

# CONSTRUCTION DRAWINGS FOR POPLAR CREEK VILLAGE PHASE IV

## KNIGHTDALE, NC

FIRST SUBMITTAL: AUGUST 14, 2020  
SECOND SUBMITTAL: OCTOBER 02, 2020  
THIRD SUBMITTAL: NOVEMBER 24, 2020  
TOK PROJECT #ZMA-7-19

### 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	GR3PUD
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	7436 SF
AVERAGE LOT AREA PROVIDED	8036 SF
<b>RECREATIONAL OPEN SPACE</b>	
ACTIVE	0.65 AC
PASSIVE	0.82 AC
<b>SETBACKS</b>	
FRONT	10
SIDE	6
REAR	25
MINIMUM DRIVEWAY LENGTH	35

### 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]
17.49	55	2,419	5,065	5,041	-	2,807	-	3,174	2,296	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 CUL-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 EXTEND PRACTICAL GIVEN THE SIZE OF THE PROJECT.
MASS GRADING COMPLIANCE			THIS PROJECT WILL BE MASS-GRADED INCLUDING THE RESIDENTIAL BUILDING LOTS. PER UDO SECTION 6.2.3.3 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.

### WATER ALLOCATION

POPLAR CREEK VILLAGE - PHASE IV WATER ALLOCATION FOR THIS PROJECT IS PROVIDED VIA PRIOR UTILITY ALLOCATION AGREEMENT FOR POPLAR CREEK VILLAGE PHASES 1 - 3

### 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

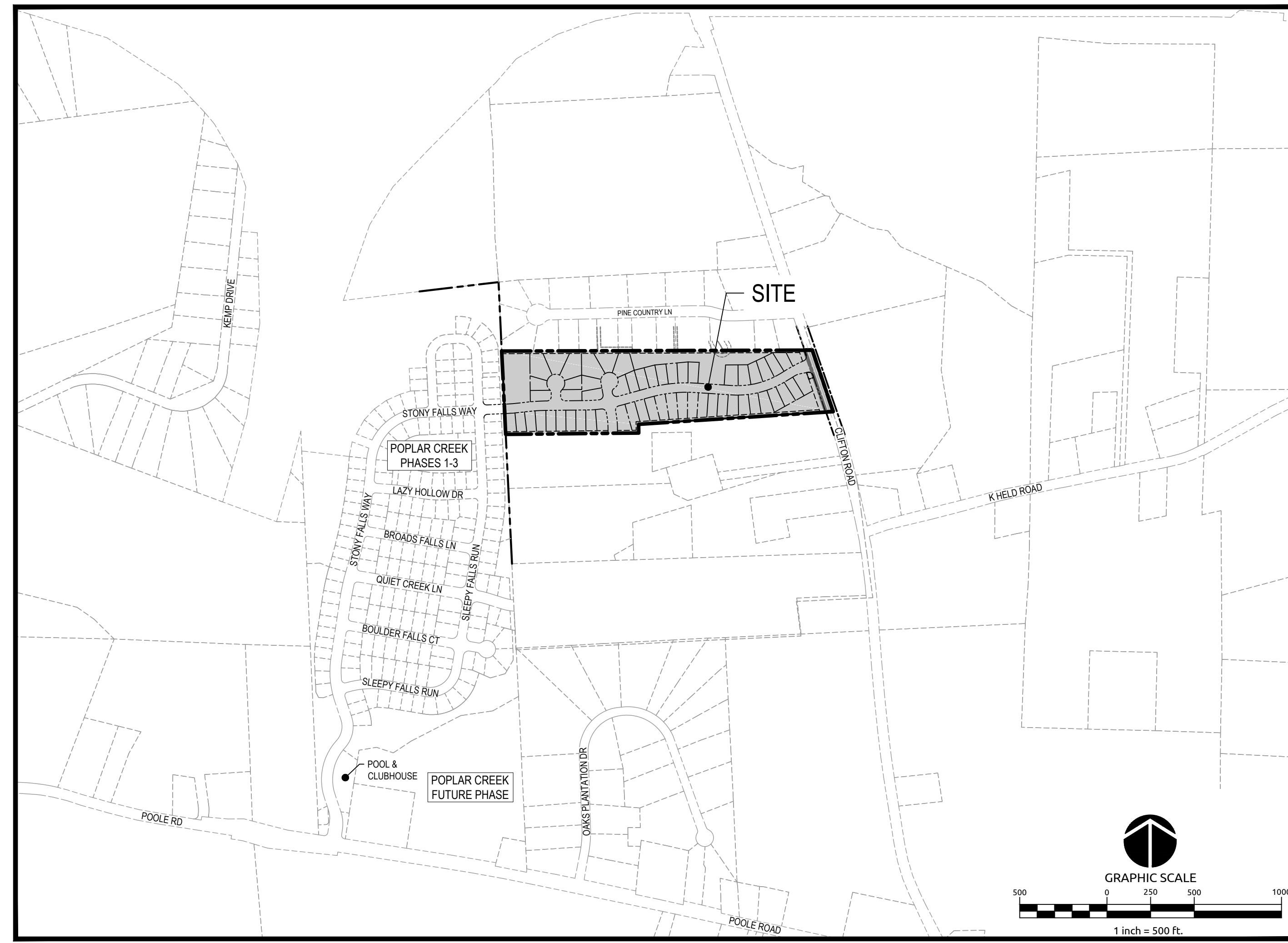
### PREPARED BY:

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

### INDEX OF SHEETS

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



### CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer \_\_\_\_\_

### SITE PERMITTING APPROVAL

#### Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** S-4727

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 #** W-3725

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

**City of Raleigh Public Utilities Department Permit #** \_\_\_\_\_

### 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

**TOWN APPROVED STANDARDS SHALL CONTROL.** IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THESE CONSTRUCTION DRAWINGS AND THE TOWN OF KNIGHTDALE APPROVED STANDARDS FOR THIS PROJECT, THE APPROVED STANDARDS SHALL CONTROL. TOWN OF KNIGHTDALE APPROVED STANDARDS SHALL MEAN ALL DEVELOPMENT DOCUMENTS NECESSARY FOR APPROVAL FOR THE PROPERTY INCLUDING, BUT NOT LIMITED TO, ANY SPECIAL USE PERMIT, SUBDIVISION PLAN, SITE PLAN, SUBDIVISION PLATS, PHASING SCHEDULE, DEVELOPMENT AGREEMENT, UTILITY ALLOCATION AGREEMENT, ANNEXATION AGREEMENT, THE TOWN OF KNIGHTDALE STANDARD SPECIFICATION AND DETAILS MANUAL AND APPLICABLE PROVISIONS OF THE NORTH CAROLINA STATE BUILDING CODE.

### 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) 996-4540 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**.

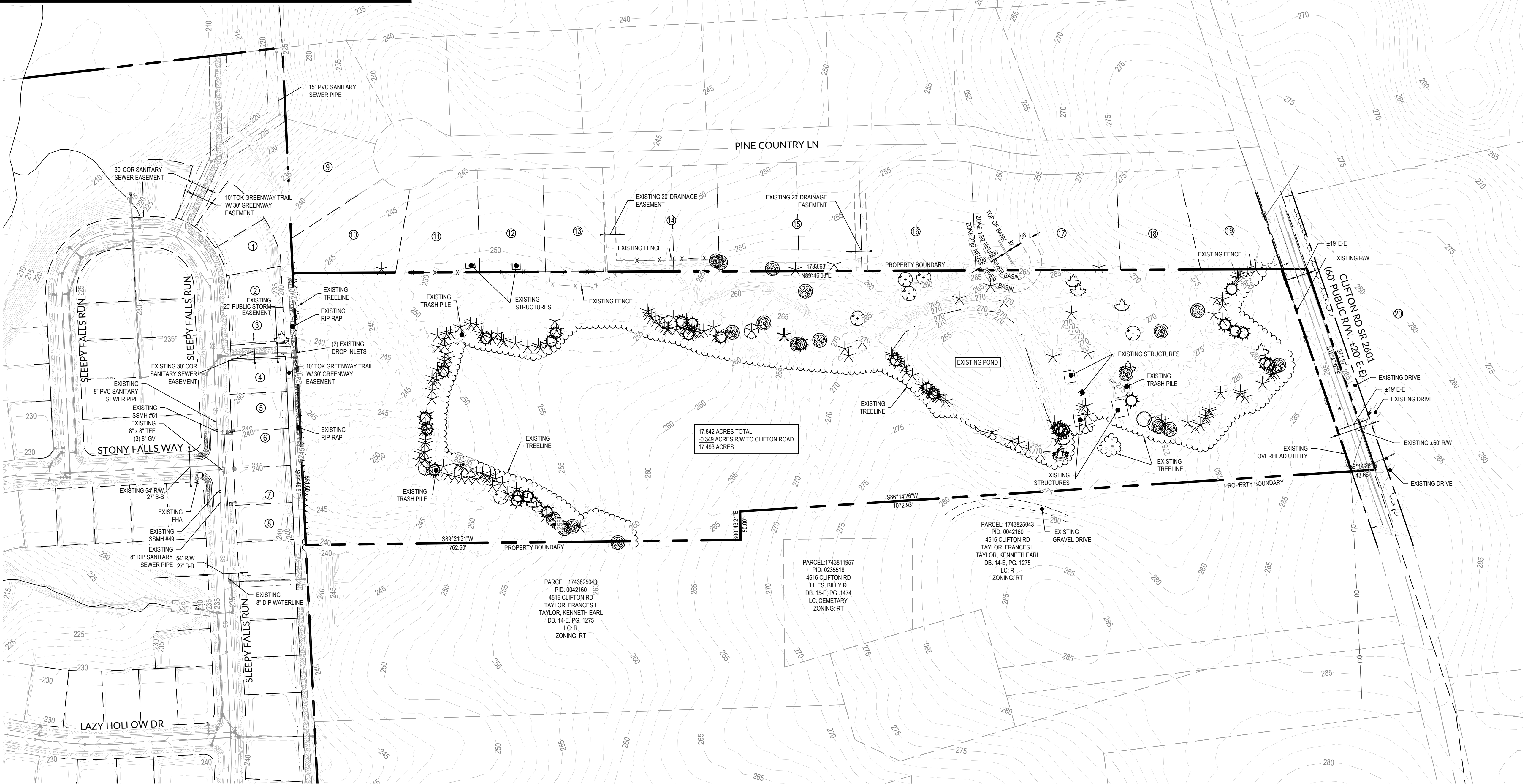
PROFESSIONAL DESIGN ENGINEER CERTIFICATION. THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE. COLLEEN BURGEA, P.E. CERTIFY THAT THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE HAVE BEEN THOROUGHLY CHECKED 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.

Designed by: Colleen Burgea  
BY: \_\_\_\_\_  
EXCISE# 070795470  
DATE: 11/24/2020



NUMBER	PARCEL	PID	MAILING ADDRESS	OWNER INFO	DB	PG.	ZONING
1	1743721538	0458321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
2	1743721346	0458320	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
3	1743721445	0458319	4717 SLEEPY FALLS RUN	BROWN, WILLIAM R. JR. BROWN, GWENDOLYN JACKSON	017459	1868	NMX
4	1743721346	0458318	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
5	1743629392	0458398	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**6	1743721157	0458316	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**7	1743721157	0458315	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
8	1743721160	0458314	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
9	1743722752	099969	120 PINE COUNTRY LANE	SAULT, CAROLYN	9155	138	GR3
10	1743723622	099970	119 PINE COUNTRY LANE	MAXWELL, MICHAEL	14957	1973	GR3
11	1743724662	099965	117 PINE COUNTRY LANE	MOLINA, SALVADOR MOLINA MARIA GUEVARA	9018	1822	GR3
12	1743725684	0099966	115 PINE COUNTRY LANE	CARONZO - DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	GR3
13	1743727604	0099967	113 PINE COUNTRY LANE	BRCH, HOWARD REGINALD III	12161	563	GR3
14	1743728644	0099963	111 PINE COUNTRY LANE	KEETER, JOHN	13521	705	GR3
15	1743820675	0099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	GR3
16	1743822685	0099959	202 MACKENAN DR.	AQUA NORTH CAROLINA INC.	13547	76	GR3
17	1743825614	0099956	105 PINE COUNTRY LANE	TEUSCHER, RICHARD DALE	5233	234	GR3
18	1743827605	0099958	103 PINE COUNTRY LANE	WRIGHT, GREGORY H	7211	699	GR3
19	1743828644	0099992	4500 CLIFFORD RD	NIXON, DORIS LEWTER	8399	2701	GR3
20	1743823384	0192190	4425 CLIFFORD RD	EARLY, TROY O EARLY, RHONDA B	8779	502	RT

- 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 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. NO WETLANDS WERE FOUND ON SITE.
  - 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.



17.842 ACRES TOTAL  
0.349 ACRES RW TO CLIFTON ROAD  
17.493 ACRES

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

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

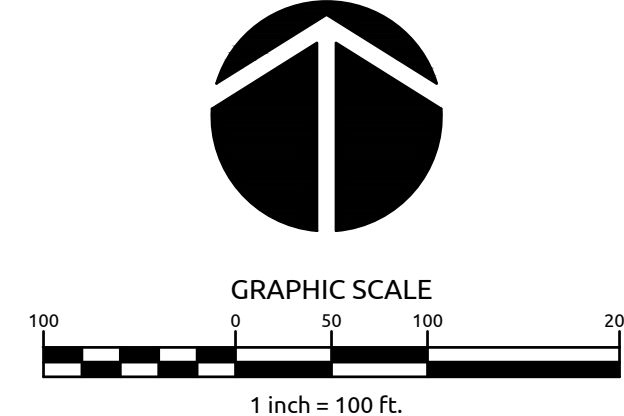
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

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



**WithersRavenel**  
Engineers | Planners | Surveyors

115 MacKenzie Drive | Cary, NC 27511 | P: 919.469.3300 | License #: C-0882 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL EXISTING  
CONDITIONS**

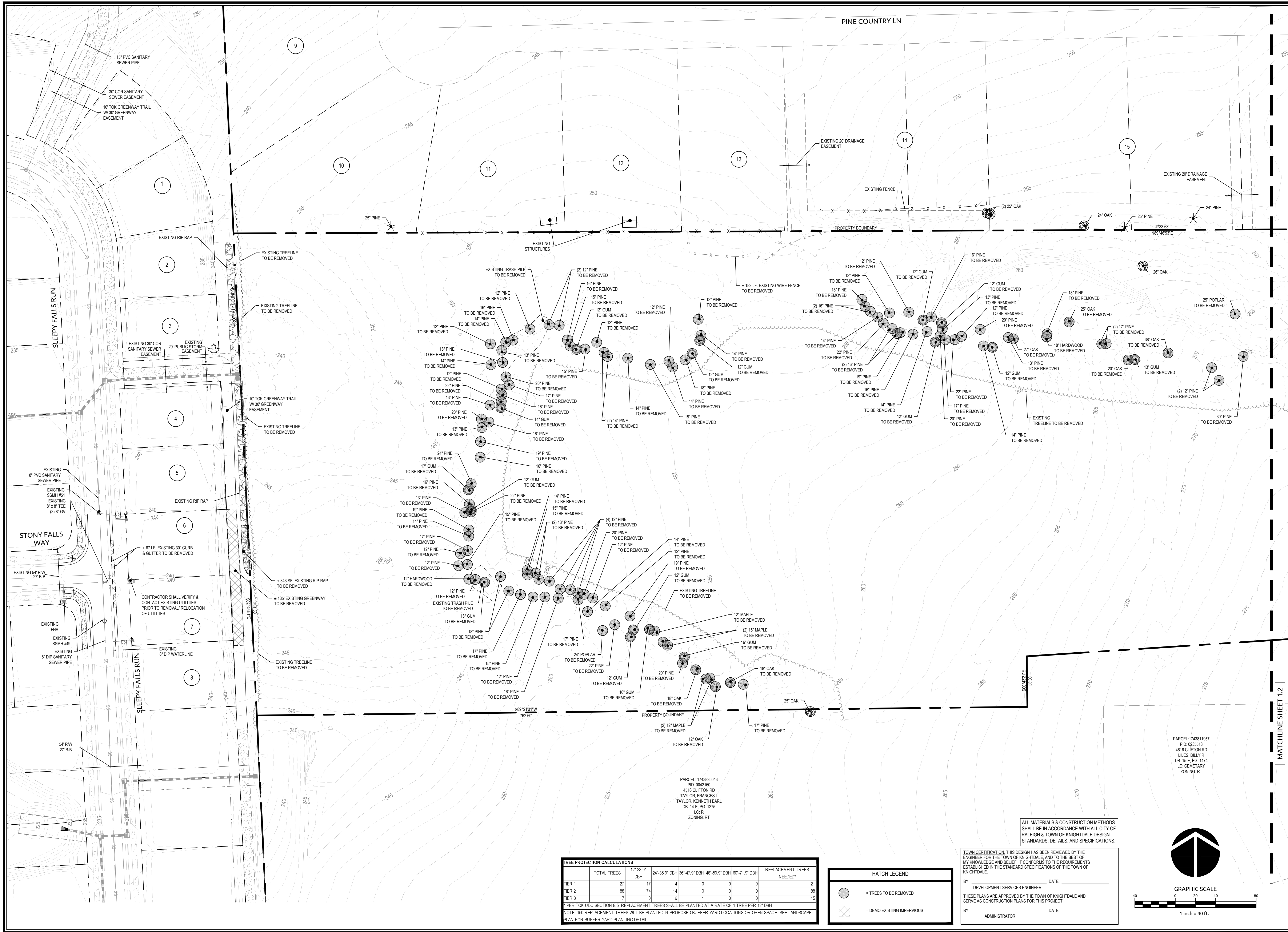
Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions	Description	Date
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**1.0**



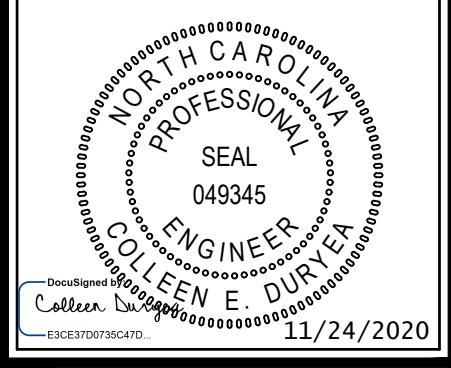


**WithersRavenel**  
 Engineers | Planners | Surveyors

**POPLAR CREEK VILLAGE  
 PHASE IV**  
 TOWN OF KNIGHTDALE, NORTH CAROLINA

**DEMOLITION PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

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*
TIER 1	27	17	4	0	0	21
TIER 2	88	74	14	0	0	88
TIER 3	7	9	6	1	0	15

\* PER TOK UDD 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.

	= TREES TO BE REMOVED
	= DEMO EXISTING IMPERVIOUS

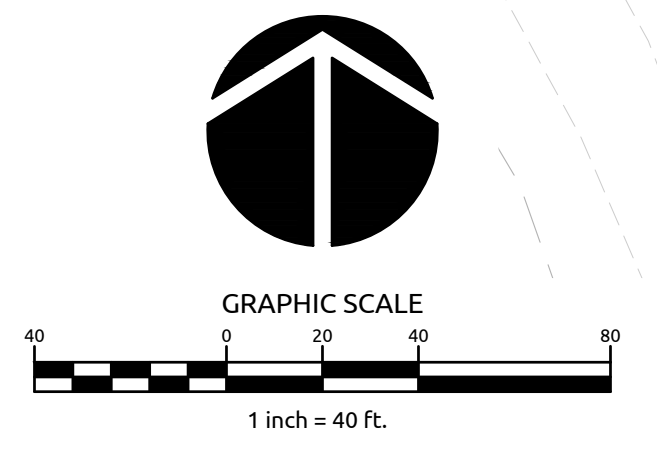
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
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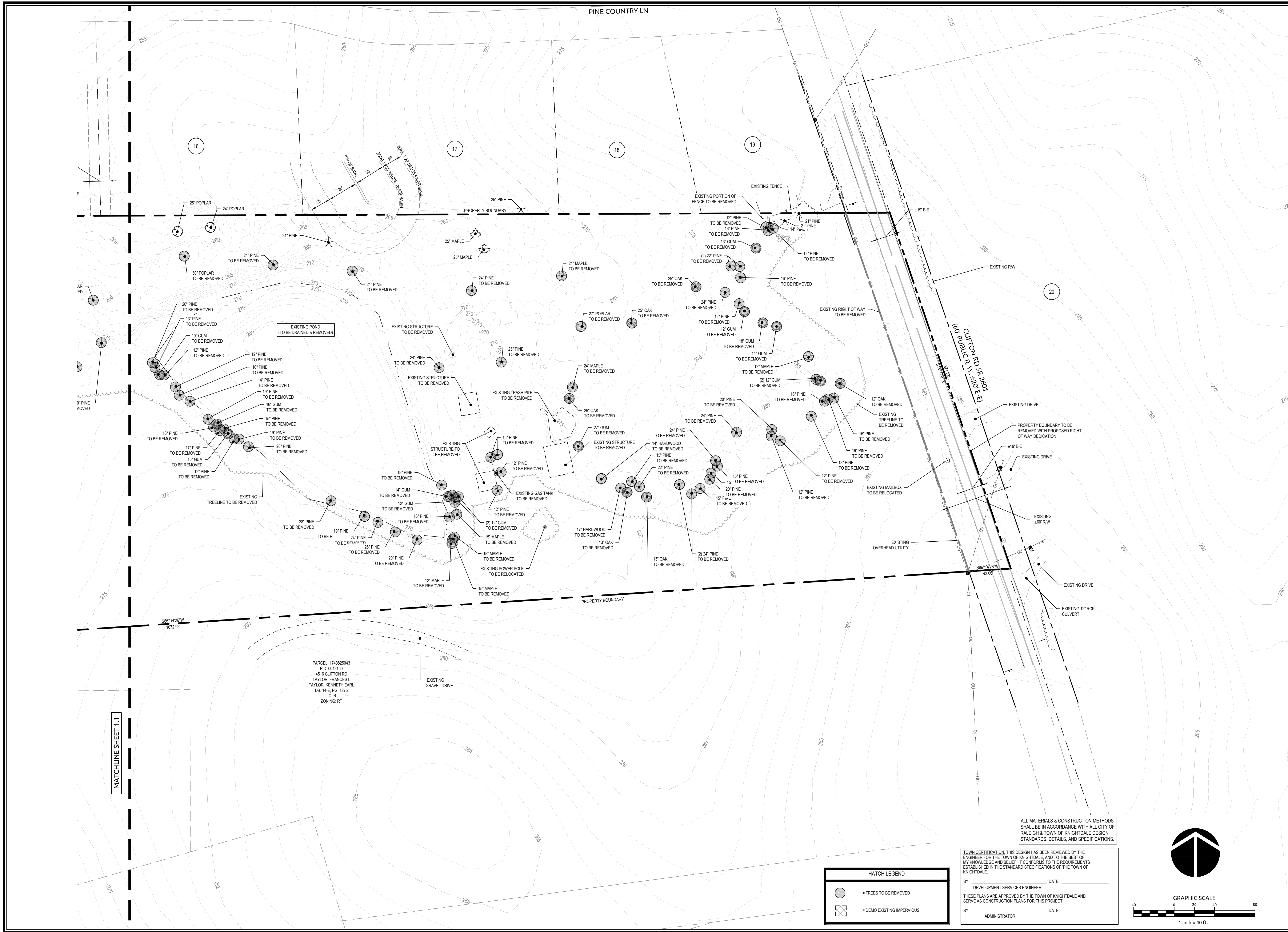


PARCEL 1743811957  
 PID: 0235518  
 4616 CLIFTON RD  
 LILES, BILLY R.  
 DB: 15-E, PG: 1474  
 LC: CEMETARY  
 ZONING: RT

PARCEL 1743825043  
 PID: 0042160  
 4516 CLIFTON RD  
 TAYLOR, FRANCES L  
 TAYLOR, KENNETH EARL  
 DB: 14-E, PG: 1276  
 LC: R  
 ZONING: RT

K:\171022501\102501\02501-Citizen Road\Subdivision\CAD\Drawings\44\Construction\10\OVERALL EXISTING CONSTRUCTION.dwg - Tuesday, November 24, 2020 10:23:24 AM - VORIK, STEPHEN





MATCHLINE SHEET 1.1

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

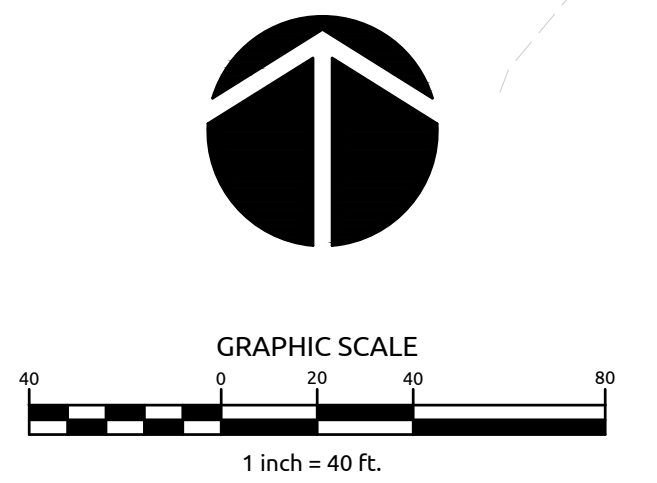
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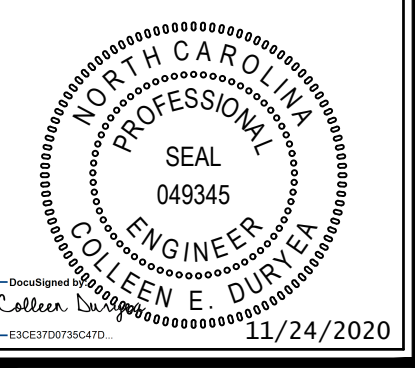


**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**DEMOLITION PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



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

- GENERAL NOTES:**
- SEE SHEET 1.0 FOR EXISTING ZONING AND PROPOSED ZONING.
  - 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 NCDQCD-DWR BUFFER DETERMINATION LETTER, RRD #19-328 DATED AUGUST 5TH, 2019.
  - LIMITS OF JURISDICTIONAL STREAM AND WETLANDS ARE BASED ON FIELD DELINEATION BY WITHERSRAVENEL, INC. AND USAGE CONFIRMATION OF JURISDICTIONAL DETERMINATION BASED ON SITE VISIT ON 07/26/19. REFERENCE USAGE ACTION ID #SAW-2019-01418.
  - PROPERTY IS CURRENTLY NOT IN TOWN OF KNIGHTDALE ETJ.
  - STREET LIGHTS SHALL BE PROVIDED FOR POPLAR CREEK PH IV PER UDO SECTION 11.5 - STREET LIGHTING POLICY. IF UPGRADES FROM THE TOWN'S STANDARD LIGHT SPECIFICATION ARE REQUESTED, THE DEVELOPER WILL BE REQUIRED TO PAY THE TOWN THE DIFFERENCE IN THE COSTS TO MAINTAIN THE DESIRED FIXTURE AND POLE COVERING A PERIOD OF 10 YEARS.
  - ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
  - THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720174300J WITH AN EFFECTIVE DATE OF MAY 2, 2006.
  - THE TURNOUT RADIUS AT ALL INTERSECTIONS SHALL BE A MINIMUM OF 30 FEET MEASURED AT THE BACK OF CURB UNLESS OTHERWISE NOTED. THE TURNOUT RADIUS AT ALL INTERSECTIONS MEASURED AT THE BACK OF CURB.
  - ALL RIGHT-OF-WAY SHOWN HEREIN IS PUBLIC RIGHT-OF-WAY, UNLESS OTHERWISE NOTED.
  - NO SIGHT OBSTRUCTION OR PARTIALLY OBSTRUCTING WALL, FENCE, FOLIAGE, BERM, SIGN, OR PARKED VEHICLE BETWEEN THE HEIGHTS OF TWO (2) AND EIGHT (8) ABOVE THE CURB LINE ELEVATION OR THE NEAREST TRAVELED WAY IN NO CURB EXISTS SHALL BE PLACED WITH IN A SIGHT TRIANGLE.
  - MAIL KIOSK IS LOCATED IN POPLAR CREEK PHASES 1-3.

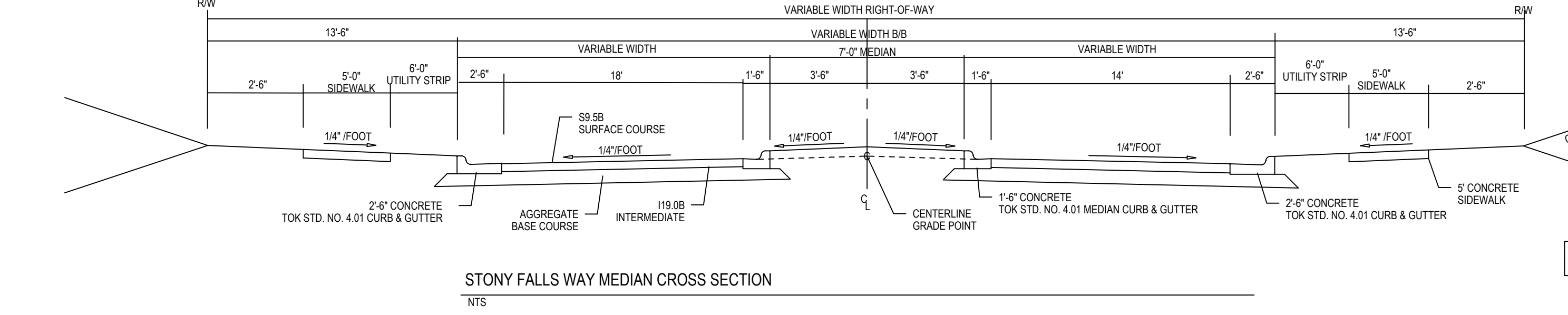
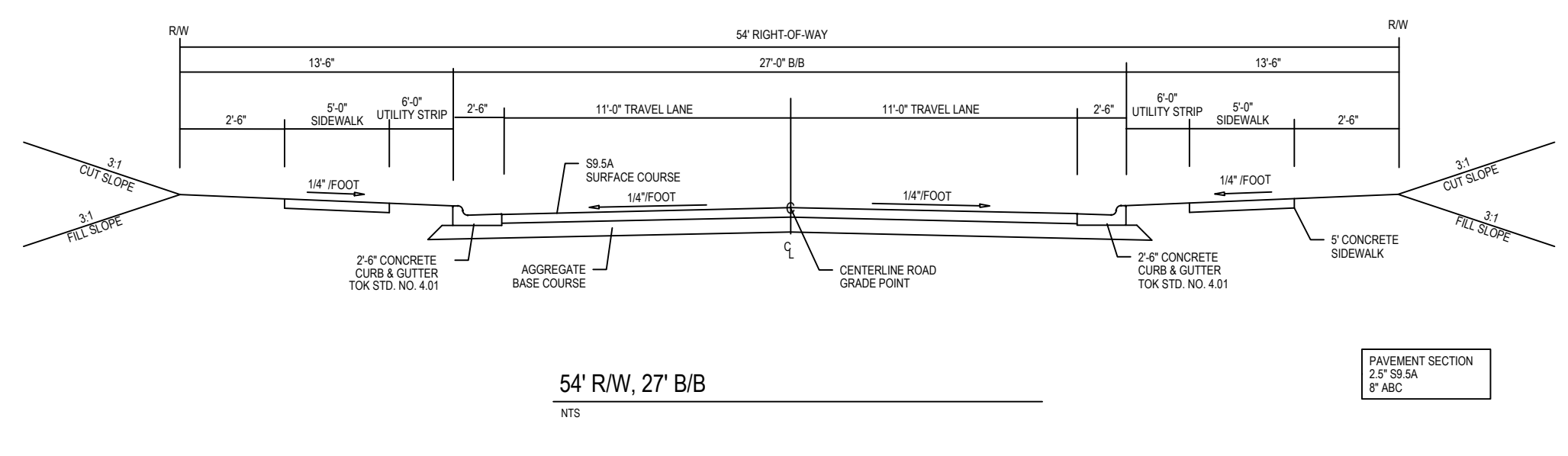
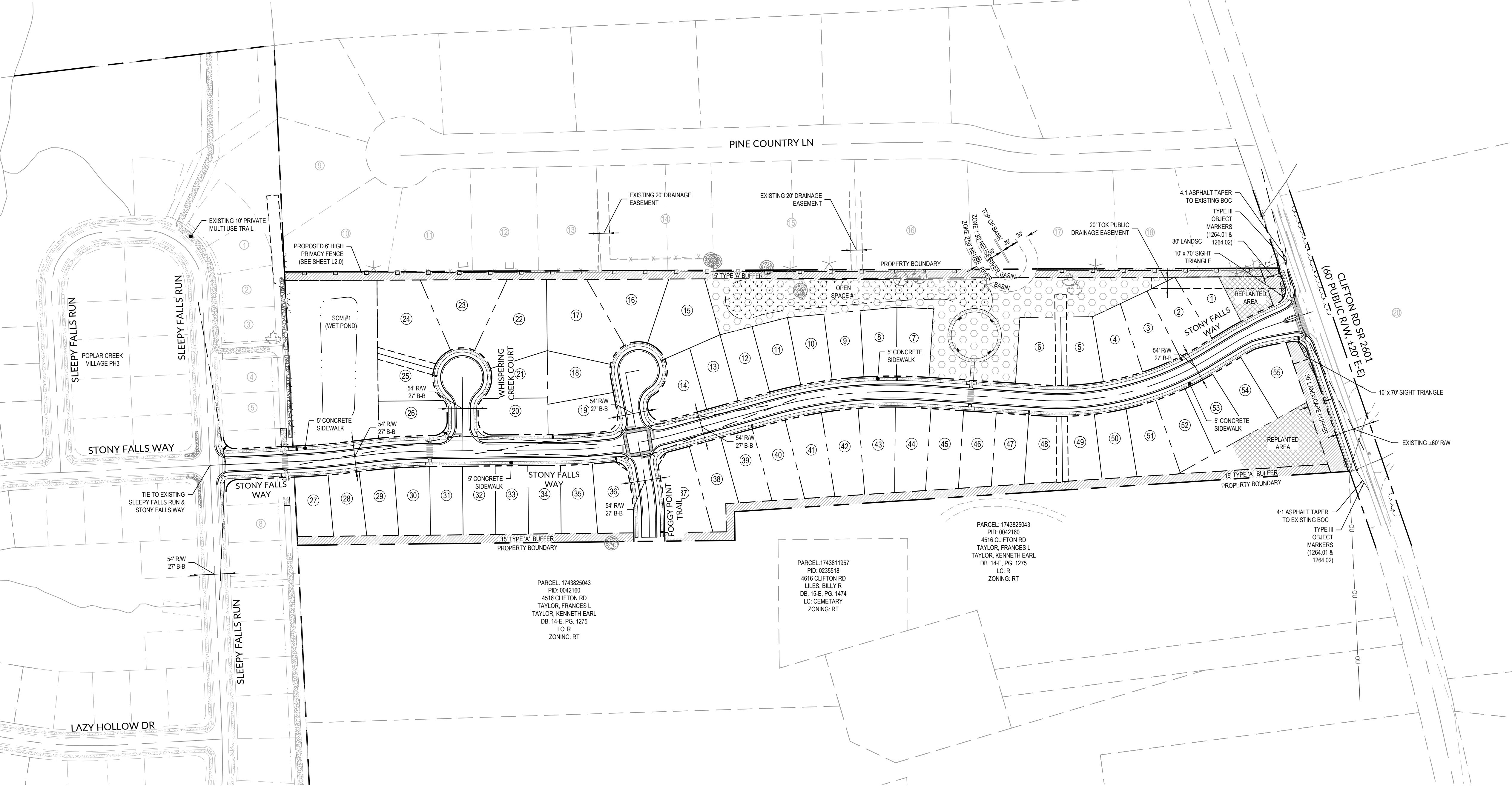
ROAD	SPEED LIMIT	CLASSIFICATION
STONY FALLS WAY	25 MPH	LOCAL STREET
WHISPERING CREEK COURT	25 MPH	LOCAL STREET
FOGGY POINT TRAIL	25 MPH	LOCAL STREET

CONNECTIVITY INDEX:		
LINKS	NODES	INDEX
6	6	1.0

SITE IMPERVIOUS	
TOTAL TRACT AREA	17.49 AC
SUBDIVISION ROADWAYS, SIDEWALKS, & PARK	2.42 AC
LOT IMPERVIOUS AREA (85 LOTS @ 4000 SF)	5.05 AC
TOTAL IMPERVIOUS	7.47 AC
PROPOSED PERCENT IMPERVIOUS	42.71 %

**HATCH LEGEND**

- PERIMETER BUFFER
- OPEN SPACE
- TREE CANOPY
- PLAY LAWN

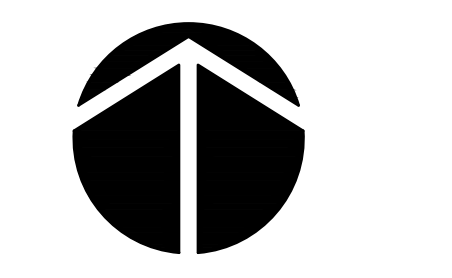


TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

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

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

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



**WithersRavenel**  
Engineers | Planners | Surveyors

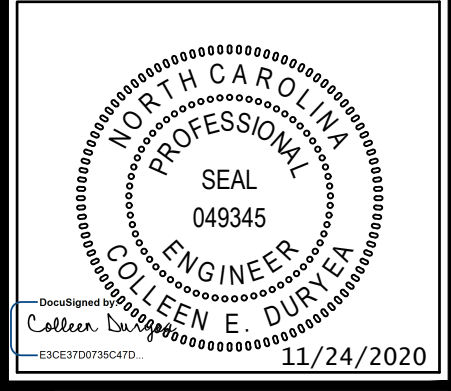
115 MacKenzie Drive | Cary, NC 27511 | P: 919.669.3300 | License #: C-0882 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL SITE PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



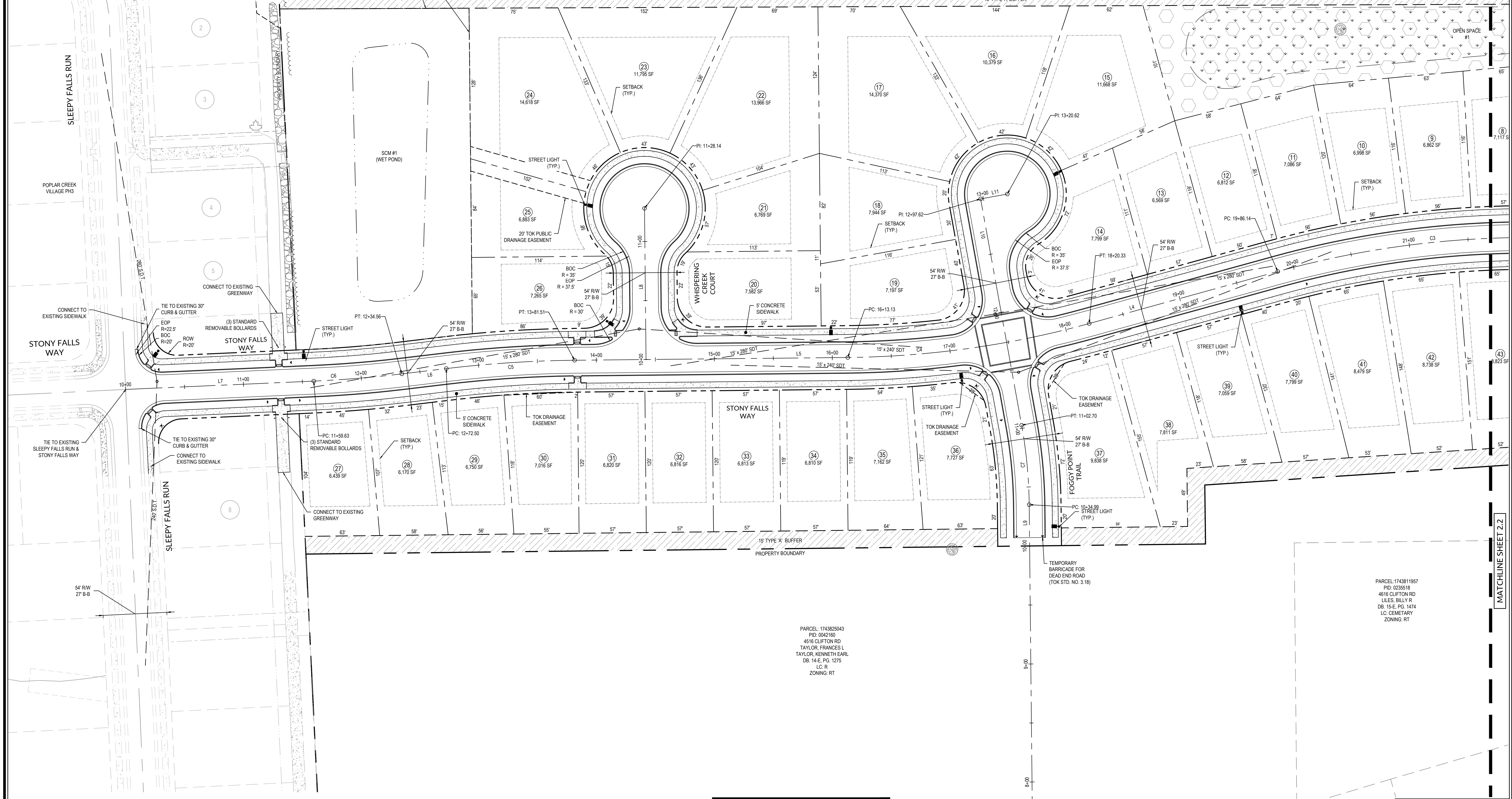
Revisions

- PER TOK COMMENTS 10/02/20
- PER TOK & NCDOT COMMENTS 11/24/20

Sheet No.  
**2.0**



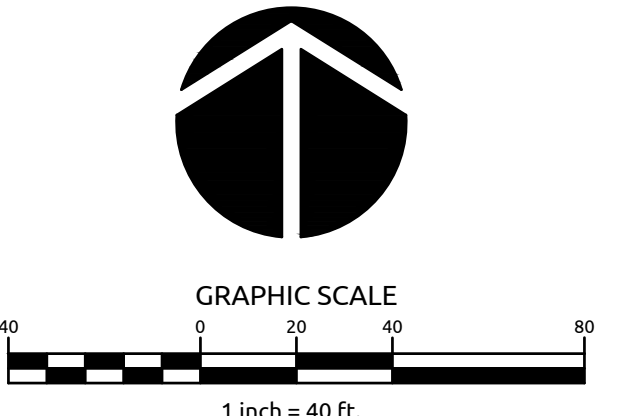
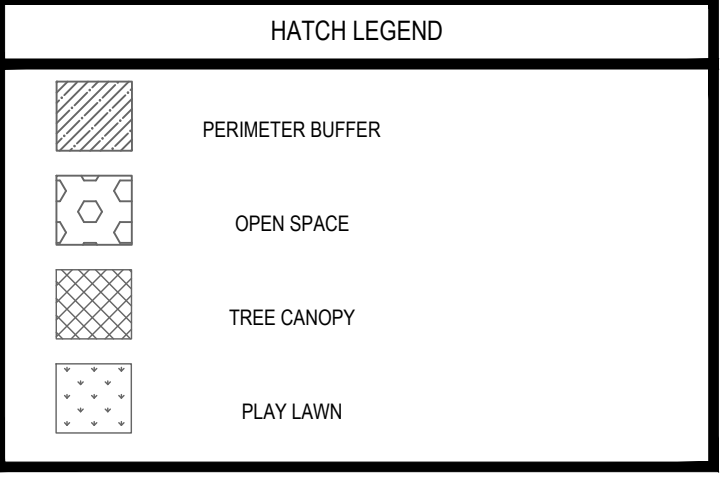
LINE TABLE		CURVE TABLE					
LINE	BEARING	DISTANCE	CURVE	RADIUS	LENGTH	CHORD	BEARING
L1	N71°16'00"E	77.98'	C1	300.00'	65.96'	65.83'	N64°58'05"E
L2	N58°40'10"E	57.38'	C2	500.00'	306.58'	301.80'	N76°14'08"E
L3	S86°11'55"E	204.70'	C3	800.00'	268.42'	267.16'	N84°11'22"E
L4	N74°34'38"E	165.81'	C4	800.00'	207.20'	206.63'	N81°59'50"E
L5	N89°25'02"E	231.61'	C5	1000.00'	109.02'	108.96'	N86°17'39"E
L6	N83°10'16"E	37.94'	C6	1000.00'	74.83'	74.91'	N85°19'03"E
L7	N87°27'51"E	159.63'	C7	400.00'	67.71'	67.63'	N5°25'55"W
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: 0042165  
 4516 CLIFTON RD  
 TAYLOR, FRANCES L  
 TAYLOR, KENNETH EARL  
 DB. 14-E, PG. 1275  
 LC. R  
 ZONING: RT

PARCEL: 1743811957  
 PID: 0235518  
 4616 CLIFTON RD  
 LILES, BILLY R  
 DB. 15-E, PG. 1474  
 LC. CEMETARY  
 ZONING: RT

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)	Calculated		Proposed	
						Left Turn Sight Distance (ft)	Right Turn Sight Distance (ft)	Left Turn Sight Distance (ft)	Right Turn Sight Distance (ft)
CLIFTON ROAD	STONY FALLS WAY	25	2.08	7.50	6.50	276	239	280	240
SLEEPY FALLS RUN	STONY FALLS WAY	25	-4.14	7.50	6.50	276	239	280	240
STONY FALLS WAY	WHISPERING CREEK COURT	25	-1.60	7.50	6.50	276	239	280	240
STONY FALLS WAY	FOGGY POINT TRAIL	25	1.60	7.50	6.50	276	239	280	240
STONY FALLS WAY	FOGGY POINT TRAIL	25	-4.50	7.50	6.50	276	239	280	240



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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

**WithersRavenel**  
 Engineers | Planners | Surveyors

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**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**SITE PLAN**

MATCHLINE SHEET 2.2

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR

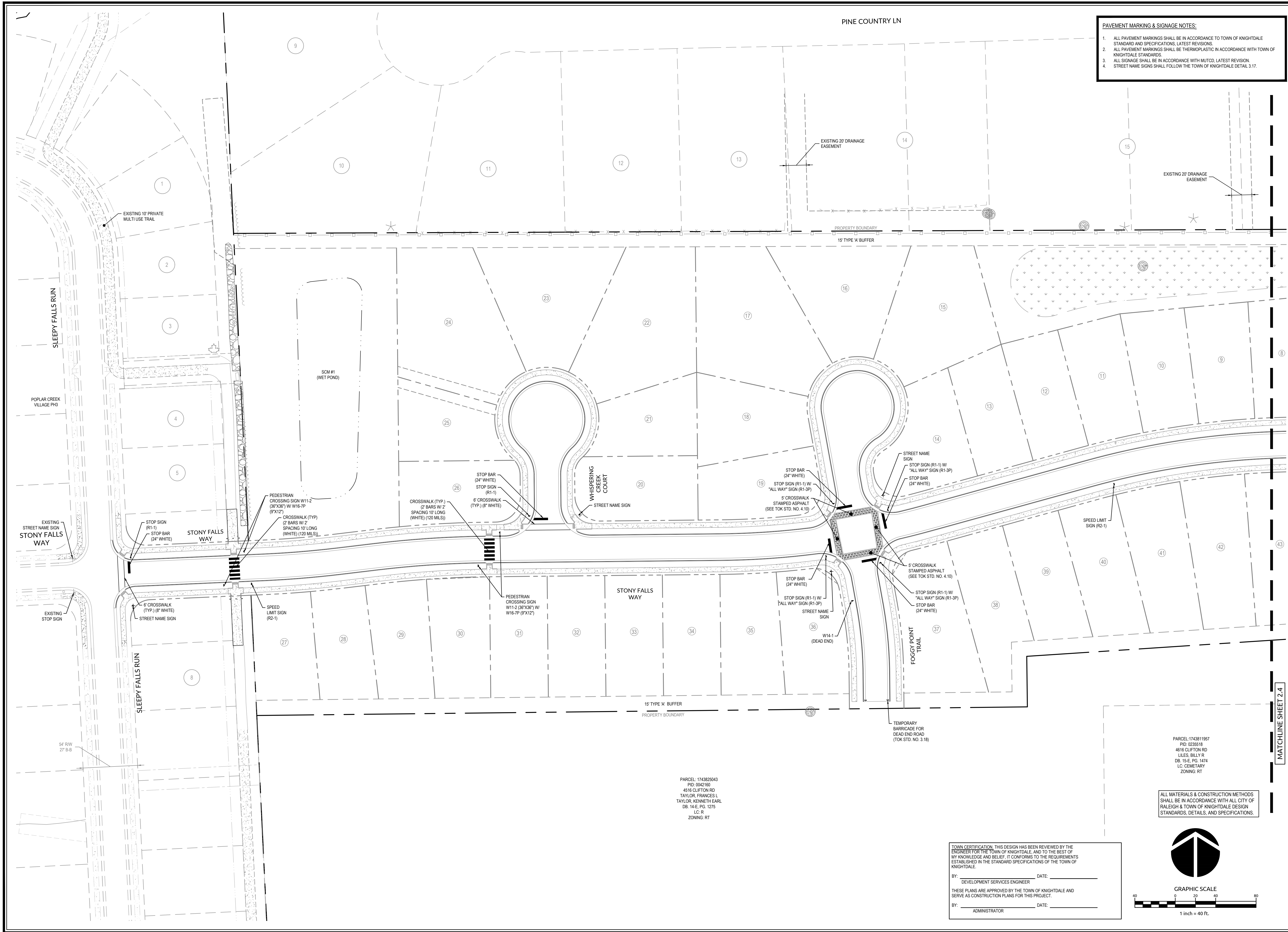
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**2.1**









**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.

**WithersRavenel**  
 Engineers | Planners | Surveyors

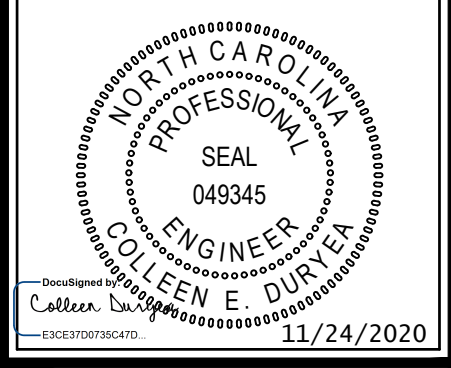
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**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**PAVEMENT MARKING &  
 SIGNAGE PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**2.3**

PARCEL: 1743825043  
 PID: 0042160  
 4516 CLIFTON RD  
 TAYLOR, FRANCES L  
 TAYLOR, KENNETH EARL  
 DB: 14-E, PGS: 1276  
 LC: R  
 ZONING: RT

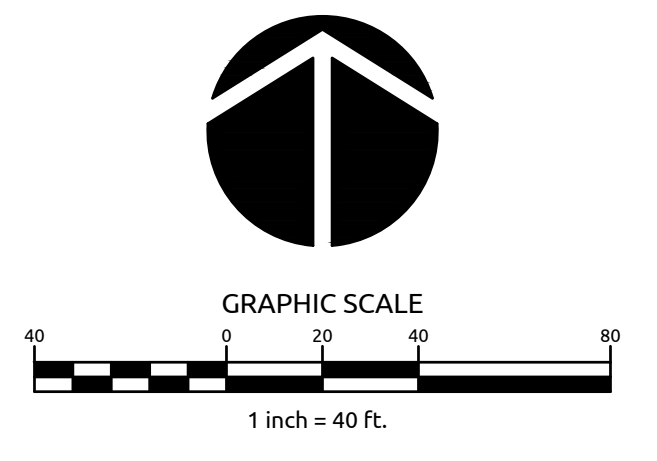
PARCEL: 1743811957  
 PID: 0235518  
 4616 CLIFTON RD  
 LILES, BILLY R  
 DB: 15-E, PGS: 1424  
 LC: CEMETARY  
 ZONING: RT

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

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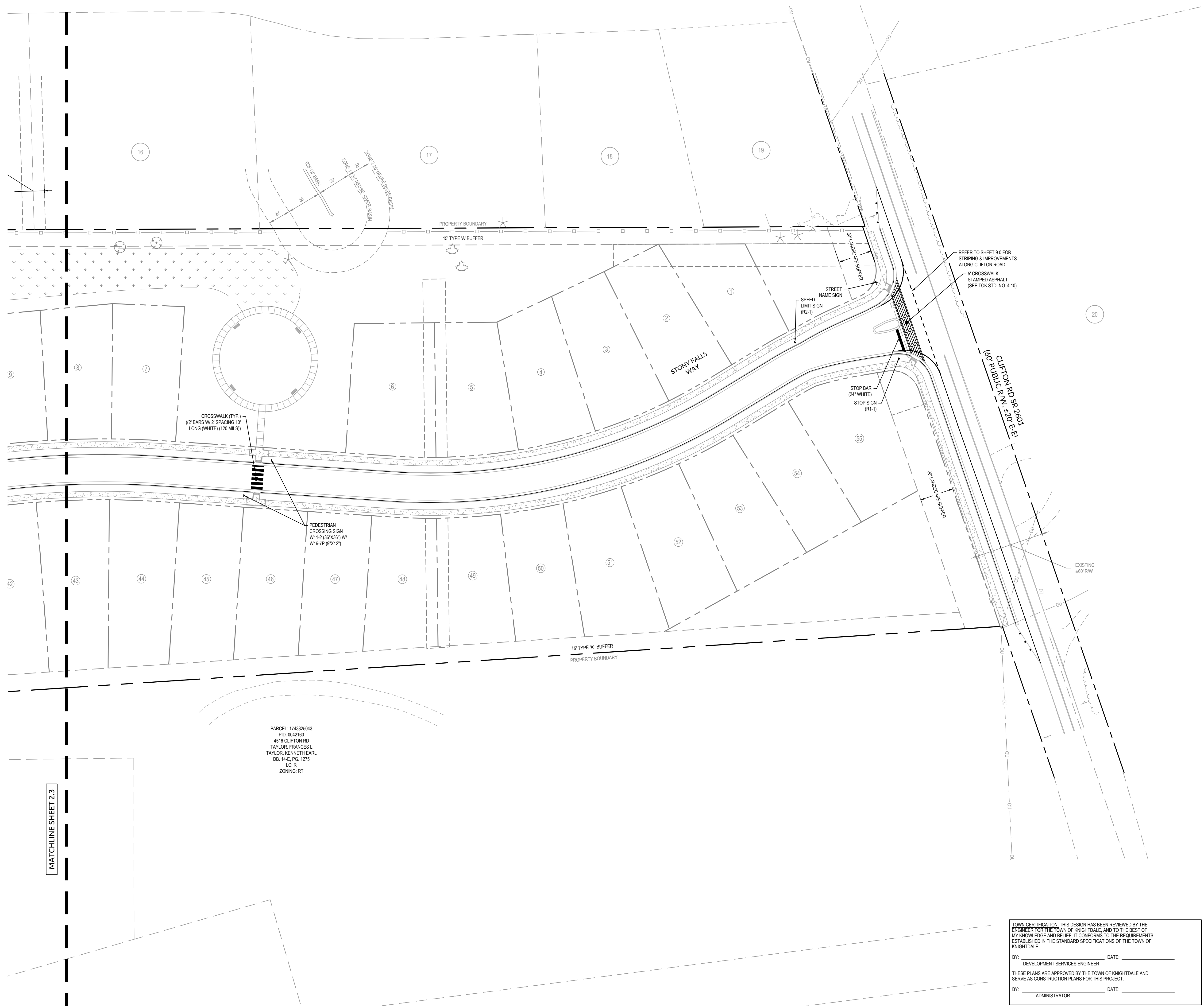
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ADMINISTRATOR



K:\1710220\170259-Citizen Road Subdivision\CAD\Drawings\441\Construction\3.2.1\_PAVEMENT MARKING & SIGNAGE.dwg, 11/24/2020 10:40:00 AM, Y:\BCK\JTB\ENR1

MATCHLINE SHEET 2.4





CROSSWALK (TYP)  
(2 BARS W/ 2 SPACING 10'  
LONG (WHITE) (120 MILS))

PEDESTRIAN  
CROSSING SIGN  
W11-2 (36"X36") W/  
W16-TP (9"X12")

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

REFER TO SHEET 9.0 FOR  
STRIPING & IMPROVEMENTS  
ALONG CLIFTON ROAD  
S CROSSWALK  
STAMPED ASPHALT  
(SEE TOK STD. NO. 4.10)

SPEED  
LIMIT SIGN  
(R2-1)

STOP BAR  
(24" WHITE)  
STOP SIGN  
(R1-1)

MATCHLINE SHEET 2.3

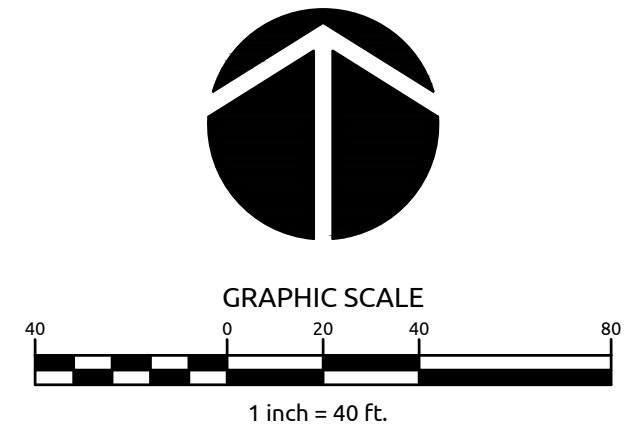
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ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF  
KNIGHTDALE.

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STANDARDS, DETAILS, AND SPECIFICATIONS.

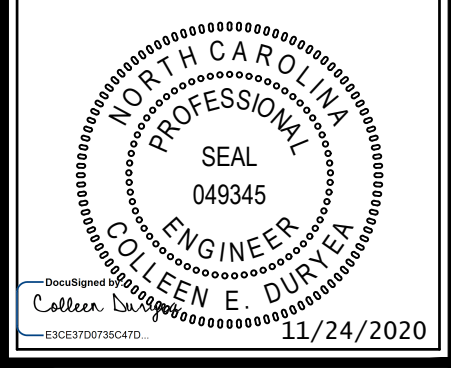


**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**PAVEMENT MARKING &  
SIGNAGE PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20



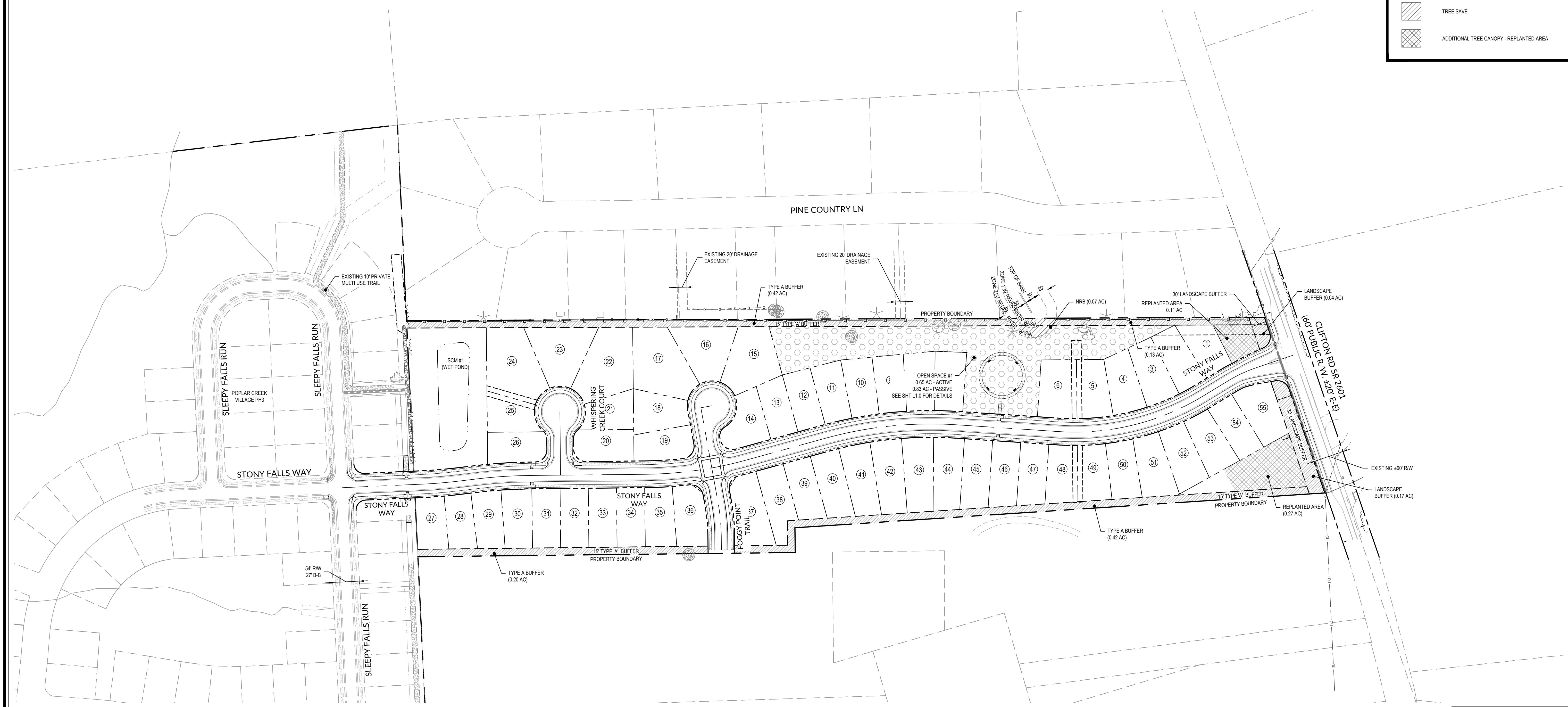
REQUIRED OPEN SPACE CALCULATIONS		
TOTAL AREA	17.49	AC
LOT COUNT	55	
TOTAL BEDROOMS (LOTS* 3.5)	192.50	BR
ACREAGE WITHIN 1/4 MILE OF PUBLIC OPEN SPACE	13.23	AC
ACREAGE WITHIN 1/2 - 1/4 MILE OF PUBLIC OPEN SPACE	4.26	AC
BEDROOMS WITHIN 1/4 MILE	146	BR
BEDROOMS WITHIN 1/4 - 1/2 MILE	47	BR
OPEN SPACE NEEDED (1/4 MILE) (260 SF/BR)	37859	SF
OPEN SPACE NEEDED (1/4 MILE - 1/2 MILE) (360 SF/BR)	18286	SF
<b>TOTAL RECREATIONAL OPEN SPACE REQUIRED</b>	<b>56145</b>	<b>SF</b>
	<b>1.29</b>	<b>AC</b>

TREE CANOPY CALCULATIONS		
TOTAL AREA	17.49	AC
PERIMETER (P)	4475	LF
TREE CANOPY AREA (P * 20 LF)/43660	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>

OPEN SPACE CALCULATIONS		
REQUIRED OPEN SPACE	1.29	AC
D.S. #1	0.65	AC ACTIVE
D.S. #1	0.82	AC PASSIVE
<b>TOTAL OPEN SPACE</b>	<b>1.47</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
	ADDITIONAL TREE CANOPY - REPLANTED AREA

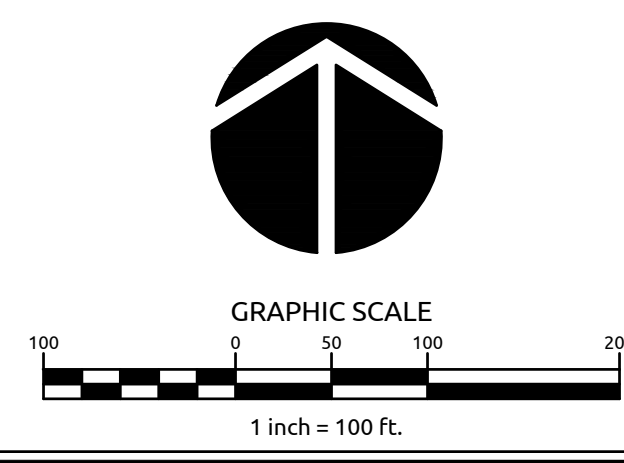


Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



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

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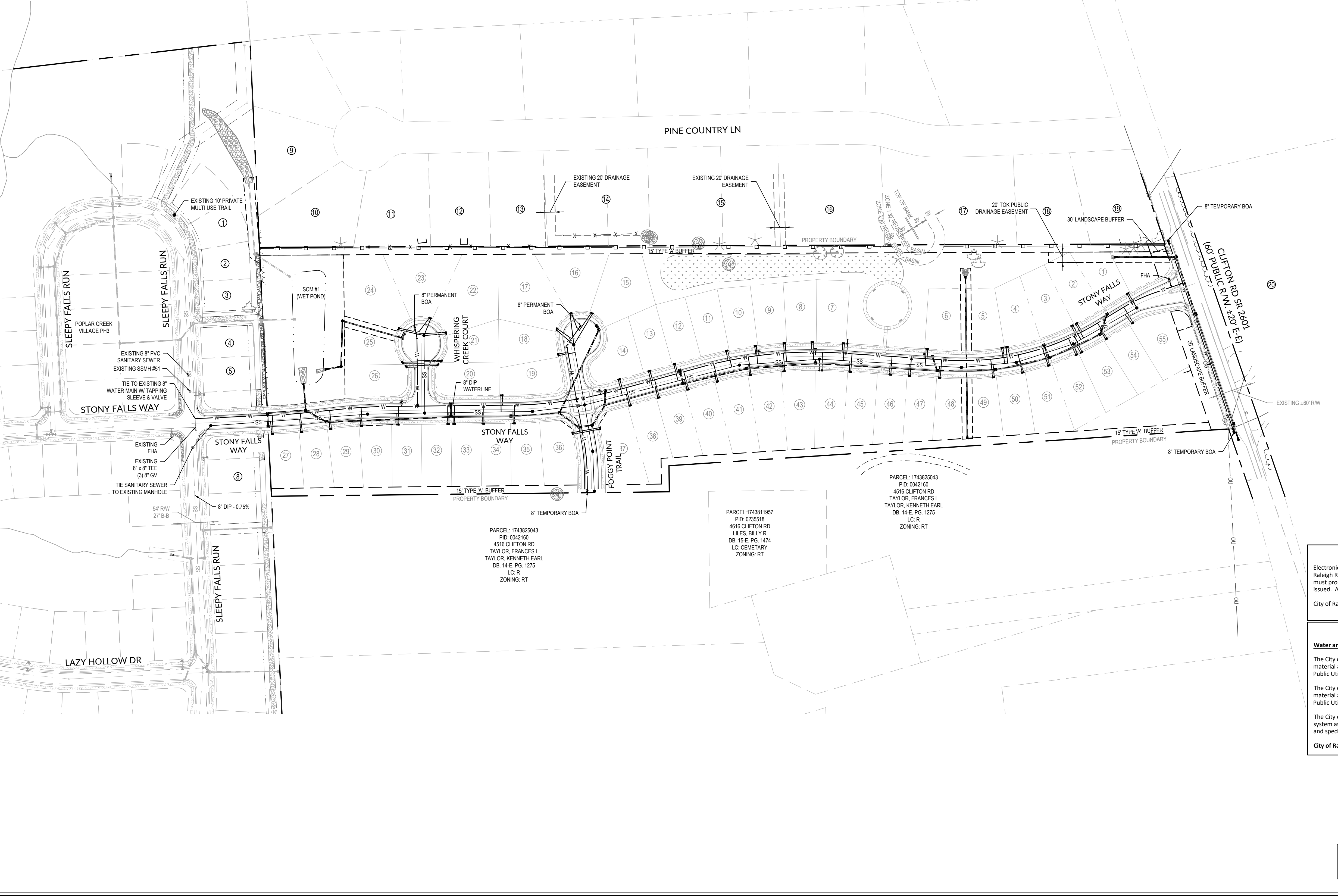
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR



