

CONSTRUCTION DRAWINGS FOR KNIGHTDALE STATION R6D AND R4 KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

AUGUST 31, 2018

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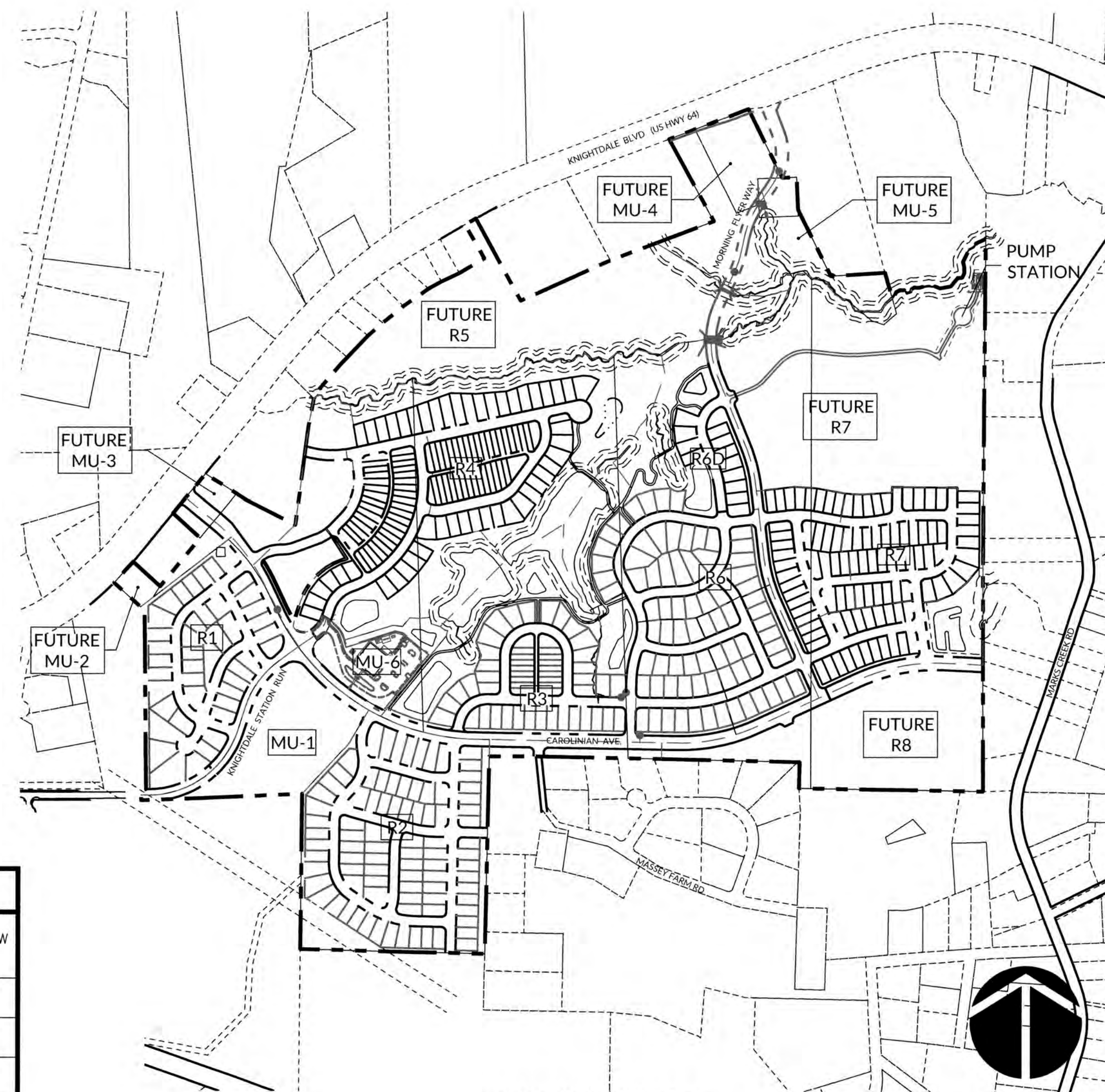
SITE DATA TABLE - PHASE R6D AND R4

KNIGHTDALE PROJECT No.	S-3-13	
OWNER	KNIGHTDALE INVESTORS, LLC.	
PARCEL PIN No.	1754868954	
EXISTING ZONING	UR12	
PROPOSED ZONING	UR12	
PROPOSED USE	SINGLE FAMILY	
TOTAL PHASE AREA	47.72 AC	
RECREATIONAL OPEN SPACE (ACTIVE)	1.17 AC	
RECREATIONAL OPEN SPACE (PASSIVE)	3.47 AC	
TOTAL OPEN SPACE	4.67 AC	
MAXIMUM DENSITY ALLOWED (UNITS/ACRE)	12	
PROPOSED DENSITY (UNITS/ACRE)	2.6	
TOTAL NUMBER OF LOTS ALLOWED	N/A	
TOTAL NUMBER OF LOTS PROVIDED	125	
TOTAL NUMBER OF PARKING SPACES PROVIDED	41	
TOTAL LINEAR FEET IN STREETS (PUBLIC)	6,203 LF	
TOTAL LINEAR FEET OF CURB & GUTTER (30")	9,099 LF	
TOTAL LINEAR FEET OF SIDEWALK	8,822 LF	
LINEAR FEET IN WATERLINES (6 IN)	172 LF	
LINEAR FEET IN WATERLINES (8 IN)	4,603 LF	
TOTAL LINEAR FEET IN STORM DRAINAGE	5,466 LF	
TOTAL LINEAR FEET IN SEWER LINES (8 IN)	3,802 LF	
PROJECTED WATER USAGE (GPD)	31,250	
(250 GPD/UNIT)		
PROJECTED SEWER USAGE (GPD)	31,250	
(250 GPD/UNIT)		
	LOTS 356-415	LOTS 416-480
MINIMUM LOT WIDTH REQUIRED	60 LF	30 LF
LOT WIDTH (TYP.)	60 LF	30 LF
MINIMUM LOT AREA PROVIDED	6,297 SF	3,930 SF
MEDIAN LOT AREA PROVIDED	7,790 SF	4,835 SF
AVERAGE LOT AREA PROVIDED	8,130 SF	4,602 SF

LOT SETBACKS

FRONT YARD	10 FT
REAR YARD	25 FT
SIDE YARD	20% OF LOT WIDTH (AGGREGATE)
	- 5 FT MIN. SETBACK PER SIDE
	(WIDTH 60' OR GREATER)
	- 3 FT MIN. SETBACK PER SIDE
	(WIDTH LESS THAN 60')
REAR SETBACK FROM LANE/ALLEY	15 FT FROM CENTERLINE
ACCESSORY STRUCTURE SIDE/REAR SETBACK	5 FT

- * PER UDO SECTION 4.6(C)(3), ACCESSORY BUILDINGS SHALL BE A MINIMUM OF 5' FROM ANY PRINCIPAL BUILDING OR OTHER ACCESSORY BUILDING.
- ** PER UDO SECTION 4.6(C), ACCESSORY BUILDINGS SHALL NOT EXCEED 800 SF, COLLECTIVELY COVER MORE THAN 20% OF THE TOTAL COMBINED AREA OF THE LOTS' REAR AND SIDE YARDS; INDIVIDUALLY EXCEED THE HEIGHT OF THE PRINCIPAL BUILDING.
- *** DRIVEWAY LENGTH FROM GARAGE TO EDGE OF ASPHALT SHALL BE A MINIMUM OF 20' ALONG ALLEYS.



VICINITY MAP



INFRASTRUCTURE DATA										
SECTIONS	AREA [AC]	UNITS	STREETS [LF]	30" CURB & GUTTER [LF]	SIDEWALK [LF]	6" WATER MAIN [LF]	8" WATER MAIN [LF]	STORM DRAINAGE [LF]	8" SEWER MAIN [LF]	SEWER FLOW [GPD]
PHASE R6D	8.8	12	685	1,377	1,359	17	667	648	686	3,000
PHASE R4 SECTION A	16.7	51	2,336	4,097	3,882	85	2,155	3,433	2,269	12,750
PHASE R4 SECTION B	22.2	62	3,182	3,625	3,581	70	1,781	1,385	847	15,500
TOTAL	47.7	125	6,203	9,099	8,822	172	4,603	5,466	3,802	31,250

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 996-4540 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 JOB SITE, OR ANY OTHER VIOLATION OF CITY OF RALEIGH STANDARDS WILL RESULT IN A FINE AND POSSIBLE EXCLUSION FROM FUTURE WORK IN THE CITY OF RALEIGH.

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

BY: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 8-31-19
ADMINISTRATOR

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # *W-3574*

AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE: 1/28/19

TOWN APPROVED STANDARDS SHALL CONTROL IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN THESE CONSTRUCTION DRAWINGS AND THE TOWN OF KNIGHTDALE'S 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 (S), 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.

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # *S-4486*

AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE: 1/28/19

PROFESSIONAL DESIGN ENGINEER CERTIFICATION, THESE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING DRAWINGS AND WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE, I, NICHOLAS J. ANTILLI, BE 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) *[Blank]* OF THESE DRAWINGS.

BY: *[Signature]* PE
DATE: 08/31/18

DEVELOPER/OWNER

KNIGHTDALE INVESTORS, LLC.
P.O. BOX 3557
CARY, NC 27519

ATTN: THAD MOORE
TELEPHONE: (919) 481-3000
FAX: (919) 677-8600

PREPARED BY:

WithersRavenel
Engineers | Planners | Surveyors

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



LINE TABLE

LINE#	BEARING	DISTANCE	LINE#	BEARING	DISTANCE	LINE#	BEARING	DISTANCE
L1	N 02°22'28" E	59.68'	L53	N 53°58'24" W	18.36'	L105	N 35°27'09" W	32.64'
L2	N 89°11'15" E	26.63'	L54	N 15°33'56" W	11.79'	L106	S 63°40'02" W	52.80'
L3	N 48°24'21" E	104.44'	L55	N 49°02'56" W	8.13'	L107	S 17°59'37" W	30.62'
L4	N 53°32'31" E	59.85'	L56	N 56°54'29" W	9.57'	L108	S 64°52'50" W	18.37'
L5	N 53°30'01" E	104.37'	L57	S 85°02'31" W	13.30'	L109	S 55°48'35" W	25.59'
L6	N 60°47'31" E	73.83'	L58	S 46°05'13" W	26.56'	L110	S 79°29'29" W	16.62'
L7	N 64°39'51" E	105.54'	L59	S 46°05'13" W	49.52'	L111	N 74°36'14" W	36.71'
L8	N 60°07'12" E	122.74'	L60	N 89°40'31" W	21.04'	L112	N 20°05'46" W	36.19'
L9	N 02°29'58" W	69.15'	L61	N 49°59'38" W	31.08'	L113	S 70°07'00" W	65.12'
L10	N 02°29'58" W	33.77'	L62	S 72°51'35" W	35.45'	L114	S 89°59'43" W	20.11'
L11	S 01°16'32" W	36.21'	L63	N 49°48'02" W	51.18'	L115	N 23°46'01" W	19.65'
L12	S 48°43'53" W	84.97'	L64	S 51°15'10" W	20.62'	L116	N 89°44'17" W	24.85'
L13	N 70°45'12" W	67.19'	L65	S 87°38'11" W	33.64'	L117	S 40°32'21" W	20.21'
L14	S 73°59'54" W	133.77'	L66	S 46°25'27" W	42.97'	L118	N 87°46'43" W	5.15'
L15	N 50°53'06" W	54.20'	L67	N 74°55'41" W	59.76'	L119	N 07°08'51" W	85.86'
L16	N 00°31'51" W	23.08'	L68	S 72°21'52" W	37.87'	L120	N 50°58'56" W	5.14'
L17	N 50°41'49" W	20.04'	L69	N 82°12'58" W	33.48'	L120A	S 45°54'58" E	22.43'
L18	N 89°27'22" W	23.41'	L70	N 61°41'08" W	30.52'	L121	N 31°17'10" E	13.42'
L19	N 82°35'53" W	20.45'	L71	S 52°21'42" W	23.32'	L122	N 61°23'47" E	19.81'
L20	N 41°06'34" W	18.42'	L72	S 77°17'26" W	36.88'	L123	N 60°07'43" E	25.12'
L21	N 80°29'28" W	17.09'	L73	N 33°08'56" W	19.46'	L124	S 35°28'34" E	14.00'
L22	N 63°40'12" W	21.24'	L74	N 07°18'23" W	29.24'	L125	S 49°04'08" E	6.98'
L23	S 80°43'26" W	27.76'	L75	S 09°07'39" W	36.83'	L126	S 78°45'33" E	21.02'
L24	N 44°35'57" W	61.10'	L76	S 53°46'53" W	51.77'	L127	N 00°41'35" E	15.64'
L25	S 81°50'32" W	13.86'	L77	S 89°29'30" W	11.01'	L128	N 64°19'57" E	21.82'
L26	S 74°43'25" W	41.09'	L78	S 82°38'11" W	51.09'	L129	S 89°48'12" E	23.02'
L27	S 00°00'33" E	32.13'	L79	N 84°40'31" W	12.45'	L130	N 79°48'20" E	24.25'
L28	S 40°28'50" W	30.51'	L80	N 64°00'43" W	25.92'	L131	N 80°07'23" E	31.84'
L29	S 18°04'04" E	18.83'	L81	S 87°55'54" W	49.90'	L132	S 89°11'45" E	31.66'
L30	S 09°59'20" W	17.56'	L82	N 33°11'44" W	13.97'	L133	N 68°43'59" E	28.48'
L31	S 09°59'20" W	43.25'	L83	S 82°07'50" W	43.93'	L134	N 72°27'38" E	56.20'
L32	S 38°35'35" W	39.85'	L84	S 60°04'36" W	20.77'	L135	N 39°33'27" E	56.30'
L33	S 31°21'51" W	38.85'	L85	N 87°48'04" W	44.59'	L136	N 87°19'56" E	22.92'
L34	S 73°07'15" W	76.44'	L86	S 66°47'52" W	23.50'	L137	N 27°13'21" E	27.33'
L35	N 71°16'18" W	27.65'	L87	N 71°24'54" W	57.45'	L138	N 01°34'30" W	33.94'
L36	S 44°22'24" W	31.42'	L88	N 89°09'54" W	36.97'	L139	N 13°45'00" W	27.28'
L37	N 78°15'11" W	41.45'	L89	S 62°12'44" W	36.41'	L140	N 25°45'01" E	75.79'
L38	S 61°02'28" W	70.91'	L90	N 49°38'30" W	8.51'	L141	N 87°39'44" W	24.74'
L39	N 30°43'56" W	25.78'	L91	S 79°15'31" W	17.00'	L142	N 38°13'27" E	22.36'
L40	S 70°38'12" W	9.74'	L92	S 59°32'56" W	66.69'	L143	N 89°15'43" E	48.28'
L41	S 54°48'25" W	14.31'	L93	N 77°21'33" W	59.32'	L144	N 38°13'05" E	11.57'
L42	S 02°18'08" W	18.51'	L94	N 06°52'36" W	22.63'	L145	N 00°12'38" W	123.18'
L43	S 49°01'05" W	42.25'	L95	N 87°25'13" W	11.49'	L147	S 00°02'36" E	114.07'
L44	S 64°52'52" W	68.84'	L96	S 59°10'15" W	13.15'	L148	S 00°02'54" W	128.44'
L45	N 48°41'18" W	28.35'	L97	S 58°30'47" W	20.15'	L149	S 15°31'14" E	140.92'
L46	S 77°22'44" W	100.00'	L98	S 47°14'39" W	16.38'	L150	N 87°39'18" E	77.48'
L47	S 82°47'15" W	124.79'	L99	S 87°10'27" W	38.41'			
L48	S 54°21'12" W	64.74'	L100	S 26°18'42" W	50.48'			
L49	S 45°52'21" W	110.19'	L101	S 69°29'45" W	36.99'			
L50	N 59°01'39" W	27.59'	L102	N 69°45'05" W	10.17'			
L51	N 71°44'52" W	43.28'	L103	S 43°10'59" W	44.16'			
L52	S 54°16'37" W	80.25'	L104	N 86°16'58" W	42.67'			

WithersRavenel
Engineers | Planners | Surveyors

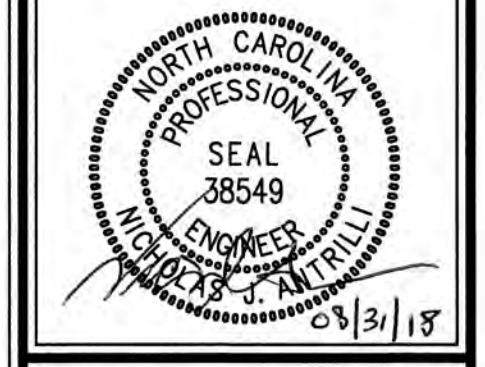
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**KNIGHTDALE STATION
R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**OVERALL EXISTING
CONDITIONS**

Job No.	02090251.6	Drawn By	W&R
Date	06/08/2018	Designer	W&R



Revisions		
1	1st TOK Comments	08/31/18

BY: *[Signature]* DATE: 8/31/2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2/10/19
ADMINISTRATOR

Sheet No.

1.0

1 inch = 200 ft.

K:\09\09-02090251.6\Knightdale Station Phase III\CAD\MASTER CONSTRUCTION DRAWINGS\1.0 OVERALL EXISTING CONDITIONS.dwg Thursday, August 30, 2018 8:49:46 PM - CURTIS COLLIER

D.B. 11604, PG. 2187
PIN NO. 1754.08-77-8974

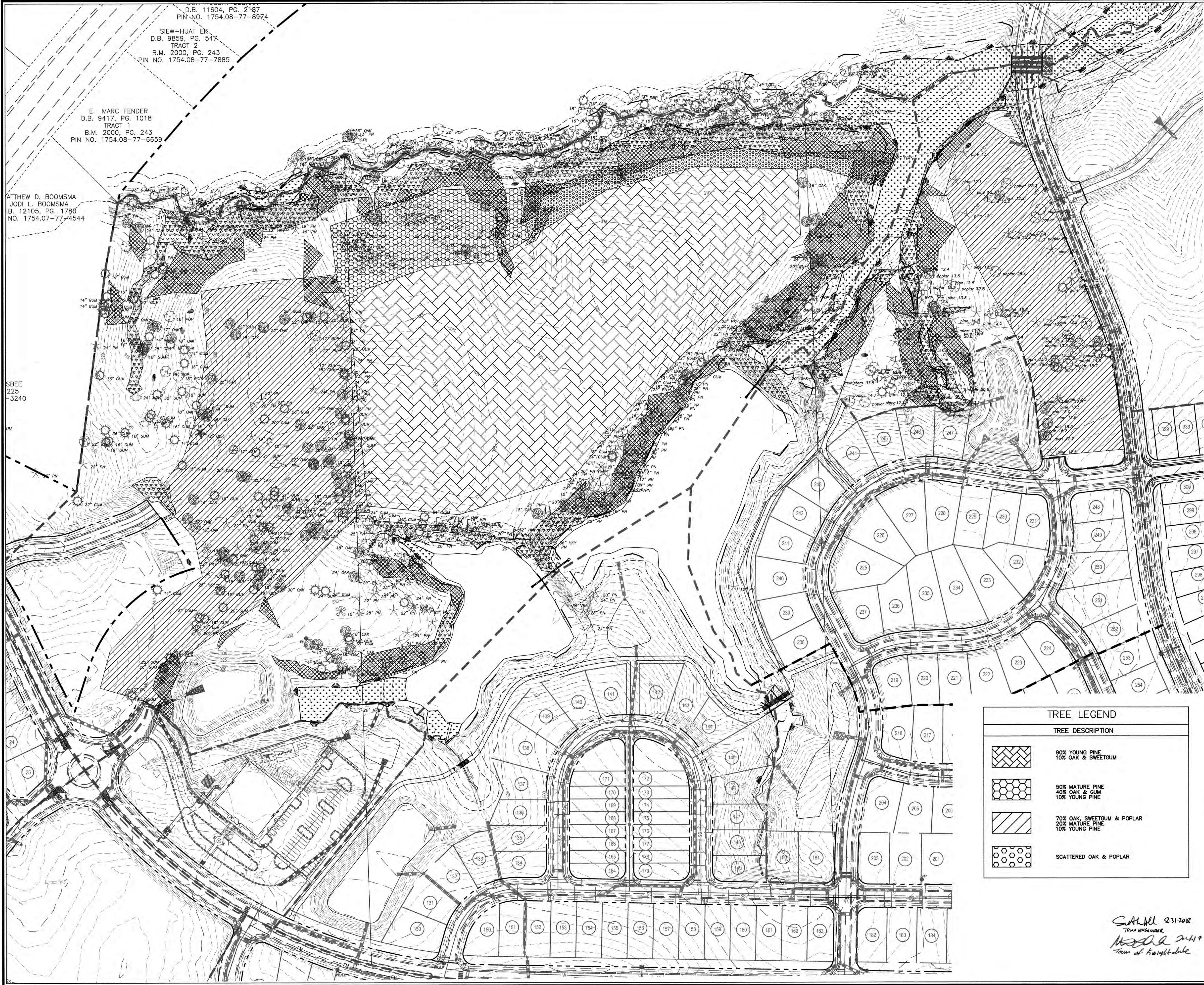
SIEW-HUAT EK
D.B. 9859, PG. 547
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885

E. MARC FENDER
D.B. 9417, PG. 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

ATTHEW D. BOOMSMA
JODI L. BOOMSMA
B. 12105, PG. 1780
NO. 1754.07-77-4544

SBEE
225
-3240

K:\09\09\0209\020516\Knightdale Station R6D AND R4\EXISTING CONDITIONS.dwg Thursday, August 30, 2018 8:00:13 PM - D:\RYKA COLLEEN



TREE LEGEND

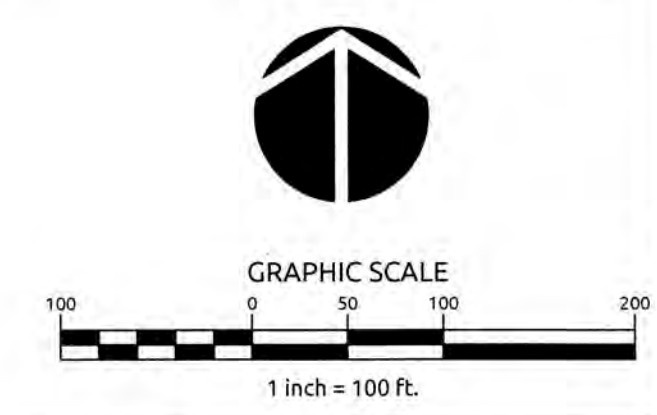
- MAPLE
- HICKORY
- PINE
- OAK
- GUM
- HOLLY
- POPLAR
- CEDAR
- SYCAMORE
- PERSIMMON
- ELM

NOTE:
- SEE SHEET 2.0 KNIGHTDALE STATION SITE PLAN FOR TREE PROTECTION AND REPLACEMENT CALCULATIONS
- SEE SHEET L1.0 - L1.3 FOR LOCATIONS OF REPLACEMENT TREES

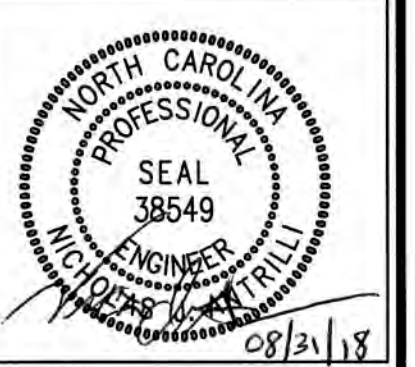
TREE LEGEND	
TREE DESCRIPTION	
	90% YOUNG PINE 10% OAK & SWEETGUM
	50% MATURE PINE 40% OAK & GUM 10% YOUNG PINE
	70% OAK, SWEETGUM & POPLAR 20% MATURE PINE 10% YOUNG PINE
	SCATTERED OAK & POPLAR

EXISTING SLOPE LEGEND	
SLOPE DESCRIPTION	
	SLOPES 15% - 25%
	SLOPES > 25%

Scale 231-2018
Town of Knightdale
08/31/18



Job No. 02090251.6 Drawn by W&R
Date 06/08/2018 Designer W&R



Revisions
1 1st TOK Comments 08/31/18



SITE DATA

TOTAL SITE AREA: 278.81 AC

PROPOSED ZONING

TRACT	AREA (AC)	EXISTING PROPOSED ZONING	PROPOSED USE
R6D	8.92 AC	UR12	SF
R4	38.9 AC	UR12	SF

SF: SINGLE - FAMILY

* TRACT AREAS ARE BASED ON GROSS AREAS INCLUDING OPEN SPACE, RIPARIAN BUFFERS, & PROPOSED RIGHT-OF-WAYS.

TREE CANOPY SUMMARY

OVERALL TREE COVER AREA REQUIRED PER UAA	= 8.90 AC
TREE COVER AREA PROVIDED BY R1 & R2 (BM 2014, PG 1718)	= 2.19 AC
TREE COVER AREA PROVIDED BY R3 (TO BE DEDICATED)	= 0.79 AC
TREE COVER AREA PROVIDED BY R6A-C (TO BE DEDICATED)	= 1.34 AC
TREE COVER AREA PROVIDED BY R7A-C (TO BE DEDICATED)	= 0.36 AC
TREE COVER AREA PROVIDED BY R8D (TO BE DEDICATED)	= 2.22 AC
TREE COVER AREA PROVIDED BY R4 (TO BE DEDICATED)	= 5.33 AC
TREE COVER AREA PROVIDED BY R1, R2, R3, R6, R7, R8D, R4	= 12.33 AC

PROJECT AREA - R1 & R2	= 41.89 AC
PROJECT AREA - R3	= 20.01 AC
PROJECT AREA - R6A-C	= 30.90 AC
PROJECT AREA - R7A-C	= 25.00 AC
THALES	= 4.56 AC
MU-1	= 8.06 AC
PROJECT AREA - R4	= 8.82 AC
PROJECT AREA - R8	= 38.9 AC
TOTAL TRACT AREA APPROVED/RECORDED (TO DATE)	= 178.17 AC
TOTAL SITE ACREAGE	= 278.81 AC
TREE CANOPY AREA REQUIRED (TO DATE)	= 12.33 AC
(178.17 AC) x (8.9 AC)	= 5.69 AC
(278.81 AC)	= 5.69 AC

12.33 AC PROVIDED > 5.69 AC REQUIRED (TO DATE)

REMAINING TREE COVER AREA REQUIRED FOR FUTURE PHASES PER UAA = 0 AC

RECREATIONAL OPEN SPACE SUMMARY

OVERALL RECREATIONAL OPEN SPACE REQUIRED PER UAA	= 17.00 AC (8.50 AC ACTIVE)
OPEN SPACE AREA PROVIDED BY R1 & R2	= 7.83 AC (ACTIVE)
OPEN SPACE AREA PROVIDED BY R3	= 2.87 AC (ACTIVE & PASSIVE)
OPEN SPACE AREA PROVIDED BY R6	= 1.93 AC (ACTIVE & PASSIVE)
OPEN SPACE AREA PROVIDED BY R7	= 0.10 AC (PASSIVE)
OPEN SPACE AREA PROVIDED BY R8D	= 0.97 AC (ACTIVE & PASSIVE)
OPEN SPACE AREA PROVIDED BY R4	= 3.67 AC (ACTIVE & PASSIVE)
OPEN SPACE AREA PROVIDED BY R1, R2, R3, R6, R7, R8D, R4	= 17.37 AC
RECREATIONAL OPEN SPACE PROVIDED	= 10.72 AC (ACTIVE)
RECREATIONAL OPEN SPACE PROVIDED	= 6.65 AC (PASSIVE)

TOTAL TRACT AREA APPROVED/RECORDED (TO DATE)	= 178.17 AC
TOTAL SITE ACREAGE	= 278.81 AC
OPEN SPACE AREA REQUIRED (TO DATE)	= 17.00 AC
(178.17 AC) x (17.0 AC)	= 10.86 AC (5.43 ACTIVE)
(278.81 AC)	= 10.86 AC (5.43 ACTIVE)

17.37 AC PROVIDED > 10.86 AC REQUIRED (TO DATE)

REMAINING RECREATIONAL OPEN SPACE REQUIRED FOR FUTURE PHASES PER UAA = 0 AC (0.00 AC ACTIVE)

R4 TREE PROTECTION

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	4	2	2	-	-	-	-
TIER 2	33	31	2	-	-	-	35
TIER 3	50	-	50	-	-	-	100

R6D TREE PROTECTION

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	-	-	-	-	-	-	-
TIER 2	7	5	2	-	-	-	9
TIER 3	4	-	4	-	-	-	8

*PER TOK UDO SECTION 8.5, REPLACEMENT TREES FOR TIER 2 AND TIER 3 SHALL BE PLANTED AT A RATE OF 1 TREE PER 12" DBH.
NOTE: 152 - REPLACEMENT TREES WILL BE REQUIRED TO BE PLANTED. REPLACEMENT TREES WILL BE PLANTED IN PROPOSED BUFFER YARD LOCATIONS, OPEN SPACE AND ADJACENT TO GREENWAYS. SEE LANDSCAPE PLAN FOR BUFFER YARD PLANTING DETAILS.

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-4196
AUTHORIZATION TO CONSTRUCT Green Mt. Sample
DATE 1/28/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

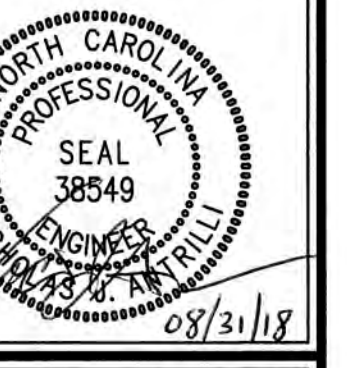
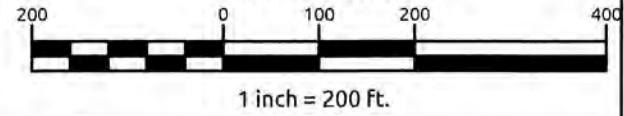
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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
AUTHORIZATION TO CONSTRUCT Green Mt. Sample
DATE 1/28/19

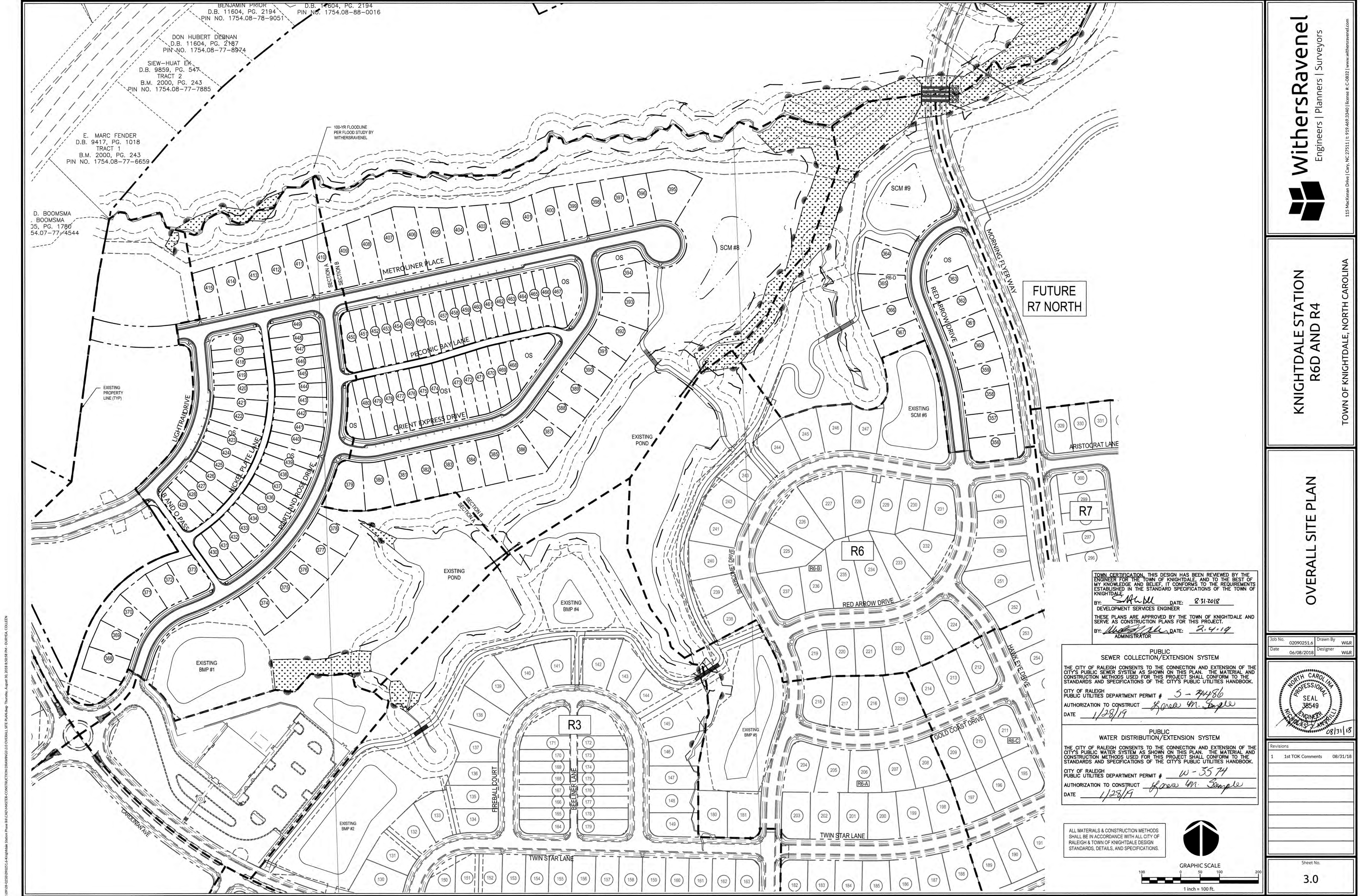
ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



GRAPHIC SCALE



Revisions
1 1st TOK Comments 08/31/18



BENJAMIN PRIOR
D.B. 11604, PG. 2194
PIN NO. 1754.08-78-9051

DON HUBERT DEBNAH
D.B. 11604, PG. 2187
PIN NO. 1754.08-77-8974

SIEW-HUAT EK.
D.B. 9859, PG. 547
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885

E. MARC FENDER
D.B. 9417, PG. 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

D. BOOMSMA
BOOMSMA
J5, PG. 1780
54.07-77-4544

100-YR FLOODLINE
PER FLOOD STUDY BY
WITHERSRAVENEL

FUTURE
R7 NORTH

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: *[Signature]* DATE: 8/31/18
DEVELOPMENT SERVICES ENGINEER

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BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-74486
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE 1/28/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE 1/28/19

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WithersRavenel
Engineers | Planners | Surveyors

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

KNIGHTDALE STATION
R6D AND R4

TOWN OF KNIGHTDALE, NORTH CAROLINA

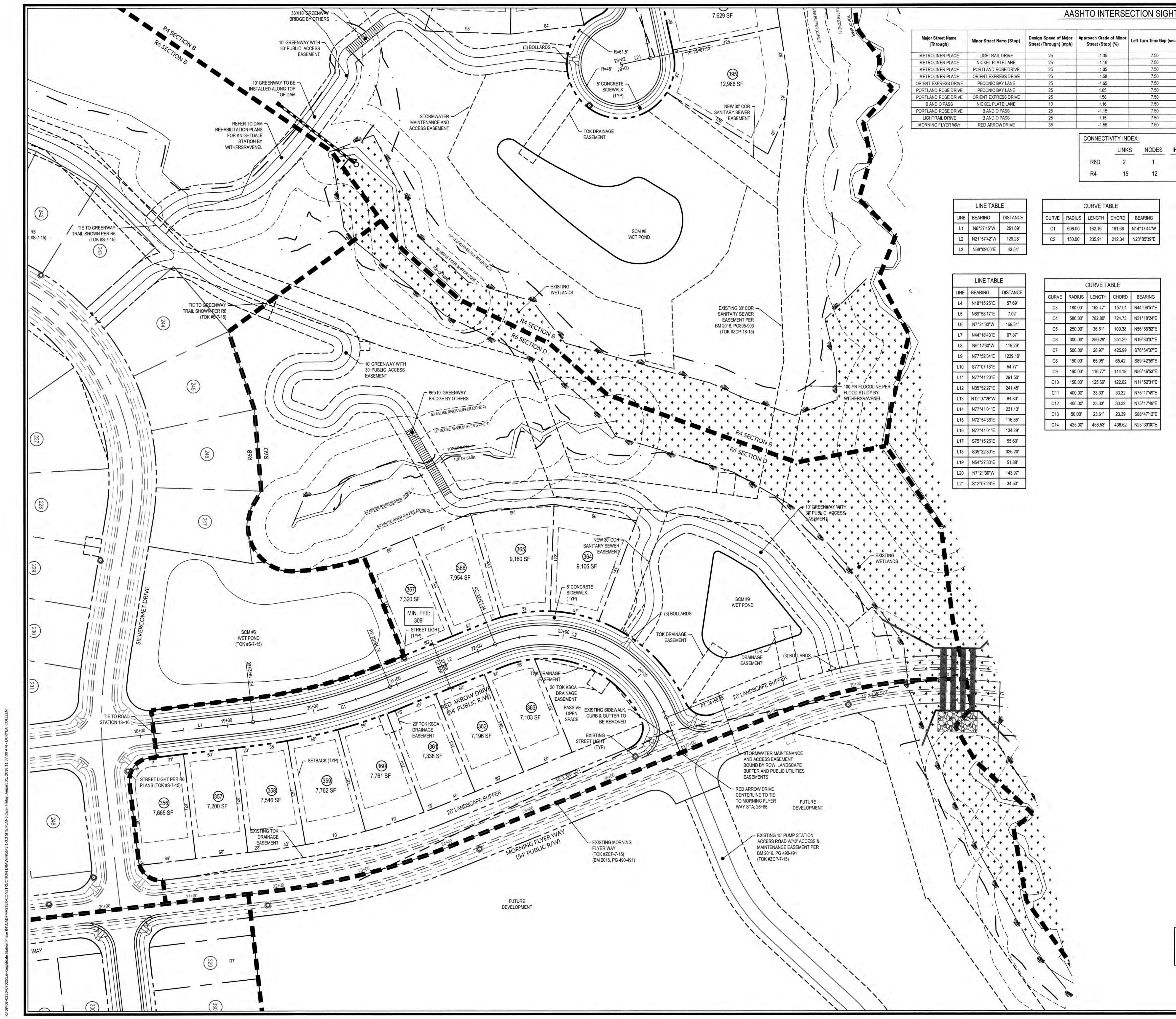
OVERALL SITE PLAN

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R

Revisions
1 1st TOK Comments 08/31/18

Sheet No.
3.0

K:\09\09-0250\090251-6-Knightdale Station R6C&D MASTER CONSTRUCTION DRAWINGS\3.0 OVERALL SITE PLAN.dwg: Thursday, August 30, 2018 8:50:08 PM - DUREYA, COLLEEN



AASHTO INTERSECTION SIGHT DISTANCE SUMMARY

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.)
METROLINER PLACE	LIGHTRAIL DRIVE	25	-1.35	7.50	6.50	276	239	280	240
METROLINER PLACE	NICKEL PLATE LANE	25	-1.16	7.50	6.50	276	239	280	240
METROLINER PLACE	PORTLAND ROSE DRIVE	25	-1.05	7.50	6.50	276	239	280	240
METROLINER PLACE	ORIENT EXPRESS DRIVE	25	-1.58	7.50	6.50	276	239	280	240
ORIENT EXPRESS DRIVE	PECONIC BAY LANE	25	1.65	7.50	6.50	276	239	280	240
PORTLAND ROSE DRIVE	PECONIC BAY LANE	25	1.65	7.50	6.50	276	239	280	240
PORTLAND ROSE DRIVE	ORIENT EXPRESS DRIVE	25	1.58	7.50	6.50	276	239	280	240
B AND O PASS	NICKEL PLATE LANE	10	1.16	7.50	6.50	110	96	110	100
PORTLAND ROSE DRIVE	B AND O PASS	25	-1.15	7.50	6.50	276	239	280	240
LIGHTRAIL DRIVE	B AND O PASS	25	1.15	7.50	6.50	276	239	280	240
MORNING FLYER WAY	RED ARROW DRIVE	35	-1.55	7.50	6.50	386	334	390	335

CONNECTIVITY INDEX:

	LINKS	NODES	INDEX
R6D	2	1	2.0
R4	15	12	1.25

LINE TABLE

LINE	BEARING	DISTANCE
L1	N6°37'45"W	261.69'
L2	N21°57'42"W	129.28'
L3	N68°09'00"E	43.54'

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD	BEARING
C1	606.00'	162.16'	161.68'	N14°17'44"W
C2	150.00'	235.91'	212.34'	N23°05'39"E

LINE TABLE

LINE	BEARING	DISTANCE
L4	N18°15'25"E	57.69'
L5	N69°58'17"E	7.02'
L6	N7°21'30"W	169.31'
L7	N44°18'45"E	67.87'
L8	N5°12'30"W	119.29'
L9	N77°52'34"E	1239.19'
L10	S77°07'18"E	54.77'
L11	N77°41'20"E	291.50'
L12	N35°52'27"E	241.45'
L13	N12°07'28"W	84.80'
L14	N77°41'01"E	231.13'
L15	N72°54'36"E	116.85'
L16	N77°41'01"E	134.29'
L17	S75°15'28"E	55.60'
L18	S35°32'07"E	326.20'
L19	N54°27'30"E	51.88'
L20	N7°21'30"W	143.97'
L21	S12°07'28"E	34.50'

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD	BEARING
C3	180.00'	162.47'	157.01'	N44°06'51"E
C4	580.00'	782.80'	724.73'	N31°18'24"E
C5	250.00'	36.51'	109.38'	N59°56'52"E
C6	300.00'	258.29'	251.29'	N19°33'07"E
C7	500.00'	28.97'	425.99'	S76°54'37"E
C8	150.00'	65.95'	65.42'	S89°42'59"E
C9	160.00'	116.77'	114.19'	N58°46'53"E
C10	150.00'	125.66'	122.02'	N11°52'31"E
C11	400.00'	33.33'	33.32'	N75°17'49"E
C12	400.00'	33.33'	33.32'	N75°17'49"E
C13	50.00'	23.61'	23.39'	S88°47'12"E
C14	425.00'	458.53'	436.62'	N23°33'00"E

ROAD	SPEED LIMIT	CLASSIFICATION
RED ARROW DRIVE	25 MPH	LOCAL STREET
LIGHTRAIL DRIVE	25 MPH	LOCAL STREET
METROLINER PLACE	25 MPH	LOCAL STREET
ORIENT EXPRESS DRIVE	25 MPH	LOCAL STREET
PORTLAND ROSE DRIVE	25 MPH	LOCAL STREET
B AND O PASS	10 MPH	ALLEY
NICKEL PLATE LANE	10 MPH	ALLEY
PECONIC BAY LANE	10 MPH	ALLEY

SITE IMPERVIOUS - R6D & R4 A-B

TOTAL TRACT AREA	47.72 AC
SUBDIVISION ROADWAYS & SIDEWALKS	4.74 AC
LOT IMPERVIOUS AREA (60 LOTS @ 3,500 SF/LOT)	4.82 AC
LOT IMPERVIOUS AREA (65 LOTS @ 2,400 SF/LOT)	3.58 AC
PROPOSED PERCENT IMPERVIOUS (13.1 AC/47.72 AC)	27.5%
EXISTING PERCENT IMPERVIOUS (0.39 AC/47.72 AC)	0.82%

- GENERAL NOTES**
- SEE SHEET 2.0 FOR EXISTING ZONING AND PROPOSED ZONING.
 - BOUNDARY SURVEY PERFORMED BY WITHERSRAVENEL.
 - WETLANDS AND STREAM BUFFERS DELINEATED AND SURVEYED BY WITHERSRAVENEL.
 - PROPERTY ANNEXED INTO TOWN OF KNIGHTDALE SEPT. 3, 2013.
 - WATER ALLOCATION HAS BEEN AWARDED BASED ON THE UTILITY ALLOCATION AND INFRASTRUCTURE AGREEMENT, D.B. 01472, PAGES 0176 - 0183 & SUBSEQUENT AMENDMENTS.
 - STREET LIGHTS SHALL BE PROVIDED FOR R7 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 3720175400U AND 3720175400L, WITH AN EFFECTIVE DATE OF MAY 2, 2006.
 - DIVISION OF WATER QUALITY (DWQ) AND/OR UNITED STATES ARMY CORPS OF ENGINEERS (USACE) APPROVAL SHALL BE REQUIRED PRIOR TO CONSTRUCTION WITHIN WETLANDS OR STREAM BUFFER AREAS.
 - 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.
 - THE MIDDLE OF THE 3 BOLLARDS AT THE GREENWAY CONNECTIONS SHALL BE REMOVABLE.

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: *[Signature]* DATE: 8/31/2018
DEVELOPMENT SERVICES ENGINEER

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BY: *[Signature]* DATE: 2.4.19
ADMINISTRATOR

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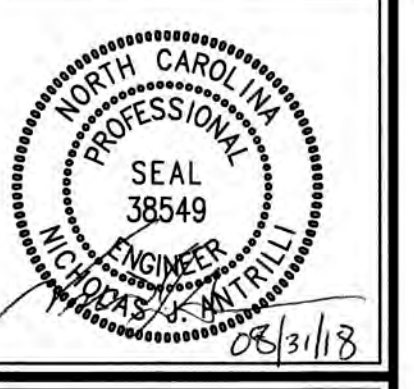
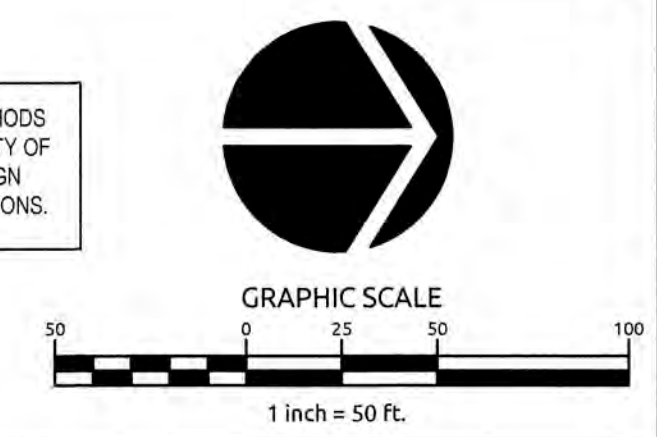
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-4456
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE 1/23/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE 1/29/19

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Revisions

1	1st TOK Comments	08/31/18
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K:\09\05\020\02021-1-Knightdale Station Phase 1\KCADMASTER-CONSTRUCTION\DRAWINGS\3.1-3.3 SITE PLANS.dwg - Pfiley, August 31, 2018 1:37:00 AM - COURTESY COLLEEN



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.

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *S-4456*

AUTHORIZATION TO CONSTRUCT *[Signature]*

DATE: *1/29/19*

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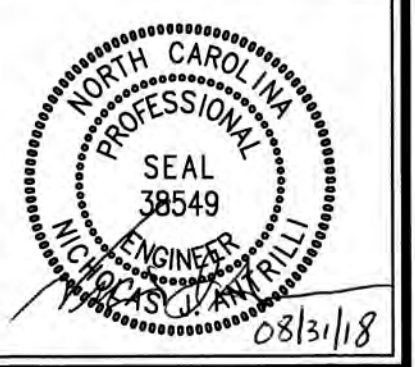
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *W-3574*

AUTHORIZATION TO CONSTRUCT *[Signature]*

DATE: *1/29/19*

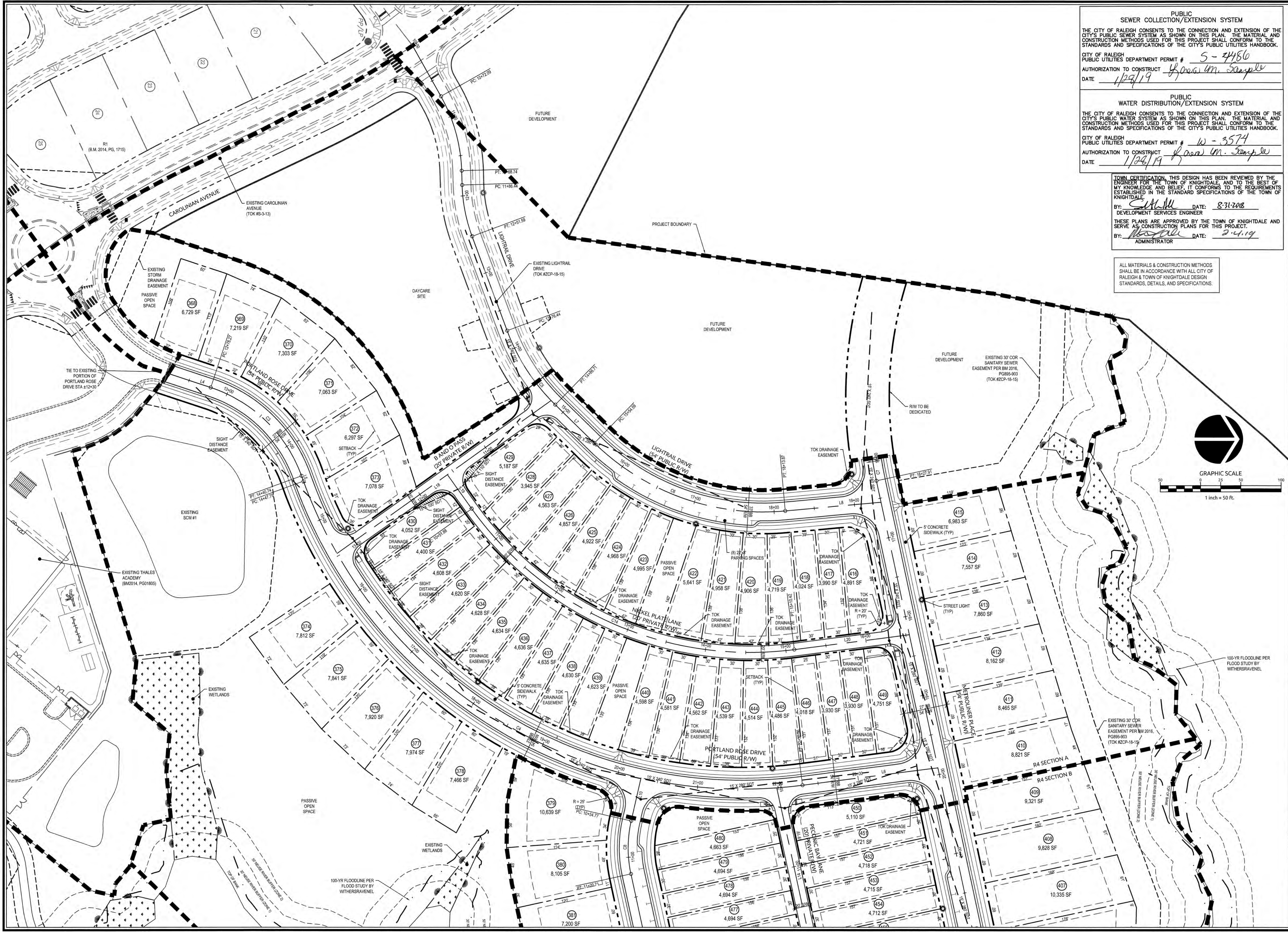
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GRAPHIC SCALE



Revisions		
1	1st TOK Comments	08/31/18

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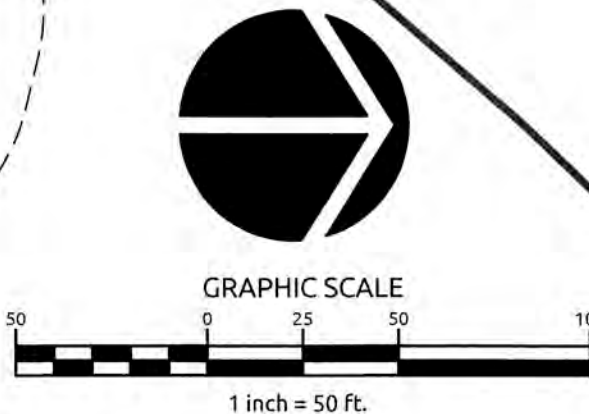


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 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-2456
 AUTHORIZATION TO CONSTRUCT James M. Sample
 DATE 1/29/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
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 AUTHORIZATION TO CONSTRUCT James M. Sample
 DATE 1/29/19

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 BY: [Signature] DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
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 BY: [Signature] DATE: 8-31-19
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WithersRavenel
 Engineers | Planners | Surveyors

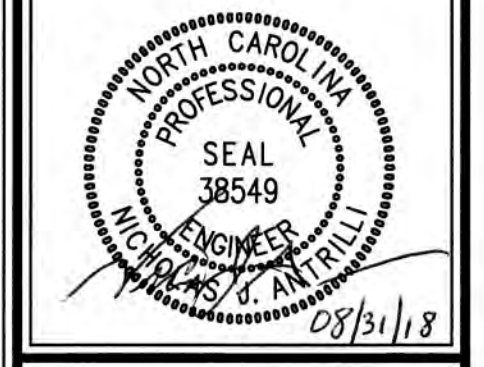
115 MacKean Drive | Cary, NC 27511 | 919.469.3340 | License # C-0832 | www.withersravenel.com

**KNIGHTDALE STATION
 R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

SITE PLAN

Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions	1st TOK Comments	08/31/18
1	1st TOK Comments	08/31/18

Sheet No.
3.3

K:\019\02090251.6-Knightdale Station Phase R4-CADD\MASTER CONSTRUCTION DRAWINGS\3.3 SITE PLANS.dwg - Thursday, August 30, 2018 8:51:46 PM - DARYLA COLLEEN



- PAVEMENT MARKINGS & 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 SIGNS SHALL FOLLOW THE TOWN OF KNIGHTDALE DETAIL 3.17.
 5. PARKING PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT TO TOWN OF KNIGHTDALE STANDARDS.

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: S. McAll DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER

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BY: [Signature] DATE: 2-4-19
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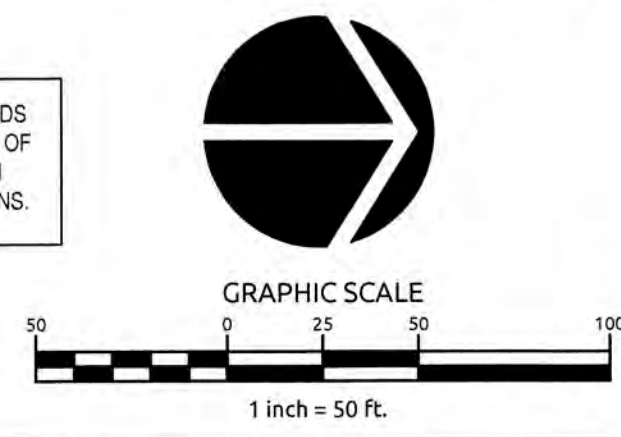
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-4486
 AUTHORIZATION TO CONSTRUCT [Signature]
 DATE 1/28/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

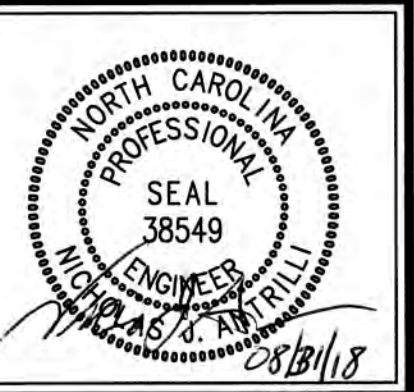
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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT [Signature]
 DATE 1/28/19

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Job No: 02090251.d Drawn By: W&R
 Date: 06/08/2018 Designer: W&R



Revisions		
1	1st TOK Comments	08/31/18

K:\07\0206\02051 - Knightdale Station Phase 8\4-CAD\MASTER-CONSTRUCTION DRAWINGS\3.4.3-A PAVEMENT MARKING & SIGNAGE PLANS.dwg Plot: August 31, 2018 8:58:39 AM - DWYTKA, COLLEEN

K:\09\09250\09251-A Knightdale Station R6D AND R4 R6D AND R4 PAVEMENT MARKING & SIGNAGE PLANS.dwg - Thursday, August 30, 2018 8:52:12 PM - DUREYA, COLLEEN

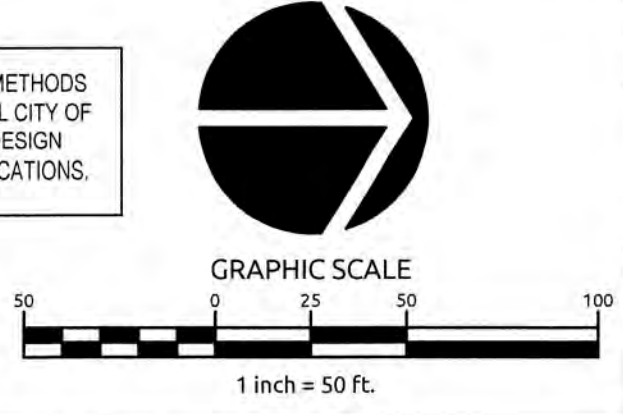


TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.
 BY: S. Hall DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: [Signature] DATE: 2-14-19
 ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4456
 AUTHORIZATION TO CONSTRUCT [Signature]
 DATE: 1/29/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT [Signature]
 DATE: 1/29/19

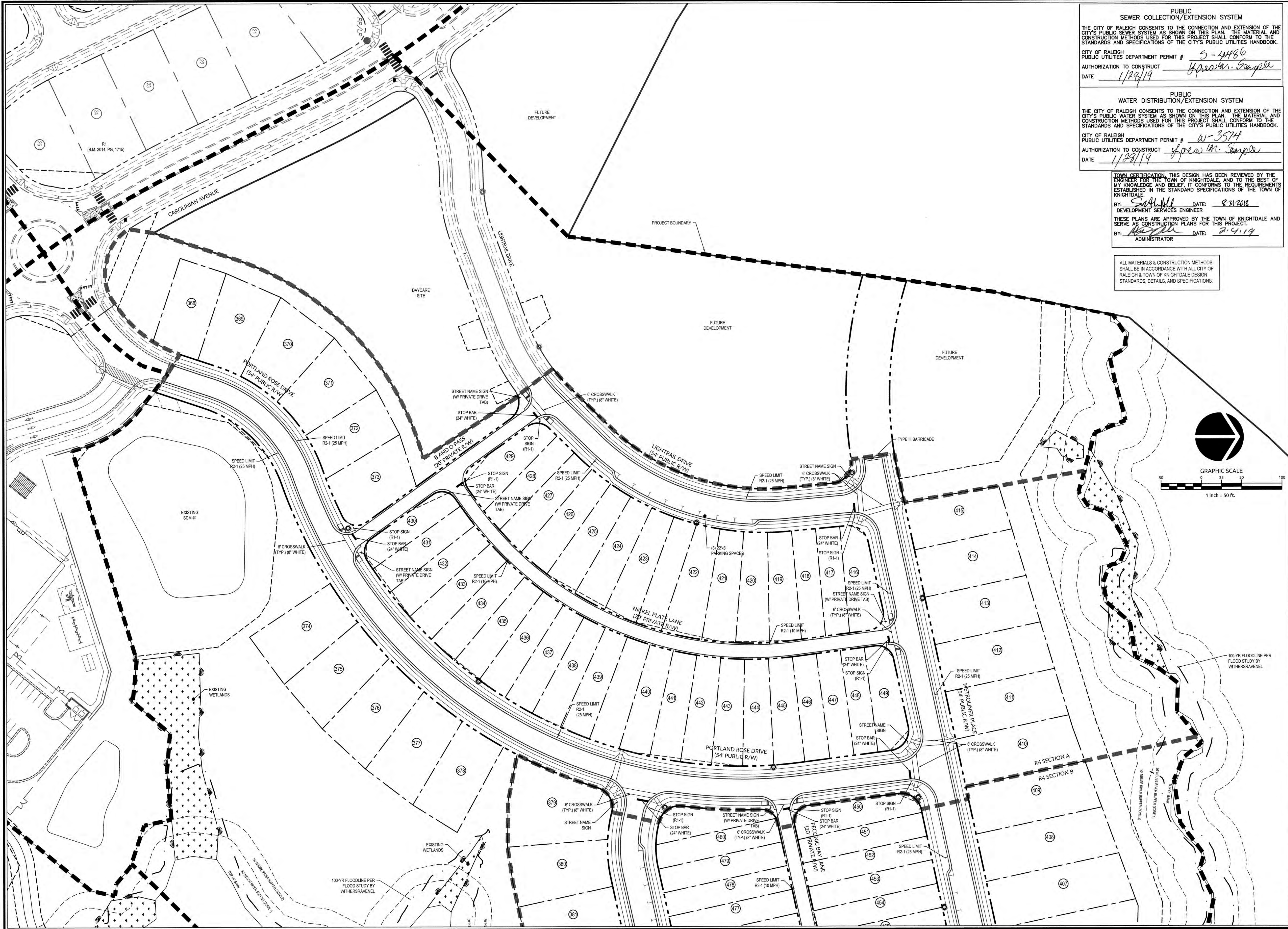
ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions		
1	1st TOK Comments	08/31/18

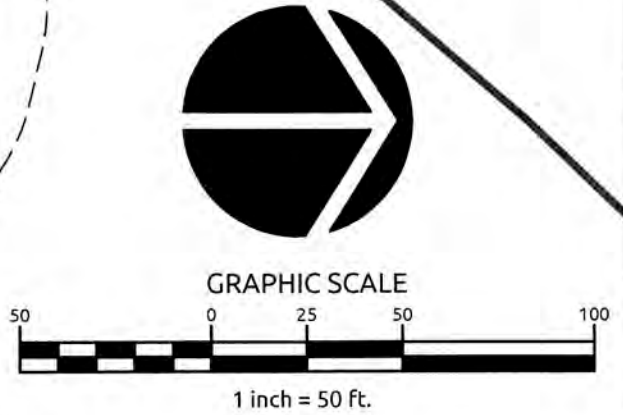


PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
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 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4466
 AUTHORIZATION TO CONSTRUCT H. Sample
 DATE 1/28/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
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 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT H. Sample
 DATE 1/28/19

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: [Signature] DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: [Signature] DATE: 2-9-19
 ADMINISTRATOR

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



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**KNIGHTDALE STATION
 R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**PAVEMENT MARKING &
 SIGNAGE PLAN**

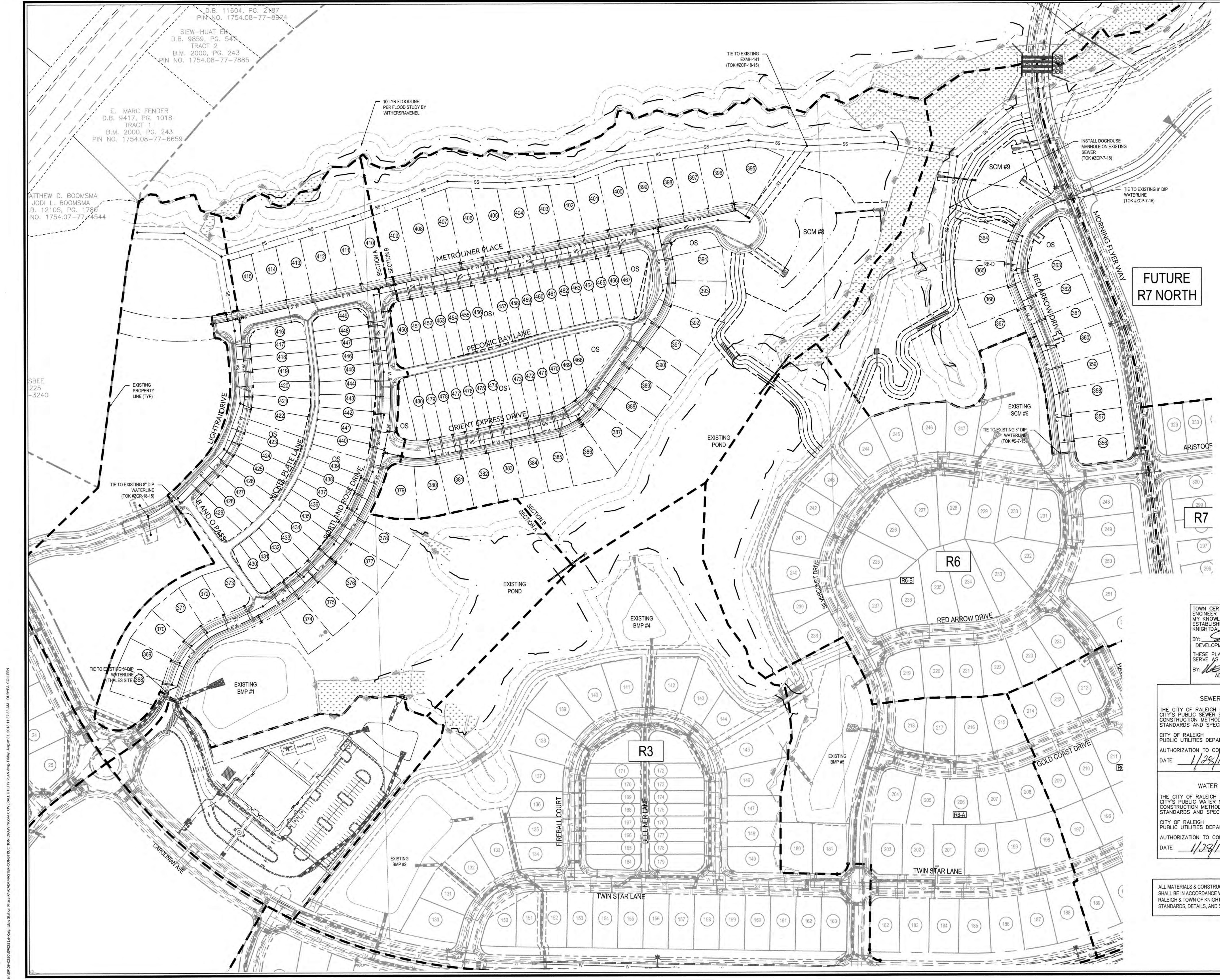
Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions		
1	1st TOK Comments	08/31/18

Sheet No.
3.6

N:\07\09\0250\0251.6 Knightdale Station R6D R4\CONSTRUCTION DRAWINGS\3.6-PAVEMENT MARKING & SIGNAGE PLANS.dwg - Thursday, August 30, 2018 8:52:38 PM - DURETA, COLLEEN



D.B. 11604, PG. 2 of 7
PIN NO. 1754.08-77-8874

SIEW-HUAT EISENBERG
D.B. 9859, PG. 54 of 54
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885

E. MARC FENDER
D.B. 9417, PG. 1018 of 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

ATTHEW D. BOOMSMA
JODI L. BOOMSMA
B. 12105, PG. 1788 of 1788
NO. 1754.07-77-4544

FUTURE R7 NORTH

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: *[Signature]* DATE: **8-31-2018**
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: **2-4-19**
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

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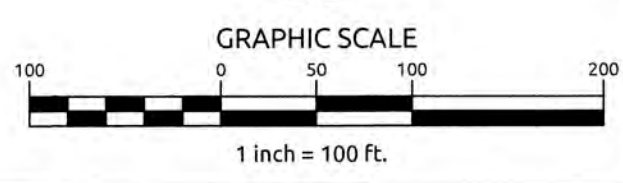
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # **S-4486**
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE **1/28/19**

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # **W-3574**
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE **1/28/19**

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



Job No. 02090251.6	Drawn By W&R
Date 06/08/2018	Designer W&R



Revisions	1st TOK Comments	08/31/18
1		

K:\09\0209\02051.6\Knightdale Station\02090251.6\Overall Utility Plan.dwg, Friday, August 31, 2018 11:27:33 AM - DUREVA COLLEEN



- 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.
 - 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.
 - WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENGAGEMENTS EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
 - 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
 - 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).
 - ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
 - ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
 - CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
 - 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCE MAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
 - IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
 - INSTALL 3/4" COPPER WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE.
 - INSTALL 4" PVC SEWER SERVICES @ 1% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
 - PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
 - ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, 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.
 - GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
 - CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

EXISTING WATER & SEWER NOTE:
 TOK #ZCP-7-15 WATER & SEWER LINES SHOWN CORRESPOND TO COR PERMIT #W-3327 AND #S-4080.

