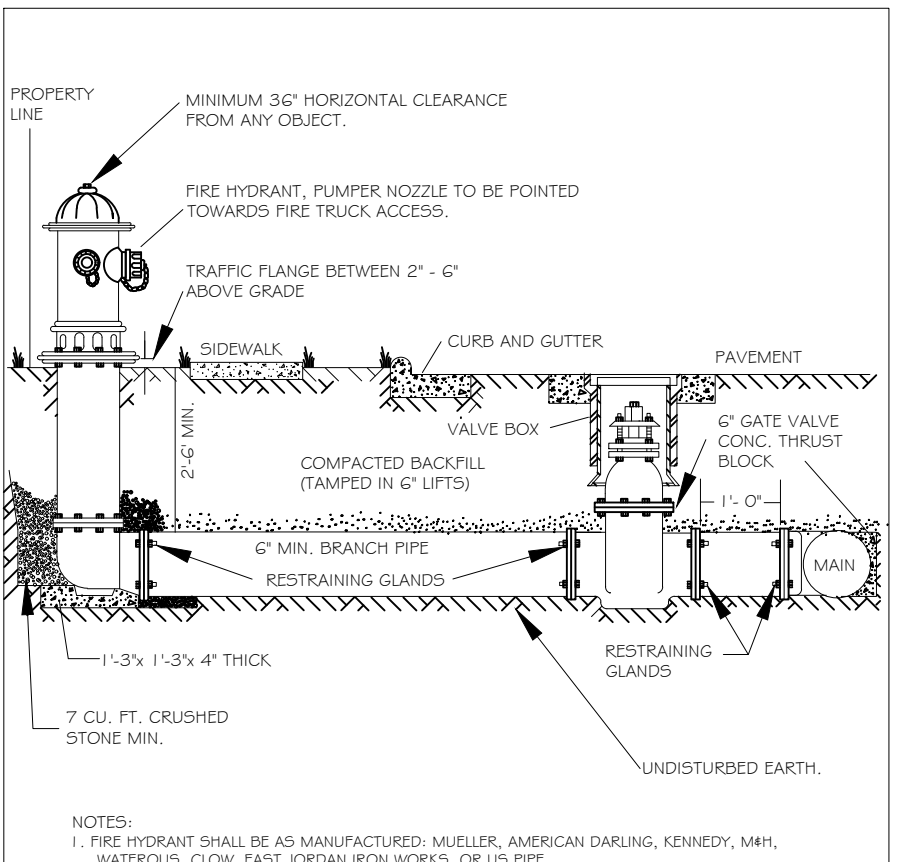
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	2-23-99	A.B.B.	4-12-04
	D.H.L.	3-31-00	J.P.S.	6-16-05



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

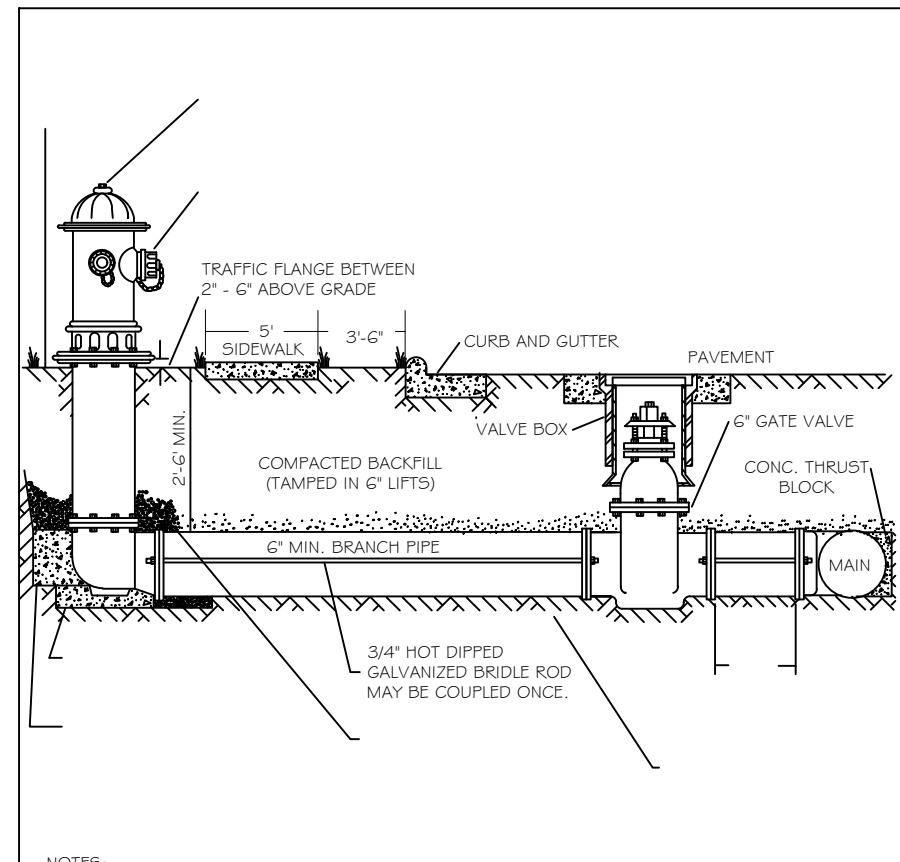


- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MULLER, AMERICAN DARLING, KENNEDY, MH, WATERLOUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
  - BRANCH PIPE SHALL BE SUCTILE IRON WITH C150-36.
  - 6" GATE VALVE SHALL BE ANMA C500-AS OPEN LEFT.
  - STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
  - FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
  - RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 50' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CASE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
  - FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT OFFSET ADJACENT TO ROW.

CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ARR	4-6-04	PAF	2-17-09
	D.H.L.	3-31-00	J.P.S.	6-16-05

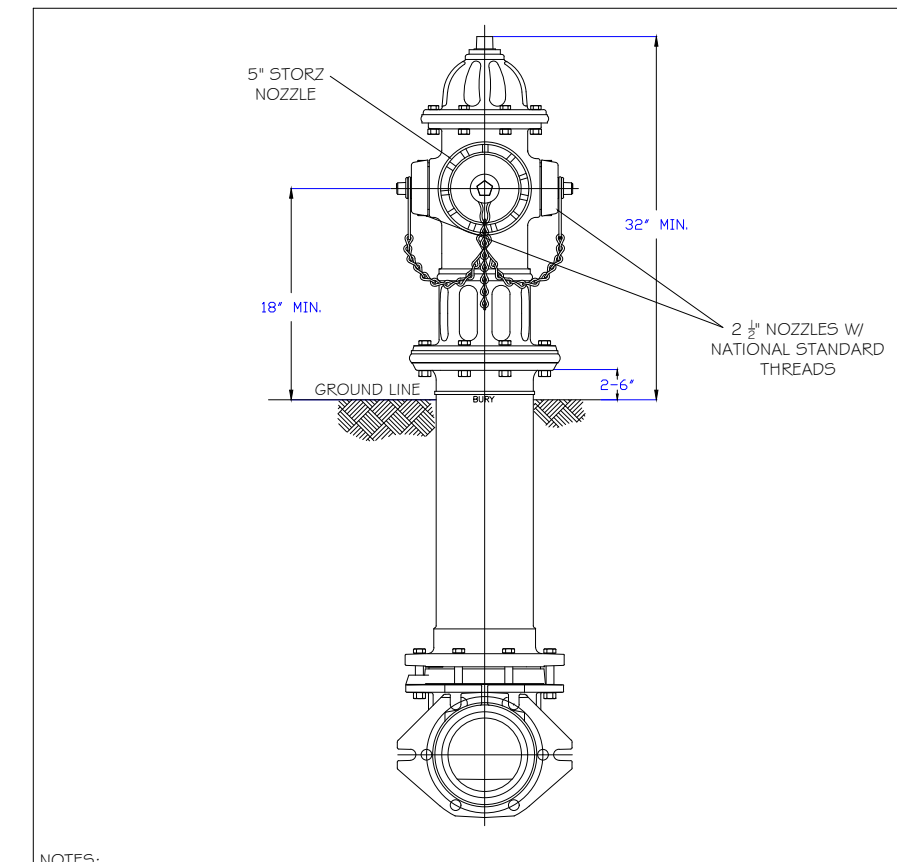


- NOTES:
- FIRE HYDRANT SHALL BE AS MANUFACTURED: MULLER, AMERICAN DARLING, KENNEDY, MH, WATERLOUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
  - BRANCH PIPE SHALL BE SUCTILE IRON WITH C150-36.
  - 6" GATE VALVE SHALL BE ANMA C500-AS OPEN LEFT.
  - STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
  - FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
  - RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 50' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CASE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
  - FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT OFFSET ADJACENT TO ROW.

CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-40	ARR	4-6-04	PAF	2-17-09
	D.H.L.	3-31-00	J.P.S.	6-16-05

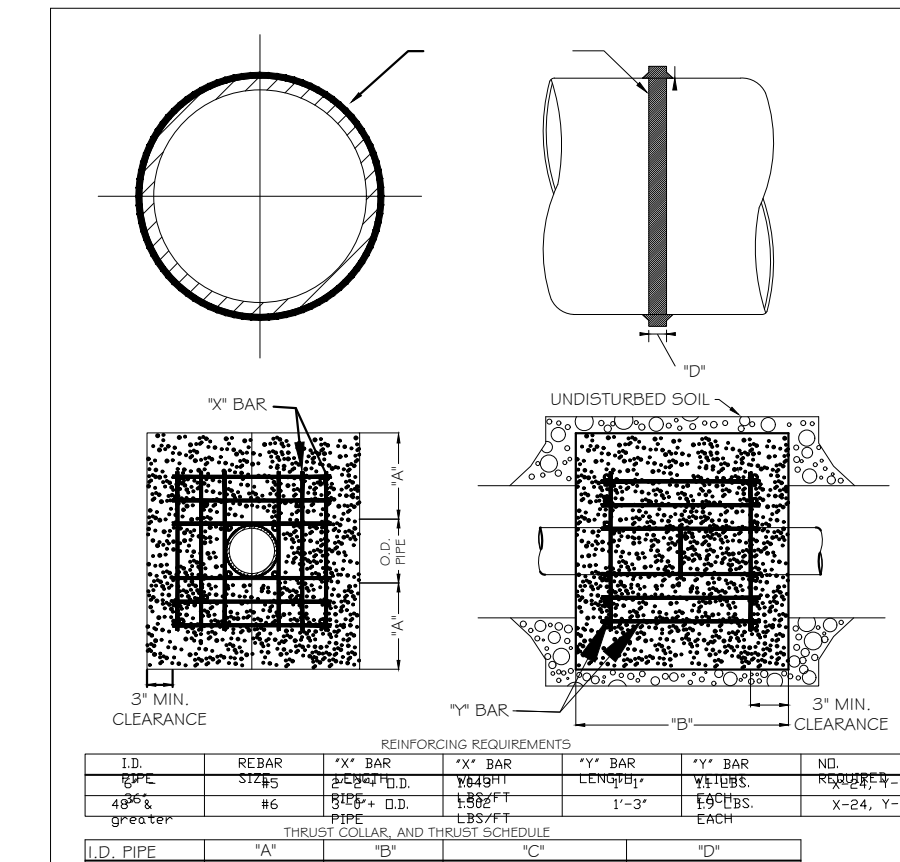


- NOTES:
- ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, KESWILL, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
  - ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT WITH 5' STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAD	6-30-16		
	KAT	12-15-17		

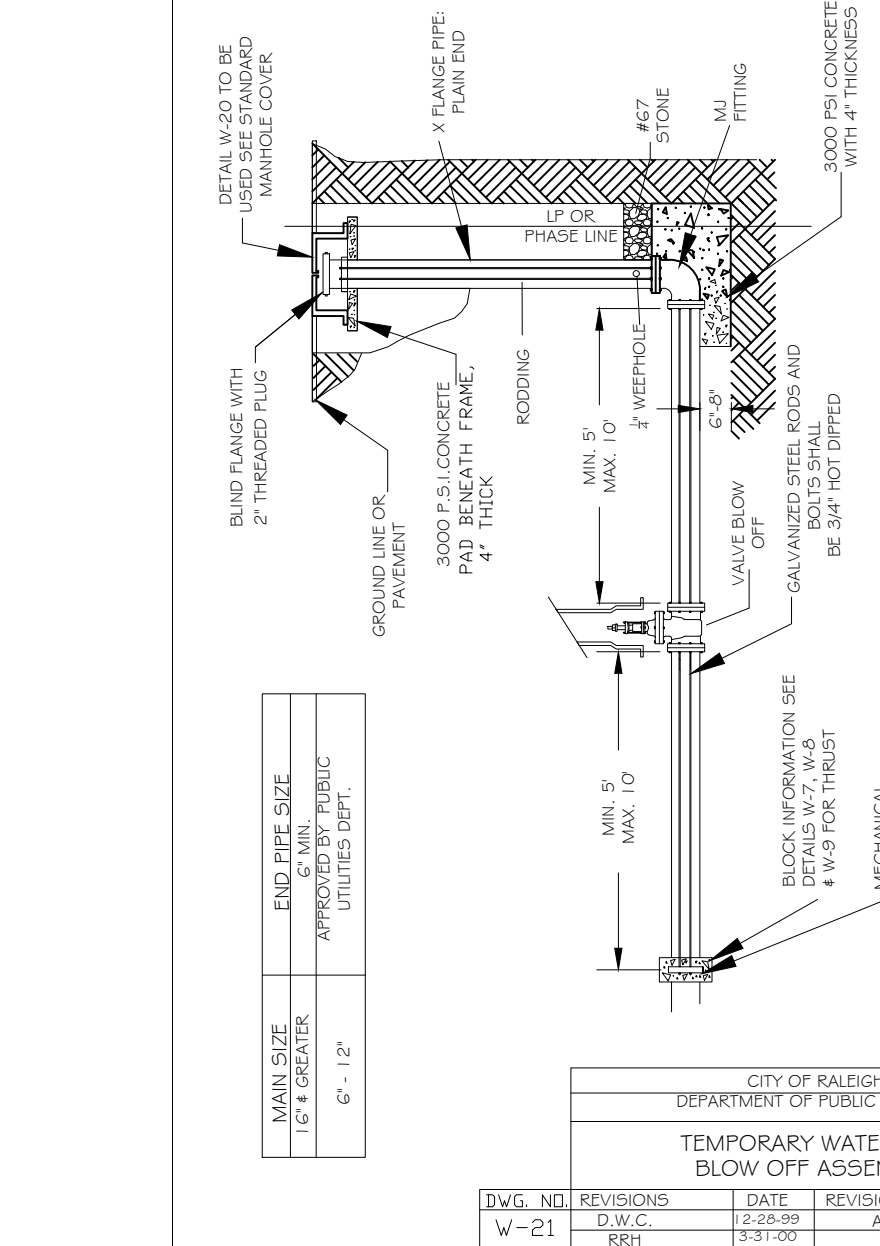


- NOTES:
- SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
  - CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
  - REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
  - TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
  - BACKFILL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

CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN DATA FOR WATER MAINS

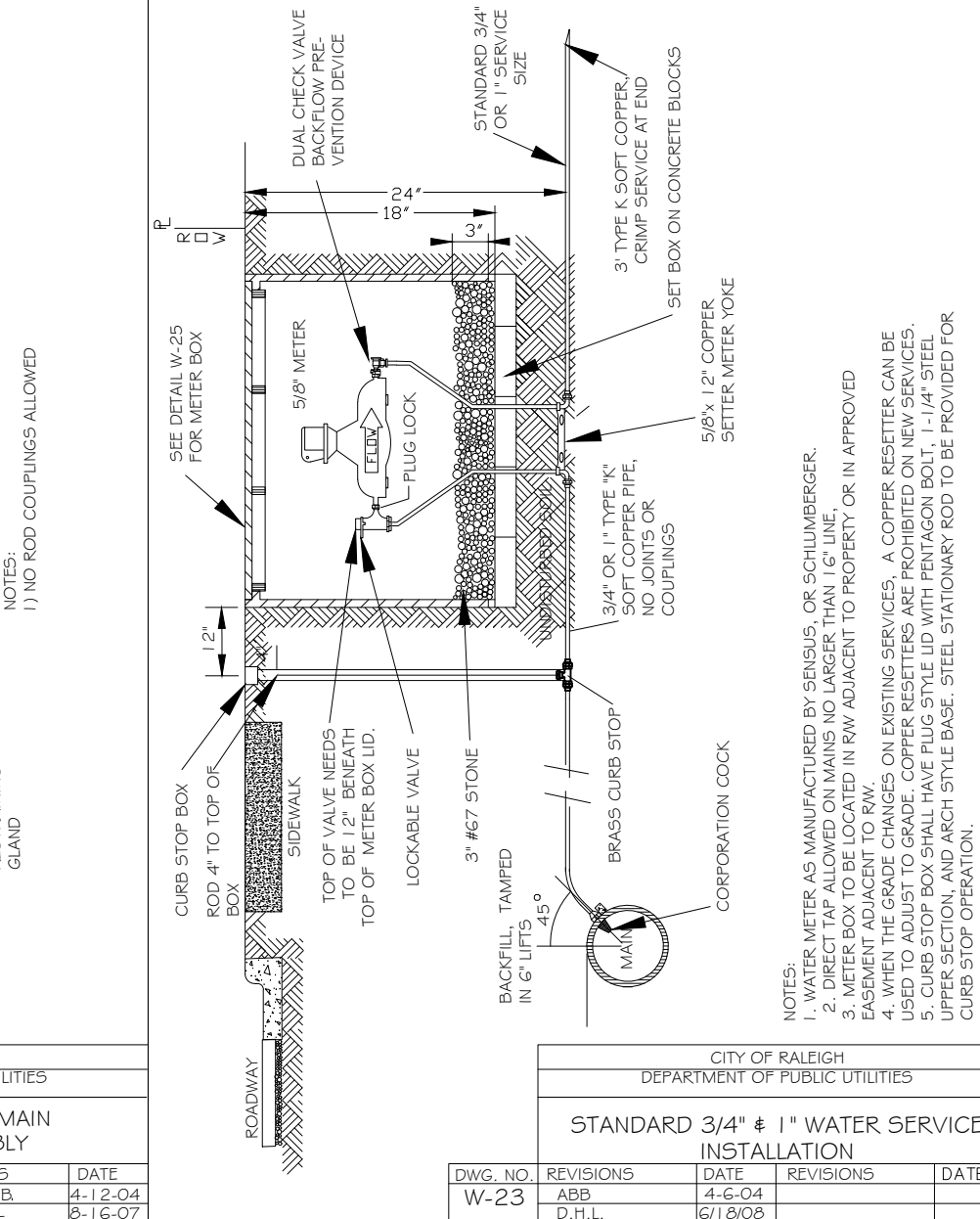
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	2-1-00	J.P.S.	6-16-05
	D.H.L.	12-15-08		



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

TEMPORARY WATER MAIN BLOW-OFF ASSEMBLY

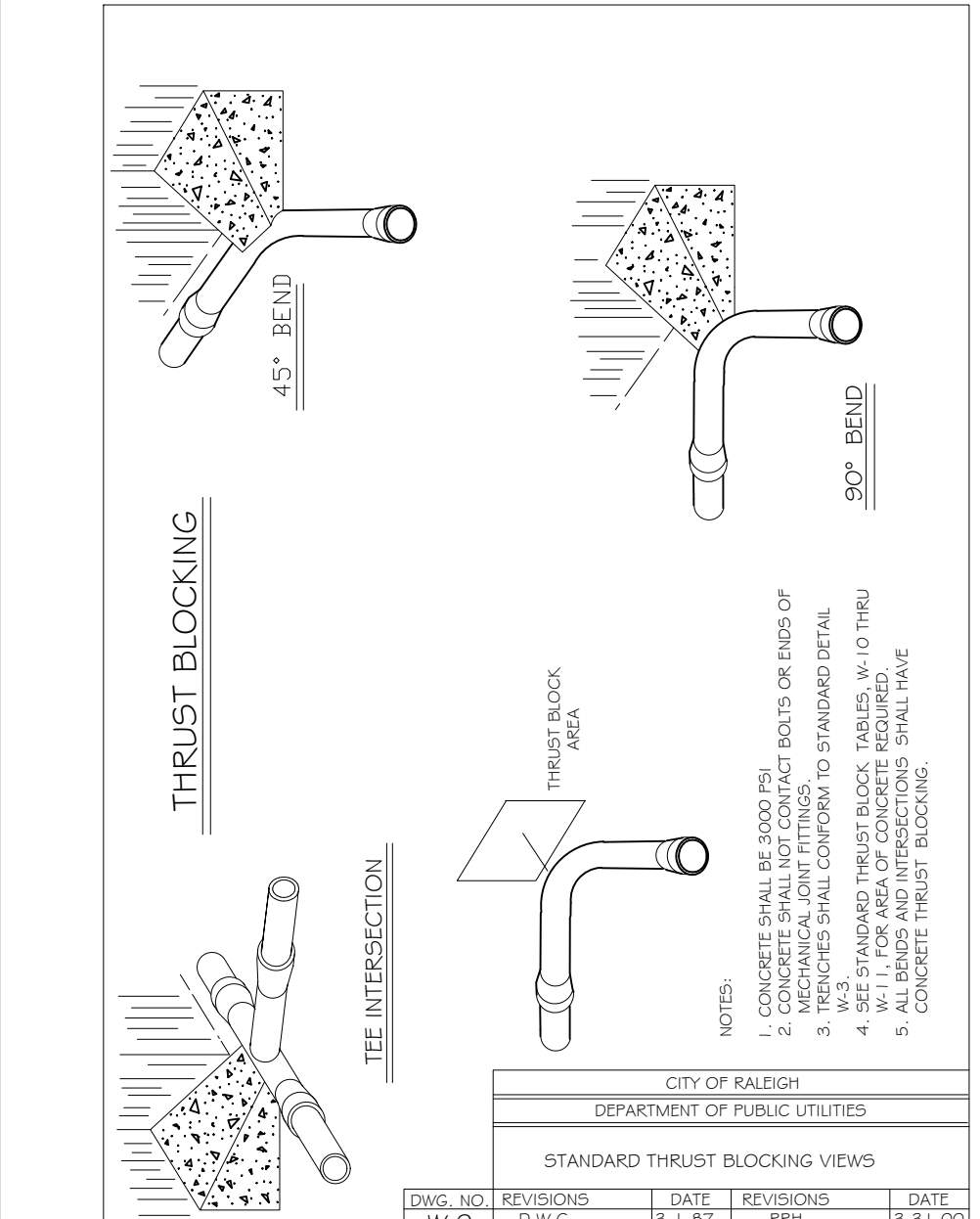
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-21	D.W.C.	2-28-99	A.B.B.	4-12-04
	RRH	1-17-00	D.H.L.	6-16-05