NUMBER	PARCEL	PID	MAILING ADDRESS	OWNER INFO	DB	PG	ZONING
1	1743721538	0498321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
2	1743721346	0498320	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
3	1743721445	0498319	4717 SLEEPY FALLS RUN	BROWN, WILLIAM R JR BROWN, GWENDOLYN JACKSON	017459	1868	NMX
4	1743721346	0498318	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
5	1743629392	0498398	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**6	1743721157	0498316	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**7	1743721157	0498315	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
8	1743721160	0498314	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
9	1743722752	099969	120 PINE COUNTRY LANE	SAULT, CAROLYN	9155	138	GR3
10	1743723622	099970	119 PINE COUNTRY LANE	MAXWELL, MICHAEL	14657	1973	GR3
11	1743724662	099965	117 PINE COUNTRY LANE	MOLINA, SALVADOR MOLINA MARIA GUEVARA	9018	1822	GR3
12	1743725684	0099966	115 PINE COUNTRY LANE	CARONZO - DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	GR3
13	1743727504	0099967	113 PINE COUNTRY LANE	BIRCH, HOWARD REGINALD II	12161	563	GR3
14	1743728644	0099963	111 PINE COUNTRY LANE	KEETER, JOHN	13621	705	GR3
15	1743820675	0099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	GR3
16	1743822985	0099959	202 MACKENAN DR	AQUA NORTH CAROLINA INC	13647	76	GR3
17	1743825514	0099956	105 PINE COUNTRY LANE	TELSCHER, RICHARD DALE	5233	234	GR3
18	1743827505	0099958	103 PINE COUNTRY LANE	WRIGHT, GREGORY H WRIGHT, RAFFAELA M	7211	699	GR3
19	1743828644	0099992	4500 CLIFFORD RD	NIXON, DORIS LEWTER EARLY, TROY O	8369	2701	GR3
20	1743923384	0192190	4425 CLIFFORD RD	EARLY, RHONDA B	8779	502	RT

- 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) DISTANCE OF 100' 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 IS 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 ENCASMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
    - D) 5.0' 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 FORCEMAINS. 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 2X2' 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 @ 1.0% 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 11' ABOVE THE NEXT UPSTREAM MANHOLE.
  - ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWM, 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) HEREINAFTER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5523 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 2X2' CORWLE



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 - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval \_\_\_\_\_ Raleigh Water Review Officer \_\_\_\_\_

**SITE PERMITTING APPROVAL**

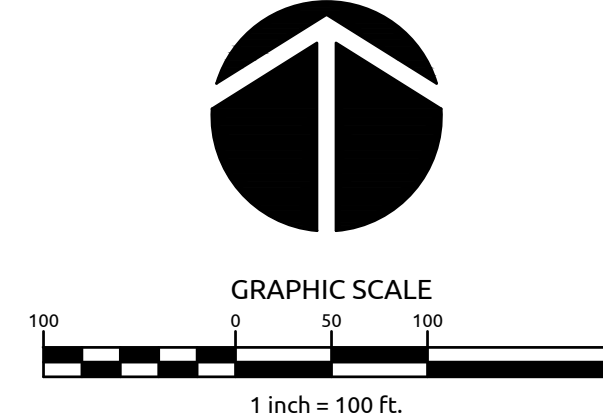
**Water and Sewer Permits (if applicable)**

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # S-4727**

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City of Raleigh Public Utilities Department Permit # \_\_\_\_\_



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**WithersRavenel**  
Engineers | Planners | Surveyors

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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL UTILITY PLAN**

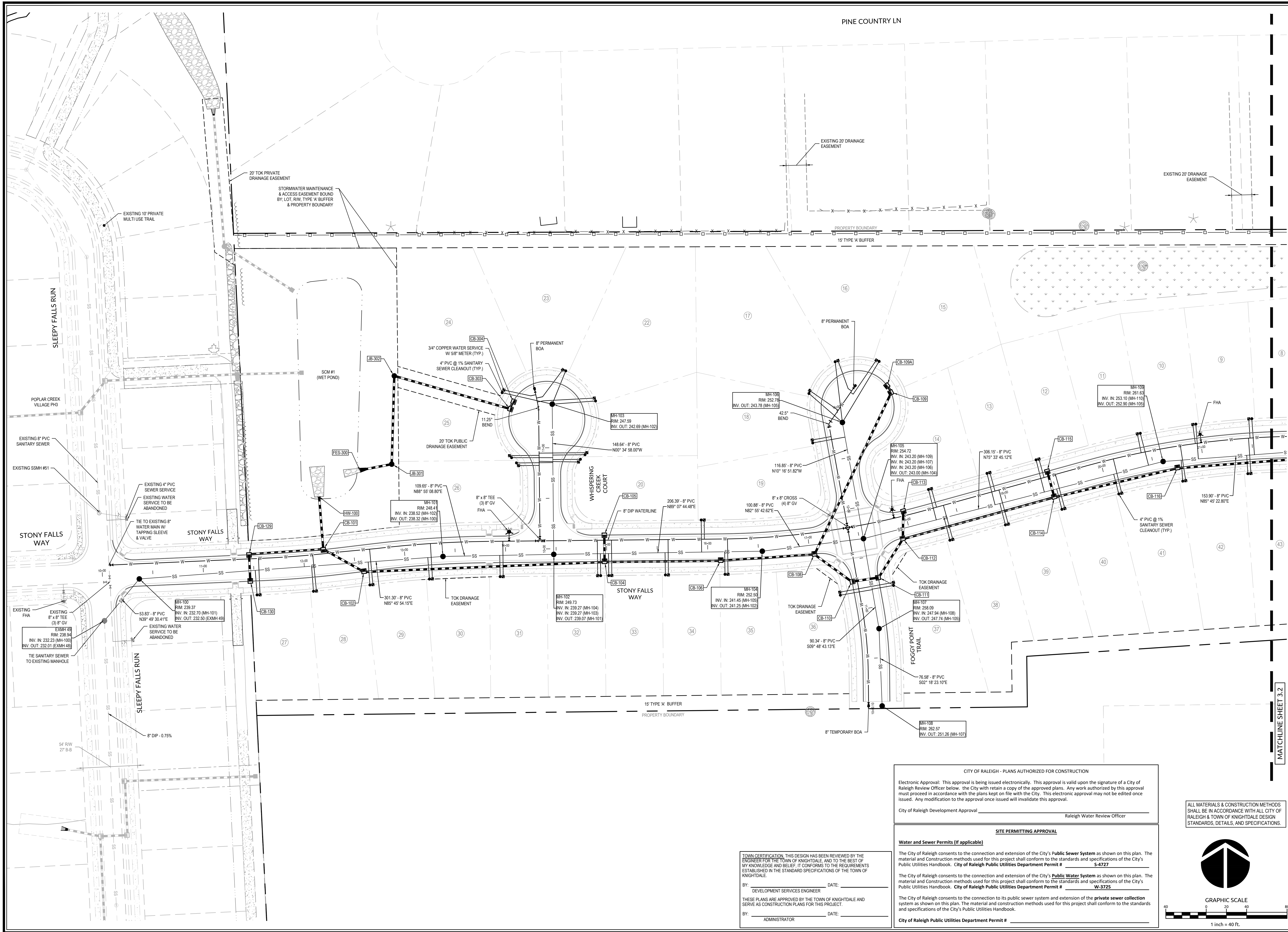
Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**3.0**





**WithersRavenel**  
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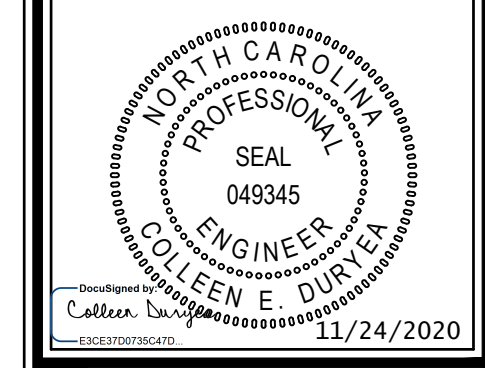
115 MacKenzie Drive | Cary, NC 27511 | P: 919.469.3300 | License # C-0852 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**UTILITY PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



Revisions	Comments	Date
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City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer

**SITE PERMITTING APPROVAL**

**Water and Sewer Permits (if applicable)**

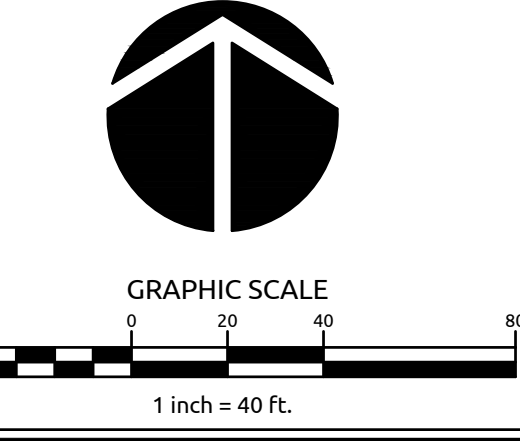
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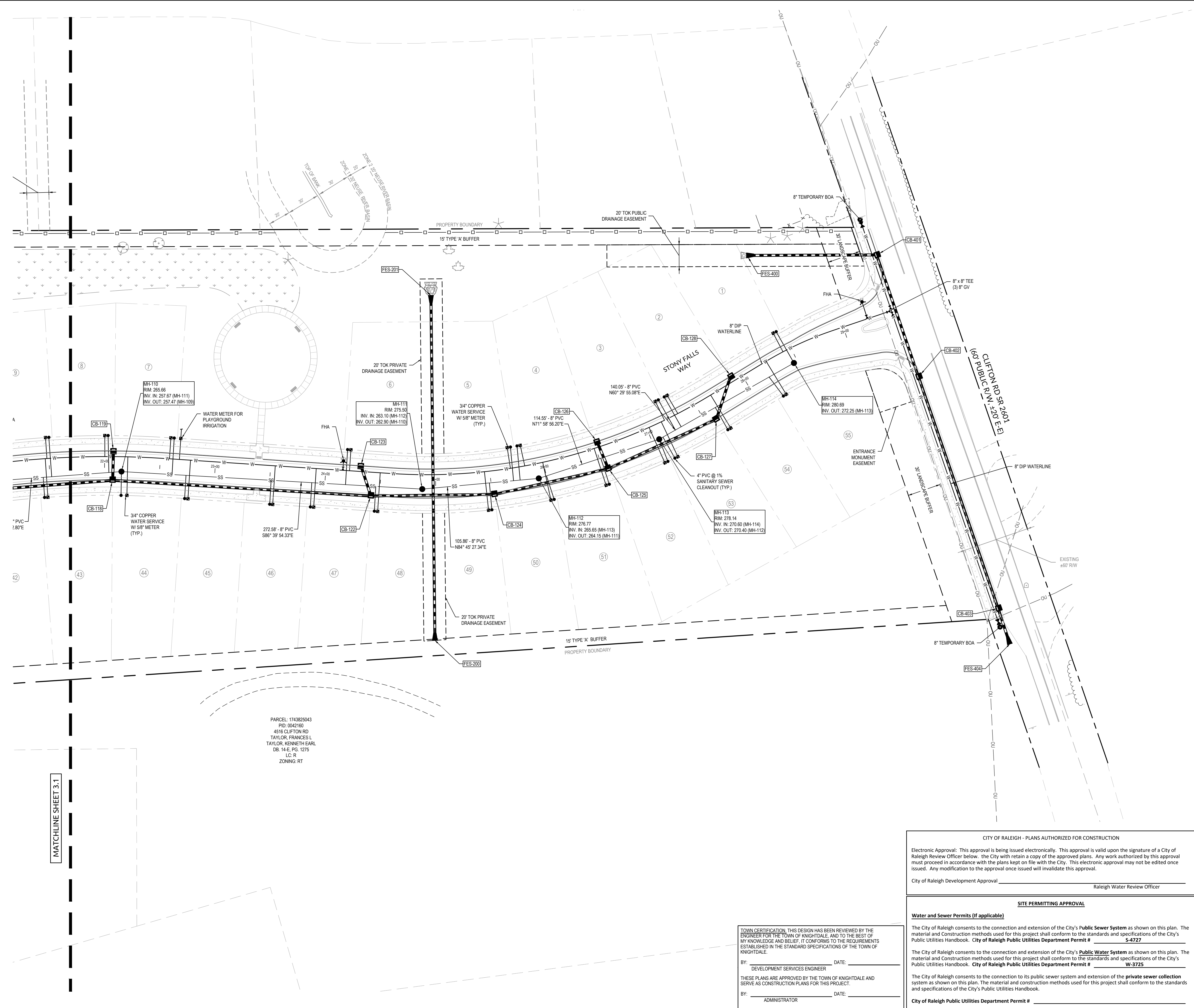
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DEVELOPMENT SERVICES ENGINEER

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





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

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 Raleigh Water Review Officer

**SITE PERMITTING APPROVAL**

**Water and Sewer Permits (if applicable)**

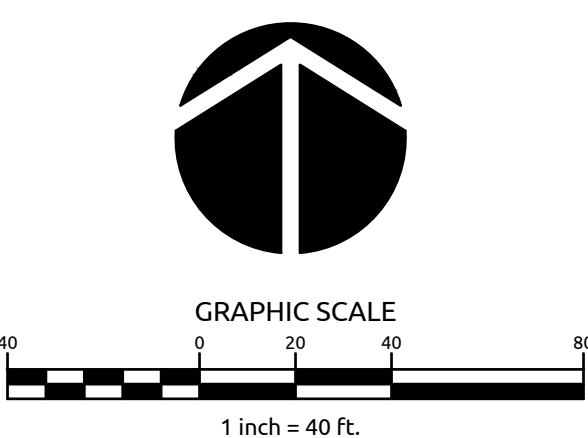
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**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**UTILITY PLAN**

Job No. 02190259 Drawn By WR  
 Date 08/14/20 Designer WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

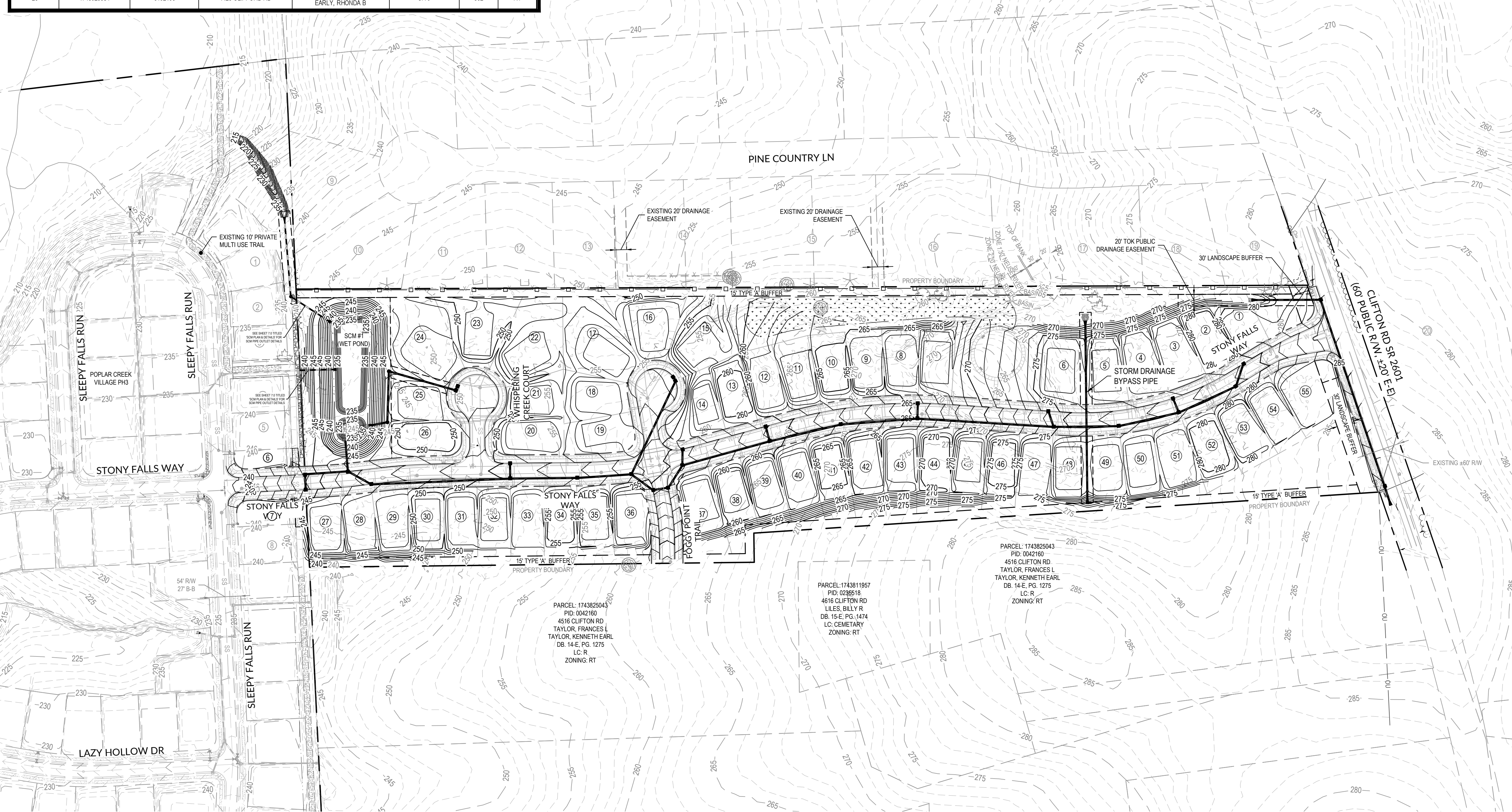
Sheet No.  
**3.2**



EXISTING ADJOINER INFO:							
NUMBER	PARCEL	PID	MAILING ADDRESS	OWNER INFO	DB	PG.	ZONING
1	1743721538	0458321	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
2	1743721346	0458320	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
3	1743721445	0458319	4717 SLEEPY FALLS RUN	BROWN, WILLIAM R. JR BROWN, GWENDOLYN JACKSON	017459	1868	NMX
4	1743721346	0458318	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
5	1743626392	0458398	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**6	1743721157	0458316	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
**7	1743721157	0458315	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
8	1743721160	0458314	441 WESTERN LN	CLAYTON PROPERTIES	017307	1416	NMX
9	1743722752	099969	120 PINE COUNTRY LANE	SAULT, CAROLYN	9155	138	GR3
10	1743723622	099970	119 PINE COUNTRY LANE	MAXWELL, MICHAEL	14957	1973	GR3
11	1743724962	099965	117 PINE COUNTRY LANE	MOLINA, SALVADOR MOLINA MARIA GUEVARA	9018	1822	GR3
12	1743725684	0099966	115 PINE COUNTRY LANE	CARONZO - DIAZ, GONZALO CARONZO CASTELLANO, BLANCA ROSA ESCOB	12204	1583	GR3
13	1743727604	0099967	113 PINE COUNTRY LANE	BIRCH, HOWARD REGINALD III	12161	563	GR3
14	1743728644	0099963	111 PINE COUNTRY LANE	KEETER, JOHN	13521	705	GR3
15	1743820675	0099960	109 PINE COUNTRY LANE	SHORNOCK, JEFFERY J	13615	2130	GR3
16	1743822895	0099959	202 MACKENAN DR.	AQUA NORTH CAROLINA INC.	13547	76	GR3
17	1743825514	0099956	105 PINE COUNTRY LANE	TEUSCHER, RICHARD DALE WRIGHT, GREGORY H	5233	234	GR3
18	1743827605	0099958	103 PINE COUNTRY LANE	WRIGHT, RAFFAELA M	7211	699	GR3
19	1743828644	0099992	4500 CLIFFORD RD	NIXON, DORIS LEWTER EARLY, TROY O	8399	2701	GR3
20	1743823384	0192190	4425 CLIFFORD RD	EARLY, RHONDA B	8779	502	RT

- 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 LILES", 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 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. 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)
  - RM 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 LDDO 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.



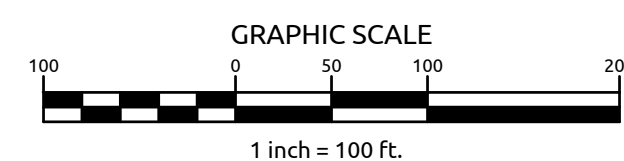
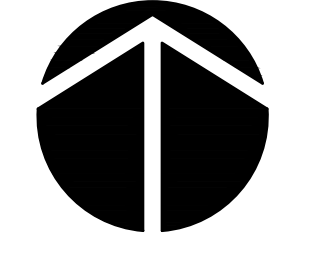
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DEVELOPMENT SERVICES ENGINEER

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 Engineers | Planners | Surveyors

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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 08/14/20 Designer WR

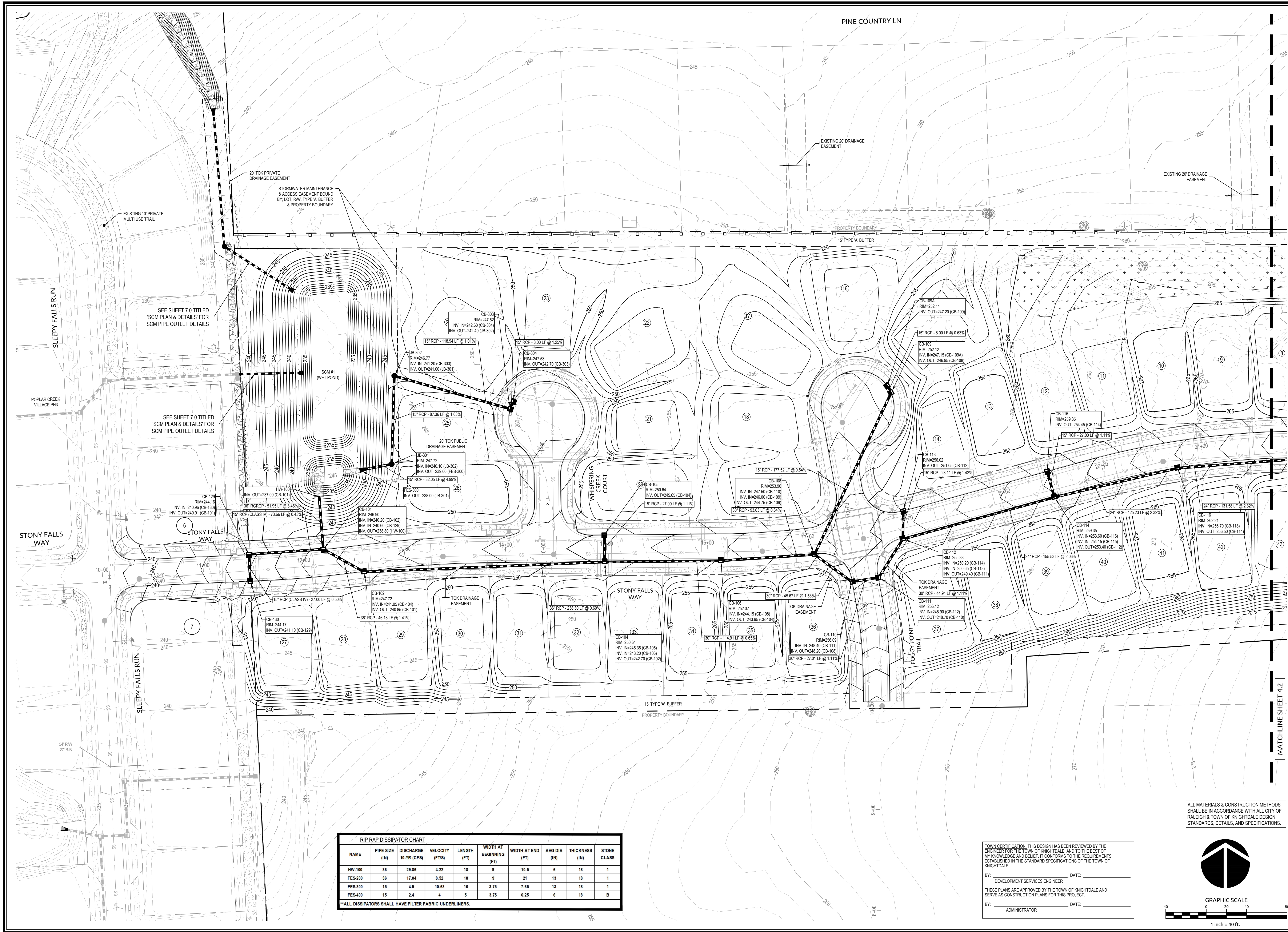


Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**4.0**





SEE SHEET 7.0 TITLED 'SCM PLAN & DETAILS' FOR SCM PIPE OUTLET DETAILS

SEE SHEET 7.0 TITLED 'SCM PLAN & DETAILS' FOR SCM PIPE OUTLET DETAILS

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
HW-100	36	28.86	4.22	18	9	10.5	6	18	1
FES-200	36	17.04	8.52	18	9	21	13	18	1
FES-300	15	4.9	10.83	16	3.75	7.85	13	18	1
FES-400	15	2.4	4	5	3.75	6.25	6	18	8

\*ALL DISSIPATORS SHALL HAVE FILTER FABRIC UNDERLAINERS.

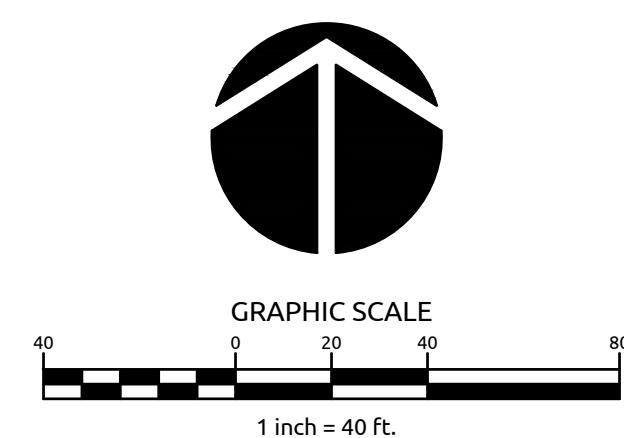
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Engineers | Planners | Surveyors

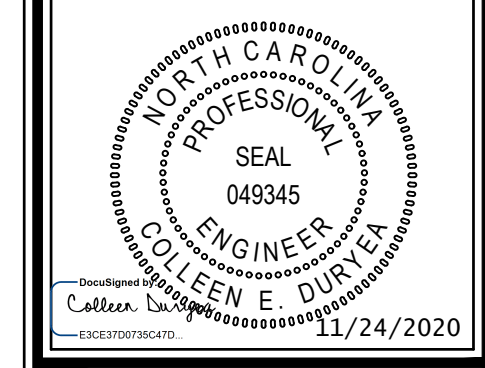
115 MacKinnon Drive | Cary, NC 27511 | P: 919.469.3300 | License #: C-0852 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**STORM DRAINAGE PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



Revisions

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2	PER TOK & NCDOT COMMENTS	11/24/20

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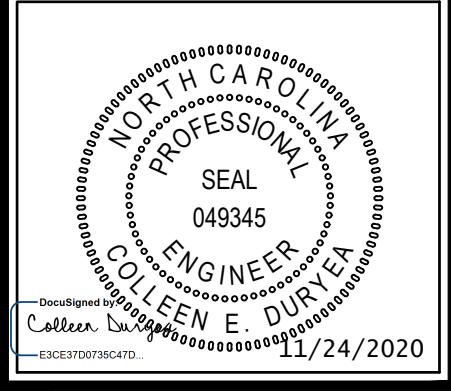
MATCHLINE SHEET 4.2



**POPLAR CREEK VILLAGE  
PHASE IV**  
TOWN OF KNIGHTDALE, NORTH CAROLINA

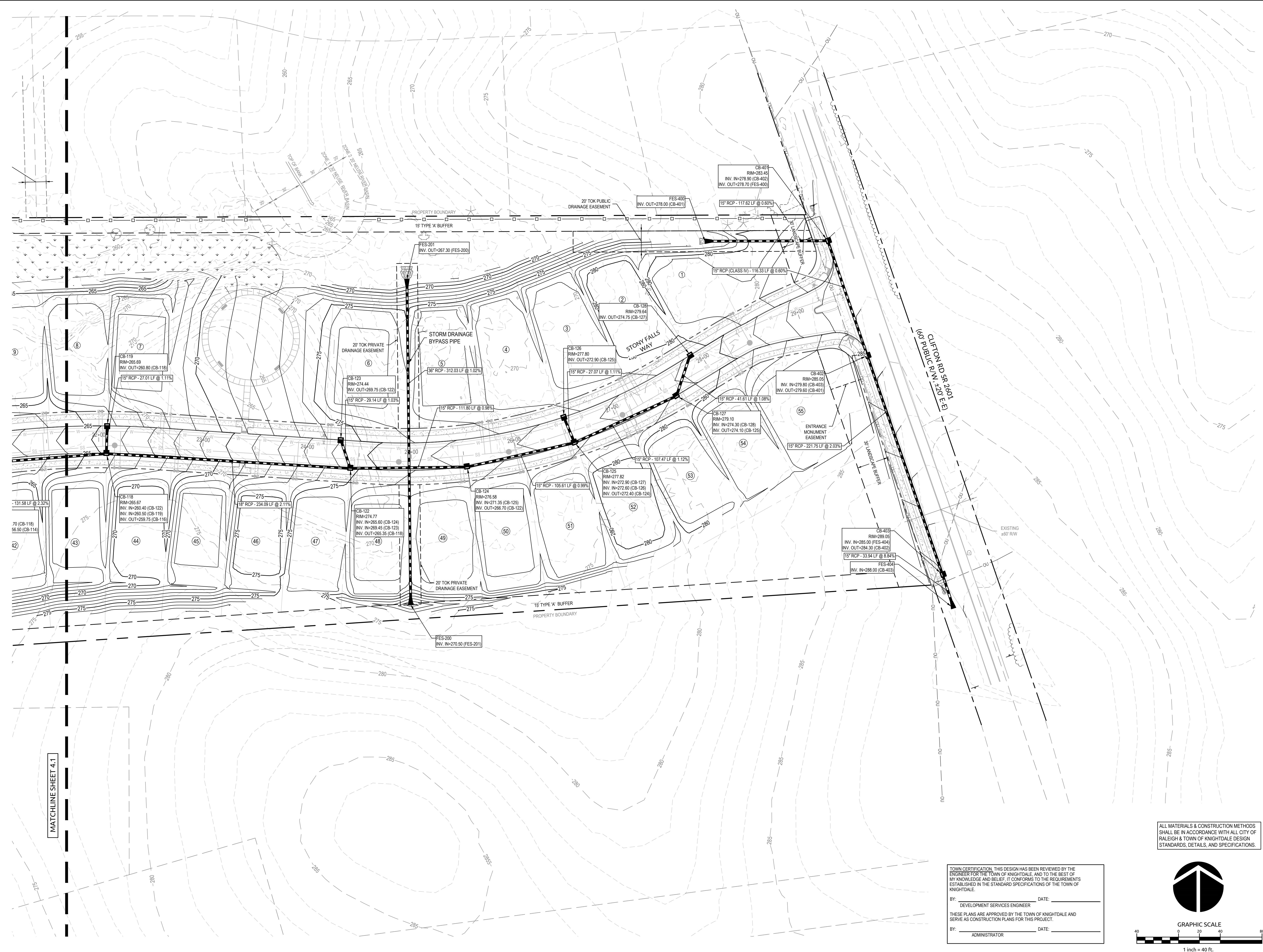
**STORM DRAINAGE PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



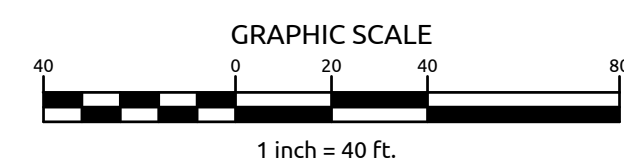
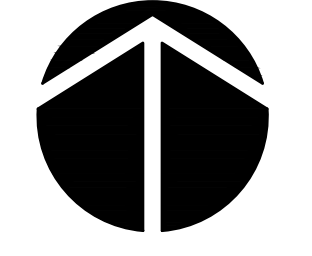
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DEVELOPMENT SERVICES ENGINEER

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

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



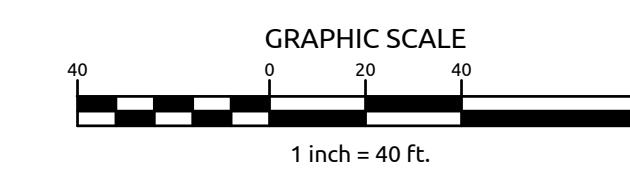
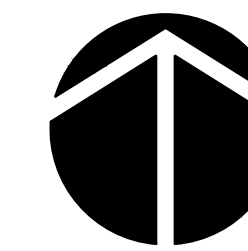
STORM SYSTEM DATA							
DOWNSTREAM STRUCTURE	UPSTREAM STRUCTURE	SIZE	LENGTH	SLOPE	MATERIAL	DOWNSTREAM INVERT	UPSTREAM INVERT
CB-101	CB-129	15	73.66	0.43%	RCP (CLASS IV)	240.60	240.91
CB-101	CB-102	36	46.13	1.41%	RCP	240.20	240.85
CB-102	CB-104	36	238.30	0.69%	RCP	241.05	242.70
CB-104	CB-105	15	27.00	1.11%	RCP	245.35	245.65
CB-104	CB-106	30	114.91	0.65%	RCP	243.20	243.95
CB-106	CB-108	30	93.03	0.64%	RCP	244.15	244.75
CB-108	CB-109	15	177.52	0.54%	RCP	246.00	246.95
CB-108	CB-110	30	45.67	1.53%	RCP	247.50	248.20
CB-109	CB-109A	15	8.00	0.63%	RCP	247.15	247.20
CB-110	CB-111	30	27.01	1.11%	RCP	248.40	248.70
CB-111	CB-112	30	44.91	1.11%	RCP	248.90	249.40
CB-112	CB-113	15	28.11	1.42%	RCP	250.65	251.05
CB-112	CB-114	24	155.53	2.06%	RCP	250.20	253.40
CB-114	CB-115	15	27.00	1.11%	RCP	254.15	254.45
CB-114	CB-116	24	125.23	2.32%	RCP	253.60	256.50
CB-116	CB-118	24	131.58	2.32%	RCP	256.70	259.75
CB-118	CB-119	15	27.01	1.11%	RCP	260.50	260.80
CB-118	CB-122	18	234.09	2.11%	RCP	260.40	265.35
CB-122	CB-123	15	29.14	1.03%	RCP	269.45	269.75
CB-122	CB-124	15	111.80	0.98%	RCP	265.60	266.70

STORM SYSTEM DATA							
DOWNSTREAM STRUCTURE	UPSTREAM STRUCTURE	SIZE	LENGTH	SLOPE	MATERIAL	DOWNSTREAM INVERT	UPSTREAM INVERT
CB-124	CB-125	15	105.61	0.99%	RCP	271.35	272.40
CB-125	CB-127	15	107.47	1.12%	RCP	272.90	274.10
CB-125	CB-126	15	27.07	1.11%	RCP	272.60	272.90
CB-127	CB-128	15	41.61	1.08%	RCP	274.30	274.75
CB-129	CB-130	15	27.00	0.50%	RCP (CLASS IV)	240.96	241.10
CB-303	CB-304	15	8.00	1.25%	RCP	242.60	242.70
CB-401	CB-402	15	116.33	0.60%	RCP (CLASS IV)	278.90	279.60
CB-402	CB-403	15	221.75	2.03%	RCP	279.80	284.30
CB-403	FES-404	15	33.94	8.84%	RCP	285.00	286.00
FES-201	FES-200	36	312.03	1.02%	RCP	267.30	270.50
FES-300	JB-301	15	32.05	4.99%	RCP	238.00	239.60
FES-400	CB-401	15	117.62	0.60%	RCP	278.00	278.70
HW-100	CB-101	36	51.95	3.46%	RGRCP	237.00	238.80
JB-301	JB-302	15	87.36	1.03%	RCP	240.10	241.00
JB-302	CB-303	15	118.94	1.01%	RCP	241.20	242.40

STORM STRUCTURE TABLE				
STRUCTURE	RIM EL	STRUCTURE IN	INVERT IN	INVERT OUT
CB-101	246.90	CB-102 CB-129	240.20 240.60	238.80
CB-102	247.72	CB-104	241.05	240.85
CB-104	250.64	CB-105 CB-106	245.35 243.20	242.70
CB-105	250.64			245.65
CB-106	252.07	CB-108	244.15	243.95
CB-108	253.90	CB-110 CB-109	247.50 246.00	244.75
CB-109	252.12	CB-109A	247.15	246.95
CB-109A	252.14			247.20
CB-110	256.09	CB-111	248.40	248.20
CB-111	256.12	CB-112	248.90	248.70
CB-112	255.88	CB-114 CB-113	250.20 250.65	249.40
CB-113	256.02			251.05
CB-114	259.35	CB-116 CB-115	253.60 254.15	253.40
CB-115	259.35			254.45
CB-116	262.21	CB-118	256.70	256.50
CB-118	265.67	CB-122 CB-119	260.40 260.50	259.75
CB-119	265.69			260.80
CB-122	274.77	CB-124 CB-123	265.60 269.45	265.35
CB-123	274.44			269.75
CB-124	276.58	CB-125	271.35	266.70

STORM STRUCTURE TABLE				
STRUCTURE	RIM EL	STRUCTURE IN	INVERT IN	INVERT OUT
CB-125	277.82	CB-127 CB-126	272.90 272.60	272.40
CB-126	277.80			272.90
CB-127	279.10	CB-128	274.30	274.10
CB-128	279.64			274.75
CB-129	244.16	CB-130	240.96	240.91
CB-130	244.17			241.10
CB-303	247.52	CB-304	242.60	242.40
CB-304	247.53			242.70
CB-401	283.45	CB-402	278.90	278.70
CB-402	285.05	CB-403	279.80	279.60
CB-403	289.05	FES-404	285.00	284.30
FES-200	273.92			270.50
FES-201	270.72	FES-200	267.30	
FES-300	239.52	JB-301	238.00	
FES-400	280.22	CB-401	278.00	
FES-404	289.52			288.00
HW-100	240.83	CB-101	237.00	
JB-301	247.72	JB-302	240.10	239.60
JB-302	246.77	CB-303	241.20	241.00

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.

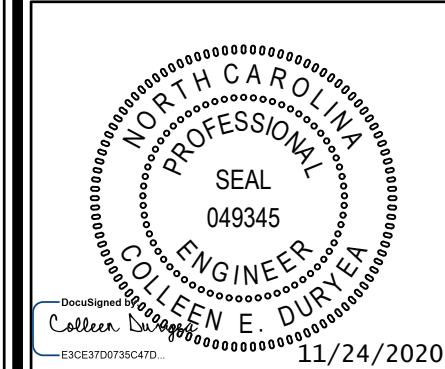
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**STORM DRAINAGE CHARTS**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions	
1	PER TOK COMMENTS 10/02/20
2	PER TOK & NCDOT COMMENTS 11/24/20

Sheet No.  
**4.3**





**MASS GRADING COMPLIANCE STATEMENT:**  
 THIS PROJECT WILL BE MASS-GRADED INCLUDING THE RESIDENTIAL BUILDING LOTS. PER UD0 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.

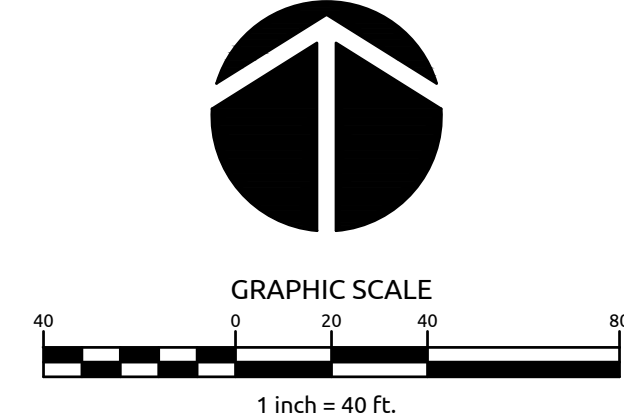
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DEVELOPMENT SERVICES ENGINEER

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

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



**WithersRavenel**  
 Engineers | Planners | Surveyors

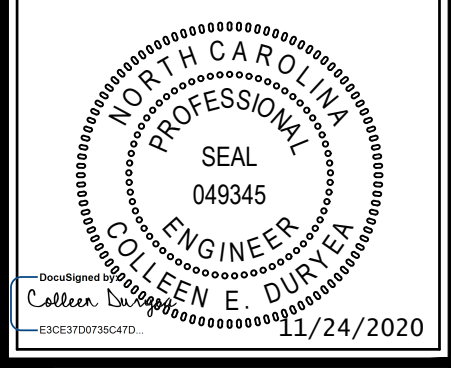
115 MacKinnon Drive | Cary, NC 27511 | P: 919.469.3300 | License #: C-0852 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**GRADING PLAN**

Job No. 02190259 Drawn By WR  
 Date 08/14/20 Designer WR



Revisions	Comments	Date
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**5.0**

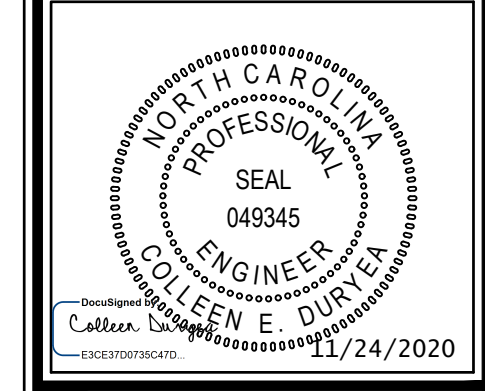
MATCHLINE SHEET 5.1



**POPLAR CREEK VILLAGE  
PHASE IV**  
TOWN OF KNIGHTDALE, NORTH CAROLINA

**GRADING PLAN**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

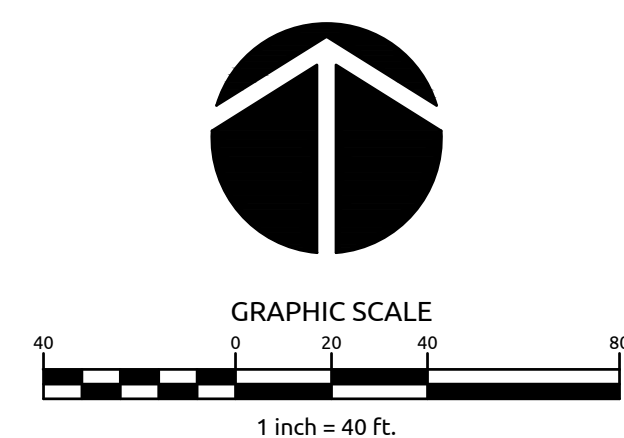
Sheet No.	5.1
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**MASS GRADING COMPLIANCE STATEMENT:**  
 THIS PROJECT WILL BE MASS-GRADED INCLUDING THE RESIDENTIAL BUILDING LOTS. PER UDO SECTION 6.2.B.3 A RESIDENTIAL SUBDIVISIONS WITH LOTS LESS THAN 60' WIDE ARE EXEMPT FROM THE RESIDENTIAL CLEARING 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.

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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 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



MATCHLINE SHEET 5.0



**TEMPORARY RIP-RAP VELOCITY DISSIPATER PAD DESIGN CHART POPLAR CREEK 11-23-2020**

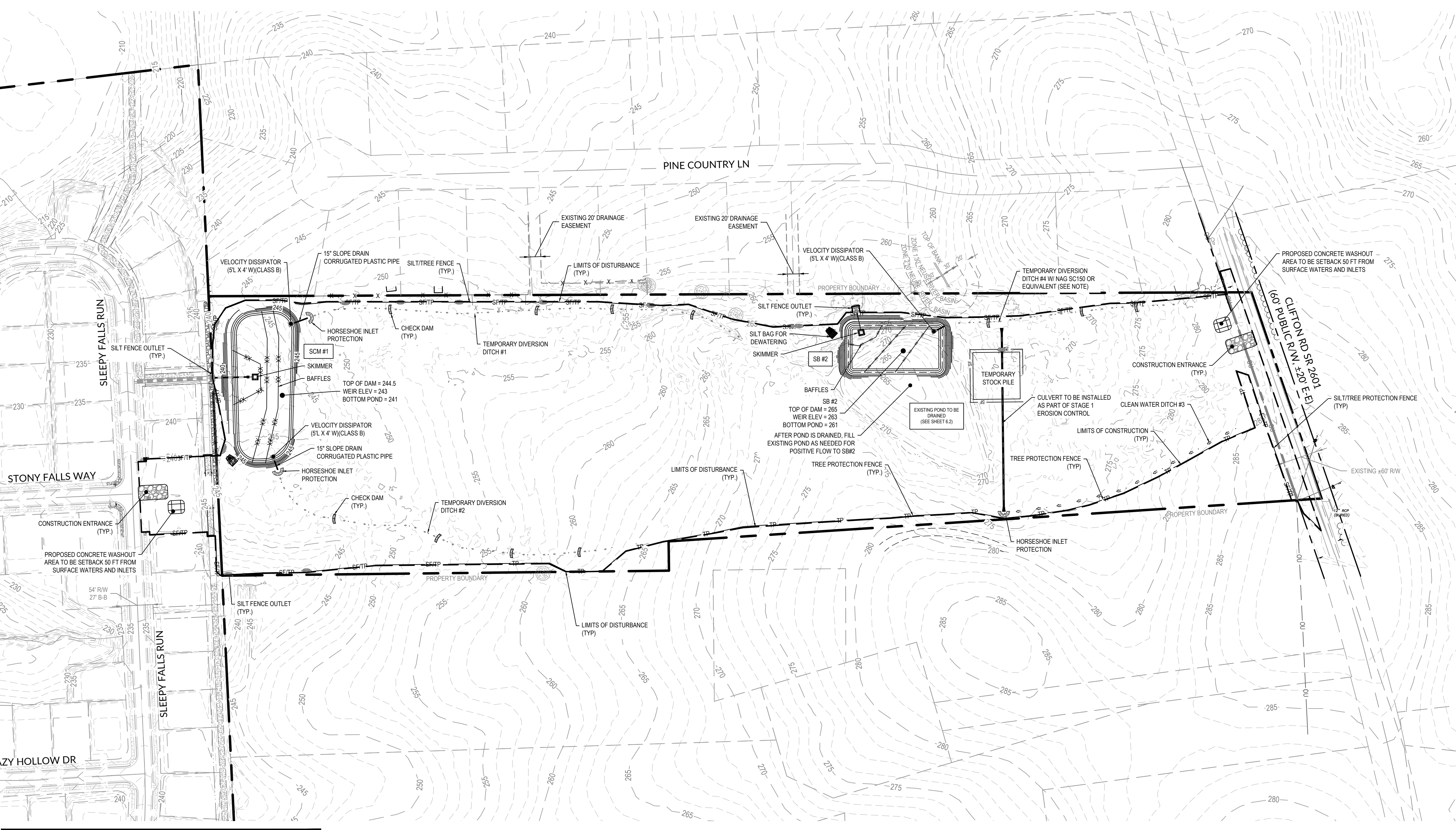
STRUCTURE #	PIPE DIA (IN)	DISCHARGE 10 yr (CFS)	VELOCITY (EXIT)	LENGTH (FT)	ENTRANCE WIDTH (FT)	EXIT WIDTH (FT)	THICKNESS (IN)	CLASS STONE
			10 yr (FTS)					
TDD 1	15	10.83	4.91	5	3.75	3.75	18	B
TDD 2	15	10.77	5.14	5	3.75	3.25	18	A
TDD 4	15	21.12	6.20	5	3.75	3.25	18	A

ALL DISSIPATERS SHALL HAVE FILTER FABRIC UNDERLINERS. VELOCITIES BASED ON TALLWATER CONDITIONS BASED ON 10 YEAR STORM.

TEMPORARY DIVERSION DITCH #4 NOTE: DITCH SECTION VARIES FROM TYPICAL SECTION. BOTTOM OF DITCH WILL BE 4' WIDE.

- CONSTRUCTION SEQUENCE:**
- SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE WATERSHED MANAGER, ALAN ALCOCK, 919-868-2560. OBTAIN A LAND-DISTURBING PERMIT.
  - INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER CONSTRUCTION. INSTALL INLET PROTECTION TO EXISTING CATCH BASINS.
  - DUE TO FILL REQUIRED FOR FINAL GRADE OF BMP, THE RISER STRUCTURE INSTALLED SHALL BE DELAYED UNTIL THE SITE IS BROUGHT UP TO GRADE.
  - CALL 919-868-2560 FOR AN ONSITE INSPECTION BY THE WATERSHED MANAGER TO OBTAIN A CERTIFICATE OF COMPLIANCE.
  - BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
  - INSTALL STORM SEWER. IF SHOWN, AND PROTECT INLETS WITH BLOCK AND GRAVEL. INLET CONTROLS, SEDIMENT TRAPS OR OTHER APPROVED MEASURES AS SHOWN ON THE PLAN. BEGIN CONSTRUCTION, BUILDING, ETC.
  - STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISH GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC. SEED AND MULCH DENUDED AREAS PER GROUND STABILIZATION TIME FRAMES.
  - WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL 919-842-7142 FOR AN INSPECTION BY THE WATERSHED MANAGER.
  - IF SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS, ETC. AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
  - WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE WATERSHED MANAGER, 919-796-5765. OBTAIN A CERTIFICATE OF COMPLETION.

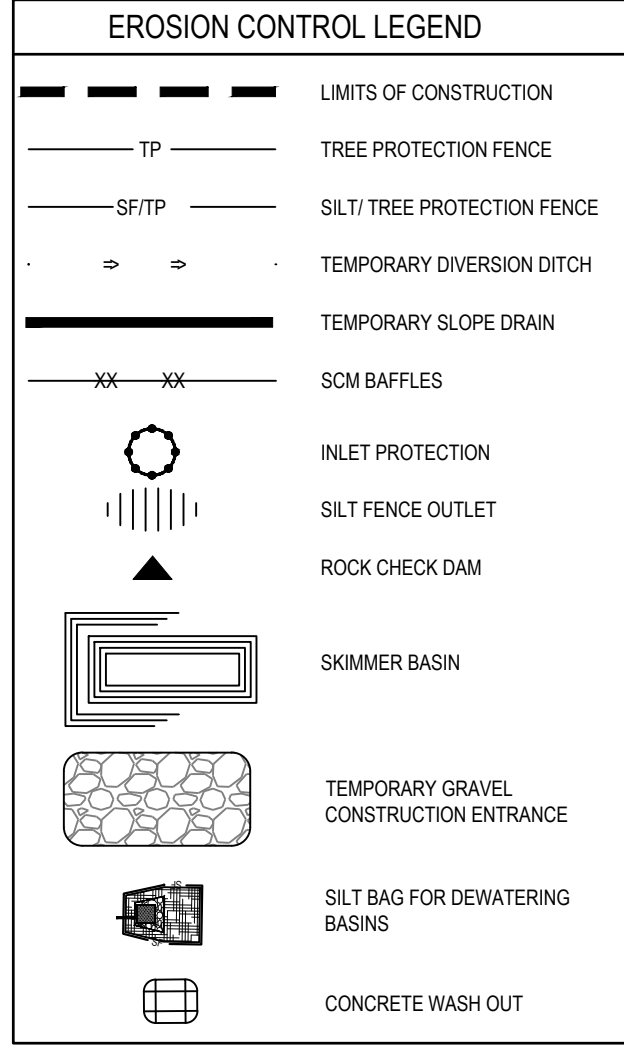
- EROSION CONTROL & STORM DRAINAGE NOTES:**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS & DETAILS.
  - BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY PERFORMED BY WITHERSRAVENEL, INC. OFFSITE TOPOGRAPHIC INFORMATION PROVIDED BY NC LIDAR.
  - LIMITS OF JURISDICTIONAL 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 R5AW-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 REFRESHED 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. STOCKPILE HEIGHT SHALL NOT EXCEED 35 FEET WITH SLOPES 2:1 OR FLATTER.
  - 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 6.2.8.3 A RESIDENTIAL SUBDIVISIONS WITH LOTS LESS THAN 60' WIDE ARE EXEMPT FROM THE RESIDENTIAL CLEARING AND GRADING REQUIREMENTS OF SECTION 6.2.8. THIS PROJECT IS A RESIDENTIAL SUBDIVISION WITH LOTS LESS THAN 60' WIDE, THEREFORE, SECTION 6.2.8 DOES NOT APPLY.

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

**DENUDED AREA = 16.20 AC**



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

**TEMPORARY SKIMMER BASIN DESIGN CHART**

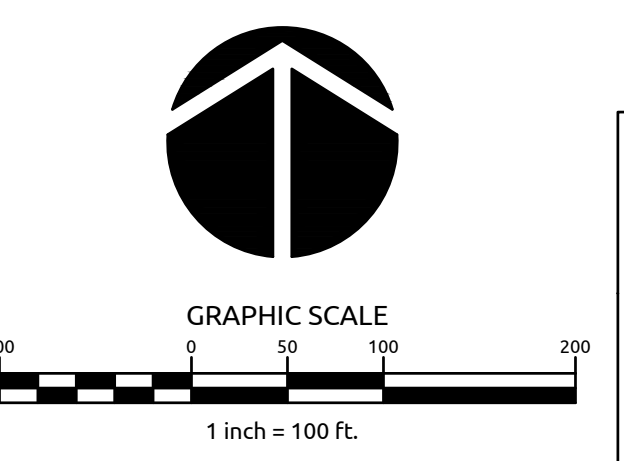
BASIN	TYPE	DRAINAGE AREA [AC]	DENUDED AREA [AC]	COMPOSITE RATIONAL C	PEAK FLOW Q10 [CFS]	BASIN DIMENSIONS			WEIR LENGTH [FT]	VOLUME REQUIRED [CF]	VOLUME PROVIDED [CF]	SURFACE AREA REQ [SF]	SURFACE PROVIDED [SF]	SKIMMER SIZE [IN]	SKIMMER ORIFICE SIZE [IN]
						DEPTH [FT]	LENGTH [FT]	WIDTH [FT]							
**SCM #1	SKIMMER	13.7	8.0	0.38	37.9	SEE E.C. PLAN	40	24,878	42,404	16,508	21,202	3.0	2.50		
SB #2	SKIMMER	10.7	5.8	0.37	28.3	2.0	160.0	80.0	30	19,188	22,816	12,299	12,800	2.5	2.25

**TEMPORARY DIVERSION DITCH CHART**

NAME	RATIONAL C	DRAINAGE AREA (AC)	Q10 (CFS)	SLOPE (%)	CALCULATED DEPTH (FT)	CALCULATED SHEAR STRESS (LBS/FT <sup>2</sup> )	CALCULATED VELOCITY (FT/S)	TYPE OF LINER
TEMPORARY DIVERSION DITCH #1	0.50	3.00	10.83	2.8	0.86	1.19	4.91	S75
TEMPORARY DIVERSION DITCH #2	0.35	4.38	10.77	3.3	0.84	1.32	5.14	S75
TEMPORARY DIVERSION DITCH #4	0.39	7.50	21.12	4.0	0.84	1.80	6.20	SC150
CLEAN WATER DITCH #3	0.22	4.53	7.20	2.5	0.58	0.87	4.15	S75

**NOTES:**  
1' OF FREEBOARD IS SHOWN PROVIDED FOR THE BASINS. VOLUME CALCULATION DOES NOT INCLUDE FREEBOARD.  
SURFACE AREA REQUIREMENT FOR A SKIMMER SEDIMENT BASIN DETERMINED PER NCDENR EROSION CONTROL MANUAL (435 SFC/FS FOR 10 YR STORM).  
VOLUME REQUIREMENT FOR A SKIMMER SEDIMENT BASIN DETERMINED PER NCDENR EROSION CONTROL MANUAL (1800 CF PER DRAINAGE AREA).  
10-YR RAINFALL INTENSITY = 7.22  
\*\*SCM #1 SKIMMER DRAINAGE AREA HAS ADDITIONAL AREA TO ACCOUNT FOR POST EROSION CONTROL CONDITIONS.

**NOTES:**  
1 RAINFALL INTENSITY BASED ON THE 10 YEAR S' 7.22  
2 CALCULATED DEPTH & CALCULATED BASED ON FLOWMASTER OUTPUT.  
3 NAG S75: NORTH AMERICAN GREEN S75 OR EQUAL  
NAG S150: NORTH AMERICAN GREEN S150 OR EQUAL  
NAG SC150: NORTH AMERICAN GREEN SC150 OR EQUAL



**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

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

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

**WithersRavenel**  
Engineers | Planners | Surveyors

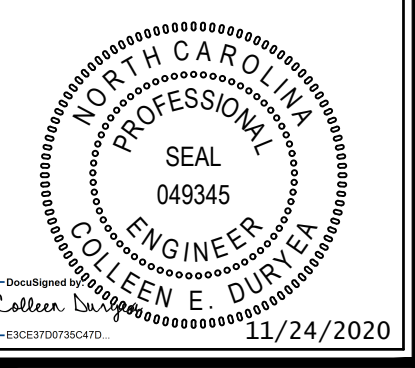
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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**STAGE 1 EROSION CONTROL  
PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



**Revisions**

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**6.0**



- 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.

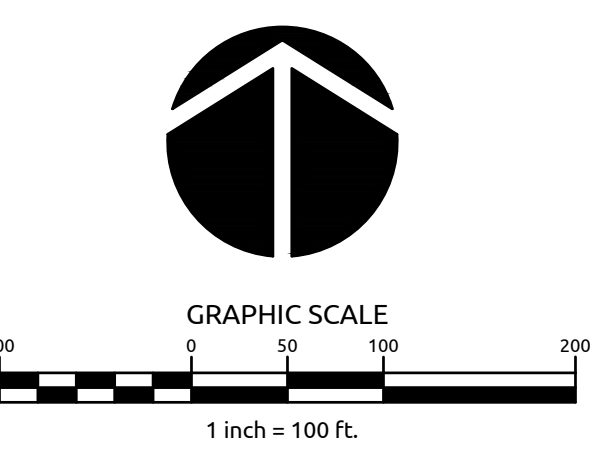
DENUDED AREA = 16.20 AC

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

**EROSION CONTROL LEGEND**

	LIMITS OF CONSTRUCTION
	TREE PROTECTION FENCE
	SILT TREE PROTECTION FENCE
	TEMPORARY DIVERSION DITCH
	TEMPORARY SLOPE DRAIN
	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.



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

**STAGE 2 EROSION CONTROL  
PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR

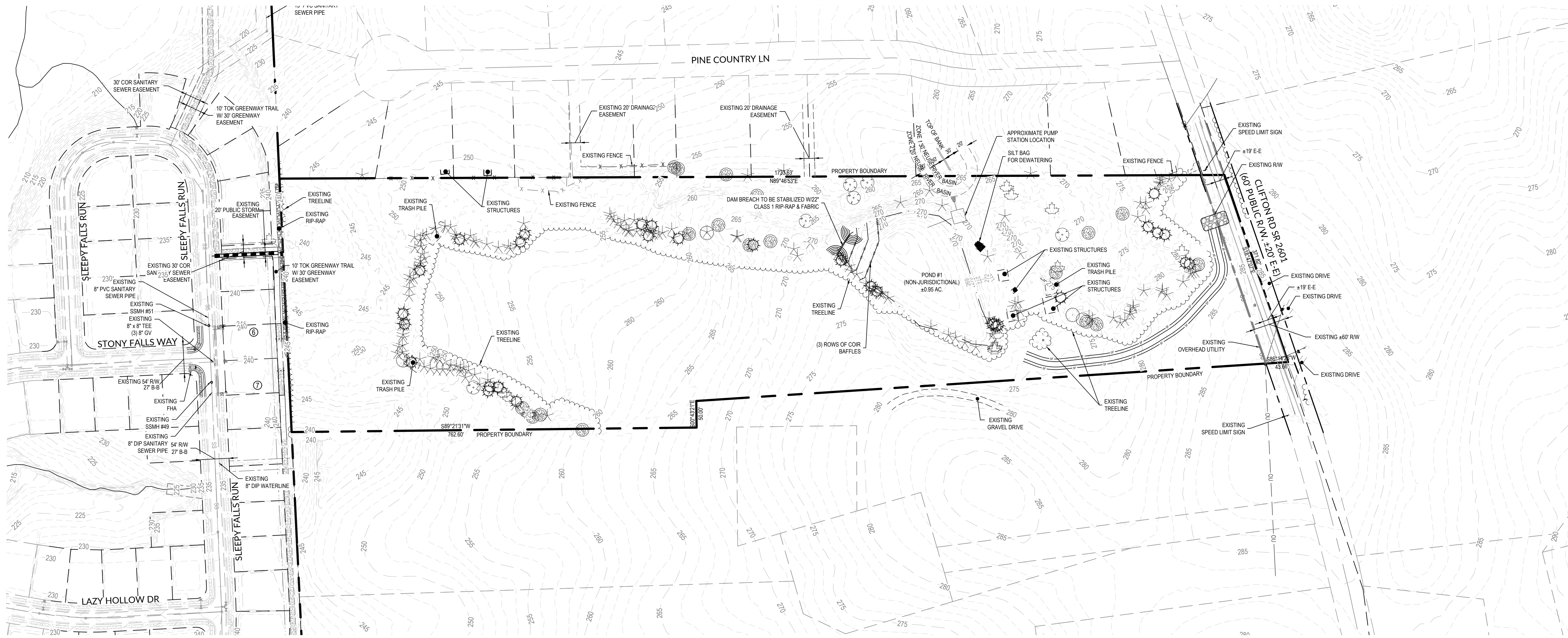
Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

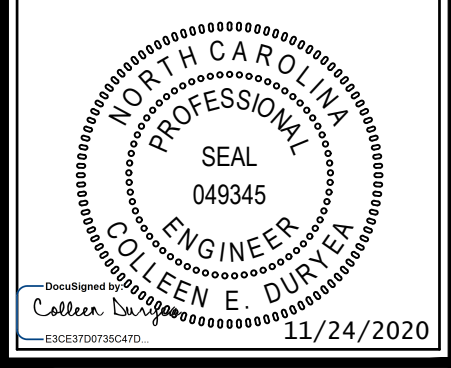
Sheet No.  
**6.1**



- 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 LES", 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 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.
  - 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.



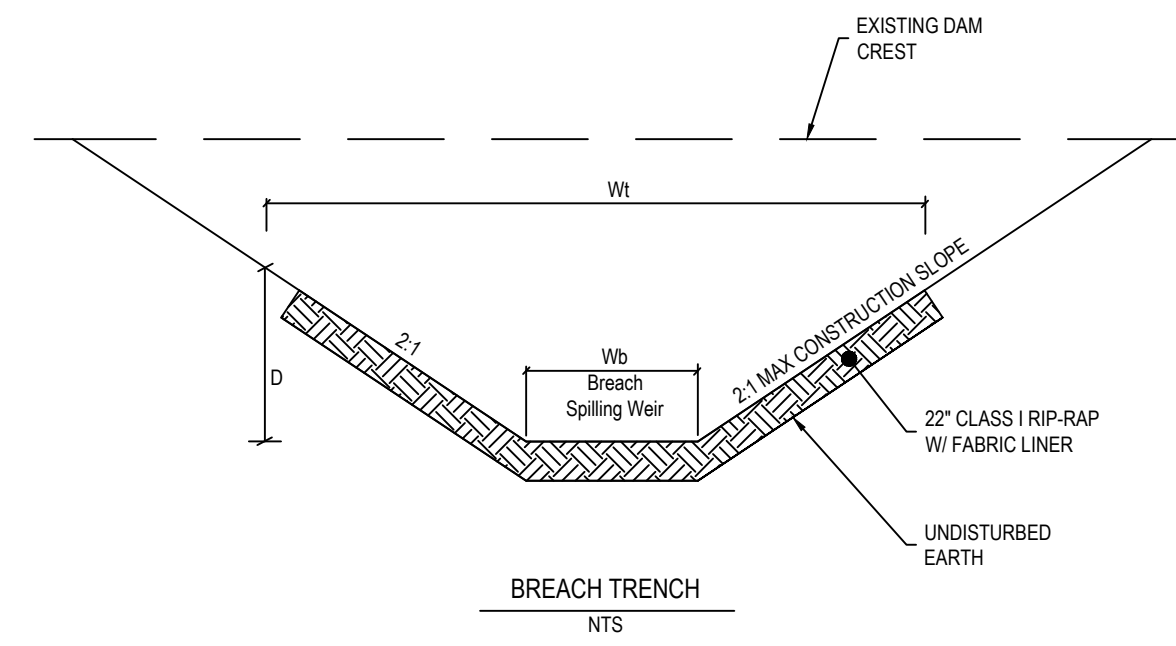
Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

- CONTROLLED DAM BREACH CONSTRUCTION SEQUENCE:**
- OBTAIN APPROVAL FROM TOWN OF KNIGHTDALE STORMWATER DIVISION.
  - CONTRACTOR MUST VERIFY THAT NO UTILITIES ARE PRESENT IN THE EXCAVATION AREA PRIOR TO COMMENCING THE DAM BREACH. CONTACT NORTH CAROLINA ONE CALL AT 1-800-632-4845.
  - CONTRACTOR SHALL PROVIDE PUMP TO LOWER WATER LEVEL. PLACE RIP-RAP AT DISCHARGE POINT OF BREACH PUMP LINE TO DETER EROSION AT OUTLET. DISCHARGE SHALL BE CONDUCTED IN A MANNER TO PREVENT SEDIMENTATION DOWNSTREAM. CONTINUE PUMPING TO FILTER BASIN AS NEEDED TO COMPLETELY DRAIN POND & THEN INSTALL WAKE COUNTY STANDARD FILTER BERM AROUND BREACH. SITE CONDITIONS MAY DICTATE THAT THIS AREA BE "FLOORED" IN BY CONTRACTOR BEFORE HE IS ABLE TO CONSTRUCT THE FILTER BERM.
  - FILL IN POND WITH SUITABLE SOIL AND ROUGH GRADE.
  - SEED ALL DISTURBED AREAS DUE TO CONSTRUCTION ACTIVITIES PER SEEDING SCHEDULE.



**BREACH TABLE**

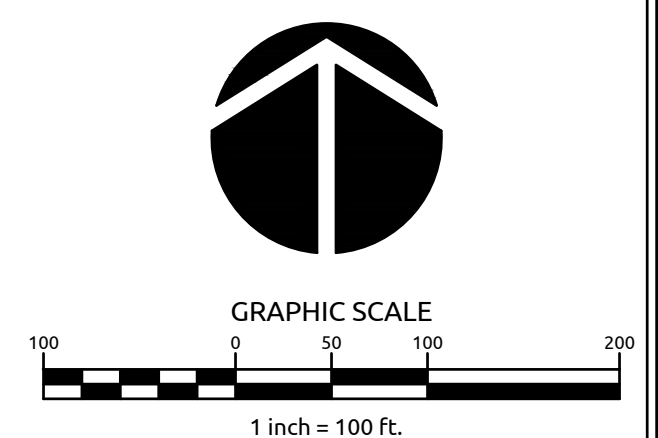
POND NAME	DRAINAGE AREA [AC]	Q10 [CFS]	Q100 [CFS]	Wb	Wt	D
1	8	19.7	26.5	3	10	3

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.

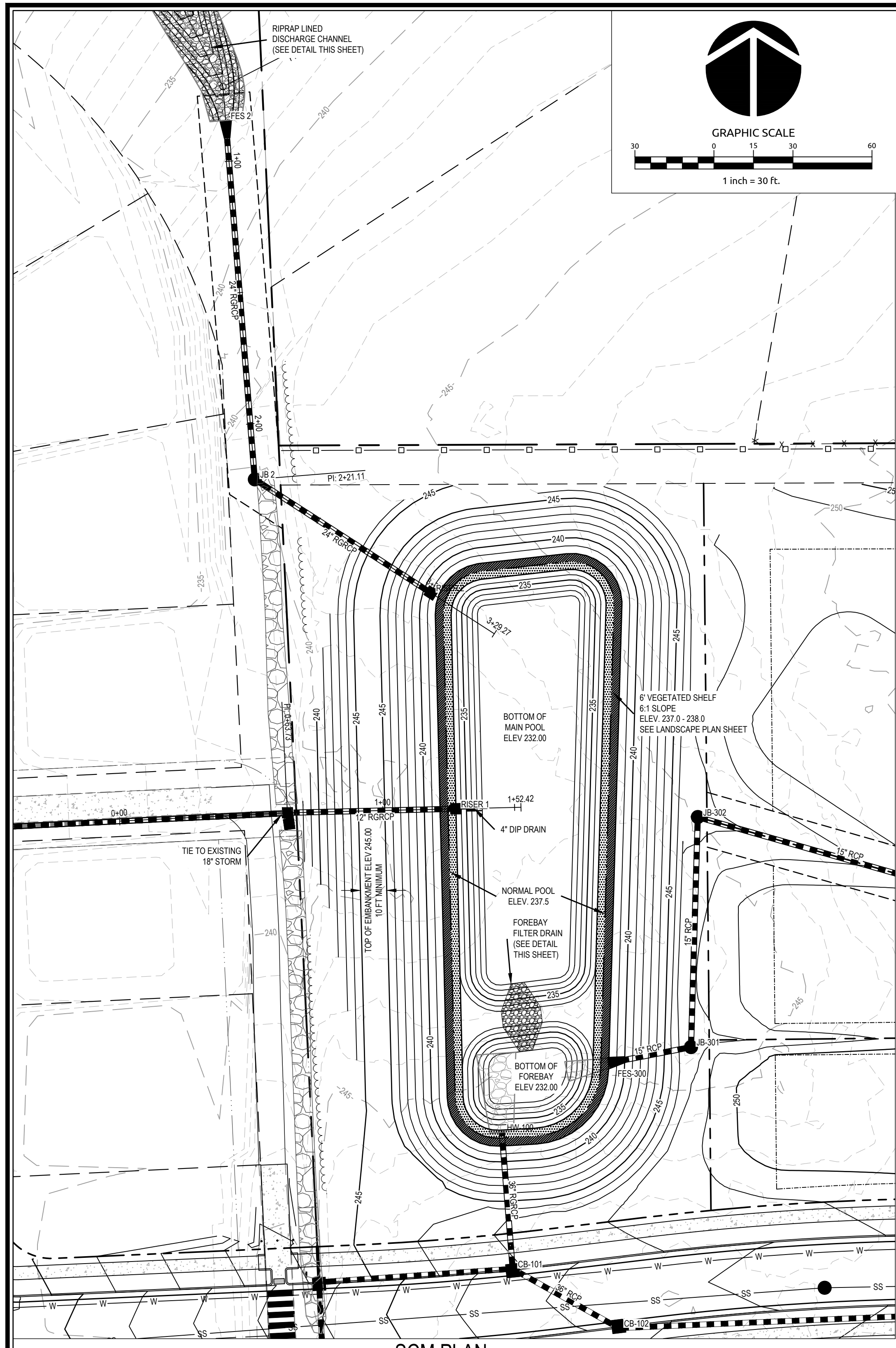
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
DEVELOPMENT SERVICES ENGINEER

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

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







SCM PLAN

**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 BE 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 BROUGHT UP BY BENCHING INTO THE EXISTING SLOPE. 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 FILL LIFTS 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 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 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.