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

EXISTING UTILITY NOTE:
 ALL EXISTING WATERMANS & DOWNSTREAM SEWER FACILITIES TO WHICH THIS PROJECT CONNECTS SHALL BE ACCEPTED BY THE CITY OF RALEIGH FOR MAINTENANCE PRIOR TO RELEASE OF 1ST CO IN KNIGHTDALE STATION, R6D & R4 PHASE OF DEVELOPMENT (SECTIONS A, B). REF: 2014 EDITION OF CORPUD HANDBOOK, PAGES 25-32

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: *[Signature]* DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 8-4-19
 ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

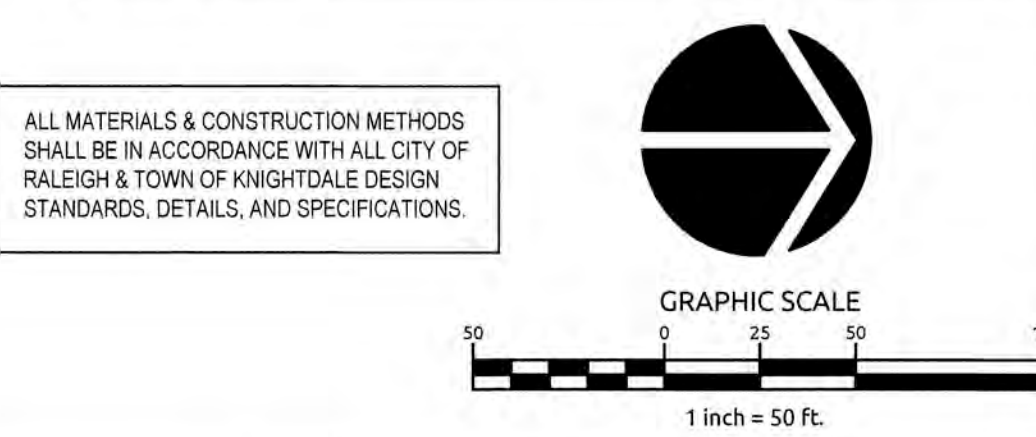
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *5-4456*
 AUTHORIZATION TO CONSTRUCT *Rose M. Sample*
 DATE: *1/29/19*

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *W-3574*
 AUTHORIZATION TO CONSTRUCT *Rose M. Sample*
 DATE: *1/29/19*



Job No.	02090251.6	Drawn By	W&R
Date	06/06/2018	Designer	W&R



Revisions	1	1st TOK Comments	08/31/18
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Sheet No.	4.1
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K:\09\09-0250\0251.6-Knightdale Station Phase R6D\DRAWINGS\CONSTRUCTION DRAWINGS\4-1-3 UTILITY PLAN.dwg, Friday, August 31, 2018 11:38:03 AM - DURVEA, COLLEEN



SEWER SERVICE NOTE: LOTS 400-406 WILL REQUIRE A NEW SERVICE FROM THE NEW SEWER MAIN INSTALLED WITHIN METROLINER PLACE

EXISTING 30' COR SANITARY SEWER EASEMENT PER DM 2016, PG895-903 (TOK #ZCP-18-15)

EXISTING MH141 NOTE: CONTRACTOR SHALL MAKE CONNECTION INTO EXMH141 PER CITY OF RALEIGH STANDARD SPECIFICATIONS VIA A CONCRETE CORING MACHINE, AND THE PIPE CONNECTION MUST BE MADE WITH A FLEXIBLE RUBBER BOOT. SEE CITY OF RALEIGH SPECIFICATION FOR ADDITIONAL REQUIREMENTS.

EXISTING SEWER NOTE: TOK #ZCP-7-15 SEWER LINES SHOWN CORRESPOND TO COR PERMIT #S-4080.

EXISTING UTILITY NOTE: ALL EXISTING WATERMAINS & DOWNSTREAM SEWER FACILITIES TO WHICH THIS PROJECT CONNECTS SHALL BE ACCEPTED BY THE CITY OF RALEIGH FOR MAINTENANCE PRIOR TO RELEASE OF 1ST CO IN KNIGHTDALE STATION, R-6D, R-4 PHASE OF DEVELOPMENT (SECTIONS A & B). REF: 2014 EDITION OF CORPUD HANDBOOK, PAGES 25-32

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *5-4486*

AUTHORIZATION TO CONSTRUCT *[Signature]*

DATE: *11/29/19*

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

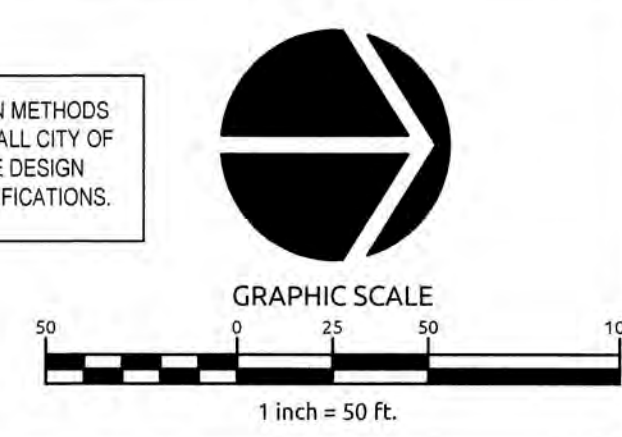
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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # *W-3574*

AUTHORIZATION TO CONSTRUCT *[Signature]*

DATE: *1/24/19*

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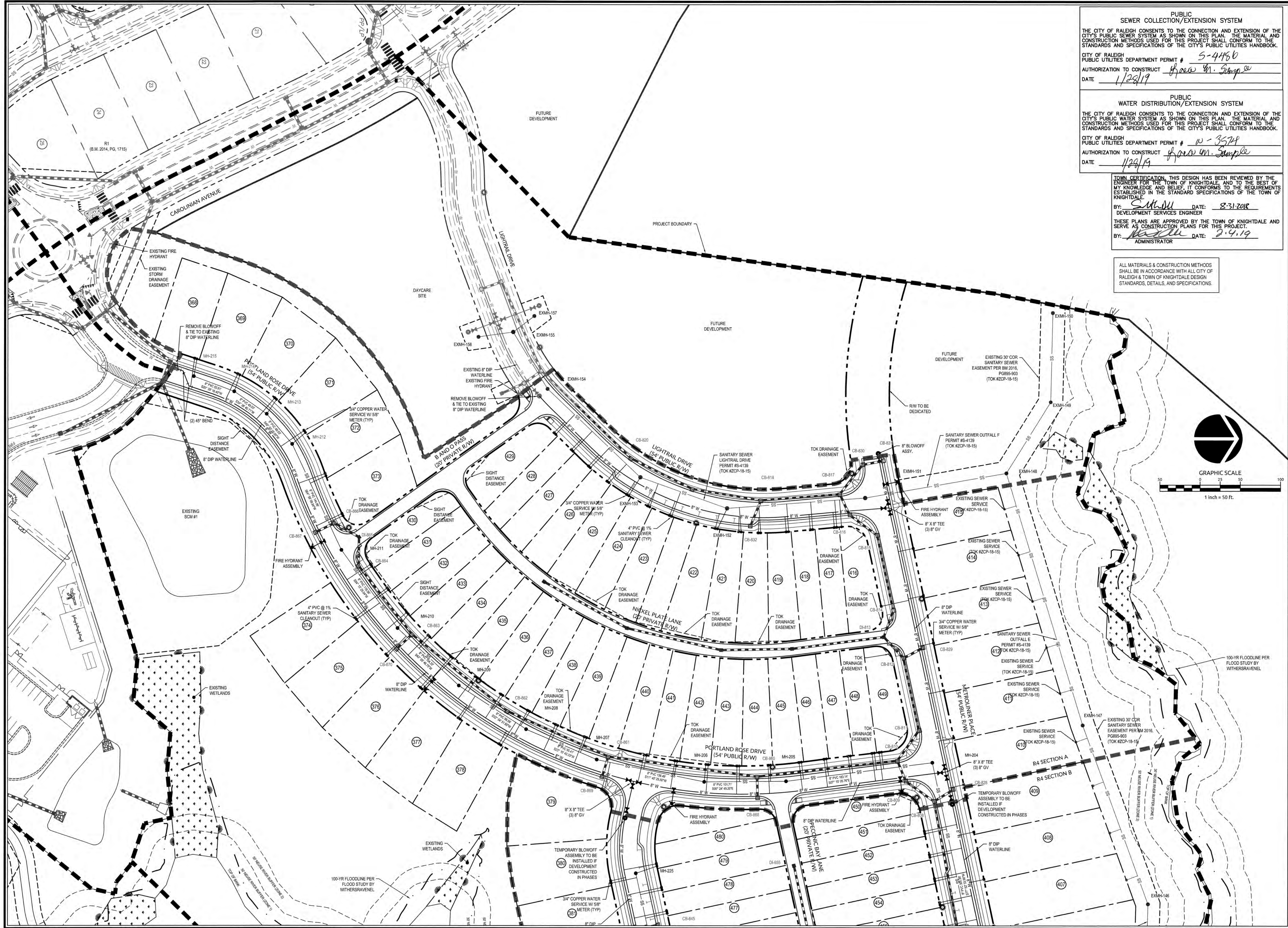


Job No.	02090251.6	Drawn By	W6R
Date	06/08/2018	Designer	W6R



Revisions		
1	1st TOK Comments	08/31/18

K:\2019\02\02090251.6-Eng\Main Power R4\CD\MASTER\CONSTRUCTION DRAWINGS\4-4.2 UTILITY PLAN.dwg, August 31, 2018 11:38:12 AM - DWGTEXTA.CCOLLEN

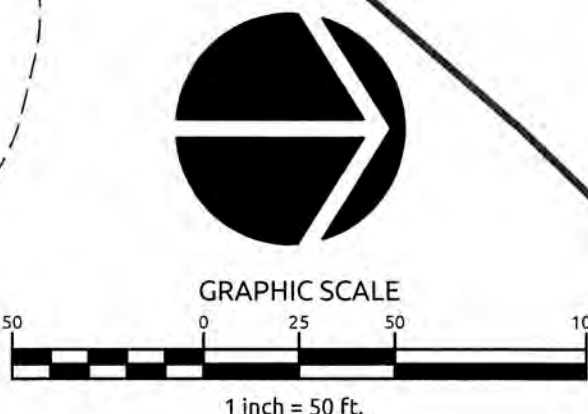


PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
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 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4456
 AUTHORIZATION TO CONSTRUCT Howe M. Sample
 DATE 1/29/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
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 AUTHORIZATION TO CONSTRUCT Howe M. Sample
 DATE 1/29/19

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 BY: [Signature] DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
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 BY: [Signature] DATE: 8-4-19
 ADMINISTRATOR

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WithersRavenel
 Engineers | Planners | Surveyors

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**KNIGHTDALE STATION
 R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

UTILITY PLAN

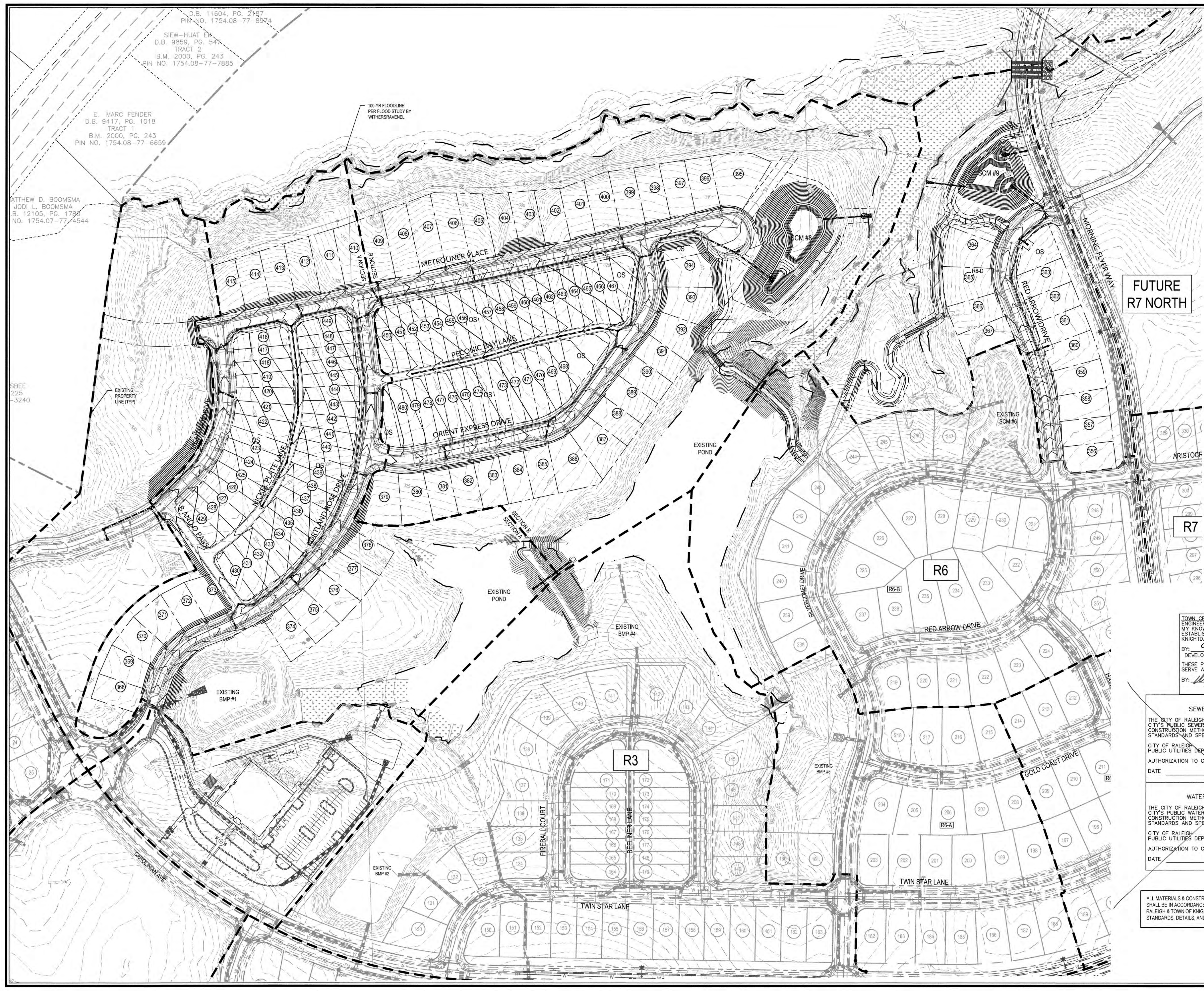
Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions		
1	1st TOK Comments	08/31/18

K:\09\025090251.6\Knightdale Station\Drawings\CONSTRUCTION\DRAWINGS\4-3 UTILITY PLAN.dwg, August 31, 2018 1:38:25 AM - DWGPLT, COLLEEN

K:\2018\02\20\022516-Knightdale Station Phase 1\CAD\MASTER CONSTRUCTION DRAWINGS\10 OVERALL STORM DRAINAGE AND GRADING PLAN.dwg, August 31, 2018 9:53:17 AM - DURTREA, COLLEEN



D.B. 11604, PG. 2 of 87
PIN NO. 1754.08-77-8874
SIEW-HUAT EK
D.B. 9859, PG. 547
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885
E. MARC FENDER
D.B. 9477, PG. 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

MATTHEW D. BOOMSMA
JODI L. BOOMSMA
B. 12105, PG. 1789
NO. 1754.07-77-4544

SBEE
225
-3240

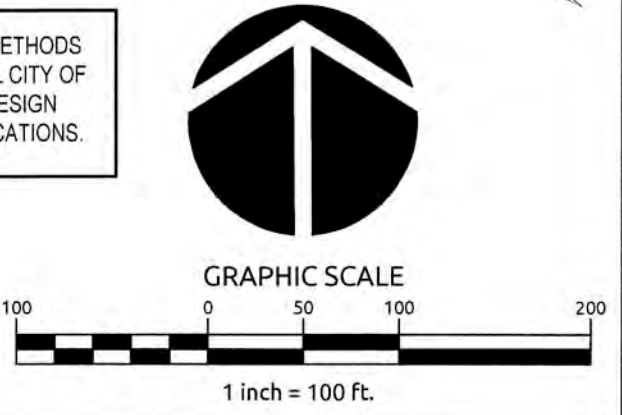
FUTURE
R7 NORTH

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: S. M. Hill DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
BY: [Signature] DATE: 2-4-19
ADMINISTRATOR

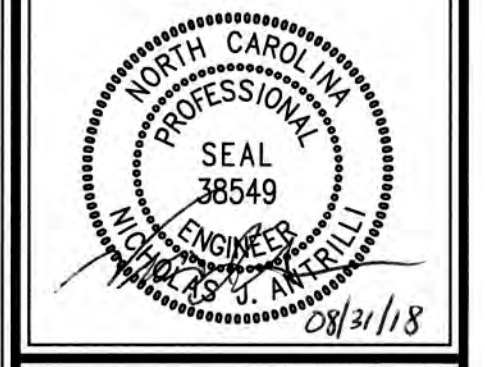
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CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #
AUTHORIZATION TO CONSTRUCT
DATE

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
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ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions

No.	Description	Date
1	1st TOK Comments	08/31/18



GRADING AND DRAINAGE NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS & DETAILS.
2. BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY PERFORMED BY WITHERSRAVENEL, INC. OFFSITE TOPOGRAPHIC INFORMATION PROVIDED BY NC LIDAR.
3. WETLANDS AND STREAM BUFFERS DELINEATED AND SURVEYED BY WITHERSRAVENEL, INC.
4. THIS PROPERTY DOES NOT LIE WITHIN THE FEMA FLOODPLAIN PER MAP NUMBER 3720175400J AND 3720176400J, WITH AN EFFECTIVE DATE OF MAY 2, 2006.
5. RECEIVING WATERCOURSE: UNNAMED TRIBUTARY OF MARKS CREEK IN THE NEUSE RIVER BASIN.
6. 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.
7. 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.
8. ALL STORM DRAINAGE PIPE SHALL HAVE A MINIMUM COVER OF 1 FOOT TO THE PIPE CROWN IN NON-TRAFFIC AREAS.
9. STORM SEWER PIPE ENDS SHALL BE FURNISHED WITH REINFORCED CONCRETE PIPE FLARED END SECTION UNLESS OTHERWISE SPECIFIED ON PLANS.
10. EACH DRAINAGE STRUCTURE SHALL HAVE A SHAPED INVERT CONSTRUCTED FROM CONCRETE PER TOWN OF KNIGHTDALE STANDARD SPECIFICATIONS.
11. 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.
12. 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.
13. ALL STORM DRAINAGE PIPE SHALL BE CLASS III REINFORCED CONCRETE PIPE (RCP) UNLESS NOTED OTHERWISE.
14. DISCHARGE BASED ON 10-YR STORM EVENT UNLESS NOTED OTHERWISE.
15. CB=CATCH BASIN; FES=FLARED END SECTION; JB=JUNCTION BOX; YI=YARD INLET (TOK #5.04); DI=DROP INLET (TOK #5.04)
16. RIM ELEVATION GIVEN FOR CB IS TOP OF CURB, YI OPENING INVERT FOR SLAB TOP OR TOP OF GRATE FOR GRATED INLET, DI IS TOP OF GRATE FOR GRATED INLET, JB IS TOP OF RIM.
17. TOK DRAINAGE EASEMENT = PUBLIC EASEMENT. KSCA DRAINAGE EASEMENT = KNIGHTDALE STATION COMMUNITY ASSOCIATION, INC.
18. ALL PUBLIC STORM DRAINAGE FRAMES, GRATES, & HOODS SHALL BE STAMPED W/ 'DRAINS TO RIVER' IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARDS.
19. THE USE OF WAFFLE BOXES IS NOT PERMITTED WITHIN PUBLIC RIGHTS OF WAY AND PUBLIC DRAINAGE EASEMENTS.
20. THE CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING STEPS IN 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.

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____

AUTHORIZATION TO CONSTRUCT _____

DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

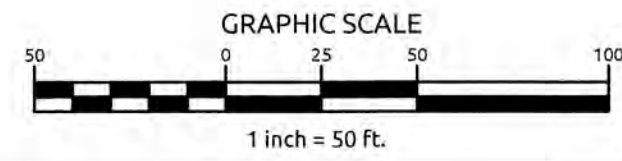
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Job No. 02990251.4 Drawn by WGR
Date 06/08/2018 Designer WGR



Revisions	1st TOK Comments	08/31/18
1	1st TOK Comments	08/31/18

K:\07\09\0250\0251.4-Knightdale Station R4 CADMASTER CONSTRUCTION DRAWINGS\5.1.6.6 STORM DRAINAGE PLANS.dwg Friday, August 31, 2018 12:26:53 PM - DURYEA, COLLEEN



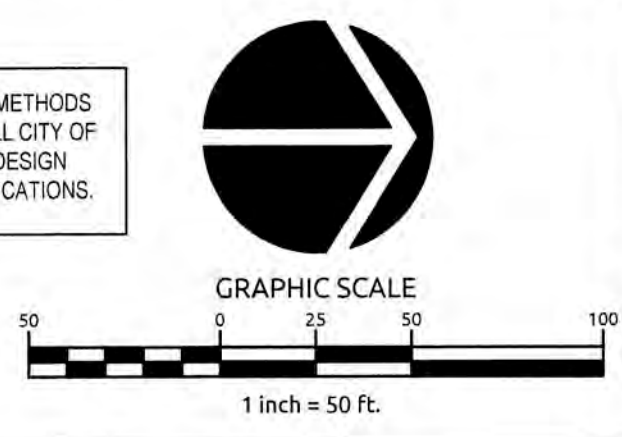
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TOWN CERTIFICATION THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.
 BY: S.M. All DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVES AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: W.R. DATE: 2-14-19
 ADMINISTRATOR

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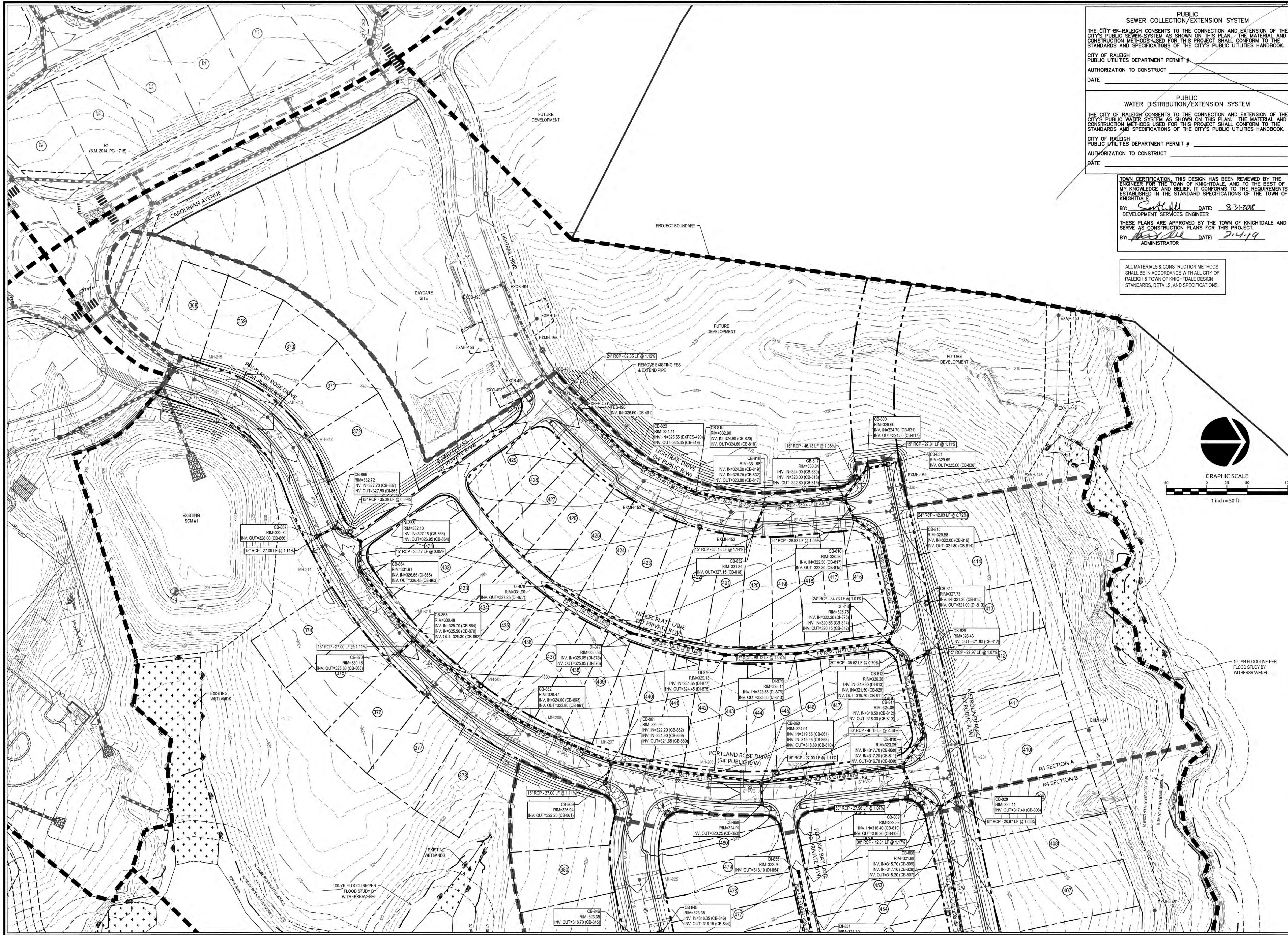
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Job No: 02090251.6
 Date: 06/08/2018
 Drawn by: W&R
 Designer: W&R

Revisions	Date	Description
1	08/31/18	1st TOK Comments

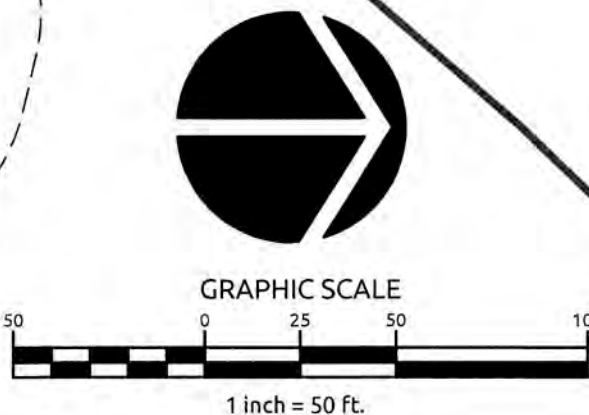


PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
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 BY: *[Signature]* DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
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 BY: *[Signature]* DATE: 2-4-19
 ADMINISTRATOR

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WithersRavenel
 Engineers | Planners | Surveyors

**KNIGHTDALE STATION
 R6D AND R4**

STORM DRAINAGE PLAN

TOWN OF KNIGHTDALE, NORTH CAROLINA

Job No. 02090251.6 Drawn By W6R
 Date 06/08/2018 Designer W6R



Revisions
 1 1st TOK Comments 08/31/18

Sheet No.
5.3

© 2018 W6R. 02090251.6 Knightdale Station R6D AND R4 STORM DRAINAGE PLAN. Rev. 08/31/18. 12:28:48 PM - CURTIS A. COLLEN

STRUCTURE SCHEDULE

FES 905

Table with 5 columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT 1N, INVERT OUT. Contains data for structures CB-906 through YI-912.

FES 800

Table with 5 columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT 1N, INVERT OUT. Contains data for structures CB-801 through CB-820.

FES 800

Table with 5 columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT 1N, INVERT OUT. Contains data for structures CB-825 through CB-863.

FES 800

Table with 5 columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT 1N, INVERT OUT. Contains data for structures CB-864 through DI-878.

FES 400

Table with 8 columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for FES-400.

FES 800

Table with 8 columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for structures CB-801 through CB-814.

FES 800

Table with 8 columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for structures CB-862 through FES-800.

PIPE SCHEDULE

FES 905

Table with 8 columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for structures CB-906 through FES-905.

FES 800

Table with 8 columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for structures CB-815 through CB-861.

FES 930

Table with 8 columns: UPSTREAM STRUCTURE, DOWNSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Contains data for FES-930.

NOTES:

RGRCP: DENOTES C-RING GASKET RCP

- List of notes regarding construction standards, rim elevations, piping materials, and storm drainage requirements.

STORM DRAINAGE NOTES: FES: FLARED END SECTIONS, CB: CATCH BASIN, JB: JUNCTION BOX, DI: DROP INLET (TOK #5.04), YI: YARD INLET (TOK #5.04)

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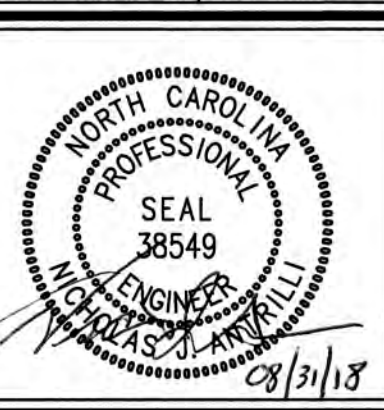
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # AUTHORIZATION TO CONSTRUCT DATE

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

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Job No. 02090251.6 Drawn By W&R Date 06/08/2018 Designer W&R



Revisions: 1 1st TOK Comments 08/31/18

\\C:\P\025020\02516-A\Knightdale Station\RF&CD\MASTER CONSTRUCTION DRAWINGS\11.5.4 STORM DRAINAGE PLANS\mgp\Title.dwg Friday, August 31, 2018 9:07:34 AM - DWYGA, COLLEEN



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: *S. M. Hill* DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-4-19
 ADMINISTRATOR

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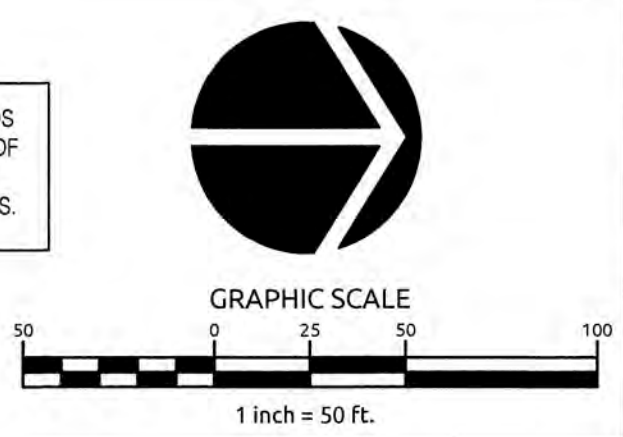
CITY OF RALEIGH
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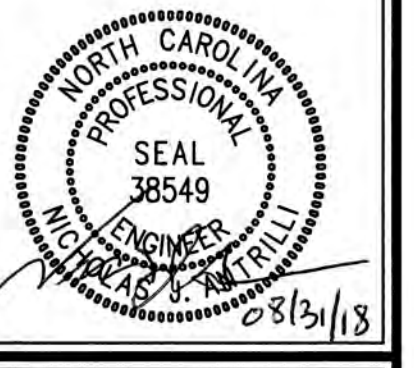
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Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions
 1 1st TOK Comments 08/31/18

Sheet No.
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K:\09\09-0250\0251.6-Knightdale Station R6D\CAD\MASTER CONSTRUCTION DRAWINGS\5.5-7 GRADING PLANS.dwg 7/18/18 12:28:03 PM - DORIEA COLLEEN



K:\09\09-0250\090251-6-Knightdale Station R6D CAD MASTER CONSTRUCTION DRAWINGS\5-5.7 GRADING PLANS\09-14 PM - DURTREA COLLEEN

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: S. Allen DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
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 BY: W. D. Williams DATE: 2-4-19
 ADMINISTRATOR

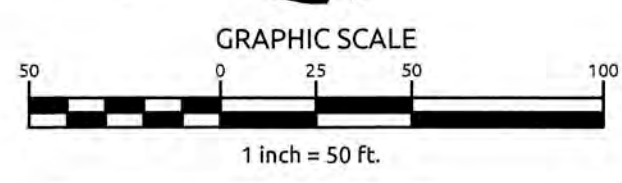
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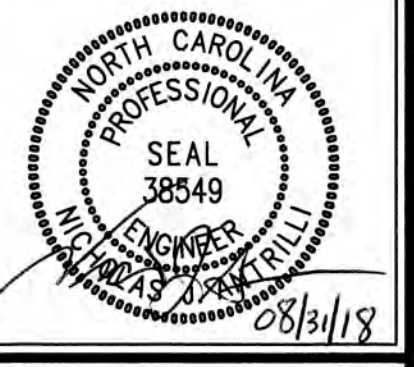
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Job No. 02090251.6 Drawn By WGR
 Date 06/08/2018 Designer WGR



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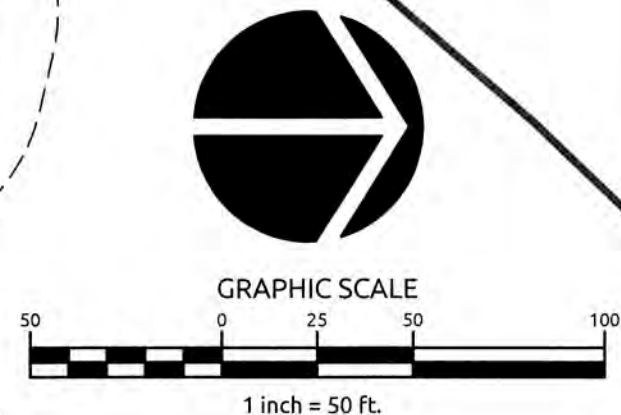
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BY: [Signature] DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: [Signature] DATE: 7-4-19
ADMINISTRATOR

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Job No. 02090251.6 Drawn By WSR
Date 06/08/2018 Designer WSR



Revisions	1st TOK Comments	08/31/18
1	1st TOK Comments	08/31/18

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D.B. 11604, PG. 2187
PIN NO. 1754.08-77-8974

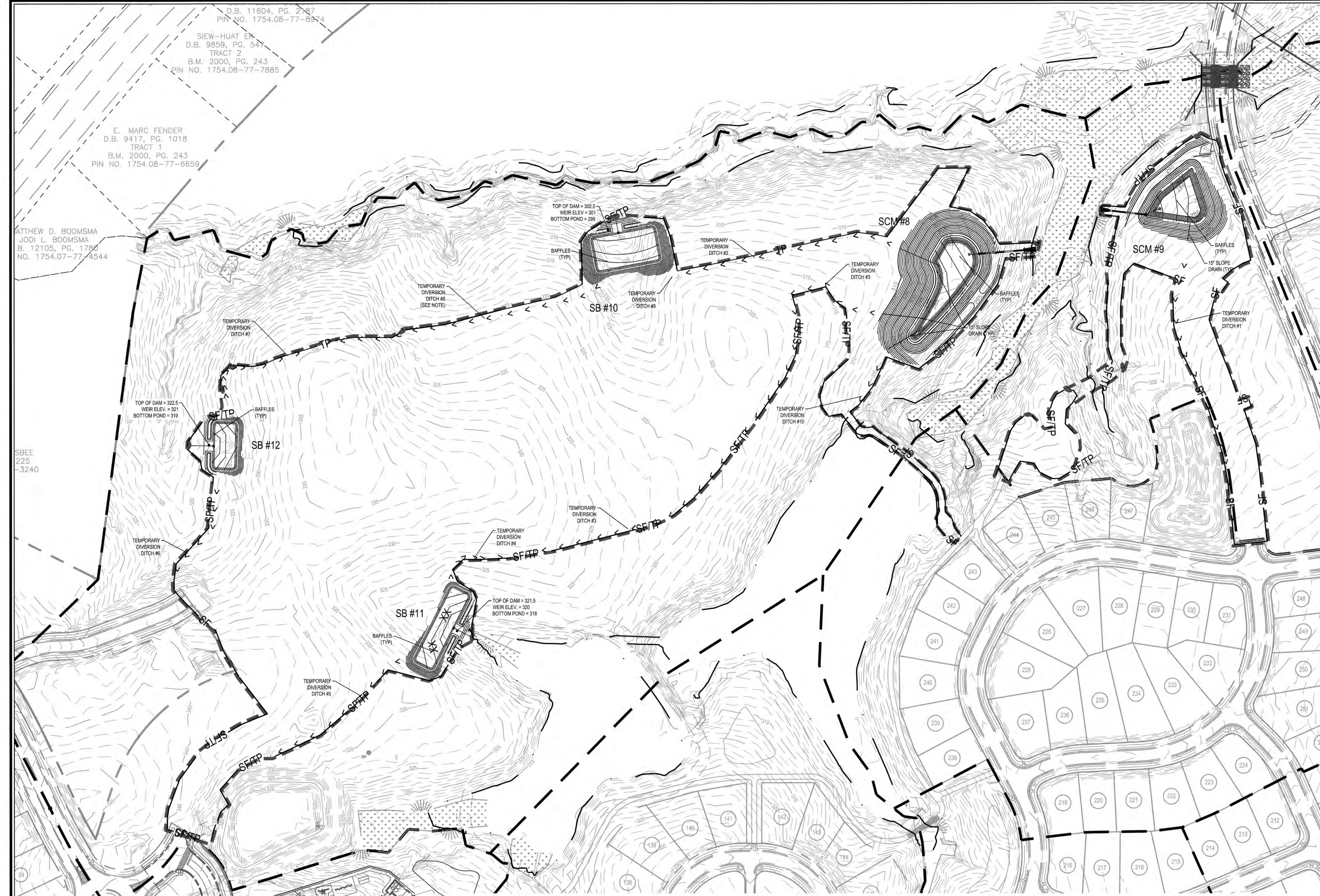
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D.B. 9859, PG. 547
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885

E. MARC FENDER
D.B. 9417, PG. 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

ATTHEW D. BOOMSMA
JODI L. BOOMSMA
B. 12105, PG. 1792
NO. 1754.07-77-4544

SBEE
225
-3240

R4 DENUDED AREA = 18.90 AC
R6D DENUDED AREA = 2.85 AC



- CONSTRUCTION SEQUENCE**
- SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE WATERSHED MANAGER, DEBBIE TANNER, 919-842-7142. 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.
 - CALL 919-842-7142 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, 919-842-7142. OBTAIN A CERTIFICATE OF COMPLETION.

TEMPORARY SKIMMER BASIN DESIGN CHART

#	AREA		COMP. COEFF.	Q10	SURFACE		VOLUME		BASIN DIMENSIONS			WEIR		SKIMMER		
	REQD.	PROV.			REQD.	PROV.	DEPTH	LENGTH	WIDTH	DEPTH	LENGTH	PROVISED	PROVISED	SIZE	SPACING	
	(AC)	(AC)		(CFS)	(SQ)	(SQ)	(CU)	(CU)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(IN)	(IN)
SCM #8	4.60	5.1	0.48	17.2	7,404	9,108	-	-	-	-	-	-	22,956	146,981	20	1.75
SCM #9	1.90	3.80	0.37	9.10	3,977	6,282	-	-	-	-	-	-	8,373	22,962	20	1.5
SB #10	5.90	5.90	0.50	20.9	9,101	10,638	2	131	73	20	9,463	16,774	30	2.0		
SB #11	5.30	4.50	0.46	17.10	7,438	9,450	2	170	46	20	7,606	13,712	25	2.0		
SB #12	3.00	3.00	0.50	10.60	4,620	5,400	2	87	49	20	4,753	7,860	20	1.5		

VELOCITY DISSIPATOR DESIGN CHART

#	OUTLET DIA (INCHES)	PIPE DISCHARGE (CFS)	LENGTH (FT)		OUTLET WIDTH (FT)		O-STREAM WIDTH (FT)		RIP RAP THICKNESS (INCHES)	RIP RAP CLASS
			15-YEAR	10-YEAR	15-YEAR	10-YEAR	15-YEAR	10-YEAR		
FES #20	24	19.22	15	6	6	8.5	18	8	B	
FES #26	18	16.61	12	4.5	6.5	18	8	8	B	
FES #30	36	21.99	24	8	13	22	1	1		
FES #32	18	17.7	7.5	3.75	4.5	18	1	1		

TEMPORARY DIVERSION DITCH #6 NOTE: DITCH SECTION VARIES FROM TYPICAL SECTION. BOTTOM OF DITCH WILL BE 4" WIDE.

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

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-14-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____

AUTHORIZATION TO CONSTRUCT _____

DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

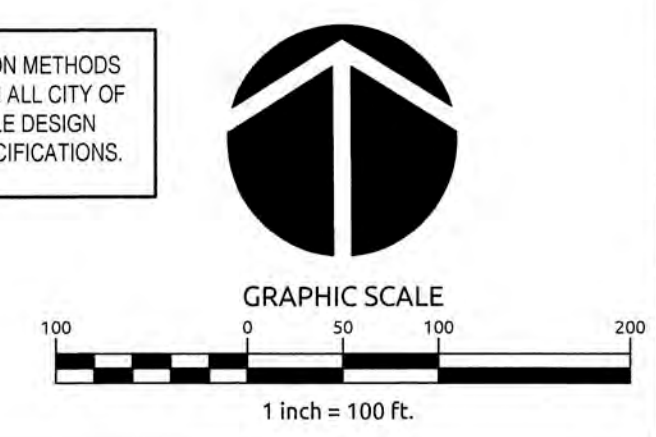
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____

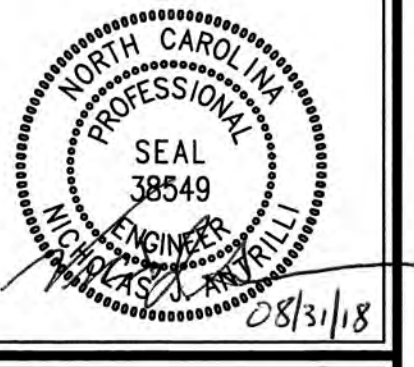
AUTHORIZATION TO CONSTRUCT _____

DATE _____

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

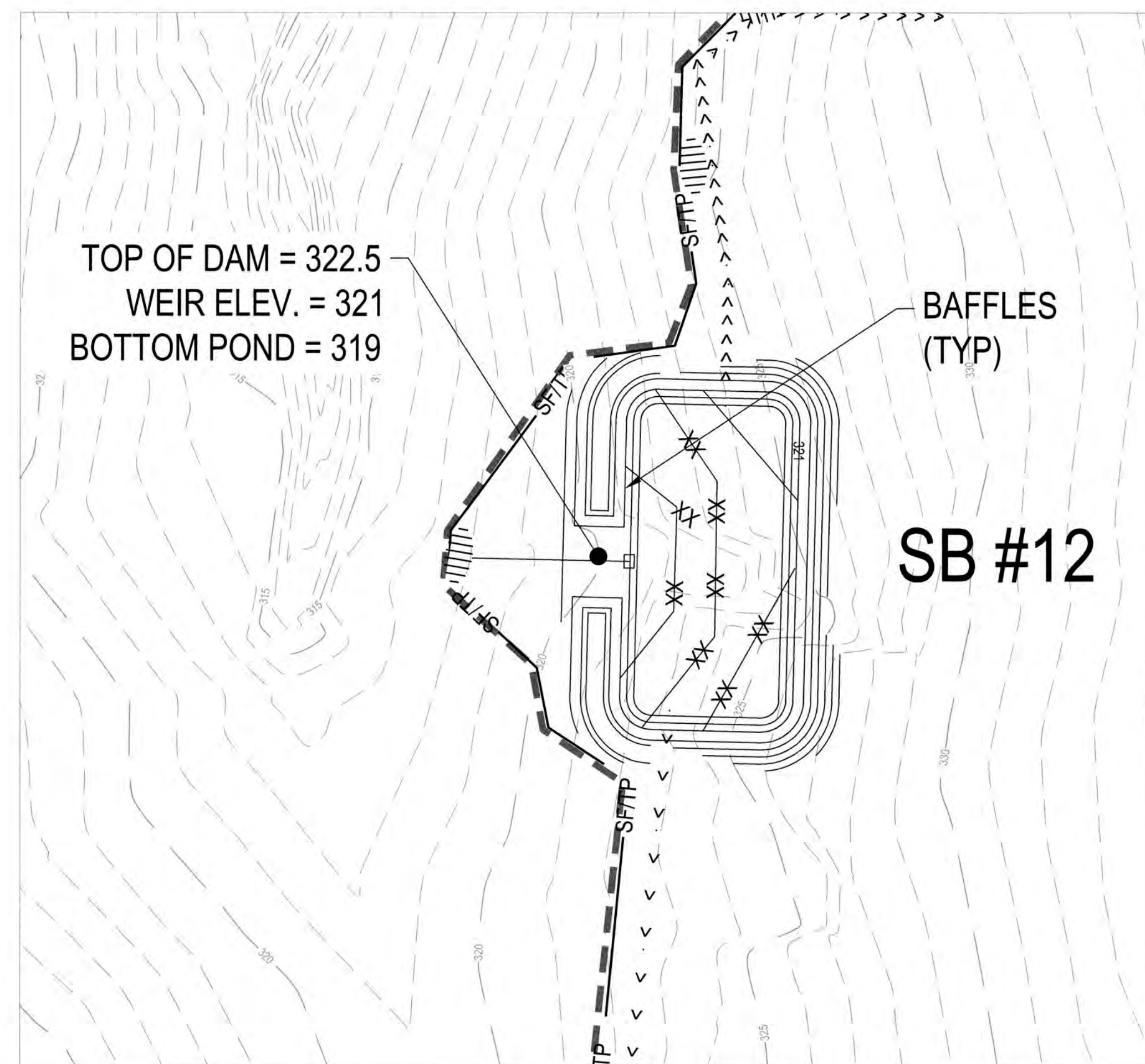
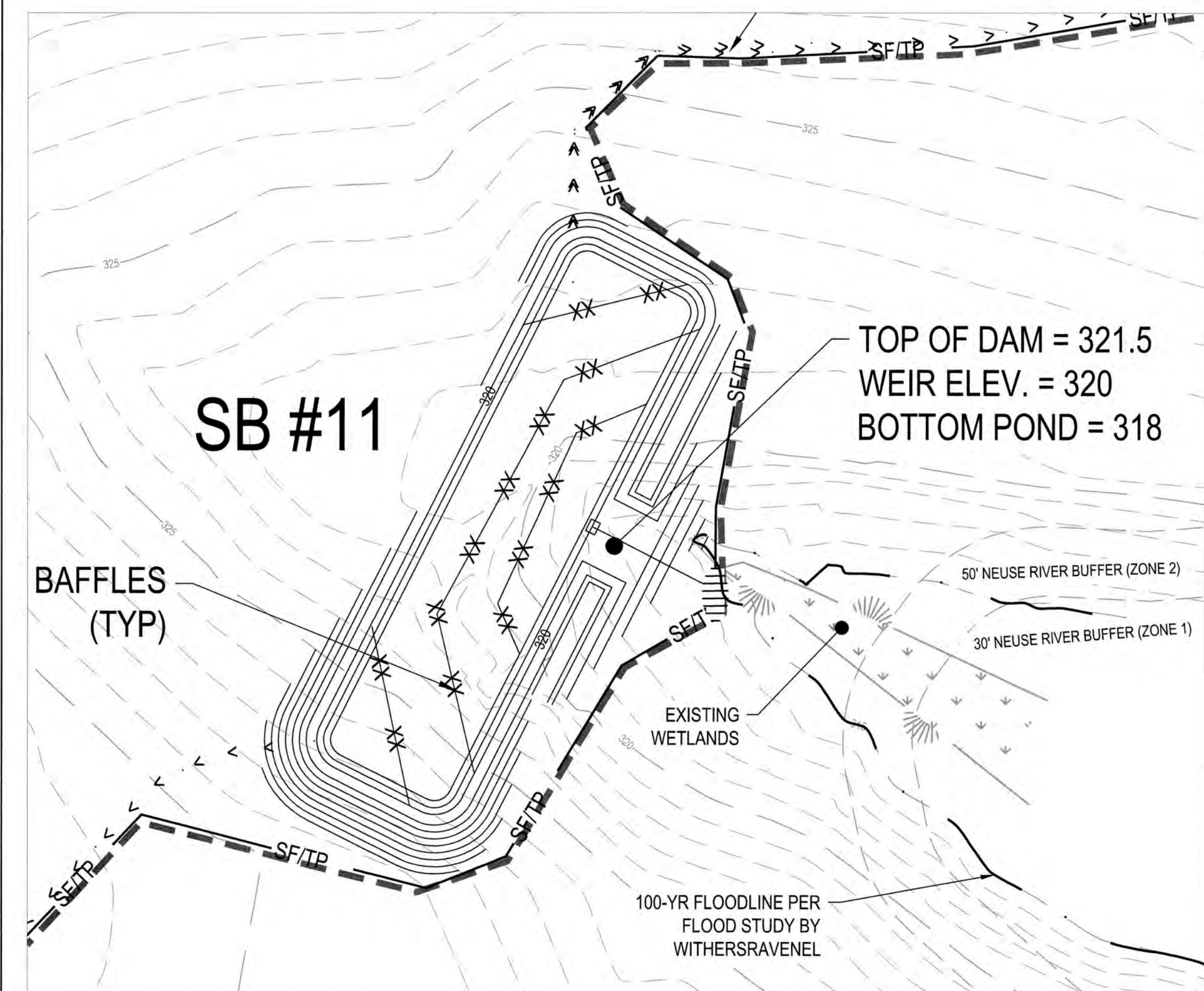
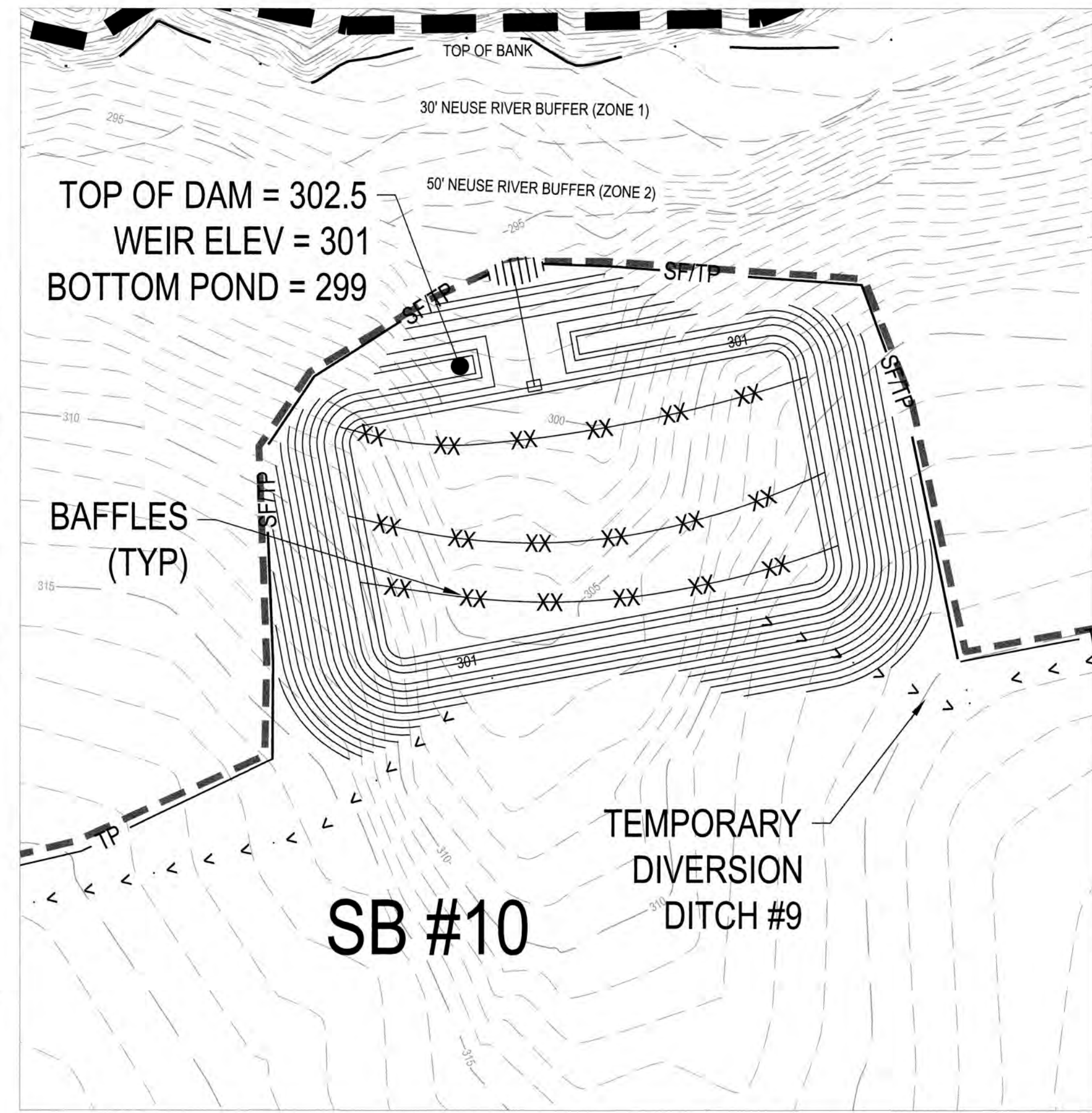
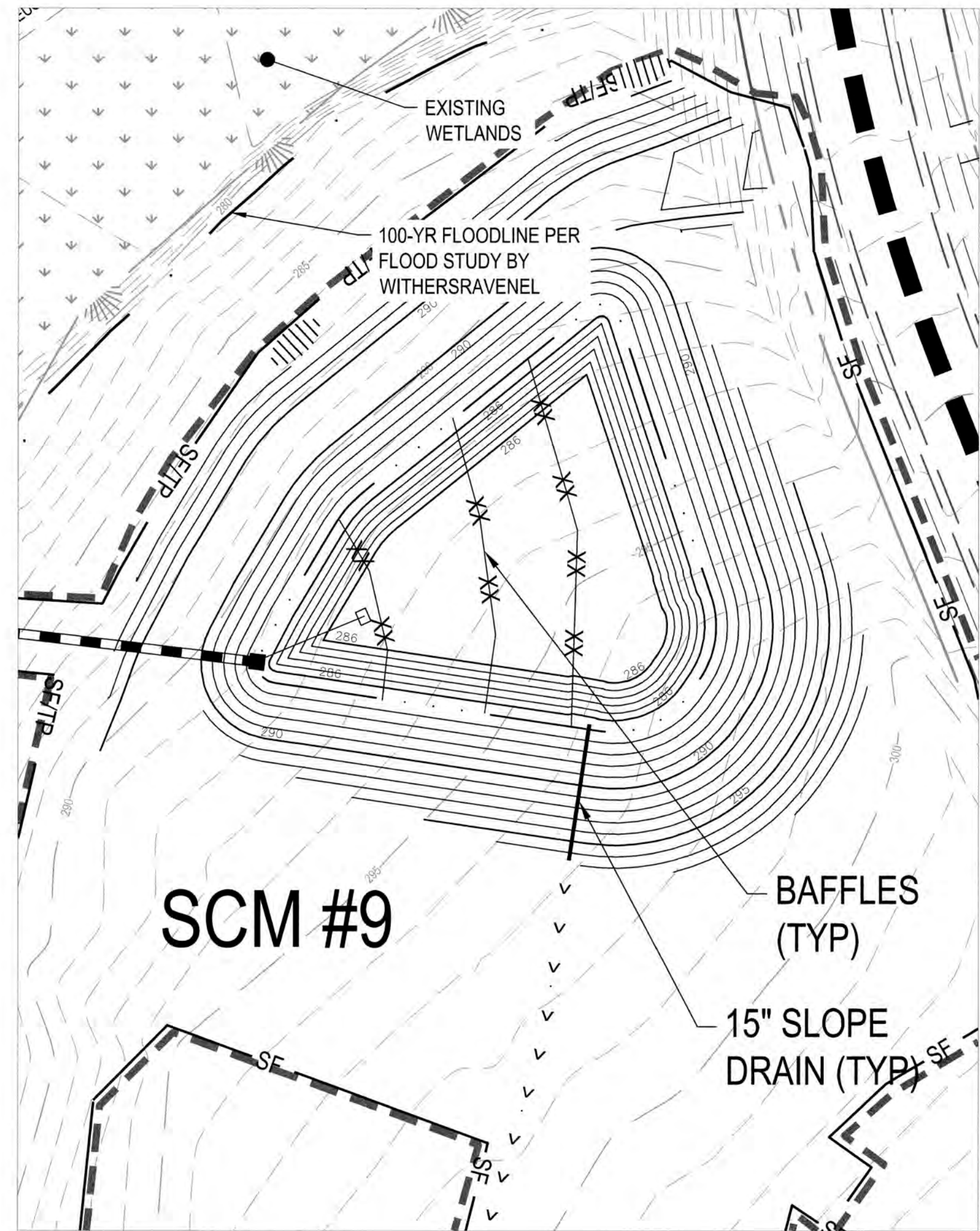
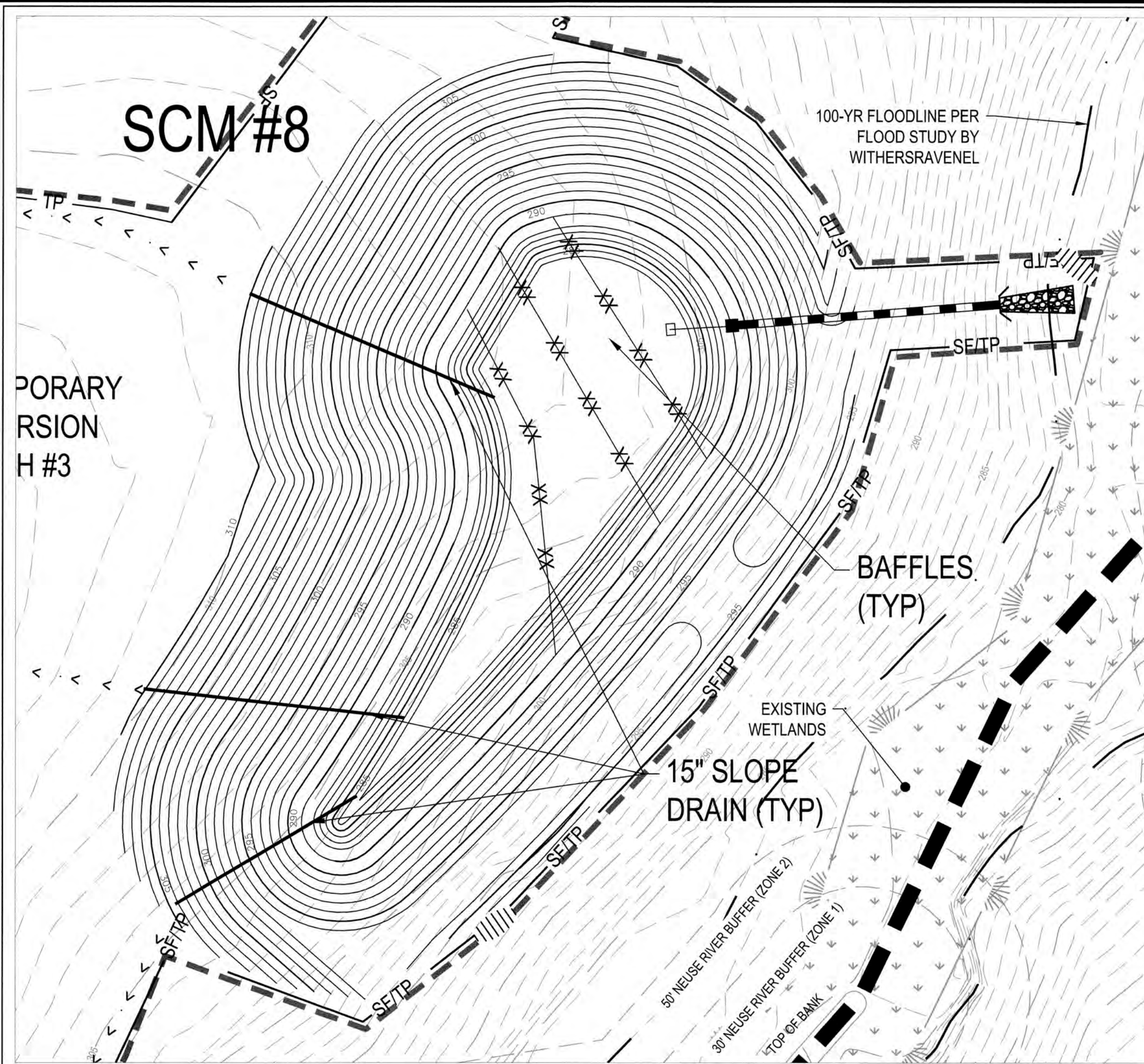


Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions
1 1st TOK Comments 08/31/18

K:\09\0520\090251.6\Knightdale Station R6D R4\CAO MASTER CONSTRUCTION DRAWINGS\04-1 PRE - OVERALL EROSION CONTROL PLAN.dwg Friday, August 31, 2018 12:25:36 PM - DURTREA COLLEN



- 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.

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: S. H. HULL DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: M. J. HULL DATE: 2-4-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

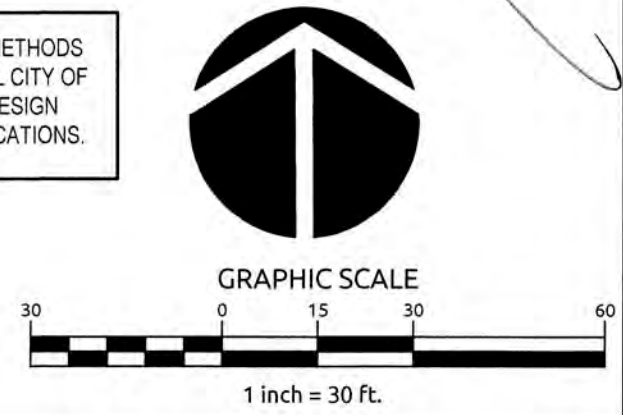
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____ AUTHORIZATION TO CONSTRUCT _____ DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

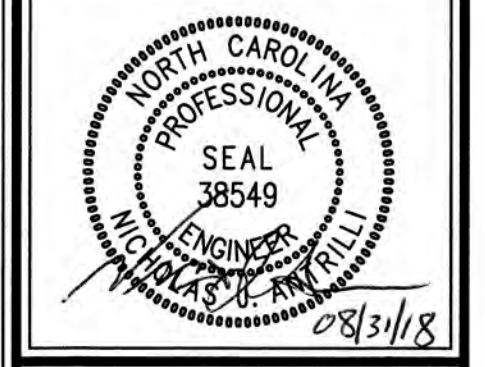
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____ AUTHORIZATION TO CONSTRUCT _____ DATE _____

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



Job No.	02090251.6	Drawn By	W&R
Date	06/08/2018	Designer	W&R



Revisions	1	1st TOK Comments	08/31/18
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K:\P\09-02090251.6-Knightdale Station R6D R4-Master Construction Drawings\04-1 PREL - OVERALL EROSION CONTROL PLAN.dwg, August 31, 2018 12:29:17 PM - DURETA, COLLEEN

D.B. 11604, PG. 2187
PIN NO. 1754.08-77-8974

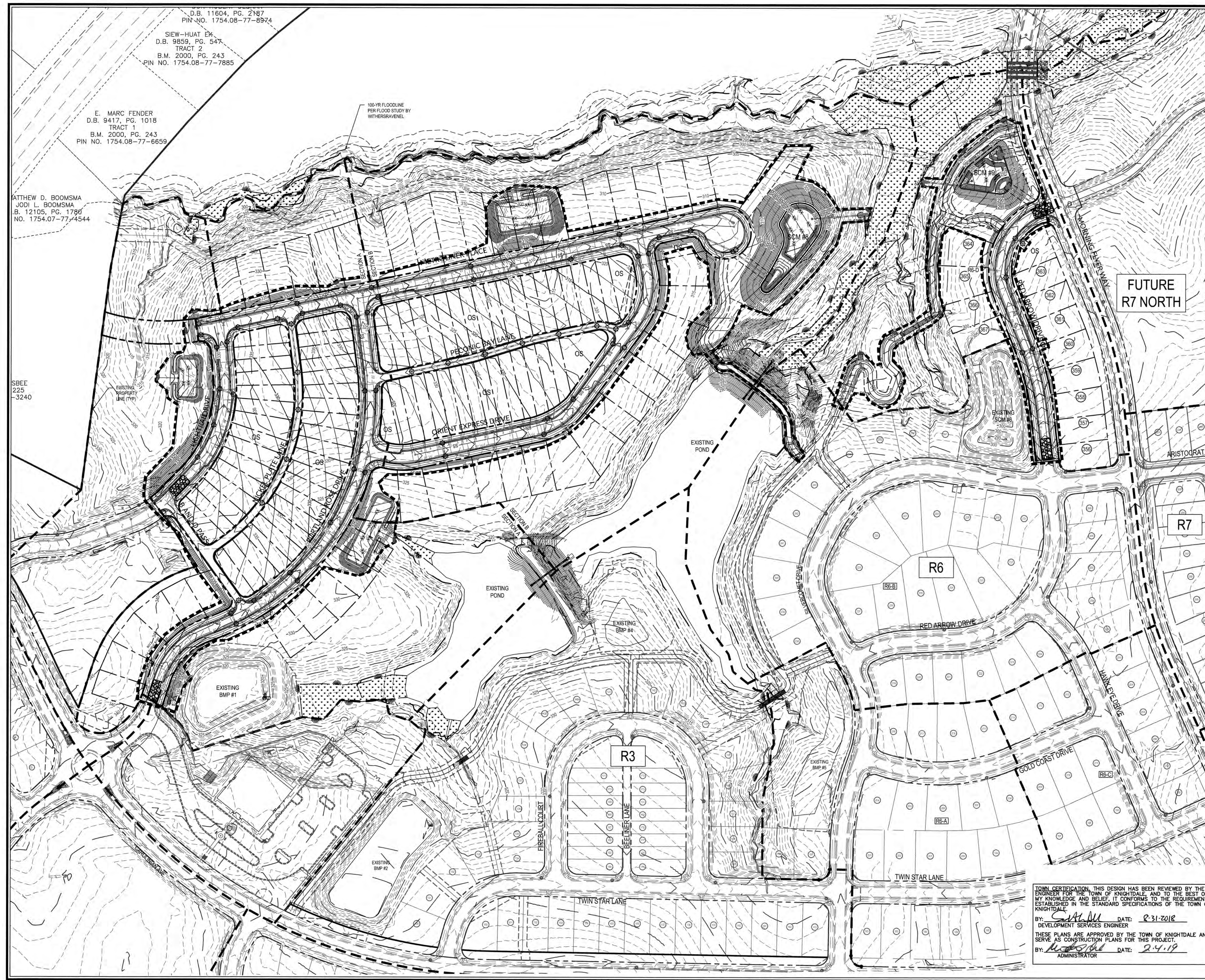
SIEW-HUAT EK
D.B. 9859, PG. 547
TRACT 2
B.M. 2000, PG. 243
PIN NO. 1754.08-77-7885

E. MARC FENDER
D.B. 9417, PG. 1018
TRACT 1
B.M. 2000, PG. 243
PIN NO. 1754.08-77-6659

ATTHEW D. BOOMSMA
JODI L. BOOMSMA
B. 12105, PG. 1790
NO. 1754.07-77-4544

SBEE
225
-3240

K:\0909-0209020211-6 Knightdale Station Phase 2 CONSTRUCTION DRAWINGS & POST OVERALL EROSION CONTROL PLAN.dwg Plot: August 31, 2018 12:29:48 PM - DURIEA COLLEEN



EROSION CONTROL LEGEND	
	LIMITS OF CONSTRUCTION
	EX. LIMITS OF CONSTRUCTION (WC #5455)
	SILT FENCE
	EX. SILT FENCE (WC #5455)
	TREE PROTECTION FENCE
	EX. TREE PROTECTION FENCE (WC #5455)
	SILT/TREE PROTECTION FENCE
	EX. SILT/TREE PROTECTION FENCE (WC #5455)
	TEMPORARY DIVERSION DITCH
	TEMPORARY CLEAN WATER DITCH
	INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
	SKIMMER BASIN
	TEMPORARY GRAVEL CONSTRUCTION
	EXISTING CATCH BASIN INLET PROTECTION

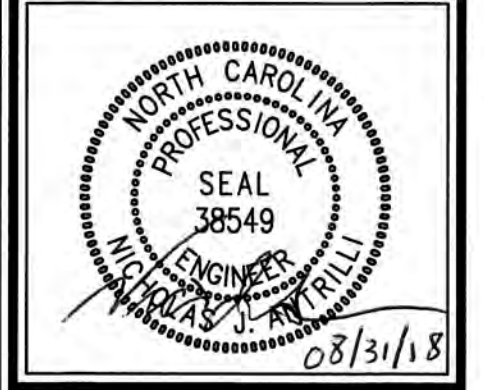
FUTURE
R7 NORTH

WithersRavenel
Engineers | Planners | Surveyors

KNIGHTDALE STATION
R6D AND R4
TOWN OF KNIGHTDALE, NORTH CAROLINA

POST - OVERALL EROSION
CONTROL PLAN

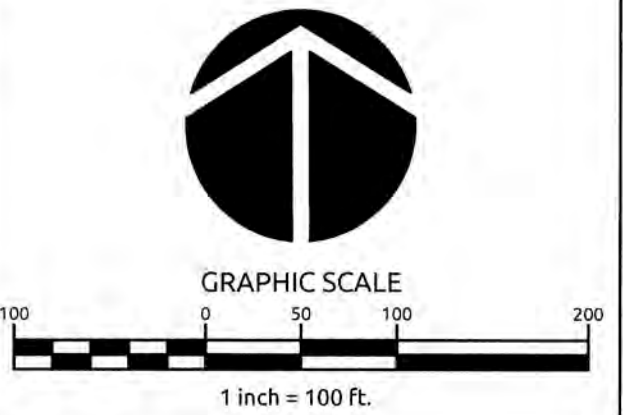
Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions
1 1st TOK Comments 08/31/18

Sheet No.
6.2

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: S.M. DU DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
BY: W&R DATE: 2.4.19
ADMINISTRATOR



K:\09\04\02\09\00231-Knightdale Station Phase 1\EROSION CONTROL MASTER DRAWINGS\4-3-3-1 POST EROSION CONTROL PLANS\4-3-3-1 DRYTIA COLLEEN



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

CONSTRUCTION SEQUENCE NOTE:
SEE SHEET 6.2 FOR BASIN REMOVAL SEQUENCE.