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD 3/4\"/>

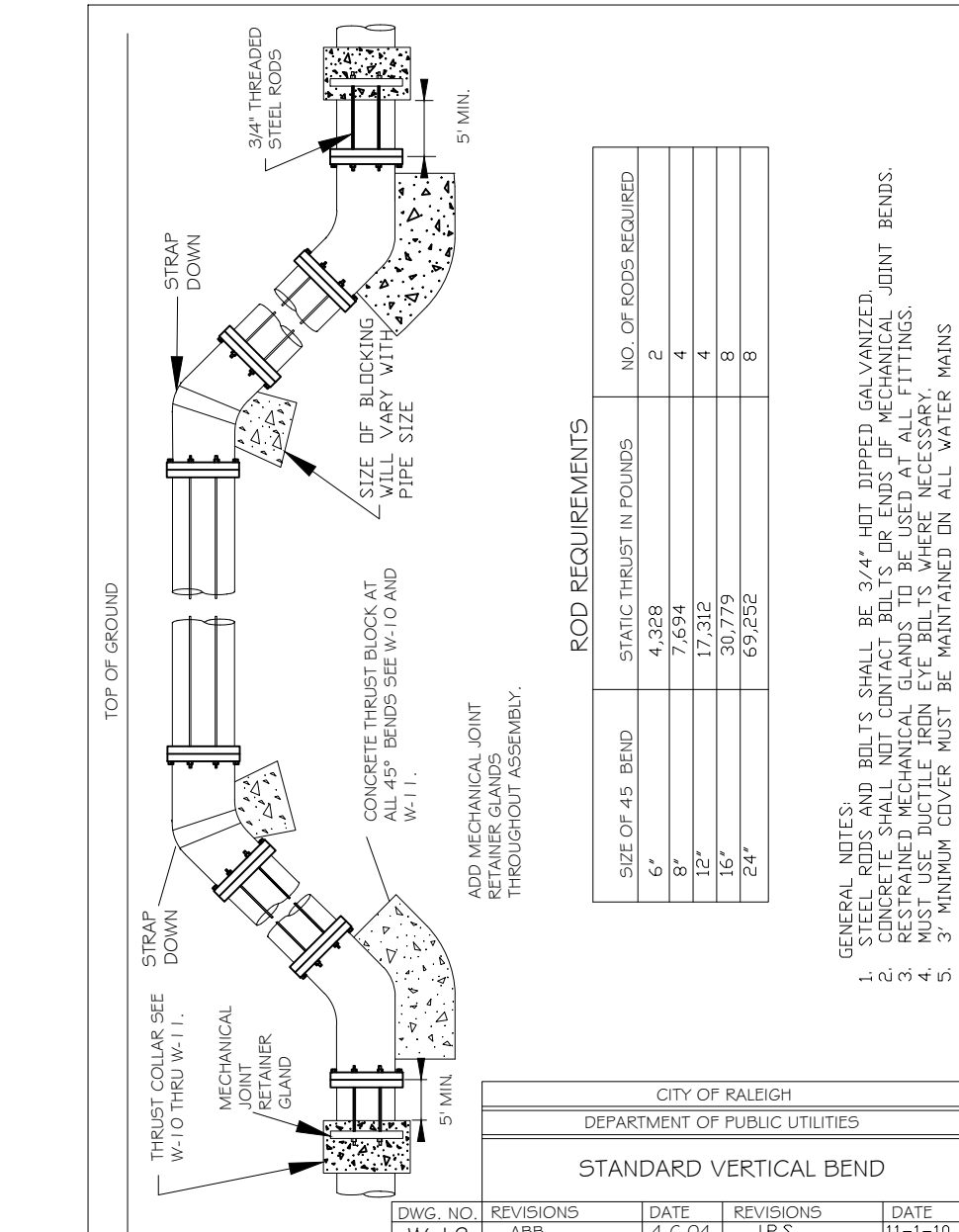
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-23	ARR	4-6-04		
	D.H.L.	3-31-00	J.P.S.	6-16-05



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD THRUST BLOCKING VIEWS

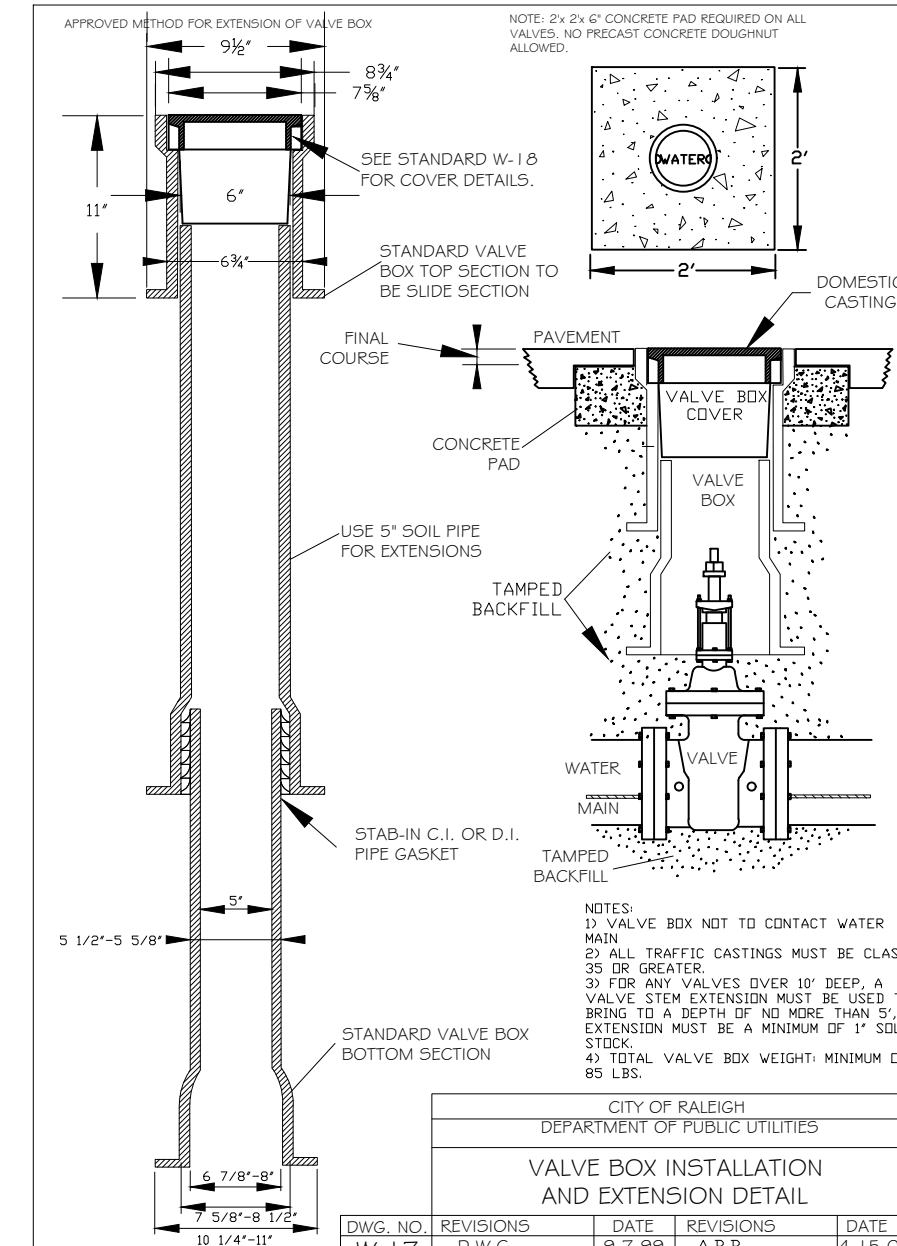
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-97	RRH	3-31-00
	D.H.L.	6-16-05		



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD VERTICAL BEND

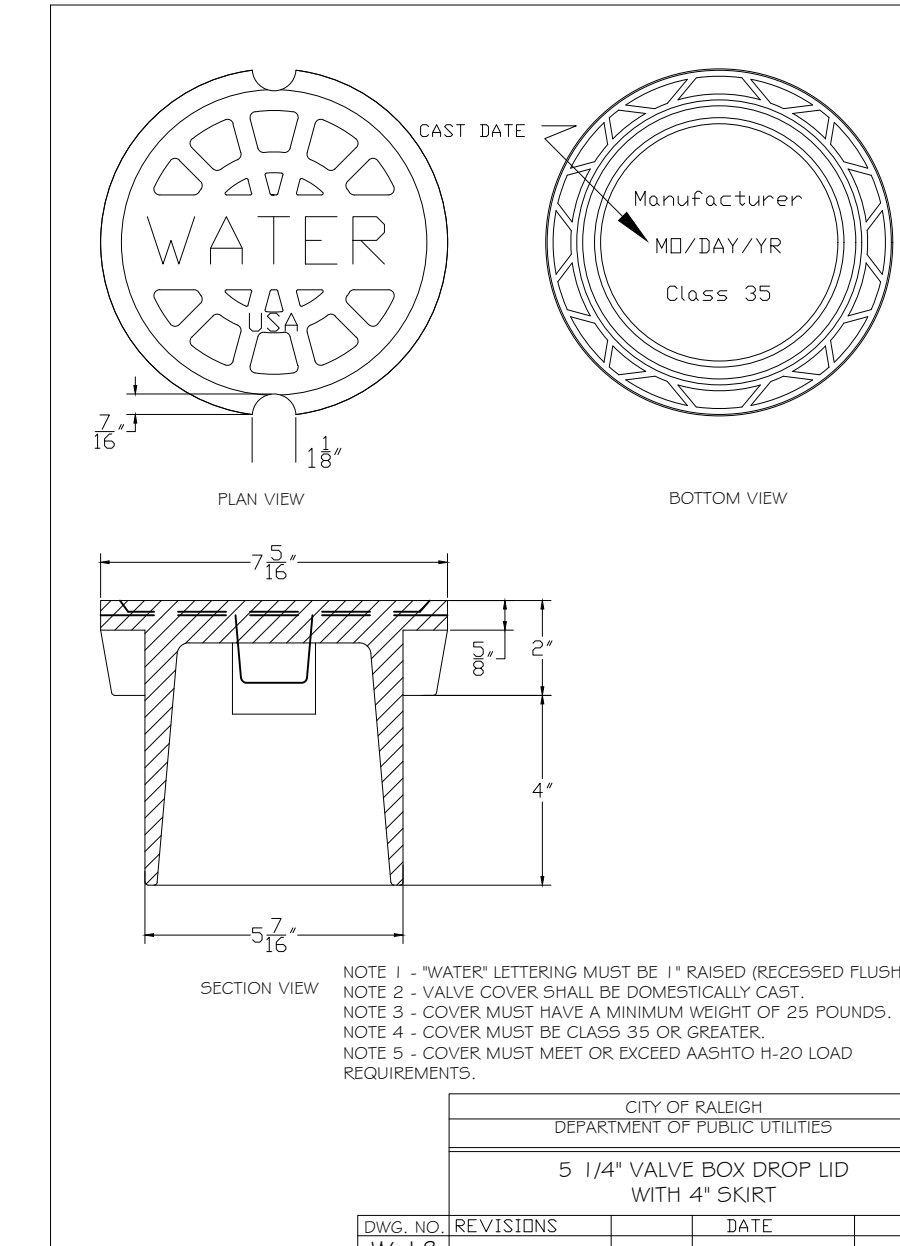
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ARR	4-6-04	J.P.S.	11-13-08
	D.H.L.	6-16-05		



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

VALVE BOX INSTALLATION AND EXTENSION DETAIL

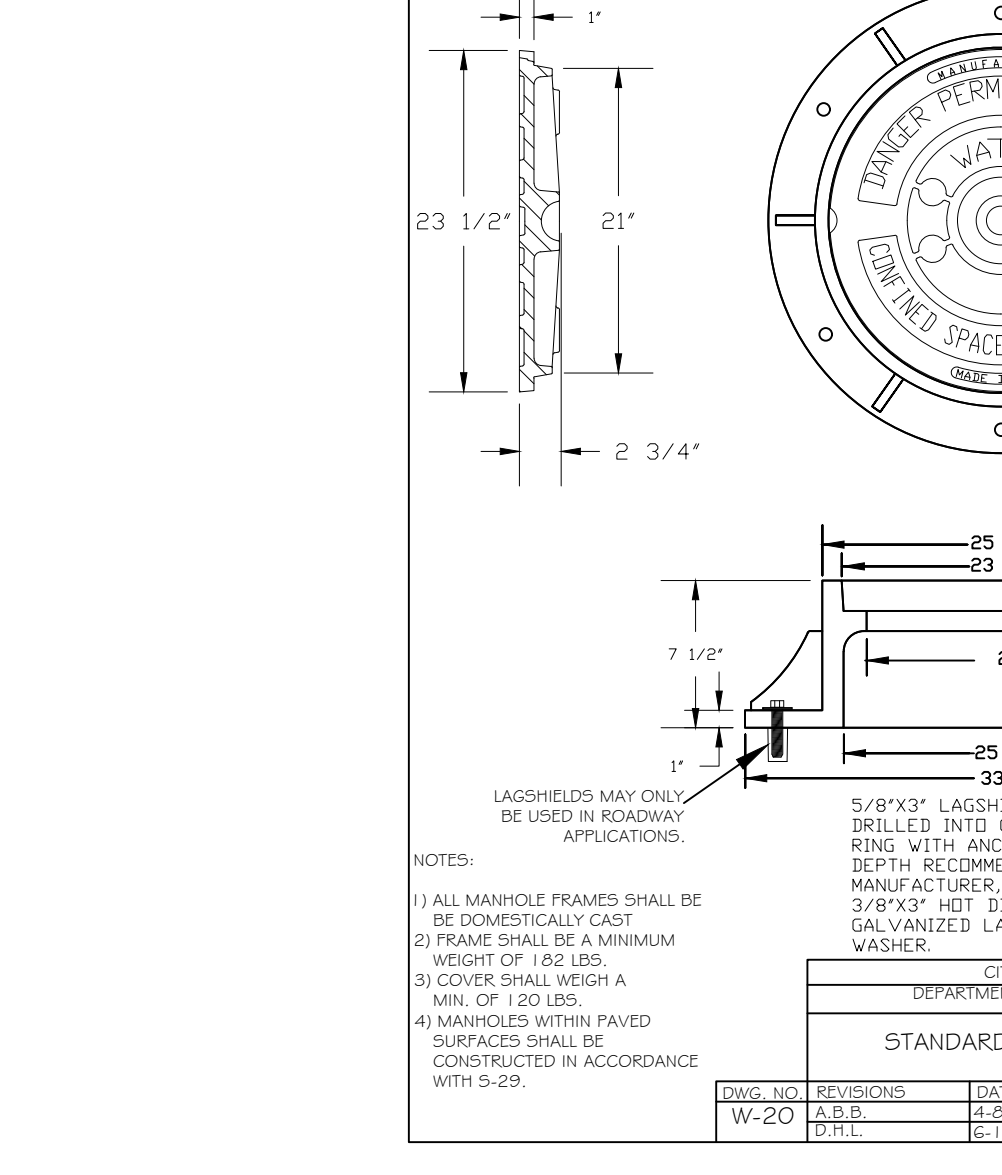
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	3-27-99	A.B.B.	4-12-04
	RRH	3-31-00	D.H.L.	6-16-05



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

5 1/4\"/>

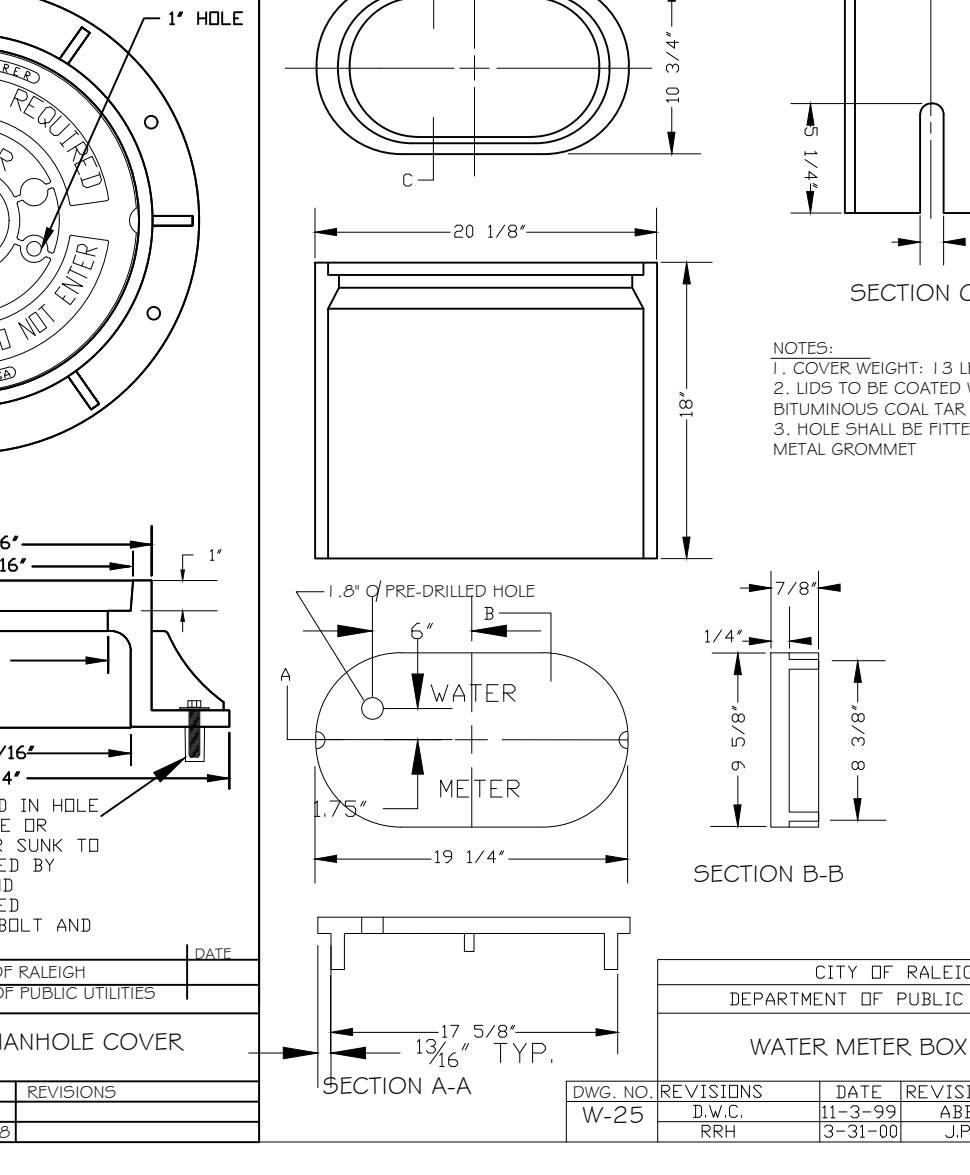
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

STANDARD MANHOLE COVER

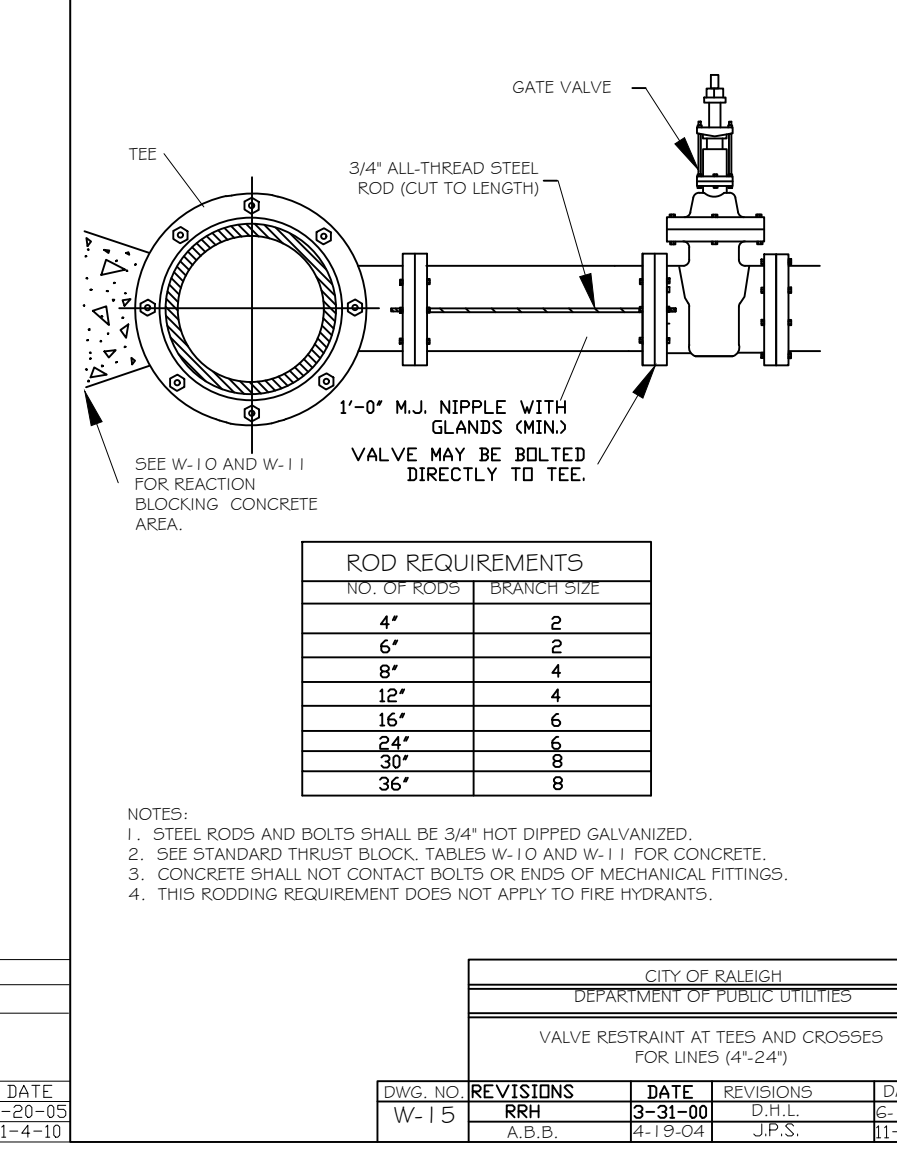
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-20	A.B.B.	4-8-04		
	D.H.L.	6-16-05		