- ONCE ALL SEDIMENT AND EROSION CONTROL DEVICES HAVE BEEN REMOVED, THE SCM SHALL BE CONVERTED TO A PERMANENT SCM.
    - ALL SEDIMENT SHALL BE REMOVED AND DISPOSED OF PROPERLY.
    - FOREBAY AND VEGETATED SHELF SHALL BE CONSTRUCTED PER PLANT SCHEDULE ON LANDSCAPE PLAN.
    - VEGETATED SHELF SHALL BE PLANTED PER PLANT SCHEDULE ON LANDSCAPE PLAN.
    - FINAL CERTIFICATION OF THE SCM BY A PROFESSIONAL ENGINEER IS REQUIRED.
- 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 IN THE TOPSOIL TO NOT PUNCTURE OR DAMAGE THE CLAY. A CLAY LINER, NO ORGANICS, MOISTURE 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 C813 (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 C243 & ASTM C361.
    - NON-O-RING JOINTS SHALL CONFORM TO ASTM C269.

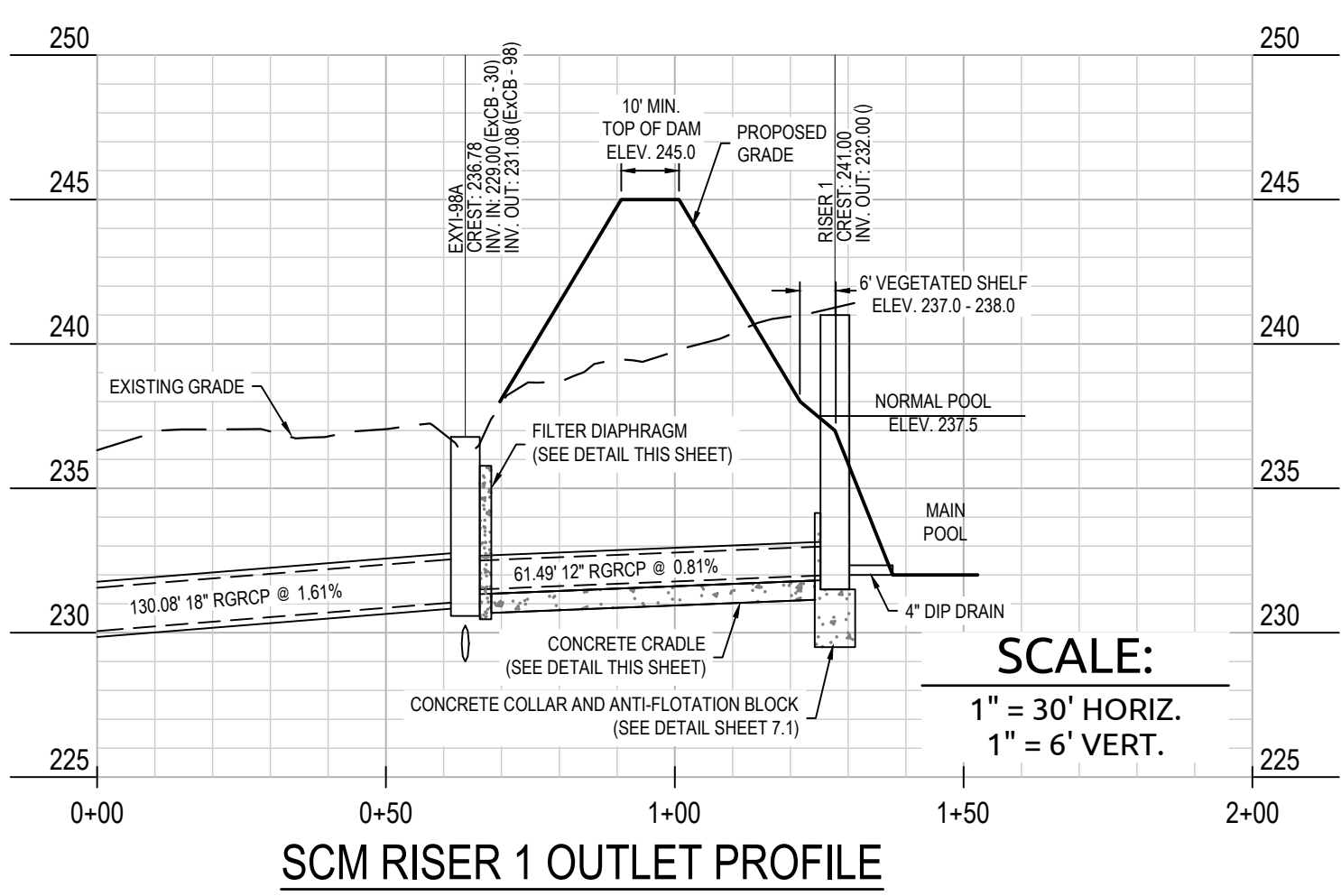
**TOWN CERTIFICATION**

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

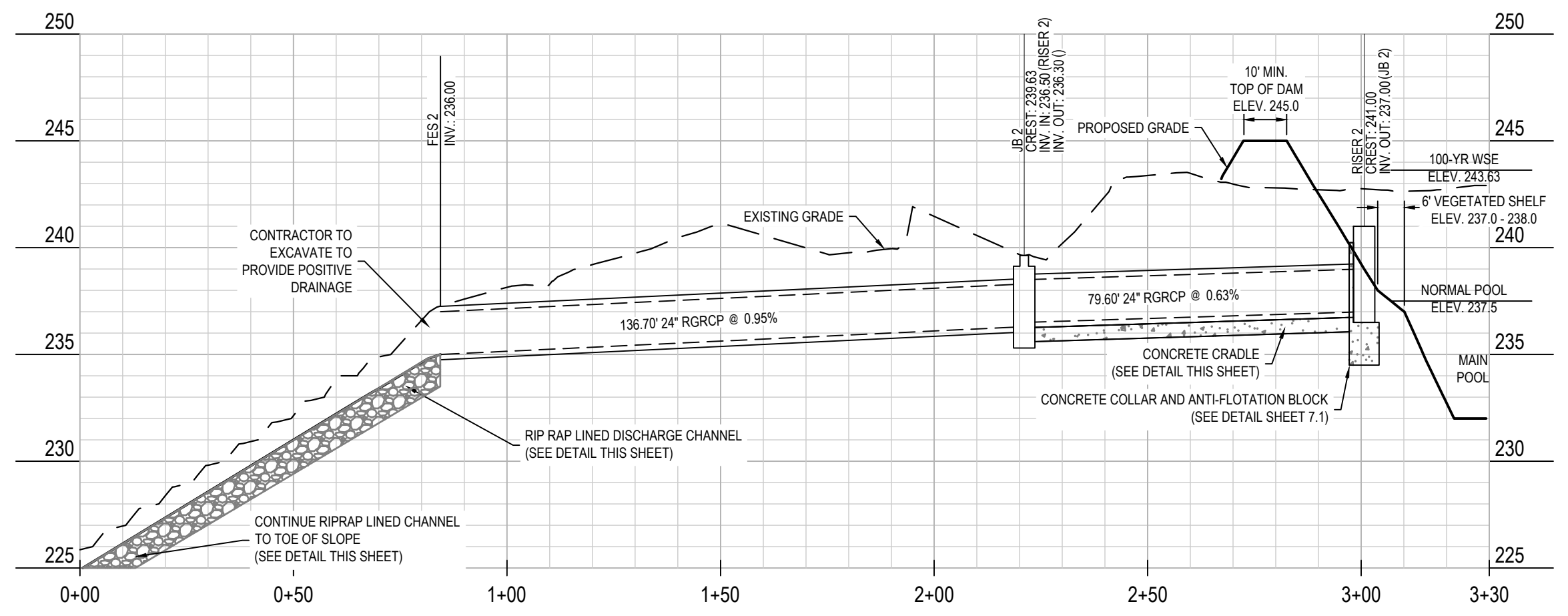
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

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



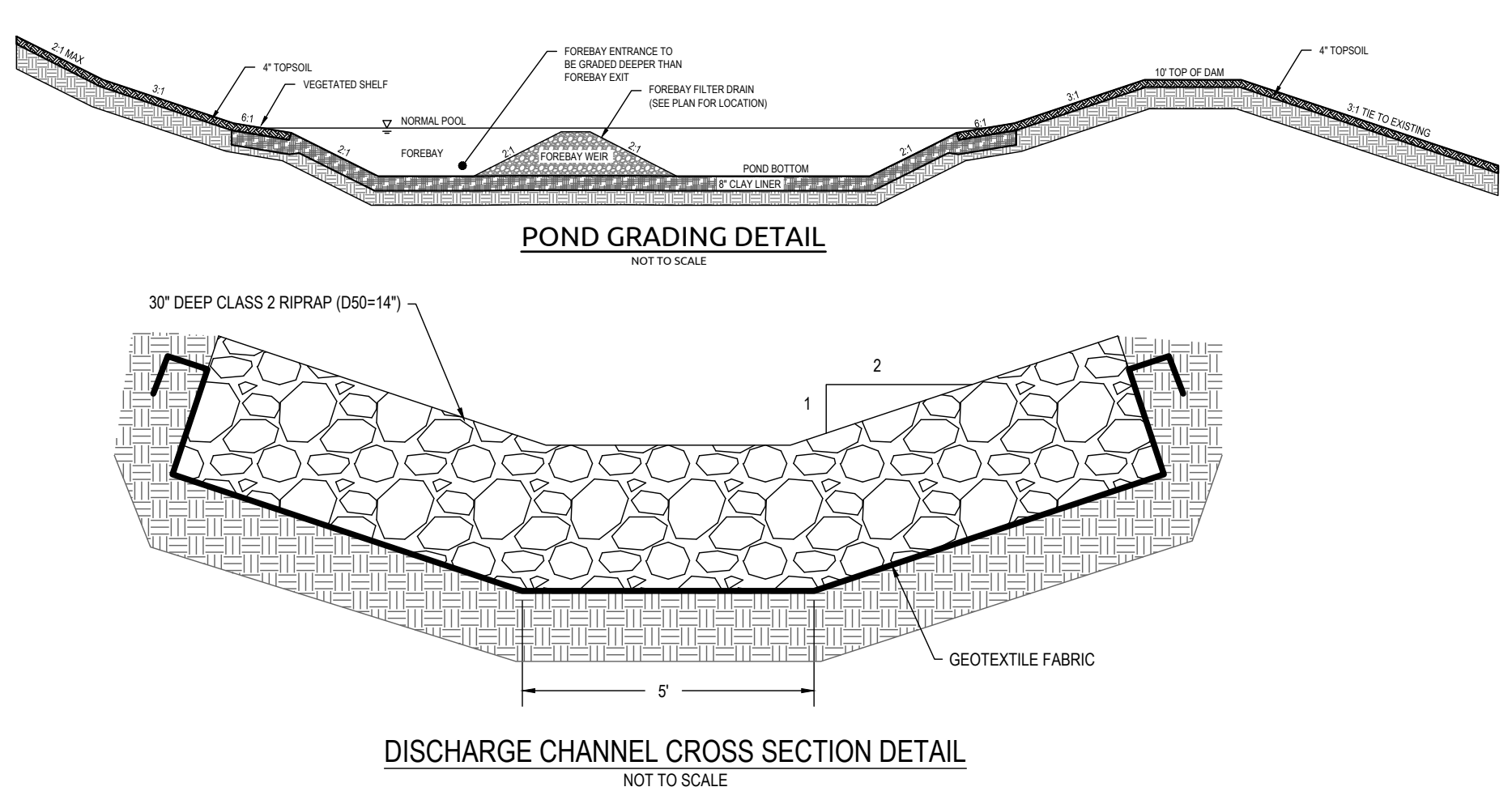
SCM RISER 1 OUTLET PROFILE

SCALE:  
1" = 30' HORIZ.  
1" = 6' VERT.



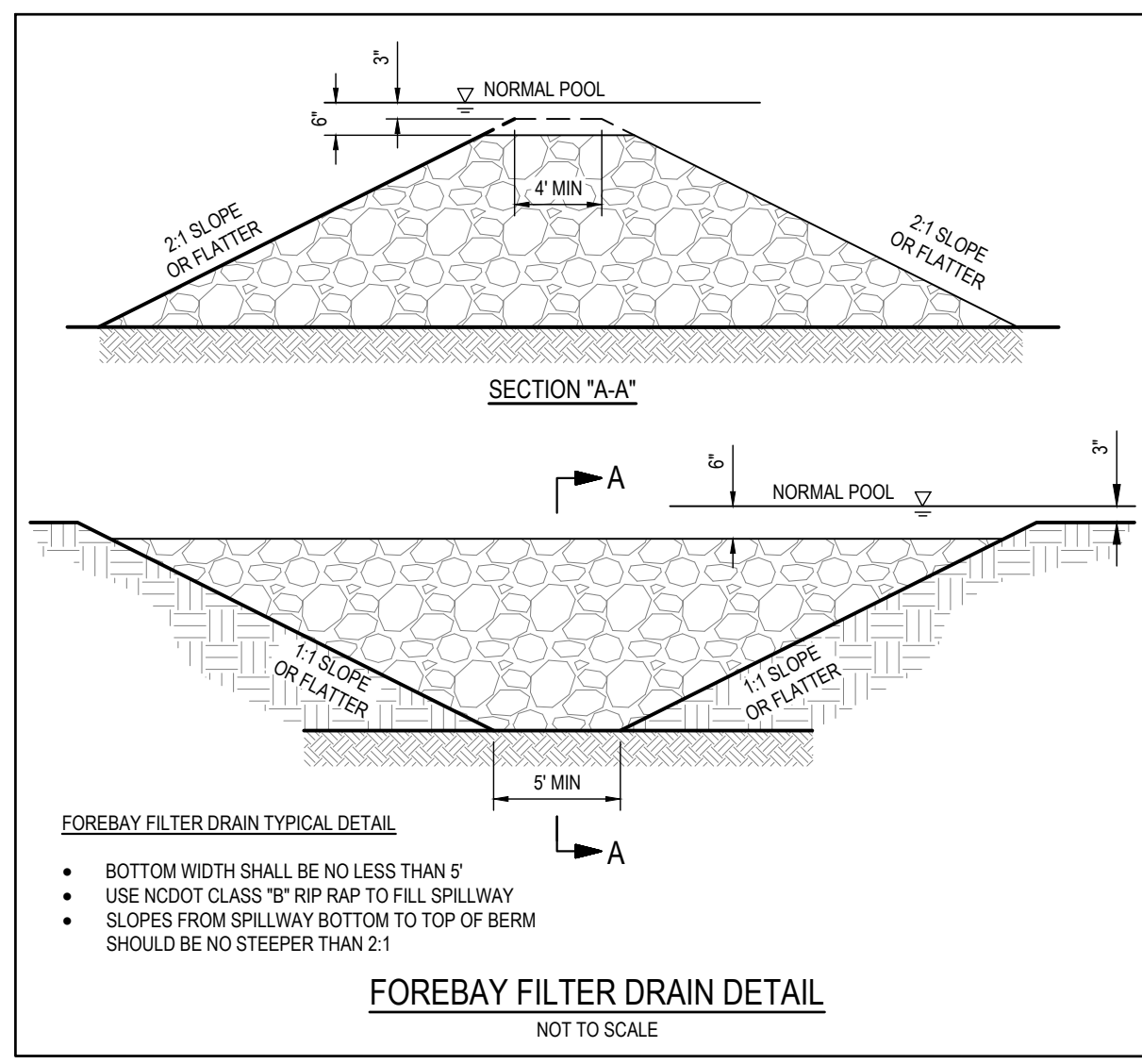
SCM RISER 2 OUTLET PROFILE

SCALE:  
1" = 30' HORIZ.  
1" = 6' VERT.



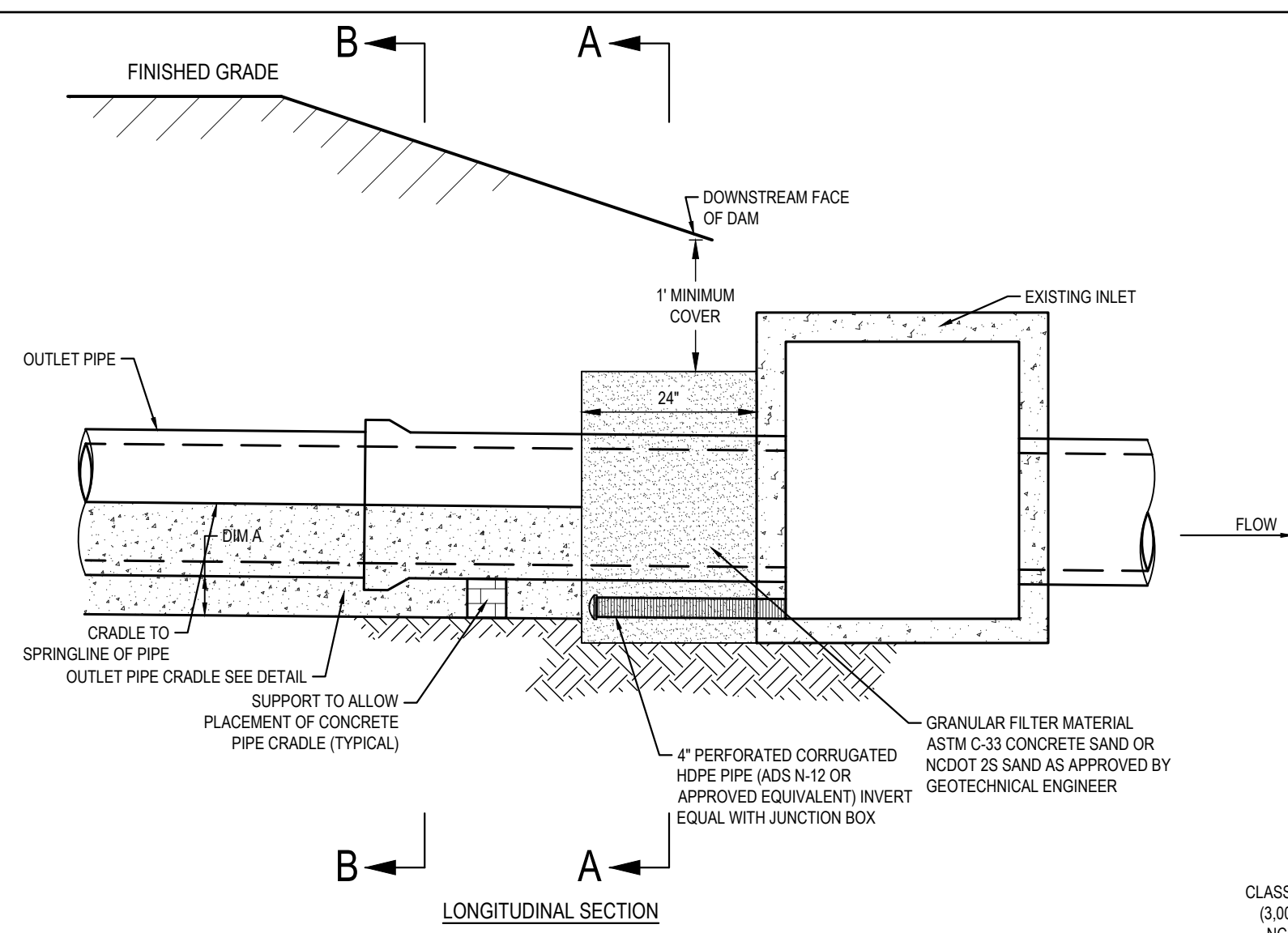
DISCHARGE CHANNEL CROSS SECTION DETAIL

POND GRADING DETAIL

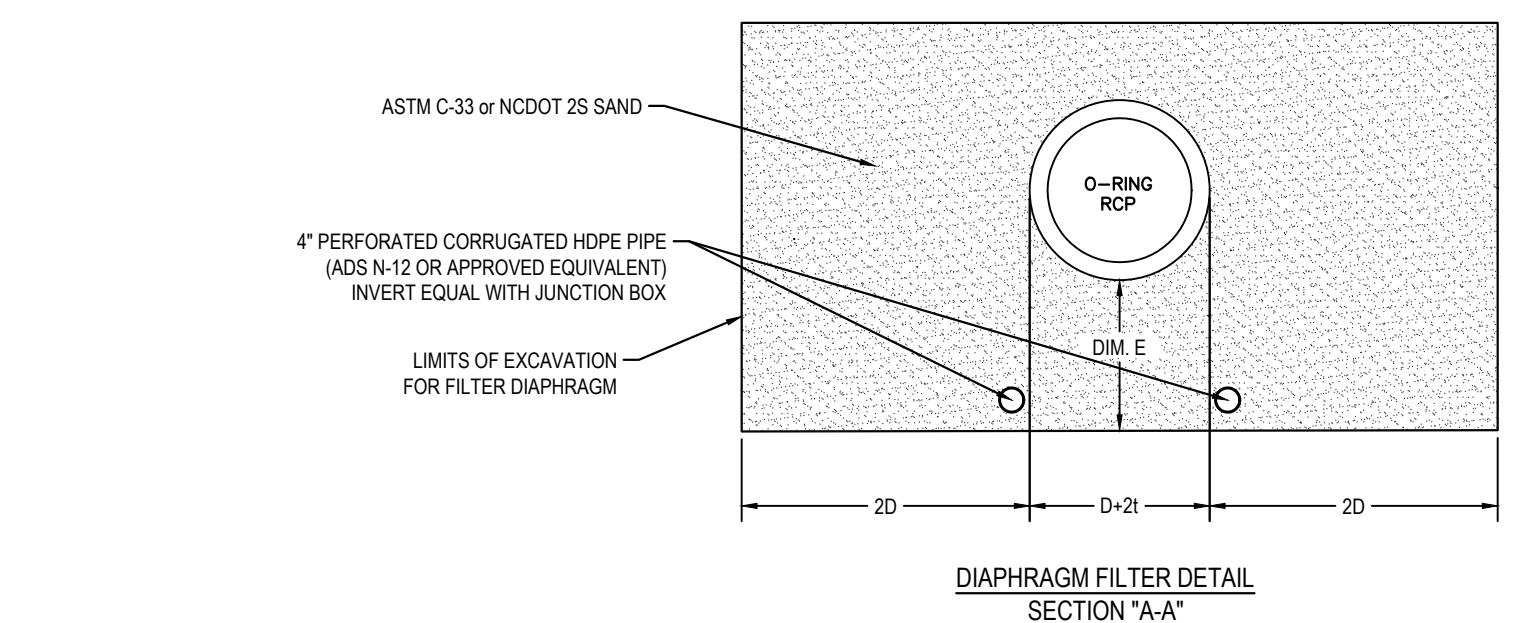


FOREBAY FILTER DRAIN DETAIL

- BOTTOM WIDTH SHALL BE NO LESS THAN 5'
- USE NCDOT CLASS "B" RIP RAP TO FILL SPILLWAY
- SLOPES FROM SPILLWAY BOTTOM TO TOP OF BERM SHOULD BE NO STEEPER THAN 2:1

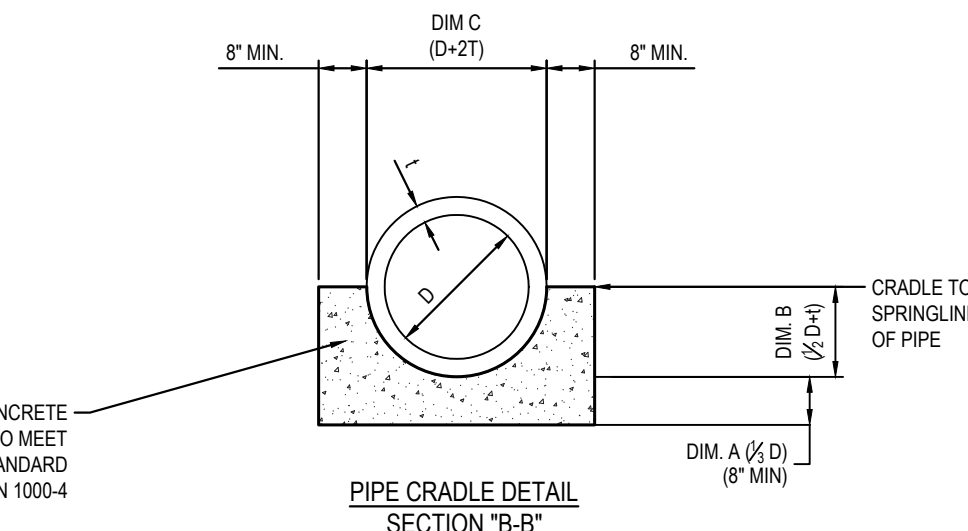


LONGITUDINAL SECTION



DIAPHRAGM FILTER DETAIL SECTION 'A-A'

OUTLET PIPE FILTER DIAPHRAGM & CONCRETE CRADLE DETAIL



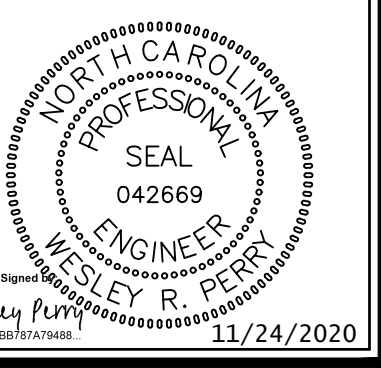
PIPE CRADLE DETAIL SECTION 'B-B'

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
30	10	18.5	37	30	14	3.5
36	12	22.0	44	36	16	4.0
42	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

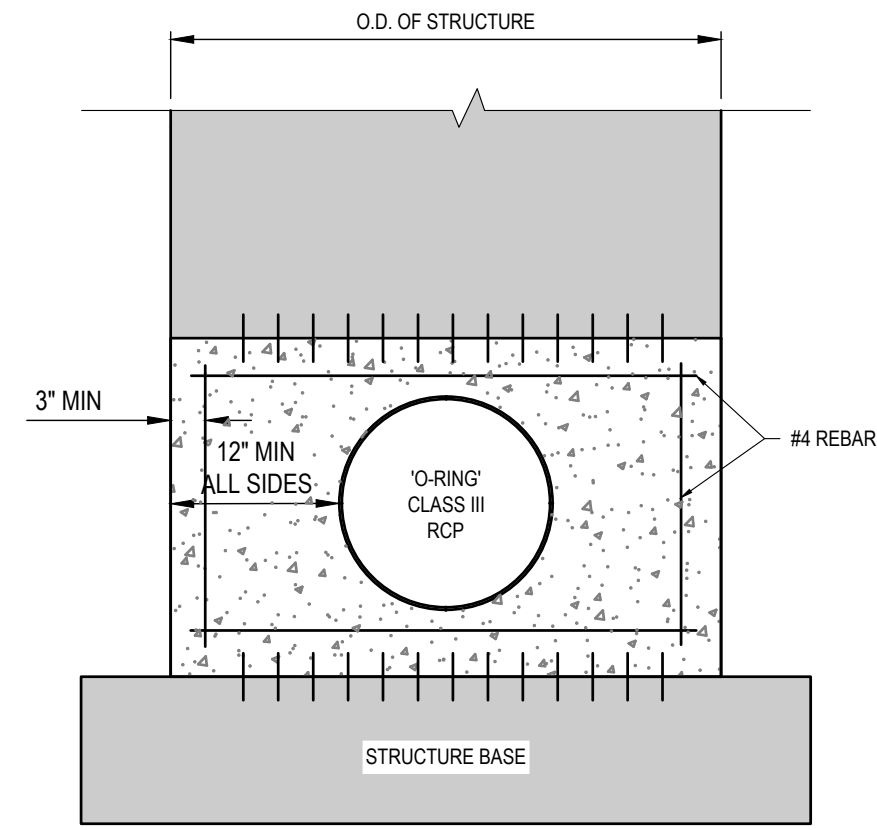
Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



Revisions

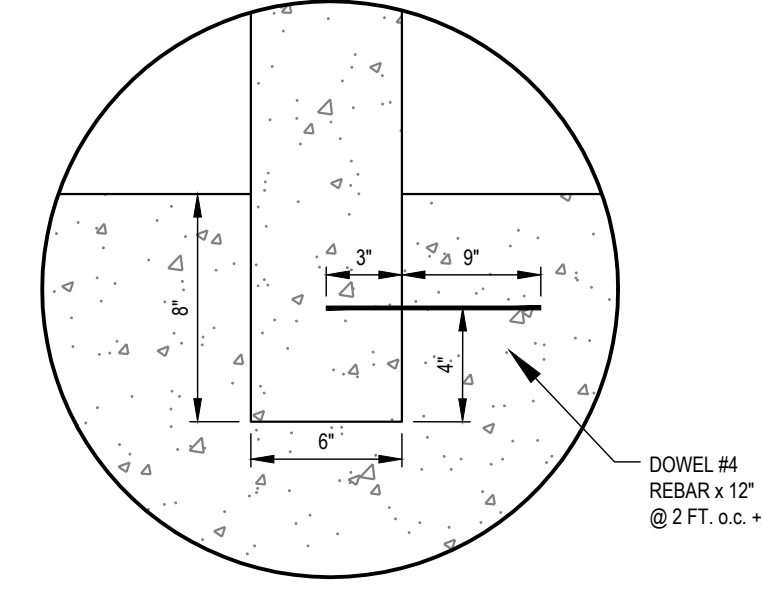
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2	PER TOK & NCDOT COMMENTS	11/24/20



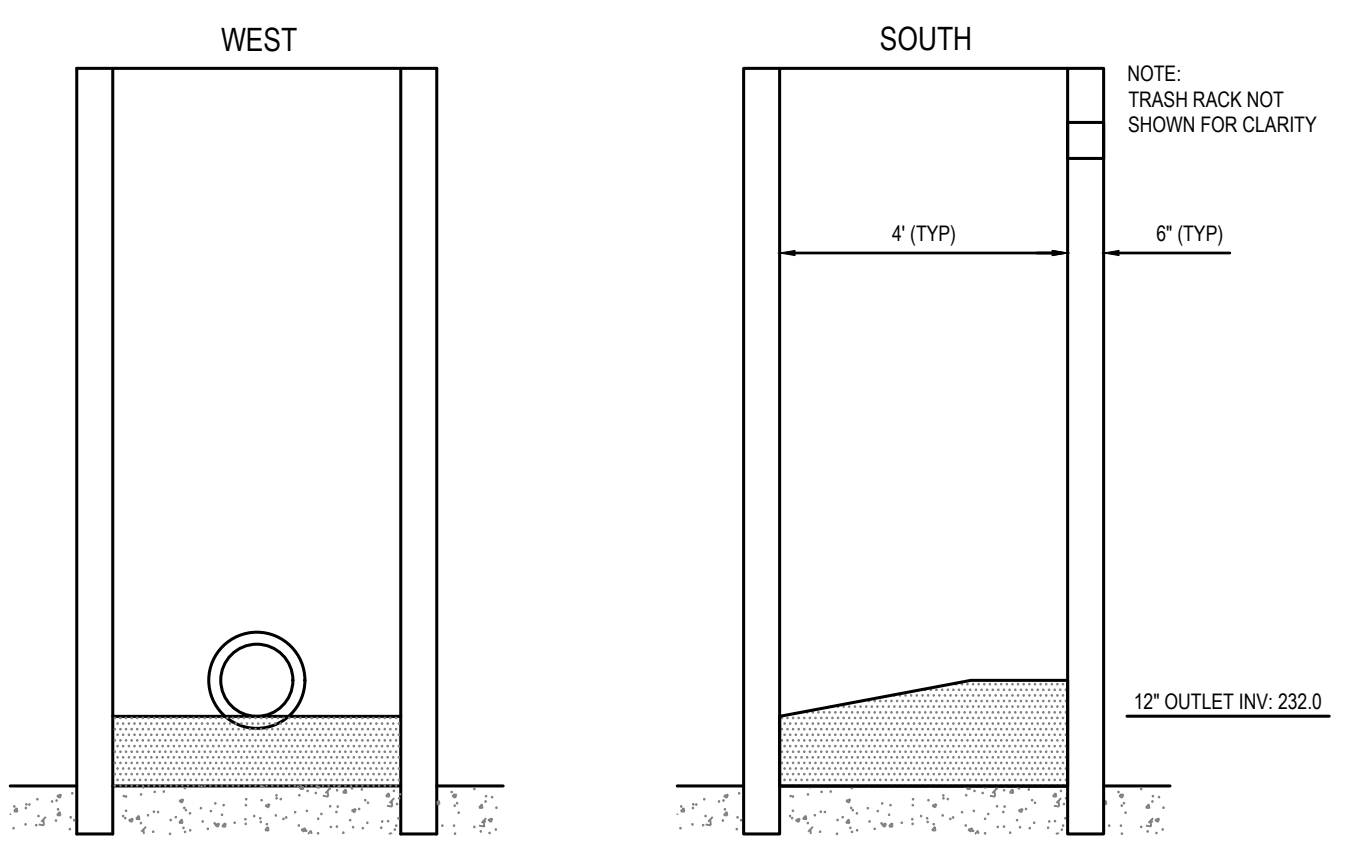
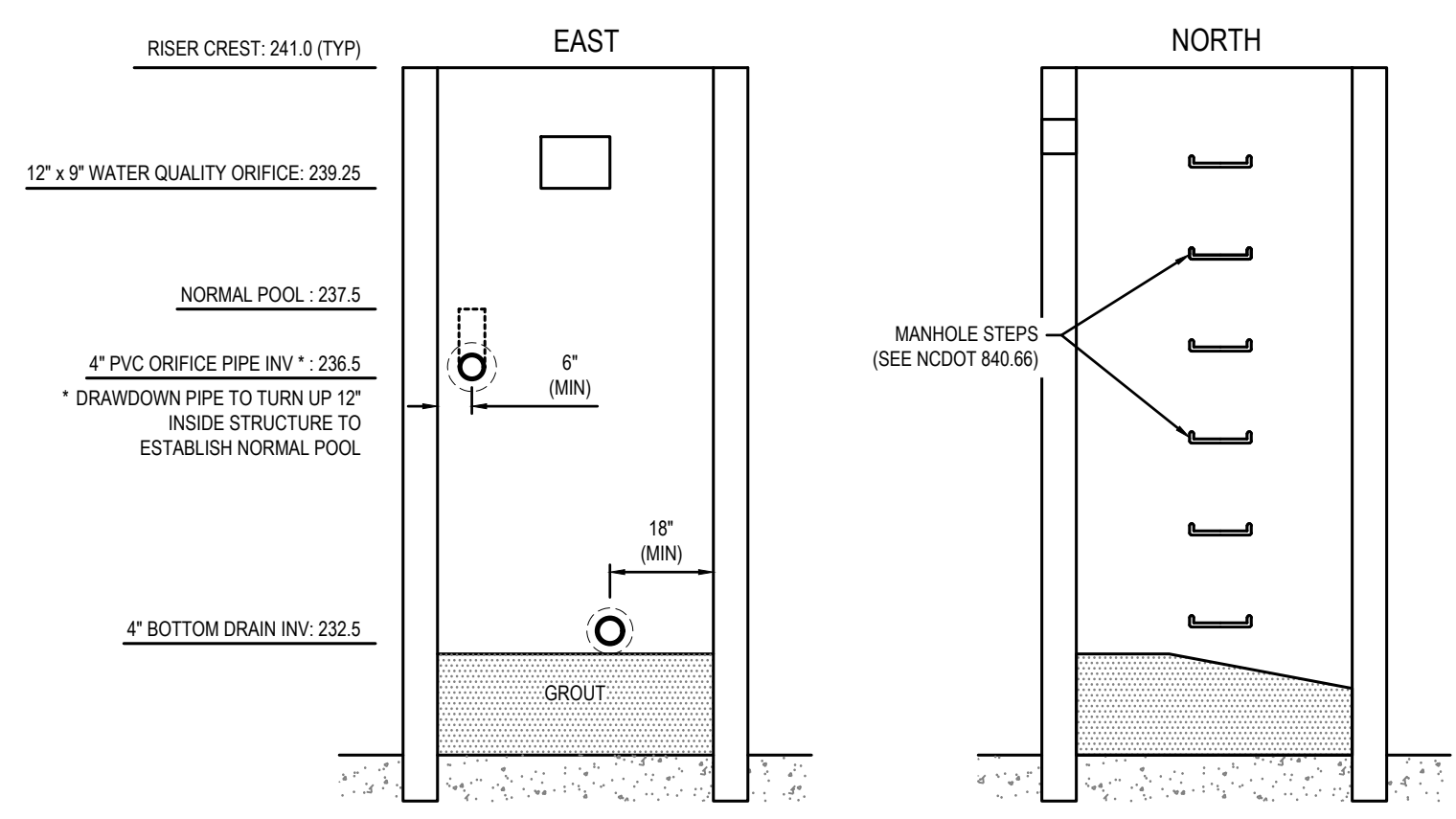


NOTE:  
INSTALL VERTICAL DOWELS IN FOUNDATION CONCRETE AS HOLDING BARS FOR CONCRETE COLLAR REBAR.

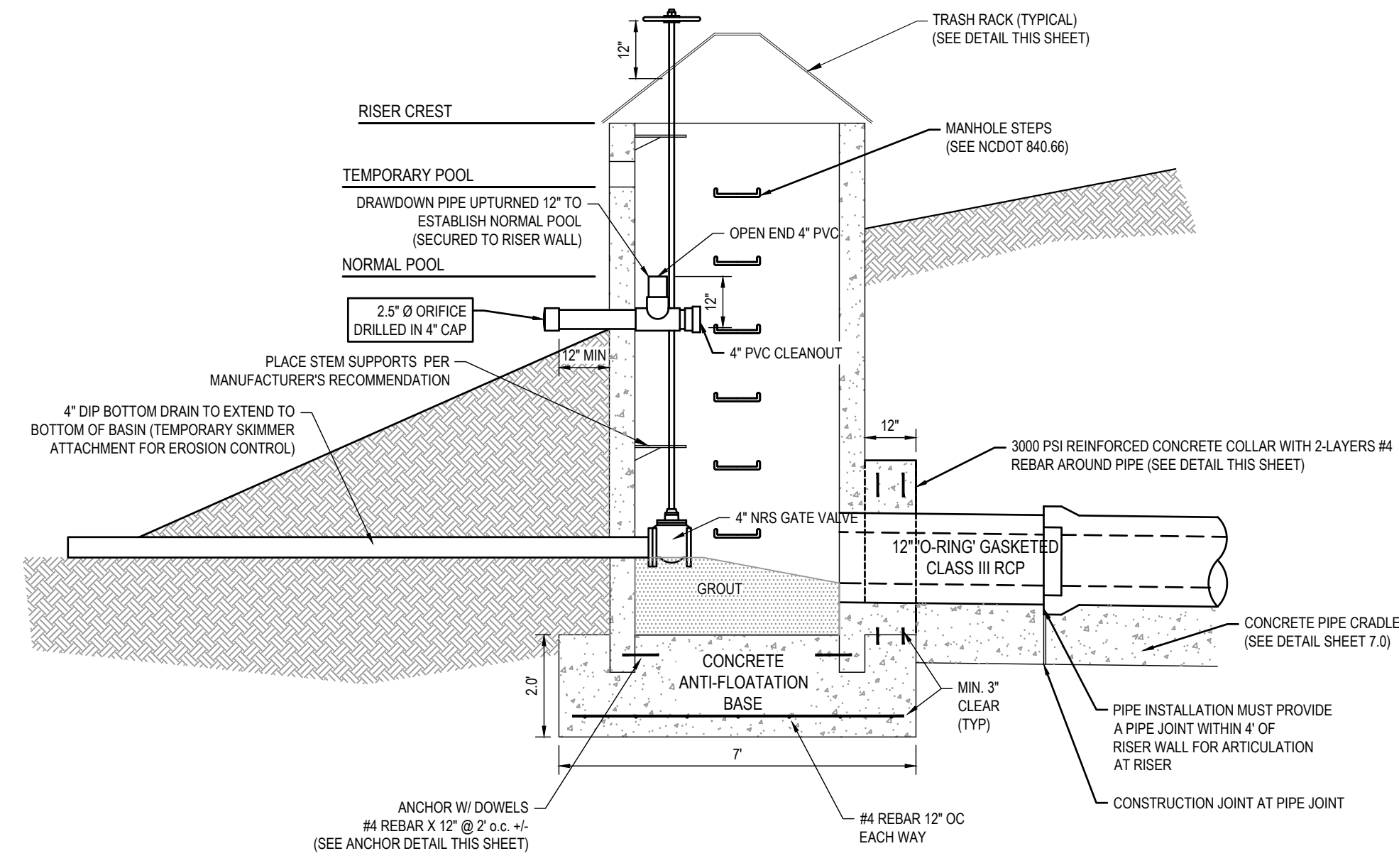
**CONCRETE COLLAR DETAIL**  
NOT TO SCALE



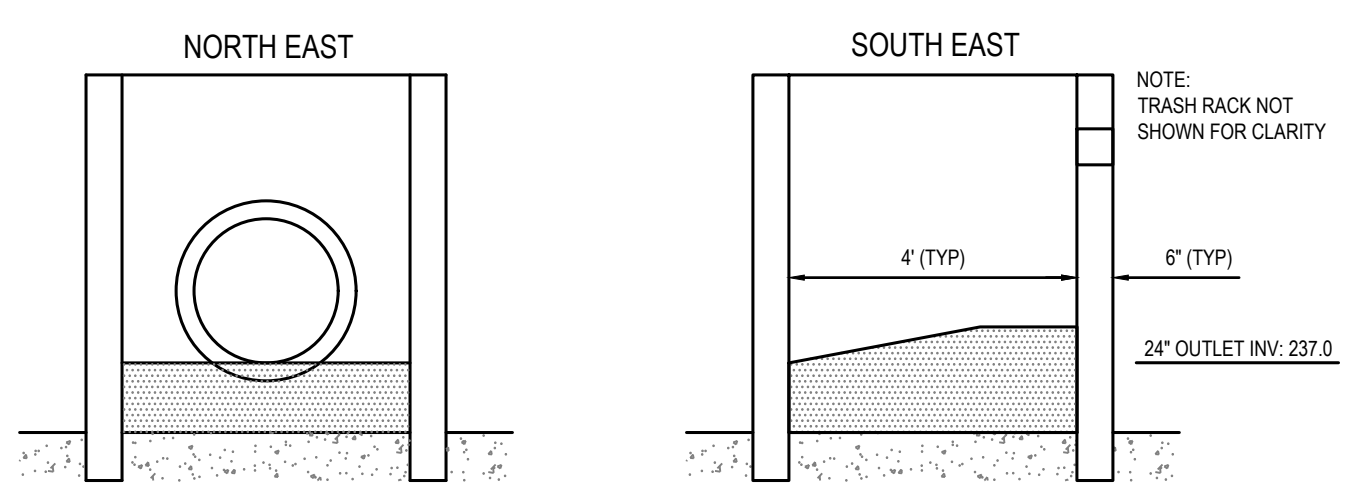
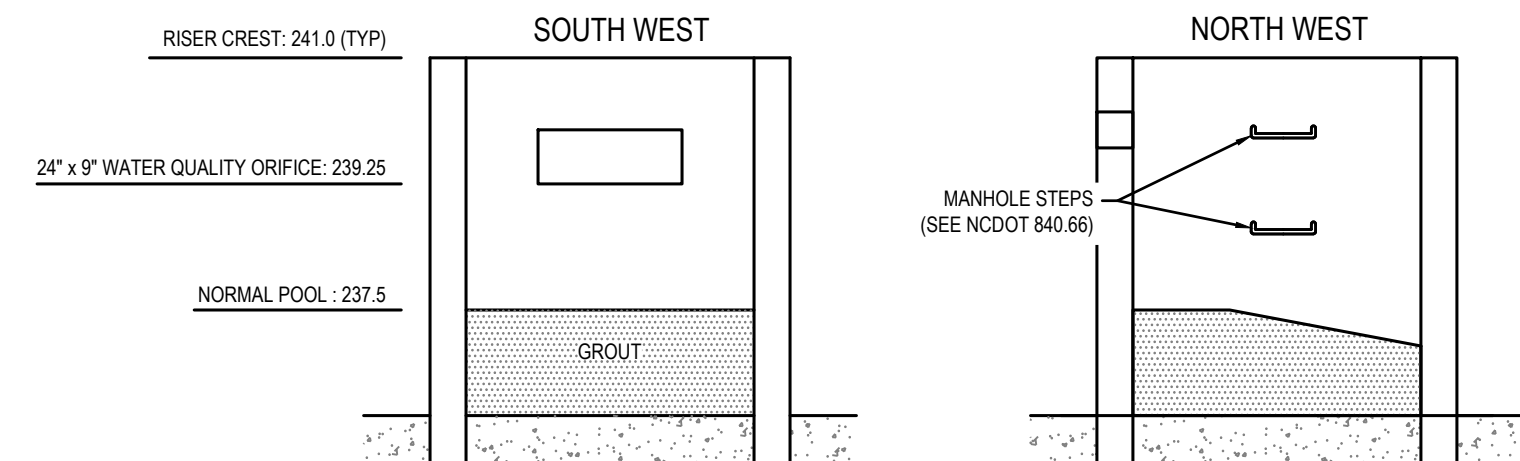
**ANCHOR DETAIL (TYPICAL)**  
NOT TO SCALE



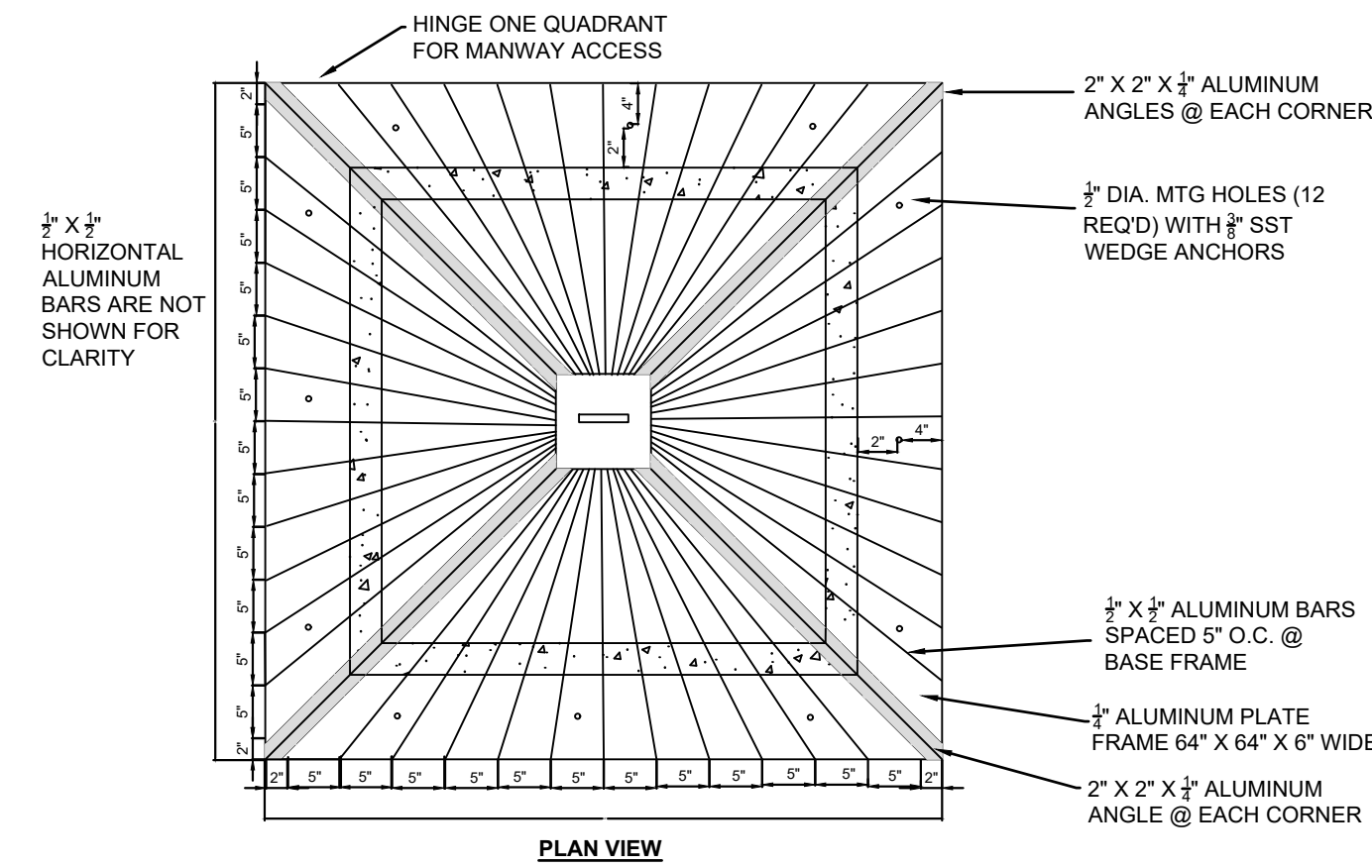
**RISER 1 WALL ELEVATIONS**  
NTS



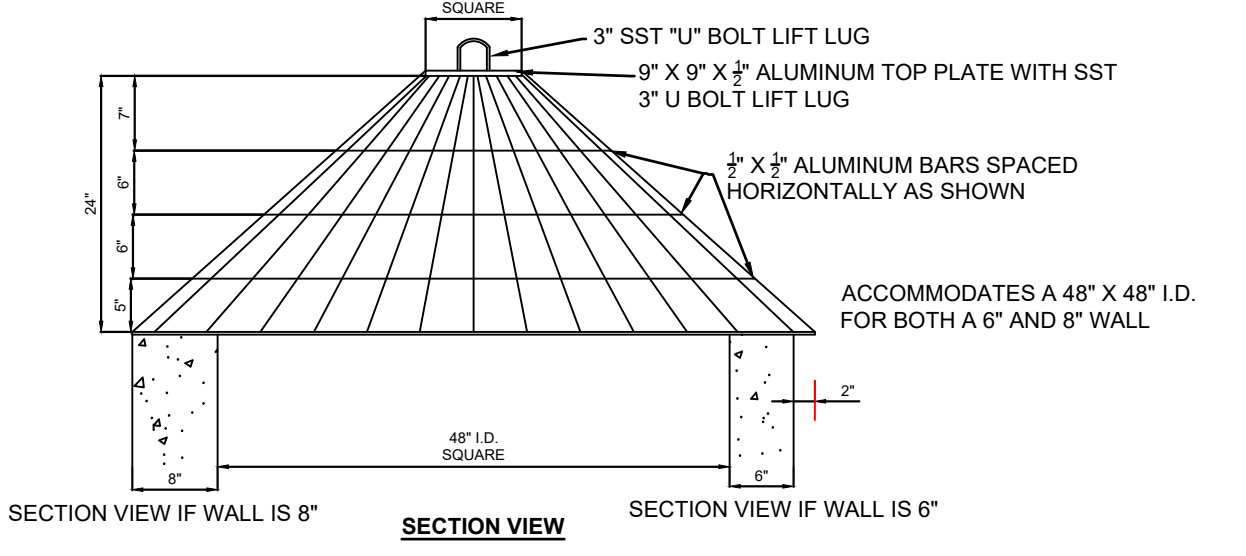
**RISER 1 DRAWDOWN DEVICE DETAIL**  
NTS



**RISER 2 WALL ELEVATIONS**  
NTS



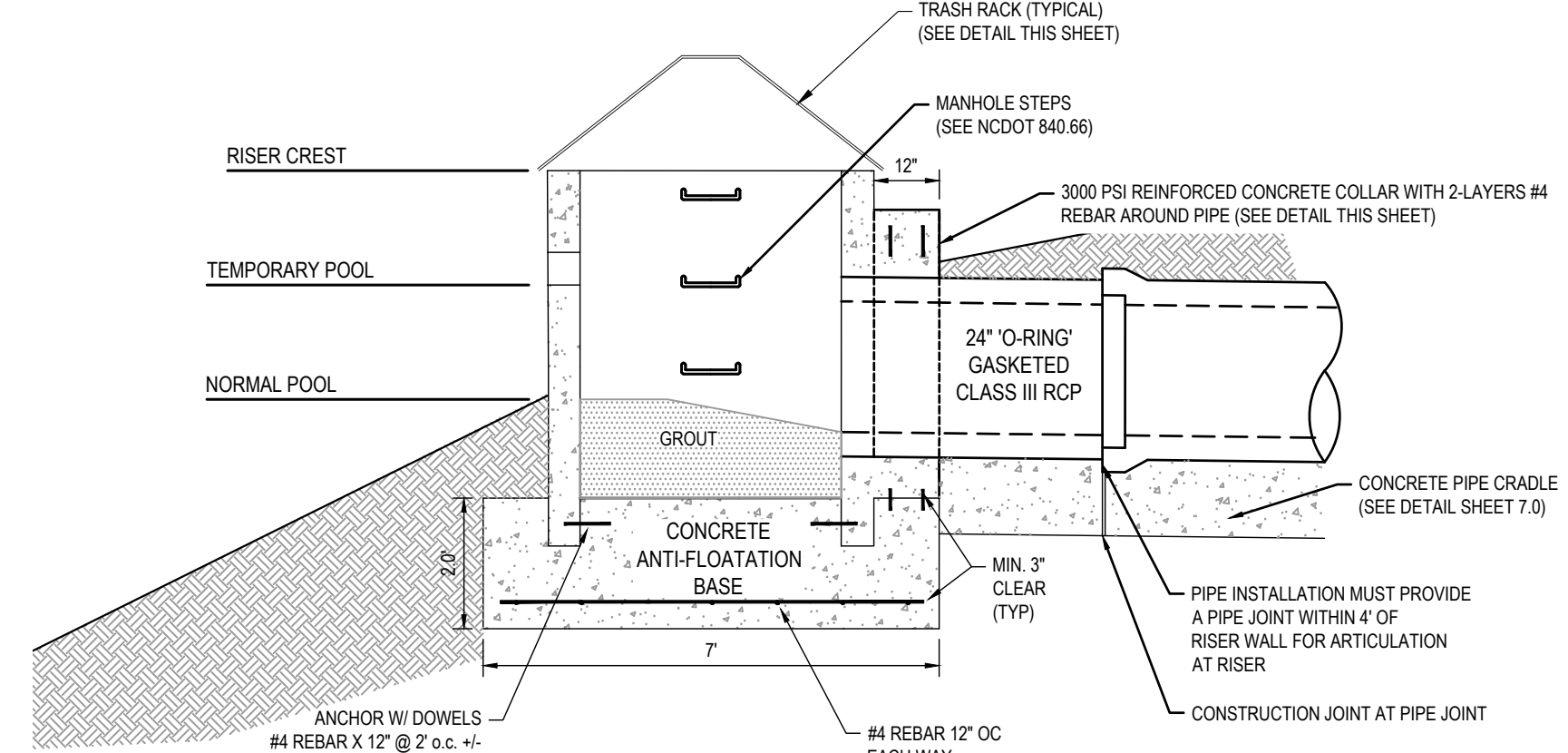
**PLAN VIEW**



**SECTION VIEW**

- NOTES**
1. 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\"/>
  - 2. TRASH RACK TO BE POWDER-COATED BLACK.

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



**RISER 2 DRAWDOWN DEVICE DETAIL**  
NTS

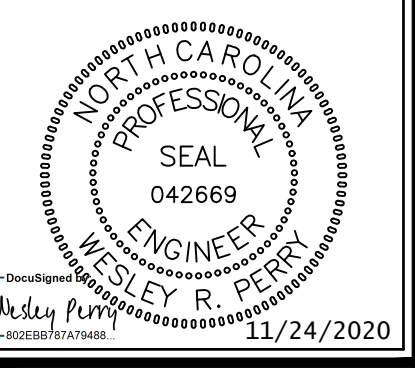
**TOWN CERTIFICATION**  
THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE AND TO THE BEST OF MY KNOWLEDGE AND BELIEF IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE

BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
TOWN ENGINEER

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

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

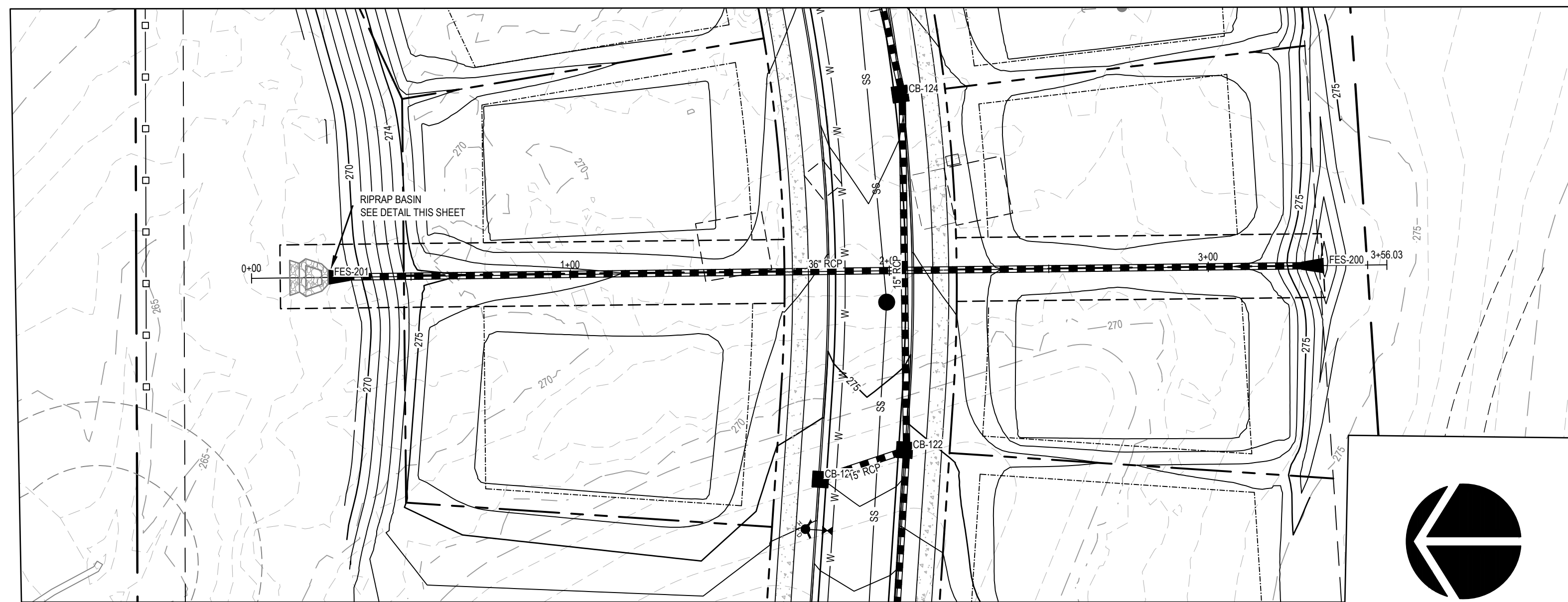
Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



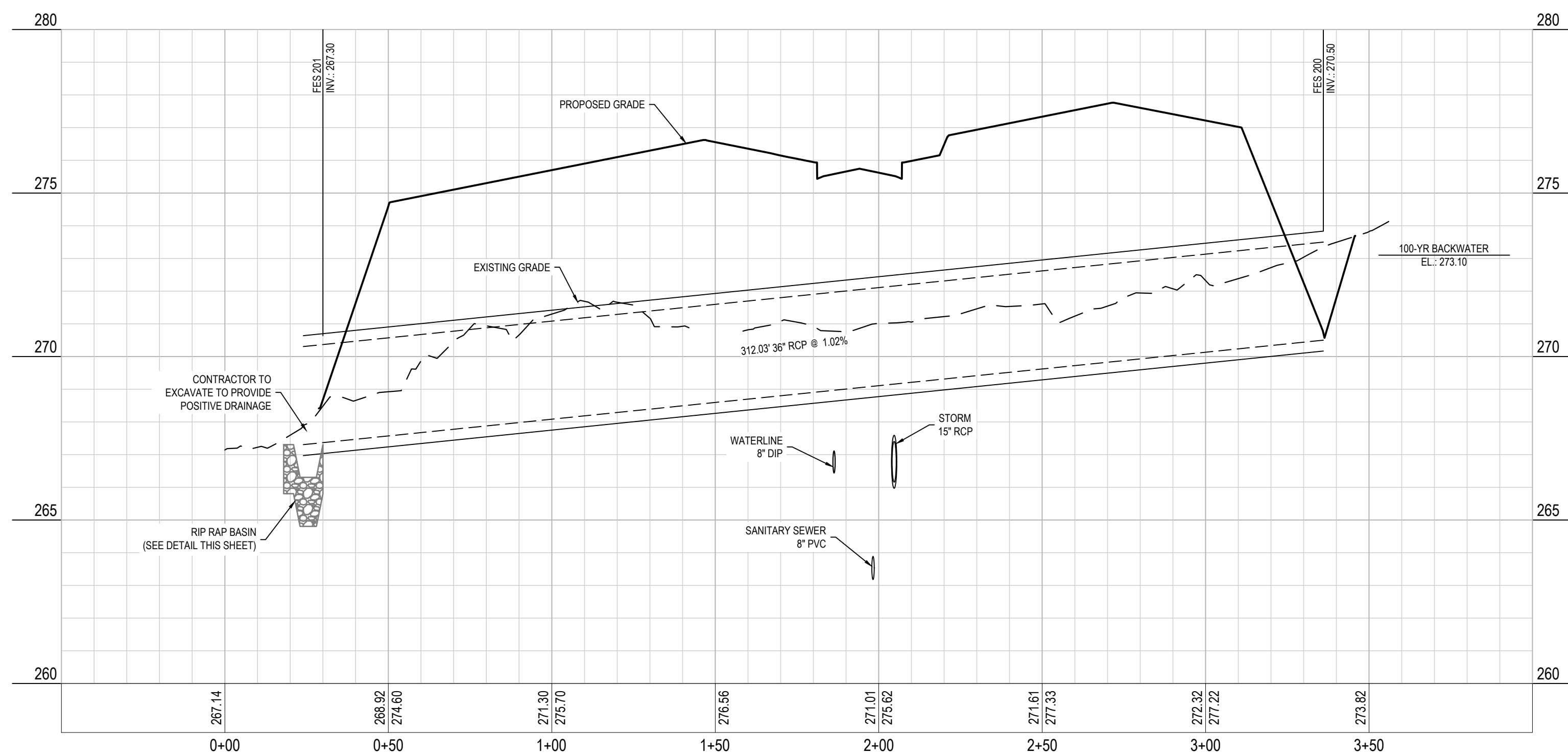
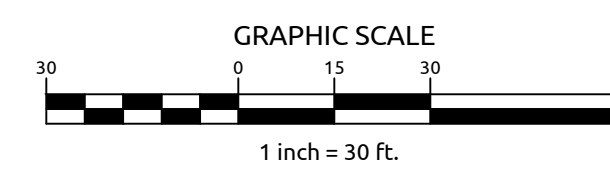
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2	PER TOK & NCDOT COMMENTS	11/24/20

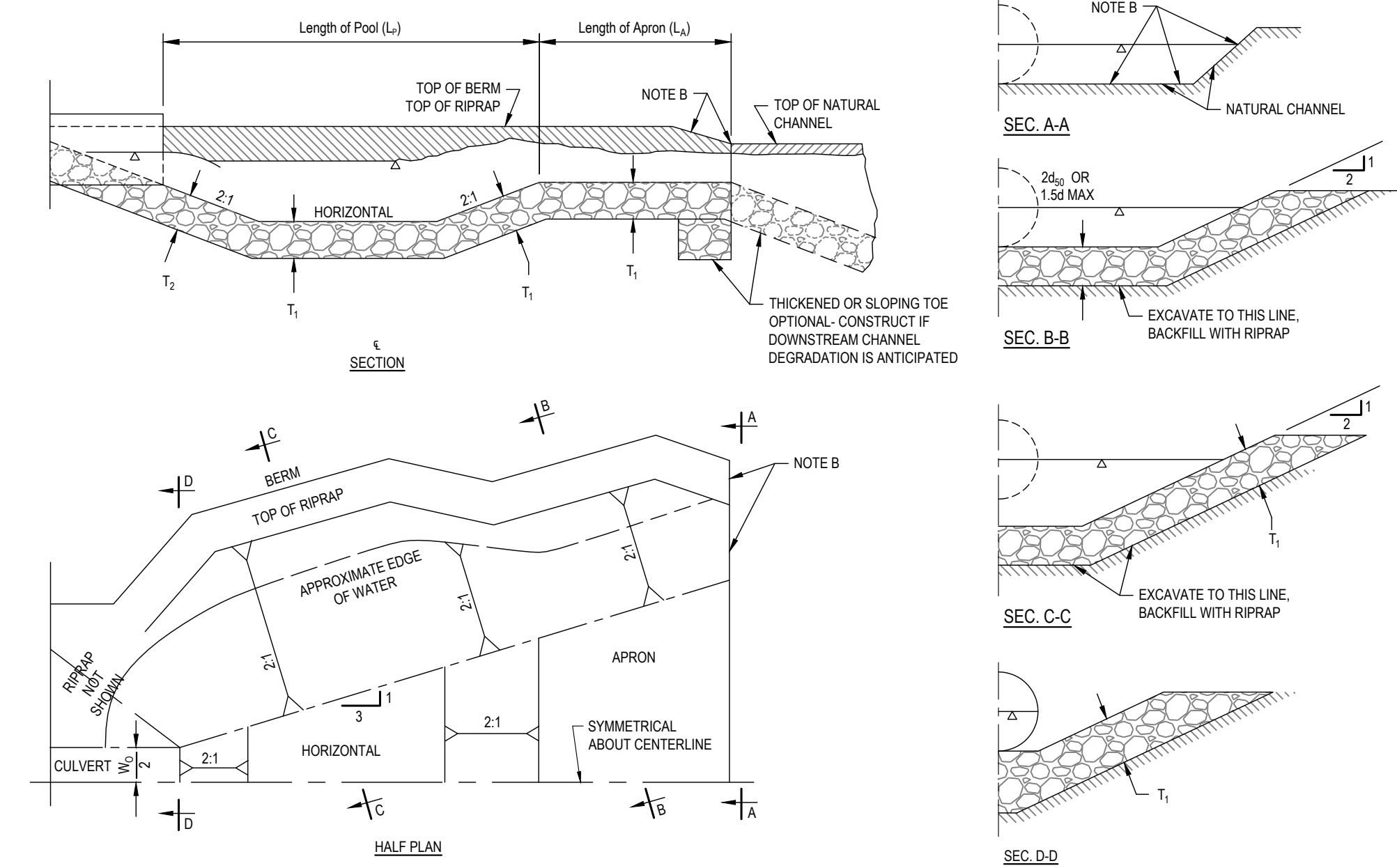




FES 200 - FES 201 PLAN



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  $Q_{out}/(CROSS\ SECTION\ AREA\ AT\ SEC.\ A-A) = SPECIFIED\ EXIT\ VELOCITY.$

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.