EROSION CONTROL LEGEND	
	LIMITS OF CONSTRUCTION
	EX. LIMITS OF CONSTRUCTION (WC #54555)
	SILT FENCE
	EX. SILT FENCE (WC #54555)
	TREE PROTECTION FENCE
	EX. TREE PROTECTION FENCE (WC #54555)
	SILT/TREE PROTECTION FENCE
	EX. SILT/TREE PROTECTION FENCE (WC #54555)
	TEMPORARY DIVERSION DITCH
	TEMPORARY CLEAN WATER INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
	SKIMMER BASIN
	TEMPORARY GRAVEL CONSTRUCTION
	EXISTING CATCH BASIN INLET PROTECTION

WithersRavenel
Engineers | Planners | Surveyors

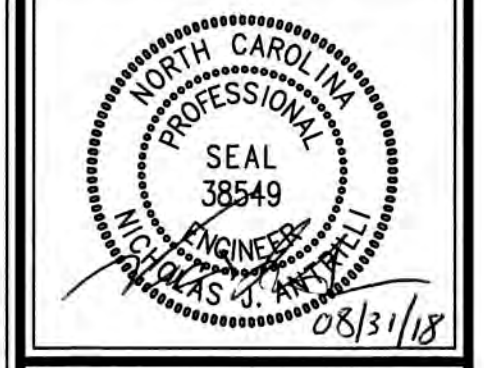
115 MackKernan Drive | Cary, NC 27511 | 919.469.3340 | License #: C-0832 | www.withersravenel.com

**KNIGHTDALE STATION
R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

EROSION CONTROL PLAN

Job No. 02090251.6 Drawn By W6R
Date 06/08/2018 Designer W6R



Revisions		
1	1st TOK Comments	08/31/18

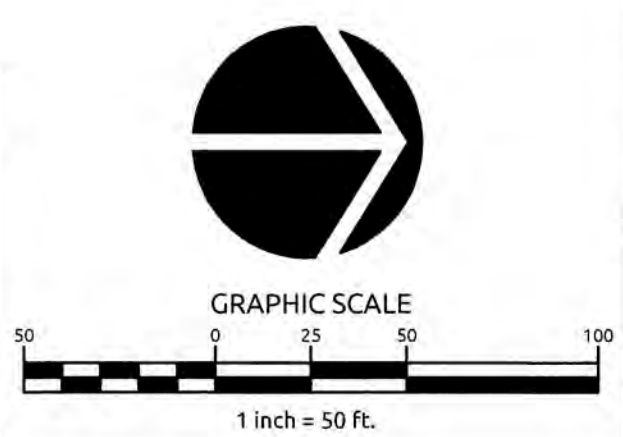
Sheet No.
6.3

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: SALAM DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: ADMIN DATE: 2-4-19
ADMINISTRATOR





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

CONSTRUCTION SEQUENCE NOTE:
SEE SHEET 6.2 FOR BASIN REMOVAL SEQUENCE.

EROSION CONTROL LEGEND	
	LIMITS OF CONSTRUCTION
	EX. LIMITS OF CONSTRUCTION (WC #54555)
	SILT FENCE
	EX. SILT FENCE (WC #54555)
	TREE PROTECTION FENCE
	EX. TREE PROTECTION FENCE (WC #54555)
	SILT/TREE PROTECTION FENCE
	EX. SILT/TREE PROTECTION FENCE (WC #54555)
	TEMPORARY DIVERSION DITCH
	TEMPORARY CLEAN WATER DITCH
	INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
	SKIMMER BASIN
	TEMPORARY GRAVEL CONSTRUCTION
	EXISTING CATCH BASIN INLET PROTECTION



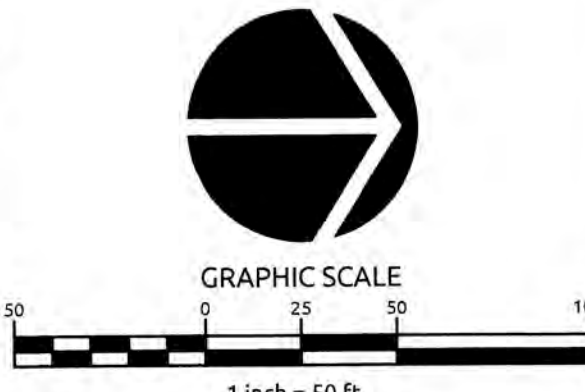
Revisions	
1	1st TOK Comments 08/31/18

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: *S. Allen* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

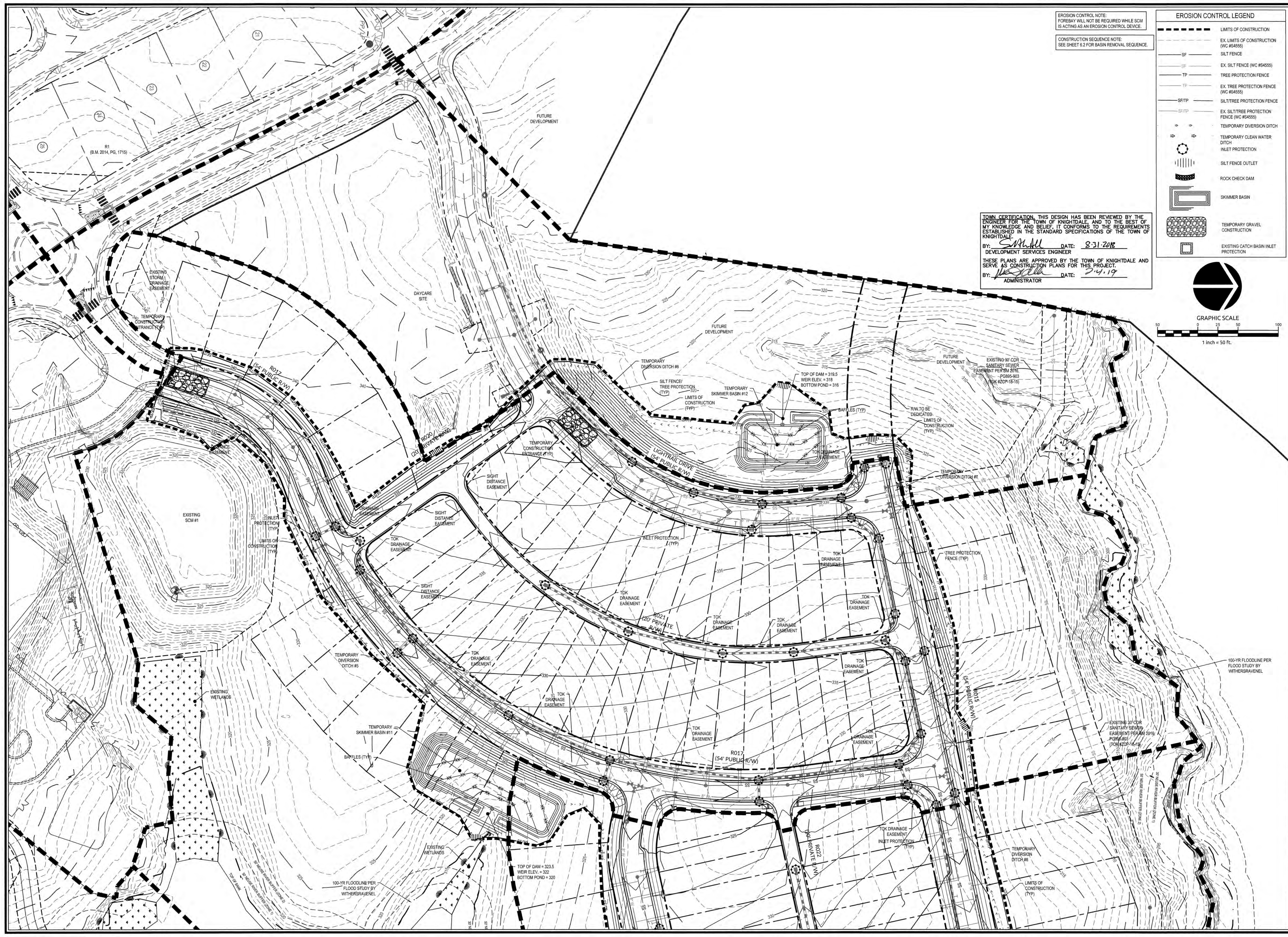
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR



K:\0709-02501-0251.6\0709-02501-0251.6-01-EROSION CONTROL PLAN.dwg: 11/18/18 10:58:29 AM: J. COLLETT

K:\DWG\2020\02012516-Knightdale Station-Phase 1B-CADMASTER-CONSTRUCTION-DRAWINGS\25-1-B-3-POST-EROSION-CONTROL-PLAN.dwg, Friday, August 31, 2018 12:00:39 PM - D:\VETIA COLLEEN



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

CONSTRUCTION SEQUENCE NOTE:
SEE SHEET 8.2 FOR BASIN REMOVAL SEQUENCE.

EROSION CONTROL LEGEND

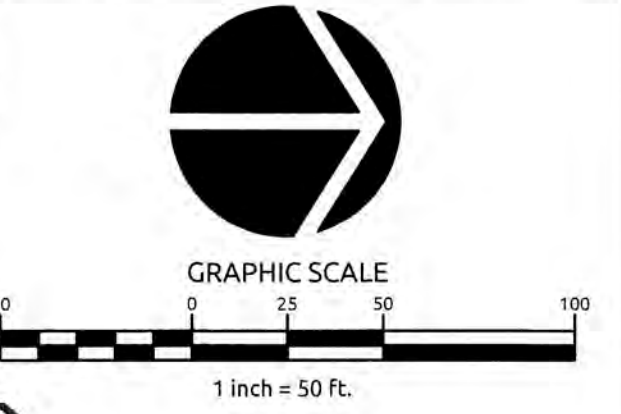
- EX. LIMITS OF CONSTRUCTION (WC #8455)
- SILT FENCE
- EX. SILT FENCE (WC #8455)
- TREE PROTECTION FENCE
- EX. TREE PROTECTION FENCE (WC #8455)
- SFT/TP SILT/TREE PROTECTION FENCE
- EX. SILT/TREE PROTECTION FENCE (WC #8455)
- TEMPORARY DIVERSION DITCH
- TEMPORARY CLEAN WATER DITCH
- INLET PROTECTION
- SILT FENCE OUTLET
- ROCK CHECK DAM
- SKIMMER BASIN
- TEMPORARY GRAVEL CONSTRUCTION
- EXISTING CATCH BASIN INLET PROTECTION

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: *S. Smith* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 8-14-19
ADMINISTRATOR



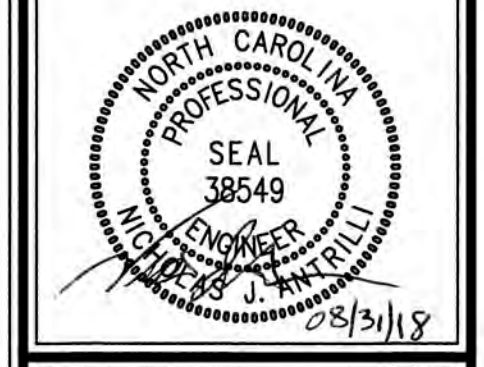
WithersRavenel
Engineers | Planners | Surveyors

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

KNIGHTDALE STATION
R6D AND R4
TOWN OF KNIGHTDALE, NORTH CAROLINA

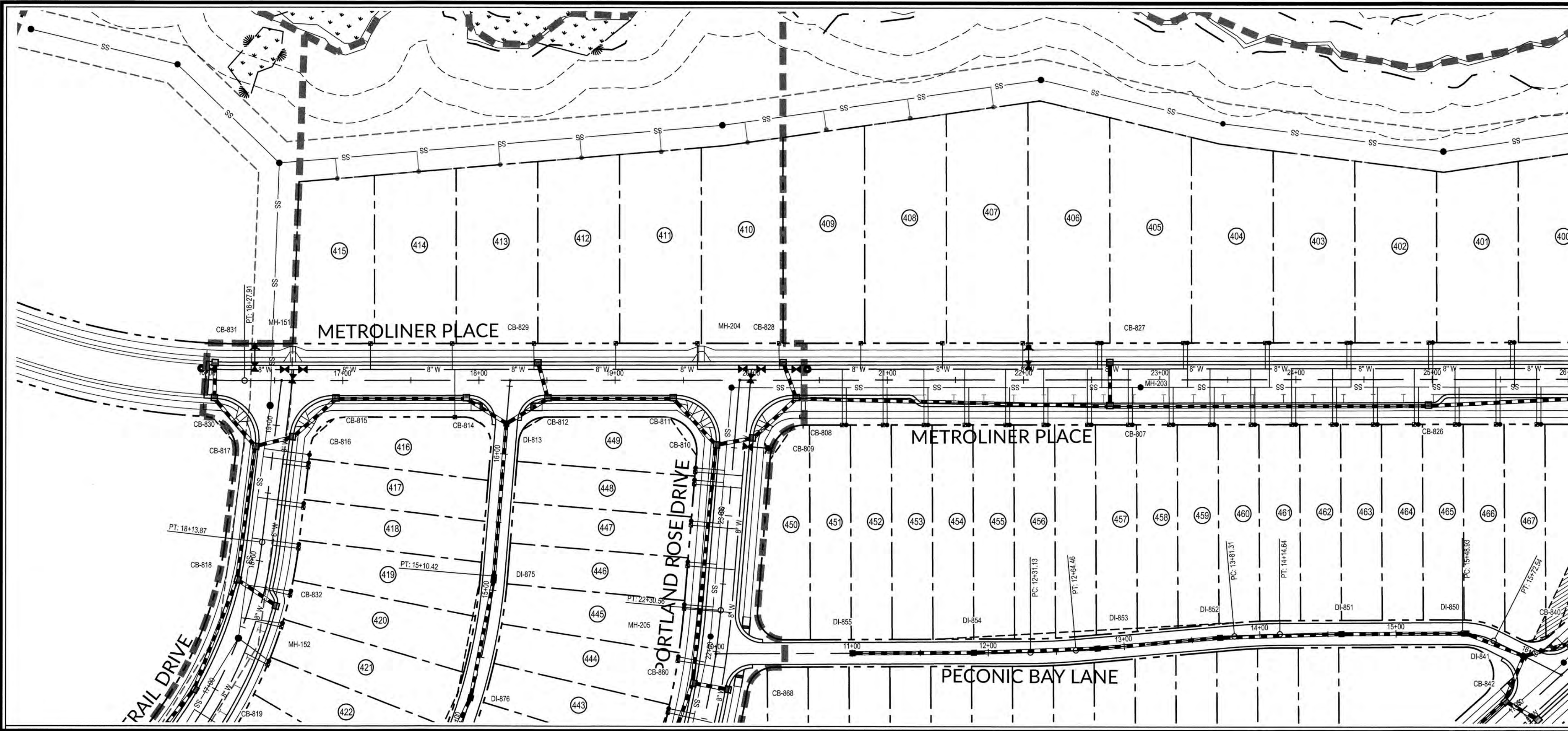
EROSION CONTROL PLAN

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions		
1	1st TOK Comments	08/31/18

Sheet No.
6.5



PUBLIC
SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # S-4460
AUTHORIZATION TO CONSTRUCT Have em. Sample
DATE 1/29/19

PUBLIC
WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

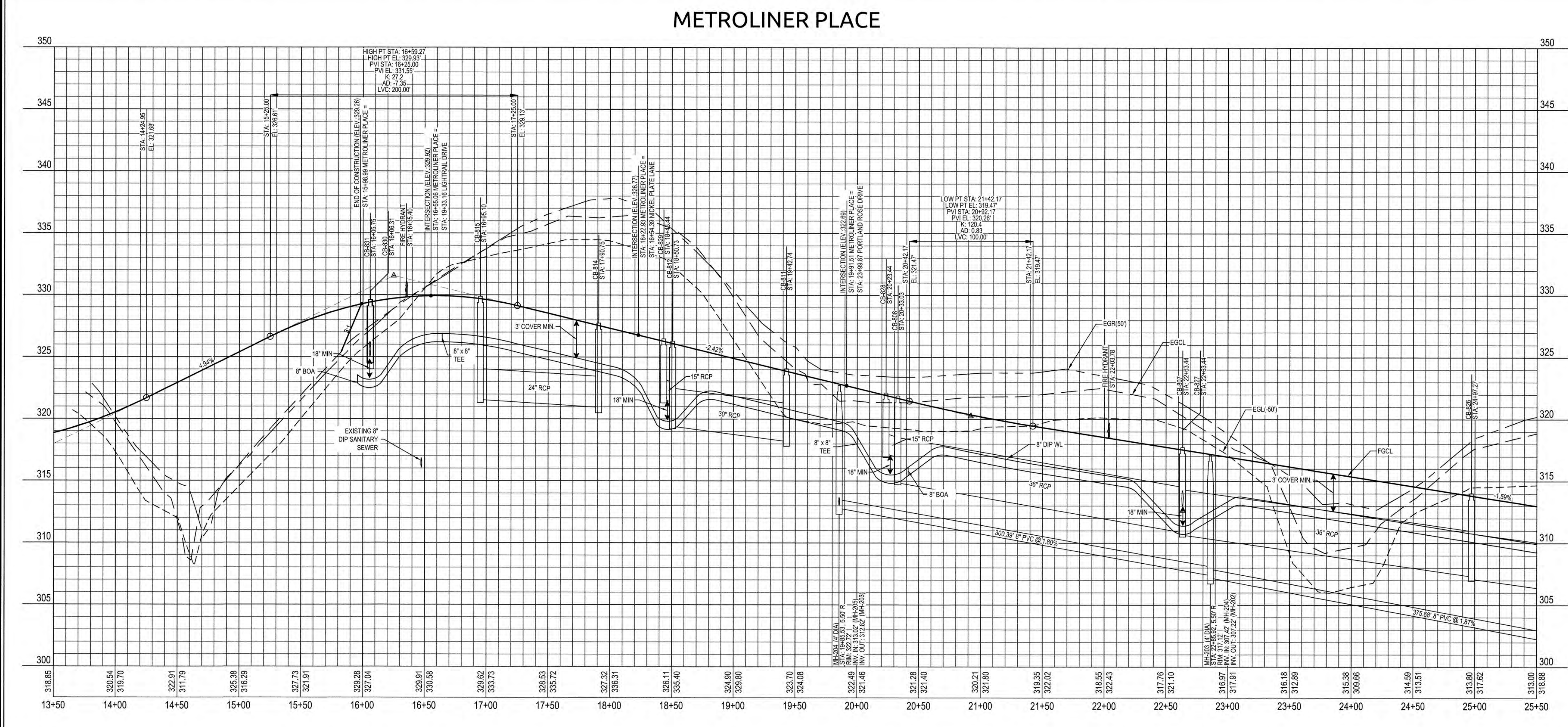
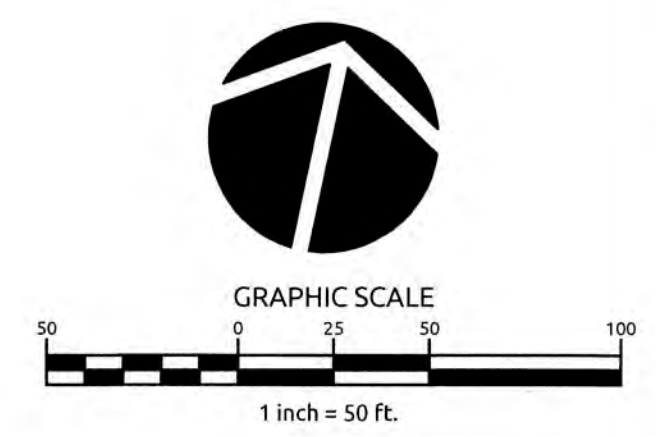
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
AUTHORIZATION TO CONSTRUCT Have em. Sample
DATE 1/29/19

TOOK 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: Subill DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: Maxwell DATE: 2-4-19
ADMINISTRATOR



SCALE:
1" = 50' HORIZ.
1" = 5' VERT.

WATERLINE NOTE:
IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS. SEE LATEST TOK STANDARD SPECIFICATIONS.

CITY OF RALEIGH

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

TRANSPORTATION SERVICES: N/A

PUBLIC UTILITIES: 42 1/29/19

STORMWATER: N/A

PLANNING: N/A

FIRE: N/A

URBAN FORESTRY: N/A

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 998-4560 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 DOWNSTEAM PLUG, HAVE PERMITTED PLANS ON THE JOB SITE, 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.

WithersRavenel
Engineers | Planners | Surveyors

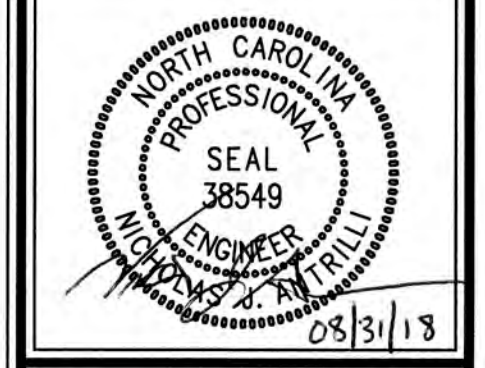
115 MacKinnon Drive | Cary, NC 27511 | (919) 469-3340 | License # C-0832 | www.withersravenel.com

**KNIGHTDALE STATION
R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**METROLINER PLACE PLAN
& PROFILE**

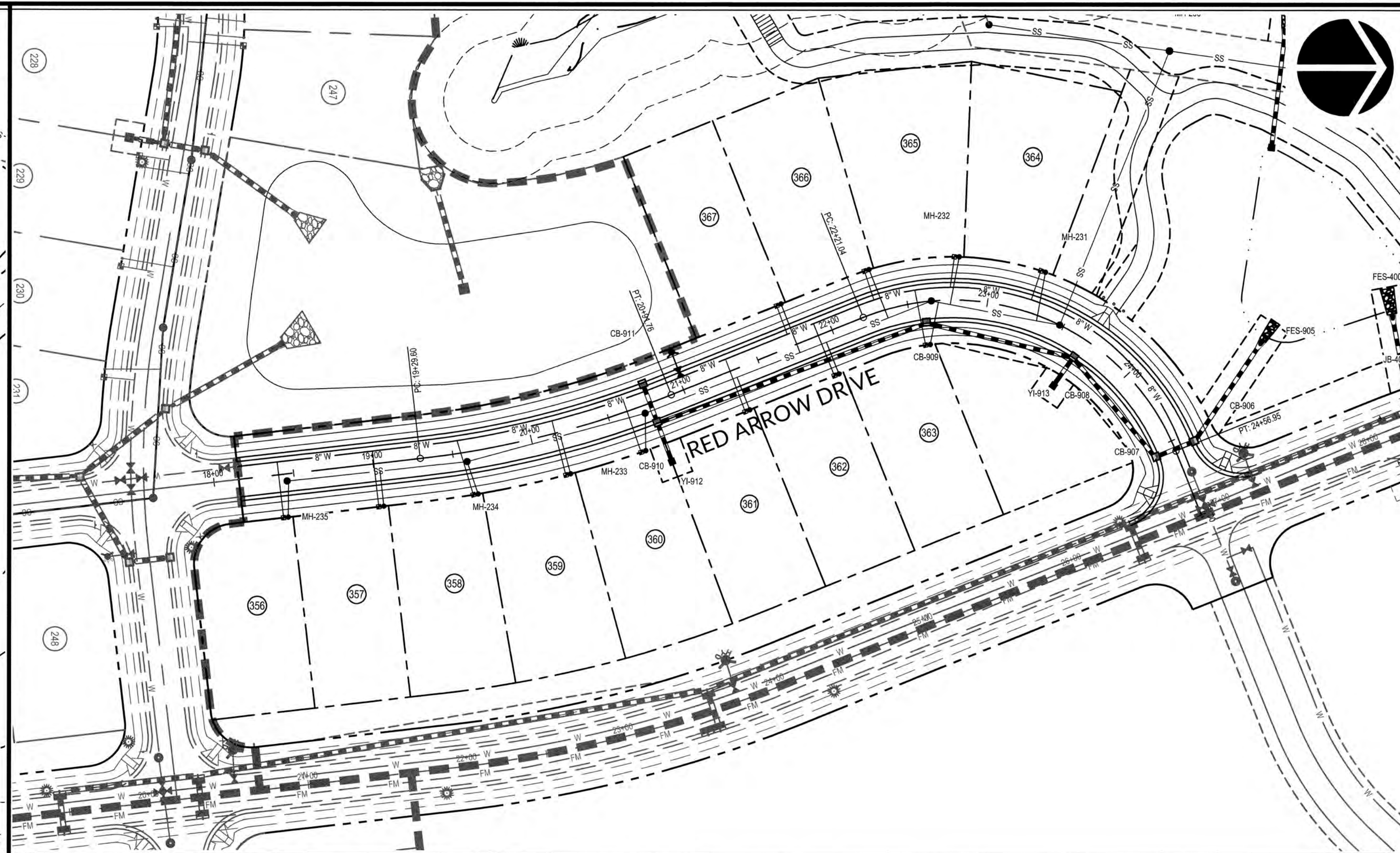
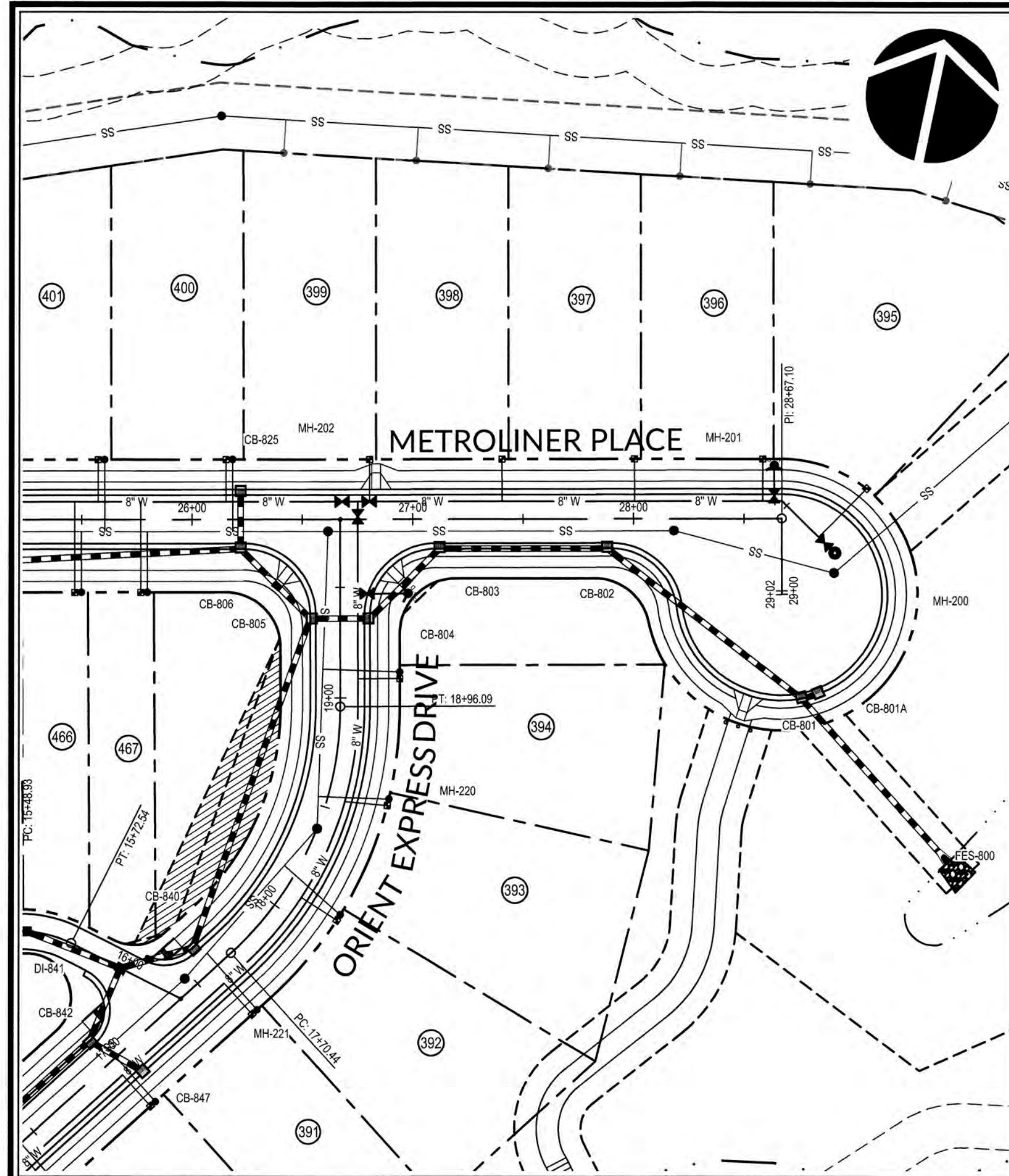
Job No. 02090251.6 Drawn By W6R
Date 06/08/2018 Designer W6R



Revisions	
1	1st TOK Comments 08/31/18

Sheet No.
7.1

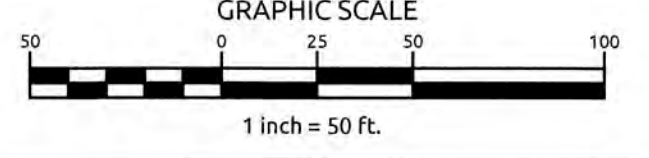
K:\09\02090251.6\Knightdale Station Power & Gas\MASTER-CONSTRUCTION DRAWINGS\1-7-18 PLAN AND PROFILES.dwg - Thursday, August 30, 2018 9:10:02 PM - DUREYA, COLLEEN



PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-4486
 AUTHORIZATION TO CONSTRUCT James M. Sample
 DATE 1/23/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT James M. Sample
 DATE 1/23/19

TOURN 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: Sam Hill DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: Wesley DATE: 2-14-19
 ADMINISTRATOR



METROLINER PLACE

RED ARROW DRIVE

SCALE:
 1" = 50' HORIZ.
 1" = 5' VERT.

WATERLINE NOTE:
 IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
 CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS. SEE LATEST TOK STANDARD SPECIFICATIONS.

CITY OF RALEIGH

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

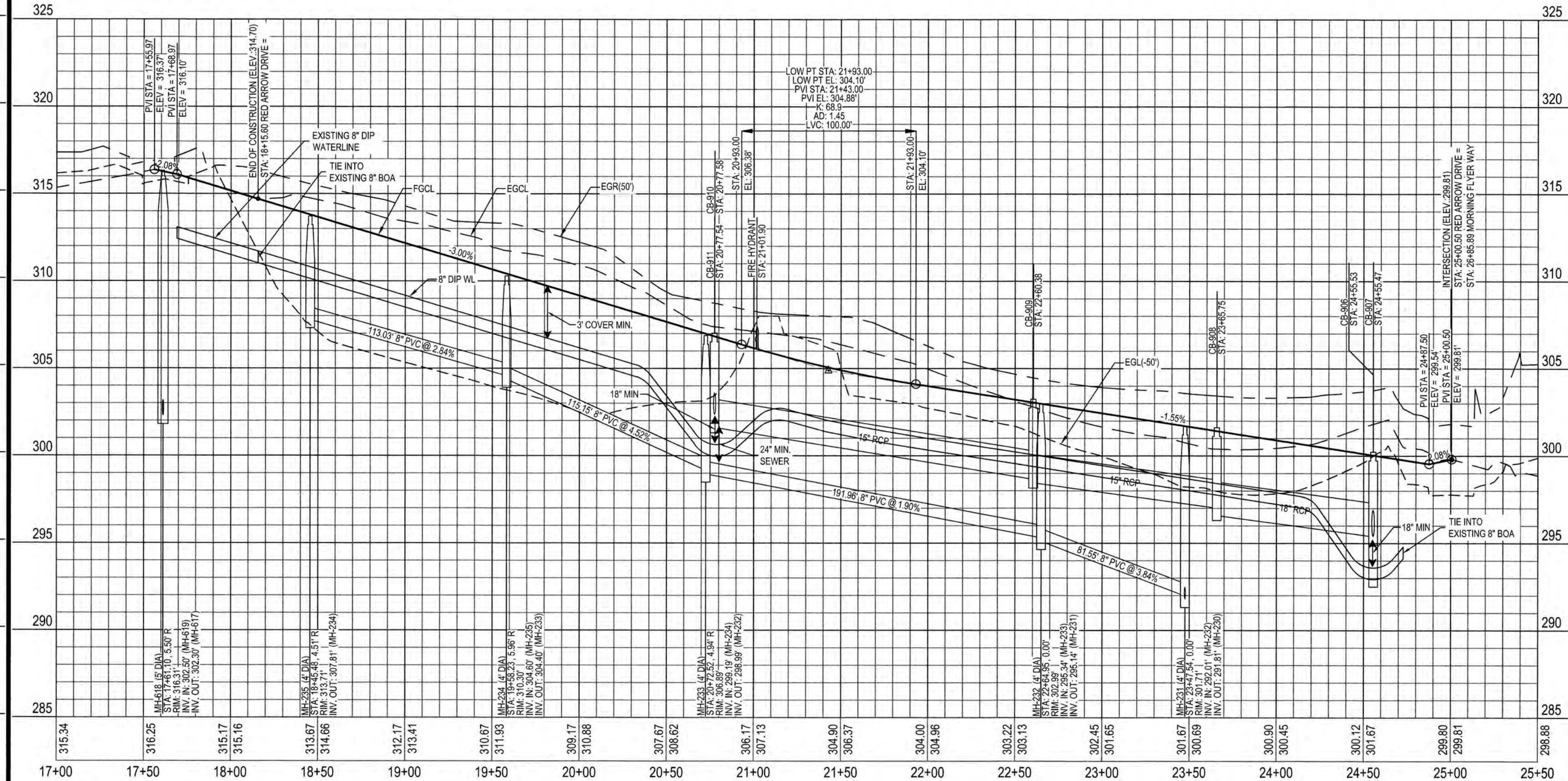
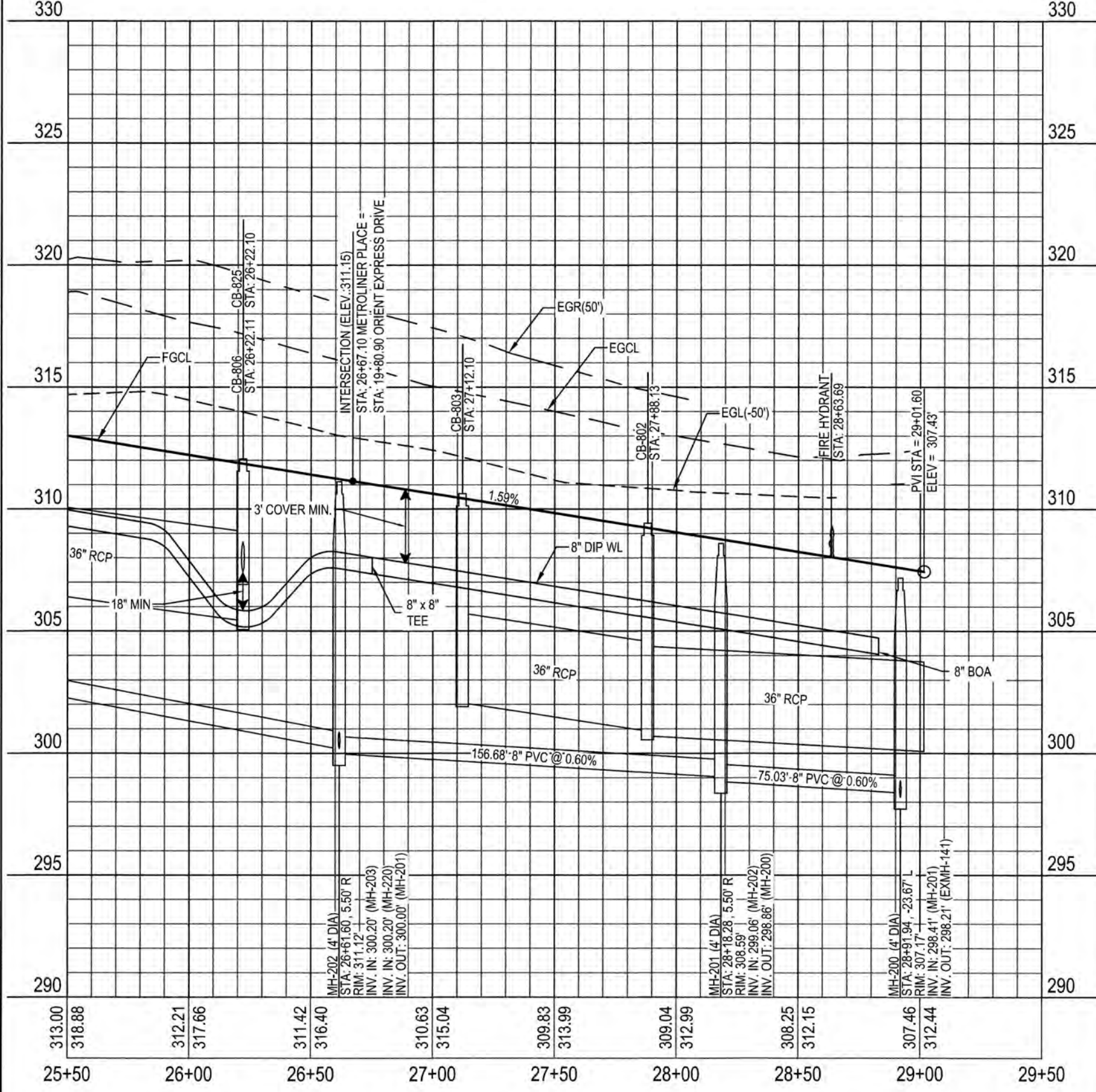
TRANSPORTATION SERVICES	N/A
PUBLIC UTILITIES	<u>470</u> 1/23/19
STORMWATER	N/A
PLANNING	N/A
FIRE	N/A
URBAN FORESTRY	N/A

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 998-4542 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 JOB SITE, 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.



KNIGHTDALE STATION
 R6D AND R4

METROLINER PLACE AND
 RED ARROW DR. PLAN &
 PROFILE

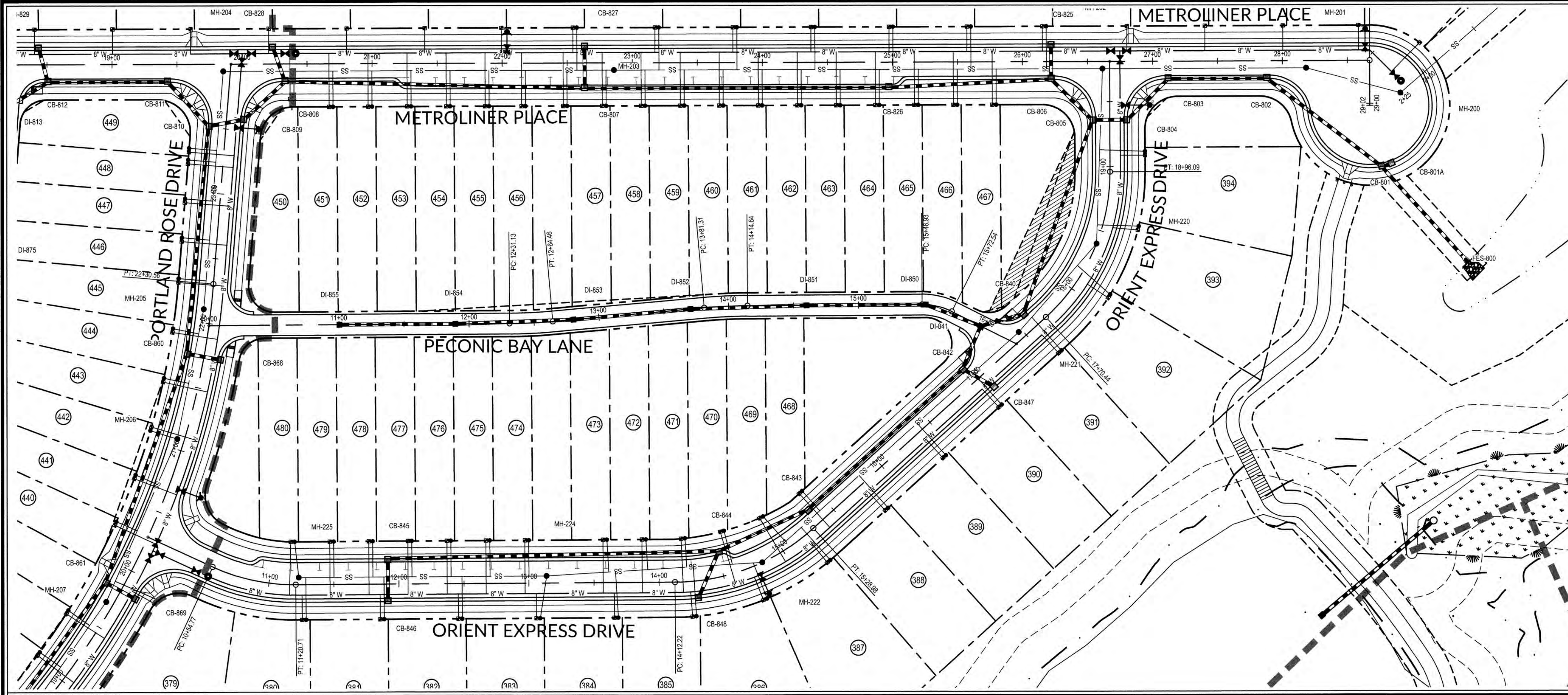
Job No. 02090251.6
 Date 06/08/2018
 Drawn By WGR
 Designer WGR



Revisions

1	1st TOK Comments	08/31/18
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K:\07\09-02090251.6-Knightdale Station\Plan\MASTER-CONSTRUCTION DRAWINGS\1.7.2-PLAN AND PROFILES.dwg - Thursday, August 30, 2018 9:10:51 PM - DARYEA, COLLEEN



PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-44510
 AUTHORIZATION TO CONSTRUCT Green Mt. Sample
 DATE 1/29/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574P
 AUTHORIZATION TO CONSTRUCT Green Mt. Sample
 DATE 1/29/19

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: Submittal DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: W. J. ... DATE: 2.9.19
 ADMINISTRATOR

WithersRavenel
 Engineers | Planners | Surveyors

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

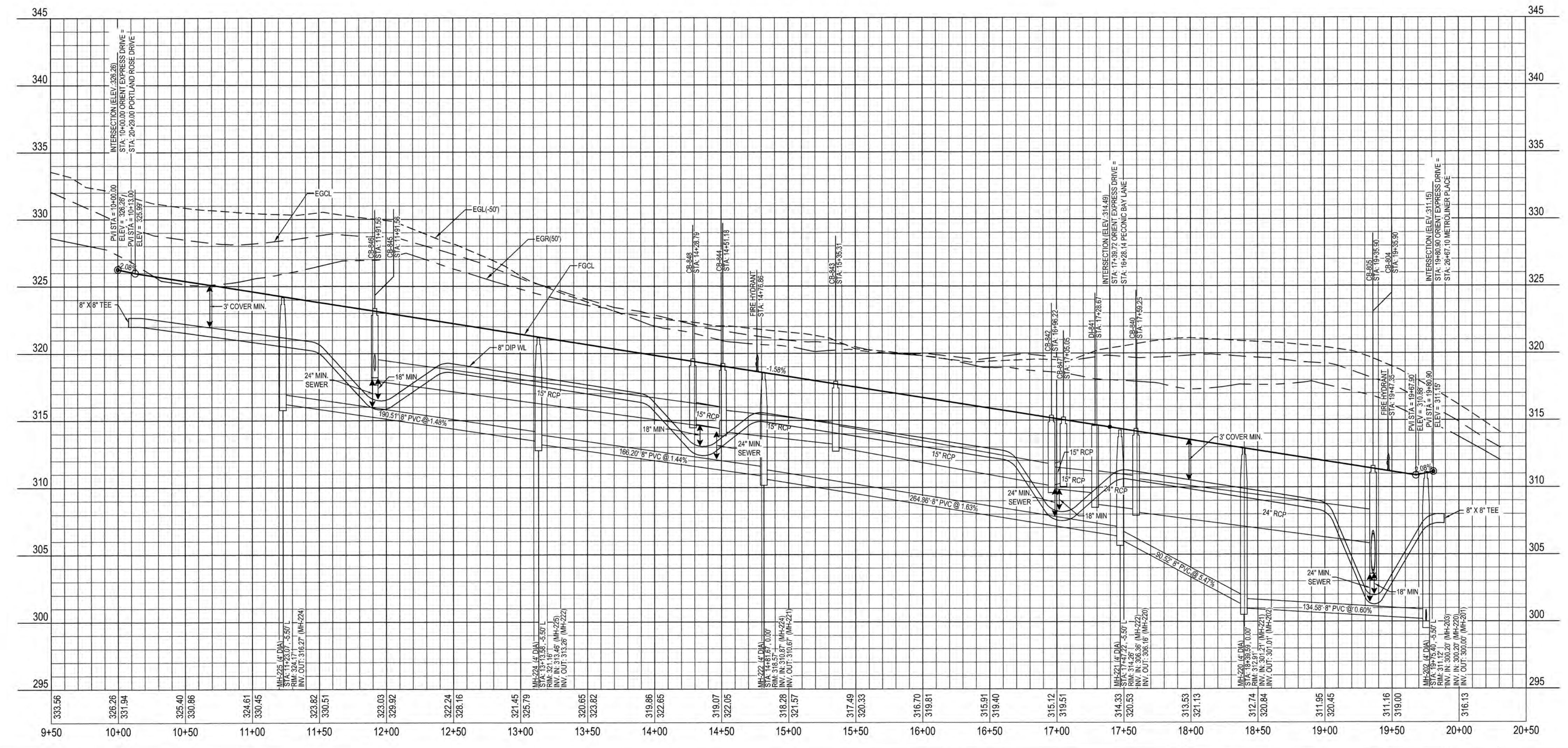
KNIGHTDALE STATION
 R6D AND R4
 TOWN OF KNIGHTDALE, NORTH CAROLINA

ORIENT EXPRESS DRIVE

SCALE:
 1" = 50' HORIZ.
 1" = 5' VERT.

WATERLINE NOTE:
 IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
 CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS. SEE LATEST TOK STANDARD SPECIFICATIONS.



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

TRANSPORTATION SERVICES: N/A
 PUBLIC UTILITIES: (43) 1/29/19
 STORMWATER: N/A
 PLANNING: N/A
 FIRE: N/A
 URBAN FORESTRY: N/A

ATTENTION CONTRACTORS

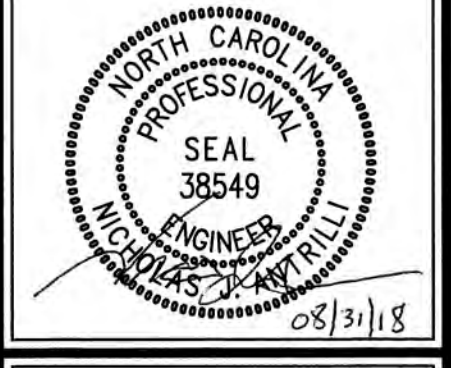
THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 998-4340 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION.

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 JOB SITE, 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.

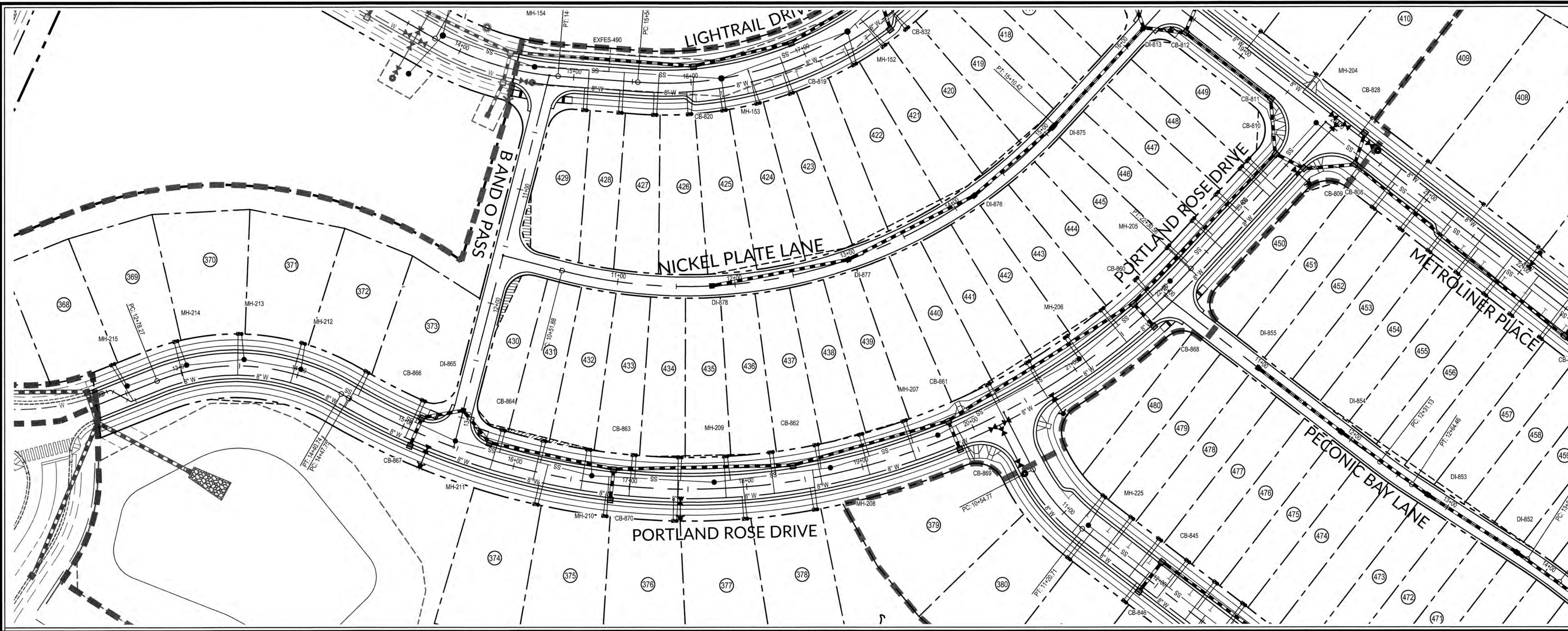
**ORIENT EXPRESS DRIVE
 PLAN & PROFILE**

Job No. 02090251.6 Drawn By: WSR
 Date: 06/08/2016 Designer: WSR



Revisions		
1	1st TOK Comments	08/31/18

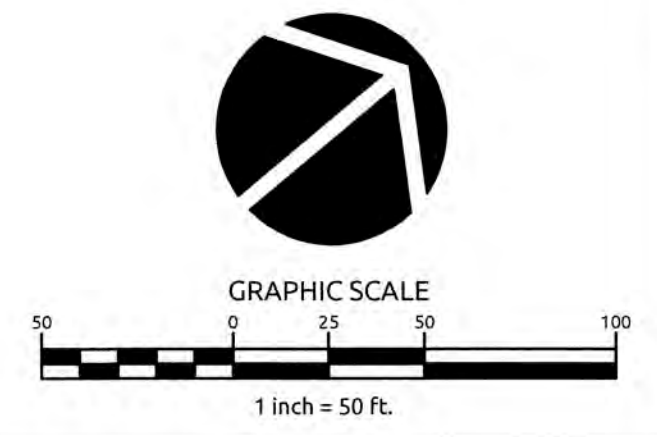
K:\09\0250\0251.6\Knightdale Station R6D\CONSTRUCTION\DRAWINGS\7.3 PLAN AND PROFILE.dwg Plotter: August 31, 2018 1:05:58 PM - D:\RVEA\COLLEEN



PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-4496
 AUTHORIZATION TO CONSTRUCT Approved
 DATE 11/29/19

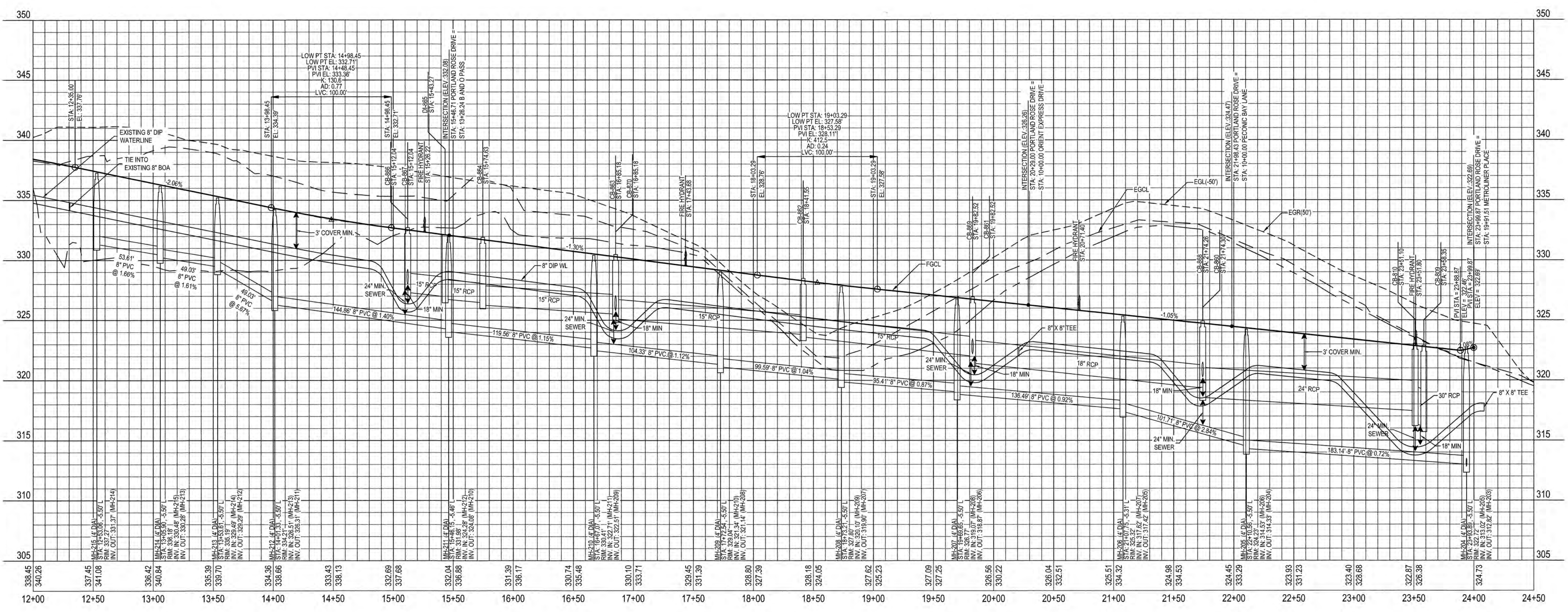
PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT Approved
 DATE 11/29/19

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: S. McNeill DATE: 8/31/2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: [Signature] DATE: 2.4.19
 ADMINISTRATOR



PORTLAND ROSE DRIVE

SCALE:
 1" = 50' HORIZ.
 1" = 5' VERT.



WATERLINE NOTE:
 IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
 CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS SEE LATEST TOK STANDARD SPECIFICATIONS.

CITY OF RALEIGH

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

TRANSPORTATION SERVICES	N/A
PUBLIC UTILITIES	<u>(83) 1/29/19</u>
STORMWATER	N/A
PLANNING	N/A
FIRE	N/A
URBAN FORESTRY	N/A

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 586-4542 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 JOB SITE, 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.

WithersRavenel
 Engineers | Planners | Surveyors

115 MacKean Drive Cary, NC 27511 | E: 919-469-3340 | License #: C-0832 | www.withersravenel.com

**KNIGHTDALE STATION
 R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

**PORTLAND ROSE DRIVE
 PLAN & PROFILE**

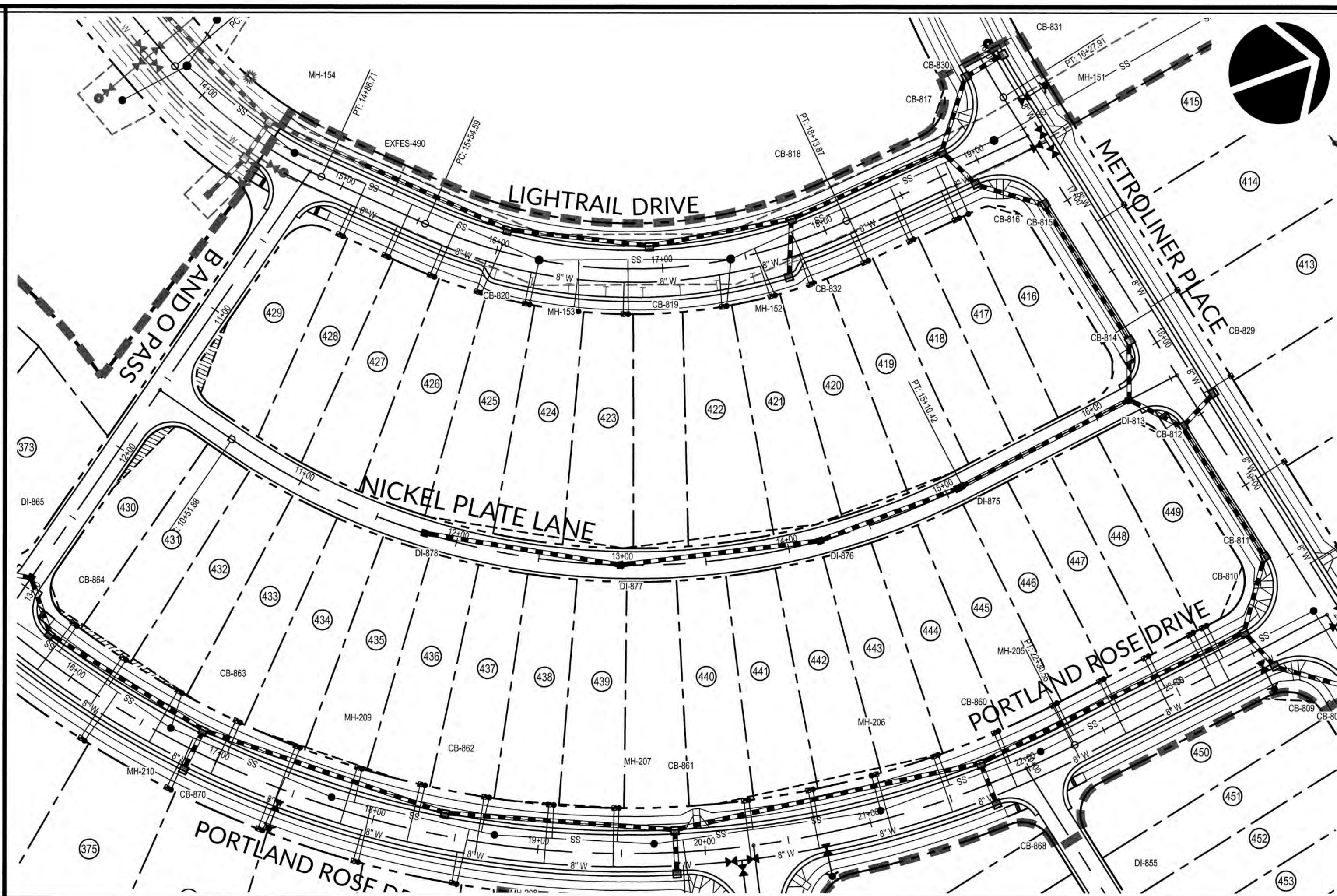
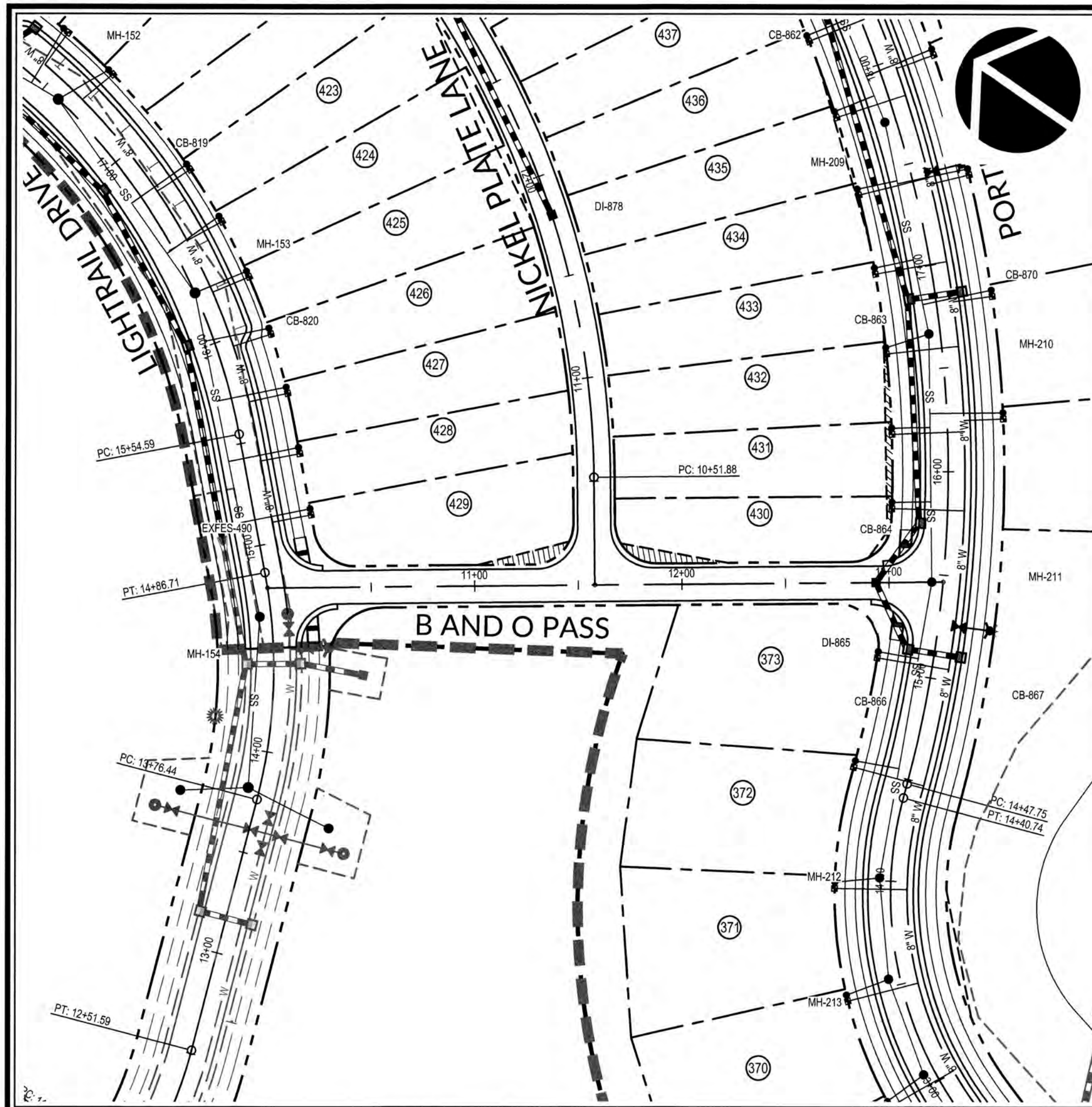
Job No. 02090251.6 Drawn By WGR
 Date 06/08/2018 Designer WGR



Revisions

1	1st TOK Comments	08/31/18
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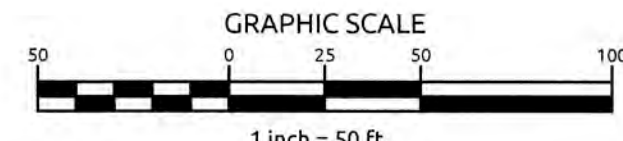
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PUBLIC SEWER COLLECTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # 5-49510
 AUTHORIZATION TO CONSTRUCT Rosa M. Sample
 DATE 1/29/19

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM
 THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.
 CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT Rosa M. Sample
 DATE 1/29/19

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: Sam All DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER
 THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
 BY: W. Sample DATE: 2-4-19
 ADMINISTRATOR



B AND O PASS

NICKEL PLATE LANE

SCALE:
 1" = 50' HORIZ.
 1" = 5' VERT.

WATERLINE NOTE:
 IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
 CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS SEE LATEST TOK STANDARD SPECIFICATIONS.

CITY OF RALEIGH
 ALL CONSTRUCTION MUST BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.
 TRANSPORTATION SERVICES: N/A
 PUBLIC UTILITIES: 19 1/29/19
 STORMWATER: N/A
 PLANNING: N/A
 FIRE: N/A
 URBAN FORESTRY: N/A

ATTENTION CONTRACTORS
 THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER AS APPROVED IN THESE PLANS IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 998-4542 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 JOB SITE, 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.