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

WATER METER BOX DETAIL

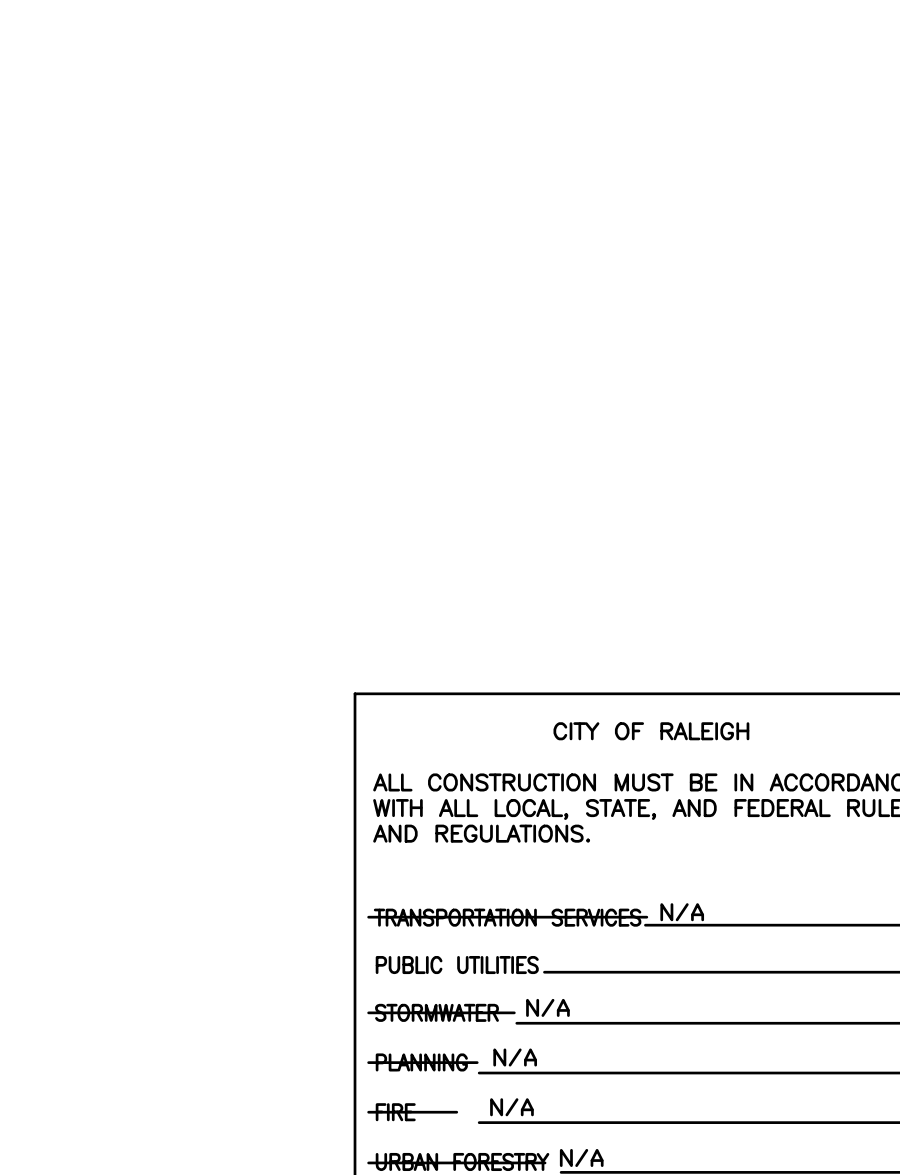
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25	D.W.C.	3-1-99	ARR	1-20-08
	RRH	3-31-00	J.P.S.	11-4-10



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES

VALVE RESTRAINT AT TEES AND CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-15	ARR	8-31-00	D.H.L.	5-16-05
	A.B.B.	6-17-04	J.P.S.	11-13-08