OUTLET ID	$L_p$	$L_a$	$H_s$	$T_1$	$T_2$	$W_0$	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

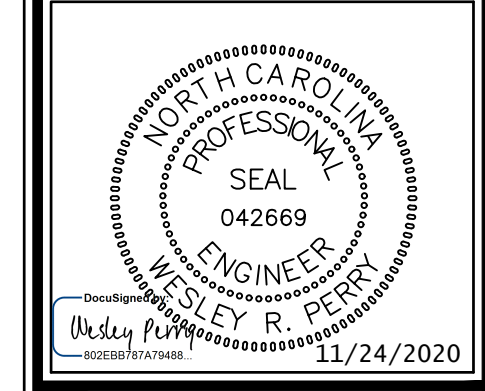
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ADMINISTRATOR

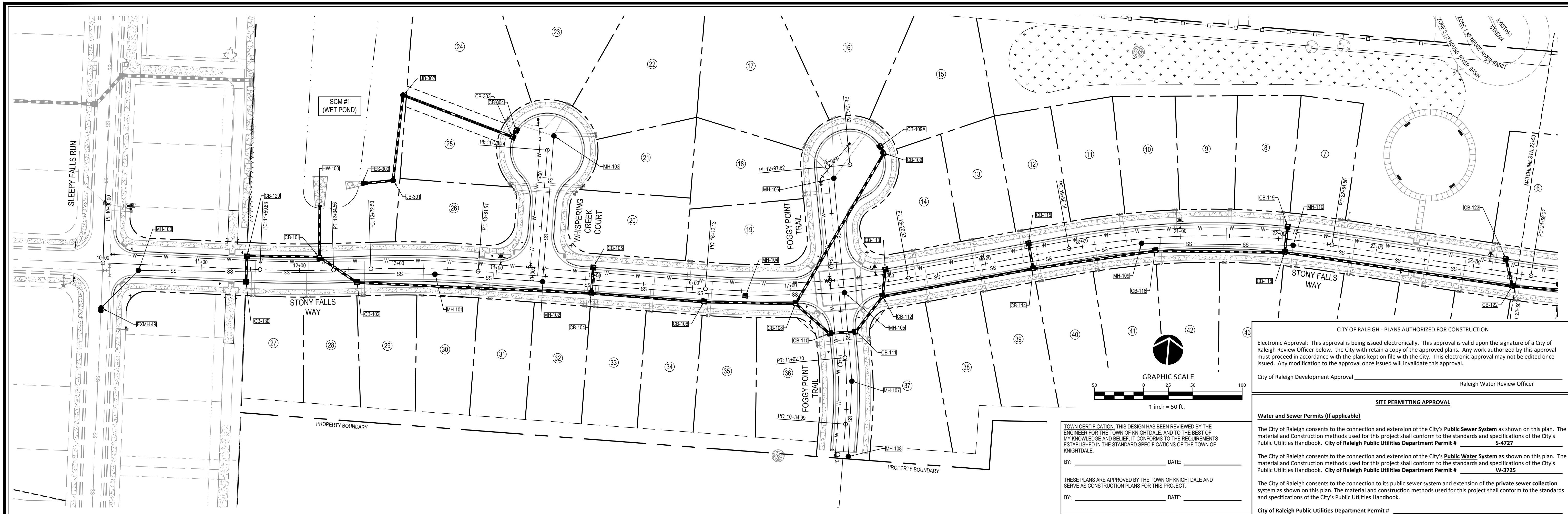
Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

K:\1\1\0220\1025\025-Culvert Road Subdivision\025-Culvert Road\DWG\PLAN & DETAIL.dwg, Titleblock, November 24, 2020 08:01 PM - YORK, STEVEN





CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval \_\_\_\_\_ Raleigh Water Review Officer \_\_\_\_\_

**SITE PERMITTING APPROVAL**

**Water and Sewer Permits (If applicable)**

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # S-4727**

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 # W-3725**

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City of Raleigh Public Utilities Department Permit # \_\_\_\_\_

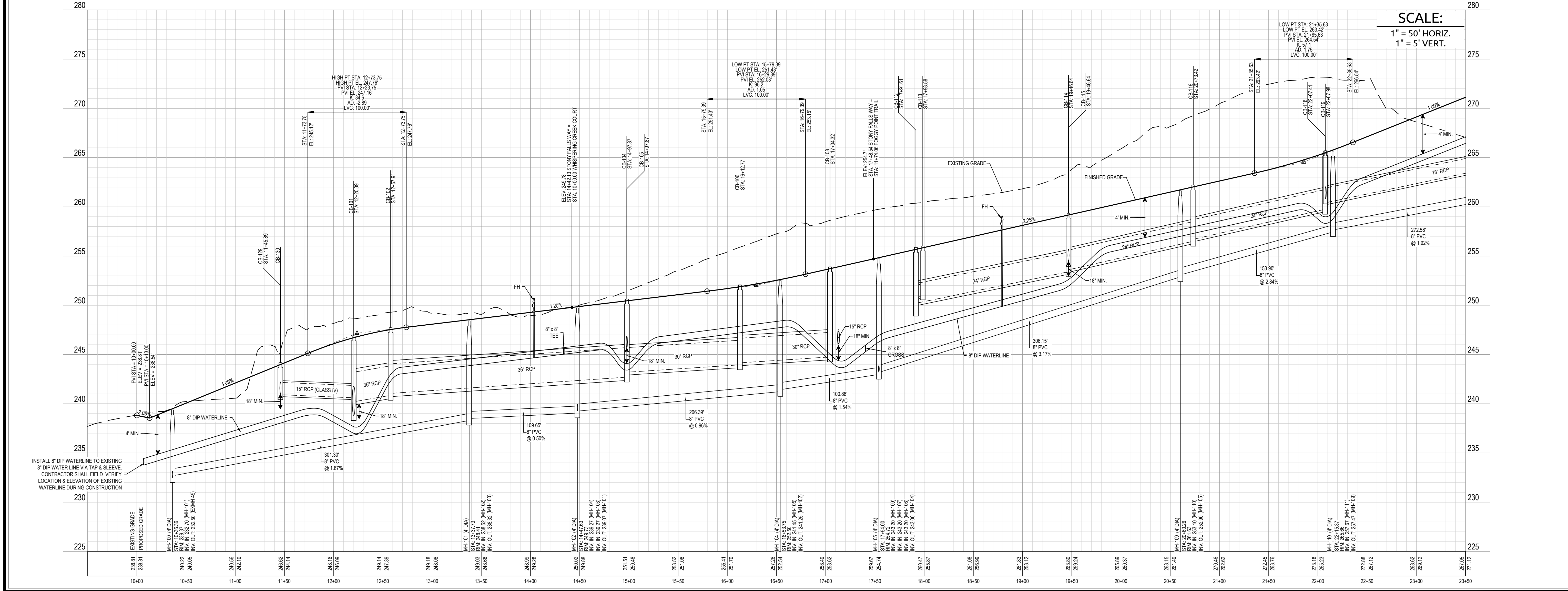
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BY: \_\_\_\_\_ DATE: \_\_\_\_\_

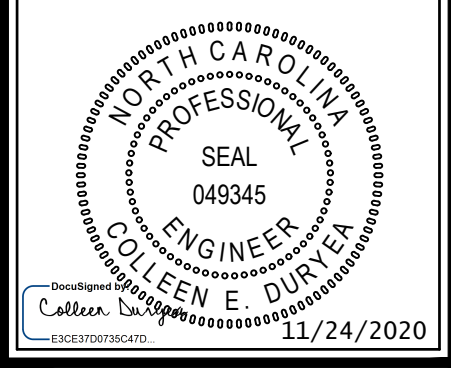
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

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

**STONY FALLS WAY**

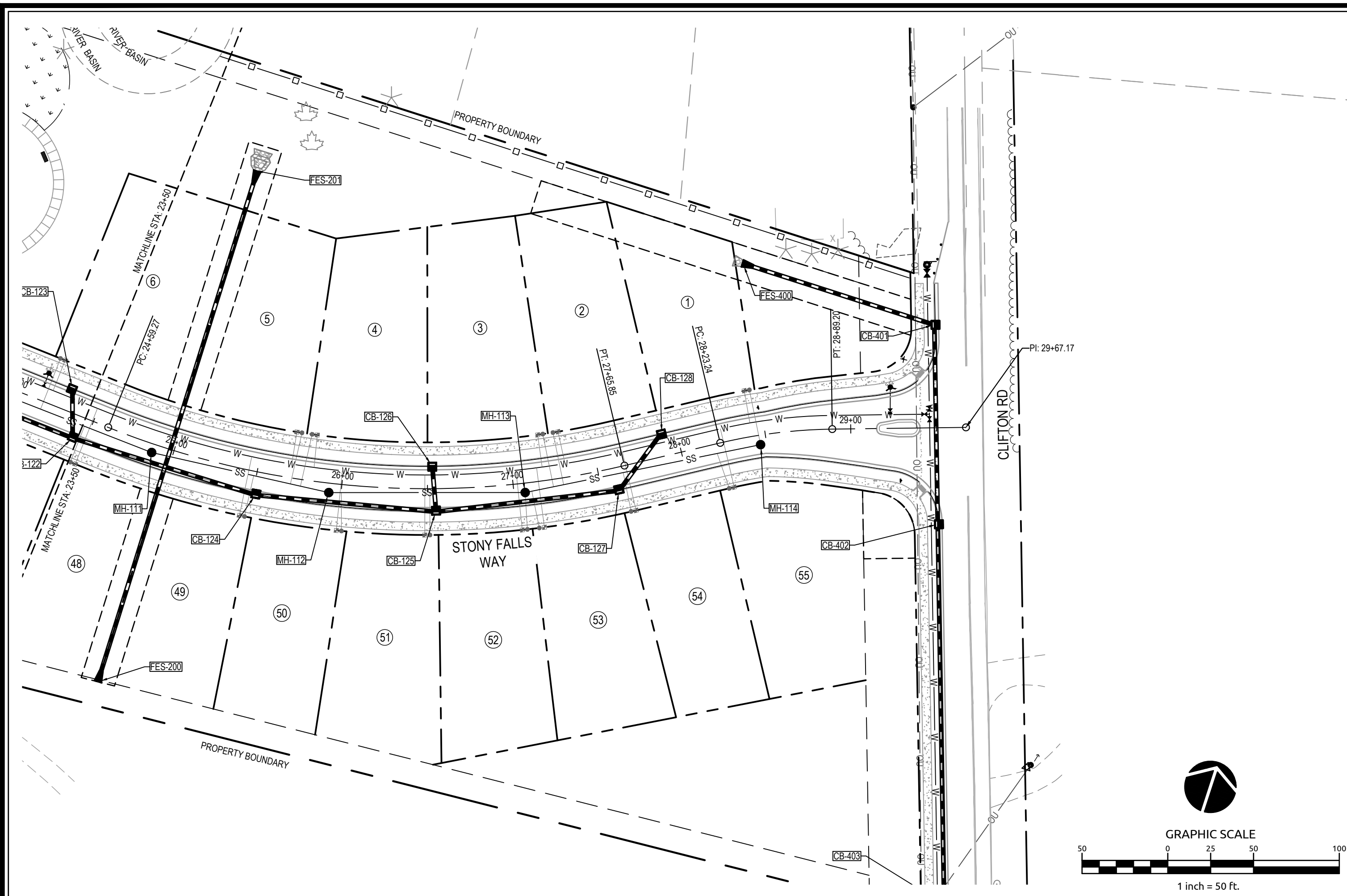


Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR

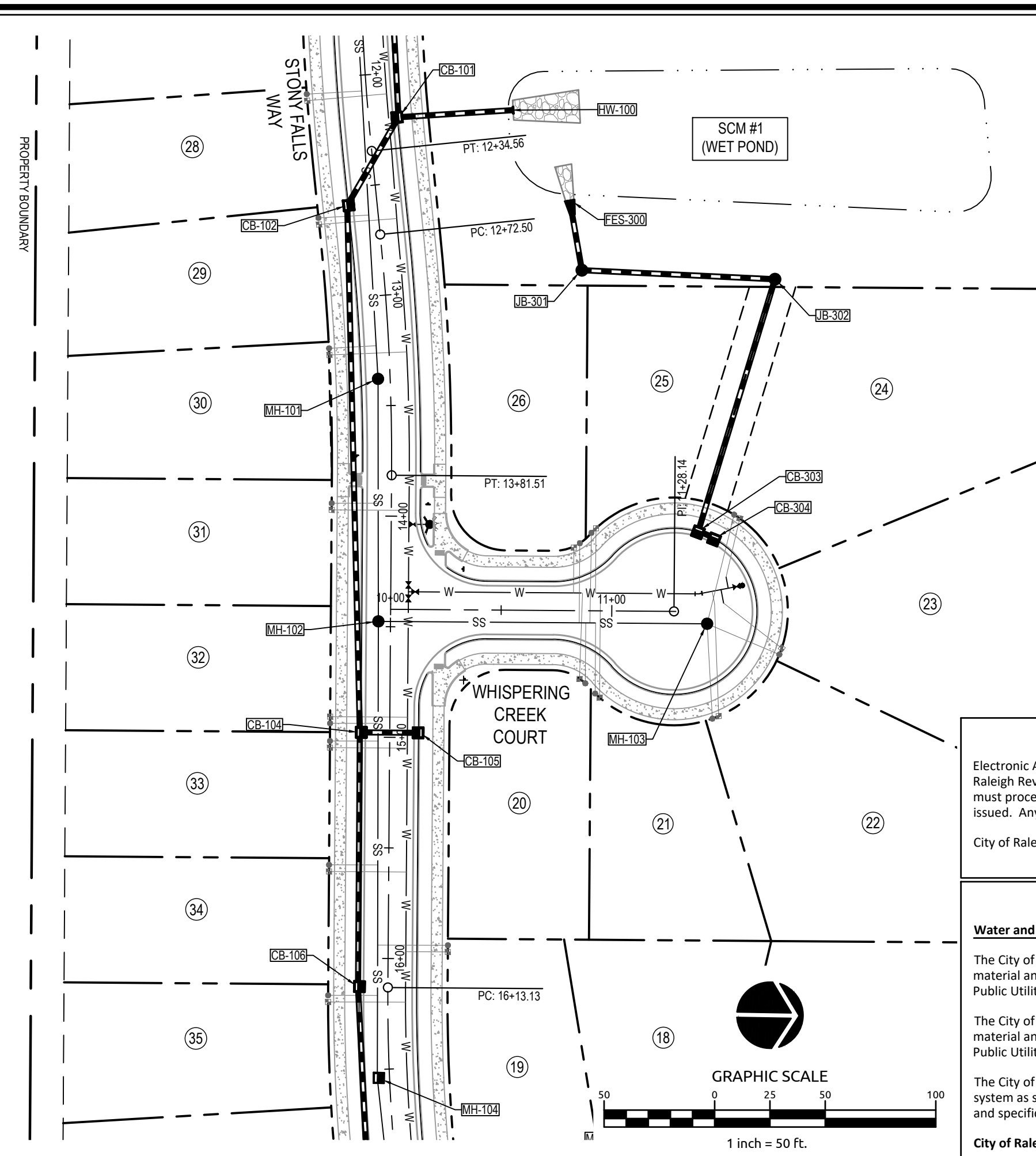


Revisions	Comments	Date
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20





STONY FALLS WAY



WHISPERING CREEK COURT

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City of Raleigh Development Approval \_\_\_\_\_ Raleigh Water Review Officer \_\_\_\_\_

**SITE PERMITTING APPROVAL**

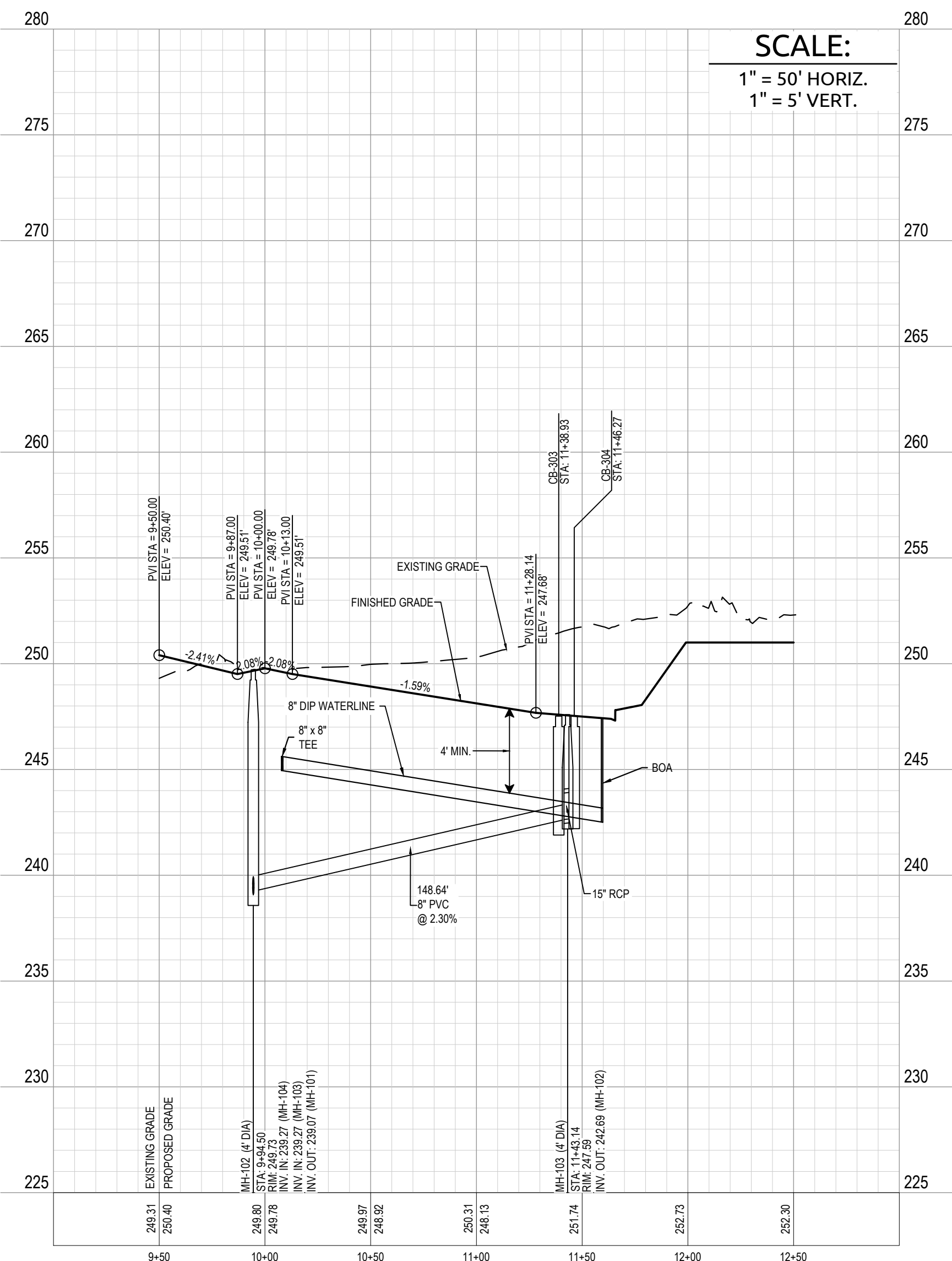
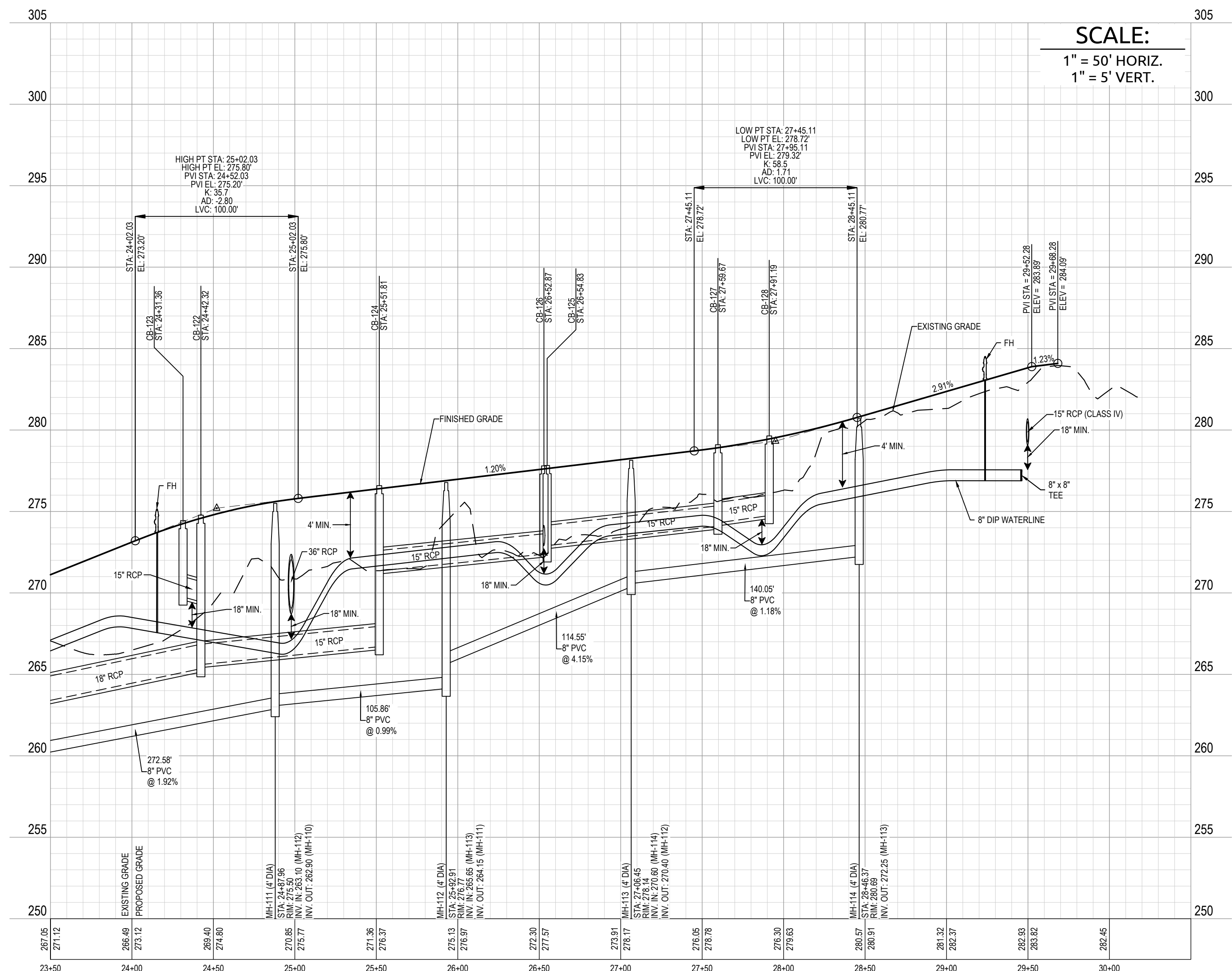
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City of Raleigh Public Utilities Department Permit # \_\_\_\_\_



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

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

**WithersRavenel**  
Engineers | Planners | Surveyors

115 MacKinnon Drive | Cary, NC 27511 | P: 919.669.3300 | License # C-0832 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**STONY FALLS WAY &  
WHISPERING CREEK COURT  
PLAN & PROFILE**

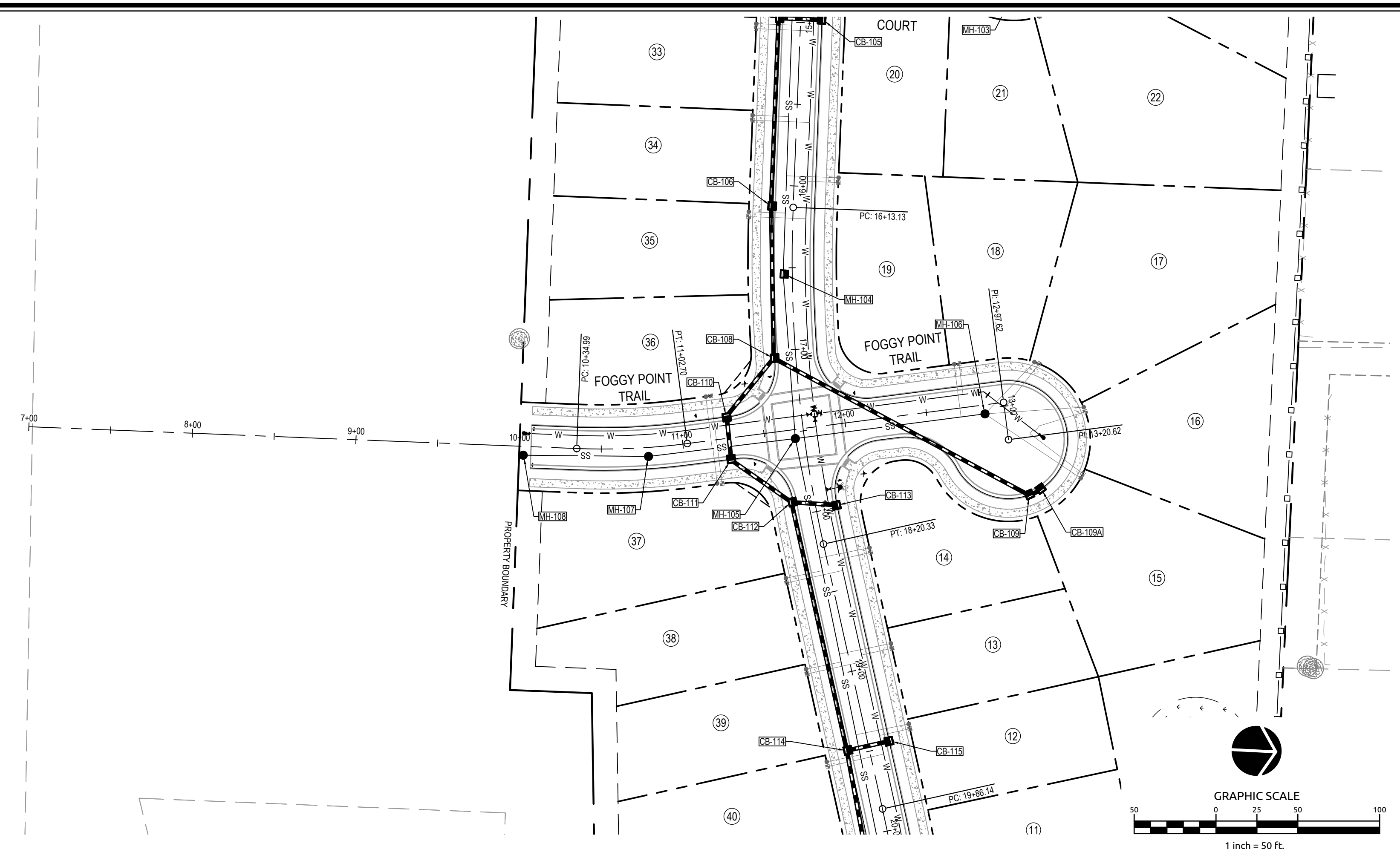
Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**8.1**





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City of Raleigh Development Approval \_\_\_\_\_ Raleigh Water Review Officer \_\_\_\_\_

**SITE PERMITTING APPROVAL**

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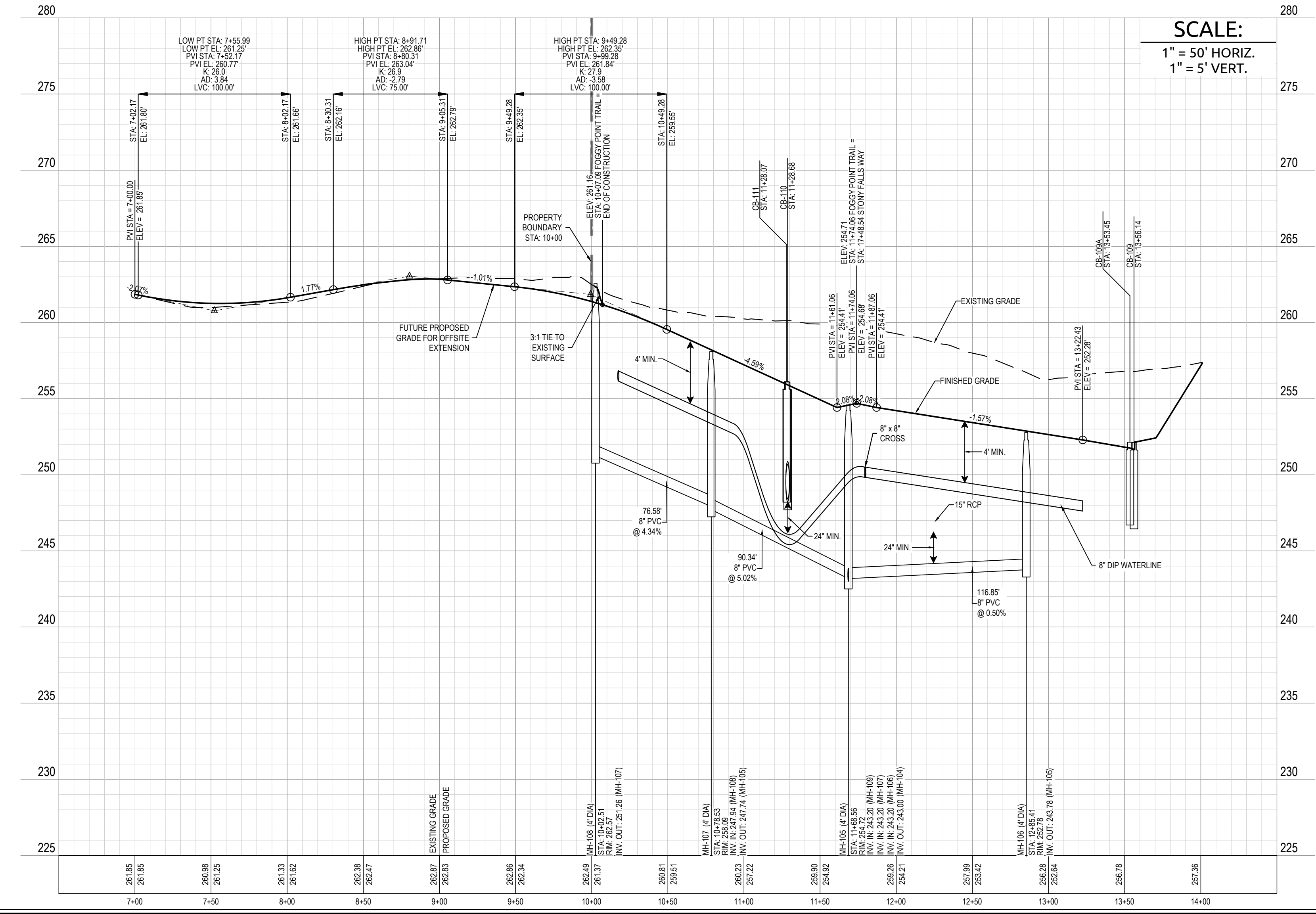
City of Raleigh Public Utilities Department Permit # \_\_\_\_\_



**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**FOGGY POINT TRAIL**



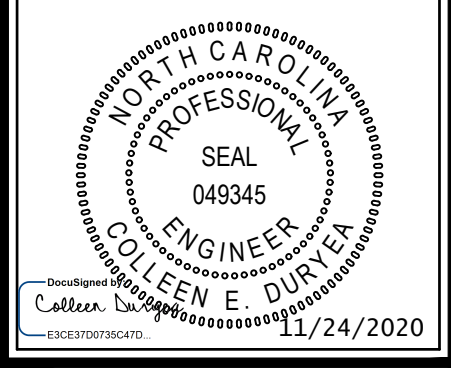
TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

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

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR

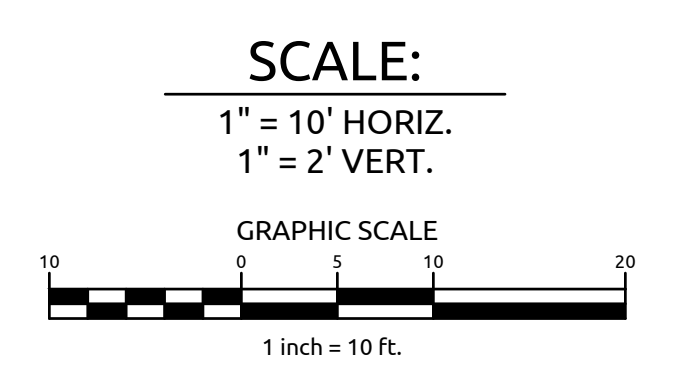
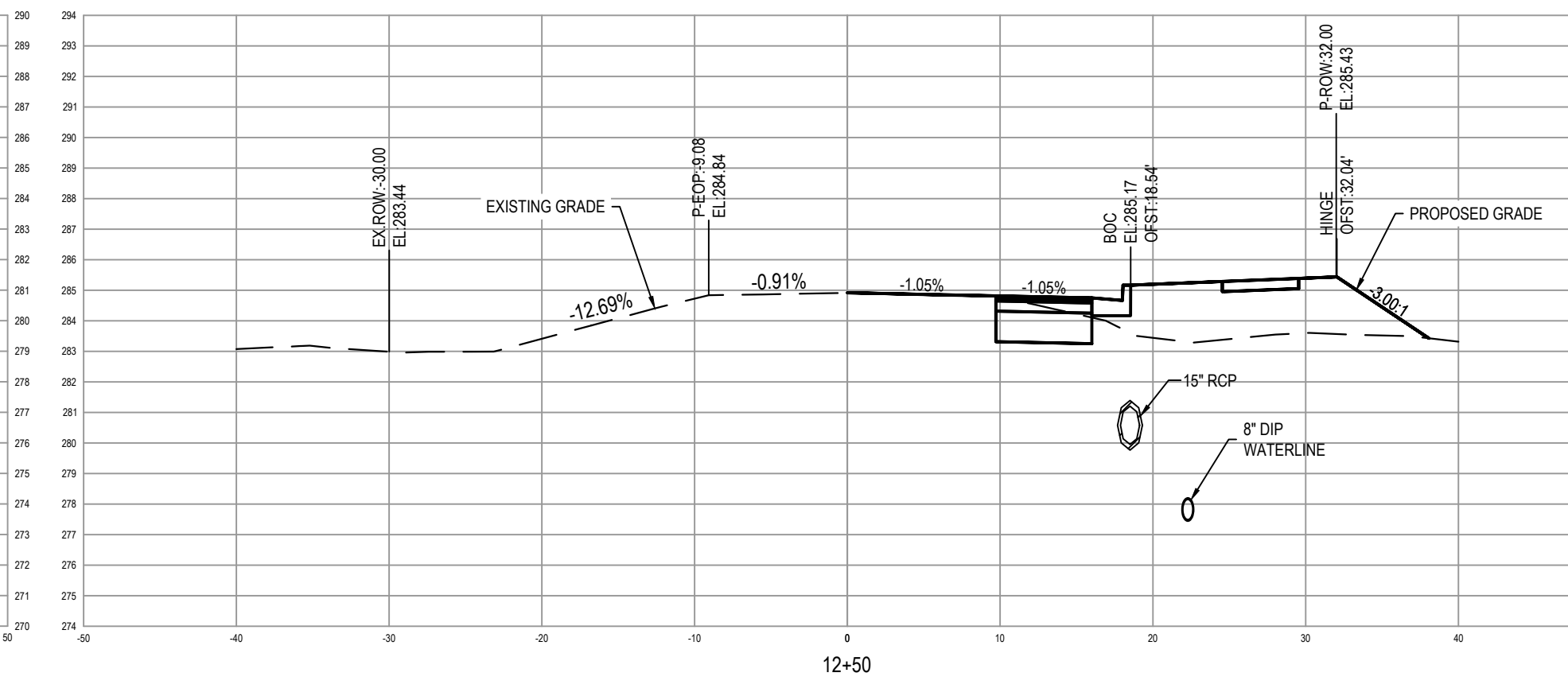
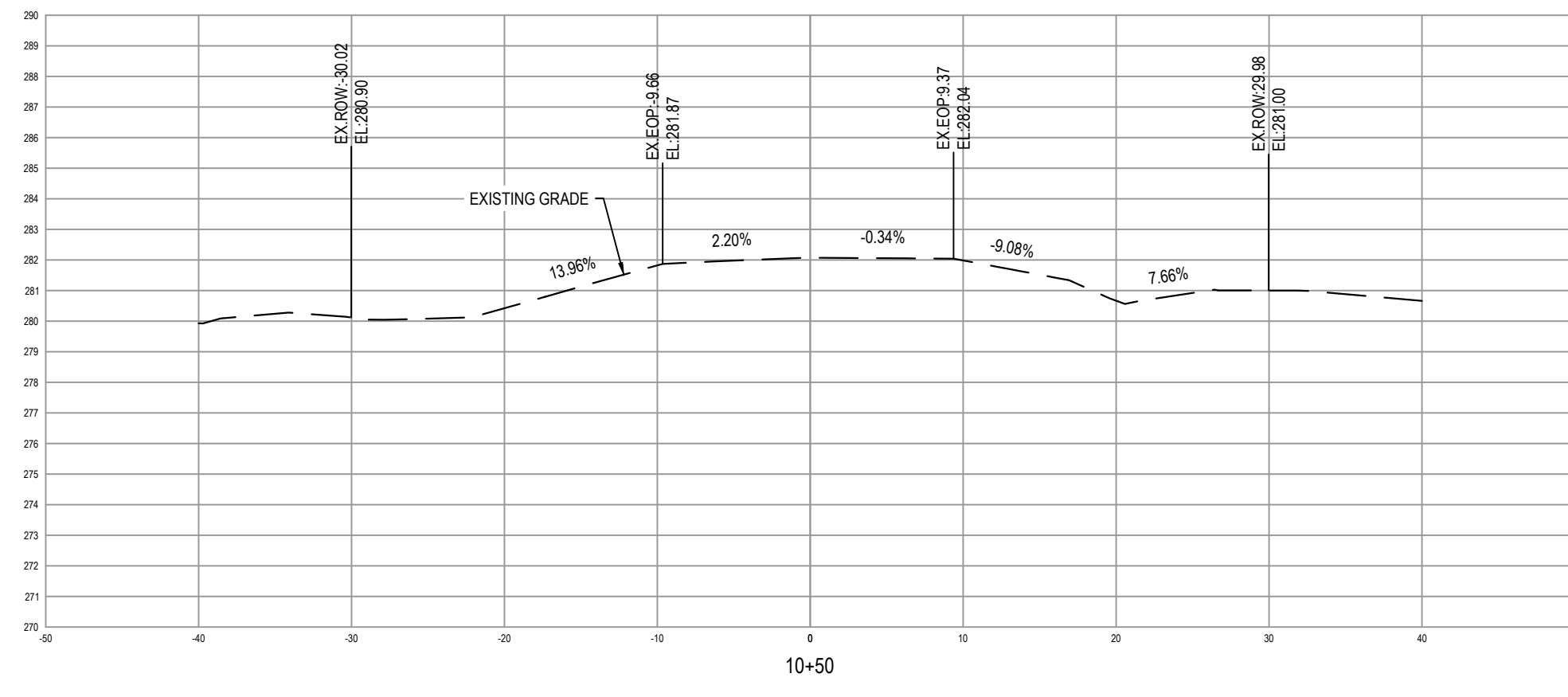
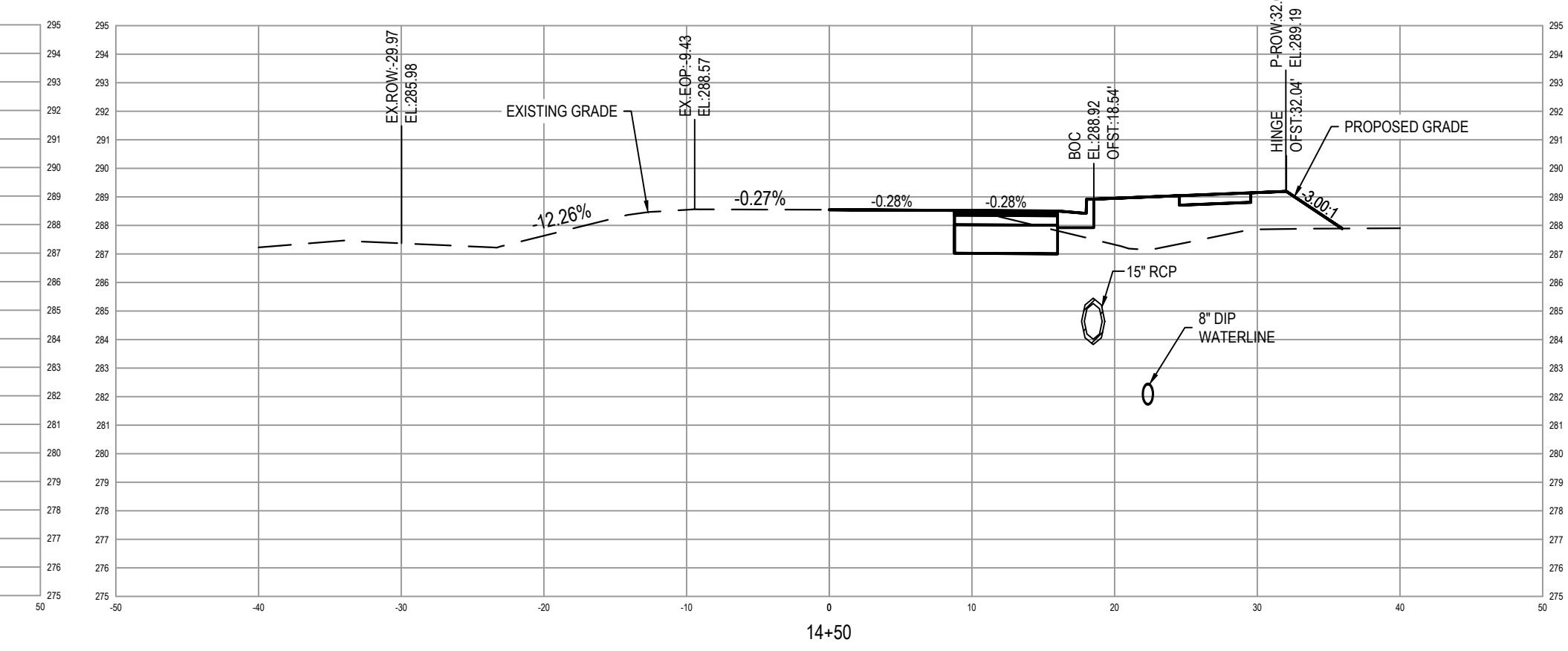
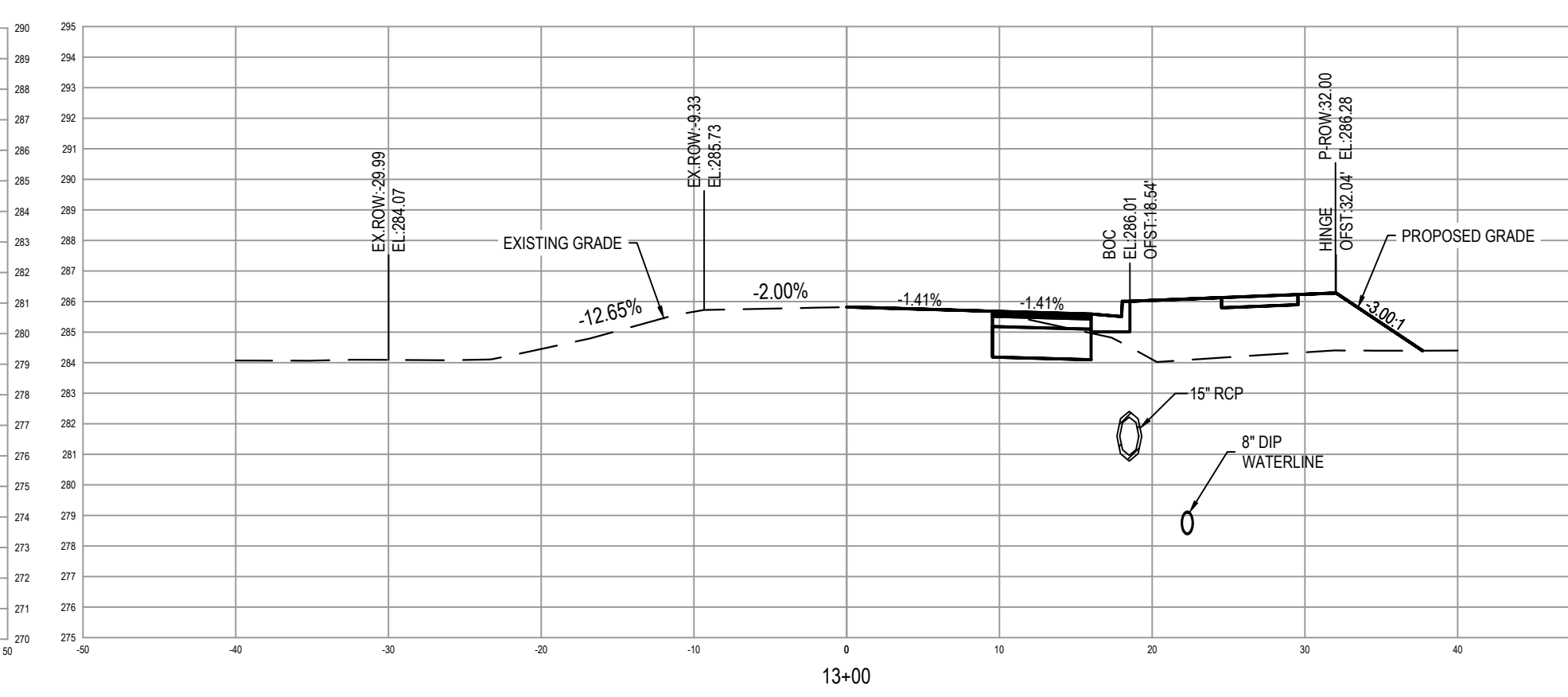
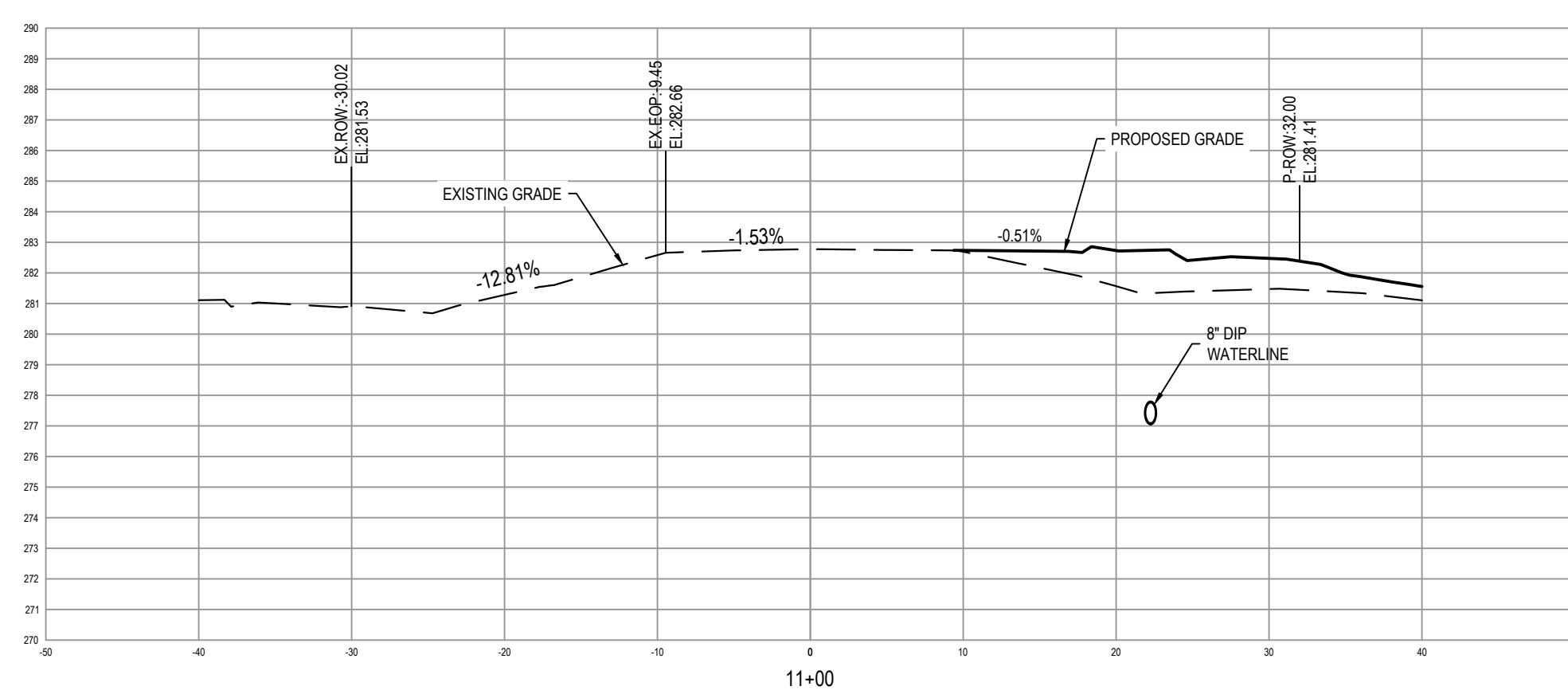
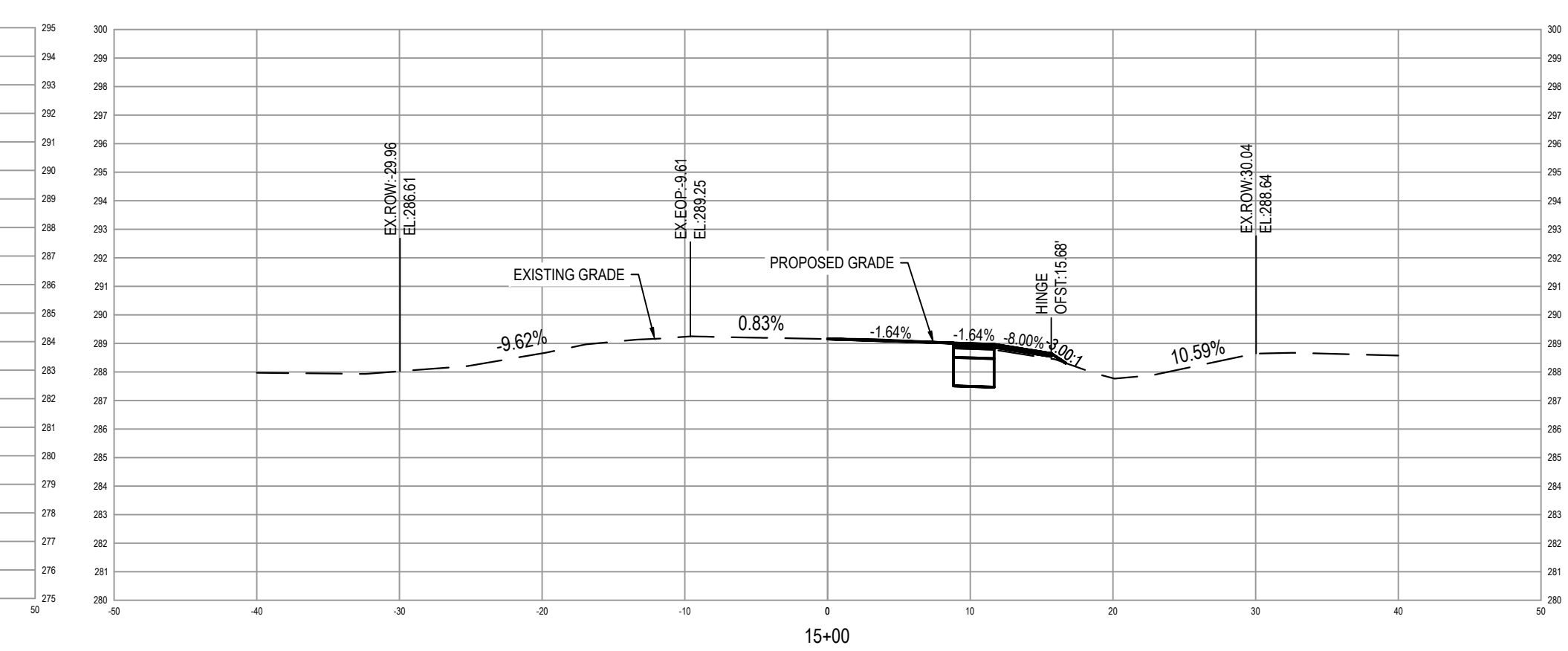
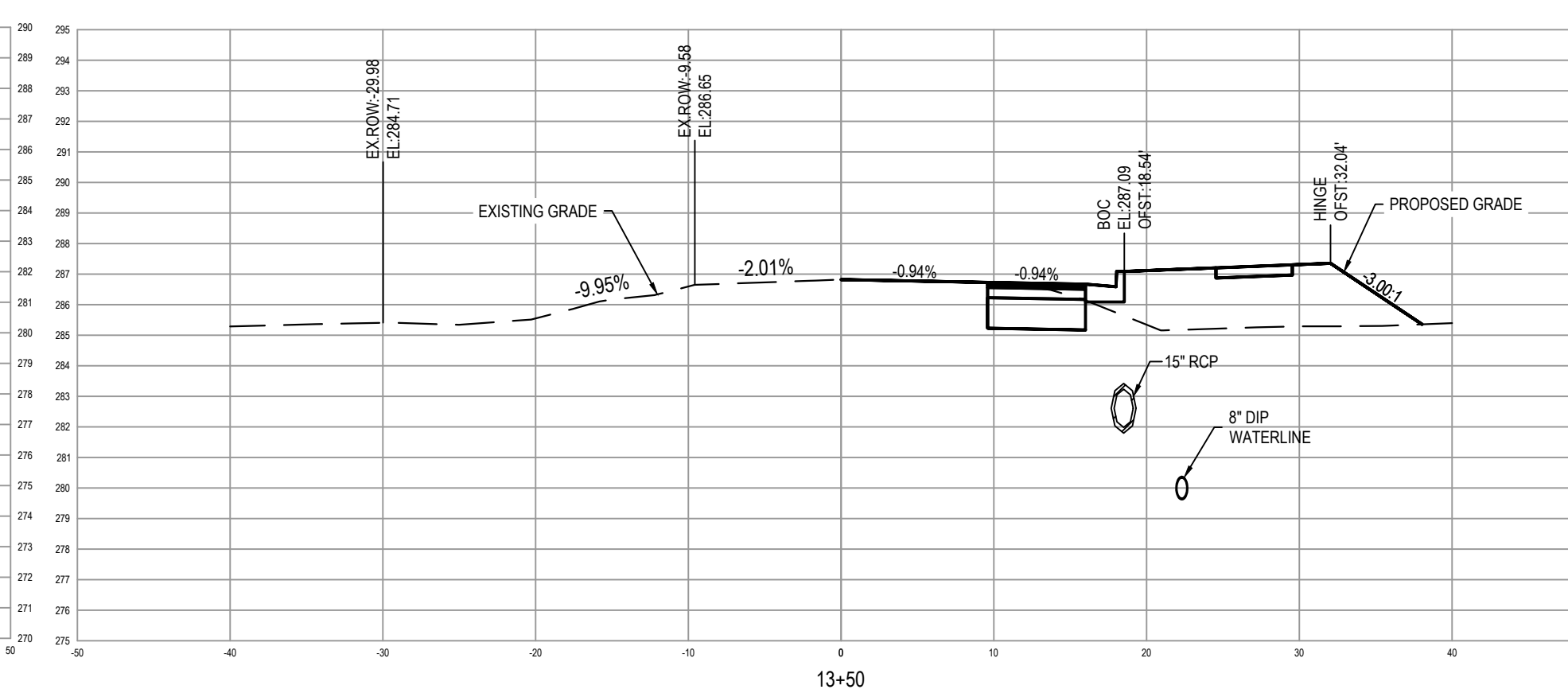
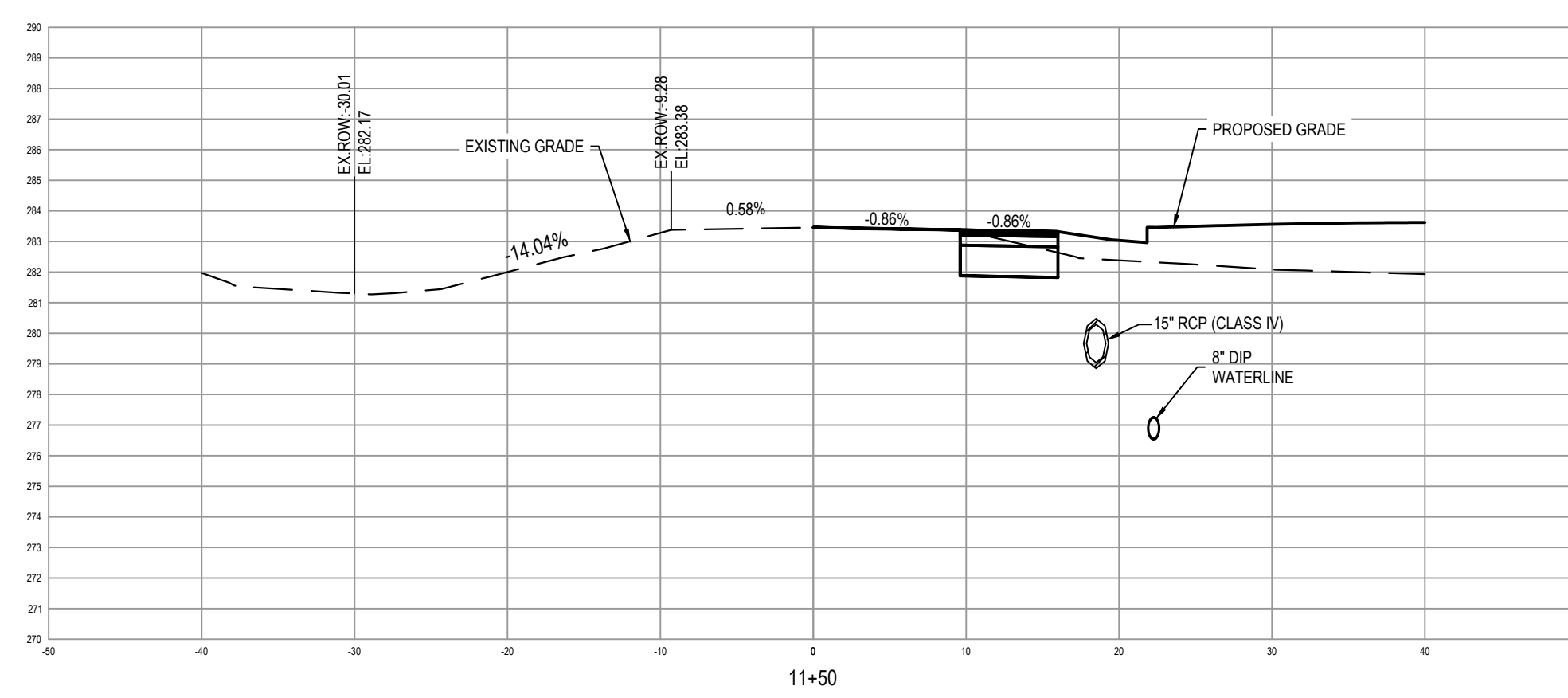
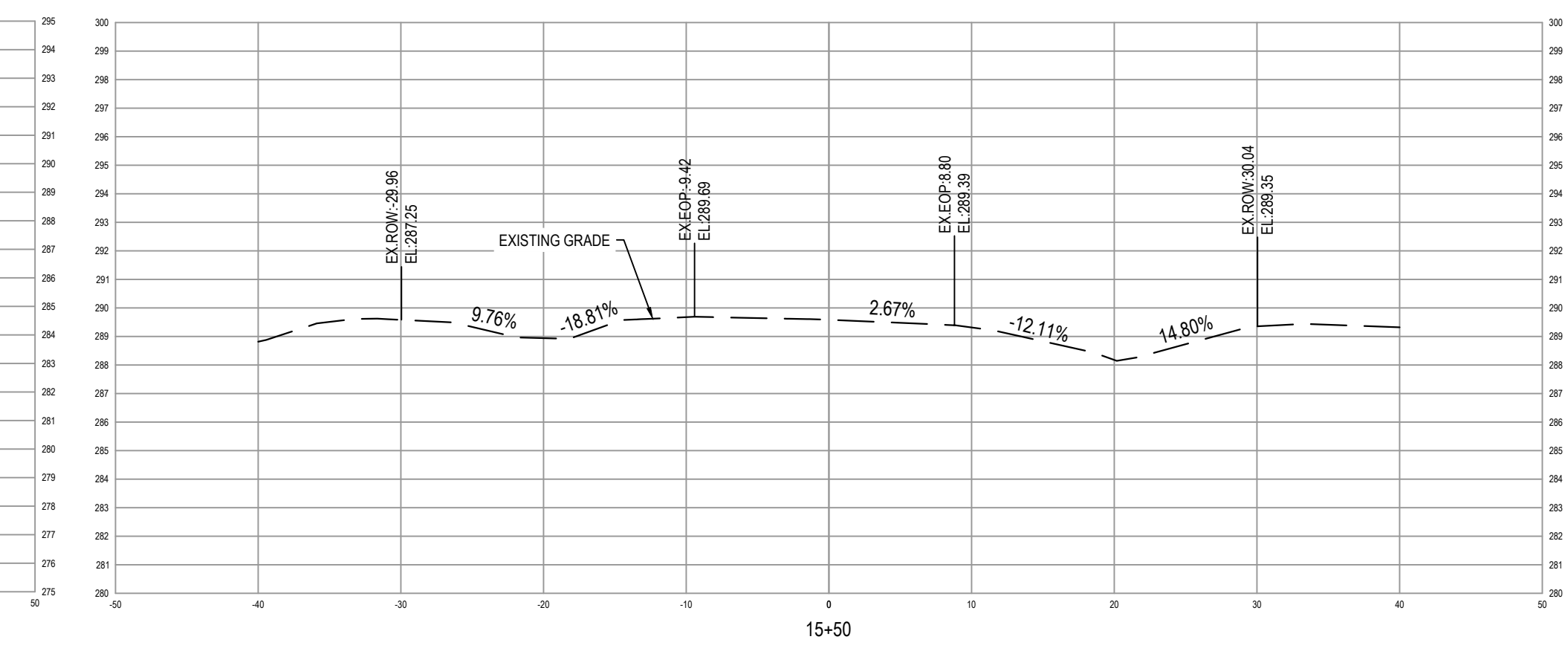
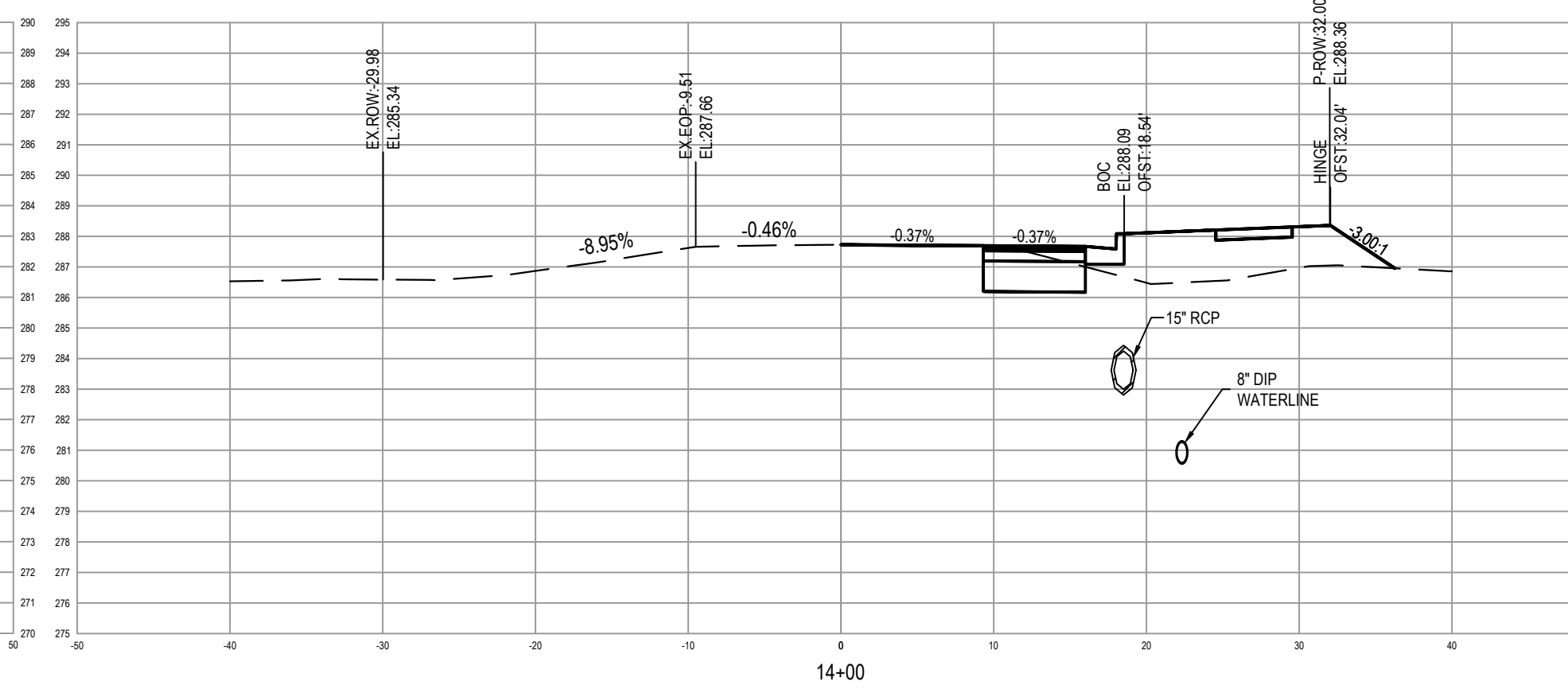
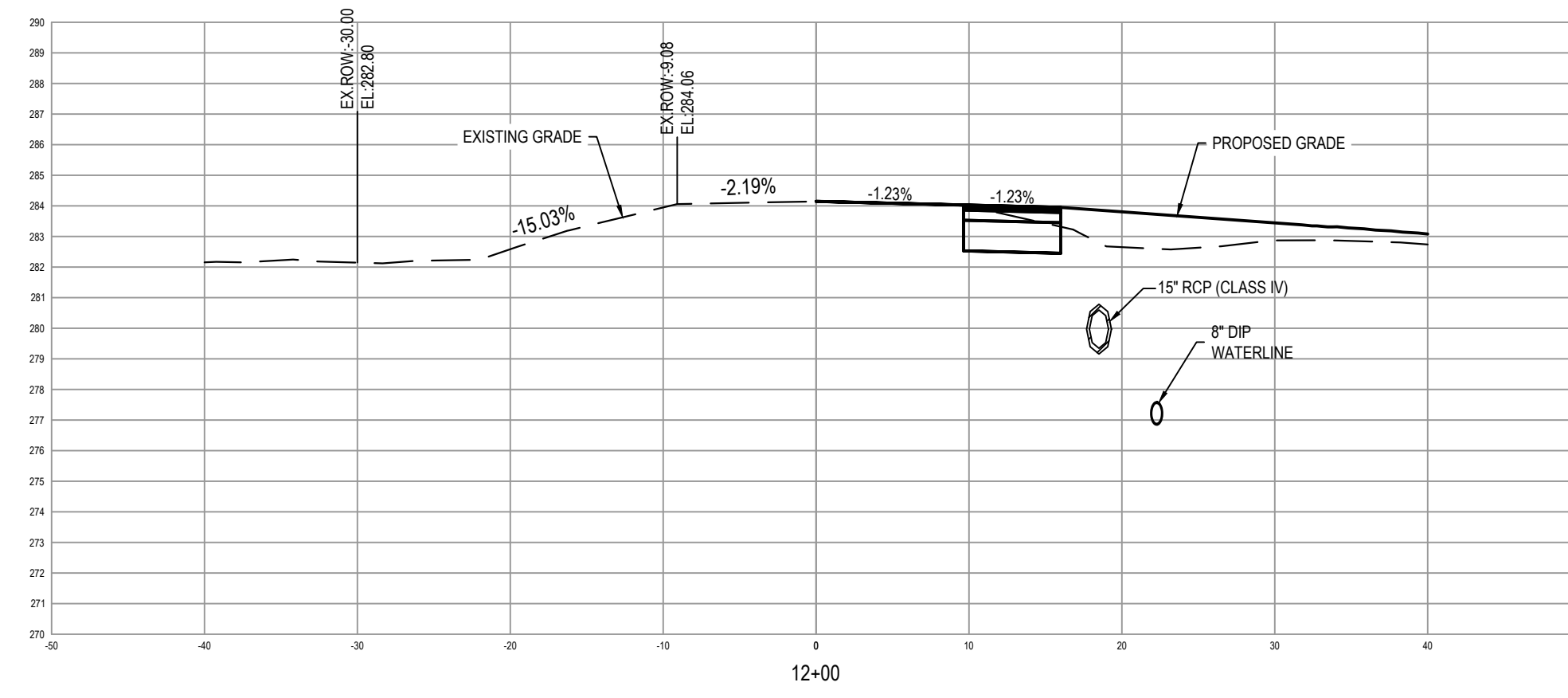


Revisions	Comments	Date
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20









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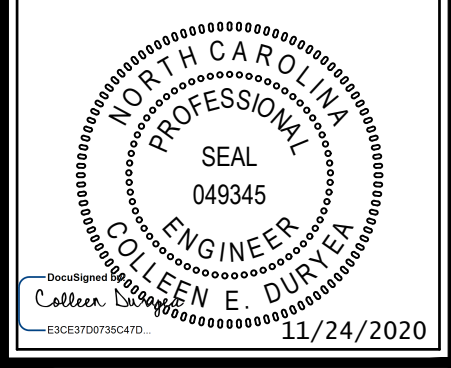
BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 ADMINISTRATOR

**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**CLIFTON ROAD  
 X-SECTIONS**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions	Comments	Date
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20



### INSTALLATION OF STREET NAME SIGN

NOTES:

- TWO STREET NAME MARKERS ARE REQUIRED IF THE MAJOR STREET HAS 3 OR MORE LANES.
- ANY VARIANCE FROM THIS STANDARD MUST BE APPROVED BY THE TOWN OF KNIGHTDALE.