WithersRavenel
 Engineers | Planners | Surveyors

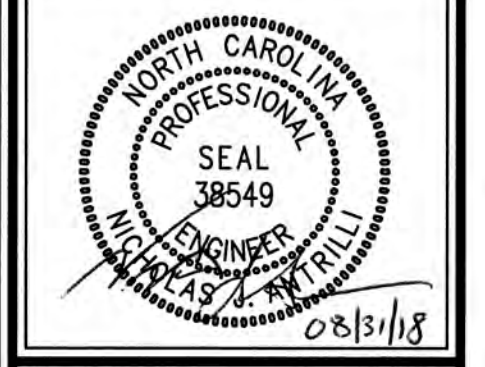
115 MacKinnon Drive | Cary, NC 27511 | 919.469.3340 | License # C-0832 | www.withersravenel.com

**KNIGHTDALE STATION
 R6D AND R4**

TOWN OF KNIGHTDALE, NORTH CAROLINA

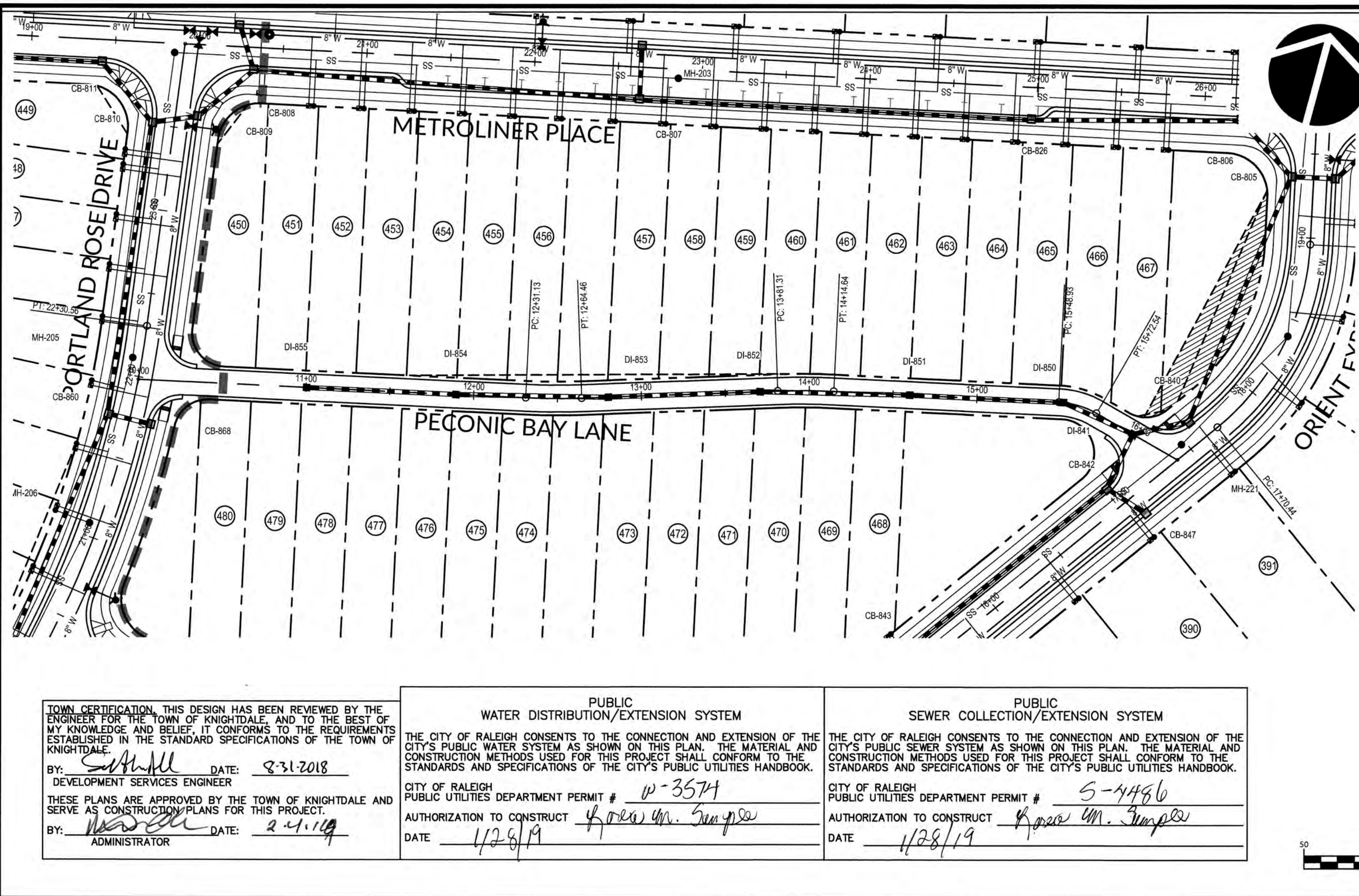
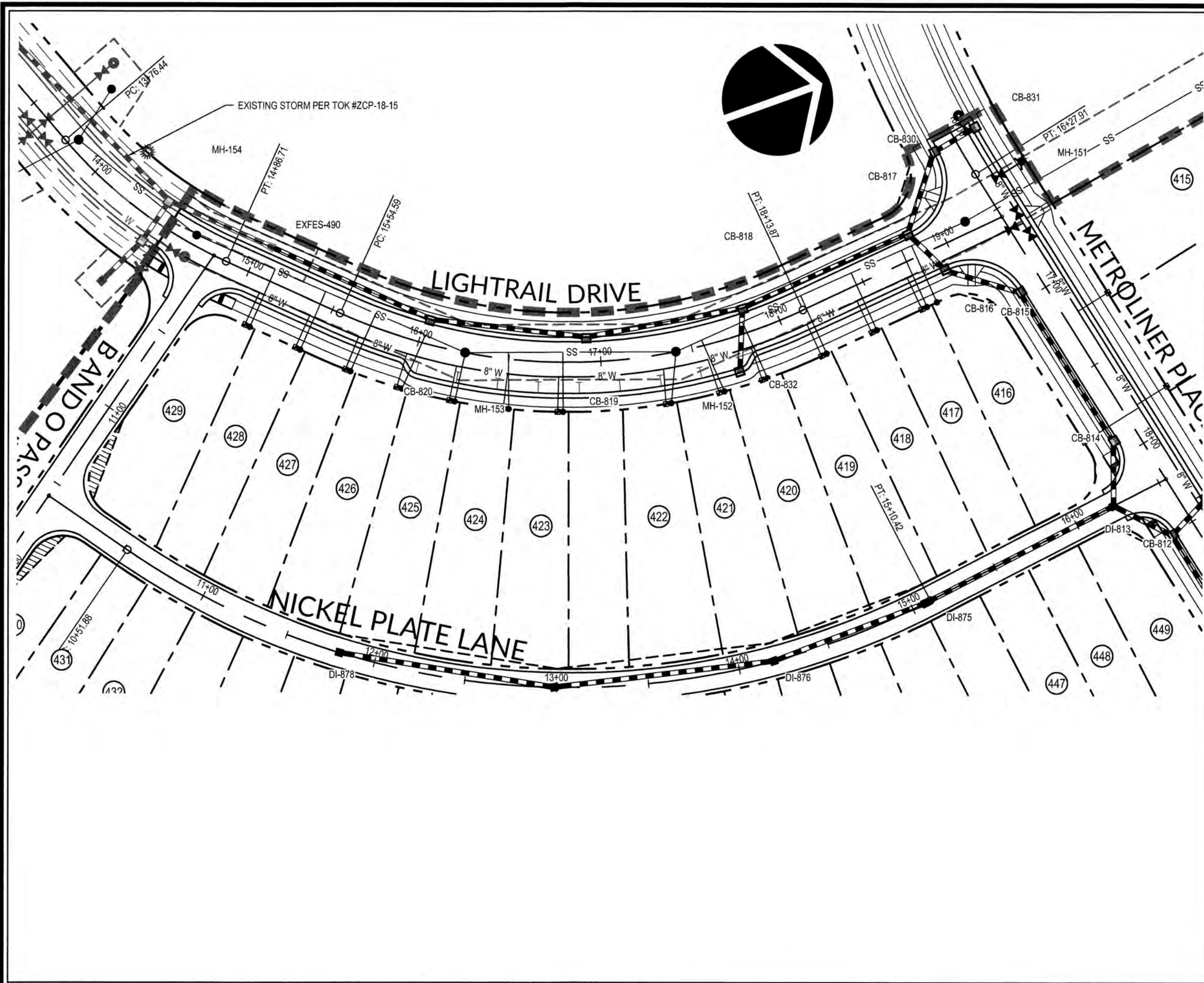
**B AND O PASS AND NICKEL
 PLATE LANE PLAN &
 PROFILE**

Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



Revisions
 1 1st TOK Comments 08/31/18

K:\09\4520\090251.6\Knightdale Station\Drawings\7.5-7.8 PLAN AND PROFILE.dwg - Thursday, August 30, 2018 9:11:31 PM - DUMREY, COLLEEN



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: *[Signature]* DATE: 2-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-21-19
ADMINISTRATOR

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

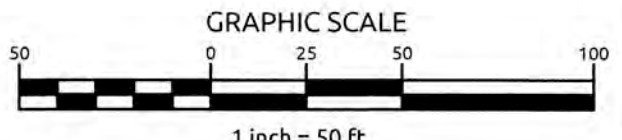
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE: 1/28/19

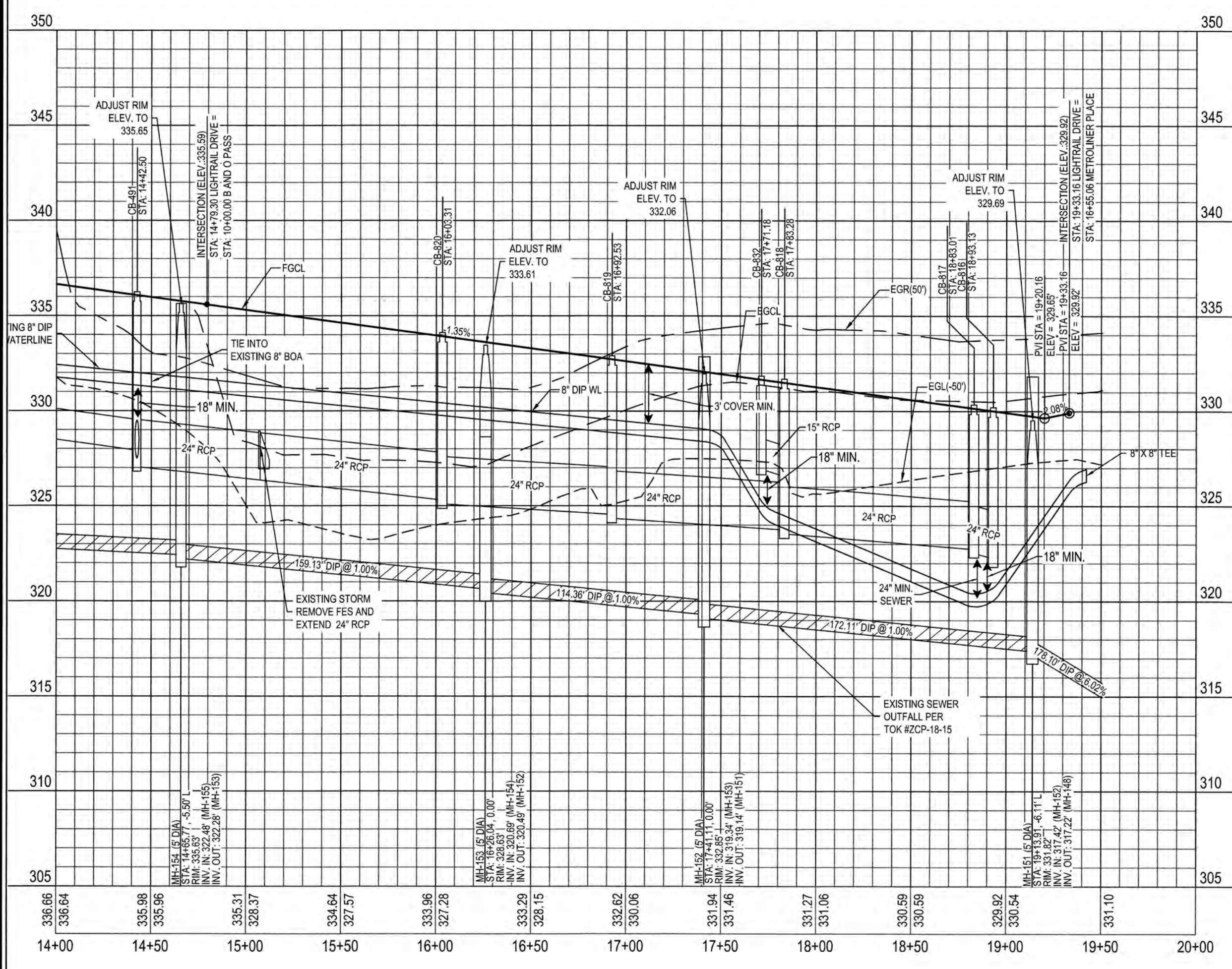
PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

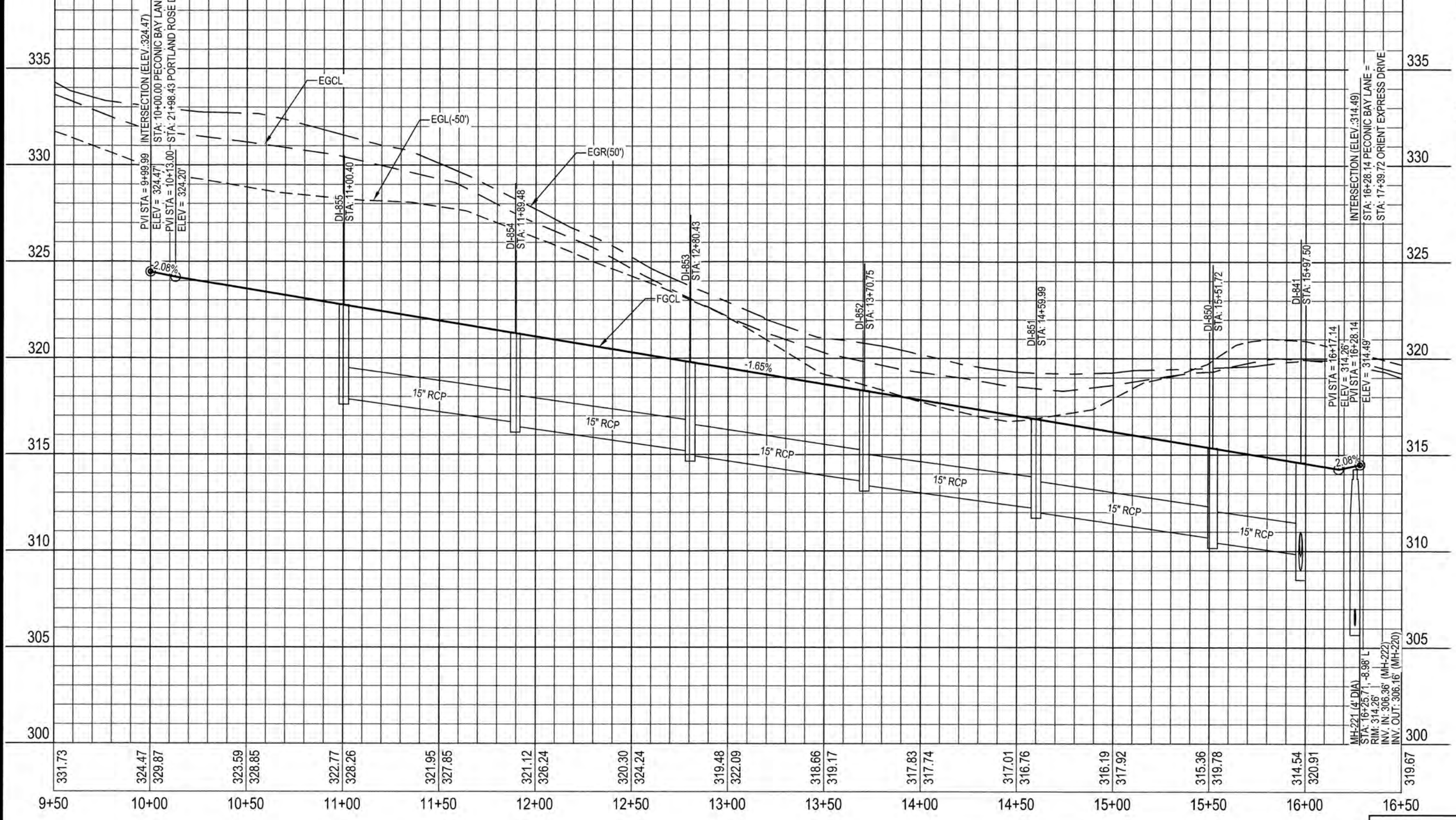
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4486
AUTHORIZATION TO CONSTRUCT *[Signature]*
DATE: 1/28/19



LIGHTRAIL DRIVE



PECONIC BAY LANE



SCALE:
1" = 50' HORIZ.
1" = 5' VERT.

WATERLINE NOTE:
IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED STORM PIPE IN FILL CONDITIONS SEE LATEST TOK STANDARD SPECIFICATIONS.

ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 998-4340 AT LEAST 21 DAYS PRIOR TO BEGINNING ANY 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 JOB SITE, 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.

CITY OF RALEIGH

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

TRANSPORTATION-SERVICES N/A

PUBLIC UTILITIES *[Signature]* 1/28/19

STORMWATER N/A

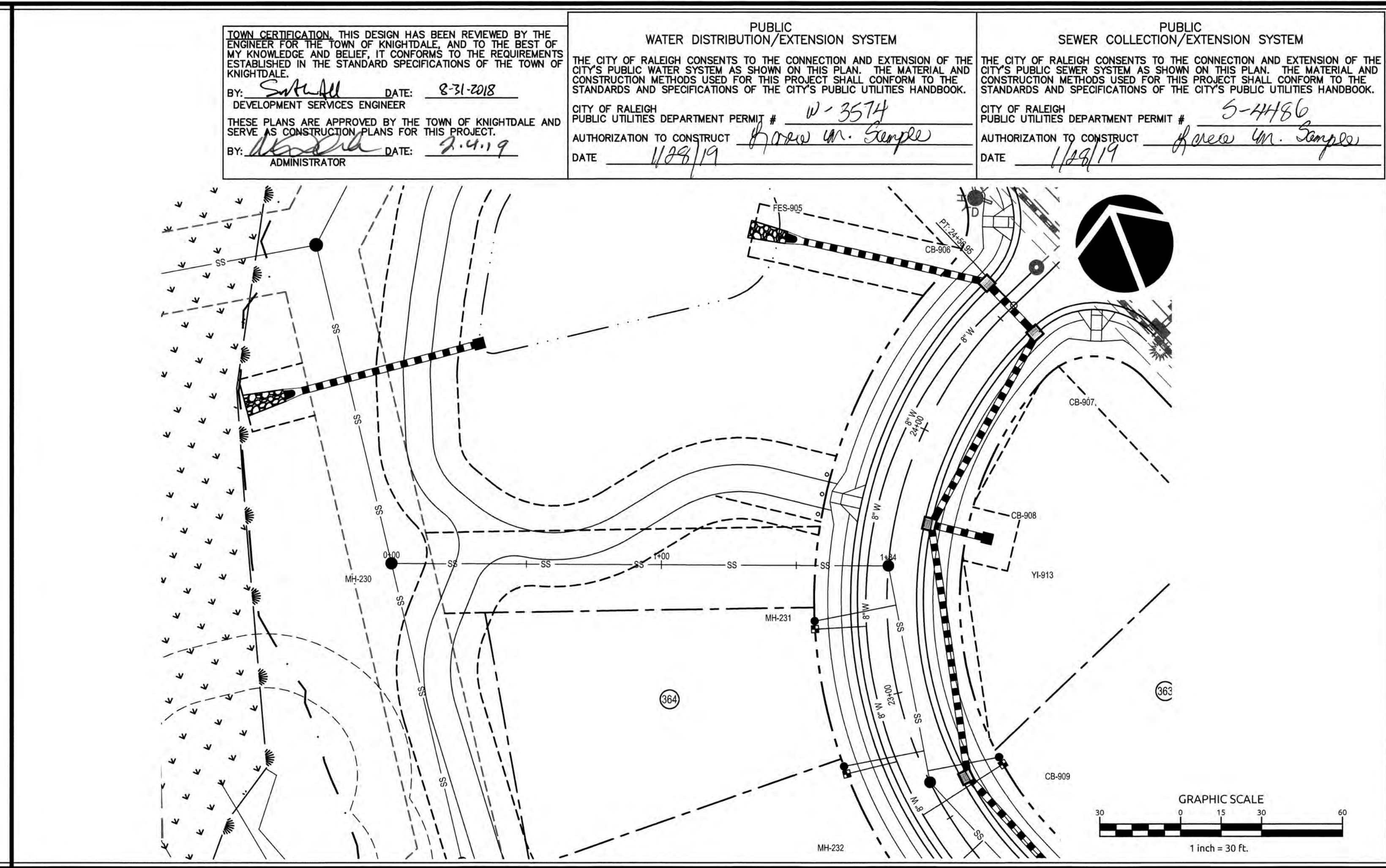
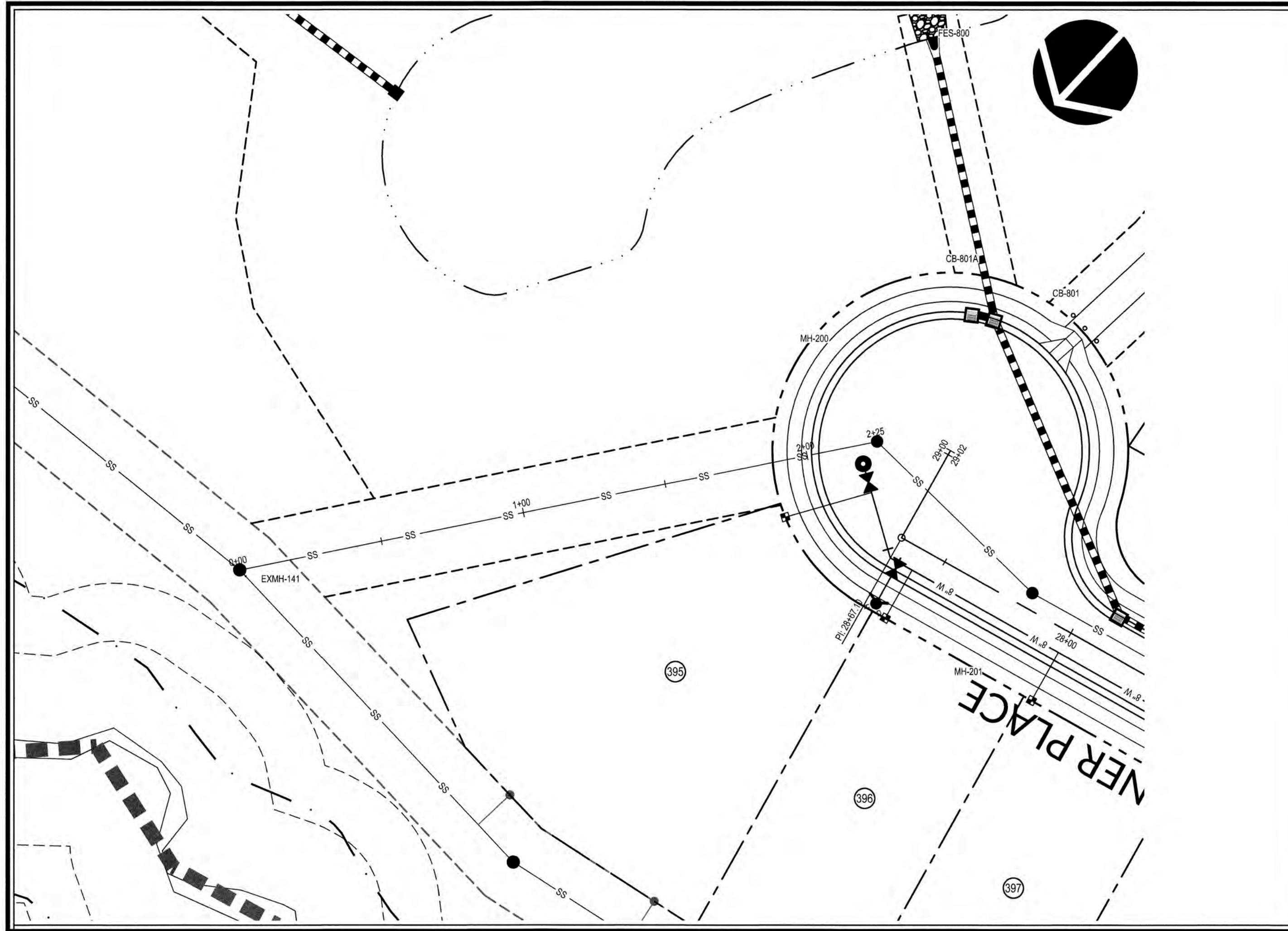
PLANNING N/A

FIRE N/A

URBAN-FORESTRY N/A



Revisions	Date	Description
1	08/31/18	1st TOK Comments



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: *[Signature]* DATE: 8-31-2018
 DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 8-4-19
 ADMINISTRATOR

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

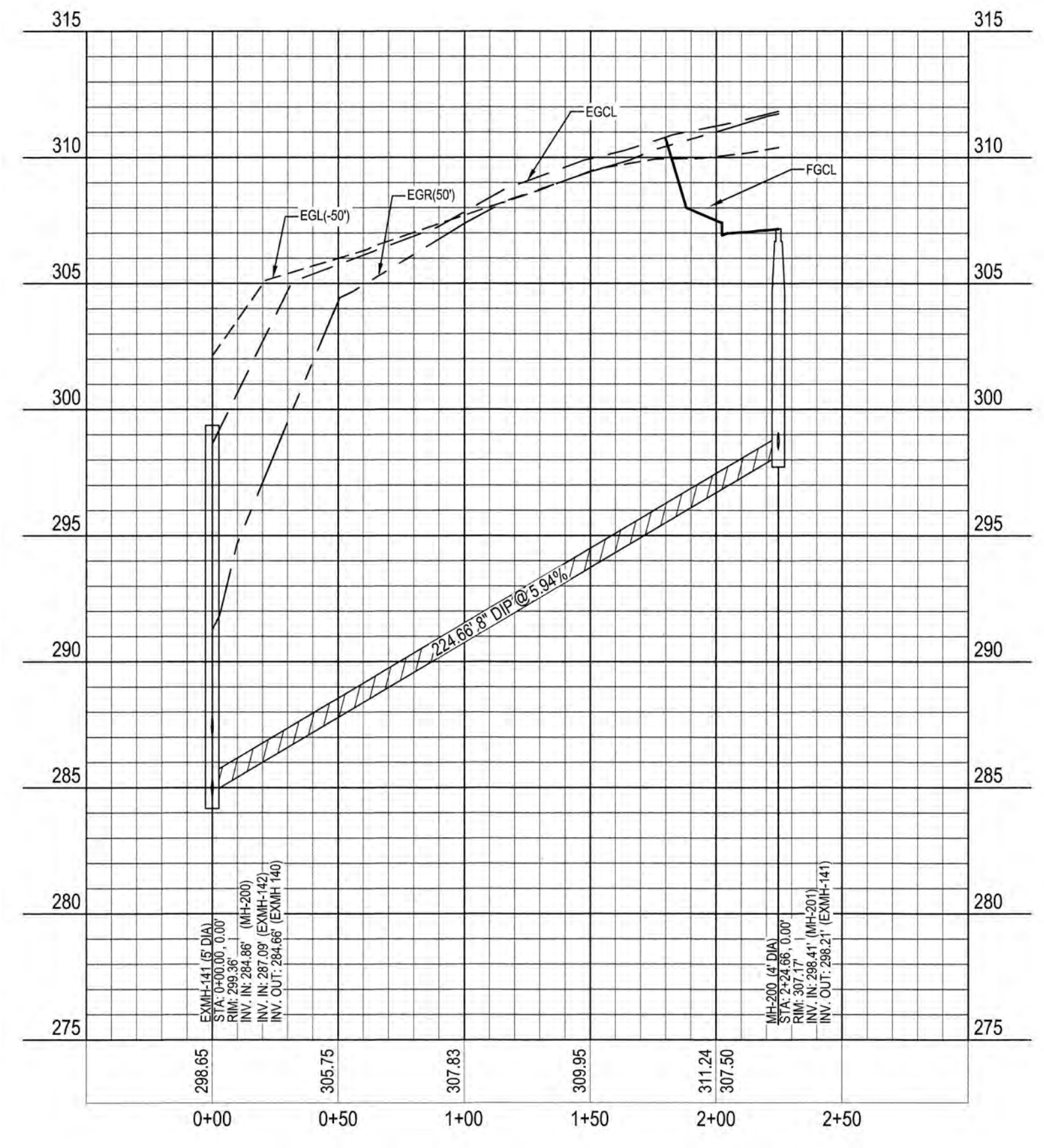
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # W-3574
 AUTHORIZATION TO CONSTRUCT *[Signature]*
 DATE: 1/28/19

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

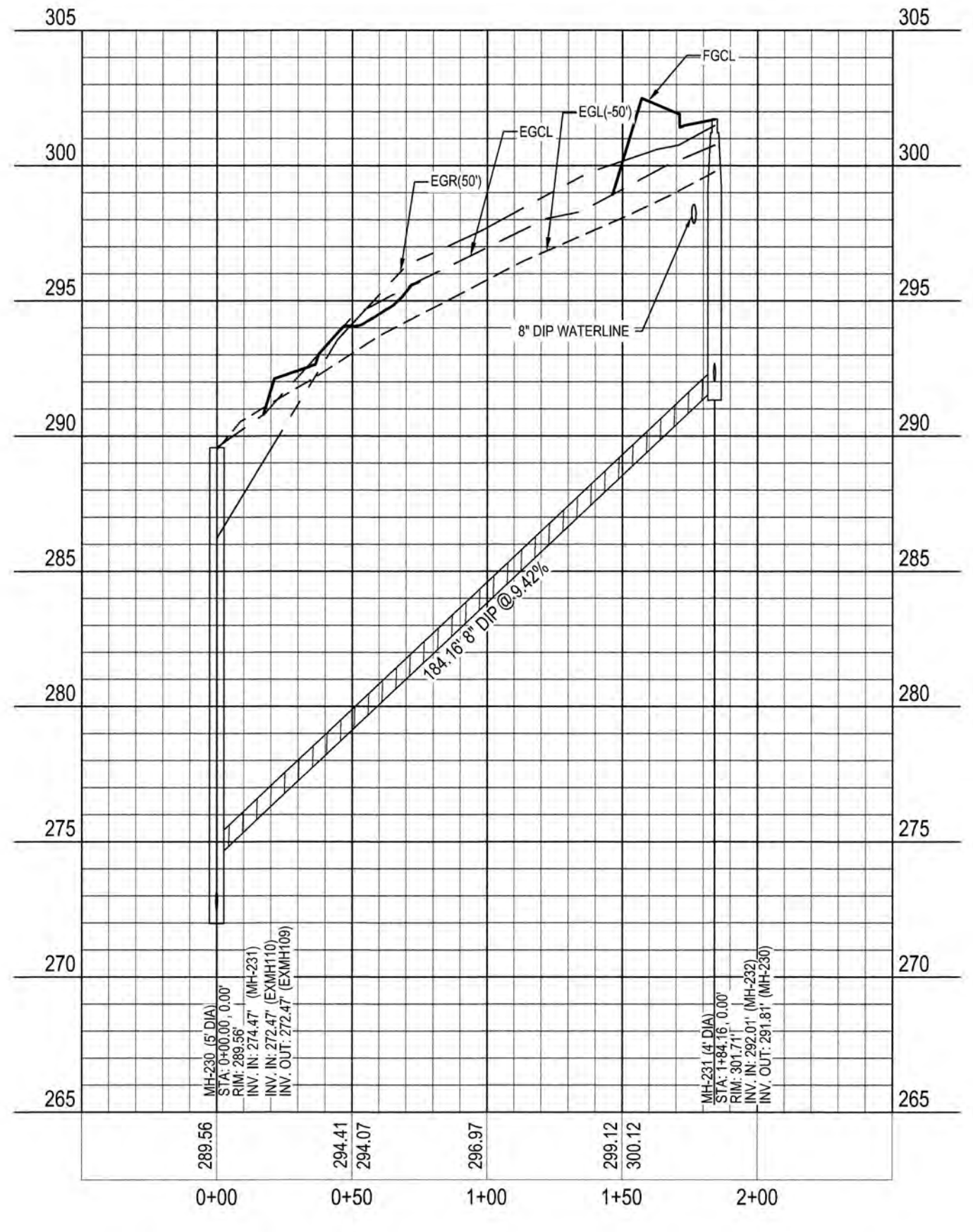
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # S-4456
 AUTHORIZATION TO CONSTRUCT *[Signature]*
 DATE: 1/28/19

SEWER OUTFALL K



SEWER OUTFALL L



SCALE:
 1" = 50' HORIZ.
 1" = 5' VERT.

WATERLINE NOTE:
 IF MINIMUM CLEARANCE CANNOT BE ACHIEVED WITHOUT EXCEEDING MAXIMUM PIPE DEFLECTION FOR THE WATERLINE, THEN CONTRACTOR TO INSTALL 45° VERTICAL BENDS PER COR DETAIL W-12.

CLASS 1 STRUCTURAL MATERIAL NOTE:
 EXISTING GROUND TO SPRING LINE OR PROPOSED STORM PIPE IN FILL CONDITIONS. SEE LATEST TOK STANDARD SPECIFICATIONS.

CITY OF RALEIGH

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

TRANSPORTATION SERVICES: N/A

PUBLIC UTILITIES: *[Signature]* 1/28/19

STORMWATER: N/A

PLANNING: N/A

FIRE: N/A

URBAN FORESTRY: N/A

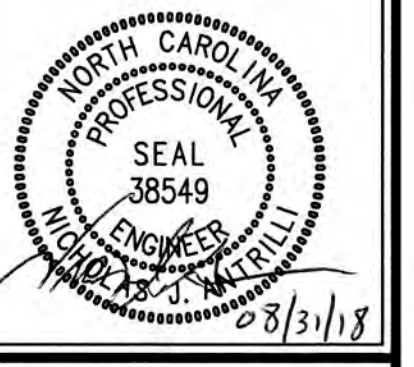
ATTENTION CONTRACTORS

THE CONSTRUCTION CONTRACTOR RESPONSIBLE FOR THE EXTENSION OF WATER AND SEWER, AS APPROVED IN THESE PLANS, IS RESPONSIBLE FOR CONTACTING THE PUBLIC UTILITIES DEPARTMENT AT (919) 996-4840 AT LEAST 24 HOURS PRIOR TO BEGINNING ANY 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 JOB SITE, 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.

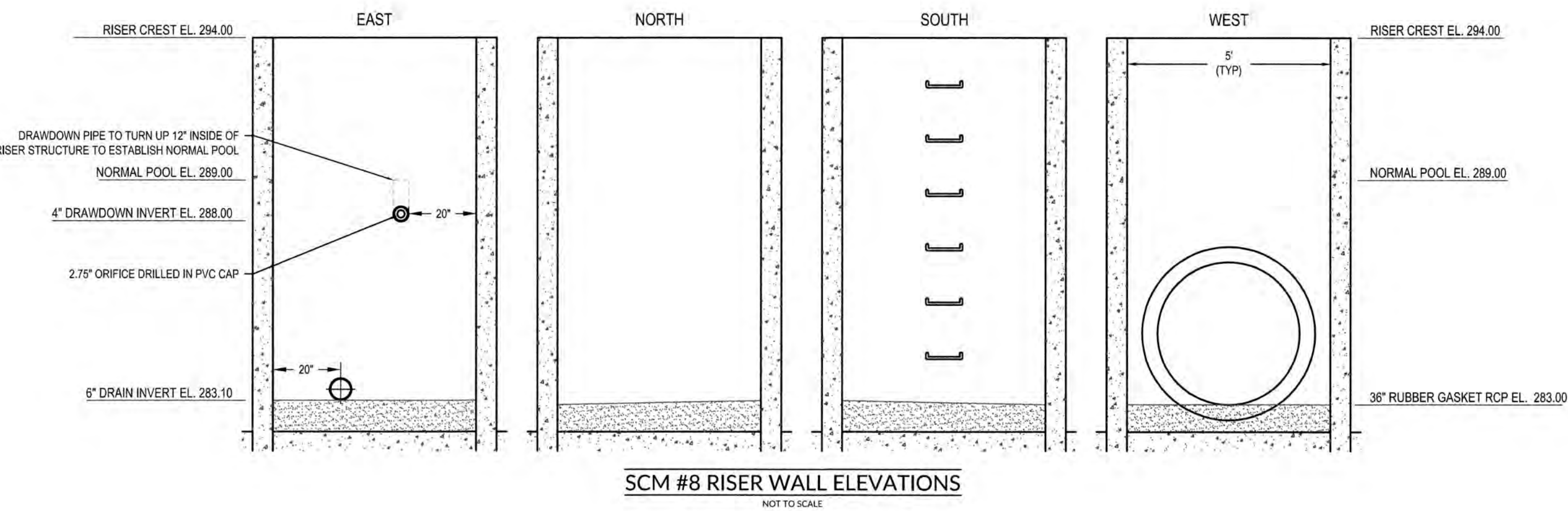
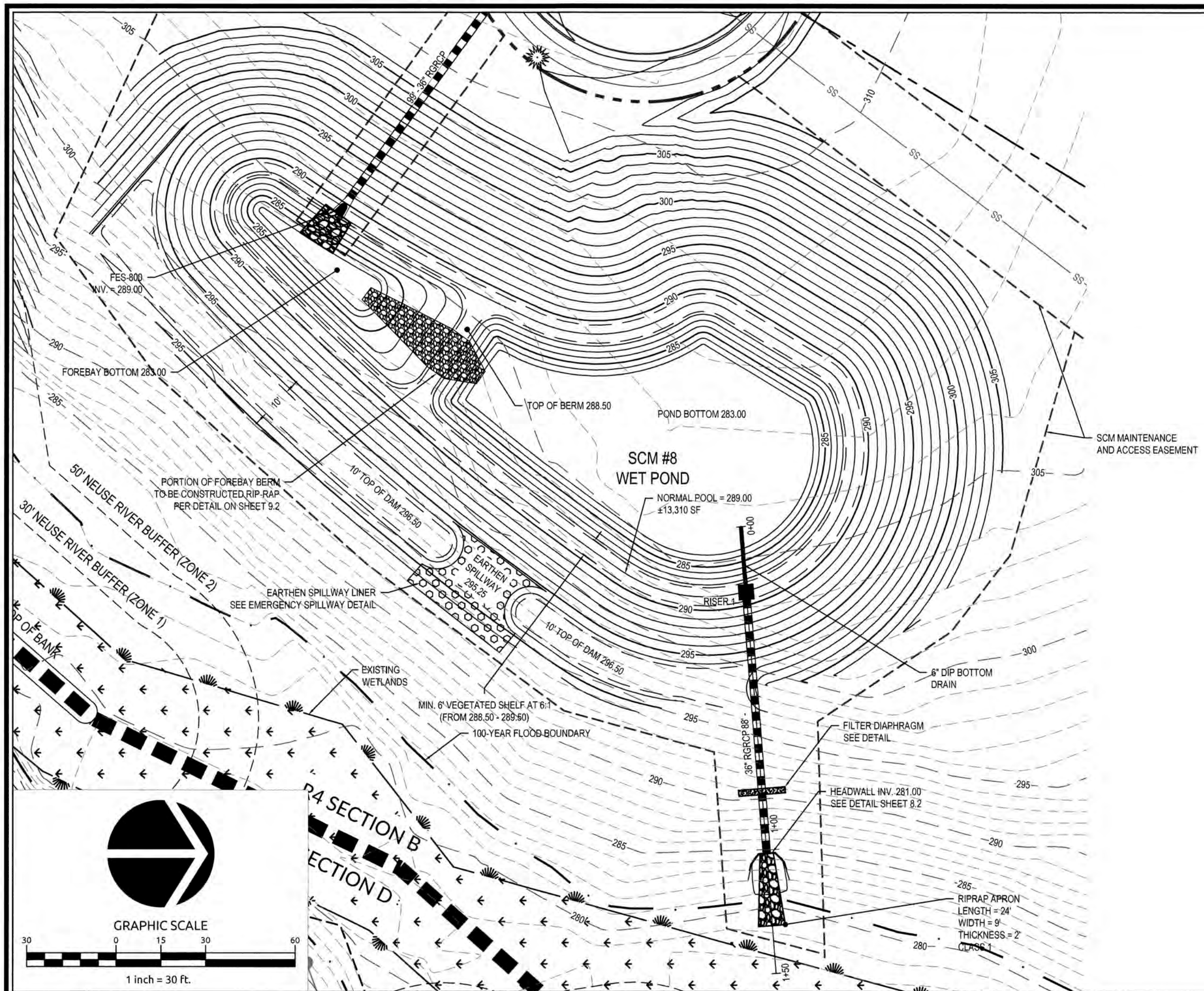
Job No. 02090251.6 Drawn By W&R
 Date 06/08/2018 Designer W&R



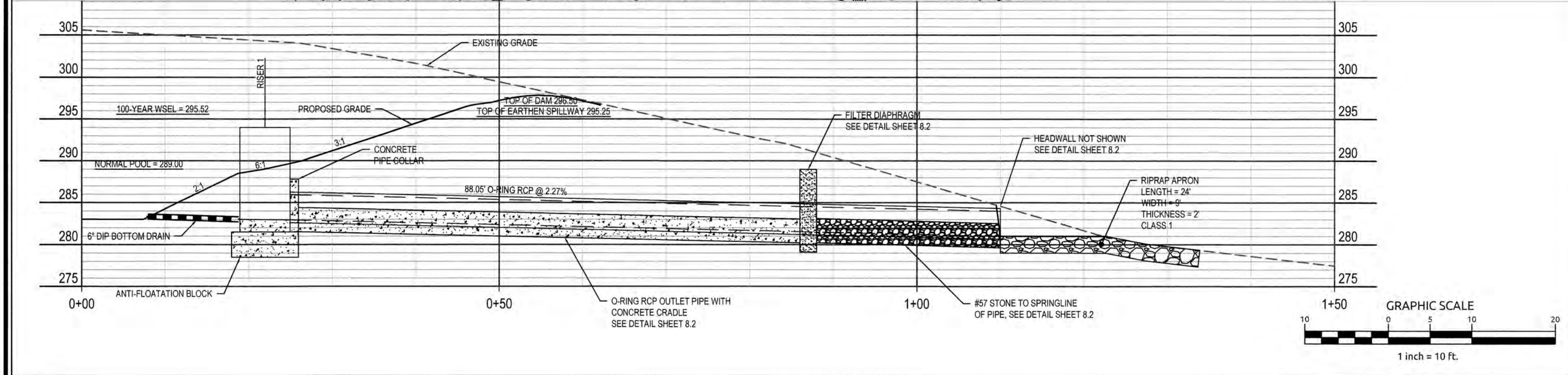
Revisions

1	1st TOK Comments	08/31/18
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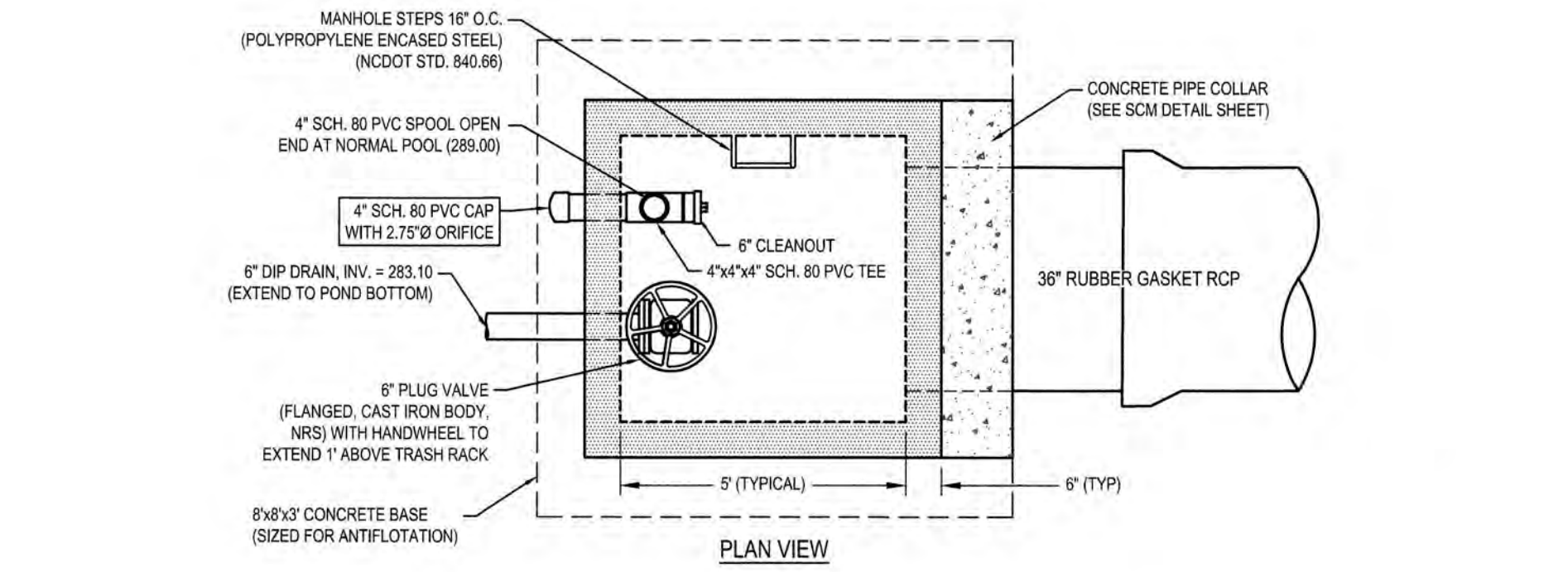
K:\09\09-02090251.6-Knightdale Station Phase B-CADWATER-CONSTRUCTION DRAWINGS\1.7-P PLAN AND PROFILES.dwg - Thursday, August 30, 2018 9:12:11 PM - DUREYA, COLLEEN



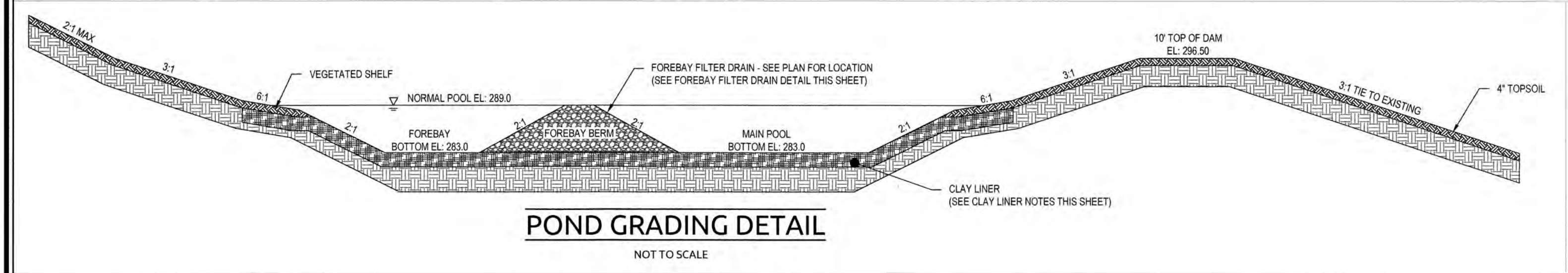
SCM #8 RISER WALL ELEVATIONS
NOT TO SCALE



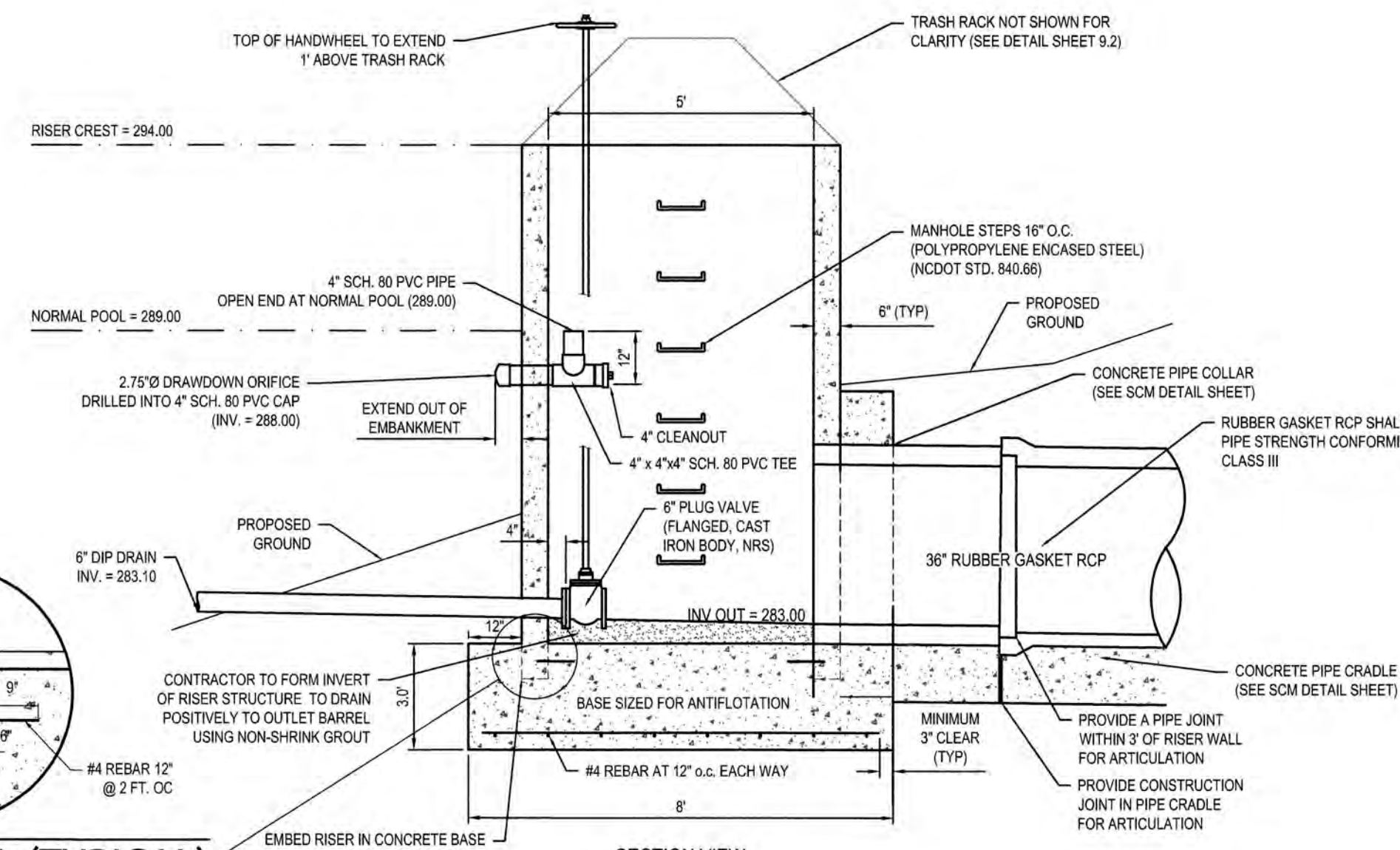
ANCHOR DETAIL (TYPICAL)
NTS



SCM #8 RISER DRAWDOWN DEVICE DETAIL
NOT TO SCALE

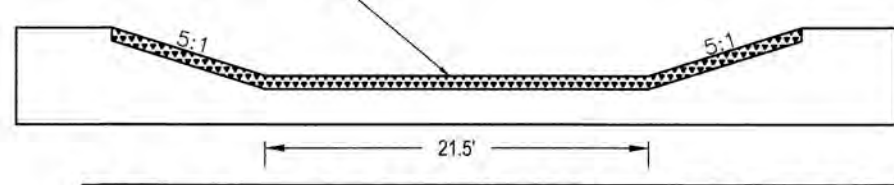


POND GRADING DETAIL
NOT TO SCALE



SECTION VIEW

EMERGENCY SPILLWAY DETAILS
NTS



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 CURRENT TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
- THE GEOTECHNICAL ENGINEER SHALL COMPLETE A GEOTECHNICAL EXPLORATION OF THE EXISTING EMBANKMENT AND PROVIDE A REPORT EVALUATING THE SUITABILITY OF EXISTING SOILS PRIOR TO CONTRACTOR COMPLETING IMPROVEMENTS.
- THE GEOTECHNICAL ENGINEER SHALL EVALUATE EXISTING AND BORROW SOILS FOR SUITABILITY OF DAM CONSTRUCTION AND SLOPE STABILITY. PROFESSIONAL CERTIFICATION OF EMBANKMENT CONSTRUCTION IS REQUIRED FOR AS-BUILT CERTIFICATION.
- EMBANKMENT 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 OF 3" OR LESS IN MEAN DIAMETER.
 - SOIL MATERIALS USED FOR EARTH FILL WHICH ARE CONSIDERED PERMEABLE OR WHICH EXHIBIT SIGNIFICANT SHRINKSWELL SHALL NOT BE USED IN THE EMBANKMENT UNLESS SPECIFICALLY APPROVED BY ON-SITE GEOTECHNICAL ENGINEER.
 - FILL SHALL BE PLACED IN 6" (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 2 FEET SHALL BE USED FOR EACH BENCH LIFT TAKING CARE TO REMOVE ROOT STRUCTURES AS THE FILL PROCEEDS. SURFACE OF EACH LIFT SHALL BE SOAKED 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-1586) 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-690) 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 SOODED. SEE LANDSCAPE PLAN SHEET L1.1.

DURING CONSTRUCTION, THE SCM IS TO BE USED AS AN EROSION CONTROL DEVICE. THE FOREBAY WILL NOT BE REQUIRED WHILE SCM IS ACTING AS AN EROSION CONTROL DEVICE.

ALL PERMANENT STRUCTURES (I.E. RISER BOX, OUTLET PIPES, CONCRETE CRADLES, SPL-LWAY FILTER, ETC.) ARE TO BE INSTALLED WITH THE INITIAL DAM CONSTRUCTION. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ORDERING STRUCTURES.

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.

INTERIOR SCM GRADING SHALL BE CONSTRUCTED PER THIS PLAN.

SCM SHALL BE PLANTED PER PLANT SCHEDULE ON LANDSCAPE PLAN SHEET

TOWN OF KNIGHTDALE REQUIRES FINAL CERTIFICATION OF SCM BY PROFESSIONAL ENGINEER.

CLAY LINER SPECIFICATIONS:

- 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 TESTING 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 IN LANDSCAPE AREAS ONLY 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 CLAYSLOY MIXTURE, NO ORGANICS, MAY BE USED IF THE ABOVE SPECIFICATIONS ARE SATISFIED AND WITH WRITTEN APPROVAL BY THE ENGINEER.

PRECAST CONCRETE MATERIALS

- ALL PRECAST CONCRETE STRUCTURES SHALL CONFORM TO ASTM C913 (RECTANGULAR) OR C478 (ROUND).
- ALL REINFORCED CONCRETE PIPE SHALL CONFORM TO ASTM C76, CLASS III (UNLESS OTHERWISE NOTED).
- RUBBER GASKETED JOINTS (O-RING) SHALL CONFORM TO ASTM C443 & ASTM C381.
- NON O-RING JOINTS SHALL CONFORM TO ASTM C890.

LANDSCAPING NOTES:

- REFER TO SHEET L1.0 FOR LANDSCAPE SCREENING & SHEET L1.1 FOR PLANTING REQUIREMENTS.

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: *[Signature]* DATE: 2-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-14-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT
DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT
DATE _____

WithersRavenel
Engineers | Planners | Surveyors

115 MacKinnon Drive | Cary, NC 27511 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

KNIGHTDALE STATION
R6D AND R4

TOWN OF KNIGHTDALE, NORTH CAROLINA

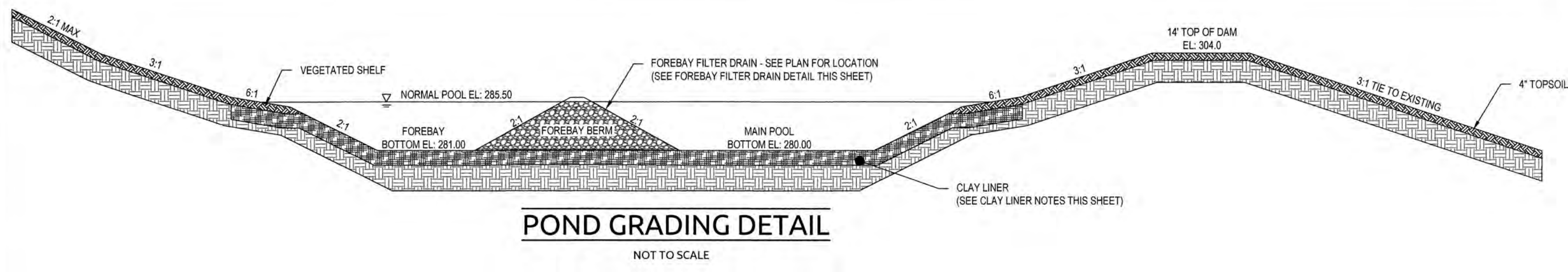
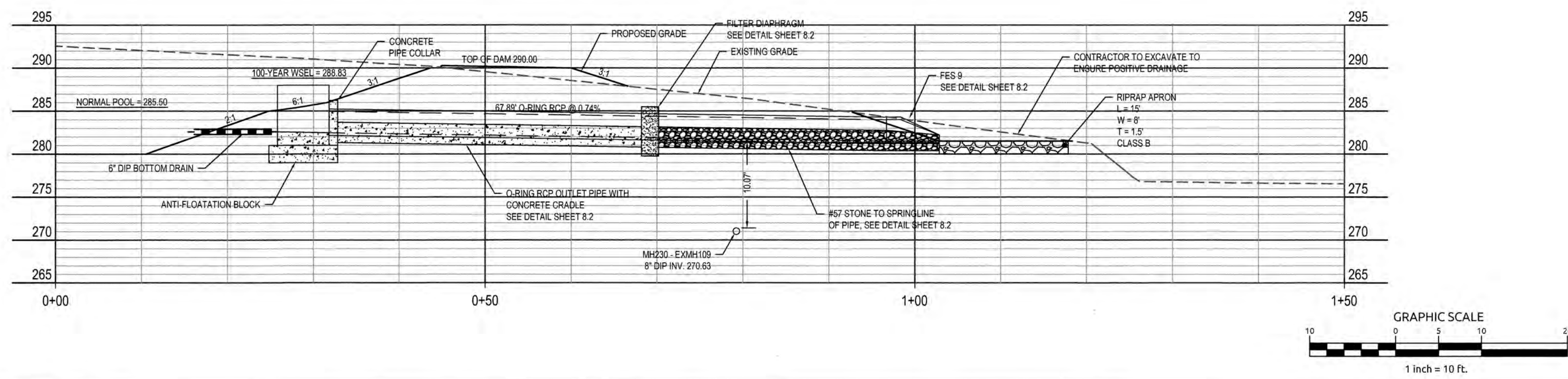
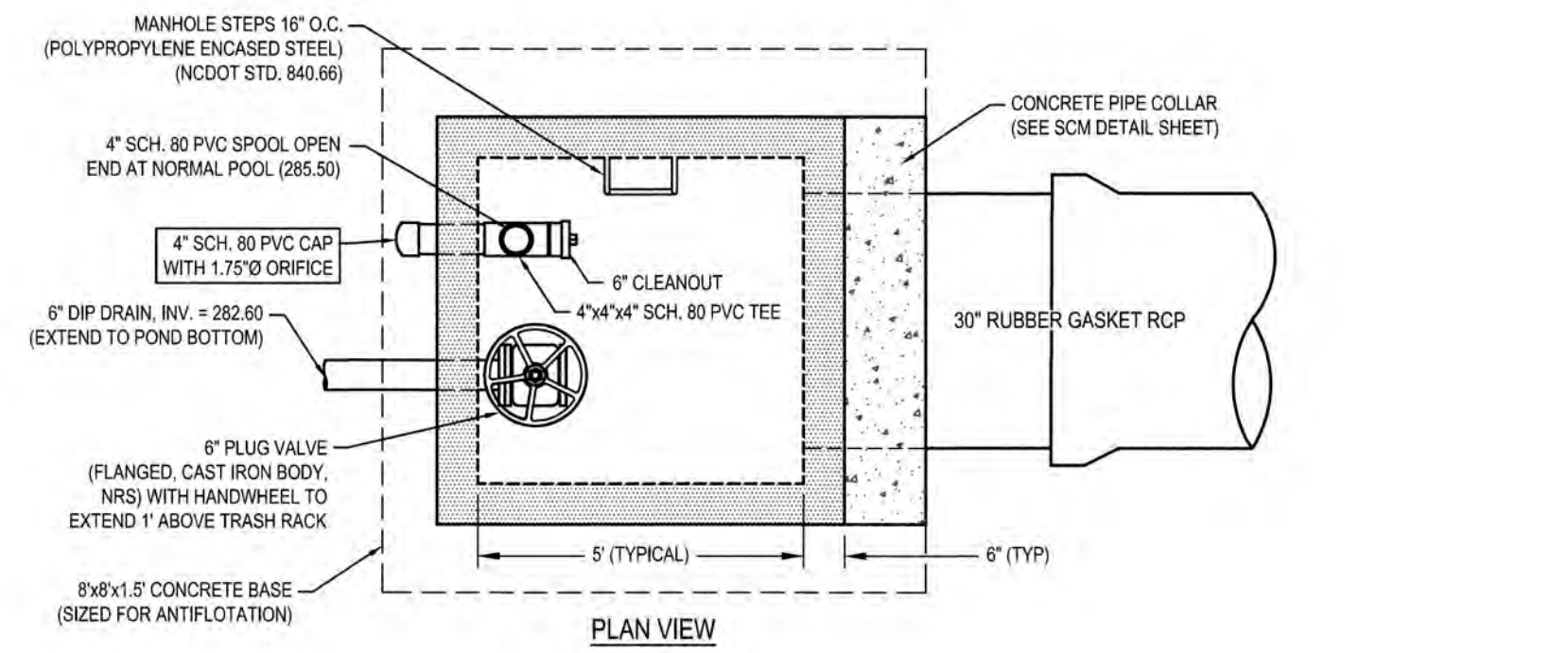
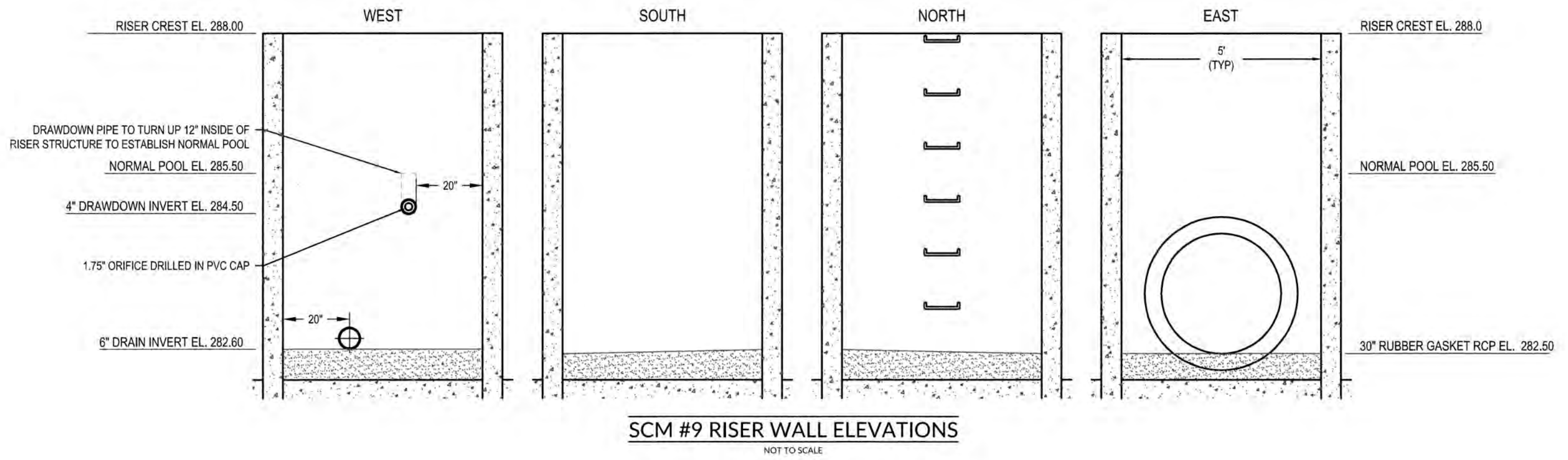
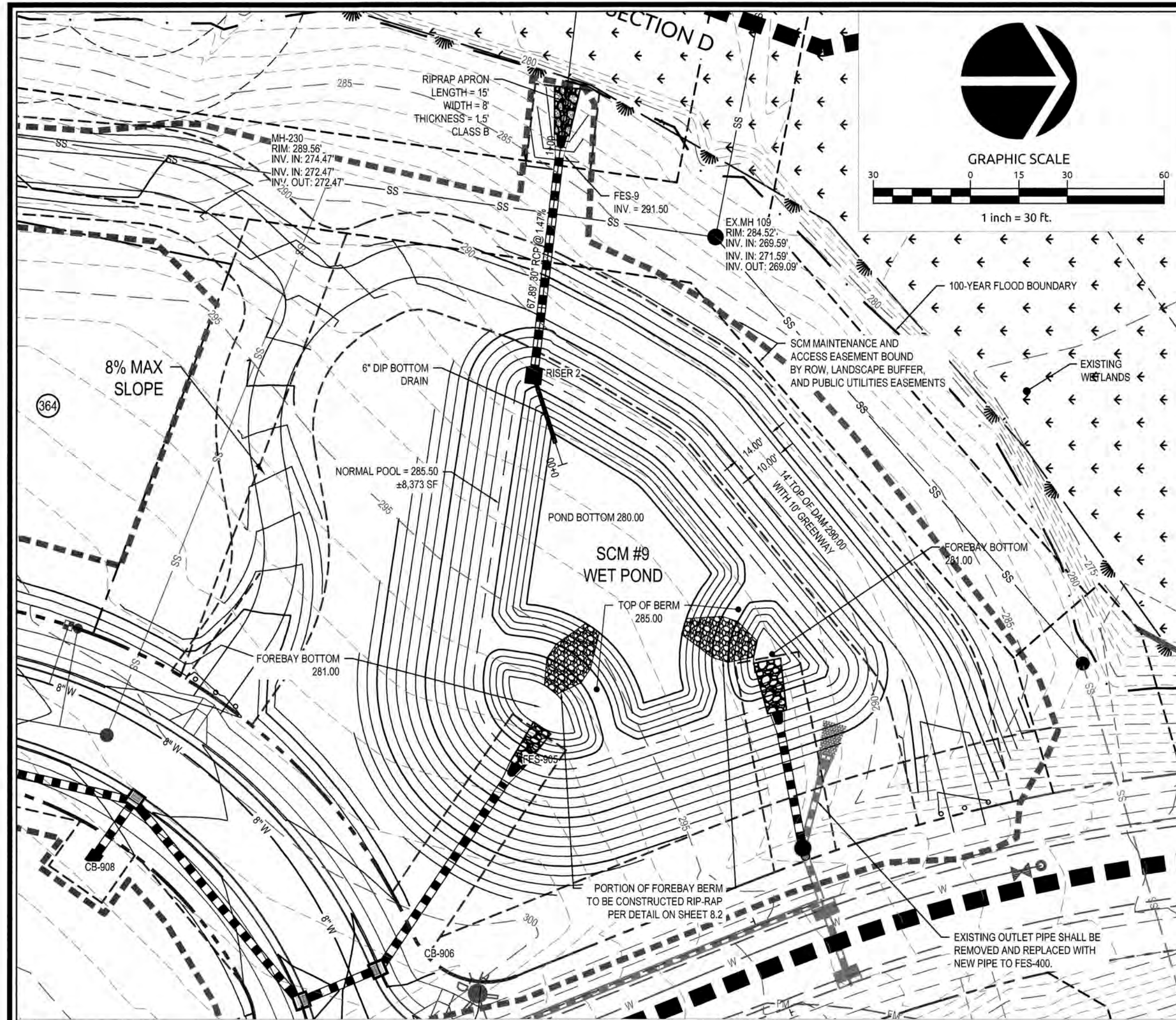
SCM #8 PLAN & DETAILS

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R

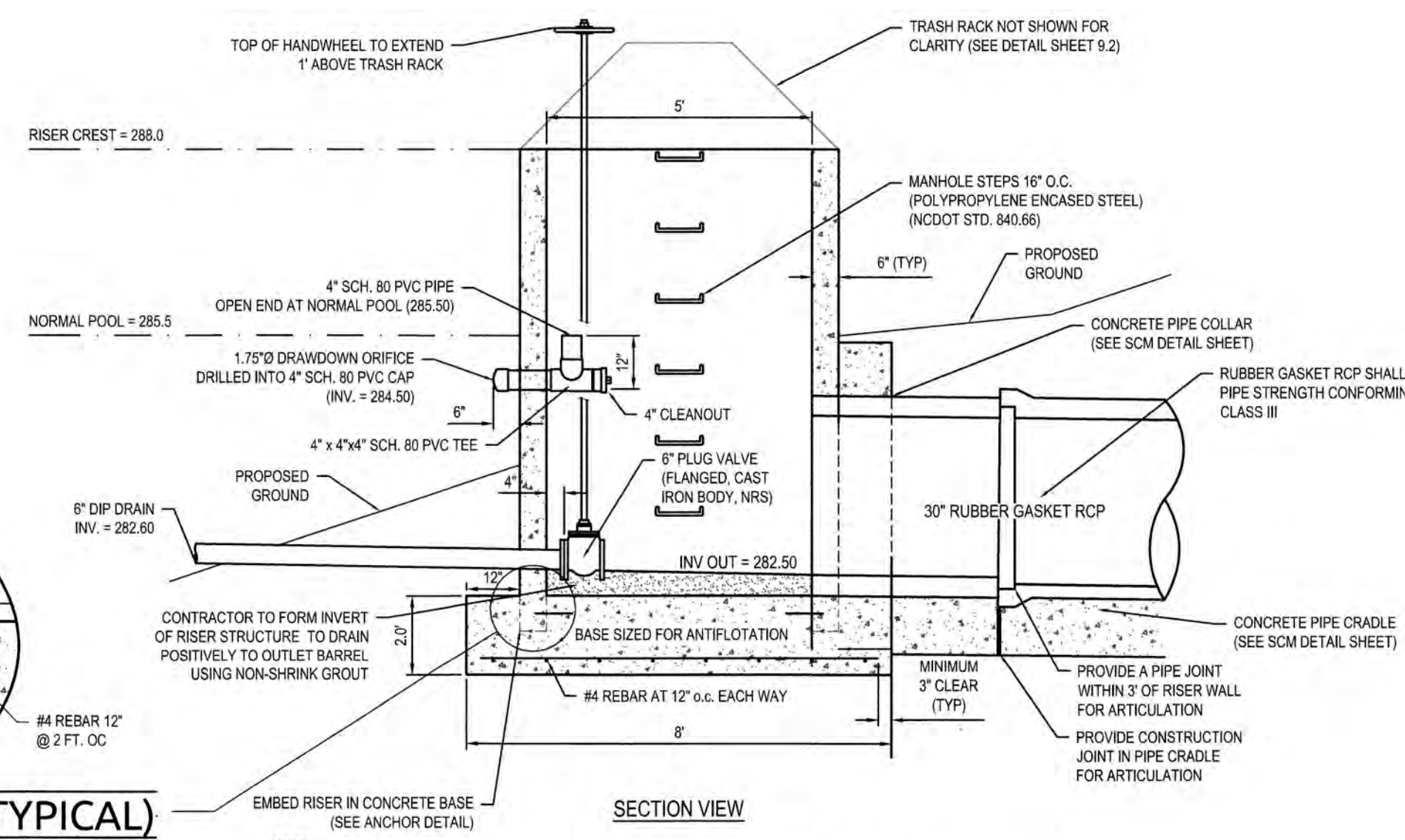
NORTH CAROLINA PROFESSIONAL SEAL
042888
WESLEY R. BERK
2-31-18

Revisions
1 1st TOK Comments 08/31/18

Sheet No.
8.0



ANCHOR DETAIL (TYPICAL)



SCM #9 RISER DRAWDOWN DEVICE DETAIL
NOT TO SCALE

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 CURRENT TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
- THE GEOTECHNICAL ENGINEER SHALL COMPLETE A GEOTECHNICAL EXPLORATION OF THE EXISTING EMBANKMENT AND PROVIDE A REPORT EVALUATING THE SUITABILITY OF EXISTING SOILS PRIOR TO CONTRACTOR COMPLETING IMPROVEMENTS.
- THE GEOTECHNICAL ENGINEER SHALL EVALUATE EXISTING AND BORROW SOILS FOR SUITABILITY OF DAM CONSTRUCTION AND SLOPE STABILITY. PROFESSIONAL CERTIFICATION OF EMBANKMENT CONSTRUCTION IS REQUIRED FOR AS-BUILT CERTIFICATION.
- EMBANKMENT 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 OF 3" OR LESS IN MEAN DIAMETER.
 - SOIL MATERIALS USED FOR EARTH FILL WHICH ARE CONSIDERED PERMEABLE OR WHICH EXHIBIT SIGNIFICANT SHRINK/SWELL SHALL NOT BE USED IN THE EMBANKMENT UNLESS SPECIFICALLY APPROVED BY ONSITE GEOTECHNICAL ENGINEER.
 - FILL SHALL BE PLACED IN 6" (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 2 FEET 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 LIFTS TOGETHER.
 - ALL COMPACTION SHALL BE TESTED BY THE SAND CONE METHOD (ASTM D-1586) 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 S0002B. SEE LANDSCAPE PLAN SHEET L1.1.
 - DURING CONSTRUCTION, THE SCM IS TO BE USED AS AN EROSION CONTROL DEVICE. THE FOREBAY WILL NOT BE REQUIRED WHILE SCM IS ACTING AS AN EROSION CONTROL DEVICE.
 - ALL PERMANENT STRUCTURES (I.E. RISER BOX, OUTLET PIPES, CONCRETE CRADLES, SPILLWAY FILTER, ETC.) ARE TO BE INSTALLED WITH THE INITIAL DAM CONSTRUCTION. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ORDERING STRUCTURES.
 - 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.
 - INTERIOR SCM GRADING SHALL BE CONSTRUCTED PER THIS PLAN.
 - SCM SHALL BE PLANTED PER PLANT SCHEDULE ON LANDSCAPE PLAN SHEET
 - TOWN OF KNIGHTDALE REQUIRES FINAL CERTIFICATION OF SCM BY PROFESSIONAL ENGINEER.
- CLAY LINER SPECIFICATIONS:**
- 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 TESTING 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 500 SQ. FT.)
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- PRECAST CONCRETE MATERIALS**
- ALL PRECAST CONCRETE STRUCTURES SHALL CONFORM TO ASTM C913 (RECTANGULAR) OR C478 (ROUND).
 - ALL REINFORCED CONCRETE PIPE SHALL CONFORM TO ASTM C78, CLASS III (UNLESS OTHERWISE NOTED).
 - RUBBER GASKETED JOINTS (O-RING) SHALL CONFORM TO ASTM C443 & ASTM C261.
 - NON O-RING JOINTS SHALL CONFORM TO ASTM C990.
- LANDSCAPING NOTES:**
- REFER TO SHEET L1.0 FOR LANDSCAPE SCREENING & SHEET L1.1 FOR PLANTING REQUIREMENTS.