CITY OF RALEIGH

ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

TRANSPORTATION SERVICES- N/A

PUBLIC UTILITIES

STORMWATER- N/A

PLANNING- N/A

FIRE- N/A

URBAN FORESTRY N/A

**WithersRavenel**  
Engineers | Planners | Surveyors

**POPLAR CREEK VILLAGE**  
PHASE IV

TOWN OF KNIGHTDALE, NORTH CAROLINA

**WATER UTILITY DETAILS**

Job No. 02190259  
Date 07/08/20  
Drawn By WR  
Designer WR

PRELIMINARY  
NOT APPROVED FOR  
CONSTRUCTION

WALTER E. DURIN

Revisions

No.	Description

Sheet No. 10.2



CITY OF RALEIGH

ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

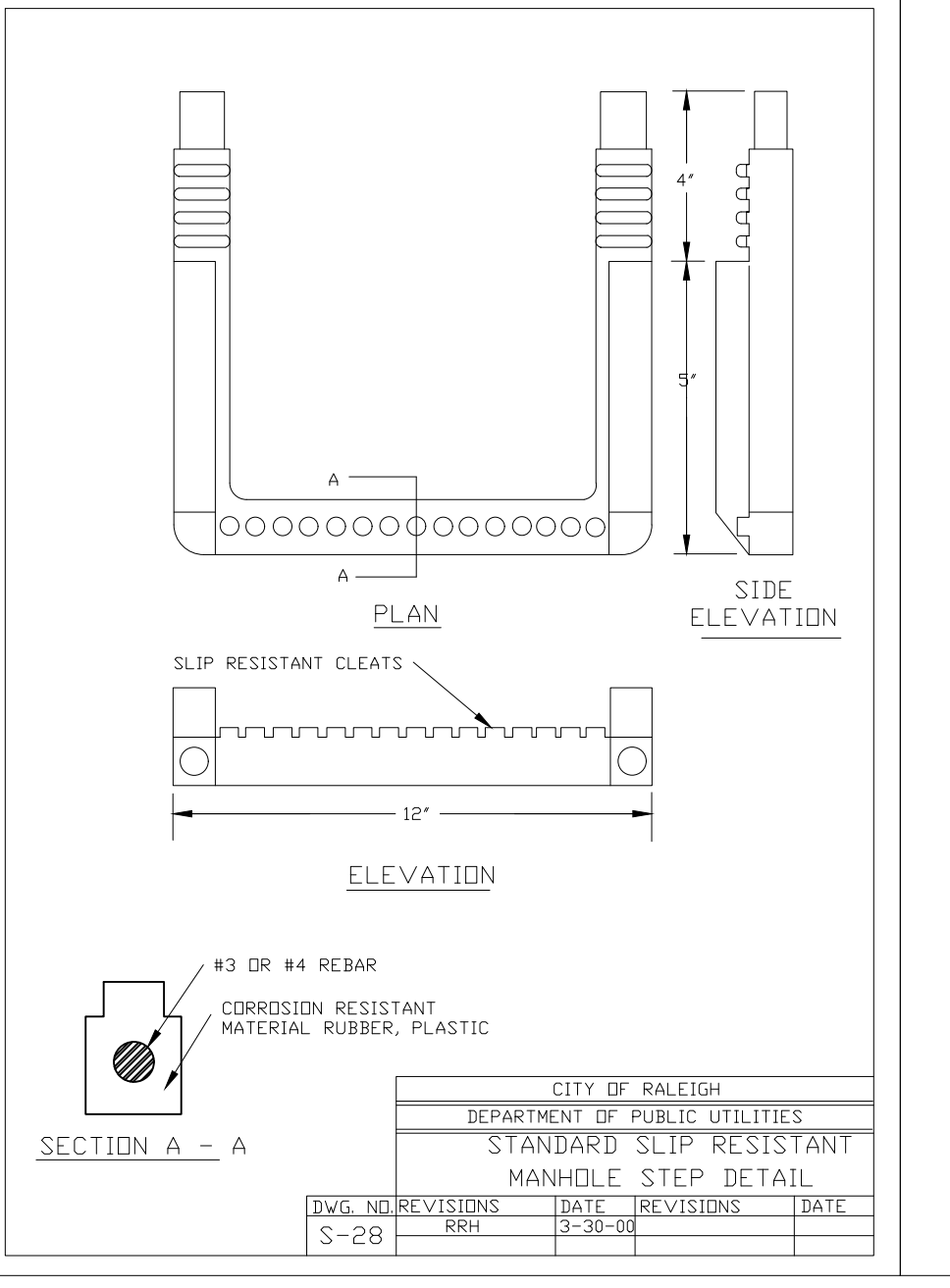
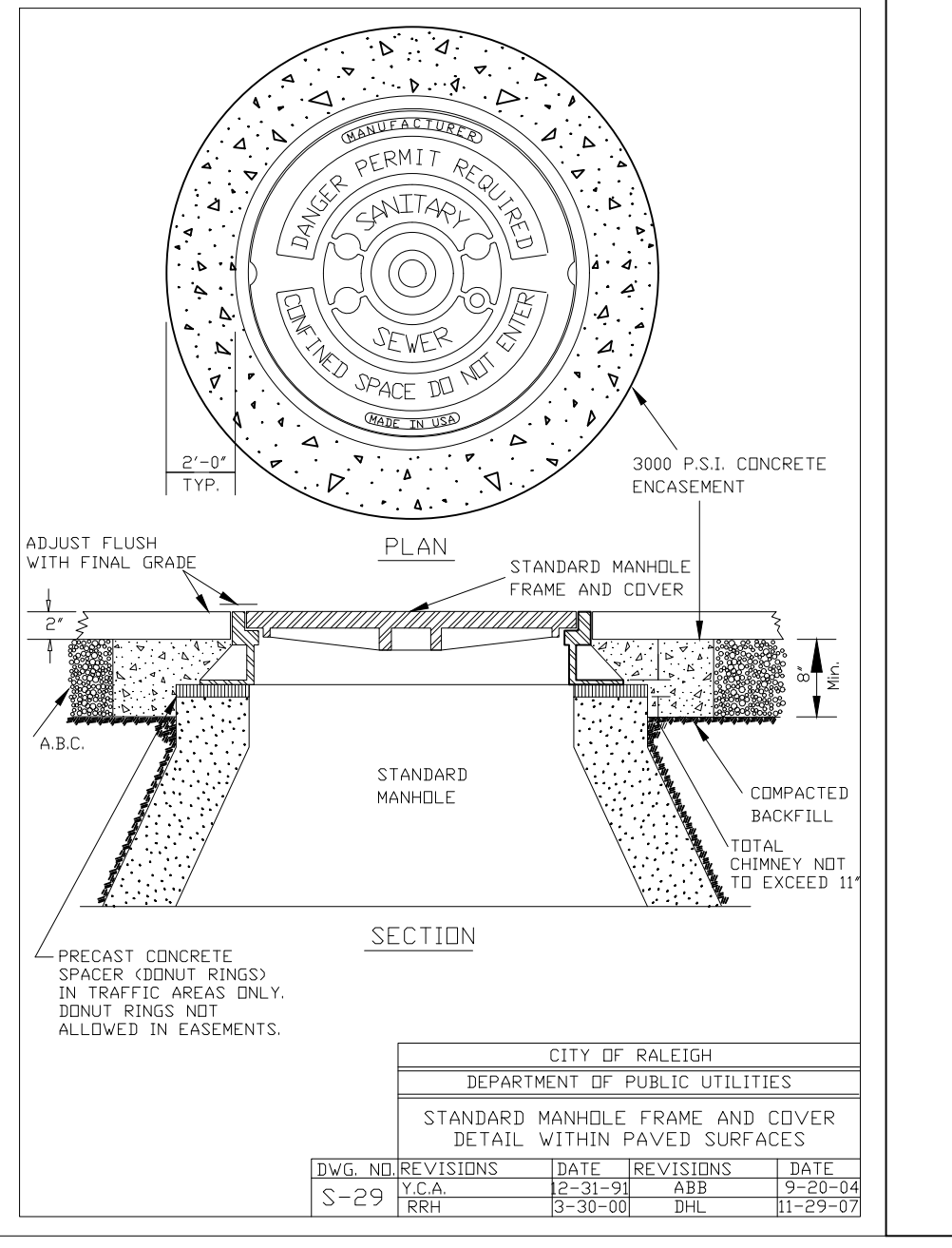
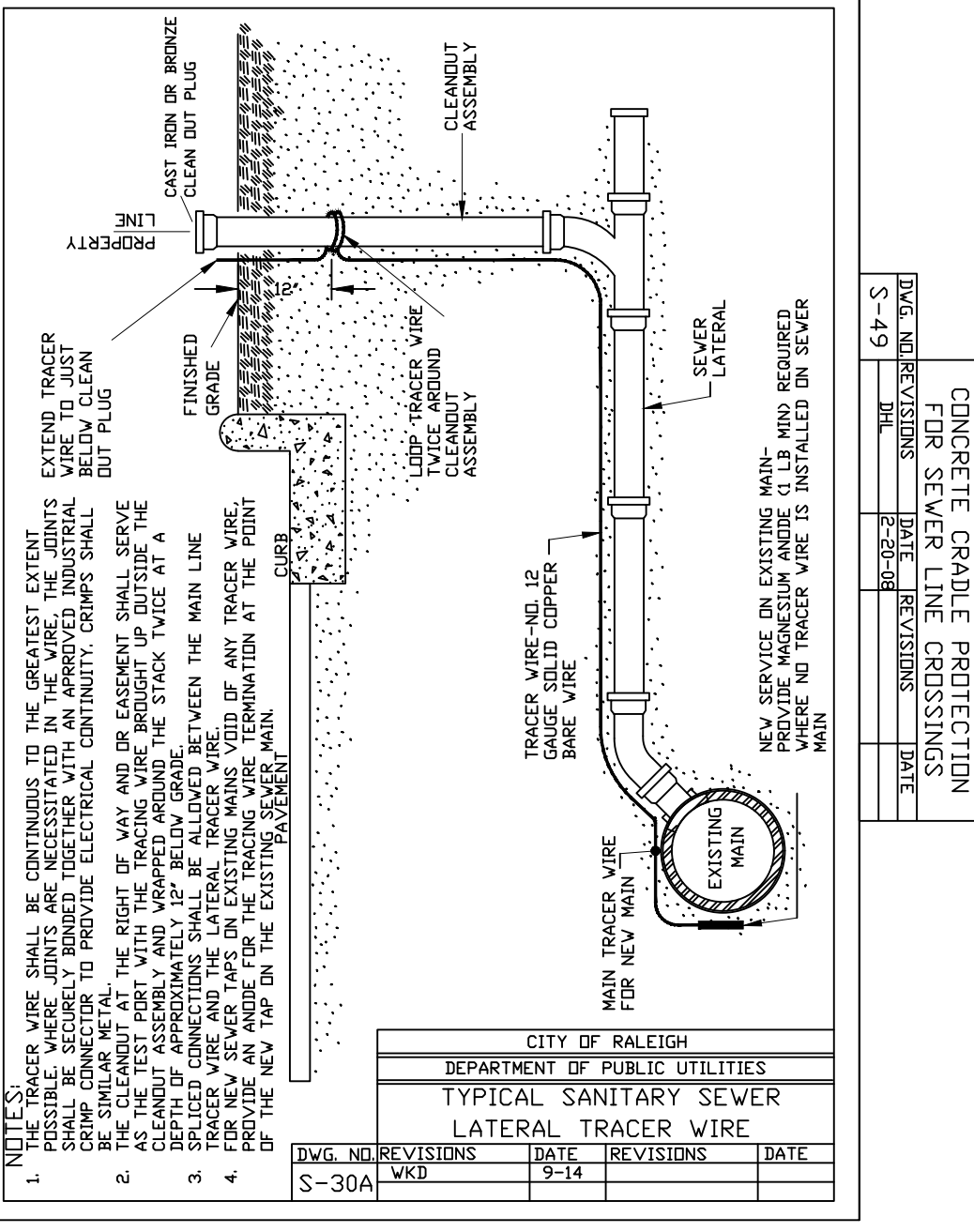
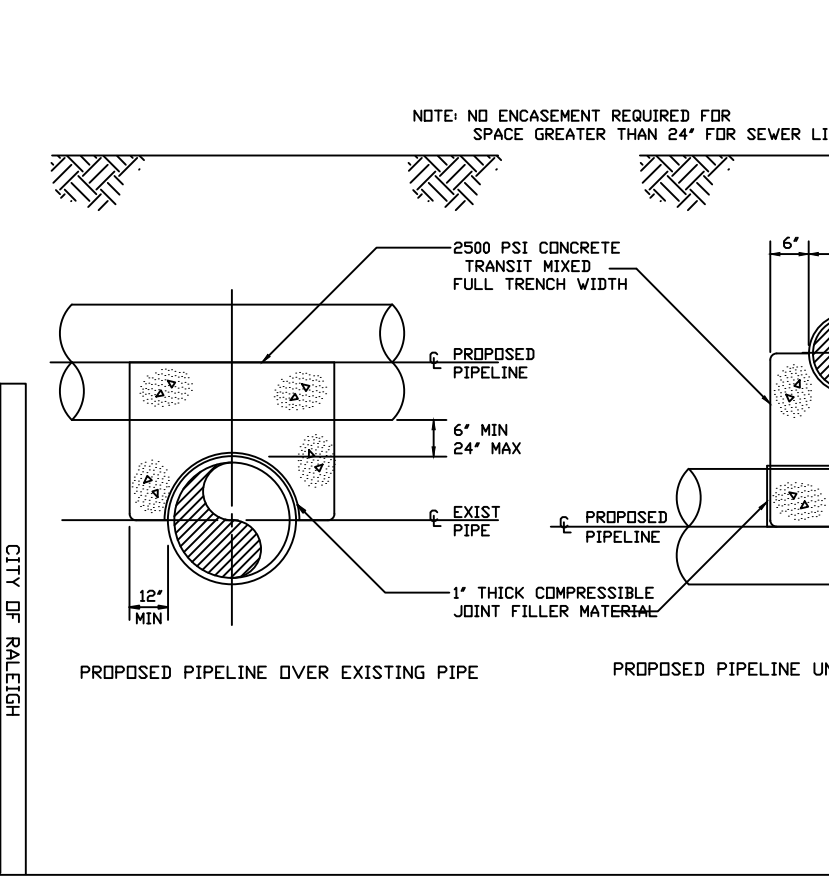
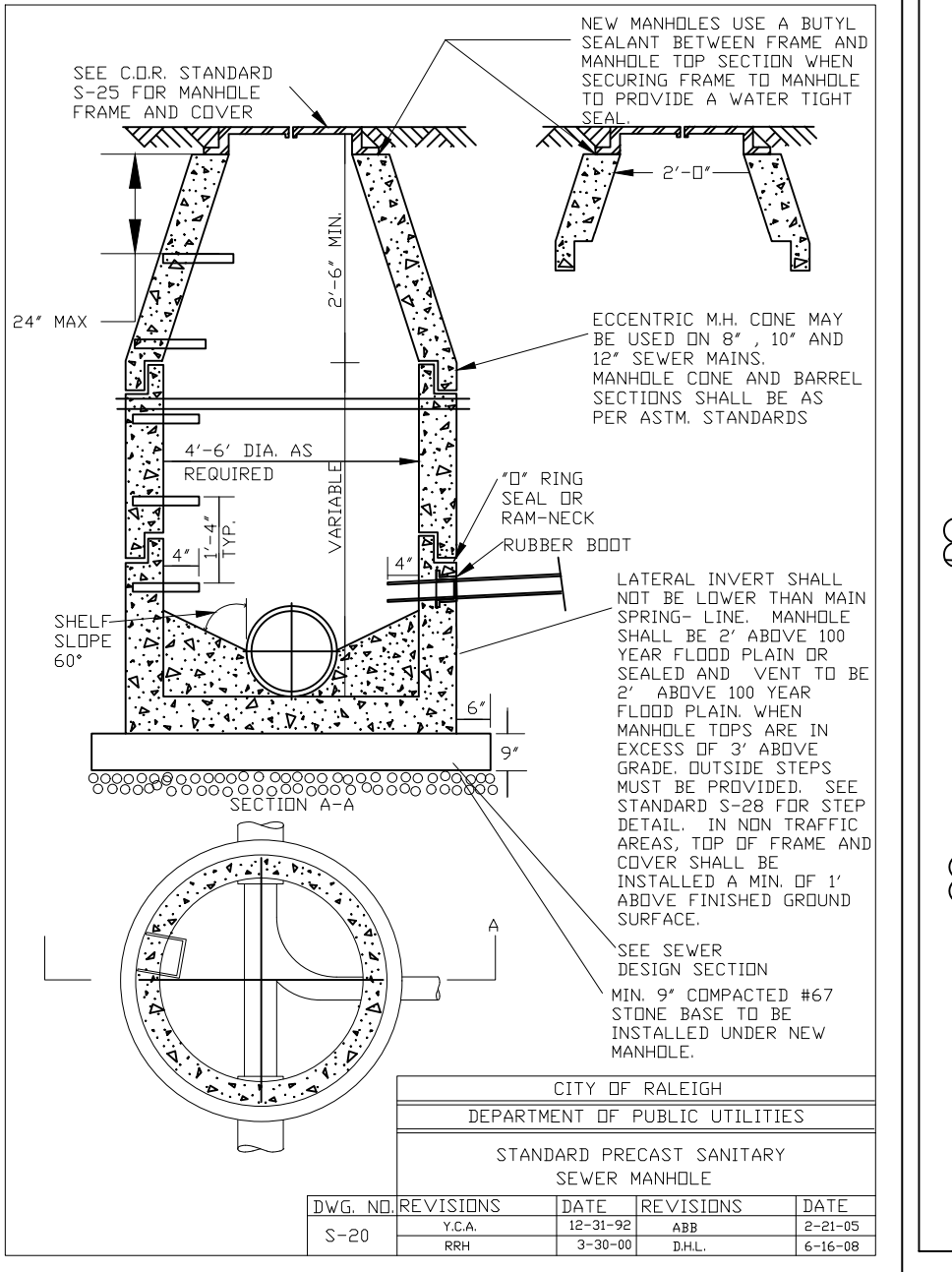
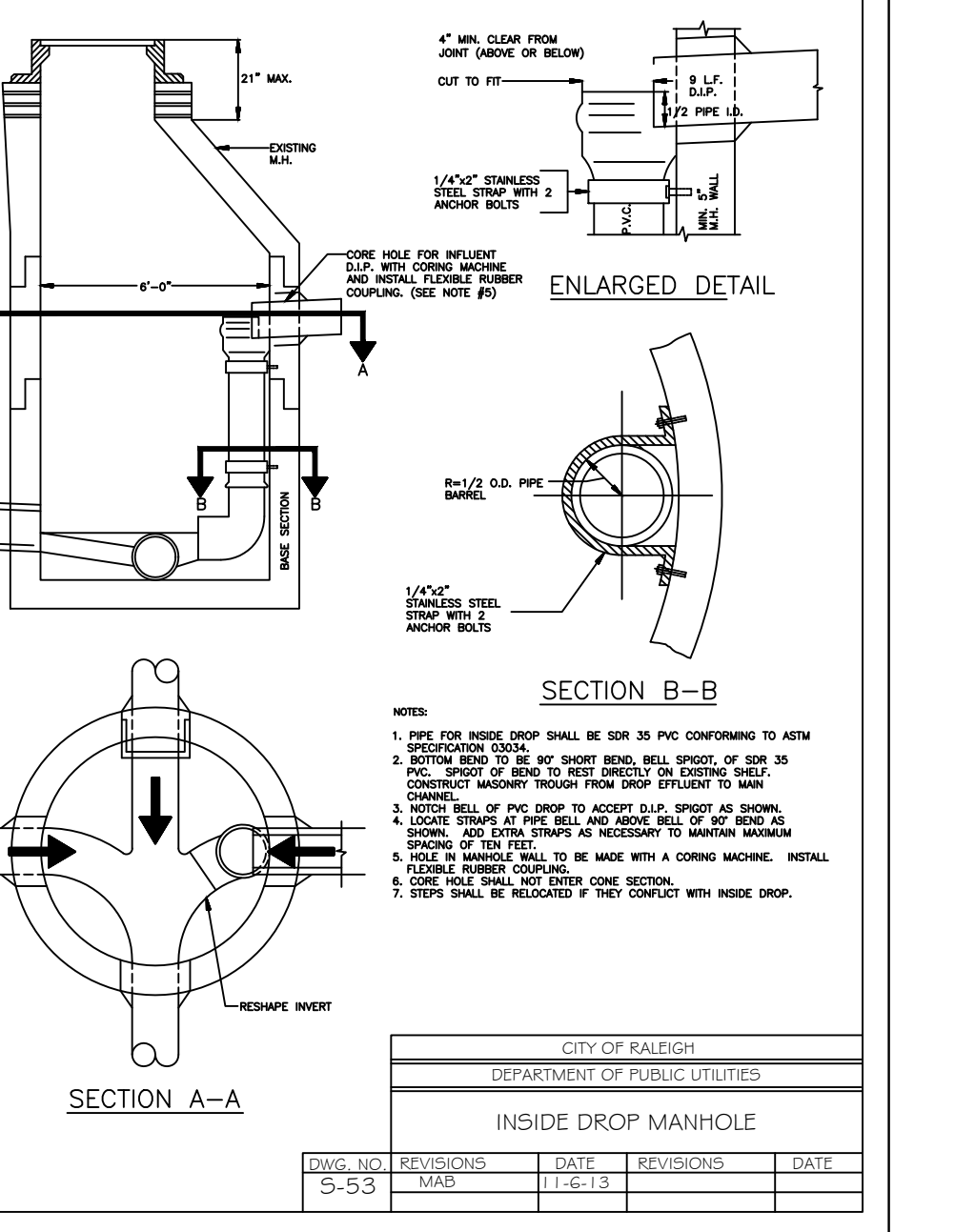
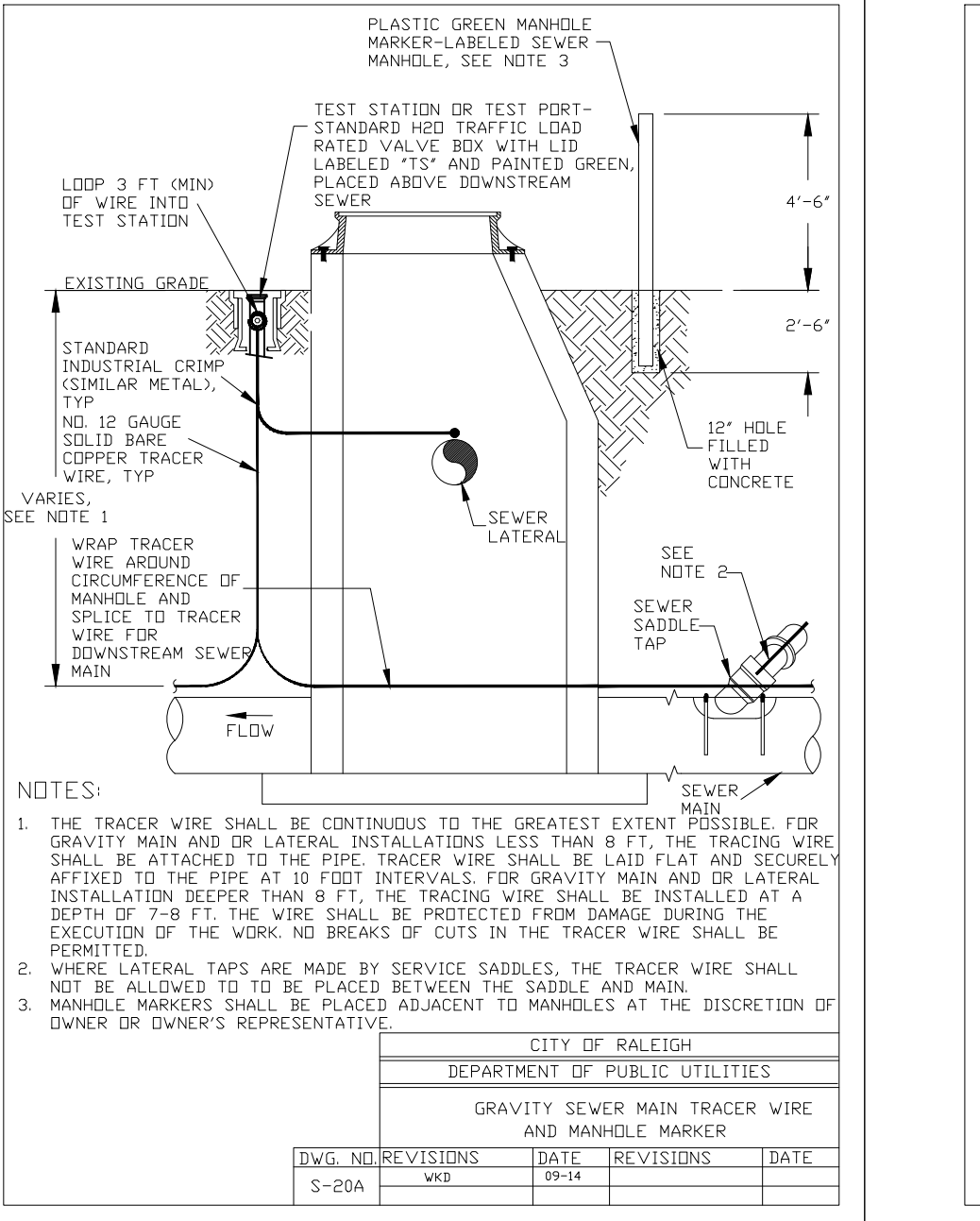
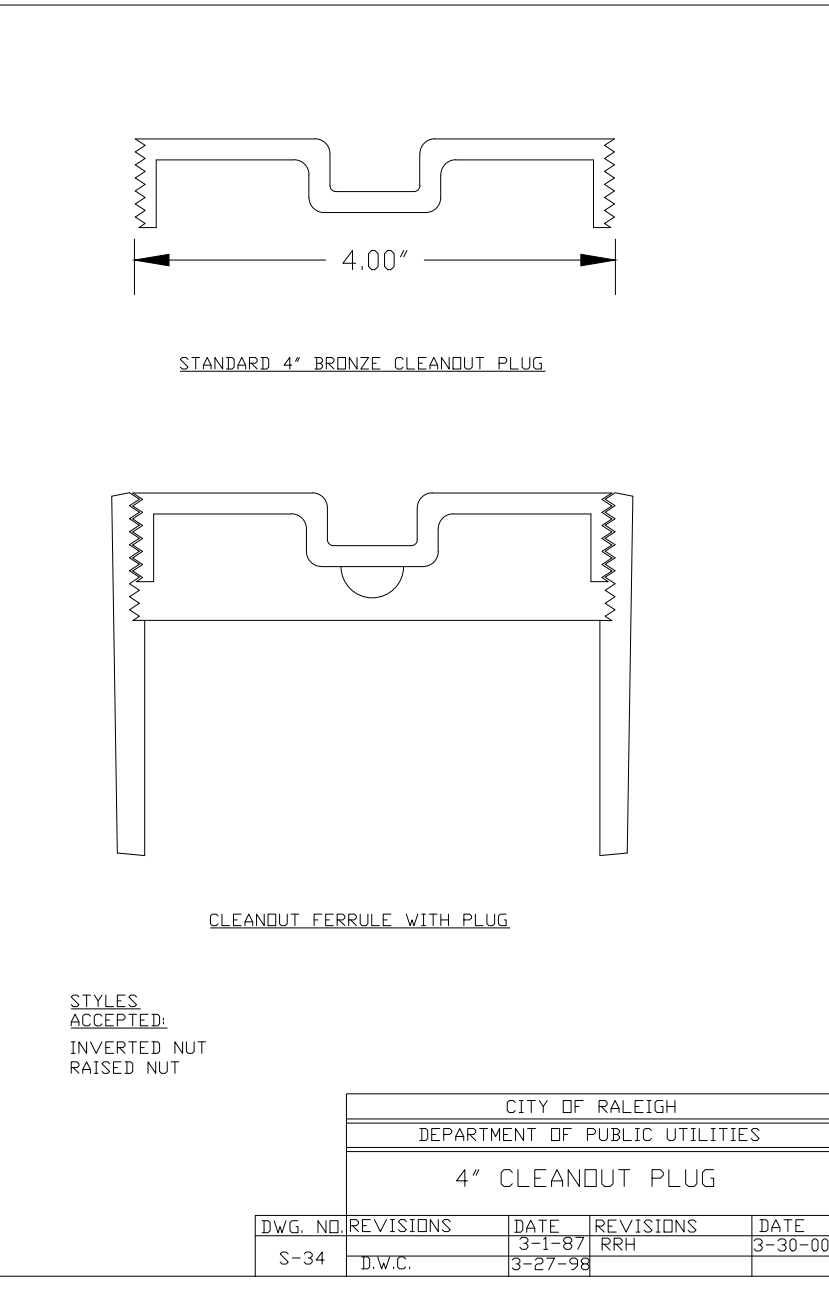
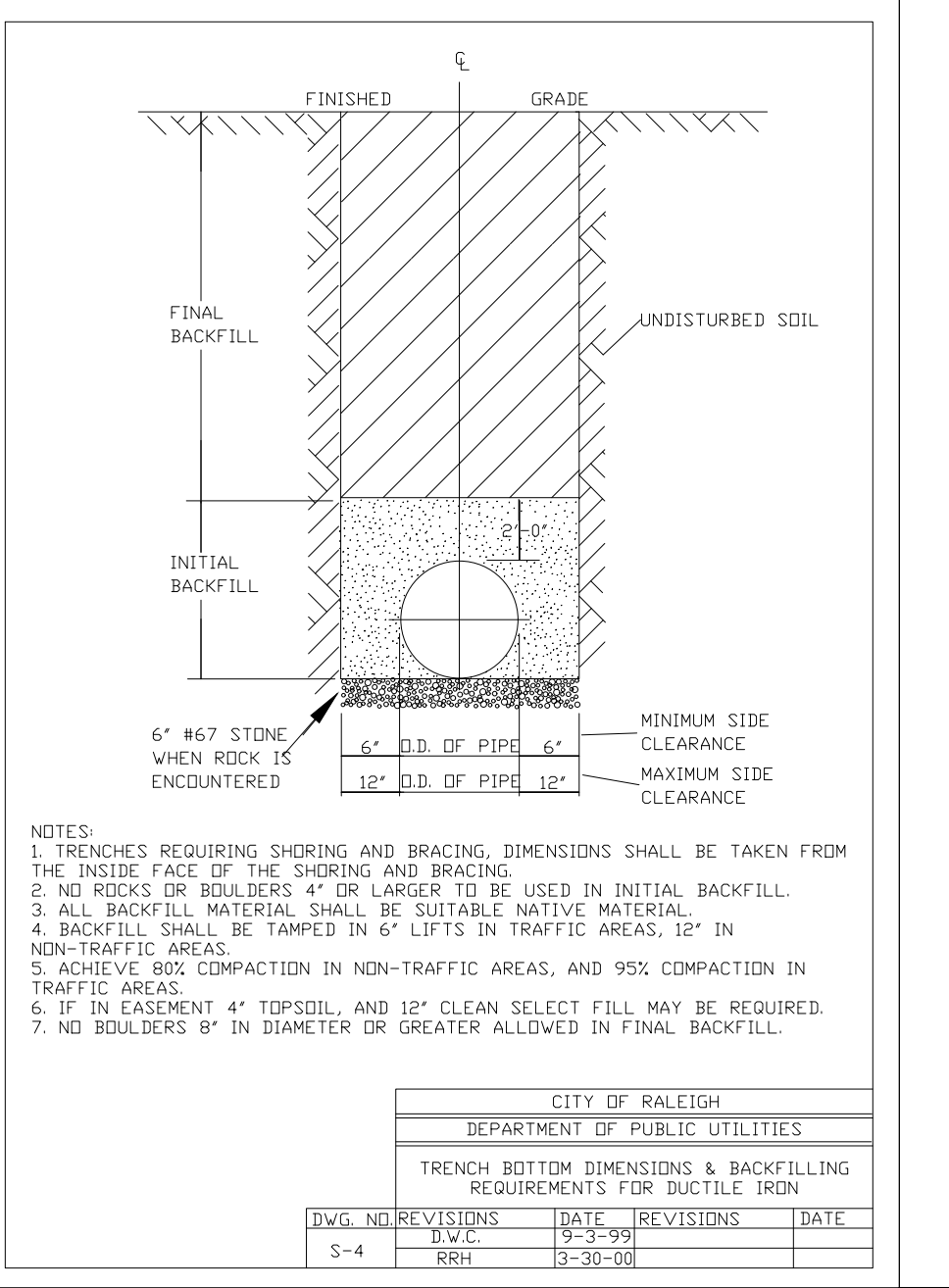
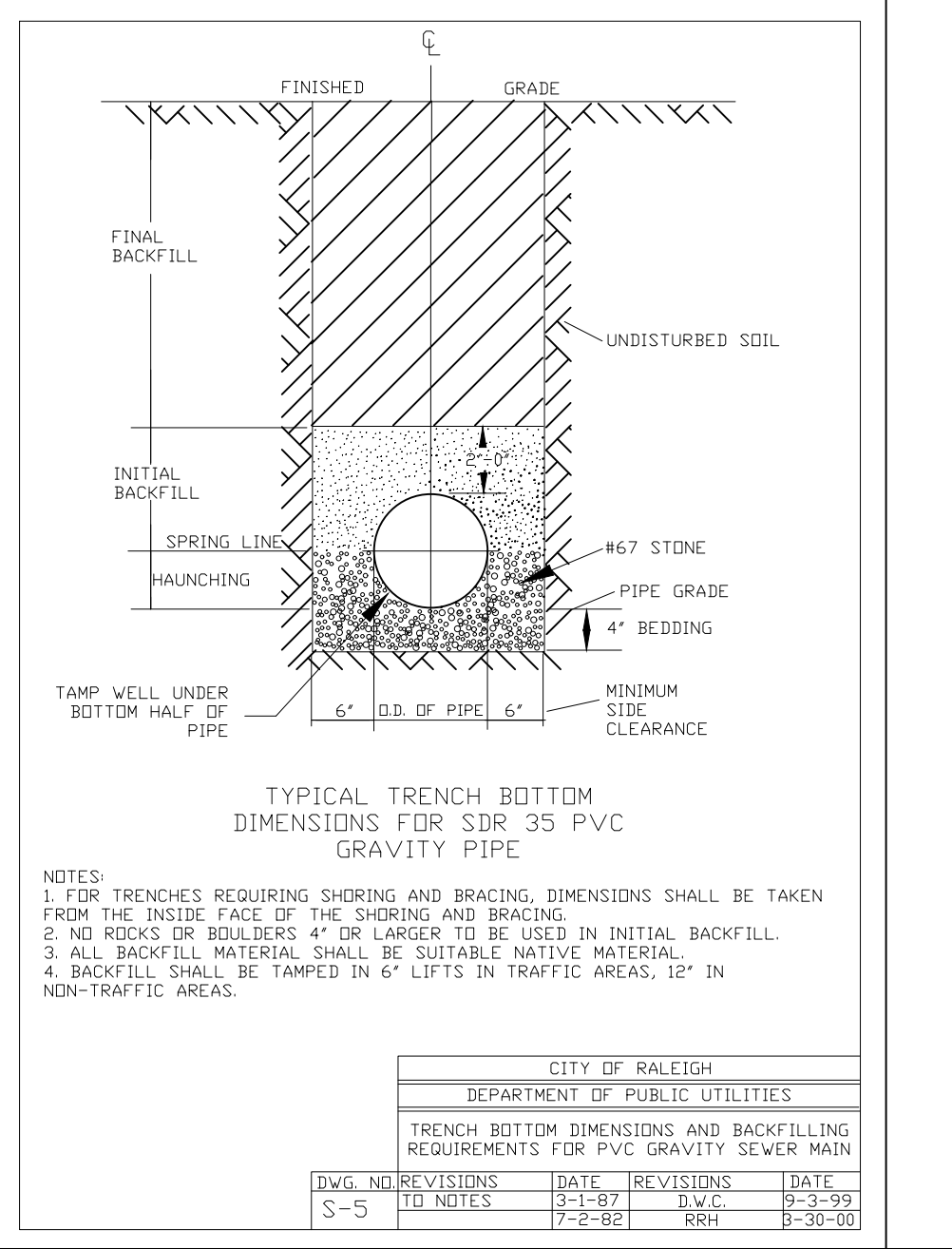
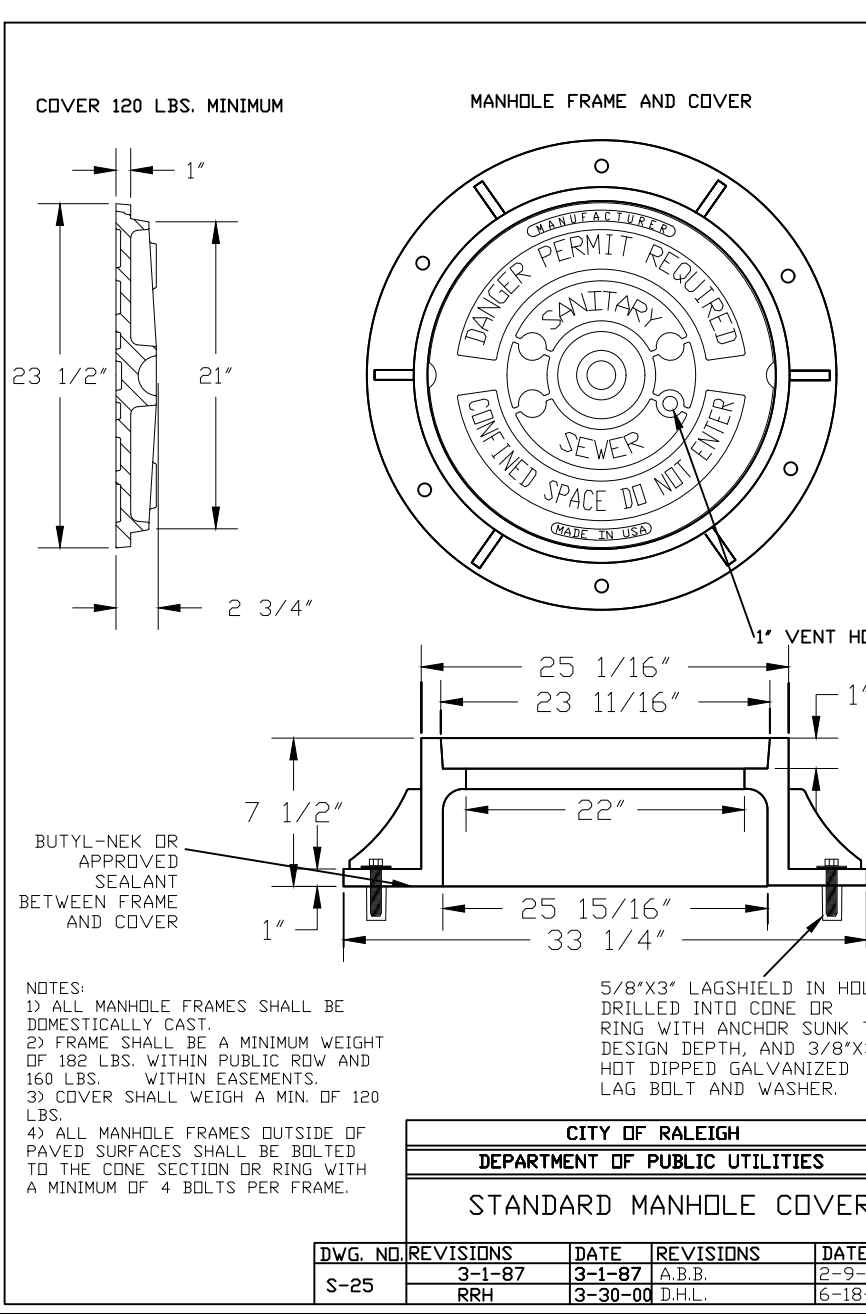
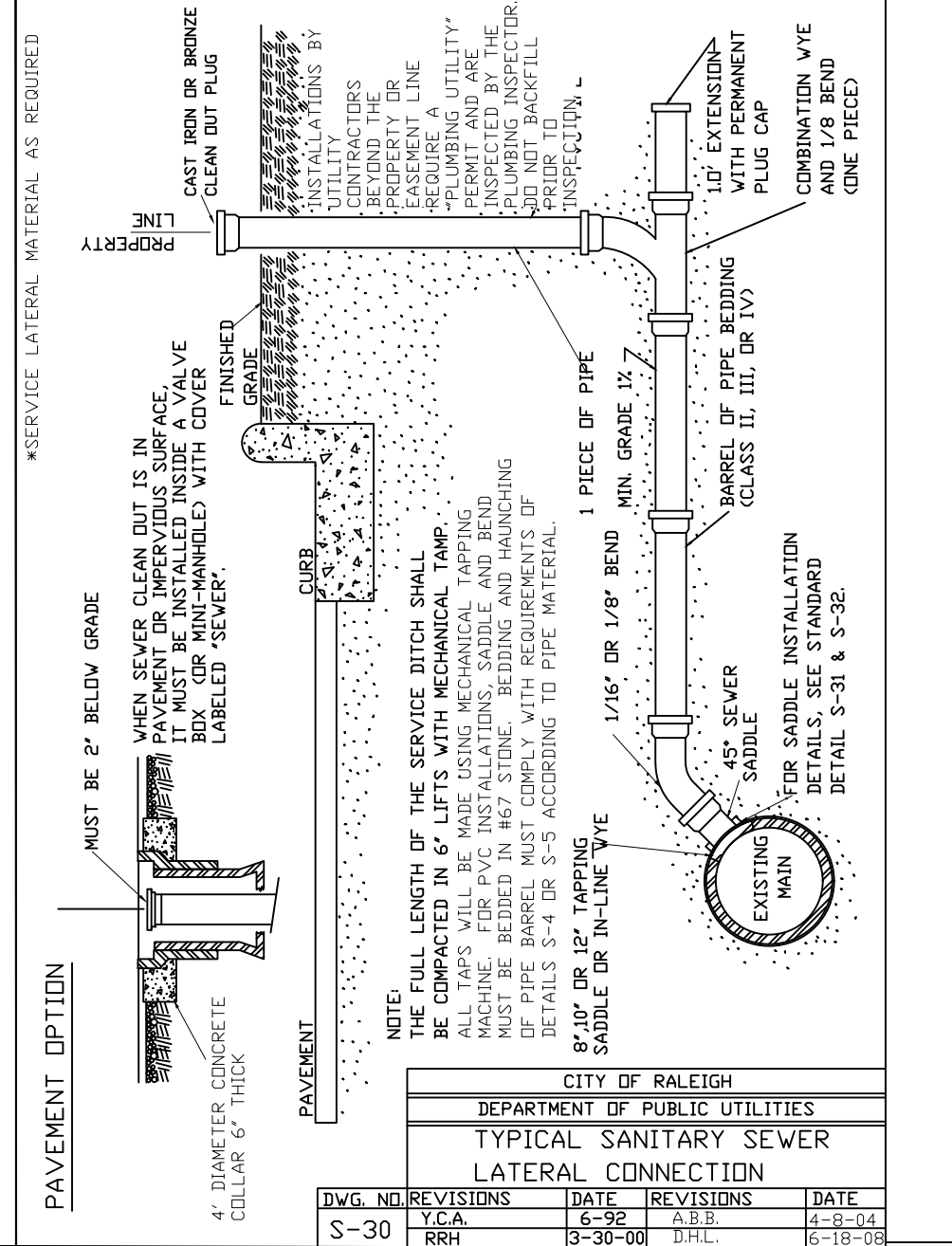
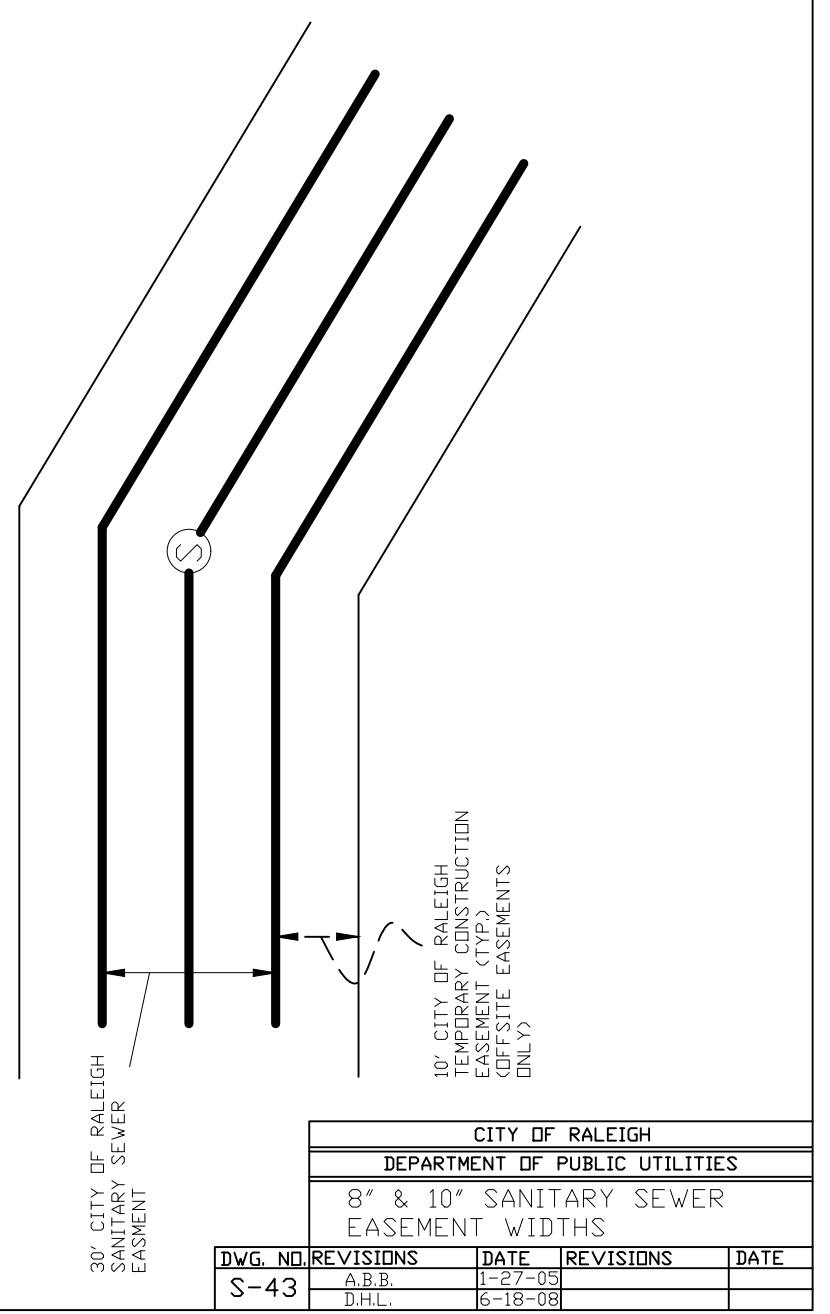
TRANSPORTATION SERVICES N/A  
PUBLIC UTILITIES  
STORMWATER N/A  
PLANNING N/A  
FIRE N/A  
URBAN-FORESTRY N/A