REVISIONS	DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

### INTERSECTION WITH SIDEWALK, CURB, AND GUTTER

STANDARD CURB AND GUTTER LOCATIONS

STB. NO. 3.16

### INTERSECTION WITH DITCHES AND NO CURB AND GUTTER

STB. NO. 3.17

### TEMPORARY BARRICADE FOR DEAD END ROADS

STB. NO. 3.18

### CONCRETE SIDEWALKS

STB. NO. 4.04

### CONCRETE SIDEWALKS

STB. NO. 4.04

### CONCRETE SIDEWALKS

STB. NO. 4.04

### STANDARD DRIVEWAY APRON

STB. NO. 4.03

### STANDARD DRIVEWAY APRON

STB. NO. 4.03

### STANDARD DRIVEWAY APRON

STB. NO. 4.03

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

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STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### STANDARD CURB AND GUTTER

STB. NO. 4.01

### TYPE 1 OBJECT MARKERS

STB. NO. 1205.07

### TYPE 2 OBJECT MARKERS

STB. NO. 1205.07

### TYPE 3 OBJECT MARKERS

STB. NO. 1205.07

### TYPE 4 OBJECT MARKERS

STB. NO. 1205.07

### TYPE 1 OR TYPE 3 MARKERS FOR OBSTRUCTIONS WITHIN THE ROADWAY

STB. NO. 1205.07

### TYPE 2 OR TYPE 3 MARKERS FOR OBSTRUCTIONS ADJACENT TO THE ROADWAY

STB. NO. 1205.07

### TYPE 1 OR TYPE 3 MARKERS FOR OBSTRUCTIONS WITHIN THE ROADWAY

STB. NO. 1205.07

### TYPE 2 OR TYPE 3 MARKERS FOR OBSTRUCTIONS ADJACENT TO THE ROADWAY

STB. NO. 1205.07

### TYPE 1 OR TYPE 3 MARKERS FOR OBSTRUCTIONS WITHIN THE ROADWAY

STB. NO. 1205.07

### TYPE 2 OR TYPE 3 MARKERS FOR OBSTRUCTIONS ADJACENT TO THE ROADWAY

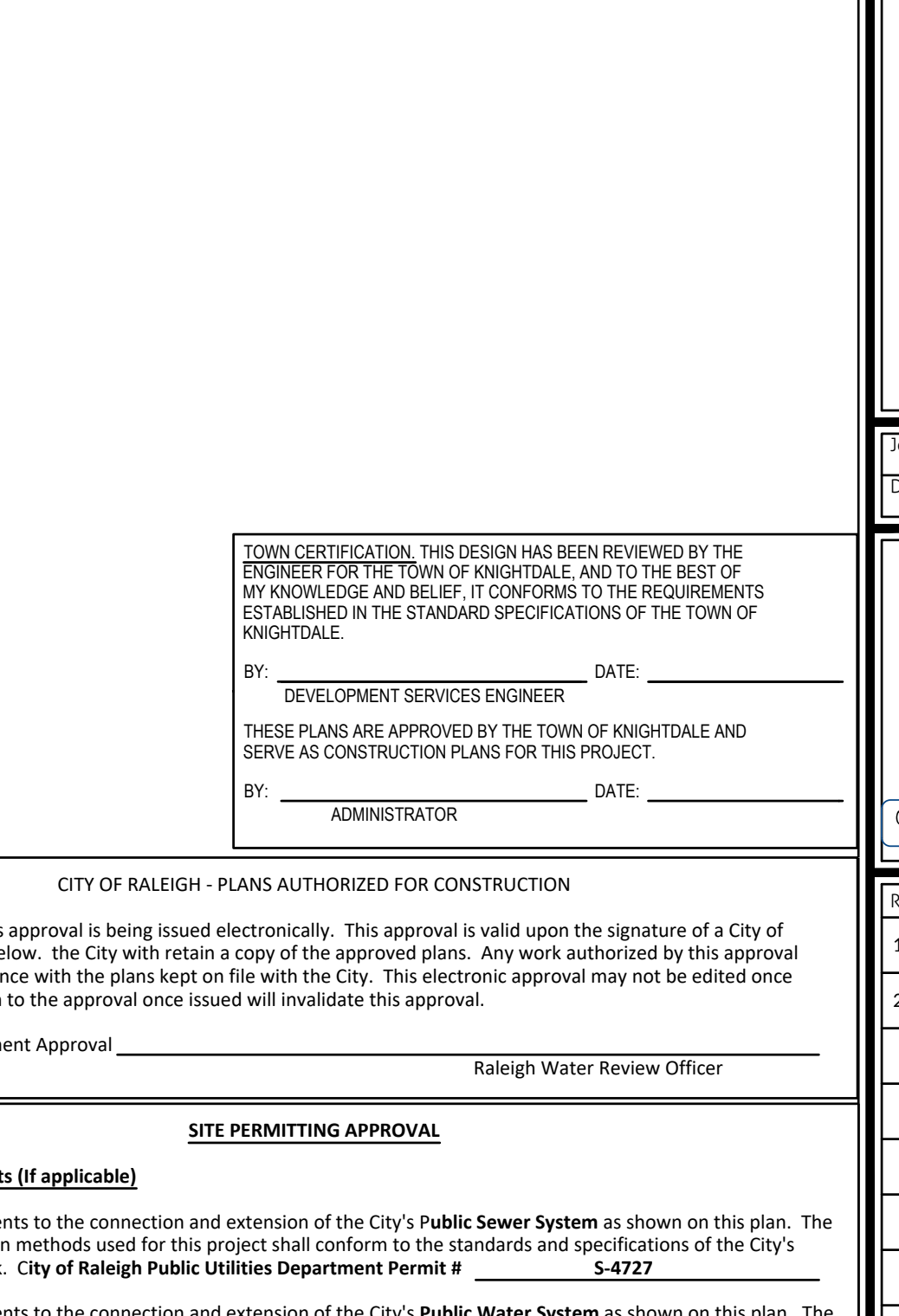
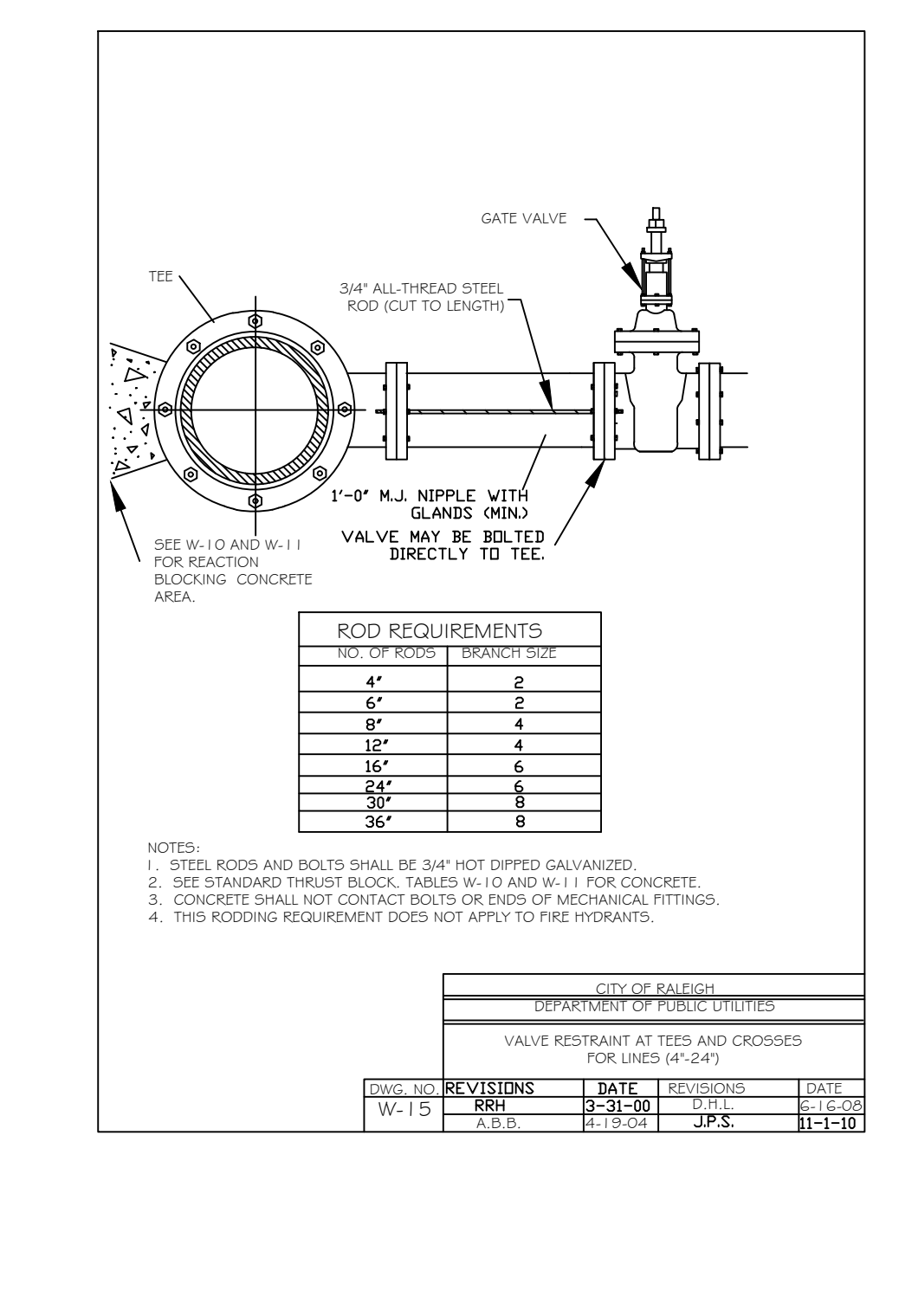
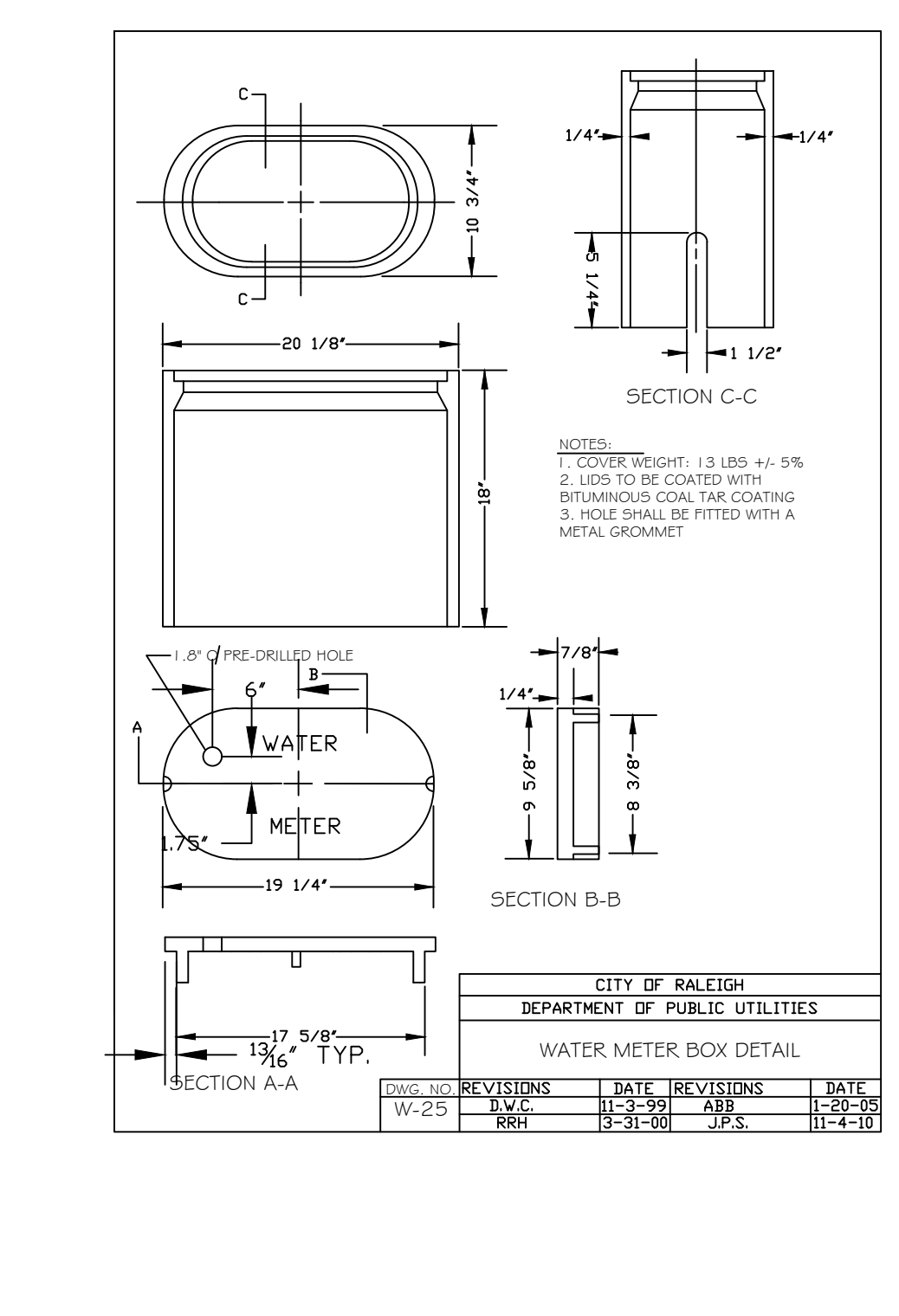
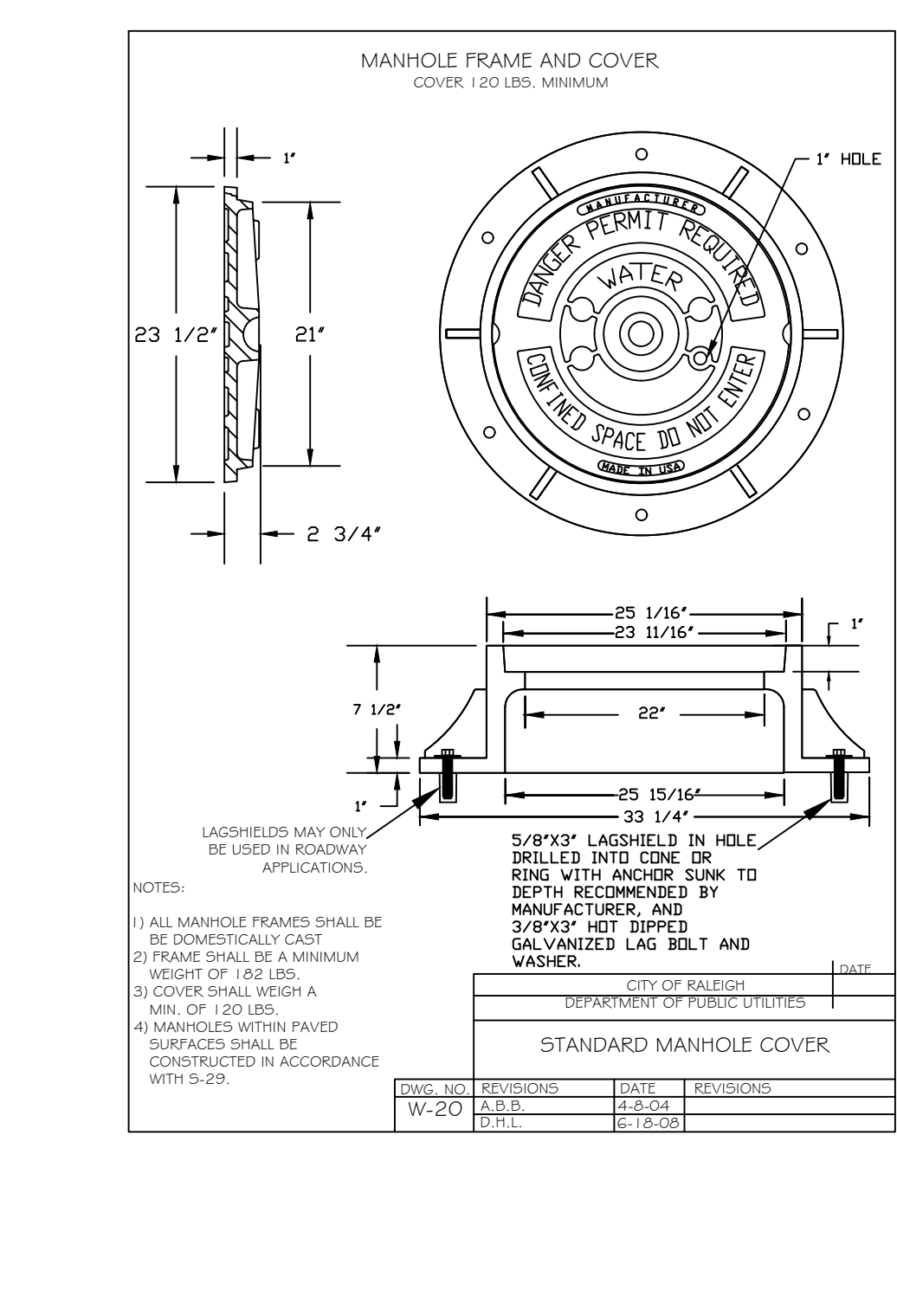
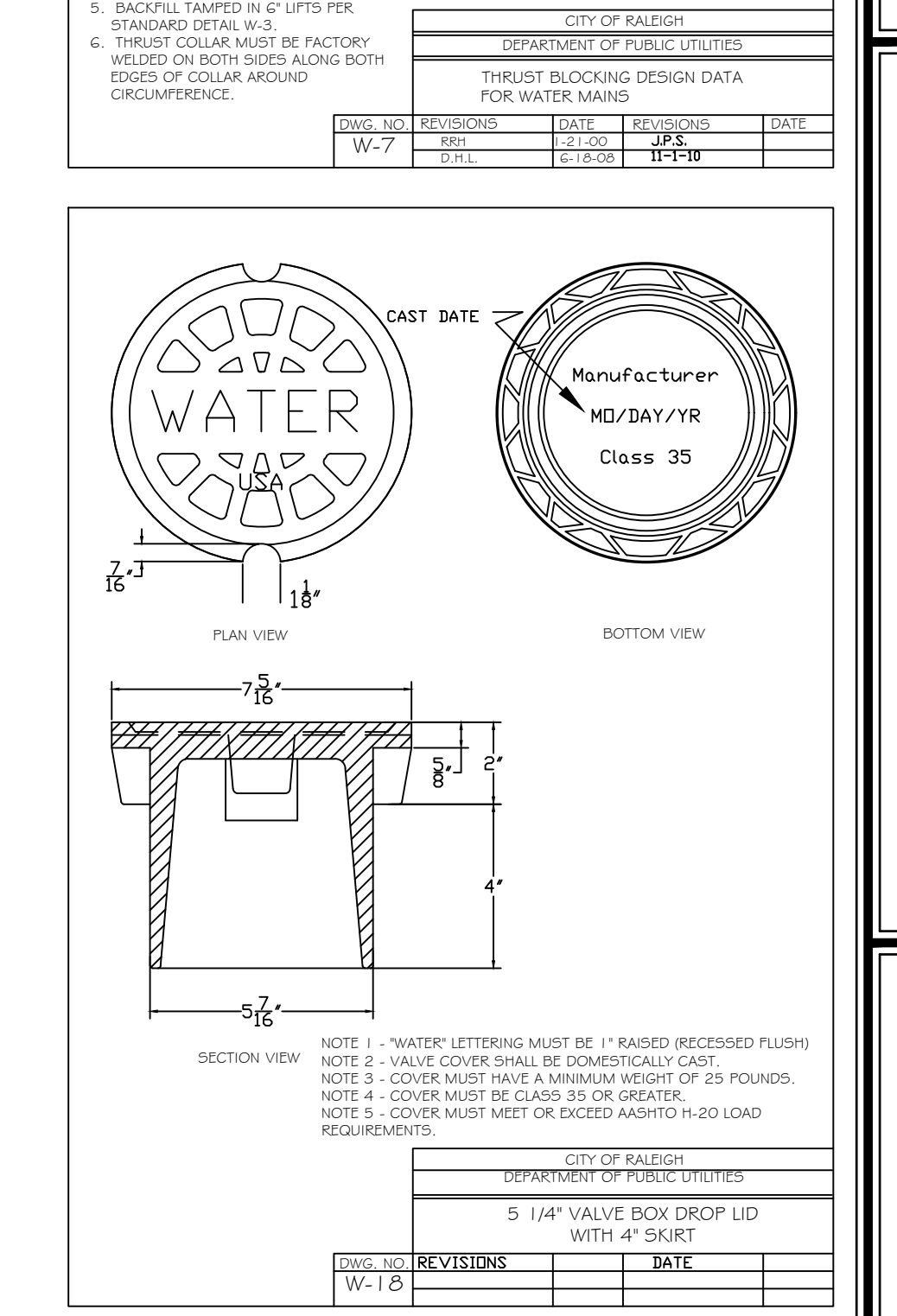
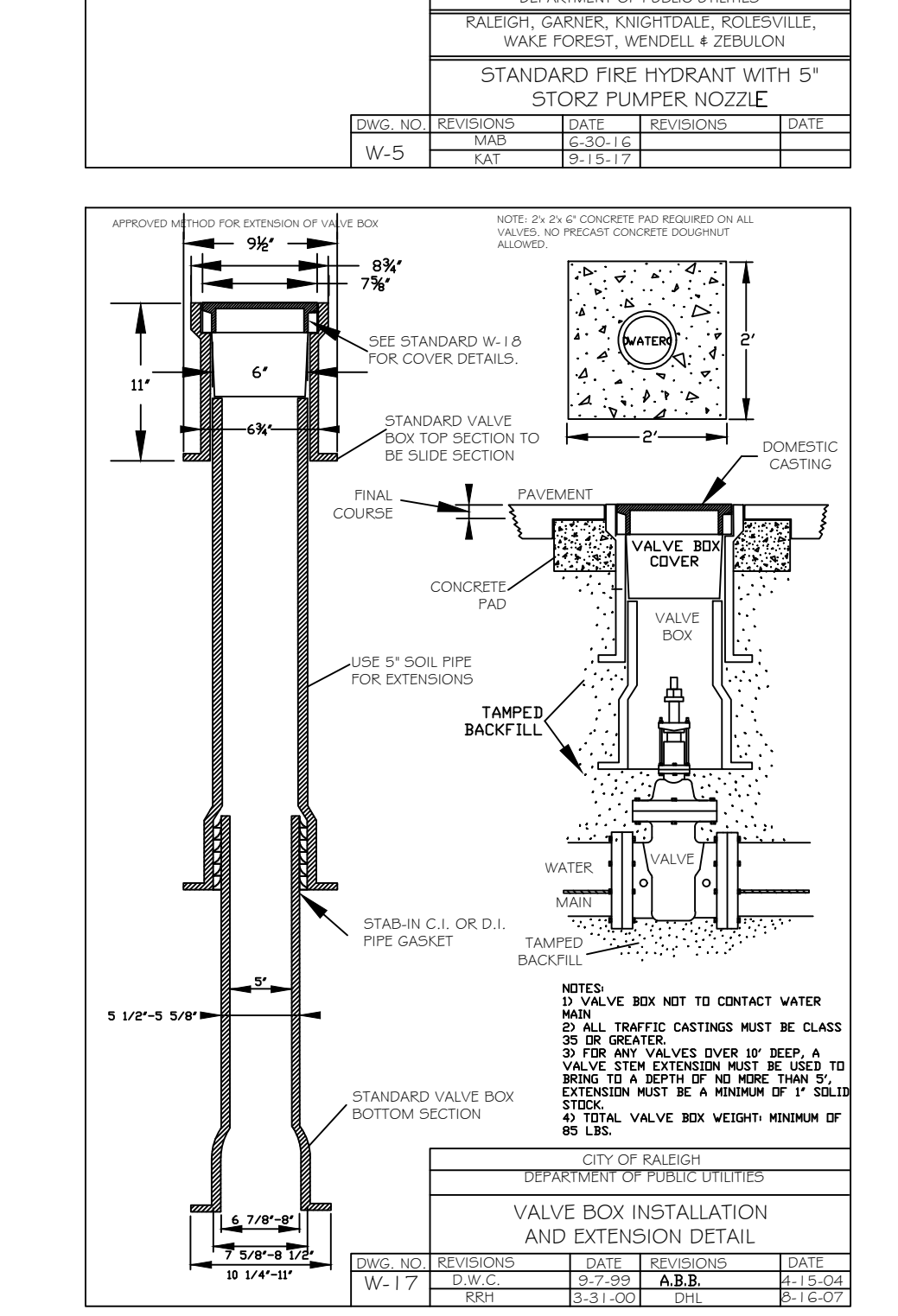
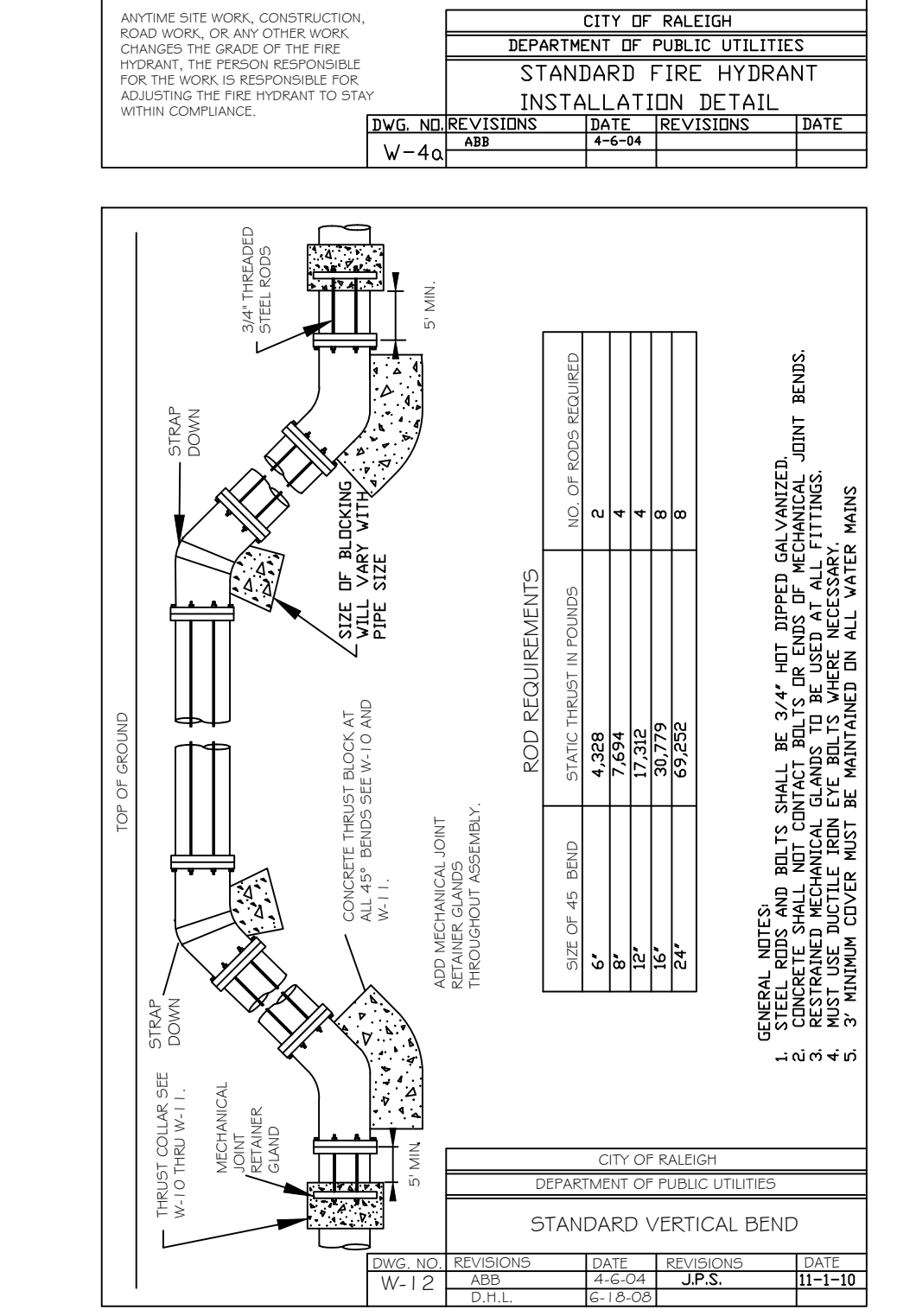
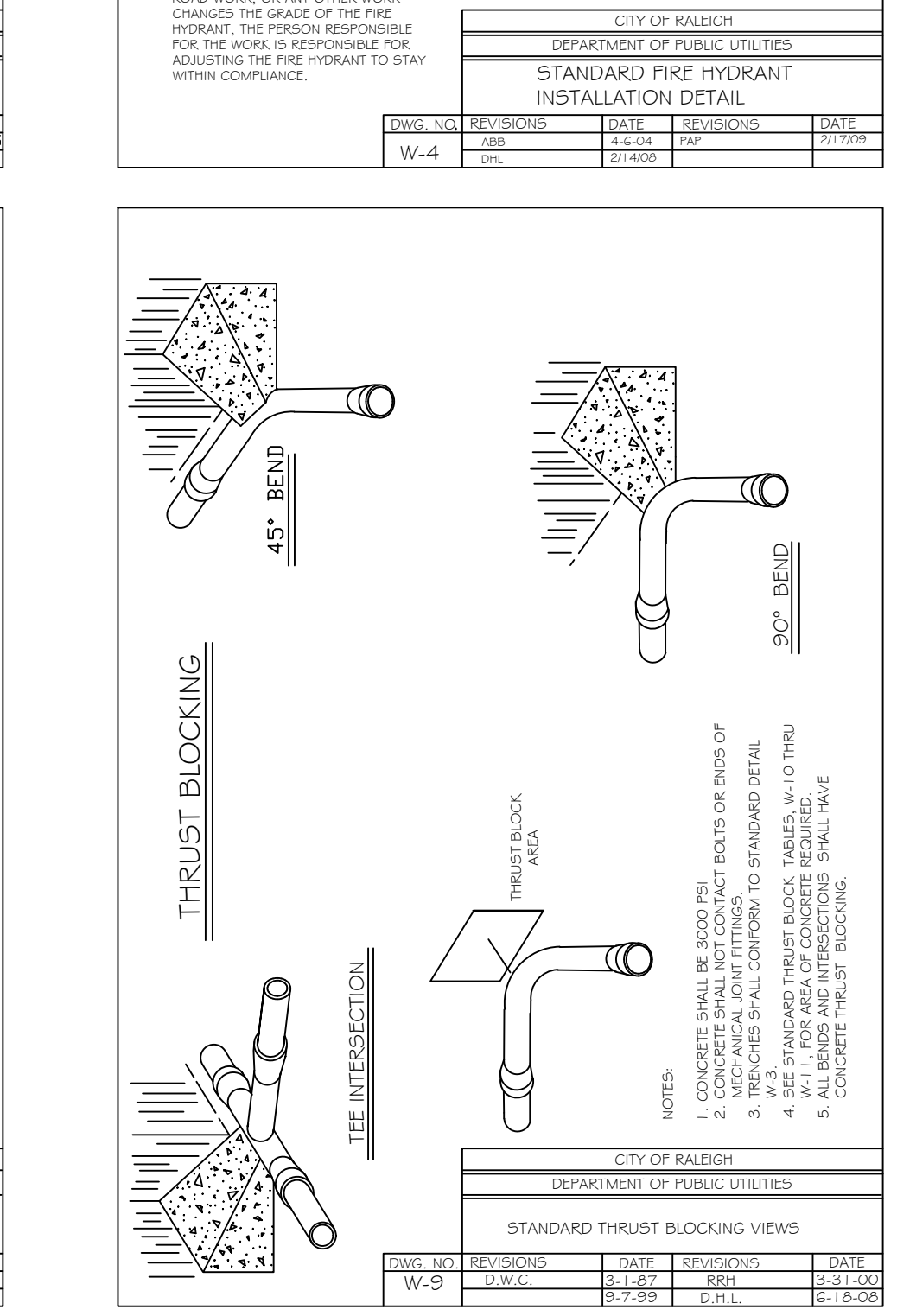
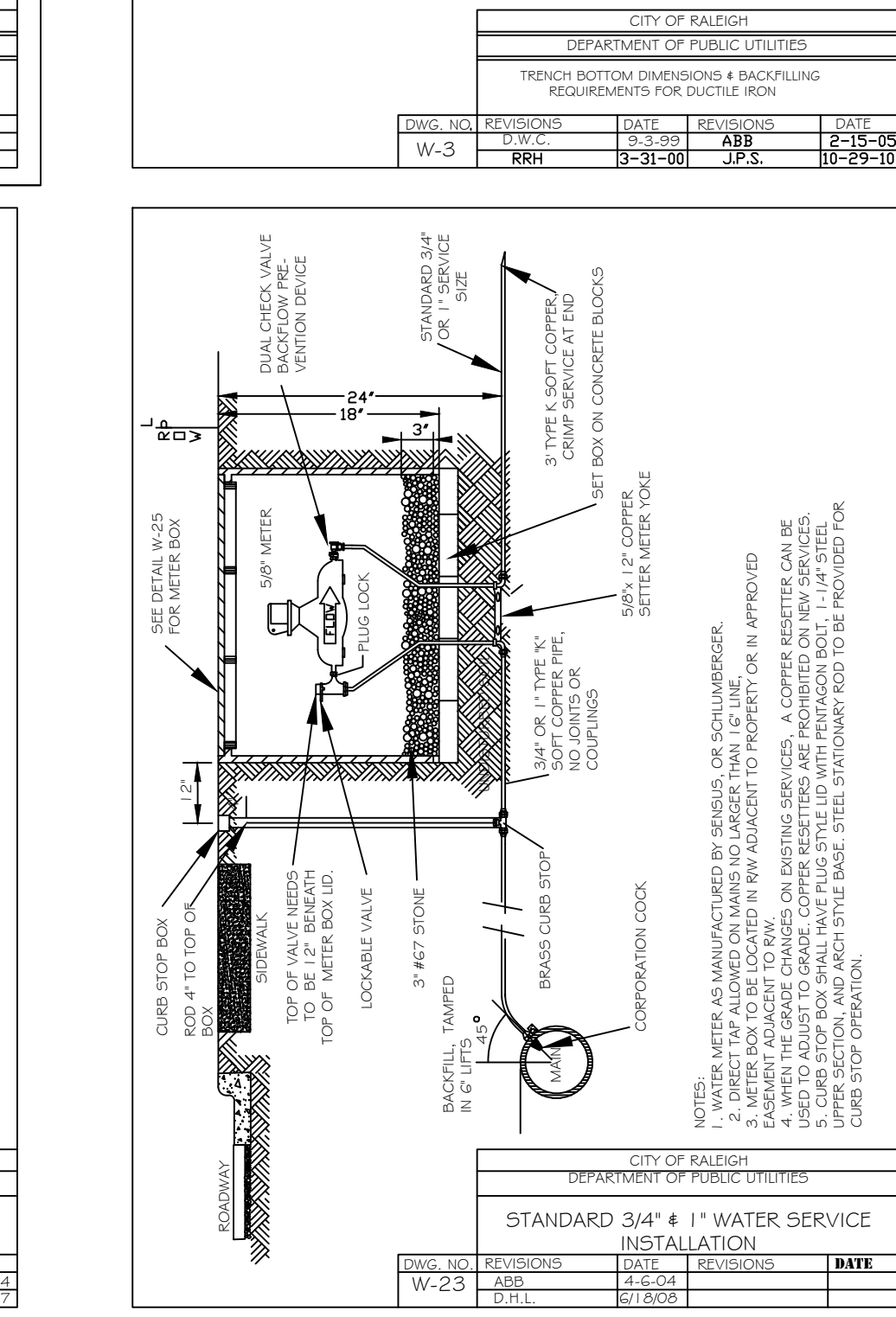
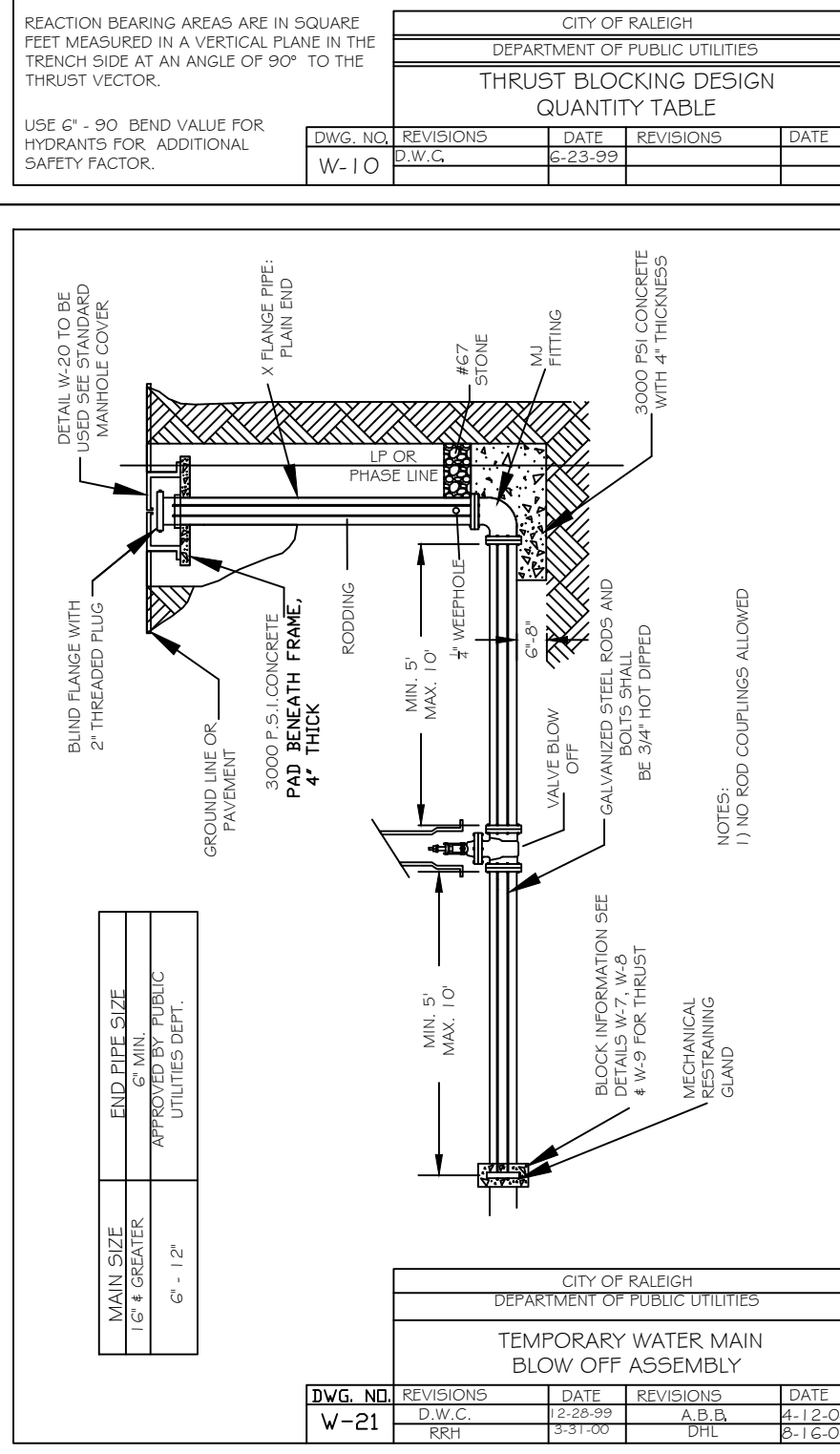
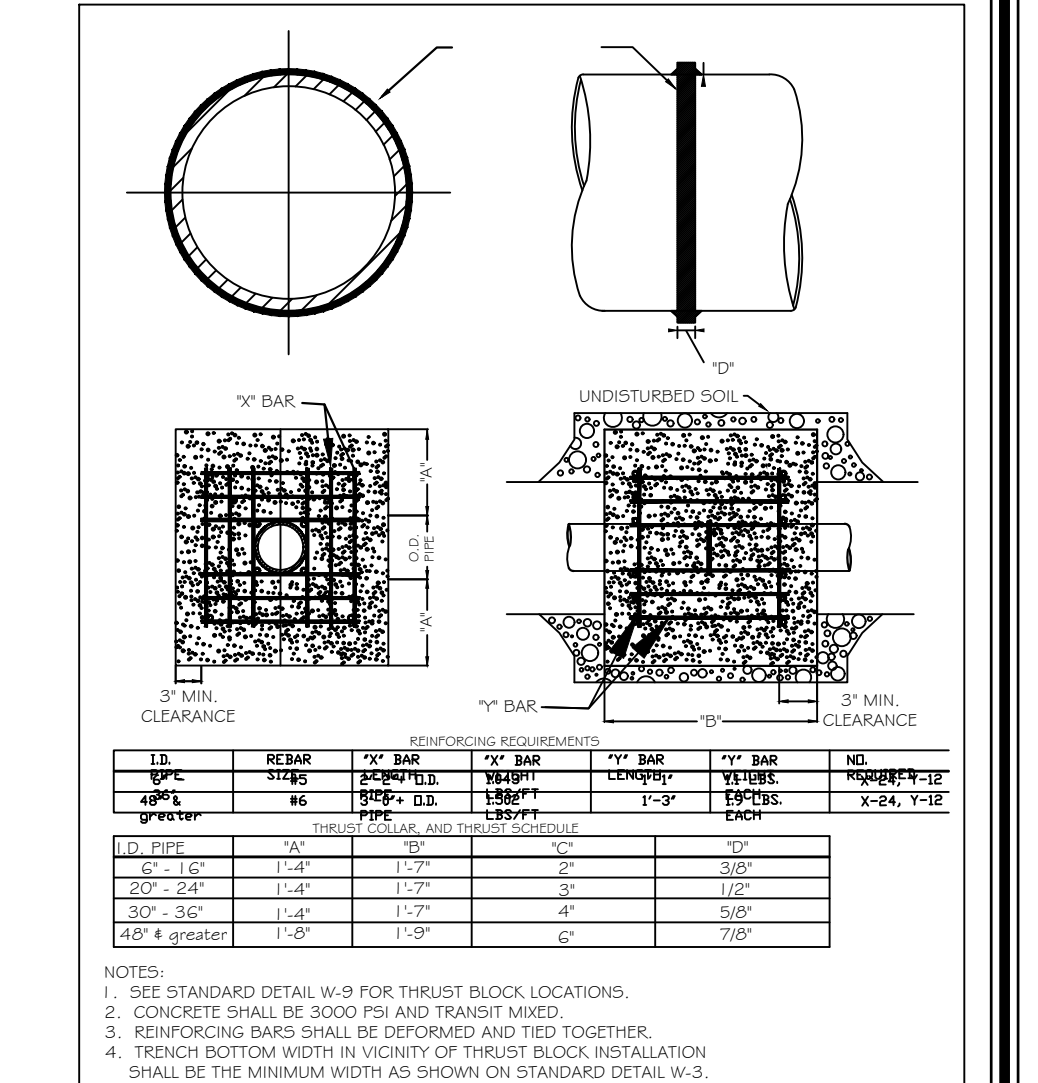
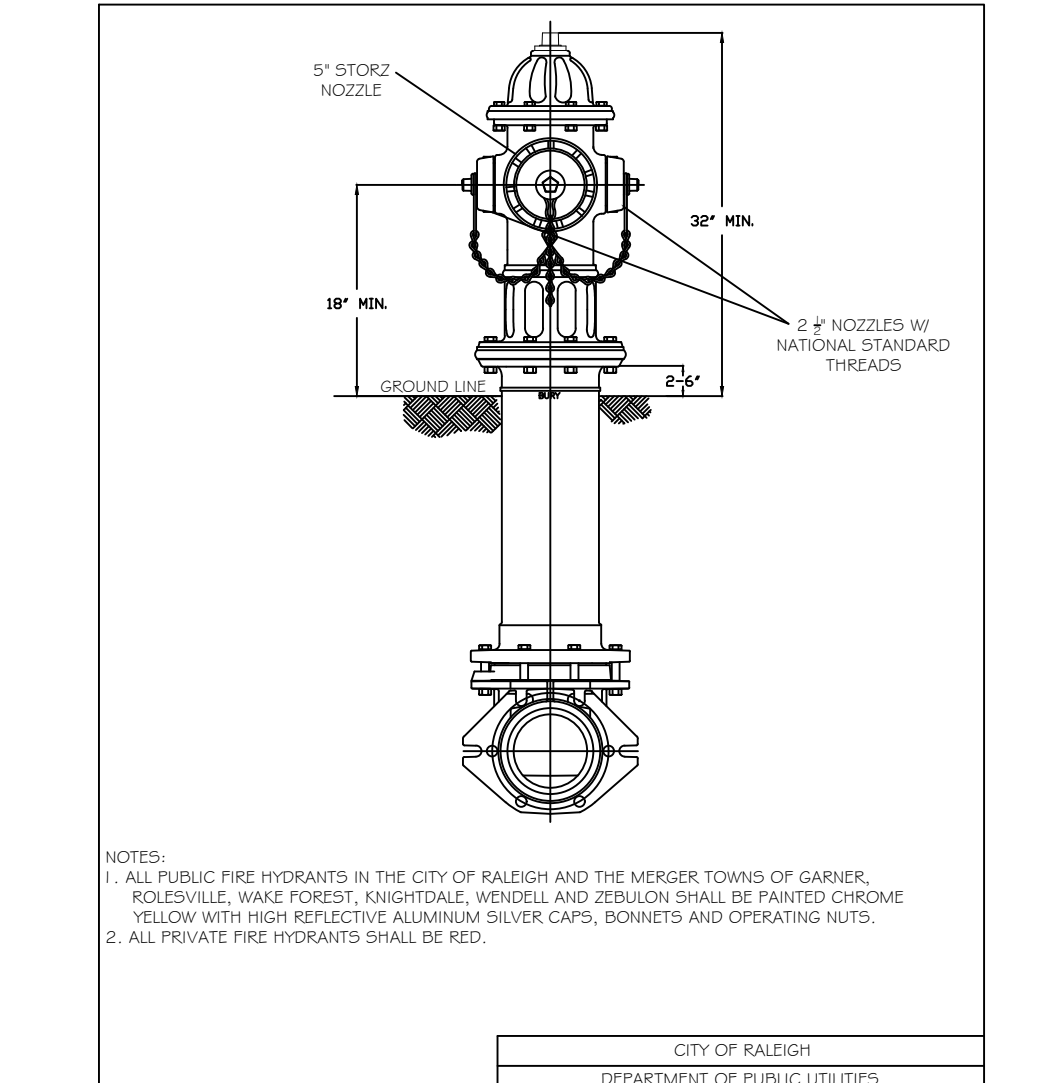
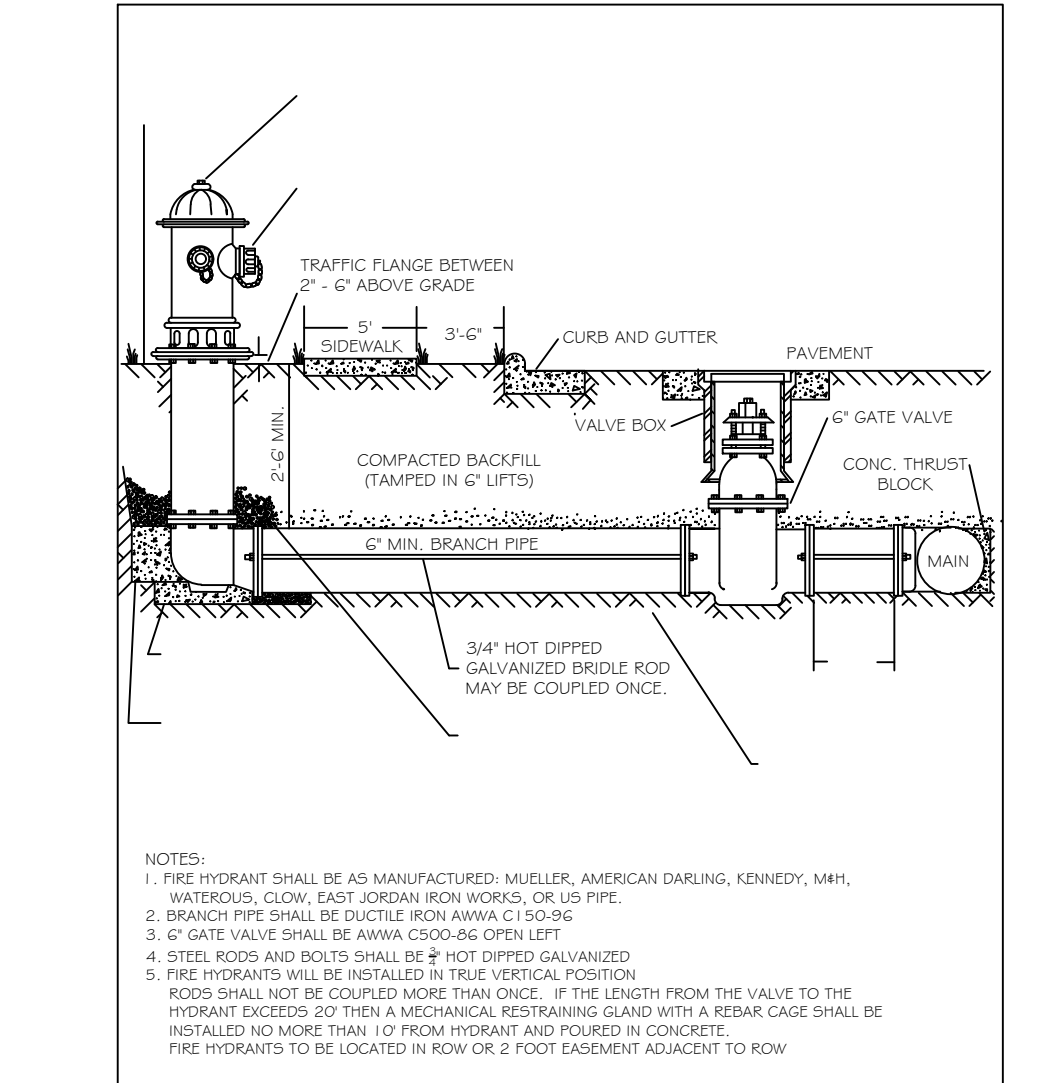
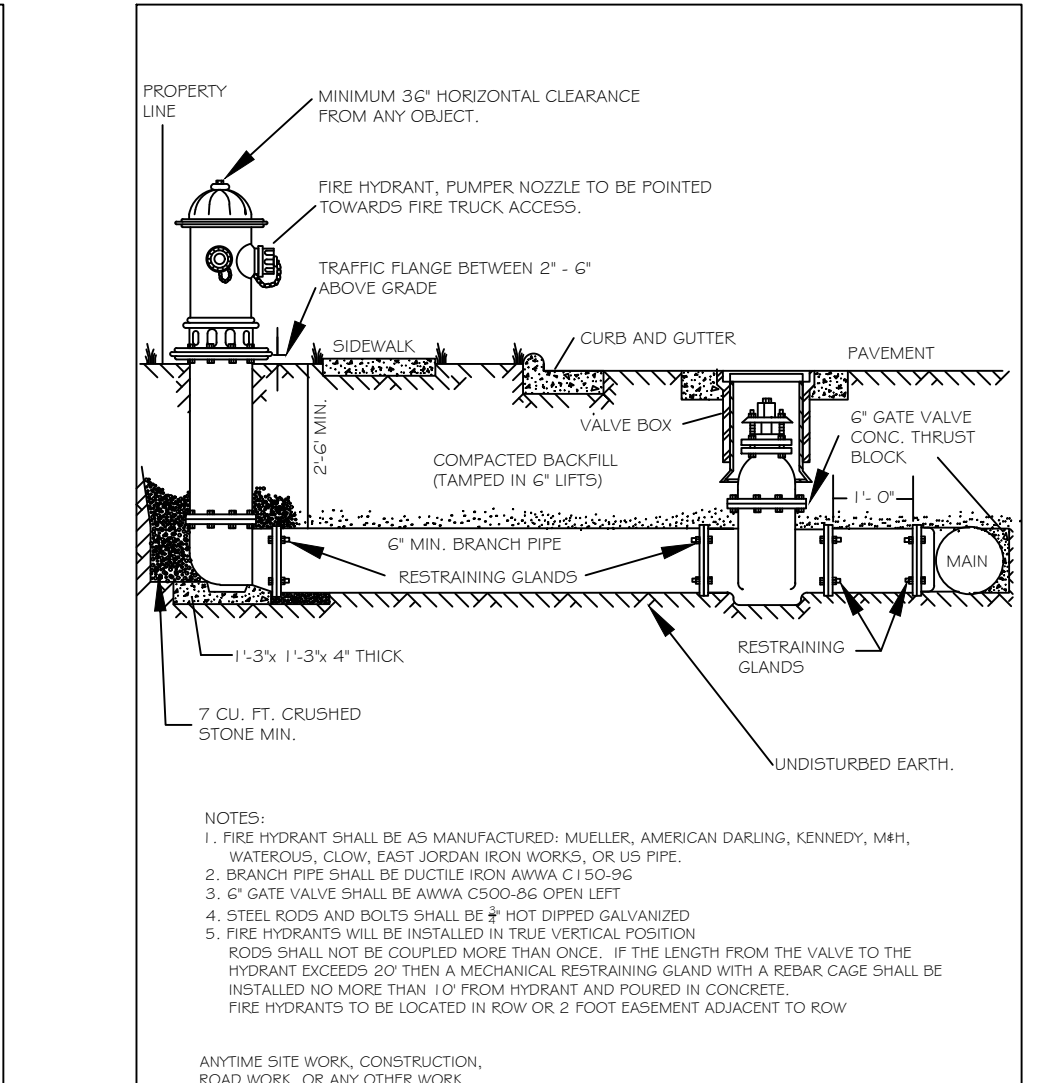
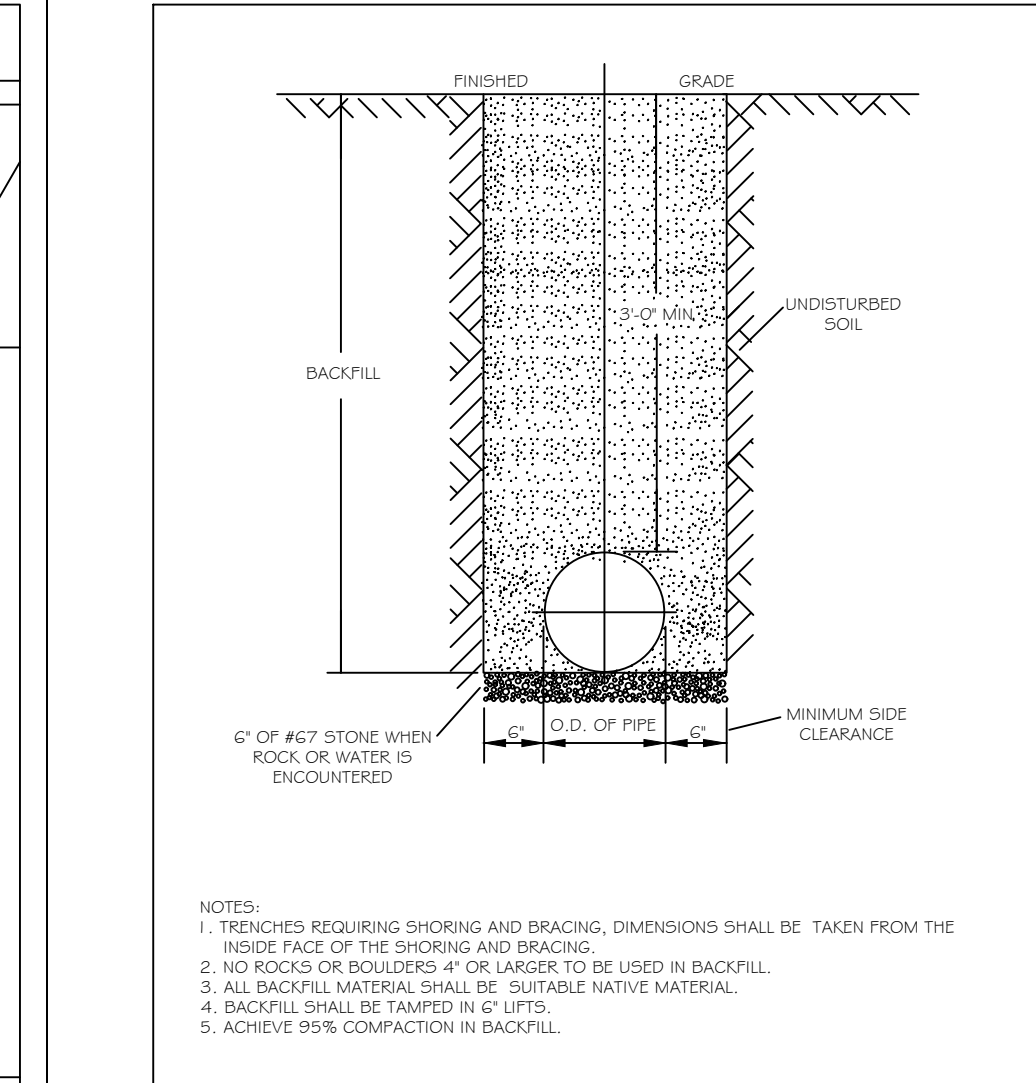
STB. NO. 1205.07



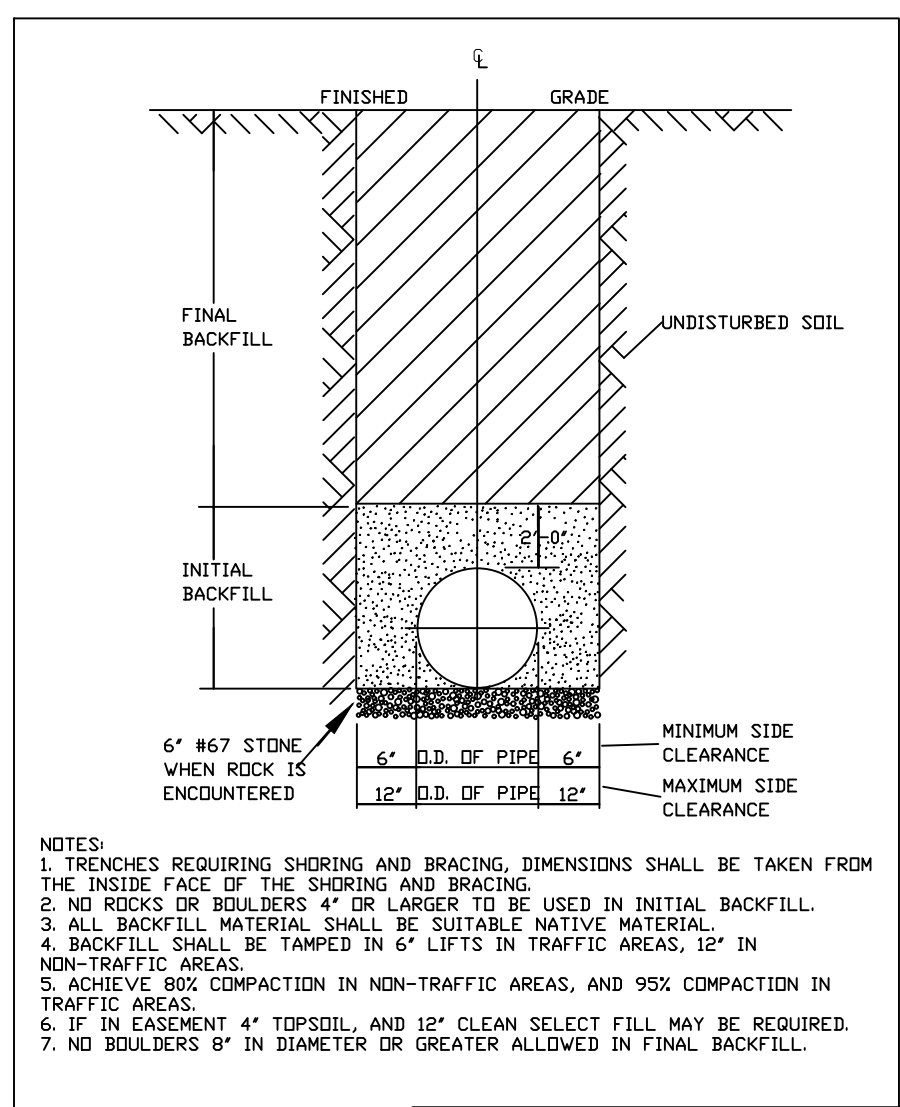
**REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS BASED ON TEST PRESSURE OF 200 P.S.I.**

ALL AREAS GIVEN IN SQUARE FEET

PIPE SIZE	90° BEND	45° BEND	30° BEND	15° BEND	10° BEND	5° BEND	2.5° BEND
6"	11 1/4"	1,108	1	1	1	1	1
8"	11 1/4"	2,207	1	2	2	1	1
10"	11 1/4"	4,328	2	3	3	1	2
12"	11 1/4"	7,996	2	4	5	1	2
15"	11 1/4"	15,655	2	3	4	1	2
18"	11 1/4"	1,970	1	1	2	1	1
20"	11 1/4"	3,922	1	2	3	1	1
24"	11 1/4"	7,694	2	4	5	1	2
30"	11 1/4"	14,215	4	8	9	2	4
36"	11 1/4"	22,619	3	5	6	2	3
42"	11 1/4"	4,433	2	3	3	1	2
48"	11 1/4"	8,826	3	5	6	2	3
54"	11 1/4"	17,312	5	9	11	3	5
60"	11 1/4"	31,983	8	16	19	4	8
66"	11 1/4"	48,619	6	12	14	3	6
72"	11 1/4"	7,881	2	4	5	1	2
78"	11 1/4"	15,651	4	8	10	2	4
84"	11 1/4"	30,779	8	16	19	4	8
90"	11 1/4"	56,861	15	29	35	8	15
96"	11 1/4"	84,213	10	21	25	5	10

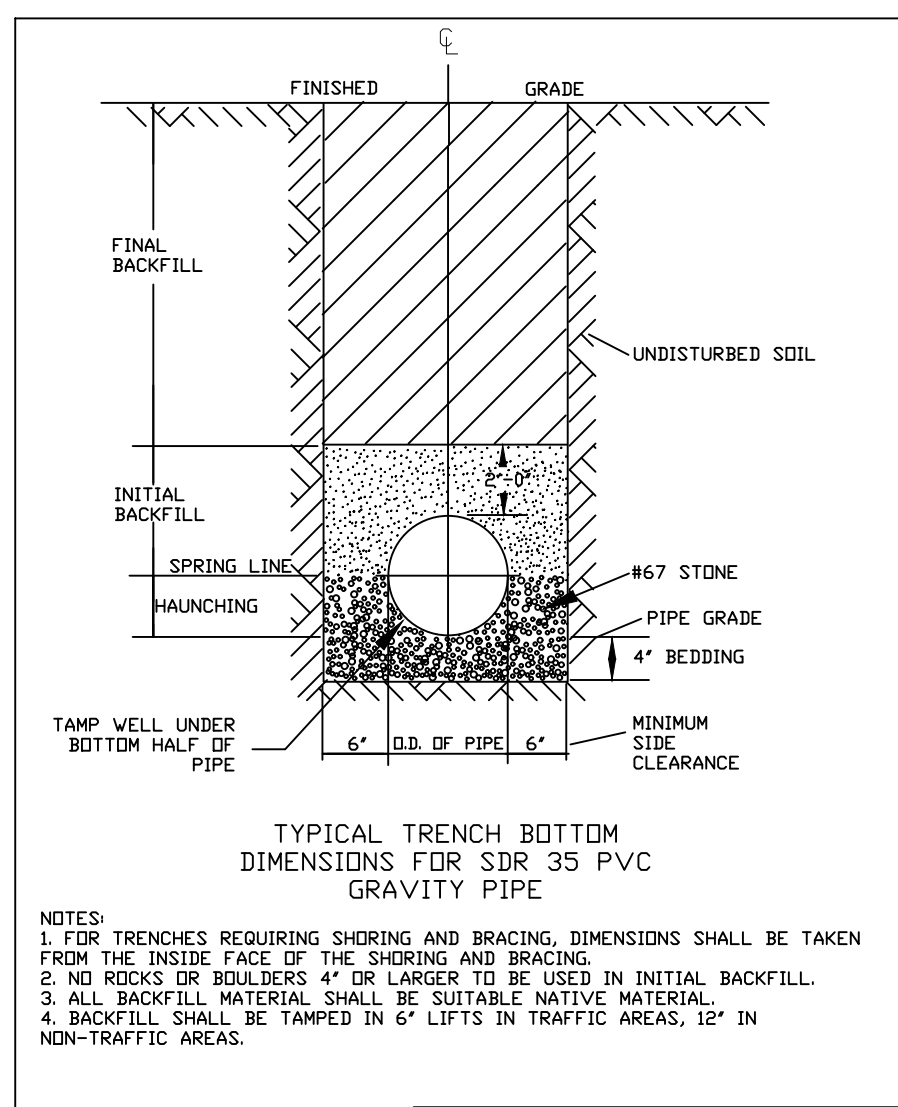






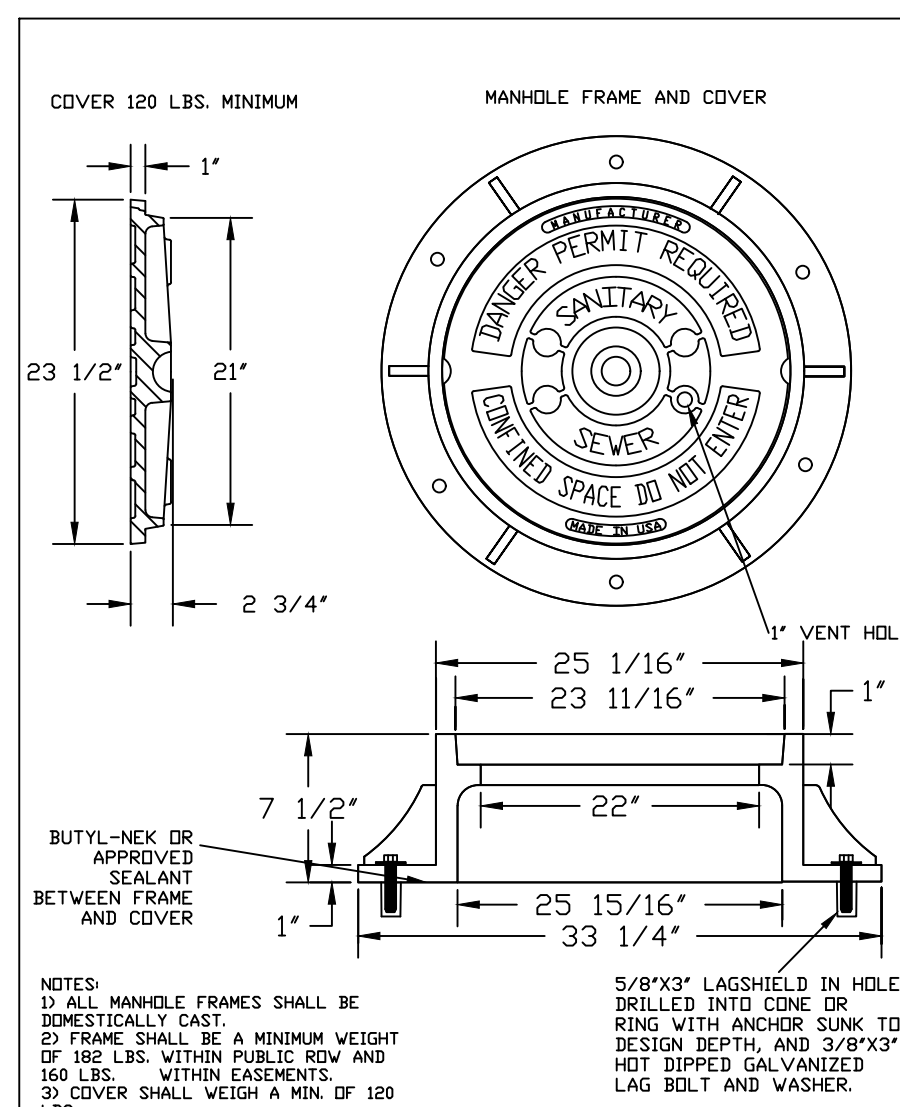
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	RRH	3-30-00		