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: *S. Mall* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT
DATE _____

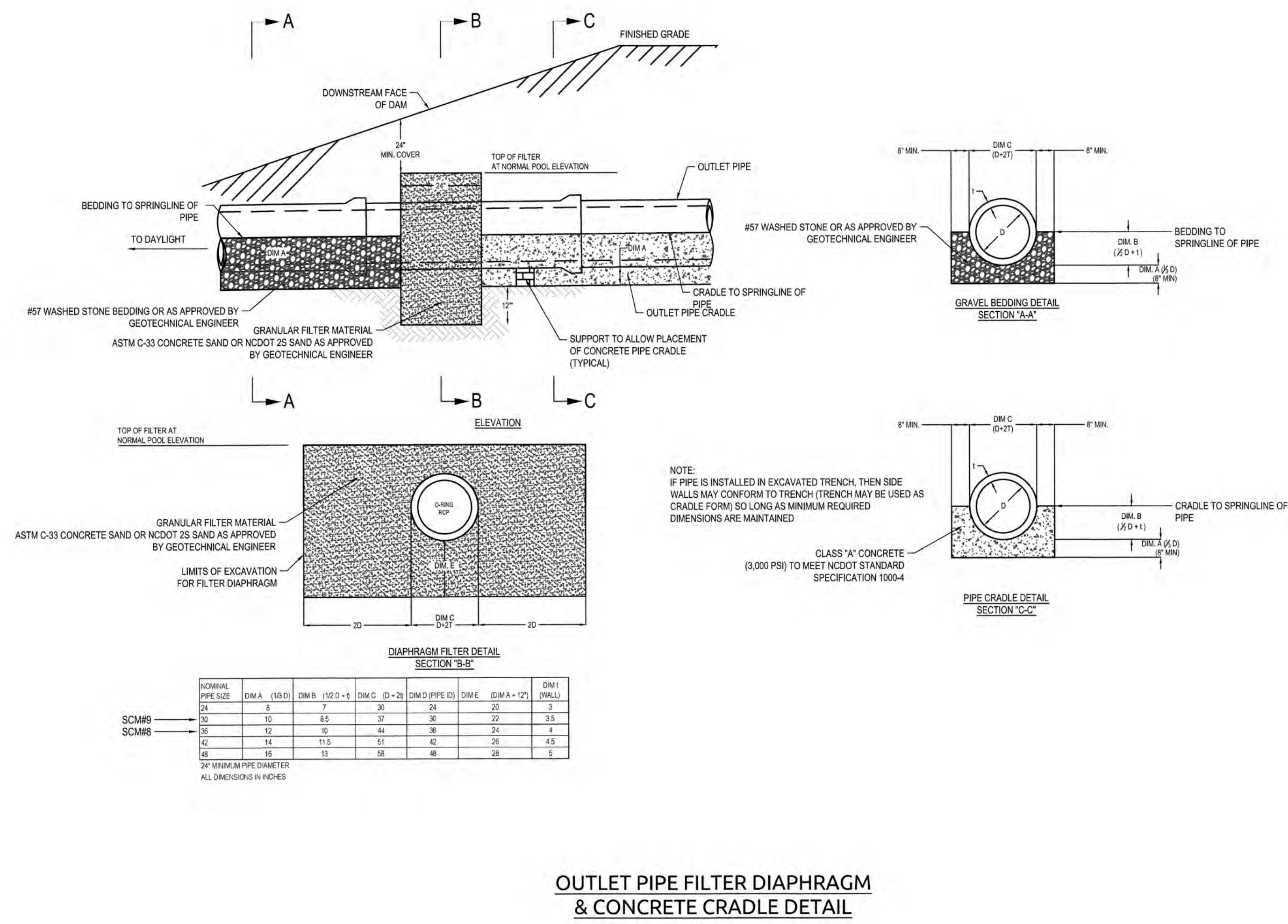
PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

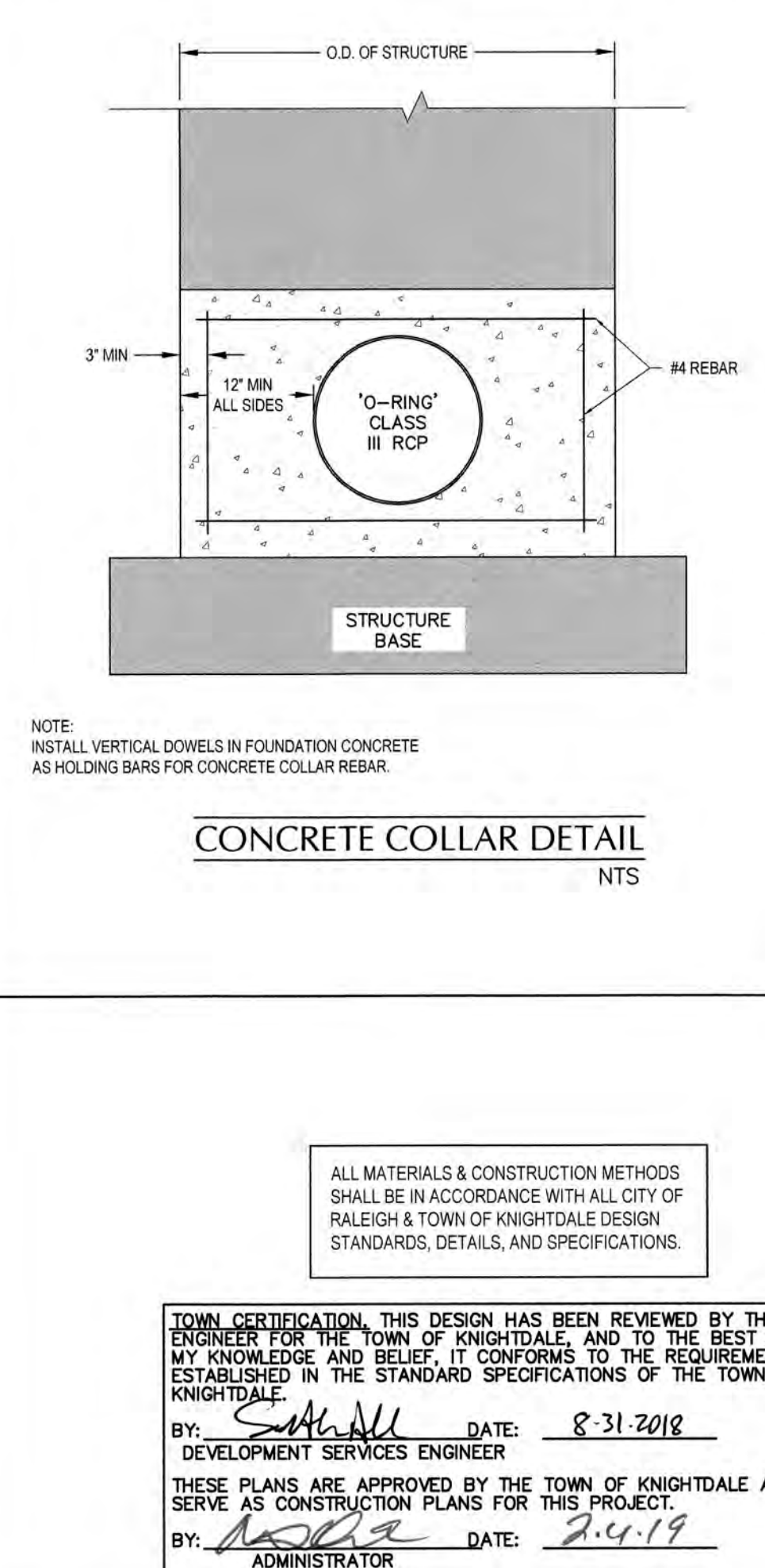
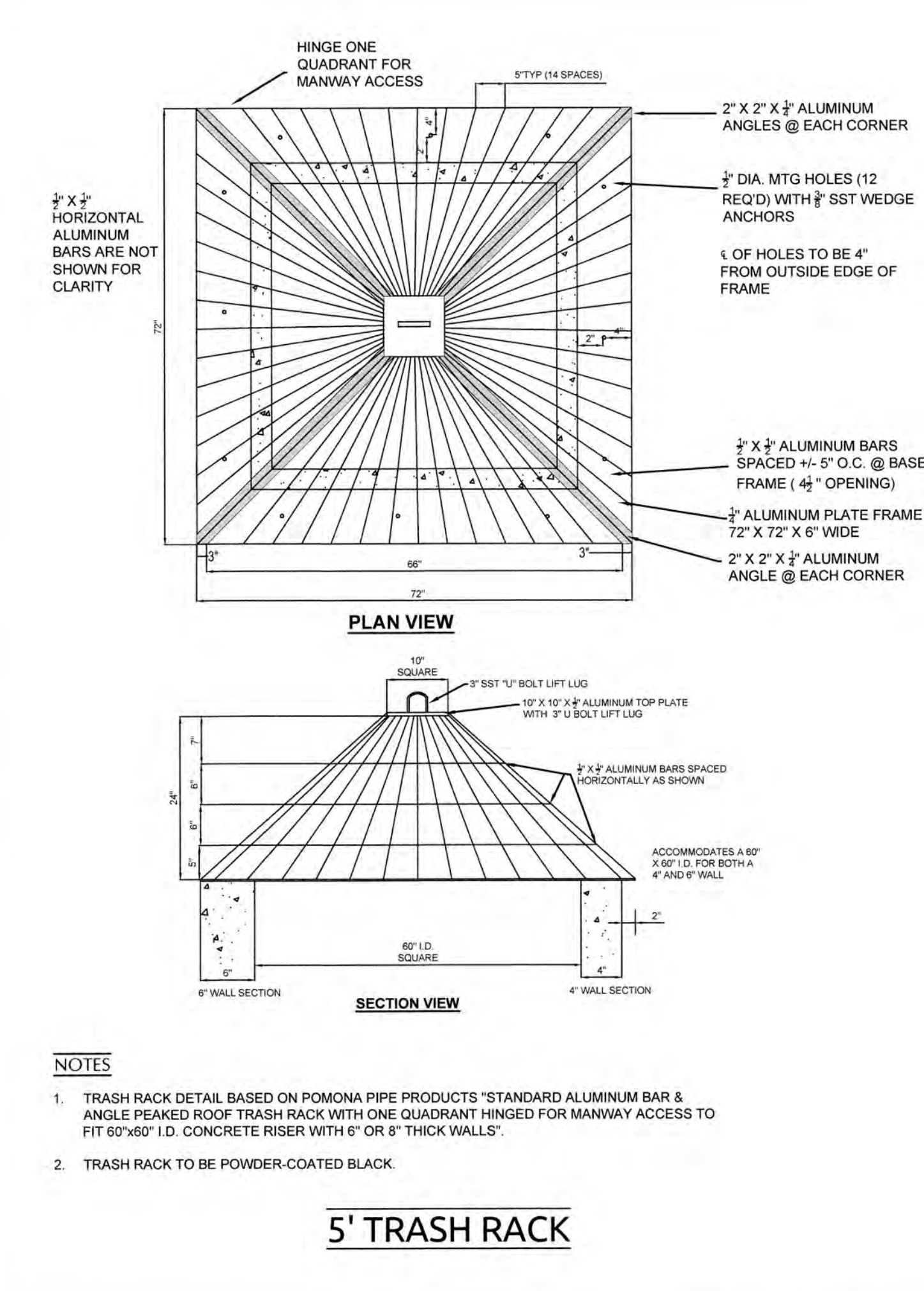
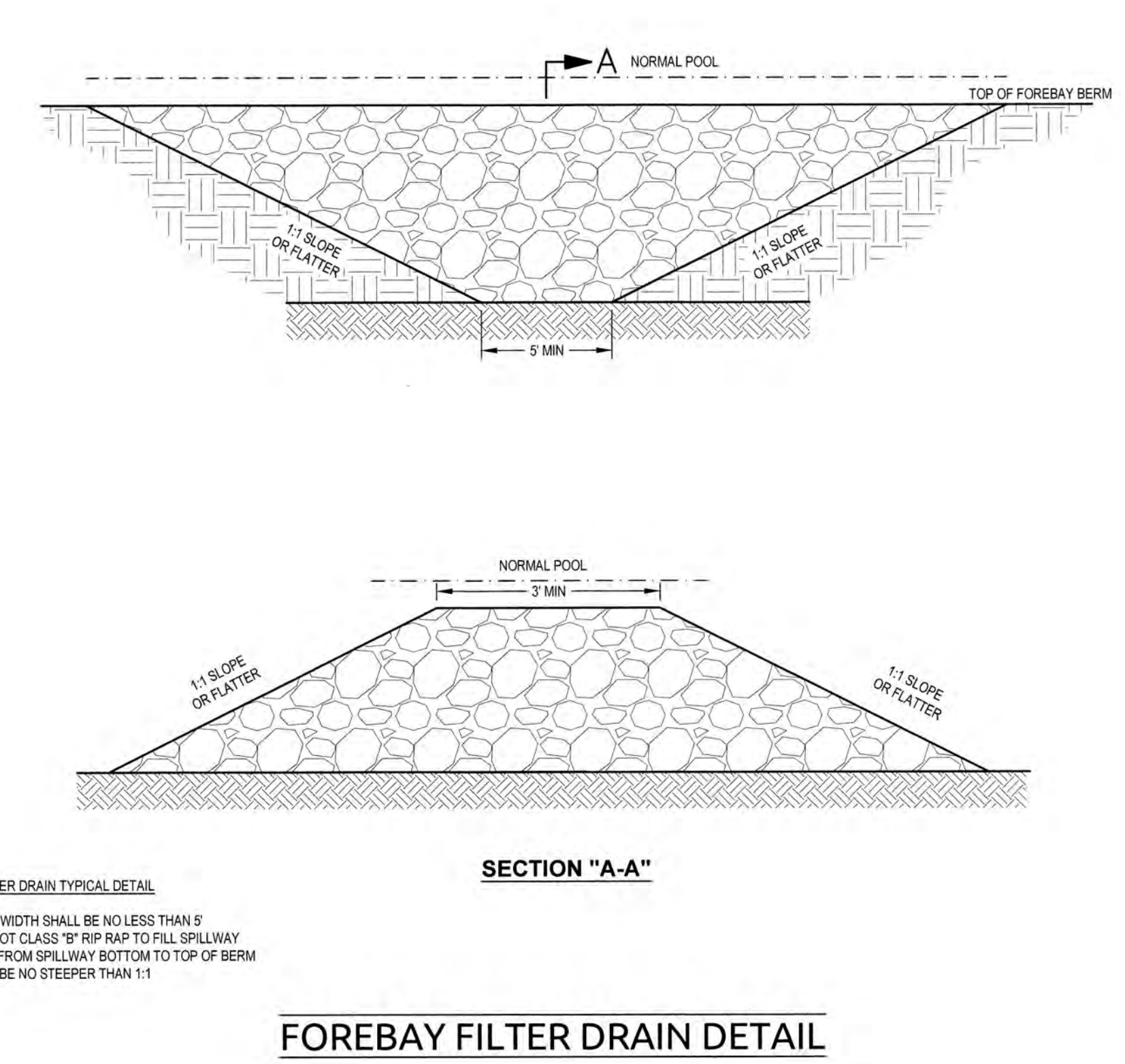
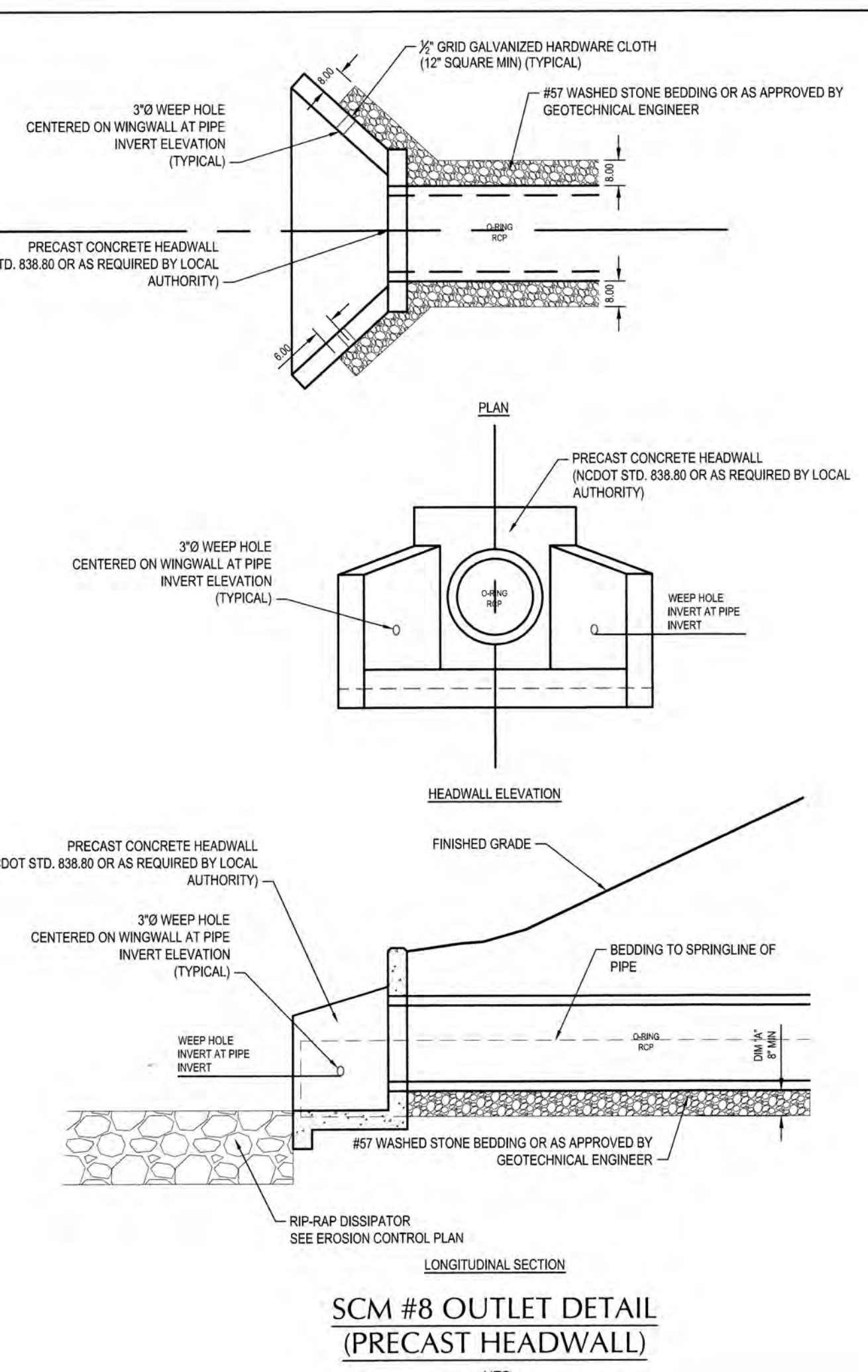
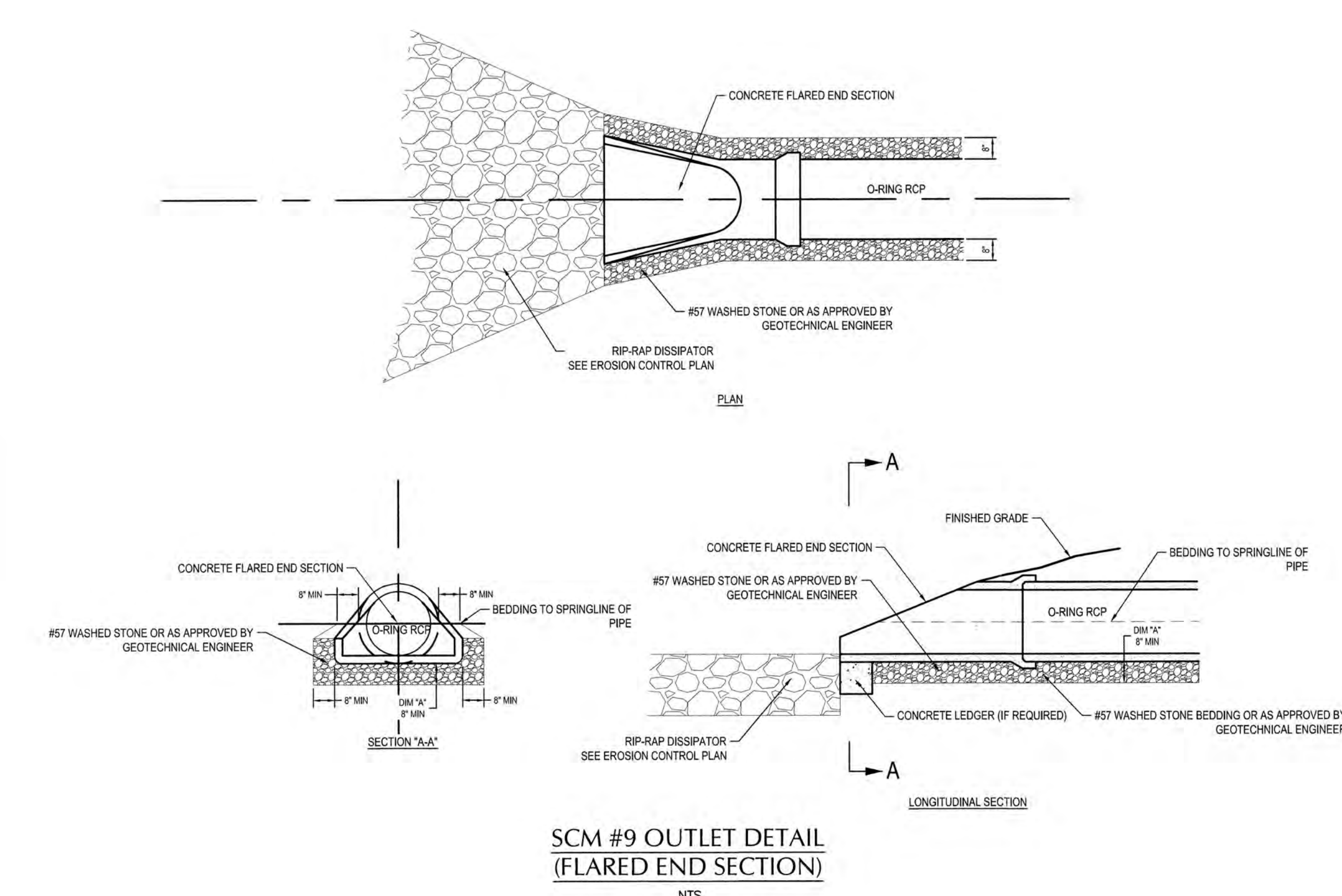
CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT
DATE _____

Job No.	02090251.6	Drawn By	W&R
Date	06/08/2018	Designer	W&R

Revisions		
1	1st TOK Comments	08/31/18
Sheet No.		
8.1		



OUTLET PIPE FILTER DIAPHRAGM & CONCRETE CRADLE DETAIL
NOT TO SCALE



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INSTALLATION OF STREET NAME SIGN

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

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

STREET NAME SIGN

NOTES:
1. BLADES SHALL BE EXTRUDED ALUMINUM OR ALLOY OR EQUAL. BLUETINTED OR BLACK. 1/4" THICK, GALVANIZED STEEL CONTINUOUS ROLL OPEN END. NO RAW EDGES OR 90, 135, 180 WALL ALUMINUM (SEE DETAIL 10).
2. CAP TO BE ALUMINUM AND ALLOY OR EQUAL. BLUETINTED OR BLACK. 1/4" THICK. CAP SHALL BE TAPPED TO RECEIVE AND HOLD 3 STAINLESS STEEL SET SCREWS FOR POST MOUNTING AND 2 STAINLESS STEEL SET SCREWS FOR BLADE MOUNTING. SET SCREWS TO HAVE ALL HEADS (SEE DETAIL 10).
3. BLADE SPACER BRACKET SHALL MEET SAME SPECIFICATIONS AS THE CAP WITH 2 SCREWS TO EACH BRACKET MOUNTING (SEE DETAIL 10).
4. THE FACE OF ALL BLADES SHALL MEET CORNER WITH FINISHING GRIND. ALL LETTERS WITH REVERSED SCREENING FOR TRANSPARENT SIGN. THE PRIMARY LETTERS SHALL BE 1/2" HIGH UPPER CASE. PVT SERIES B AND PVT/SUPPLY LETTERS SHALL BE 2-1/2" HIGH UPPER CASE. PVT SERIES C. BLOCK NUMBERS SHALL BE 2-1/2" HIGH. PVT SERIES C. ALL LETTERS TO BE PREPARED ALUMINUM OR ALLOY OR EQUAL. FINISH MATERIAL REMOVED (SEE DETAIL 10).
5. LETTERS, NUMBERS AND SPACING SHALL CONFORM TO THE STANDARD ALPHABET FOR HIGHWAY SIGNS, 1988 EDITION. REVISION MAY BE BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, OFFICE OF TRAFFIC OPERATION.
6. ALL STREET NAME SIGNS ARE SUBJECT TO APPROVAL BY THE TOWN. BLOCK NUMBERS SHALL BE PROVIDED ON SIGNS AND CORRESPOND TO OFFICIALLY APPROVED ADDRESSES.
7. IF THE STREET IS INTENDED TO BE PRIVATE, A SUPPLEMENTAL PLATE MAY BE AFFIXED TO THE SIGN OR AN EXTENDED BLADE WITH BLACK ON BLACK FINISHING MAY BE USED. THE SIGN SHALL HAVE BLACK LETTERS THAT SHOW UP TO STAND FOR PRIVATE. THE LETTERS SHALL BE 2-1/2" HIGH UPPER CASE. PVT SERIES C. ON A BACKGROUND OF YELLOW FINISHING GRIND SHEETING. (SEE DETAIL 10).

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

TEMPORARY BARRICADE FOR DEAD END ROADS

NOTES:
1. BARRICADES TO BE ERECTED ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
2. ADVANCE WARNING SIGN W14-1 (DEAD END) SHALL BE PLACED JUST AFTER LAST INTERSECTING STREET.
3. WARNING FOR BARRICADE PALE SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS OF MUTCD R11-2 AND BE REQUIRED ATOP EACH BARRICADE USE.
5. PLACE BARRICADE OR OTHER APPROVED BALLASTED METHOD ON THE FEET OF THE PAVEMENT. DO NOT PLACE BARRICADE ON TOP OF A STRIPPED PALE OR STRIPPED PALE DO NOT BALLAST BARRICADES BY HEAVY OBJECTS SUCH AS ROCKS, CHAINS OF CONCRETE OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK BY A VEHICLE.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

PAVEMENT SECTION
2.5' SB 5A
8" ABC

54' R/W, 27' B/B NTS

60' R/W, 33' B/B NTS

STANDARD 2" CURB AND GUTTER

NOTES:
1. 1-1/2" METAL CURB AND GUTTER TO BE USED IN MEDIANS WHEN LANES ARE SLOPED FROM ISLAND OR AS SPECIFIED BY THE TOWN ENGINEER.
2. 1-1/2" MOUNTABLE CURB AND GUTTER TO BE USED IN MEDIANS ONLY WHEN SPECIFIED BY THE TOWN ENGINEER.
3. 1-1/2" UNDER CURB TO BE USED IN ALLEYS ONLY WHEN SPECIFIED BY THE TOWN ENGINEER.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

1-1/2" CURB AND GUTTER

NOTES:
1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE MAINTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 80-FOOT INTERVALS AND ADJUSTED TO ALL ROAD OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ADJUTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3000 PSI IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS

TRANSVERSE EXPANSION JOINT

NOTES:
1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE MAINTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 80-FOOT INTERVALS AND ADJUSTED TO ALL ROAD OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ADJUTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3000 PSI IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

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TOWN OF KNIGHTDALE STANDARD DETAILS

CONCRETE SIDEWALKS

NOTES:
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET APART.
2. CONTROL JOINTS TO BE AT 5 FEET O.C.
3. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.
4. SIDEWALK SUB-BASE TO BE A MIXTURE OF 70 PERCENT #57 STONE AND 30% C-3 SAND OR EQUAL.

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TOWN OF KNIGHTDALE STANDARD DETAILS

CONCRETE SIDEWALKS

NOTES:
1. A GROOVE JOINT 1" DEEP WITH 1/8" RADIUS SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WORK OF SIDEWALK ON THROUGHFARE STREETS SHALL BE A MINIMUM OF 5' WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE TOWN ENGINEER.
4. WORK OF SIDEWALKS ON NON-THROUGHFARE STREETS SHALL BE A MINIMUM OF 5' UNLESS OTHERWISE SPECIFIED BY THE TOWN'S LIMITED DEVELOPMENT ORDINANCE.
5. SIDEWALK TO BE FINISHED TO END OF RADIIUS AT INTERSECTING STREETS.
6. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3000 PSI IN 28 DAYS.

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TOWN OF KNIGHTDALE STANDARD DETAILS

STANDARD DRIVEWAY APRON

NOTES:
1. RESIDENTIAL DRIVEWAYS TO BE 12' TO 14'.
2. COMMERCIAL DRIVEWAYS TO BE A MINIMUM OF 36' WIDE.
3. CONCRETE SHALL BE 3000 P.S.I.
4. CONTROL JOINTS NOT TO EXCEED 15' ON CENTER.
5. CURB RADIUS SHALL NOT RISE MORE THAN 1" (ONE) INCH.
6. IF THE DRIVEWAY SECTION BETWEEN THE SIDEWALK AND THE DRIVEWAY APRON IS 10' OR LESS THE SIDEWALK WILL BE WIDENED TO THE APRON AND AN EXPANSION JOINT ELIMINATED.
7. DRIVEWAY SHALL BE A MINIMUM OF 5 FEET FROM PROPERTY LINE.

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TOWN OF KNIGHTDALE STANDARD DETAILS

CURB RAMP

NOTES:
1. THE RAMP SURFACE SHALL BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE WIDTH CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATIONS AS DIRECTED BY THE ENGINEER.
3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATIONS AS DIRECTED BY THE ENGINEER.
6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
8. CONSTRUCT THE HORIZONTAL SLOPE OF THE RAMP & 2% MAXIMUM.
9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PARKING OVER OR THROUGH THE ISLAND.
14. SMALL CHANNELIZATION ISLANDS THAT DO NOT PROVIDE A 6'x6' LANDINGS AT THE TOP OF A RAMP, WILL GO THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLACING A OTHER NON-WALKING SURFACE ON THE SIDE APPROACH TO SUBSTANTIALLY IMPROVE.
16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURBS AS SHOWN IN ROADWAY STANDARD DRAWING 848-05.
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED.

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TOWN OF KNIGHTDALE STANDARD DETAILS

CURB RAMP

NOTES:
1. THE RAMP SURFACE SHALL BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
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3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATIONS AS DIRECTED BY THE ENGINEER.
6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
8. CONSTRUCT THE HORIZONTAL SLOPE OF THE RAMP & 2% MAXIMUM.
9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
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14. SMALL CHANNELIZATION ISLANDS THAT DO NOT PROVIDE A 6'x6' LANDINGS AT THE TOP OF A RAMP, WILL GO THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLACING A OTHER NON-WALKING SURFACE ON THE SIDE APPROACH TO SUBSTANTIALLY IMPROVE.
16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURBS AS SHOWN IN ROADWAY STANDARD DRAWING 848-05.
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED.

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TOWN OF KNIGHTDALE STANDARD DETAILS

COLLAPSIBLE BOLLARD

NOTES:
1. COLLAPSIBLE BOLLARD SHALL BE CONSTRUCTED OF COLD ROLLED STEEL.
2. BOLLARD SHALL INCLUDE A BASE UNIT WITH BOLT DOWN BASE PLATE WITH LOCKING CLEAR RELEASE TO AN ANCHOR BASE SET FURNISH BY A CONCRETE FOOTING. THE BASE UNIT SHALL INCORPORATE AN EMERGENCY BREAKAWAY SYSTEM THAT WILL PREVENT DAMAGE TO SURROUNDING PAVEMENT. THE BOLLARD SHALL BE PREPARED TO ALLOW FOR THE BOLLARD TO BE LOWERED TO ALLOW FOR THE VERTICAL UNIT OF THE BOLLARD SHALL BE CONNECTED TO THE SAME UNIT WITH TWO SET PIVOT SCREWS AND LOCKWASER WITH A PADLOCK.
3. BOLLARD SHALL REQUIRE A MAXIMUM GROUND CLEARANCE OF 4' WHEN COLLAPSED.
4. BOLLARD SHALL BE FINISHED WITH A RUST INHIBITOR PRIME COAT AND AN EXTERIOR FINISH FROM COAT.
5. COLLAPSIBLE BOLLARD SHALL BE MAX-FORCE MODEL MC-SP-SS-16 OR APPROVED EQUAL.

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TOWN OF KNIGHTDALE STANDARD DETAILS

STANDARD MULTI-USE PATH GREENWAY

NOTES:
1. CROSS SLOPE DIRECTION VARIES. SEE LAYOUT PLANS FOR DIRECTION OF SLOPE.
2. CONTRACTOR IS RESPONSIBLE FOR REESTABLISHING ALL SLOPES DISTURBED BY CONSTRUCTION.

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TOWN OF KNIGHTDALE STANDARD DETAILS

STANDARD MULTI-USE PATH GREENWAY

NOTES:
1. CROSS SLOPE DIRECTION VARIES. SEE LAYOUT PLANS FOR DIRECTION OF SLOPE.
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REVISIONS	
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TOWN OF KNIGHTDALE STANDARD DETAILS

STANDARD MULTI-USE PATH GREENWAY

NOTES:
1. CROSS SLOPE DIRECTION VARIES. SEE LAYOUT PLANS FOR DIRECTION OF SLOPE.
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TOWN OF KNIGHTDALE STANDARD DETAILS

DETECTABLE WARNING DOMES

NOTES:
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16. PLACE A 1/2" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURBS AS SHOWN IN ROADWAY STANDARD DRAWING 848-05.
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE NOTED.

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TOWN OF KNIGHTDALE STANDARD DETAILS

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TOWN OF KNIGHTDALE STANDARD DETAILS

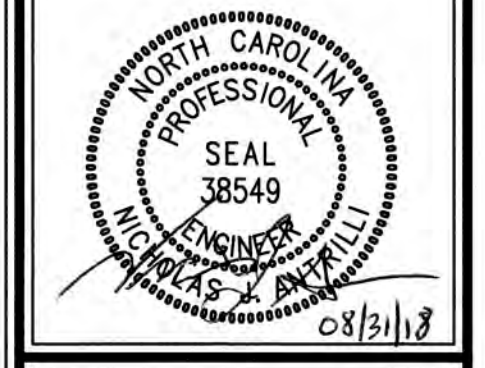
COLLAPSIBLE BOLLARD

NOTES:
1. COLLAPSIBLE BOLLARD SHALL BE CONSTRUCTED OF COLD ROLLED STEEL.
2. BOLLARD SHALL INCLUDE A BASE UNIT WITH BOLT DOWN BASE PLATE WITH LOCKING CLEAR RELEASE TO AN ANCHOR BASE SET FURNISH BY A CONCRETE FOOTING. THE BASE UNIT SHALL INCORPORATE AN EMERGENCY BREAKAWAY SYSTEM THAT WILL PREVENT DAMAGE TO SURROUNDING PAVEMENT. THE BOLLARD SHALL BE PREPARED TO ALLOW FOR THE BOLLARD TO BE LOWERED TO ALLOW FOR THE VERTICAL UNIT OF THE BOLLARD SHALL BE CONNECTED TO THE SAME UNIT WITH TWO SET PIVOT SCREWS AND LOCKWASER WITH A PADLOCK.
3. BOLLARD SHALL REQUIRE A MAXIMUM GROUND CLEARANCE OF 4' WHEN COLLAPSED.
4. BOLLARD SHALL BE FINISHED WITH A RUST INHIBITOR PRIME COAT AND AN EXTERIOR FINISH FROM COAT.
5. COLLAPSIBLE BOLLARD SHALL BE MAX-FORCE MODEL MC-SP-SS-16 OR APPROVED EQUAL.

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TOWN OF KNIGHTDALE STANDARD DETAILS

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions
1 1st TOK Comments 08/31/18

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: W&R DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.
BY: W&R DATE: 2-4-19
ADMINISTRATOR

Sheet No. **9.1**

K:\09\0220\020214-Knightdale Station\Plan\RAICAD MASTER CONSTRUCTION DRAWINGS\14.9.2\DETAILS.dwg - Thursday, August 30, 2018 9:18:30 PM - D:\RYAN COLLEEN

NOTES:

- A MINIMUM OF 24" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. 2% FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6" UNDER NO CIRCUMSTANCES SHALL MATERIAL BE PERMITTED TO BE UNCOMPACTED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
- ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF AT LEAST 95% 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.

REVISIONS
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TOWN OF KNIGHTDALE STANDARD DETAILS TRENCH FOR STORM DRAIN PIPES STD. NO. 5.02

NOTES:

- OTHER SOLID BRICK, SOLID BLOCK, OR PRECAST CONCRETE MAY BE USED.
- PRECAST CONCRETE WALLS SHALL BE 8" THICK MINIMUM.
- ALL CONCRETE SHALL BE 3000 P.S.I.
- FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSIDE DIMENSIONS.

REVISIONS
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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.
- BASE SLAB 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.

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD CURB INLET STD. NO. 5.05

NOTES:

- MINIMUM CURB & GUTTER HEIGHT SHALL BE AS SHOWN FOR SINGLE PIPE.
- THIS MINIMUM DISTANCE BETWEEN PIPES IN A DOUBLE PIPE HEADWALL IS 2'-0".

PIPE SIZE	MINIMUM CURB & GUTTER HEIGHT	MINIMUM DISTANCE BETWEEN PIPES
12"	1'-0"	2'-0"
15"	1'-0"	2'-0"
18"	1'-0"	2'-0"
21"	1'-0"	2'-0"
24"	1'-0"	2'-0"
30"	1'-0"	2'-0"
36"	1'-0"	2'-0"
42"	1'-0"	2'-0"
48"	1'-0"	2'-0"
54"	1'-0"	2'-0"
60"	1'-0"	2'-0"
66"	1'-0"	2'-0"
72"	1'-0"	2'-0"
78"	1'-0"	2'-0"
84"	1'-0"	2'-0"
90"	1'-0"	2'-0"
96"	1'-0"	2'-0"
102"	1'-0"	2'-0"
108"	1'-0"	2'-0"
114"	1'-0"	2'-0"
120"	1'-0"	2'-0"

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD CURB INLET STD. NO. 5.05

NOTES:

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

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS STD. NO. 5.06

NOTES:

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

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS STANDARD REINFORCED CONCRETE HEADWALL WITH WINGWALLS STD. NO. 5.06

NOTES:

- MINIMUM CURB & GUTTER HEIGHT SHALL BE AS SHOWN FOR SINGLE PIPE.
- THIS MINIMUM DISTANCE BETWEEN PIPES IN A DOUBLE PIPE HEADWALL IS 2'-0".

PIPE SIZE	MINIMUM CURB & GUTTER HEIGHT	MINIMUM DISTANCE BETWEEN PIPES
12"	1'-0"	2'-0"
15"	1'-0"	2'-0"
18"	1'-0"	2'-0"
21"	1'-0"	2'-0"
24"	1'-0"	2'-0"
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72"	1'-0"	2'-0"
78"	1'-0"	2'-0"
84"	1'-0"	2'-0"
90"	1'-0"	2'-0"
96"	1'-0"	2'-0"
102"	1'-0"	2'-0"
108"	1'-0"	2'-0"
114"	1'-0"	2'-0"
120"	1'-0"	2'-0"

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS DIMENSIONS FOR HEADWALL WITH WINGWALLS STD. NO. 5.09

NOTES:

- MINIMUM CURB & GUTTER HEIGHT SHALL BE AS SHOWN FOR SINGLE PIPE.
- THIS MINIMUM DISTANCE BETWEEN PIPES IN A DOUBLE PIPE HEADWALL IS 2'-0".

PIPE SIZE	MINIMUM CURB & GUTTER HEIGHT	MINIMUM DISTANCE BETWEEN PIPES
12"	1'-0"	2'-0"
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120"	1'-0"	2'-0"

REVISIONS
DATE DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS DIMENSIONS FOR HEADWALL WITH WINGWALLS STD. NO. 5.09

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



Revisions
1 1st TOK Comments 08/31/18

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 7-9-19
ADMINISTRATOR

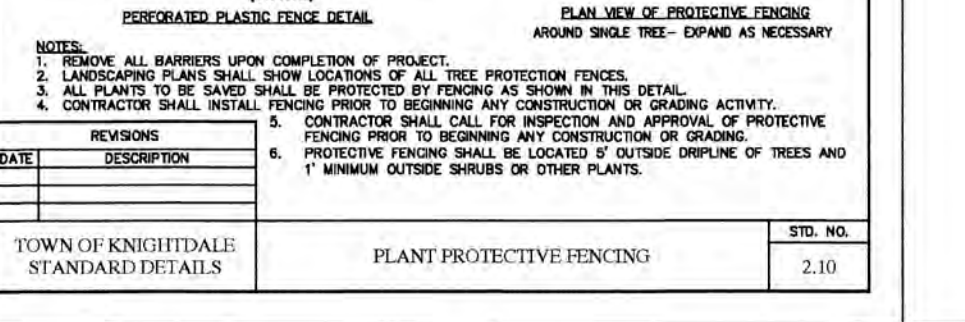
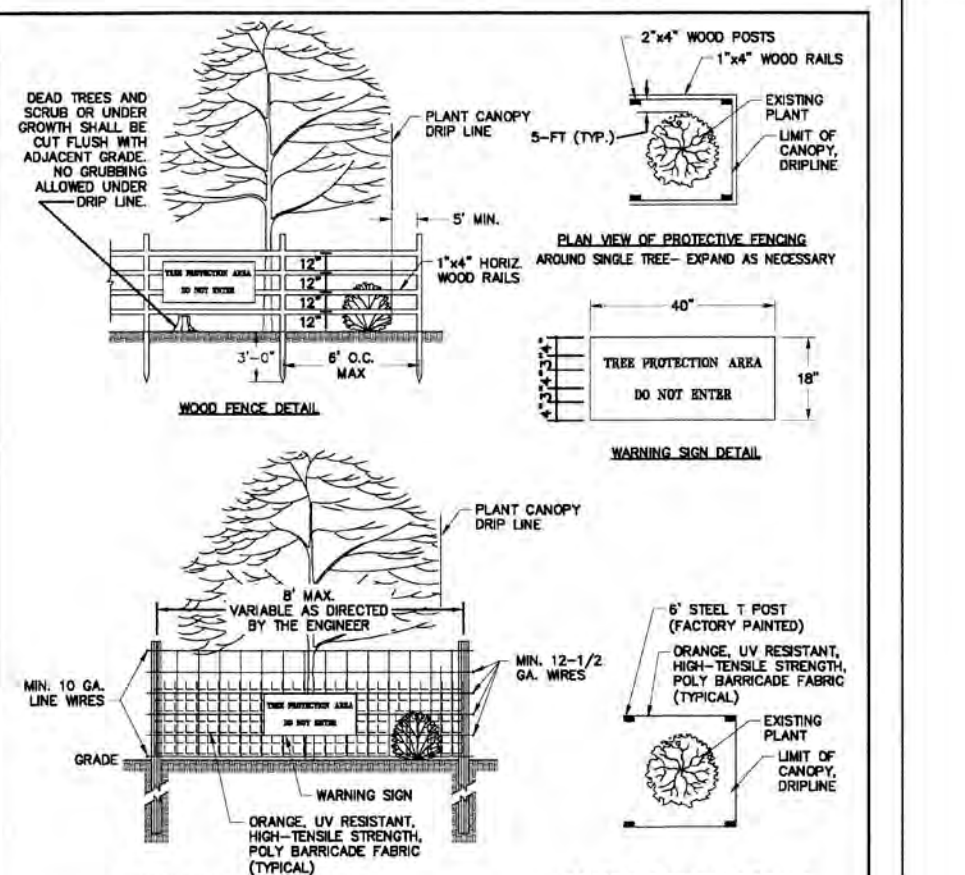
SEEDING SCHEDULE		
SEEDING PERIOD	SEEDING TYPE	APPLICATION RATE (LBS/Acre)
AUGUST 15 - NOVEMBER 01	TALL FESCUE	300
NOVEMBER 01 - MARCH 01	TALL FESCUE AND ABRUZZI RYE	25
MARCH 01 - APRIL 15	TALL FESCUE	300
APRIL 15 - JUNE 30	HALLED COMMON BERMUDAGRASS	25
JULY 01 - AUGUST 15	TALL FESCUE AND HORNWORM MILLET OR HORNWORM-SUDAN HYBRIDS	30
SEEDS 2:1 TO 3:1		
MARCH 01 - JUNE 01	BERNISA LEONDEZA (SCARIFIED)	50
MARCH 01 - APRIL 15	TALL FESCUE OR HALLED COMMON BERMUDAGRASS	100
MARCH 01 - JUNE 30	HALLED COMMON BERMUDAGRASS	10
JUNE 01 - SEPTEMBER 01	HORNWORM MILLET OR HORNWORM-SUDAN HYBRIDS	25
SEPTEMBER 01 - MARCH 01	TALL FESCUE OR ABRUZZI RYE	25

TEMPORARY - RESEED ACCORDING TO OPTIMAL SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW PAST 12" IN HEIGHT BEFORE REMOVAL. OVERSEEDING PERIODS MAY BE ADJUSTED TO ACCOMMODATE CONSTRUCTION SCHEDULES. FOR CONSTRUCTION OF SLOPES OR ADDITIONAL INFORMATION, CONSULT WITH THE PERMITTING AGENCY. SEEDING SCHEDULES ARE SUBJECT TO CHANGE BASED ON WEATHER CONDITIONS AND OTHER FACTORS. SEEDING SCHEDULES WILL BE UPDATED AS NECESSARY. OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

GRASS COVER - MINIMUM LAND DISTURBANCE ACTIVITY IS UNACCEPTABLE IN A TRACT COMPRISED MORE THAN ONE (1) ACRE. A GRASS COVER SUPPORT TO RESTRAIN EROSION MUST BE PLANTED OR PROVIDED WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS.

GRASS SEEDS AND FELS - WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS, OR COMPLETION OF ANY PHASE OF GRADING, WHICHEVER PERIOD IS SHORTER, SLOPES SHALL BE PLANTED OR OVERSEED PROVIDED WITH GRASS COVER, SEEDS, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION.

REVISIONS	DESCRIPTION	DATE
1		
2		



Environmental Services

300 Fayetteville St., Suite 200, Raleigh, NC 27601
 919.974.4172

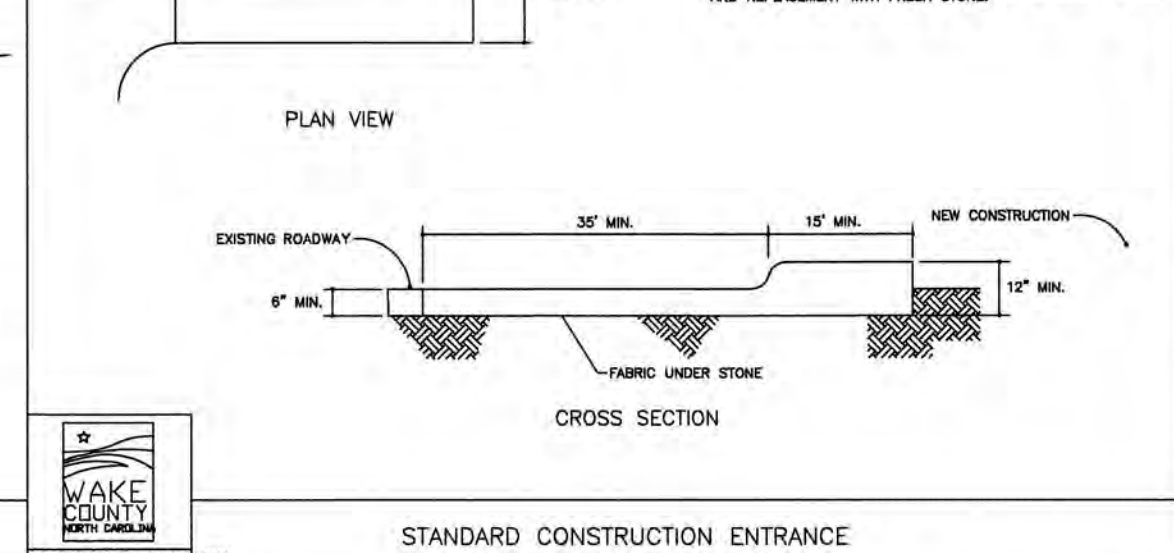
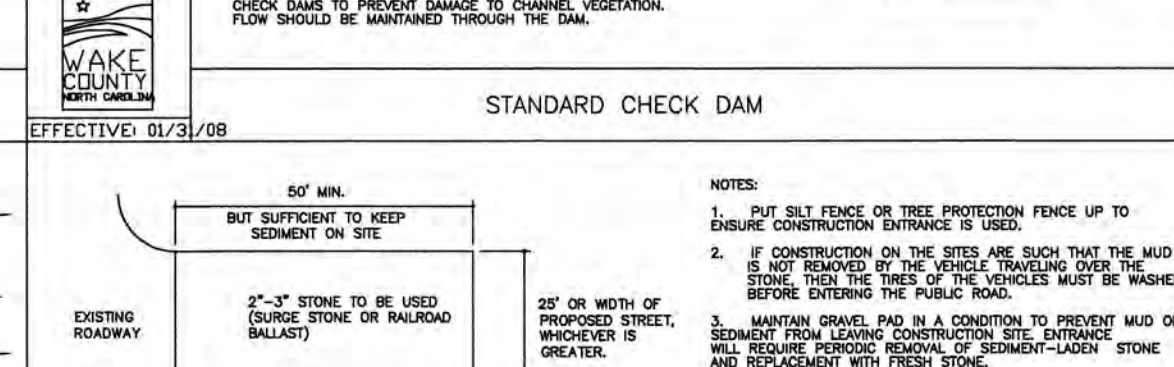
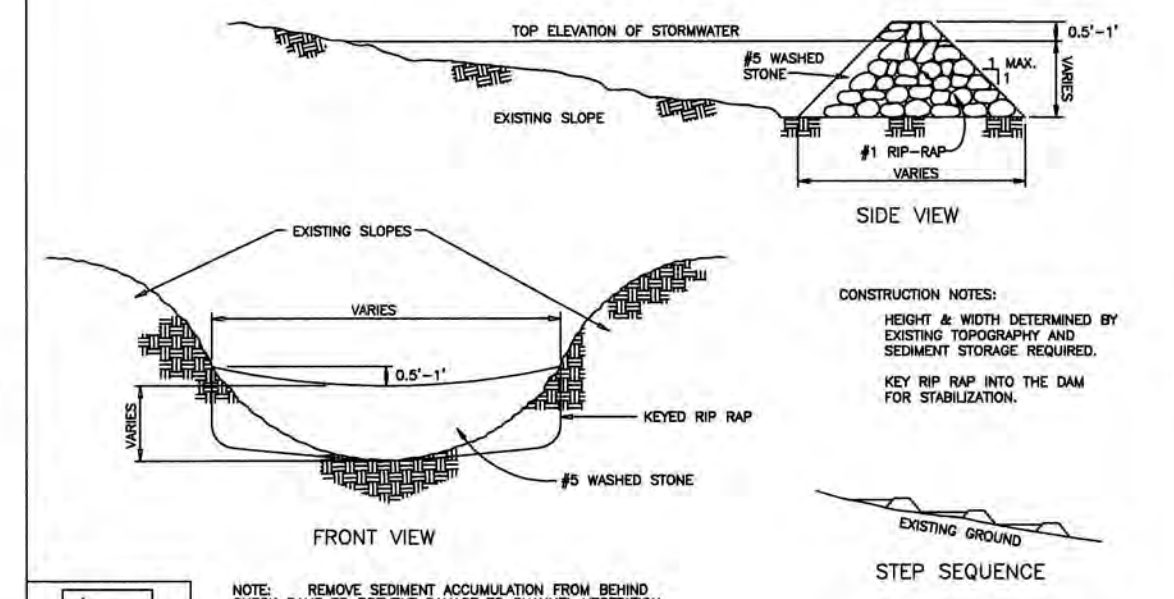
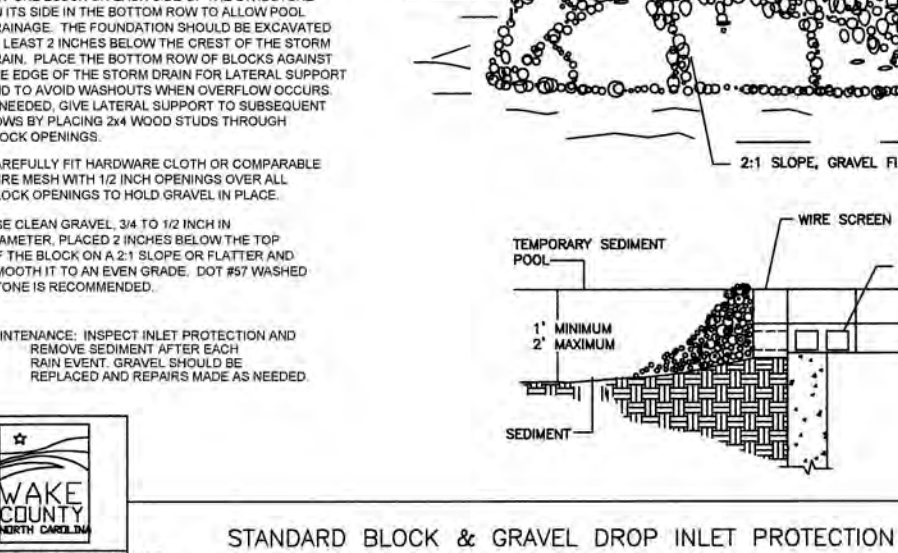
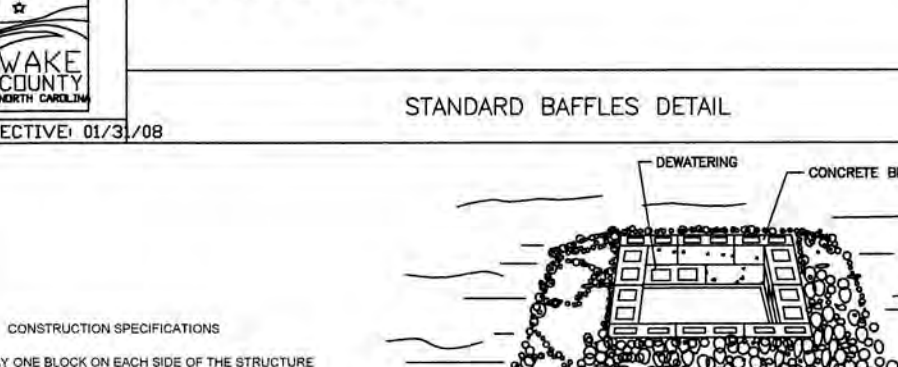
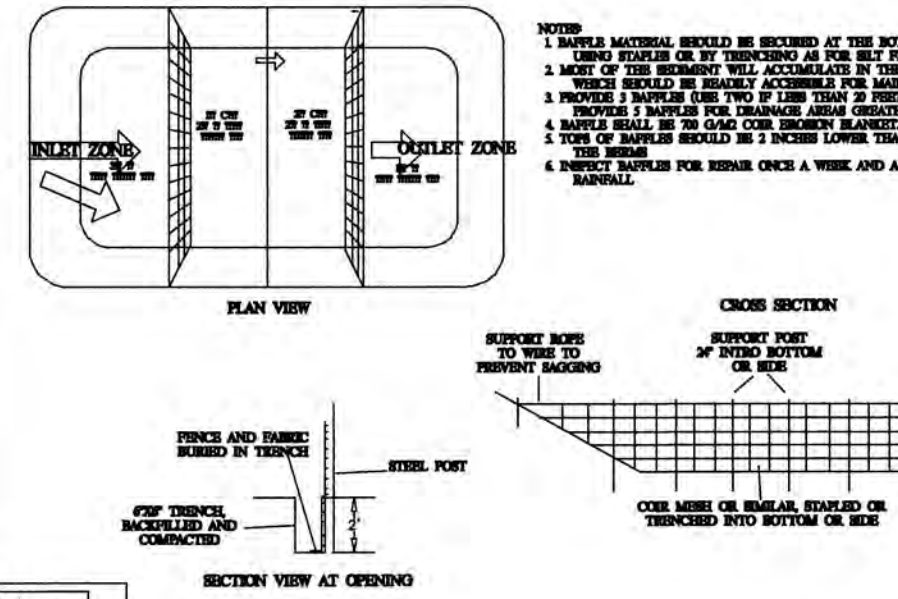
Effective September 1, 2008

Soil stockpiles shall be located on the approved plan and shall adhere to the following requirements:

- A 23-foot temporary maintenance and access easement shall be shown around all proposed stockpiles (includes control measures surrounding the stockpile shall be shown at the outer limit of this easement).
- Stockpile footprints shall be setback a minimum of 25' from adjacent property lines.
- A note shall be provided on the approved plan that stockpile height shall not exceed 35 feet.
- Stockpile slopes shall be 2:1 or flatter.
- Approved BMPs shall be shown on a plan to control any potential sediment loss from a stockpile.
- Stockpiling materials adjacent to a ditch, drainageway, watercourse, wetland, stream buffer, or other body of water shall be avoided unless an alternative location is demonstrated to be unavoidable.
- Any concentrated flow likely to affect the stockpile shall be diverted to an approved BMP.
- Off-site spoil or borrow areas must be in compliance with Wake County LDC and State Regulations. All spoil areas over an acre are required to have an approved sediment control plan. Developer/Contractor shall notify Wake County of any off-site disposal of soil, prior to disposal. Fill of FEMA Floodways and Non-encroachment Areas are prohibited except as otherwise provided by subsection 14-19-2 of the Wake County Unified Development Ordinance (ordinances and permits required).

Maintenance Requirements to be Noted on the Plan

- Seeding or covering stockpiles with tarp or mulch is required and will reduce erosion problems. Tarp should be kept in at the top of the slope to keep water from running underneath the plastic.
- If a stockpile is to remain for future use after the project is complete (Ditches, etc.), the financial responsible party must notify Wake County of a new responsible party for that stockpile.
- The approved plan shall provide for the use of mulch seeding and mulching on a continual basis while the stockpile is in use.
- Establish and maintain a vegetative buffer at the toe of the slope (where practical).