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.

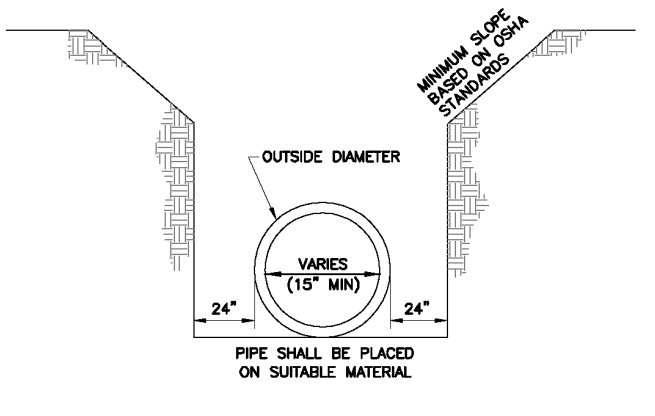
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR



- NOTES:**
- A MINIMUM OF 2" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL. BACKFILL OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 8" UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO BE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED AND PLACE.
  - ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTION DENSITY OF AT LEAST 90% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
  - THE FINAL 2" OF BACKFILL MATERIAL SHALL BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
  - ALL TRENCHING OPERATIONS SHALL MEET OSHA STANDARDS.
  - BACKFILL MATERIAL BENEATH ROADWAY SHALL BE SELECT BACKFILL MATERIAL.

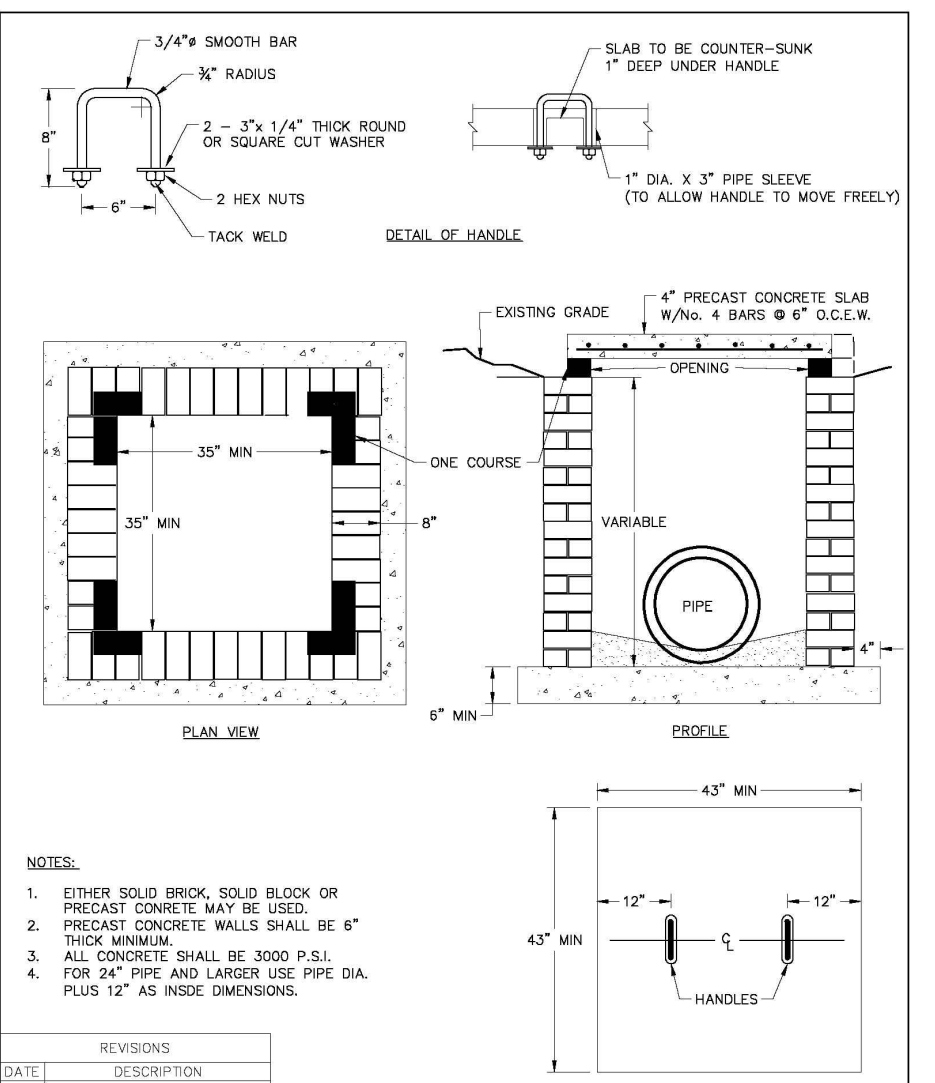


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

TRENCH FOR STORM DRAIN PIPES

5.02

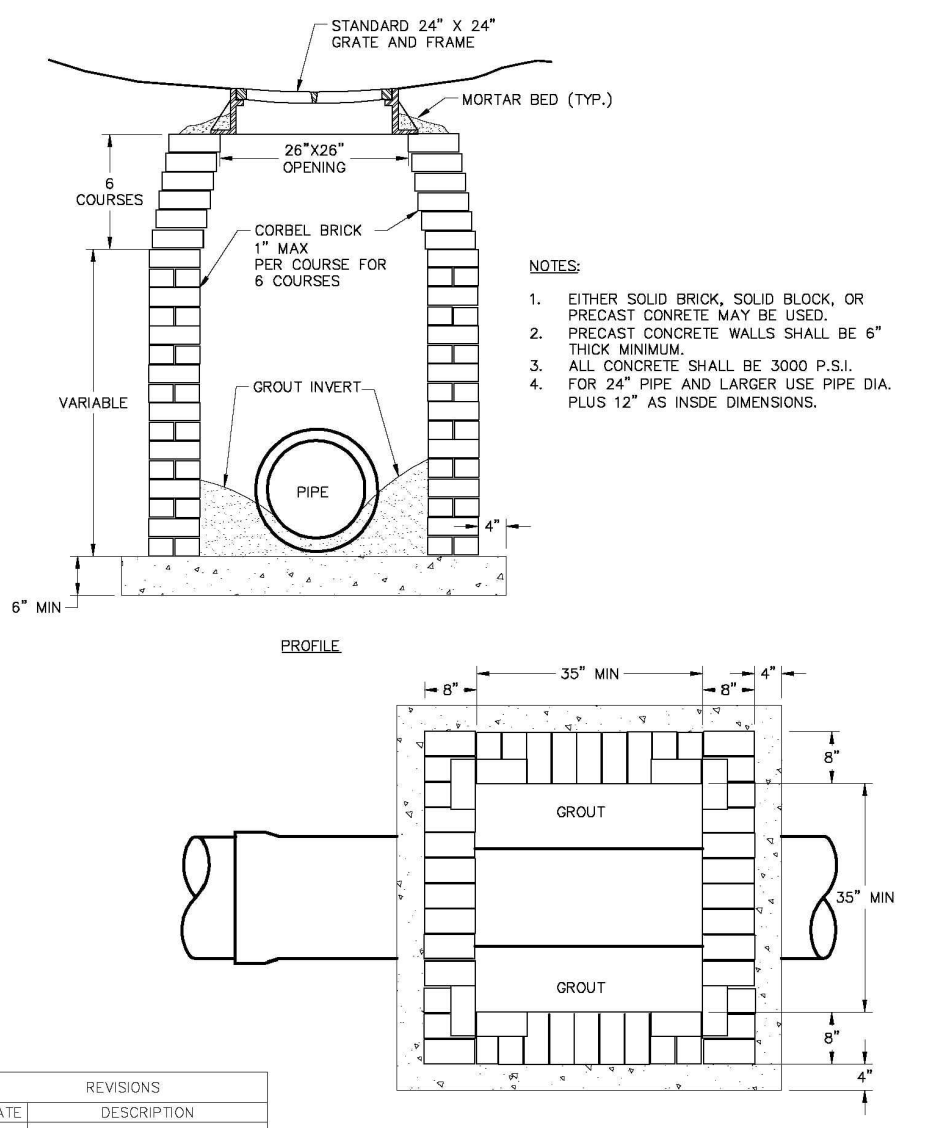


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD YARD INLET WITH CONCRETE SLAB

5.03

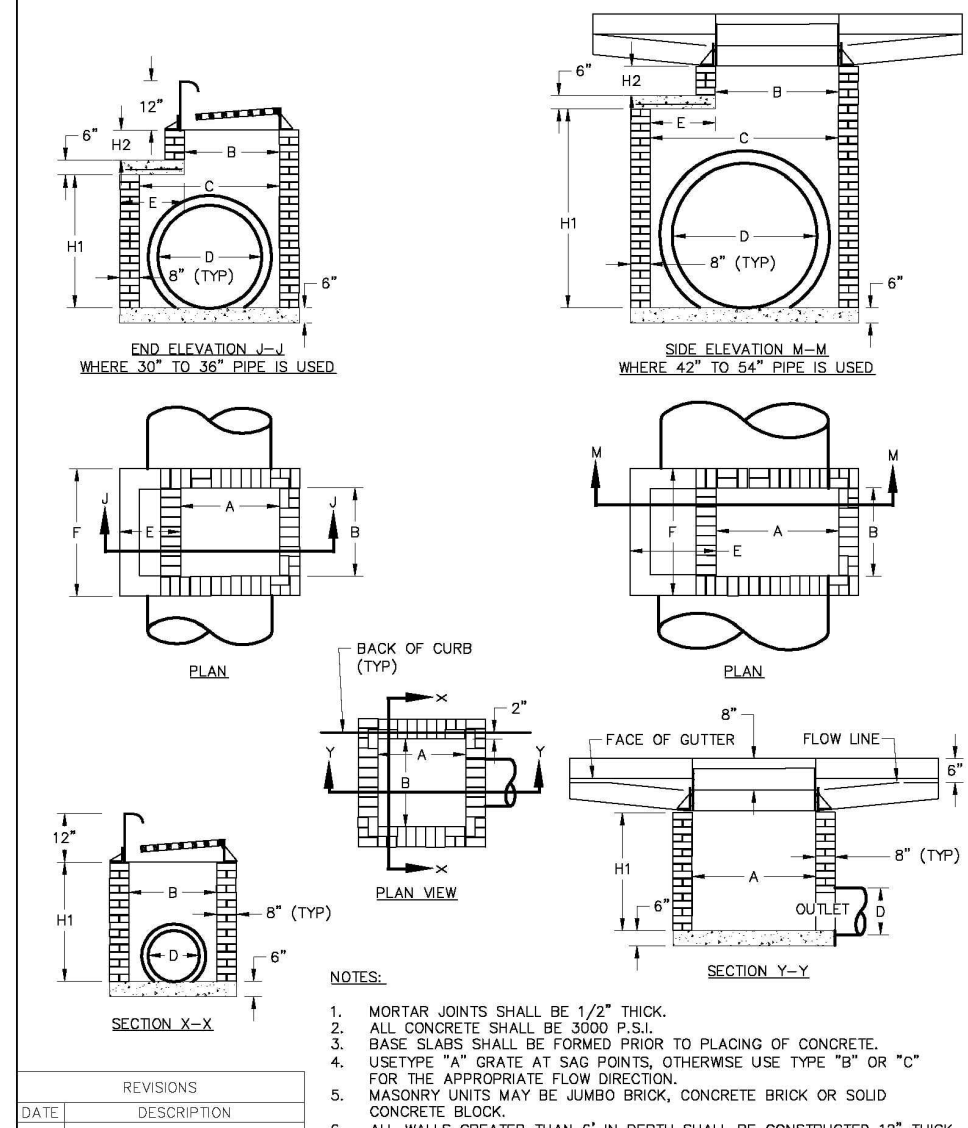


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD DROP INLET WITH GRATE AND FRAME