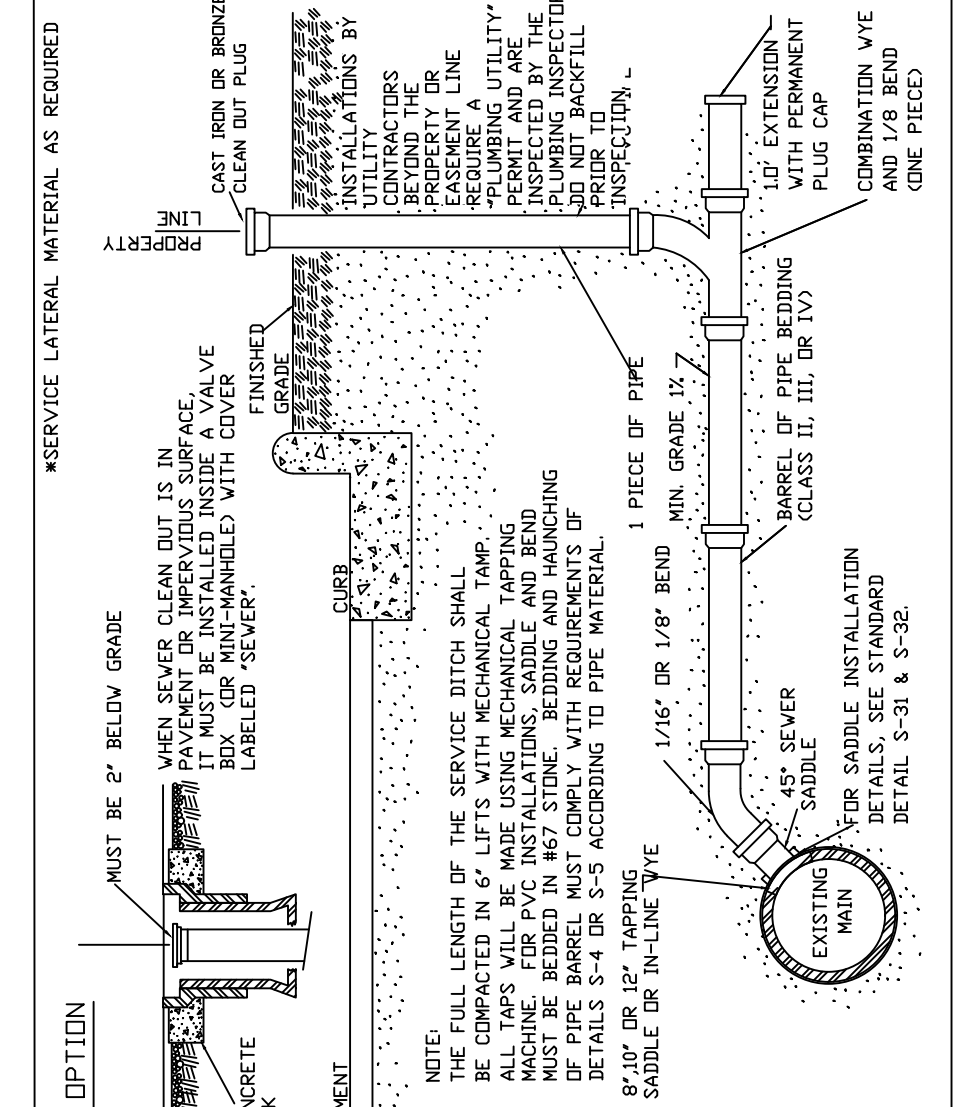
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-5	10 NOTES	7-2-02	RRH	3-30-00



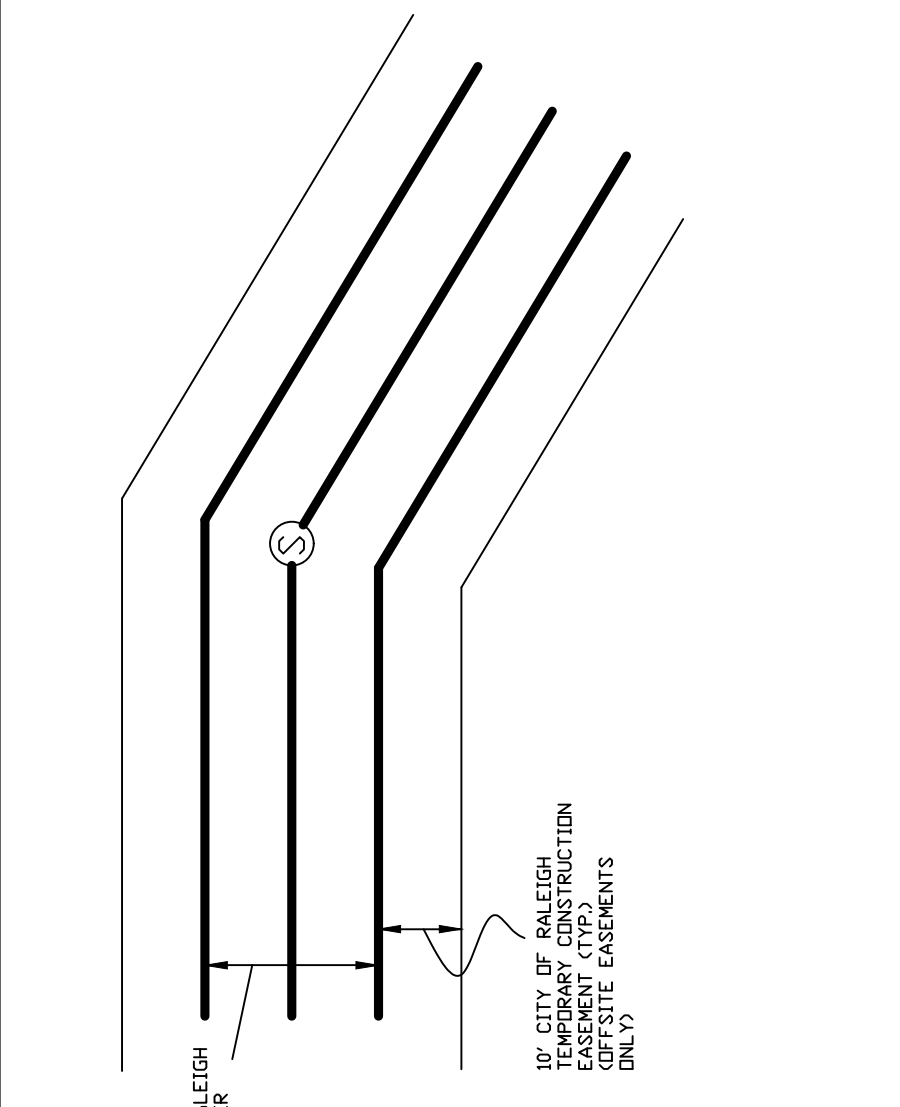
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
STANDARD MANHOLE COVER

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25	RRH	3-30-00	D.H.L.	6-18-08



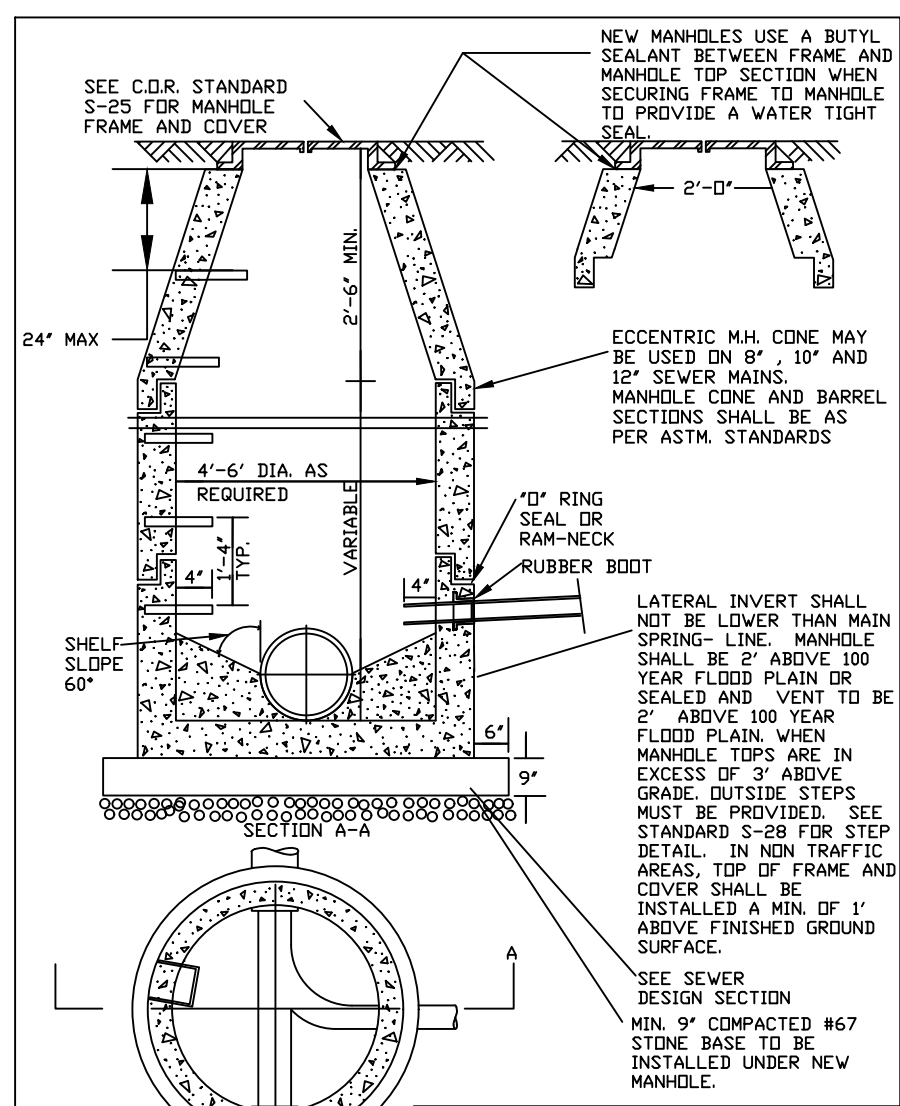
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
TYPICAL SANITARY SEWER LATERAL CONNECTION

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30	RRH	3-30-00	D.H.L.	6-18-08



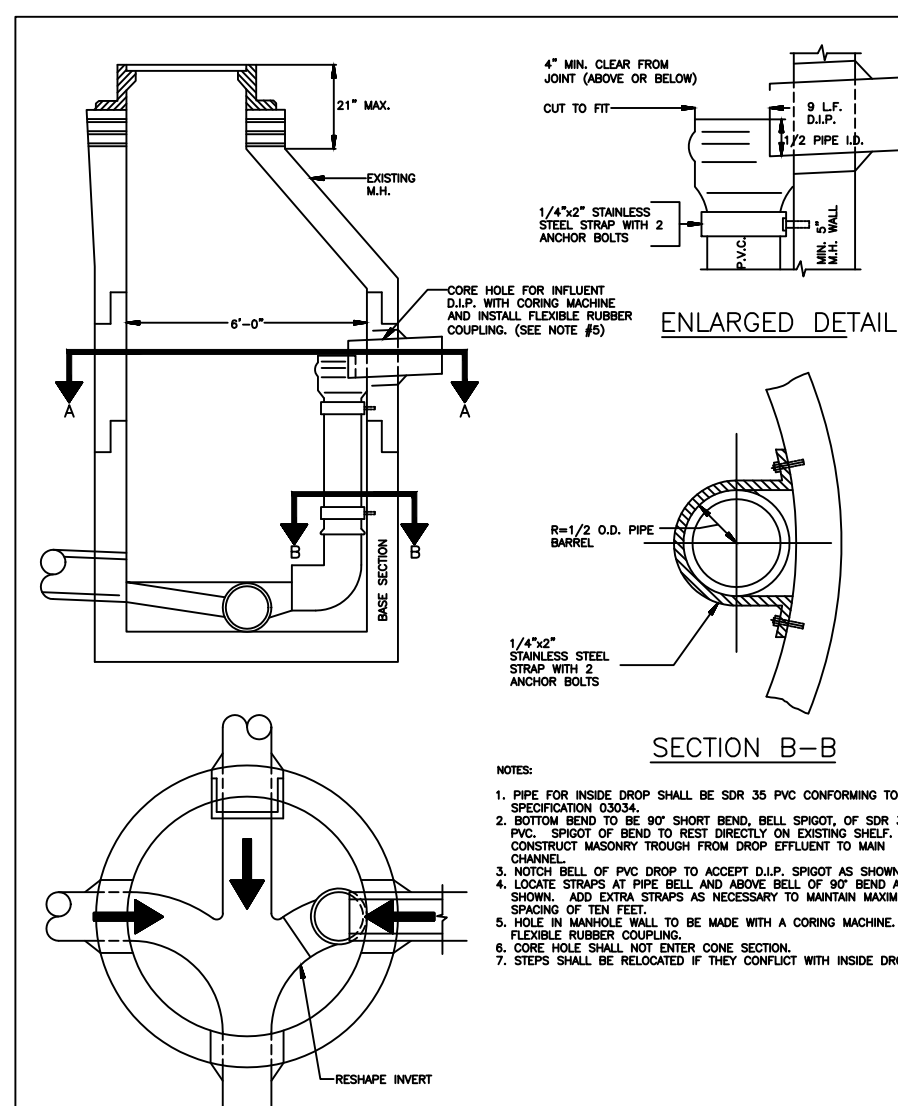
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
8" & 10" SANITARY SEWER EASEMENT WIDTHS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-43	D.H.L.	6-18-08		



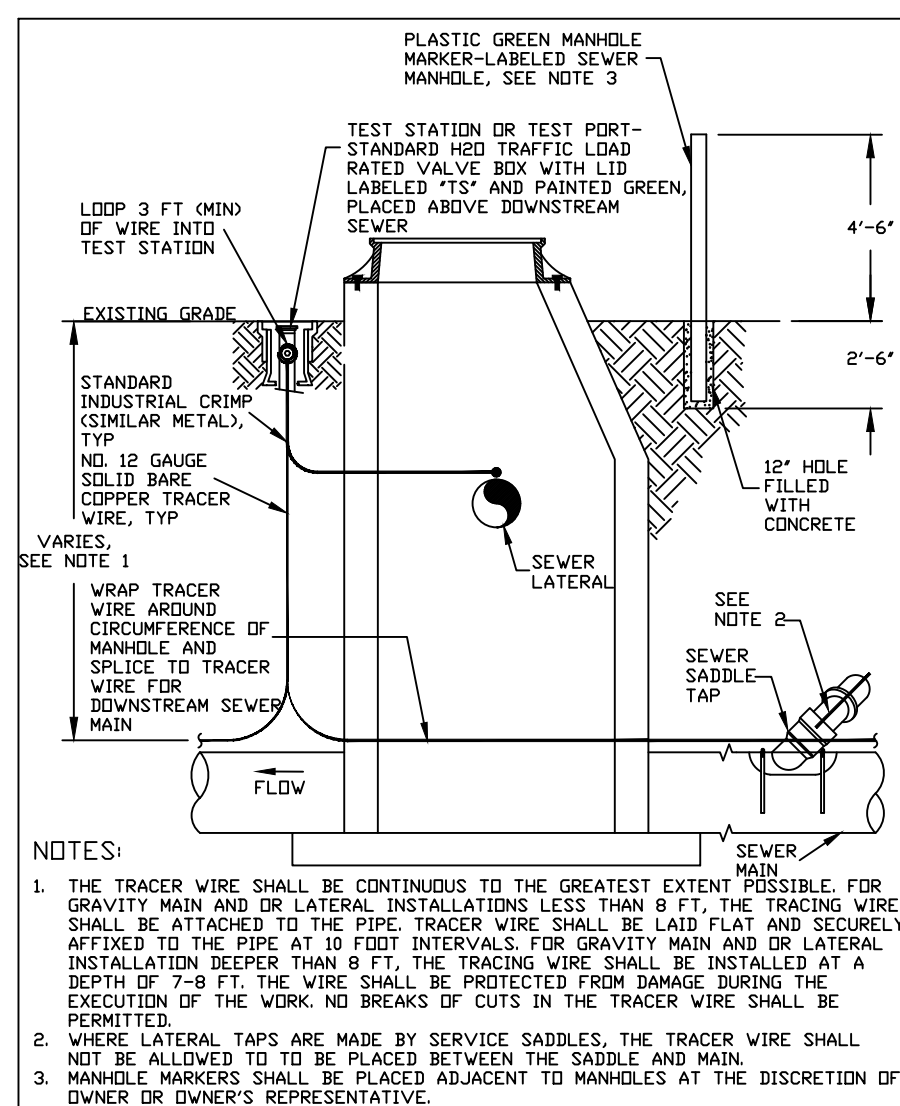
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
STANDARD PRECAST SANITARY SEWER MANHOLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20	RRH	3-30-00	D.H.L.	6-18-08



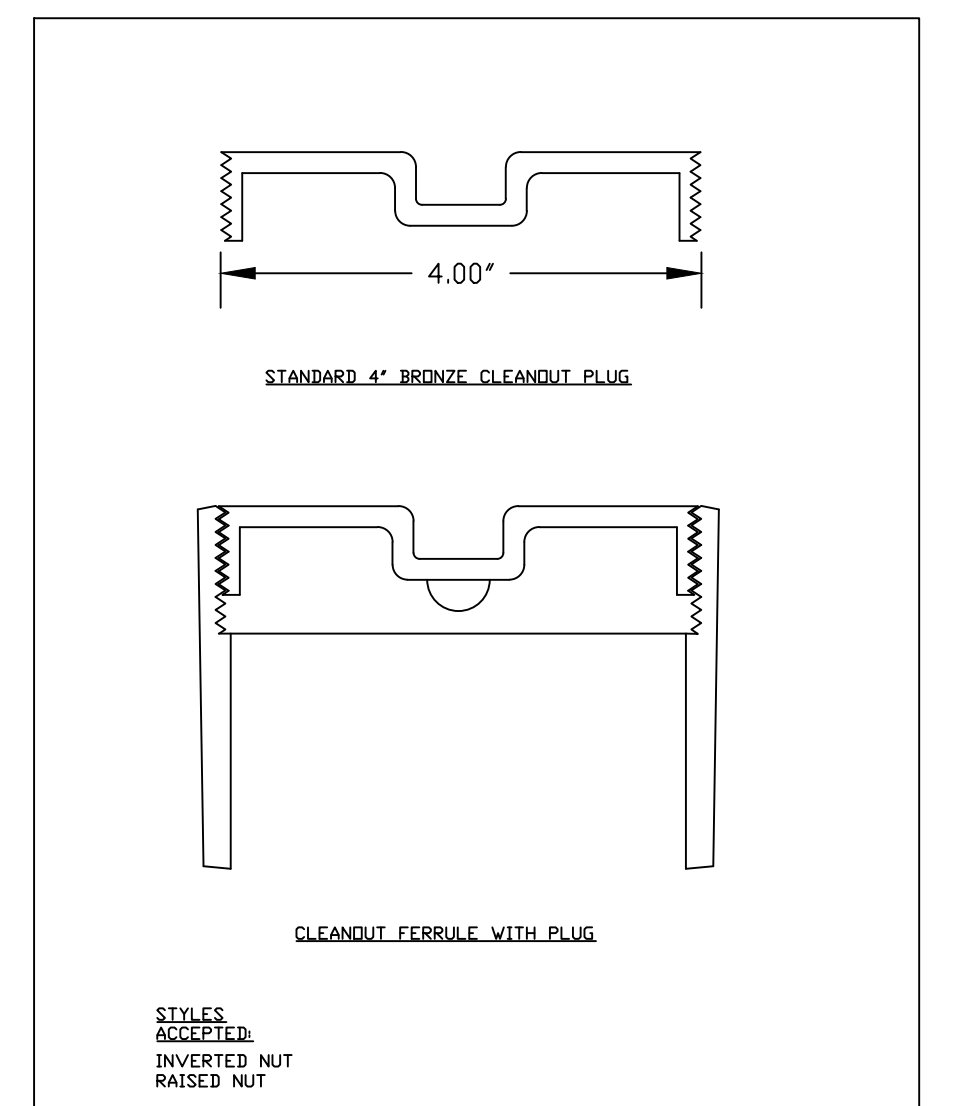
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
INSIDE DROP MANHOLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-23	RRH	3-30-00	D.H.L.	6-18-08



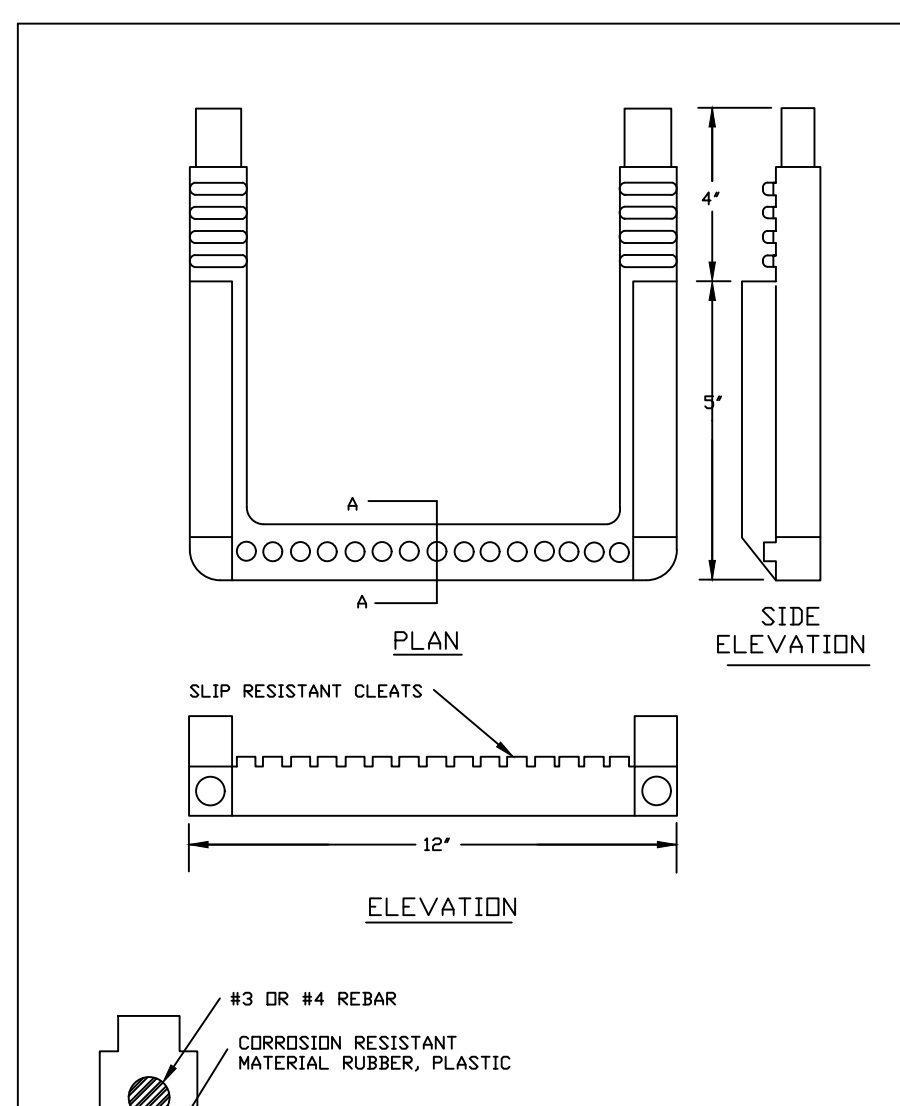
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20A	RRH	3-30-00	D.H.L.	6-18-08



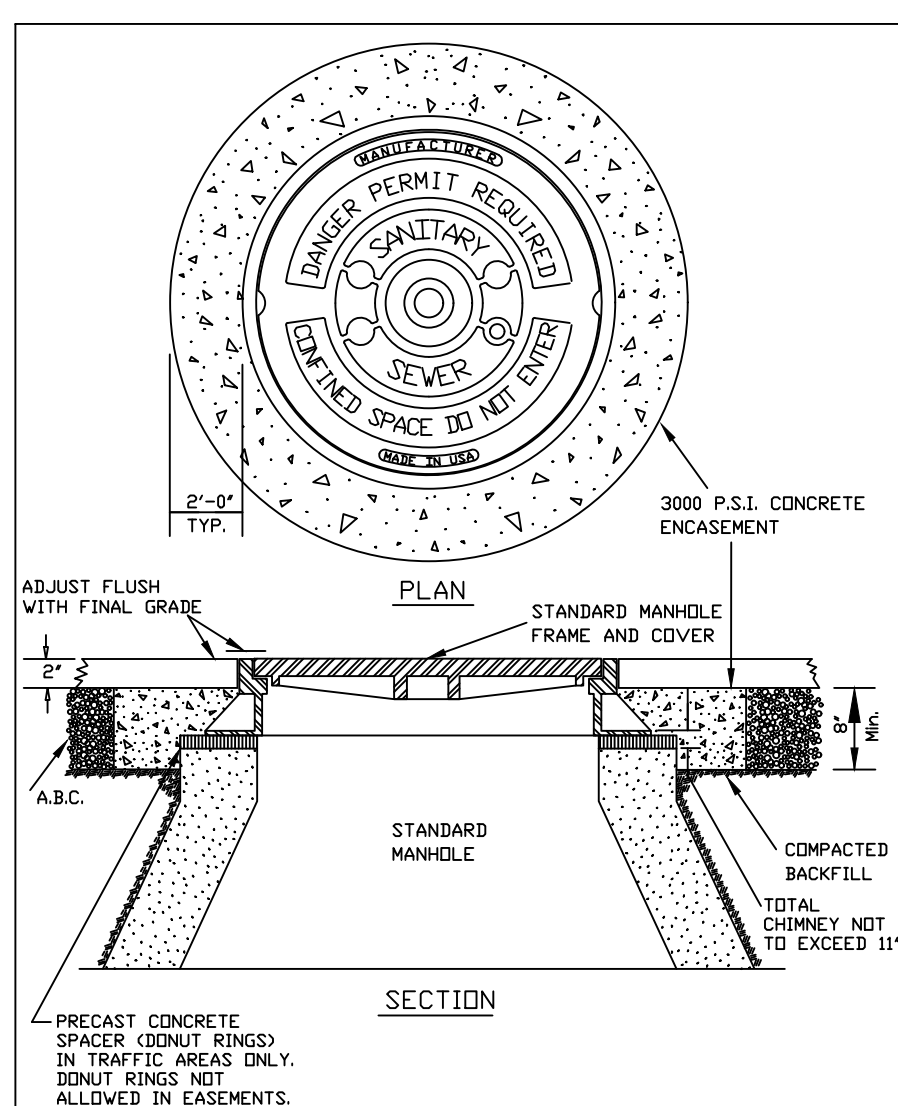
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
4" CLEANOUT PLUG

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-34	RRH	3-30-00	D.H.L.	6-18-08



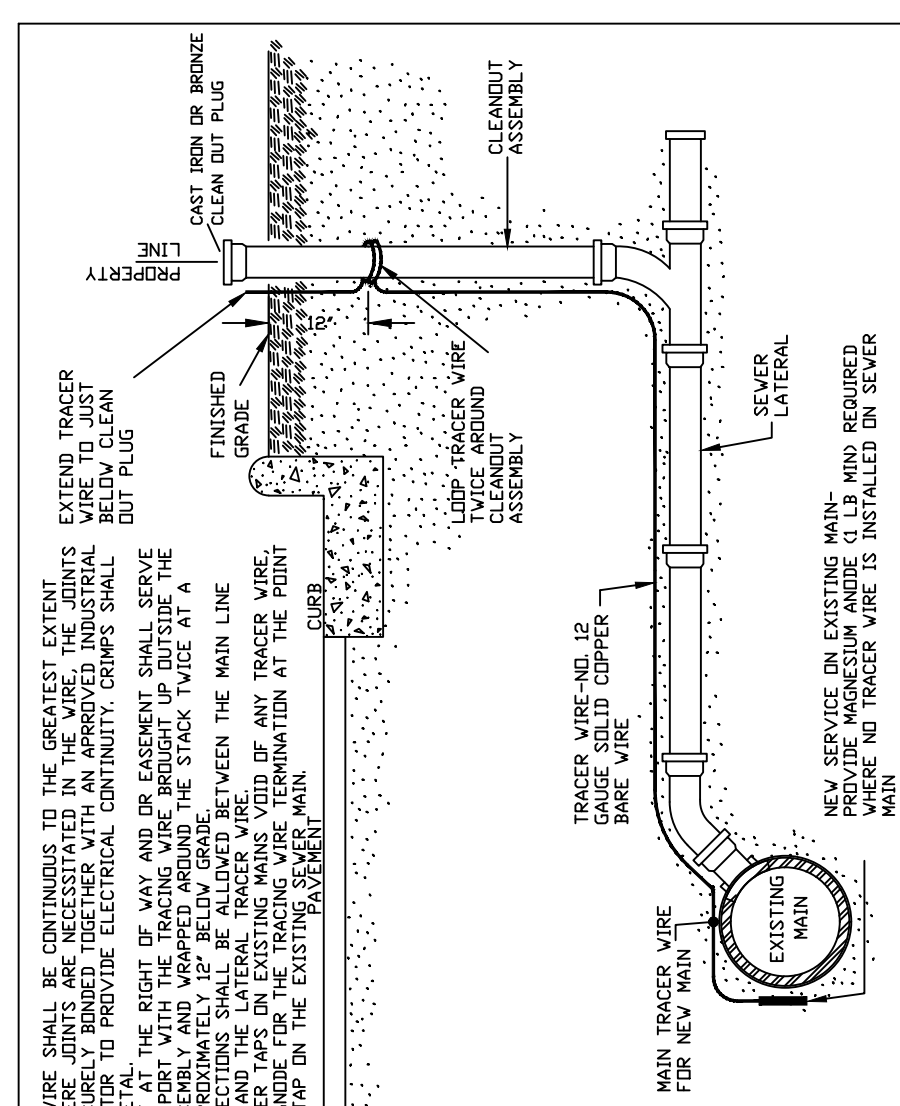
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
STANDARD SLIP RESISTANT MANHOLE STEP DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-28	RRH	3-30-00	D.H.L.	6-18-08



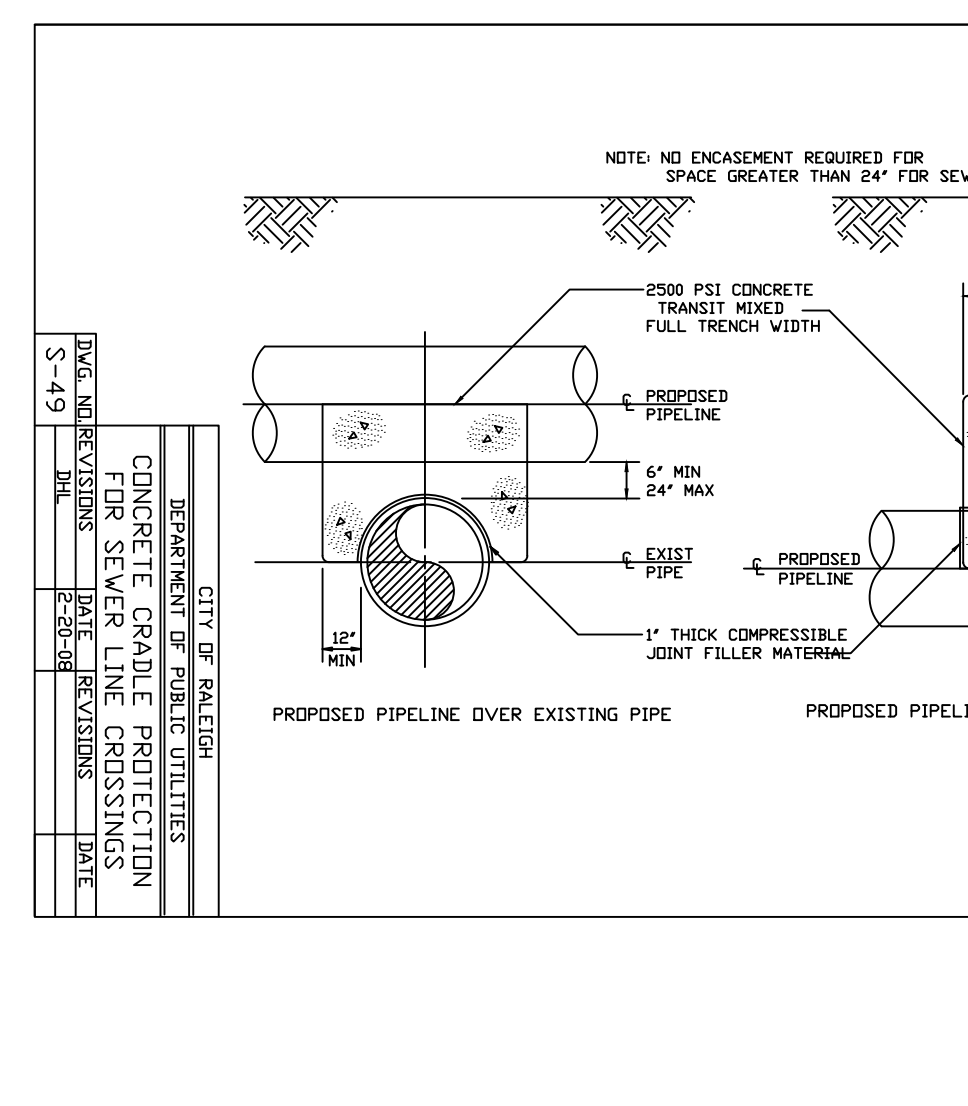
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-29	RRH	3-30-00	D.H.L.	6-18-08



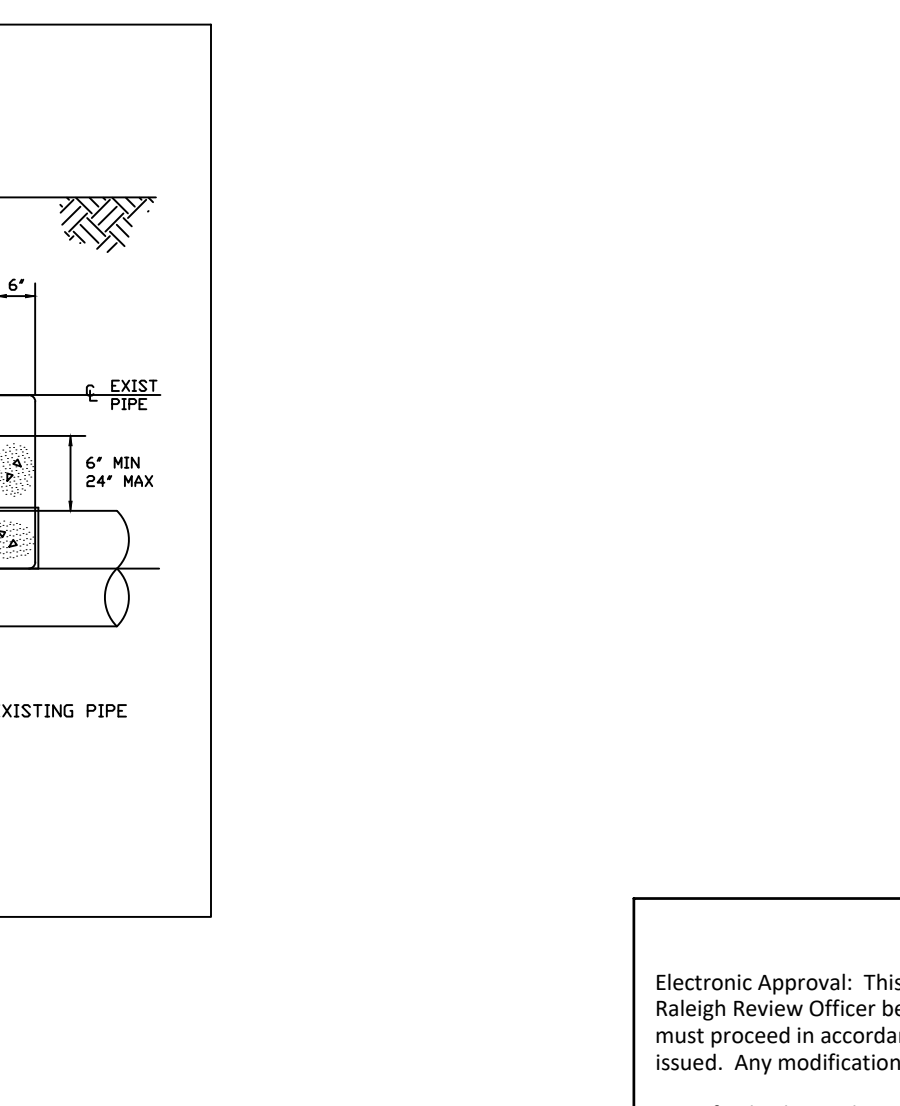
CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
TYPICAL SANITARY SEWER LATERAL TRACER WIRE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30A	RRH	3-30-00	D.H.L.	6-18-08



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-69	RRH	3-30-00	D.H.L.	6-18-08



CITY OF RALEIGH  
DEPARTMENT OF PUBLIC UTILITIES  
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-69	RRH	3-30-00	D.H.L.	6-18-08

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 - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer \_\_\_\_\_

**SITE PERMITTING APPROVAL**

**Water and Sewer Permits (if applicable)**

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # S-4727**

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 # W-3725**

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

City of Raleigh Public Utilities Department Permit # \_\_\_\_\_

**WithersRavenel**  
Engineers | Planners | Surveyors

115 Macklemin Drive | Cary, NC 27511 | P: 919-469-3300 | F: 919-469-3300 | www.withersravenel.com

**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**SEWER UTILITY DETAIL**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR

Professional Engineer  
SEAL 049345  
COLLEEN E. DURKIN  
11/24/2020

Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**10.3**



**NOTES:**

- A MINIMUM OF 24" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTED FILL MATERIAL. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 4" UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. CONNECTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPERS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
- ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF AT LEAST 90% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
- THE FINAL 24" 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: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS TRENCH FOR STORM DRAIN PIPES STD. NO. 5.02

**NOTES:**

- EITHER SOLID BRICK, SOLID BLOCK OR PRECAST CONCRETE MAY BE USED.
- PRECAST CONCRETE WALLS SHALL BE 6" THICK MINIMUM.
- ALL CONCRETE SHALL BE 3000 P.S.I. FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSIDE DIMENSIONS.
- FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSIDE DIMENSIONS.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD YARD INLET WITH CONCRETE SLAB STD. NO. 5.03

**NOTES:**

- EITHER SOLID BRICK, SOLID BLOCK, OR PRECAST CONCRETE MAY BE USED.
- PRECAST CONCRETE WALLS SHALL BE 6" THICK MINIMUM.
- ALL CONCRETE SHALL BE 3000 P.S.I. FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSIDE DIMENSIONS.
- FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSIDE DIMENSIONS.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD DROP INLET WITH GRATE AND FRAME STD. NO. 5.04

**NOTES:**

- MORTAR JOINTS SHALL BE 1/2" THICK. ALL CONCRETE SHALL BE 3000 P.S.I.
- BACK FACES SHALL BE FORMED PRIOR TO PLACING OF CONCRETE. USE TYPE "A" GRATE AT SAG POINTS, OTHERWISE USE TYPE "B" OR "C" FOR THE APPROPRIATE FLOW DIRECTION.
- MASONRY UNITS MAY BE JUMBO BRICK, CONCRETE BRICK OR SOLID CONCRETE BLOCK.
- ALL WALLS GREATER THAN 6" IN DEPTH SHALL BE CONSTRUCTED 12" THICK.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD CURB INLET STD. NO. 5.05

**NOTES:**

- ALL DIMENSIONS FOR WIND WALLS NOT LISTED IN HEADWALL DIMENSIONS SHALL BE IN ACCORDANCE WITH STANDARD SPEC. 310.
- DOUBLE PIPE HEADWALL IS 2'-0".

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD CURB INLET STD. NO. 5.05

**NOTES:**

- SET STANDARD DETAIL 5.09 FOR DIMENSIONS.
- PLACE 1 CUBIC FOOT OF WASHED STONE BEHIND EACH WEEP HOLE.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS STD. NO. 5.06

**NOTES:**

- SET STANDARD DETAIL 5.09 FOR DIMENSIONS.
- PLACE 1 CUBIC FOOT OF WASHED STONE BEHIND EACH WEEP HOLE.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS STD. NO. 5.06

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

TYPE	REINFORCEMENT	THICKNESS	HEIGHT	WIDTH	DEPTH	AREA	PERCENT	MIN. AREA	MAX. AREA	MIN. PERCENT	MAX. PERCENT
A	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
B	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
C	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
D	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
E	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
F	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
G	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
H	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
I	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
J	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
K	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
L	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
M	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
N	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
O	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
P	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Q	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
R	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
S	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
T	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
U	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
V	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
W	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
X	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Y	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Z	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS DIMENSIONS FOR HEADWALL WITH WINGWALLS STD. NO. 5.09

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

TYPE	REINFORCEMENT	THICKNESS	HEIGHT	WIDTH	DEPTH	AREA	PERCENT	MIN. AREA	MAX. AREA	MIN. PERCENT	MAX. PERCENT
A	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
B	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
C	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
D	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
E	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
F	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
G	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
H	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
I	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
J	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
K	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
L	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
M	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
N	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
O	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
P	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Q	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
R	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
S	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
T	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
U	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
V	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
W	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
X	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Y	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00
Z	1	12"	12"	12"	12"	144	1.00	144	144	1.00	1.00

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 TOWN OF KNIGHTDALE STANDARD DETAILS DIMENSIONS FOR HEADWALL WITH WINGWALLS STD. NO. 5.09

**GENERAL NOTES:**

- CHAMFER ALL EXPOSED CORNERS 1".
- USE CLASS "B" CONCRETE THROUGHOUT.
- OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR JOINTS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- USE FORMS TO CONSTRUCT THE BOTTOM SLAB.
- IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.00.
- PROVIDE ALL JUNCTION BOXES OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTERS IN ACCORDANCE WITH STD. NO. 840.00.
- ADJUST THE STEEL, CONCRETE AND BRICK MASONRY QUANTITIES TO INCLUDE THE ADDITION OF THE MANHOLE (I.E. DIAGONAL BARS SHORTENED AROUND OPENING IN TOP SLAB, ADDITIONAL VARIABLE HEIGHT BRICK MASONRY, OPENING IN TOP SLAB.)
- MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12 FEET.

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.  
 ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE  
 SHEET 1 OF 310.31

**NOTES:**

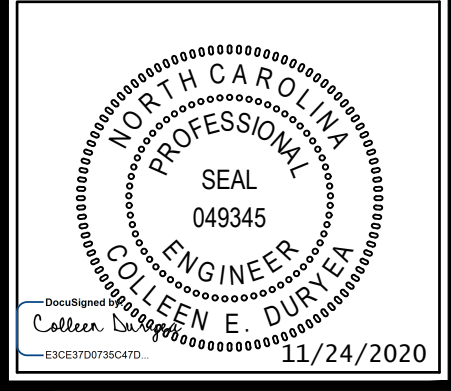
- CONSTRUCT PIPE END SECTION USING #4 REBAR SPACED 9" EACH WAY AND MEET ALL REQUIREMENTS OF STD. SPEC. 310.
- CHAMFER ALL EXPOSED CORNERS 3/4".

DATE: \_\_\_\_\_ REVISIONS: \_\_\_\_\_  
 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.  
 ROADWAY STANDARD DRAWING FOR PARALLEL PIPE END SECTION PRECAST CONCRETE SECTION FOR 15" TO 24" PIPE  
 SHEET 1 OF 310.02

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

D	L	W	T <sub>s</sub>	T <sub>b</sub>	T <sub>e</sub>	A	B
15"	7'-6"	19"	4"	4"	6"	173 3/8"	20 7/8"
18"	9'-0"	23"	4"	4"	6"	211 1/4"	25"
24"	12'-6"	30"	4"	4"	6"	277 7/8"	32"

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



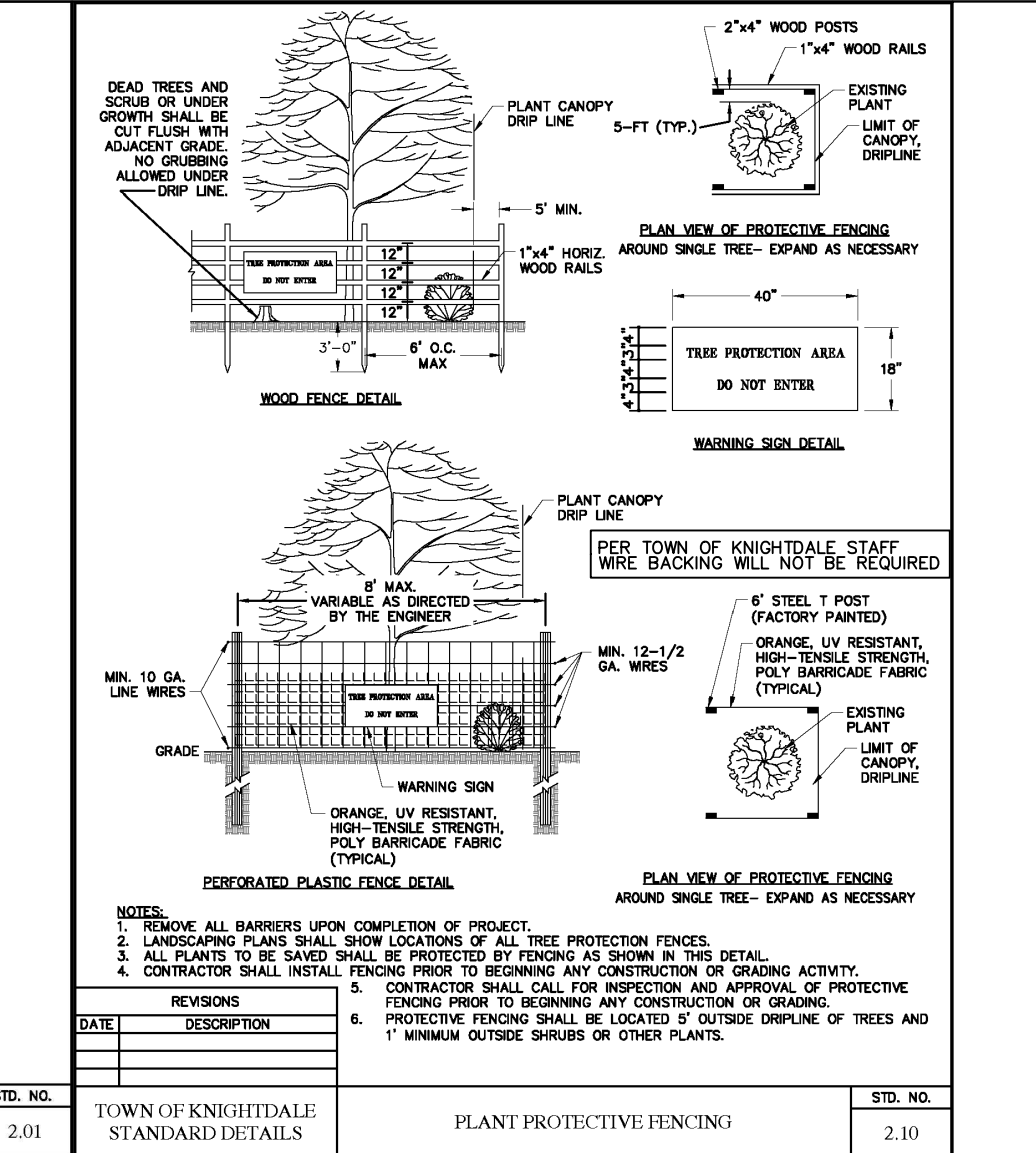
Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

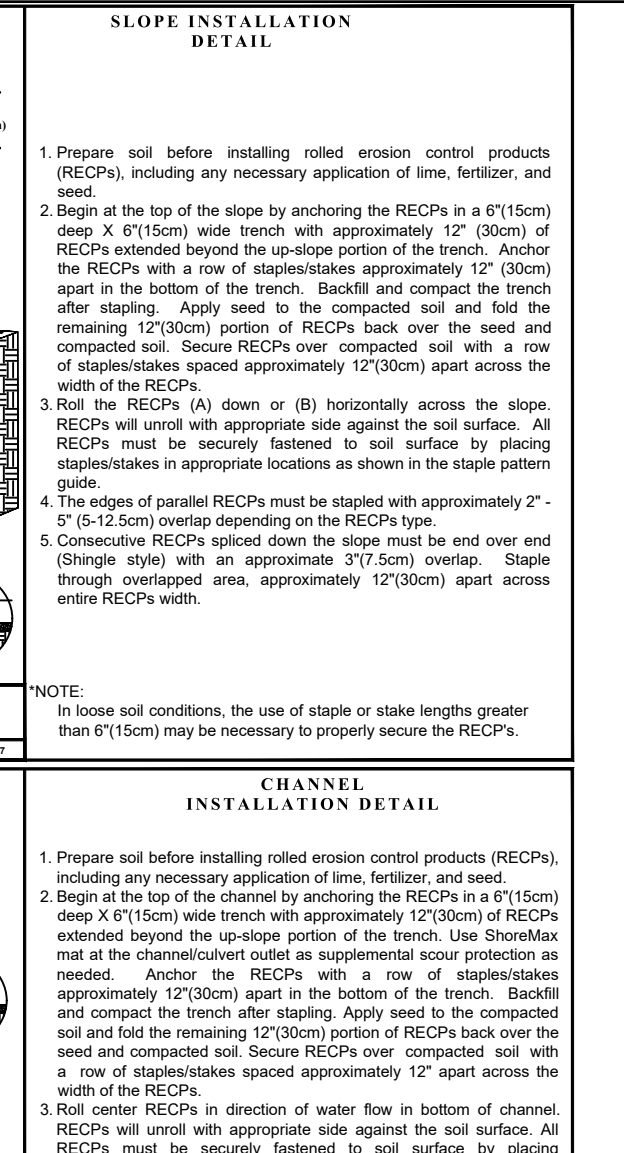
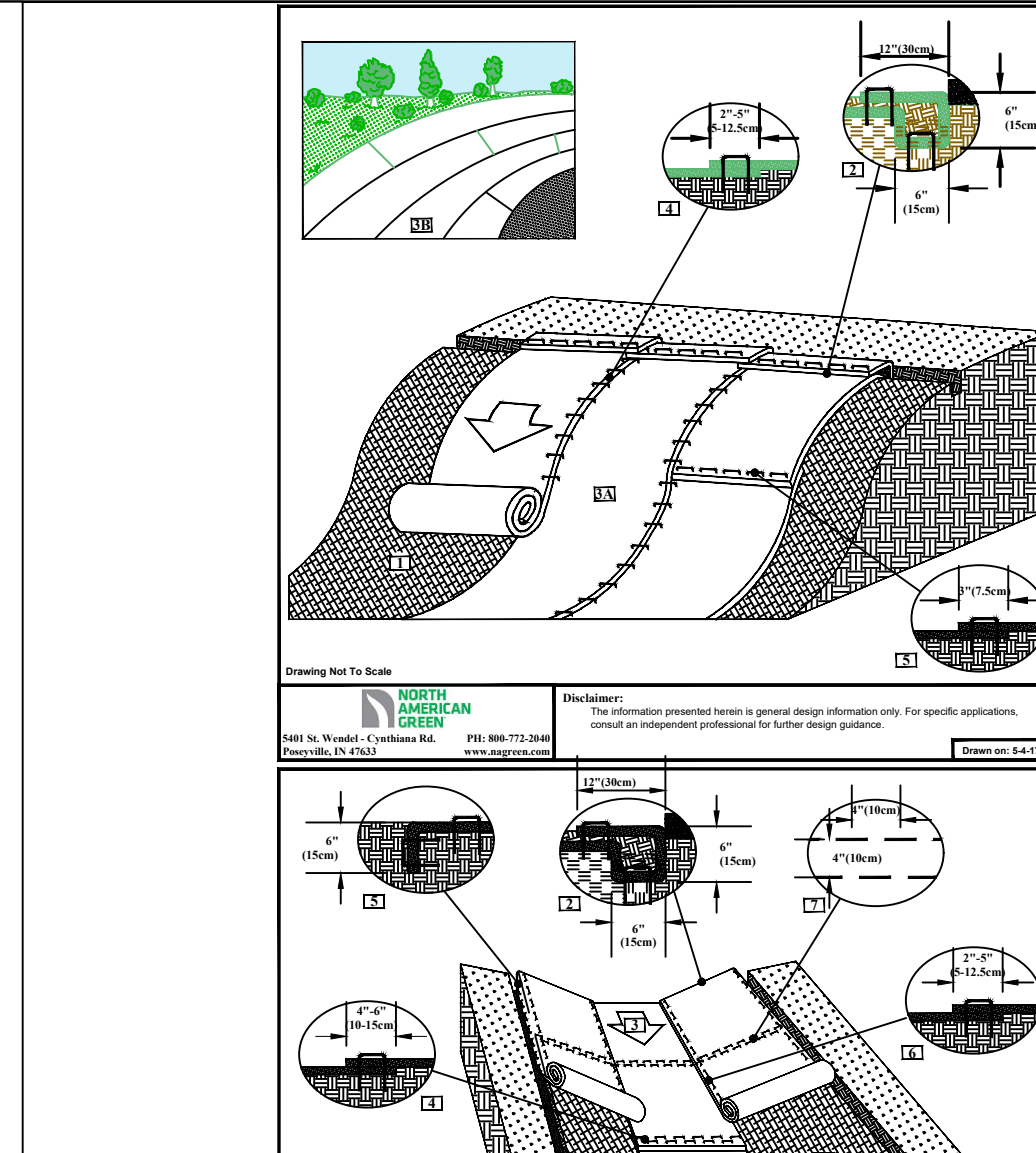
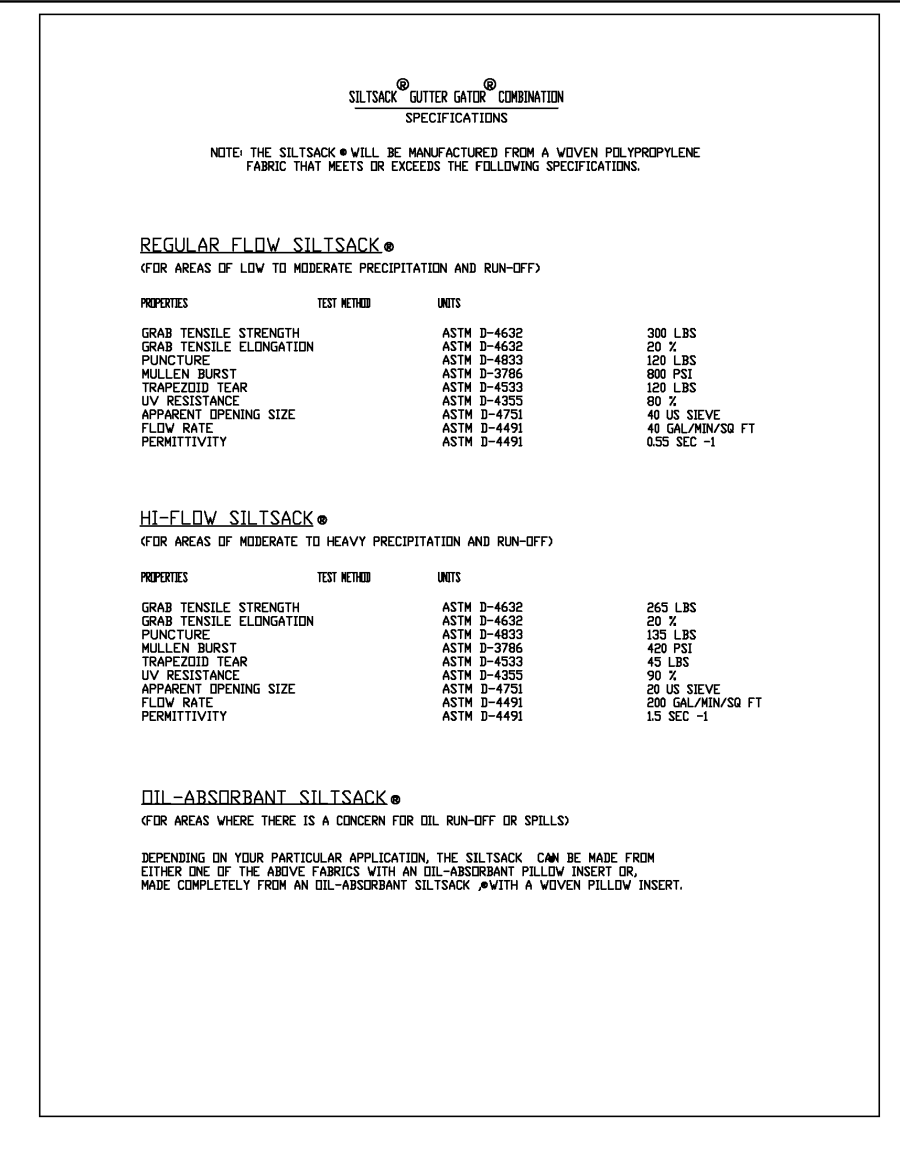
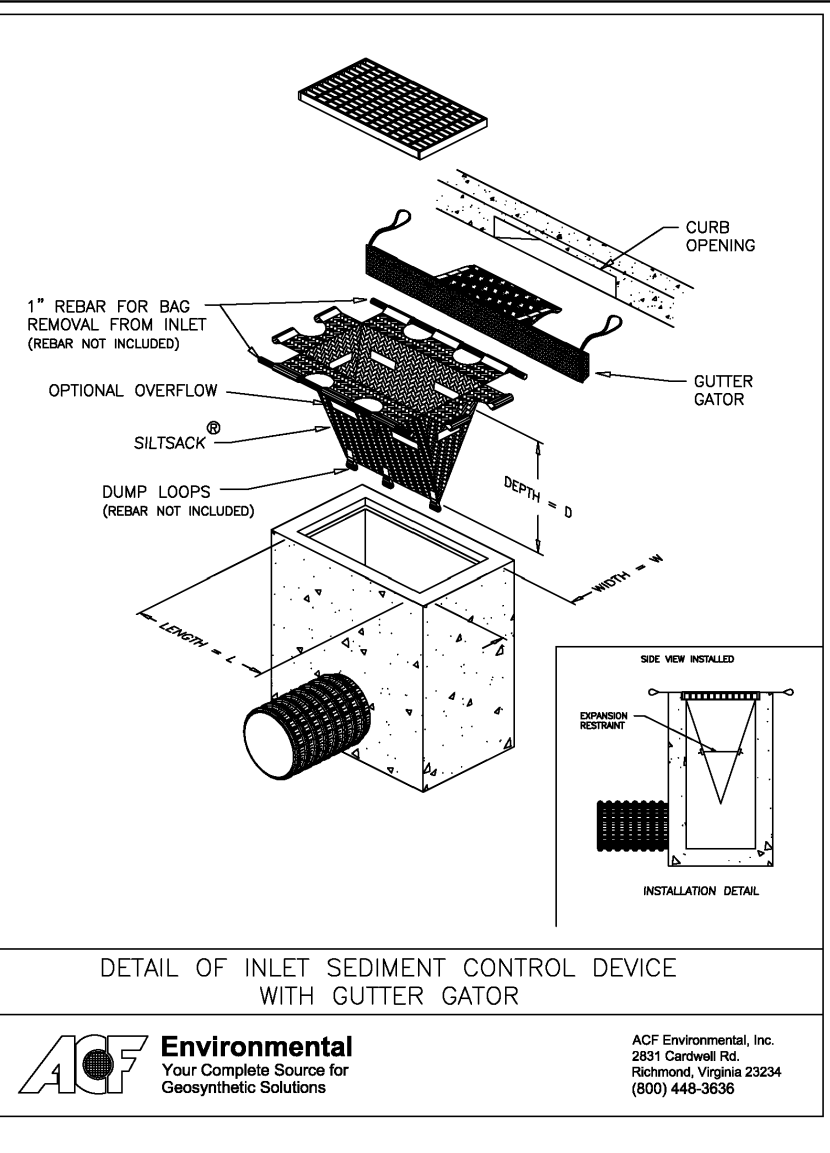
Sheet No. 10.4