SITE AREA DESCRIPTION	GROUND STABILIZATION	
	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (H2O) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES FLATTER THAN 3:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HOW ZONES)

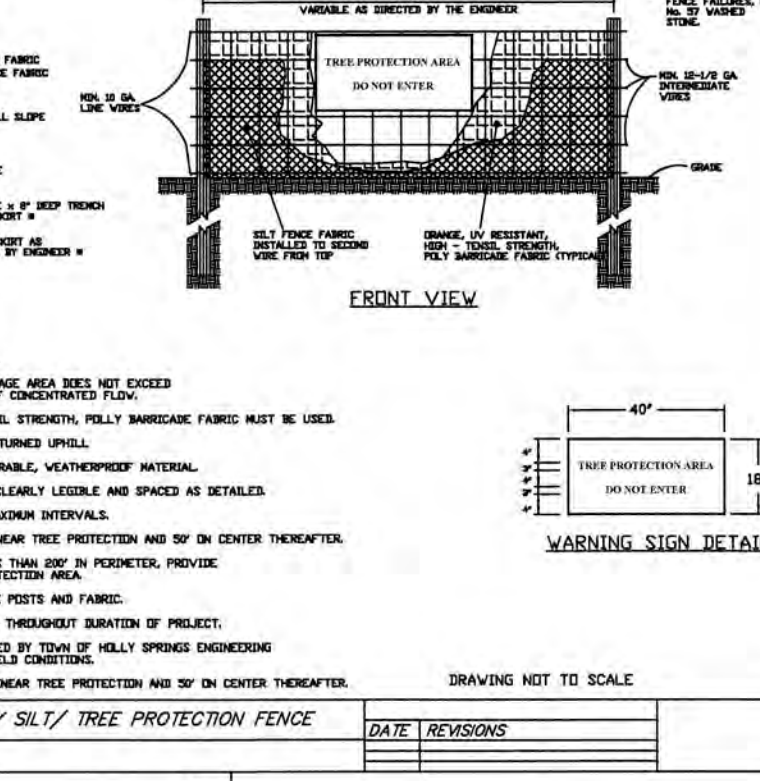
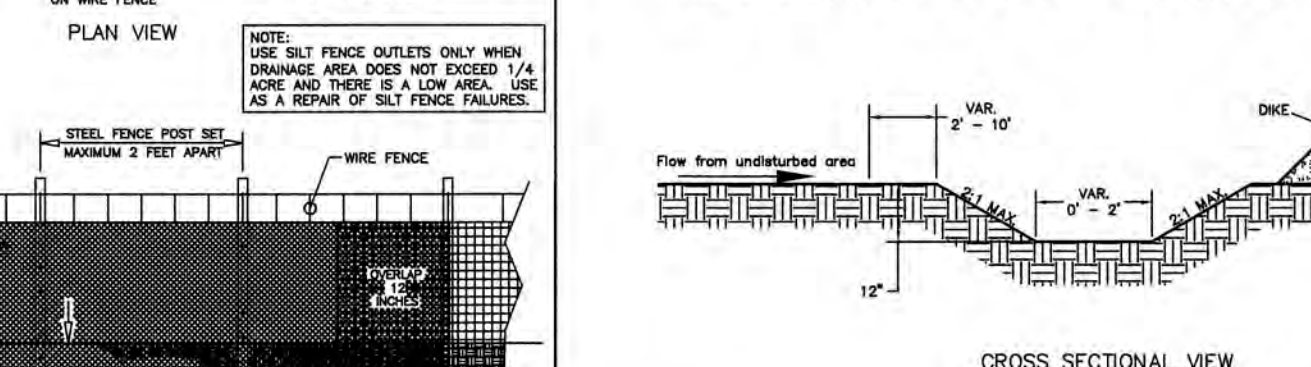
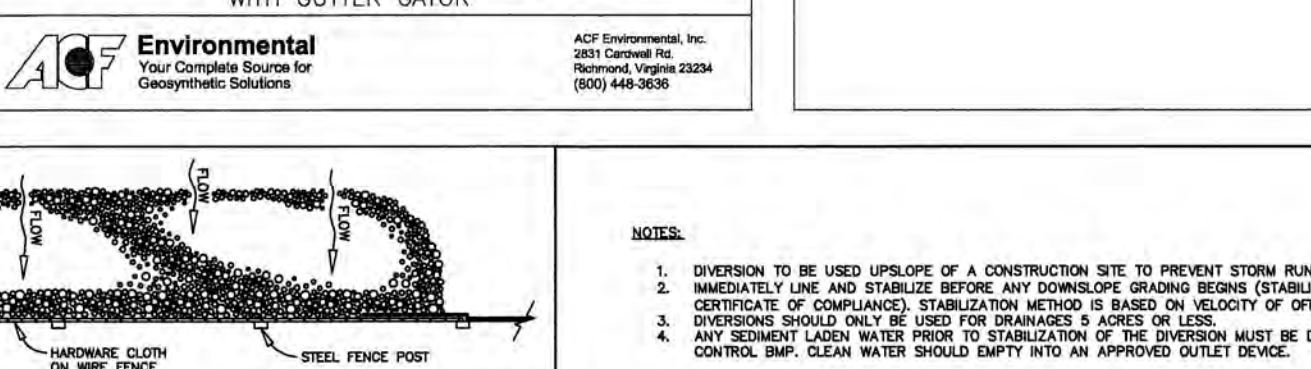
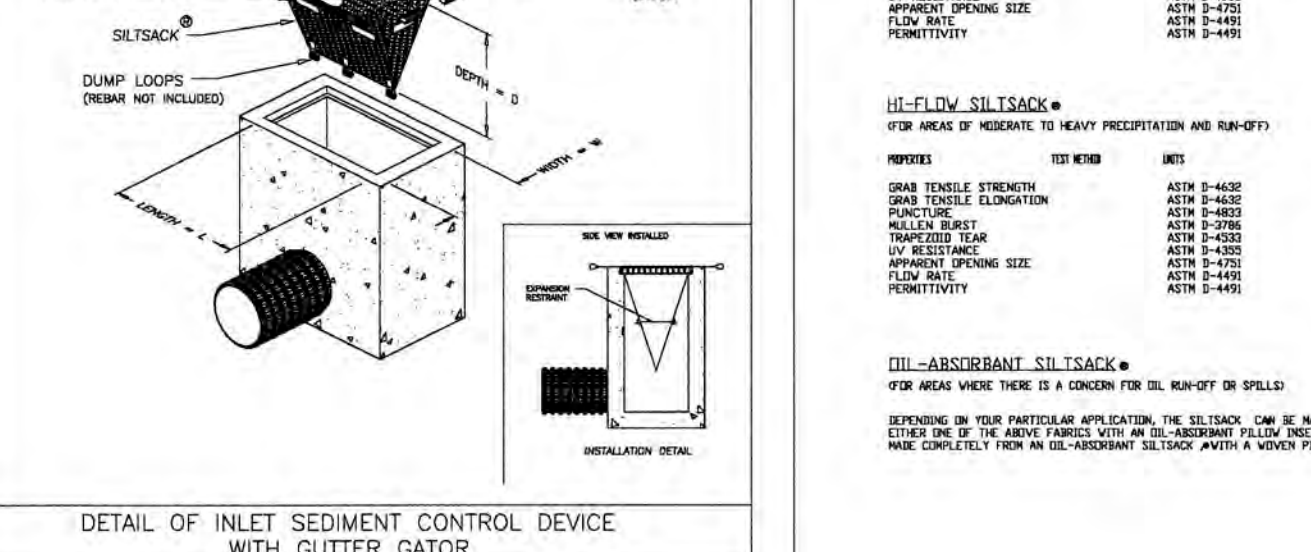
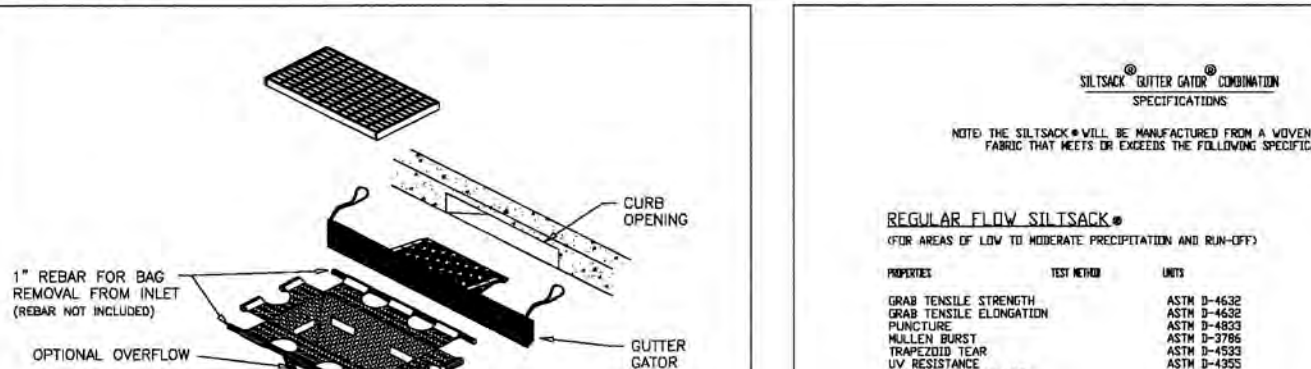
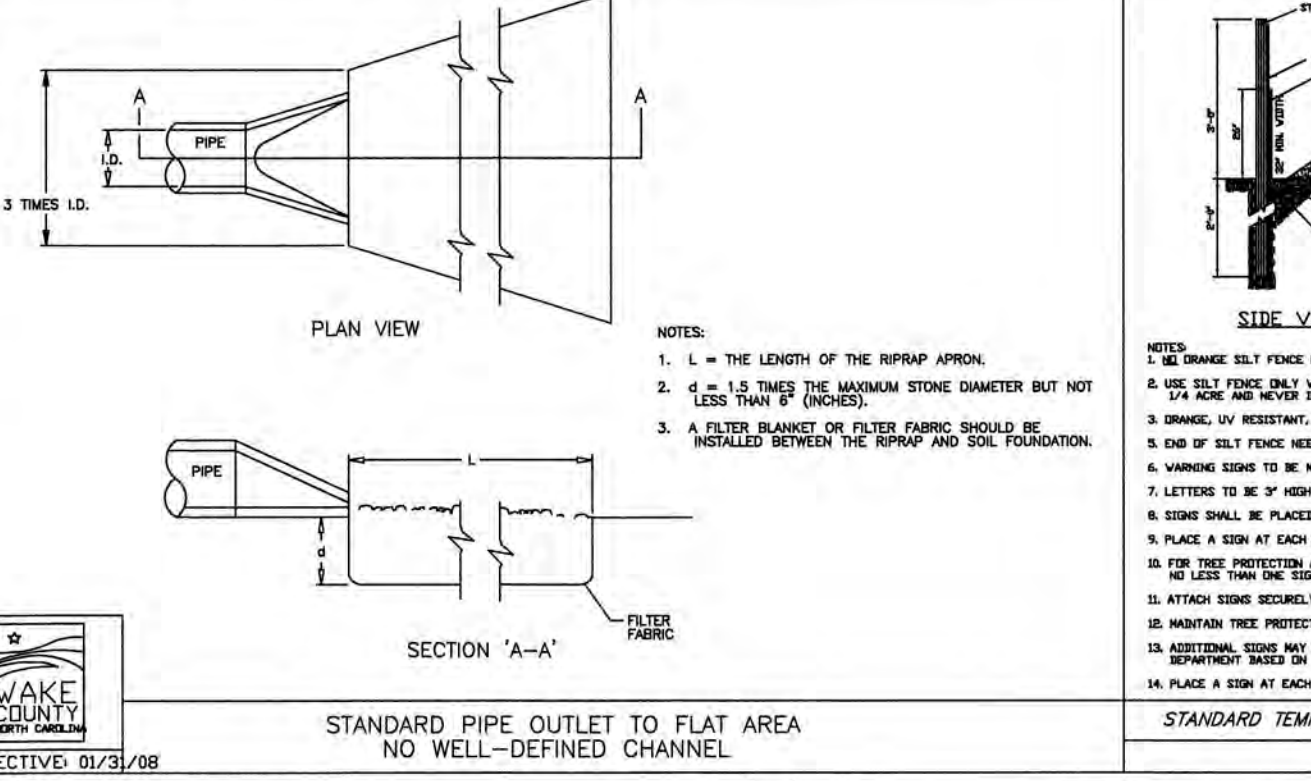
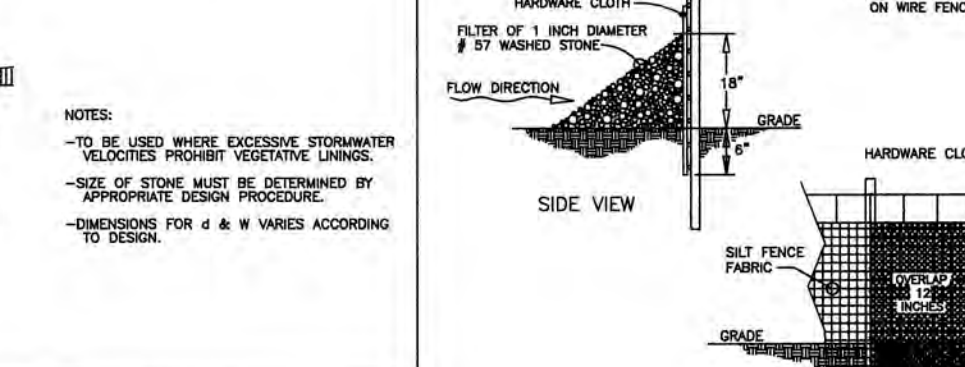
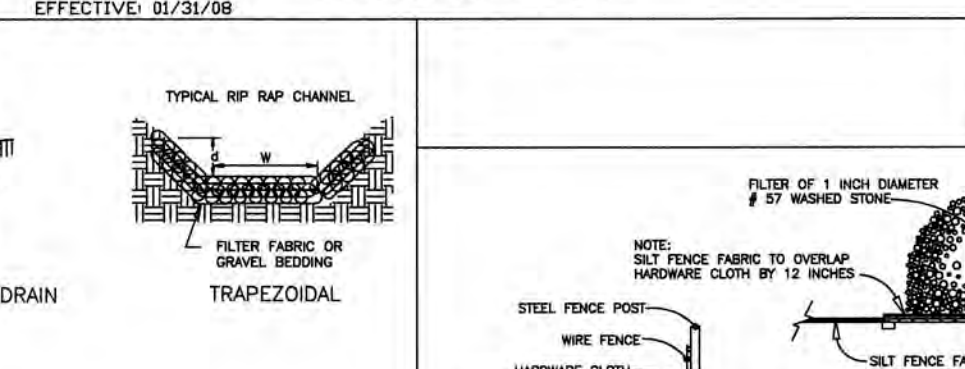
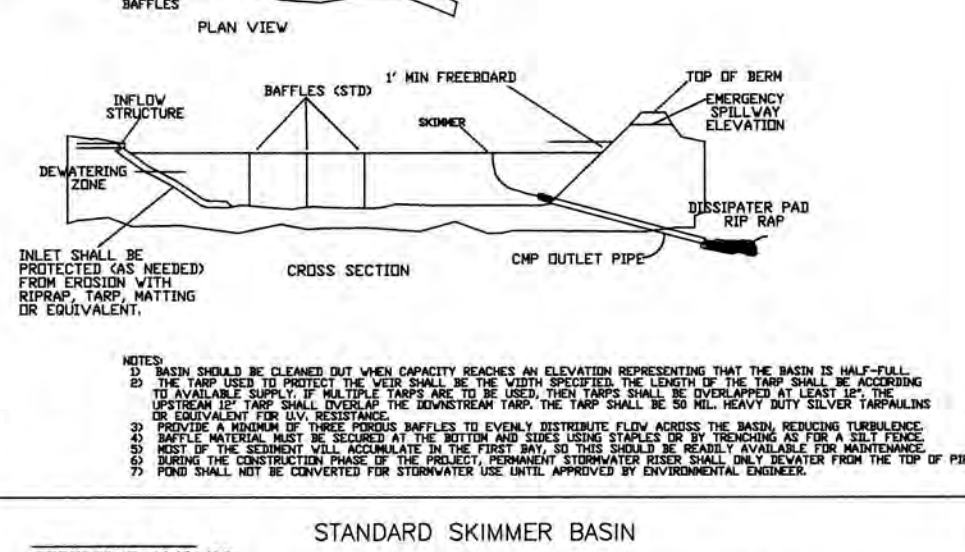
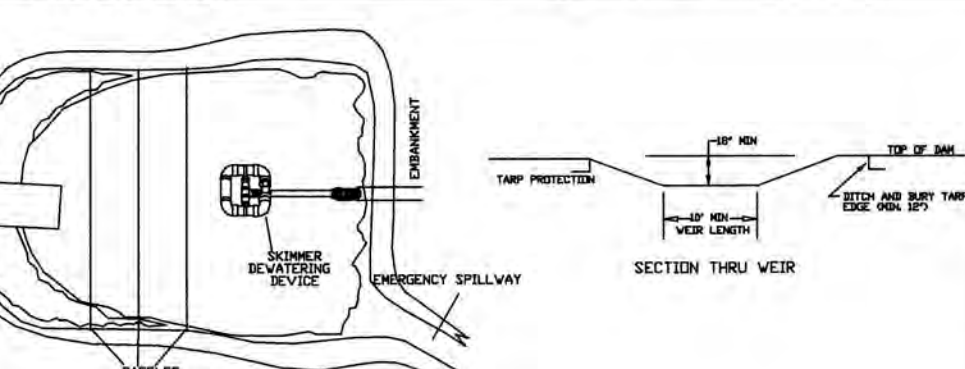
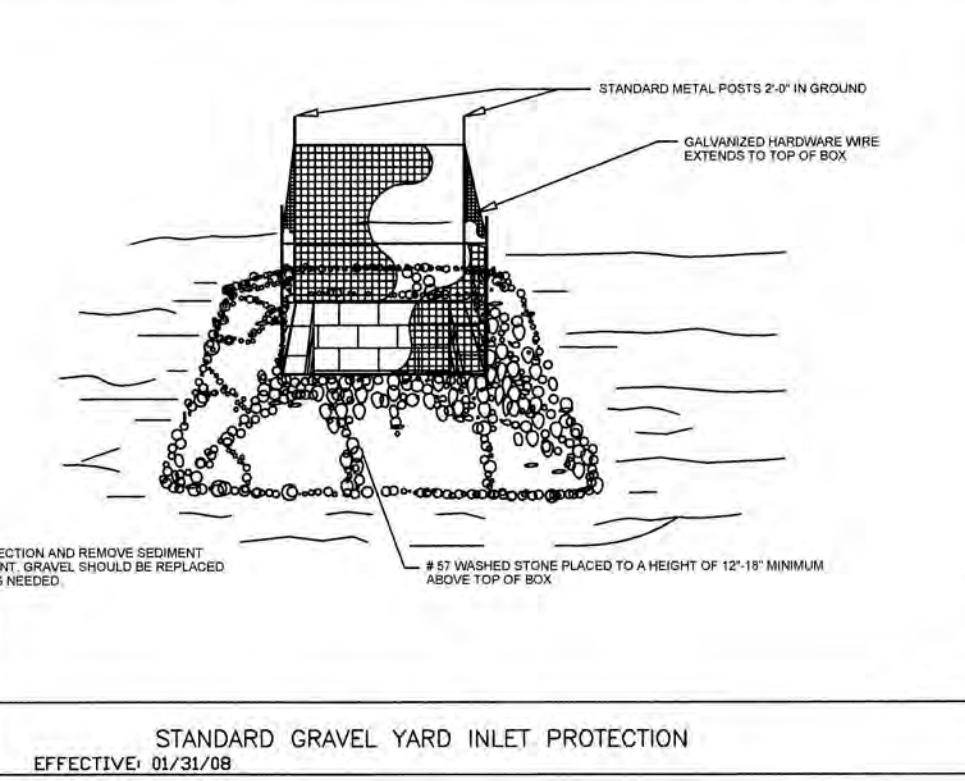
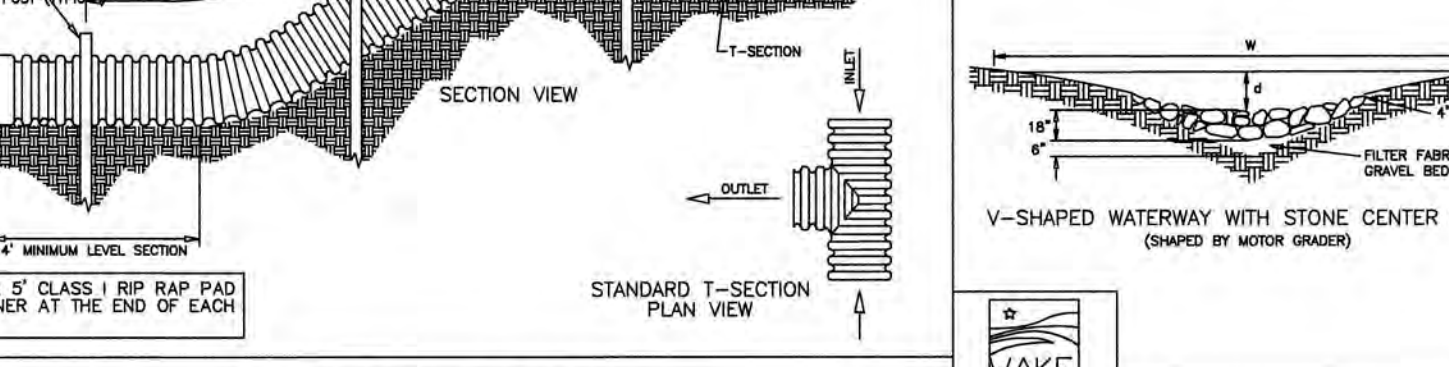
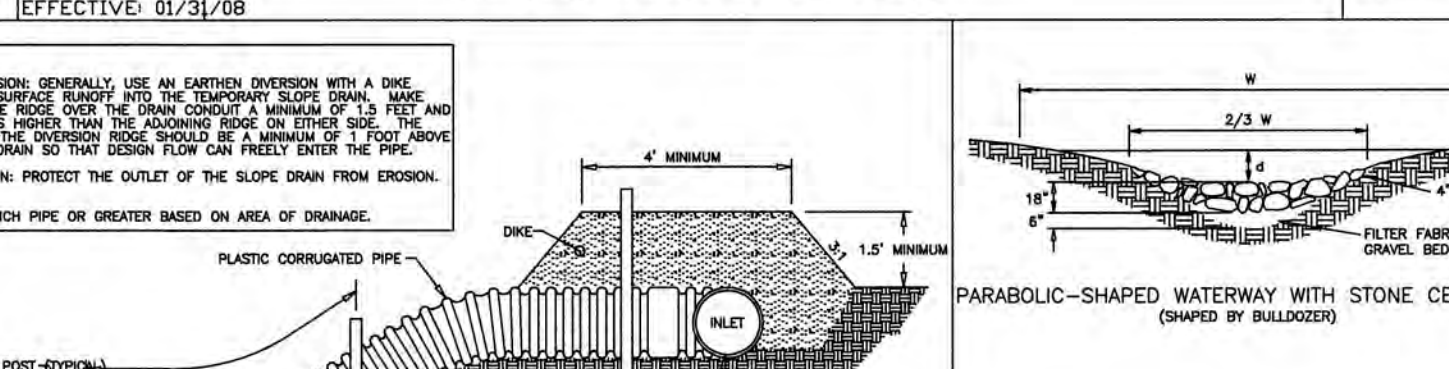
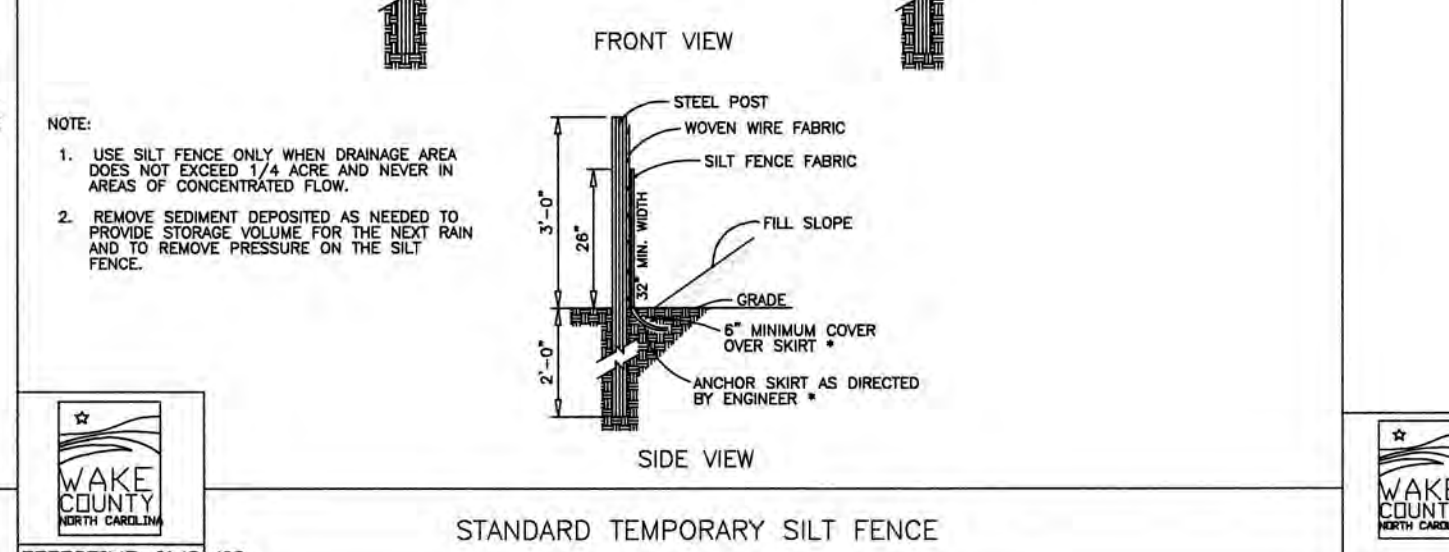
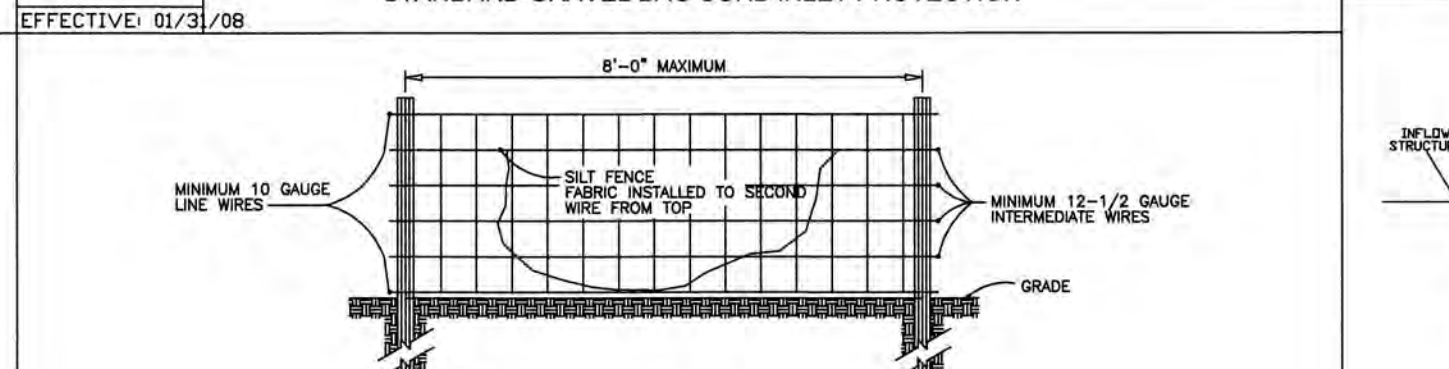
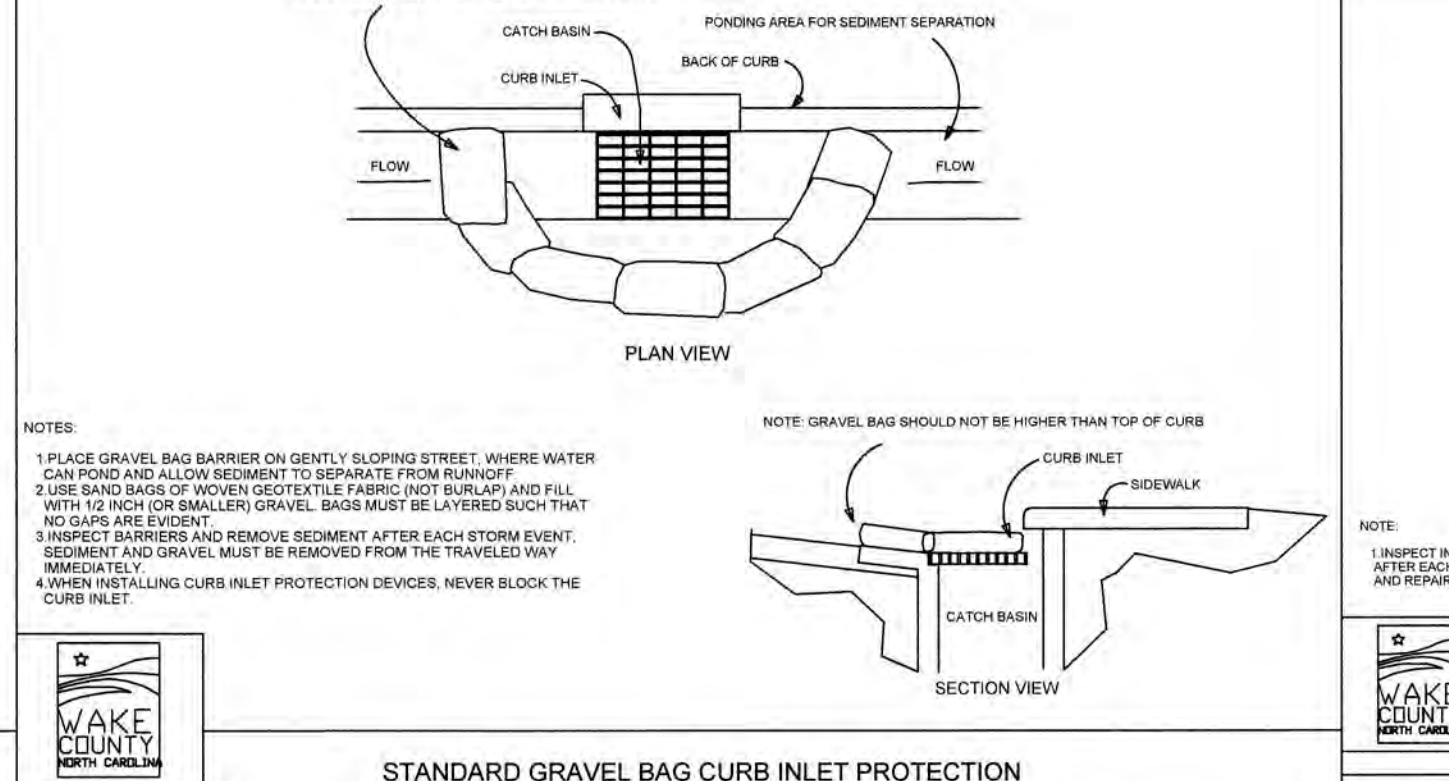
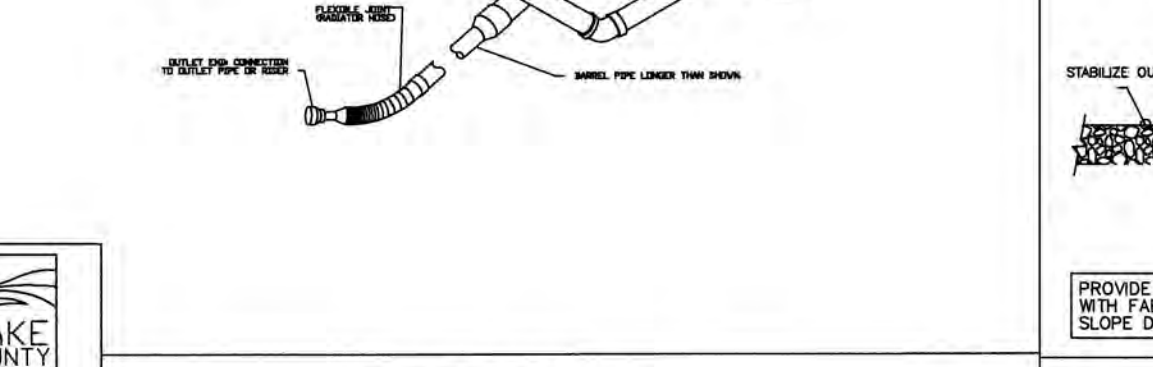
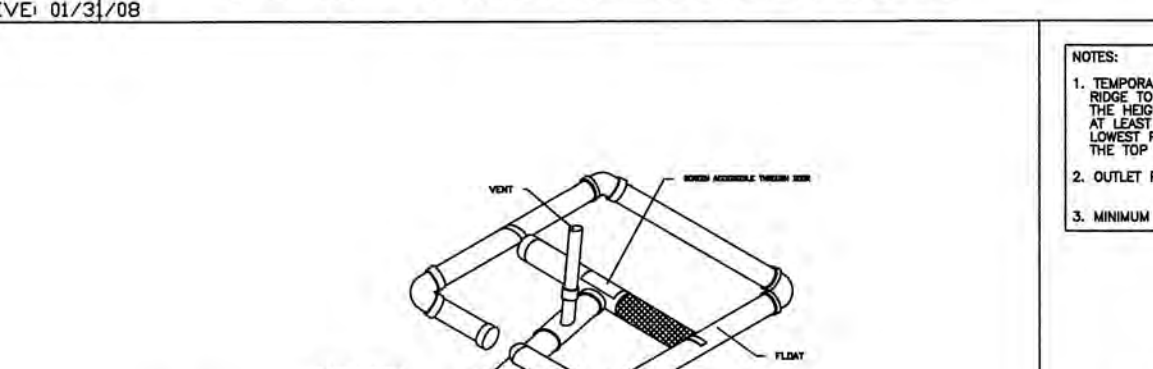
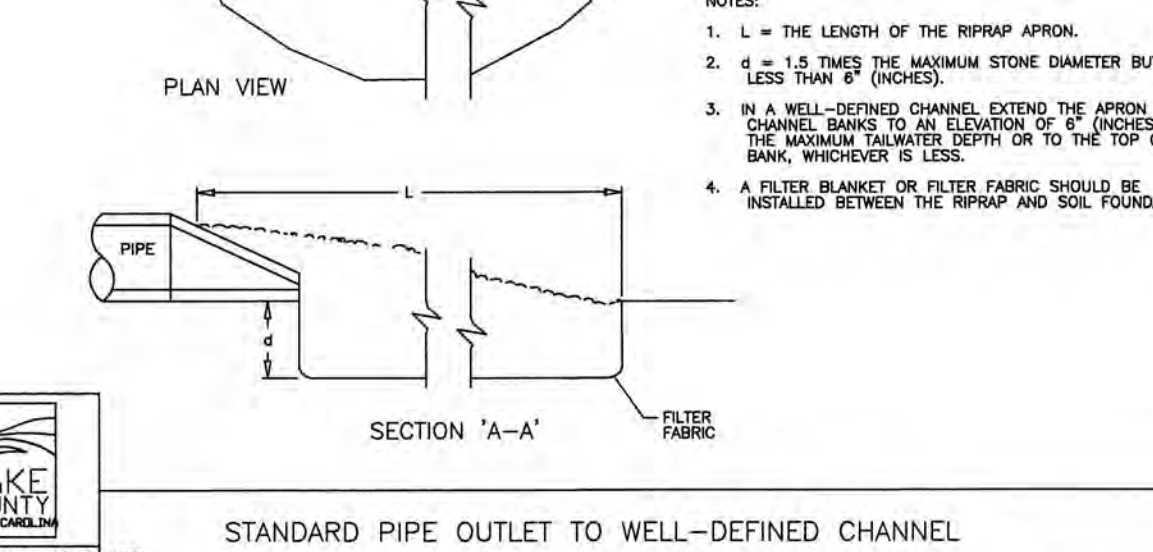
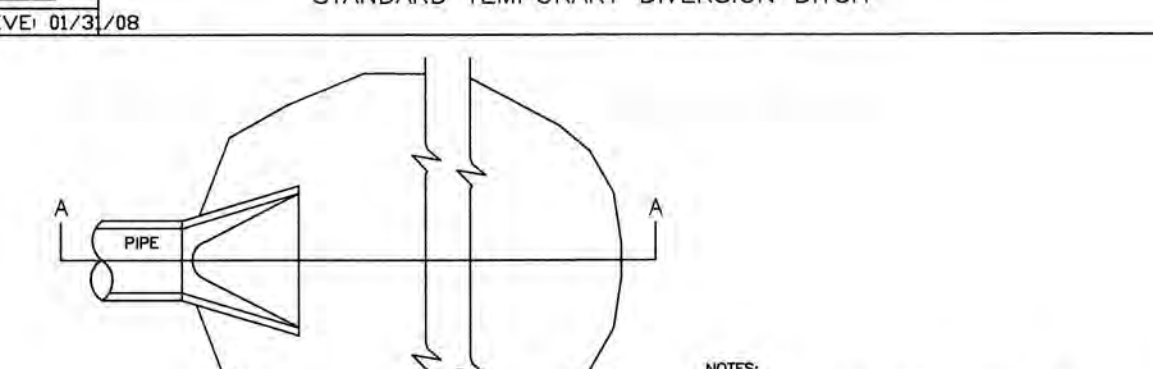
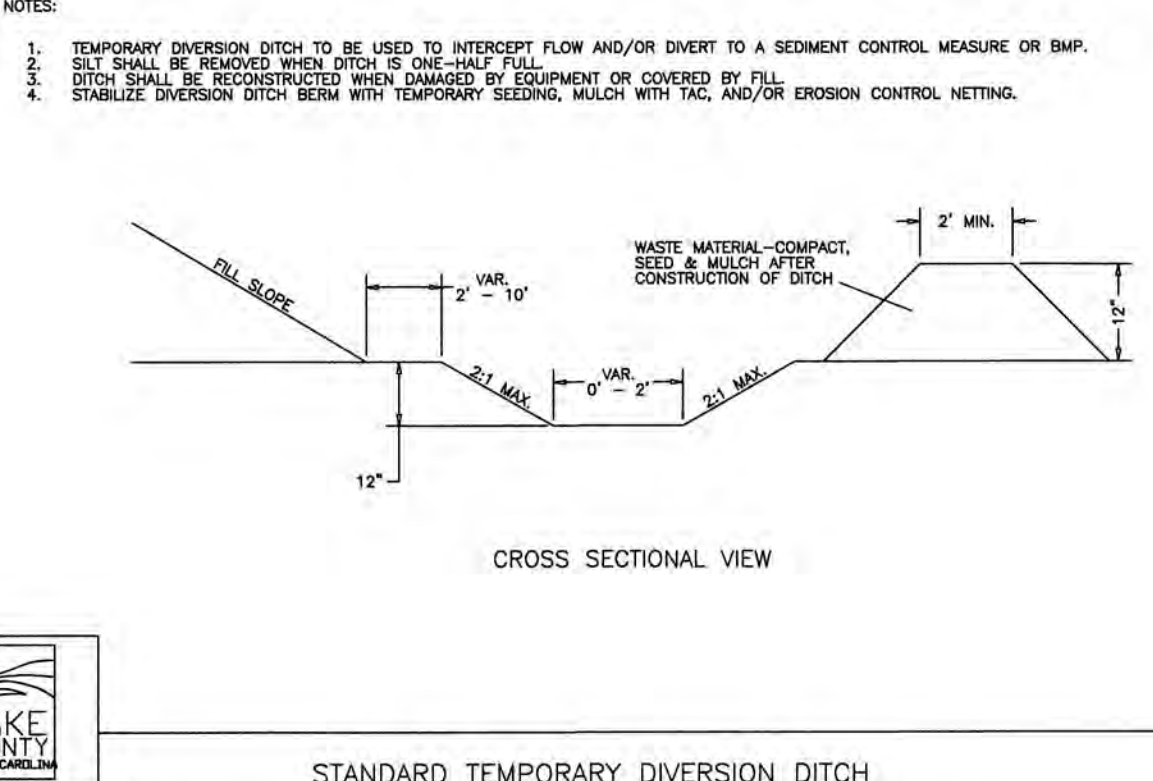
Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable. (Section 11.8(c)(6))

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: *SAMU* DATE: *8-31-2008*
DEVELOPMENT SERVICES ENGINEER

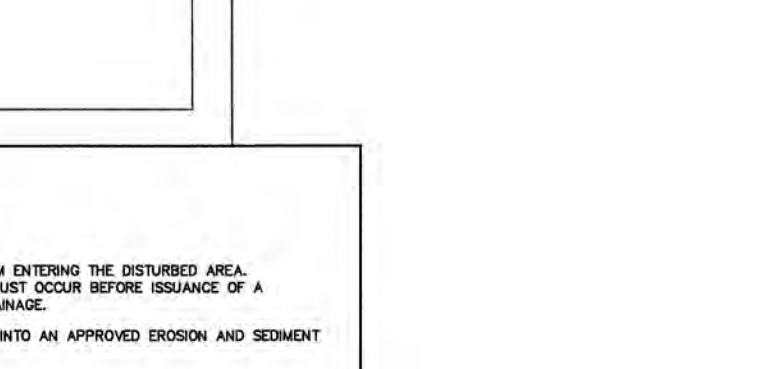
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: *Mason* DATE: *9-4-19*
ADMINISTRATOR



3" TYPICAL SLOTS PER FOOT			
REGULAR FLOW SILTSACK*			
APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)
10	15	20	25
30	40	50	60
70	80	90	100
110	120	130	140
150	160	170	180
200	210	220	230
250	260	270	280
300	310	320	330
350	360	370	380
400	410	420	430
450	460	470	480
500	510	520	530
550	560	570	580
600	610	620	630
650	660	670	680
700	710	720	730
750	760	770	780
800	810	820	830
850	860	870	880
900	910	920	930
950	960	970	980
1000	1010	1020	1030

H-FLUX SILTSACK*			
APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)	APPROX. WIND SPEED (MPH)
10	15	20	25
30	40	50	60
70	80	90	100
110	120	130	140
150	160	170	180
200	210	220	230
250	260	270	280
300	310	320	330
350	360	370	380
400	410	420	430
450	460	470	480
500	510	520	530
550	560	570	580
600	610	620	630
650	660	670	680
700	710	720	730
750	760	770	780
800	810	820	830
850	860	870	880
900	910	920	930
950	960	970	980
1000	1010	1020	1030



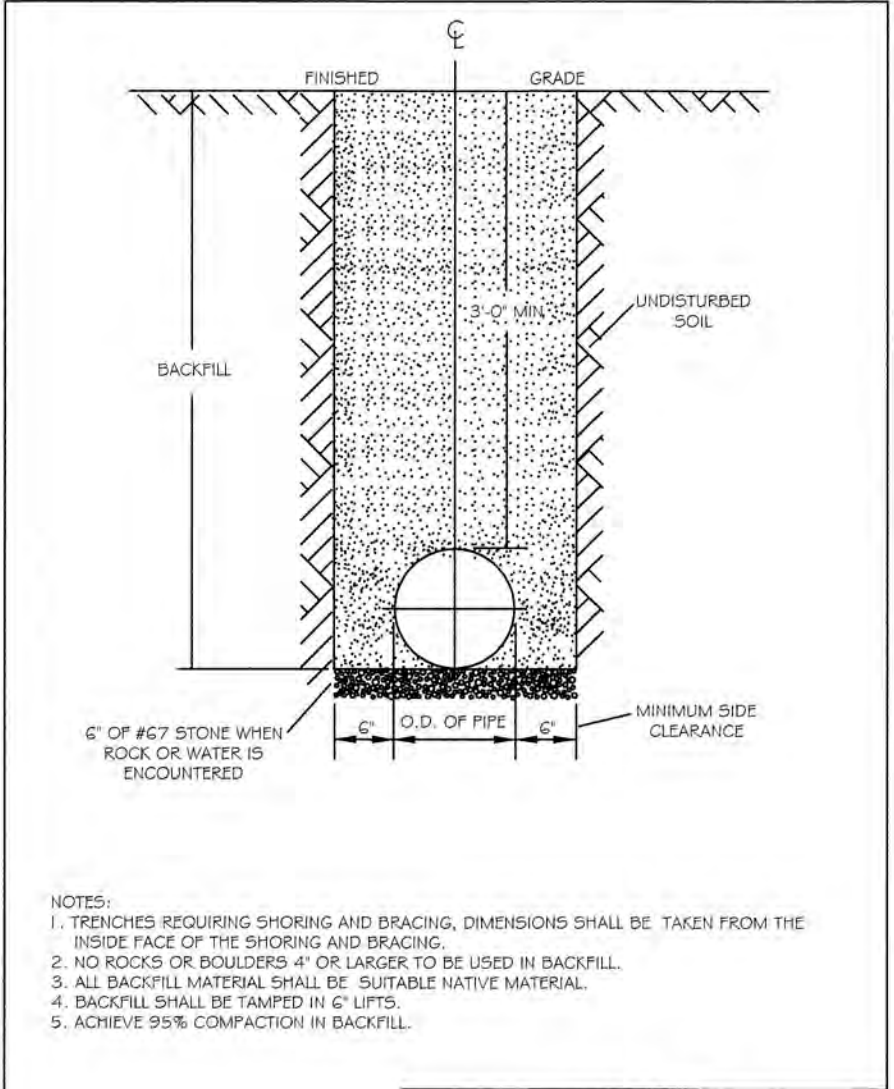
Revisions		
1	1st TOK Comments	08/31/18

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

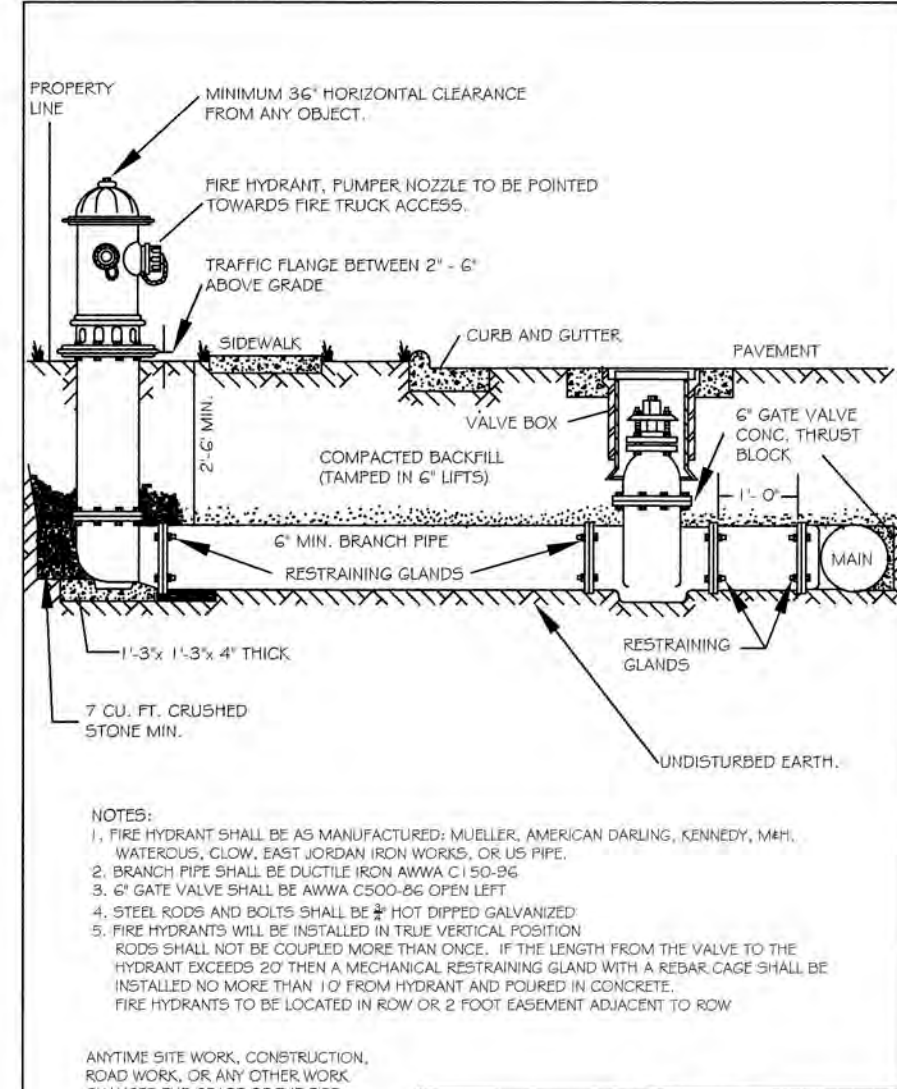
SIZE AND WEIGHT OF PIPE	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT	STANDARD WEIGHT
6"	1.108	1	1	1	1	1	1	1	1
8"	2.207	1	2	2	1	1	1	1	3
10"	4.268	2	3	3	1	1	2	5	1
12"	7.794	2	4	5	1	1	2	8	1
14"	5.655	2	3	4	1	1	2	6	1
16"	1.970	1	1	2	1	1	1	2	1
18"	3.922	1	2	3	1	1	1	4	1
20"	7.694	2	4	5	1	1	2	8	1
24"	14.215	4	8	9	2	2	4	15	2
FLUG	10.053	3	5	6	2	2	3	10	1
11 1/4"	4.433	2	3	3	1	1	2	5	1
12 1/2"	8.866	3	5	6	2	2	3	9	1
14 1/2"	17.312	5	9	11	3	3	5	18	2
16 1/2"	31.943	8	16	19	4	4	8	32	4
FLUG	22.619	6	12	14	3	3	6	23	3
11 1/4"	7.881	2	4	5	1	1	2	8	1
12 1/2"	15.691	4	8	10	2	2	4	16	2
14 1/2"	30.779	8	16	19	4	4	8	31	4
16 1/2"	56.861	15	29	35	8	8	15	57	6
FLUG	40.213	10	21	25	5	5	10	41	5

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

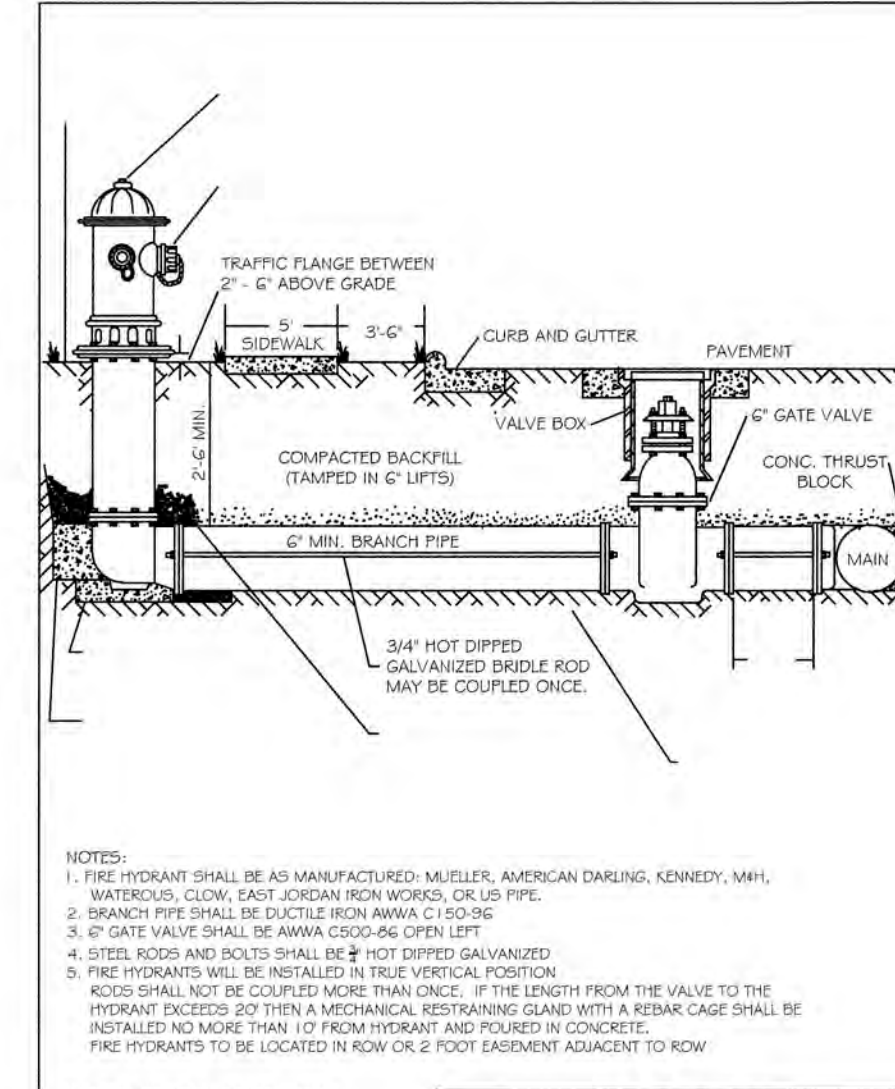
USE 6" x 90" END VALVE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.



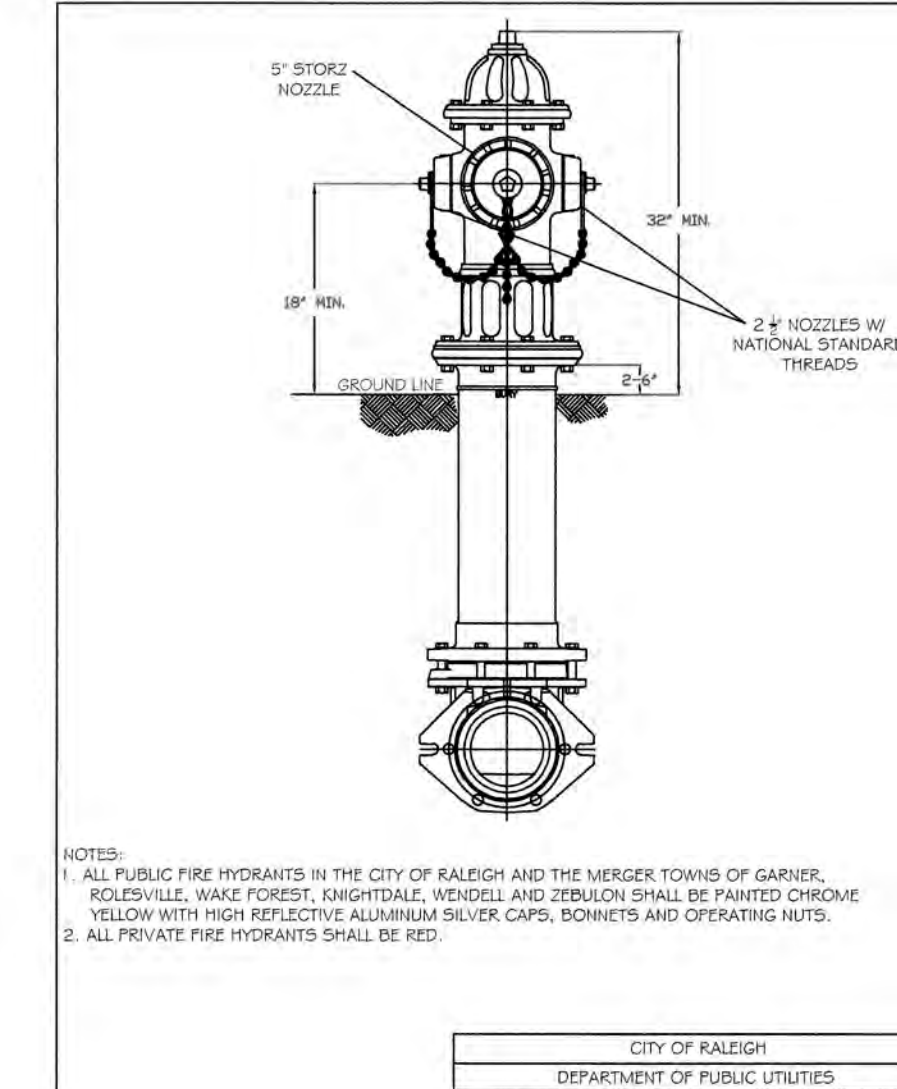
NOTES:
 1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
 2. NO ROCKS OR BouldERS 4" OR LARGER TO BE USED IN BACKFILL.
 3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
 4. BACKFILL SHALL BE TAMPED IN 6" LIFTS.
 5. ACHIEVE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



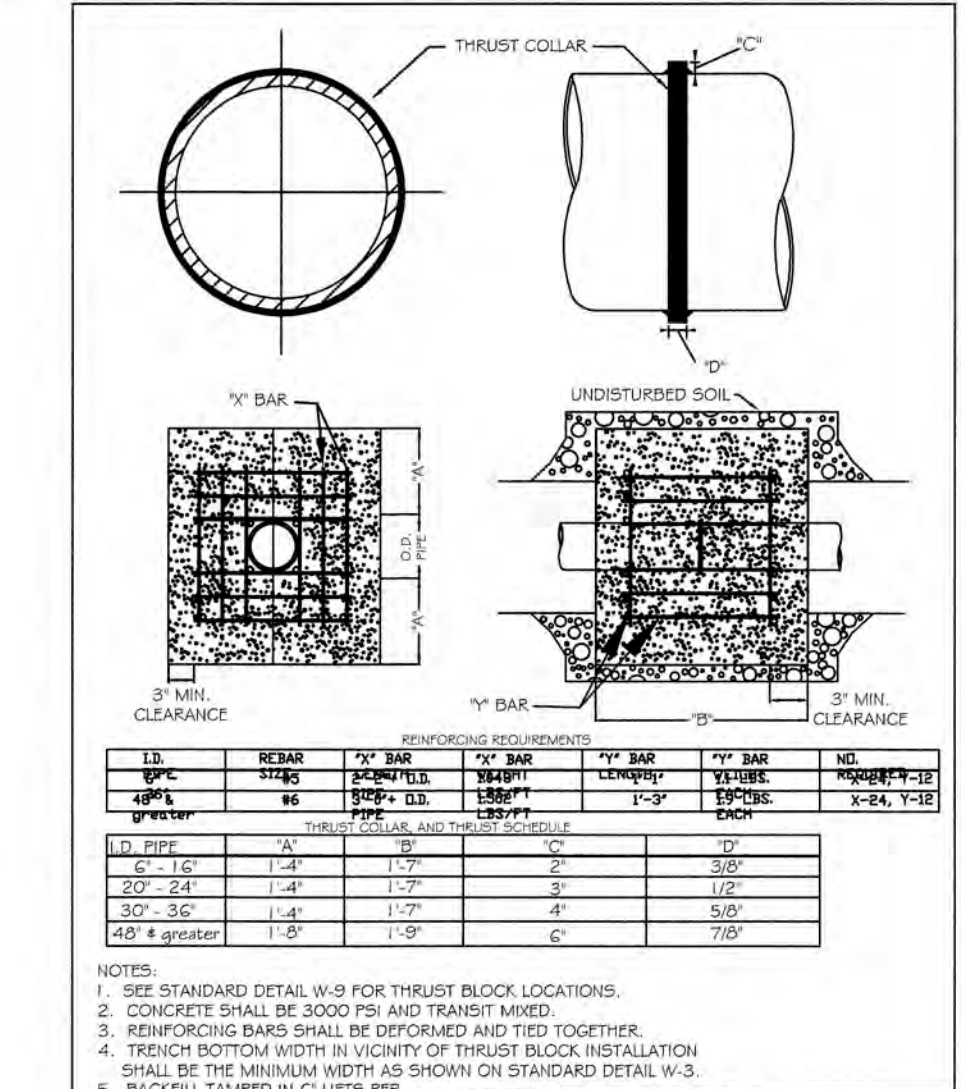
NOTES:
 1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATERLOO, GLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 2. BRANCH PIPES SHALL BE DUCTILE IRON WITH A 10' TO 12' MINIMUM LENGTH.
 3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT.
 4. STEEL RODS AND BOLTS SHALL BE 3/4\"/>



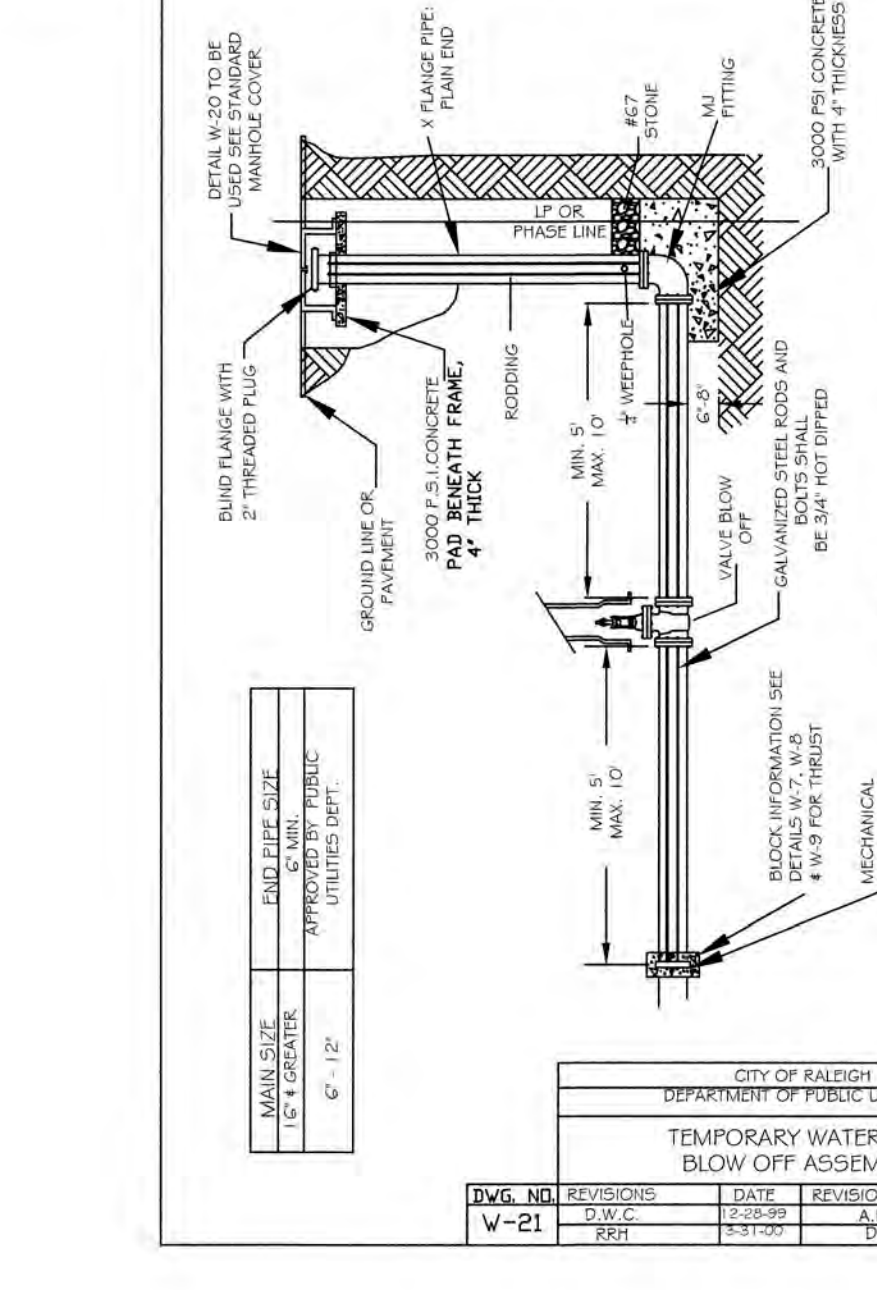
NOTES:
 1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATERLOO, GLOW, EAST JORDAN IRON WORKS, OR US PIPE.
 2. BRANCH PIPES SHALL BE DUCTILE IRON WITH A 10' TO 12' MINIMUM LENGTH.
 3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT.
 4. STEEL RODS AND BOLTS SHALL BE 3/4\"/>



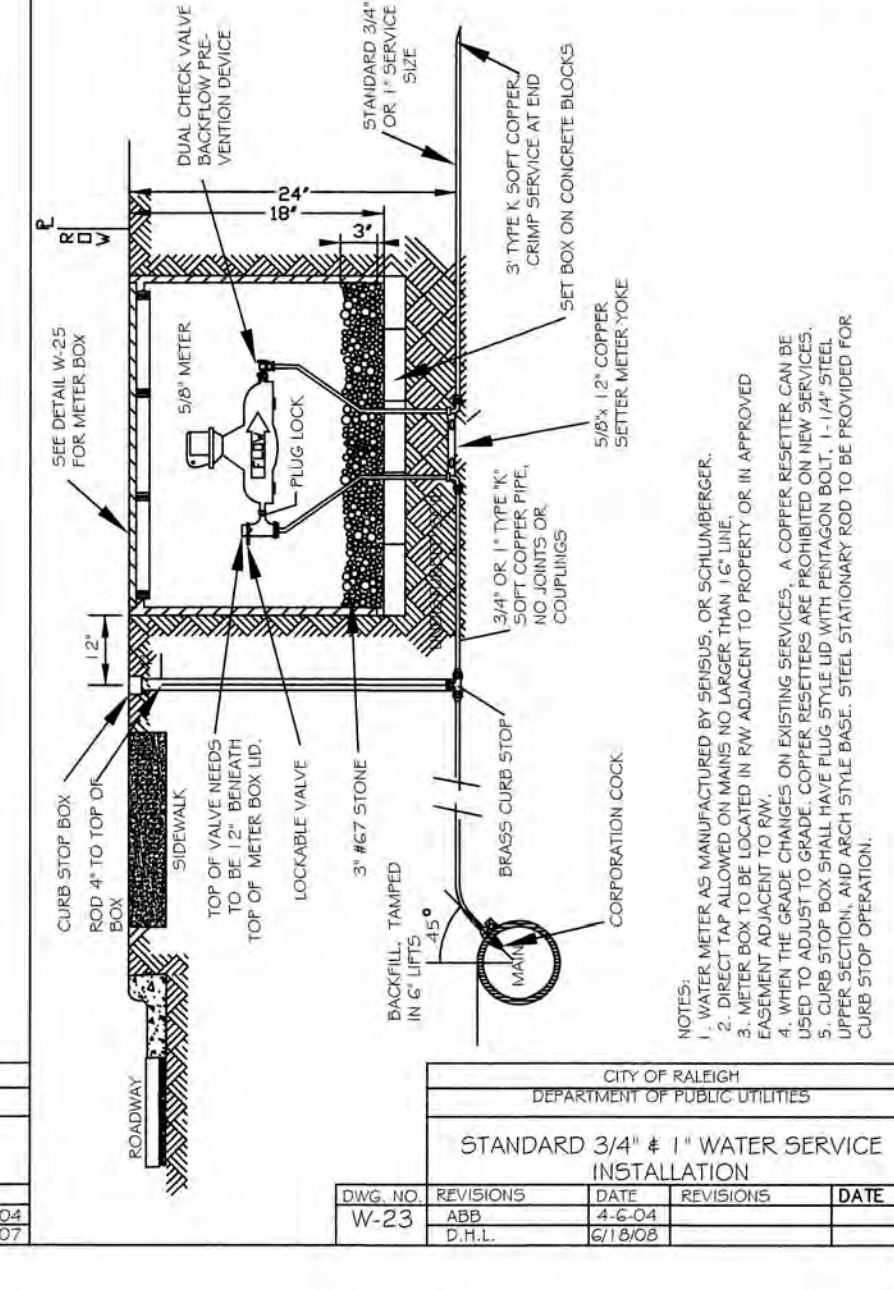
NOTES:
 1. ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERCER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDILL & ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
 2. ALL PRIVATE FIRE HYDRANTS SHALL BE RED.



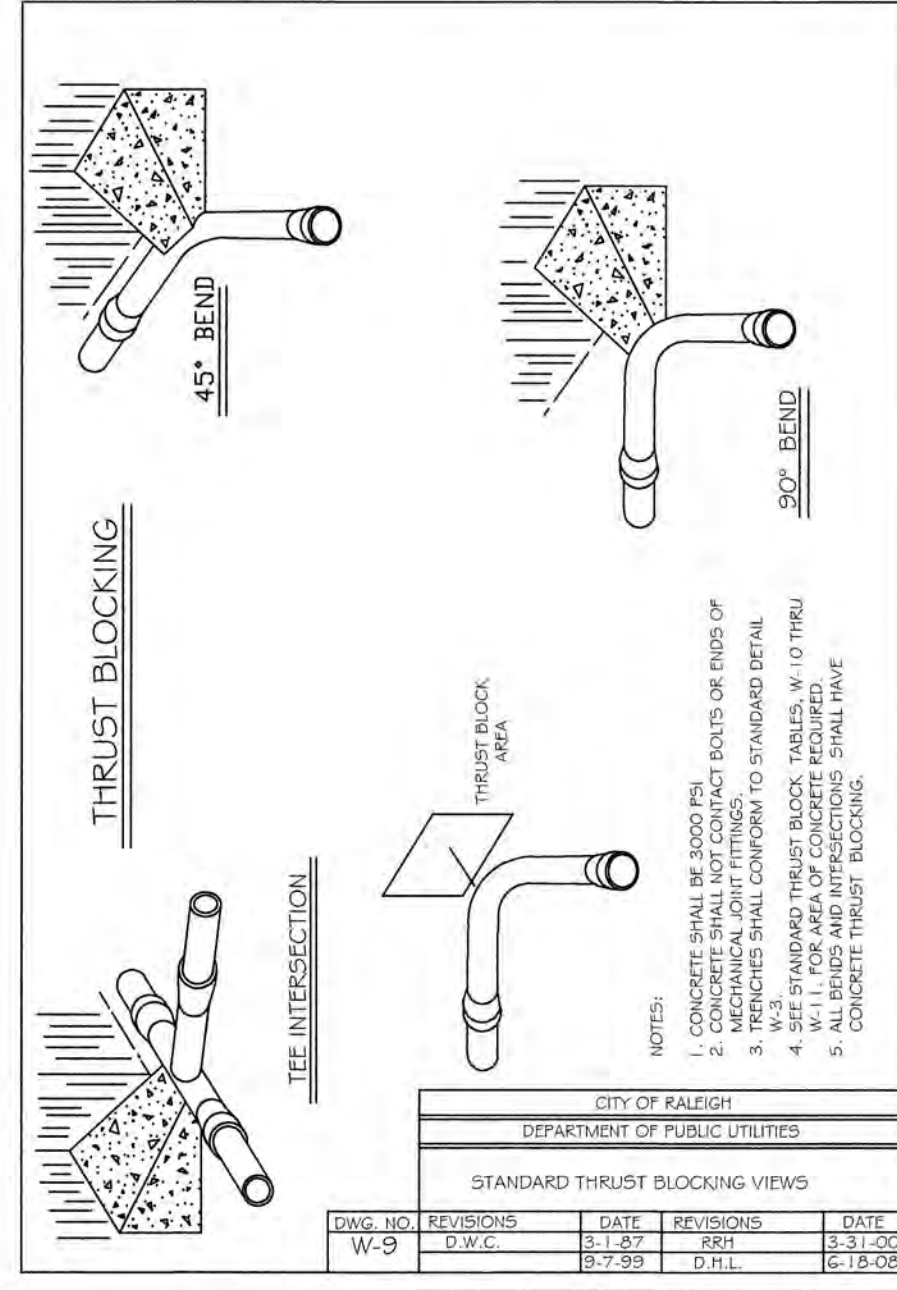
NOTES:
 1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
 2. CONCRETE SHALL BE 3000 PSI AND TRANSPORT MIXED.
 3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
 4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.



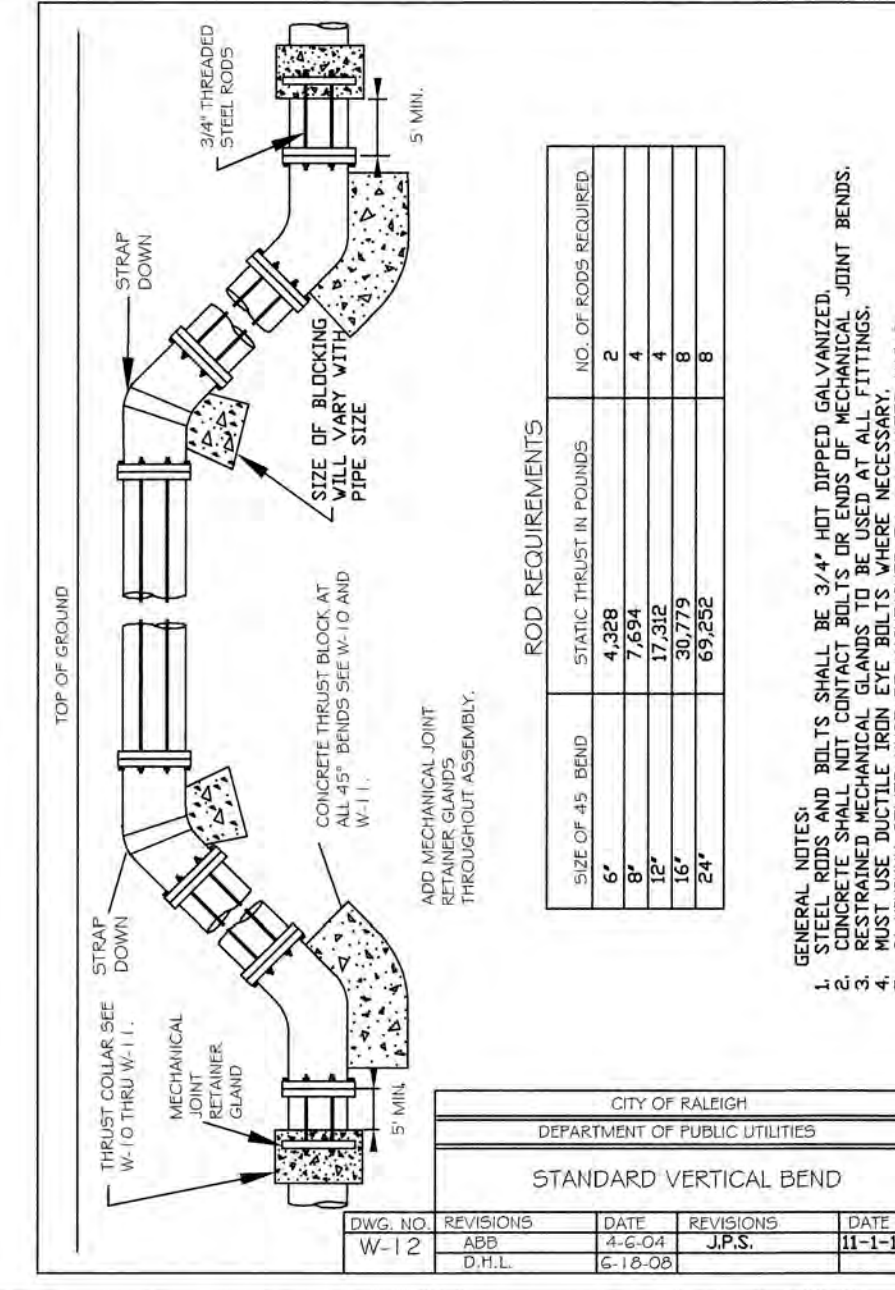
NOTES:
 1. ALL MAINS TO BE USED IN ROADWAY APPLICATIONS.
 2. FRAME SHALL BE A MINIMUM WEIGHT OF 162 LBS.
 3. COVER SHALL WEIGH A MIN. OF 130 LBS.
 4. MANHOLES WITH PAVED SURFACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH S-29.