5.04

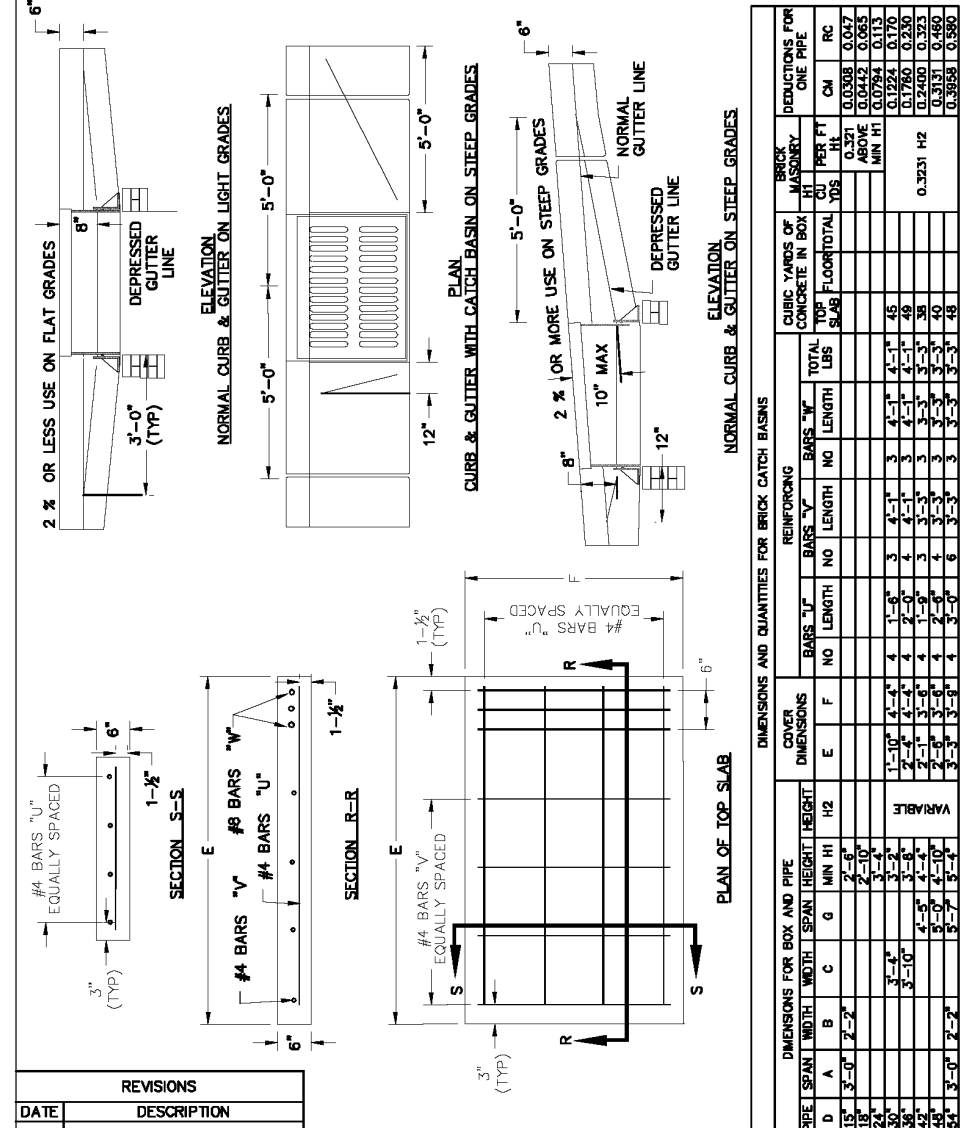


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD CURB INLET

5.05

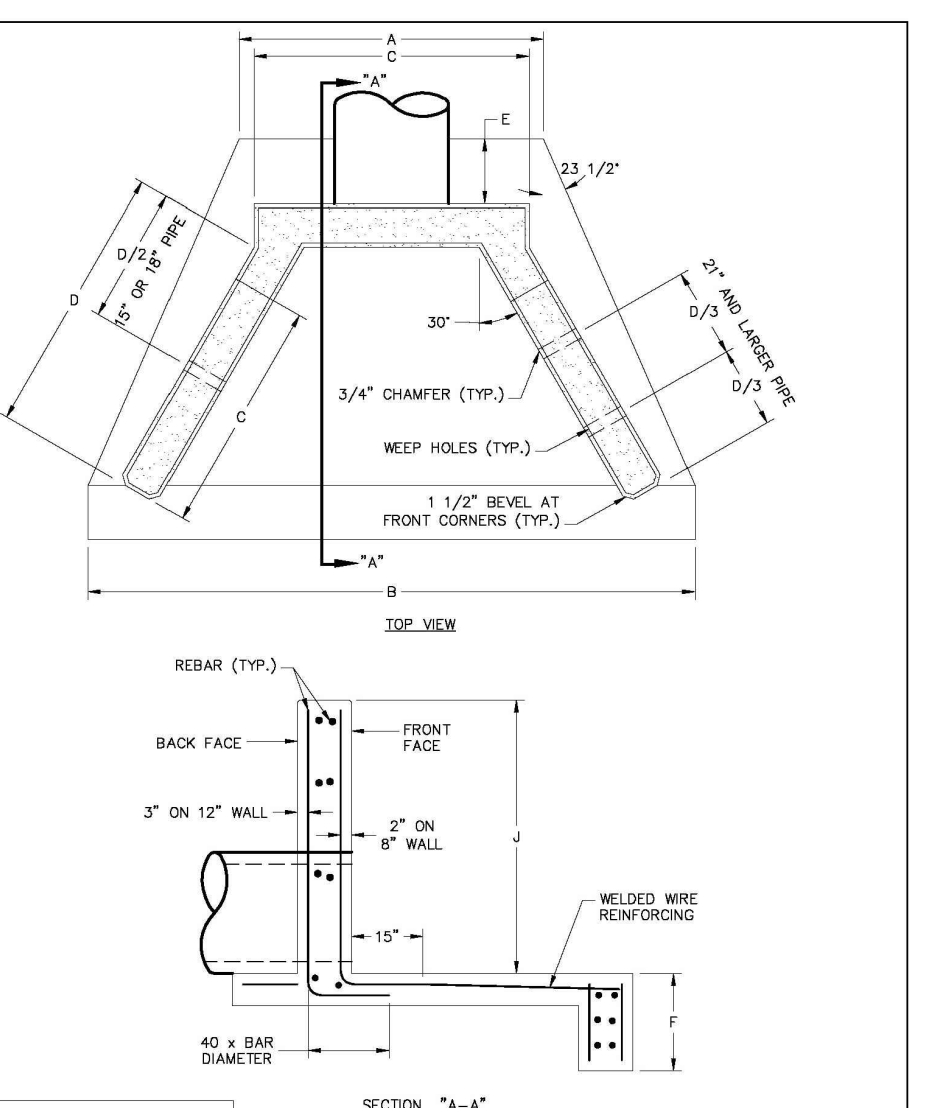


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD CURB INLET

5.05

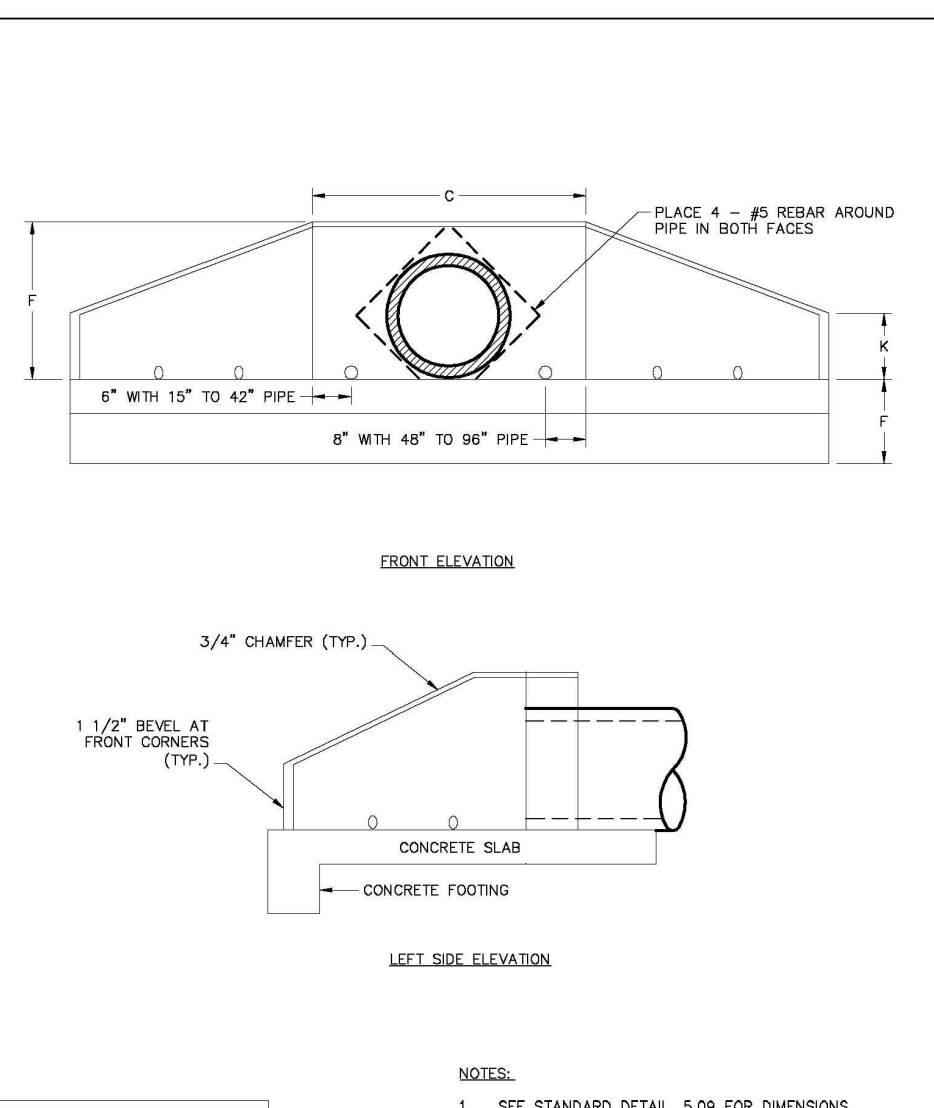


DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS

5.06



DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS

5.06

PIPE SIZE	MINIMUM HEADWALL HEIGHT	MINIMUM HEADWALL LENGTH	MINIMUM HEADWALL WIDTH	MINIMUM HEADWALL THICKNESS	MINIMUM HEADWALL REINFORCEMENT	MINIMUM HEADWALL FINISH
12"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
15"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
18"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
21"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
24"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
30"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
36"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
42"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
48"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
54"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
60"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
66"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
72"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
78"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
84"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
90"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
96"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
102"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
108"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
114"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
120"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT

DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

DIMENSIONS FOR HEADWALL WITH WINGWALLS

5.09

PIPE SIZE	MINIMUM HEADWALL HEIGHT	MINIMUM HEADWALL LENGTH	MINIMUM HEADWALL WIDTH	MINIMUM HEADWALL THICKNESS	MINIMUM HEADWALL REINFORCEMENT	MINIMUM HEADWALL FINISH
12"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
15"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
18"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
21"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
24"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
30"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
36"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
42"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
48"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
54"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
60"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
66"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
72"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
78"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
84"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
90"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
96"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
102"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
108"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
114"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT
120"	4'-0"	10'-0"	12'-0"	12"	4 #4 @ 12" O.C.	1/2" GROUT

DATE	REVISIONS DESCRIPTION	STD. NO.

TOWN OF KNIGHTDALE  
STANDARD DETAILS

DIMENSIONS FOR HEADWALL WITH WINGWALLS

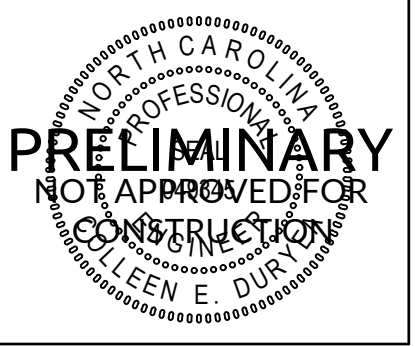
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TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR



Revisions

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# NCGO1-DETAIL GROUND STABILIZATION AND HANDLING PLAN

EFFECTIVE: 04/01/19

**GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCGO1 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 NCGO1 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.

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

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

**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/relocate 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/settle, 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.

# NCGO1-SELF INSPECTION, RECORDKEEPING & REPORTING

EFFECTIVE: 04/01/19

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING		
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&S 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 (SDOs)	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 as applicable.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&S measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

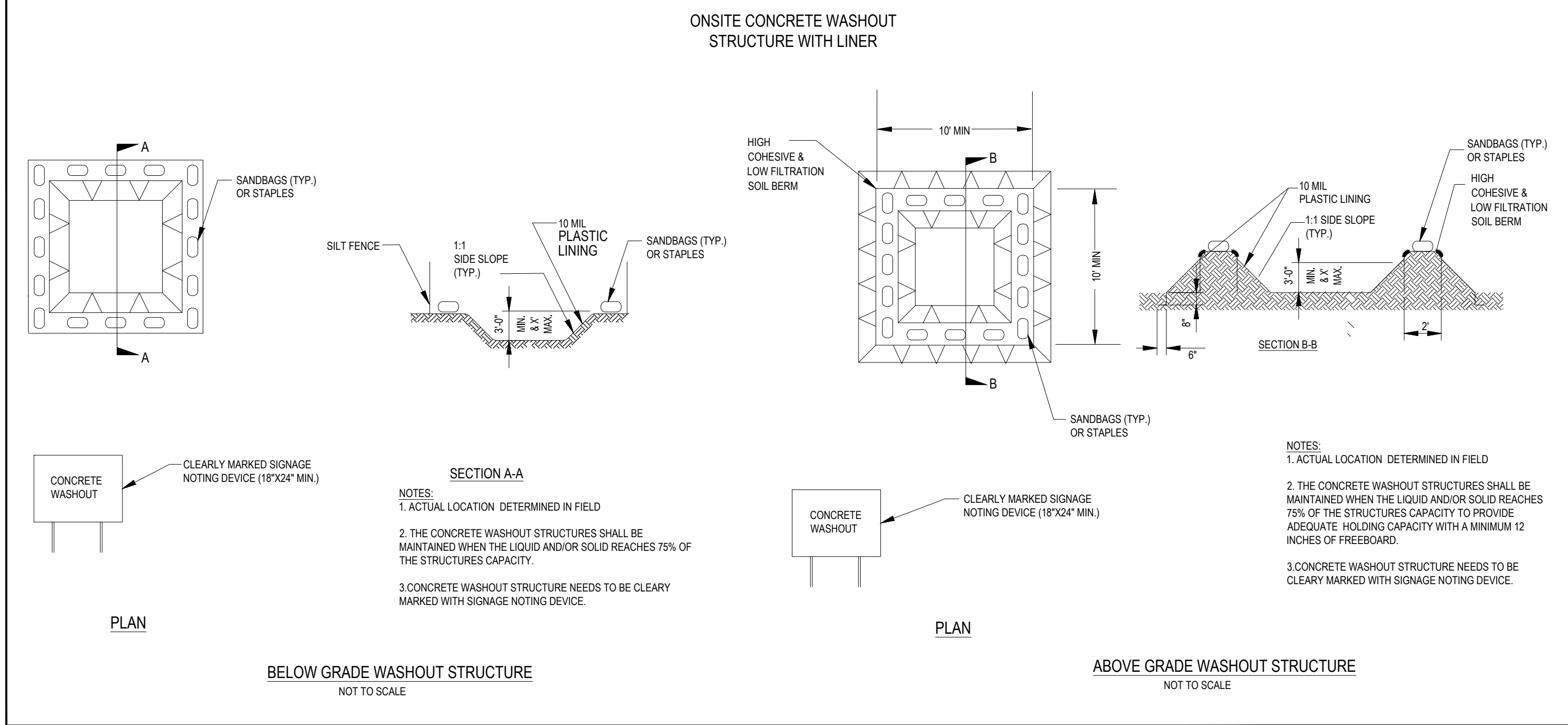
NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING	
Item to Document	Documentation Requirements
(a) Each E&S Measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&S Plan.	Initial and date each E&S Measure on a copy of the approved E&S Plan or complete, date and sign an inspection report that lists each E&S Measure shown on the approved E&S Plan. This documentation is required upon the initial installation of the E&S Measures or if the E&S Measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&S 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&S Plan.	Initial and date a copy of the approved E&S 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&S Measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&S Measures.	Initial and date a copy of the approved E&S Plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

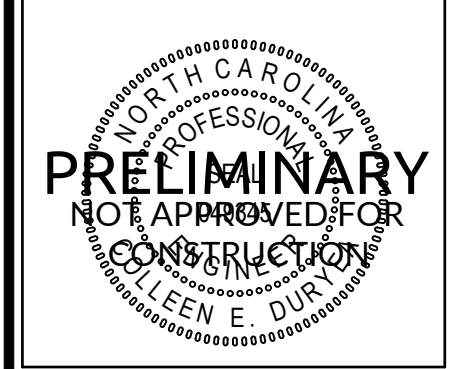
**2. Additional Documentation**  
In addition to the E&S Plan documents above, the following items shall be kept on the site and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make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

- This general permit as well as the certificate of coverage, after it is received.
- Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.
- All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING	
SECTION C: REPORTING	
<b>1. Occurrences that must be reported</b> Permittees shall report the following occurrences:	
(a) Visible sediment deposition in a stream or wetland.	<ul style="list-style-type: none"> <li>They are 25 gallons or more,</li> <li>They are less than 25 gallons but cannot be cleaned up within 24 hours,</li> <li>They cause sheen on surface waters (regardless of volume), or</li> <li>They are within 100 feet of surface waters (regardless of volume).</li> </ul>
(b) Oil spills if:	<ul style="list-style-type: none"> <li>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.</li> <li>Anticipated bypasses and unanticipated bypasses.</li> <li>Noncompliance with the conditions of this permit that may endanger health or the environment.</li> </ul>
<b>2. Reporting Timeframes and Other Requirements</b> After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.	
Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> <li><b>Within 7 calendar days</b>, 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.</li> <li>If the stream is named on the <a href="#">NC 303(d) list</a> 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.</li> </ul>
(b) Oil spills and release of hazardous substances per Item 3(b)-(c) above	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.</li> </ul>
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	<ul style="list-style-type: none"> <li><b>A report at least ten days before the date of the bypass, if possible.</b> The report shall include an evaluation of the anticipated quality and effect of the bypass.</li> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> </ul>
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	<ul style="list-style-type: none"> <li><b>Within 7 calendar days</b>, a report that includes an evaluation of the quality and effect of the bypass.</li> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> </ul>
(e) Noncompliance with the conditions of this permit that may endanger health or the environment [40 CFR 122.41(i)(7)]	<ul style="list-style-type: none"> <li><b>Within 7 calendar days</b>, 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 recurrence of the noncompliance. [40 CFR 122.41(i)(6).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>



Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

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: \_\_\_\_\_  
DEVELOPMENT SERVICES 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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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

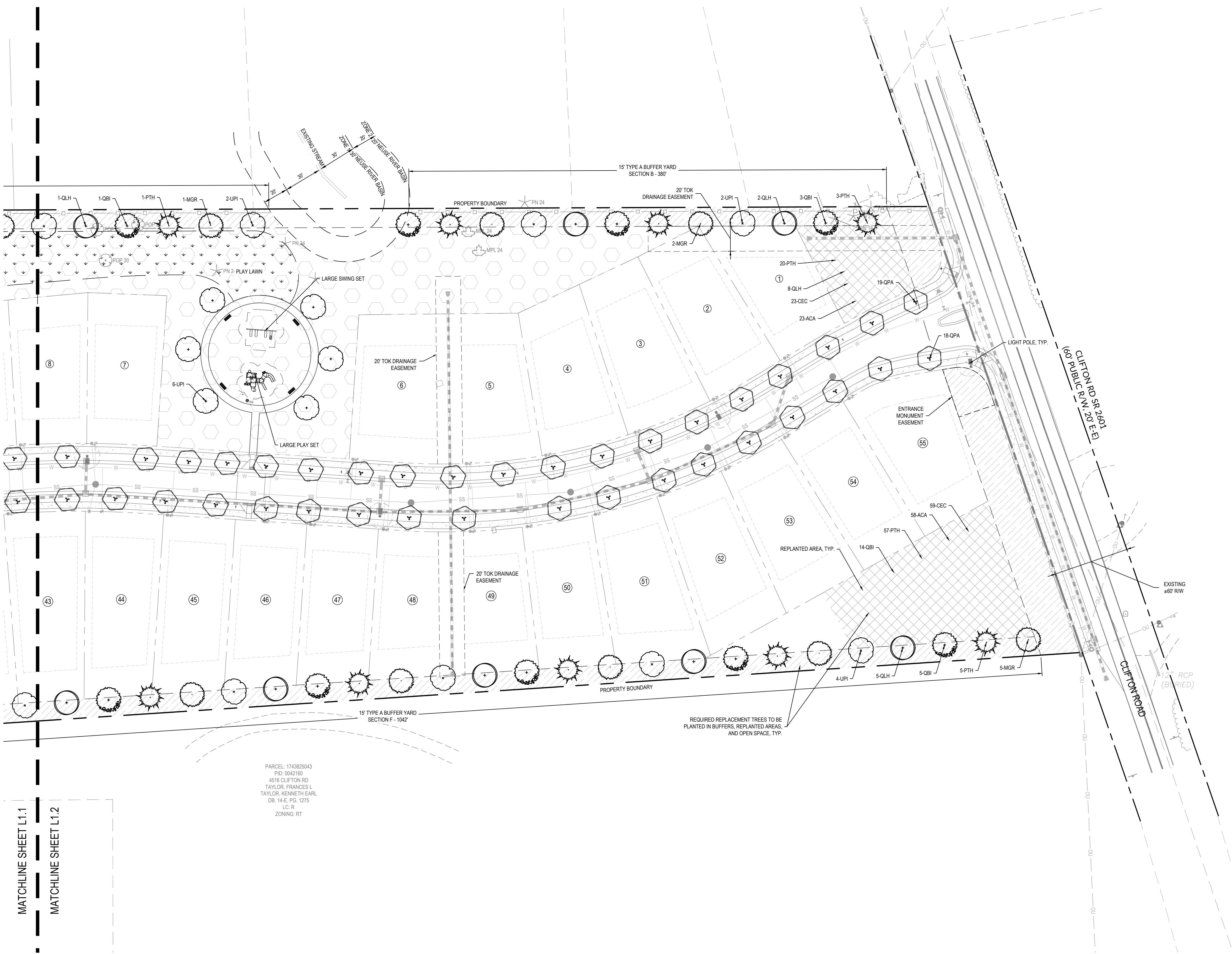
**LANDSCAPE PLAN**

Job No.	02190259	Drawn By	WR
Date	07/08/20	Designer	WR



Revisions

Sheet No.  
**L1.2**

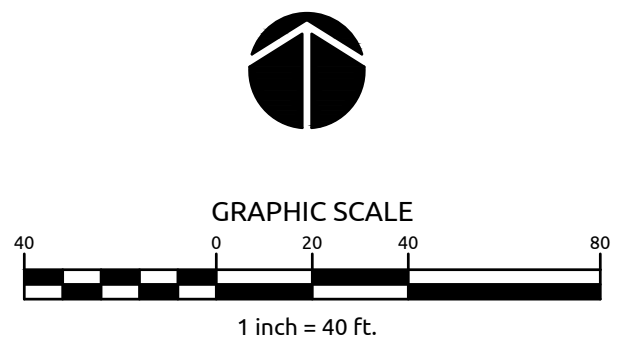
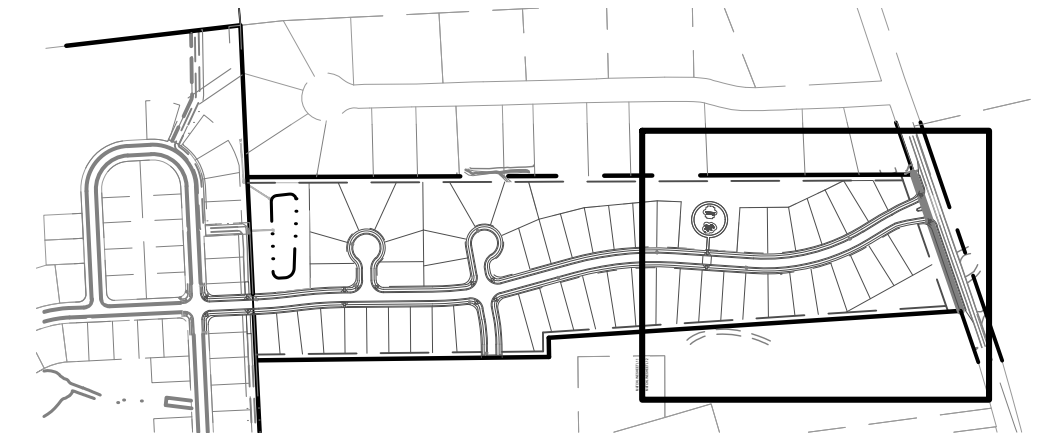


**PLANT SYMBOL KEY:**

	QPH - QUERCUS PHELLOS
	QLH - QUERCUS LYRATA
	QBI - QUERCUS BICOLOR
	ZSO - ZELKOVA SERRATA
	ARO - ACER RUBRUM
	MGR - MAGNOLIA GRANDIFLORA
	PTH - PINUS TAEDA
	UPI - ULMUS AMERICANA