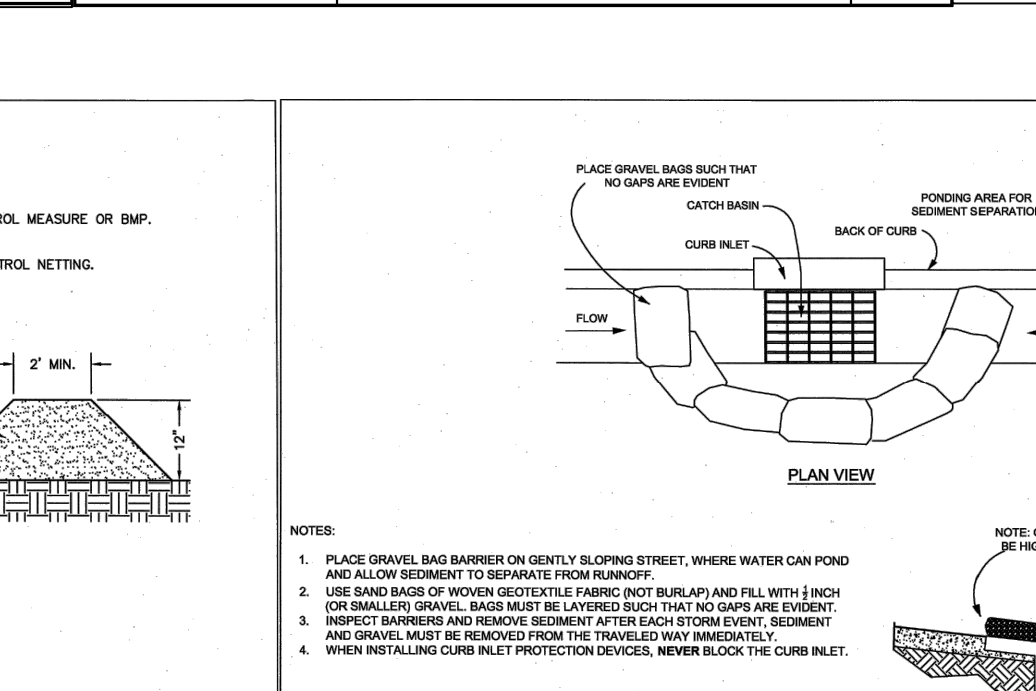
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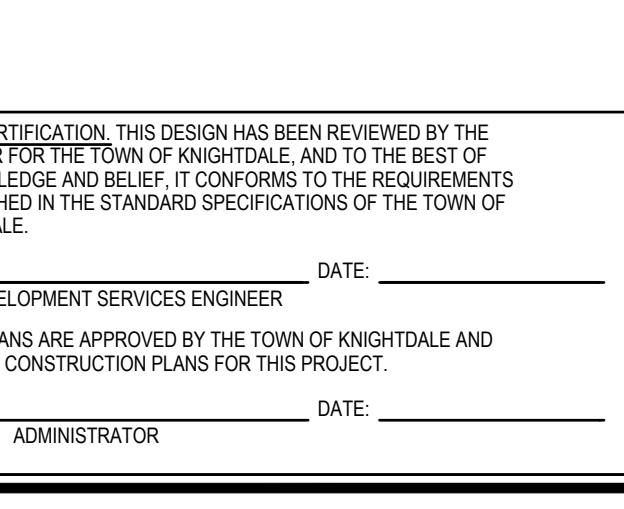
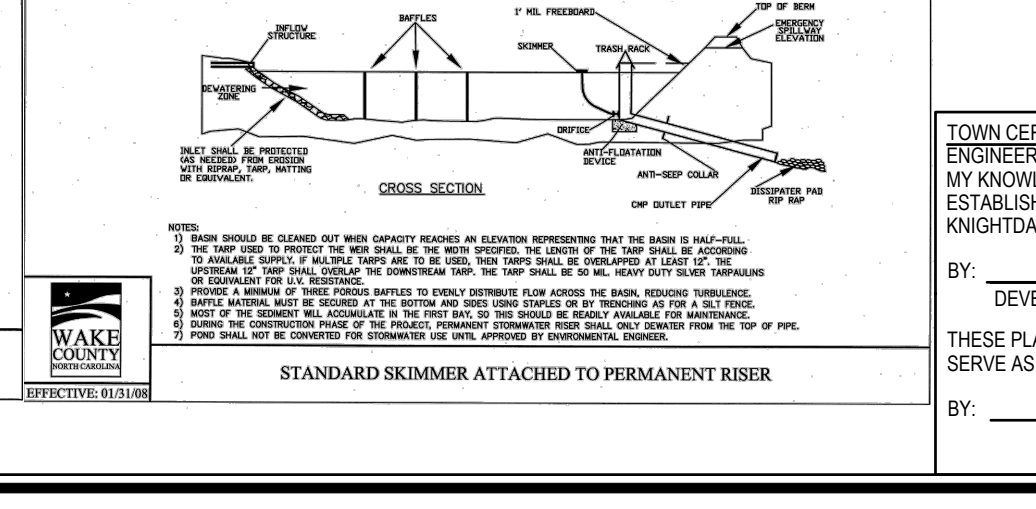
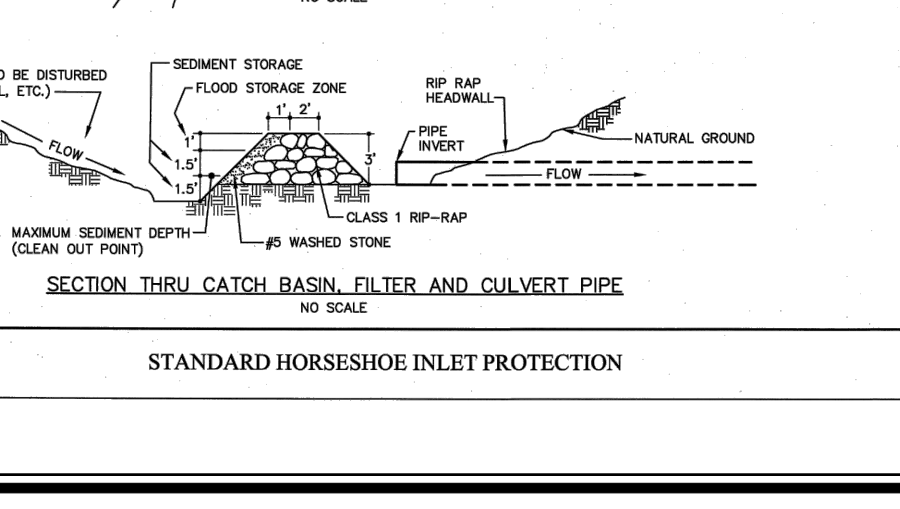
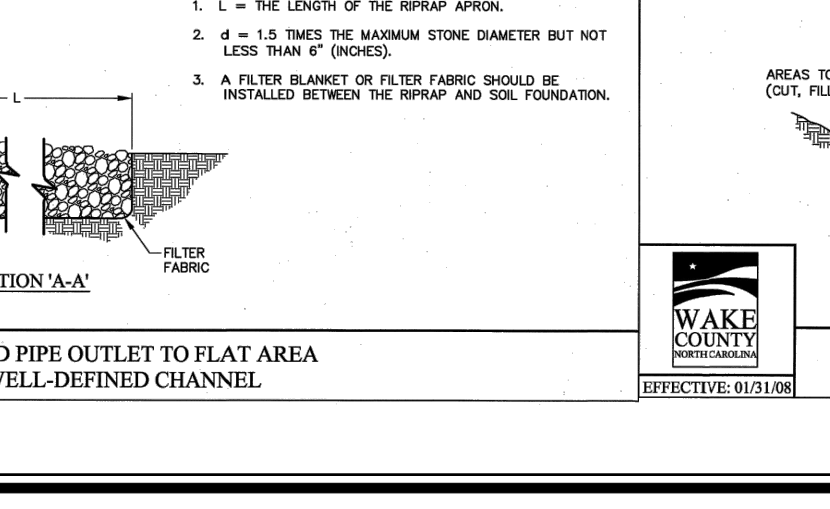
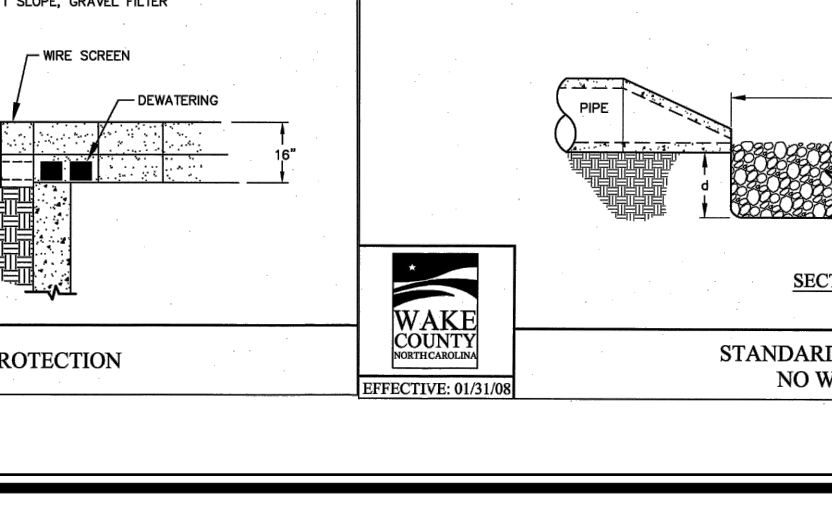
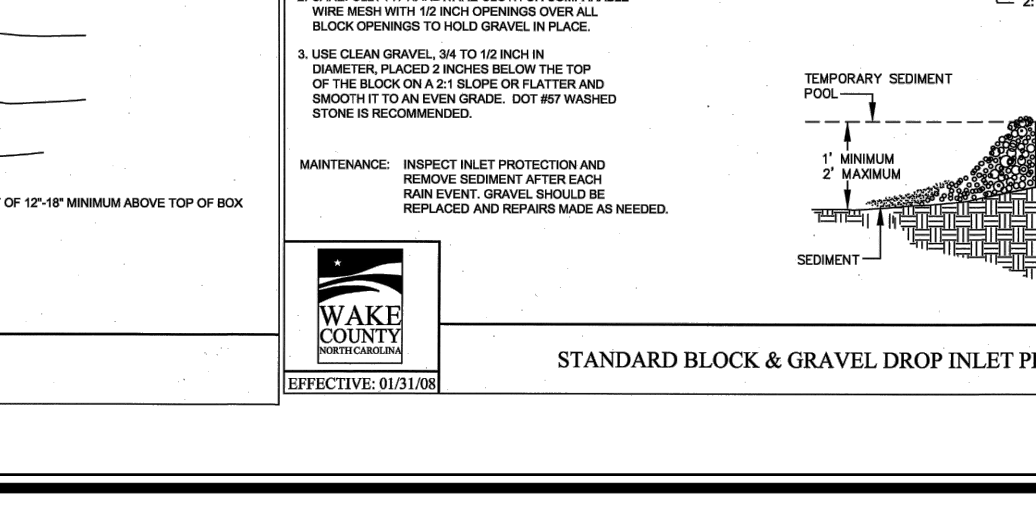
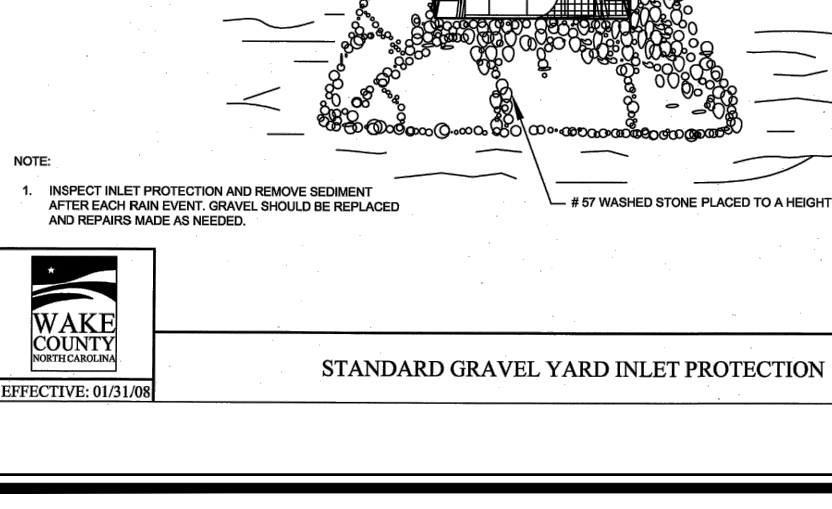
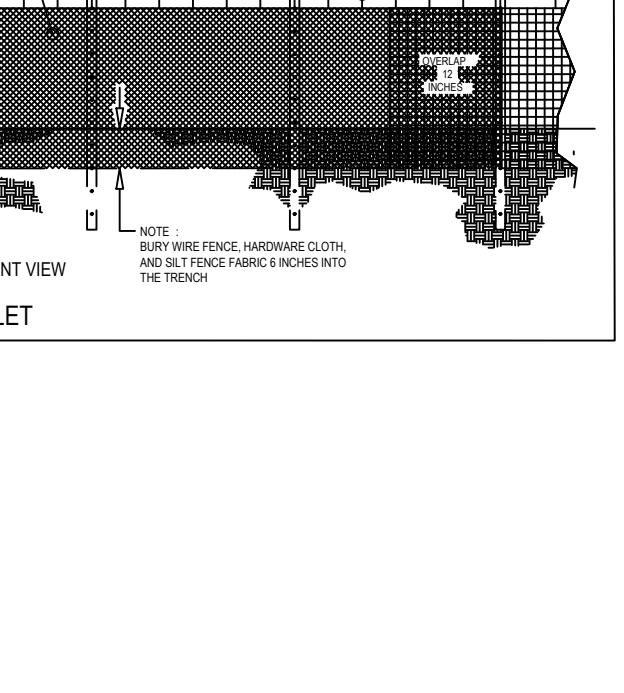
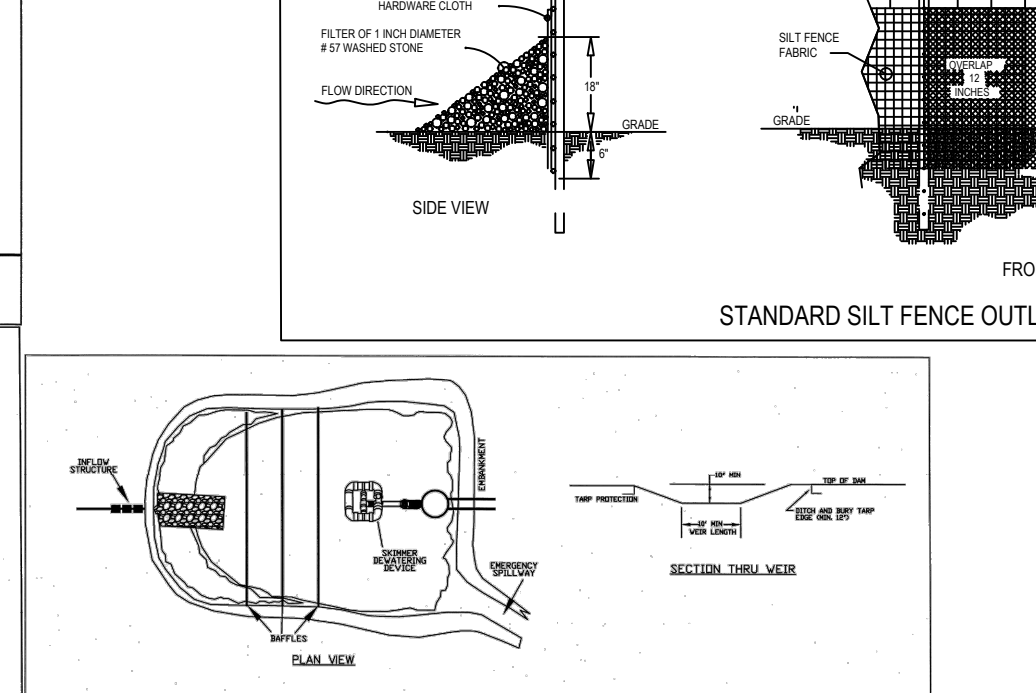
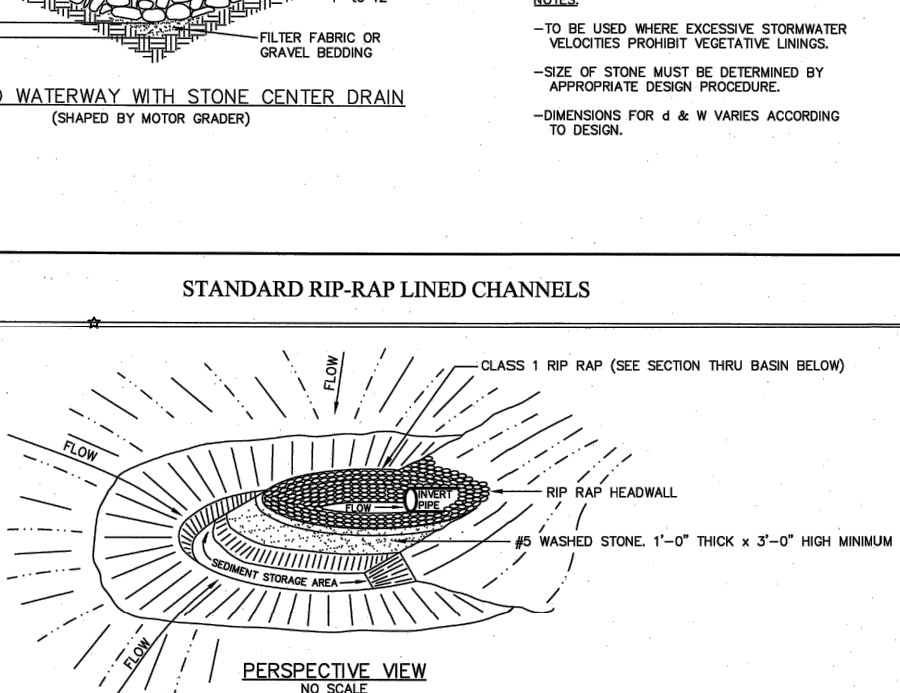
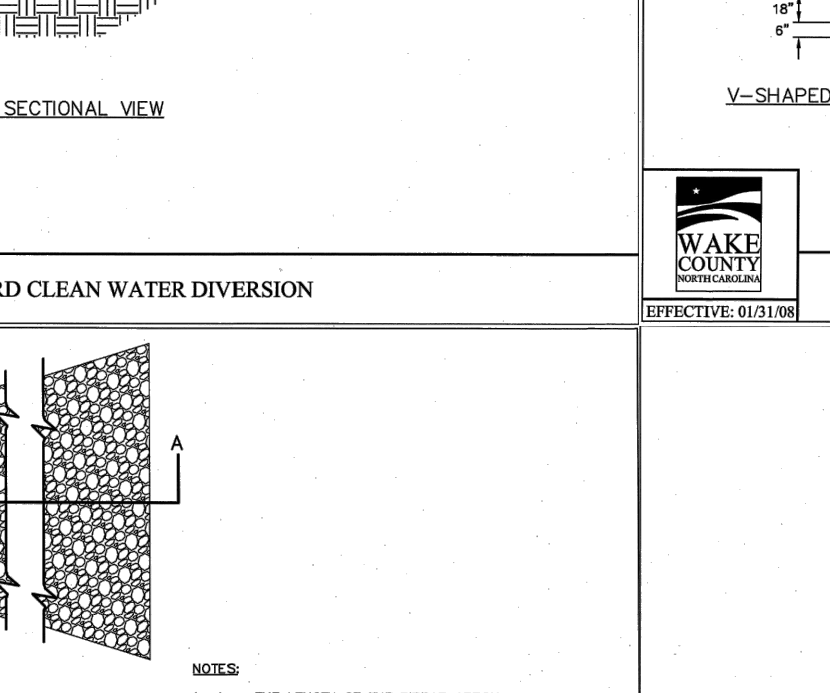
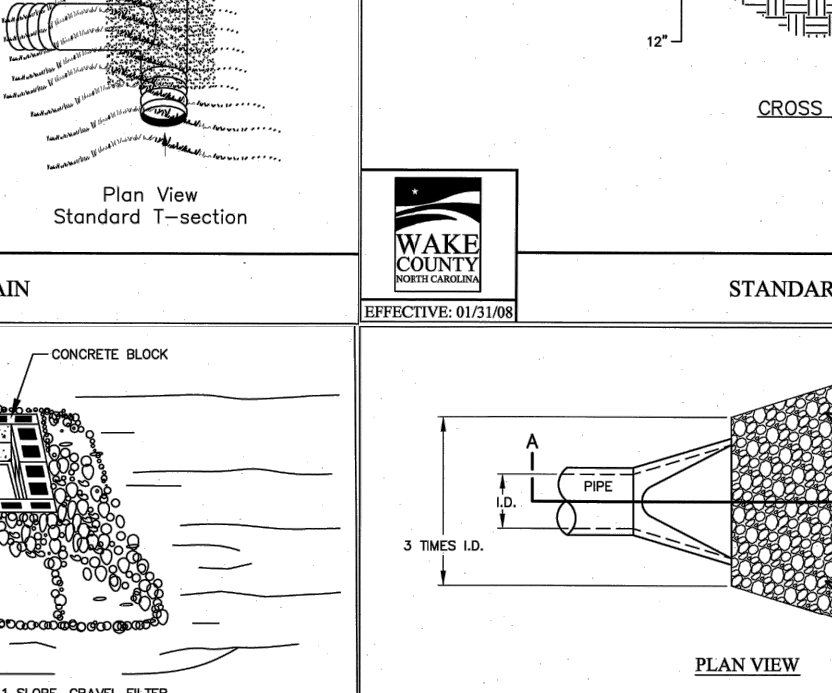
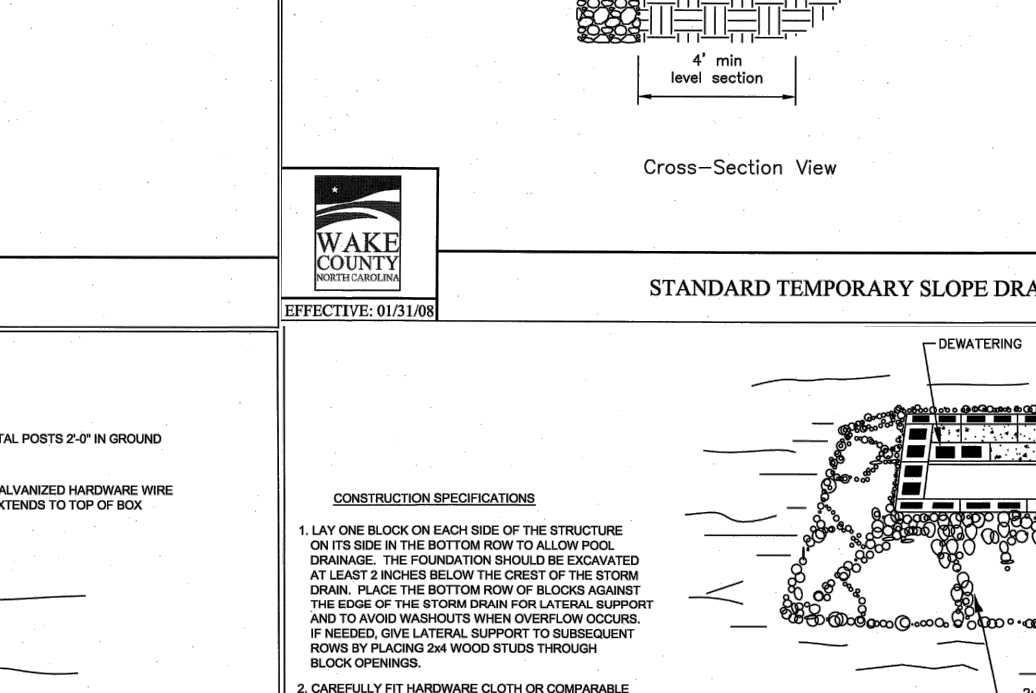
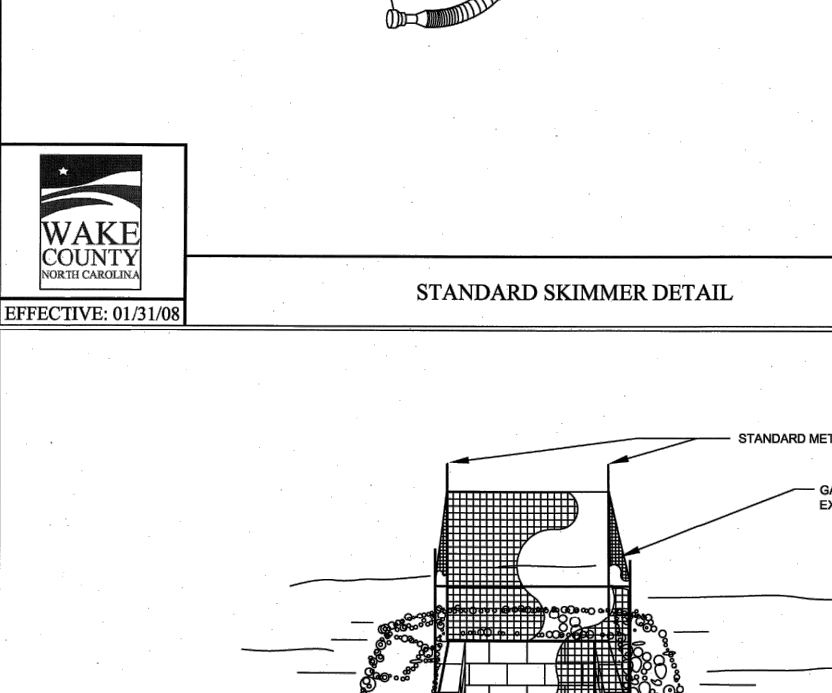
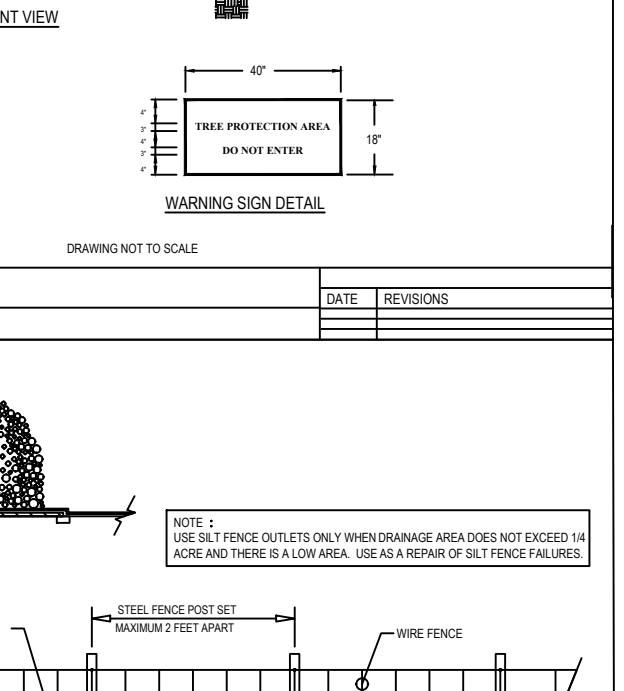
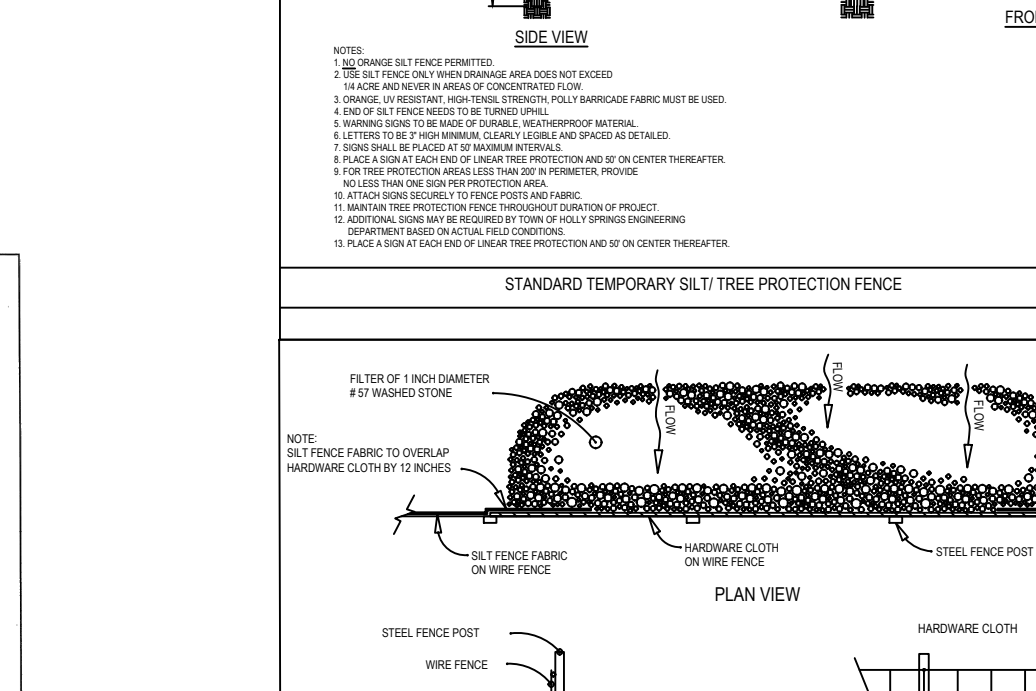
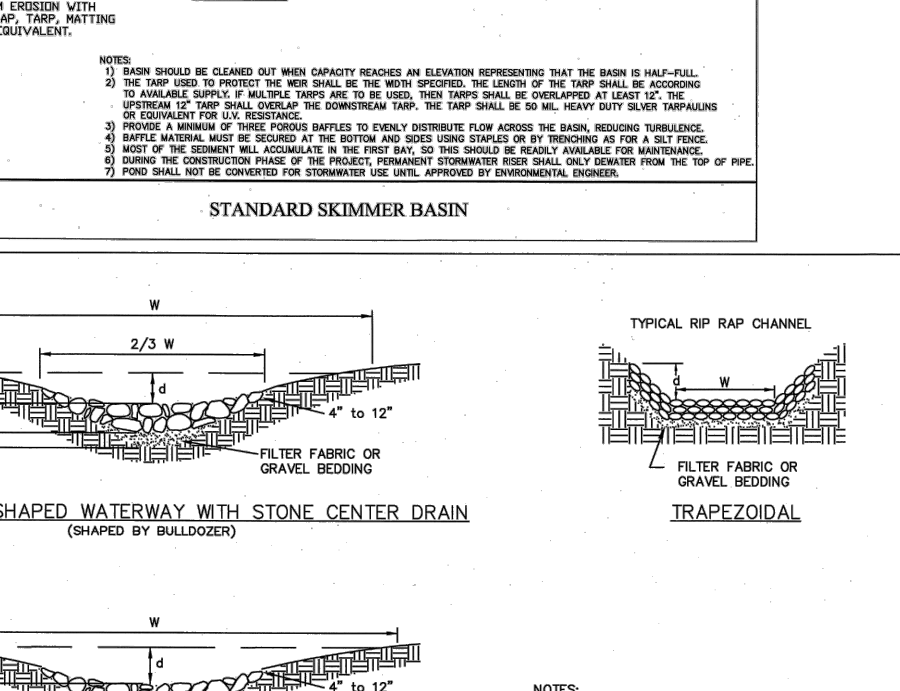
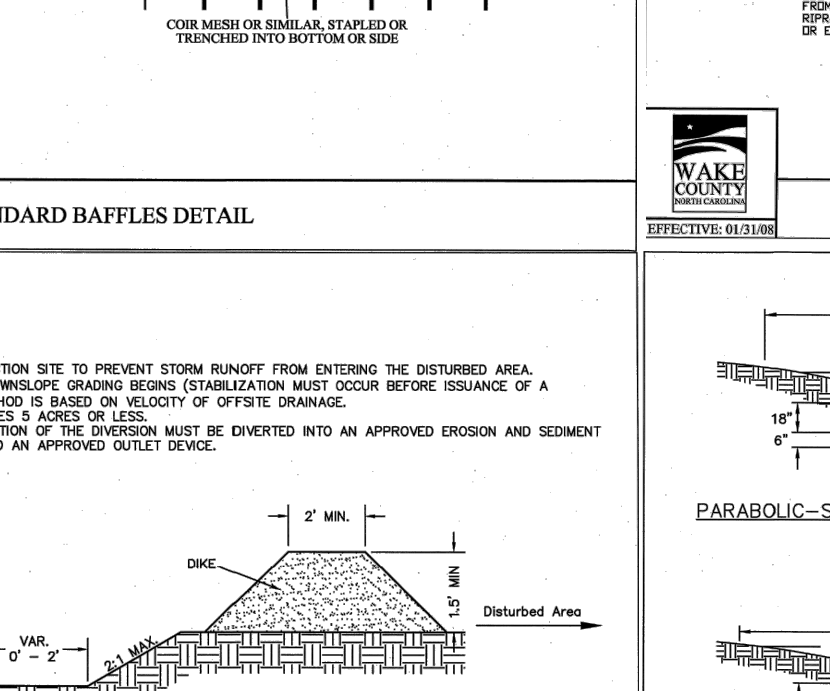
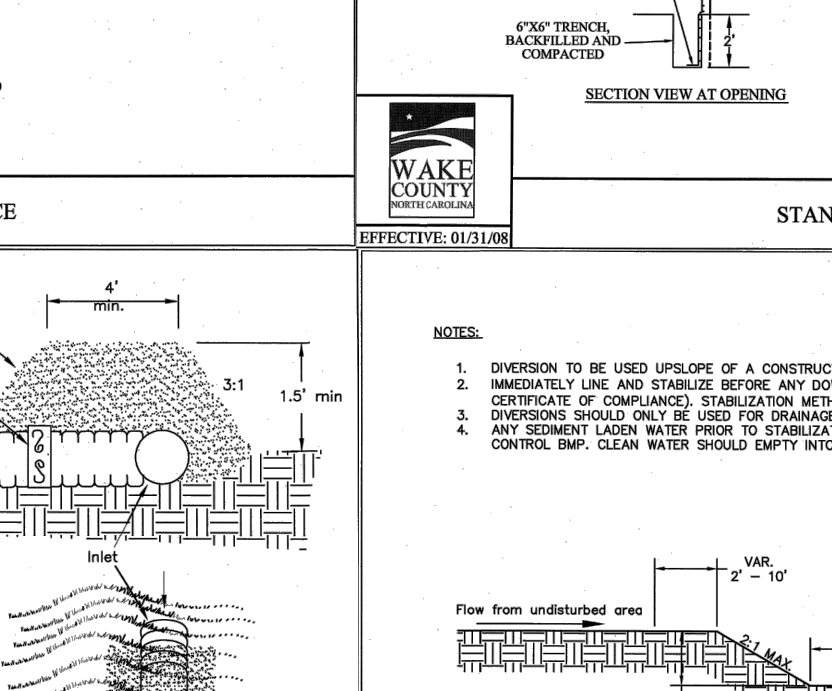
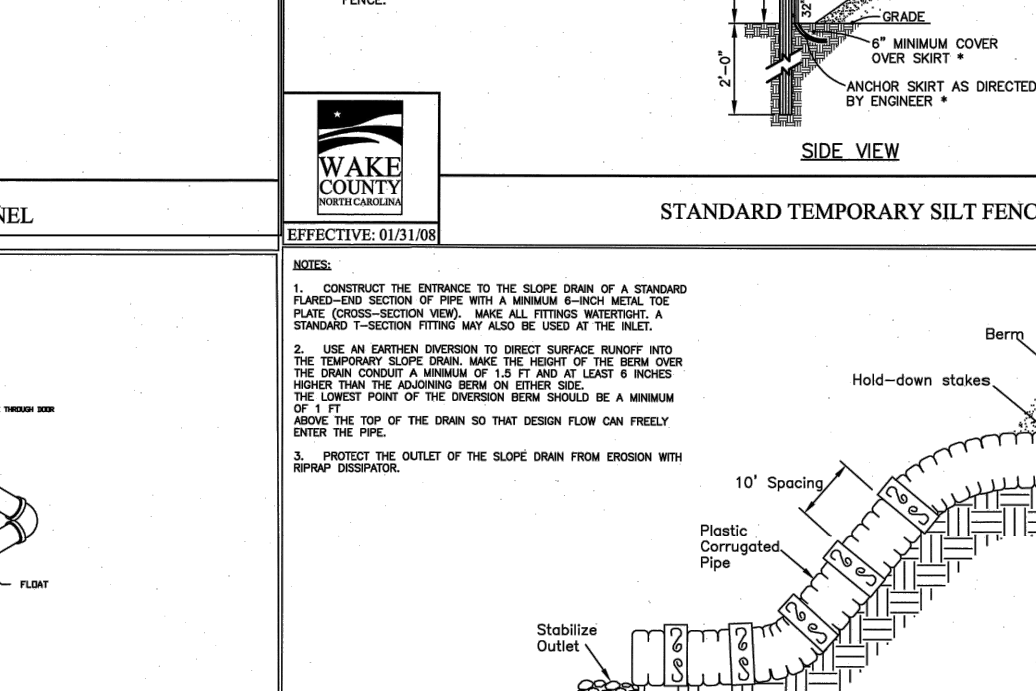
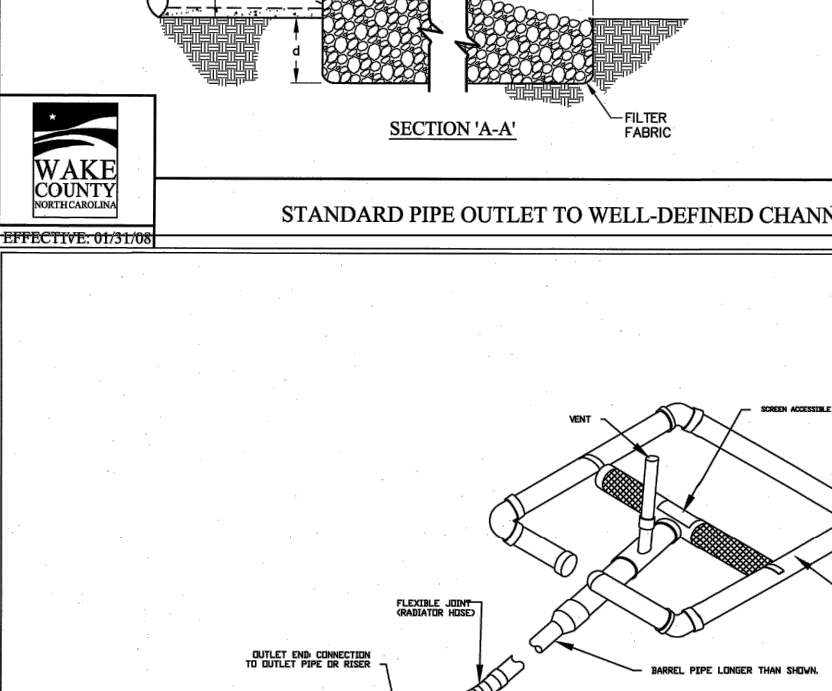
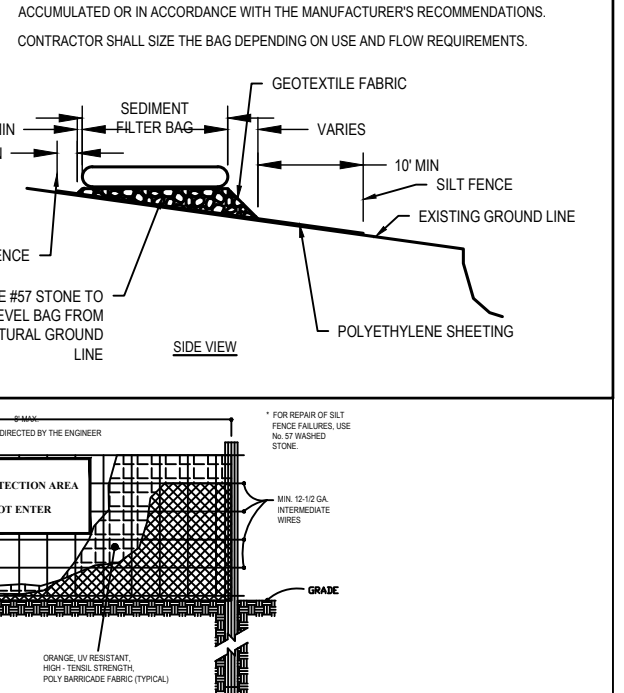
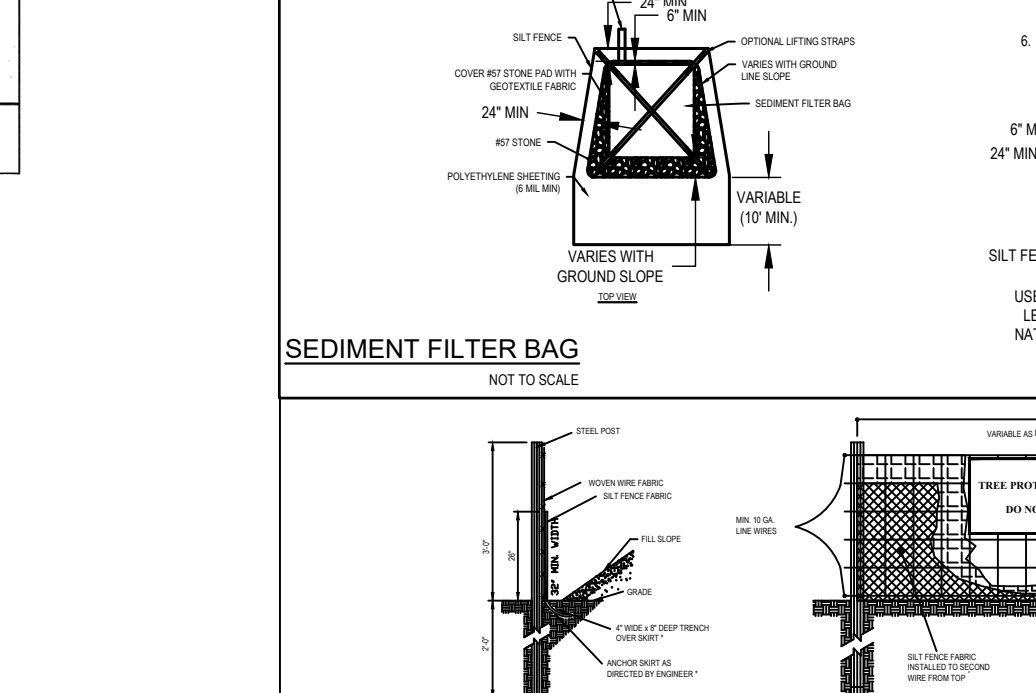
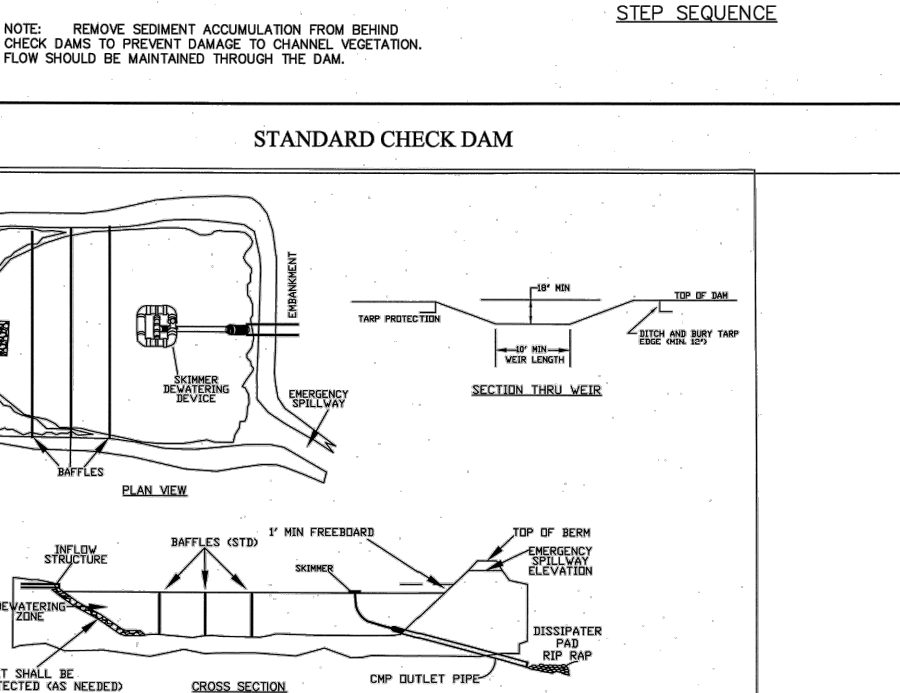
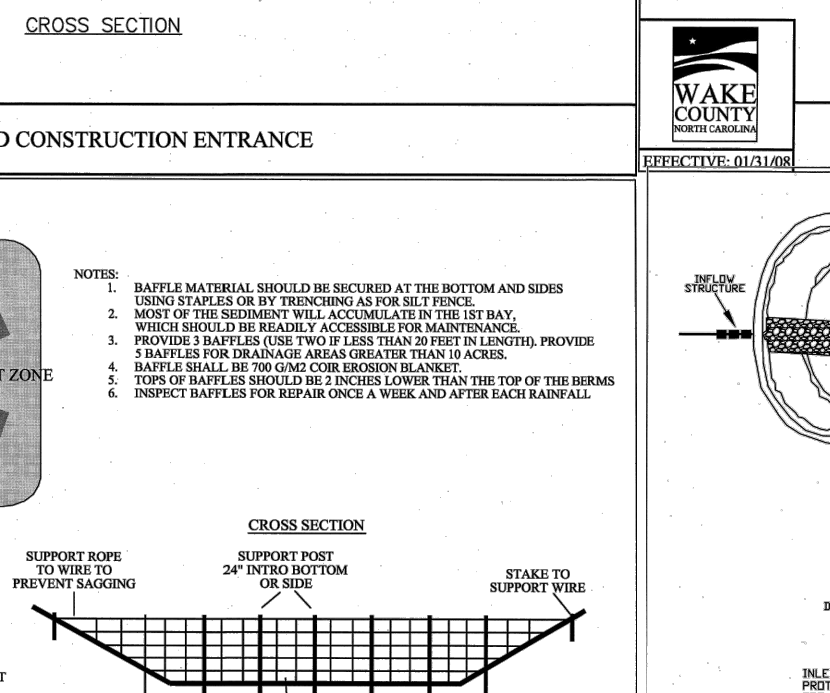
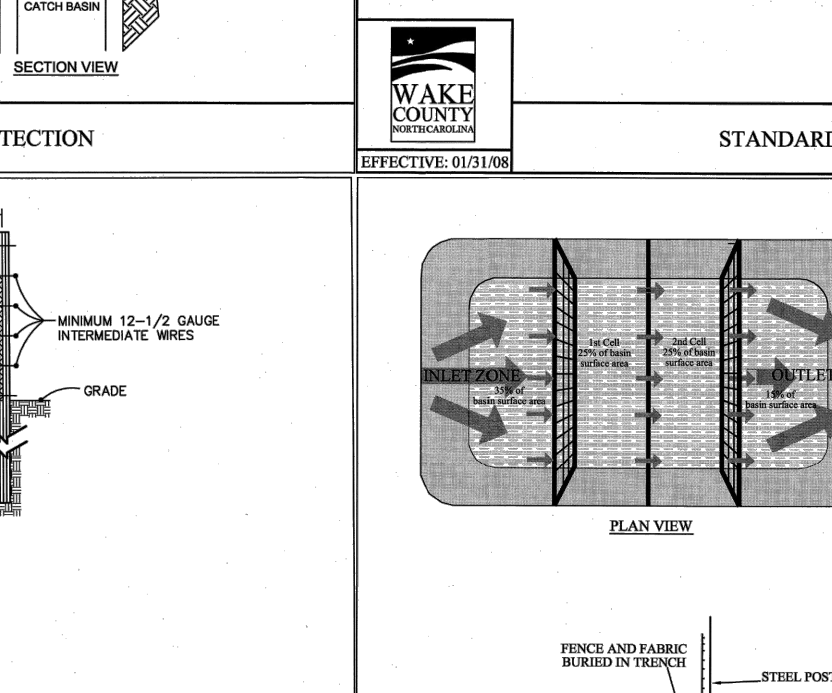
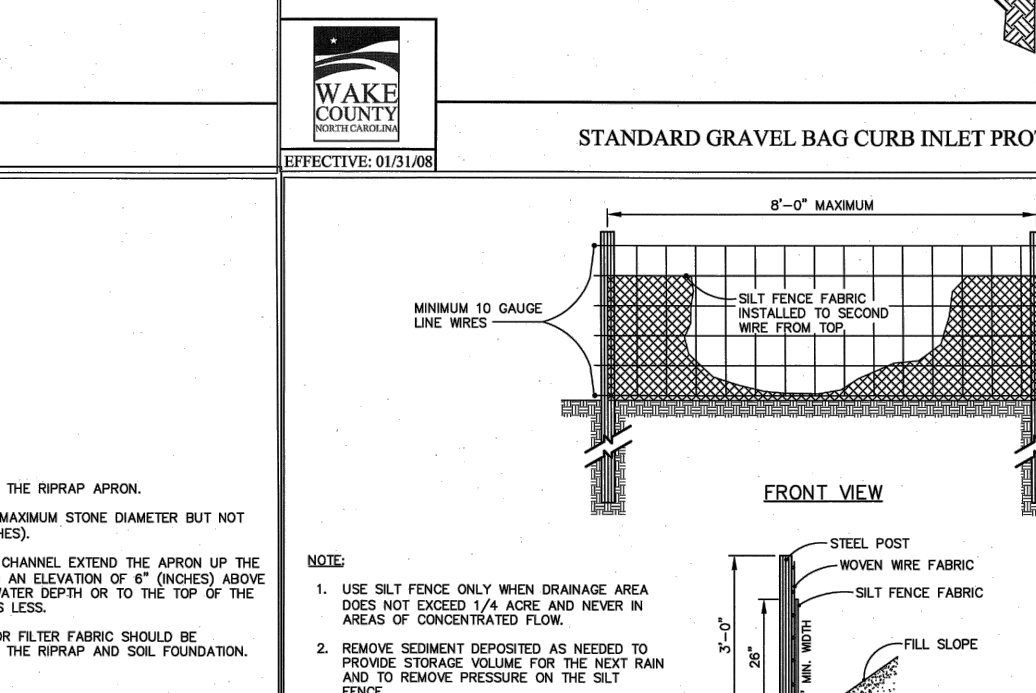
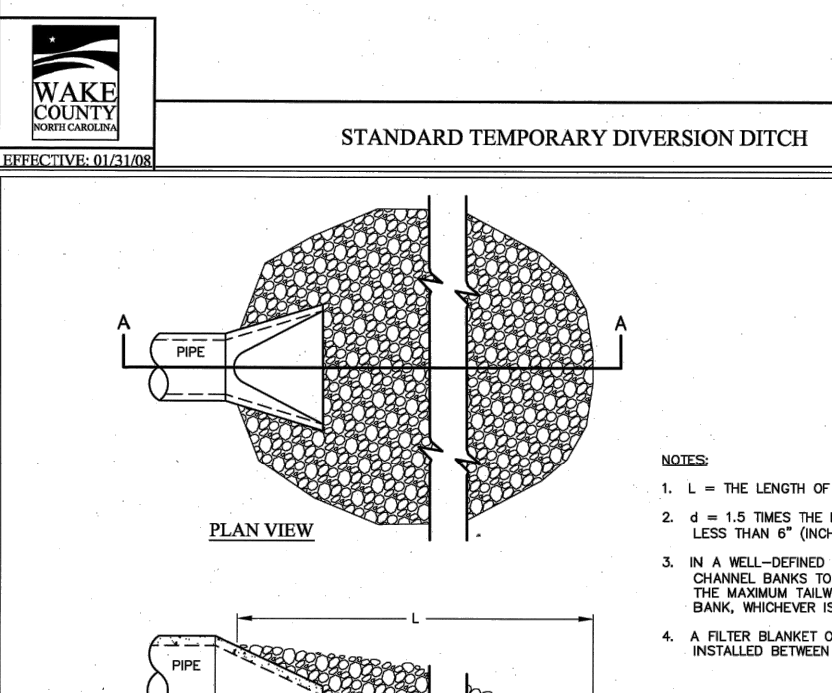
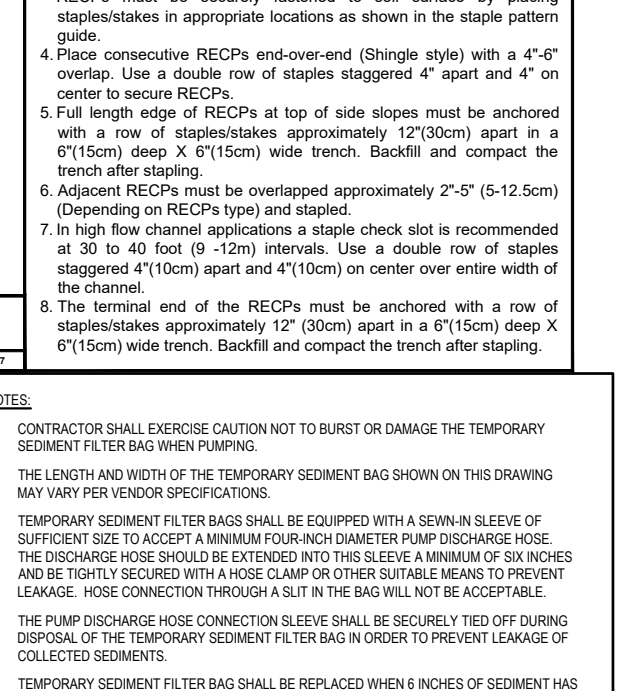
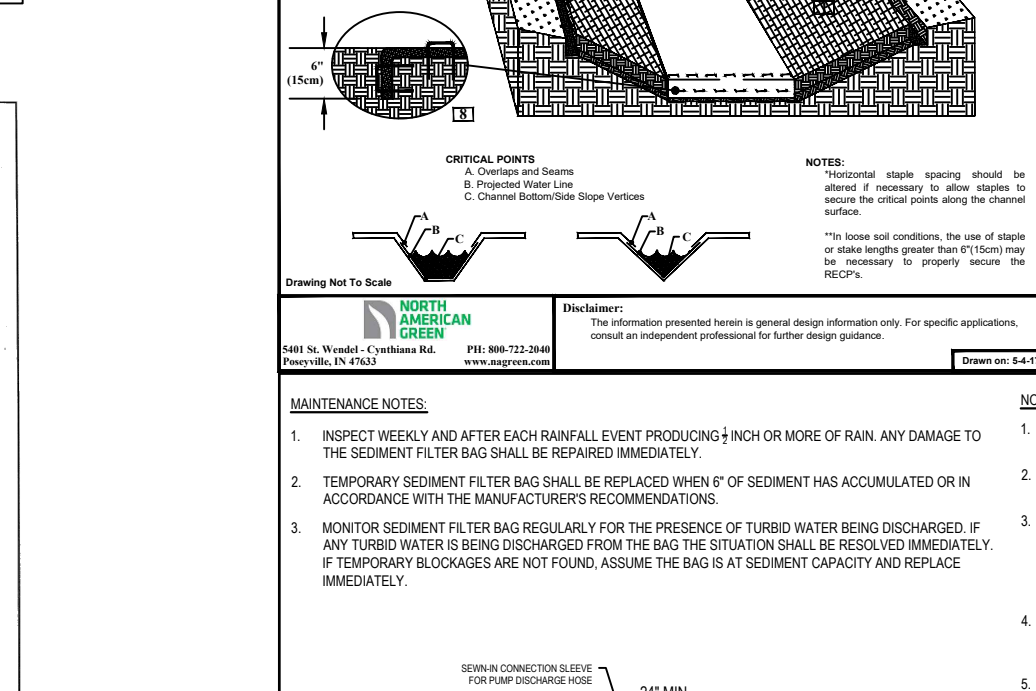
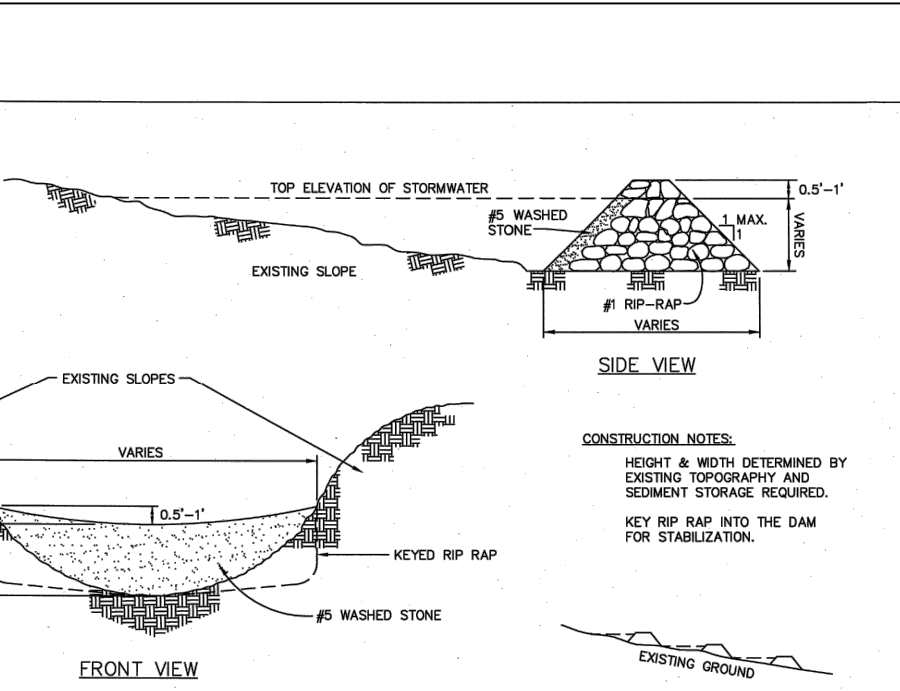
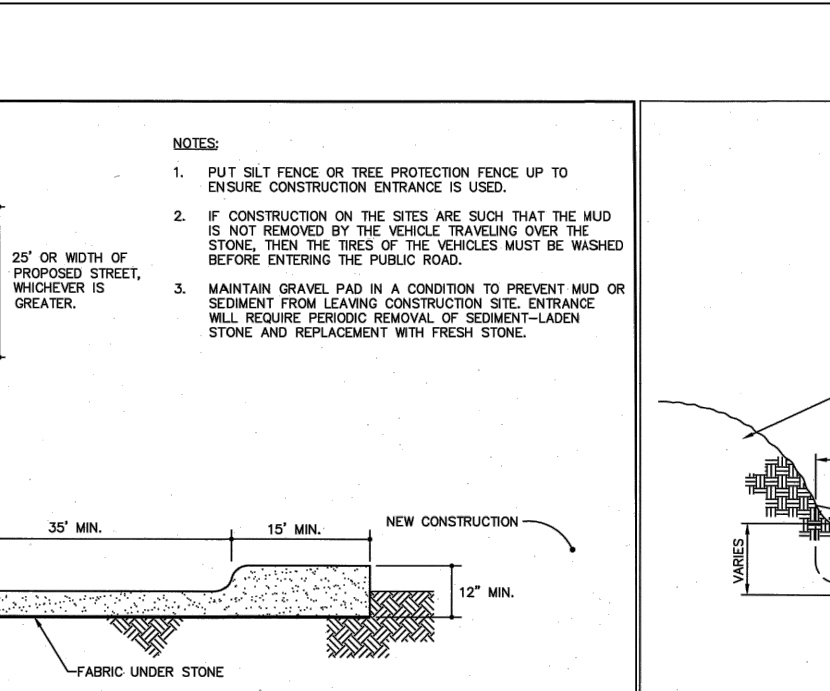
Environmental Services logo and text. Effective September 1, 2008. Stockpiles shall be located on the approved plan and shall adhere to the following requirements: 1. A 2-foot temporary maintenance and access easement shall be shown around all proposed stockpiles...



SEEDING SCHEDULE table with columns for SEEDING PERIOD, SEEDING TYPE, and APPLICATION RATE (LBS/ACRE). Includes rows for August 15 - November 01, November 01 - March 01, March 01 - April 15, April 15 - June 30, July 01 - August 15, and September 01 - March 01.



Environmental Services logo and text. Effective September 1, 2008. Stockpiles shall be located on the approved plan and shall adhere to the following requirements: 1. A 2-foot temporary maintenance and access easement shall be shown around all proposed stockpiles...



WithersRavenel logo and text: WithersRavenel Engineers | Planners | Surveyors

POPLAR CREEK VILLAGE PHASE IV TOWN OF KNIGHTDALE, NORTH CAROLINA

EROSION CONTROL DETAILS

Job No. 02190259, Drawn By WR, Date 08/14/20, Designer WR, North Carolina Professional Engineer Seal, 049345, 11/24/2020, Revisions: 1 PER TOK COMMENTS 10/02/20, 2 PER TOK & NCDOT COMMENTS 11/24/20, Sheet No. 10.5



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.

**SECTION E: GROUND STABILIZATION**

Site Area Description	Required Ground Stabilization Timeframes	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>Roller 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>Roller 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 relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

**EARTHEN STOCKPILE MANAGEMENT**

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

**CONCRETE WASHOUTS**

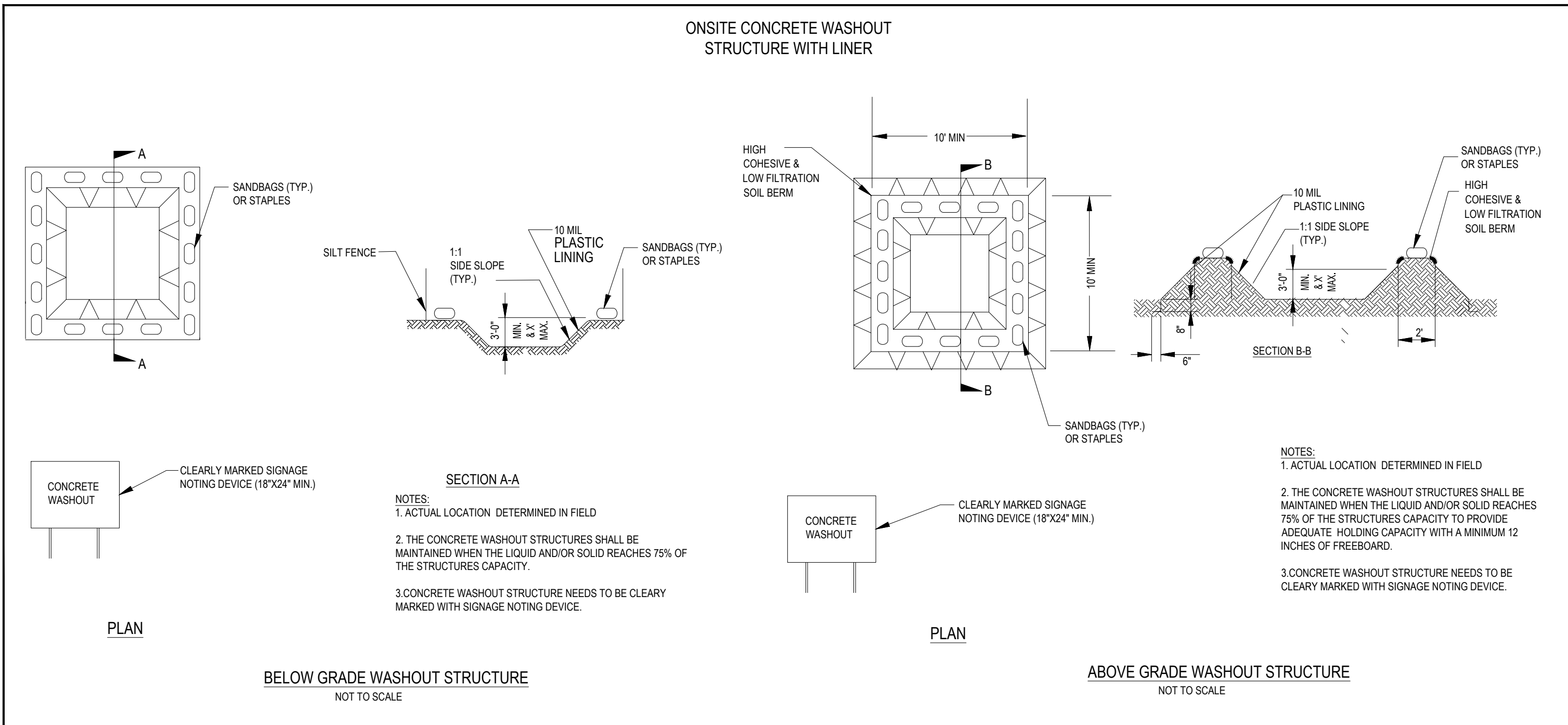
- Do not discharge concrete or cement slurry from the site.
- Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- Manage washout from mortar mixers in accordance with the above item and in addition place the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

**HERBICIDES, PESTICIDES AND RODENTICIDES**

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

**HAZARDOUS AND TOXIC WASTE**

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



NCGO1-SELF INSPECTION, RECORDKEEPING & REPORTING

EFFECTIVE: 04/01/19

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

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

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event $\geq 1.0$ inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (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.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

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

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

**SECTION C: REPORTING**

**1. Occurrences that must be reported**  
Permittees shall report the following occurrences:

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

**2. Reporting Timeframes and Other Requirements**  
After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the 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 1(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> <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> </ul>
(c) Anticipated bypasses (40 CFR 122.41(m)(3))	<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 includes an evaluation of the quality and effect of the bypass.</li> </ul>
(d) Unanticipated bypasses (40 CFR 122.41(m)(3))	<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 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(h)(6)).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</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 24 hours</b>, an oral or electronic notification.</li> <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(h)(6)).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>

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

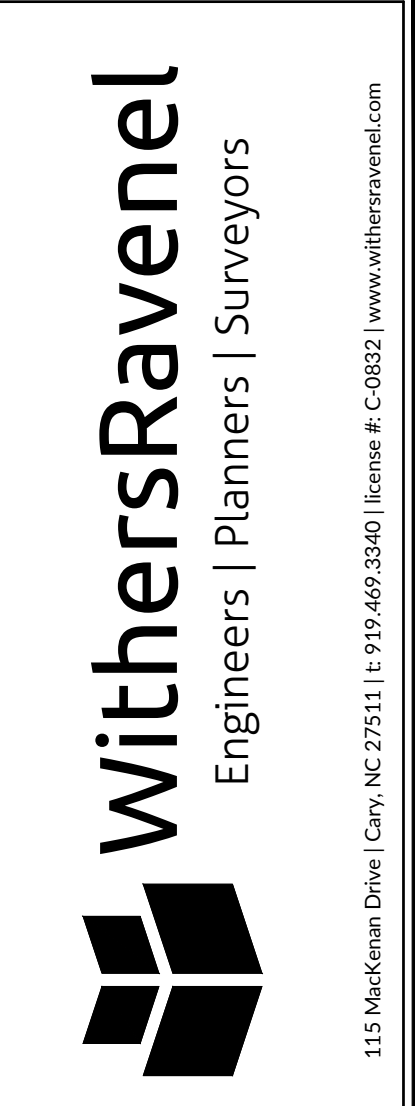
**SECTION B: RECORDKEEPING**

**1. E&SC Plan Documentation**  
The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

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

**2. Additional Documentation**  
In addition to the E&SC 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)

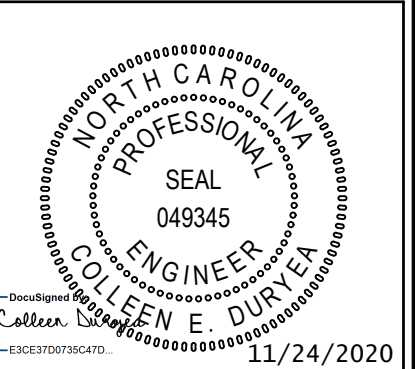


**POPLAR CREEK VILLAGE  
PHASE IV**

**TOWN OF KNIGHTDALE, NORTH CAROLINA**

**NCDEQ NCGO1 DETAILS**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR



**Revisions**

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

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

Sheet No.  
**10.6**



**ARCHITECTURAL APPROVED GUIDELINES:**

THE APPROVED ARCHITECTURAL GUIDELINES ARE A CONDITION OF ORDINANCE #20-06-17-004. ANY VARIATIONS OF THE APPROVED ELEVATIONS SHALL BE REVIEWED BY THE DEVELOPMENT SERVICES DIRECTOR TO ENSURE COMPLIANCE WITH THE REQUIREMENTS OF THE APPROVED PLANNED UNIT DEVELOPMENT.

1. THE FRONT ELEVATIONS OF ALL RESIDENTIAL DWELLINGS SHALL HAVE AT LEAST ONE (1) OF THE FOLLOWING FEATURES: BOARD AND BATTEN, SHAKE SIDING, OR SECOND STORY PORCH AND AT LEAST (1) OF THE FOLLOWING FEATURES: GABLE WINDOW, DORMER(S), DECORATIVE WINDOW CAP/ PEDIMENT, FRONT DOOR TRANSOM OR SIDELIGHT WINDOW. HAVING TWO (2) ITEMS FROM THE FIRST LIST IN LIEU OF ONE FROM EACH LIST WILL MEET THIS ARCHITECTURAL REQUIREMENT.
2. VINYL SIDING IS PERMITTED AND SHALL BE A MINIMUM OF .045 IN IN THICKNESS.
3. SIDE AND REAR ELEVATIONS ARE NOT REQUIRED TO HAVE ADDITIONAL MATERIALS, AND CAN BE 100% VINYL MATERIALS.
4. ALL PITCHED ROOFS SHALL BE PROFILED BE EAVES PROJECTING A MINIMUM OF 10 INCHES FROM THE BUILDING FACE WHICH MAY INCLUDE GUTTERS.
5. FRONT-LOADED GARAGE DOORS SHALL UTILIZE A CARRIAGE STYLE OR SIMILAR STYLISTIC GARAGE DOOR THAT IS ARCHITECTURALLY COMPATIBLE WITH THE HOUSING STYLE (PANELED GARAGE DOORS ARE NOT PERMITTED).
6. THE CRAWLSPACE OF BUILDINGS SHALL BE ENCLOSED WITH BRICK, STONE, OR STUCCO. SLABS SHALL BE COVERED ON ALL SIDES WITH BRICK, STONE OR STUCCO NO LESS THAN THE HEIGHT EQUIVALENT OF THREE (3) COURSES OF BRICK (EIGHT [8] INCHES) VISIBLE ABOVE GRADE. AREAS UNDER PORCHES MAY BE ENCLOSED WITH LATTICE.
7. PORCHES AND STOOPS SHOULD BE USED AS A PRIMARY ARCHITECTURAL ELEMENT OF THE BUILDING DESIGN AND BE LOCATED ON THE PRIMARY FACADE OR THE OTHER ELEVATION FRONTING A PUBLIC RIGHT-OF-WAY. FRONT PORCHES SHALL BE A MINIMUM OF 6' IN DEPTH ON AT LEAST 50% OF THE ELEVATIONS, BUT IN NO CASE SHALL THE FRONT PORCH BE LESS THAN A 5' AVERAGE WITH THE NARROWEST PORTION BEING 4'.
8. THE MAXIMUM HEIGHT FOR ANY ELEVATION SHALL NOT EXCEED 45' AS MEASURED BY THE KNIGHTDALE UDO.

**NOTE:**

APPROVED ELEVATIONS ARE INCLUDED IN THE SIGNED ORDINANCE #20-06-17-004.