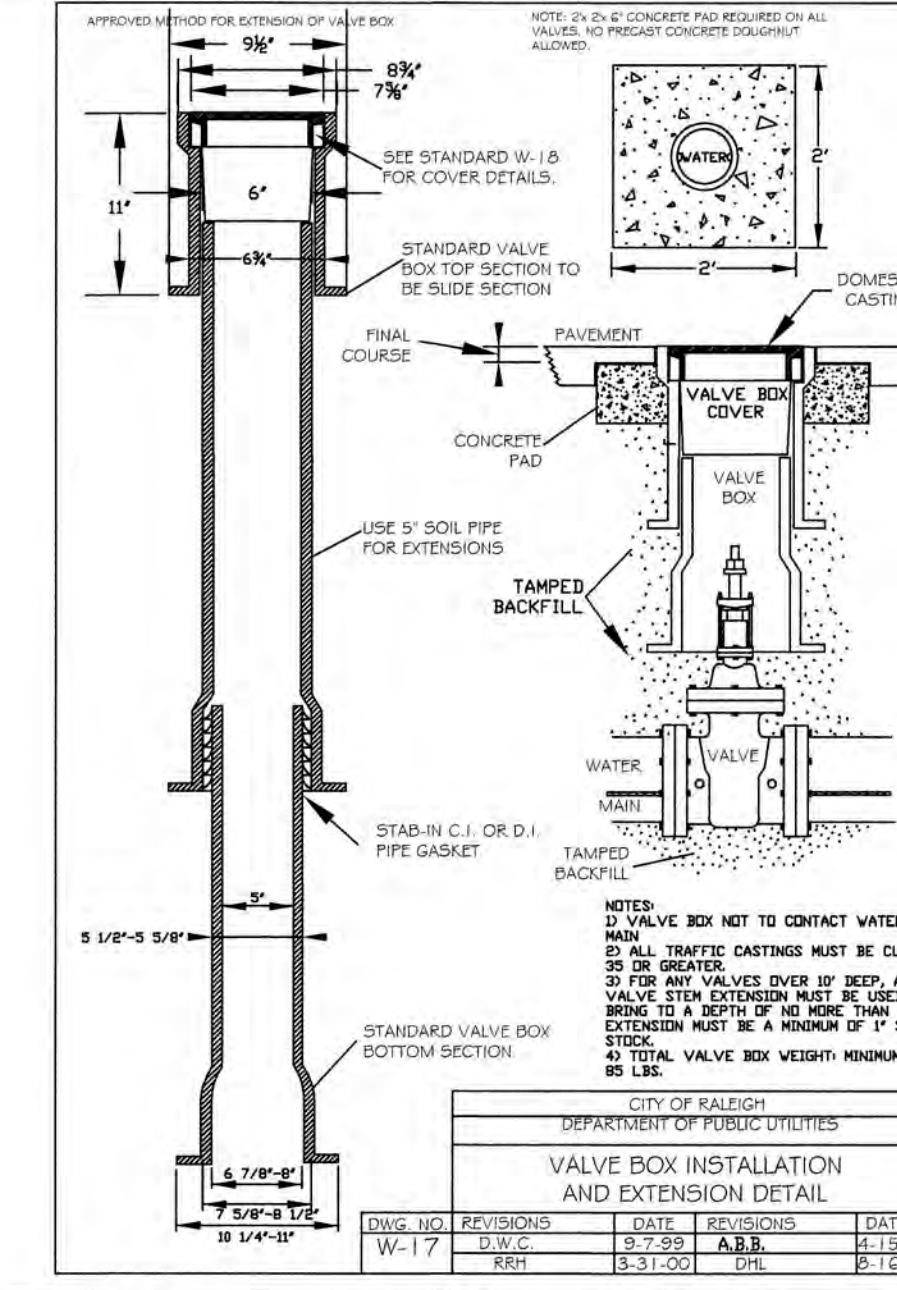
NOTES:
 1. WATER MAINS AS MANUFACTURED BY SERRAVALLO, SCHLUMBERGER, 3. WATER BOX TO BE LOCATED IN PAV ADJACENT TO PROPERTY OR IN IMPROVED
 4. WHEN THE GRADE CHANGES ON EXISTING SERVICES, A COVER RESETTER CAN BE USED TO ADJUST THE COVER TO THE GRADE.
 5. COVER SHALL BE 12\"/>



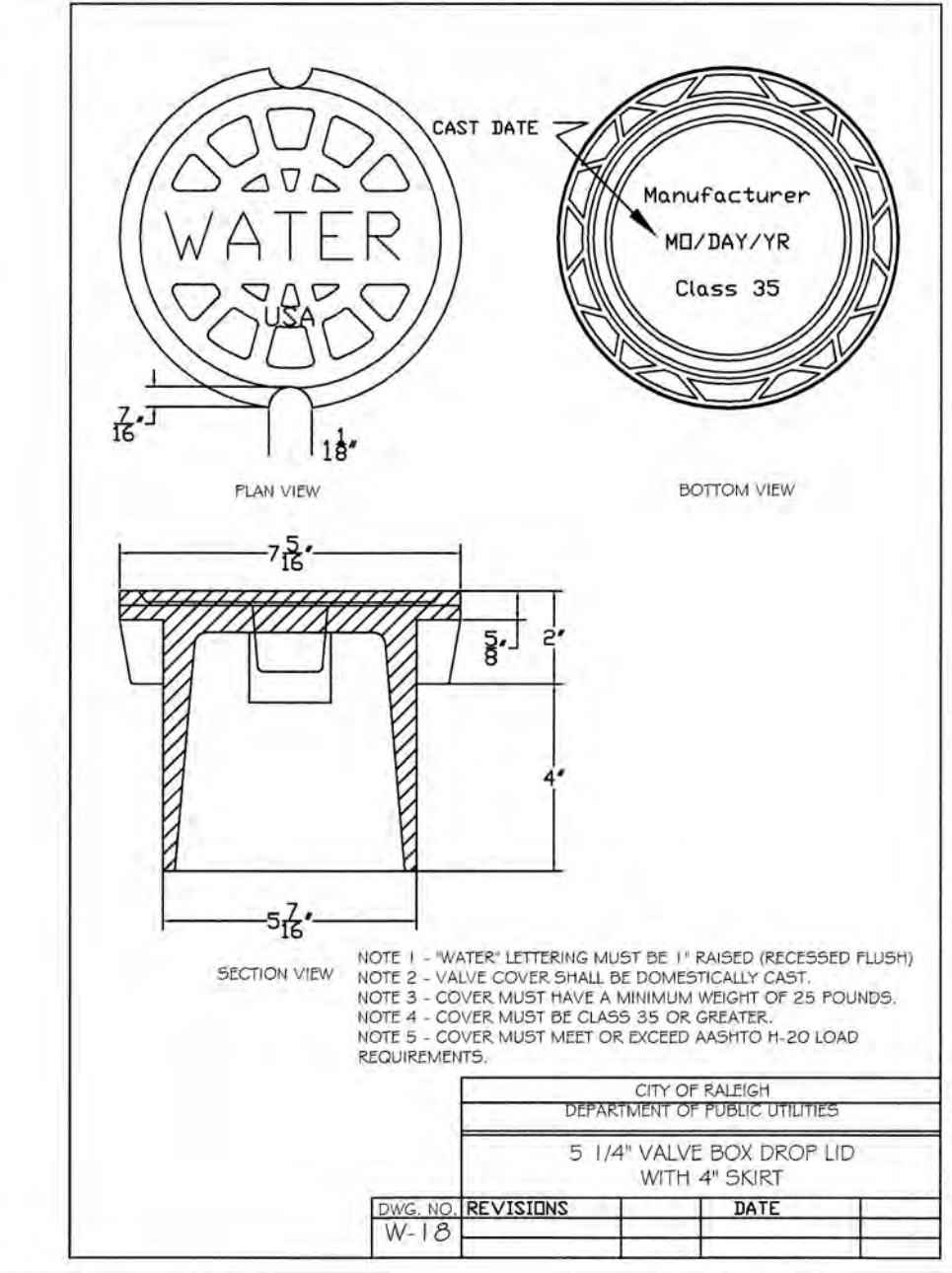
NOTES:
 1. CONCRETE SHALL BE 3000 PSI.
 2. CONCRETE SHALL NOT CONTACT DATEL OR RINGS OF
 3. TRENCHES SHALL CONFORM TO STANDARD DETAIL W-10 THROUGH W-12.
 4. SET STANDARD THRUST BLOCK TABLES W-10 THROUGH W-12.
 5. ALL REBAR AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.



NOTES:
 1. COVER WEIGHT, 13 LBS +/- 5%
 2. LIDS TO BE COATED WITH BITUMINOUS COAL TAR COATING
 3. HOLE SHALL BE FITTED WITH A METAL GROMMET



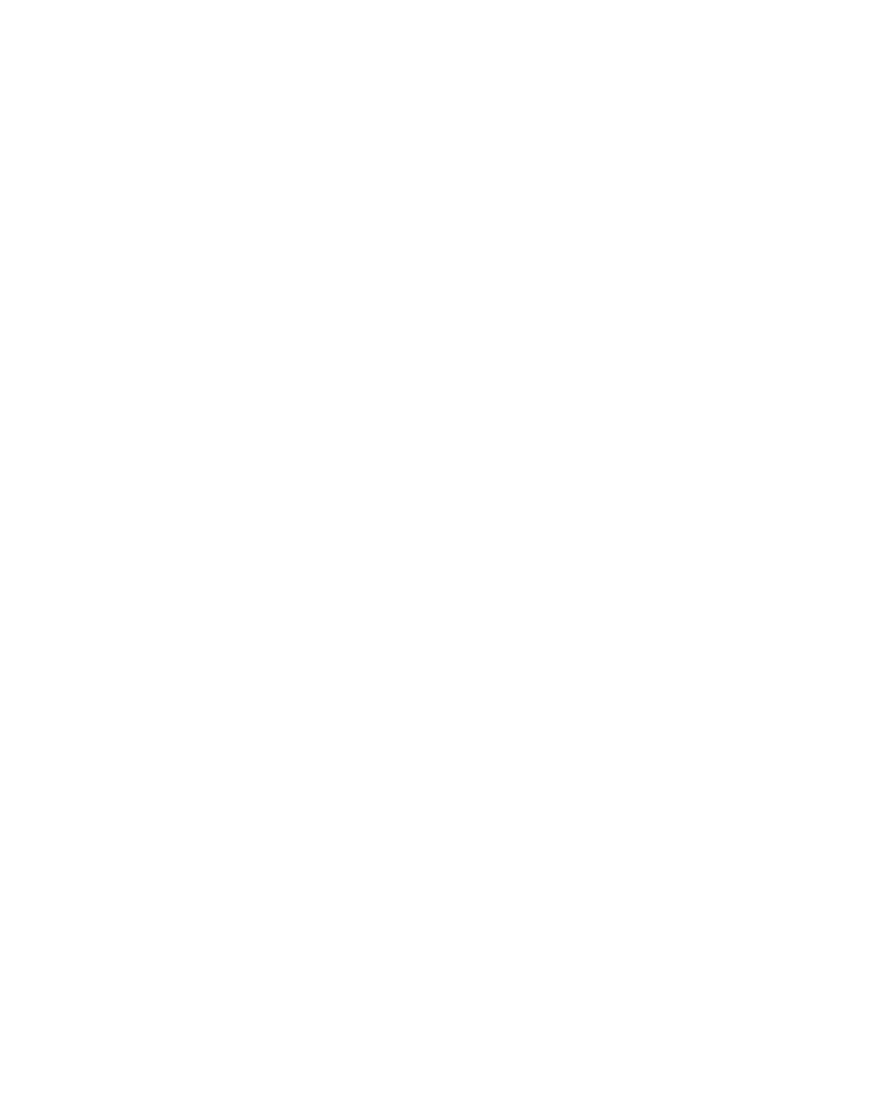
NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>



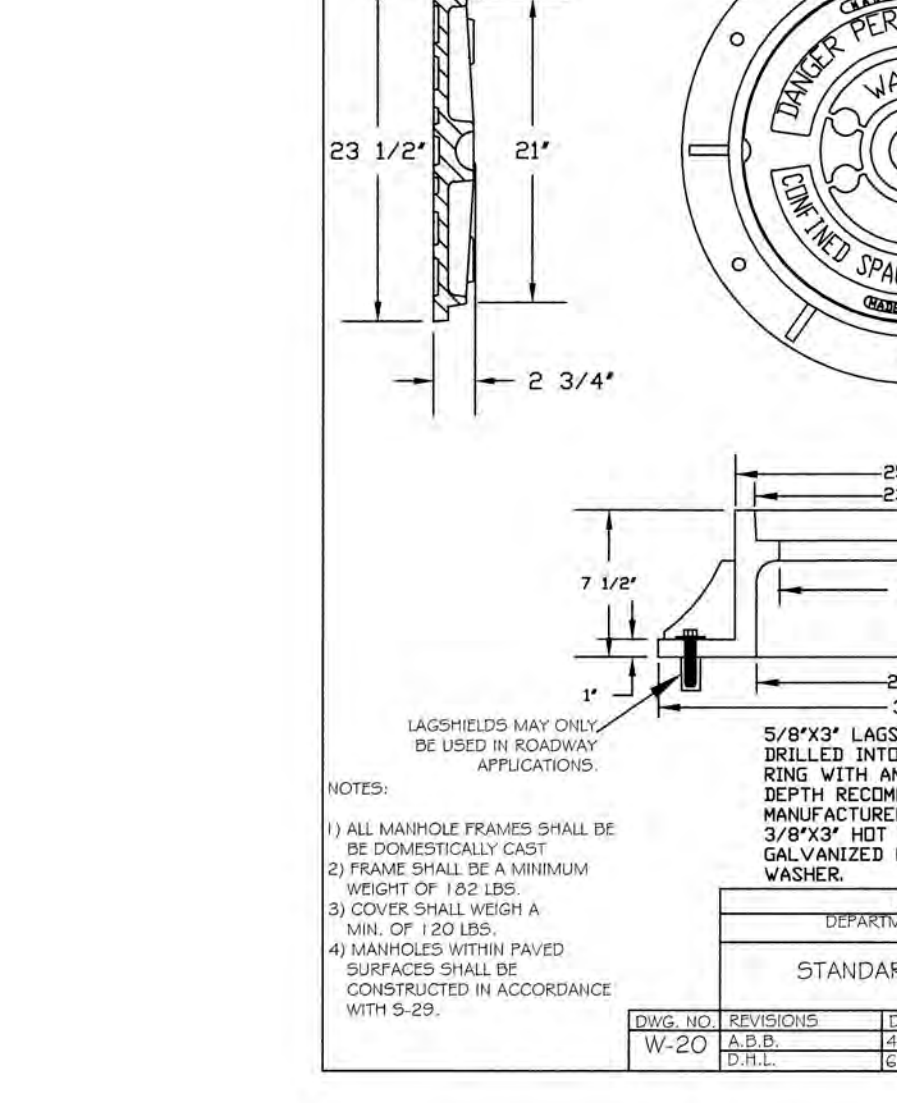
NOTES:
 1. WATER LETTERING MUST BE 1\"/>



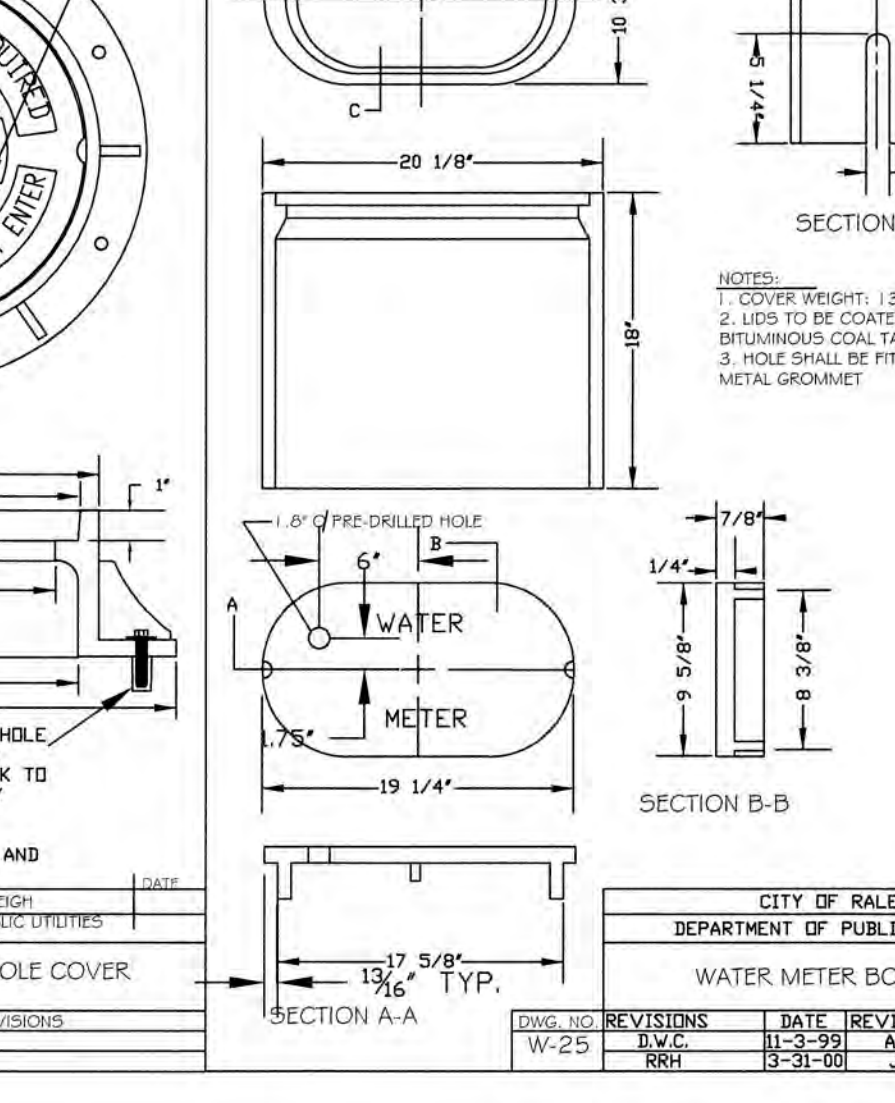
NOTES:
 1. ALL MANHOLE FRAMES SHALL BE COMMERCIALLY CAST
 2. FRAME SHALL BE A MINIMUM WEIGHT OF 162 LBS
 3. COVER SHALL WEIGH A MIN. OF 130 LBS
 4. MANHOLES WITH PAVED SURFACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH S-29.



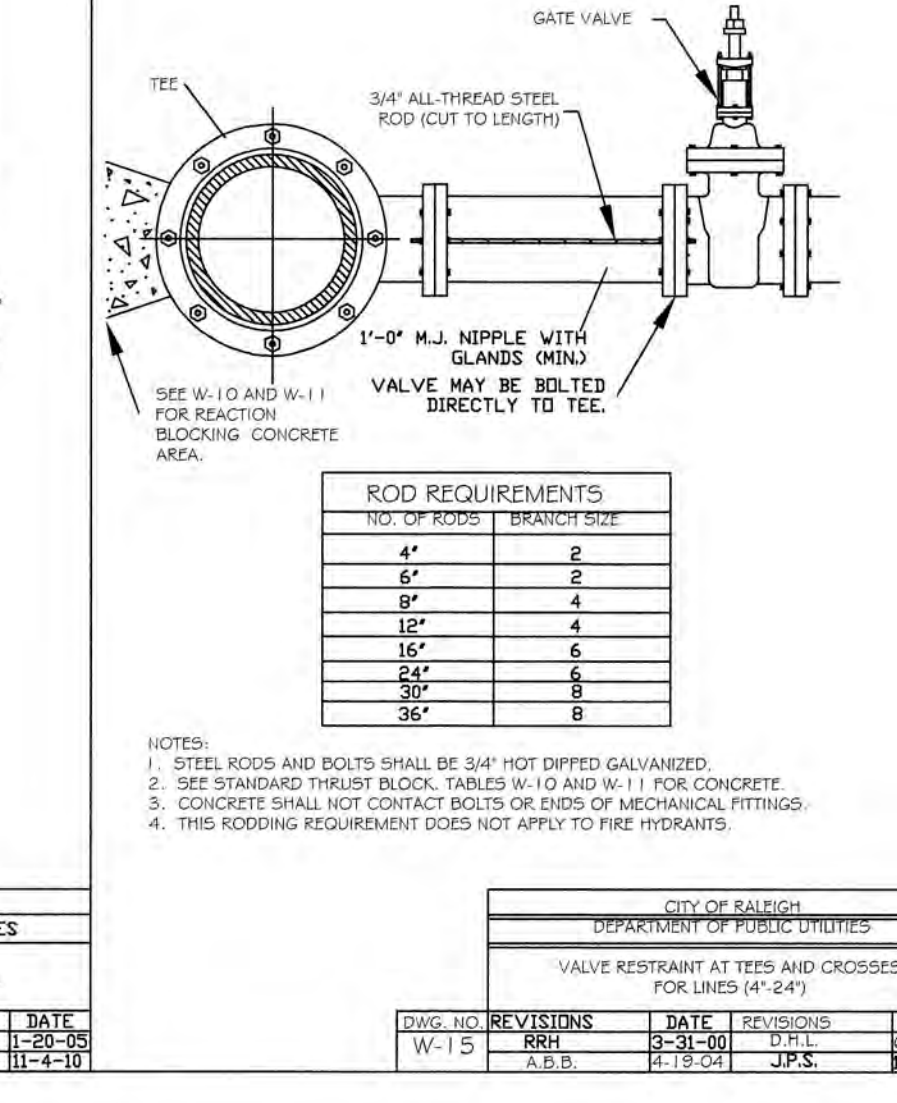
NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>



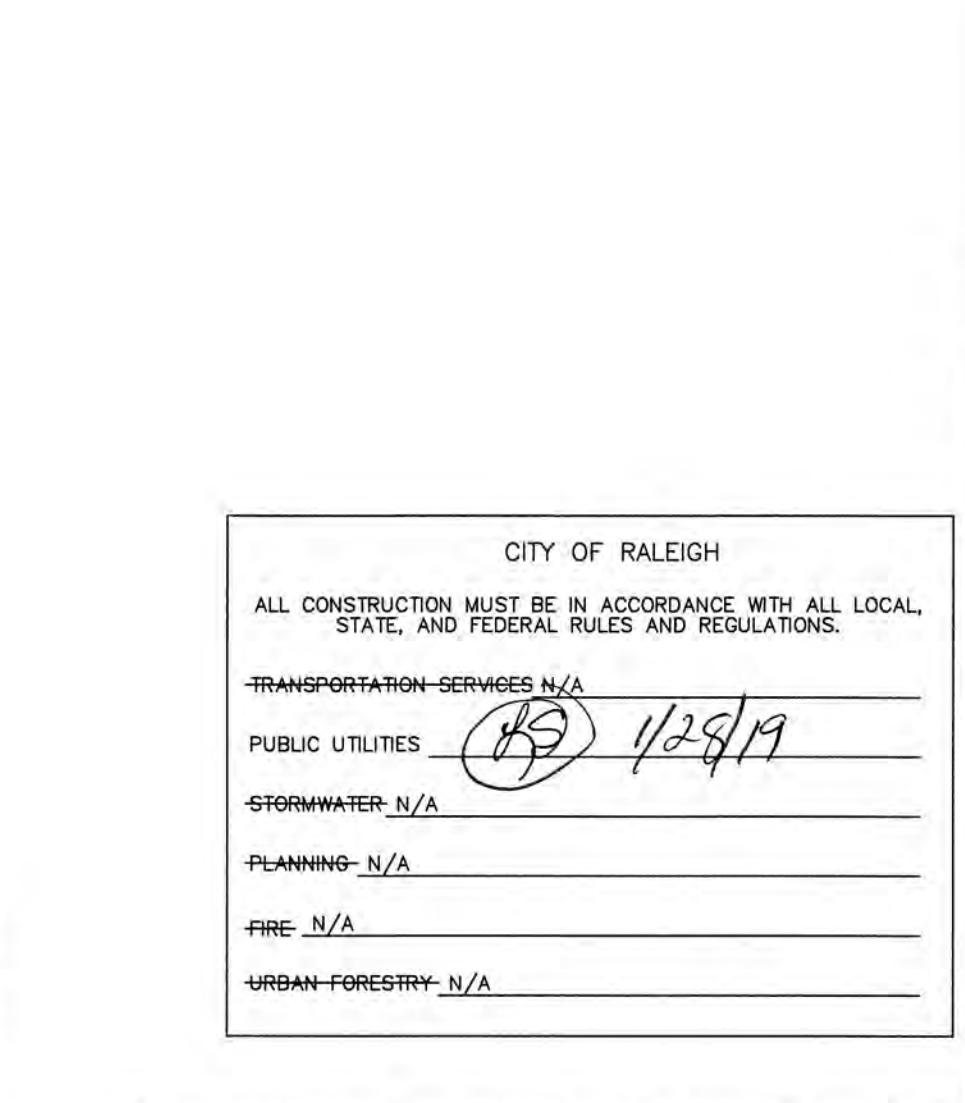
NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>



NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>

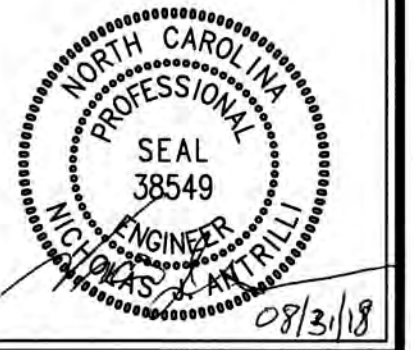


NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>

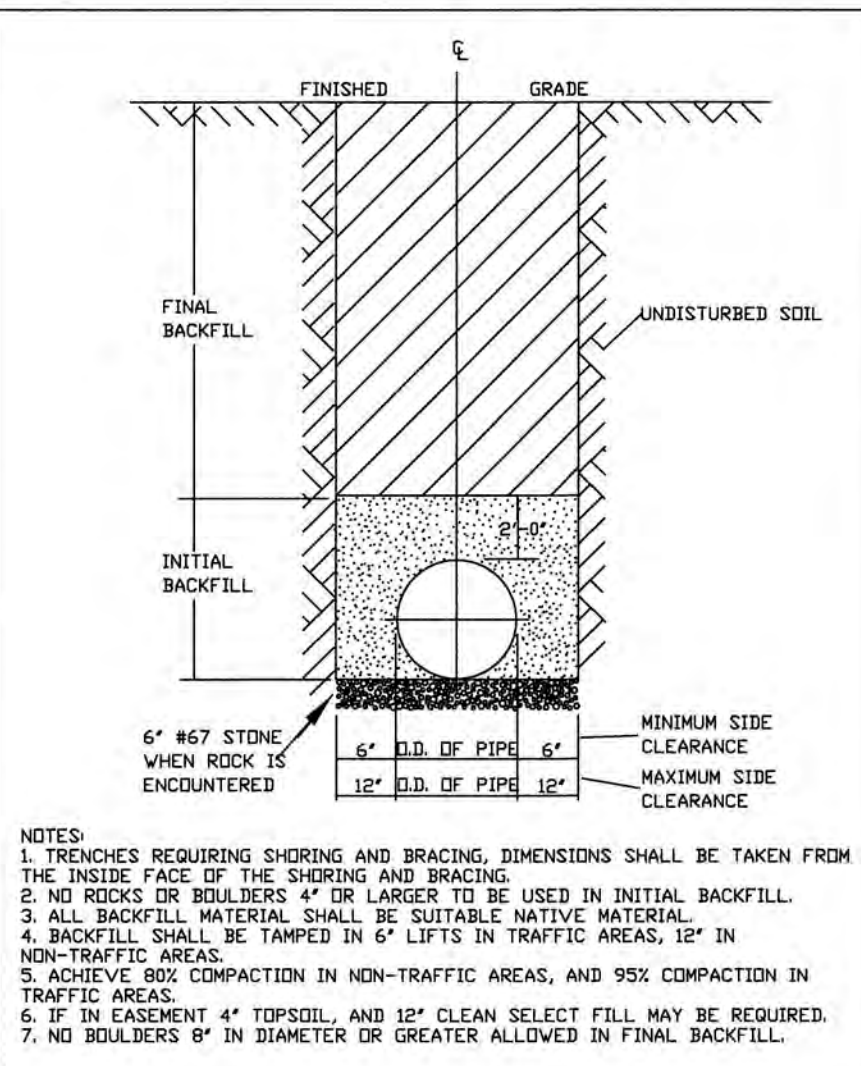


NOTES:
 1. STEEL RODS AND BOLTS SHALL BE 3/4\"/>

Job No. 02090251.6 Drawn By W6R
Date 06/08/2018 Designer W6R

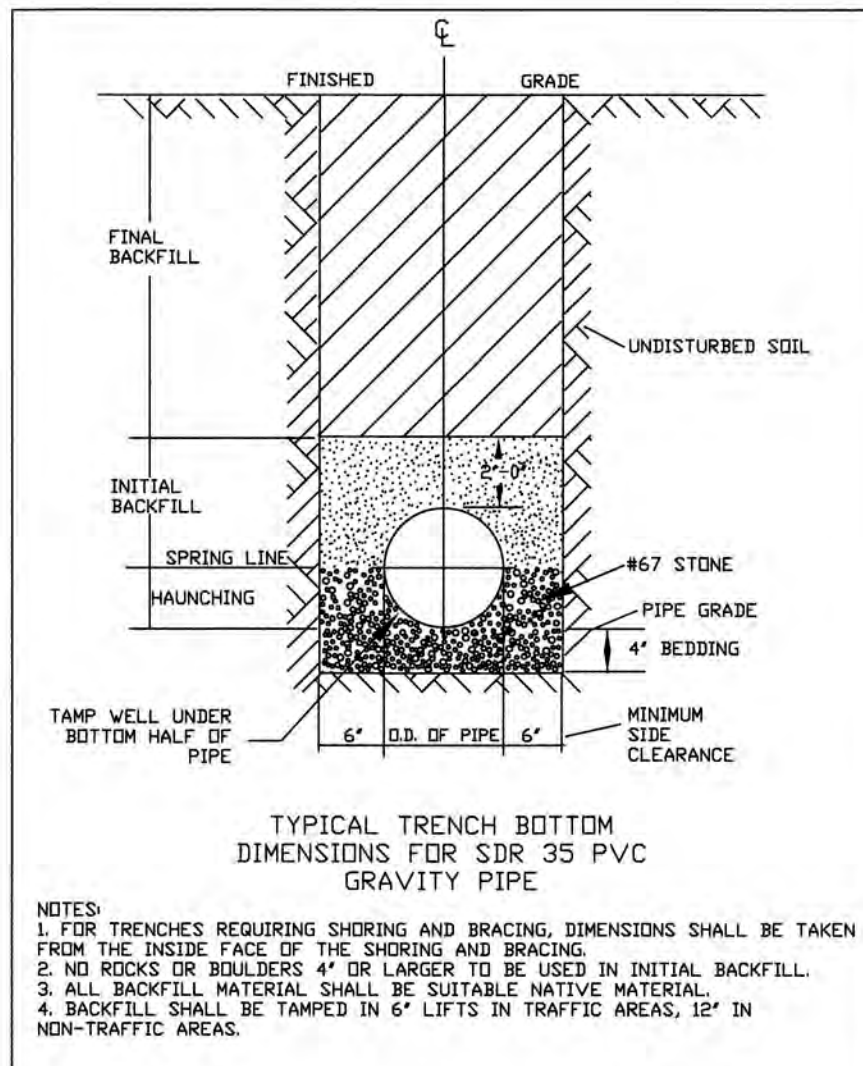


Revisions
1 1st TOK Comments 08/31/18



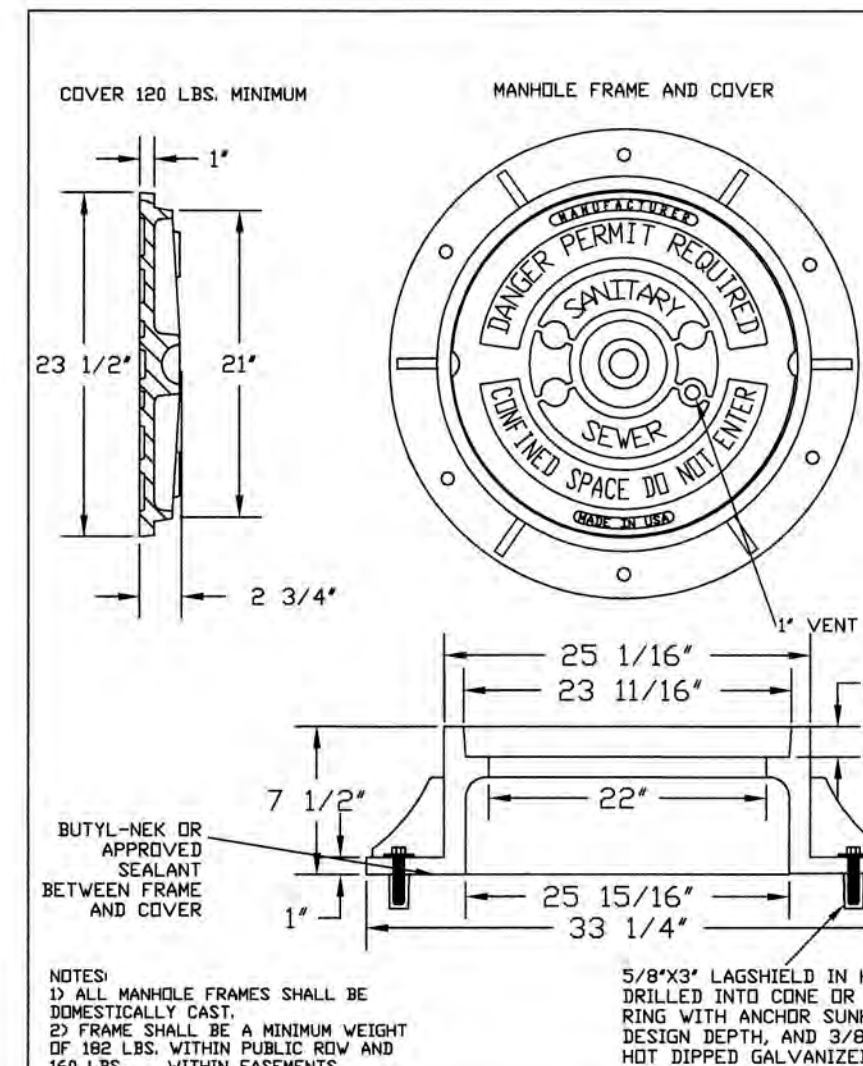
TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

DATE	REVISIONS
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3-25-05	1.1
3-25-05	1.2



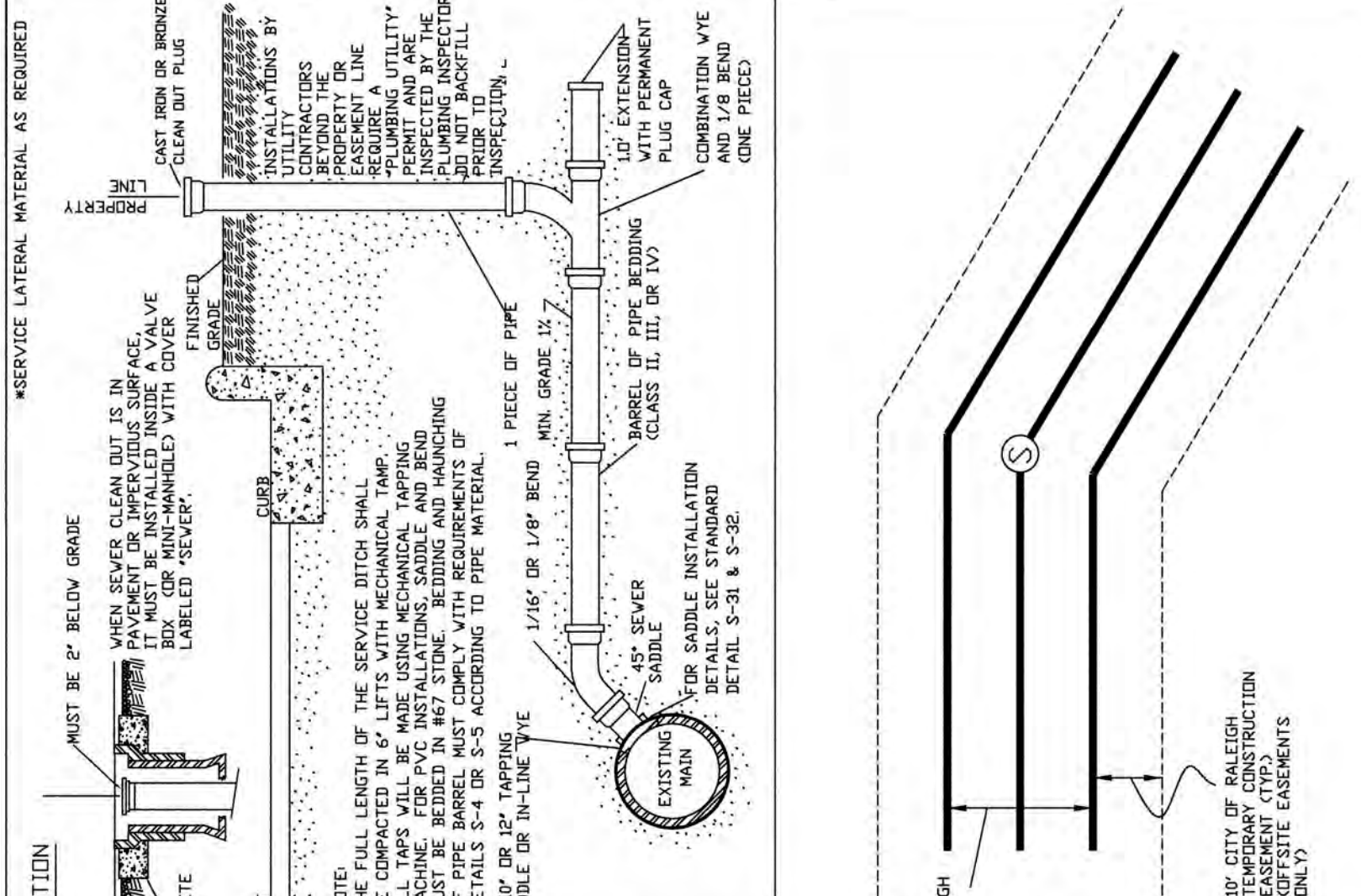
TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

DATE	REVISIONS
8-20-04	1.0 INITIAL
3-25-05	1.1
3-25-05	1.2



STANDARD MANHOLE COVER

DATE	REVISIONS
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3-25-05	1.1
3-25-05	1.2



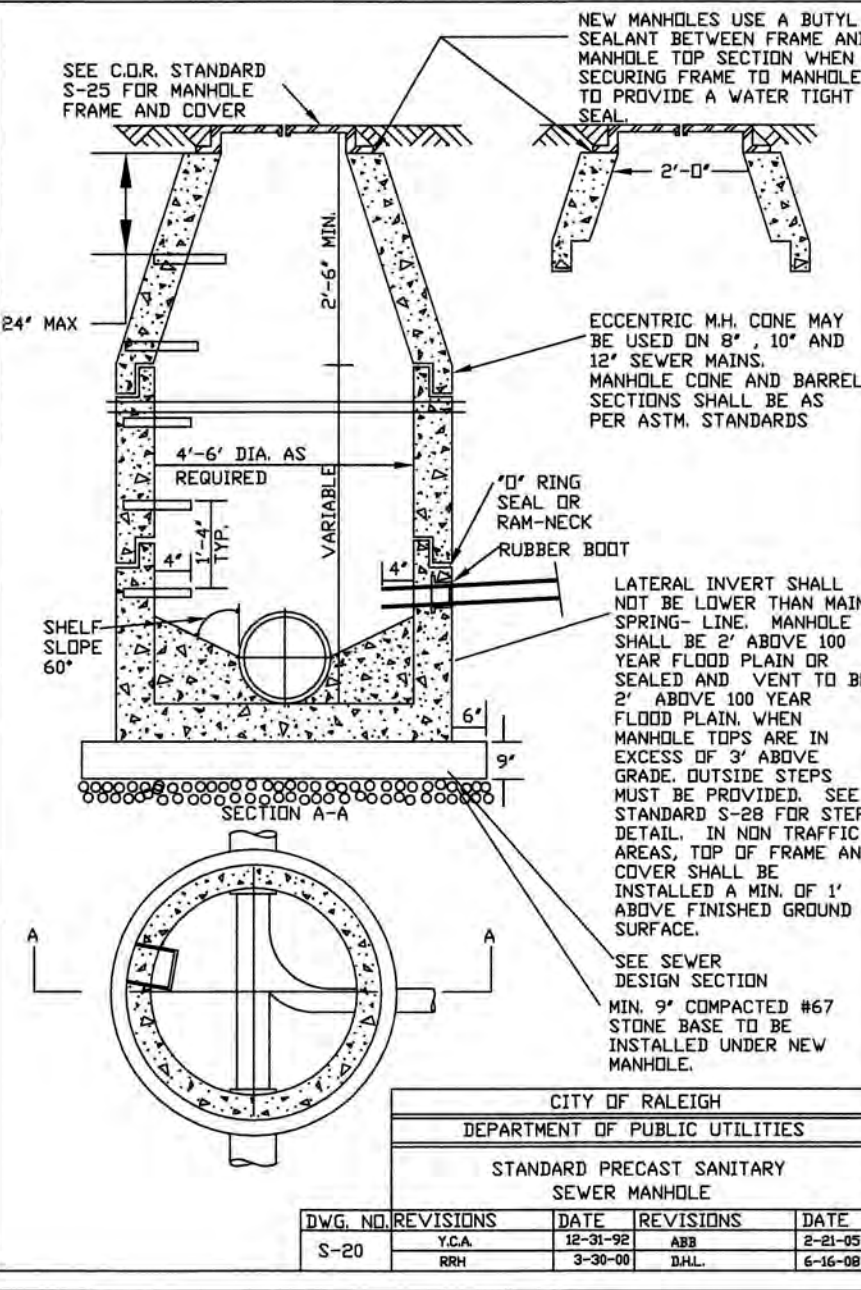
TYPICAL SANITARY SEWER LATERAL CONNECTION

DATE	REVISIONS
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3-25-05	1.2



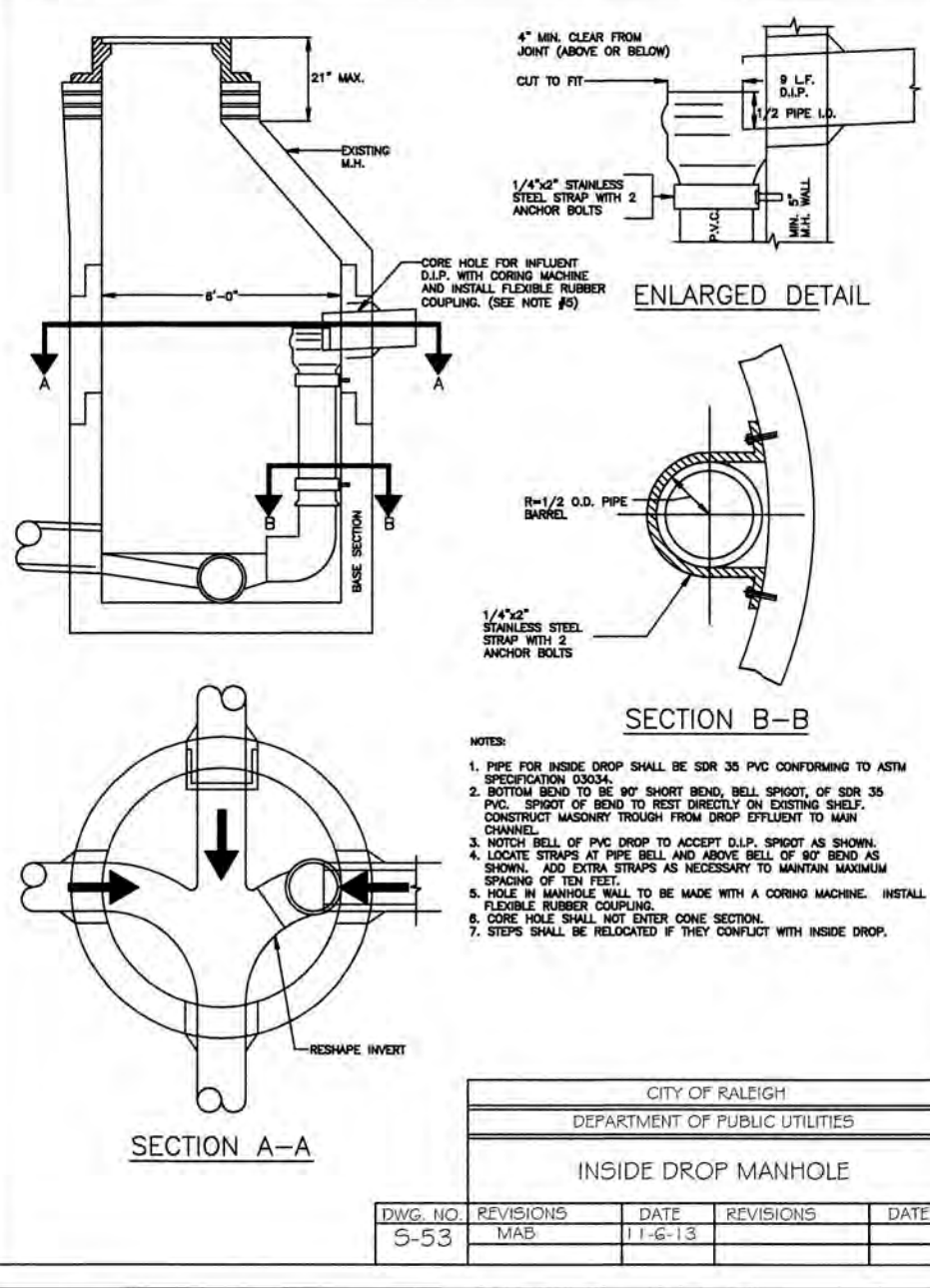
8" & 10" SANITARY SEWER EASEMENT WIDTHS

DATE	REVISIONS
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3-25-05	1.2



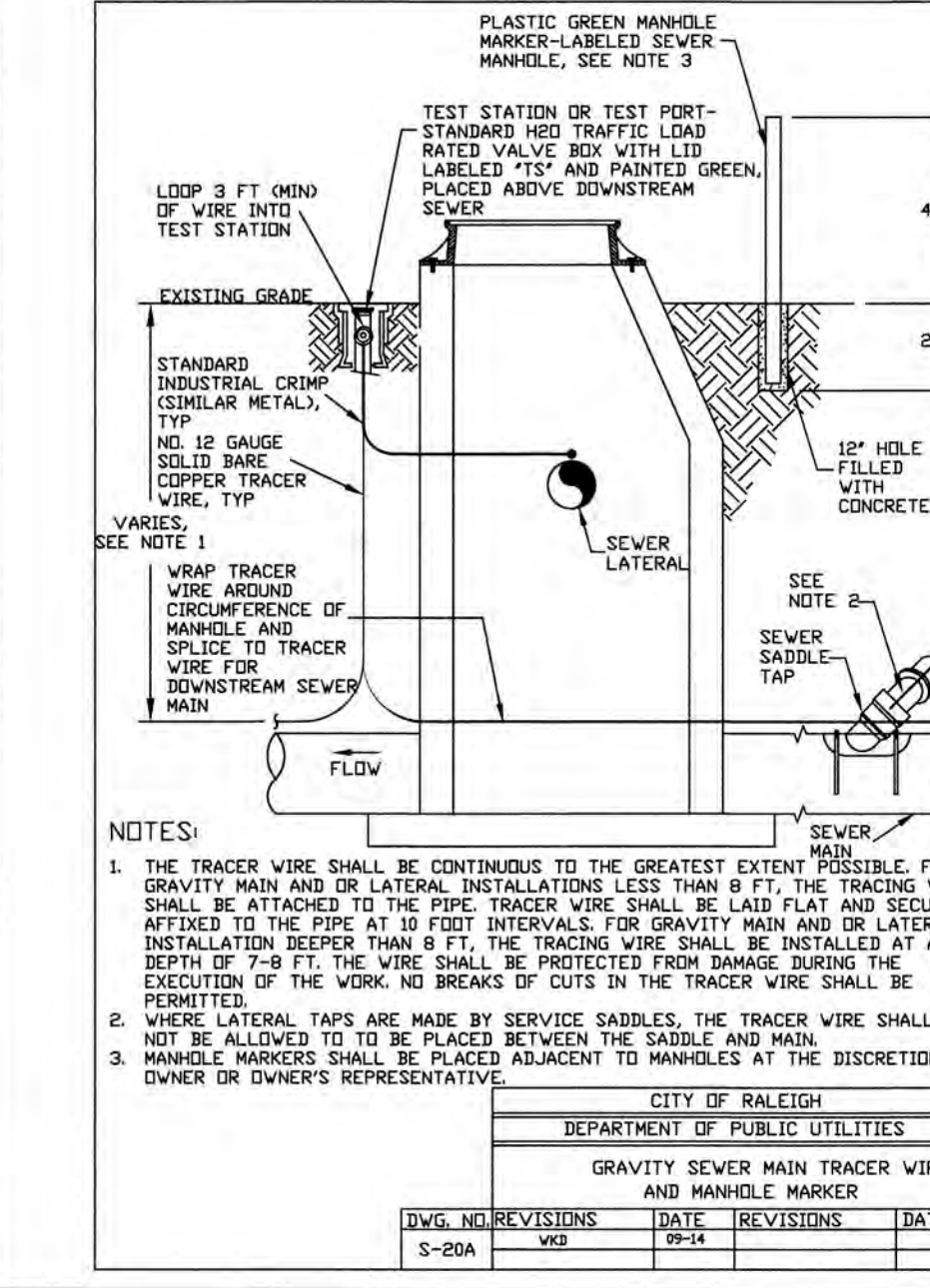
STANDARD PRECAST SANITARY SEWER MANHOLE

DATE	REVISIONS
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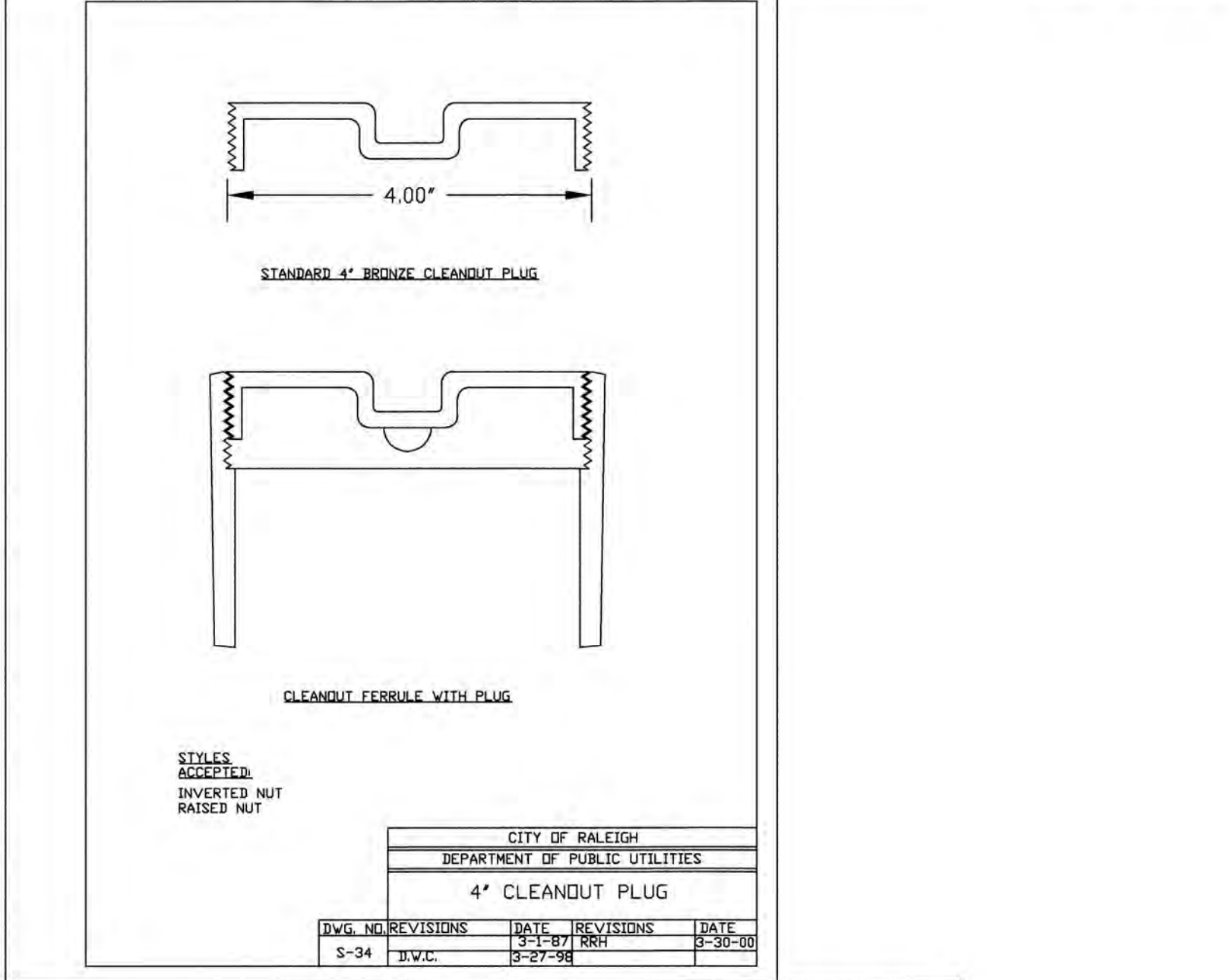
INSIDE DROP MANHOLE

DATE	REVISIONS
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3-25-05	1.2



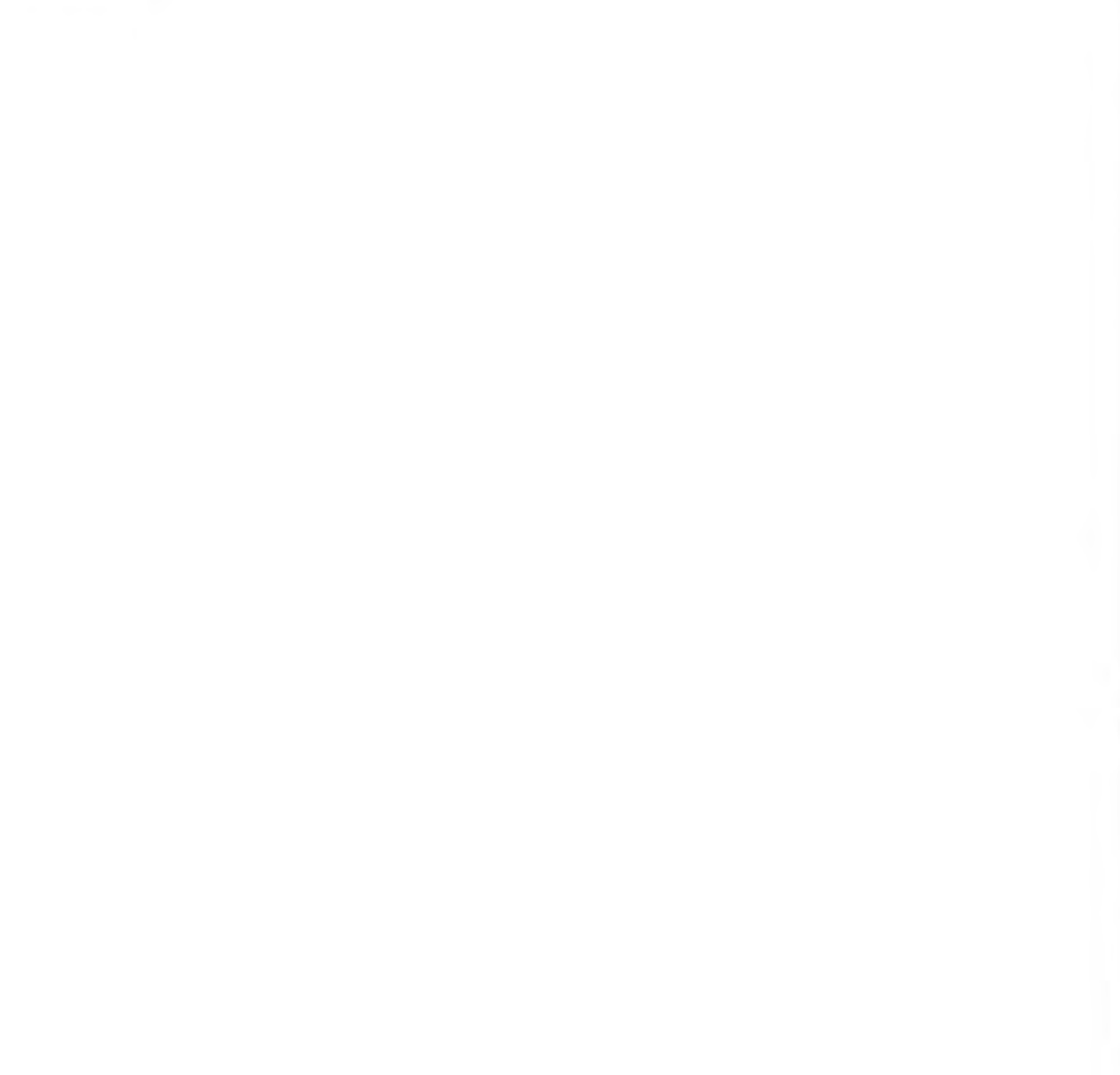
GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER

DATE	REVISIONS
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3-25-05	1.2



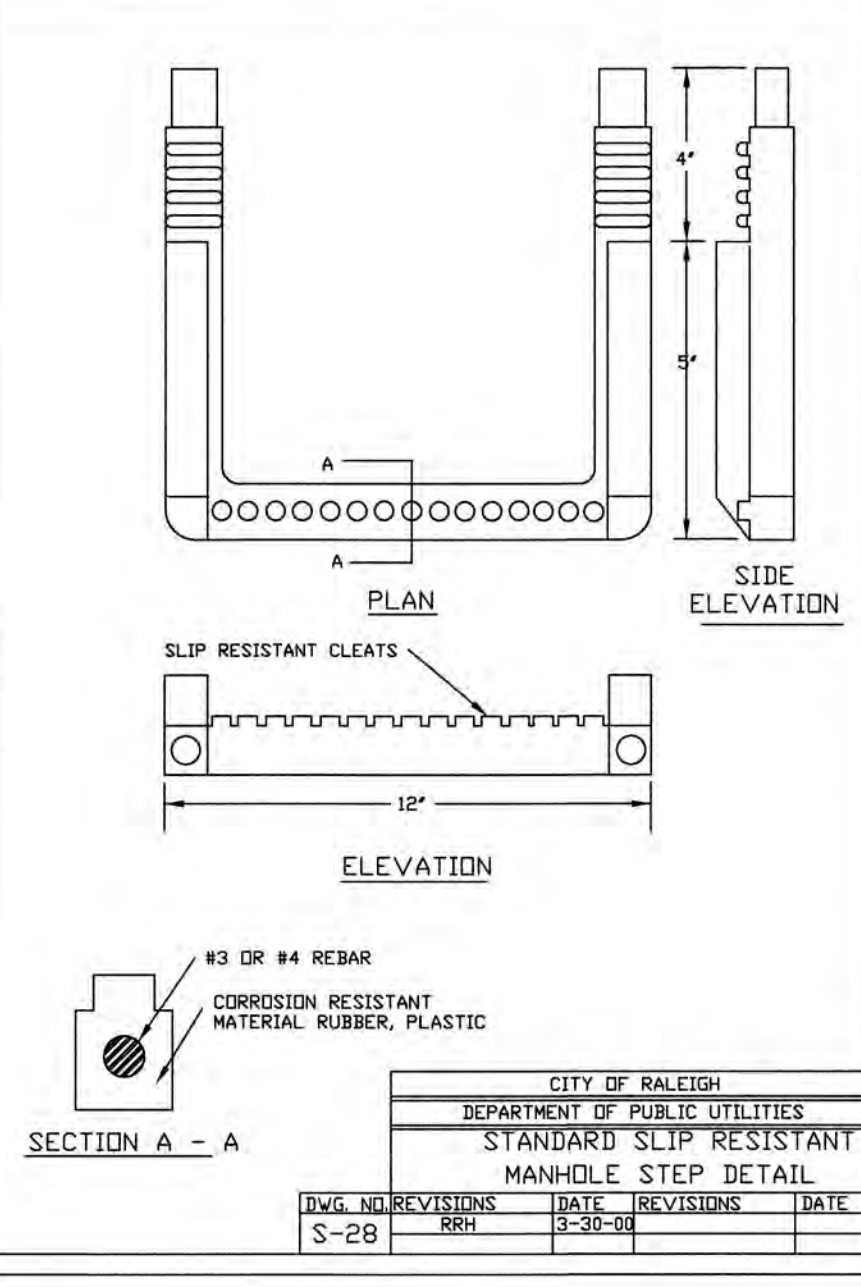
4" CLEANOUT PLUG

DATE	REVISIONS
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3-25-05	1.2



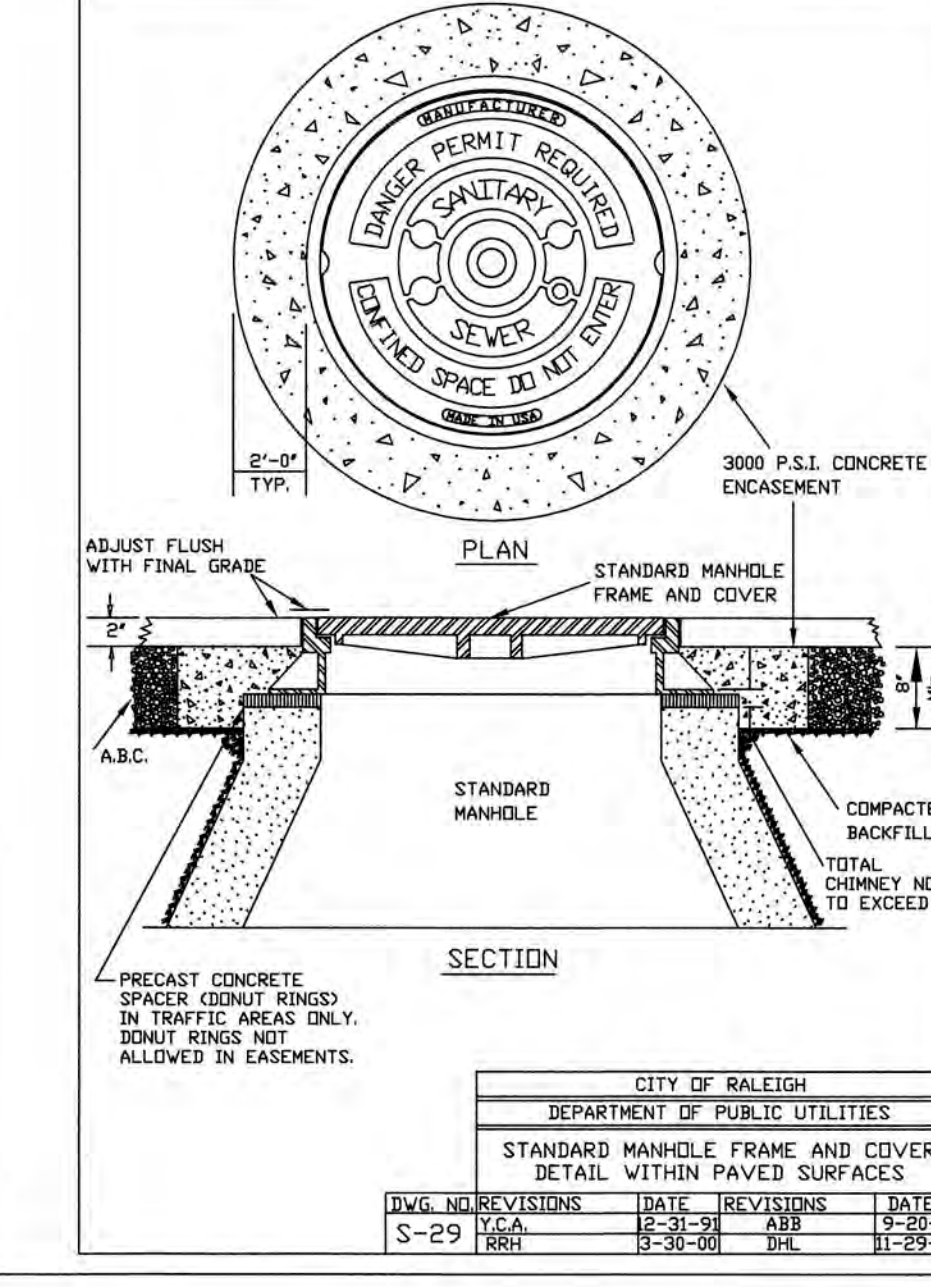
CLEANOUT FERRULE WITH PLUG

DATE	REVISIONS
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3-25-05	1.2



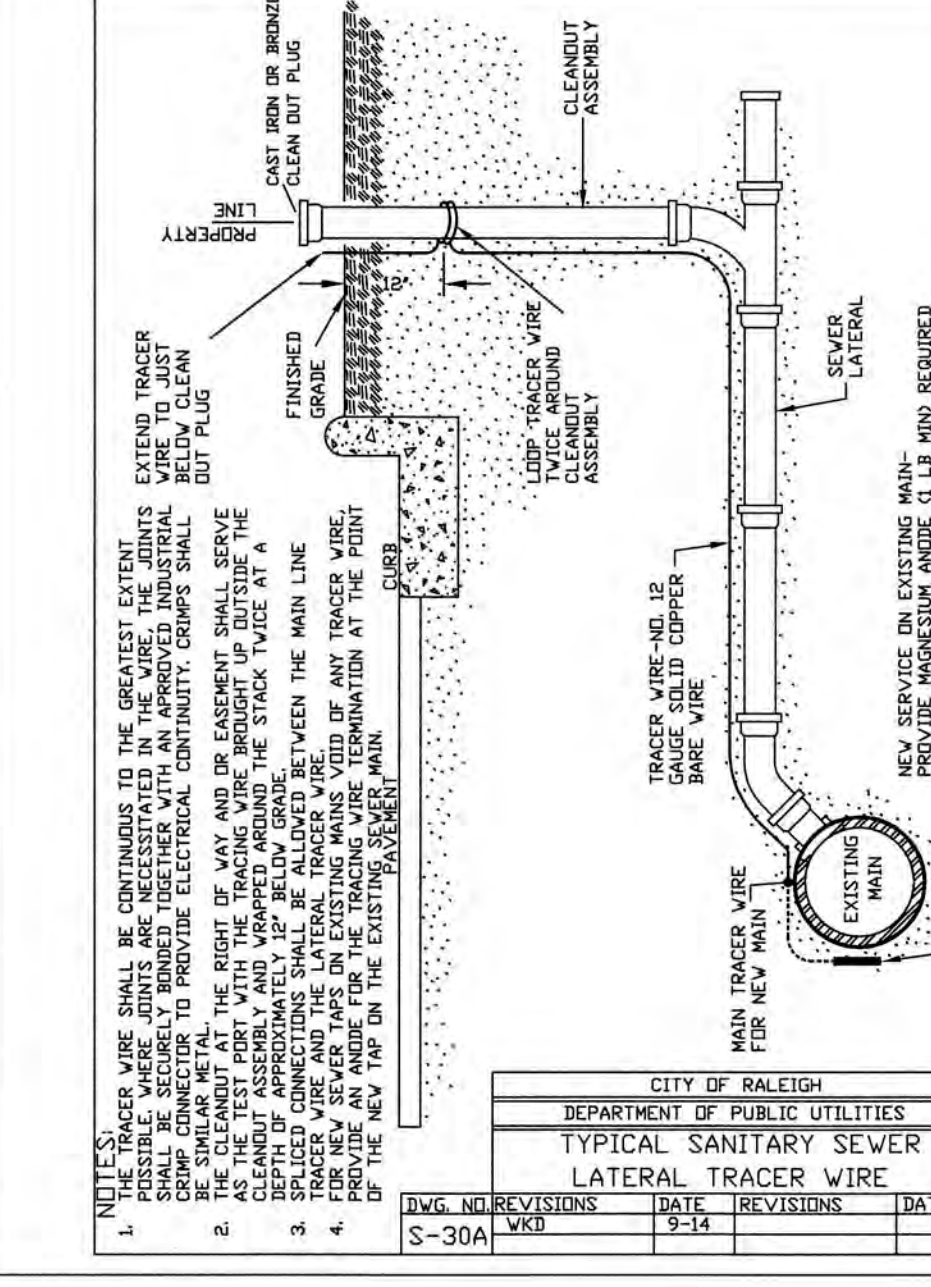
STANDARD SLIP RESISTANT MANHOLE STEP DETAIL