**HATCH LEGEND**

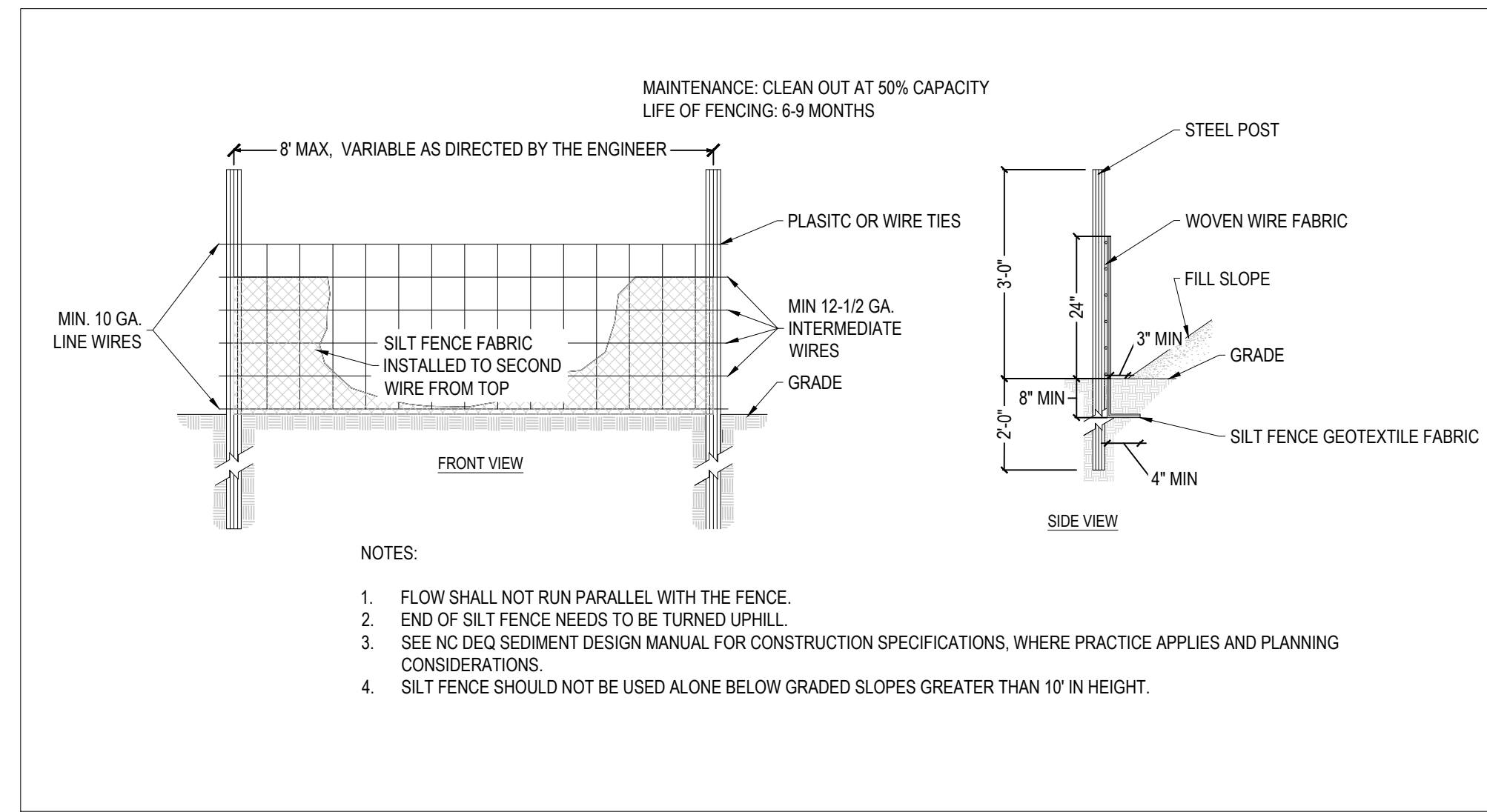
	BUFFER
	OPEN SPACE
	TREE CANOPY - REPLANTED AREA
	SEEDED LAWN
	SCM - SHALLOW LAND
	SCM - SHALLOW WATER



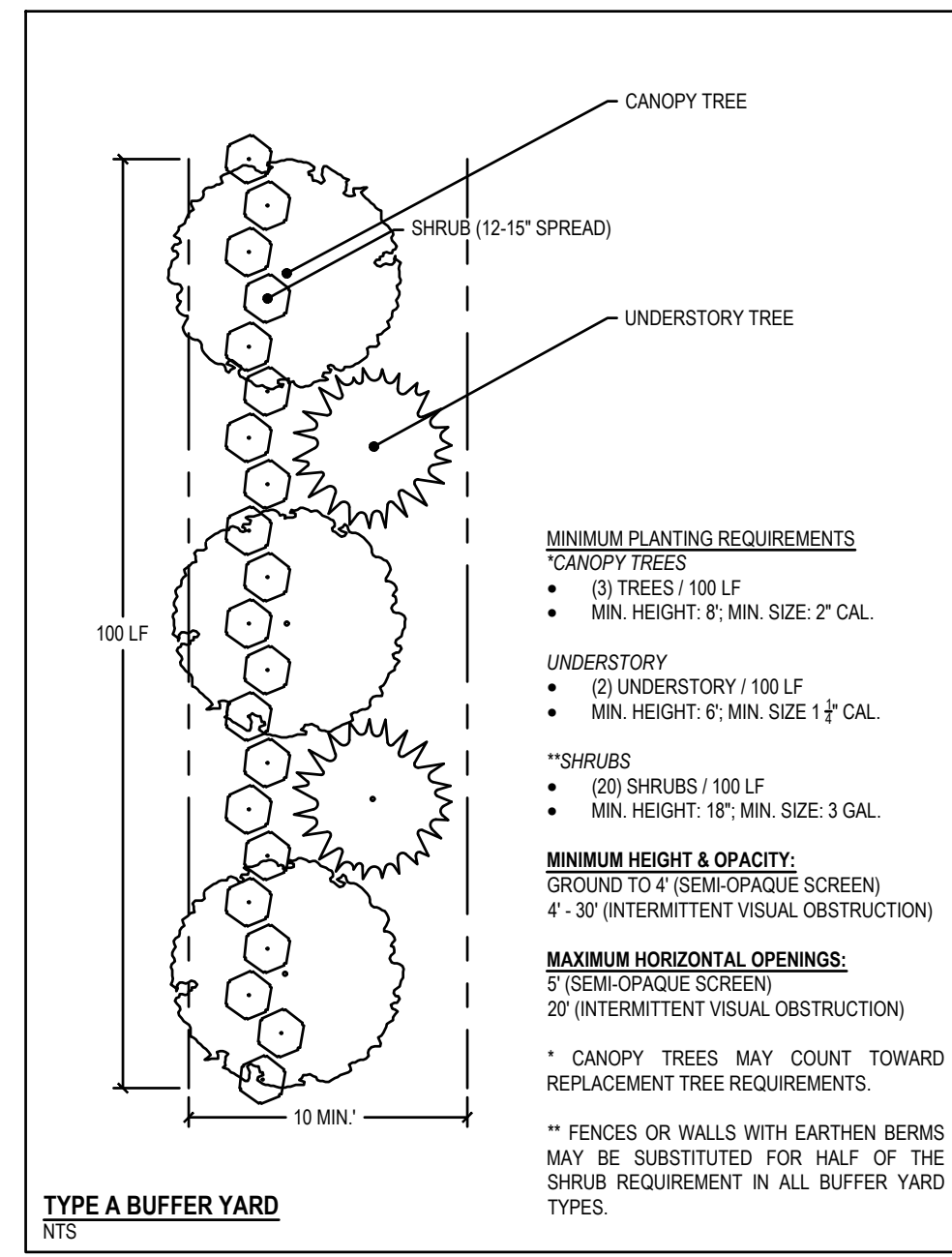
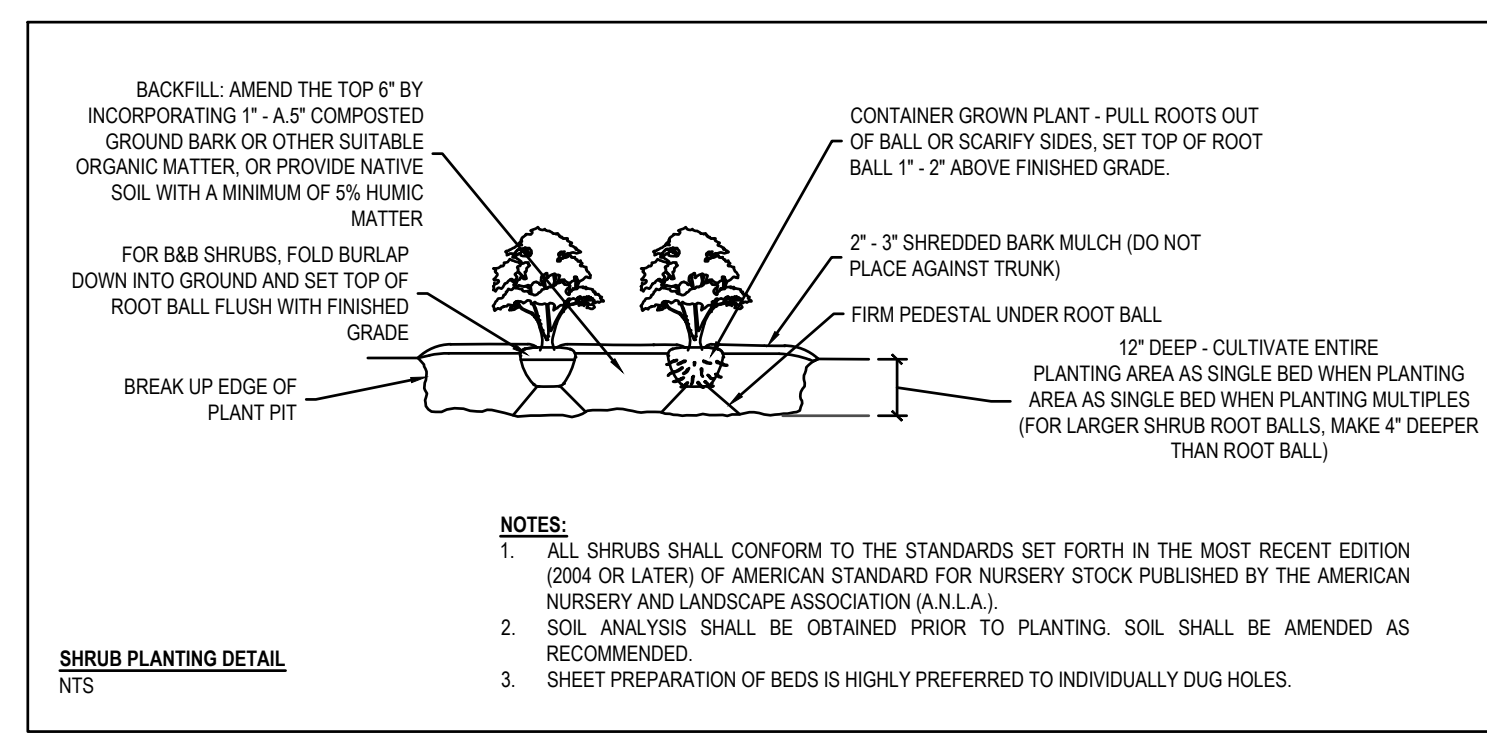
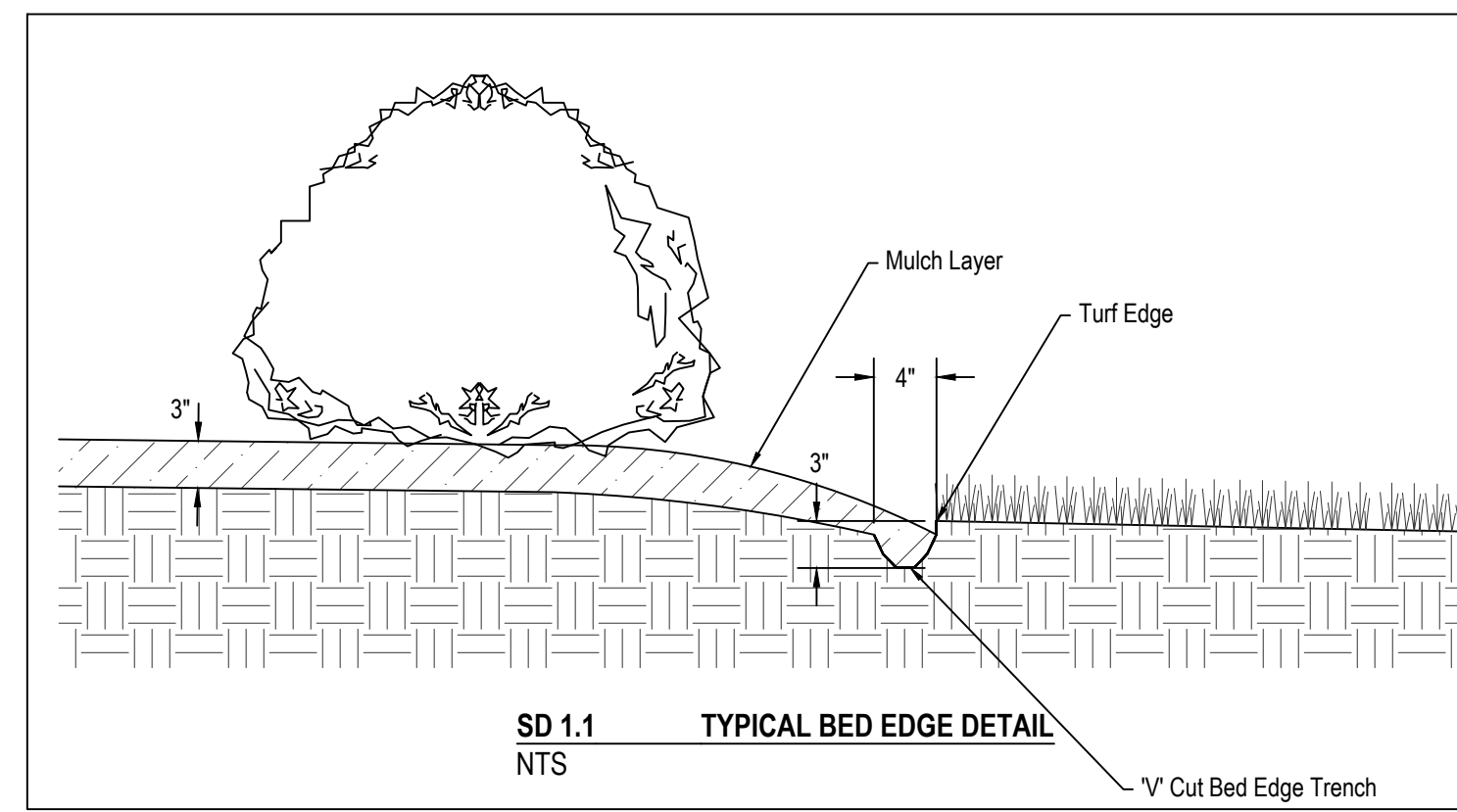
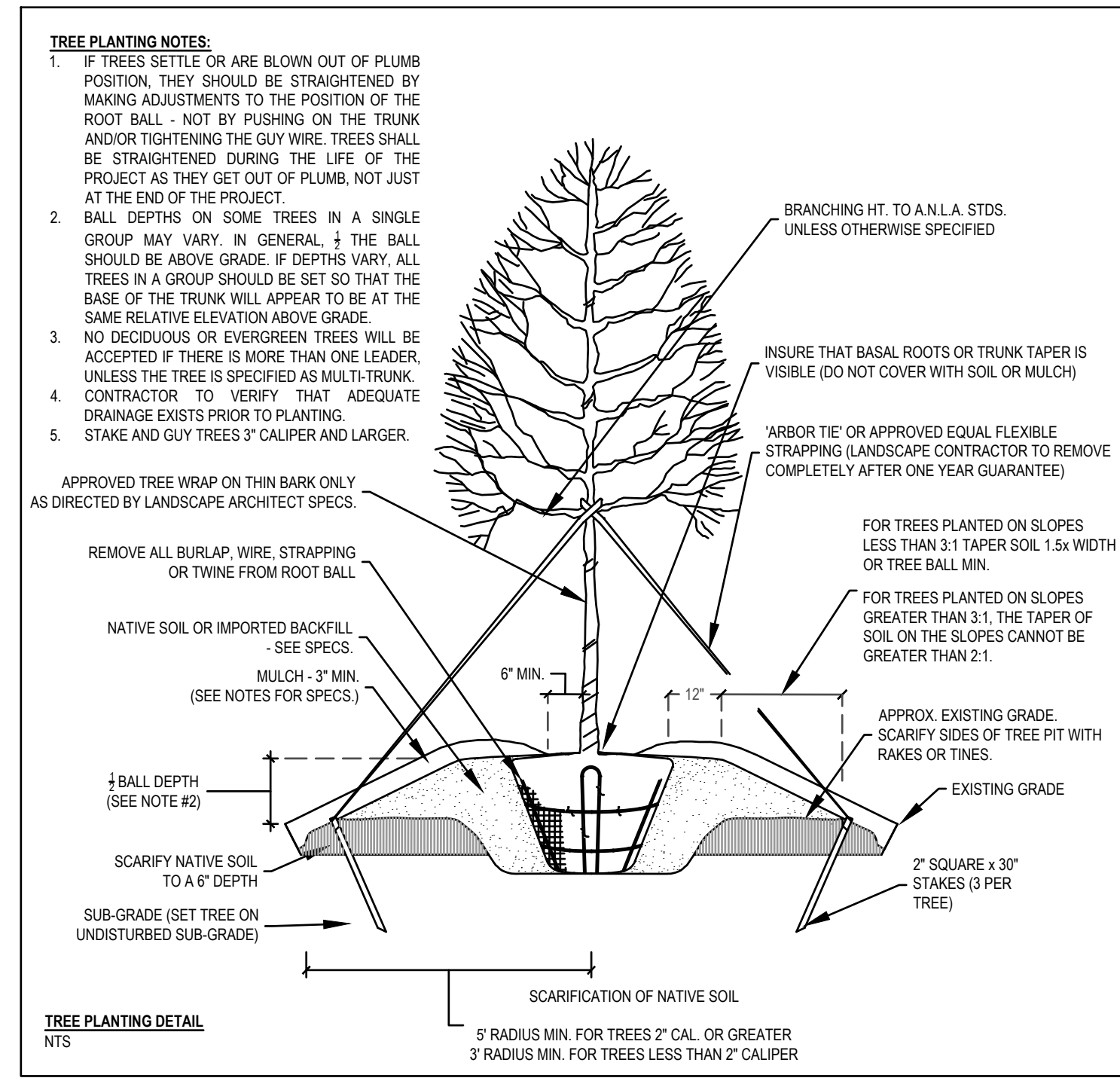
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TAYLOR, KENNETH EARL  
DB, 14-E, PG. 1275  
LC: R  
ZONING: RT

MATCHLINE SHEET L1.1  
MATCHLINE SHEET L1.2

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**TREE PROTECTION FENCE DETAIL**



**LANDSCAPE CALCULATIONS:**

**RESIDENTIAL LANDSCAPING:**

- 1 CANOPY TREE / 2,000 SF OF LOT AREA (OR A FRACTION THEREOF UP TO 20,000 SF)
- UTILITY EASEMENTS SHALL NOT BE INCLUDED IN LOT AREA
- NO EXISTING LARGE TREES MEASURING MORE THAN 6" DBH MAY BE COUNTED TOWARDS REQUIREMENT.
- FOUNDATION PLANTINGS CONSISTING OF EVERGREEN SHRUBS SHALL BE INSTALLED ALONG THE ENTIRE FOOTING WALL OF THE BUILDING (MIN. 2' HEIGHT AND 4" O.C.)

**STREET TREE PLANTINGS:**

- CANOPY TREES TO BE INSTALLED AT A MINIMUM AVERAGE DISTANCE OF 40' O.C. IN A PLANTING STRIP (MIN. WIDTH OF 5').
- WHERE OVERHEAD UTILITIES EXIST PRIOR TO DEVELOPMENT, UNDERSTORY TREES MAY BE SUBSTITUTED.
- STREET TREES SHALL BE PLACED AT LEAST 10' FROM LIGHT POLES AND 12' FROM ELECTRICAL TRANSFORMERS IN ORDER TO ALLOW THESE UTILITIES TO BE SAFELY SERVICED (UNDERSTORY TREES MAY BE PLACED WITHIN 5' OF SUCH DEVICES).
- STREET TREES SHALL BE DECIDUOUS HARDWOODS AND SHALL MEET THE CRITERIA SET FORTH IN PREVIOUS NOTES/DETAILS.

**ALL BERMS SHALL NOT EXCEED:**

- A SLOPE WITH MAXIMUM RISE OF ONE (1) FOOT TO A RUN OF THREE (3) FEET.
- A MAXIMUM HEIGHT OF FOUR (4) FEET AND
- A MINIMUM TOP OF BERM WIDTH OF TWO (2) FEET.

**BERMS SHALL BE STABILIZED WITH A GROUND COVER OR OTHER SUITABLE VEGETATION OR PERMANENT SLOPE RETENTION DEVICE.**

- BERMS TALLER THAN FOUR (4) FEET SHALL BE APPROVED BY THE ADMINISTRATOR ON A CASE BY CASE BASIS, BUT SHALL CONFORM TO THE SLOPE AND WIDTH RESTRICTIONS AS PREVIOUSLY DETAILED.