THE FOLLOWING ELEVATIONS WERE APPROVED:

PLAN	ELEVATIONS	
JAMISON	A*, B, C	*WITH BRICK OR STONE
LANGFORD	C	
PALMER	A, B, C	
RICHARDSON	B, C	
ROLAND	A, C	
VICTOR	A, B, C	
WARWICK	B, C, D, E, F	WITH ENCLOSED 3 <sup>RD</sup> BAY GARAGE
WEBSTER	C, F	
WORTHING	A, B, C	
YATES	A, B, C	



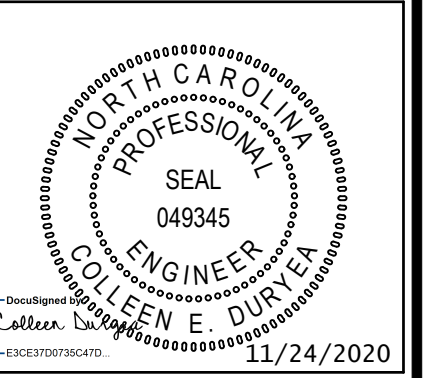
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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**APPROVED BUILDING  
ELEVATIONS**

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

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

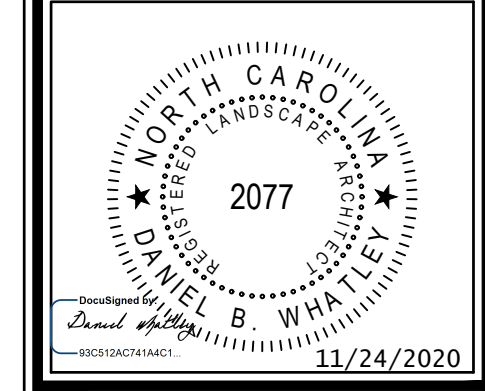
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

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





Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions		
1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20


**HATCH LEGEND**

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

**GRAPHIC SCALE**

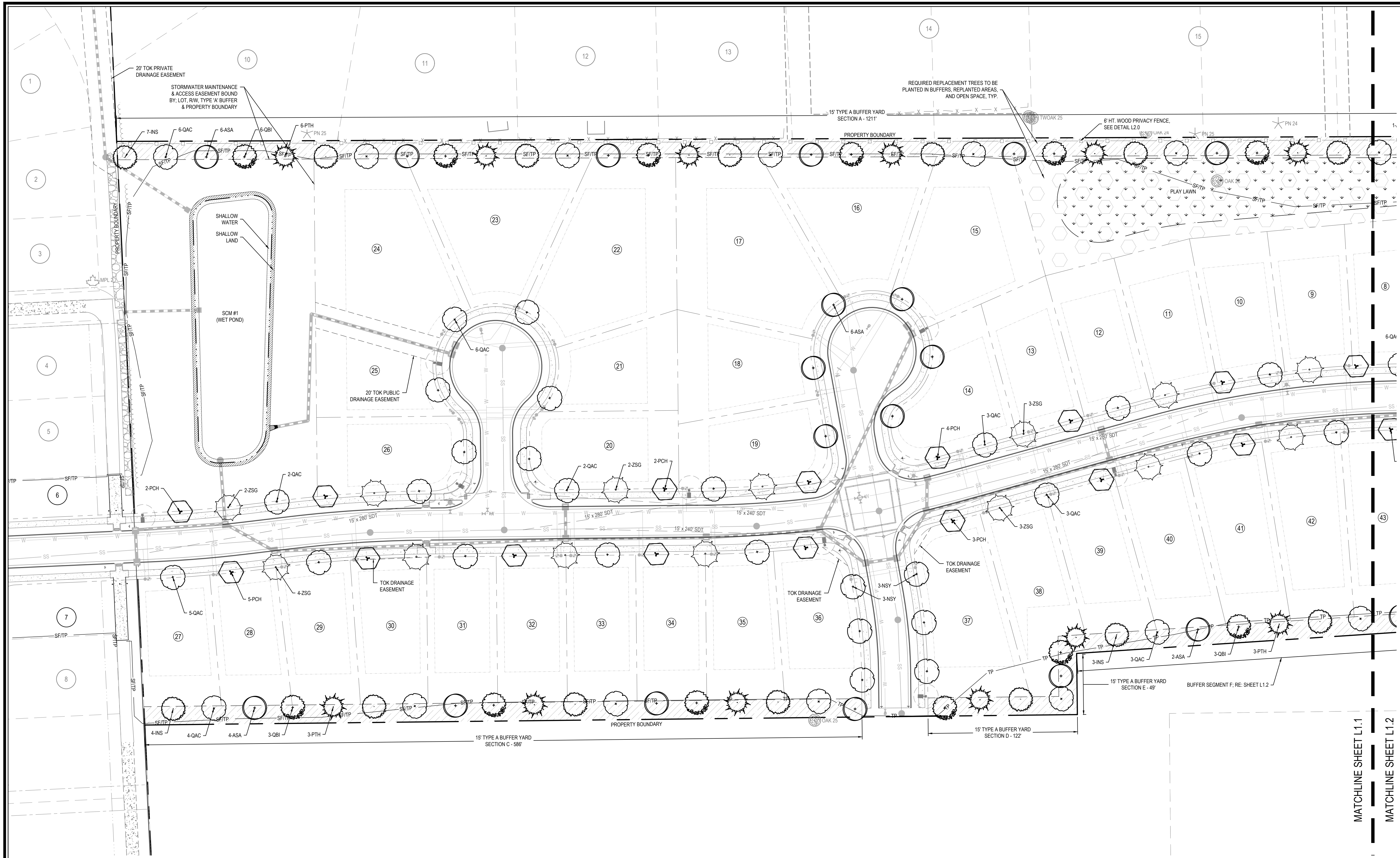
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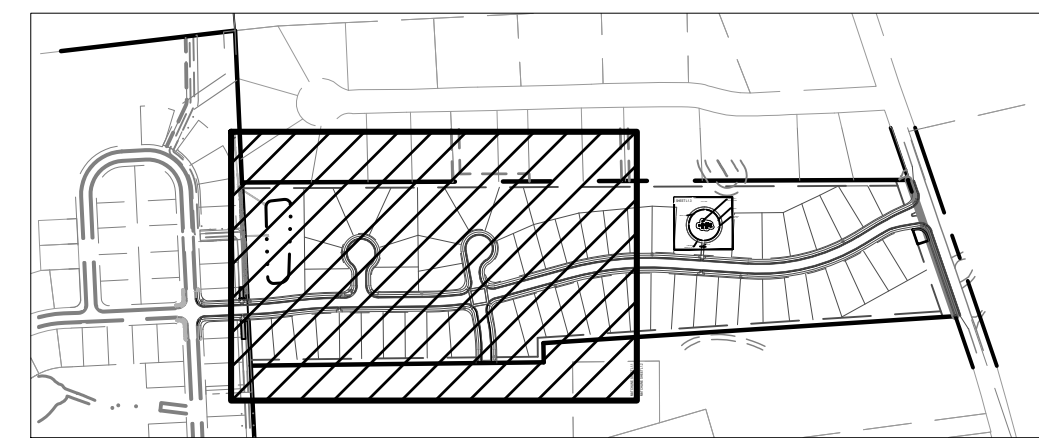




- PLANT SYMBOL KEY:**
- PCH - PISTACHIA CHINENSIS
  - ASA - ACER SACCHARUM 'LEGACY'
  - QBI - QUERCUS BICOLOR
  - ZSG - ZELKOVA SERRATA
  - INS - ILEX 'NELLE R. STEVENS'
  - PTH - PINUS TAEDA
  - QAC - QUERCUS ACCUTISSIMA
  - NSY - NYSSA SYLVATICA
  - CAC - CERCIIS CANADENSIS

- HATCH LEGEND**
- BUFFER
  - OPEN SPACE
  - TREE CANOPY: REPLANTED AREA
  - SEEDED LAWN
  - SCM: SHALLOW LAND
  - SCM: SHALLOW WATER

MATCHLINE SHEET L1.1  
MATCHLINE SHEET L1.2

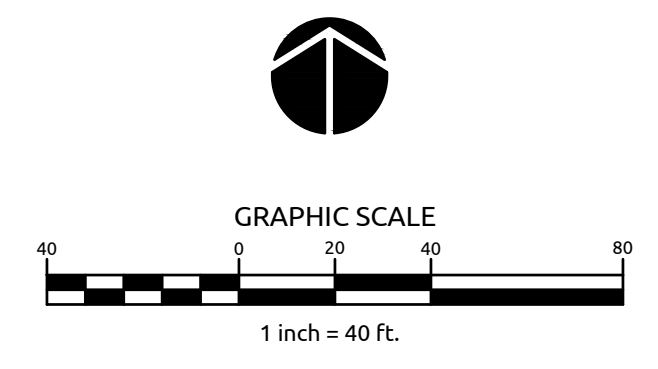


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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
ADMINISTRATOR



**WithersRavenel**  
Engineers | Planners | Surveyors

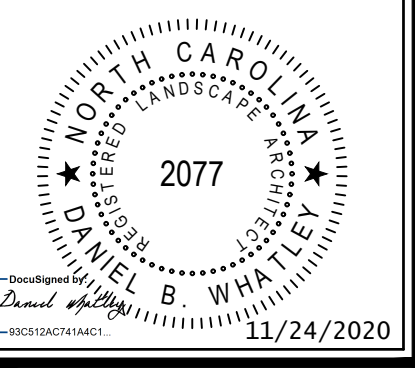
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**POPLAR CREEK VILLAGE  
PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**LANDSCAPE PLAN**

Job No. 02190259 Drawn By WR  
Date 08/14/20 Designer WR

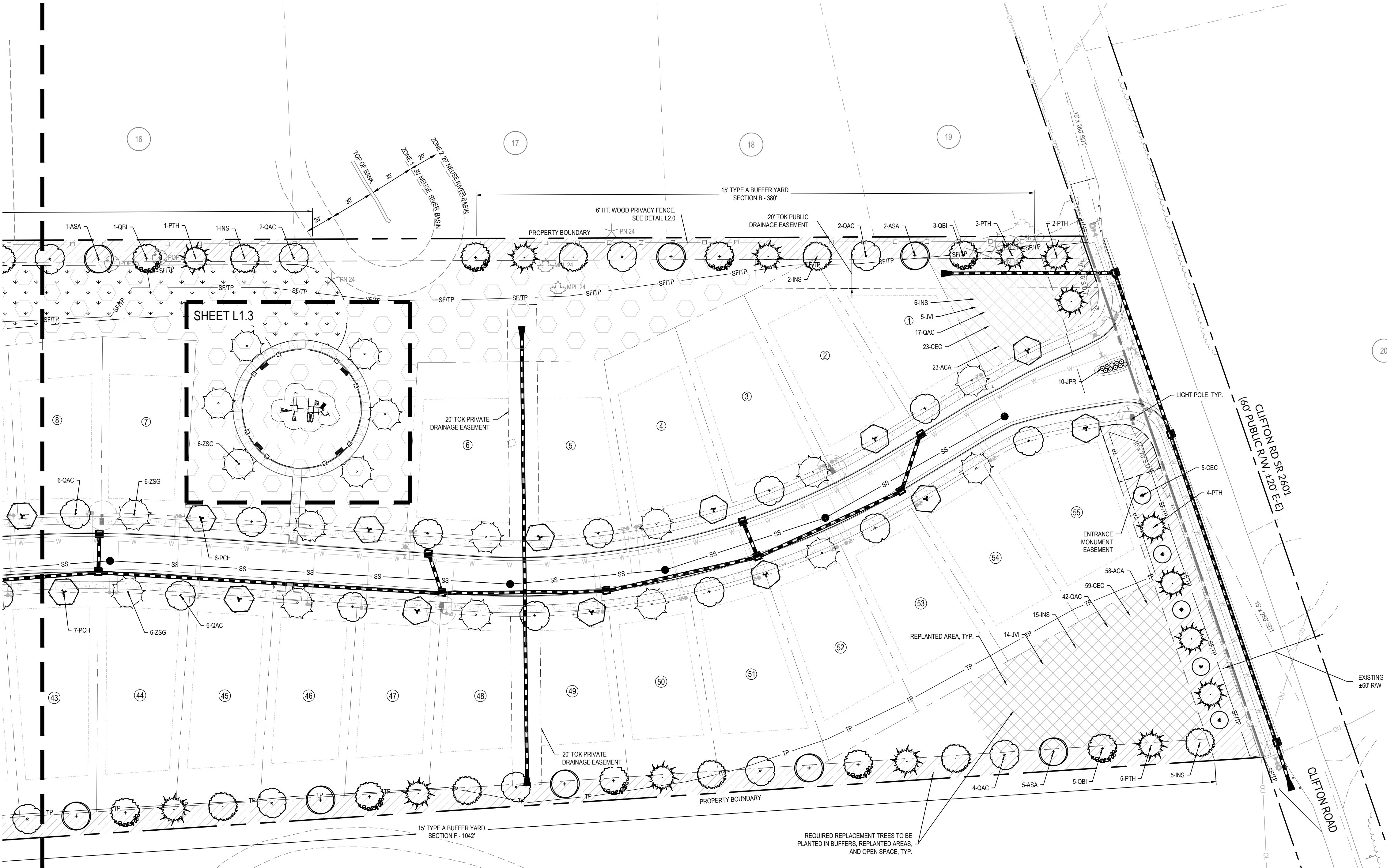


Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

Sheet No.  
**L1.1**





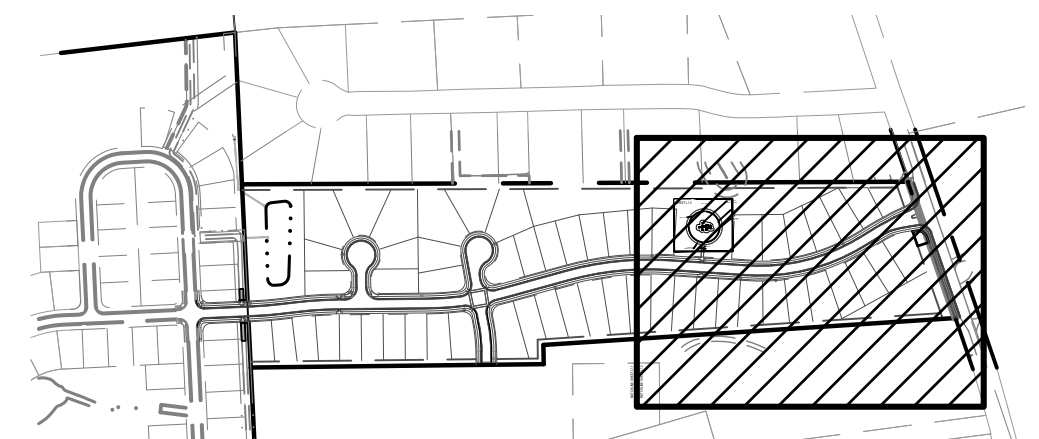
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	CAC - CERCIIS CANADENSIS

**HATCH LEGEND**

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

MATCHLINE SHEET L1.1  
 MATCHLINE SHEET L1.2

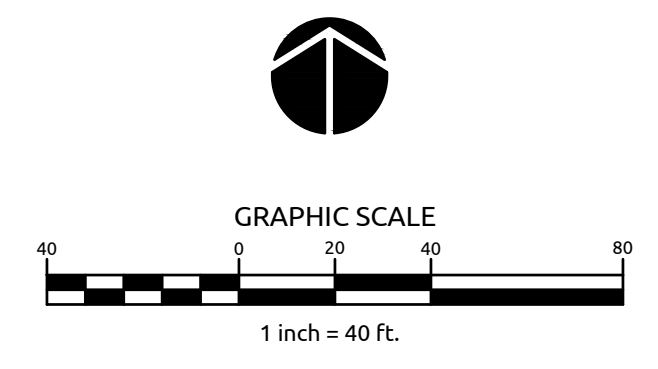


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BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DEVELOPMENT SERVICES ENGINEER

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

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



**WithersRavenel**  
 Engineers | Planners | Surveyors

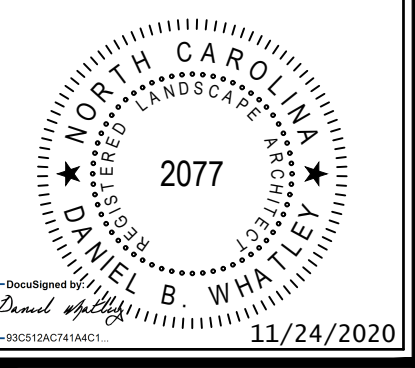
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**POPLAR CREEK VILLAGE  
 PHASE IV**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**LANDSCAPE PLAN**

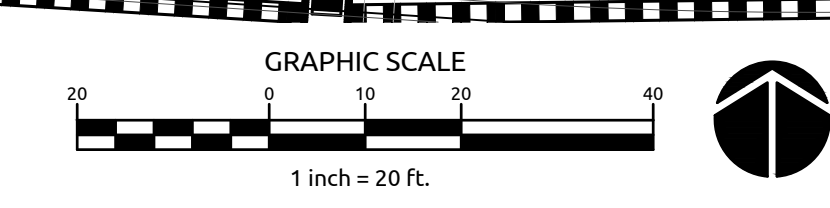
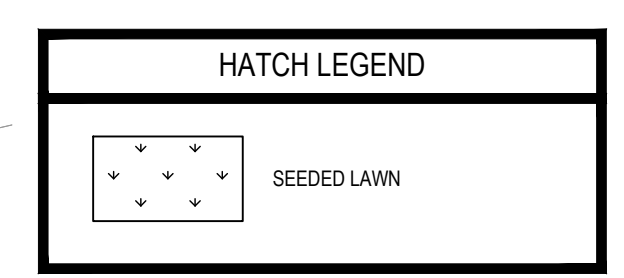
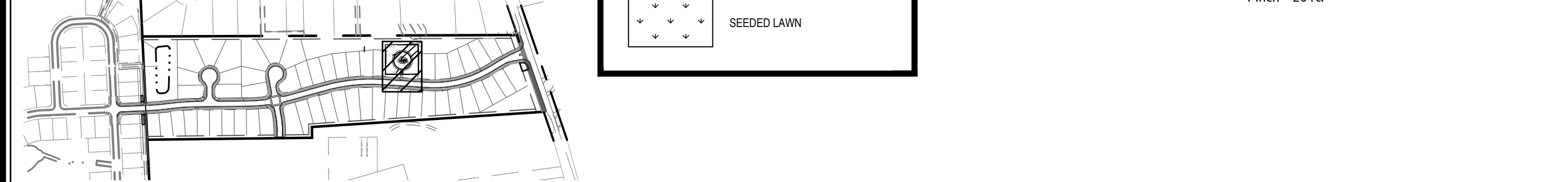
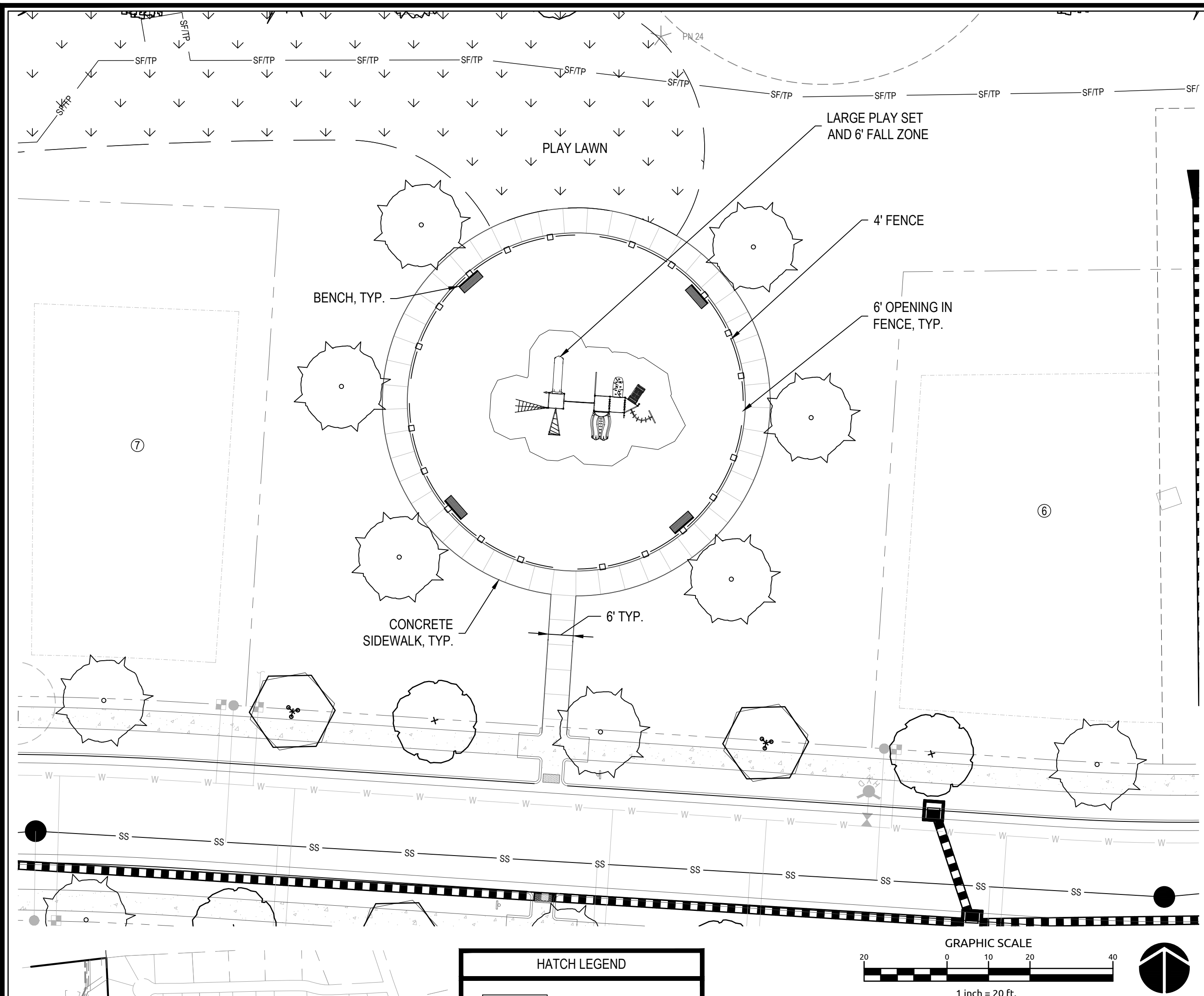
Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



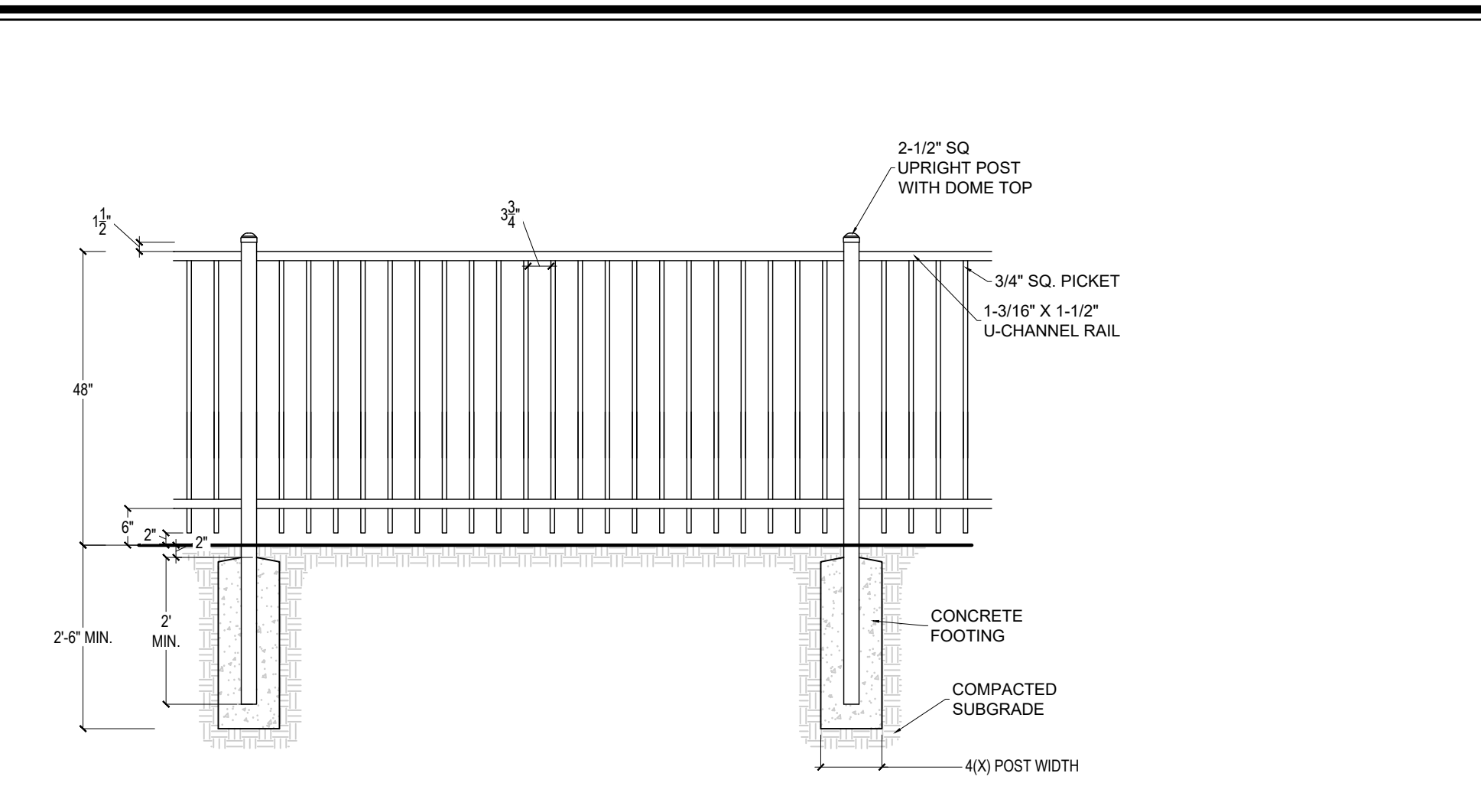
Revisions

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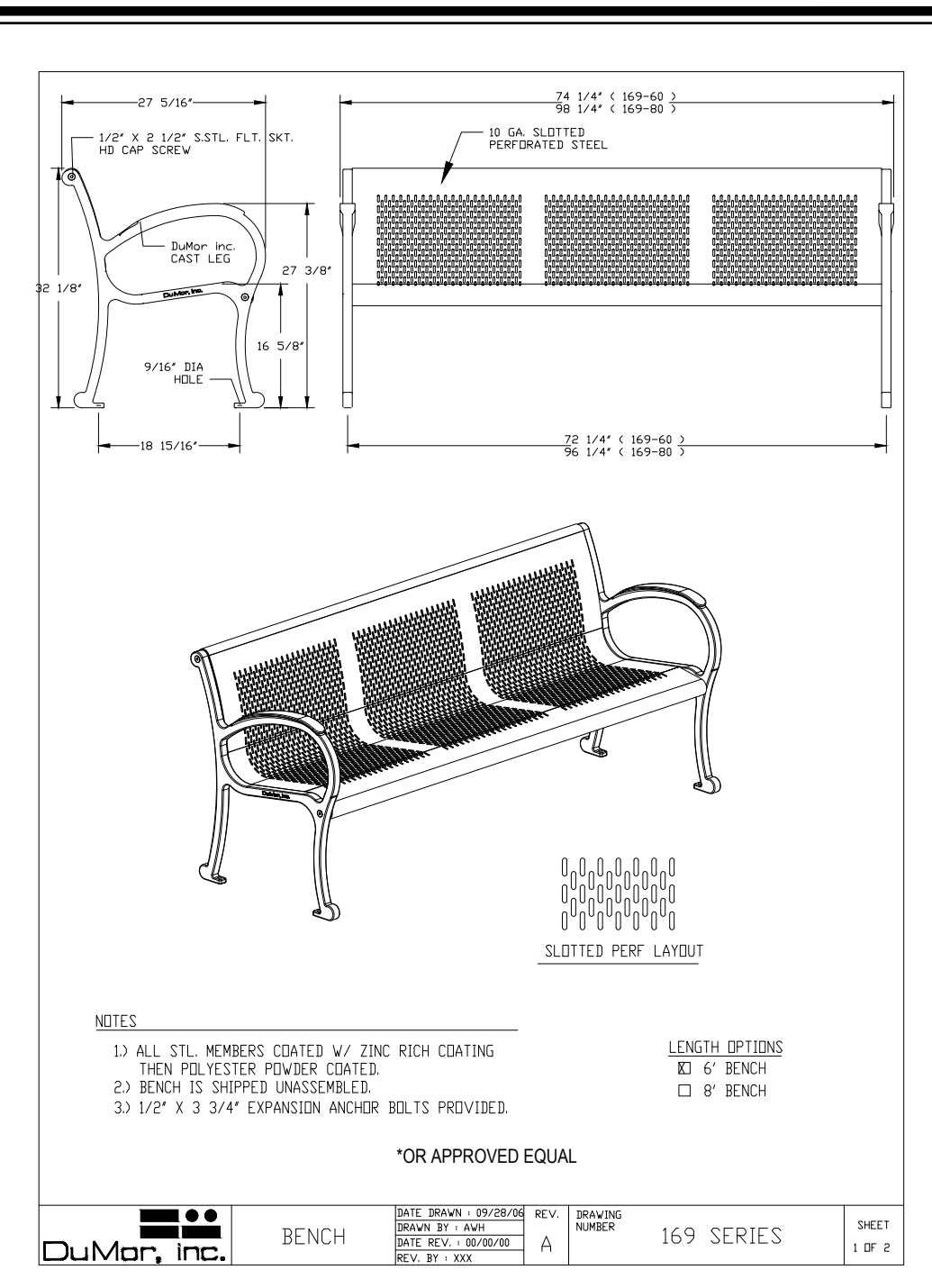




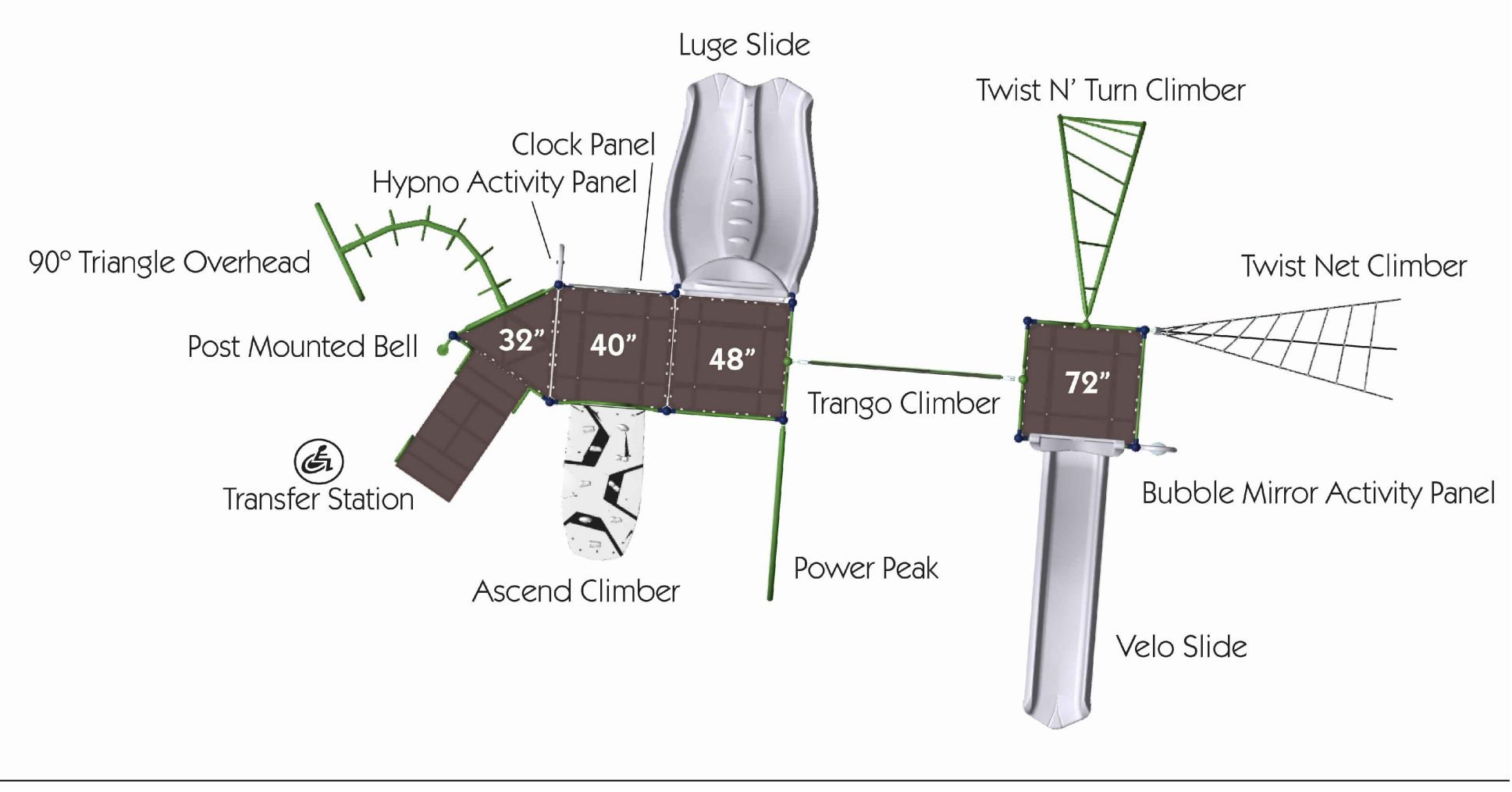
01  
L1.3  
4' PLAYGROUND FENCE  
Scale: 1/2" = 1'-0"



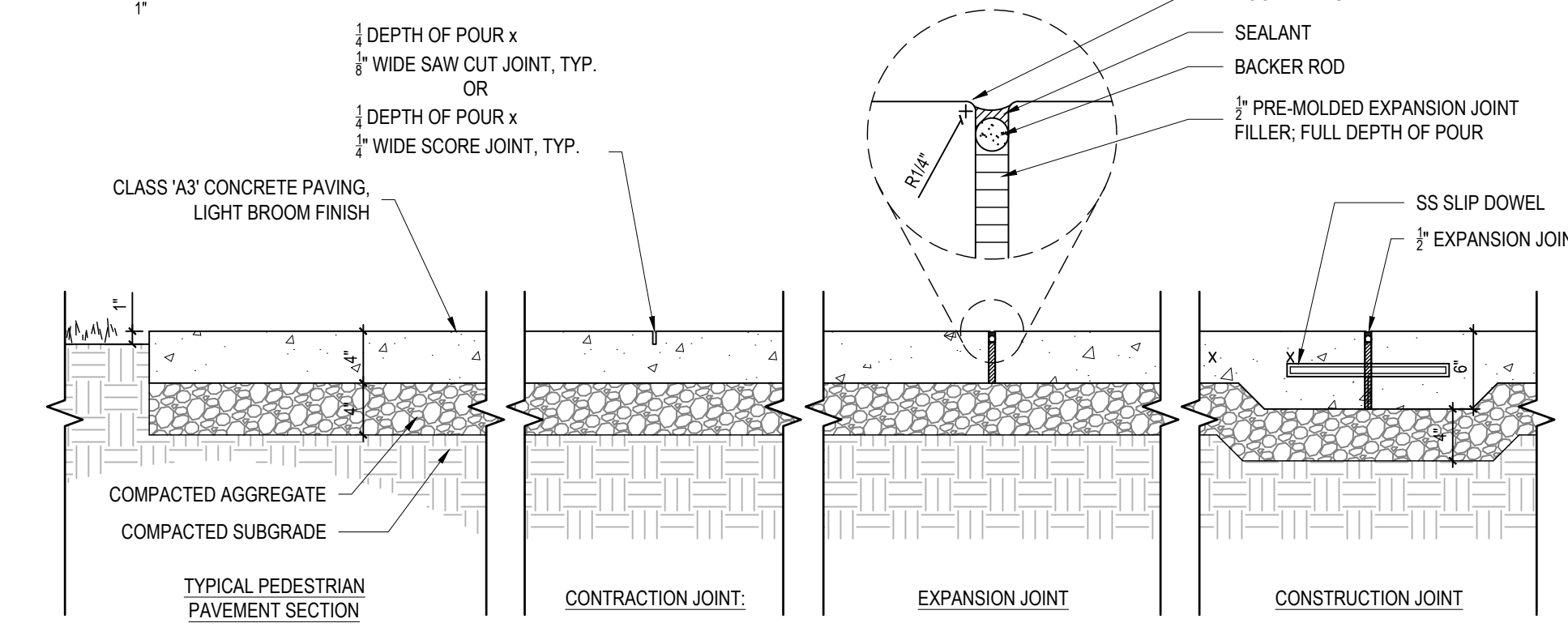
02  
L1.3  
6' BENCH WITH BACK  
Scale: N.T.S.



03  
L1.3  
LARGE PLAY SET  
Scale: 3/16" = 1'-0"



MIN. CROSS SLOPE; RE: GRADING PLANS FOR ADDITIONAL INFORMATION



- NOTES:
1. PROVIDE EXPANSION JOINT WHERE WALKS ARE POURED AGAINST VERTICAL SURFACES AND/OR DIFFERENT PAVING MATERIALS AND AS SPECIFIED ON PLANS OR 25'-0" MAX. O.C.
  2. PROVIDE CONTRACTION JOINT AT 5' INTERVALS UNLESS OTHERWISE NOTED (SEE PLAN). CONTRACTOR TO PROVIDE MOCK-UP OF CONCRETE SIDEWALK SCORING FOR LANDSCAPE ARCHITECTS APPROVAL. MOCK-UP CAN BE USED AS PART OF FINAL PROJECT.

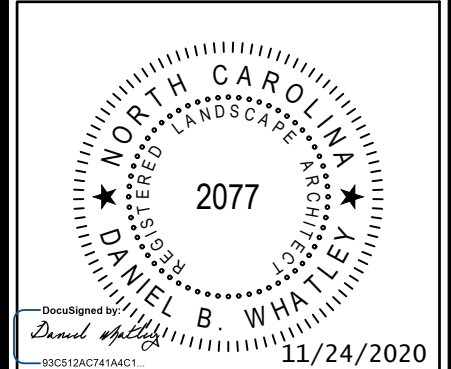
04  
L1.3  
TYPICAL CONCRETE PEDESTRIAN PAVING  
Scale: 1" = 1'-0"

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

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

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR

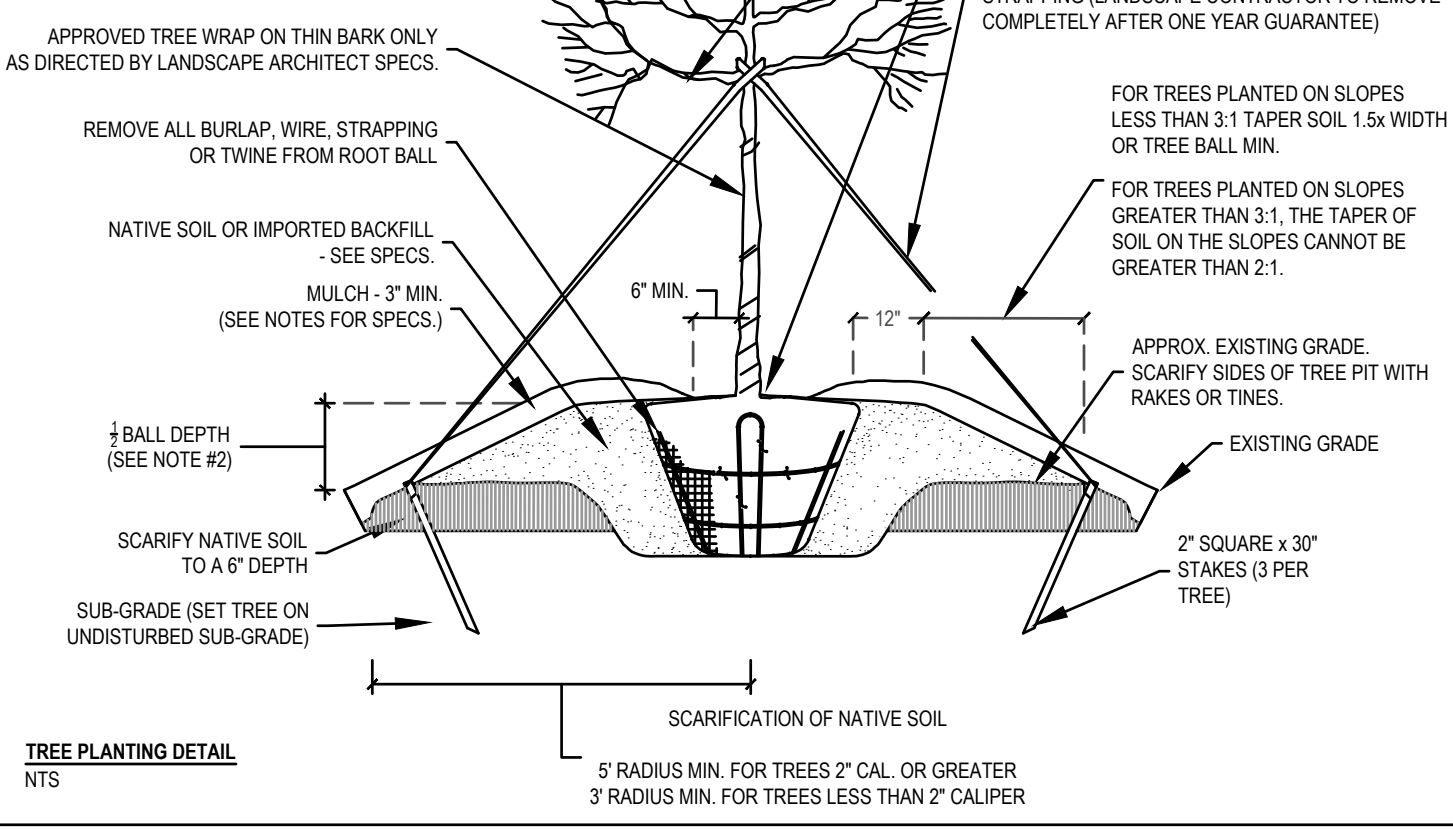


Revisions		
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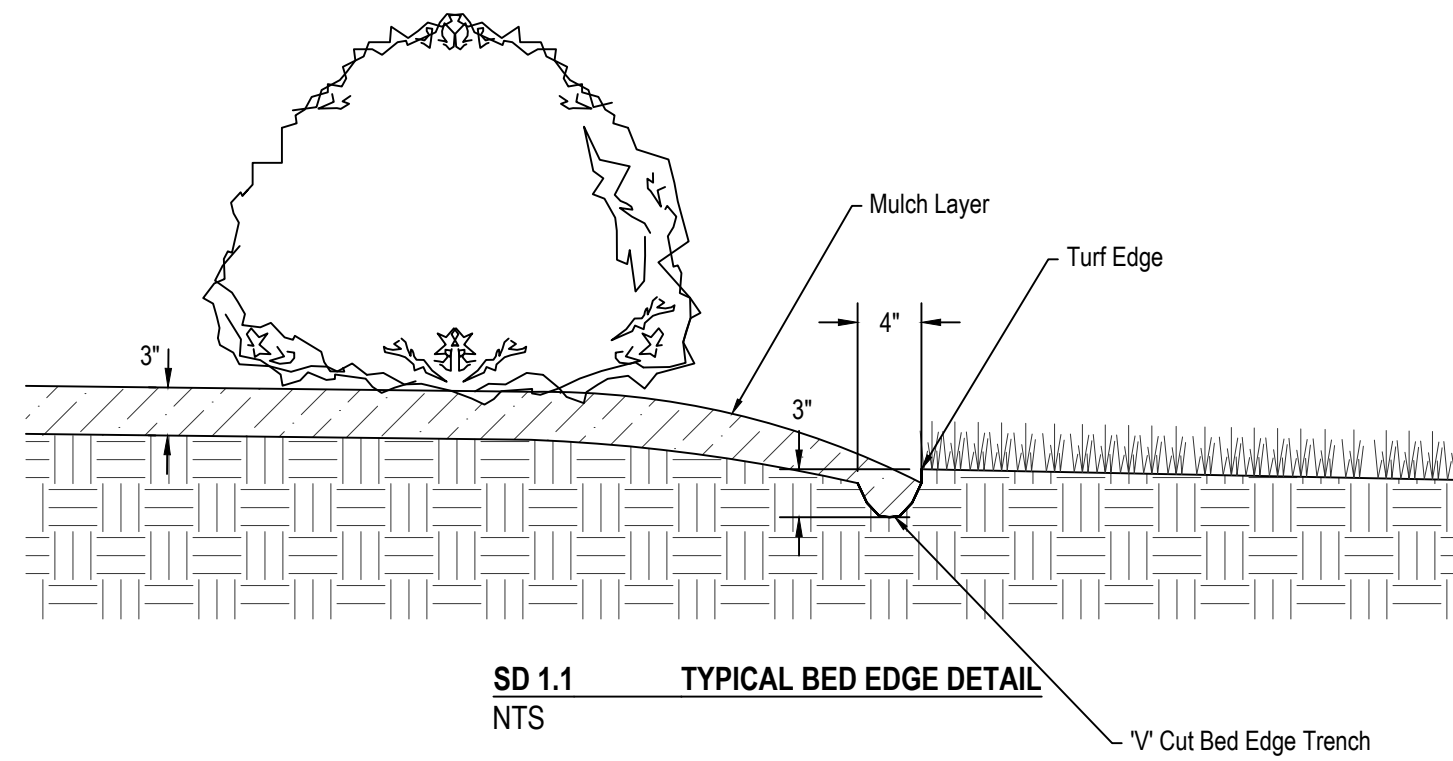


TREE PLANTING NOTES

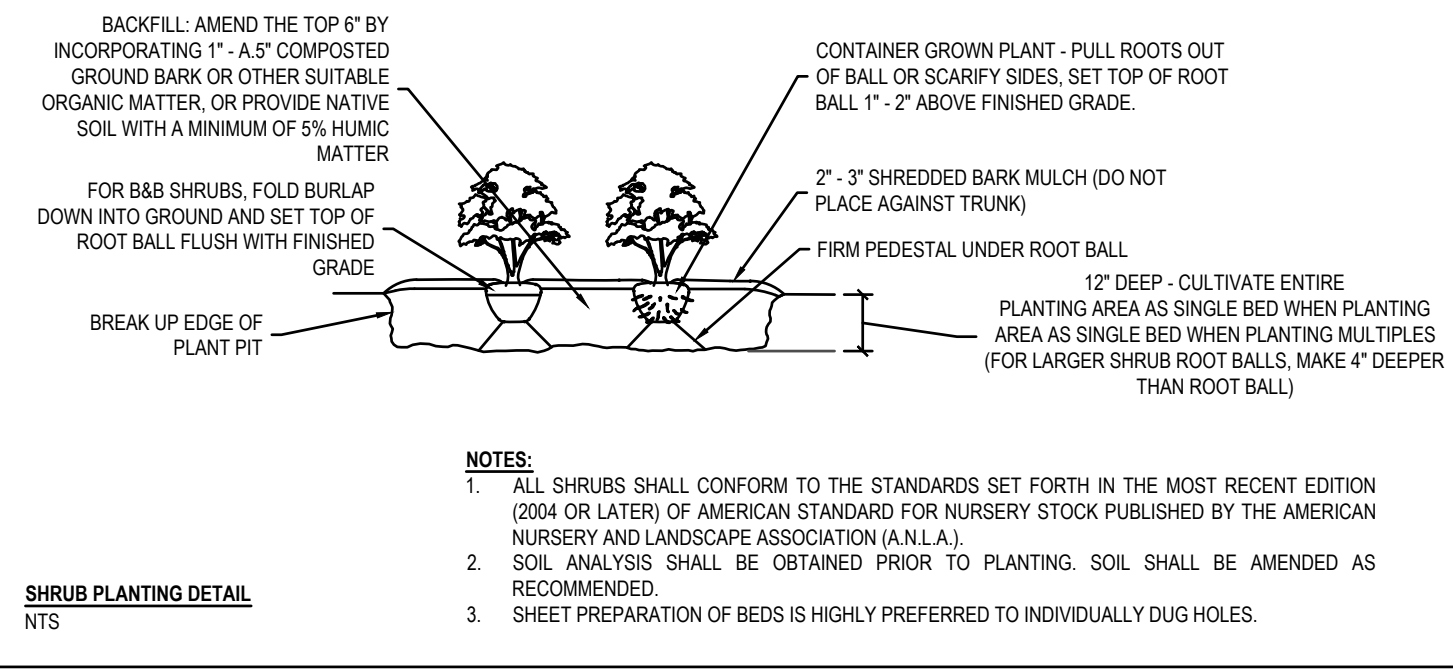
- IF TREES SETTLE OR ARE BLOWN OUT OF PLUMB POSITION, THEY SHOULD BE STRAIGHTENED BY MAKING ADJUSTMENTS TO THE POSITION OF THE ROOT BALL - NOT BY PUSHING ON THE TRUNK AND/OR TIGHTENING THE GUY WIRE. TREES SHALL BE STRAIGHTENED DURING THE LIFE OF THE PROJECT AS THEY GET OUT OF PLUMB, NOT JUST AT THE END OF THE PROJECT.
- BALL DEPTHS ON SOME TREES IN A SINGLE GROUP MAY VARY IN GENERAL. THE BALL SHOULD BE ABOVE GRADE. IF DEPTHS VARY, ALL TREES IN A GROUP SHOULD BE SET SO THAT THE BASE OF THE TRUNK WILL APPEAR TO BE AT THE SAME RELATIVE ELEVATION ABOVE GRADE.
- NO DECIDUOUS OR EVERGREEN TREES WILL BE ACCEPTED IF THERE IS MORE THAN ONE LEADER, UNLESS THE TREE IS SPECIFIED AS MULTI-TRUNK. CONTRACTOR TO VERIFY THAT ADEQUATE DRAINAGE EXISTS PRIOR TO PLANTING.
- STAKE AND GUY TREES 3" CALIPER AND LARGER.



TREE PLANTING DETAIL NTS

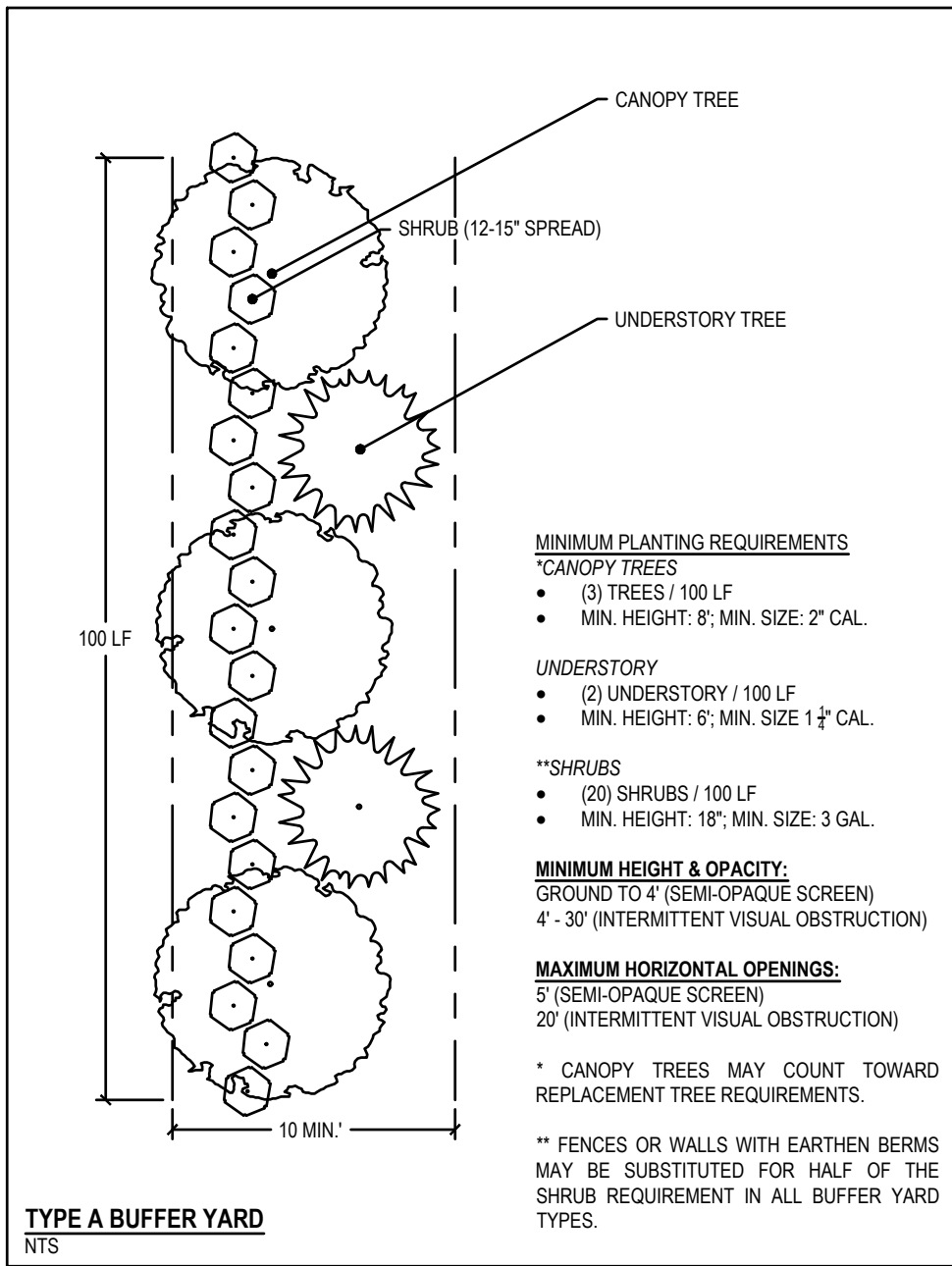


SHRUB PLANTING DETAIL NTS



NOTES

- ALL SHRUBS SHALL CONFORM TO THE STANDARDS SET FORTH IN THE MOST RECENT EDITION (2004 OR LATER) OF AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (A.N.L.A.).
- SOIL ANALYSIS SHALL BE OBTAINED PRIOR TO PLANTING. SOIL SHALL BE AMENDED AS RECOMMENDED.
- SHEET PREPARATION OF BEDS IS HIGHLY PREFERRED TO INDIVIDUALLY DUG HOLES.



TYPE A BUFFER YARD NTS

TIER	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
TIER 1	21	23	4	0	0	0	25
TIER 2	90	76	14	0	0	0	102
TIER 3	7	0	6	1	0	0	15

\* PER TOK UDD SECTION 8.5, REPLACEMENT TREES SHALL BE PLANTED AT A RATE OF 1 TREE PER 12' DBH.  
NOTE: 142 REPLACEMENT TREES WILL BE PLANTED IN PROPOSED BUFFER YARD LOCATIONS OR OPEN SPACE. SEE LANDSCAPE PLAN FOR BUFFER YARD PLANTING DETAIL.

Street Name	Length (LF)	REQUIRED TREES 1 per 40 LF	PROVIDED TREES
STONE FALLS WAY	1624	82	82
ROCK TRAIL COURT	85	5	6
FOGGY POINT TRAIL	232	12	12

PLANT SCHEDULE

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
<b>CANOPY TREES</b>							
26	ASA	<i>Acer saccharum 'Legacy'</i>	Legacy Sugar Maple	B&B	2" CAL. MIN.	8' HT. MIN.	STREET; BUFFER
6	NSY	<i>Nyssa sylvatica</i>	Black Gum	B&B	2" CAL. MIN.	8' HT. MIN.	STREET
29	PCH	<i>Pistacia chinensis</i>	Chinese Pistache	B&B	2" CAL. MIN.	8' HT. MIN.	STREET
36	QAC	<i>Quercus acutissima</i>	Sawtooth Oak	B&B	2" CAL. MIN.	8' HT. MIN.	STREET; REPLANTED AREA
26	ZSG	<i>Zelkova serata</i>	Japanese Zelkova	B&B	2" CAL. MIN.	8' HT. MIN.	STREET
27	PTH	<i>Pinus taeda</i>	Loblolly Pine	B&B	2" CAL. MIN.	8' HT. MIN.	BUFFER; EVERGREEN
21	QBI	<i>Quercus bicolor</i>	Swamp White Oak	B&B	2" CAL. MIN.	8' HT. MIN.	BUFFER
<b>UNDERSTORY TREES</b>							
81	ACA	<i>Ametanther 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
<b>SHRUBS</b>							
10	JPR	<i>Juniperus procumbens 'Nana'</i>	Dwarf Japanese Garden Juniper	CONT.	3 GAL. MIN.	18" WIDE MIN.	MATCHED

REPLACEMENT TREES

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
43	WIS	<i>Ilex x 'Nellie R. Stevens'</i>	Nellie R. Stevens Holly	B&B	2.5" CAL. MIN.	6' HT. MIN.	REPLANTED AREA; BUFFERS; EVERGREEN
19	JVI	<i>Juniperus virginiana</i>	Eastern Red Cedar	B&B	2.5" CAL. MIN.	6' HT. MIN.	REPLANTED AREA; EVERGREEN
74	QAC	<i>Quercus acutissima</i>	Sawtooth Oak	B&B	2.5" CAL. MIN.	8' HT. MIN.	REPLANTED AREA; BUFFERS
6	ZSG	<i>Zelkova serata</i>	Japanese Zelkova	B&B	2.5" CAL. MIN.	8' HT. MIN.	OPEN SPACE

BUFFER PLANTS

QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
<b>UNDERSTORY TREES</b>							
58	CEC	<i>Cercis canadensis</i>	Eastern Redbud	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; EVERGREEN
<b>SHRUBS</b>							
140	MCE	<i>Myrica cerifera</i>	Wax Myrtle Or Bayberry	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED; EVERGREEN
139	LOC	<i>Loropetalum chinense f. rubrum 'Burgundy'</i>	Redleaf Loropetalum	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED; EVERGREEN
139	ILC	<i>Ilex crenata 'Rotundifolia'</i>	Japanese Holly	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED; EVERGREEN
52	FIN	<i>Forsythia x intermedia</i>	Forsythia	CONT.	3 GAL. MIN.	18" HT. MIN.	MATCHED
52	CAM	<i>Callicarpa 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>						
AMM	100	<i>Azocora americana</i>	Swallowtail	CONT.	2.25" PLUG (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
AMN	100	<i>Asclepias incarnata</i>	Butterfly Milkweed	CONT.	2.25" PLUG (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNE	100	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
EDU	100	<i>Eupatorium dubius</i>	Dwarf Joe Pye Weed	CONT.	2.25" PLUG (32S)	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 (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
PVC	97	<i>Pontederia cordata</i>	Pickersweed	CONT.	2.25" PLUG (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
SAC	97	<i>Saururus cernuus</i>	Lizard's Tail	CONT.	2.25" PLUG (32S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNB	97	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32S)	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.

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.
  - 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 FOUNDATION 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 TREES REPLACEMENT REQUIRED
40% EVERGREEN PROVIDED	= 57
60% DECIDUOUS PROVIDED	= 85

TREE REPLANTING AREA CALCULATIONS	TOTAL TREES PROVIDED
3 CANOPY TREES / 500 SF = 28 REQUIRED	4,618 SF
5 UNDERSTORY TREES / 500 SF = 48 REQUIRED	

11,724 SF	3 CANOPY TREES / 500 SF = 71 REQUIRED
5,862 SF	5 UNDERSTORY TREES / 500 SF = 117 REQUIRED

15' TYPE A BUFFER SECTIONS

SECTION A - W/ PRIVACY FENCE	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 1211 LF
TOTAL TREES PROVIDED	= 37
UNDERSTORY TREES (5 PER 100 LF)	= 61
TOTAL UNDERSTORY TREES PROVIDED	= 61
SHRUBS (10 PER 100 LF)	= 122
TOTAL SHRUBS PROVIDED	= 122

SECTION B - W/ PRIVACY FENCE	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 380 LF
TOTAL TREES PROVIDED	= 12
UNDERSTORY TREES (5 PER 100 LF)	= 19
TOTAL UNDERSTORY TREES PROVIDED	= 19
SHRUBS (20 PER 100 LF)	= 38
TOTAL SHRUBS PROVIDED	= 38

SECTION C	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 586 LF
TOTAL TREES PROVIDED	= 18
UNDERSTORY TREES (5 PER 100 LF)	= 30
TOTAL UNDERSTORY TREES PROVIDED	= 30
SHRUBS (20 PER 100 LF)	= 118
TOTAL SHRUBS PROVIDED	= 118

SECTION D	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 122 LF
TOTAL TREES PROVIDED	= 4
UNDERSTORY TREES (5 PER 100 LF)	= 7
TOTAL UNDERSTORY TREES PROVIDED	= 7
SHRUBS (20 PER 100 LF)	= 25
TOTAL SHRUBS PROVIDED	= 25

SECTION E	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 49 LF
TOTAL TREES PROVIDED	= 2
UNDERSTORY TREES (5 PER 100 LF)	= 3
TOTAL UNDERSTORY TREES PROVIDED	= 3
SHRUBS (20 PER 100 LF)	= 10
TOTAL SHRUBS PROVIDED	= 10

SECTION F	REQUIREMENTS
CANOPY TREES (3 PER 100 LF)	= 1042 LF
TOTAL TREES PROVIDED	= 32
UNDERSTORY TREES (5 PER 100 LF)	= 53
TOTAL UNDERSTORY TREES PROVIDED	= 53
SHRUBS (20 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	= 116
TOTAL CANOPY TREES REQUIRED	= 303
TOTAL CANOPY TREES PROVIDED	= 316
2.5" CALIPER TREES REQUIRED	= 142
2" CALIPER TREES REQUIRED	= 174

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 SIGNIFICANT 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 GRADES 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 COMPLEMENT 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 PEROUS 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.
- GROUNDCOVER 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 GUYYED 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 EXCEPT FOR 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 CONTAINMENT 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 REFUSE AND DEBRIS FROM WASHING ONTO 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 AUTOMATIC TIMERS 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 MATURE SIZE.
- TREE 'TOPPING' (THE REMOVAL OF MORE THAN 25% OF A TREE'S CANOPY) IS CONSIDERED TO BE DAMAGE AND MIS-CONFIGUREMENT AND SHALL BE PROHIBITED ON ALL TREES ON PUBLIC PROPERTY, PUBLIC RIGHT-OF-WAY, REQUIRED TREE SAVE AREAS AND PARKING LOT LANDSCAPING AREAS 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 TREE OR SHRUB CONSTITUTES A HAZARD TO LIFE AND PROPERTY, OR HARBOR INSECTS OR DISEASE WHICH CONSTITUTES 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 WARRANTY. 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





Outdoor Lighting  
Roadway LED



The Roadway LED is a green solution and great fit for streets, roads, long, narrow areas and parking lots. This energy-efficient luminaire delivers the light where it is needed while increasing visibility and reducing spill light to adjoining properties. Choose low to medium light output on wood or fiberglass poles for mount on an existing pole. Available with one to four fixtures per pole, depending on the fixture/pole combination selected.

LED (Light Emitting Diode)

50 | 75 | 105 | 150 | 215 | 280 watts

Mounting heights: 25', 30', 35'

Color: Gray, Black

Poles: Fiberglass, Metal (special conditions), Wood

For additional information, visit us at [duke-energy.com/OutdoorLighting](http://duke-energy.com/OutdoorLighting) or call us toll free at 866.769.6417.



Outdoor Lighting  
Roadway LED

Light source: LED (white)  
Lumens: 4,807 - 25,050 (fixture dependent)

Wattage	Light Pattern	IESNA Backlight-Uplight - Glare (BUG) Rating
LED 50	IESNA Type III (medium oval)	B1-U0-G1
LED 75	IESNA Type II (long oval)	B1-U0-G2
LED 105	IESNA Type II (long oval)	B2-U0-G3
LED 150	IESNA Type III (medium oval)	B2-U0-G2
LED 215	IESNA Type III (medium oval)	B3-U0-G3
LED 280	IESNA Type III (medium oval)	B3-U0-G4



Color temperature: 4,000K  
Warm-up and restrike time: Instant on (no warm-up or restrike time)

Poles available:

Name	Mounting height	Color
Fiberglass	25', 30', 35'	Gray
Fiberglass	25', 30', 35'	Black (additional cost)
Wood	25', 30', 35'	Standard
Metal (special conditions)*	25', 30', 35'	Gray

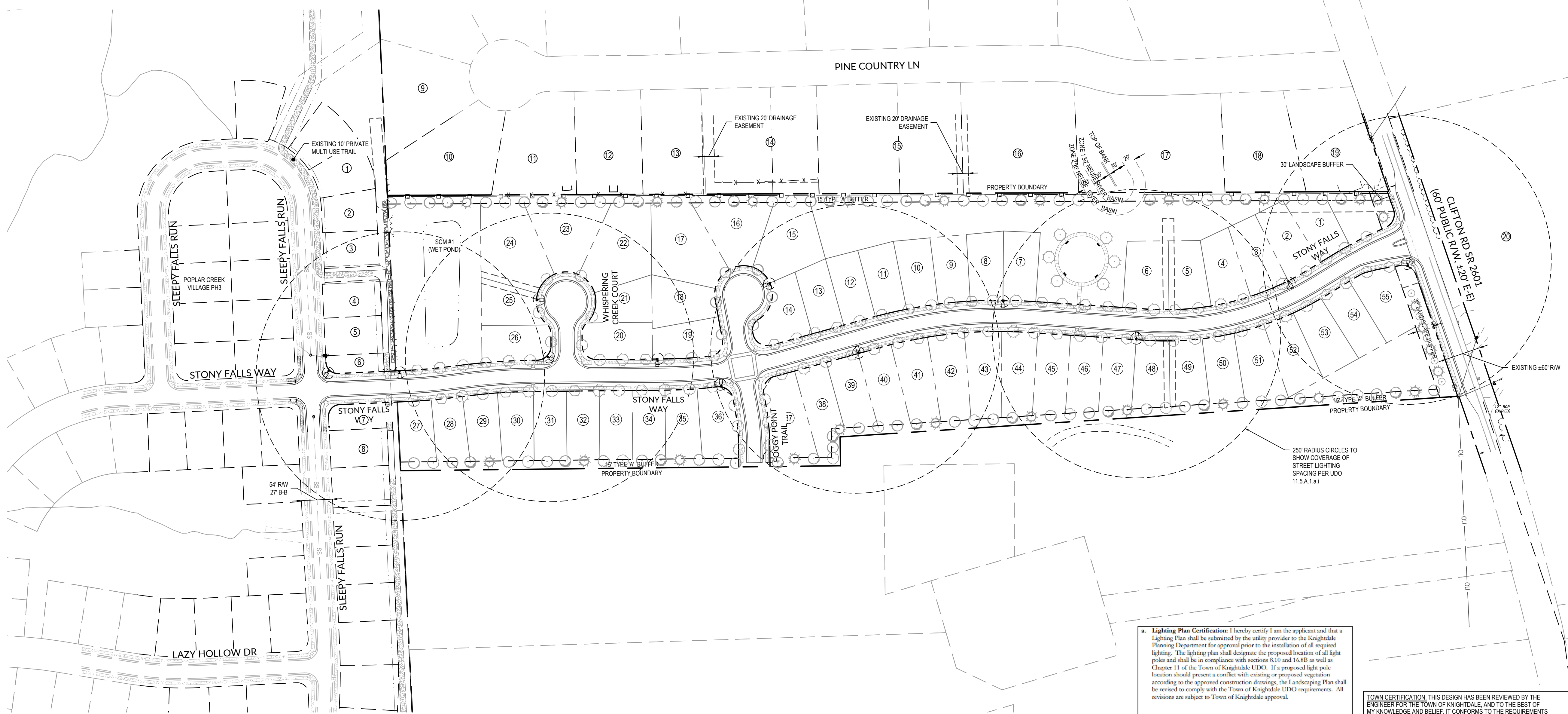
Features	Benefits
Little or no installation cost	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
Backed by over 40 years of experience	A name you can trust today ... and tomorrow

\*2" raked foundation available when required.  
©2015 Duke Energy Corporation 131307 7/15

LUMINAIRE SCHEDULE

CALLOUT	SYMBOL	LAMP	DESCRIPTION	BALLAST	MOUNTING	MODEL	VOLTS	QUANTITY
R0WY3		(1) 50W LED Array, LED	ATB0 SERIES 49W LED 700MA TYPE 3 4000K CCT	ELECTRONIC	POLE -30'	American Electric Lighting, ATB0 208LEDE70 XXXXX R3	120V 1P 2W	12

NOTE: FIXTURES ARE FULL-CUTOFF



- GENERAL NOTES
- SEE SHEET 1.0 FOR EXISTING ZONING AND PROPOSED ZONING.
  - 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 688.
  - SURROUNDING AND ADJACENT PARCEL INFORMATION IS BASED ON WAKE COUNTY GIS DATA.
  - LIMITS OF NEUSE RIPARIAN BUFFERS ARE BASED ON NCDQDWR 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. REFEREND USACE ACTION ID #SAW-2019-01418.
  - PROPERTY IS CURRENTLY NOT IN TOWN OF KNIGHTDALE ETJ.
  - STREET LIGHTS SHALL BE PROVIDED FOR POPLAR CREEK PH IV PER UDO SECTION 11.5 - STREET LIGHTING POLICY. IF UPGRADES FROM THE TOWN'S STANDARD LIGHT SPECIFICATION ARE REQUESTED, THE DEVELOPER WILL BE REQUIRED TO PAY THE TOWN THE DIFFERENCE IN THE COSTS TO MAINTAIN THE DESIRED FIXTURE AND POLE COVERING A PERIOD OF 10 YEARS.
  - ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
  - THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720174300J WITH AN EFFECTIVE DATE OF MAY 2, 2006.
  - THE TURNOUT RADIUS AT ALL INTERSECTIONS SHALL BE A MINIMUM OF 30 FEET MEASURED AT THE BACK OF CURB UNLESS OTHERWISE NOTED. THE TURNOUT RADIUS AT ALL INTERSECTIONS WITH ALLEYS SHALL BE A MINIMUM OF 17.5 FEET MEASURED AT THE BACK OF CURB.
  - ALL RIGHT-OF-WAY SHOWN HEREIN IS PUBLIC RIGHT-OF-WAY UNLESS OTHERWISE NOTED.
  - NO SIGHT OBSTRUCTION, OR PARTIALLY OBSTRUCTING WALL, FENCE, FOLIAGE, BERM, SIGN, OR PARKED VEHICLE BETWEEN THE HEIGHTS OF TWO (2) AND EIGHT (8) ABOVE THE CURB LINE ELEVATION OR THE NEAREST TRAVELED WAY IN NO CURB EXISTS SHALL BE PLACED WITHIN A SIGHT TRIANGLE.

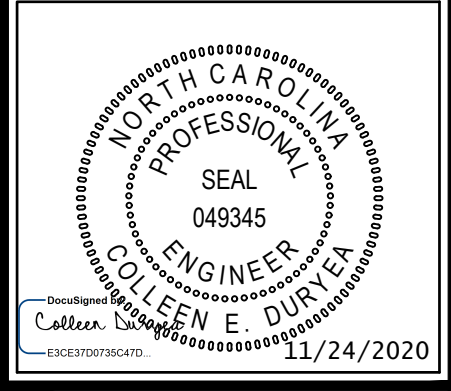
**WithersRavenel**  
Engineers | Planners | Surveyors

115 MackKram Drive | Cary, NC 27511 | P: 919-669-3300 | E: c-0852 | [www.withersravenel.com](http://www.withersravenel.com)

POPLAR CREEK VILLAGE  
PHASE IV  
TOWN OF KNIGHTDALE, NORTH CAROLINA

LIGHTING PLAN

Job No.	02190259	Drawn By	WR
Date	08/14/20	Designer	WR



Revisions

1	PER TOK COMMENTS	10/02/20
2	PER TOK & NCDOT COMMENTS	11/24/20

**Lighting Plan Certification:** I hereby certify I am the applicant and that a Lighting Plan shall be submitted by the utility provider to the Knightdale Planning Department for approval prior to the installation of all required lighting. The lighting plan shall designate the proposed location of all light poles and shall be in compliance with sections 8.10 and 16.8B as well as Chapter 11 of the Town of Knightdale UDO. If a proposed light pole location should present a conflict with existing or proposed vegetation according to the approved construction drawings, the Landscaping Plan shall be revised to comply with the Town of Knightdale UDO requirements. All revisions are subject to Town of Knightdale approval.

Date: \_\_\_\_\_ Applicant: \_\_\_\_\_  
I (officer authorized to take acknowledgments) do hereby certify that personally appeared before me this day and acknowledged the due execution of this certificate. Witness my hand and (where an official seal is required by law) official seal this \_\_\_\_ day of \_\_\_\_\_ A.D., \_\_\_\_ year.

Official Seal: \_\_\_\_\_ Notary: \_\_\_\_\_  
Commission Expires: \_\_\_\_\_

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.