DATE	REVISIONS
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3-25-05	1.2



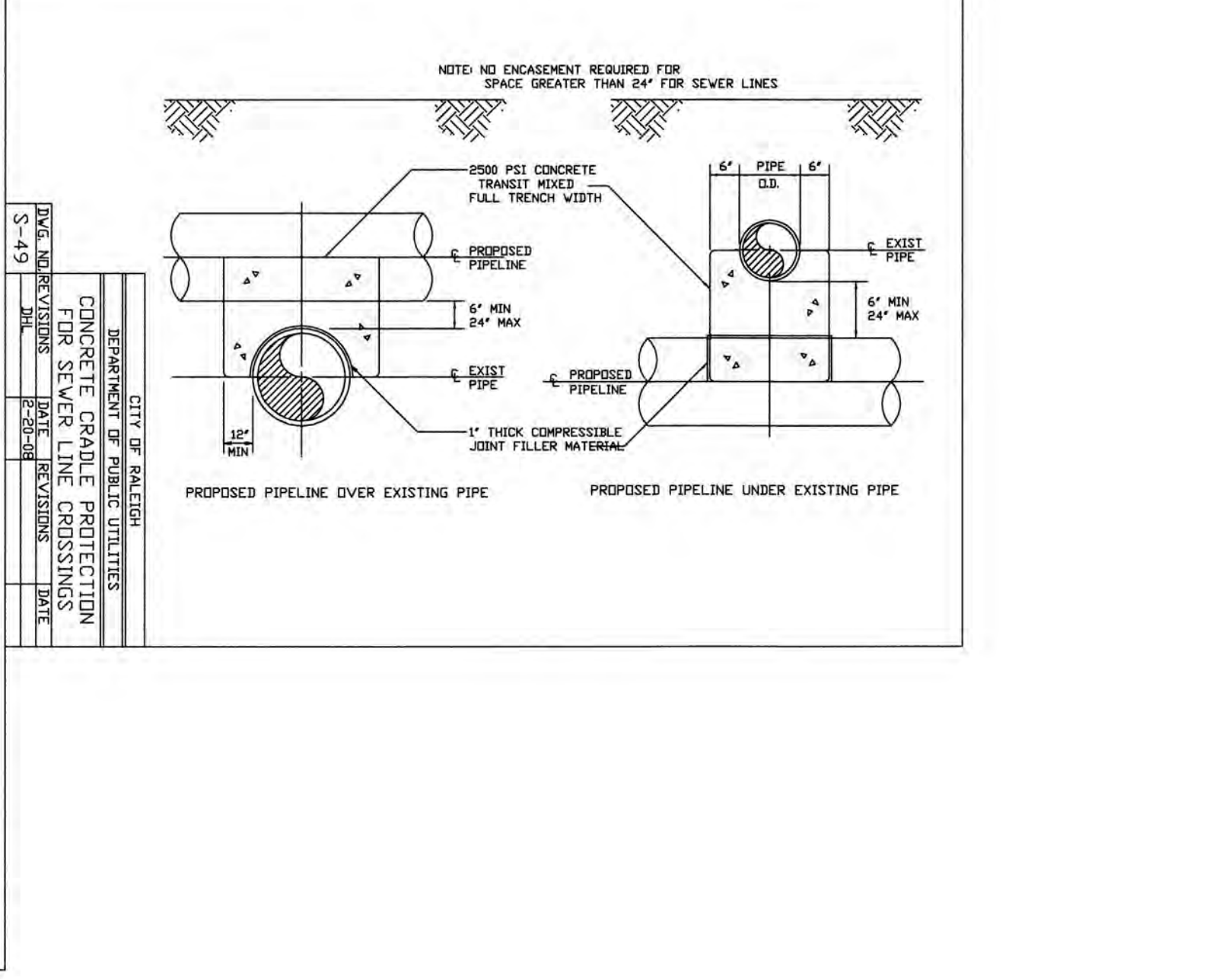
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES

DATE	REVISIONS
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3-25-05	1.2



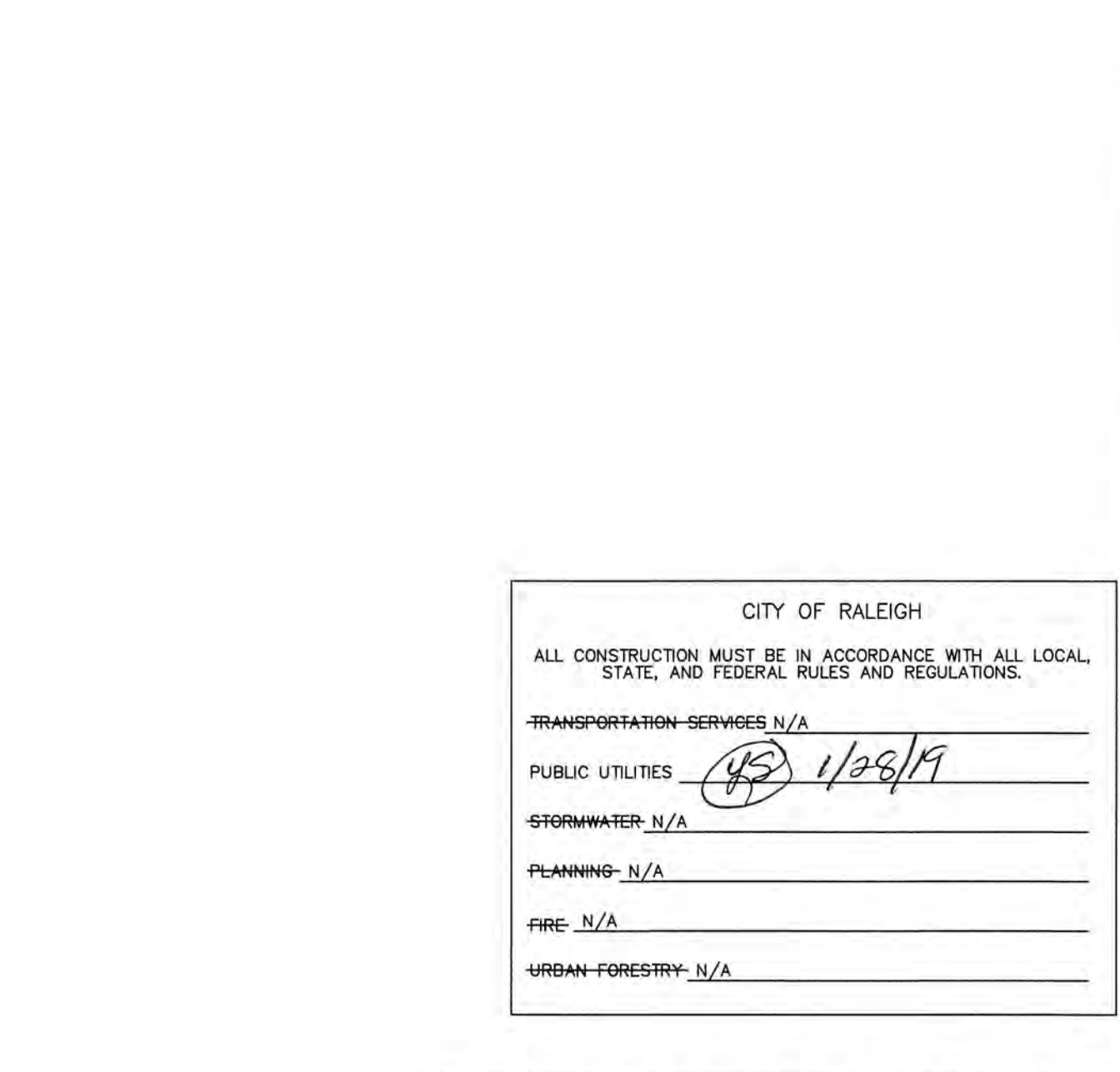
TYPICAL SANITARY SEWER LATERAL TRACER WIRE

DATE	REVISIONS
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3-25-05	1.1
3-25-05	1.2



CONCRETE GRADE PROTECTION

DATE	REVISIONS
8-20-04	1.0 INITIAL
3-25-05	1.1
3-25-05	1.2



TYPICAL SANITARY SEWER LATERAL CONNECTION

DATE	REVISIONS
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3-25-05	1.2

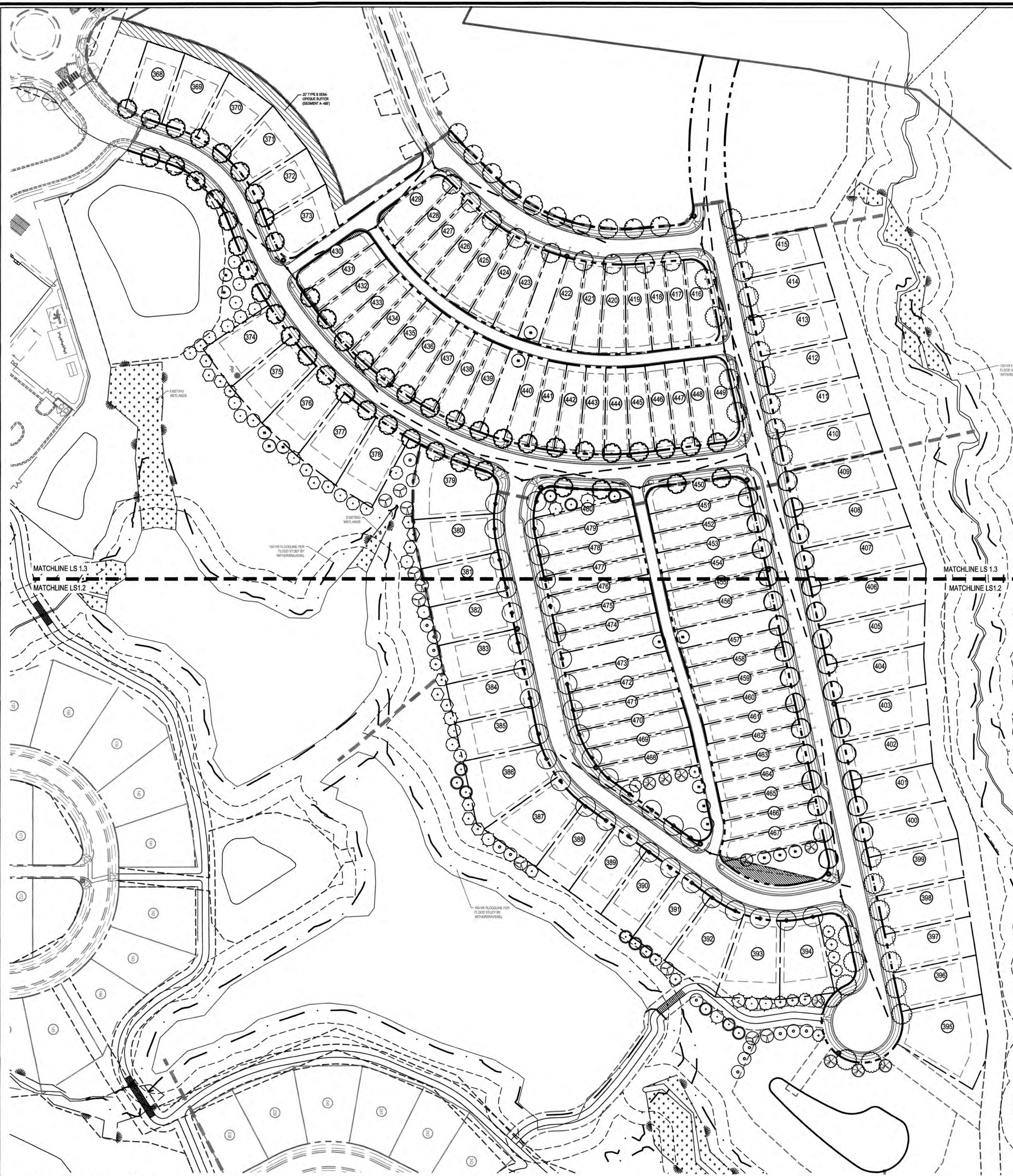
TOWN CERTIFICATION: THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

BY: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

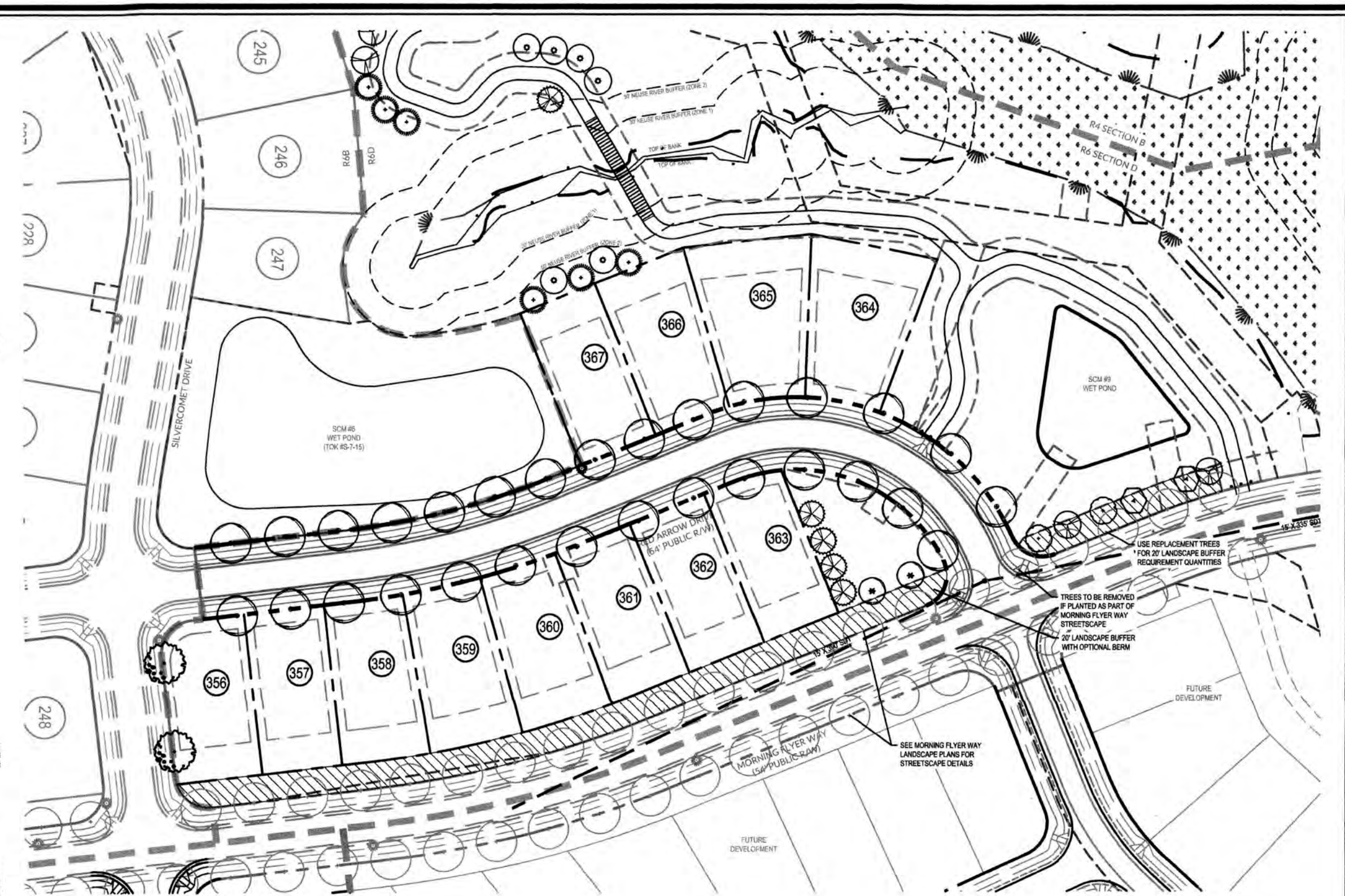
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: *[Signature]* DATE: 2-4-19
ADMINISTRATOR

K:\2018\02\02090251.6-Knightdale Station Sewer Construction Drawings\1.1-1.5 Details.dwg, Thursday, August 30, 2018 1:58:51 PM, DURITA COLLEEN



PHASE R4 : OVERALL LANDSCAPE PLAN



PHASE R6-D : OVERALL LANDSCAPE PLAN

R:\2018\0220\0225 - Agriculture - Public Works\WATER CONSTRUCTION\DRAWINGS\LS-1 LANDSCAPE PLAN.dwg, Plot Date: August 31, 2018 11:52:52 AM - NANCYAL BARNER

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.

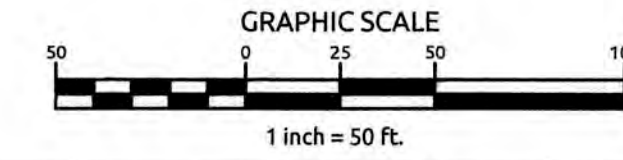
BY: *[Signature]* DATE: 2-31-2018
DEVELOPMENT SERVICES ENGINEER

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

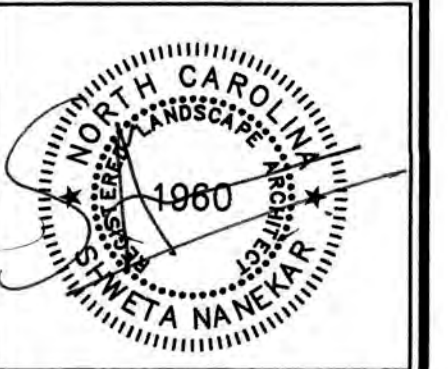
BY: *[Signature]* DATE: 2-9-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM	
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.	
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #	
AUTHORIZATION TO CONSTRUCT	
DATE	
PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM	
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.	
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #	
AUTHORIZATION TO CONSTRUCT	
DATE	

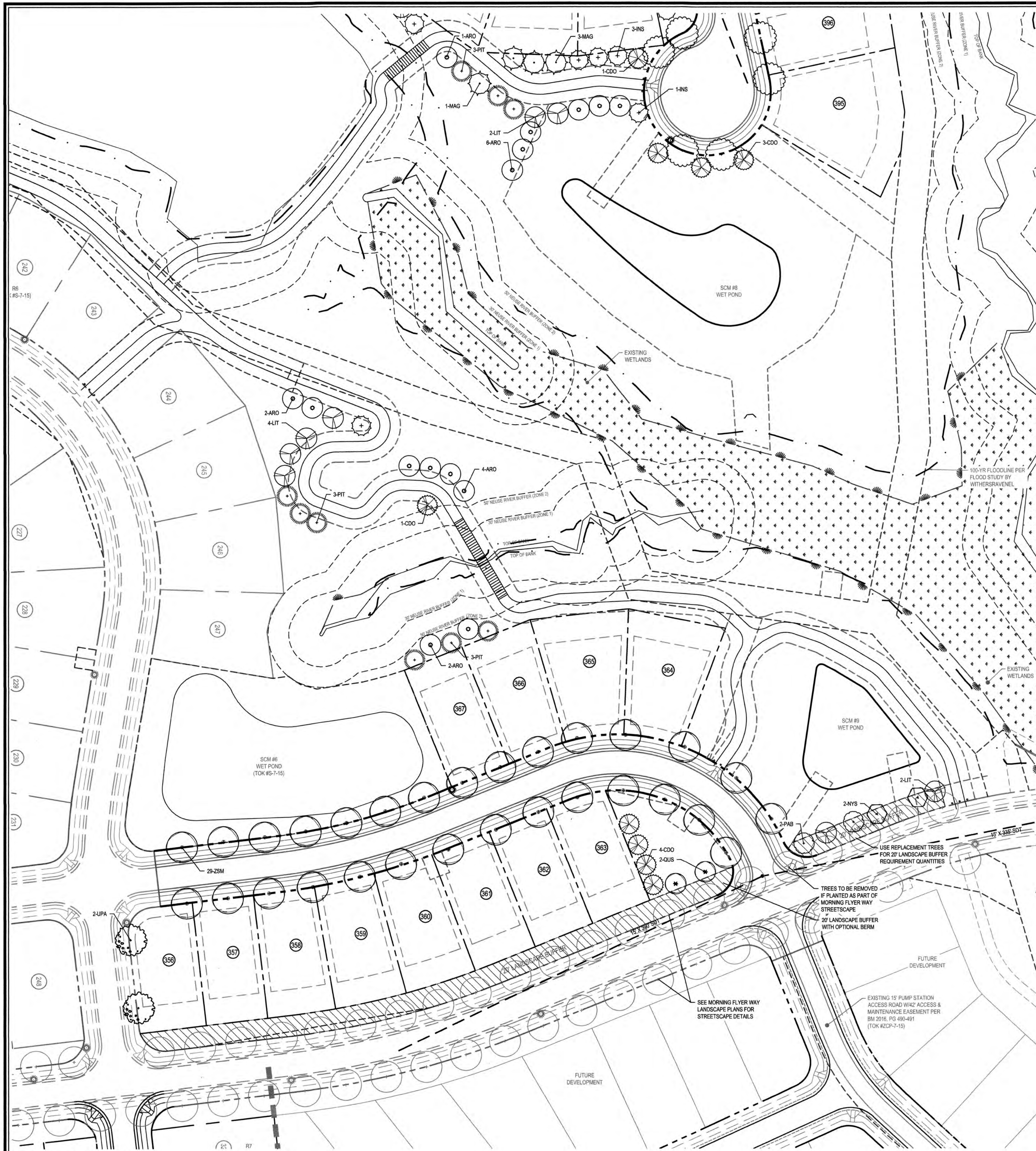
ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



Job No.	02090251.6	Drawn By	W&R
Date	06/08/2018	Designer	W&R



Revisions	
1	1st TOK Comments 08/31/18



PHASE R6-D OVERALL LANDSCAPE PLAN

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

BY: *[Signature]* DATE: 2-21-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 2-9-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

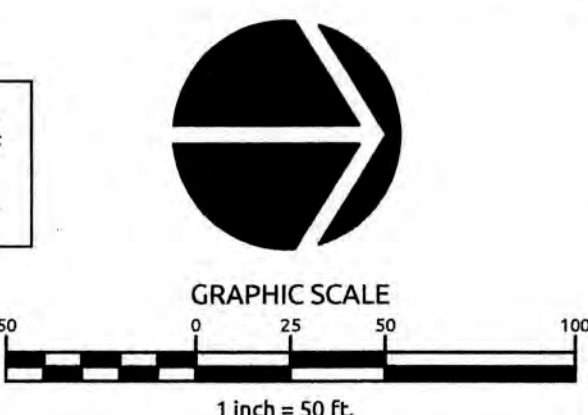
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT _____
DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT _____
DATE _____

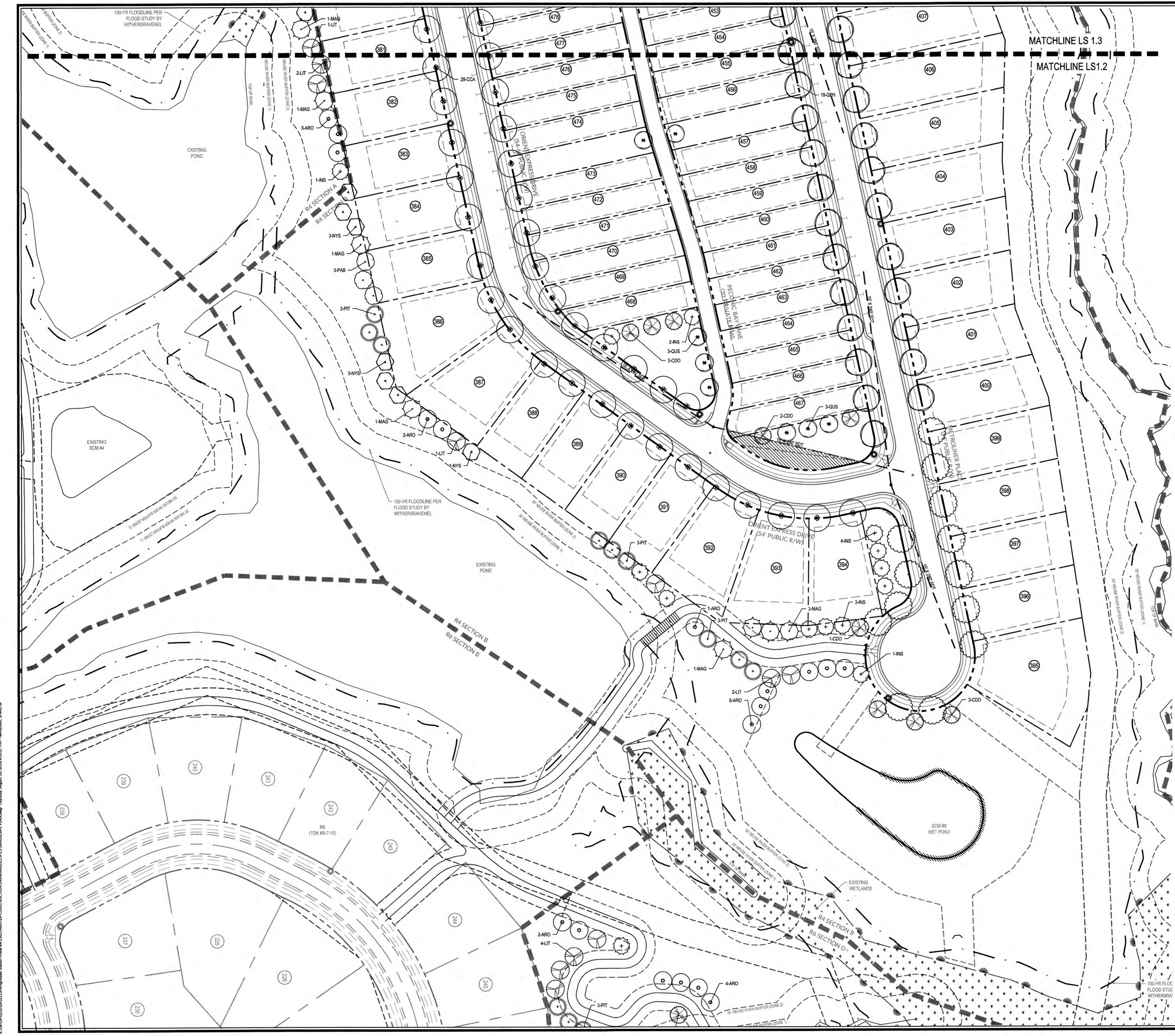
ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ALL CITY OF RALEIGH & TOWN OF KNIGHTDALE DESIGN STANDARDS, DETAILS, AND SPECIFICATIONS.



Revisions

1	1st TOK Comments	08/31/18
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R:\WORK\022018\022018-1-Knightdale Station-Phase R6-D\Master Construction Drawings\LD-1-Landscape Plan - revised.dwg - Friday, August 31, 2018 11:20:00 AM - NAME:RAE, SHWETA



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: *S. Smith* DATE: 2-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *M. Smith* DATE: 2-9-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT _____
DATE _____

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

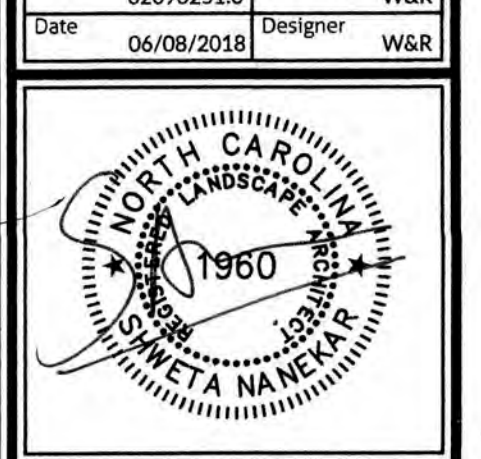
THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH
PUBLIC UTILITIES DEPARTMENT PERMIT # _____
AUTHORIZATION TO CONSTRUCT _____
DATE _____

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

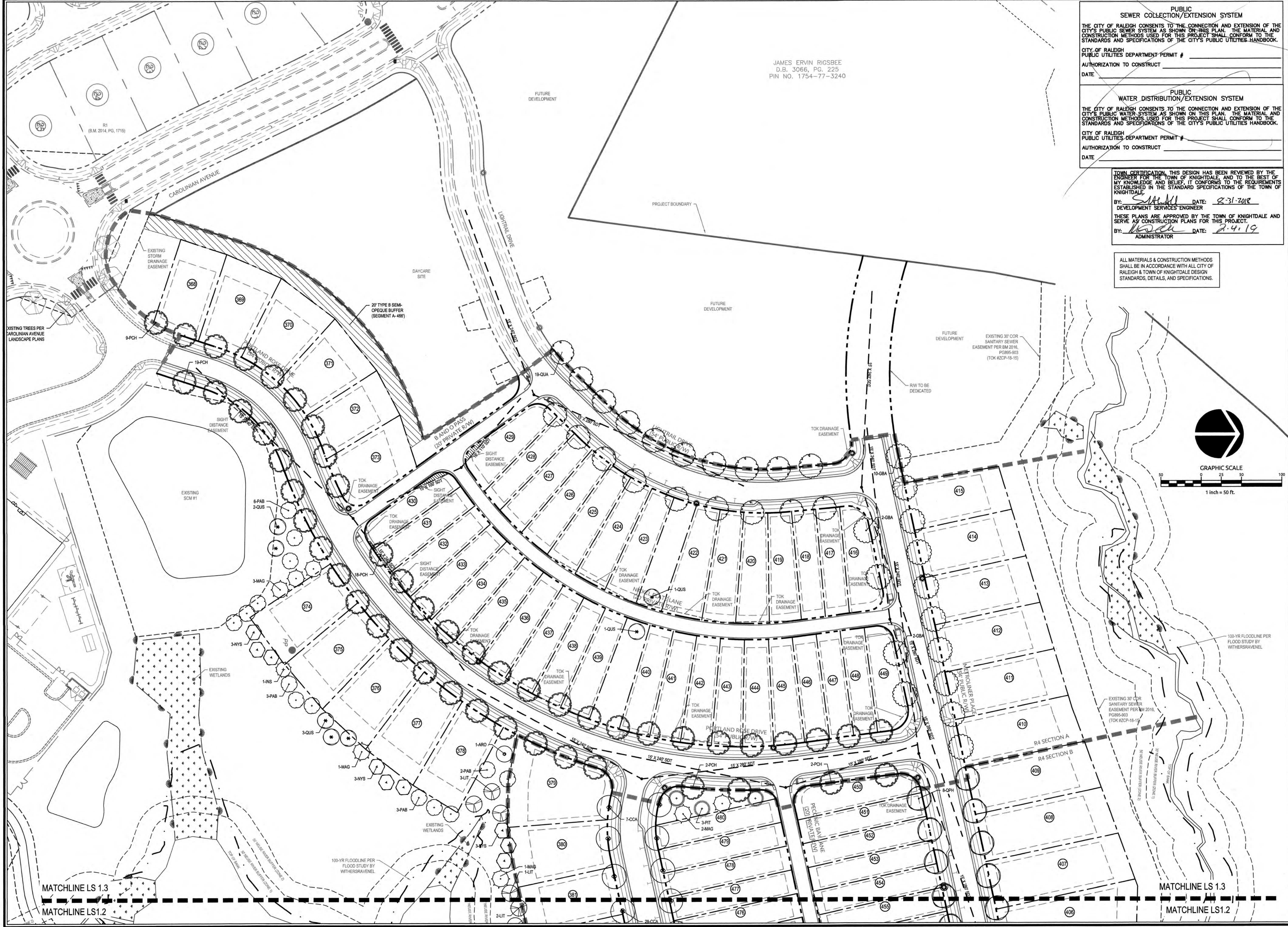
GRAPHIC SCALE
1 inch = 50 feet

Sheet No.
L1.2



Revisions	
1	1st TOK Comments 08/31/18

K:\09\02092518\Knightdale Station R6D\MASTER CONSTRUCTION DRAWINGS\11.01.13 LANDSCAPE PLAN.dwg, Thursday, August 30, 2018 4:02:27 PM - MANISARAL DWYETA



WithersRavenel
Engineers | Planners | Surveyors

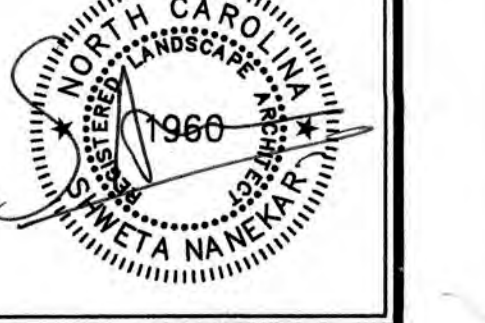
115 Maclean Drive | Cary, NC 27511 | 919.469.3340 | License #: C-0832 | www.withersravenel.com

KNIGHTDALE STATION
R6D AND R4

TOWN OF KNIGHTDALE, NORTH CAROLINA

LANDSCAPE PLAN

Job No. 02090251.6 Drawn By W&R
Date 06/08/2018 Designer W&R



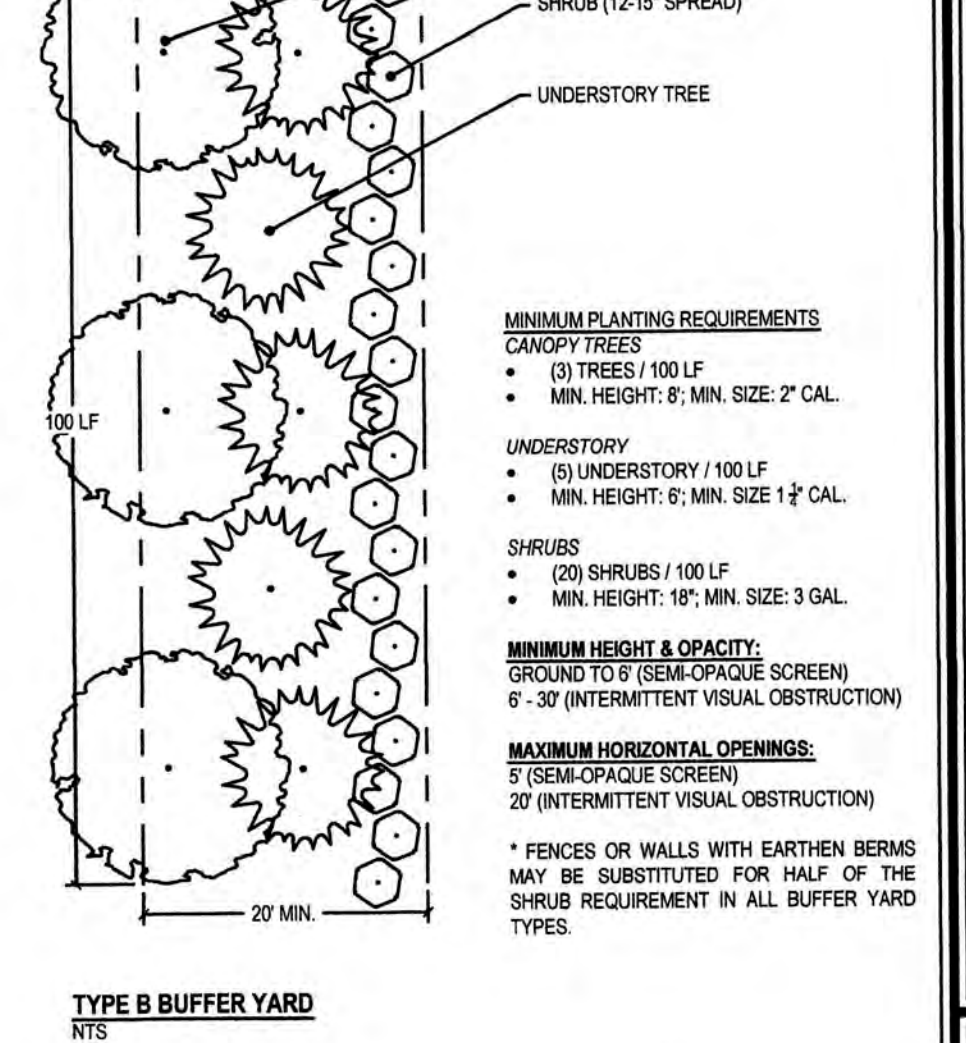
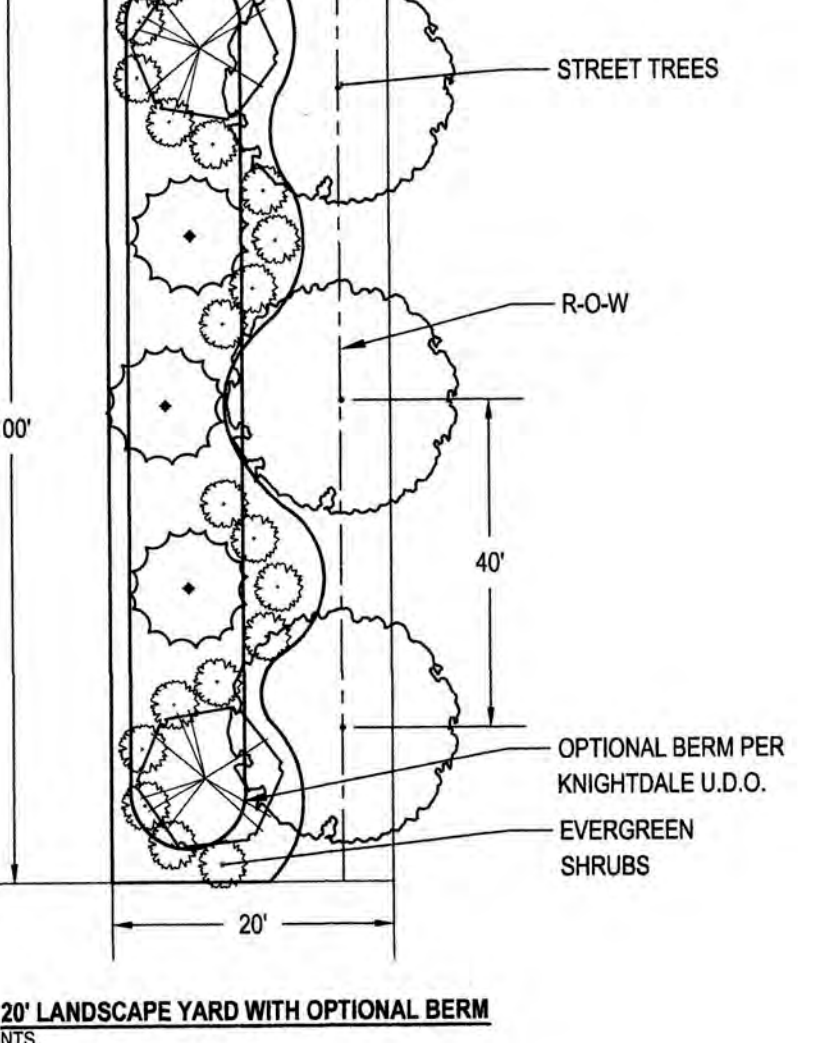
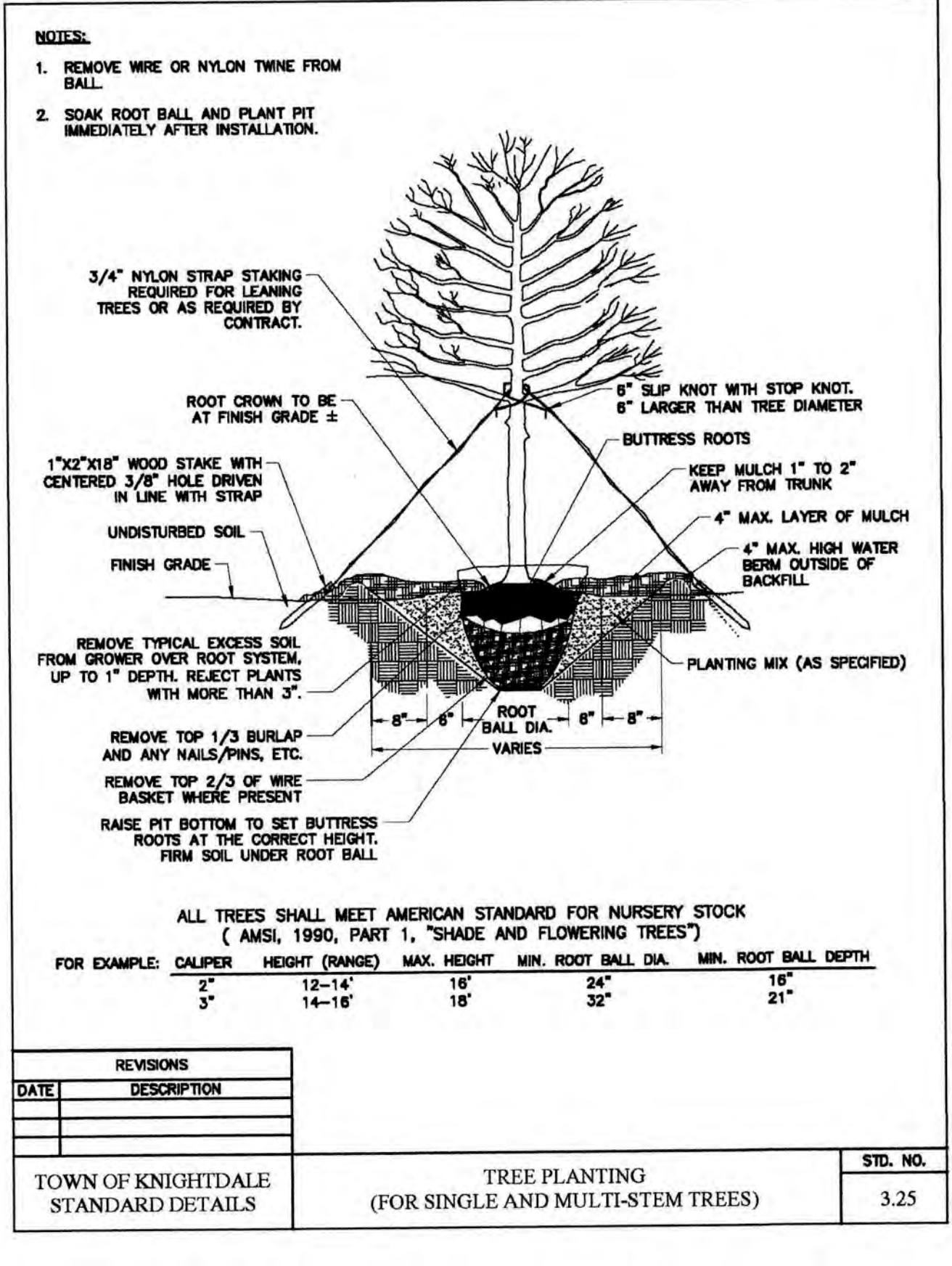
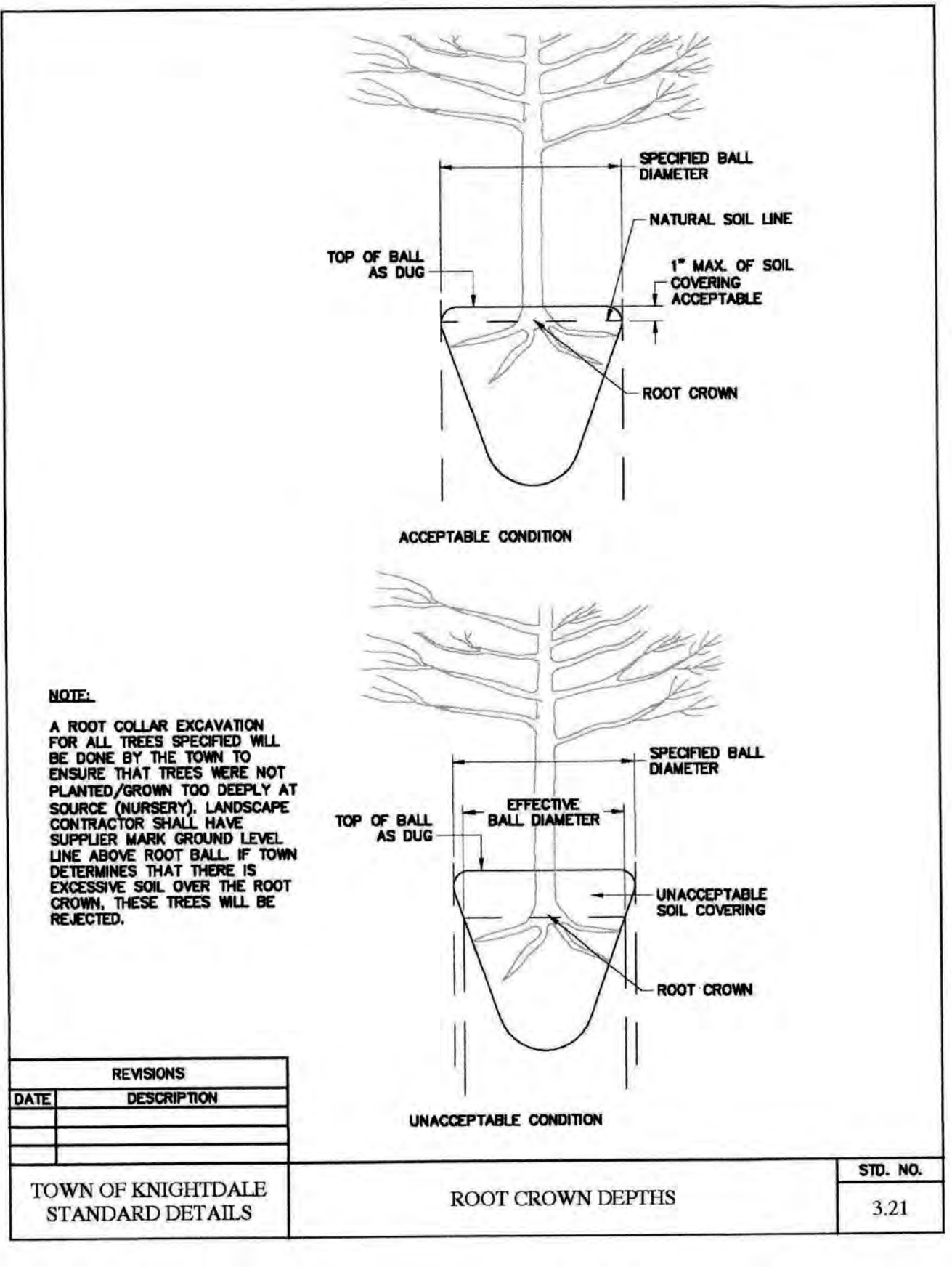
Revisions	
1	1st TOK Comments 08/31/18

Sheet No.
L1.3

R:\1709-02090251-0\17090251-0\17090251-0\LANDSCAPE PLAN\DWG\LANDSCAPE PLAN.dwg, August 31, 2018 11:40:07 AM - NANCY B. SHAFER

GENERAL LANDSCAPE NOTES

- TREE PROTECTION FENCE SHALL SURROUND ALL EXISTING PLANTINGS AND EXISTING BUFFER AREAS WHERE APPLICABLE AND SHALL BE MAINTAINED UNTIL ALL SITE WORK IS COMPLETE. THE FENCE SHALL BE REMOVED PRIOR TO THE FINAL SITE INSPECTION FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- WHERE EXISTING OR PROPOSED VEGETATION FAILS TO FUNCTION ADEQUATELY AS REQUIRED, THE TOWN OF KNIGHTDALE SITE INSPECTOR RESERVES THE RIGHT TO REQUIRE SUPPLEMENTAL PLANTINGS IN ADDITION TO THOSE SHOWN ON THE LANDSCAPE PLAN BASED ON ACTUAL FIELD CONDITIONS.
- NO CHANGES TO ANY ASPECT OF THIS SITE PLAN, INCLUDING BUT NOT LIMITED TO LANDSCAPING, GRADING, BUILDING ELEVATIONS (ESPECIALLY COLOR), LIGHTING, OR UTILITIES WILL BE MADE WITHOUT THE APPROVAL OF THE TECHNICAL REVIEW COMMITTEE OF THE TOWN OF KNIGHTDALE.
- ALL EXTERIOR SITE LIGHTING WILL BE DESIGNED TO PREVENT OFF-SITE GLARE.
- THE SITE SHALL BE STABILIZED AND SEEDED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO).
- ALL ABOVE GROUND UTILITY EQUIPMENT (AND FACILITIES ASSOCIATED WITH ON-SITE ELECTRIC, TELEPHONE, GAS, CABLE, OR OTHER SIMILAR UTILITY) AND ENCLOSED TRASH CONTAINMENT SHALL BE SCREENED BY THE ELEMENTS OF A TYPE B (SEMI-OPAQUE) BUFFER YARD TO A SIX (6) FEET IN HEIGHT OR THE HEIGHT OF THE UTILITY OR ENCLOSURE, WHICHEVER IS LESS.
- ALL RIP RAP PADS, DETENTION PONDS, AND OTHER STORMWATER RELATED DEVICES SHALL BE SCREENED WITH EVERGREEN PLANTINGS TO REDUCE VISUAL IMPACT FROM OFF-SITE.
- NO TREE SHALL BE LOCATED WITHIN TEN FEET OF A LIGHT POLE OR 12 FEET FROM ELECTRICAL TRANSFORMERS.
- THIS PLAN IS FOR PLANTING PURPOSES ONLY. FOR INFORMATION REGARDING ROAD WORK GEOMETRY, GRADING, WALLS, UTILITIES, ETC., REFER TO THE CIVIL DRAWINGS.
- ALL PLANTS AND PLANTING PROCEDURES SHALL MEET OR EXCEED A.N.L.A. STANDARDS AS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK", 2004 OR LATER EDITION.
- ALL TREES AND SHRUBS SHALL BE FULL, WELL-BRANCHED PLANTS WHICH ARE CHARACTERISTIC TO THE SPECIES.
- ALL CANOPY TREES TO BE A MINIMUM OF 2" CALIPER AND 8' HEIGHT, ALL UNDERSTORY TREES 1 1/2" CALIPER, 8' HEIGHT AND SHRUBS 18", 3 GAL. CONTAINER AT TIME OF INSTALLATION.
- NO FENCING SHALL BE PLACED WITHIN BUFFER AREAS UNLESS INSTALLED AT ONE TIME FOR THE ENTIRE LENGTH OF THE BUFFER OR STREETScape. NEITHER INDIVIDUAL LOT OWNERS NOR THE H.O.A. SHALL INSTALL FENCES IN A PIECEMEAL FASHION. PRIOR TO PLACING A FENCE IN A BUFFER OR STREETScape, THE FENCE SHALL BE SUBMITTED TO AND APPROVED BY THE TOWN OF KNIGHTDALE.
- PLANT MATERIAL LOCATED WITHIN A REQUIRED SIGHT DISTANCE MAINTENANCE EASEMENT SHALL BE MAINTAINED AT A HEIGHT LESS THAN 24 INCHES OR LIMBED UP TO A MINIMUM HEIGHT OF SIX FEET.
- ALL PLANT BEDS TO BE MULCHED WITH A MINIMUM OF 3" OF CLEAN PINE STRAW OR SHREDDED HARDWOOD BARK AT THE DISCRETION OF THE DEVELOPER. ALL PLANT GROUPINGS SHALL BE MULCHED AS ONE BED.
- RESIDENTIAL LANDSCAPING:
 - EACH SINGLE-FAMILY OR DUPLEX LOT SHALL CONTAIN A MINIMUM OF ONE (1) CANOPY TREE FOR EACH TWO THOUSAND (2,000) SQUARE FEET OF LOT AREA OR FRACTION THEREOF UP TO 20,000 SQUARE FEET IN LOT AREA. ANY PORTION OF THE RESIDENTIAL LOT OCCUPIED BY A RECORDED UTILITY EASEMENT SHALL NOT BE INCLUDED AS PART OF THE TOTAL LOT AREA. THE LOCATION OF PLANTING TO ACCOUNT FOR PHYSICAL CONDITIONS MAY BE ADJUSTED BY THE ADMINISTRATOR.
 - THE USE OF EXISTING TREES MEETING THE FOLLOWING STANDARDS TO SATISFY THIS REQUIREMENT IS ENCOURAGED. EXISTING LARGE SHADE TREES OVER SIX (6) INCHES IN CALIPER AS MEASURED AT DBH (DIAMETER BREAST HEIGHT) MAY BE COUNTED TOWARDS FULFILLING THIS REQUIREMENT.
 - REQUIRED STREET TREES MAY NOT BE COUNTED TOWARDS THE FULFILLMENT OF THIS RESIDENTIAL LANDSCAPING REQUIREMENT. APART FROM REQUIRED STREET TREES, ALL OTHER TREES REQUIRED UNDER THIS CHAPTER SHALL BE PLANTED WITHIN THE PRIVATE LOT.
 - A LIGHTING PLAN SHALL BE SUBMITTED BY THE UTILITY PROVIDER TO KNIGHTDALE DEVELOPMENT SERVICES 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.



KNIGHTDALE UDO REQUIREMENTS

- STREET TREE PLANTINGS**
- CANOPY TREES SHALL BE INSTALLED AT A MINIMUM AVERAGE DISTANCE OF 40 FEET ON CENTER IN A PLANTING STRIP MINIMUM OF FIVE FEET IN WIDTH. WHERE OVERHEAD UTILITIES EXIST PRIOR TO DEVELOPMENT, AND ARE IN CONFLICT WITH PROPOSED CANOPY TREES, UNDERSTORY TREES MAY BE SUBSTITUTED WITH APPROVAL.
 - IF UNDERSTORY TREES SUBSTITUTED, THEY HAVE TO BE PLANTED 20 FEET ON CENTER AND SPECIES SHALL BE APPROVED BY THE TOWN OF KNIGHTDALE PRIOR TO INSTALLATION.
 - STREET TREES SHALL BE PLACED AT LEAST 10 FEET FROM LIGHT POLES AND 12 FEET FROM ELECTRICAL TRANSFORMERS.
 - STREET TREES SHALL BE DECIDUOUS HARDWOODS.
 - ANY ABOVE GROUND UTILITIES HAVE TO BE SCREENED IN ACCORDANCE WITH UDO SECTION 8.7.

KNIGHTDALE STATION R-4: INTERNAL STREETScape PLANT SCHEDULE

PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
CANOPY STREET TREES	34	CCA	Carpinus caroliniana	American Hornbeam / Ironwood	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
	36	GBA	Ginkgo biloba 'Autumn Gold'	Autumn Gold Ginkgo	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
	50	PCH	Pistacia chinensis	Chinese Pistache	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
	19	QLA	Quercus acutifolia	Sawtooth Oak	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
	26	QPH	Quercus phellos	Willow Oak	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
CANOPY TREES (EVERGREEN)	2	LPA	Ulmus parvifolia 'Allee'	Allee Lacebark Elm	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)
	29	ZSM	Zelkova serrata 'ZSFKF'	Myriam Japanese Zelkova	B&B	2" CAL. MIN.	8' MIN.	MATCHED (47 O.C.)

KNIGHTDALE STATION R-4 AND R6-D: TREE REPLACEMENT PLANT SCHEDULE

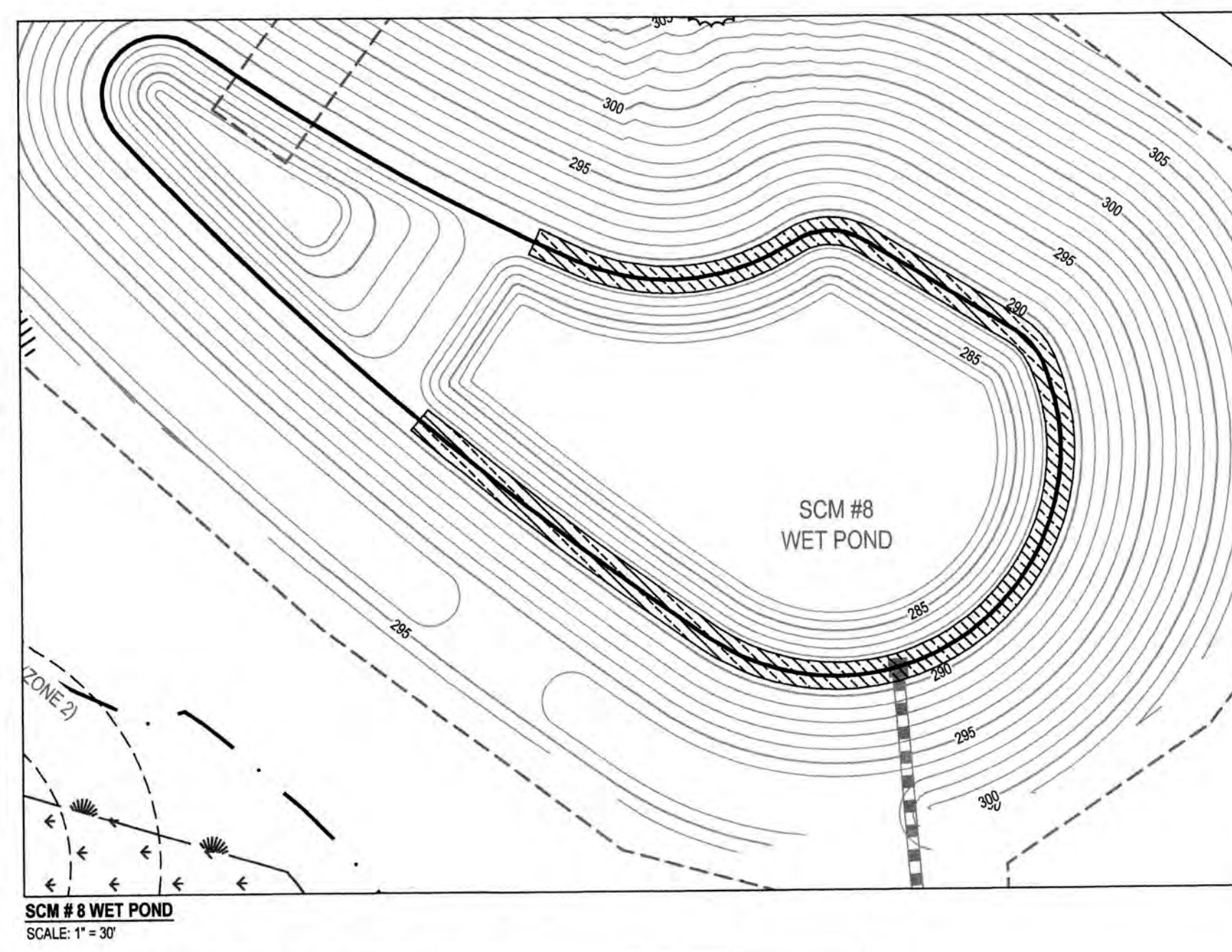
PLANT TYPE	QTY	KEY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	HEIGHT	NOTES
CANOPY TREES (DECIDUOUS)	21	ARO	Acer rubrum 'October Glory'	October Glory Maple	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	16	LIT	Liriodendron tulipifera	Tulip Poplar	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	17	QUS	Quercus shumardii	Shumard Oak	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	18	NYS	Nyssa sylvatica	Black Gum	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	19	PAB	Platanus x acerifolia 'Bloodgood'	London Plane Tree	B&B	2" CAL. MIN.	8' MIN.	MATCHED
CANOPY TREES (EVERGREEN)	14	CDO	Cedrus deodara	Deodar Cedar	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	14	MAG	Magnolia grandiflora	Southern Magnolia	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	18	PIT	Pinus taeda	Loblolly Pine	B&B	2" CAL. MIN.	8' MIN.	MATCHED
	15	INS	Ilex x Nellore R. Stevens'	Nellore Stevens Holly	B&B	2" CAL. MIN.	8' MIN.	MATCHED

TREE REPLACEMENT QUANTITY CALCULATIONS FOR PHASE R4
REFER TO SHEET 2.0 OVERALL SITE PLAN FOR TREE REPLACEMENT CALCULATIONS.

TOTAL TREE REPLACEMENT REQUIRED = 135
40% EVERGREEN PROVIDED = 54
60% DECIDUOUS PROVIDED = 81

TREE REPLACEMENT QUANTITY CALCULATIONS FOR PHASE R6-D
REFER TO SHEET 2.0 OVERALL SITE PLAN FOR TREE REPLACEMENT CALCULATIONS.

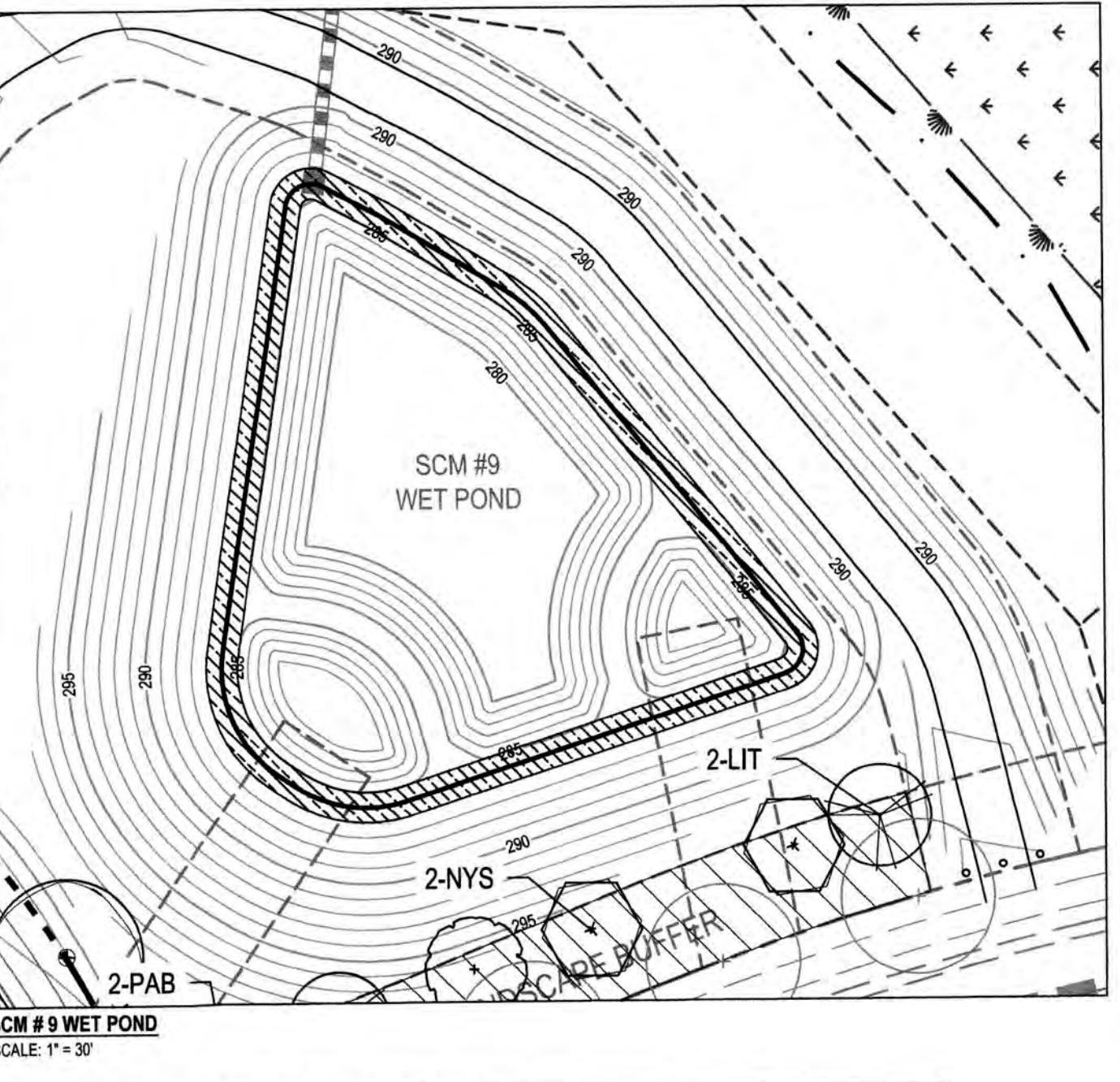
TOTAL TREE REPLACEMENT REQUIRED = 17
40% EVERGREEN PROVIDED = 7
60% DECIDUOUS PROVIDED = 10



VEGETATED SHELF = 2,000 SF w/ 50 HERB. PLANTS / 200 SF = 500 PLANTS

PLANT TYPE	QTY	BOTANICAL NAME	COMMON NAME	ROOT	NOTES
HERBACEOUS	83	Asclepias incarnata	Swamp Milkweed	CONT.	MIN. 24" - 36" O.C.
	83	Carex tenax	Quill Sedge	CONT.	MIN. 24" - 36" O.C.
	83	Eupatoriadelphus fistulosus	Joe Pye Weed	CONT.	MIN. 24" - 36" O.C.
	83	Lobelia cardinalis	Cardinal Flower	CONT.	MIN. 24" - 36" O.C.
	84	Rhynchospora colorata	Starrush White-top	CONT.	MIN. 24" - 36" O.C.
84	Saccharum baldwinii	Narrow Plumegrass	CONT.	MIN. 24" - 36" O.C.	

- NOTES:**
- ON THE DAM AND DAM EMBANKMENT SLOPES, TURF GRASS PROVIDES STABILITY AND ENHANCES ACCESS TO THE FACILITY FOR MAINTENANCE. DEQ RECOMMENDS PERENNIAL GRASSES SUCH AS HYBRID BERMLUDA OR CENTPEDE IN THE COASTAL PLAIN AND PIEDMONT, AND COOL SEASON TURF GRASS SUCH AS FESCUE AND BLUEGRASS IN THE MOUNTAINS. WEEPING LOVE GRASS IS NOT ALLOWED BECAUSE IT DOES NOT PROVIDE LONG TERM SLOPE STABILIZATION.
 - THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS; TREES AND SHRUBS SHALL NOT BE ALLOWED.
 - THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF (3) DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 SQUARE FEET OF SHELF AREA.



VEGETATED SHELF = 2,205 SF w/ 50 HERB. PLANTS / 200 SF = 552 PLANTS

PLANT TYPE	QTY	BOTANICAL NAME	COMMON NAME	ROOT	NOTES
HERBACEOUS	92	Asclepias incarnata	Swamp Milkweed	CONT.	MIN. 24" - 36" O.C.
	92	Carex tenax	Quill Sedge	CONT.	MIN. 24" - 36" O.C.
	92	Eupatoriadelphus fistulosus	Joe Pye Weed	CONT.	MIN. 24" - 36" O.C.
	92	Lobelia cardinalis	Cardinal Flower	CONT.	MIN. 24" - 36" O.C.
	92	Rhynchospora colorata	Starrush White-top	CONT.	MIN. 24" - 36" O.C.
92	Saccharum baldwinii	Narrow Plumegrass	CONT.	MIN. 24" - 36" O.C.	

ALL BERMS SHALL NOT EXCEED:

- A SLOPE WITH MAXIMUM RISE OF ONE (1) FOOT TO A RUN OF TWO (2) FEET.
- A MAXIMUM HEIGHT OF FOUR (4) FEET 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 FOUR (4) FEET SHALL BE APPROVED BY THE ADMINISTRATOR OR A CASE BY CASE BASIS, BUT SHALL CONFORM TO THE SLOPE AND WIDTH RESTRICTIONS AS PREVIOUSLY DETAILED.

MINIMUM PLANTING REQUIREMENTS

TOTAL LENGTH OF BUFFER ALONG MORNING FLYER WAY = 780 LF.

CANOPY TREES (3 PER 100 LF.)
MIN. HEIGHT = 8' MIN.
INSTALLED SIZE = 2" CAL.
TOTAL TREES PROVIDED = 23

SHRUBS (20 PER 100 LF.)
80% OF ALL NEW SHRUBS SHALL BE EVERGREEN
MATURE HEIGHT = 6'
INSTALLED SIZE = 18"
TOTAL SHRUBS PROVIDED = 152

UNDERSTORY TREES (5 PER 100 LF.)
40% (MAX. 60%) OF ALL NEW TREES SHALL BE EVERGREEN
MATURE HEIGHT = 10-15 FT. OR HIGHER
INSTALLED SIZE = 1 1/2" CALIPER & 8" HT.
TOTAL UNDERSTORY TREES PROVIDED = 38

MINIMUM PLANTING REQUIREMENTS

TOTAL LENGTH OF BUFFER SEGMENT A = 466 LF.

CANOPY TREES (3 PER 100 LF.)
MIN. HEIGHT = 8' MIN.
INSTALLED SIZE = 2" CAL.
TOTAL TREES PROVIDED = 14

SHRUBS (20 PER 100 LF.)
80% OF ALL NEW SHRUBS SHALL BE EVERGREEN
MATURE HEIGHT = 6' HT.
INSTALLED SIZE = 18" HT.
TOTAL SHRUBS PROVIDED = 94

UNDERSTORY TREES (5 PER 100 LF.)
40% (MAX. 60%) OF ALL NEW TREES SHALL BE EVERGREEN
MATURE HEIGHT = 10-15 FT. OR HIGHER
INSTALLED SIZE = 1 1/2" CALIPER & 8" HT.
TOTAL UNDERSTORY TREES PROVIDED = 23

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: *[Signature]* DATE: 8-31-2018
DEVELOPMENT SERVICES ENGINEER

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

BY: *[Signature]* DATE: 8-24-19
ADMINISTRATOR

PUBLIC SEWER COLLECTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC SEWER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #

AUTHORIZATION TO CONSTRUCT

DATE

PUBLIC WATER DISTRIBUTION/EXTENSION SYSTEM

THE CITY OF RALEIGH CONSENTS TO THE CONNECTION AND EXTENSION OF THE CITY'S PUBLIC WATER SYSTEM AS SHOWN ON THIS PLAN. THE MATERIAL AND CONSTRUCTION METHODS USED FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY'S PUBLIC UTILITIES HANDBOOK.

CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PERMIT #

AUTHORIZATION TO CONSTRUCT

DATE

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

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KNIGHTDALE STATION
R6D AND R4

TOWN OF KNIGHTDALE, NORTH CAROLINA

LANDSCAPE DETAILS

Job No. 02090251.6 Drawn by W&R
Date 06/08/2018 Designer W&R

Revisions

1	1st TOK Comments	08/31/18