**TREE REPLACEMENT QUANTITY CALCULATIONS:**

TOTAL TREE REPLACEMENT REQUIRED	= 150
40% EVERGREEN PROVIDED	= 60
60% DECIDUOUS PROVIDED	= 90

**TREE REPLANTING AREA CALCULATIONS:**

11,724 SF	3 CANOPY TREES / 500 SF = 71 REQUIRED
5 UNDERSTORY TREES / 500 SF = 117 REQUIRED	

**15' TYPE A BUFFER SECTIONS:**

**SECTION A - W/8' PRIVACY FENCE** = 1211 LF

CANOPY TREES (3 PER 100 LF)	= 37
TOTAL TREES PROVIDED	= 31
UNDERSTORY TREES (6 PER 100 LF)	= 61
TOTAL UNDERSTORY TREES PROVIDED	= 57
*SHRUBS (10 PER 100 LF)	= 122
TOTAL SHRUBS PROVIDED	= 122

**SECTION B - W/6' PRIVACY FENCE** = 380 LF

CANOPY TREES (3 PER 100 LF)	= 18
TOTAL TREES PROVIDED	= 12
UNDERSTORY TREES (6 PER 100 LF)	= 19
TOTAL UNDERSTORY TREES PROVIDED	= 18
*SHRUBS (10 PER 100 LF)	= 38
TOTAL SHRUBS PROVIDED	= 38

**SECTION C** = 586 LF

CANOPY TREES (3 PER 100 LF)	= 18
TOTAL TREES PROVIDED	= 18
UNDERSTORY TREES (6 PER 100 LF)	= 30
TOTAL UNDERSTORY TREES PROVIDED	= 118
*SHRUBS (10 PER 100 LF)	= 118
TOTAL SHRUBS PROVIDED	= 118

**SECTION D** = 122 LF

CANOPY TREES (3 PER 100 LF)	= 4
TOTAL TREES PROVIDED	= 4
UNDERSTORY TREES (6 PER 100 LF)	= 7
TOTAL UNDERSTORY TREES PROVIDED	= 25
*SHRUBS (10 PER 100 LF)	= 25
TOTAL SHRUBS PROVIDED	= 25

**SECTION E** = 49 LF

CANOPY TREES (3 PER 100 LF)	= 2
TOTAL TREES PROVIDED	= 2
UNDERSTORY TREES (6 PER 100 LF)	= 3
TOTAL UNDERSTORY TREES PROVIDED	= 10
*SHRUBS (10 PER 100 LF)	= 10
TOTAL SHRUBS PROVIDED	= 10

**SECTION F** = 1042 LF

CANOPY TREES (3 PER 100 LF)	= 32
TOTAL TREES PROVIDED	= 32
UNDERSTORY TREES (6 PER 100 LF)	= 53
TOTAL UNDERSTORY TREES PROVIDED	= 209
*SHRUBS (10 PER 100 LF)	= 209
TOTAL SHRUBS PROVIDED	= 209

\* 80% OF ALL NEW SHRUBS SHALL BE EVERGREEN  
MATURE HEIGHT = 6' HT.  
INSTALLED SIZE = 18" HT.

**CANOPY TREE SUMMARY:**

CANOPY TREES REQUIRED FOR STREET TREES	= 99
CANOPY TREES REQUIRED FOR REPLANTING AREA	= 99
CANOPY TREES REQUIRED FOR TYPE A BUFFER	= 105
TOTAL CANOPY TREES REQUIRED	= 303
PROVIDED	= 307

2.5" CALIBER REPLACEMENT TREES REQUIRED = 150  
2" CALIBER TREES REQUIRED = 153

**TREE PROTECTION CALCULATIONS**

	TOTAL TREES	12'-23.9" DBH	24'-35.9" DBH	36'-47.9" DBH	48'-59.9" DBH	60'-71.9" DBH	REPLACEMENT TREES NEEDED*
TER 1	27	23	4	0	0	0	31
TER 2	90	76	14	0	0	0	104
TER 3	7	0	6	1	0	0	15

\* PER TOWN UDO SECTION 8.5, REPLACEMENT TREES SHALL BE PLANTED AT A RATE OF 1 TREE PER 12' DBH.  
NOTE: 150 REPLACEMENT TREES WILL BE PLANTED IN PROPOSED BUFFER YARD LOCATIONS OR OPEN SPACE. SEE LANDSCAPE PLAN FOR BUFFER YARD PLANTING DETAIL.

**STREET TREE CALCULATIONS**

Street Name	Length (LF)	REQUIRED TREES 1 per 40 LF	PROVIDED TREES
R001	1624	82	82
R002	85	5	7
R003	222	12	13

**PLANT SCHEDULE: STREET TREES AND REPLANTED AREA TREES**

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
<b>CANOPY TREES</b>							
7	ARD	<i>Acer rubrum</i>	Red Maple	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
7	MGR	<i>Magnolia grandiflora</i>	Southern Magnolia	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
56	QPA	<i>Quercus phellos</i>	Willow Oak	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
7	UPI	<i>Ulmus americana</i>	Princeton Elm	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
26	ZSG	<i>Zelkova serata</i>	Japanese Zelkova	B&B	2" CAL. MIN.	6' HT. MIN.	MATCHED
54	PTH	<i>Pinus taeda</i>	Loblolly Pine	B&B	2" CAL. MIN.	6' HT. MIN.	REPLANTED AREA
<b>UNDERSTORY TREES</b>							
81	ACA	<i>Amelanchier canadensis</i>	Serviceberry	CONT.	1.25" CAL. MIN.	6' HT. MIN.	REPLANTED AREA
82	CEC	<i>Cercis canadensis</i>	Eastern Redbud	CONT.	1.25" CAL. MIN.	6' HT. MIN.	REPLANTED AREA

**REPLACEMENT TREES**

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
<b>CANOPY TREES</b>							
22	MGR	<i>Magnolia grandiflora</i>	Southern Magnolia	B&B	2.5" CAL. MIN.	6' HT. MIN.	MATCHED
38	PTH	<i>Pinus taeda</i>	Loblolly Pine	B&B	2.5" CAL. MIN.	6' HT. MIN.	MATCHED
35	QBI	<i>Quercus bicolor</i>	Swamp White Oak	B&B	2.5" CAL. MIN.	6' HT. MIN.	MATCHED
28	QLH	<i>Quercus lyrata</i>	Overcup Oak	B&B	2.5" CAL. MIN.	6' HT. MIN.	MATCHED
27	UPI	<i>Ulmus americana</i>	Princeton Elm	B&B	2.5" CAL. MIN.	6' HT. MIN.	MATCHED
<b>BUFFER PLANTS</b>							
<b>UNDERSTORY TREES</b>							
58	HVI	<i>Hamamelis virginiana</i>	Witchhazel	B&B	1.25" CAL. MIN.	6' HT. MIN.	MATCHED
58	MST	<i>Magnolia stellata</i>	Star Magnolia	B&B	1.25" CAL. MIN.	6' HT. MIN.	MATCHED
57	PCA	<i>Prunus caroliniana</i>	Carolina Cherry Laurel	B&B	1.25" CAL. MIN.	6' HT. MIN.	MATCHED
<b>SHRUBS</b>							
140	MCE	<i>Myrica cerifera</i>	Wax Myrtle Or Bayberry	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED
139	ILF	<i>Ilicium floridanum</i>	Florida Anise Tree	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED
139	OSF	<i>Ocotea fragrans</i>	Tea Olive	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED
52	FIN	<i>Forsythia x intermedia</i>	Forsythia	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED
52	CAM	<i>Calliopsis americana</i>	Beautyberry	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED

**WET POND - SCM #1**

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	NOTES
<b>SHALLOW LAND = 1594 SF W/ 50 HERB. PLANTS/200 SF = 400</b>						
AAM	100	<i>Acorus americanus</i>	Sweetflag	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
AIN	100	<i>Azelastrum nuttallii</i>	Butterfly Milkweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNE	100	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
EDU	100	<i>Elymus canadensis</i>	Dwarf Joe Pye Weed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
<b>SHALLOW WATER = 1537 SF W/ 50 HERB. PLANTS/200 SF = 388</b>						
SQL	97	<i>Sagittaria latifolia</i>	Broadleaf Arrowhead	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
PNC	97	<i>Pontedericia cordata</i>	Pickernelweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
SAC	97	<i>Saururus cernuus</i>	Lizard's Tail	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNB	97	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE

Note: \*Shared coverage\* means that the species will be evenly interspersed on their designated shelf across a single 24" OC square grid.

- GENERAL LANDSCAPE NOTES:**
- LANDSCAPED AREAS SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION.
  - NO GRADING, DEVELOPMENT OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN AREA BUFFER YARDS IF FOREST CANOPY, SPECIMEN TREES OR LANDSCAPE VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES 3:1 OR LESS ARE ENCOURAGED TO ENSURE PROPER TRANSITION OF GRASSES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE.
  - PERMANENT OFF-SITE LANDSCAPE EASEMENTS MAY BE USED TO MEET REQUIRED BUFFER YARDS PROVIDED THAT THE SIZE OR SHAPE OF THE PARCEL SIGNIFICANTLY RESTRICTS THE ABILITY TO REASONABLY USE THE PROPERTY AND MEET THE BUFFER YARD REQUIREMENTS. THESE EASEMENTS MUST BE RECORDED PRIOR TO OR IN CONJUNCTION WITH THE APPROVAL OF THE SITE OR SUBDIVISION PLAN.
  - NEW PLANT MATERIAL SHOULD COMPLY WITH EXISTING VEGETATION NATIVE TO THE SITE. THE USE OF DROUGHT TOLERANT, INDIGENOUS, NATIVE AND/OR REGIONALLY GROWN SPECIES OF TREES, SHRUBS AND GROUNDCOVERS ARE ENCOURAGED IN ORDER TO MAKE PLANTED AREAS COMPATIBLE WITH EXISTING NATIVE HABITATS AND TO REDUCE DEPENDENCY ON IRRIGATION.
  - ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS & DETAIL MANUAL. LANDSCAPING SHOULD BE OF SUFFICIENT SIZE SO THAT MATURE APPEARANCE WILL BE ACHIEVED WITHIN (3) YEARS OF INSTALLATION FOR SHRUBS AND WITHIN (5) YEARS OF INSTALLATION FOR TREES, WHERE THE MINIMUM SIZE REQUIREMENTS OVERLAP, THE HIGHER STANDARD SHALL PREVAIL.
  - EACH CANOPY TREE SHALL BE PROVIDED WITH A MINIMUM PERVIOUS GROUND AREA OF 300 SF FOR ROOT GROWTH (EXCEPTION: STREET TREES) AND SHOULD BE PLANTED ON SLOPES NOT TO EXCEED 1:4 VERTICAL TO HORIZONTAL DISTANCE. GROUND COVER MUST BE PLANTED WITH ON-CENTER SPACING EQUIVALENT TO THE AVERAGE MATURE SPREAD FOR EACH PARTICULAR SPECIES.
  - ALL NEW PLANT MATERIAL SHALL BE OF GOOD QUALITY, FREE FROM DISEASE, INSTALLED IN SOUND MANNER, MULCHED (3-4" LAYER) AND MEET STANDARDS SET FORTH IN THE AMERICAN STANDARD FOR NURSERY STOCK BY AMERICAN NURSERY & LANDSCAPE ASSOCIATION (ANLA). THE SELECTION OF PLANTS, PLANTING METHODS, MINIMUM HEIGHT, ROOT BALL AND CONTAINER SIZE, NUMBER OF BRANCHES AND WIDTH, SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE ANLA FOR THAT TYPE OF TREE OR SHRUB AT THE TIME OF INSTALLATION.
  - ALL NEW TREES SHALL ALSO BE PROPERLY GUDED AND STAKED AT THE TIME OF PLANTING.
  - ADEQUATE DRAINAGE AND MULCHING SHALL BE PROVIDED IN ALL CASES, PARTICULARLY FOR MEDIANS AND ISLANDS.
  - INSTALLATION PRACTICES SHALL BE UTILIZED WHICH PRESERVE AND REPLACE EXISTING TOPSOIL OR AMEND THE SOIL TO REDUCE COMPACTION.
  - ALL PORTIONS OF A LANDSCAPED AREA NOT PLANTED WITH SHRUBS AND TREES OR COVERED BY A WALL OR OTHER SCREENING DEVICE SHALL BE PLANTED WITH GROUND COVER AND/OR GRASS, OR COVERED WITH NATURAL MULCH WITH A MINIMUM DEPTH OF 2".
  - WHERE A CANOPY TREE IS REQUIRED AND OVERHEAD UTILITY LINES EXIST, (2) UNDERSTORY TREES SHALL BE SUBSTITUTED WITH THE APPROVAL OF THE ADMINISTRATOR.
  - NOTHING SHALL BE PLANTED OR INSTALLED WITHIN AN UNDERGROUND OR OVERHEAD UTILITY EASEMENT OR DRAINAGE EASEMENT WITHOUT THE CONSENT OF THE TOWN AND THE EASEMENT HOLDER AT THE TIME OF MASTER PLAN APPROVAL.
  - CONTRACTOR SHALL WARRANT ALL NEW PLANT MATERIAL FOR (1) YEAR FROM TIME OF INSTALLATION.
  - ALL LANDSCAPING, MULCHING AND SEEDING SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED SITE PLAN AND THE STANDARDS OF THIS CHAPTER PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY. REQUESTS FOR A DELAY IN COMPLYING WITH THIS REQUIREMENT WILL BE CONSIDERED FOLLOWING A WRITTEN REQUEST DIRECTED TO THE ADMINISTRATOR. SUCH REQUEST FOR A DELAY SHALL NOTE THE TIMEFRAME DURING WHICH THE PLANTING SHALL BE COMPLETED. CERTIFICATES OF OCCUPANCY WILL BE ISSUED WITH THE APPROVAL OF A REQUEST FOR PLANTING DELAY, IF DETERMINED REASONABLE.
  - THE TOWN MAY ISSUE A TEMPORARY CERTIFICATE OF OCCUPANCY FOR A PERIOD OF 30-180 DAYS, RELATIVE TO THE NEXT PLANTING SEASON, WHILE THE TOWN OF KNIGHTDALE MAY ALSO ISSUE A TEMPORARY CERTIFICATE OF OCCUPANCY FOR A PERIOD NOT TO EXCEED 30 DAYS.
  - WHERE SIGHT TRIANGLES FOR DRIVES OR STREETS OVERLAP SCREENING, GROUND COVER VEGETATION SHALL BE USED EXCLUSIVELY (EXCEPTION SINGLE-FAMILY DWELLINGS & DUPLEXES).
  - ALL SIDES OF PARKING LOTS SHALL BE SCREENED WITH A TYPE 'A' BUFFER YARD. SIDES ADJACENT TO AN ARTERIAL SHALL BE SCREENED WITH A TYPE 'B' BUFFER YARD. OTHER VEHICLE ACCOMMODATION AREAS SHALL BE SCREENED FROM OFF-SITE VIEW WITH A TYPE 'B' BUFFER YARD.
  - ABOVE GROUND UTILITIES AND ENCLOSED CONTAINER AREAS FOR TRASH AND RECYCLABLES SHALL BE SCREENED BY ELEMENTS OF A TYPE 'B' BUFFER YARD THAT PERTAIN TO SEMI-OPAQUE SCREENS UP TO 6' IN HEIGHT OR THE HEIGHT OF THE UTILITY OR ENCLOSURE, WHICHEVER IS LESS.
- BERMS WITH A FENCE OR WALL:**
- ALL BERMS SHALL NOT EXCEED A SLOPE WITH MAXIMUM RISE OF 1' TO A RUN OF 2'. A MAXIMUM HEIGHT OF 4' AND A MAXIMUM WIDTH OF 40% OF THE REQUIRED BUFFER WIDTH.
  - BERMS SHALL BE STABILIZED WITH A GROUND COVER OR OTHER SUITABLE VEGETATION OR PERMANENT SLOPE RETENTION DEVICE. BERMS TALLER THAN 4' SHALL BE APPROVED BY THE ADMINISTRATOR ON A CASE BY CASE BASIS, BUT SHALL CONFORM TO THE SLOPE AND WIDTH RESTRICTIONS AS PREVIOUSLY DETAILED.
- MAINTENANCE:**
- THE OWNER(S) OF THE PROPERTY SHALL BE RESPONSIBLE FOR ALL NATURAL AND PHYSICAL FEATURES REQUIRED BY THE LANDSCAPE SECTION OF THE UDO AND SHALL PRESERVE AND MAINTAIN THESE FEATURES IN HEALTHY GROWING CONDITIONS, REPLACE THEM WHEN NECESSARY, AND KEEP THE AREAS AROUND THEM FREE OF REFUSE AND DEBRIS IN A MANNER THAT PREVENTS OBSTRUCTION OF PUBLIC RIGHTS-OF-WAY.
  - THE USE OF IRRIGATION IS PERMITTED IN ALL REQUIRED LANDSCAPING AREAS AS REQUIRED BY THE LANDSCAPE SECTION OF THE UDO AND MAY CONNECT TO THE PUBLIC WATER SYSTEM SUBJECT TO THE REQUIREMENTS OF THE TOWN'S STANDARDS SPECIFICATIONS AND DETAILS MANUAL, AND OTHER APPLICABLE TOWN ORDINANCES OR POLICIES. THE USE OF MOISTURE METERING DEVICES AND ALTERNATE TIERERS WITH ANY IRRIGATION SYSTEM IS REQUIRED. THE USE OF XERISCAPE PRACTICES AND DRIP IRRIGATION IS ALSO ENCOURAGED, UNLESS OTHERWISE REQUIRED.
  - ALL VEGETATION SHOULD BE ALLOWED TO REACH AND BE MAINTAINED AT ITS NATURE SIZE.
  - TREE TOPPING: THE REMOVAL OF MORE THAN 25% OF A TREE'S CANOPY IS CONSIDERED TO BE DAMAGE AND TREE TOPPING SHALL BE PROHIBITED UNLESS OTHERWISE APPROVED BY THE LAND USE REVIEW BOARD (LURB). TREES LOCATED WHERE PROPER PRUNING PRACTICES ARE IMPRACTICAL MAY BE EXEMPTED FROM THIS ARTICLE AT THE DETERMINATION OF THE ADMINISTRATOR.
  - THE OWNER OF ANY TREE OR SHRUB ON PRIVATE PROPERTY THAT OVERHANGS ANY PUBLIC RIGHT-OF-WAY WITHIN THE TOWN SHALL PRUNE THE BRANCHES SO THAT SUCH BRANCHES SHALL NOT OBSTRUCT THE LIGHT FROM ANY STREET LAMP OR OBSTRUCT THE VIEW OF ANY STREET INTERSECTION AND SO THAT THERE SHALL BE A CLEAR SPACE OF 8' ABOVE THE SURFACE OF THE STREET OR SIDEWALK.
  - THE TOWN OF KNIGHTDALE PUBLIC WORKS DIRECTOR IS AUTHORIZED TO PRUNE TREES AND SHRUBS FROM PUBLIC PROPERTIES AND PUBLIC RIGHTS-OF-WAY.
  - THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) IS AUTHORIZED TO PRUNE TREES AND SHRUBS IN THE PUBLIC RIGHTS-OF-WAY OWNED BY THE STATE OF NORTH CAROLINA.
  - THE REMOVAL BY ANY ENTITY OF A TREE OR SHRUB THAT IS DEAD, INFECTED BY DISEASE, OR DETERMINED TO BE A HAZARD TO PUBLIC SAFETY AND WELFARE AND SUBSEQUENT REPLACEMENT MAY BE APPROVED BY THE ADMINISTRATOR. TREES REMOVED MUST BE REPLACED IN ACCORDANCE WITH THE REPLACEMENT PROVISIONS OF THE UDO.
  - OWNERS SHALL REMOVE ALL DEAD, DISEASED OR HAZARDOUS TREES AND SHRUBS AS WELL AS ANY BROKEN OR DECAYED LIMBS WHICH CONSTITUTE A MENACE TO THE SAFETY OF THE PUBLIC. THE TOWN SHALL HAVE THE RIGHT TO CAUSE THE REMOVAL OF ANY DEAD OR DISEASED TREES AND SHRUBS ON PRIVATE PROPERTY WHEN SUCH TREES OR SHRUBS CONSTITUTE A HAZARD TO LIFE AND PROPERTY, OR HARBOR INSECTS OR DISEASE WHICH CONSTITUTE A POTENTIAL THREAT TO OTHER VEGETATION IN THE TOWN. THE ADMINISTRATOR WILL NOTIFY PROPERTY OWNER(S) OF THE REQUIREMENT TO REMOVE SUCH TREES, SHRUBS OR LIMBS. REMOVAL SHALL BE DONE AT THE OWNER(S) EXPENSE WITHIN 60 DAYS AFTER THE DATE OF SERVICE OF THE WRITTEN NOTICE. FAILURE TO COMPLY WITH SUCH PROVISIONS SHALL CONSTITUTE A VIOLATION OF THE TOWN OF KNIGHTDALE ORDINANCE AND SHALL BE SUBJECT TO THE APPLICABLE PROCEDURES AND PENALTIES.
  - WHEN REMOVING TREES AND SHRUBS, STUMPS SHALL BE REMOVED OR GROUND TO A MINIMUM DEPTH OF 4".
  - IN THE EVENT THAT ANY REQUIRED VEGETATION IS SEVERELY DAMAGED DUE TO AN UNUSUAL WEATHER OCCURRENCE OR NATURAL DISASTER, THE OWNER SHALL HAVE (1) GROWING SEASON TO REPLACE OR REPLANT FOLLOWING THE EVENT OR FOLLOWING THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY EVENT-RELATED SITE RECONSTRUCTION, WHICHEVER IS LATER.
  - VEGETATION WITHIN A REQUIRED TREE PROTECTION OR LANDSCAPED AREA THAT DIES WITHIN (1) YEAR OF CONSTRUCTION COMPLETION SHALL BE REMOVED AND REPLACED WITH NEW VEGETATION OF EQUAL OR GREATER SIZE BY THE CONTRACTOR PROVIDING THE WARRANT. SHOULD ANY VEGETATION REQUIRED IN A TREE PROTECTION OR LANDSCAPED AREA DIE AFTER THE EXPIRATION OF THE WARRANTY, THE PROPERTY OWNER SHALL REPLACE IT WITHIN 180 DAYS WITH VEGETATION OF EQUAL OR GREATER SIZE.
  - A PLAN DENOTING THE PROPOSED LOCATION AND SPECIES OF REPLACEMENTS SHALL BE SUBMITTED TO THE TOWN OF KNIGHTDALE FOR APPROVAL. THE ADMINISTRATOR MAY ELECT TO PRESENT THE PLAN TO THE LURB FOR FINAL APPROVAL.
  - ALL VEGETATION SHALL BE REPLACED IN A MANNER THAT SATISFIES THE APPLICABLE TYPE, AMOUNT AND PERFORMANCE CRITERIA REQUIRED BY THE TOWN OF KNIGHTDALE UDO.
  - THE ADMINISTRATOR MAY INSPECT THE SITE ONCE A YEAR AFTER THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY IN ORDER TO ENSURE COMPLIANCE WITH THE APPROVED SITE PLAN AND TO ENSURE THAT THE VEGETATION AND LANDSCAPING IS PROPERLY MAINTAINED. THE ADMINISTRATOR MAY ISSUE A NOTICE OF VIOLATION TO COMPLY WITH THE PROVISIONS OF THE KNIGHTDALE ORDINANCE IF WARRANTED UPON AN INSPECTION.

